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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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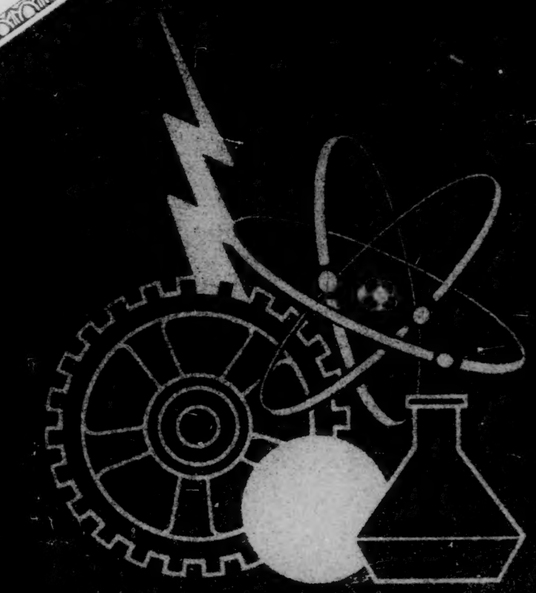
DEPARTMENT OF COMMERCE · UNITED STATES · 75 · Stimulating America's Progress 1913-1988

PATENTS

March 1, 1988

U.S.
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The Patent and Trademark Office, itself preparing for its 200th anniversary celebration, wishes the U.S. Department of Commerce a very happy 75th birthday.

The Department of Commerce was established on March 4, 1913. The Patent Office, having been a bureau of the Department of State and, subsequently, the Department of the Interior, was transferred to the Commerce Department in 1925.

The Patent and Trademark Office has continued to work in harmony with its sister agencies to bring to fruition Departmental goals. Our more significant role in this respect includes efforts

- to increase America's competitiveness in the world economy by strengthening worldwide protection of intellectual property;
- to stimulate productivity and economic development by promoting the development and application of science and technology in U.S. industries and by reducing patent pendency and improving patent quality; and
- to improve service delivery and internal management by automating the patent and trademark processes.

Three quarters of a century and twenty-seven Commerce Secretaries later, more than 33,000 dedicated employees certainly dispell the characterization of the Department by Oscar S. Straus, the Secretary of Commerce and Labor from 1906 to 1909. He told Herbert Hoover, Secretary of Commerce from 1921 to 1928, that the office required only a couple of hours of work a day and "no other qualification than to be able to put the fish to bed at night and turn on the lights around the coast."

Congratulations!

Donald J. Quigg
Assistant Secretary and Commissioner
of Patents and Trademarks

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UNITED STATES PATENT AND TRADEMARK OFFICE
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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Mar. 15, 1988, and was announced in the *Official Gazette* at 1087 O.G. 24 on Feb. 16, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	
—If paid before Mar. 15, 1988	1180.00
—If paid on or after Mar. 15. 1988	1300.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Jan. 21, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on February 26, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,501,023 through 4,502,152
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 13, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,419,773	06/357,731	12/13/83
4,419,779	06/366,718	12/13/83
4,419,780	06/228,774	12/13/83
4,419,785	06/332,951	12/13/83
4,419,786	06/223,398	12/13/83
4,419,791	06/447,312	12/13/83
4,419,795	06/293,108	12/13/83
4,419,799	06/343,381	12/13/83
4,419,800	06/227,137	12/13/83
4,419,803	06/444,671	12/13/83
4,419,812	06/410,674	12/13/83
4,419,837	06/276,877	12/13/83
4,419,840	06/294,512	12/13/83
4,419,842	06/346,416	12/13/83
4,419,856	06/325,060	12/13/83
4,419,871	06/326,369	12/13/83
4,419,876	06/215,915	12/13/83
4,419,878	06/295,082	12/13/83
4,419,881	06/374,830	12/13/83
4,419,883	06/353,609	12/13/83
4,419,885	06/379,397	12/13/83
4,419,890	06/244,301	12/13/83
4,419,893	06/399,942	12/13/83
4,419,900	06/320,873	12/13/83
4,419,904	06/306,179	12/13/83
4,419,911	06/265,230	12/13/83
4,419,936	06/408,317	12/13/83
4,419,943	06/387,872	12/13/83
4,419,950	06/354,797	12/13/83
4,419,954	06/378,788	12/13/83
4,419,959	06/427,152	12/13/83
4,419,966	06/351,370	12/13/83
4,419,967	06/430,692	12/13/83
4,419,969	06/311,103	12/13/83
4,419,978	06/375,292	12/13/83
4,419,979	06/244,308	12/13/83
4,419,982	06/376,297	12/13/83
4,419,983	06/305,972	12/13/83
4,419,989	06/251,184	12/13/83
4,419,990	06/236,109	12/13/83
4,419,997	06/467,614	12/13/83
4,420,005	06/438,011	12/13/83
4,420,007	06/338,267	12/13/83
4,420,011	06/328,606	12/13/83
4,420,013	06/320,663	12/13/83
4,420,022	06/251,327	12/13/83
4,420,024	06/308,913	12/13/83
4,420,030	06/401,156	12/13/83
4,420,035	06/434,672	12/13/83
4,420,043	06/277,572	12/13/83
4,420,044	06/409,511	12/13/83
4,420,046	06/284,797	12/13/83
4,420,049	06/396,248	12/13/83
4,420,054	06/314,166	12/13/83
4,420,058	06/276,083	12/13/83
4,420,060	06/257,177	12/13/83
4,420,070	06/353,873	12/13/83
4,420,071	06/303,929	12/13/83
4,420,075	06/252,510	12/13/83
4,420,082	06/414,585	12/13/83
4,420,084	06/378,645	12/13/83
4,420,088	06/315,926	12/13/83
4,420,096	06/273,003	12/13/83
4,420,098	06/319,946	12/13/83
4,420,099	06/272,122	12/13/83
4,420,111	06/402,224	12/13/83

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Patent Number	Serial Number	Issue Date	4,420,329	06/319,565	12/13/83
			4,420,359	06/290,358	12/13/83
4,420,112	06/260,592	12/13/83	4,420,367	06/368,515	12/13/83
4,420,113	06/383,125	12/13/83	4,420,375	06/297,228	12/13/83
4,420,124	06/412,600	12/13/83	4,420,380	06/242,091	12/13/83
4,420,131	06/317,785	12/13/83	4,420,394	06/318,954	12/13/83
4,420,136	06/271,485	12/13/83	4,420,401	06/275,856	12/13/83
4,420,141	06/296,405	12/13/83	4,420,411	06/384,961	12/13/83
4,420,143	06/330,895	12/13/83	4,420,417	06/403,067	12/13/83
4,420,152	06/291,773	12/13/83	4,420,423	06/345,666	12/13/83
4,420,164	06/339,729	12/13/83	4,420,438	06/328,860	12/13/83
4,420,168	06/386,908	12/13/83	4,420,472	06/430,947	12/13/83
4,420,169	06/373,419	12/13/83	4,420,476	06/380,973	12/13/83
4,420,174	06/330,349	12/13/83	4,420,488	06/243,618	12/13/83
4,420,175	06/218,506	12/13/83	4,420,513	06/295,023	12/13/83
4,420,182	06/321,127	12/13/83	4,420,519	06/426,938	12/13/83
4,420,183	06/393,593	12/13/83	4,420,521	06/361,755	12/13/83
4,420,185	06/291,055	12/13/83	4,420,547	06/303,867	12/13/83
4,420,186	06/271,307	12/13/83	4,420,557	06/436,581	12/13/83
4,420,192	06/266,755	12/13/83	4,420,569	06/483,898	12/13/83
4,420,197	06/259,412	12/13/83	4,420,573	06/359,054	12/13/83
4,420,198	06/277,239	12/13/83	4,420,578	06/302,303	12/13/83
4,420,199	06/316,622	12/13/83	4,420,625	06/421,925	12/13/83
4,420,200	06/253,725	12/13/83	4,420,641	06/457,335	12/13/83
4,420,211	06/291,797	12/13/83	4,420,651	06/294,035	12/13/83
4,420,216	06/292,039	12/13/83	4,420,652	06/297,411	12/13/83
4,420,217	06/450,322	12/13/83	4,420,664	06/460,049	12/13/83
4,420,227	06/325,492	12/13/83	4,420,665	06/418,441	12/13/83
4,420,230	06/314,799	12/13/83	4,420,667	06/390,409	12/13/83
4,420,231	06/378,854	12/13/83	4,420,680	06/373,845	12/13/83
4,420,238	06/369,809	12/13/83	4,420,681	06/374,423	12/13/83
4,420,245	06/382,617	12/13/83	4,420,710	06/292,749	12/13/83
4,420,255	06/302,892	12/13/83	4,420,734	06/356,906	12/13/83
4,420,269	06/348,090	12/13/83	4,420,739	06/297,630	12/13/83
4,420,277	06/303,328	12/13/83	4,420,741	06/297,530	12/13/83
4,420,278	06/234,745	12/13/83	4,420,745	06/328,646	12/13/83
4,420,283	06/304,646	12/13/83	4,420,755	06/295,034	12/13/83
4,420,287	06/260,770	12/13/83	4,420,759	06/238,556	12/13/83
4,420,296	06/386,918	12/13/83	4,420,768	06/324,586	12/13/83
4,420,298	06/288,298	12/13/83	4,420,779	06/292,912	12/13/83
4,420,302	06/321,724	12/13/83	4,420,802	06/484,890	12/13/83
4,420,303	06/321,700	12/13/83	4,420,815	06/264,510	12/13/83
4,420,308	06/384,074	12/13/83	4,420,818	06/243,078	12/13/83
4,420,317	06/316,354	12/13/83	4,420,834	06/272,441	12/13/83
4,420,328	06/342,879	12/13/83	4,420,836	06/270,763	12/13/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,397,346	06/268,722	8/9/83	6/1/81	2/1/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,176,316, Re. S.N. 004,369, Filed Jan. 15, 1987, Cl. 380/32, SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER, Louis A. De Rosa, Owner of Record: *International Telephone Telegraph Corp., Nutley, N.J.,* Attorney or Agent: Paul W. Hemminger, et al., Ex. Gp.: 222

4,555,980, Re. S.N. 127,888, Filed Dec. 2, 1987, Cl. 92/88, SEALING DEVICE FOR A PRESSURE FLUID CYLINDER WITHOUT PISTON ROD, Ingolf Hoglund, Owner of Record: *AB Mecman, Stockholm, Sweden,* Attorney or Agent: Jack F. Kramer, et al., Ex. Gp.: 341

4,651,558, Re. S.N. 125,578, Filed Nov. 25, 1987, Filed 73/40.5R, METHOD AND APPARATUS FOR INSPECTING LATERAL LINES, Kenneth R. Guthrie, et al., Owner of Record: *Cues, Inc., Orlando, Fla.,* Attorney or Agent: Ira C. Edell, et al., Ex. Gp.: 265

4,664,743, Re. S.N. 127,283, Filed Dec. 1, 1987, Cl. 156/113, GROWTH OF SEMI-CONDUCTORS AND APPARATUS FOR USE THEREIN, Rodney H. Moss, et al., Owner of Record: *British Telecommunications, London, England,* Attorney or Agent: Arthur R. Crawford, et al., Ex. Gp.: 113

4,676,142, Re. S.N. 110,686, Filed Oct. 20, 1987, Cl. 92/130R, ADAPTER WITH MODULAR COMPONENTS FOR A ROBOT END-OF-ARM INTERCHANGEABLE TOOLING SYSTEM, Peter E. McCormick, et al., Owner of Record: *EOA System Inc., Dallas, Tex.,* Attorney or Agent: Kenneth R. Glaser, et al., Ex. Gp.: 341

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 292,913, Reexam. No. 90/001,418, Requested: Jan. 6, 1988, Cl. D13/8, BATTERY PACK, Richard Shaper, Owner of Record: *Inventor, Old Brookville, N.Y.,* Attorney or Agent: Jacobs & Jacobs, Ex. Gp.: 290, Requester: Owner

4,495,030, Reexam. No. 90/001,419, Requested: Jan. 11, 1988, Cl. 162/145, FILTER PAPERS, Robert D. Giglia, Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Frank M. Van Riet, Ex. Gp.: 150, Requester: Owner

4,565,727, Reexam. No. 90/001,420, Requested: Jan. 11, 1988, Cl. 428/172, NON-WOVEN ACTIVATED CARBON FABRIC, Robert D. Giglia, et al., Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Frank M. Van Riet, Ex. Gp.: 150, Requester: Owner

4,604,359, Reexam. No. 90/001,417, Requested: Jan. 12, 1988, Cl. 435/253, MICROBIAL EXPRESSION OF A GENE FOR HUMAN GROWTH HORMONE, David V. Goeddel, et al., Owner of Record: *Genentech Inc., San Francisco, Calif.,* Attorney or Agent: Lyon & Lyon, Ex. Gp.: 120, Requester: Owner

Request for Comments on the Proposal for the Harmonization of Unity of Invention Practice Among the Trilateral Offices (The U.S. Patent & Trademark Office, The European Patent Office and the Japanese Patent Office)

Harmonization of restriction practice, or unity of invention practice, as it is called internationally, is presently being pursued within the Trilateral Cooperation Effort involving the U.S. Patent and Trademark Office (USPTO), the European Patent Office (EPO) and the Japanese Patent Office (JPO). The purpose of this notice is to solicit public comment on the most recent draft proposal of the harmonization of unity of invention practice among the USPTO, the EPO and the JPO. The Jan. 12, 1988 draft Trilateral harmonization proposal on unity of invention practice appears immediately after this notice.

Purpose of Harmonization

The purpose of the harmonization of unity of invention practice is to develop a single specific definition of unity of invention which will be the same in all three Trilateral offices. This should simplify and facilitate the filing and prosecution of patent applications in all three offices for patent applicants. The aim of the harmonization proposal is to provide a unity of invention practice which is well-defined, reasonable, logical and workable and as uniformly applied as possible in all three offices. A harmonized unity of invention practice will effectively serve the needs of the patent applicants and attorneys and will benefit those who seek patent protection in each of the three offices because they would not have to comply with different requirements. It is anticipated that if the USPTO adopts a harmonized proposal as outlined herein, the unity of invention practice would be uniformly applied to all applications, including international applications filed under the Patent Cooperation Treaty (PCT).

Efforts to Date

Work on harmonization of unity of invention practice initially involved a comparative study of the unity of invention practice currently used in each of the three offices for PCT and national or regional applications. The EPO, as the lead office for the unity of invention project, prepared a comparative study report based on the national reports provided by each office. The comparative study report was discussed at the Fourth Trilateral Conference held in Jan. of 1987. After consultation with various members of the U.S. patent bar during a meeting held in Dec. of 1986, the USPTO, at the Jan. 1987 Trilateral Conference, agreed with the EPO and the JPO to use the EPO unity of invention practice as the basis for harmonization discussions and to exchange proposals for the harmonization and simplification of the unity of invention practices. The harmonization proposals were also discussed at the Trilateral Meetings held in Sept. and Nov. of 1987. Subsequent to the Nov. Trilateral Meeting, the EPO prepared a draft harmonization proposal which reflected the EPO's views of the results of the Nov. Trilateral Meeting. This draft harmonization proposal was discussed with an ad hoc committee of the American Intellectual Property Law Association (AIPLA) in Dec. of 1987. However, there was not enough time to fully review this draft harmonization proposal with all members of the U.S. patent bar between the Nov. 1987 Trilateral Meeting and the Fifth Trilateral Conference held Jan. 11-15, 1988. Comments on the draft harmonization proposal from the USPTO and the JPO were submitted to the EPO and discussed at the Jan. 1988 Trilateral Conference. At the Jan. 1988 Trilateral Conference, the USPTO reserved the right to modify its position on the harmonization proposal after further consultation with the private sector. The attached draft harmonization proposal for unity of invention practice was the result of the discussions at the Fifth Trilateral Conference and was drafted by the EPO. Further discussions will be held at the June 1988 Trilateral Technical Meeting. The three offices agreed that after each office completes consultations with its private sector, the harmonization proposal will be further discussed and finalized, if possible, at the next Trilateral Conference scheduled for the fall of 1988.

The USPTO has consulted with representatives and experts of the U.S. patent bar as harmonization relating to unity of invention has proceeded. Such consultations will continue as harmonization efforts progress. It should be noted however that any modifications in the harmonization proposal must also be acceptable to the EPO and JPO in order to be adopted.

Date: Any comments and suggestions on the harmonization proposal should be received by May 9, 1988.

Address: Address written comments and suggestions to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 to the attention of R. Franklin Burnett, Crystal Plaza 3-11A13. For further information contact R. Franklin Burnett by telephone at (703) 557-3054.

Analysis of Proposal

The unity of invention proposal being considered in the Trilateral harmonization effort is based on a single general inventive concept and involves specific guidelines in the following areas:

1. Different categories of invention;
2. Independent claims of the same category including genus/species and combination/subcombination;
3. Markush practice;
4. Intermediate/final products; and
5. Procedural aspects.

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The harmonization proposal contains certain general principles applicable to all the areas noted above. Basic rules and guidelines are set forth for each of the above-noted areas in the attached draft harmonization proposal.

General Principles

Section (A), General Principles, sets forth the principle that an application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept. The same language is set forth in PCT Rule 13.1. The determination of whether there is a single general inventive concept would be based on the extent to which there is a close technical interrelationship between the inventions claimed. Adoption of the harmonization proposal would eliminate the current USPTO practice of determining whether multiple inventions are claimed in an application based on the independent/distinct standard of 35 U.S.C. 121 and substitute a standard based on whether a single general inventive concept is being recited in all of the claims of an application, which standard would be uniformly applied in all applications, including international applications filed under the PCT.

Different Categories of Invention

Section (B)(1) relates to different categories of invention. The basic rule of this section permits different categories of invention (product, process, apparatus, use) to be claimed in a single application provided they are so linked as to form a single general inventive concept. In order for the requirement of a single general inventive concept to be satisfied all the claims of the different categories must include one or more of the same or corresponding special technical feature(s) thereby establishing a close technical interrelationship between the inventions of different categories. The expression "special technical features" means those technical features which define the contribution(s) which the invention makes over the prior art. The three combinations of claims to different categories of invention listed in PCT Rule 13.2 are included in the basic rule. However, the terms "specially adapted" and "specifically designed" are defined in the guidelines in more detail than presently exists with respect to PCT Rule 13.2. The basic rule clearly points out that other combinations, including claims of different scope to different categories of invention are acceptable provided that the claims are so linked as to form a single general inventive concept as defined in section (B)(1)(a). Adoption of the harmonization proposal would eliminate the "distinctness" criteria as applied to the current USPTO practice for national applications and substitute an analysis of a single general inventive concept, which analysis would be uniformly applied to all applications, including international applications filed under the PCT.

Claims to the Same Catergory of Invention

Section (B)(2) relates to claims to the same category of invention. Genus/species, combination/subcombination and independent claims to the same category have been grouped together under this section of the harmonization proposal since the approach and criteria for determining unity of invention are the same for claims of these types. The basic rule of this section points out that the basic test for unity is the same for claims to the same category as in the case of claims to different categories of invention, i.e., in order for the requirement of a single general inventive concept to be satisfied all of the claims must include one or more of the same or corresponding special technical feature(s) thereby establishing a close technical interrelationship between the inventions. The determination of unity of invention is the same whether the different inventions are claimed in different claims or as alternatives in a single claim. The standard for determining unity of invention would be uniformly applied to all applications, including international applications filed under the PCT.

Markush

Section (C)(I) relates to Markush practice. The basic rule of this section sets forth that in order for the requirement of a single general inventive concept to be satisfied a claim must cover alternatives that (a) are of a similar nature and (b) do not make the claim obscure or difficult to construe. In order to determine whether chemical or non-chemical alternatives are of a similar nature, the test set forth in the basic rule for claims to the same category (section (B)(2)(a)) is applied, that is, do all the claims include one or more of the same or corresponding special technical feature(s) thereby establishing a close technical interrelationship between the inventions? When the Markush grouping is for alternatives of chemical compounds, they satisfy the basic rules in section (B)(2)(a) and are of a similar nature when the criteria set forth in the guidelines are satisfied. The standard for determining unity of invention would be uniformly applied to all applications, including international applications filed under the PCT.

Intermediate and Final Products

Section (C)(II) relates to intermediate and final products. Two alternatives to the basic rule in this section are set forth. Both of the alternatives are under further consideration by the Trilateral offices. Both of the alternatives would permit applications to contain claims which have the relationship of being intermediate and final products. In order for the requirement of a single general inventive concept to be satisfied under the two alternatives, (a) the intermediate and final products must exhibit the same essential structural element and (b) the intermediate and final products must be in close interrelationship. The first alternative differs from the second alternative in that the first alternative sets forth the criteria that if the intermediate has a separate patentability, the intermediate and final product relationship no longer exists. Unity is then determined according to the criteria set forth for claims to the same category. Under the second alternative, the fact that the intermediate has a separate patentability would not affect the determination of unity of invention according to the criteria set forth for intermediate and final products. Adoption of the harmonization proposal would eliminate the current USPTO one way distinctness test and substitute an analysis of the degree to which a close interrelationship and the same essential structural element are present, which analysis would be uniformly applied to all applications, including international applications filed under the PCT.

Procedural Matters

Section (D) relates to the manner of examination and other procedural matters and would permit the current USPTO practice on matters such as the filing of divisional applications and determination of the elected invention. An office could grant applicant the right to file a divisional application as the result of a holding of lack of unity of invention at any time up to at least the time when the parent application is in order for a grant. Section (D)(3)(b) has been bracketed upon request by the JPO. The three Trilateral offices have not yet agreed to this particular section. The JPO requested additional time to further consider this section and indicated that it must, for the time being, reserve any commitment to the language set forth in this section.

Change in United States Law

The present U.S. patent laws and rules governing restriction practice on the basis of "independent and distinct inventions" will have to be changed in order to adopt the unity of invention practice set forth in the harmonization proposal which is governed by the "single general inventive concept". A change in U.S. law will be required for two purposes. A change is needed in the present 35 U.S.C. 121, which permits restriction for "independent and distinct" inventions to assure that there is authority in the statute for the type of unity of invention practice set forth in the draft harmonization proposal, including a revised U.S. Markush practice. Second, the change in the U.S. restriction practice may increase the average burden per application required to examine and process certain types of applications and reduce the total number of applications that are filed although the number of claims and scope of subject matter claimed would remain the same or even increase. Accordingly, fee income would fall and statutory fee increases would be required to offset these impacts. In addition to changes in Title 35 of the U.S. Code, appropriate changes will be made in the rules relating to unity of invention practice involving both national applications and international applications.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Feb. 2, 1988.

* * * * *

Draft

Project 12.1
Trilateral Proposals for Harmonization of Unity of Invention Practice

(A) General Principles

(1) A patent application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept (requirement of unity of invention).
(2) A plurality of inventions may be claimed in separate claims or as alternatives within a single claim. In either case, the determination whether there is a single general inventive concept should be based on the extent to which there is a close technical interrelationship between the inventions claimed.
(3) An objection of lack of unity may be raised at any stage in the procedure relating to a patent application i.e. a priori before a search has been made or a posteriori after a partial or complete search. However lack of unity is not a ground of objection against a granted patent and a patent may not be held invalid because the examiner failed to object where unity was lacking.
(4) If the different inventions fall within the Basic rules set forth below which apply the General Principles, then unity of invention is present. If, on the other hand, the inventions do not fall within the Basic rules, an objection of lack of unity is proper.

(B) Application of the General Principles (A) to Different Combinations of Claims

(1) Claims to different categories

Basic rules

(a) Claims to different categories of inventions are so linked as to form a single general inventive concept when all of the claims of the different categories include one or more of the same or corresponding special technical feature(s) thereby establishing a close technical interrelationship between the inventions of different categories. The expression "special technical features" means those technical features which define the contribution(s) which the invention makes over the prior art.
(b) Claims for the following combinations of different categories of invention satisfy the above requirements and thus have unity of invention. This does not imply that other combinations, including combinations in which the claims in the different categories are also of different scope, may not also be acceptable in cases where the above requirements are satisfied.

One and the same patent application may include:

(i) in addition to an independent claim for a given product, an independent claim for a process specially adapted for the manufacture of the said product, and an independent claim for a use of the said product; or
(ii) in addition to an independent claim for a given process, an independent claim for an apparatus or means specifically designed for carrying out the said process; or
(iii) in addition to an independent claim for a given product, an independent claim for a process specially adapted for the manufacture of the said product, and an independent claim for an apparatus or means specifically designed for carrying out the said process.

Guidelines to Basic rule (b)

1. References in (i) to (iii) to "process", "product", "apparatus", "means" or "use" refer to these inventions as recited in the claims.
2. In (i) and (iii), the requirement that the process has to be "specially adapted" for the manufacture of the product is fulfilled if the process results exclusively in the claimed product. The expression "specially adapted" does not imply that the product could not also be manufactured by a different process. It also does not imply that the same kind of process of manufacture could not also be used for the manufacture of other products.
3. In (ii) and (iii), the requirement that the apparatus or means has to be "specifically designed" for carrying out the process is fulfilled if the apparatus or means is suitable for carrying out the whole process and if there is at least one special technical feature in the apparatus or means which establishes a close technical interrelationship with the same or corresponding technical feature in the process. It follows from the above conditions that it is not sufficient for unity that the apparatus or means is merely capable of being used in carrying out the process. On the other hand, the expression "specifically designed" does not imply that the apparatus or means could not be used for carrying out another process, nor that the process could not be carried out using an alternative apparatus or means.

(2) Claims to the same category

Basic rules

(a) The basic test for unity is the same as in the case of claims in different categories. Claims of the same category are so linked as to form a single general inventive concept when all of the claims include one or more of the same or corresponding special technical feature(s) thereby establishing a close technical interrelationship between the inventions. The expression "special technical features" means those technical features which define the contribution(s) which the invention makes over the prior art.

Furthermore, the determination of unity is exactly the same whether the different inventions (e.g. products, processes) are claimed in different claims or as alternatives in a single claim.*

Unity has to be considered in the first place only in relation to the independent claim and not the dependent claims. By "dependent" claim is meant a claim which contains all the features of another claim.

* Each Office is however free to object to alternatives being contained in a single claim in the light of considerations such as clarity or conciseness of claims and the claims fee system applicable in that Office.

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(b) If the independent claims are patentable and satisfy the unity requirement, no problem of lack of unity can arise in respect of the dependent claims. In particular, it does not matter if a dependent claim itself contains a further invention. Equally, no problem arises in the case of a genus/species situation where the genus claim is patentable.

No problem arises in the case of a combination/subcombination situation where the subcombination claim is patentable and the combination claim includes all the features of the subcombination.

(c) If, however, an independent claim is not patentable then the question whether there is still an inventive link between all the claims dependent on that claim needs to be carefully considered in view of the Basic rule (a) above.

If there is no link remaining, an objection of unity a posteriori should be raised. Similar considerations apply in the case of a genus/species or combination/subcombination situation.

(C) Application of the General Principles to Special Chemical Problems

I. Markush Practice

(1) Basic rule

A claim may cover alternatives provided that:

(a) those alternatives are of a similar nature; and
(b) the number and presentation of alternatives in a single claim do not make the claim obscure or difficult to construe.*

Basic rule (B)(2)(a) applies when determining whether chemical or non-chemical alternatives are of a similar nature.

(2) Guidelines

1. In order for a claim that includes a Markush grouping to possess unity, all of the recited alternatives must be technically interrelated.
2. When the Markush grouping is for alternatives of chemical compounds, they are deemed to satisfy Basic rule (B)(2)(a) and to be of a similar nature when the following criteria are fulfilled:

(a) all alternatives have a common property or activity and either
(b)(i) a common structure is present, i.e. a significant structural element is shared by all of the alternatives; or
(b)(ii) in cases where the common structure cannot be the unifying criteria, all alternatives belong to a recognized class of compounds in the art to which the invention pertains.

— In (b)(i) above, "significant structural element is shared by all of the alternatives" refers to cases where the compounds share a common chemical structure which occupies a large portion of their structures, or in case the compounds have in common only a small portion of their structures, the commonly shared structure constitutes a structurally distinctive portion in view of existing prior art.

The structural element may be a single component or a combination of individual components linked together.

— In (b)(ii) above, "recognised class of chemical compounds" means that there is an expectation from the knowledge in the art that members of the class will behave in the same way in the context of the claimed invention. In other words, each member could be substituted one for the other, with the expectation that the same intended result would be achieved.

3. The "number and presentation of alternatives" in a single claim does not make the claim obscure or difficult to construe if the Markush grouping retains a minimum degree of ready comprehensibility. Ready comprehensibility can reasonably be questioned in instances where there are a large number of provisos or disclaimers within the Markush grouping.
4. The fact that the alternatives of a Markush grouping, which alternatives do not share a common structure, can be differently classified is not, taken alone, justification for a finding of a lack of unity of invention.
5. When dealing with alternatives, if it can be shown that at least one Markush alternative is not novel, unity shall be reconsidered by the examiner.

II. Intermediate/Final Products

[First Alternative

(1) *Basic rule*

Intermediate and final products may be claimed in a single patent application.

(a) The term "intermediate" as used here means intermediate or starting products which have, according to the patent application, no direct effect or activity which could be used to establish their separate patentability. They are described for their ability to be used to produce patentable final products through a physical or chemical change in which the intermediate loses its identity. If the intermediate has a separate patentability, unity of invention is determined according to the criteria set forth for claims to the same category.
(b) Unity is present when:

(i) the intermediate and final products exhibit the same essential structural element, *and*
(ii) the intermediate and final products are in close interrelationship, this meaning that the final product is manufactured directly from the intermediate or is separated from it only by a very small number of intermediates all containing the same essential structural element.

(c) Unity may also be present between intermediate and final products wherein the structures are not known. For example, as between an intermediate having a known structure and a final product the structure of which is not known or as between an intermediate of unknown structure and a final product of unknown structure.

In such cases there should be sufficient evidence which would, in order to satisfy unity, lead one to conclude that the intermediate/final products are technically closely interrelated as for example when the intermediate contains the same essential element as the final product or incorporates an essential element into the final product.]

[Second Alternative

(1) *Basic rule*

(a) When intermediate and final products are claimed in a single patent application and patentability of the intermediates is based on their ability to be used to produce final products through a physical or chemical change, unity is present when:

(i) the intermediate and final products exhibit the same essential structural element, *and*
(ii) the intermediate and final products are in close interrelationship, this meaning that the final product is manufactured directly from the intermediate or is separated from it only by a very small number of intermediates all containing the same essential structural element.

(b) Unity may also be present between intermediate and final products wherein the structures are not known. For example, as between an intermediate having a known structure and a final product the structure of which is not known or as between an intermediate of unknown structure and a final product of unknown structure.

in such cases there should be sufficient evidence which would, in order to satisfy unity, lead one to conclude that the intermediate/final products are technically closely interrelated as for example when the intermediate contains the same essential element as the final product or incorporates an essential element into the final product.

(c) As long as unity can be recognized applying the above rules, the fact that besides their ability to be used to produce final products the intermediates also exhibit other possible effects or activities would not affect the decision on unity of invention.]

(2) *Guidelines*

1. Intermediate and final products exhibit the same essential structural element when:

(a) the basic chemical structures of the intermediate and the final products are the same, or
(b) the chemical structures of the two products are technically closely interrelated, the intermediate incorporating an essential structural element into the final product.

2. Different intermediate products used in different processes for the preparation of the final product may be accepted in a single application provided that they all contain the same essential structural element.
3. The intermediate and final products should not be separated, in the process leading from one to the other, by an intermediate which is not new.
4. If the same application claims different intermediates for different structural parts of the final product, unity would not be present between the intermediates.
5. If the intermediate and final products are families of compounds, each intermediate compound should correspond to a compound claimed in the family of the final products. However, some of the final products may have no corresponding compound in the family of the intermediate products so that the two families need not be absolutely congruent.

(D) Manner of Examination and Other Procedural Aspects

(1) Manner of examination
Where there is a lack of unity of invention, each Office should be free to develop its own practice for determining which invention is to be considered as the elected invention to be examined. This applies also to the follow-up procedure, e.g. whether to insist that the other inventions be divided out or whether to allow the applicant, on payment of an additional fee, to request search reports on the other inventions.
(2) Easy-to-search/examine rule
Each Office should be free to adopt its own policy regarding rules such as easy-to-search or examine, discretion of the examiner, benefit of the doubt.
(3) Divisional application
(a) The applicant has the right to file one or more divisional application(s), in particular in order to meet an objection of lack of unity of invention with regard to the patent application.
[(b)A divisional application may be filed at any time up to at least the time when the parent application is in order for a grant.]
(c) A properly filed divisional application retains the filing date of the parent application and benefits from any right to priority. The priority document(s), if already filed in the parent application, need not be filed again in the divisional application.

* The three Offices wish to emphasize their serious concern regarding the scope and content of Markush groups presented in some patent applications. The large search and examination effort due to the wide scope of some Markush claims and the difficulties in comprehensibility and interpretation, place an unfair and disproportionate burden both on the Offices themselves and upon third parties. The guidelines hereinbelow therefore represent a reasonable approach to the acceptance of Markush claims.

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PATENT NOTICES

Certificates of Correction for the Week of Mar. 1, 1988

Re. 32,487	4,660,980	4,681,576	4,693,298
3,843,395	4,661,282	4,681,614	4,693,909
4,248,999	4,661,995	4,681,866	4,693,923
4,383,922	4,663,080	4,682,156	4,694,270
4,399,786	4,665,485	4,682,182	4,695,443
4,491,932	4,666,532	4,682,522	4,695,851
4,504,634	4,666,925	4,683,246	4,695,982
4,506,172	4,667,550	4,683,939	4,696,458
4,550,448	4,668,006	4,684,674	4,696,507
4,566,195	4,668,417	4,685,417	4,696,713
4,567,158	4,669,852	4,685,650	4,696,840
4,608,686	4,669,979	4,685,748	4,699,516
4,616,379	4,670,079	4,686,249	4,699,550
4,618,238	4,670,349	4,686,292	4,699,657
4,620,633	4,670,568	4,686,765	4,699,734
4,624,264	4,670,599	4,686,909	4,699,965
4,625,199	4,672,545	4,687,008	4,699,989
4,634,425	4,673,109	4,687,383	4,700,197
4,635,234	4,674,046	4,687,745	4,700,249
4,640,142	4,674,108	4,687,807	4,700,600
4,641,049	4,674,764	4,687,866	4,700,622
4,642,119	4,674,839	4,688,233	4,700,747
4,643,902	4,675,397	4,688,243	4,700,791
4,643,975	4,675,815	4,688,294	4,701,022
4,647,549	4,676,403	4,688,627	4,701,085
4,648,797	4,676,841	4,688,665	4,701,089
4,649,063	4,677,388	4,688,889	4,701,384
4,650,005	4,677,585	4,688,953	4,702,056
4,650,006	4,678,148	4,689,146	4,702,746
4,650,205	4,678,261	4,689,829	4,703,061
4,651,966	4,678,695	4,690,765	4,705,183
4,653,051	4,679,011	4,691,768	4,705,269
4,655,350	4,679,428	4,691,843	4,707,253
4,656,068	4,679,899	4,691,942	4,707,581
4,656,706	4,679,939	4,692,054	4,711,312
4,658,320	4,680,210	4,692,057	4,716,158
4,659,241	4,680,388	4,692,792	
4,660,240	4,680,525	4,692,969	
4,660,255	4,680,702	4,693,281	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
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Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
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	Miami-Dade Public Library	(305) 375-2665
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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 30, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	2-18-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-18-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	4-17-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-5-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	2-18-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during January 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,551,909 to 3,559,208, inclusive

Plant Patents . . . . . Numbers 3,011 to 3,021 inclusive

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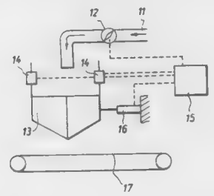
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 32,058 (818th)

REGULATING THE CONTINUOUS SUPPLY OF MATERIAL

David Brunnschweiler, Blackburn, and Barrie Sedgely, Sandbach, both of England, assignors to Cosmopolitan Textile Co. Ltd., Winsford, England

Reexamination Request No. 90/001, 209, Apr. 3, 1987.
Reexamination Certificate for Reissue Patent Re. 32,058, issued Dec. 31, 1985, Ser. No. 568,916, Jan. 6, 1984.
Original No. 4,366,872, dated Jan. 4, 1983, Ser. No. 190,965, Sep. 26, 1980.
Claims priority, application United Kingdom, Oct. 18, 1979, 793211
Int. Cl.[4] **G01G** *19/22, 13/24, 13/14;* **B67D** *5/08*
U.S. Cl. 177—1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 2 is confirmed.

Claim 1 is cancelled.

[1. A method for regulating the continuous supply of material, comprising the steps of:
(a) taring a weighpan;
(b) loading a first quantity of material in said weighpan;
(c) comparing the weight of said first quantity with a desired weight and determining the difference;
(d) discharging said first quantity to a subsequent process requiring a consistent quantity of said material per unit time;
(e) determining a second quantity based upon comparing said difference and said desired quantity;
(f) loading said second quantity of material in said weighpan;
(g) discharging said second quantity to said process; and
(h) repeating steps b through g whereby a consistent quantity of material is delivered to said subsequent process.]

B1 4,203,062 (819th)

MACHINE TOOL CONTROL SYSTEM

Roland Bathen, Weissach, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

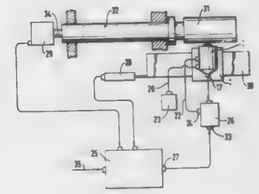
Reexamination Request No. 90/001,193, Mar. 16, 1987.
Reexamination Certificate for Patent No. 4,203,062, issued May 13, 1980, Ser. No. 911,610, Jun. 1, 1978.
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724808
Int. Cl.[4] **G05B** *19/25;* **B23B** *25/06*
U.S. Cl. 318—571

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 3 and 5 are cancelled.

Claims 1 and 4 are determined to be patentable as amended.

1. A control system for a machine tool including a spindle for rotating a workpiece to be machined and a cutting head mounted for relative movement towards and away from the axis of the spindle, comprising:
(a) spindle transmitter means for providing a signal indicative of the angular position of the machine tool spindle,
(b) position transmitter means for providing a signal indicative of the relative axial position of the machine tool cutting head and the workpiece rotatable by said tool spindle,
(c) control means for storing information representing desired angular and longitudinal parameters of the desired workpiece shape and including first and second inputs for receiving the signals from said position and spindle transmitter means respectively and an output for providing a signal dependent upon the stored information and said input signals,
(d) an electromagnetic plunger-type coil motor having [its] *a* plunger mechanically coupled directly to said cutting head for moving said head towards and away from



the axis of the tool spindle, *said motor comprising a housing, an excitation coil located in said housing, a plunger coil carried by said plunger, a soft-iron core located within said excitation coil, and a resilient element carried at its outer edge by said housing, said motor additionally comprising a further resilient element carried at its outer edge by said housing, the two resilient elements being disposed one at each end of said housing, and a rod passing through a bore in said soft-iron core connected at one end to said plunger and at the other end to said further resilient element, said resilient elements taking the form of diaphragms, said plunger and said plunger coil being movably mounted to said housing via said resilient elements,*
(e) transducer means having an output to provide signals indicative of the respective position of the plunger, and
(f) positional control means having two inputs connected respectively to the output of said control means and the output of said transducer means, an output connected to the plunger coil, and comparator means which compares these signals arriving at the two inputs and, in the event of any difference existing between the actual value and the nominal value, emits a correcting signal to the plunger coil to determine the position of the position of the cutting head.

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STATUTORY INVENTION REGISTRATIONS

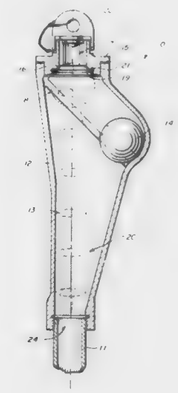
PUBLISHED MARCH 1, 1988

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H438
FLUID TANK SOUNDING TUBE CHECK VALVE

Janis I. Viksne, Alexandria, Va., and Thomas S. Allen, Newport, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1986, Ser. No. 858,986
Int. Cl.[4] F16K *17/34*
U.S. Cl. 137—519.5 **7 Claims**



1. For a fluid tank sounding tube into which depth sounding and fluid sampling instruments can be inserted, said sounding tube being subject to a streaming backflow of fluid, a floating ball check valve, comprising:

a floating ball valve;

a generally upright valve housing having an upper terminal, a lower terminal, a clearance therebetween, guide ribs, and an elongated geometrically tapered throat;

said clearance being substantially in-line with the sounding tube, allowing unobstructed passage for said depth sounding and fluid sampling instruments;

said upper terminal having an annular valve seat, substantially encompassing said clearance, internally oriented, and allowing unobstructed passage for said depth sounding and fluid sampling instruments;

said lower terminal being in fluid communication with said sounding tube;

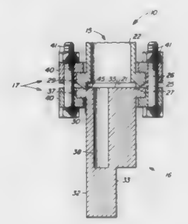
said guide ribs being inclinedly disposed within said valve housing, affixed thereto, exterior to said clearance, and supporting and guiding said floating ball valve from a resting position outside said clearance to an elevated position substantially below said annular valve seat; and,

said elongated geometrically tapered throat extending from said lower terminal to the resting position of said floating ball valve, wherein fluid streaming through said lower terminal into said valve housing is nozzled, directing the stream to impinge against said floating ball valve and forcing said floating ball valve to seat.

H439
ULTRAHIGH VACUUM MOUNTING

Victor L. Rehn, Ridgecrest, and Peter J. Love, Santa Barbara, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1986, Ser. No. 870,218
Int. Cl.[4] F16L *19/08*
U.S. Cl. 285—328 **3 Claims**



1. A mounting for an object which is to have a predetermined temperature while in an ultrahigh vacuum environment, the mounting being inwardly extendable from a wall of an ultrahigh vacuum chamber and comprising:

a cylindrical tube unitarily constructed of relatively hard material, the tube having one axial end for connection to said wall and having an opposite axial end bearing an annular knife edge unitarily constructed with the tube and circumscribing an opening which extends axially through the tube;

a generally cylindrical finger unitarily constructed of relatively soft material and having an axial end surface and a receiving portion, the finger selectively being detachable from the tube and being attachable thereto so as to extend coaxially from the tube with the receiving portion extended axially of the finger from the knife edge, the finger closing the opening and being accessible through the opening and the end surface being accessible in a direction radially of the end surface when the finger is detached from the tube;

coupling means for detachably connecting the finger to the tube and for urging the finger axially toward the tube without relative movement rotationally or radially therebetween to force the knife edge into ultrahigh vacuum sealing relation with said end surface.

H440
BLANKET BAR FOR NARROW GAP CYLINDERS

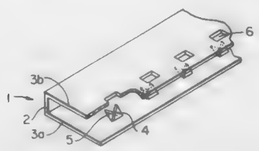
Dennis D. O'Rell, Boxborough, Mass., assignor to W. R. Grace & Co., Lexington, Mass.

Filed Jun. 30, 1986, Ser. No. 880,223
Int. Cl.[4] B41F *1/28*
U.S. Cl. 101—415.1 **14 Claims**

1. A blanket bar comprising an elongated strip of metal having a channel, first arm and second arm radiating outwardly from the channel in parallel relationship to each other, the first arm and second arm having a series of projections perpendicular to the plane of the first and second arms, the first and second arms having a series of holes in alignment with the

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series of projections on the other arm, the projections being of such length as to extend through the holes on the other arm



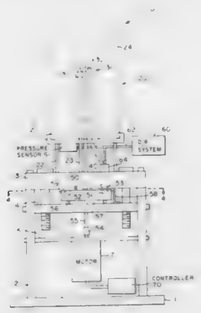
and capable of being clenched over so as to lock the first and second arms together.

H441

TECHNIQUE AND MECHANISM FOR HOT SPALL TESTING UNDER PRESSURE

Robert W. Milton, Huntsville, and Lawrence B. Thorn, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 4, 1987, Ser. No. 99,197
Int. Cl.[4] G01L *5/14;* **G01N** *25/00*
U.S. Cl. 374—8 **5 Claims**



1. A hot spall tester comprising:

(i) structural components comprising: (a) a base plate, (b) a pair of side plates mounted vertically to said base plate in a spaced apart relationship to provide stability and support for said hot spall tester, (c) an intermediate motor support plate mounted perpendicularly to each of said side plates, (d) a top support plate mounted parallel to said intermediate motor support plate and to each of the top surfaces of said vertically mounted side plates, (e) an adjustable thrust bearing alignment plate mounted in a parallel relationship to and below said top support plate for providing adjustment to thrust bearings for a rotatable carrousel portion, and (f) thrust bearings mounted on said thrust bearing alignment plate;

(ii) a rotatable carrousel portion having a plurality of sample cup shaped compartments arranged in circular and evenly spaced positions around the top surface of said rotatable carrousel portion, said rotatable carrousel position when in operational position being positioned on said thrust bearings mounted on said thrust bearing alignment plate;

(iii) a tube furnace portion including an outer housing member supported by a furnace support plate, said furnace support plate supported by support rods secured to said furnace support plate and to the surface of said top support plate, said tube furnace portion including an outer housing member being easily removable from said furnace support plate to facilitate access to internal cavity of said tube furnace to permit the loading of steel ball bearings to a magazine portion of said hot spall tester;

(iv) a magazine support plate positioned at the centerline of said tube furnace, said magazine support plate supported by variable height support rods extending from said magazine support plate to a top surface of said top support plate, and said magazine support plate having an opening to permit the individual dropping of a steel ball bearing from a magazine portion to a feed tube leading to an aligned sample cup of a carrousel portion;

(v) a rotatable magazine portion positioned above said magazine support plate, said magazine portion having a plurality of evenly spaced openings or chambers for containing steel ball bearings which after being heated are to be individually dropped by gravity travel to a sample cup of said carrousel portion;

(vi) a feed tube member positioned between said magazine portion and said carrousel portion to provide gravity travel capability from an aligned opening of said magazine portion to an aligned sample cup of said carrousel portion that receives a dropped heated steel ball bearing;

(vii) a torque rod positioned and extended through said intermediate support plate, said torque rod positioned and extended through an opening at center line of said carrousel portion member, positioned and further extended through an opening in said top support plate positioned and further extended through an opening in said furnace support plate, and further extended through an opening at the centerline of said magazine support plate, and said torque rod coupled at the lower portion to said carrousel portion and at the upper portion to said magazine portion to achieve simultaneous rotation of said magazine portion and said carrousel portion in a timed and aligned relationship to facilitate gravity travel of a steel ball bearing between an opening of said magazine portion to a propellant sample cup in said sample cup shaped compartment of said carrousel portion by way of said feed tube member;

(viii) a stepping motor coupled to lower end of said torque rod;

(ix) a controller for said stepping motor to achieve rotational movement of said carrousel portion and said magazine portion with a 0.9 degree rotation per full step of said stepping motor to achieve the result after rotation is accomplished including the required alignment of openings in said magazine, in said carrousel, and in said feed tube to permit passage of a heated steel ball bearing to touch a propellant sample in said sample cup shaped compartment of said carrousel portion;

(x) means to acquire data as said heated steel ball bearing contacts the propellant sample, said data acquired including time to ignition, temperature of burn, and pressure during burn; and

(xi) means to confine and allow pressure buildup in said sample cup shaped compartment after heated steel ball bearing touches a propellant sample in said sample cup shaped compartment of said carrousel portion.

H442

COMPOSITION AND METHOD FOR CLEANING EMBEDDED SOIL FROM SURFACES HAVING LOW GLOSS COATINGS

Kenneth G. Clark, Chalfont, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,876
Int. Cl.[4] C09D *9/02;* **C11D** *7/50, 17/00;* **C23G** *5/032*
U.S. Cl. 252—163 **1 Claim**

1. A composition for cleaning embedded soil from a surface having a flat or low-gloss coating, said composition consisting of:

about 90% by weight of a non-abrasive thixotropic cleaning fluid; and

about 10% by weight of 6 to 30 mil particles of an elastomeric material selected from the group consisting of acrylic elastomers, chlorinated polyethylene elastomers, nitrile elastomers, polybutadiene elastomers, polychloroprene elastomers, polyisobutylene elastomers, polysulfide elastomers, silicone elastomers, styrene-butadiene copolymers, styrene-isoprene elastomers, thermoplastic polyester elastomers, thermoplastic polyolefin elastomers, urethane elastomers, vinyl acetate/ethylene copolymers, and natural rubbers.

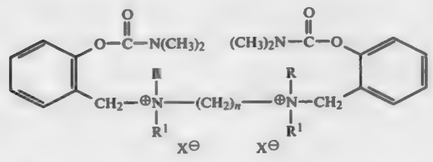
H443

CHEMICAL AGENTS

Harold Z. Sommer, Havre de Grace, and Omer O. Owens, Abingdon, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1967, Ser. No. 645,564
Int. Cl.[4] C07C *125/04;* **A61K** *31/27*
U.S. Cl. 560—133 **3 Claims**

1. Chemical compounds having the generic formula:



wherein n is selected from 5–16; R, R′ are radicals selected from the group consisting of methyl, ethyl, propyl, isopropyl, and butyl; and X is one equivalent of an anion selected from the group consisting of monovalent and polyvalent anions, said anions being selected from the group consisting of halide, hydrogen oxalate, perchlorate, hydrogen sulfate, and nitrate.

H444

PROCESS FOR MAKING MOLDED ARTICLES WITH MOLD RELEASE AGENTS

Claris D. Roth, and Kenneth B. Moser, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 20, 1985, Ser. No. 735,900
Int. Cl.[4] B29C *49/00, 45/83, 45/00*
U.S. Cl. 264—45.1 **30 Claims**

1. A process for the production of molded articles from a polymeric resinous material comprising the steps of:

(a) injecting into a mold cavity a mixture which comprises a flowable polymeric resinous material and a mold release agent comprising a glycoside compound containing one or more fatty acid ester or ether groups;

(b) solidifying said mixture in said mold cavity to form said molded article;

(c) removing said molded article from said mold cavity; and

(d) applying a surface coating material to said molded article; said process being further characterized by the glycoside compound being present in the resinous material in an amount sufficient to provide enhanced adhesion of the surface coating material to the molded article.

30. A process for producing a polyurethane product, which comprises the steps of:

(a) injecting into a mold cavity a reactive mixture which comprises a polyol and which further comprises, per hundred parts of said polyol:

(i) 50 to 500 parts of a polyisocyanate;

(ii) 0 to 20 parts of a volatile blowing agent;

(iii) a catalyst component, and;

(iv) a mold release agent comprising a glycoside compound containing at least one fatty acid ester or ether group, said mold release agent being employed in an amount ranging from 0.1 to 10 percent of the weight of said polyol;

(b) subjecting said reaction mixture in said mold cavity to temperature and pressure conditions sufficient to convert said reaction mixture to said polyurethane product;

(c) removing the resulting molded polyurethane product from the mold cavity; and

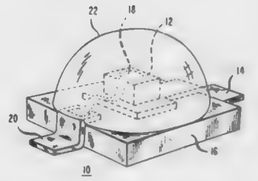
(d) applying a surface coating material to said molded polyurethane product; said process being further characterized by the glycoside compound being present in the reactive mixture in an amount sufficient to provide enhanced adhesion of the surface coating material to the molded polyurethane product.

H445

METHOD OF FORMING LIGHT EMITTING DEVICE WITH DIRECT CONTACT LENS

Anne B. Bock, Kutztown; Samuel E. Kurtz, and Thomas E. Seibert, both of Reading, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Technologies, Incorporated, Berkeley Heights, N.J.

Filed Nov. 29, 1985, Ser. No. 802,979
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.7 **7 Claims**



1. A method of forming a direct contact lens on a semiconductor light emitting device assembly comprising the steps of:

a. lowering a deposition apparatus including a downwardly extending vertical pin into a path of a liquid lens material;

b. removing said deposition apparatus from said bath so that a drop of lens material adheres to said vertical pin;

c. lowering said deposition apparatus over said semiconductor light emitting device so that said drop of lens material contacts a top portion of said semiconductor light emitting device;

d. raising said deposition apparatus in a manner such that said drop of lens material adheres to said device and flows to substantially cover both said device and a mounting structure holding said device to form the direct contact lens for said semiconductor light emitting device; and

e. curing said light emitting device assembly to harden the direct contact lens in its final form.

H446

METHOD OF CONTROLLING FUSION REACTION RATES

Russell M. Kulsrud; Harold P. Furth, both of Princeton; Ernest J. Valeo, Princeton Junction, all of N.J., and Maurice Goldhaber, Bayport, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 492,924, May 9, 1983, abandoned. This application Apr. 18, 1986, Ser. No. 854,667
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—143 **13 Claims**

1. A method of controlling the reaction rates of fuel nuclei in a fusion reactor having a plasma confining magnetic field, a vacuum vessel and a fuel consisting essentially of a fusion plasma, said method comprising the steps of:

(a) polarizing the nuclei of neutral fuel atoms in a particular direction relative to the plasma confining magnetic field, said fuel atoms being polarized such that essentially all of said atoms have the same polarization;

(b) injecting said polarized fuel atoms into said vacuum vessels; and

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(c) forming said fusion plasma from said polarized fuel atoms.

H447
SYNTHESIS OF 1,3,5-TRINITRO-1,3,5-TRIAZACYCLOHEXANE

John W. Fischer, and Ronald L. Atkins, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1987, Ser. No. 24,437
Int. Cl.[4] C07D *251/06*
U.S. Cl. 544—180 **4 Claims**

1. A process of preparing pure 1,3,5-trinitro-1,3,5-triaza cyclohexane having the step of reacting hexamethylenetetramine with dinitrogen pentoxide as a primary nitrating agent, the improvement comprising the steps of:
dissolving dinitrogen pentoxide in 100% nitric acid to form a nitrating solution;
contacting said nitrating solution with hexamethylenetetramine under nitrating conditions;
neutralizing said mixture with sodium bicarbonate and extracting said product with a suitable solvent; and
removing said solvent and isolating pure 1,3,5-trinitro-1,3,5-triazacyclohexane.

H448
CO-NITRATION OF 1,2,4-BUTANETRIOL AND GLYCERIN

Robert E. Farncomb, Accokeek, and Walter A. Carr, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1987, Ser. No. 70,758
Int. Cl.[4] C06B *25/14*; C07C *76/04*
U.S. Cl. 149—104 **6 Claims**

1. A process for preparing an energetic binary mixture of 1,2,4-butanetriol trinitrate and nitroglycerin comprising:
a. forming a binary polyol mixture consisting essentially of from about 40 to about 60 weight percent of 1,2,4-butanetriol with the remainder of the polyol mixture being glycerin;
b. nitrating the polyol mixture with a mixed acid consisting essentially of from 30 to 60 weight percent of nitric acid with the remainder of the mixed acid being sulfuric acid; and
c. isolating the product mixture of 1,2,4-butanetriol trinitrate and nitroglycerin.

H449
CATALYST COMPOSITIONS

John A. Rudesill, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

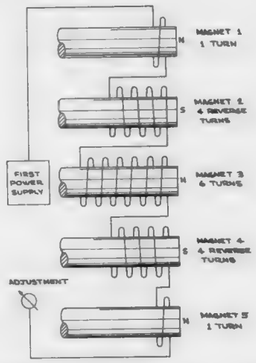
Continuation of Ser. No. 819,777, Jan. 16, 1986, abandoned. This application Jul. 31, 1987, Ser. No. 81,554
Int. Cl.[4] B01J *29/06, 29/08*; C10G *11/05*
U.S. Cl. 502—67 **6 Claims**

1. A catalytic cracking composition which comprises a separate particulate octane-enhancing additive component comprising ZSM-5 dispersed in an inorganic oxide matrix, and a particulate Y zeolite containing catalytic cracking catalyst component, comprising 15 to 60 percent by weight ultrastable y zeolite dispersed in an inorganic oxide matrix.

H450
MAGNETIC FIELD ADJUSTMENT STRUCTURE AND METHOD FOR A TAPERED WIGGLER

Klaus Halbach, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 19,728
Int. Cl.[4] H01S *1/00*; H01J *25/00*
U.S. Cl. 330—4 **18 Claims**



13. An improved wiggler having means for adjusting the magnetic field generated by electromagnet poles spaced along the path of a charged particle beam to compensate for energy losses in the charged particles which comprises;
(a) a plurality of windings on at least some of said electromagnet poles in said wiggler;
(b) one of said windings on each of a group of adjacent electromagnet poles connected to a first power supply, and another winding on said electromagnet poles having more than one winding connected to a second power supply; and
(c) means for independently adjusting one power supply to independently vary the current in one of said windings on a group of adjacent electromagnet poles;
whereby the magnetic field strength of a group of adjacent electromagnet poles in said wiggler may be changed in smaller increments.

REISSUES

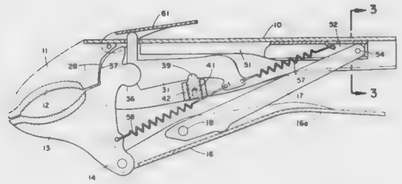
MARCH 1, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,614
SELF-ADJUSTING LOCKING WRENCH

Neill R. Wilson, Berryville, Va., assignor to Christopher B. Fagan, Cleveland, Ohio

Original No. 4,499,797, dated Feb. 19, 1985, Ser. No. 443,135, Nov. 19, 1982. Application for reissue Nov. 12, 1986, Ser. No. 930,683
Int. Cl.[4] B25B *7/12*
U.S. Cl. 81—367 **19 Claims**

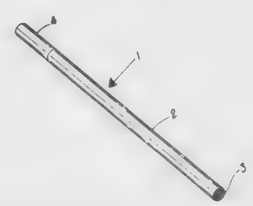


1. A wrench comprising:
a first handle having a fixed upper jaw integral therewith,
a force multiplying cam member pivotally mounted on said handle,
a movable lower jaw having a pivot point for pivoting against said cam member to enable said lower jaw to move relative to said cam member and said upper jaw, said lower jaw also having an ear,
sliding bar means mounted inside said handle and adapted to slide with respect to said handle,
toggle linkage means including two pivotally interconnected elongate members, a free end of a first linkage member being pivotally connected to said ear, a free end *of* a second linkage member being pivotally connected to said sliding bar means whereby said pivot point is movable relative to said handle,
a tension spring having one end fixed to said ear and having the other end operatively connected to said handle whereby said movable jaw is urged away from said fixed jaw,
an extension integral with said first linkage member, said extension forming a second handle substantially coextensive with said first handle and cooperative therewith to move said toggle linkage means and move said jaws toward each other as said handles are squeezed together, such movement continuing until said jaws contact an associated object, and whereby, after such contact, continued handle squeezing causes the second linkage member to urge said sliding bar means to move back away from said upper jaw, and
means operatively connected to said handle for actuating said cam member to cause said cam member to rotate and contact with *said* sliding bar means and thereby inhibit further sliding movement thereof, whereby continued squeezing of said handles increases the force applied to said lower jaw which in turn applies an increased rotational force through its pivot point to the cam member which in turn more securely contacts said sliding bar means and inhibits further rearward movement thereof as said toggle linkage means are moved to an over-center position to lock the wrench on the associated object.

Re. 32,615
CIGARETTES

John A. Luke, Eastleigh, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Original No. 4,637,410, dated Jan. 20, 1987, Ser. No. 757,406, Jul. 22, 1985. Application for reissue Mar. 30, 1987, Ser. No. 32,401
Claims priority, application United Kingdom, May 24, 1985, 8513233
Int. Cl.[4] A24D *1/00*
U.S. Cl. 131—361 **15 Claims**

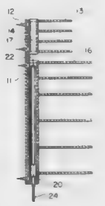


1. A *finished* cigarette [comprising a tobacco] *of commercially acceptable quality and elegant appearance in the form of an elongated rod of uniform cross-section throughout its length capable of sustained smoulder when lit but not being smoked, said elongated* rod [which rod comprises] *consisting of* a *cut* tobacco filler [and], a *cigarette* paper wrapper, *circumscribing said cut tobacco filler, a filter in abutment with one end of said cut tobacco filler and a tipping wrapper maintaining said filter in abutment with said one end of said cut tobacco filler,* the circumference of said *elongated* rod being within a range of 10 mm to 19 mm, and having a *cut* tobacco filler packing density within the range of 150 mg per cm^3 to 350 mg per cm^3 yielding a free burn rate of said rod within a range of 25 to 45 mg min^{-1}, *the aforesaid cigarette utilizing tobacco at greater efficiency than conventional commercially marketed cigarettes.*

Re. 32,616
TOWEL WARMER AND HOLDER

Joe Graham, P.O. Box 51, Milo, Iowa 50166

Original No. 4,559,442, dated Dec. 17, 1985, Ser. No. 500,524, Jun. 2, 1983. Application for reissue Aug. 4, 1986, Ser. No. 892,305
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—385 **4 Claims**



1. A device for warming and holding towels comprising in combination:
a single, solid vertical support means, attached thereto, by bonding means, a single hollow vertical support means;

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attached to the hollow vertical support means, by bonding means, a plurality of horizontal, spaced apart holding means;

contained within the hollow vertical support means, a heating means for the purpose of heating the hollow vertical support means and the plurality of horizontal spaced apart holding means;

the horizontal holding means are spaced apart a sufficient vertical distance to receive and store a folded towel;

attached to each horizontal holding means is a flap, of sufficient size to reach the next lower horizontal holding means.

Re. 32,617
WATCHCASE

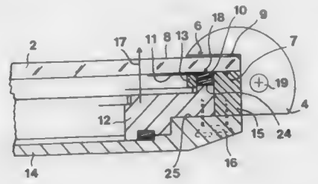
Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Longeau, Switzerland

Original No. 4,490,052, dated Dec. 25, 1984, Ser. No. 379,360, May 18, 1982. Application for reissue May 2, 1986, Ser. No. 858,730

Claims priority, application Switzerland, Jun. 1, 1981, 3557/81

Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—292 **10 Claims**



1. A watchcase assembly for attaching a thin [flat] crystal to the watchcase, said crystal being substantially coextensive with said watchcase, said assembly comprising a plurality of separate fixation members attaching the watchcase to the crystal, said fixation members each having inwardly directed grooves sized to receive the edges of the crystal, said grooves comprising parallel facing surfaces spaced apart a distance slightly greater than the thickness of said thin [flat] crystal to engage said crystal, a sealing strip applied against the perimeter of the lower face of the crystal in the region of said fixation member, the upper face of said parallel facing surfaces bearing against the upper face of the crystal, the area of contact at the fixation member between the sealing strip and the lower face of the crystal and between the upper surface of said facing surface and the upper face of the crystal being vertically aligned with each other, the dimensions of the fixation member being substantially smaller than the corresponding dimensions of the crystal, further comprising a retaining ring comprising at the top thereof a bearing surface for the sealing strip and means for thrusting the retaining ring towards the crystal thus pressing said sealing strip against the [inner] *lower* face of the crystal.

Re. 32,618
MERCAPTOPHENOL DERIVATIVES AS AGE RESISTERS FOR POLYMERS

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

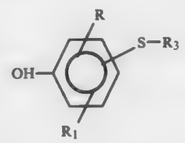
Original No. 4,308,199, dated Dec. 29, 1981, Ser. No. 112,996, Jan. 17, 1980. Application for reissue Apr. 18, 1986, Ser. No. 853,820

Int. Cl.[4] C07C *149/36*; C08K *5/36*

U.S. Cl. 524—331 **12 Claims**

8. A composition of matter conforming to the following structural formula:

(II)



wherein R and R_1 are selected from the group comprised of hydrogen radicals and aralkyl radicals of 7 to 9 carbon atoms and R_3 is selected from the group comprised of saturated and unsaturated nonconjugated polycyclic radicals of 7 to 20 carbon atoms.

9. A composition of matter according to claim 8 wherein R and R_1 are located meta to the sulfur atom and the phenolic hydroxyl group is para to the sulfur atom.

12. A polymer subject to oxidative degradation having incorporated therein an antioxidant amount of a composition selected from: 5,11 and/or -5,12-bis(3,5-ditertiary butyl-4-hydroxyphenylthio) pentacyclo[8.2.1.1.^{4,7}0.^{2,9}0.^{3,8}]tetradecane.

PLANT PATENTS

GRANTED MARCH 1, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,117
ROSE PLANT KORHOLST

Reimer Kordes; Werner Kordes, and Hermann Kordes, all of Klein Offenseth-Sparrieshoop, Fed. Rep. of Germany, assignors to Jackson & Perkins Company, Medford, Oreg.

Filed Feb. 27, 1986, Ser. No. 833,614

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of dark green foliage and bright red flowers borne on an upright vigorous growing shrub that has good mildew resistance in Southern California.

6,118
PLUM TREE, "BROKEN HEART"

Frank A. Vieira, Visalia, Calif., assignor to Livorio C. Huerta and Elsie E. Huerta, both of Reedley, Calif.

Filed Dec. 23, 1985, Ser. No. 812,358

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described which is somewhat similar to the Elephant Heart Plum Tree (unpatented) from which it is a scaffold mutation, but from which it is distinguished by bearing fruit which is greenish-yellow in external coloration with a pronounced purplish-red suture line, and by its unique orangish-yellow flesh which has red colored striations that extend radially from the pit cavity to an area just adjacent to the surface and which is further ripe for harvesting approximately August 6 through August 16 at Visalia, Calif.

6,119
***PRUNUS PERSICA* LAST CHANCE PEACH NUMBER ONE**

James W. Sprague, 23500 West Ave., D-15, Lancaster, Calif. 93534

Filed Apr. 24, 1986, Ser. No. 855,832

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of *Prunus persica* as described and shown herein characterized particularly by its small leaf size and its late inflorescent and fruit ripening patterns.

6,120
SYNGONIUM PLANT NAMED MAGNUM

Gary Welter, 41-875 Kakaina St., Waimanalo, Hi. 96795

Filed Feb. 25, 1986, Ser. No. 832,780

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Syngonium podophyllum* named Magnum, as illustrated and described, and particularly characterized by its large leaves, large diameter stem and petioles, with the petioles carrying the leaves very erect; and by its full appearance.

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GRANTED MAR. 1, 1988

ERRATA

For CLASS	See PATENT NO.
228-122	4,727,633
057-084	4,727,713
128-667	4,727,730
063-020	4,727,883
123-627	4,727,891
439-172	4,728,163
439-870	4,728,164
405-260	4,728,219
437-009	4,728,282
437-017	4,728,371
260-502	4,728,460
427-066	4,728,519
528-119	4,728,555
437-033	4,728,606
503-200	4,728,631
503-213	4,728,632
503-221	4,728,633
549-503	4,728,671
423-511	4,728,682
526-304	4,728,696
524-448	4,728,699
524-611	4,728,700
430-019	4,728,724
367-023	4,729,066

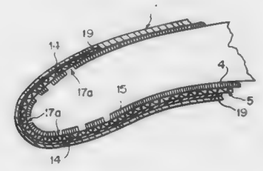
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GRANTED MARCH 1, 1988

GENERAL AND MECHANICAL

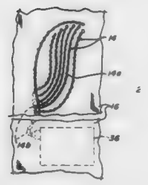
4,727,602
INSULATED HANDWEAR CONSTRUCTION
Erik O. Giese, and Roger Brown, both of Aspen, Colo., assignors to The Marmon Group, Inc., Chicago, Ill.
Filed Nov. 18, 1985, Ser. No. 799,039
Int. Cl.[4] A41D *19/00*; H05B *1/00*
U.S. Cl. 2—163 **13 Claims**



1. Insulated handwear construction having an outer shell, an inner lining and an insulation material positioned between said outer shell and said inner lining and adapted to extend over a portion of a hand of a wearer, characterized in that:
(a) said insulation material has convection passages therein; and
(b) said insulation material having convection passages extends from a center part of the handwear construction with the convection passages in thermal contact with said center part, where the passage are adapted to be connected with a source of heat, and over one side of finger portions around tips of the finger portions and over a part of the opposite sides of the finger portions where the convection passages are in thermal contact therewith whereby heat may be transferred from said source around the tips of the fingers of a wearer.

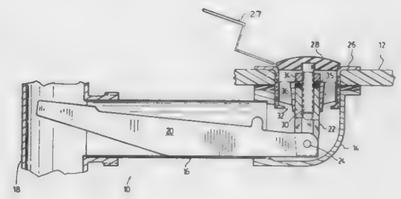
4,727,603
GARMENT WITH LIGHT-CONDUCTING FIBERS
Rebecca L. Howard, 825-27th St., Denver, Colo. 80205
Filed Mar. 6, 1987, Ser. No. 22,643
Int. Cl.[4] A41B *1/00*
U.S. Cl. 2—243 R **6 Claims**





1. An article of clothing including a display of light-conducting fibers wherein a segment of each fiber is affixed to an outer surface of the clothing to form a decorative pattern thereon and wherein said clothing includes a plurality of openings therethrough through which individual fibers are passed so that the remainder portion of each fiber is disposed adjacent to the opposite surface of the clothing, said remainder portion of the fibers being gathered at their ends into a bundle adjacent to said opposite surface, and a light source connected to said bundle so as to emit rays of light into the bundled ends of said fibers.

4,727,604
WASTE STOPPER ARRANGEMENT
S. G. Peturnson, 2196 Linby St., Mississauga, Ontario, Canada L4Y 1V6
Filed May 15, 1987, Ser. No. 49,836
Int. Cl.[4] E03C *1/22*
U.S. Cl. 4—204 **6 Claims**



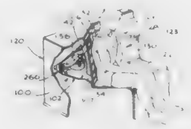
1. In combination with a washroom fixture having a waste pipe, a waste outlet within said fixture connected in liquid sealing relation with said waste pipe, a remote actuating mechanism extending within said waste pipe to a location beneath said waste outlet having a waste actuating post extending upwardly towards said waste outlet, a waste stopper having a disc portion to block said outlet when in a closed position, stopper post means interconnecting said disc portion in adjustable axially spaced relation with said waste actuating post, to provide selective upwards displacement of said disc in opening relation with said waste outlet upon actuation of said actuating mechanism, and threaded locking means securing said stopper post to said actuating post in locked relation therewith, said locking means being directly accessible solely through said waste outlet when said disc is in a raised condition, by way of a cranked tool, to preclude unauthorized tampering with said fixture, said actuating mechanism precluding upward withdrawal of said waste stopper from said waste outlet.

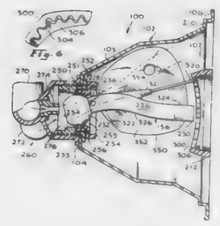
4,727,605
HYDROTHERAPY MASSAGE METHOD AND APPARATUS
Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001
Division of Ser. No. 843,151, Mar. 24, 1986, Pat. No. 4,679,258, which is a continuation-in-part of Ser. No. 796,987, Nov. 12, 1985, Pat. No. 4,692,950. This application Apr. 15, 1987, Ser. No. 38,517
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **6 Claims**

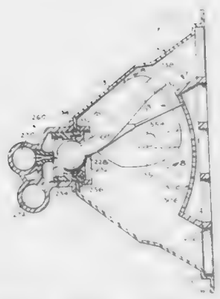
1. A method of massaging a user's body in a water tub having a perimeter wall, said method comprising the steps of:
discharging a stream of water into said tub through an opening in an area of said wall; and

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translating said water stream along a substantially random path extending substantially parallel to said wall area, said path including portions extending in first and second substantially perpendicular directions.







4,727,606
BATHROOM ACCESSORY
Suzanne E. Cavey, 830 Glastonbury Rd. #505, Nashville, Tenn. 37217-7401, and George Spector, 233 Broadway RM 3615, New York, N.Y. 10007
Filed Mar. 14, 1986, Ser. No. 839,631
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—611 **2 Claims**

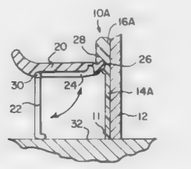
1. A bathroom accessory for installation on a wall within a shower which comprises:

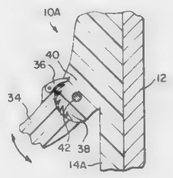
(a) an elongated waterproof sheet having an embossed form of a person in a bathing suit thereon;

(b) a plurality of holders on said sheet for carrying toilet articles used in bathing, wherein said holders are in the form of upturned hands extending from terminal ends of arms of said embossed form;

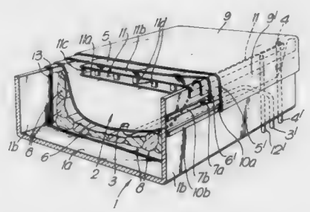
(c) said embossed form further comprising a pair of legs each having a lower portion with a rear recess therein extending the length thereof and an upper portion, a ball socket joint pivotly connecting said lower portion to said upper portion; and

(d) a pair of support legs each pivotly connected, respectively, to said lower portions of said pair of legs at a lower point in said recess so that when each of said lower portions of said pair of legs is pulled upwards with respect to said upper portion of said pair of legs, said support legs can pivot downwards to make contact with a shower floor, whereby said lower portions are used for supporting a bather's foot.



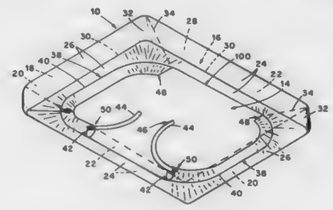


4,727,607
WATER BED
Jan R. Nystad, Elverhoy, N-2313 Ottestad, Norway
Filed Dec. 19, 1986, Ser. No. 943,934
Claims priority, application Norway, Dec. 20, 1985, 855218
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—450 **5 Claims**



1. A water bed, preferably for use in the home, and especially for use as a therapy bed, comprising an upwards open box having side walls and a water tight, closed bag placed in said box and made from a flexible sheeting material having an opening for filling and emptying water and a vent opening for venting said bag when water is introduced into said bag, characterized in that the bag has an upper side made of a flexible elastic material having edge portions which are provided with securing means for releasable engagement with complementary securing means externally on the side walls of said box in order to maintain said upper side of said bag stretched, and that said bag has an underside shaped to depend from the stretched upper side of said bag in contact with the inside of said box when the bag is filled with water, the inside of said box being shaped according to the longitudinal profile of the rear side of a human body by the aid of elongated flexible cases extending longitudinally of said box, said cases being filled with a lightweight filler, said cases being provided on the bottom of said box below the underside of said bag.

4,727,608
FITTED BED SHEET AND METHOD OF MAKING SAME
William R. Joyce, P.O. Box 489, Fairview, N.C. 28730
Filed Jul. 28, 1986, Ser. No. 891,208
Int. Cl.[4] A47G *9/04, 9/02*
U.S. Cl. 5—497 **8 Claims**



1. A fitted sheet for a mattress, or the like, comprising:

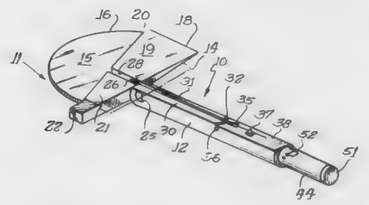
a web of textile material dimensioned to fittingly cover the top, ends, and sides of the mattress with an extreme free edge of said web extending below the lower edge of the mattress and extending generally around the sides and ends of the mattress;

opposed, spaced-apart sheaths extending along portions of said extreme free edge of said web, one end of each of said sheaths being open;

resiliently extensible strips located within said sheaths, each strip having one end extending out of the open end of its associated sheath and having another end anchored to the end of said associated sheath opposite the opening; and

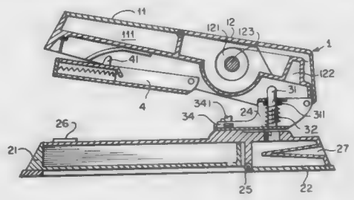
means on each of said strips adapted to slide within said sheaths when said strips are in an unstretched condition for releasably attaching each of said resiliently extensible strips to its associated sheath adjacent the opening thereof when the end of said strip extending out of the opening is resiliently extended in said sheath to locate said last mentioned means adjacent the opening of said sheath, whereby employing said last mentioned means to attach said strip to said associated sheath at the opening thereof causes the resiliency of said strip to contract said strip within its associated sheath to gather the corners of the sheet inwardly of the bottom of the mattress and to draw the sheet into fitting engagement with the mattress, said last mentioned means holding each of said strips in an extended, tensioned, configuration in its associated sheath to hold the sheet on the mattress.

4,727,609
SURVIVAL TOOL
Frederick A. Smith, Jr., 1026 N. Woodbine, Oak Park, Ill. 60302
Filed Mar. 14, 1986, Ser. No. 839,905
Int. Cl.[4] B26B *11/00;* **B25F** *1/00;* **F41B** *5/00*
U.S. Cl. 7—145 **4 Claims**



1. A survival tool comprising a multi-function tool head secured to an elongated hollow shaft, the end of the hollow shaft opposite the tool head being selectively closable by a tubular handle closed at one end and receiving a removable knife blade means in the opposite, open end, the knife blade means being sized to be received within the elongated shaft, the closed end of the tubular handle being recessed so as to removably receive compass means, the elongated hollow shaft having a transverse slot therethrough adjacent the tool head and sized to slidably receive a one-piece bow therethrough, adjustable pressure plate means disposed within the hollow shaft so as to engage the bow to secure it in place and sight means for the bow pivotally received in the tubular handle portion so as to be foldable to lie substantially against the surface of the tubular handle when the sight means is not in use.

4,727,610
MULTI-PURPOSE STAPLER
Johnny C. H. Lin, 5F-8, No. 413, Lin Sen N. Road, Taipei, Taiwan
Filed Aug. 11, 1986, Ser. No. 895,100
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—160 **1 Claim**



1. A multi-purpose deskmate having: a punch arm comprising a staple arm, a storage compartment, a storage flap covering said storage compartment, a tape compartment with a tape roller and a tape cutter; a hole puncher with a paper slot and a slideable scale for measuring the width between slots; a base comprising a pencil sharpener which deposits pencil shavings into an open compartment, a paper clip drawer, and a staple blank; and being further characterized in that:

a punch arm support connects the base and the punch arm together on the pencil sharpener end of said multi-purpose deskmate, said punch arm support also houses a function plate having a function block which determines whether the staple arm or the hole puncher is to be used, said paper clip drawer is on the end of said base opposite said pencil sharpener, a staple blank is on the paper clip drawer end of the base, and said hole puncher is mounted and stabilized by said punch arm support.

4,727,611
APPARATUS AND METHOD FOR DYEING YARNS
Lior Shwartzman, Ramat Gan, Israel, assignor to Arel Technology (1971) Ltd., Yavne, Israel
Filed Jul. 17, 1986, Ser. No. 886,430
Claims priority, application Israel, Aug. 6, 1985, 76022
Int. Cl.[4] D06B *5/16*
U.S. Cl. 8—155.1 **7 Claims**

6. A method for dyeing yarn on cones comprising the steps of:

providing first and second dyeing enclosures;

providing at least one carrier disposed in each of said first and second dyeing enclosures, for liquid communication with the interior of cones of yarn disposed thereon;

simultaneously operating said first and second dyeing enclosures for dyeing operation including:

during a first stage of dyeing operation:

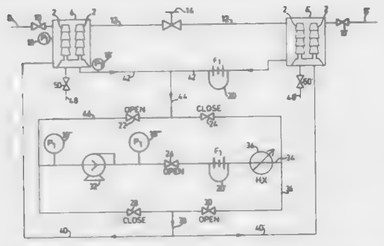
causing circulation in said first dyeing enclosure of a first amount of dye liquor, which is generally little more than just sufficient to fill the carrier and the insides of

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the cones, in a circulation sequence from the inside of the cones therethrough to the outside; and simultaneously

causing circulation in said second dyeing enclosure of a second amount of dye liquor, which is generally sufficient to fill the second dyeing enclosure at least to the top of the cones therein in a circulation sequence from the outside of the cones therethrough to the inside; and

during a second stage of dyeing operation:



causing circulation in said second dyeing enclosure of a first amount of dye liquor, which is generally little more than just sufficient to fill the carrier and the insides of the cones, in a circulation sequence from the inside of the cones therethrough to the outside; and simultaneously

causing circulation in said first dyeing enclosure of a second amount of dye liquor, which is generally sufficient to fill the first dyeing enclosure at least to the top of the cones therein in a circulation sequence from the outside of the cones therethrough to the inside.

4,727,612

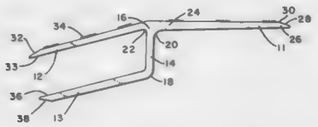
TAIL BRIDGE

Edward R. Smith, 53 Belcher Rd., Blairstown, N.J. 07825

Filed Feb. 2, 1987, Ser. No. 9,916

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—69.5 **17 Claims**



1. A tail bridge for bridging a tail end of a motor vehicle and a ramp rail comprising:

a first plate to be placed on the tail end of the motor vehicle for running substantially parallel to the tail edge of the motor vehicle tail end;

a second plate rigidly joined to the first plate along a straight uninterrupted junction line and extending at an edge of the first plate and forming an angle of from about 12 to 20 degrees relative to the first plate;

an intermediate section attached between the first and second plate substantially along the straight junction line and extending downwardly;

a third plate attached to the lower end of the intermediate section and running substantially parallel to the second plate and spaced therefrom by a distance corresponding to the width of a rail to be placed between the second and third plate.

4,727,613

DOCK LEVELER

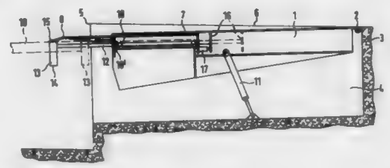
Kurt Alten, Ringstrasse 14, D-3015 Wenningsen, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 943,646

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544545

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—71.1 **10 Claims**



1. A dock leveler, comprising:

a bridge plate having a first end pivotably mounted on a dock in such a way as to be pivotable about a horizontal axis, said bridge plate also having a second end remote from said first end displaceable into a lower end position where it rests upon a fixed abutment location;

an extension movably mounted on said second end of said bridge plate in such a way as to be extensible from said bridge plate from an initial position into an operative position, and in such a way as to be retractable into a rest position of said dock leveler, with said extension, in said operative position, serving for support of said bridge plate on a platform of a vehicle that is to be loaded or unloaded; said extension has a tip remote from said first end of the bridge plate;

switch means for triggering return of said dock leveler to said rest position in the absence of a platform;

switch-controlling means movably connected to said extension in such a way as to be movable toward and away from said bridge plate and said switch means; and

a sensing element that is connected to said switch-controlling means and that is disposed extending downwardly in a predetermined range for an effective extent approximately below said tip of said extension in the operative position of the latter and prior to placement of said extension on a platform; said sensing element is adapted to be contacted by a platform, said switch-controlling means engaging said switch means, when said sensing element is not in contact with said platform, and said switch-controlling means disengaging said switch means, when said sensing element is in contact with said platform, said switch means being operatively connected with said switch-controlling means so that for safety reasons to avoid any accidents an automatic return to initial-rest position occurs only when said switch means is actuated by said switch-controlling means that results only when no platform is in the vicinity of said extension.

4,727,614

GROUND CORONA COMB

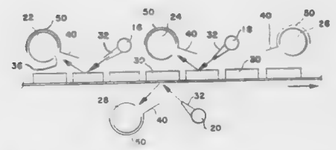
Gwido K. Swistun, Saco, Me., assignor to Shape Inc., Biddeford, Me.

Filed Jan. 20, 1987, Ser. No. 4,417

Int. Cl.[4] B08B *6/00, 5/02*

U.S. Cl. 15—1.5 R **17 Claims**

1. A ground corona comb in an ionized fluid cleaning apparatus, the ionized fluid cleaning apparatus including a nozzle for directing a jet of ionized fluid toward a workpiece carrying debris, and a suction pipe having an opening therein for withdrawing the debris dislodged by the jet of ionized fluid, said ground corona comb comprising:



a plate, formed of electrically conductive material, having a jagged edge disposed adjacent to and separated from the workpiece; and

grounding means for electrically grounding said plate.

4,727,615

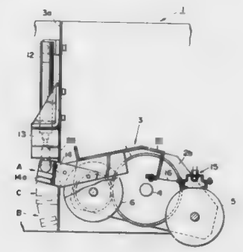
BOWLING LANE MAINTENANCE APPARATUS

Chikanari Kubo, Sagamihara, Japan, assignor to Eishin Technology Company, Limited, Japan

Filed Jun. 13, 1986, Ser. No. 873,956

Int. Cl.[4] A47L *13/30*; B24B *29/00*

U.S. Cl. 15—98 **1 Claim**



1. A bowling lane maintenance apparatus for applying a conditioning oil to the surface of a bowling lane and then buff finishing the oil applied bowling lane surface, said maintenance apparatus comprising: a body, a box member pivotally mounted on said body and including a pair of parallel spaced side plates, oil applicator and buffing roller means rotatably supported within said box member perpendicular to said side plates and disposed on the opposite sides about the pivot, and a positioning air cylinder mechanism operably interposed between said body and one edge of said box member at its longitudinal center, said positioning air cylinder mechanism being adapted to pivot said box member such that one of said oil applicator and buffing roller means will be brought into contact with the surface of the bowling lane or both the roller means will be separated from the bowling lane surface, said positioning air cylinder mechanism including two air cylinders different in stroke and biasing force from each other, one of said air cylinders having a longer stroke and a smaller biasing force being pivotally connected with said box member, the other air cylinder having a shorter stroke and a larger biasing force engaging said box member, whereby said box member can be shifted to its desired position by the action of said one air cylinder, the pressure exerted on the oil applying roller means through said box member can be controlled by the action of said other air cylinder, and said box member can be held by said other air cylinder at a netural position wherein both the roller means are separated from the bowling lane.

4,727,616

PICK UP ROLLER

Ronald Kucera, 1641 Kenneth Rd., Glendale, Calif. 91201, and John Sartuche, 10508-3 Sunland Blvd., Sun Valley, Calif. 91040

Filed Sep. 15, 1986, Ser. No. 907,317

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—104 A **8 Claims**



1. A pick-up roller comprising:

(a) A support;

(b) A cylinder carried by said support for rotation about its longitudinal axis; and

(c) plurality of windings of material wound about said cylinder, each of said windings having an outwardly facing adhesive surface and having a continuous cut along a substantial portion of a line extending across each said winding to define a circumferentially extending narrow band of uncut windings disposed proximate one edge of said cylinder.

4,727,617

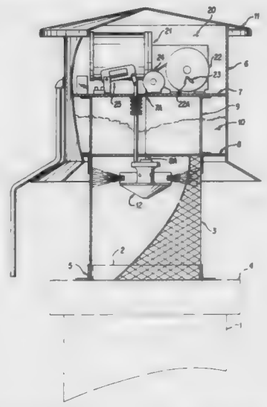
CHIMNEY CLEANING APPARATUS

Armando J. Bardini, 136 Hanley Dr., Grass Valley, Calif. 95945, and Gary R. Caravantes, 1788 Edgewater Ct., Greenwood, Calif. 95635

Filed Dec. 9, 1985, Ser. No. 806,598

Int. Cl.[4] F23J *3/00*

U.S. Cl. 15—163 **1 Claim**

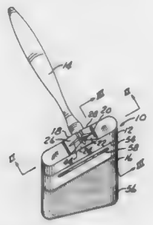


1. A chimney cleaning apparatus comprising in combination:

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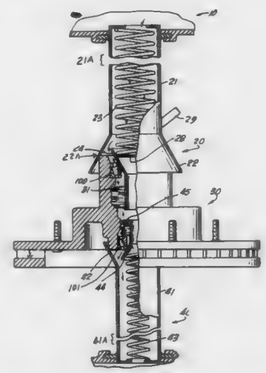
a. a support structure disposed on the upper edge surface of the chimney, said support structure having a horizontally oriented plate member that is spaced a predetermined distance above said upper edge surface so as to allow the products of combustion to be vented to the atmosphere,
b. a cable drive mechanism mounted on said plate member, said cable drive mechanism comprising a reversible electric motor and a rotary cable drum drivingly coupled with said electric motor, said plate member provided with an opening to allow said cable to pass therethrough,
c. a cable secured at one end to said rotary drum, the length of the cable being approximately the length of the chimney to be cleaned and defining the bottom of the length of travel of the cleaning stroke,
d. a brush cleaning means for cleaning the inner surfaces of the chimney, said brush cleaning means being secured to the other end of said cable,
e. a motor control circuit for causing the rotary drum to unwind the cable and move the cleaning means downwardly from a stored position above the chimney to its lowermost length of travel inside the chimney and then to automatically rewind said cable and move said brush cleaning means upwardly back to said stored position in one continuous, uninterrupted cycle, without reversing the rotation of said electric motor and rotary drum,
f. said motor control circuit including a limit switch device that is activated to close and make electrical contact with said motor control circuit when the brush cleaning means is allowed to be lowered and to be de-activated to make open electrical contact with said motor control circuit when said brush cleaning means reaches said stored position, in order to de-energize said electric motor and thus stop the upward travel of said brush cleaning means,
g. said motor control circuit further including a switch means for energizing said electric motor when said brush cleaning means is located in its stored position, said switch means being electrically coupled with the limit switch device whereby, when said switch means is activated to energize said electric motor, said brush cleaning means starts its descent into said chimney to start another cleaning cycle and causes said limit switch to make electrical contact with said motor control circuit, said switch means further including electrically coupled control means to sequentially alternate the reversibility of rotation of the electric motor for the next brush cleaning cycle.

4,727,618
ADJUSTABLE HANDLE ON A HAND IMPLEMENT
Frederick G. Mahoney, 212 9th St., Pittsburgh, Pa. 15222
Filed Oct. 26, 1984, Ser. No. 664,999
Int. Cl.[4] A46B *9/10*
U.S. Cl. 15—172 **7 Claims**



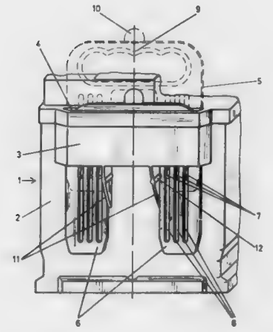
5. A hand implement comprising:
a base member
a tool head carried by said base member by retention means which permits said tool head to be retained by said base member in at least a pair of use positions;
said base member including a handle mounting portion comprised of a plurality of planar abutment surfaces residing in a respective plurality of non-parallel planes;
said retention means comprising an elongated handle securing means cooperable with said base member and said handle for selective retention of said handle in any of a plurality of positions, each of which corresponds to an orientation of said handle perpendicular to one of said abutment surfaces;
said securing means including an elongated stem and an oblong ball member affixed to said stem with its major axis oriented transverse to the axis of said stem such that said oblong ball cooperates with said base member to form a ball and socket pivot joint wherein said securing means is constrained by said base member against axial rotation; and
said securing means further including rotary means for securing said handle thereto and for selective adjustment of the longitudinal position of said handle axially of said securing means by axial rotation of said handle with respect to said securing means.

4,727,619
APPARATUS FOR CLEANING WHEEL BEARINGS
Robin S. Robbins, P.O. Box 2451, Kings Beach, Calif. 95719
Filed Jul. 1, 1986, Ser. No. 881,036
Int. Cl.[4] B08B *9/00*
U.S. Cl. 15—304 **6 Claims**



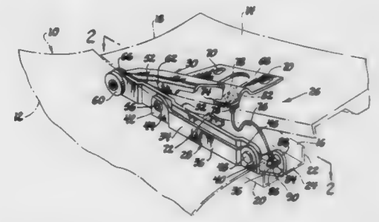
1. Apparatus for cleaning bearings in automotive wheels comprising a pair of fixtures to hold said wheel at positions adjacent the bearings in said wheel; means associated with said pair of fixtures suitable to pass a cleaning fluid to the interior of the wheel and in contact with the bearings so as to remove grease or other matter from the bearings; means to receive said fluid after it has passed through said wheel; and brush means associated with said pair of fixtures in such manner that the wheel may be rotated causing the brush means to assist in removing grease or other impurities from the wheel bearings.

4,727,620
RETRACTABLE CARRYING HANDLE FOR A STORAGE BATTERY
Klaus Gummelt, Garbsen, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed May 21, 1986, Ser. No. 865,890
Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519511
Int. Cl.[4] B25G *1/04*
U.S. Cl. 16—115 **2 Claims**



1. A carrying device for a storage battery, comprising
at least one substantially solid and flat retractable handle connected to said storage battery, said retractable handle adaptable to be movable along a side of said storage battery,
a plurality of guidance members associated with said handle, said guidance members projecting outward from said side of said battery, said guidance members guiding the movement of said handle,
said handle including a crosspiece having an aperture therein for grasping said handle, and an arm extending from said crosspiece parallel to said side of said battery, said arm including a longitudinal slit therein adapted to closely receive said guidance member, said guidance member abutting against a lower end of said slit when said handle is in an extended position, said arm substantially supporting the weight of said battery when said handle is in said extended position,
said arm comprising a plurality of longitudinal slits;
said guidance members being received within said longitudinal slits;
a band extending along one side of said battery, said band including a slot therein, and said arm passing through said slot; said band substantially conforming to the shape of said battery;
said guidance members being disposed in the region of an underside of said band; and
a guide plate projecting from said side of said battery and located adjacent said arm;
said guide plate projecting from an underside of said band along said side of said battery.

4,727,621
MULTIPOSITION HINGE
Donald D. Emery, 3645 Bellows Dr., Troy, Mich. 48083; David C. Stewart, 22100 W. Brandon, Farmington Hills, Mich. 48024, and Geoffrey Waterworth, 5256 Edgelake Rd., P.O. Box 36, Lakeland, Mich. 48143, assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 19, 1986, Ser. No. 932,326
Int. Cl.[4] E05D *7/06, 11/10, 11/06;* **B62D** *25/10*
U.S. Cl. 16—239 **4 Claims**



1. A multiposition hinge for mounting a closure to a vehicle for movement between a closed position and multiple open positions comprising, in combination,
a vehicle mounted first hinge member having a first pivot opening and a second pivot opening,
a link member having a first pivot opening, a second pivot opening, and a third pivot opening, the first and second pivot openings of the first hinge member and the link member corresponding to each other,
first pivot means rotatably securing the corresponding first pivot openings of the first hinge member and link member to each other,
a closure mounted second hinge member having a pivot opening corresponding to the third pivot opening of the link member,
second pivot means rotatably securing the corresponding pivot openings of the link member and second hinge member to each other,
and removable fastener means extending through the corresponding second openings to secure the link member to the first hinge member,
the second hinge member being rotatable about the second pivot means to move such hinge member and a closure mounted thereto between closed and first open positions,
removal of the fastener means permitting the link member to rotate about the first pivot means individually or conjointly with rotation of the closure mounted hinge member about the second pivot means to move the closure between the closed position and other open positions.

4,727,622
HINGE
Ken Tsuneki, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan
Filed Aug. 16, 1985, Ser. No. 766,193
Claims priority, application Japan, Dec. 10, 1984, 59-260385
Int. Cl.[4] E05D *15/00, 3/06*
U.S. Cl. 16—368 **6 Claims**

1. A door hinge particularly adapted to permit a relatively wide opening movement of a relatively thick door, said door having a socket the depth of which is such that a substantial portion of the moving parts of the hinge is confined when the door is closed, the width of said socket being greater than the width of the moving components of the hinge, comprising:
(a) a body adapted to be fixedly secured to a frame for said door, said door in the area adjacent said socket engaging the forward surface of said frame when said door is closed;
(b) first and second arms for pivotally connecting the socket

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of said door to said body, said second arm having an outer end mounted in said socket and an inner end mounted on movable pin means having an axis about which said door rotates, the axis of said pin means being only slightly rearwardly of said forward surface of said frame when said door is closed and being essentially in the plane of said forward surface when said door is opened;

(c) connecting means comprising a first link connected at one end to said body and at its other end to said pin means, and

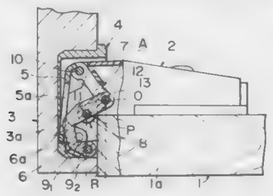
(d) guide means comprising a second link pivotally connected at one end thereof to said body and at its other end to a shaft pin mounted on said second arm forwardly of said pin means,

whereby when said door is opened, said pin means travels through an arcuate forward path so as to space said door from the frame to permit a more wide-open movement of the door.

3. A door hinge particularly adapted to permit a relatively wide opening movement of a relatively thick door, said door having a socket in which a substantial portion of the moving parts of the hinge is confined when the door is closed, the width of said socket being greater than the width of the moving components of the hinge, comprising:

(a) a body adapted to be fixedly secured to a frame for said door;

(b) first and second arms for pivotally connecting the socket of said door to said body, said first arm having a first end fixedly connected to said body and a second end fixedly connected to said socket, said second arm having an outer



end mounted in said socket and an inner end mounted on movable pin means having an axis about which said door rotates;

(c) connecting means comprising a link connected at one end to said body and at its other end to said first pin means;

(d) an arcuate guide slot formed in said body forwardly of said link, and

(e) a second pin means on said second arm and movable in said arcuate guide slot,

whereby when said door is opened, said second pin means travels in said arcuate guide slot and said first pin means travels forwardly so as to space said door from the frame to permit a more wide-open movement of the door.

5. A door hinge particularly adapted to permit a relatively wide opening movement of a relatively thick door, said door having a socket in which a substantial portion of the moving parts of the hinge is confined when the door is closed, the width of said socket being greater than the width of the moving components of the hinge, comprising:

(a) a body adapted to be fixedly secured to a frame for said door;

(b) first and second arms for pivotally connecting the socket of said door to said body, said second arm having an outer end mounted in said socket and an inner end mounted on first pin means having an axis about which said door rotates;

(c) means for connecting said first pin means and said body, said connecting means comprising a first guide slot in which said first pin means engages to permit said first pin means to travel through a path forwardly when the door is opened, thereby spacing said door from the frame to permit a more wide-open movement, and backwardly when the door is closed, and

(d) guide means for guiding the travel of said first pin means, said guide means comprising a second arcuate slot formed in said body forwardly of said first slot, and second pin means on said second arm forwardly of said first pin means and engagable in said second slot,

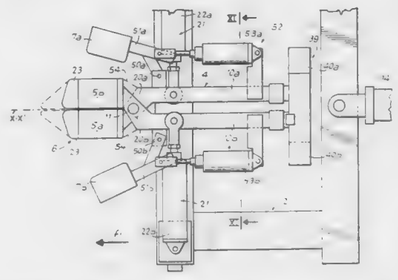
whereby when door is opened, said second pin means moves arcuately in said second slot thereby permitting said first pin means to move forwardly in said first slot to space the door from the frame.

4,727,623

MACHINE FOR PULLING OFF STRIPS OF FAT FROM HOG CARCASSES

Lucien Durand, Baix, France, assignor to Societe Anonyme: Societe des Ateliers de Constructions Mecaniques: Lucien Durand, Baix, France

Filed Apr. 24, 1987, Ser. No. 42,270
Claims priority, application France, Apr. 28, 1986, 86 06360
Int. Cl.⁴ A22B *5/00*
U.S. Cl. 17—1 R **19 Claims**



1. Machine for pulling off the belly strips from a hog carcass, wherein said machine comprises:

means for suspending an eviscerated hog carcass by its hind legs,

means for introducing, in the hog's open rib cage, a clamp equipped with inwardly-directed active jaws,

means for placing the active jaws substantially inside the plane of the lower end portions of the belly strips lining the internal faces of the hog's sides,

means for opening the clamp in order to place the active jaws against the lower end portions of the belly strips,

means for pressing, against the external face of the hog's sides, passive counter-jaws, in facing relationship to said active jaws,

means for bringing out of said active jaws, means for gripping the belly strips simultaneously,

means for opening out the passive counter-jaws,

means for closing the clamp so as to bring the active jaws close together and to pull off the lower end portions of the belly strips gripped by said gripping means,

means for raising the clamp in order to loosen the belly strips from the internal faces of the hog's sides, and

means for extracting the clamp from the hog.

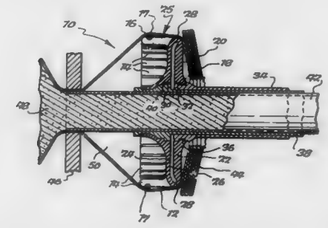
4,727,624

FOOD CASING PRESIZING DEVICE

Thomas R. Stanley, Downers Grove, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Oct. 22, 1986, Ser. No. 921,978
Int. Cl.⁴ A22C *11/02*
U.S. Cl. 17—41 **12 Claims**

1. A sizing ring for food casing, comprising means for mounting said ring onto a stuffing horn, means for diametrically engaging and stretching the food casing from a length of casing on the stuffing horn, and a continuous, bifurcated wall means extending radially from the mounting means for supporting said means for engaging and stretching the casing, said bifurcated wall means including moveable means for expanding and relaxing said means for engaging and stretching the casing.

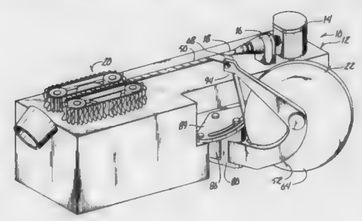


4,727,625

ENCASED PRODUCT AND METHOD AND APPARATUS FOR ENCASING SAME

Ray T. Townsend, Des Moines; David W. Smith, and Robert M. Dykes, both of Urbandale, all of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 731,995, May 8, 1985, Pat. No. 4,660,255. This application Feb. 5, 1987, Ser. No. 13,050
Int. Cl.⁴ A22C *11/00, 13/00*
U.S. Cl. 17—49 **15 Claims**



1. An apparatus for encasing a plastic product, comprising, a support;

an elongated casing strip having opposite side edges;

first means on said support for forming said strip into an elongated tubular casing with the side edges of said strip frictionally engaging and overlapping each other along an elongated seam;

second means on said support for introducing said plastic product into said casing;

said overlapped edges of said casing strip being sufficiently overlapped to maintain said side edges in fixed overlapping relation to maintain said casing strip in a self-contained tubular casing to contain said plastic product.

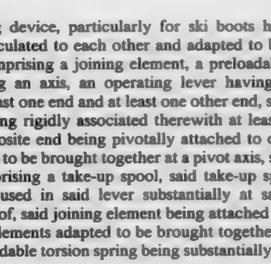
4,727,626

CONTROL OF FIBERS IN APRON DRAFTING SYSTEMS OF MACHINERY USED IN THE SPINNING PROCESS

D. Ricardo M. Vinas, Barcelona, Spain, assignor to Platt Saco Lowell S.A., Greenville, S.C.

Filed Dec. 16, 1985, Ser. No. 809,610
Claims priority, application Spain, Dec. 14, 1984, 539.294
Int. Cl.⁴ D01H *5/86*
U.S. Cl. 19—244 **9 Claims**

1. In an apron drafting system of a spinning frame of the type which includes a back draft between a first pair of rolls and a second pair of rolls, a front draft between said second pair of rolls and a third pair of front rolls wherein between said pairs of rolls the roving or sliver is drafted, a guidance zone defined between said second and third pairs of rolls by a top apron and a bottom apron, wherein the improvement comprises an improved fiber control which includes a projection means carried in engagement with said bottom apron in said guidance zone which includes at least one projection element carried transverse to said lower apron, said projection element being carried in a manner that is adjustable in its position within the bottom apron along the length of the guidance zone in the direction of sliver travel and independently adjustable in its position perpendicular to the direction of sliver travel, and said projection element being fixed against movement once adjusted to a desired position so that a prescribed guided path may be defined between said top and bottom apron in said sliver guidance zone which may be configured to permit effective control of the sliver in said fiber guidance zone between said aprons.

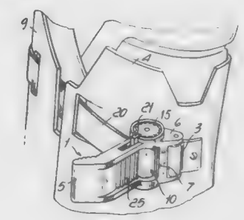


4,727,627

LOCKING DEVICE PARTICULARLY FOR SKI BOOTS

Giorgio Baggio, S. Martino Di Lupari, and Giuseppe De Bortoli, Montebelluna, both of Italy, assignors to Nordica S.p.A., Montebelluna TV, Italy

Filed Jan. 30, 1987, Ser. No. 9,169
Claims priority, application Italy, Feb. 6, 1986, 20872/86[U]
Int. Cl.⁴ A43B *11/00*; A43C *11/00*
U.S. Cl. 24—68 SK **6 Claims**



1. Locking device, particularly for ski boots having two elements articulated to each other and adapted to be brought together, comprising a joining element, a preloadable torsion spring having an axis, an operating lever having a middle portion, at least one end and at least one other end, said at least one end having rigidly associated therewith at least one grip tab, said opposite end being pivotally attached to one of said two elements to be brought together at a pivot axis, said device further comprising a take-up spool, said take-up spool being internally housed in said lever substantially at said middle portion thereof, said joining element being attached to another of said two elements adapted to be brought together, said axis of said preloadable torsion spring being substantially parallel to

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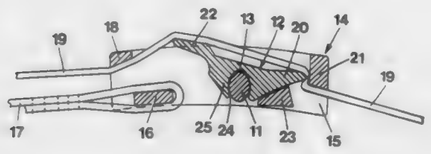
said pivot axis, said preloadable torsion spring being accomodated internally at said spool and adapted for automatically rewinding said joining element around said spool, said spool being rotatable about a spool axis, said spool axis coinciding with said axis of said preloadable torsion spring, said lever and said take-up spool being ratatable about said pivot axis, said pivot axis being substantially spaced from said spool axis.

4,727,628

STRAP BUCKLE WITH SELF-LOCKING FUNCTION

Göran Rudholm, Borås, Sweden, assignor to Rudholm & Co. i Boras AB, Borås, Sweden

PCT No. PCT/SE86/00489, § 371 Date Jun. 30, 1987, § 102(e) Date Jun. 30, 1987, PCT Pub. No. WO87/02552, PCT Pub. Date May 7, 1987
PCT Filed Oct. 23, 1986, Ser. No. 74,489
Claims priority, application Sweden, Oct. 24, 1985, 8505015
Int. Cl.[4] A44B *11/12*
U.S. Cl. 24—170 1 Claim



1. A strap buckle with self-locking function, incorporating a frame shaped holder (15) with a shaft (11) provided between the opposite inner long sides of the frame, about which shaft is pivotably supported a double-armed locking member (12), which is adapted to cooperate with one end gable (21) of the frame, thereby locking a part (19) of a strap situated between the locking member (12) and said end gable, and which locking member under actuation of an external force (A) is pivotable about the shaft against the action of a resilient member, characterized therein,

that both arms (20,22) of the two-armed locking member (12) are situated inside the outer frame (18,21) of the holder (15),

that the locking member (12) is provided with a transverse groove (13) arranged between its arms (20,22) and having a non-round, oblong cross-section,

that the shaft (11) is designed with a non-round, elongated cross-sectional shape mainly corresponding to that of the groove (13),

that the resilient member is an integral part of the locking member (12), whereby the portions (25) about the groove (13) are elastically resilient, and that the holder (15) as well as the locking member (12) are manufactured from plastic material and are held together solely by that the locking member with its groove (13) is fixed by being snapped upon the shaft (11) of the holder.

4,727,629

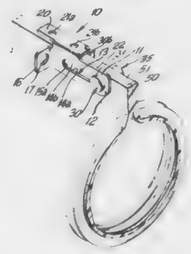
FASTENER WHICH ROTATES AND CLAMPS

Cuyler Hoen, Rennesselaer, and Frederick J. Pufpaff, Loudonville, both of N.Y., assignors to Simmons Fastener Corporation, Albany, N.Y.

Filed Mar. 6, 1987, Ser. No. 23,162
Int. Cl.[4] E05C *3/00*; A44B *21/00*
U.S. Cl. 24—458 13 Claims

1. A fastener adapted to removably clamp the edges of first and second panels, each panel having top and bottom sides and a hole therethrough with the holes in the two panels being aligned when the panels are joined, the fastener comprising three members and including:

a body member having a flat top flange portion having an elongated slot therein, said top flange portion adapted to slide on the top side of the first panel; a side wall portion connected to said top flange portion and substantially perpendicular thereto, said side wall portion in height being substantially the thickness of both panels combined and adapted to be held against the edges of the panels when the fastener is closed; and a flat bottom flange portion parallel to the top flange portion;



a hinge pin which acts as a pivot for the body member having a head portion which prevents the hinge pin from escaping through the slot in the top flange portion, a shank portion which fits through the slot in the top flange portion and a hole in the first panel;

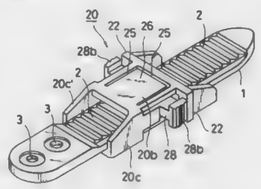
a retainer cap which fits onto and is joined with said hinge pin and which fits in the hole in the second panel.

4,727,630

PLASTIC BUCKLE

Kong Alan, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Oct. 17, 1986, Ser. No. 920,486
Claims priority, application Japan, Nov. 8, 1985, 60-172181[U]
Int. Cl.[4] A44B *11/24*
U.S. Cl. 24—585 1 Claim



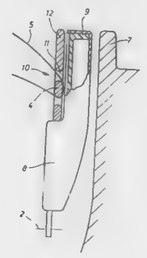
1. A plastic buckle comprising a one-piece plastic molding having a belt insertion hole defined by top and bottom walls facing each other in spaced apart relation and opposite side walls facing each other, a belt or the like member being inserted through said belt insertion hole, a lock portion defined by a U-shaped slit-like opening formed in said top wall and having a free end portion capable of elastic deformation, said free end portion of said lock portion being provided with a depending lock member beneath said free end portion and having downwardly and inwardly tapering oblique side portions and having at its lower end an inner lock pawl, side holes formed in said opposite side walls and communicating with said belt insertion hole, and operating members penetrating said side holes and elastically deformable inwardly for each thereof engaging an oblique side portion of said lock portion to cause an upward displacement of the free end of said lock portion, and said one-piece plastic molding including an integral resiliently deformable connection between the molding and said operating members.

4,727,631

LOCK FOR SAFETY BELTS

Walter Jahn, Ehningen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1987, Ser. No. 32,233
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611107
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—633 6 Claims



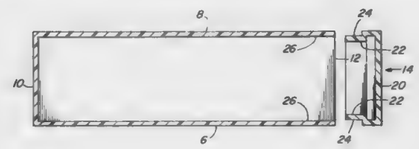
1. Lock for safety belts for a seat, including a lock tongue provided with a deflection web and with a lock tongue shackle arranged above it to be received in a lock housing and a press button on said lock housing both of which are arranged next to a wall adjacent said seat and having a top edge, wherein the top edge of the lock, tongue and the press button extends upwards relative to the deflection web of the lock tongue into the vicinity of and substantially coplanar with the top edge of said wall.

4,727,632

ARTICLE AND METHOD FOR ENCLOSING AND PROTECTING ENTOMBMENT CASKETS

David A. Yearsley, 2208 Delaware Ave., Pittsburgh, Pa. 15218

Filed Aug. 7, 1986, Ser. No. 894,001
Int. Cl.[4] A61G *17/00*; E04H *13/00*
U.S. Cl. 27—35 8 Claims



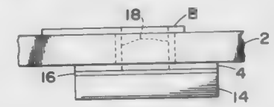
1. The method of providing long-term storage of an entombment casket in an above ground building which method comprises encasing said casket in a thin-walled enclosure means which is made of synthetic resinous material and is of two-part construction, said enclosure means comprising a unitary body member which envelopes said casket and an end-cap member, permanently joining, in an air-tight and water-proof manner, said body member after said casket has been inserted therein, and said end cap member, and venting the space enclosed by said enclosure means while supported at a desired location in said above ground building.

4,727,633

METHOD OF SECURING METALLIC MEMBERS TOGETHER

Geoffrey C. Herrick, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 763,497, Aug. 8, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 910,321
Int. Cl.[4] B23K *31/02, 35/28*
U.S. Cl. 228—122 5 Claims



1. A method of securing first and second metallic members together over a defined area of respective surfaces of said members, the first metallic member being a multiple layer metallic coating on a dielectric substrate, comprising:

(a) coating a layer of metal on selected areas of the surface of the second metallic member, the layer of metal being silver and copper having a melting point in the range of 500 degrees C. to about 900 degrees C., being of essentially uniform composition over said area, and being of essentially uniform thickness over said defined area;

(b) bringing said surfaces into confronting, contacting relationship; and

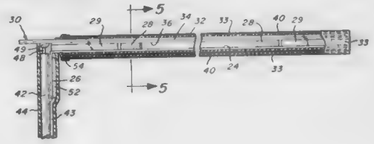
(c) brazing the first and second metallic members together.

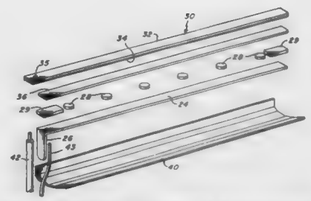
4,727,634

MUSICAL INSTRUMENT TRANSDUCER

Lawrence R. Fishman, Green St. 5, Woburn, Mass. 01801

Division of Ser. No. 876,238, Jun. 19, 1986, which is a continuation-in-part of Ser. No. 856,189, Apr. 28, 1986, abandoned. This application Jun. 25, 1987, Ser. No. 66,754
Int. Cl.[4] H04R *17/00*
U.S. Cl. 29—25.35 6 Claims





1. A method of fabricating a stringed instrument transducer that is adapted to be positioned adjacent the instrument strings to receive acoustic vibratory signals therefrom, said method comprising the steps of, providing an electrically conductive ground plane, providing a conductive strip, disposing a plurality of piezoelectric crystals sandwiched between the conductive ground plane and conductive strip so as to provide an elongated unitary structure and with the crystals disposed so as to be in alignment with respective strings when installed in the musical instrument, wrapping a paper product about the unitary structure and painting the paper with a conductive paint

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so as to form a shield about the structure, and connecting electrical leads to the ground plane and conductive strip, respectively.

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METHOD OF SECURING TUBES BETWEEN TUBE SHEETS

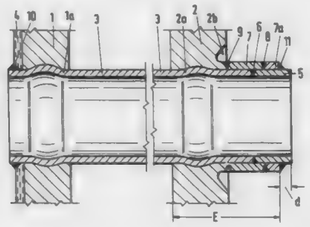
Herbert Krips, Bochum, and Miroslan Podhorsky, Ratingen, both of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Apr. 24, 1987, Ser. No. 42,410

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614237

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—157.3 C **3 Claims**



1. A method of securing tubes between tube sheets of a heat exchanger, with said tube sheets being interconnected via a housing, and with said tubes and/or said tube sheets being made of a steel that has to be annealed, for stress-relieving purposes, after a welding process; said method includes the steps of:

providing said tube sheets with holes for receiving said tubes;

extending the length of at least one end of each of said tubes by welding thereto a tubular piece that is made of a material that can be welded without a subsequent thermal treatment being required;

welding onto the outer surface of at least one of said tube sheets sleeves that respectively extend the length of said holes in that tube sheet, with at least the free, non-welded end of each of said sleeves being made of a material that can be welded without a subsequent thermal treatment being required;

inserting said tubes into said holes of said tube sheets;

welding onto one of said tube sheets one end of each of said tubes if that tube end is not provided with a tubular extension piece, with a tube sheet that is provided with said sleeves remaining non-welded to said tubes;

carrying out a final thermal treatment of said tube and tube sheet structure after all welding steps that require a subsequent thermal treatment are concluded; and

indirectly connecting said tubes to those tube sheets that are provided with said sleeves by welding the free, non-welded ends of said tubular extension pieces of said tubes to said sleeves.

4,727,636

MANUFACTURING METHOD FOR AN ELLIPTIC GEAR

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 29, 1986, Ser. No. 890,356

Claims priority, application Japan, Jul. 31, 1985, 60-170136

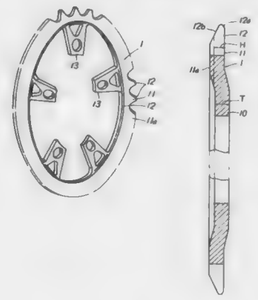
Int. Cl.⁴ B21K *1/30*

U.S. Cl. 29—159.2 **4 Claims**

1. A manufacturing method for a elliptic gear, said method compriisng the steps of:

(a) providing an aluminum plate having an outer peripheral portion in an elliptic shape,

(b) forming an intermediate element having a substantially cup-shaped cross-section by pressing said aluminum plate to cause said outer peripheral portion of said plate to project unidirectionally in a thickness direction of said intermediate element with respect to a radially inward



portion of said intermediate element to form a flange at said outer peripheral portion, and

(c) forming a plurality of teeth members at said outer peripheral portion by cutting said flange of said intermediate element in a thickness direction thereof at an outer surface in a projecting direction of said flange to reduce a thickness of said flange relative to a thickness of said intermediate element.

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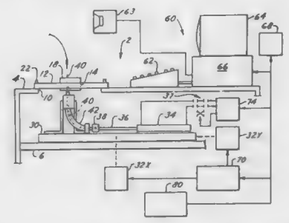
COMPUTER AIDED CONNECTOR ASSEMBLY METHOD AND APPARATUS

Richard J. Buckwitz, Issaquah; Leslie A. Anderson, Bothell; Hugh R. Schlosstein, Renton, and Alfred E. Walter, Jr., Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 20, 1987, Ser. No. 5,242

Int. Cl.⁴ B23Q *17/00, 15/00;* **B23P** *21/00*

U.S. Cl. 29—407 **18 Claims**



1. A method for assembling multiple rod-form elements into a support member provided with multiple apertures for receiving said elements, comprising:

identifying a given rod-form element and in response thereto ascertaining the location of the aperture wherein the given rod-form element is to be inserted;

extending a guide member into the thus ascertained aperture so as to enable the aperture to be discerned;

withdrawing the guide member; and

inserting the given rod-form element into the aperture from which the guide member was withdrawn.

3. Apparatus for use in assembling multiple conductors into a connector wherein said connector is provided with apertures for receiving said conductors, said apparatus comprising:

control means responsive to identification of a given conductor for indicating the aperture in said connector wherein said given conductor is to be inserted;

insertable rod means extendable into said apertures; and

movable means carrying said rod means and responsive to an indication that said given conductor is to be inserted in a particular aperture for moving said rod means to said last mentioned aperture and extending the rod means into such aperture.

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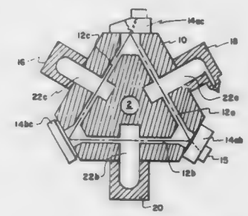
LOW COST RING LASER ANGULAR RATE SENSOR

Gerald R. Altmann, Rodgers, and Mark W. Weber, Elk River, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1986, Ser. No. 879,746

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—417 **8 Claims**



1. A method of making a ring laser comprising:

forming at least three flat surfaces on a block, said flat surfaces each having a normal to the plane thereof, and all of said normal to said surfaces being substantially coplanar, said flat surfaces arranged relative to each other to permit a selected group of connected line segments extending between said flat surfaces to form a closed-loop polygon in which a normal to each of said flat surfaces passes through the vertex of adjacent ones of said connected line segments, intersects the flat surface, and bisects the angle between said adjacent line segments;

boring a first set of cavities through said block along said selected group of line segments;

boring at least a second set of cavities through said block similarly arranged as said first set of cavities;

affixing mirrors to said flat surfaces; and

slicing said block into separate block portions having a single set of cavities.

4,727,639

METHOD OF MANUFACTURING SUBCALIBER SEGMENTED SABOT PROJECTILE

Ulrich Theis, Muehlheim, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

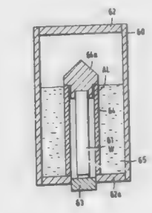
Continuation-in-part of Ser. No. 291,825, Aug. 10, 1981, Pat. No. 4,565,132. This application Nov. 18, 1985, Ser. No. 799,335

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030072

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—421 E **5 Claims**

1. Process for the manufacture of joint formed by a form-locking medium between a subcaliber segmented sabot and a subcaliber penetrator projectile made of heavy metal comprising the steps of placing a layer carrying form-locking lands and grooves on the surface of the penetrator projectile core, the penetrator containing a high percentage of a heavy metal in an n-phased sintered alloy (where n=2), the said layer carrying the form-locking medium forming at least an additional phase in the circumference of the penetrator, bonding the material of the form-locking medium together with the material of the projectile core by means of explosion welding, and interlocking a subcaliber segmented sabot to the lands and grooves bonded on the penetrator projectile core.



4,727,640

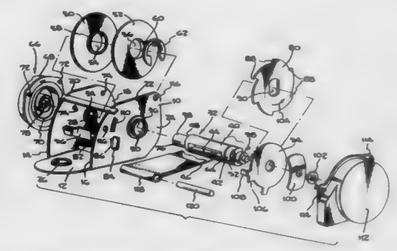
EASILY ASSEMBLED SEAT BELT RETRACTOR AND METHOD

William Hollowell, Pacific Palisades, Calif., assignor to American Safety Equipment Corp., Troy, Mich.

Continuation of Ser. No. 757,886, Jul. 23, 1985, abandoned, which is a division of Ser. No. 536,292, Sep. 27, 1983, Pat. No. 4,562,977. This application Sep. 18, 1986, Ser. No. 897,625

Int. Cl.⁴ B60R *22/34;* **B23P** *11/00*

U.S. Cl. 29—434 **9 Claims**



1. A method for assembling a safety belt retractor comprising the steps of:

providing a retractor frame having n integrally formed bottom and left and right side walls and open top, said side walls having inside faces facing each other and outside faces, said side walls each also having a belt storage spool shaft receiving opening for rotatable mounting of a belt storage spool shaft, wherein said storage spool shaft receiving opening in said left side wall is smaller than the storage spool shaft receiving opening in said right side wall;

providing a belt storage spool shaft having a left end, a middle portion, a right end and a transverse passageway through said storage spool shaft middle portion of sufficient size for receiving a safety belt wherein said storage spool shaft left end has a reduced diameter portion insertible within said left side wall opening for rotatable mounting and a shoulder between said reduced diameter end portion and said shaft middle portion;

providing a left belt rub protector disc and a right belt rub protector disc, each disc having a centrally located transverse storage spool shaft receiving opening around which is located a concentric collar that is integral with each of said belt rub protector discs;

positioning said left belt rub protector disc adjacent said left frame wall inside face so as to axially align the left disc storage spool shaft receiving opening with the left wall storage spool shaft receiving opening;

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positioning said left belt rub protector disc adjacent said right frame wall inside face so as to axially align the right disc storage spool shaft receiving opening with the right wall storage spool shaft receiving opening;

inserting said belt storage spool shaft left end through said storage spool shaft receiving opening in said right frame wall and through said belt rub protector discs to position said left storage spool shaft end within said left frame wall opening and to position said shoulder on said belt storage spool shaft adjacent to the inside wall of said left side wall to provide positioning of said belt storage spool shaft in said retractor frame and to rotatably mount said belt storage spool shaft to said frame;

securing said belt storage spool shaft to said frame to prevent transverse movement to the right of said belt storage spool shaft relative said frames; and

securing said belt rub protector discs to said belt storage spool shaft at spaced locations adjacent said frame walls by press fitting said collars to said belt storage spool shaft after said storage spool shaft is inserted through said shaft receiving opening in said right frame wall.

4,727,641

THERMOPLASTIC METHOD OF REDUCING THE DIAMETER OF A METAL TUBE

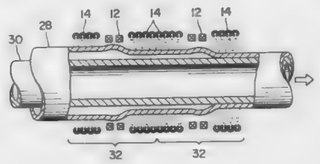
Fumiyoshi Kanatani, Kobe; Shigetomo Matsui, Higashiosaka; Toshio Atsuta; Takeshi Yamada, both of Kobe; Eisuke Mori, Tokyo, and Toshiaki Araki, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jun. 6, 1986, Ser. No. 871,917

Claims priority, application Japan, Jun. 7, 1985, 60-122663; Sep. 10, 1985, 60-198633; Sep. 10, 1985, 60-198634; Sep. 10, 1985, 60-198635; Sep. 10, 1985, 60-198636

Int. Cl.⁴ B23P *11/02*

U.S. Cl. 29—447 **13 Claims**



1. A thermoplastic method of reducing the diameter of a metal tube, which comprises: holding around the metal tube an annular heater capable of applying localized heat to the annular part of the metal tube so as to cause softening thereof; moving the annular heater and the metal tube relative to each other in the axial direction of the metal tube for producing a travelling annular heated part of the metal tube throughout the length thereof; and cooling parts of the metal tube neighboring said annular heated part on the opposite sides thereof in the axial direction of the metal tube by using a pair of annular coolers surrounding the metal tube and disposed close to said annular heater on the opposite sides thereof so as to be movable with the annular heater, the cooling by the coolers being such as to hold said parts neighboring the annular heated part at a temperature sufficiently low to limit the free radially outward thermal expansion of the annular heated part and to cause yielding of the same, whereby the diameter of the metal tube on cooling is made less than that before the heating.

4,727,642

TOOL-CHANGER MECHANISM

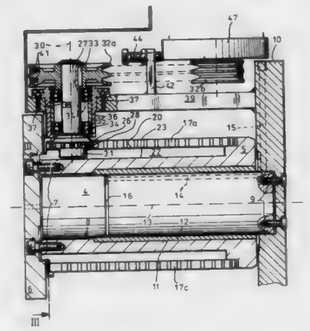
Walter Christner, Hülben, and Peter Häussler, Pfullingen, both of Fed. Rep. of Germany, assignors to Burkhardt & Weber GmbH & Co KG, Reutlingen, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 864,838

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522156; Oct. 9, 1985, 3536048

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **12 Claims**



1. In a tool-changer mechanism for a machine tool, such as a drilling, boring or milling machine, wherein for a single tool-changing cycle a slide for carrying a tool-gripping device first is guided for axial displacement (a) from a retracted rear position of gripping engagement with an installed used tool to be replaced and with a stored tool that is to replace the used tool and (b) to a forward position into which a gripped installed used tool and a gripped replacement tool have been displaced in extraction from their respective installed and stored locations, said slide being then partially rotated in the forward position to index the gripped replacement tool into alignment for prospective installation while also indexing the gripped used tool into an alignment for prospective storage, all prior to axial withdrawal of the slide to its retracted position, the improvement (c) in which a single continuous rack externally accessible on said slide follows a generally U-shaped course comprising two parallel axial legs and an arcuate leg connecting corresponding forward ends of the axial legs, and (d) in which a single drive pinion meshes with said rack, so that a single continuous drive of said pinion in a first rotational direction may impart a single cycle of axial and rotary slide displacement from one to the other end of said U-shaped course, and so that a succeeding single continuous drive of said pinion in the opposite rotational direction may impart another single cycle of axial and rotational displacement from said other end to said one end of said U-shaped course.

4,727,643

METHOD FOR MANUFACTURING A MAGNETIC HEAD BY A THIN-FILM TECHNIQUE

Herbert Schewe, Herzogenaurach, and Dietrich Stephani, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1986, Ser. No. 850,228

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513431

Int. Cl.⁴ G11B *5/127*

U.S. Cl. 29—603 **5 Claims**

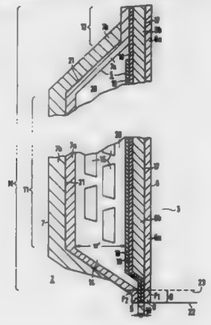
1. A method for manufacturing a magnetic head by a thin-film technique, which magnetic head comprises a magnetic conduction body for carrying magnetic flux and having at least two magnet legs which define an enlarged space through which the turns of at least one write and/or read coil winding

extends and which have pole surface facing a recording medium disposed in a common plane with a predetermined small spacing from each other, the method comprising the steps of:

forming a preliminary product of the magnetic head on a substrate body, the magnet legs of the head extending beyond the plane of the pole surfaces and forming thereby end pieces which are spaced by only a small gap;

providing a conductor structure of electrically conducting material mechanically connected with the substrate body;

removing the end pieces simultaneously with material-removing machining of the substrate body from the side facing the recording medium up to the plane of the pole surfaces such that said conductor structure is separated, just when the plane of the pole surfaces is reached in the



material-removing machining of the substrate body, into two conductor parts electrically insulated from each other;

measuring the electric resistance between these conductor parts for controlling the material-removing machining;

said step of forming comprising making the preliminary product of the magnetic head, at least in the region of the gap between the end pieces of the magnet legs, such that a first magnet leg is provided with a thin metal layer electrically insulated from the first magnet leg, and depositing the second magnetic leg in the region of its end piece directly on and in electrical contact with the metal layer, said second magnet leg and said metal layer forming said conductor structure.

4,727,644

CALIBRATING COMPONENTS

John C. Corfield, Ascot, England, assignor to Unimax Switch Limited, Wokingham, England

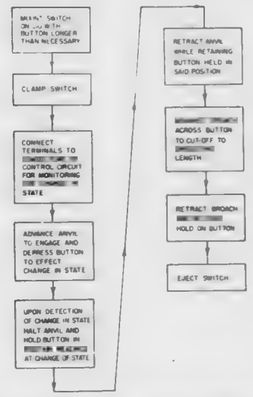
Filed Aug. 21, 1986, Ser. No. 898,675

Claims priority, application United Kingdom, Aug. 21, 1985, 8520992

Int. Cl.⁴ H01H *11/00*

U.S. Cl. 29—622 **7 Claims**

1. An automatic process for calibrating components of a kind including an actuating member on the component movable from a first position to a second position causing a change of state within said component, said actuating member having a greater extent than required to cause said change of state, the purpose of the calibration being to ensure that the change of state occurs at a predetermined position of an externally engageable surface of said actuating member in relation to the remainder of the component, said process comprising applying a force to said actuating member progressively to cause said member to move from said first position towards said second position while monitoring for the internal change of state, then, when said change of state occurs, holding said member in the position it has then reached and, while it is held, removing



material from said member to form said externally engageable surface occupying said predetermined position.

4,727,645

DEVICE FOR SURFACE MOUNTING OF COMPONENTS

Gunnar Rodin, Bromma, and Leonart Stridsberg, Enskede, both of Sweden, assignors to Mydata Automation AB, Stockholm, Sweden

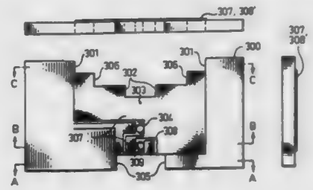
PCT No. PCT/SE85/00468, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/03367, PCT Pub. Date Jun. 5, 1986

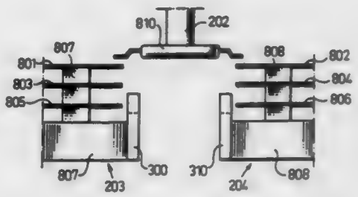
PCT Filed Nov. 18, 1985, Ser. No. 890,849

Claims priority, application Sweden, Nov. 19, 1984, 8405803

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—740 **5 Claims**





1. An apparatus for surface mounting of components on a support, comprising a positioning device for holding and moving the components to a mounting position in relation to the support, whereby centering means are movable towards and away from each other and are arranged to center the component from opposite sides concurrently with its movement to the mounting position, characterized in that the centering means comprises two centering electrodes which are provided

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with recesses, the recesses having dimensions corresponding to dimensions of the components to be mounted, and that the centering electrodes comprise electrical contact members to connect the components to an equipment for measurement of its electrical properties.

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DIE SET FOR SECURING A SELF-ATTACHING ELEMENT

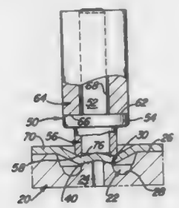
Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, Division of Ser. No. 229,274, Jan. 28, 1981, abandoned, Continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Aug. 20, 1986, Ser. No. 898,295

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003908

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—798 8 Claims



1. A die set, including a die member and a relatively movable drive member for securing metal self-attaching elements to a metal plastically deformable panel, said self-attaching elements each having an annular barrel portion including a free open end, said die member having a generally planar panel supporting surface at least partially surrounding a concave annular die cavity including a bottom surface which is relatively smooth and generally hemispherical in cross-section, said annular die cavity surrounding a center post projecting from said bottom surface, said center post having a top face spaced below said panel supporting surface and a conical side surface adjacent said top face which is inclined outwardly from the axis of said post, said top face forming a relatively sharp piercing edge which cooperates with a piercing surface on the free end of said self-attaching element annular barrel portion to pierce a slug from said panel, said conical surface smoothly blending with said die cavity hemispherical bottom surface and said bottom surface and defining a portion of the side surface of said post, said drive member aligning said self-attaching element with said die member with the internal surface of said annular barrel portion generally coaxially aligned with said center post conical side surface, the internal diameter of said barrel portion internal surface generally equal to the minor diameter of said post side conical surface, and a panel supported in fixed relation on said die member panel supporting surface overlying said die cavity, said drive member driving said self-attaching element barrel portion free end through an opening in said panel into engagement with said center post conical side surface and then into contact with said die cavity bottom surface, deforming said barrel portion free end radially outwardly into a U-shape in cross-section and said die set simultaneously deforming said panel adjacent said opening into said U-shaped barrel portion, forming a secure mechanical interlock.

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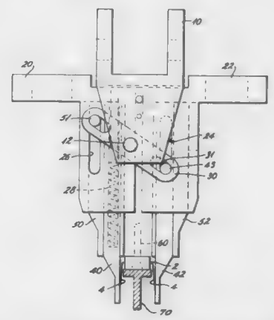
VCD TOOLING FOR DIP COMPONENTS OF DIFFERENT WIDTHS

Crawford A. Matson, Wyalusing, and Roy G. Space, Brackney, both of Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 18, 1986, Ser. No. 897,272

Int. Cl.[4] H05K *3/30;* B23P *19/00*

U.S. Cl. 29—838 12 Claims



1. A method of handling components having bodies which may differ in at least one particular dimension, from component to component, and comprising the steps of:

providing a gripper assembly having at least two pairs of fingers with a spacing between fingers of each pair of fingers providing a gripping range different from at least one other pair of fingers in order to grip components having said particular dimension corresponding to said gripping range of said each pair of fingers;

selecting automatically between said pairs according to said particular dimension of each component; and

gripping each said component upon actuation of said assembly.

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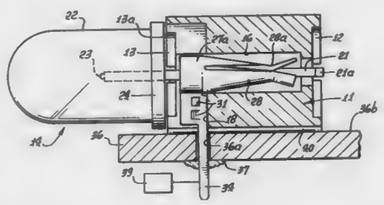
CIRCUIT COMPONENT MOUNT AND ASSEMBLY

John M. Savage, Jr., 538 B Via De La Valle, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 918,295, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 725,565, Apr. 22, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 56,051

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—839 16 Claims



1. In the method of mounting a circuit component to a circuit board means in any of a plurality of modes, using multiway mount, said component comprising an electrical unit having a base and terminal means projecting endwise from the base, the steps that include:

(a) providing a mounting body to support the unit on the circuit board means, the body defining an axis, cavity means, and slot means intersecting the cavity means and

formed in a generally axially parallel plane, the body capable of supporting said unit at either of two ends of the body which are axially spaced apart, via said terminal means in said cavity means,

(b) providing conductive means including contact structure for electrically connecting said unit with said circuit board means, the contact structure including spring fingers spaced about at least one zone adapted to receive the unit terminal means, in electrical contact therewith, said conductive means including auxiliary terminal means to be integral with said contact structure and the contact structure assembled into the cavity means so that the auxiliary terminal means projects outwardly of the body via said slot means, said contact structure and said auxiliary terminal means being defined by a single metallic sheet having tab means for anchoring the sheet to the body, and said sheet having a bridge portion between said contact structure and said auxiliary terminal means, said bridge portion mounting said tab means deflected from a plane defined by said bridge portion, said plane extending generally axially of the body, and said assembling carried out to locate said bridge portion in said slot means,

(c) assembling the conductive means to the body as aforesaid and the electrical unit to the contact structure so that the unit is disposed at one of said ends of the body, and

(d) joining the auxiliary terminal means to a circuit board.

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METHOD FOR PRODUCING AN OPTICAL DEVICE

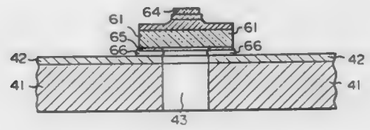
Hideaki Nishizawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 671,783, Nov. 15, 1984, Pat. No. 4,663,652. This application Sep. 9, 1986, Ser. No. 905,231

Claims priority, application Japan, Nov. 21, 1983, 58-218964; Nov. 25, 1983, 58-223020; Dec. 8, 1983, 58-232341

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—840 19 Claims



1. A method for producing an optical device, comprising the steps of:

sequentially mounting an electrode having a light passing hole on a light incident surface of an optical chip device and mounting a solder layer on said electrode;

mounting a die bonding pad on a light passing substrate; and

die-bonding said electrode on said optical chip device to said die bonding pad by using said solder layer, whereby an integral optical device is produced that is die bonded in a stable state.

4,727,650

BEAD STRIPPING DEVICE

Alan J. Dickinson, Cramlington, England, assignor to British Gas Corporation, London, England

Continuation of Ser. No. 912,691, Sep. 26, 1986, abandoned, which is a continuation of Ser. No. 741,558, Jun. 5, 1985, abandoned. This application Jun. 16, 1987, Ser. No. 62,424

Claims priority, application United Kingdom, Jun. 8, 1984, 8414642

Int. Cl.[4] B23D *21/06*

U.S. Cl. 30—94 6 Claims

1. A device for removing a bead from a cylindrical workpiece of synthetic thermoplastics material comprising:

a body;

a drive wheel;

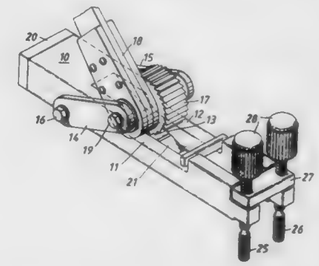
peripheral surface means on said drive wheel;

mounting means on which said drive wheel is rotatably mounted and connecting the same to said body;

manually operable means connected in driving relationship with said drive wheel for turning the same;

first and second runner means on said body engageable with the external surface of said workpiece at respective circumferentially spaced apart locations one of said runner means being positionally adjustable so as to engage said external surface and thereby stabilize the position of the device as it operates;

a blade mounted on said body and defining a cutting edge;



ramp surface means on said body extending back from said cutting edge, said ramp surface means being inclined so as to support thereon a free portion of said bead after the same has been cut by said blade and separated away from said workpiece;

and said manually operable means being operable to turn said drive wheel with said peripheral surface thereon engaging a first outer surface of said free portion of said bead in pulling, driving relationship therewith, a second minor freshly cut surface of said free portion being forced thereby to slide along said ramp surface means away from said cutting edge, which edge is thereby driven with said device as it pulls itself around said workpiece to cut said bead therefrom as said first and second runner means run around said workpiece upon said external surface thereof.

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CHAIN SAW

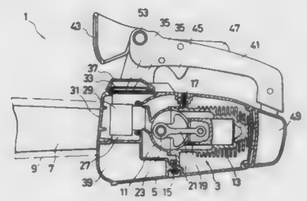
Kazuo Nakajima, Tokorozawa, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan

Filed Jan. 2, 1986, Ser. No. 815,732

Claims priority, application Japan, Jan. 8, 1985, 60-000403; Mar. 19, 1985, 60-038208[U]

Int. Cl.[4] B23D *57/02*

U.S. Cl. 30—383 6 Claims



1. A chain saw comprising:

a hollow main casing having a front end and a rear end;

an upper handle disposed above the main casing and extend-

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ing longitudinally therealong, said handle being secured to the casing adjacent the front and rear ends thereof;

an engine disposed removably in the main casing, said engine being provided with a crank case, a cylinder, and an ignition plug, said cylinder extending horizontally toward the rear end, the plug being disposed at the end of the cylinder;

a carburetor housing disposed in front of the crank case adjacent the front end of the main casing;

a fuel tank disposed in front of the crank case adjacent the front end of the main casing and located underneath the carburetor; and

a lubrication tank disposed between the cylinder and the rear end of the main casing, said lubrication tank having a recessed portion in which said plug is positioned.

2. Air intake apparatus for use with an engine of a chain saw comprising:

a hollow casing having a partition disposed adjacent but spaced from an outer wall, the space between the partition and the outer wall constituting a chamber, the remaining space constituting the main portion of the casing, the engine being disposed in the main portion;

a carburetor mounted on the engine, said carburetor having an air intake opening, said intake opening opening in the chamber whereby the chamber constitutes a carburetor chamber;

the outer wall having a plurality of air intake apertures therein which constitute an air intake passage;

an outer cover covering the outside of the air intake passage and having a narrowed air inlet opening to the ambient air; and

a muffler disposed in the cover and connected between the air inlet opening and the air intake passage whereby air passes through the inlet opening, the muffler, the intake passage, the chamber and the air intake opening into the carburetor.

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CUTTING DEVICE FOR A CUTTING MACHINE, PARTICULARLY FOR CUTTING SOFT, STICKING OR DIRTYING MATERIALS

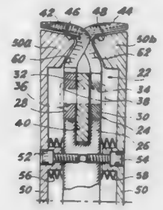
Jean-Claude Malet; Gérard Miachon, both of Venelles, and Jean Regnier, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 22, 1986, Ser. No. 865,854

Claims priority, application France, May 30, 1985, 85 08137

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—383 **2 Claims**



1. A cutting device for a cutting machine, particularly for cutting soft materials, comprising a chain guided in translation along a cutting plane by a chain guide with two sides and having cutting tools alternately arranged on either side of the cutting plane, said cutting plane defining an outside, each cutting tool having a curved, cutting end curved towards the outside of the cutting plane and defining a concave surface, two scrapers, each scraper located on one of the two sides of the chain guide and having an end, each end projecting towards said cutting plane and having a convex surface complementary to said concave surface, so that said ends remove cutting waste from said tools during the passage of the tools on the scraper.

4,727,653

COORDINATE MEASURING INSTRUMENT

Matusiro Fujitani, Kawasaki; Hideo Takaku, Tokyo, and Yukiji Yoda, Kawasaki, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

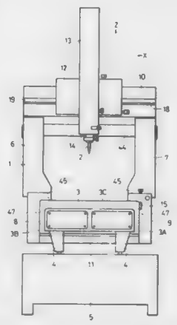
PCT No. PCT/JP86/00023, § 371 Date Sep. 19, 1986, § 102(e) Date Sep. 19, 1986, PCT Pub. No. WO86/04407, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 22, 1986, Ser. No. 917,942

Claims priority, application Japan, Jan. 22, 1985, 60-7546; Jan. 25, 1985, 60-12249

Int. Cl.[4] G01B *5/03, 7/03*

U.S. Cl. 33—503 **10 Claims**



1. A coordinate measuring instrument, wherein a work to be measured, which is mounted on a mount plate, and a measuring element held by a moving mechanism having a pair of legs are moved relative to each other at least in two directions of axes perpendicularly intersecting each other out of the directions of X-, Y- and Z-axes, and configuration and the like are measured from relative displacement values, characterized in that: said mount plate is provided over a base with a space formed therebetween; and position regulating means in the direction of X-axis, which are formed on said mount plate and opposed to two vertical surfaces parallel to each other and extending in the direction of Y-axis are provided on both legs of said moving mechanism, respectively, so that said legs are made movable relative to said mount plate.

4,727,654

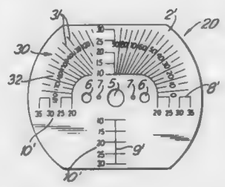
LENS PATTERN BLANK

James Cingone, Hempstead, N.Y., assignor to James Industries Co., Hempstead, N.Y.

Continuation-in-part of Ser. No. 798,037, Nov. 14, 1985, Pat. No. 4,656,754. This application Dec. 4, 1986, Ser. No. 937,656

Int. Cl.[4] A61B *3/10*

U.S. Cl. 33—507 **6 Claims**



1. In a lens pattern blank having two planar faces, a mounting hub on one face, a circular mounting hole passing through the faces and the hub and a first grid pattern on the other face and having the origin of the axes thereof coincident with the center of the mounting hole, the improvement comprising: an axis scale pattern on said other face including a first mark along one axis of the first grid pattern and spaced apart from the origin on one side of the other axis and angular markings with a zero degree line coincident with said one axis and having the radial center at said mark, wherein the angular markings are spaced apart from the origin on the other side of said other axis.

4,727,655

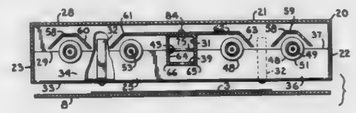
HEAT LAMP ASSEMBLY WITH AIR DUCT

Cecil T. Jacobi, Jr., Marshall, Mo., assignor to Amjo Infra Red Dryers, Inc., Marshall, Mo.

Filed Feb. 2, 1987, Ser. No. 9,495

Int. Cl.[4] F26B *23/04*

U.S. Cl. 34—4 **18 Claims**



1. A heat lamp assembloy, which comprises:

(a) a reflective housing;

(b) a quartz tube heat lamp mounted within said housing; and

(c) an air tube mounted on said housing in a heat-exchange relationship with said heat lamp and said housing and including inlet and outlet ir openings, said air tube being spaced from said heat lamp.

4,727,656

DEVICE FOR DRYING FOOTWEAR

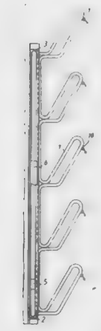
Helmut Jannach, Prokoppigasse 2, A-8010 Graz (Osterreich), and Hermann Obrist, Hochtennstrasse 19, A-5700 Zell AM SEE (Osterreich), both of Austria

Filed Apr. 20, 1987, Ser. No. 40,481

Claims priority, application Austria, Apr. 22, 1986, 1066/86

Int. Cl.[4] F26B *9/00*

U.S. Cl. 34—104 **3 Claims**



1. A device for drying footwear comprising a holding element on which the footwear to be dried is slipped onto with at least one serpentine pipe for conducting warm air into the footwear through at least one discharge port and at least one carrier organ to distribute the warm air, characterized in that the holding elements are formed by tube bends (1',11') and adjacent legs of the serpentine pipe (1,11) whereby the discharge ports (18,16) are arranged in the area of the downward pointing end of the outer curve of the tube bend.

4,727,657

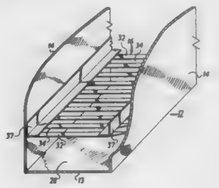
DECLINED BED CONTACTOR

Robert E. Miller, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 840,844, Mar. 18, 1986, abandoned. This application May 29, 1986, Ser. No. 868,768

Int. Cl.[4] C10B *1/02;* **F27D** *5/00*

U.S. Cl. 34—182 **13 Claims**



1. An apparatus for contacting solids with gases which comprises:

(a) an elongated and enclosed housing having sidewalls, a top wall, a bottom wall, an entrance end and an exit end for solids;

(b) a bed support dividing said housing into an upper chamber and a lower chamber and having a longitudinal axis declined from the horizontal at an angle such that solids introduced into the entrance end of said housing flow down said bed support toward the exit end of said housing, said bed support comprising means extending between and attached to the sidewalls of said housing and defining a solids flow surface having a plurality of openings therein, said openings distributed between two solid rectangular borders oriented parallel to said longitudinal axis, which borders define two long parallel sides of said bed support, wherein said openings are large enough to allow gas flow from said lower chamber into said upper chamber, and wherein said solid rectangular borders rest on top of said means defining a solids flow surface such that one long edge of each border is attached flush to a sidewall of said housing;

(c) means for introducing gases into said lower chamber; and

(d) means for removing gases from said upper chamber.

4,727,658

DRYING MACHINE

Henrik Ullum, Karlslunde, Denmark, assignor to A/S Atlas, Ballerup, Denmark

Filed Apr. 1, 1987, Ser. No. 33,055

Claims priority, application Denmark, Apr. 3, 1986, 1530/86

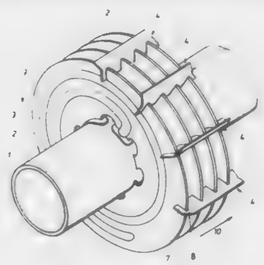
Int. Cl.[4] F26B *17/20*

U.S. Cl. 34—183 **4 Claims**

1. Drying machine for the heating and drying of wet, comminuted materials, said machine comprising: a stationary housing with a rotary, hollow axle for admission and extraction of heat and condensate thereof, and wherein the rotor has a plurality of annular drying elements arranged at intervals, and which are heated, including lifting elements arranged along the periphery of said drying elements, and wherein the lifting elements include plates which are secured to and span at least two adjacent drying elements and wherein said plates include slots to radially engage said drying elements and wherein said

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portion of each plate includes a lifting portion extending generally from a radially outermost edge of said plate and a deflecting portion extending generally beyond the surface of and perpendicular to said drying elements.

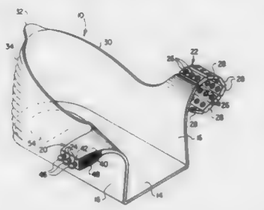


4,727,659

SHOE HEEL PROTECTOR

N. Tony Walker, 501 Redwood Dr., Grand Prairie, Tex. 75051

Filed Dec. 16, 1986, Ser. No. 942,192
Int. Cl.[4] A43B *23/30*; B65D *63/02*; A44B *11/22*
U.S. Cl. 36—72 B 14 Claims



1. A shoe heel apparatus for engaging the rear portion of a shoe, comprising:

a base positionable beneath the heel and instep of the shoe;

side walls formed contiguous with said base and extending generally upwardly therefrom to cover the sides and upper heel portion of the shoe;

strap means formed contiguous with said side walls and extending therefrom to selectively engage over the instep of the shoe, said strap means comprising a pin strap and socket strap which selectively interlock at their distal ends, said socket strap including a plurality of section plates having a plurality of apertures formed therein such that a selected one of said section plates may be positioned to form the distal end of said socket strap for engagement with said pin strap, thereby selectively adjusting the length of said socket strap.

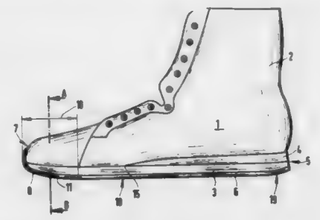
4,727,660

SHOE FOR REHABILITATION PURPOSES

Constantin Bernhard, Munich, Fed. Rep. of Germany, assignor to Puma AG Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,734
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520786
Int. Cl.[4] A43B *7/14*; A61F *5/04*
U.S. Cl. 36—88 24 Claims

1. Shoe for rehabilitation purposes, particularly for wear in connection with injury and post-surgical foot rehabilitation, comprising an outsole having a front part that upwardly embraces the tip of the shoe, extends from the shoe tip to approximately a toe base joint location and is formed of an unprofiled material having a low coefficient of friction, at least with regard to conventional street, path and floor surfaces, and an outsole portion extending rearwardly from the front part that has a profiled ground contacting surface and is formed of an abrasion-resistant flexible material, a separation line between the front part and the rearwardly extending outsole portion extending diagonally rearwardly in conformance with the toe base joint from in front of a big toe ball area at a medial side of the shoe to a small toe area at the lateral side of the shoe; and a wedge-like midsole formed of a continuous midsole layer, primarily of constant thickness, and a wedge, extending over the midsole layer from the heel to a midfoot area, which wedge, viewed from above, terminates behind a big toe ball and small toe ball area, has a greater hardness than that of the midsole layer and is longer on the medial side of the shoe than on the lateral side thereof.

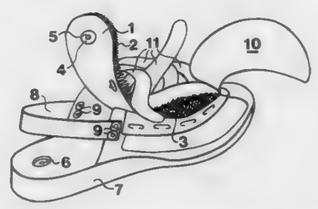


4,727,661

FOOTWEAR WITH REMOVABLE INSOLE

Margrit Kuhn, Salzstrasse 8, CH-8437 Zurzach, Switzerland

Filed Dec. 1, 1986, Ser. No. 936,120
Claims priority, application Switzerland, Dec. 5, 1985, 5178/85
Int. Cl.[4] A43B *3/24, 13/40*
U.S. Cl. 36—100 4 Claims



1. In an article of footwear of the type comprising a sole, and an insole with an upper and lower surface, said upper surface having a plurality of nubs from about 1 to 12 mm in length for massaging at a foot reflex zone, said upper surface also having a plurality of magnetic metal parts mounted thereon for massaging at four main points of a foot reflex zone, the improvement comprising:

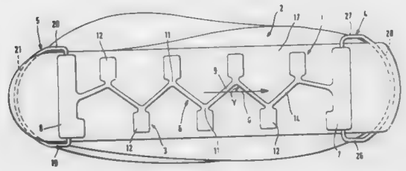
a plurality of snap fasteners for removably fastening said nubbed insole to said sole, each snap fastener comprising an upper part mounted on the lower surface of the insole directly below a respective one of said magnetic metal parts, and a lower part mounted on the sole.

4,727,662

WALKING FACILITY OR ANTI-SKID MEANS FOR FOOTGEAR

Bengt E. Ilon, Schildrüthalde 4, CH-6006 Lazern, Switzerland

PCT No. PCT/SE86/00106, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05370, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 12, 1986, Ser. No. 5,027
Claims priority, application Sweden, Mar. 14, 1985, 8501267
Int. Cl.[4] A43C *15/00, 15/02*; A43B *5/00*
U.S. Cl. 36—132 14 Claims



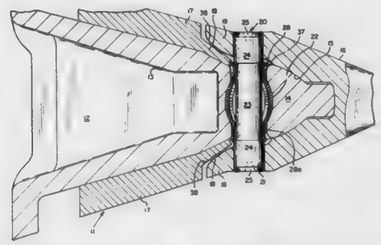
1. Device intended to be positioned under footgear as a walking facility and/or anti-skid means, whereby the device comprises a tread means (3) which is fastenable at the front and at the back of the footgear (2) through fore and rear anchoring members (4 and 5 respectively), characterized in that the tread means (3) is zigzag-shaped, in its normal shape substantially shorter than the footgear (2) and straightenable through elongation with regard to its zigzag-shape for increasing the length thereof, whereby said tread means is fastenable to the footgear.

4,727,663

EXCAVATING TOOTH HAVING A LOCK INCLUDING A BASKET SPRING

Frederick C. Hahn, Aloha, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Oct. 24, 1985, Ser. No. 791,117
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 A 5 Claims



1. A lock for an excavating tooth and the like comprising a relatively elongated pin having a reduced diameter central cylindrical portion and a basket spring mounted on and substantially surrounding said cylindrical portion between said lock and tooth, said basket spring including a relatively elongated unitary member having a central part diametrically enlarged relative to the spring end parts, said central part including a plurality of longitudinally extending slots, said basket spring end parts including angularly flanged slotted ends spaced from said longitudinally extending slots of said central part.

4,727,664

DIGGING TOOTH AND HOLDER THEREFOR

Charles W. Hemphill, Duncanville, Tex., assignor to Hemphill Industries, Inc., Mansfield, Tex.

Filed Jul. 9, 1986, Ser. No. 883,643
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 R 18 Claims



1. An improved non-rotatable, dirt type excavating tooth in combination with a support block of the type having a cylindrical bore formed therein which rotatably receives a prior art rotatable type rock bit;

said excavating tooth has a longitudinal axis and includes a cylindrical shank at one end thereof and a relatively wide ground engaging blade at the other end thereof, said shank describes a circle in cross-section and is made complementary respective to the support block bore so that said shank can be telescopingly received in a captured manner within the bore of the block, thereby removably mounting said excavating tooth respective to the block;

said excavating tooth and block include means thereon that forms a locking device which is located at a medial portion thereof when the tooth and block are assembled; said locking device includes a male abutment member on said tooth and a female abutment member on said block; said male abutment member is formed at the rear of the blade and separates the blade form the shank;

said male abutment member includes a plurality of wall surfaces connected together to form part of a polygon, with the central axis of the polygon coinciding with the longitudinal axis of the shank;

said female abutment member is spaced from said bore and includes means on said block for selectively receiving at least one of said wall surfaces of said male abutment member therewithin and in abutting engagement therewith in a manner which prevents the tooth shank from being rotated axially within the bore of the block.

4,727,665

HYDRAULIC ACTUATED MOLDBOARD WITH AUTOMATIC LOCK

Jan H. Verseef, Clayton, N.Y., assignor to Frink America, Inc., Clayton, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,019
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—236 16 Claims

1. Snowplowing apparatus having a moldboard unit pivotably attached to a support unit secured to a prime mover, the apparatus including

a fluid actuated drive cylinder acting between the two units for angularly positioning the moldboard unit about the pivot,

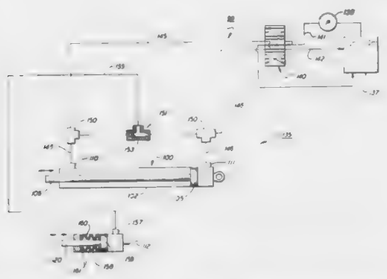
valve means having at least one active position for selectively connecting the drive cylinder to a pump whereby pressurized fluid is delivered to the drive cylinder to position the moldboard unit, and a release position for connecting the drive cylinder to a fluid reservoir for relieving fluid pressure in the drive cylinder.

a locking bar slidably mounted in an indexing station in said support unit for movement between a locking position wherein the locking bar is in locking engagement with the

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moldboard unit and an unlocked position wherein the locking bar is disengaged from the moldboard unit,

spring means for biasing the locking bar into locking engagement with the moldboard unit, and



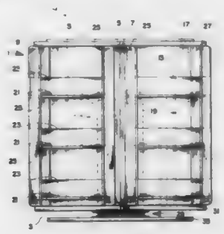
a locking cylinder having a piston joined to the locking bar, said locking cylinder being responsive to the valve means to connect one side of the piston to said pump when the valve means is in the said at least one active position and to connect the same side of said piston to said reservoir when the valve means is in the release position.

4,727,666

DISPLAY AND DISPENSING APPARATUS

Arlene Kyler, 3445 Park Ave., Oceanside, N.Y. 11572

Filed Feb. 14, 1986, Ser. No. 829,829
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—10 R **38 Claims**



1. An apparatus for displaying and dispensing items, such as advertising material, and also for containing articles, such as food products, available for selective removal therefrom, comprising:

a support;

a structure rotatably connected to said support and including a surface upon which said items can be placed for selective removal;

said structure including side walls forming an at least partly closed multi-sided enclosure, and said surface upon which the items can be placed for selective removal thereof comprising at least one ledge connected to and extending outwardly from one of said side walls;

a receptacle connected to said structure for receiving and holding said articles for selective removal of said articles; and

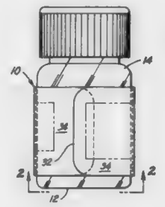
a pair of vertical bracing walls extending outwardly from and at both sides of each of said side walls with one of said ledges being attached to and between said pair of bracing walls, a plurality of said ledges being attached to said bracing walls in the vertical direction, whereby said bracing walls secure the ledges in position.

4,727,667

EXTENDED WRAP AROUND LABELS

Donald E. Ingle, Upland, Calif., assignor to Best Label Co., Cerritos, Calif.

Filed Nov. 14, 1986, Ser. No. 931,407
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—306 **9 Claims**



1. An elongated strip-like label having a front, a back and ends, a first portion of said label adjacent to and extending from one of said ends being adapted to be wrapped around a cylindrical exterior of a container with its back surface in contact with and adhesively secured to said exterior of said container and a second portion of said label adjacent to and extending from the other of said ends being adapted to be wrapped around at least part of said exterior of said container with the back of said second portion facing in the direction of the front of said first portion when said first portion is located as indicated in which the improvement comprises:

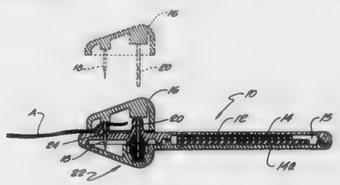
at least the back of said second portion adjacent to said other of said ends being coated with an exposed amount of a pressure sensitive adhesive which is sufficiently adherent to secure said second portion to the part of front of said label under said second portion when all of said label is wrapped around said exterior of said container, said pressure sensitive adhesive having such a limited adherence for said front of said label that said second portion of said label can be pealed away from said part of the front of said label under said pressure sensitive adhesive so that both sides of said second portion can be inspected and so that the front of said first portion can be inspected, said pressure sensitive adhesive being of such adherence that said second portion can be readhered to the front of said label in the position in which it was formerly located after it has been pealed away from the front of said label.

4,727,668

CODED SURVEILLANCE MARKER WITH IMPROVED BIASING

Philip M. Anderson, Madison, and Ronald K. Reich, Florham Park, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 3, 1985, Ser. No. 772,215
Int. Cl.[4] G09F *3/02*
U.S. Cl. 40—625 **7 Claims**



1. A surveillance marker for utilization in antipilferage, anticounterfeiting and like systems, comprising:

ferromagnetic signal producing means comprising at least one strip of magnetostrictive ferromagnetic material; and

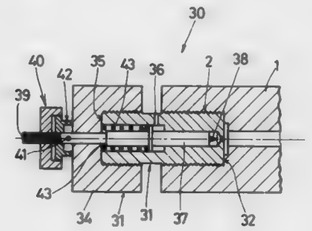
combined housing and biasing means for said signal producing means formed of plastic impregnated with ferrimagnetic or ferromagnetic powder of relatively high coercivity; said high coercivity powder providing a quasi-solenoidal dc magnetic bias field for activating said ferromagnetic signal producing means to produce an identifiable singal in response to an applied magnetic interrogation field.

4,727,669

TOOL FOR BREAKING UP ROCK OR LIKE STRUCTURES

Johan D. Kunneke, 34 Terral Ct., Reitz St., Sunnyside, Pretoria, South Africa

Filed Oct. 5, 1984, Ser. No. 658,116
Claims priority, application South Africa, Mar. 7, 1984, 84/1699
Int. Cl.[4] F41C *11/02*
U.S. Cl. 42—69.01 **9 Claims**



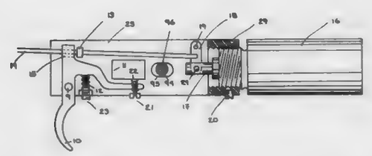
1. A firing mechanism having a body adapted to be releasably connected to a firing chamber, and housing a slidable firing in biasable towards a striking position and movable to a cocked position, the rear of the firing pin carrying a screw threaded end cap screwable relative to the firing pin to react against the body and move the firing pin to a cocked position, the firing pin being adapted to cooperate with a trigger stop to hold the firing pin in the cocked position, and with the firing pin in this position, the end cap being screwable away from the body to allow firing pin travel between the cocked and the striking positions.

4,727,670

ELECTROMECHANICAL FIRING MECHANISM

Edwin E. Krouse, P.O. Box 4082, Owensboro, Ky. 42302

Filed Sep. 29, 1986, Ser. No. 912,787
Int. Cl.[4] F41C *19/12, 17/08*
U.S. Cl. 42—69.01 **7 Claims**



1. A trigger mechanism for a firearm including a firing mechanism to discharge the firearm, said firing mechanism being activated in response to the operation of a trigger, the improvement comprising:

a timing means to disable said trigger mechanism after a specified period of time if the firearm is not discharged within said specified period of time, and

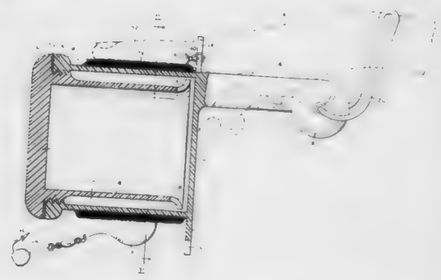
a means for automatically restarting said timing means if the firearm is discharged within said specified period of time.

4,727,671

FISHING UNIT

Farley J. Archer, 722 N. 7th St., Edwardsville, Kans. 66111

Filed Apr. 3, 1987, Ser. No. 33,653
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 **5 Claims**



1. A hand-held fishing unit comprising:

a. a cylindrical drum having forward and rearward ends,

b. a fishing line having one end thereof secured to said drum and being wound on said drum, the opposite end of said fishing line extending from said drum and having a fishhook and casting weight secured thereto, and

c. handle affixed to said drum and extending rearwardly therefrom, said drum being provided at its rearward end with a radially extending flange, said flange being notched adjacent said handle to permit a user grasping said handle to extend his forefinger therethrough to overlie the line windings on said drum to prevent unwinding of said line from said drum, with the axis of said drum extending forwardly and rearwardly in a direction generally parallel to the user's forefinger, whereby when the user flexes his forearm and wrist forwardly, and then releases his forefinger from the line windings, the fishhook and wight are propelled forwardly, with the line spinning from the forward end of said drum.

4,727,672

ARTIFICIAL STRUCTURE FOR ATTRACTING FISH

Loren G. Hill, 2826 Castlewood, Norman, Okla. 73069; William H. Wilson, Fort Smith, Ark.; James J. Thompson, Lithonia, Ga.; J. Douglas Alsup, Conyers, Ga., and James B. Watson, Lithonia, Ga., assignors to Loren G. Hill, Norman, Okla.

Filed Jul. 8, 1986, Ser. No. 883,326
Int. Cl.[4] A01N *3/00;* **A41G** *1/00*
U.S. Cl. 43—4 **29 Claims**

1. An artificial structure for attracting fish comprising:

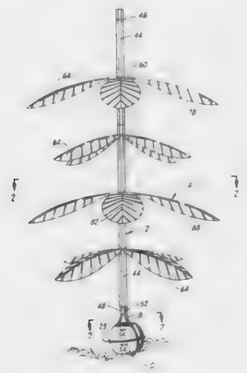
a ballast assembly for anchoring the structure at a selected location on the bottom of a body of water;

an elongated trunk assembly constructed of a buoyant material and freely pivotally connected to the ballast assembly for pivotation about a horizontal axis as said trunk assembly undergoes movement due to motion of the water, and extending generally upwardly therefrom; and

a plurality of leaf frond subassemblies detachably engaged with the trunk assembly, and each selectively rotatable about the longitudinal axis of said trunk assembly without

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concurrent rotating movement of said trunk assembly whereby the several leaf frond subassemblies can be ar-



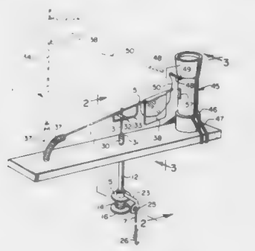
ranged in circumferentially preselected array about the axis of said elongated trunk assembly.

4,727,673

INDICATOR LIGHT FOR AN ICE FISHING TIP-UP

Kenneth A. Dumar, 3994 Vet's Memorial Dr., Rhinelander, Wis. 54501

Filed Aug. 21, 1986, Ser. No. 899,067
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 4 Claims



1. In combination, light means and holding and operational means therefor for use with an ice fishing tip-up; said combiantion comprising:

a lighting device holder in the form of a sleeve adapted to receive a base portion of a lighting device therein and hold the same in a coaxial projecting position relative to said holder and in a radially directed relation relative to a tip-up on which said holder is designed to be mounted whereby to permit ready removal of a lighting device from said holder, said holder including an end portion provided with releasable connection means for releasable attachment of said holder to a tip-up;

a lighting device for removable mounting in said holder, said lighting device including a casing having internal circuit completion means including a movable switching portion which opens and closes a circuit, external operating means in engagement with said movable switching portion for independent operational use of said lighting device, and an aperture aligned with an operable end of said movable switching portion for external access to said movabloe switching portion; and

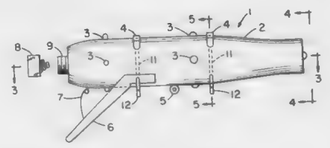
circuit completion interruption means for insertion through said aperture into removable engagement with said movable switching portion to interrupt said circuit and prevent said lighting device from being operable, said interruption means being attached to withdrawal means for connection with an operational portion of a tip-up to withdraw said interruption means form said lighting device upon operation of a tip-up thereby permitting completion of the operational circuit of said lighting device.

4,727,674

ELECTRONICALLY LIGHTED FISHING LURE

Michael Garr, 1 Ziska St., Jericho, N.Y. 11753

Continuation of Ser. No. 661,162, Oct. 15, 1984, abandoned.
This application Sep. 22, 1986, Ser. No. 910,310
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—17.6 7 Claims



1. A lighted fishing lure, comprising:

(a) a lure body defining a lure cavity having an orifice communicating with the space outside said lure body;

(b) a cap for closing said orifice;

(c) engaging means adapted to mate with said cap, said engagement means being secured around said orifice to permit said orifice to be closed by said cap;

(d) a battery configured and dimensioned to pass through said orifice;

(e) circuit means adapted to receive said battery and provide an electrical signal in response thereto;

(f) a solid state light emitting device connected to receive said electrical signal; and

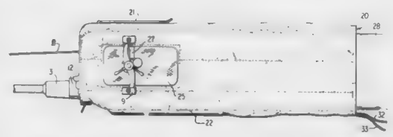
(g) a large diameter homogeneous unitary fiber-optic member having a diameter at least of the same order of magnitude as said solid state light emitting device, said member being optically coupled to said solid state light emitting device and extending between said solid state device and the outside surface of said lure body and terminating with a plurality of facets oriented at different angles at the outside surface of said lure body, whereby the facets allow transmission of light over a wide range of different directions to attract fish in various positions about the lure.

4,727,675

COLD WEATHER FISHING MITT

Robert L. Huntt, 10420 Watkins Rd., Germantown, Md. 20874

Filed May 29, 1987, Ser. No. 55,525
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—25 10 Claims



1. A fishing mitt for encompassing

(a) at least a portion of a handle of a fishing rod,

(b) a portion of a fishing reel mounted on said rod, and

(c) said fishing mitt protecting the user's hand from the elements while gripping said handle to permit the fishing reel to be operated,

said mitt comprising relative rigid guide means mounted on the fishing rod in front of the reel mounted thereon for

providing support for an aperture in said mitt through which line passes from the fishing reel to line guides on the rod, and

mitt means having a front, a rear, a top, a bottom and sides for covering the user's hand, a portion of the reel, and at least a portion of the fishing rod handle, said mitt means including:

first aperture means located at the front of the mitt means for providing an opening through which the rod can protrude,

second aperture means located at the front of the mitt means for providing an opening through which the line can pass, said second aperture means being held in relatively fixed position relative to the rod and the reel by said guide means to minimize or reduce frictional forces on the line passing therethrough,

third aperture means located on a side of the mitt means for providing an opening through which an operating handle of the fishing reel can operatively protrude, and

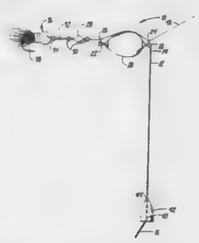
fourth aperture means located proximate the back of the mitt means for providing an opening through which a user's hand can be inserted to grip the rod handle and to contact the fishing reel.

4,727,676

FISHING DEVICE

William S. Runyan, Ames, Iowa, assignor to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Sep. 30, 1982, Ser. No. 431,336
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—43.1 2 Claims



1. A fishing device adapted for fishing near the bottom of a body of water, comprising,

an elongated resilient wire means including a straight wire element having upper and lower ends,

connecting means on said upper end for securing said wire element to the line of a fishing rod for pulling said fishing device in a forward direction through a body of water,

a float means secured to said upper end of said wire element, and a hook means movably connected to said float means so that said float means will buoyantly hold said hook means and upper end of said wire element at an elevated position in a body of water with respect to the lower end of said wire element,

a sharp obtuse angle bend means in said wire element adjacent said lower end, defining a straight lower end portion below said bend means,

a sinker element having an elongated aperture therethrough, said wire element slidably extending through said elongated aperture,

said sinker element being positioned adjacent and above said obtuse angle bend means whereby said obtuse angle bend means releasably prevents said sinker element from sliding off of the lower end of said wire element,

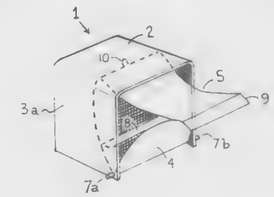
the resiliency of said wire element, and the size of said aperture and said obtuse angle being such that pulling tension in a forward direction on the upper end of said wire element by a line attached thereto will cause said wire element at said obtuse angle bend means to straighten sufficiently when said sinker element is held against forward movement that said wire element will slidably and forwardly move through said aperture and said sinker element will slide from the lower end of said wire element.

4,727,677

RODENT TRAP

George K. Mellard, 43 Pineview Avenue, B18, Cardiff, N.J. 08232

Filed Jun. 30, 1987, Ser. No. 67,980
Int. Cl.[4] A01M *32/02*
U.S. Cl. 43—61 10 Claims



1. A rodent trap comprising: a shell having two parallel side walls and a top; an enclosure of generally triangular shape having a door connected to a roof; a connecting side rigidly connected to said door at one end and to said roof at the other end, said enclosure being pivotally connected to said side walls at a juncture between said door and said connecting side, whereby said enclosure is partially open when it is tilted forward, and said enclosure is totally enclosed by the side walls when it is tilted back by the weight of a rodent having entered the enclosure.

4,727,678

HERBICIDE APPLICATOR WITH ADJUSTABLE SHIELD

Steve L. Struve, deceased, late of Friona, and by Seva W. Struve, executrix, P.O. Box 909, Friona, both of Tex. 79035

Filed Dec. 19, 1986, Ser. No. 943,497
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 7 Claims



1. An herbicide applicator including an elongated tubular handle having first and second ends and means closing said first end,

an elongated tubular body having first and second ends and closed at its first end,

liquid conduit means removably mounting the second end of

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said tubular body from said second end of said handle for angular adjustment of said tubular body about its longitudinal center axis relative to said handle and communicating the interiors of said handle and tubular body for closed liquid flow from the interior of said handle into the interior of said tubular body,

said tubular body having a plurality of circumferentially and longitudinally spaced aperatures formed therethrough communicating the inner surface of said tubular body with the outer surface thereof,

said outer surface including a liquid absorbent covering,

a generally cup-shaped annular shield mounted from said liquid conduit means and closely adjacent and opening toward said second end of said tubular body, and

a tubular sleeve snugly telescoped over said tubular body and said absorbent covering and having a window formed in one side thereof for exposing said absorbent covering through said window,

said sleeve being adjustably rotatable about said tubular body for exposing different sides of said absorbent covering through said window,

said sleeve being frictionally engaged with said absorbent covering for frictional retention of the angularly adjusted position of said sleeve on said absorbent covering,

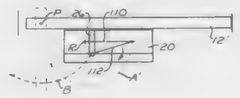
said liquid conduit means mounting said second end of said tubular body from said handle in position with said tubular body inclined approximately 45° relative to said handle.

4,727,679

SWING-DOOR OPERATOR SYSTEM

Henning N. Kornbrekke, Burlington; Philip J. Lombardo, Simsbury; Leon Boiucaner, Farmington, and Sam L. Crocker, Avon, all of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Apr. 2, 1987, Ser. No. 33,183
Int. Cl.⁴ E05F *15/00*
U.S. Cl. 49—138 **28 Claims**



1. A door operator system for controlling the operation of a pivotally moveable door comprising:

motor means including a drive shaft for selectively bi-directionally rotatably driving said drive shaft;

control means responsive to a plurality of input signals for selecting a voltage value from an array of pre-established voltages and deriving a motor voltage from said selected voltage value and generating a desired voltage polarity signal, said control means comprising means for applying said polarity signal and said selected voltage value to energize said motor means for driving said drive shaft at a selected speed and direction;

transmission means including an operator shaft for translating rotatable motion of said drive shaft to a corresponding reduced speed rotatable motion of said operator shaft; and

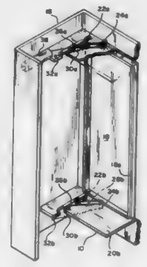
linkage means connecting said operator shaft in generally fixed angular relationship therewith and comprising connector means for pivotally connecting with an associated door, said operator shaft angularly driving said linkage means for pivotally opening and closing the door in accordance with the operation of said motor means.

4,727,680

DOOR ASSEMBLY FOR CABINETS OR THE LIKE

Jeffrey M. Lewis, Maynard, and John C. Killian, Jr., Sudbury, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 12, 1986, Ser. No. 862,112
Int. Cl.⁴ E05D *15/58*
U.S. Cl. 49—260 **5 Claims**



1. A door assembly for closing a door opening in a wall of a cabinet or the like, said assembly comprising:

A. a door having first and second ends and an edge extending between said ends;

B. first and second guide pins extending from each of said ends,

1. said first guide pins being disposed adjacent to said edge, and

2. said second guide pins being spaced from said first guide pins in a direction away from said edge;

C. first and second guide members fixed with respect to and oriented substantially perpendicular to said wall, said guide members being disposed adjacent to opposite ends of said door, each of said guide members including first and second intersecting slots in which first and second guide pins are respectively disposed,

1. each of said first slots extending from a forward end to a rear end, said forward ends being disposed adjacent to said wall, said first slots being oriented substantially perpendicular to said door opening,

2. each of said second slots having a forward end spaced laterally from the forward end of said first slots, said forward ends of said second slots being disposed adjacent to said wall, each of said second slots extending from its forward end to intersect with one of said first slots at an angle, each of said second slots being oriented such that it forms an acute angle with respect to said wall, whereby when the door is closed, the first guide pins are adjacent to the forward ends of the first slots and the second guide pins are adjacent to the forward ends of the second slots, and when the door is open, the first guide pins are disposed rearwardly from the intersections of said first and second slots and the second guide pins are disposed forwardly thereof; and

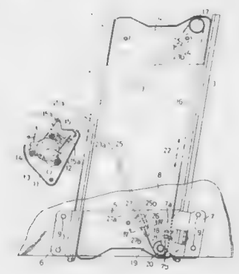
D. a spring, said spring connected between one of said second guide pins and a retaining member, said retaining member disposed rearward of one of said second slots and being fixed with respect to one of said guide members, said spring being arranged to urge said door laterally and rearwardly into said door opening.

4,727,681

METHOD AND APPARATUS FOR SECURING WIRES STRETCHINGLY TO A WIRE DRIVING TYPE WINDOW REGULATOR

Tomotaka Kinoshita, and Masatoshi Matsui, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Japan

Filed Nov. 3, 1986, Ser. No. 926,431
Claims priority, application Japan, Nov. 7, 1985, 60-248078
Int. Cl.⁴ E05F *11/48;* **B21D** *39/00*
U.S. Cl. 49—352 **4 Claims**



1. A method for securing a wire stretchedly in a wire driving type window regulator in which a window glass is secured to a carrier plate which is mounted on a guide rail so as to do up and down movements along said guide rail, a raising wire and a lowering wire each of which one end terminals is secured to said carrier plate and each of intermediate portions of which is inserted into respective outer tubes are reciprocally moved by and tensioned toward a driving means along a passage one part of which runs along said guide rail, one end of each outer tube abutting a guide member on said driving means, and thus the carrier plate and the window glass are moved to up and down directions, characterized by comprising steps of:

boring an elongated guide hole on a member supporting the guide rail;

inserting slidably a tube end plug mounted on a wire and against the other end of said outer tube into interengagement with side edges of said guide hole;

pressing said tube end plug in the tensioned direction of said wire along said side edges of said hole with one end thereof against the other end of said tube so that said outer tube may form a slight arc-shaped curve; and

providing a projecting portion projected from an edge of an opening of said guide hole without being separated therefrom against the other end of said tube end plug so as to maintain said arc-shaped curve in said tensioned condition of the wire.

2. An apparatus for securing a wire stretchedly in a wire driving type window regulator in which a window glass is secured to a carrier plate which is mounted on a guide rail so as to do up and down movements along said guide rail, a raising wire and a lowering wire each of which one end terminals is secured to said carrier plate and each of intermediate portions of which is inserted into respective outer tubes are reciprocally moved by and tensioned toward a driving means along a passage one part of which runs along said guide rail, one end of each outer tube abutting a guide member on said driving means, and thus the carrier plate and the window glass are moved up and down directions, characterized in that:

a guide hole bored on a supporting member secured to said guide rail so as to form a narrow hole elongating in the tensioned direction of said wire and an inserting hole which is successively connected with said narrow hole;

an end tube plug having a groove on each side of the lower portion thereof for engaging slidingly movable in the tensioned direction of said wire with respective edges of said narrow hole through said inserting hole is provided on one end of said outer tube; and

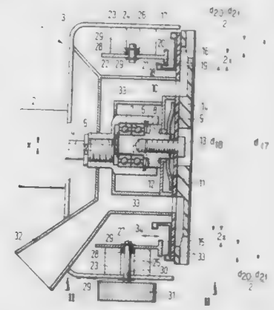
a projecting portion projected from an edge of an opening of said guide hole playing a role for a stopper which is engageable with the other end of said tube end plug, while said tube end plug is pressed in the tensioned direction of said wire so that said outer tube is maintained in a slight arc-shaped curve is formed on said narrow hole of said guide hole.

4,727,682

ECCENTRIC GRINDER WITH A DEVICE FOR CHANGING A GRINDING MOTION

Manfred Stäbler, and Walter Barth, both of Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, STuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,776
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1986, 3602571
Int. Cl.⁴ B24B *7/00, 23/03*
U.S. Cl. 51—120 **12 Claims**



1. In an eccentric grinder comprising a housing; a driving shaft having an axis; a grinding disc positioned in said housing eccentrically relative to said shaft; a pure eccentric drive for driving said disc from said shaft; and a device for changing a grinding movement of said grinding disc, said device including drive means for said grinding disc, said drive menas including a first crown means positioned rotationally on said driving shaft and eccentrically relative to said driving shaft, and a second crown means engageable with said first crown means for forcible rolling movement thereon and positioned in said housing concentrically with said driving shaft, the improvement comprising said grinding disc supporting said first crown means which include an internal crown (**17/39**) and an external crown (**18/40**), said housing supporting said second crown means (**20/21, 37/38**) which include an internal crown (**21/38**) engageable with said external crown (**18/40**) of said first crown means and an external crown (**20/37**) engageable with said internal crown (**17/39**) of said first crown means, said internal crown and external crown of said first crown means being offset relative to each other along the axis of said driving shaft, and said internal crown and external crown of said second crown means being displaceable along the axis of said drive shaft so as to establish or release a drive connection between said first and second crown means.

4,727,683

ABRASIVE BELT MACHINE

Michael W. Lamb, Grand Island, N.Y., assignor to Dynabrade, Inc., Tonawanda, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,868
Int. Cl.⁴ B24B *21/00*
U.S. Cl. 51—147 **10 Claims**

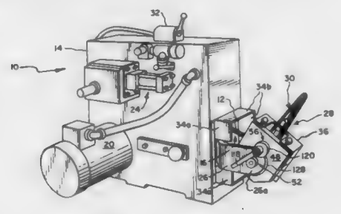
1. A machine for supporting and driving an endless abrasive belt comprising in combination:

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a base mounting a powered belt drive roller, a belt tension control roller and a support arm, said drive and tension control rollers having essentially parallel axes of rotation, said support arm having a free end portion projecting from said base in a direction generally towards a user of said machine and normal to said axes;

a contact arm mounting an idler roller adjacent one end thereof;

mounting means for mounting an opposite end of said contact arm on said free end portion for pivotal movement about a belt position adjustment axis incident to which an axis of rotation of said idler roller is disposed essentially parallel to said axes of said drive and tension control rollers and said adjustment axis and moves along an arcuate path of travel disposed concentrically of said adjustment axis, said path of travel being disposed outwardly of said free end portion in a direction away from said base, said mounting means includes means for releasably fixing the pivotal position of said contact arm relative to said free end portion about said adjustment axis; and



first, second and third tension rollers having their axes disposed essentially parallel to said adjustment axis and mounted on said mounting means for pivotal movement with said contact arm, said first and second tension rollers straddling said contact arm adjacent said opposite end thereof, said third tension roller and said idler roller are disposed on opposite sides of a plane passing through said axes of said first and second tension rollers, said endless belt is adapted to be trained in succession about said drive roller, said tension control roller, intermediate said first and third tension rollers, about said idler roller, and intermediate said second and third tension rollers for return to said drive roller, said first, second and third tension rollers being arranged such that said first and second tension rollers engage with said belt adjacent a mid portion of said path of travel, at least said first and third tension rollers engage with said belt adjacent one end portion of said path of travel, and at least said second and third tension rollers engage with said belt adjacent an opposite end of said path of travel.

4,727,684

FULL-AUTOMATIC WORK FINISHING MACHINE WITH HIGH-SPEED ROTATING BARREL CONTAINERS

Hisamine Kobayashi; Toshiharu Shimizu, and Yoichi Seo, all of Nagoya, Japan, assignors to Tipton Manufacturing Corporation, Nagoya, Japan

Filed Jan. 6, 1987, Ser. No. 877

Claims priority, application Japan, Jan. 16, 1986, 61-6816

Int. Cl.⁴ B24B *31/02*

U.S. Cl. 51—164.2 **4 Claims**

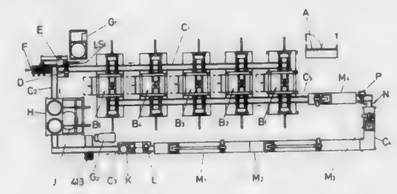
1. A high-speed work finishing machine including a high-speed turret and stacked individual barrel containers each containing flanged a mass of workpieces to be surface-finished and abrasive media used for the work-surface finishing, the barrel containers being supported by the high-speed turret and their respective shafts for both orbital and axial rotations, thereby subjecting the said mass to the produced centrifugal forces and forming a sliding layer on the mass, thus causing a relative motion between the workpieces and abrasive media thereby to allow the workpieces to be surface-finished by the abrasive media, the high-speed work finishing machine comprising:

a series of work finishing units each supported by its own high-speed turret;

individual barrel containers demountably mountable onto respective work finishing units;

first means for manipulating the barrel container on one side and the opposite sides of each work finishing unit, for loading and unloading the barrel container to and from the work finishing unit;

circulating transport means for conveying the barrel container between the loading and unloading manipulator means;



second manipulator means for unstacking the multiply-stacked barrel containers, mass separator means for separating the surface-finished workpieces and the used abrasive media, media supplying means for supplying a specific amount of new abrasive media, media blending means, additive supply means for supplying a specific amount of additives, brush-cleaning means for cleaning the flange of the barrel container, media heating means, means for feeding workpieces next to be surface-finished into a barrel container, and third manipulator means for stacking multiple barrel containers one on another, all or part of which are arranged in the above-listed order on the way of the circular transport means; and

sequential control means for controlling the operations of all the above-listed means.

4,727,685

PORTABLE POWER FILE AND BELT TENSIONING ARRANGEMENT THEREFOR

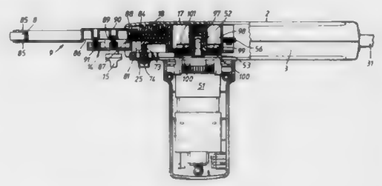
Dennis M. Batt, Bishop Auckland, England, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 18, 1986, Ser. No. 908,994

Claims priority, application United Kingdom, Sep. 23, 1985, 8523450

Int. Cl.⁴ B24B *23/06*

U.S. Cl. 51—170 EB **14 Claims**



1. A portable power file, comprising:

a housing;

an electric motor mounted in said housing;

an arm assembly extending forwardly from said housing;

a drive pulley mounted in said housing and connected to said motor for rotation thereby;

an idler pulley rotatably mounted on a forward end of said arm assembly and spaced forwardly a distance from said drive pulley;

an abrasive belt trained around said drive and idler pulleys;

a rear end of said arm assembly comprising a hollow tube which is slidably mounted in a guide supported in said housing;

a spring located inside said hollow tube and resiliently urging said arm assembly forwardly for tensioning said belt;

a manually rotatable control member carrying a cam having therein a cam track; and

a cam follower connected to said arm assembly and engaged in said cam track, rotation of said control member adjustably sliding said hollow tube in said guide to limit forward movement of said arm assembly by said spring.

4,727,686

APPARATUS FOR FINISHING FLAT SURFACES

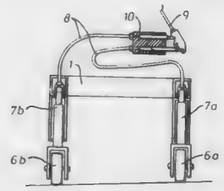
Gert Persson, Lyckeby, Sweden, assignor to Dynapac AB, Solna, Sweden

Filed Sep. 9, 1986, Ser. No. 905,199

Claims priority, application Sweden, Sep. 9, 1985, 8504164

Int. Cl.⁴ B24B *23/00;* **A47L** *11/00;* **E21C** *47/00*

U.S. Cl. 51—174 **5 Claims**



1. A grinding and milling apparatus for smooth-finishing a flat surface such as a floor of concrete or similar hard material, the apparatus comprising:

an elongated frame having a forward end and a rearward end and defining a plane parallel to said surface;

first wheel means non-pivotable about an axis perpendicular to said plane and mounted on the left-hand side of said forward end of said frame for supporting said frame on said surface;

second wheel means non-pivotable about an axis perpendicular to said plane and mounted on the right-hand side of said forward end of said frame for supporting said frame on said surface;

said frame further defining a longitudinal axis midway between said first wheel means and second wheel means;

said first wheel means and said second wheel means being mounted on said frame so as to facilitate forward or rearward movement in the direction of said longitudinal axis;

rotatable abrasive means mounted on said forward end of said frame between said first wheel means and said second wheel means for imparting a rotative abrasive action to said flat surface on both sides of said axis;

weight means mounted on said abrasive means for imparting a predetermined grinding pressure to said abrasive means;

third wheel means mounted on said rearward end of said frame remote from said rotatable abrasive means and from said first and second wheel means for coacting with said first and second wheel means to support said frame above the flat surface independently of said abrasive means;

adjusting means operatively connected to said first and second wheel means for lifting or lowering said frame with respect to either one of said wheel means to laterally tilt said frame and said weight means to the left or right when viewed in the direction of said axis thereby causing said abrasive means to develop a greater friction force on one side of said axis than on the other side of said axis and so impart a resultant force to said frame in a straight-line direction along said axis to self-propel said apparatus forwardly or rearwardly in the straight-line direction of said axis and in dependence upon the direction of the lateral tilt with respect to said axis; and,

said adjusting means including first actuating means connected directly to said first wheel means and interposed between said first wheel means and said frame for lifting said frame with respect to said first wheel means so as to tilt said frame laterally to the right-hand side about said longitudinal axis; second actuating means connected directly to said second wheel means and interposed between said second wheel means and said frame so as to tilt said frame laterally to the left-hand side about said longitudinally axis; and, means connected to said first and second actuating means for actuating a selected one of said actuating means so as to cause said apparatus to be self-propelled in a straight-line direction along said longitudinal axis.

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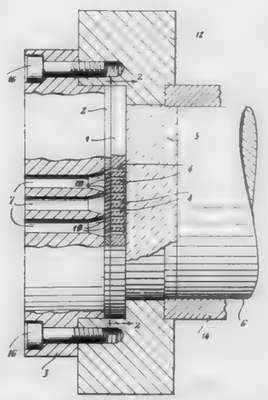
EXTRUSION ARRANGEMENT FOR A CRYOGENIC CLEANING APPARATUS

David E. Moore, Cincinnati, Ohio, assignor to Cryoblast, Inc., West Haven, Conn.

Filed Dec. 14, 1984, Ser. No. 681,903

Int. Cl.⁴ B29C *47/30*

U.S. Cl. 51—410 **3 Claims**



1. In a cryogenic cleaning apparatus wherein pellets of material which sublime from the solid to the vapor state are projected at a body to be cleaned for abrasively cleaning the body, an improved arrangement for producing the pellets comprising:

(a) a cylinder for receiving a sublimeable material from which the pellets are to be formed;

(b) an extrusion die positioned at one end of said cylinder;

(c) said die having a plurality of pellet extrusion apertures formed therein;

(d) a piston positioned in said cylinder for forcing the sublimeable material under pressure against said extrusion die and causing said material to be extruded through said apertures in said die;

(e) a backing plate for mounting and re-enforcing said extrusion die in position at one end of said cyliner;

(f) said backing plate have a plurality of apertures formed thereupon;

(g) said backing plate apertures having a relatively greater cross sectional area than said apertures formed in said die;

(h) each of said backing plate apertures positioned for receiving pellets formed by a pluralityof said die apertures

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and passing said pellets through said backing plate apertures;

(i) a breaker plate positioned between said die and said backing plates;

(j) said breaker plate having a plurality of apertures formed therein; and,

(k) said breaker plate apertures communicating with said die and backing plate apertures and oriented relative to said die apertures for breaking pellets which are extruded by said die.

4,727,688

RETRACTABLE ROOF STRUCTURE

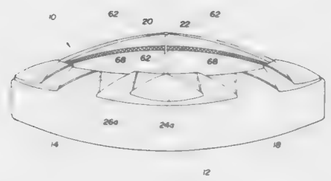
Yukio Kida, and Toru Aoyagi, both of Tokyo, Japan, assignors to Ohbayashi-Gumi, Ltd., Osaka, Japan

Filed Oct. 22, 1986, Ser. No. 921,416

Claims priority, application Japan, Apr. 8, 1986, 61-79099; Aug. 7, 1986, 61-184313

Int. Cl.⁴ E04H *3/10*

U.S. Cl. 52—6 **5 Claims**



1. A retractable roof structure comprising:

a stationary roof section fixed to a side wall constructed on the ground and defining a central opening inside said stationary roof section;

a plurality of guide beams extending between the inner circumference of said stationary section and the center of said central opening;

a plurality of guide rails, each said guide rail extending along a respective said guide beam and on said stationary roof section;

a retractable roof section for opening and closing said central opening and comprising a plurality of movable roof units corresponding to regions defined by dividing radially from a center portion of said central opening each of not less than two concentric areas of said central opening, said roof units in the inner said area being retractable over respective said roof units in the radially adjacent outer said area, and said roof units in the outermost said area being retractable with respective said roof units of the radially adjacent inner said area retracted thereon over said stationary section;

a carriage mounted on each said movable roof unit substantially at the circumferentially middle portion thereof, said carriages traveling along respective said guide rails;

a plurality of cable members, each said cable member being connected to a respective said carriage; and

separate drive means, operatively connected to respectively said cable members, for each of said roof units for permitting individual movement of each said roof unit such that, when closing said central opening, respective said roof units in the inner and outer areas are moved together at substantially the same speed to a position where each said roof unit in the outer area is fully extended from said stationary roof section, and then only said roof units in said inner area is further moved to extend from said roof units in said outer area.

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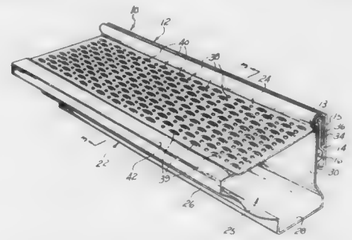
DETACHABLE RAIN GUTTER

Kenneth D. Bosler, Bensalem, Pa., assignor to Kusan, Inc., Brentwood, Tenn.

Filed Aug. 28, 1986, Ser. No. 901,326

Int. Cl.⁴ E04D *13/06*

U.S. Cl. 52—12 **6 Claims**



1. A gutter for collecting falling moisture from a roof of a building, said gutter including a mounting member secured to said building, said mounting member including channel means for detachably accepting and securing said gutter, said gutter including a trough defined by an outer wall, an inner wall, and an integral bottom wall, said outer wall having an integrally formed upper portion spacedly overlying said bottom wall and terminating in a flange, said flange restrictively fitted within said mounting member channel means to provide securement means wherein said gutter is suspended adjacently below said building roof.

4,727,690

SCREED RAIL

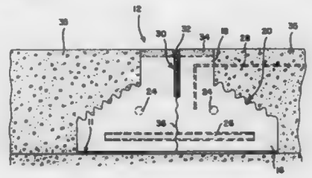
Keith Honeyman, 67 Edison Drive, Meadowridge, Cape Town, South Africa

Filed Dec. 3, 1986, Ser. No. 937,308

Claims priority, application South Africa, Dec. 3, 1985, 85/9260

Int. Cl.⁴ E04B *1/41*

U.S. Cl. 52—98 **11 Claims**



1. A prefabricated leave-in-place screed rail for use in forming a floor or pavement slab of slab material cast on opposite sides of the screed rail so that the slab material forms a bond with each said side of the screed rail, the screed rail having an upwardly open, downwadly closed groove extending along the rail between said sides, thereby to provide for preferential cracking of the screed rail along and below the groove upon shrinkage of the slab material.

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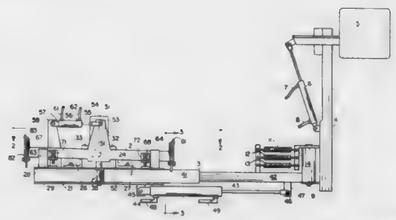
AUTOMATIC SWINGING AND LOCKING APPARATUS AND METHOD

Johnny L. Kubacak, Jourdanton, Tex., assignor to Cibolo Manufacturing Company, Jourdanton, Tex.

Filed Apr. 16, 1986, Ser. No. 852,976

Int. Cl.⁴ B05B *1/20*

U.S. Cl. 52—114 **6 Claims**



1. A pivoting boom arm adapted for attachment to an end of a moving vehicle, means for pivoting the boom arm from one side of the vehicle to the other side of the vehicle and means for locking the boom arm at either side of the vehicle at the end of its pivot, said locking means comprising a rocker arm having a locking mechanism on each end thereof for releasing and locking said boom arm, said rocker arm having power means connected thereto for rotating said rocker arm into locking position.

4,727,692

WALL ELEMENT

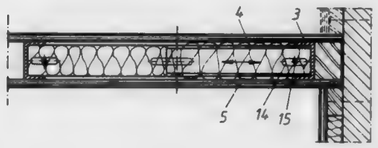
Karl Glockenstein, Mautner Markhofgasse 94, A-1110 Vienna, Austria

Continuation of Ser. No. 577,170, Feb. 6, 1984, abandoned, which is a division of Ser. No. 364,252, Apr. 1, 1982, Pat. No. 4,603,530. This application Apr. 27, 1987, Ser. No. 42,522

Claims priority, application Austria, Apr. 7, 1981, 1610/81; Apr. 7, 1981, 1611/81; Apr. 7, 1981, 1612/81

Int. Cl.⁴ E04B *2/82, 5/58*

U.S. Cl. 52—126.4 **4 Claims**



1. Wall element having a frame and cover plates covering said frame, said frame comprising at least two frame parts which are mutually adjustable with respect to one another and formed symmetrically in relation to the central plane of the wall, said frame parts including U-shaped profiles which are horizontally slidable into one another, the cover plates being fixedly attached to one of said adjustable frame plates and connectable to the other said frame part after adaptation of said frame part to the dimensions of a room, a hole in at least one of said frame parts aligned with said central plane and a screw adapted to pass through said hole and to contact a floor for height adjustment of said frame parts.

4,727,693

APPARATUS FOR ANCHORING A TRACTION MEMBER IN THE GROUND

Gottfried Rockenfeller, Hilchenbach, and Wolfgang Rockenfeller, Hilchenbach-Helberhausen, both of Fed. Rep. of Germany, assignors to Rockenfeller KG Befestigungselemente, Hilchenbach, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,808

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1985, 8519054[U]

Int. Cl.⁴ E02D *5/74*

U.S. Cl. 52—163 **19 Claims**



1. In an apparatus for anchoring a traction member comprising an elongated anchoring body which is shaped with a plurality of transverse cross sections each of which is small compared to the longitudinal cross section of said body and an insertable guiding rod couplable detachably with said anchoring body and alignable longitudinally with said anchoring body, wherein an attaching piece for said traction member is mounted laterally on said anchoring body with spacing from both ends of said anchoring body, the improvement wherein said anchoring body is provided with a cutter like tapered front end and simultaneously on a rear end with a sectioning for nonrotatable engagement with said insertable guiding rod, said sectioning being shaped to be flush with said rod upon the insertion thereon of said anchoring body, and said attaching piece for said traction member is mounted between the center of gravity of said anchoring body and said cutter like tapered front end and said attaching piece comprises a shackle engaged pivotally in a passage through said anchoring body, said front end of said anchoring body having an aproximately semicircular grooved shaped one of said transverse cross sections, said transverse cross section being reduced in a direction along said anchoring body toward said attaching piece, said anchoring body being provided adjacent said attaching piece of said traction member with a peripheral bulge lying substantially in the plane of symmetry of said groove shaped transverse cross section whose smallest transverse cross sectional dimension is directed along the longitudinal axis of said passage, while the largest cross sectional dimension of said peripheral bulge extends in said plane of symmetry of said grooved shaped cross section of said anchoring body.

4,727,694

APPARATUS FOR ANCHORING A TRACTION MEMBER IN THE GROUND

Gottfried Rockenfeller, Hilchenbach, and Wolfgang Rockenfeller, Hilchenbach-Helberhausen, both of Fed. Rep. of Germany, assignors to Rockenfeller KG Befestigungselemente, Hilchenbach, Fed. Rep. of Germany

Filed Sep. 18, 1986, Ser. No. 909,126

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533408

Int. Cl.⁴ E02D *5/74*

U.S. Cl. 52—163 **11 Claims**

1. In an apparatus for anchoring a traction member comprising an elongated anchoring body and an insertable guiding rod

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couplable detachably with said anchoring body and alignable longitudinally with said anchoring body, and attaching piece for said traction member being mounted laterally on said anchoring body with spacing from both ends of said anchoring body, the improvement wherein said anchoring body is provided with a cutter-like tapered front end and simultaneously on a rear end with a section for nonrotatable engagement with said insertable guiding rod and said attaching piece for said



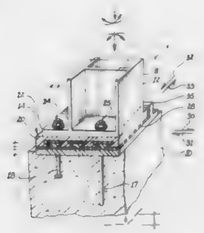
traction member is mounted between the center of gravity of said anchoring body and the front end of said anchoring body and at and/or near said attaching piece for said traction member an arm is mounted so as to be limitedly pivotable, the rear end of which is associated with said rear end of said anchoring body and which forms together with said anchoring body a spreadable anchoring element, and wherein said rear end of said arm has a shovel-like configuration.

4,727,695

BUILDING STRUCTURE SHOCK ISOLATION SYSTEM

Zoltan A. Kemeny, 7625 N. 10th St., Phoenix, Ariz. 85020

Filed Jul. 24, 1986, Ser. No. 888,963
Int. Cl.[4] E04H *9/02*
U.S. Cl. 52—167 **4 Claims**



2. In a building structure having a foundation and having major structural elements secured to said foundation, a vibration and shock isolation and energy absorption system comprising:

(a) a donor plate secured to said foundation;

(b) a receptor plate secured to a major structural element;

(c) a layer of elastomeric material positioned between and in contact with said donor and receptor plates to maintain said plates separated; and

(d) said plates having keyed interlocking cross-sectional configurations with respect to each other securing said plates together to form a keyed interlocking shear and uplift proof intermediate element between said foundation and said structural element;

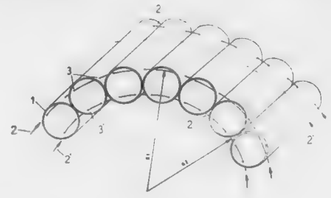
whereby, said isolation and absorption is achieved exclusively by said elastomeric layer.

4,727,696

STABLE STRUCTURE CONSISTING OF TUBULAR COMPONENTS AND POSTTENSIONED CABLES OR OTHER TENSORY ELEMENTS

Americo A. Heariques da Trindade, Rua Jacinta Marto, 8-5o Esq., Lisbon, Portugal

Filed Sep. 30, 1985, Ser. No. 781,925
Claims priority, application Portugal, Nov. 29, 1984, 79575
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—227 **15 Claims**



1. A stable support structure comprising:

a plurality of adjacent conformable tubular components, each of said tubular components having at least two pairs of perforations formed in the periphery thereof at predetermined intervals longitudinally of and according to the length of said tubular components;

the perforations of one of said at least two pairs being located at respective ends of a first chord defined by a specified cross section of one of said tubular components, wherein said first chord diametrically opposes a second similar chord defined by the perforations of the other of said at least two pairs in another specified cross section of the same tubular component; and

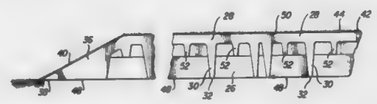
tensory means, threaded through said pairs of perforations of adjacent tubular components, for forming said stable support structure whose static form is determined by the relative lengths of said tensory means and by the relative lengths of the diametrically opposed chords.

4,727,697

IMPACT ABSORBING SAFETY MATTING SYSTEM

Thomas M. Vaux, 937 Kirkland Ave., Kirkland, Wash. 98033

Continuation of Ser. No. 364,811, Apr. 2, 1982, abandoned. This application Apr. 23, 1986, Ser. No. 767,718
Int. Cl.[4] A47G *9/06*
U.S. Cl. 52—177 **3 Claims**



1. An impact absorbing safety mat for placement under playground equipment on an asphalt or concrete subbase, comprising:

a surface layer having a bottom and outer edges;

an array of air filled cells affixed to the bottom of the surface layer;

rib means, extending from the bottom of the surface layer, for defining the array of air filled cells;

a sloping outer edge means, surrounding all sides of the mat, for preventing the escape of air from the air filled cells;

sealer and aggregate spread over the surface layer, the sloping outer edge means, and the asphalt or concrete subbase immediate to edges of the mat, said sealer preventing the escape of air therefrom;

median rib means, extending a shorter distance from the bottom of the surface layer than the defining rib means, for giving added support to the surface layer against a strong blow striking the array of air filled cells; and

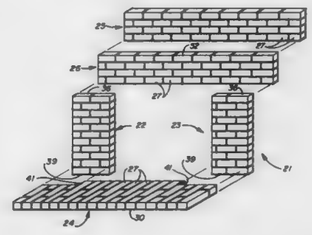
outer rib means, extending from the outer edges of the surface layer, for giving added strength to the surface layer, said outer rib means being structurally wider and stronger than the defining rib means.

4,727,698

FIREPLACE SURROUND ASSEMBLY AND METHOD

Michael L. Altman, Sacramento, Calif., assignor to Charles M. Gonder and Rosella M. Gonder, both of Rancho Cordova, Calif.

Filed Aug. 11, 1986, Ser. No. 895,275
Int. Cl.[4] F24C *15/12*
U.S. Cl. 52—314 **2 Claims**



1. In a firplace surround assembly having a plurality of separate surround components including, a pair of leg members each having a lower end and an upper end, said leg members being mounted to extend vertically along wall means on opposite sides of a fireplace opening, a lintel member mounted across the upper ends of said leg members above said opening, and a hearth member mounted on floor means below said opening to extend between the lower ends of said leg members, each of said surround components being cast from a cement-based brick-simulating material to provide a plurality of brick-like shapes spaced apart by and defining grout receiving recesses therebetween, said recesses terminating in webs of said brick-simulating material which integrally and rigidly connect said brick-like shapes, fastener means mounted in said recesses and extending through said webs to secure at least some of said components to said wall means, and grout means positioned in said recesses over said fastener means and said webs, the improvement comprising:

said hearth member extending transversely in front of said lower end of each of said leg members and protruding inwardly between said lower end of each of said leg members to define a pair of notches in said hearth member dimensioned to and receiving said lower ends of said leg members and providing L-shaped grout joints therebetween;

grout means positioned in and filling said L-shaped grout joints between said lower ends of said leg members and said hearth member;

grout means positioned under said lower ends of said leg members and between said upper ends of said leg members and said lintel member and filling a shim joint supporting the position of said leg members with respect to said floor means and a shim joint supporting said lintel member with respect to said leg members; and

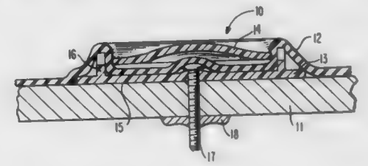
grout means positioned between said components and said wall means and filling a shim joint between said components and said wall means.

4,727,699

ROOFING MEMBRANE SECUREMENT SYSTEM

Richard G. Sargent, 70G West Briar, Stafford, Va. 22554

Filed Apr. 7, 1987, Ser. No. 35,422
Int. Cl.[4] E04B *2/08;* **E04D** *3/36;* **A44B** *21/00*
U.S. Cl. 52—410 **13 Claims**



1. A roofing membrane securement system, comprising:

a lower member of relatively hard and non-resilient material and having a bottom surface portion adapted to be placed on and fastened to a substrate of a roof; a circumferential wall portion extending upwardly from said bottom surface portion; and a plurality of ledges spaced apart from one another around one circumferential surface of said wall portion, said ledges sloping downwardly from the upper edge of said wall portion; one of said circumferential wall portion and said bottom surface portion having a plurality of arcuate slots therethrough at intervals therearound and adjacent the junction of said circumfererential wall portion and said bottom surface portion to permit said circumferential wall portion to flex; and

an upper member of relatively hard and non-resilient material and including means cooperating with the ledges of said circumferential wall portion to permit said upper member cooperating means to snap beneath said lower member ledges to releasably connect said upper member with said lower member;

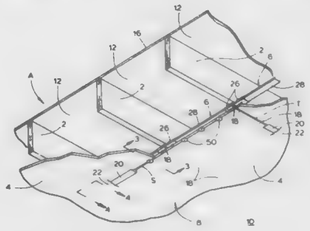
such that with said lower member fastened to a roof substrate and a roofing membrane positioned over the roof substrate and over said lower member said upper member can be positioned on top of the roofing membrane above said ledges, and upon application of sufficient downward force to said upper member, said circumferential wall portion flexes to allow said upper member and the roofing membrane to be positioned beneath said ledges, securing the roofing membrane to the substrate.

4,727,700

CEILING OR WALL HAVING IMPROVED FIRE RESISTANCE AND METHOD OF INSTALLING THE SAME

George F. Eberle, 414 Killearn La., St. Louis, Mo. 63141

Filed Jun. 9, 1986, Ser. No. 872,176
Int. Cl.[4] E04B *2/74, 2/80, 1/68*
U.S. Cl. 52—417 **25 Claims**



1. A partition structure for a building, said partition structure

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comprising: framing members having mounting surfaces; at least two wallboard sheets attached to and supported on the framing members against the mounting surfaces thereof so as to generally obscure the mounting surfaces, with the sheets having side edges located in close proximity to each other to form a seam; and runners attached to the framing members at the seam, each runner extending from one framing member to the next behind the seam so that it projects laterally beyond the seam in both directions, each runner having an outwardly presented surface that lies generally flush with the mounting surfaces of the two framing members between which it extends and is generally against the wallboard sheets which create the seam at the runner, each runner including at least two pieces which are capable of sliding easily relative to each other generally parallel to the seam so that the length of the runner will not change appreciably as the runner experiences variations in temperature.

4,727,701

BUILDING PANEL

Andres G. Figari, Calle 77 - 801 Apto 302, Bogota, Colombia

Continuation-in-part of Ser. No. 462,434, Jan. 31, 1983, Pat. No. 4,573,303. This application Nov. 7, 1985, Ser. No. 795,765

Claims priority, application United Kingdom, Jan. 29, 1982, 8202562

Int. Cl.[4] E04B *1/04;* **E04C** *1/30, 2/04, 2/50*

U.S. Cl. 52—587 **4 Claims**



1. A rectangular precast panel for use in constructing walls and floors of buildings, which panel is made of a cement-based material and comprises a first and second face that are opposed to each other, a pair of first opposed sides and a pair of second opposed sides, wherein:

(a) each first side has a shoulder spaced apart from the second face of the panel, one surface of which shoulder is flush with the first face of the panel and there being a void between a second surface of said shoulder, opposite said one surface, and a plane of the second face of the panel;

(b) each second side is shaped to internest with a second side of an identically-shaped panel;

(c) the panel further includes a plurality of engaging means embedded in the panel adjacent to each of said first sides, and bores extending from each engaging means to the said second face whereby bolts can be secured in the panels by engagement with said engaging means to hold shuttering against said second face; said panel also including a plurality of securing members each having an arm embedded in the panel and a hook part extending from one of the first sides, said hook part being capable of hooking onto a structural member to engage the panel on the structural member.

4,727,702

PANEL USEFUL FOR GATES OR FENCE SECTIONS

Kathleen T. Baker, 4381 Bodega Ave., Petaluma, Calif. 94952, and David E. Baker, Rohnert Park, Calif., assignors to Kathleen T. Baker, Petaluma, Calif.

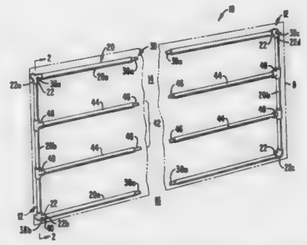
Filed Nov. 3, 1986, Ser. No. 926,899

Int. Cl.[4] E04B *1/343;* **E06B** *3/22*

U.S. Cl. 52—656 **10 Claims**

1. A panel comprising:

a peripheral structure defining an internal region and an external region and having at least one hollow plastic extrusion and at least one solid extrusion corresponding to the hollow plastic extrusion, the corresponding solid extrusion disposed within the hollow plastic extrusion while leaving sufficient space to permit a liquid to be interposed in the hollow plastic extrusion; and,



means operatively associated with the hollow plastic extrusion for selectively permitting a liquid to be interposed into the hollow plastic extrusion adjacent the corresponding solid extrusion and selectively drained therefrom.

4,727,703

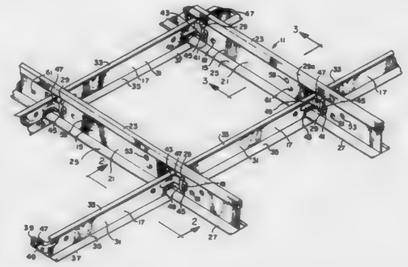
SUSPENDED CEILING GRID STRUCTURE

William J. Platt, Collingdale, Pa., assignor to National Rolling Mills Inc., Malvern, Pa.

Filed Jul. 18, 1986, Ser. No. 886,838

Int. Cl.[4] E04C *2/42*

U.S. Cl. 52—664 **8 Claims**



1. A suspended ceiling grid structure adapted to support ceiling tiles or the like, comprising

a plurality of main beams arranged in spaced-apart, substantially parallel relationship, each main beam having a central fin and oppositely disposed flanges,

cross tees connecting adjacent main beams, each cross tee having a central fin and oppositely disposed bottom flanges,

a vertically disposed belt loop formed in the central fin of the main beams and having a rear edge and a forward edge,

a locking tongue extending from each end of the cross tees in opposite directions at substantially right angles from the cross tee central fin, the locking tongue being releasably engaged by the belt loop,

a locking bump formed in the outer end portion of the locking tongues, and

positive stop shoulders at the top and bottom of the locking tongue for contacting the rear edge of the belt loop when the locking tongue is fully inserted into the belt loop,

the locking bump having a rear surface which slopes toward the fin and is pressed against by the belt loop to urge the stop shoulders into tight engagement with the rear edge of the belt loop.

4,727,704

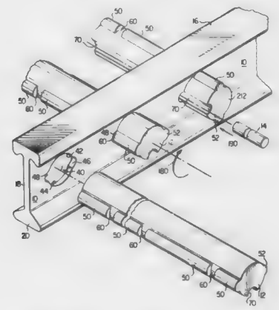
GRATING STRUCTURE AND METHOD FOR ASSEMBLY

Donald G. Carlton, Denton, Tex., assignor to Fibergrate Corporation, Dallas, Tex.

Filed May 7, 1987, Ser. No. 47,621

Int. Cl.[4] E04C *2/42*

U.S. Cl. 52—667 **7 Claims**



1. A load bearing grate structure comprising:

a plurality of longitudinal span bars having lateral locating holes spaced therealong;

a plurality of transverse tie bars having a substantially circular cross-sectional shape with oppositely disposed protruding lobes;

said lobes having slots cut in them so as to interference fit with said lateral locating holes; and

said lateral locating holes on said longitudinal span bars further having holes sized to receive said oppositely disposed protruding lobes, whereby the transverse tie bars are slidably inserted into the holes in the span bars by aligning the lobes with the holes sized to receive them, and then twisting the tie bar approximately 90°, thus allowing the slots cut in the lobes to engage with the span bar;

longitudinal lock rods for holding said slots in engagement with said locating holes to prevent rotation of said tie bars with respect to said longitudinal span bars;

said transverse tie bars having first and second ends with at least one elongated groove extending from said first end to said second end; and

said elongated groove being sized to slidably receive said lock rods.

4,727,705

PACKAGE FOR MEMBRANE FILTERS

Joseph G. Zahka, Dracut, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Dec. 4, 1986, Ser. No. 937,752

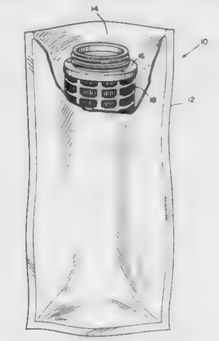
Int. Cl.[4] B65B *55/02*

U.S. Cl. 53—425 **7 Claims**

1. A method of packaging a hydrophobic membrane filter comprising the steps of:

inserting said membrane filter into a moisture and bacteria impervious container, the pores of said membrane filter containing water and being substantially free of any other substance;

sealing said container after said filter is inserted therein to form a fluid and bacteria tight sealed package; and



sterilizing said sealed package such that after said sterilizing step water is retained within said pores.

4,727,706

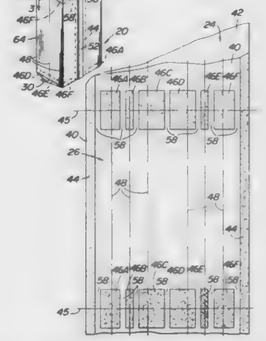
METHOD FOR FORMING SMOOTH WALLED FLEXIBLE PACKAGE

Jeffrey S. Beer, Sellersville, Pa., assignor to Fres-co System USA, Inc., Telford, Pa.

Division of Ser. No. 789,793, Oct. 21, 1985, abandoned. This application May 7, 1987, Ser. No. 47,604

Int. Cl.[4] B65D *30/08, 81/20*

U.S. Cl. 53—434 **4 Claims**



1. A method of fabricating a package and storing contents therein under vacuum, said method comprising the steps of:

(a) providing a roll of a continuous, laminated web construction, said web construction including a first continuous flexible web formed of a gas barrier material adapted to form an inner bag of said package, and a second continuous flexible web adapted to form an outer bag of said package, said first and second continuous webs being adhered together by adhesive bonds to form said laminated web construction, said adhesive bonds including a discrete pattern of bonded areas which repeats in the machine-direction of the laminated web construction to define between discrete patterns of bonded areas a plurality of sequentially disposed, dual walled sheets, each of said dual walled sheets having a length required to form a package, each of said discrete patterns of bonded areas

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including discrete bonds which are spaced apart from each other in the cross-machine-direction of the roll to define between said discrete bonds at least one passageway between said first and second continuous webs, said first continuous flexible web and said second continuous flexible web of the laminated web construction being of different materials for precluding sealing of the at least one passageway when a bonding energy is applied to the dual walled sheets for sealing the package with contents in the inner bag of said package under vacuum, the machine-direction spacing between the discrete patterns of bonded areas permitting separation of the web construction through discrete patterns of bonded areas which are spaced apart from each other in the machine-direction to thereby form a plurality of said dual walled sheets;

(b) forming said dual walled sheets into said tubular packages and sealing one opposed end of each of said tubular packages to form a closed bottom and a gas space between the inner and outer bags of each said tubular package without closing said at least one passageway located between the discrete bonds securing the walls of the dual walled sheet together adjacent said closed bottom, whereby the gas space between the inner bag and the outer bag remains in communication with the ambient atmosphere through said at least one passgaeway adjacent the closed bottom;

(c) severing the sequentially disposed dual walled sheets in the cross-machine-direction through discrete patterns of bonded areas which are spaced-apart from each other in the machine-direction to separate the sequentially disposed dual walled sheets, with the walls thereof bonded together at opposed ends by two of said repeating, discrete patterns of bonded areas;

(d) placing the contents to be packaged within the inner bag of each package;

(e) creating a vacuum in the inner bag of each package; and

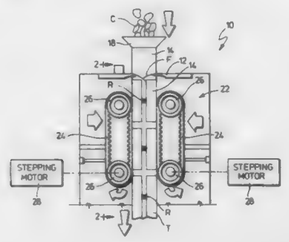
(f) applying said bonding energy to the other of said opposed ends constituting an upper mouth of each of said packages for sealing together inner surfaces of the inner bag of each of said packages adjacent the upper mouth, to thereby seal the contents placed in the inner bag under vacuum, without closing said at least one passageway located between discrete bonds securing the walls of the dual walled sheet together adjacent the upper mouth, whereby the gas space between the inner bag and outer bag remains in communication with the ambient atmosphere through said at least one passageway adjacent the upper mouth, with the contents within the inner bag packaged under vacuum.

4,727,707

PACKAGING FILM FEEDING APPARATUS AND METHOD

William A. Hadden, Conyers, Ga., assignor to Kliklok Corporation, Decatur, Ga.

Filed Dec. 15, 1986, Ser. No. 941,694
Int. Cl.[4] B65B *41/18, 9/08*
U.S. Cl. 53—451 **9 Claims**



1. The method of making form, fill and seal packages of constant length during a fixed time packaging cycle comprising the steps of:

feeding by a specified number of increments a full length of film having a registration mark at an intermediate point in order to produce a package of desired length;

sensing said registration mark during feeding;

counting a predetermined number of feed increments past said registration mark during continued feeding; and

sealing said package at a sealing location upon reaching said predetermined number of feed increments,

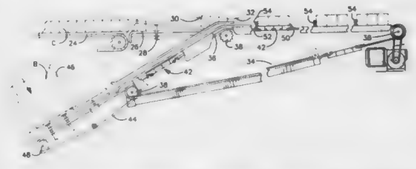
whereby said package is assured of being full length.

4,727,708

WRAP-AROUND PACKAGING MACHINE

Peter M. Conforto, Monroe, La., and Steven G. Ingram, Ravenna, Ohio, assignors to Manville Corporation, Denver, Colo.

Filed Oct. 6, 1986, Ser. No. 915,456
Int. Cl.[4] B65B *5/06*
U.S. Cl. 53—534 **13 Claims**



1. Apparatus for packaging a plurality of articles in a wrap-around carton having a bottom panel, side panels foldably connected to the bottom panel, an inner top panel foldably connected to one of the side panels, an outer top panel foldably connected to the other side panel, and end panels foldably connected to the bottom panel, the end panels and the side panels being foldably connected by tuck flaps, the apparatus being adapted to receive articles at its upstream end from an infeed conveyor, the apparatus comprising:

means for segregating a predetermined number of articles fed to the upstream end of the apparatus;

article support means mounted for movement in a downstream direction;

means for introducing a carton blank to the article support means so that the carton blank is supported thereon;

means for moving the segregated articles to the article support means and loading the articles onto the support means so that the articles rest directly on the portion of the carton blank designed to be the bottom of the carton;

means for moving the article support means in a downstream direction, the side and top panels of the blank extending to the side of the article support means, one of the end panels extending in a downstream direction and the other end panel extending in an upstream direction;

means attached to and carried by the article support means for folding the leading and trailing tuck flaps of the carton blank toward each other to elevate the side and end panels while the article support means is moving downstream;

means on the article support means for pushing against the trailing faces of the articles while the article support means is moving downstream; and

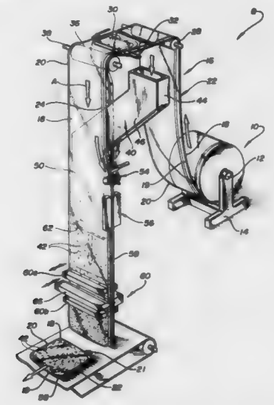
means for folding and securing the side and top panels in place to complete the forming of the carton.

4,727,709

STEERING, JOINING AND GUIDING MECHANISM FOR ZIPPERED FILM

Larry M. Zieke, and R. Douglas Behr, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1986, Ser. No. 889,571
Int. Cl.[4] B65B *9/08*
U.S. Cl. 53—551 **10 Claims**



1. In a form, fill and seal packaging machine, including means for supplying a continuous plastic bag film having interlocked reclosable fastener elements on respective opposing plies of said film, means for feeding said film through a filling station, a filling station for filling said film with product, means preceding said filling station for separating said fastener elements and guiding said film through said filling station, means for pressing said fastener elements together in an interlocking relationship, means for laterally sealing said bag film to form a bag assembly having first and second side seams, and means for severing said bag assembly from said bag film,

the improvement wherein said means for pressing said fastener elements together in an interlocking relationship includes a pair of opposing press rolls, the longitudinal axis of each of said rolls being offset from about 2° to 30° from a line perpendicular to the direction of travel of said bag film and said filling station includes a portion disposed interiorly of said opposing plies of said bag film at generally the same point in the direction of travel of the bag film as said opposing press rolls, said filling station and press rolls being cooperatively positioned to permit the press rolls to pull the bag film against the filling station.

4,727,710

AUTOMATIC VEHICLE GROUND SPEED CONTROL CONVERTIBLE TO MANUAL OPERATION

Lowell L. Kuhn, Independence, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed May 30, 1986, Ser. No. 868,692
Int. Cl.[4] A01D *41/12*
U.S. Cl. 56—10.2 **10 Claims**

1. In a combine having a ground speed control with automatic and manual operating modes, the combination comprising:

drive means operable to propel the combine at various ground speeds,

a support,

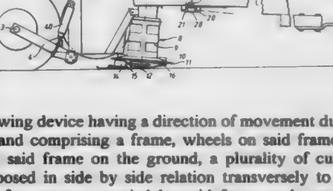
a control member connected in speed controlling relation to said drive means and mounted on said support for pivotal movement in opposite speed increasing and speed decreasing directions about a pivot axis,

a harvesting efficiency monitor,

operating means for automatically pivoting said control member about said axis in response to signals from said monitor to effect said automatic operating mode including a reversible motor and a control for said motor including a switch operable to establish and disestablish said automatic operating mode,

a manually operable lever including a first part adapted for manual engagement by the combine operator and a second part connected for pivotal movement with said control member about said axis and extending therefrom in a radial direction, said first part including a switch operating member,

a lost motion connection between said first part of said lever and said second part of said lever permitting endwise sliding movement of said first part relative to said second part toward and away from said axis from a first position in which said switch operating member causes said switch



to effect said automatic operating mode to a second position in which said switch operating member causes said switch to effect disestablishment of said automatic operating mode and establishment of said manual operating mode,

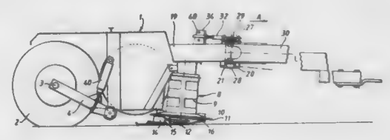
said lost motion connection including a resiliently yieldable connection between said parts of said lever permitting limited pivotable movement of said first part of said lever in said speed increasing and speed decreasing directions relative to said control member from a normal position occupied by said first part and a displaced position which is occupies when said first part of said lever is manually operated in one of said speed increasing and speed decreasing directions while said speed control is in said automatic operating mode, said switch operating member causing said switch to effect a disestablishment of said automatic operating mode when said lever is in said displaced position.

4,727,711

MOWING DEVICE

P. Quataert, Nuenen, Netherlands, assignor to P. J. Zweegers en Zonen B.V., Geldrop, Netherlands

Filed Sep. 24, 1986, Ser. No. 911,214
Claims priority, application Netherlands, Nov. 15, 1985, 8503156
Int. Cl.[4] A01D *34/74*
U.S. Cl. 56—16.2 **9 Claims**



1. A mowing device having a direction of movement during operation and comprising a frame, wheels on said frame for supporting said frame on the ground, a plurality of cutting means disposed in side by side relation transversely to said direction of movement carried by said frame and rotatable

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about substantially upward extending axes of rotation, said cutting means having knives thereon defining substantially circular cutting paths when in operation, a plurality of resilient skids supporting said cutting means and contacting the ground rearwardly of the foremost portions of the cutting paths of said knives such that said frame is supported resiliently with respect to said ground wheels, means on said frame for defining a substantially vertical pivot axis for pivotable connection to a draw bar coupled to a vehicle, and means on said frame for tilting said vertical pivot axis in a vertical plane parallel to the direction of movement such that said draw bar is adjusted relative to said frame around a horizontal axis transverse to the direction of movement whereby the rotary axes of said cutting means are tilted in planes parallel to the direction of movement.

4,727,712

MOWING DEVICE

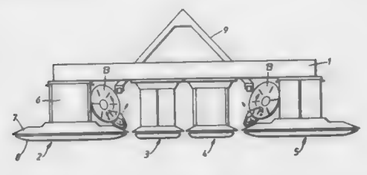
Petrus W. Zweegers, Geldrop, Netherlands, assignor to P.J. Zweegers en Zonen B.V., Geldrop, Netherlands

Filed Jun. 5, 1986, Ser. No. 870,917

Claims priority, application Netherlands, Jun. 26, 1985, 8501837

Int. Cl.⁴ A01D *57/30*

U.S. Cl. 56—192 **9 Claims**



1. A mowing device having a direction of movement (A) during operation and comprising a frame beam (1) substantially transverse to said direction of movement, at least two cutting elements (2–5) carried by said frame beam and rotatable about vertically extending rotary axes, said cutting elements each comprising collars (7) and cutters attached to said collars, the cutting elements being driven so that during operation adjacent portions of adjacent cutting elements move in a direction opposite to said direction of movement, a freely rotatable first swath wheel (13) disposed at the rear most portion of an outter most cutting element with respect to said direction of movement and at least partially above the collar of said cutting element, a freely rotatable second swath wheel (15) disposed rearwardly of and at least partially overlapping said first swath wheel with respect to said direction of movement, the axis of rotation (14) of said first swath wheel being inclined at a smaller angle to the horizontal than the axis of rotation of said second swath wheel (17), a portion of said second swath wheel being lower than said first swath wheel such that any portion of a crop cut by said outter most cutting element which portion passes under said first swath wheel will be caught by said second swath wheel.

4,727,713

ROVING OR SLIVER CLAMPING DEVICE FOR A DRAFTING FRAME OR A SPINNING MACHINE

Herbert König, Ebersbach, and Werner Meissner, Hattenhofen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 27, 1987, Ser. No. 20,105

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606609

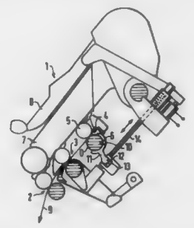
Int. Cl.⁴ D01H *13/18, 13/14*

U.S. Cl. 57—84 **7 Claims**

1. A roving clamping device for use in a drafting unit of a spinning machine, said drafting unit having an upper inlet roller and a lower inlet roller engaging a roving between them, said device comprising:

clamping means swingable to enter between said upper inlet roller and said lower inlet roller to raise the upper inlet roller from the lower inlet roller for clamping a roving against said upper inlet roller in an operative position of said clamping means;

actuating means operatively connected with said clamping means and including a first force-generating element biasing said clamping means in a direction of movement into said operative position and freely shiftable in said direction at all times by a first force contributed by said element; and



holding means for retaining said actuating means against said force for holding said actuating means against movement in said direction solely by force balance and without a mechanical locking of said actuating means, said holding means including:

a second force-generating element operatively coupled to said actuating means for generating a second force acting counter to said first force contributed by said first force-generating element, and

means connected to one of said force-generating elements for controlling same to relieve the effect of said second force and release said actuating means so that said first force can insert said clamping means between said upper inlet roller and said lower inlet roller.

4,727,714

TOMATO PICKING MACHINE

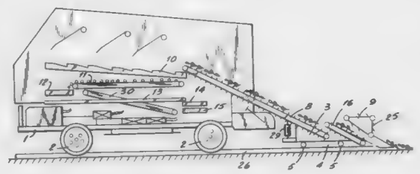
Djenjo P. Karakolev; Milko Y. Stoyanov; Zapryan G. Zapryanov; Pavel N. Tontchev, all of Plovdiv; Ivan V. Vaklinov, Stambolii; Hristo A. Simitchiev, and Marin P. Tchernev, both of Plovdiv, all of Bulgaria, assignors to NPSK "G. Dimitrov", Plovdiv, Bulgaria

Continuation-in-part of Ser. No. 685,297, Dec. 24, 1984, abandoned. This application Oct. 28, 1986, Ser. No. 924,238

Claims priority, application Bulgaria, Dec. 22, 1983, 63532

Int. Cl.⁴ A01D *45/00*

U.S. Cl. 56—327.1 **1 Claim**



1. A tomato picking machine comprising

a support frame with a front part;

an inclined vibrating conveyor articulately fastened to the front part of the support frame; said vibrating conveyor having an upper and lower part; the lower part of said vibrating conveyor being mounted on

a ground level copying device;

a picker placed above said copying device and mounted behind

a cutting device being situated at the lowest part of said inclined vibrating conveyor; said picker having articulately mounted spikes which rotate in one direction only;

a tomato separator placed above the highest part of the inclined vibrating conveyor;

a waste product cleaning conveyor mounted under said tomato separator; said cleaning conveyor operatively connected with separating conveyors;

said separating conveyors being placed crosswise to the machine; the outer ends of said separating conveyors lying above lengthwise conveyors;

said lengthwise conveyors being situated on opposite sides of the machine and operatively connected with a picking conveyor;

said picking conveyor being mounted crosswise to the machine and operatively connected to a moving rake conveyor;

a short receiving conveyor is mounted between the picker and the inclined vibrating conveyor parallel to the inclined vibrating conveyor;

the ground copying device is placed immediately behind the cutting device and lies on the processed bed;

the vibrating inclined conveyor and cleaning conveyor are made of endless chains placed lengthwise to the machine;

the vibrating inclined conveyor comprises tube type supports, which the cleaning conveyor comprises smooth tube type rollers;

lengthwise conveyors, separating conveyors, and crosswise gathering conveyors are all of the belt type and self-cleaning;

the cutting device vibrates and has two comb-like blades placed perpendicular to the longitudinal axis of the machine

wherein the ground level copying device comprises

a separate second frame; said second frame having

a front end and

a back end; said second frame being

articulately mounted at its front end to the lower part of the inclined vibrating conveyor, while the back end of said second frame is

mounted to the inclined vibrating conveyor by

means of hydro-cylinders; said second frame having

two axes, each axis provided with

self cleaning wheels mounted close to one another so that the cleaning device centers the inclined vibrating conveyor and the cutting device.

4,727,715

METHOD AND APPARATUS FOR STARTING SPINNING OPERATION OF AN OPEN END FRICTION SPINNING AGGREGATE

Wolfgang Feuchter, Deggingen-Reichenbach; Wolfram Ilg, Bad Überkingen, and Johann Weber, Deggingen, all of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 13,788

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3606015

Int. Cl.⁴ D01H *15/00, 7/892*

U.S. Cl. 57—263 **25 Claims**

1. Piecing process for an open-end friction spinning apparatus of the type including:

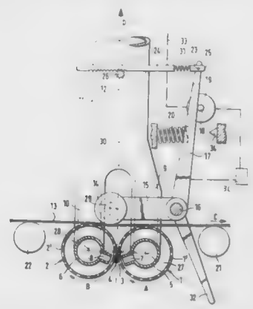
movable friction surface means for forming yarn including a pair of friction rollers operating as said friction surface means forming a yarn-forming zone therebetween;

friction surface driving means for moving said friction surface means during operation and for interrupting the movement of said friction surface means, said friction surface driving means including roller driving means for driving one roller into the yarn-forming zone and for driving another roller out of the yarn-forming zone;

yarn end orientation means for orienting a yarn end during the piecing process;

said process comprising:

placing a yarn end into the yarn-forming zone when the friction surface means are stopped; and



starting the friction surface means whereby said yarn end is prevented from being pulled too deeply into said yarn-forming zone by the yarn end orientation means, said starting of the friction surface means including using control means for preventing the roller rotating into the yarn-forming zone from starting prior to the starting of the roller rotating out of the yarn-forming zone.

4,727,716

DUAL NIP OPEN-END FRICTION SPINNING

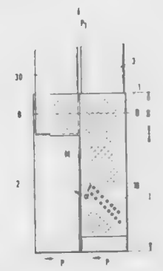
Werner Billner, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,241

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524942

Int. Cl.⁴ D01H *1/135*

U.S. Cl. 57—40 **47 Claims**



1. An open-end friction spinning apparatus, comprising:

friction roller means, comprising a pair of friction rollers being rotatable in the same direction, and disposed adjacent one another so as to define a relatively small gap therebetween, and defining a spinning nip on one side of said gap adapted for spinning opened fibers directed thereto into yarn, and further defining a feeding nip on the other side of said gap;

fiber feeding channel means for feeding opened fibers to the proximity of said friction roller means into said feeding nip thereof; and

conveying means for directing to said spinning nip said

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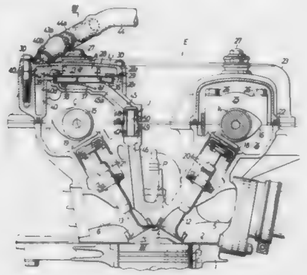
opened fibers fed by said channel means, whereby said fibers are stretched and held tightly for being spum into fibers, wherein said conveying means includes means for providing the friction roller rotating out of said feeding nip and into said spinning nip with a greater fiber slaving force than the other friction roller so as to carry said fibers from said feeding nip to said spinning nip through said gap between said friction rollers.

4,727,717

EXHAUST GAS CLEANING SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

Yasuo Ikenoya, Kawagoe; Makoto Hirano, and Masafumi Araki, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,909
Claims priority, application Japan, Dec. 3, 1980, 55-170698
Int. Cl.[4] F01N *3/30*
U.S. Cl. 60—293 **18 Claims**



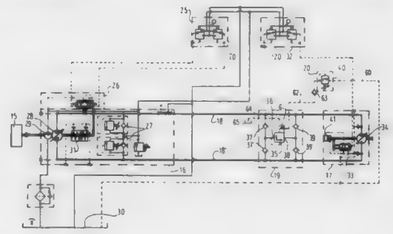
1. An exhaust gas cleaning system for a multi-cylinder internal combustion engine comprising a plurality of combustion chambers, an exhaust system having exhaust ports opening into respective combustion chambers, a secondary air supplying system communicating with said exhaust system for supplying secondary air to said exhaust system, and a plurality of reed valve means interposed in said secondary air supplying system and adapted to open or close in response to pulsations of exhaust gas developed in said exhaust system during engine operation for controlling supply of secondary air to said respective exhaust ports independently of each other, said secondary air supplying system including single common inlet passage means leading to the ambient atmosphere for feeding secondary air to said reed valve means and a plurality of outlet passage means connected to said exhaust ports, respectively, said reed valve means including reed valve members and upstream and downstream chambers formed at opposite sides of said reed valve members, respectively, said upstream chambers being formed independently of one another for connection to said common inlet passage means while said downstream chambers are formed independently of one another and communicate with said respective outlet passage means, and a cylinder head cover, said inlet passage means as well as at least part of said outlet passage means, said reed valve members, said upstream and downstream chambers all being in said cylinder head cover.

4,727,718

WINCH SYSTEM HAVING HYDRAULIC TRANSMISSION INCLUDING A SAFETY CIRCUIT

Luitzen B. Koopmans, No. 38a, Geikenes, 2964 AC Groot-Ammers, Netherlands

Continuation of Ser. No. 397,536, Jul. 12, 1982, abandoned. This application Jul. 17, 1985, Ser. No. 755,559
Claims priority, application Netherlands, Jul. 21, 1981, #103444
Int. Cl.[4] F16H *39/44*
U.S. Cl. 60—468 **3 Claims**



1. A winch system comprising the combination of:
a hydrostatic pump and drive means for driving said pump continuously to deliver a predetermined flow rate of hydraulic fluid corresponding to a vertically upward maximum speed of a tool controlled by the winch system;
a hydrostatic motor and a cable drum driven by said motor, a cable wound on said drum and a tool connected to said cable so that the tool may be moved vertically;
a fluid feed line extending from said pump to said motor and a fluid return line extending from said motor to said pump to establish closed fluid connection between said pump and said motor; and
control means for controlling the power delivered from said pump to said motor independently of said predetermined flow rate of hydraulic fluid continuously delivered by said pump, said control means comprising flow path means extending back and forth between the fluid feed line and the fluid return line for automatically diverting fluid from said feed line to said return line in response to a pressure difference existing between said lines which exceeds a variable limit whose maximum value is less that that value which could impose destructive tension in the cable, and operator controlled means for changing said variable limit to any value between a low value at which the tool is free falling and said maximum value at which the tool is subjected to maximum upward acceleration from a bottomed standstill after free falling until the maximum upward speed of the tool is attained whereby the motion imparted to said tool may converted smoothly by the operator from said vertically upward maximum speed to a free falling downward motion and smoothly from a tool bottomed standstill with maximum upward acceleration to said vertically upward maximum speed without creating destructive tension in said cable and without altering the predetermined flow rate delivered by the pump.

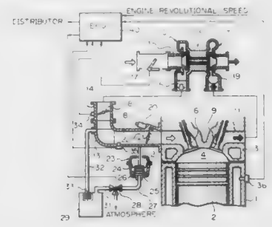
4,727,719

APPARATUS FOR CONTROLLING INLET AIR FLOW IN A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Koichi Mizutani, Seto, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 9, 1987, Ser. No. 12,324
Claims priority, application Japan, Feb. 26, 1986, 61-039022
Int. Cl.[4] F02B *37/12*
U.S. Cl. 60—611 **7 Claims**

1. An apparatus for controlling inlet air flow in an internal combustion engine having a turbo-supercharger; said turbo-supercharger having a turbine driven by a pressure of an exhaust gas and an air compressor actuated by said turbine and connected to a combustion chamber of said engine through at least two intake passages so that inlet air compressed thereby is supplied to said combustion chamber, said engine having a means for controlling ignition timing; wherein said apparatus comprises:
an air flow control valve provided in one of said intake passages;



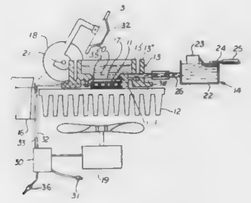
means for detecting an accelerating transitional condition of said engine;
means for detecting a pressure of inlet air compressed by said air compressor;
means for closing said air flow control valve and delaying an ignition timing while said engine is running in the accelerating transitional condition and until a pressure of the compressed air reaches a predetermined value.

4,727,720

COMBINATION ICE MOLD AND ICE EXTRACTOR

Paul F. Wernicki, 4501 NE. 21 Ave., #308, Fort Lauderdale, Fla. 33308

Filed Apr. 21, 1986, Ser. No. 854,145
Int. Cl.[4] R25B *21/02*
U.S. Cl. 62—3 **25 Claims**



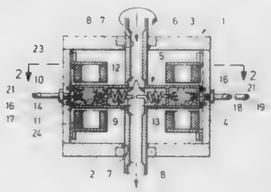
20. An ice machine comprising a mold,
an ice extractor,
an evaporator plate and a water supply,
said mold comprising sides, a bottom and an open top,
said bottom having a cavity therein defined by cavity sides terminating in an opening in the bottom,
said cavity sides are tapered downwardly and inwardly converging toward said opening terminating in sharp edges,
said evaporator plate being disposed below said opening,
sealing means between said ice mold and said evaporator plate whereby said evaporator plate forms a closure for said opening in said ice mold,
said ice extractor having an open top, an open bottom and sides extending downwardly and inwardly terminating in a sharp lower edge,
said extractor being adapted to be received in said cavity, said sharp lower edge of said extractor resting on said evaporator plate,
means to supply water to said mold,
means to swing said ice extractor from a position in said cavity to an inverted position over an ice receptacle,
a heat sink,
said ice mold being supported on said heat sink,
said evaporator plate being supported in spaced relation to said heat sink.

4,727,721

APPARATUS FOR MAGNETOCALORIC REFRIGERATION

Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Nov. 4, 1986, Ser. No. 927,260
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539584
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **8 Claims**



1. An apparatus for magnetocaloric refrigeration, comprising a ferromagnetic material arranged in a rotor and alternately entering and exiting from a stationary magnetic field when the rotor rotates, and also comprising a circuit for a working gas coming into successive heat exchange contact with a ferromagnetic material arranged outside the magnetic field and thereby cooled, a refrigeration load, a ferromagnetic material located within the magnetic field and thereby heated as well as an external negative heat source, characterized in that discrete members (11) consisting of ferromagnetic material are arranged around the rotor circumference so as to be angularly offset, that two members (11) are connected each time to form a pair by a flow path (heat exchanger duct 13) for the working gas, said flow path being arranged within the rotor (5) and leading from an outer surface (18) of the rotor (5) via heat contact with one member (11) of said pair into the center of the rotor (5) and then via heat contact with the other member (11) of said pair to an outer surface (18) of the rotor (5) again, that at least one stationary supply conduit (15) ending in a sealed manner at the outer surface (18) of the rotor (5) and one stationary outlet conduit (16) beginning in a sealed manner at the outer surface (18) of the rotor (5) are provided for the working gas, both conduits communicating with the flow path of one pair in a predetermined angular position of the rotor (5), that each outlet conduit (16) is associated with a stationary magnetic field such that the member (11) adjacent the outlet conduit (16) is located within this stationary magnetic field and the other member (11) of the pair outside the magnetic field in said predetermined angular position, and that a cooling conduit is guided through a hollow bearing shaft (6) of the rotor (5) and has a refrigeration medium flowing through it, said refrigeration medium acting as refrigeration load and coming into heat contact with the working gas in the center of the rotor (5).

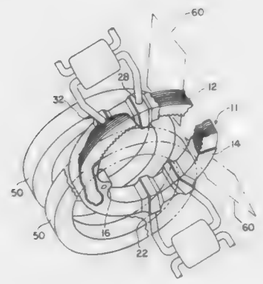
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4,727,722

ROTARY MAGNETIC HEAT PUMP

Lance D. Kirol, Shelly, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 11, 1987, Ser. No. 13,518
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **8 Claims**



1. A rotary magnetic heat pump comprised of:

at least one circular plate comprised of predetermined material, having a central hole and an axis of rotation through said hole;

a substantially toroidal shaped housing having first inlet and outlet ports and having second inlet and outlet ports and with said at least one circular plate being rotatably mounted in said housing;

means for inducing a localized strong magnetic field throughout the interior portion of said housing substantially between said first inlet and said second outlet port;

means for rotating said, at least one circular plate in a predetermined direction in said housing on said axis of rotation of said at least one circular plate;

a heat transfer fluid at least in said housing, in thermal contact with said at least one circular plate;

thermal load exchange means in combination with a first pumping means, said combination operatively connected to said first inlet port and said first outlet port to permit transfer of said heat transfer fluid through said first outlet port, through said thermal load exchange means and through said first pumping means and return to said housing through said first inlet port;

a heat rejection means in combination with a second pumping means, said combination operatively connected to said second inlet and said second outlet port to permit the transfer of said heat transfer fluid through said second outlet port, through said heat rejection means, through said second pumping means, to said housing through said second inlet port;

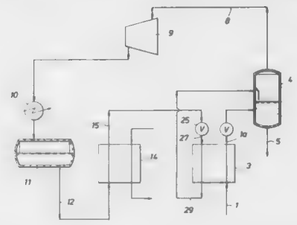
said housing and said at least one circular plate being of a size and said ports being prepositioned in said housing whereby said heat transfer fluid flows in said housing through said first inlet port and splits into first and second flow portions such that said first flow portion flows against the direction of rotation of said plates and said second portion flows with the direction of rotation of said plates, fluid flowing into said housing through said second inlet port splits into third and fourth fluid flow portions such that said third fluid flow portion such that said third fluid flow portion flows against the rotation of said plates and said forth fluid flow portion flows with said rotation.

4,727,723

METHOD FOR SUB-COOLING A NORMALLY GASEOUS HYDROCARBON MIXTURE

Charles A. Durr, Houston, Tex., assignor to The M. W. Kellogg Company, Houston, Tex.

Filed Jun. 24, 1987, Ser. No. 65,743
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 **9 Claims**



1. A method for sub-cooling a normally gaseous hydrocarbon product stream which comprises:

(a) expanding a liquid phase, sub-cooled, multi-component, normally gaseous, hydrocarbon stream into a low-pressure, adiabatic gas/liquid separation zone;

(b) recovering a gaseous refrigerant stream containing portions of at least two of the lightest components of the multi-component, normally gaseous, hydrocarbon stream from the low-pressure, adiabatic gas/liquid separation zone;

(c) compressing the gaseous refrigerant stream to an elevated pressure and then condensing the stream to form a high-pressure refrigerant liquid;

(d) sub-cooling at least a portion of the high-pressure refrigerant liquid to form a first, cold refrigerant liquid;

(e) expanding at least a portion of the first, cold refrigerant liquid to form a first, low-pressure refrigerant;

(f) vaporizing the first low-pressure refrigerant to form a first low-pressure revaporized refrigerant;

(g) introducing the first low-pressure revaporized refrigerant to the low-pressure, adiabatic gas/liquid separation zone;

(h) sub-cooling a multi-component, normally gaseous, hydrocarbon process stream by indirect heat exchange with the first low-pressure refrigerant to form the liquid phase, sub-cooled, multi-component, normally gaseous, hydrocarbon stream that is expanded into the low-pressure, adiabatic gas/liquid separation zone; and

(i) recovering a normally gaseous, liquid phase, hydrocarbon product stream from the low-pressure, adiabatic gas/liquid separation zone.

4,727,724

CRYSOSORPTION PUMP FOR THE ROTOR OF AN ELECTRIC MACHINE HAVING A SUPERCONDUCTING EXCITER WINDING

Lutz Intichar; Wolfgang Schmidt; Christoph Schnapper, all of Erlangen; Karl-Heinz Spiess, Moers, and Erich Weghaupt, Mülheim on the Ruhr, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,137
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609273
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **17 Claims**

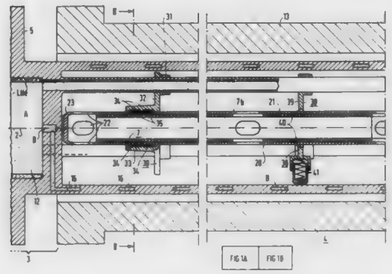
1. In an electric machine having a superconducting exciter winding, the machine having a rotor comprising

the superconducting exciter winding to be cooled by a cryogenic coolant;

evacuable spaces for insulating the winding;

at least a vacuum insulated coolant supply line for supplying coolant to the rotor; and

a co-rotating transfer part for the coolant supply line on one side of the rotor having a central chamber in communication with the evacuable spaces,



a cryosorption pump for perpetuating a thermal insulating vacuum in the rotor comprising:

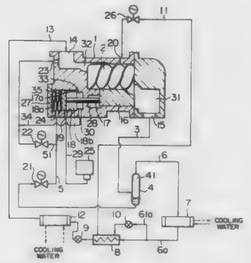
means for cryosorption disposed in the central chamber of the co-rotating transfer part along the axis of rotation thereof, said means for cryosorption thermally connected to the coolant supply line.

4,727,725

GAS INJECTION SYSTEM FOR SCREW COMPRESSOR

Kimio Nagata, and Shigekazu Nozawa, both of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,245
Claims priority, application Japan, May 20, 1985, 60-105804
Int. Cl.[4] F25B *41/04*; F04C *18/16, 29/08*; F04B *49/02*
U.S. Cl. 62—196.3 **5 Claims**



1. In a refrigeration cycle having a screw compressor provided with a slide valve means for controlling a compression capacity of said screw compressor, an economizer means disposed in a refrigerant liquid passage for subcooling said refrigerant liquid by the refrigerant of a reduced pressure, and a refrigerant gas injection line through which the refrigerant gas generated in said economizer means is injected into the compression chamber of said screw compressor in a compression phase, a refrigerant gas injection system comprising:

an oil supplying means adapted to supply a pressurized oil to an actuator for actuating said slide valve, only when said screw compressor is operating in an unloaded state; and

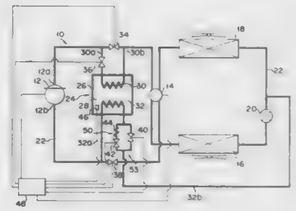
a gas injection solenoid valve disposed in said refrigerant gas injection line and adapted for operating in relation to an operation of said oil supplying means in such a manner so as to open when said screw compressor is operating at a full load level and to close when the screw compressor is operating in the unloaded state.

4,727,726

REFRIGERATION CYCLE APPARATUS

Akio Mitani, Yokohama; Koji Kashima, Yokohama; Hiroichi Yamaguchi, Yokohama, and Kouroku Endo, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1987, Ser. No. 8,329
Claims priority, application Japan, Oct. 31, 1986, 61-258507
Int. Cl.[4] F25B *27/02*
U.S. Cl. 62—238.6 **11 Claims**



1. A refrigeration cycle apparatus comprising:

a refrigeration cycle main unit including a compressor, a condenser, an evaporator, and refrigerant flow means for connecting the above components to form a closed circuit through which a refrigerant flows;

a heat accumulating unit for accumulating an excess heat generated during the operation of said main unit and for radiating the accumulated heat at a desired time to heat the refrigerant to be sent to the compressor, said accumulating unit including a heat accumulating container and latent heat accumulating material accommodated in the container, said heat accumulating material having a predetermined phase transition temperature, and a supercooling state release temperature which is lower than the phase transition temperature, said heat accumulating material maintaining a supercooling state at a temperature between said phase transition temperature and said supercooling state release temperature; and

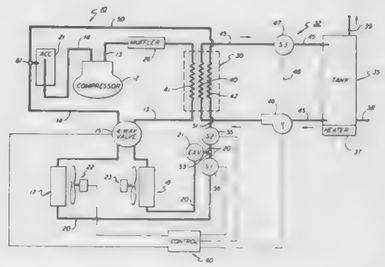
release means for releasing the supercooling state of the heat accumulating material to cause the heat accumulating material to radiate latent heat.

4,727,727

INTEGRATED HEAT PUMP SYSTEM

Wayne R. Reedy, Cazenovia, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 20, 1987, Ser. No. 17,167
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.6 **11 Claims**



1. An integrated heat pump and hot water system that includes

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a heat pump having an indoor heat exchanger and an outdoor heat exchanger that are selectively connected to the suction line and the discharge line respectively of a compressor by a flow reversing means, and to each other by a liquid line having an expansion device mounted therein, whereby heating and cooling is provided to an indoor comfort zone by cycling the flow reversing means,

a refrigerant to water heat exchanger having a hot water flow circuit in heat transfer relation with a first refrigerant condensing circuit and a second refrigerant evaporating circuit,

said first refrigerant condensing circuit being connected in series with the discharge line of the compressor and the flow reversing means,

a connection mounted in the liquid line between the indoor heat exchanger and the expansion device,

said second refrigerant evaporating circuit being connected in series between the suction line of the compressor and said connection in the liquid line, and

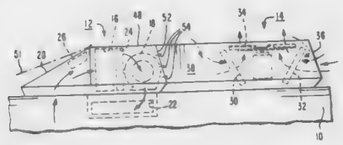
control means for regulating the flow of refrigerant through the refrigerant to water heat exchanger to selectively transfer heat into and out of the hot water flow circuit.

4,727,728

BUS AIR CONDITIONING UNIT FOR ROOF TOP MOUNTING

Ronald W. Brown, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed May 12, 1983, Ser. No. 493,898
Int. Cl.⁴ B60H *1/32*
U.S. Cl. 62—244 **9 Claims**



1. An air conditioning unit for on the roof of a vehicle, such as a passenger bus, comprising:

a vehicle air conditioning section comprising a first enclosure part including front, rear and opposite sidewalls assembled to each other in substantially water tight relation and housing evaporator coil means, evaporator fan means for circulating air from the vehicle interior for conditioning and returning it to the interior, an openable top panel in substantially water tight relation on said first enclosure part, and detachable side panel means spaced outboard of each of said opposite sidewalls to provide first side spaces therebetween;

a condenser section, physically separate from said air conditioning section, and having an independent frame and panel means forming a separate housing containing condenser coil means, and condenser fan means for circulating ambient air through said condenser coil means;

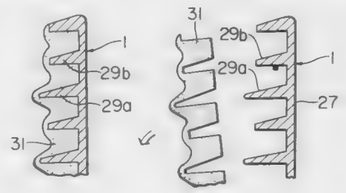
means for attaching said sections together to form the unit with said air conditioning and condenser sections spaced apart to provide a generally central part of said unit which is upwardly open over an area sufficiently extensive to provide standing room on said roof for a person to permit working on the unit from the central part.

4,727,729

ICE MAKING COMPARTMENT IN AN ICE MAKER

Ko Toya, Shimane, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Jan. 5, 1983, Ser. No. 455,897
Claims priority, application Japan, Jan. 20, 1982, 57-4996[U]
Int. Cl.⁴ F25C *1/12*
U.S. Cl. 62—347 **5 Claims**



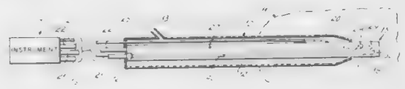
1. In an ice making compartment for an ice making apparatus which compartment comprises a vertical ice making plate in which a cooling pipe is fixed to the rear surface of the ice making plate, and a plurality of longitudinal and transversal partition plates are fixed to the front surface of the ice making plate, thus defining cells in cooperation with the ice making plate, the improvement wherein both said partition plates comprise plates having different heights from the front surface of the ice making plate.

4,727,730

INTEGRATED OPTIC SYSTEM FOR MONITORING BLOOD PRESSURE

Anthony A. Boiarski, Columbus; Nile F. Hartman, Westerville, both of Ohio, and Rand C. Sherman, Holmdel, N.J., assignors to Medex, Inc., Hilliard, Ohio

Filed Jul. 10, 1986, Ser. No. 884,219
Int. Cl.⁴ A61B *5/02*
U.S. Cl. 128—667 **3 Claims**



1. Blood pressure monitoring apparatus comprising,

a block,

means defining a cavity in said block,

said cavity having an opening,

a resilient diaphragm overlying said opening and having an outside surface exposed to blood in a blood vessel,

a diffraction grating cantilevered over said opening and engaged by said diaphragm to bend said grating into said cavity upon application of blood pressure on the outside surface of said diaphragm,

means for directing a beam of light consisting of two wavelengths onto said diffraction grating,

light-receiving means presenting a surface in said cavity,

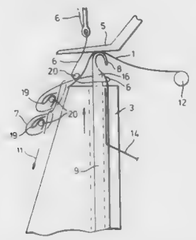
and means for measuring the quantity of each said wavelength impinging on said surface.

4,727,731

COMPOSITE SHEET MATERIAL

William H. Tough, Tayport, Scotland, assignor to Scott & Fyfe Limited, Scotland

Filed Oct. 23, 1986, Ser. No. 922,457
Claims priority, application United Kingdom, Oct. 25, 1985, 8526342; Apr. 8, 1986, 8608493; Jun. 19, 1986, 8614964
Int. Cl.⁴ D04B *23/06*
U.S. Cl. 66—85 A **24 Claims**



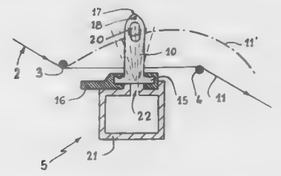
1. A method of producing composite sheet material in which longitudinal rows of stitches are formed in a sheet materal by needles which are advanced and retracted during the formation of each stitch, the method comprising the steps of utilizing the needles in a first stage of the advance thereof to move the sheet material without piercing the sheet material thereby increasing the length of sheet material used per stitch, subsequently restraining the sheet material from further movement by the needles thereby causing the needles in a second stage of the advance thereof to pierce the sheet material, and thereafter retracting the needles to form the stitch and thereby entrap within each stitch in each longitudinal row of stitches formed in the sheet material a portion of sheet material having a length greater than the length of the completed stitch.

4,727,732

DEVICE FOR DETECTING THE PRESENCE OF AN INDIVIDUAL YARN IN A LAP OF PARALLEL YARNS

Pierre G. Campin, 3 avenue du Sud, 94110 Le Perreux; Jean P. Dumas, 6, bis rue Le Serrurier, 02100 Saint Quentin; Michel Gre, 121 rue de Monly, 69230 Saint Gents Laval; Alain Legay, 18 chemin de la Creuse, 07100 Annonay; André Langlet, 38 rue Calixte Souplet, 02100 Saint Quentin, and Yvon Madec, 33 rue du Poitou, 02100 Saint Quentin, all of France

Filed Feb. 13, 1987, Ser. No. 14,730
Claims priority, application France, Feb. 13, 1986, 86 02118
Int. Cl.⁴ D04B *35/26*
U.S. Cl. 66—163 **6 Claims**



1. A device for detecting the presence of a yarn in a lap of parallel yarns, comprising:

advancing means for advancing the lap of parallel yarns;

detecting means disposed to one side of, and in the vicinity of the advancing lap, for detecting the presence of a yarn moved away from the lap;

blowing means disposed to the other side of said lap for blowing against the lap of yarns;

means controlled by the detecting means for stopping the advancing means or for triggering off an alarm system; and

a comb comprising a plurality of parallel teeth spaced apart by the dimension of a knot, between which the advancing yarns pass to space the yarns regularly;

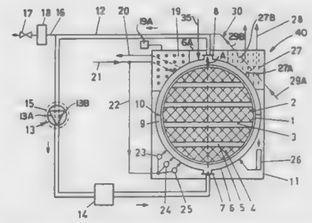
wherein said blowing means is situated at the base of said comb and includes means to direct the flow of air towards the tip of the teeth and to channel the air flow between each pair of adjacent teeth towards the tip of the teeth.

4,727,733

WASHING MACHINE

Jakob Huber, Les Aveneyeres 8, 1806 St. Légier, Switzerland

Filed Nov. 29, 1985, Ser. No. 803,074
Claims priority, application Switzerland, Feb. 12, 1985, 615/85
Int. Cl.⁴ D06F *21/04, 37/08*
U.S. Cl. 68—12 R **32 Claims**



1. A washing machine for washing washable articles, particularly washable textile articles, comprising:

a rotatable drum defining an axis;

rotary drive means for rotating said rotatable drum about said axis;

a casing surrounding said rotatable drum;

said rotatable drum being provided with circumferentially distributed passage openings;

holding means for receiving and holding in place said washable articles in said rotatable drum during operation of the washing machine;

means for passing at least washing liquid through said passage openings of said rotatable drum in a direction approximately normal to said axis of said rotatable drum;

said casing having an inlet and an outlet; and

recirculation means containing a recirculation pump and a recirculation conduit interconnecting said outlet and said inlet of said casing for recirculating at least said washing liquid during operation of the washing machine.

4,727,734

ULTRASONIC WASHING MACHINE

Masao Kanazawa, 6-10, Nakakagaya 4-chome, Suminoe-ku, Osaka, and Yukio Ooka, Toyonaka, both of Japan, assignors to Masao Kanazawa, Osaka, Japan

Filed Sep. 25, 1985, Ser. No. 780,081
Int. Cl.⁴ B08B *3/12*
U.S. Cl. 68—355 **9 Claims**

1. An ultrasonic washing machine for washing articles, said machine comprising:

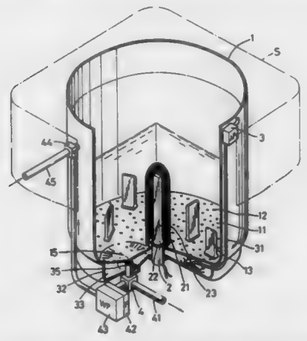
a metal tub having a bottom and an open upper end through which the articles to be washed are placed in said tub, and fluid inlet means through which water is supplied to said tub;

an ultrasonic generator fixed to and within said tub for generating ultrasound in the water supplied to said tub through said fluid inlet means; and

bubble supplying means at the bottom of said tub for supplying and dispersing air bubbles throughout the water sup-

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plied to said tub some of which dissolve in the water to replace air that has been removed from the water due to cavitation when said ultrasonic generator generates ultrasound and the remainder of which reflects the ultrasound to diffuse the ultrasound throughout said tub onto the articles to be washed in said tub.

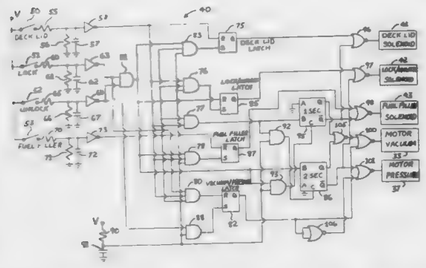


4,727,735

ELECTROPNEUMATIC POWER DOOR LOCK CONTROL FOR MOTOR VEHICLE

Ronald H. Haag, East Detroit, and Lloyd W. Rogers, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 938,991
Int. Cl.[4] E05B *53/00*
U.S. Cl. 70—264 **2 Claims**



1. A power door lock control for a motor vehicle comprising, in combination:

a pump activatable to generate a first pressure or a second pressure but not both simultaneously, one of the first and second pressures being above atmospheric pressure and the other being below atmospheric pressure;

a passenger door lock actuator responsive to the first pressure to perform a first locking operation and further responsive to the second pressure to perform a second locking operation;

an auxiliary door lock actuator responsive to one of the first and second pressures to perform a third locking operation;

a passenger solenoid valve activatable to communicate the pump with the passenger door lock actuator;

an auxiliary solenoid valve activatable to communicate the pump with the auxiliary door lock actuator;

a bistable pressure latch;

a bistable passenger lock latch;

a bistable auxiliary lock latch;

a first timer having, when started, a first time period of activation with self termination at the end thereof;

a second timer having, when started, a second time period of activation different from the first time period of activation with self termination at the end thereof;

passenger lock initiation means;

passenger unlock initiation means;

auxiliary initiation means;

first circuit means repsonsive to activation of the auxiliary initiation means to set the auxiliary latch in a first state, set the passenger lock latch in a second state, start the first timer and terminate the second timer;

second circuit means responsive to activation of the passenger lock initiation means or passenger unlock initiation means to set the passenger lock latch in a first state, set the auxiliary latch in a second state, start the second timer and terminate the first timer;

third circuit means responsive to activation of one of the passenger lock initiation means and passenger unlock initiation means to set the pressure latch in a first state;

fourth circuit means responsive to activation of the other of the the passenger lock initiation means and passenger unlock initiation means to set the pressure latch in a second state;

fifth circuit means responsive to activation of the auxiliary initiation means to set the pressure latch in one of its first and second states;

sixth circuit means responsive to the first state of the auxiliary lock latch with activation of the first timer to activate the auxiliary solenoid valve;

seventh circuit means responsive to the first state of the passenger lock latch with activation of the second timer to activate the passenger solenoid valve;

eighth circuit means responsive to the first state of the pressure latch with activation of the second timer to activate the pump to generate the first pressure;

ninth circuit means responsive to the second state of the pressure latch with activation of the second timer to activate the pump to generate the second pressure; and

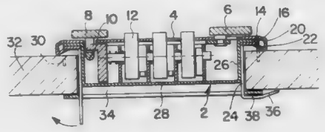
tenth circuit means responsive to the one of the first and second states of the pressure latch with activation of the first timer to activate the pump to generate the one of the first and second pressures.

4,727,736

LOCK AND METHOD OF FASTENING SAME

Edwald Lotz, Obertshausen, Fed. Rep. of Germany, assignor to Amiet AG, Oberdorf, Switzerland

Filed Feb. 3, 1986, Ser. No. 826,144
Claims priority, application Switzerland, Feb. 8, 1985, 572/85
Int. Cl.[4] E05B *9/08*
U.S. Cl. 70—312 **3 Claims**



1. The combination of a lock having a lock housing and a substantially flat object having an opening, said lock housing being substantially flus mounted in the opening of the substantially flat object, comprising:

a cover plate connected to the lock housing and protruding beyond said lock housing on all sides thereof;

said lock housing having a plurality of sides, a plurality of side walls and a rear wall;

said lock housing extending with said plurality of side walls and said rear wall into said opening of the substantially flat object;

at least one respective fastening clip arranged on each of at least two mutually opposite sides of said plurality of sides;

each said at least one respective fastening clip extending in neighboring relationship along an associated side wall of said plurality of side walls and protruding beyond said rear wall;

said lock housing together with said plurality of side walls and said rear wall and each said at least one respective fastening clip extending through the same said opening of the substantially flat object;

a fastening plate;

each said at least one respective fastening clip being formed integrally with said fastening plate;

said lock housing having a flange portion; and

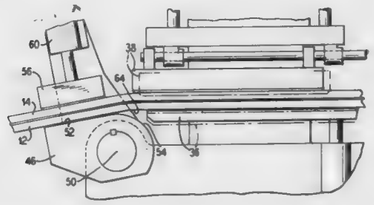
said fastening plate engaging with said cover plate so as to retain said flange portion against said cover plate and said fastening plate.

4,727,737

METHOD AND APPARATUS FOR BENDING A HEAT EXCHANGER COIL

Ralph S. Bryant, Brentwood, Tenn., assignor to Heil-Quaker Home Systems, Inc., Lavergne, Tenn.

Filed Dec. 31, 1986, Ser. No. 948,125
Int. Cl.[4] B21D *7/04*
U.S. Cl. 72—153 **16 Claims**



1. A method for bending a heat exchanger coil comprising the steps:

indexing a heat exchanger coil positioned in a coil plane by a support bed and a hold-down to a bending location so that a portion of said coil overlies a pivotable mandrel;

clamping said overlying portion to said mandrel while holding said coil against said support bed;

initiating bending of said coil by rotating said mandrel about an axis while providing relative separating movement between said mandrel and said entire support bed and hold-down in a direction perpendicular to said coil plane so that a bending portion of said coil is held away from said mandrel; and

continuing the bending of said coil by only rotating said mandrel about said axis without further relative perpendicular movement between said mandrel and support bed.

4,727,738

BENDING APPARATUS

Teruaki Yogo, Nagoya, Japan, assignor to Kabushikikaisha Chuodenkiseisakusho, Japan

Filed Dec. 16, 1986, Ser. No. 942,130
Claims priority, application Japan, May 31, 1986, 61-127809; Oct. 13, 1986, 61-242297
Int. Cl.[4] B21D *7/04*
U.S. Cl. 72—157 **5 Claims**

1. A bending apparatus comprising:

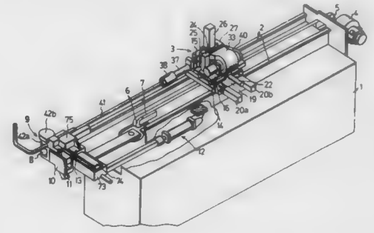
(a) a main shaft mounted on an elongated bed;

(b) a bending template assembly having upper and lower circular bending templates which are stacked in the axial direction of said main shaft around the main shaft for rotation relative to said bed, said upper circular template having a larger radius of curvature than said lower circular template;

(c) a bending arm mounted at one end thereof on said main shaft for turning movement relative to said bed;

(d) a fastening apparatus including a base pivotally supported to said bending arm by first and second parallel links which move said apparatus vertically with respect to said bending template, and toggle linkage means connected between said bending arm and parallel links for moving said parallel links effecting vertical motion of said fastening apparatus, said fastening apparatus rotating with said bending arm relative to said bed;

(e) first and second fastening pieces supported on said base member for linear motion to and from said upper and lower templates, respectively, for grasping and releasing a workpiece against said templates, said first fastening piece being shorter in length than said second fastening piece and being disposed above said second fastening piece, whereby said first and second fastening pieces may be



retracted from said templates and moved downwardly along an arc which permits a workpiece to be positioned with respect to either of said templates;

(f) a bender-driving apparatus connected to said bending arm and adapted to turn said arm about said main shaft;

(g) a carriage for supporting a workpiece having a carriage base slidable in the longitudinal direction of said bed and a chuck mounted on said carriage base for movement in a vertical plane perpendicular to the direction of the longitudinal movement of said carriage base;

the rear end of said workpiece being held in said chuck, the portion of said workpiece to be bent being positioned with respect to said bending template assembly by the advance of said carriage and said portion being located against the outer periphery of a desired one of said bending templates by the movement of said chuck in said vertical plane when said fastening apparatus fastening pieces are retracted.

4,727,739

BOX TO SEPARATE ROLLED STOCK

Claudio Piccotti, Gorizia, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Apr. 18, 1986, Ser. No. 853,556
Claims priority, application Italy, Apr. 22, 1985, 83359 A/85
Int. Cl.[4] B21B *1/00*
U.S. Cl. 72—203 **9 Claims**

1. A box to separate rolled stock, comprising:

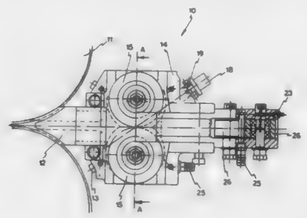
a frame;

an inlet guide mounted to the frame;

a pair of specially shaped rolls to split the rolled stock into two portions; and

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means for supporting the rolls within the frame and for adjusting the distance between the centers of the rolls, said



supporting and adjusting means being able to move both rolls with respect to the frame at the same time.

4,727,740

THERMAL AND WEAR RESISTANT TOUGH NICKEL BASED ALLOY GUIDE ROLLS

Ritsue Yabuki, Iwatsuki; Junya Ohe, Urawa, and Takumi Kawamura, Iwatsuki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00352, § 371 Date May 4, 1983, § 102(e) Date May 4, 1983, PCT Pub. No. WO83/00883, PCT Pub. Date Mar. 17, 1983

Continuation of Ser. No. 498,208, May 4, 1983, abandoned. This PCT application Sep. 2, 1982, Ser. No. 858,576

Claims priority, application Japan, Sep. 4, 1981, 56-138594; Sep. 4, 1981, 56-138595

Int. Cl.⁴ B21B *17/10*

U.S. Cl. 72—209 **16 Claims**

1. The thermal and wear resistant, tough nickel base alloy at elevated temperatures consisting essentially of 0.55 to 2.0% by weight of carbon, 10 to 28% by weight of chromium, 1 to 30% by weight of iron, 0.01 to 4.5% by weight of titanium, 0.01 to 4.5% by weight of aluminum, 0.1 to 10% by weight of tungsten, 0.1 to 10% by weight of molybdenum, 0.1 to 3% by weight of silicon, 0.1 to 3% by weight of manganese and the balance nickel and incidental impurities.

4,727,741

CROSS-ROLLING MILL

Yoshinori Ushifusa; Shinji Takubo, and Toshihiro Fukuzaki, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 842,846

Claims priority, application Japan, Aug. 9, 1985, 60-173988

Int. Cl.⁴ B21B *31/16*

U.S. Cl. 72—237 **6 Claims**

1. A cross-rolling mill comprising:

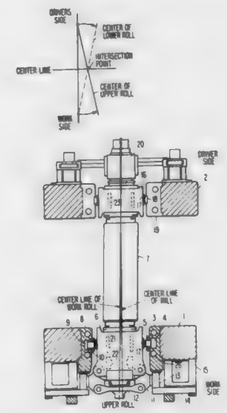
a first roll rotatably mounted in the mill about a rotational axis thereof, said first roll having a first end at a driver side of the mill and a second end at a work side of the mill;

a second roll rotatably mounted in the mill about a rotational axis thereof and coacting with said first roll for rolling a workpiece travelling in a rolling direction, the rotational axis of said first roll extending in a first plane that is parallel to a second plane in which the rotational axis of said second roll extends and a third plane in which the rolling direction extends, said second roll having a first end adjacent the first end of said first roll at the driver side of the mill and a second end adjacent the second end of said first roll at the work side of the mill, the mill having a center line passing through a point generally midway along the length of and between said first and second rolls and extending in a direction transverse to the direction in which said rolls extend,

said first roll being pivotal in the mill in said first plane only about the first end thereof at the driver side of the mill,

said second roll being pivotal in the mill in said second plane only about the second end thereof at the work side of the mill; and

pivoting means for pivoting said first roll in the mill only about the first end thereof and said second roll only about



the second end thereof so that an axis intersecting the center line of the mill and the rotational axes of said first and said second rolls is repositionable along the center line while continuing to intersect the center line.

4,727,742

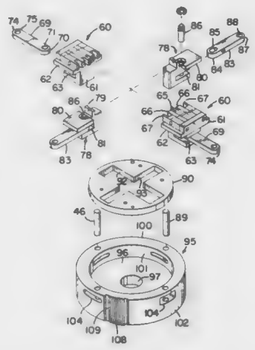
CRIMPING TOOL FOR FIBER OPTIC SPLICE CONNECTOR

David B. Weaver, Landisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 24, 1986, Ser. No. 831,945

Int. Cl.⁴ B21D *7/06*; B23P *11/00*

U.S. Cl. 72—402 **6 Claims**



1. Crimping apparatus for use in butt splicing two optical fibers in an connector of the type comprising a sleeve and deformable fiber support means therein, said support means having a plurality of elongate parallel ribs situate radially about a fiber-receiving passage, said apparatus comprising:

a frame,

a workstation for holding said connector in a first plane and stationary relative to said frame, where said workstation comprises

a pair of radial die sets movable toward and away from said workstation in a second plane and parallel to said first plane, which sets apply pressure in a radial direction to said connector,

a pair of axial die sets movable toward and away from said workstation in said second plane, which axial die sets have a different configuration than said radial die sets and configured to accommodate the axial ends of the connector and apply axial compressive pressure to said connector,

a die set holder comprising a ring-like member rotatable relative to said frame, a guide plate having radial slots therein receiving said die sets, and four toggle links at approximate ninety degree intervals about said ring-like member, each toggle link having an outer end pivotably attached to said ring-like member and an inner end pivotably attached to a respective die set, said links extending at line angles to said ring-like member, whereby upon rotating said ring-like member in a first direction, the die sets in each pair will move toward each other within its respective said radial slot, and upon rotating said ring-like member in a second, opposite direction, the die sets in each pair will move away from each other.

4,727,743

ARRANGEMENT FOR THE COVERING OF AN UNDERFLOOR POWER CONTAINING CHANNEL IN THE SPACE BELOW A MOVING AREA OF A SLIDEABLE MOVING TABLE OF A PRESS

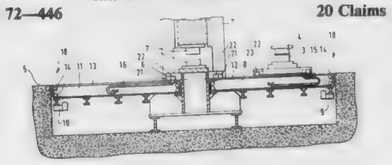
Siegfried Baur, Goeppingen, Fed. Rep. of Germany, assignor to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

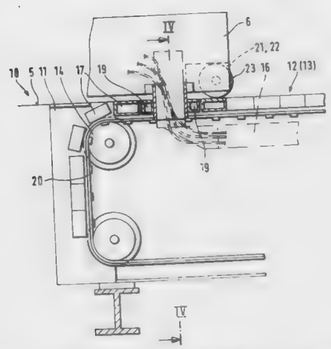
Filed Sep. 10, 1986, Ser. No. 906,133

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533767

Int. Cl.⁴ B21J *13/08*

U.S. Cl. 72—446 **20 Claims**





1. An arrangement for the covering of an underfloor power containing channel for a sliding tool or die table of a press wherein:

the table is movable into and out of the press, first adjusting means for applying a driving motion to the sliding table, plural rail means extending on opposite sides of the press for supporting the sliding table in its movement, at least one underfloor power containing channel arranged between the rail means for the housing of at least one power supply line in the channel which supply line is connected to the sliding table and movable therewith, the underfloor power containing channel being closed by at least one shutter-type covering means, the first adjusting means for applying the driving motion to the sliding table being arranged at the sliding table and connected for transmitting driving motion to wheels on the table which are guided by the rails, a second adjusting means for moving the covering means and said second adjusting means arranged at the underfloor power containing channel and connected to the covering, the covering means having end parts fastened at the sliding table, and wherein control means are connectable to said first and second adjusting means for actuation of the first and second adjusting means such that said second adjusting means for the moving of the covering is actuated before said first adjusting means for the driving motion of the sliding table.

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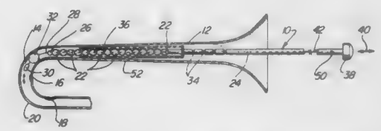
DENT REMOVING TOOL

Clifford Ferree, Tampa, Fla., assignor to Ferree' Tools, Inc., Battle Creek, Mich.

Filed Nov. 17, 1986, Ser. No. 931,523

Int. Cl.⁴ B21B *25/00*

U.S. Cl. 72—466 **16 Claims**



1. A dent removal tool for removing dents from curved tubing comprising, in combination:

a metal cable;

a series of barrel-shaped force transmitting beads strung on said cable, said beads having a smaller maximum diameter than the tube portion through which they will pass;

a cylindrical handle into one end of which an end of said cable extends and is attached, said handle end being in abutment with; the force transmitting bead at one end of said series of beads;

a metal driver ball rigidly attached to said cable and in abutment with the force transmitting bead at the other end of said series of beads; and

a barrel-shaped metal dent ball free to move relative to said driver ball;

whereby when said barrel-shaped dent ball is inserted into said curved tubing, it can be repeatedly impacted by said driver ball by reciprocating motion of said handle within said tubing which first wedges the dent ball at the dent in said tubing, and further impacts of said driver ball progressively removes said dent, said series of force transmitting beads strung on said cable permitting travel of said tool around curves in said tubing.

15. The method of removing dents in curved brass tubing of a musical instrument without the necessity of removing the curved tube from the remainder of the instrument, comprising the following steps:

(a) introducing a tool into the instrument tubing which tool has a central cable with a retainer bead afixed at its forward end, a driver bead afixed to the cable in spaced relationship to said retainer bead, a barrel-shaped steel dent ball strung on said cable between the retainer bead and driver ball for movement along said cable therebetween, a series of barrel-shaped force transmitting beads, and a tubular handle retaining said beads in abutment with each other and said driver;

(b) lodging said dent ball under the tubing dent by inward motion on said handle impacting said driver ball against the dent ball;

(c) reciprocating said tool with emphasis on the in stroke to impact the driver against the dent ball raising the tubing

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dent in a series of hammer-like impacts driving the dent ball past the dent; such emphasis not allowing impacting the retainer bead against the dent ball with enough force to dislodge the dent ball from the dent;

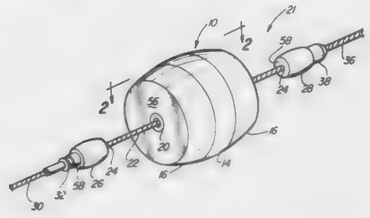
(d) removing said tool by reciprocating said tool with emphasis on the out stroke to impact the retainer bead against the dent ball.

4,727,745

COMPOSITE DENT BALL

Clifford M. Ferree, Tampa, Fla., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jan. 2, 1987, Ser. No. 97
Int. Cl.[4] B21D *1/08*
U.S. Cl. 72—478 10 Claims



1. A 2½ inch to 4½ inch diameter composite barrel-shaped dent ball for removing dents from curved tubing comprising:

a hard wood core with a centrally located external groove extending approximately one-third of the overall length of the ball;

a steel band seated within the core groove circumscribing the central portion of the length of said ball core,

the exterior profile of said ball being a continuous barrel shape embracing the central steel band wtih wood on both sides thereof.

4. A 2½ inch to 4½ inch diameter composite barrel-shaped dent ball for removing dents from curved tubing comprising:

a hardwood core material with a steel band circumscribing the central portion of the length of the ball, the exterior profile of said ball being a continuous barrel shape embracing the central steel band with wood on both sides thereof; and

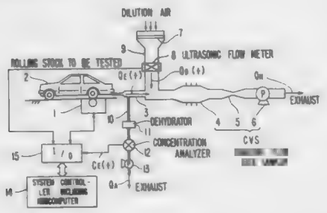
a metal tube located at the axis of said barrel-shape dent ball extending the length of said ball.

4,727,746

METHOD OF MODAL MASS ANALYSIS OF EXHAUST GAS FROM A MOTOR VEHICLE

Hajime Mikasa, and Hideji Kitamura, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 31, 1986, Ser. No. 948,037
Claims priority, application Japan, Dec. 31, 1985, 60-298457
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—23 2 Claims



1. A method of measuring the quantity of an ingredient gas in the exhaust gas from a motor vehicle during the time period of each of a sequence of driving modes, the time period of each driving mode having a starting time and an ending time, the ending time of the time period of each driving mode being the starting time of the time period of the next driving mode in the sequence, the method comprising for each driving mode in the sequence, the steps of:

measuring and storing data representative of the flow rate $Q_E(t)$ of the exhaust gas at a succession of times, N_Q in number, including the starting time and the ending time, during the time period of the driving mode;

measuring and storing data $C_{ES}(t)$ representative of the concentration of the ingredient gas in the exhaust gas at successive times, N_C in number, beginning at a time delayed relative to the starting time by a first predetermined amount of time dependent upon the change in driving mode at the starting time and the ingredient gas and ending at a time delayed relative to the ending time by a second predetermined amount of time dependent upon the change in driving mode at the ending time and the ingredient, such that the first measurement of concentration corresponds to the flow rate $Q_E(t)$ at the starting time and the N_Cth measurement of concentration corresponds to the flow rate $Q_E(t)$ at the ending time;

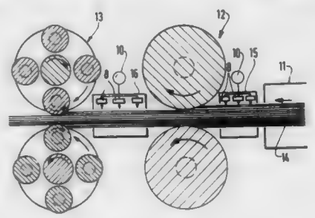
performing an interpolation method on the stored data $C_{ES}(t)$ to obtain, and then store, values $C_{E1}(t)$ representative of the concentration of the ingredient gas in the exhaust gas corresponding to, and at times in the same phase as, the stored data representative of the flow rate $Q_E(t)$, and then correcting the values representative of the concentration $C_{E1}(t)$ to obtain corrected values $C_E(t)$ representative on a one-to-one basis in phase and magnitude to the flow rate $Q_E(t)$ by one of a data-compression method and a data-expansion method based on the operational equation $C_E(t)=C_{E1}(t)\times N_C/N_Q$; and determining the quantity M(t) of the ingredient gas in the exhaust gas for each of the succession of times during the time period based on the operational equation $M(t)=\rho\times C_E(t)\times Q_E(t)$, where ρ is the density of the ingredient.

4,727,747

PROCESS AND INSTALLATION FOR PROTECTING A SOLID METAL AGAINST OXIDATION DURING ROLLING

Jean-Michel Naud, Mont-Saint-Martin; Gilles Vernet, Paris; Albert-Gilbert Goursat, Voisins-le-Bretonneux, and Bruno Wagner, Metz, all of France, assignors to L'Air Liquide, Paris, France

Continuation of Ser. No. 741,696, Jun. 6, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 3,794
Claims priority, application France, Jun. 7, 1984, 84 08903
Int. Cl.[4] B21B *9/00*
U.S. Cl. 72—38 11 Claims



1. An installation for protecting a solid metal blank against oxidation during a rolling operation, the installation comprising, in combination:

a rolling stand disposed along the path of travel of the blank to be rolled;

means for advancing said blank along said path through said rolling stand;

an enclosure located along said path upstream of the rolling stand, said blank being advanced along said path through said enclosure;

a plurality of inert gas distributing chambers located within said enclosure in position to direct inert gas toward said blank at a plurality of spaced points along the path of travel of said blank, said gas distributing chambers providing successive reductions in pressure of the inert gas prior to the time it reaches said blank and producing an ejection velocity of the gas below about 0.5 m/sec; and

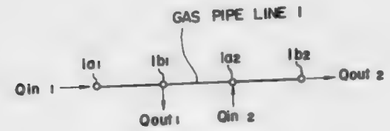
means for injecting inert gas into the gas distributing chambers within said enclosure.

4,727,748

METHOD AND APPARATUS FOR DETECTING LEAKS IN A GAS PIPE LINE

Hidekazu Horigome; Takahiro Onishi, both of Yokohama, and Makoto Yamagishi, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,911
Claims priority, application Japan, Dec. 25, 1984, 59-275257; Dec. 25, 1984, 59-275258
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—40 3 Claims



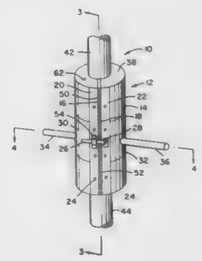
2. A leak detecting apparatus for a gas pipe line comprising; a flow meter arranged at each of all inlets and outlets of a gas pipe line to measure from instant to instant an inflow rate Qin and an outflow rate Qout thereat; and computing means for receiving data measured by said flow meters, integrating said inflow rates Qin and said outflow rates, Qout respectively, over a predetermined period of time and calculating a sum $\Sigma\int$Qdt of said integrated values, calculating a relation between the integration time and a standard deviation of $(\Sigma\int Qindt-\Sigma\int Qoutdt)/\Sigma\int Qindt$ in accordance with a result of the calculation of said sum, determining an integration time T corresponding to a rate of leakage to be detected from said calculated relation, and performing an integration over time from each of a plurality of time instants shifted from each other by an integral fraction of said integration time T whereby an alarm signal is generated when said sum $\Sigma\int$Qdt $(\Sigma\int dindt-\Sigma\int doutdt)$ deviates from a predetermined value upon reaching said integration time T.

4,727,749

METHOD AND APPARATUS FOR LEAK TESTING OF PIPE

Ronnie F. Miller; Arthur L. Dwyer; Darwin A. Miller, and Darwin L. Miller, all of Houma, La., assignors to Damco Testers, Inc., Houma, La.

Division of Ser. No. 571,823, Jan. 18, 1984, Pat. No. 4,601,194, which is a continuation-in-part of Ser. No. 458,790, Jan. 18, 1983, abandoned. This application May 29, 1986, Ser. No. 868,009
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—46 9 Claims



1. A leak detection apparatus for a pipe coupling joint comprising:

means insertable into a pipe and locatable astride a joint, said insertable means including a pair of spaced apart means for engaging the inner surface of the pipes being coupled and conduit means for feeding a gas into a first volume defined by said pair of engaging means and the portion of the interior of the pipes extending between said pair of engaging means with said first volume including at least one pipe joint,

deformable sleeve means having slot means permitting said sleeve means to be disposed about the exterior surface of a pipe joint to define a second volume between the interior of said sleeve means and the site of the joint externally thereof, said sleeve means including passage means for establishing communication between said second volume and means for detecting the presence of a gas in said second volume, said sleeve means comprising a resiliently deformable tube having a longitudinal axis and an opening defined by a pair of facing edges extending substantially parallel to said axis with said edges being movable away from each other to permit said tube to placed about a pipe joint and towards each other to close said tube about the pipe joint, said tube having a pair of reinforcing metal strips extending parallel to said longitudinal axis, one of said strips being adjacent one of said edges and the other of said strips being adjacent the other of said edges.

4,727,750

STEAM LEAKAGE MEASURING DEVICE

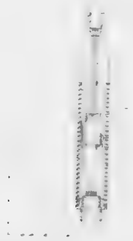
Masao Yonemura, Hyogo, Japan, assignor to TLV Co., Ltd., Hyogo, Japan

Filed Mar. 12, 1987, Ser. No. 25,163
Claims priority, application Japan, Mar. 14, 1986, 61-57499
Int. Cl.[4] G01M *3/08*
U.S. Cl. 73—46 3 Claims

1. A device for measuring steam leakage particularly in a steam device comprising: detector means including vibration sensor means for sensing vibration and temperature sensor means for sensing temperature; and signal processing means consisting of an arithmetic unit receiving and processing sig-

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nals representative of a vibration level and of a temperature level in said steam device developed from said detector means



for determining steam leakage based upon said processed signals.

4,727,751

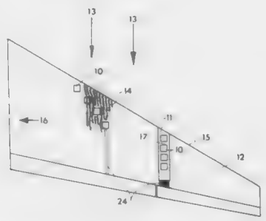
CROSSFLOW VORTICITY SENSOR

Bruce J. Holmes, Newport News; Debra L. Carraway, Norfolk; Harlan K. Holmes, Newport News, and Thomas C. Moore, Poquoson, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 15, 1987, Ser. No. 3,676

Int. Cl.[4] G01M *9/00*

U.S. Cl. 73—147 **9 Claims**



1. A crossflow sensor for measuring the behavior of crossflow vorticity over a laminar surface comprising:
   a plurality of crossflow sensors;
   a means for non-invasively adhering said crossflow sensors to said laminar surface;
   a means for sensing heat transfer rate changes caused by crossflow vorticity in said crossflow sensors;
   a means for arranging said crossflow sensors on said laminar surface to measure crossflow vorticity as a function of said heat transfer rate changes.

4,727,752

PSEUDOSINUSOIDAL OSCILLATOR DRIVE SYSTEM

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 4, 1987, Ser. No. 10,799

Int. Cl.[4] G01P *15/10*; **H03B** *5/32*

U.S. Cl. 73—517 AV **16 Claims**

1. An accelerometer for measuring acceleration along a sensitive axis, comprising:
   a support;
   a proof mass;
   mounting means for mounting the proof mass to the support such that the proof mass can undergo movement relative to the support along the sensitive axis; and
   a transducer for reacting to said movement by producing a signal indicative of acceleration along the sensitive axis, the transducer including:
   (a) a resonator comprising a piezoelectric crystal connected between the proof mass and the support and constructed to undergo mechanical vibration at a frequency f that varies with the force applied to the crystal in response to an electrical drive signal having a harmonic component at frequency f, and means for producing an electrical resonator signal corresponding to said mechanical vibration; and



   (b) drive circuit means including means for receiving the resonator signal and for producing the drive signal in the form of a periodic pseudosinusoidal staircase function at a fundamental frequency f, the staircase function having N steps and M discrete nonzero amplitude levels per period, M and N being integers greater than 1 with M being less than N, the circuit means including means for producing the M amplitude levels such that predetermined harmonics of the fundamental frequency f are not present in the drive signal.

4,727,753

ARRANGEMENT FOR MONITORING PRESSURE PULSES IN GAS/PARTICULATE MATERIAL MEDIA FLOWING THROUGH PIPELINES AND/OR CONTAINERS

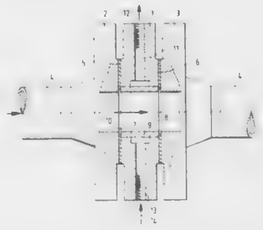
Hans-Richard Baumann, Essen-Bredeney, and Gerhard Winkler, Essen, both of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 825,097

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504870

Int. Cl.[4] G01L *7/00*

U.S. Cl. 73—706 **6 Claims**



1. An arrangement for monitoring pressure pulses in a flow of gas/particulate material flowing through an enclosed space, such as a pipeline, a container, and the like, comprising an annular metallic housing formed with a flow passage centered on an axis and connected to said enclosed space, an annular chamber surrounding said flow passage, and two connecting ports for respectively connecting said annular chamber with a pulse conduit and a rinsing conduit; and a barrier layer of a wear-resistant porous material fittingly received in said housing and circumferentially enclosing said flow passage to separate said annular chamber from said flow passage, said porous barrier layer establishing a continual pressure equalization between the gas/particulate material flowing through said enclosed space and said annular chamber and thus a connecting port connecting said annular chamber with said pulse conduit.

4,727,754

ELECTROMAGNETIC FLOWMETER

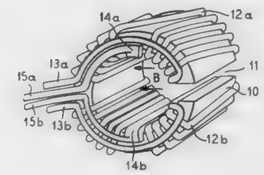
Johannes Ruckel, Munich, Fed. Rep. of Germany, assignor to Klaus Thurau, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,483

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530055

Int. Cl.[4] G01F *1/58*

U.S. Cl. 73—861.12 **8 Claims**



1. A probe for an electromagnetic flowmeter for measuring the flow rate of fluid in a conduit comprising:
   an annular core which can be placed around said conduit consisting of a plurality of alternating sheets of permanent magnetic material having a thickness of 10 μm and sheets of insulating material;
   a coil wound around said core for generating a magnetic field extending transversely to the direction of flow of said fluid in said conduit upon electrical excitation of said coil, said coil having two oppositely wound coil sections;
   two electrodes disposed opposite each other on the interior of said core; and
   an electrode lead for each of said electrodes extending perpendicularly to said direction of flow and having a diameter of less than 0.8 mm.

4,727,755

ELECTROMAGNETIC FLOWMETER WITH ALTERNATING PERMANENT MAGNET FIELD

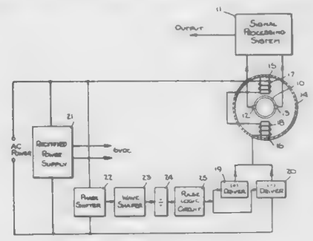
Roy F. Schmoock, Yardley, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Dec. 8, 1986, Ser. No. 938,870

Int. Cl.[4] G01F *1/60*

U.S. Cl. 73—861.12 **14 Claims**

1. An electromagnetic flowmeter comprising:
   (A) a flow tube through which the fluid to be metered is conducted, said tube having a pair of electrodes in contact with the fluid;
   (B) means to establish an alternating magnetic field across the tube to be intersected by the fluid flowing therethrough to induce a voltage therein which is transferred to the electrodes and has a value that is a function of flow rate, said means being constituted by a magnet circuit which includes a pair of pole pieces of hard magnetic material disposed at diametrically-opposed positions, each piece having a coil wound thereon;
   (C) positive and negative drivers to periodically apply excitation pulses of alternating polarity to said coils to alternately magnetize the pole pieces in one direction and remagnetize the pole pieces in the reverse direction, thereby to establish said field; and
   (D) means to alternately trigger said drivers on the peak positive and peak negative crests of a standard a-c power line voltage.



4,727,756

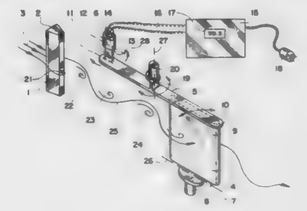
VORTEX SHEDDING FLOWMETER WITH LEVER ACTION SIGNAL AMPLIFICATION

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Oct. 24, 1986, Ser. No. 922,850

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.24 **20 Claims**



1. A flowmeter for measuring fluid flow comprising in combination:
   (a) a flowmeter body including a flowpassage extending from one extremity to the other extremity of said flowmeter body;
   (b) a vortex generator of an elongated cylindrical shape with a blunt cylindrical side surface disposed across a first cross section of the flow passage, wherein said blunt cylindrical side surface is disposed substantially perpendicular to the central axis of the flow passage in
   (c) a wing disposed across a second cross section of the flow passage; in a substantially parallel relationship with respect to said vortex generator wherein one extremity of said wing is secured to the wall of said flow passsage;
   (d) a transmitter lever disposed substantially parallel to the central axis of the flow passage with one extremity connected to the other extremity of said wing opposite to said one extremity secured to the wall of the flow passage, wherein the other extremity of said transmitter lever opposite to said one extremity connected to the wing is secured to the wall of the flow passage in a pivotable relationship about a pivoting axis parallel to the lengthwise axis of the wing; and
   (e) a transducer means under a pressurized contact with a flange, wherein said flange is connected to said transmitter

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lever at a point adjacent to said pivoting axis by an adapter member including a flat section disposed on a first plane including said pivoting axis and perpendicular to said flange;

wherein said transducer means provides signals related to frequencies of the vortex shedding from said vortex generator as a measure of fluid flow through the flow passage.

4,727,757

FERRO-MAGNETIC FOIL FOR A TORQUE SENSOR

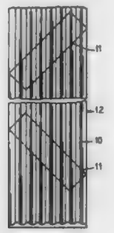
Hans-Rainer Hilzinger, Langenselbold; Hans-Joachim Nilius, Seligenstadt, and Michael Friedrichs, Hanau, all of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Division of Ser. No. 837,815, Mar. 10, 1986, Pat. No. 4,703,550. This application Apr. 3, 1987, Ser. No. 14,537

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509552

Int. Cl.⁴ G01L *3/10*

U.S. Cl. 73—862.36 **9 Claims**



1. A ferro-magnetic foil for use on a shaft of a torque sensor having an axis of rotation comprising:

a magnetostrictive amorphous strip section, said strip section being stamped from a larger amorphous strip having a plurality of cast periodic thickness variations across a width of said larger strip extending longitudinally along said larger strip, said strip section having spaced edges with said thickness variations running obliquely therebetween such that upon attachment of said strip section in a ring around a circumference of said shaft, said thickness variations are disposed at an angle between 0° and 90° with respect to said axis of rotation of said shaft.

4,727,758

FLOW-THROUGH SAMPLING DEVICE

David L. Murdock, Lake City, Fla., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 28, 1986, Ser. No. 901,219

Int. Cl.⁴ G01N *1/20*

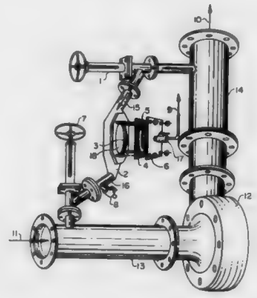
U.S. Cl. 73—863.61 **4 Claims**

1. A flow-through apparatus for obtaining fluid samples from a slurry stream of phosphoric acid containing calcium sulfate solids flowing through a pipeline, said pipeline containing a pump for pressurizing the pipeline, said apparatus comprising:

(a) an enclosed sample chamber containing inlet and outlet means for continuously admitting and withdrawing a fluid slurry to and from said sample chamber, said inlet means being in fluid communication with the high pressure side of said pipeline downstream of the pump, and said outlet means being in fluid communication with the low pressure side of said pipeline upstream of the pump, said sample chamber having an opening disposed in a side portion of the chamber for diverting a portion of the slurry flowing through the sample chamber,

(b) means for regulating the flow of slurry to and from the sample chamber,

(c) a filter housing sealingly engaged with the opening in the side portion of said sample chamber, said filter housing containing a filter which is in fluid communication with the slurry flowing through the sample chamber and being adapted to remove calcium sulfate solids from the slurry stream, and



(d) means for withdrawing a filtrate sample from the filter and for backwashing the filter with water to remove solid deposits accumulating on said filter, the flow regulating means permitting the flow of fluid slurry through the apparatus during sample withdrawal and filter backwashing.

4,727,759

POWER TRANSMISSION MECHANISM FOR A TRACTOR

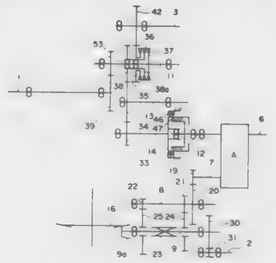
Kojiro Yamaoka, Nishinomiya, and Shusuke Nemoto, Yao, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed Aug. 19, 1986, Ser. No. 897,859

Claims priority, application Japan, Aug. 27, 1985, 60-131169; Aug. 28, 1985, 60-132403; Aug. 31, 1985, 60-192754; Aug. 31, 1985, 60-133908; Aug. 31, 1985, 60-133909

Int. Cl.⁴ F16H *37/00, 47/00*

U.S. Cl. 74—15.2 **6 Claims**



1. A power transmission mechanism for a tractor, comprising:

a front transmission casing;

a rear transmission casing;

means coupling said front transmission casing to said rear transmission casing to define a single transmission casing;

means for receiving and supporting an upper rotatable input shaft near the top of said front casing;

means, located generally below said coupling means, for receiving and supporting a lower rotatable input shaft in said front casing;

a drive-speed changing unit comprising:

(a) a speed change shaft, driven by said lower input shaft, located generally below and to the side of said lower input shaft; and

(b) a pinion shaft, driven by said speed change shaft, located generally below and to the side of said speed change shaft;

a pinion gear on the end of said pinion shaft that extends toward said rear casing;

a differential gear unit supported within said rear casing, said differential gear unit comprising a ring gear driven by said pinion gear;

a PTO clutch unit with a clutch shaft coupled to said upper input shaft;

a clutch driven shaft extending from said PTO clutch unit;

a rear PTO shaft located generally below said clutch unit and extending out of said rear casing;

a fixed gear on said rear PTO shaft located at the end of said rear PTO shaft nearest said clutch unit;

a mid PTO shaft located generally below said rear PTO shaft and beside said pinion shaft, and extending out of said front transmission casing;

a fixed gear on said mid PTO shaft; and

drive means coupling said clutch driven shaft to said mid PTO shaft, and to said rear PTO shaft.

4,727,760

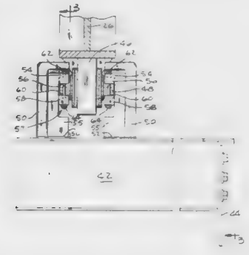
CONNECTION BETWEEN THE EQUALIZER BEAM AND THE WALKING BEAM OF A WALKING BEAM TYPE OIL WELL PUMPING UNIT

Larry W. Teel; Donald L. Bailey, both of Yukon, and Brian K. Davis, Stillwater, all of Okla., assignors to Baker International Corporation, Houston, Tex.

Filed Sep. 19, 1986, Ser. No. 909,199

Int. Cl.⁴ F04B *47/02;* **F16D** *1/00*

U.S. Cl. 74—41 **24 Claims**



13. A connection between an equalizer beam and a tail shaft rotatably mounted near an end of a walking beam in an oil well pumping unit, the connection comprising:

a pair of support members spaced from one another lengthwise of the equalizer beam and being rigidly secured to the equalizer beam, each support member having a integral arm extending laterally outwardly from the support member toward the other support member, generally parallel to the equalizer beam and spaced above the beam, said arms having curved, generally downwardlyfacing bearing surfaces adapted for engagement by the respective ends of the tail shaft, and retainer means associated with each support member for holding a respective end of the tail shaft in engagement with said downwardly-facing bearing surface when forces tending to separate the shaft from the bearing surface are applied to the shaft.

4,727,761

WOBBLE PLATE ENGINE STABILIZER MECHANISM

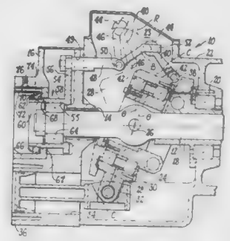
Joseph Scalzo, Kew, Australia, assignor to Scalzo Patents Pty. Ltd., Victoria, Australia

Filed Mar. 25, 1987, Ser. No. 30,443

Claims priority, application Australia, Mar. 27, 1986, PH5226

Int. Cl.⁴ F16H *23/00;* **F04B** *1/26*

U.S. Cl. 74—60 **12 Claims**



1. A wobble plate engine mechanism including a cylinder block having a mainshaft rotatable therein; a drive hub mounted obliquely on the mainshaft for rotation therewith; a wobble plate rotatably mounted on the drive hub; a plurality of cylinders arranged around the mainshaft, each with a piston reciprocally movable therein along a respective axis substantially parallel to the mainshaft, each piston being coupled to a respective arm of the wobble plate; and a stabilizer mechanism operating between the wobble plate and a mounting on the cylinder block or associated engine case, the stabilizer mechanism comprising first and second mutually inclined, elongate link means, the first link means having one end connected to the wobble plate by a first pivotal coupling and the second link means having one end connected to said mounting by a second pivotal coupling, spaced axially with respect to the mainshaft from said first couping, with said link means being connected together at their other ends by a third pivotal coupling centered on a bisecting plane for the wobble plate, said plane bisecting the angle between the wobble plate and a plane perpendicular to the longitudinal axis of the mainshaft; said third pivotal coupling having three degrees of freedom, and said second pivotal coupling constraining said second link means so as to be pivotable only on a pivot axis which is spaced from and substantially at right angles to the mainshaft.

4,727,762

DRIVING FORCE SUPPORT FOR LINEAR ACTUATOR

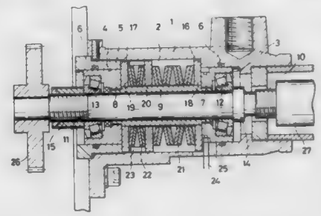
Shuji Hayashi, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 914,665

Claims priority, application Japan, Jan. 7, 1986, 61-133[U]

Int. Cl.⁴ F16C *19/08;* **F16H** *25/20*

U.S. Cl. 74—89.15 **1 Claim**



1. In a linear actuator comprising a motor-driven screw shaft having a thrust-bearing nut threaded thereon and movable

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along the axis of the screw shaft as the screw shaft rotates, a driving force support comprising a hollow structure body having a larger diameter cylindrical cavity, and smaller diameter cylindrical cavities coaxial with and on the front and rear sides of said larger diameter cavity, front and rear bearing receivers having inner side surfaces, said bearing receivers being guided and slidable axially in said smaller diameter cavities, bearings within said bearing receivers, said rotatable screw shaft being supported on said bearings and secured thereto and to the bearing receivers so that an intermediate portion of said screw shaft moves as a unit with said bearing receivers as they slide axially, front and rear spring seats provided in said larger diameter cavity, said spring seats normally contacting the inner side surfaces of said bearing receivers and the end surfaces of said larger diameter cavity, a compression spring having a high degree of stiffness and a compression spring having a limited degree of flexure and a smaller degree of stiffness, said springs being provided in series under a set prepressure between said front and rear spring seats, and means for detecting movement of said bearings and thereby detecting the driving force of the rotatable screw shaft.

4,727,763

MECHANISM FOR TRANSFORMING A RECIPROCATING RECTILINEAR MOTION INTO AN INTERMITTENT ROTARY MOTION

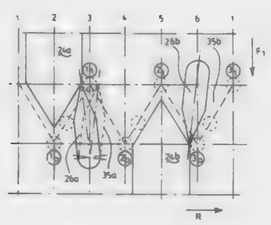
Jean-Pierre Georget, Douchy Les Mines, France, assignor to Fives-Cail Babcock, Paris, France

Filed May 13, 1987, Ser. No. 50,049

Claims priority, application France, May 27, 1986, 86 07541

Int. Cl.[4] F16H *27/02, 31/00*

U.S. Cl. 74—129 **3 Claims**



1. A mechanism for transforming a reciprocating rectilinear motion into an intermittent rotary motion, which comprises

(a) a first element having a longitudinal axis and being reciprocable in a direction parallel to said axis, the first element carrying

(1) a set of at least two cams circumferentially and axially spaced from each other, each cam having, in plan view, the shape of a rectangular part having two opposite sides extending parallel to the axis and a triangular part having a base adjoining the rectangular part, the triangular part projecting from the rectangular part in the direction of the axis, and the triangular parts of the cams pointing in opposite directions,

(b) a second element coaxially surrounding the first element and being rotatable about said axis, the second element carrying

(1) a set of at least three pins having radially extending axes disposed in a plane extending perpendicularly to the longitudinal axis, the pins being circumferentially spaced from each other and projecting towards the cams for cooperation therewith to transform the reciprocating rectilinear motion of the first element into an intermittent rotary motion of the second element, the cams having a width and disposition and the pins having a circumferential spacing such that two adjacent ones of the pins simultaneously engage the opposite sides of the rectangular part of one cam and the third pin faces the point of the other cam, and

(c) a cam follower needle associated with each cam, the needle resiliently engaging a side of the triangular cam part close to the base thereof to displace a respective one of the pins from the triangular cam part side when the pin glides along the rectangular cam part and reaches the triangular cam part base, and the needle being resiliently displaceable from the triangular cam part side to permit the passage of the pin gliding therealong from the point to the base of the triangular cam part.

4,727,764

AUTOMOTIVE TRANSMISSION SYSTEM

Hermann Klaue, Cremlingen-Weddel, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

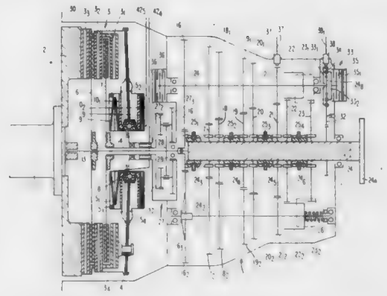
PCT No. PCT/EP85/00211, § 371 Date Jan. 7, 1986, § 102(e) Date Jan. 7, 1986, PCT Pub. No. WO85/05427, PCT Pub. Date Dec. 5, 1985

PCT Filed May 9, 1985, Ser. No. 823,490

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417504

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—331 **19 Claims**



1. A multiple speed transmission for motor vehicles having a plurality of gear ratios, said transmission comprising:

a main transmission shaft and at least one juxtaposed auxiliary transmission shaft, a plurality of gear wheel groups mounted thereon, each of said gear wheel groups having at least two gears which are in permanent meshing arrangement;

sliding sleeves for shifting between said gear wheel groups, which sleeves are positioned on one of said transmission shafts, said sleeves are rotationally fixed and axially slidable on said transmission shaft to positively couple with at least one gear;

a selector fork for each of said sliding sleeves;

actuating cylinders having actuating pistons therein, each of said pistons operably connected to one of said selector forks and movable by communication of a servoagent to said cylinder to move said selector fork;

an accelerating device;

a retardation device;

said accelerating device and said retardation device acting on one of said auxiliary shafts to synchronize one of said sliding sleeves for engagement with one of said gears;

an electrical control means for receiving sensed rotational speed signals and shift commands to control communication of said servoagent to said actuating cylinders and pistons in response to synchronism of the respective sliding sleeve;

dual frictional shifting elements;

an auxiliary transmission component which is operable by said dual frictional shifting elements to provide a split

speed arrangement which doubles the number of gear ratios of said transmission; and,

said accelerating device having a planetary gear set for a necessary speed jump and a friction brake, said planetary gear set adapted to connect said main transmission shaft to said one of said auxiliary shafts.

4,727,765

SHIFT MECHANISM FOR MANUAL TRANSMISSION

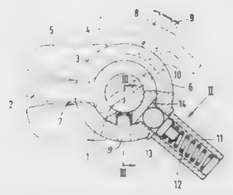
Josef Schneider, Wesseling-Berzdorf, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1986, Ser. No. 944,902

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602157

Int. Cl.[4] G05G *5/10, 9/12*

U.S. Cl. 74—477 **6 Claims**



1. A gear shift mechanism for engaging the various gears of a multiple speed ratio manually operated transmission comprising:

a selector shaft rotatable for selecting gear shift planes and axially displaceable for engaging a selected gear in the selected gear shift plane;

a selector finger fixed by a hub to the selector shaft, extending radially from the selector shaft, having detent recesses spaced along the axis of the selector shaft corresponding to a neutral position within a gear shift plane and the gear engagement positions within the gear shift plane;

a check plate rotatably mounted on the selector shaft and fixed against axial displacement, located for contact with the selector finger as the selector shaft rotates, having a hub surrounding the hub of the selector finger;

detent means for resiliently, releasably engaging the detent recesses

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4,727,766

HEAT REGULATING MECHANISM FOR AUTOMOTIVE HEATING AND AIR CONDITIONING SYSTEMS

John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 870,438, Jun. 4, 1986, Pat. No. 4,667,068. This application Feb. 13, 1987, Ser. No. 14,937

Int. Cl.[4] G05G *7/10;* **B60H** *1/00*

U.S. Cl. 74—491 **7 Claims**

1. A heat regulating mechanism for automotive air environment regulating systems, such heat regulating mechanism comprising

a control lever having means for connecting such control lever to a heat control device,

first pivot means for pivotally supporting such control lever for swinging movement about a first pivot axis,

a manually operable operating lever having an end portion with manually engageable means thereon movable along a predetermined path,

such operating lever having a second portion with a generally longitudinal guide slot therein,

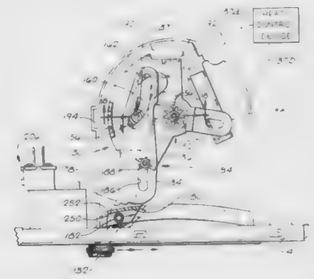
second pivot means extending through such guide slot and supporting such second portion of such operating lever for a combination of pivotal and sliding movement,

such second pivot means being disposed along a second pivot axis which is parallel with but spaced from such first pivot axis,

a stationary guide track near the end portion of the operating lever,

such operating lever having a follower thereon for slidably engaging and following the guide track,

and pin and slot elements forming an operative connection between such operating lever and such control lever,



such pin element being on one of such levers while such slot element is on the other of such levers,

whereby manual movement of such operating lever causes swinging movement of such control lever with a combination of swinging and sliding movements between such pin and slot elements.

4,727,767

TORQUE VARIATION ABSORBING DEVICE

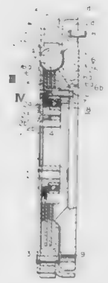
Shigetaka Aiki, Kariya; Kiyonori Kobayashi, Chiryu, and Satoshi Kato, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Continuation of Ser. No. 755,899, Jul. 17, 1985, abandoned. This application Jun. 11, 1987, Ser. No. 60,946

Claims priority, application Japan, Jul. 19, 1984, 59-108288[U]; Jul. 19, 1984, 59-108289[U]; Jul. 19, 1984, 59-108290[U]

Int. Cl.[4] F16D *3/14;* **F16F** *15/10*

U.S. Cl. 74—574 **13 Claims**



1. A torque variation absorbing device comprising:

a driving plate coupled to a driving shaft and having a pair of steel side plates and ring-shaped outer and inner bodies, said outer body being clamped between said pair of side plates, said outer and inner bodies and said pair of side plates bewing integrally connected;

a flywheel arranged coaxial with said driving plate and rotatably supported via a bearing on said driving plate; and

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a spring mechanism, a torque limiting mechanism, and a hysteresis mechanism interposed between said driving plate and said flywheel, said torque limiting mechanism being located radially inside of said spring mechanism.

4,727,768

TRANSMISSION FOR AGRICULTURAL TRACTOR

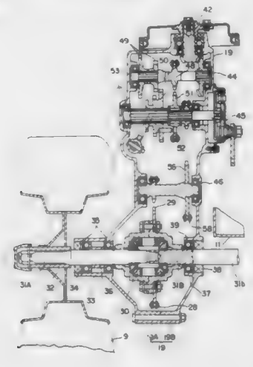
Tetsuaki Hayashi, Osaka; Hiroyuki Ogasawara, Izumi; Nobuyuki Yamashita, Sakai; Fumihiro Ikeda, Osaka; Niro Bando, and Kazuaki Kurohara, both of Sakai, all of Japan, assignors to Kubota, Ltd., Shikitsuhigashi, Japan

Filed May 2, 1986, Ser. No. 858,759

Claims priority, application Japan, Sep. 2, 1985, 60-193364; Sep. 2, 1985, 60-193361; Sep. 3, 1985, 60-195606

Int. Cl.[4] F16H *37/08*

U.S. Cl. 74—701 **4 Claims**



1. A transmission for an agricultural working vehicle comprising:

first and second transmission shafts rotatably supported in a transmission case, the first transmission shaft being operatively connected to an engine, the second transmission shaft being operatively connected to axles,

driving and driven sprockets operatively connected to each other by a wrapping connector, the driving sprocket being fixed to the first transmission shaft, the driven sprocket being relatively rotatably mounted on the second transmission shaft,

a plurality of change speed gears fixed to the first transmission shaft,

a shift gear splined to the second transmission shaft to be slidable relative thereto and including gear portions selectively engageable with said plurality of change speed gears when assuming change speed positions, and

engaging means for placing the shift gear and the driven sprocket in mutual engagement when the shift gear assumes a position other than the change speed positions;

wherein the first transmission shaft is transversely supported at a front portion of the transmission case, the second transmission shaft being transversely supported rearwardly of the first transmission shaft, a third transmission shaft and the rear axles being transversely supported rearwardly of the second transmission shaft and one above the other, and wherein the second transmission shaft and the third transmission shaft are operatively connected to each other by a wrapping connector so as to effect reduction, the third transmission shaft and the axles being operatively connected to each other by a wrapping connector so as to effect reduction, and wherein the front portion of the transmission case has a smaller veritcal dimension than a rear portion thereof and is disposed at a lower level than a top of the rear portion, and wherein the first and second transmission shafts are supported in the front portion, the third transmission shaft and the axles being supported in the rear portion, and wherein a driving rotary member of a sidewise wrapping connector driving mechanism for operatively connecting the first transmission shaft to the engine is disposed above the front portion of the transmission case.

4,727,769

INTEGRATED MULTI-FUNCTION DIFFERENTIAL SYSTEM

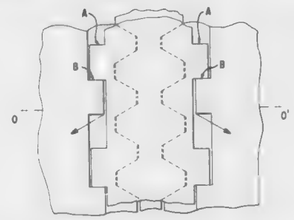
Derong Wu, Shiyan, China, assignor to The Second Automobile Manufacture Plant, Hubei Province, China

Filed Mar. 31, 1986, Ser. No. 846,168

Claims priority, application China, Apr. 1, 1985, 85101984

Int. Cl.[4] F16H *1/44, 35/04*

U.S. Cl. 74—710.5 **5 Claims**



1. An integrated multi-axle-drive differential system capable of reacting simultaneously to a difference in speed between the axles or the wheels of a vehicle having multiple drive axles comprising:

a differential associated with each drive axle, each said differential including a drive ring, a center ring and two axle shaft clutch sleeves,

means connecting each axle shaft clutch sleeve to a respective axle shaft of said drive axle,

means providing a rotary driving gear connection between said drive ring and each of said axle shaft clutch sleeves,

a beveled tooth overriding gear connection between said center ring and each of said axle shaft clutch sleeves,

a plurality of bores extending radially through said drive ring,

a plurality of chock slots open through the outer periphery of said center ring, each said chock slot being radially aligned with one of said bores through said drive ring and having a rotary driving surface, adjacent ones of said chock slots having said rotary driving surfaces facing in opposite directions,

two sets of cylindrical sliding blocks with each sliding block mounted in one of said bores through said drive ring, each said sliding block having a radially inner end adapted for reciprocal movement into and out of rotary driving engagement with a driving surface of a corresponding one of said chock slots,

a sliding sleeve axially movably mounted on the outer cylindrical surface of said drive ring, said sliding sleeve having axially spaced internal camming means and being movable relative to said drive ring from a first position wherein one of said axially spaced camming means engages one of said sets of sliding blocks and moves the radially inner ends thereof into driving engagement with said corresponding driving surfaces of said chock slots and a second position wherein the other said axially spaced camming means engages the other said set of sliding blocks and moves the radially inner ends thereof into rotary driving engagment with said corresponding driving surfaces of said chock slots, and

means permitting manual or automatic control to effect simultaneous movement of the axially movable sliding sleeves of all of said differentials depending upon the condition of the accelerator and direction of movement of said vehicle.

4,727,770

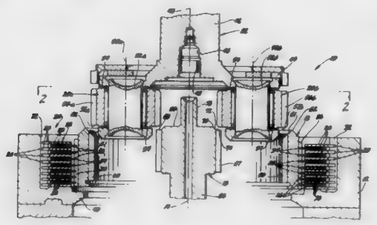
PLANETARY GEAR SET AND ASSEMBLY METHOD

Richard A. Ordo, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1986, Ser. No. 831,869

Int. Cl.[4] F16H *3/44*

U.S. Cl. 74—785 **5 Claims**



4. A method of assembling a planetary gear set on a support defining a main axis,

said planetary gear set including

a sun gear having a plurality of gear teeth and disposed on said support for rotation about said main axis and for limited translation in a plane perpendicular to said main axis between aligned and eccentric positions relative to said main axis,

a ring gear having a plurality of gear teeth and disposed on said support for limited translation in a plane perpendicular to said main axis between aligned and eccentric positions relative to said main axis,

a plurality of planet gears each having a plurality of gear teeth adapted to mesh with said ring gear teeth and said sun gear teeth, and

a planet carrier supporting each of said planet gears for rotation about respective ones of a corresponding plurality of parallel planet axes of said carrier,

said method comprising the steps of:

forming on one end of said sun gear a staging annulus in a plane perpendicular to said main axis having a first edge defined by the addendum circle of said sun gear teeth and a second edge defined by the dedendum circle of said sun gear teeth,

said staging annulus being interrupted by the tooth spaces between said sun gear teeth,

forming on said sun gear a frustoconical concentricity chamfer having one edge contiguous with said second edge of said staging annulus,

aligning said carrier on said main axis and advancing said carrier toward said sun gear until said planet carrier achieves a staged position relative to said sun gear wherein said planet gears abut said sun gear on said staging annulus with the addendum circles of each of said planet gears tangent to said second edge of said staging annulus,

at least one of said planet gears engaging said sun gear on said concentricity chamfer when said sun gear is in said eccentric position and camming said sun gear to said aligned position when said planet carrier achieves said staged position,

biasing said carrier toward said sun gear,

effecting relative rotation between said carrier and said sun gear so that said planet gears sequentially achieve meshing engagement with said sun gear,

forming on one end of said ring gear a frustoconical bevel surface overlapping the ends of said ring gear teeth, and

further advancing said planet carrier toward said ring gear and rotating said planet carrier to achieve substantially simultaneous meshing engagement between each of said planet gears and said ring gear,

at least one of said planet gears engaging said ring gear on said frustoconical bevel surface when

said ring gear is in said eccentric position and camming said ring gear to said aligned position.

4,727,771

METHOD FOR CONTROLLIG A CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION

Takao Niwa; Takeshi Gono, and Akinori Osanai, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 607,139, May 4, 1984, abandoned. This application Jun. 8, 1987, Ser. No. 57,641

Claims priority, application Japan, May 9, 1983, 58-79306

Int. Cl.[4] B60K *41/12*

U.S. Cl. 74—866 **5 Claims**



1. A method for controlling a continuously variable transmission which includes a driving pulley mounted on an input shaft, the driving pulley comprising a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member, a driven pulley mounted on an output shaft, the driven pulley comprising another fixed member and another movable member, the another movable member being similarly actuated by another hydraulic cylinder supplied with a line pressure to form another V-shaped opening between said another movable member and said another fixed member and an endless belt member spanning the pulleys so that an effective diameter of the pulleys can be varied at different rates with regard to each other so that different speed ratios can be obtained, said method comprising the steps of:

(1) detecting first and second openings of a throttle valve, an actual rotational speed of the driving pulley and an actual rotational speed of the driven pulley, the second opening of the throttle valve being detected at a predetermined time period after the first throttle valve opening is detected;

(2) determining a desired power in accordance with the detected amount of the throttle valve;

(3) calculating a desired rotational speed of the driving pulley in accordance with a first stored relationship and the determined desired power, the desired rotational speed of the driving pulley being calculated to provide a minimum fuel consumption for the determined desired power;

(4) detecting whether a first flag, a second flag and a third flag are set;

(5) calculating a change in the detected throttle valve opening per unit time;

(6) comparing the calculated change in detected throttle valve opening per unit time with a first predetermined change in throttle valve opening per unit time and a second predetermined change in throttle valve opening per unit time;

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(7) comparing the first detected throttle valve opening with the second detected throttle valve opening;

(8) determining a rate "e" of changing RPM ratio in accordance with a result of comparison step (7), whereby:

(8-a) when the first detected throttle valve opening is equal to or greater than the second detected throttle valve opening, the rate "e" is set equal to a first predetermined value "d", and

(8-b) when the first detected throttle valve opening is less than the second detected throttle valve opening, the rate "e" is determined in accordance with a result of detecting step (4), whereby:

(8-b-1) when the first flag is set, the rate "e" is set equal to a second predetermined value "a",

(8-b-2) when the first flag is not set and the second flag is set, the rate "e" is set equal to a third predetermined value "b",

(8-b-3) when the first flag and the second flag are not set and the third flag is set, the rate "e" is set equal to a fourth predetermined value "c",

(8-b-4) when the first flag, the second flag and the third flag are not set, the rate "e" is determined in accordance with a result of comparison step (6), whereby:

(8-b-4) when the calculated change in throttle valve opening per unit time is less than the first predetermined change in throttle valve opening per unit time, the rate "e" is set equal to the second predetermined value "a",

(8-b-4-b) when the calculated change in throttle valve opening per unit time is equal to or greater than the first predetermined change in throttle valve opening per unit time and is less than the second predetermined change in throttle valve opening per unit time, the rate "e" is set equal to the third predetermined value "b", and

(8-b-4-c) when the calculated change in throttle valve opening per unit time is equal to or greater than the second predetermined change in throttle valve opening per unit time, the rate "e" is set equal to the fourth predetermined value "c";

(9) calculating a value "Δe " in accordance with a result of the determined step (8);

(10) comparing the detected actual rotational speed of the driving pulley with the calculated desired rotational speed;

(11) selecting either a positive value "$+\Delta e$" or a negative value "$-\Delta e$" in accordance with a result of the comparison of step (10), whereby:

(11-a) when the detected value of the actual rotational speed of the driving pulley is less than the calculated desired rotational speed of the driving pulley, the negative value "$-\Delta e$" is selected, and

(11-b) when the detected value of the actual rotational speed of the driving pulley is greater than the calculated desired rotational speed of the driving pulley, the positive value "$+\Delta e$" is sclected;

(12) calculating an actual RPM ratio "e" from the values of the actual rotational speeds of the driving and driven pulleys;

(13) calculating a compensated desired RPM ratio "e_c'" by adding the selected value "$+\Delta e$" or "$-\Delta e$" to a desired RPM ratio "e'";

(14) determining a feedback value from a difference between the calculated compensated desired RPM ratio "e_c'" and the calculated actual RPM ratio "e"; and

(15) controlling a flow control valve of the continuously variable transmission in accordance with the determined feedback value, whereby the actual RPM ratio "e" is controlled by the calculated feedback value.

4,727,772

MULTISTAGE AUTOMATIC SHIFT CONTROL APPARATUS

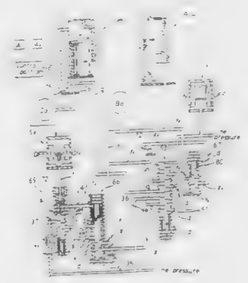
Koji Sumiya, Nishio; Yoshikazu Sakaguchi, Anjo; Takuji Taniguchi, Okazaki; Yutaka Taga, Aichi, and Yoshio Shindo, Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 31, 1986, Ser. No. 846,041

Claims priority, application Japan, Jul. 31, 1985, 60-169189

Int. Cl.[4] B60K *41/02*

U.S. Cl. 74—867 **7 Claims**



1. A multistage automatic shift control apparatus for a multistage automatic transmission including a gear shifting mechanism, the gear shifting mechanism having a sub-shifting unit and a main shifting unit which when up-shifted and down-shifted facilitate a multistage shifting operation of the transmission, said apparatus comprising:

friction engaging elements operatively connected to the units for varying a torque transmitting path through the units, said friction engaging elements comprising a first and a second friction engaging element,

said first friction engaging element being operatively connected to one of the units for causing said one of the units to up-shift when engaged as a result of oil fed thereto,

said second friction engaging element being operatively connected to the other of said units for causing said other of the units to down-shift when disengaged as a result of oil being drained therefrom;

a rotational speed detecting means associated with at least said one of the units to which said first friction engaging element is operatively connected for sensing the rotational speed of a predetermined rotatable element comprising at least said one of the units and for issuing a signal corresponding to the rotational speed of the predetermined rotatable element; and

a control means operatively connected to said rotational speed detecting means for receiving said signal therefrom when a change in a shifting state of the first frictional engaging element occurs at which time said first frictional engaging element engages, and for regulating the drainage of the oil from the said second frictional engaging element in response to said signal to cause said second frictional engaging element to disengage concurrently with the engagement of said first frictional engaging element for synchronizing the up-shifting and the down-shifting operations of the respective units caused by the concurrent engagement and disengagement of said first and said second frictional engaging elements.

4,727,773

HYDRAULIC CIRCUIT FOR CONTROLLING AUTOMATIC TRANSMISSION

Koji Sumiya, Nishio; Yoshikazu Sakaguchi, Anjo; Takuji Taniguchi, Okazaki; Yutaka Taga, Aichi, and Yoshio Shindo, Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 31, 1986, Ser. No. 846,044

Claims priority, application Japan, Jul. 31, 1985, 60-169191; Jul. 31, 1985, 60-169192; Feb. 8, 1986, 61-26449

Int. Cl.[4] B60K *41/22, 41/28*

U.S. Cl. 74—867 **10 Claims**



1. A hydraulic circuit for controlling an automatic transmission having a speed changing gear mechanism comprising operatively engageable and disengable parts, and a frictional engagement element for engaging and disengaging the parts of the speed changing gear mechanism, said hydraulic circuit comprising:

a hydraulic servomotor for actuating said frictional engagement element;

a shift valve for supplying said hydraulic servomotor with hydraulic fluid so that a servo pressure is established and for draining said hydraulic servomotor;

a control valve operatively hydraulically connected between said shift valve and said hydraulic servomotor; and

a duty-ratio controlled solenoid valve operatively connected to said control valve for controlling said control valve to cause the servo pressure of said hydraulic servomotor to be gradually reduced through said control valve before said hydraulic servomotor is drained through said shift valve through which shift valve said hydraulic servomotor is completely drained.

2. In an automatic transmission of the type having a sub-transmission unit and a main transmission unit in which paths through which power is transmitted in the respective transmission units are changeable to output different respective speeds, and frictional engagement elements for shifting the paths through which power is transmitted in the respective transmission units to attain a plurality of speeds through a combination of the different speeds output by the sub-transmission unit and the main transmission unit,

a hydraulic circuit for controlling the automatic transmission comprising:

hydraulic servomotors for controlling the frictional engagement elements;

shift valves for supplying and draining hydraulic fluid to and from said hydraulic servomotors to establish and reduce respective servo pressure therein;

a control valve disposed in a hydraulic oil passage hydraulically connected to the hydraulic servomotor of one of the frictional engagement elements in at least one of the sub-transmission unit and the main transmission unit;

a solenoid valve for controlling the hydraulic fluid flow through said control valve; and

a controlling means for activating said control valve through said solenoid valve so as to control the servo pressure acting in said hydraulic servomotor and actuate the frictional engagement element in an operational manner in which the shifting in both of the transmission units is synchronized.

4,727,774

CUT-BACK PRESSURE CONTROL DEVICE FOR MULTI-SPEED AUTOMATIC TRANSMISSION

Koji Sumiya, Nishio; Yoshikazu Sakaguchi, Anjo; Takuji Taniguchi, Okazaki; Yutaka Taga, Aichi, and Yoshio Shindo, Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaishi, both of Aichi, Japan

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Claims priority, application Japan, Jul. 31, 1985, 60-169196; Jul. 31, 1985, 60-169194

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—867 **5 Claims**



1. A cut-back pressure control device for an automatic transmission, comprising:

a sub-transmission unit through which power is transmitted in a respective one of power transmitting paths defined therethrough, the sub-transmission unit shiftable between a high-speed mode at which power is transmitted through one of said paths and a low-speed mode at which power is transmitted through another of said paths;

a main transmission unit through which power is transmitted in one of at least two power transmitting paths, the main transmission unit shiftable between at least two shifting stages at which power is transmitted through respective ones of said at least two power transmitting paths,

said main transmission unit operatively connected in series to said sub-transmission unit with engine torque being input to only one of the transmission units for driving said one of the transmission units and only the output of said one of the transmission units being input to the other of the transmission units for driving the other of the transmission units so that the effective output of the main transmission unit is combined with the effective output of the sub-transmission unit to provide a plurality of successively higher speeds that are capable of being output by the transmission;

frictional engagement elements for selecting the power transmitting paths through which power is transmitted in the sub-transmission unit and the main transmission unit;

hydraulic servomotors for actuating said frictional engagement elements;

a thorttle valve for establishing throttle pressure,

a cut-back valve operatively hydraulically connected to said throttle valve for applying cut-back pressure to said throttle valve to regulate the throttle pressure;

said hydraulic servomotors including a first hydraulic servomotor disposed in said sub-transmission unit and operatively hydraulically connected to said cut-back valve, said first hydraulic servomotor for operating one of the fric-

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tional engaging elements with hydraulic pressure that varies when the sub-transmission unit is shifted between the high-speed mode and the low-speed mode, and

a second hydraulic servomotor disposed in said main transmission unit and operatively hydraulically connected to said cut-back valve, said second hydraulic servomotor for operating another of the frictional engaging elements with hydraulic pressure when the main transmission unit is shifted to the second of said at least two shifting stages and any of higher ones of said at least two shifting stages at which the main transmission unit outputs a speed that is higher than that output by the main transmission unit when shifted to the first of said at least two shifting stages; and

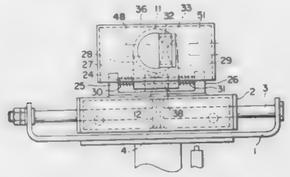
said cut-back valve having a spool for moving between a first position at which the cut-back valve does not apply said cut-back pressure to the throttle valve in response to the hydraulic pressure transmitted from said first hydraulic servomotor when said main transmission unit is shifted to the first shifting stage and the sub-transmission unit is shifted to said low-speed mode and a second position at which the cut-back valve applies said cut-back pressure to the throttle valve when said sub-transmission unit is shifted to said high-speed mode or when said main transmission unit is shifted to the second or the higher ones of said shifting stages.

4,727,775

DRESSING DEVICE FOR TIP OF WELDING GUN

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Filed May 21, 1986, Ser. No. 866,024
Claims priority, application Japan, Dec. 21, 1985, 60-286902
Int. Cl.[4] B23K *11/30*
U.S. Cl. 76—1 **3 Claims**



1. A dressing device for a tip of a welding gun, comprising:

a base;

a driving device movably provided on said base and being movable relative to the base from a nondressing position into a dressing position;

dresser means movably supported on said driving device for movement with said driving device and relative to said base, said dresser means being movable relative to said driving device along a direction which is generally parallel to the direction of relative movement between said driving device and said base;

said dresser means including rotatable blade means for dressing said tip and air motor means for effecting rotation of said blade means;

on-off valve means for controlling flow of air to said air motor means;

control switch means coacting between said driving device and a body of said dresser means for controlling the actuation of said on-off valve means;

timer circuitry means responsive to pressure supplied to said air motor means for controlling the duration of the dressing operation when the blade means is rotatably engaged with the tip;

changeover valve means for supplying air to said driving device to control movement thereof between said dressing and nondressing positions, said changeover valve means being connected to said timer circuitry means;

a quick return mechanism mounted on said driving device and coacting with said base for effecting quick return of said driving device from said dressing position to said nondressing position, said quick return mechanism including pneumatic cylinder means; and

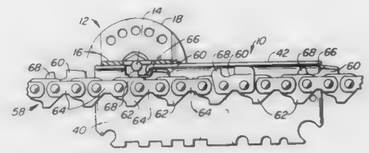
control valve means for controlling flow of air to said pneumatic cylinder means, said control valve means being connected with said timer circuitry means.

4,727,776

CHAIN SAW SHARPENING SYSTEM

Elof Granberg, 15 Harbor View Ct., San Rafael, Calif. 94901

Filed Aug. 5, 1982, Ser. No. 405,490
Int. Cl.[4] B23D *63/16*
U.S. Cl. 76—25 A **3 Claims**



1. A system for sharpening individual saw teeth on a chain saw blade wherein each saw tooth comprises both a cutting edge and a forward post, said system including:

a grinder having a rotary grinding element and a height plate, said height plate being a unitary structure defining a plane which may be adjustably spaced-apart from the axis of the rotary grinding element; and

a gauge comprising a plate having (1) at least one straight edge with a length greater than the spacing of two adjacent saw teeth and (2) a flange joined to said straight edge at substatially a right angle, said plate and said flange together having an opening with dimensions suitable for receiving the grinding element and for allowing the element sufficient space to grind down the forward post of the saw tooth, said flange having a stop member projecting from the flange surface opposite the plate and spaced apart from the opening by a distance chosen to prevent the rotary grinding element from contacting the plate as the grinder is moved across the forward post and lip adjacent the opening to protect the gauge from damaging the rotary grinding element;

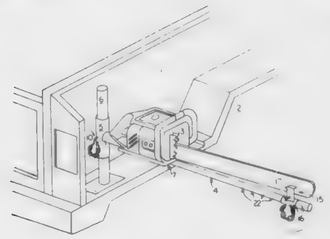
whereby the grinder and the gauge may be used to grind down the forward post of a saw tooth to a preselected depth by first placing the gauge over at least two adjacent saw teeth so that the flange rests over the cutting edge of each tooth and the forward post to be ground is positioned in the opening, and thereafter moving the grinder across the gauge so that the height plate slidingly contacts the flange within the limits of the stop member and the rotary grinding element engages the forward post, the grinding depth being selected by adjusting the relative positions of the rotary grinding element and the height plate.

4,727,777

VEHICLE-MOUNTED SUPPORT FOR SHARPENING CHAIN SAWS

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Filed Aug. 11, 1986, Ser. No. 895,172
Claims priority, application Canada, Aug. 12, 1985, 488485
Int. Cl.[4] B23D *61/00*
U.S. Cl. 76—78 A **4 Claims**



1. A support on which a chain saw may be mounted for sharpening comprising:

(a) a base member adapted for securing to a stable horizontal surface such as a pick-up truck fender;

(b) a vertical member secured to said base member;

(c) horizontal member rotatably fixed at one end to said vertical member for rotation thereabout;

(d) a surface on said horizontal member for supporting a chain saw; and

(e) means at the end of said horizontal member opposite said vertical member for securing the end of the guide bar of said chain saw while permitting free movement of the saw chain

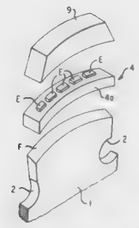
whereby said horizontal member may be rotated to a position away from said pick-up truck fender when said support is in use and rotated to a position parallel to said pick-up truck fender when said support is not in use.

4,727,778

METHOD OF MANUFACTURING OF CUTTING TOOL

Shohei Omi, Anjo, Japan, assignor to Omi Kogyo Co., Ltd., Anjo, Japan

Continuation-in-part of Ser. No. 688,216, Jan. 2, 1985. This application Mar. 17, 1986, Ser. No. 841,029
Claims priority, application Japan, Dec. 6, 1984, 59-257918
Int. Cl.[4] B23B *63/00*
U.S. Cl. 76—112 **12 Claims**



10. A method of manufacturing cutting tools, comprising:

preparing a circular body of a cutting tool having a plurality of installation portions, each installation portion having an inclined surface at an outer periphery thereof extending substantially across thickness of the body;

preparing a plurality of interposed members, each interposed member including a plate portion having a circumferential upper surface, longitudinal ends, and a plurality of projections extending upwardly from the plate portion, said projections being arranged on the circumferential upper surface, along the longitudinal direction of the plate portion and spaced apart from each other, two of said projections located adjacent to the respective longitudinal ends of the plate portion being spaced from the respective longitudinal ends of the plate portion so that any portions of the projections are not coplanar with the longitudinal ends of the plate portion and are located completely away therefrom, thickness or height of the interposed member being between 2.5–4.0 mm and height of the projection being between 0.8–1.2 mm;

preparing a mold having a space so that width thereof is substantially the same as width of the interposed member, said mold including first and second molding members slidably situated inside the space;

disposing the interposed member in the space of the mold;

disposing metal powder with diamond dust in the space of the mold so that at least the space adjacent the projections is completely filled with the metal powder with the diamond dust;

heating the metal powder with diamond dust by applying electricity between the first and second molding members and pressurizing the metal powder toward the interposed member by applying pressure against the first and second molding members so that a cutting segment is formed by the metal with diamond dust and is firmly fixed onto the interposed member to completely cover the projections to thereby prevent possibility of cracks occurring on the cutting segment;

disposing the interposed members with the cutting segments adjacent the inclined surfaces of the installation portions along the radial direction of the circular body; and

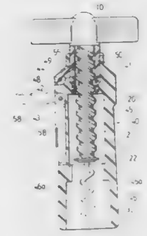
welding the interposed members with the cutting segments onto the inclined surfaces of the body of the cutting tool so that the interposed members are welded to the body from a side of the body of the cutting tool with the inclined surface.

4,727,779

CORK SCREW

Wen-Hsin Lee, 4th Fl., No. 61, Liu-Ho I Road, Kaohsiung, Taiwan

Continuation-in-part of Ser. No. 872,121, Jun. 9, 1986, Pat. No. 4,677,883. This application Apr. 1, 1987, Ser. No. 33,171
Int. Cl.[4] B67B *7/04*
U.S. Cl. 81—3.37 **7 Claims**



1. A cork screw comprising:

a rotary handle;

a stem connected to said handle and having a helical groove extending on the periphery of said stem;

a penetrating screw fixed to the bottom of said stem;

a hollow pedestal having an upper surrounding wall portion receiving said stem and a lower portion having an internal cross-section greater than an internal cross-section of said upper wall portion and adapted to be seated against a

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spout of a bottle, said upper wall portion having a hole therein,

a sliding sleeve surrounding said stem, fitted in said upper wall portion in an axially slideable position, said sleeve having an opening aligned radially with said hole;

a dog member pivotally mounted to said upper wall portion and within said hole and having an engaging end extending into said opening, said engaging end extending to the interior of said sleeve through said opening and engaging said stem when said opening is at a first level relative to said hole; and

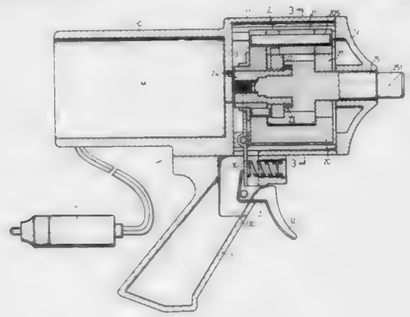
a spring means for biasing said sleeve to move said opening to a second level higher than said first level so as to retract said engaging end in said opening.

4,727,780

VEHICLE-CARRYING PURPOSE WRENCH

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Filed Aug. 25, 1986, Ser. No. 900,176
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—54 **1 Claim**



1. A wrench comprising:

a housing assembly further comprising:

a motor casing;

a tool casing being integrally formed with the motor casing and being located at one side of the motor casing;

a cover being disposed and fixed to one side of the motor casing;

a handle being disposed below the motor casing and the tool casing and being secured thereto, the upper portion of the handle being formed with a space to receive a trigger assembly;

a reversible motor being mounted in the motor casing, said motor being capable of taking the vehicle electrical power as its power source; characterized by

the tool casing comprising a tool assembly;

the tool assembly further comprising:

a main body having a first side wall, a second side wall and a recess formed therebetween, the first side wall being provided at the center with an aperture, around the central axis of the aperture being furnished with a plurality of holes in which a plurality of pins are respectively located, the length of each pin being longer than the thickness of the first side wall, the first side wall having at its upper portion a pin hole, the second side wall having at its upper portion a pin hole which aligns with the pin hole of the first side wall, the second side wall further having a central hole;

a drive member being provided at its center with a hole, the drive member being located in the recess of the main body by passing a fixing pin through the hole of the drive member and the pin holes of the first and second side walls of the main body, the drive member further having two wings extending downward and an extension;

a transmission member being a hollow ring body, said transmission member having a first and a second circumferential sections, the radius of curvature of the first circumferential section being arranged to correspond to that of the inner arcuate surface of the wings of the drive member, the circumferential section being formed with a notched slot to engage with the extension of the drive member, the transmission body being furnished at its center with a rectangular key;

a drive shaft being a hollow cylinder, one end of the drive shaft being connected with the shaft of the motor and the other end thereof being connected with the connection end of a follower shaft, said other end of the drive shaft further being provided with a stop ring and a rectangular key slot which corresponds to the rectangular key of the transmission member;

an elastic member being disposed in the drive shaft and located behind the transmission member, said elastic member being arrangd to lean against the ring stop of the drive shaft to avoid being dropped out of the drive shaft,

a follower shaft passing at one end through the drive shaft and the other end thereof being formed with a rectangular body to correspond to a sleeve which is used to tighten and loosen the screws for fixing a tire to a vehicle;

a follow member being fixed to the follower shaft, the circumference of the follow member being provided with teeth to correspond to the wings of the drive member;

a cover being received within the central hole of the second side wall of the main body;

a trigger assembly comprising:

a trigger being pivotally connected to the lower portion of the space of the handle;

a stop being disposed at the outer wall of the first side wall of the main body; and

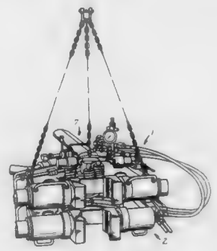
a Y-shaped press plate the lower portion of which being arranged to contact with the upper portion of the trigger while the upper portion thereof contacts with the stop, when pressing the trigger in a predetermind manner, the upper portion of the trigger being capable of pushing the lower portion of the Y-shaped press plate to make the Y-shaped press plate displced from its original position.

4,727,781

SUPERCHARGED POWER TONGS

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Filed Apr. 9, 1986, Ser. No. 850,717
Claims priority, application China, Apr. 17, 1985, 85103021.1
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—57.34 **22 Claims**



1. Power tongs for making up or breaking apart pipe joints having a longitudinal axis comprising:

an upper tong and a lower tong lying in spaced apart horizontal planes having on each tong body a pair of opposed gripping jaws disposed in facing relation and synchronously movable along a linear trace, respectively, for gripping engagement with upper and lower drill pipe joints, respectively;

means swivelly connecting and guiding said upper and lower tongs for relative angular movement about a vertical axis by an actuator;

a pressurized fluid powered multistage torque-generating unit with an assist fluid cylinder pivotally connected with said upper and lower tongs, respectively, said unit being able to output a torque to swivel said tongs in relation to each other over a limited displacement angle around the longitudinal axis of the pipe joints being gripped, whereby the drill pipe joint may be made up or broken apart, and being able to offer a bigger torque at the beginning of an unscrewing operation;

a supercharged gripping device disposed on each tong whereby said each pair of opposed gripping jaws may first move towards each other along a linear trace to grip pipes speedily and then by means of a supercharged fluid cylinder enlarge the gripping force to get hold of said pipes firmly without raising the pressure of fluid system, each said pair of gripping jaws may realize synchronous movement by means of a synchronizing mechanism;

a manual-pneumatic pull-in locating device mounted in parallel on said upper tong for aligning said upper and lower tongs with and pulling the over to said pipes; and

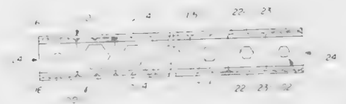
a program controlling system enabling gripping operation and make-up or break-apart operation to be carried out according to a procedure predetermined.

4,727,782

SOCKET WRENCH AND SOCKET MEMBERS THEREFOR

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Aug. 14, 1986, Ser. No. 896,270
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—124.4 **1 Claim**



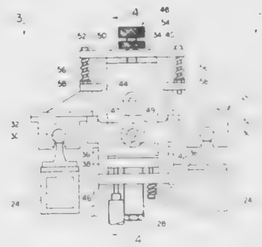
1. A wrench and socket combination, comprising a handle having at least one open end, the handle being of tubular construction and having a longitudinal through bore formed therein, the bore having a rectangular cross-section, the handle further having a pair of parallel side walls, each of which has a relieved portion adjacent to the open end of the handle, thereby forming a shoulder in each of the parallel side walls of the handle, a relatively flat spring clip secured within each of the relieved portions, respectively, and bottoming on the shoulder in the respective side wall, each of the spring clips having an inwardly-directed projection formed intermediately thereof, a plurality of sockets received in the bore of the tubular handle, the sockets being disposed adjacent to each other, each of the sockets having a substantially identical plan outline, such that the sockets are keyed to the handle, thereby preventing substantial rotation of the sockets within the handle, each of the sockets further having four side walls, each of the side walls having a notch formed therein for cooperation with a respective one of the spring clips in the handle, such that the respective sockets may be inserted into the handle without regard to the orientation of the sockets therein, and such that the plurality of sockets is retained in the tubular handle, each of the sockets having a polygonal socket bore formed therein, the respective socket bores being of different sizes, the handle having a further pair of parallel walls intermediate the side walls thereof, and at least one of the further pair of walls having a window formed therein, such that the window provides accessibility to the polygonal socket bore in the respective socket which is retained by the respective spring clips adjacent to the open end of the handle.

4,727,783

FLYING CUTOFF APPARATUS

Clarence D. John, Jr., Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1986, Ser. No. 875,156
Int. Cl.[4] B23B *37/00*
U.S. Cl. 82—53.1 **16 Claims**



1. A flying cutoff apparatus for cutting longitudinally moving and axially rotating tubing, comprising:

(a) a track positioned along the direction of longitudinal movement of the tubing;

(b) a carriage mounted on said track adjacent to the tubing for movement along said track in the direction of longitudinal movement of the tubing;

(c) a cutting device and a backing device mounted on said carriage adjacent the tubing and stationary relative to axial rotation thereof, said cutting device and said backing device also being mounted on said carriage for movement with said carriage, said cutting device being disposed on one side of the moving tube and said backing device being disposed on an opposite side of said moving tubing, at least one of said cutting and backing devices also being mounted on said carriage for movement relative thereto and relative to the other in transverse relation to the direction of longitudinal movement of the tubing between a non-cutting position wherein said cutting and backing devices are disengaged from the tubing and a cutting position wherein said cutting and backing devices clamp and thereby move with the tubing as the same moves longitudinally and operate concurrently to cut the tubing as the same rotates relative to said cutting and backing devices, the movement of said carriage and said cutting and backing devices with the moving tubing being due solely to said cutting and backing devices clamping the tubing therebetween when in said cutting position; and

(d) means mounted on said carriage for moving said one of said cutting and backing devices relative to said carriage and to the other between said non-cutting and cutting positions.

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WEB CUT BLANK PILING METHOD AND APPARATUS

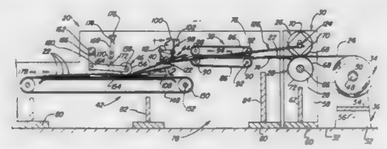
Albert J. Sarka, West Bloomfield, and Jerry L. Bell, Pontiac, both of Mich., assignors to Bernal Rotary Systems, Inc., Troy, Mich.

Filed May 20, 1986, Ser. No. 865,103
Int. Cl.[4] B26D *7/32*
U.S. Cl. 83—26 **26 Claims**

1. A method of piling a plurality of blanks of a flexible material comprising, completely severing a plurality of flexible blanks from a continuous web of a flexible material so that the cut blanks move substantially consecutively at a first speed of

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at least 300 lineal feet per minute, accelerating each cut blank along a first path of travel to a second speed at least 1.5 times said first speed to provide a gap between its trailing edge and the leading edge of an immediately succeeding cut blank, after acceleration of each blank positively deflecting each blank out of the first path of travel of such blank and onto a second path of travel inclined downwardly and at an acute included angle relative to said first path of travel, independently of said deflecting rapidly positively displacing the trailing edge of each



blank from the second path of travel, and after deflection onto the second path of travel and out of the first path of travel rapidly decelerating each blank to a third speed of less than about 1/5 of the second speed of such blank and into a third position inclined at an acute included angle to said second path so that an immediately succeeding blank will overlap and at least in part be deposited upon such blank without sliding engagement therewith over a substantial length thereof to provide a pile of a plurality of overlapped cut blanks.

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CUTTING MACHINE

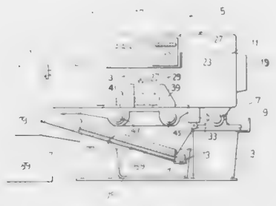
Masayuki Taguchi, Hadano, Japan, assignor to Amada Company, Limited, Japan

Continuation of Ser. No. 796,510, Nov. 13, 1985, abandoned, which is a continuation of Ser. No. 721,131, Apr. 8, 1985, abandoned, which is a continuation of Ser. No. 502,292, Jun. 8, 1983, abandoned. This application Nov. 19, 1986, Ser. No. 933,332

Claims priority, application Japan, Jun. 8, 1982, 57-96988

Int. Cl.⁴ B23D *55/04;* **B26D** *7/06, 7/18*

U.S. Cl. 83—113 **3 Claims**



1. A cutting machine, comprising:

a base;

front and rear brackets carried by said base;

a cutting head having means for holding a cutting tool, said cutting head being disposed on the base and having means connected thereto for moving said head up and down in a cutting zone;

front vise means having a fixed jaw and a movable jaw for holding a workpiece at the cutting zone;

a front vise bed supporting said front vise means, said front vise fixed jaw being fixed to said front vise bed and said front vise moveable jaw being mounted on said front vise bed for horizontal movement in a direction perpendicular to the direction of feed of the workpiece;

first means for moving said front vise moveable jaw toward said front vise fixed jaw to clamp a workpiece therebetween mounted on said front vise bed;

rear vise means having a fixed jaw and a movable jaw for feeding the workpiece into the cutting zone;

a rear vise bed supporting said rear vise means, said rear vise fixed jaw being fixed to said rear vise bed and said rear vise moveable jaw being mounted on said rear vise bed for horizontal movement in a direction perpendicular to the direction of feed of the workpiece;

second means for moving said rear vise moveable jaw toward said rear vise fixed jaw to clamp a workpiece therebetween mounted on said rear vise bed;

a pair of parallel guide rails removably mounted on said brackets adjacent the cutting zone for aligning said front and rear vise means with each other so as to align said jaws in such a manner as to be at right angles to the cutting plane of said cutting tool, said vise beds being commonly mounted on and longitudinally slideable on said guide rails;

wherein said vise beds are formed with through bores for the passage therethrough of said guide rails, and said vise beds are mounted on said guide rails by the passage of said guide rails through said through bores;

third means for moving said rear vise bed along said guide rails toward and away from said front vise bed for feeding the workpiece into the cutting zone;

means disposed in said cutting machine directly beneath the cutting zone for collecting and removing cutting oil and chips; and

fourth means for moving said front vise bed along said guide rails away from the cutting zone a sufficient distance so as to facilitate removal of cutting chips from the cutting zone and into said collecting and removing means;

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SCRAP CUTTER

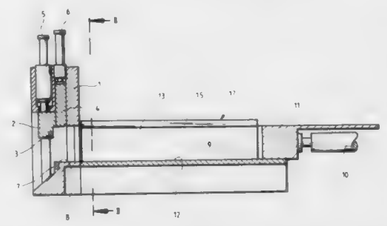
Siegfried Quante, Düsseldorf, and Gabriele Greiner, Mönchengladbach, both of Fed. Rep. of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,354

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439002

Int. Cl.⁴ B26D *1/08;* **B30B** *9/32, 15/08*

U.S. Cl. 83—404.2 **14 Claims**



1. In a device for cutting large-sized, difficult to compact scrap material and small-sized scrap material comprising first knives for cutting the scrap material, a horizontally extending feed trough having an upper side and a lower side and extending transversely from said first knives, said feed trough including an upwardly extending wall acting as a side pressure ram displaceable across said feed trough, and a cover at least partially covering the upper side of said feed trough, wherein the improvement comprises means for forming at least two second knives extending along said feed trough and being movable relative to one another for cutting without compacting large-sized, difficult to compact scrap material placed downwardly into the feed trough from the upper side thereof, and at least one of said second knives is arranged to extend obliquely to the other said second knife so that a progressive cut is effected on the side of the side pressure ram of the feed trough when said second knives are moved toward one another, both said second knives being in cutting position when the large-sized uncompacted scrap material has been placed in the feed trough.

4,727,787

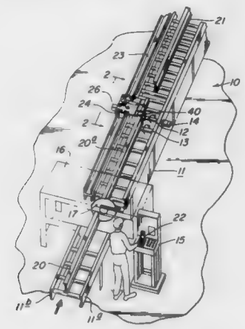
APPARATUS FOR MEASURING ELONGATE ARTICLES

Irvin L. Schlosser, P.O. Box 116, 2641 Township Line Rd., Hatfield, Pa. 19440

Filed Feb. 13, 1987, Ser. No. 14,586

Int. Cl.⁴ B26D *7/27, 7/28;* **B65G** *43/00, 47/00*

U.S. Cl. 83—522 **7 Claims**



1. In apparatus for measuring a length of an elongate member from one end thereof and performing an operation on the member at a datum location remote from said end, said apparatus including a conveyor adapted to receive the elongate member and to permit it to be advanced lengthwise in opposite directions with respect to said datum location, an elongate measuring scale extending lengthwise of said conveyor, a carriage mounted for movement parallel to said conveyor and along said scale, means mounted on said carriage for reading said scale and remotely displaying the reading, and means for driving said conveyor selectively in opposite directions for displacing said elongate member lengthwise relative to said datum location, the improvement comprising: remotely operable means mounted on said carriage for releasably coupling said carriage to said end of said elongate member for causing said carriage to move in unison with said elongate member when said elongate member is displaced in either of said opposite directions, whereby a measured length of said elongate member can be precisely positioned with respect to the datum location.

4,727,788

SAW BLADE

Sumio Yoshida, Ono; Yoshikazu Takegawa, Miki; Susumu Tsujimoto, Ono, and Katsuhiko Kawabata, Takasago, all of Japan, assignors to Amada Company, Limited, Japan

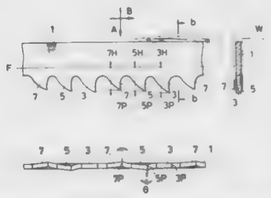
Filed Apr. 3, 1986, Ser. No. 847,731

Claims priority, application Japan, Apr. 3, 1985, 60-69239; Dec. 12, 1985, 60-277842; Dec. 26, 1985, 60-291894

Int. Cl.⁴ B23D *57/00;* **B27B** *33/02*

U.S. Cl. 83—848 **8 Claims**

1. A saw blade comprising an unset leading tooth which performs the cutting of a workpiece and advances in a feed direction while the workpiece is being cut, and a plurality of trailing teeth which cut the workpiece later than the leading tooth, which are alternately set in opposed lateral directions, and serve to widen the leading cut channel which is cut by the leading tooth, wherein the leading tooth and the plurality of trailing teeth form one group, wherein the heights of the trailing teeth from a basic position on the saw blade to the tips of the teeth are smaller than the height of the leading tooth from the basic position to its tip, wherein the heights of the trailing teeth are different and wherein the smaller the height of the



trailing teeth, the wider is the set of the trailing teeth in the lateral direction.

4,727,789

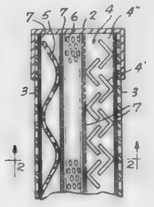
VENTED SUPPRESSIVE SHIELDING

David J. Katsanis, Pylesville, and Paul W. Henderson, Bel Air, both of Md., assignors to T & E International, Inc., Bel Air, Md.

Filed Jun. 24, 1986, Ser. No. 877,962

Int. Cl.⁴ F42B *33/06*

U.S. Cl. 86—50 **10 Claims**



1. In a ventilated, porous structure for an explodable device, a shielding barrier having a frame means carrying at least two barrier means in selected positions relative to one another, said shielding barrier having oppositely facing surface members and one of said surface members being disposed to face the explodable device with the other surface member facing away from the explodable device,

a first one of said barrier means being located adjacent said one of said surface members and a second one of said barrier means being disposed adjacent said other surface member,

said first one of said barrier means being free to move in a space defined by said frame means and relative to said frame means,

wherein said first one of said barrier means comprises louver means, and

wherein said louver means includes a subframe movably carried in said frame means.

4,727,790

AUTOMATED SHELL LOADING APPARATUS FOR EXTERNALLY MOUNTED TANK CANNON

Vernet F. DeHaven, Huron, and Francis J. Warin, Oak Harbor, both of Ohio, assignors to Ares, Inc., Port Clinton, Ohio

Filed May 3, 1985, Ser. No. 730,341

Int. Cl.⁴ F41F *9/04, 9/06*

U.S. Cl. 89—46 **11 Claims**

1. Automated shell loading apparatus for loading shells from a shell magazine into the breech of an associated gun for firing, said loading apparatus comprising:

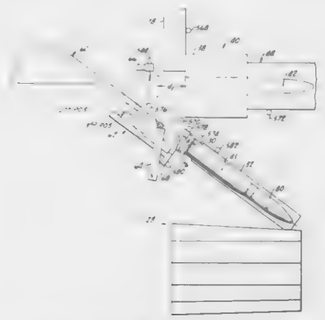
(a) a shell rammer having means for releasably gripping the base of a shell;

(b) means for moving said shell rammer between a first, shell

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extraction position in which, when the gun barrel is in a specific shell loading elevational position, the shell gripping means are positioned to grip the base of a shell located in a magazine shell pickup position and a second, shell releasing position in which the shell rammer is rearwardly aligned with the open breech of the associated gun and forward portions of a shell, the base of which is gripped by said gripping means, are inserted into said open breech, the means for moving the shell rammer causing initial movement of the rammer upwardly and rearwardly from the first position so as to extract from the magazine a shell the base of which is gripped by the shell gripping means; and

(c) means responsive to forward movement of the shell rammer into said second position for causing said shell base gripping means to release the shell gripped thereby, whereupon forward momentum of the shell causes the shell to



continue moving forwardly into the breech and to become fully chambered therein, the means for moving the shell rammer including a generally "D"-shaped cam track having a linear portion and an arcuate portion, a cam track follower and means for interconnecting the cam track follower with the shell rammer, the means interconnecting the cam track follower with the shell rammer being configured for permitting limited linear movement of the rammer relative to the cam track follower, the means for moving the rammer from the first position to the second position causing the rammer to move from said first position to the limit of travel permitted to the cam track follower, permitted by the interconnecting means without there being caused any substantial movement of the cam track follower, the moving means thereafter causing the cam track follower to move with the rammer along the cam track.

4,727,791

APPARATUS FOR CONTROLLING A HYDRAULIC SINGLE ACTING CYLINDER

Yuji Satoh, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1986, Ser. No. 882,531

Claims priority, application Japan, Jul. 10, 1985, 60-104944[U]

Int. Cl.⁴ F15B *13/02*

U.S. Cl. 91—47 **4 Claims**

1. An apparatus for controlling a piston continuously subjected to a constant unidirectional force within a hydraulic cylinder, said apparatus comprising:

a first solenoid operated valve disposed in a supply line through which working fluid is supplied from a hydraulic pressure source to a working chamber defined in the hydraulic cylinder by the piston, said first solenoid operated valve movable between a first position to open said supply line and a second position to close the supply line;

a second solenoid operated valve comprising a proportional pressure control valve disposed in said supply line for regulating the pressure of fluid in said supply line;

a third solenoid operated valve disposed in a return line through which working fluid is returned from the working chamber to a hydraulic tank, said third solenoid operated valve comprising a proportional pressure control valve for regulating the pressure of fluid in said return line;

a control unit operatively connected to said first solenoid operated valve for moving said first solenoid valve be-



tween said first and said second positions, the control unit operatively connected to said second and said third solenoid operated valves for inputting a variable exciting current to the solenoid of the second and the third solenoid operated valves respectively which causes the second and the third solenoid operated valves to restrict the supply line and the return line respectively in proportional amounts over a range of values corresponding to the magnitude of the exciting current input thereto thereby controlling the piston speed.

4,727,792

HYDRAULIC HOLDING VALVE

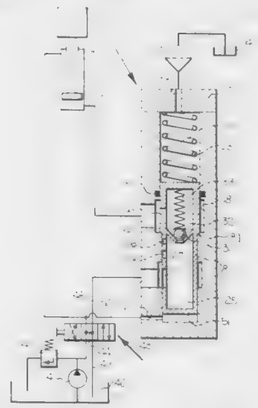
Hubert Häussler, Schweiz, Switzerland, assignor to Beringer-Hydraulik, GmbH, Neuheim, Switzerland

Filed Apr. 7, 1986, Ser. No. 849,111

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512894; Apr. 18, 1985, 3514007

Int. Cl.⁴ F15B *13/042*

U.S. Cl. 91—420 **13 Claims**



13. A hydraulic operating system comprising

a hydraulic consumer having a lifting line communicating with one side thereof and a lowering line communicating with the opposite side thereof,

a pressurized fluid source,

control valve means for selectively connecting said pressurized fluid source to either said lifting line, said lowering line, or an external tank, and such that said lowering line is connected to said lifting line, and said lifting line is connected to said tank when said pressurized fluid source is connected to said lowering line,

a hydraulic holding valve comprising

(a) a valve housing having a bore therein, said bore having closed inner end, an outer end, and an outwardly facing annular seat intermediate its ends to define an inner cylindrical bore portion and an outer cylindrical bore portion which has a diameter greater than that of said inner bore portion,

(b) a first fluid channel communicating with said outer bore portion and being connected to said lifting line in direct communication with said consumer, a second fluid channel communicating with said inner bore portion and being connected to said lifting line in direct communication with said control valve means, and a third fluid channel communicating with said bore immediately adjacent said inner end thereof and being connected to said lowering line,

(c) a control piston slidably mounted in said bore and comprising a cylindrical outer end portion which is closely received in said outer bore portion, and a cylindrical inner end portion closely received in said inner bore portion, and an inwardly facing annular shoulder between said inner and outer end portions, said piston being slideably mounted in said bore for movement between a closed position wherein said annular shoulder engages said annular seat, and an open position wherein said annular shoulder is axially separated from said seat, and wherein the space between the inner end of said bore and the inner end of said inner end portion of said piston comprises a control space which communicates with said third fluid channel, said control piston being hollow and including a first radial passage positioned on the outer side of said annular shoulder and adapted to communicate with said first fluid channel of said housing, and a second radial passage positioned on the inner side of said annular shoulder and adapted to communicate with said second fluid channel of said housing, and one way valve means disposed in said hollow control piston for permitting fluid flow only in a direction from said second radial passage to said first radial passage, said control piston further including opening means extending through the wall thereof at a location between said shoulder and said second radial passage whereby fluid is adapted to flow from said first fluid channel through said opening means, through the interior of said hollow piston, and outwardly said second radial passage and said second fluid channel when said piston is moved to said open position,

(d) spring biasing means for biasing said control piston toward its closed position, and

whereby a pressurized fluid received in said control space acts to bias said piston toward said open position against the force of said spring biasing means, to thereby permit controlled flow from said first fluid channel through the interior of said control valve and to said second fluid channel.

4,727,793

SIGNAL VALVE FOR PRESSURE COMPENSATED SYSTEM

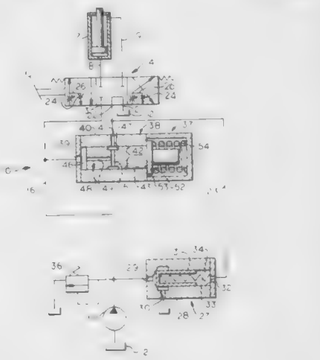
Lowell R. Hall, Elwood, Ill., assignor to Caterpiller, Inc., Peoria, Ill.

Filed Jan. 24, 1983, Ser. No. 673,162

Claims priority, application PCT Int'l Appl., Jan. 24, 1983, 83/00105

Int. Cl.⁴ F15B *13/64*

U.S. Cl. 91—451 **7 Claims**



1. In a hydraulic system (**10**) having a tank (**12**), a pump (**11**), a supply conduit (**16**) connected to the pump, a control valve (**14**) connected to the supply conduit (**16**) and to a hydraulic jack (**17**), said control valve (**14**) being movable between a neutral position at which the hydraulic jack (**17**) is isolated from the supply conduit (**16**) and an operating position at which fluid from the supply conduit (**16**) is directed to the hydraulic jack, fluid repsonsive means (**27**) having a signal chamber (**34**) therein and being effective to control the fluid flow through the supply conduit (**16**) in response to the pressure level of a load pressure signal directed to the signal chamber (**34**), and a signal line (**23**) connected to the control valve and to the signal chamber (**34**) of the fluid responsive means for directing a load pressure signal to the signal chamber at the operating position of the control valve, the improvement comprising:

valve means (**37**) repsonsive to the fluid pressure in the supply conduit (**16**) for directing an artificial load signal to the signal chamber (**34**) of the fluid responsive means (**27**) when the control valve (**14**) is at the operating position and the fluid pressure in the supply conduit (**16**) is below a preselected level.

4,727,794

RADIAL ENGINE

Marek A. Kmicikiewicz, 2100 Chomedey Street, Apt. 301, Montreal, Quebec, Canada H3H 2A9

Filed Jan. 20, 1987, Ser. No. 4,562

Int. Cl.⁴ F01B *1/06;* **F02B** *75/22*

U.S. Cl. 91—491 **7 Claims**

1. A radial engine comprising:

a housing;

a plurality of equally spaced openings disposed in ring-like arrangement on the periphery of said housing;

a piston and cylinder arrangement in each said opening, a piston rod for each arrangement fixed to and extending radially inwardly from its respective piston and through its respective opening;

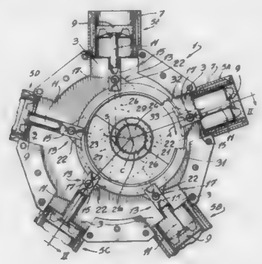
shoe means pivotally attached at the other end of each said piston rod;

radial guide means extending in said housing in line with each of said piston rods, and said shoe means provided

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with guide means followers to ensure radial reciprocal movement of the piston rods and shoe means; and

a connecting ring journaled on a crankshaft for circular translation motion in said housing, the ring including a circular rim;



each said shoe means including an arcuate follower member being slidably connected to the rim of said connecting ring.

4,727,795

PISTONS

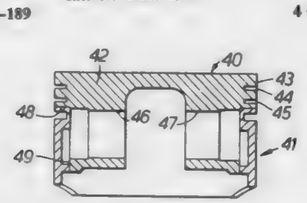
Edward J. Murray, Ilkley, and Frederick H. Thompson, Bradford, both of England, assignors to AE PLC, Warwickshire, England

Filed Oct. 29, 1984, Ser. No. 666,225

Claims priority, application United Kingdom, Oct. 29, 1983, 8328931

Int. Cl.[4] F16J *1/00*

U.S. Cl. 92—189 **4 Claims**



1. A piston for an internal combustion engine, comprising:

a separately formed upper piston part,

a crown provided on said upper piston part,

an upper portion of a ring band provided on said upper piston part,

at least two axially spaced piston ring grooves formed in said upper portion of the ring band,

means defining a pair of co-axial bores for receiving a gudgeon pin provided on said upper piston part,

a separately formed sleeve-shaped lower piston part connected to said upper piston part,

a lower portion of said ring band provided on said lower piston part as a continuation of said upper portion of the ring band,

at least one further piston ring groove formed in said lower portion of the ring band at an upper end of said lower portion and spaced axially from a lowermost part of said at least two piston ring grooves by substantially the same axial distance as the spacing of said at least two axially spaced piston ring grooves,

a skirt provided on said lower piston part,

said means defining said pairs of co-axial bores terminating inwardly of said second piston part so that the ends of said means defining said pair of gudgeon pin bores are covered by said sleeve-shaped lower piston part and imaginary extensions thereof at least partially intersecting the ring band to reduce the overall height of the piston.

4,727,796

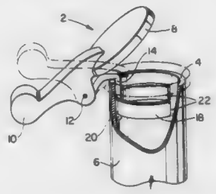
WEATHER CAP FOR UPSTANDING EXHAUST PIPES

W. George Derkach, c/o 11535-160 Street, Edmonton, Alberta, Canada T5M 3V9

Filed Oct. 28, 1986, Ser. No. 923,964

Int. Cl.[4] F23L *17/02*

U.S. Cl. 98—59 **11 Claims**



1. In a weather cap for upstanding exhaust pipes for gasoline and diesel engines and the like, the cap comprising a frame to be secured to the upper end of the exhaust pipe, a flap and a counterweight means pivotally secured to the frame by a normally horizontally oriented pivot, the flap and the counterweight means being positioned on opposite sides of the pivot, the improvement characterized by the frame comprising an elongated post to extend into the open upper end of the pipe, the upper end of the post protruding therefrom, the pivot being located in the upper end of the post, a resilient strip spring secured to the post below its upper end, the strip spring to bear against the interior of the pipe and thereby secure the cap in position with respect to the pipe.

4,727,797

SECONDARY WINDOW VENTILATORS

Nigel R. Smith, Colchester, England, assignor to Titon Hardware Limited, Clochester, England

Filed Jul. 3, 1986, Ser. No. 881,745

Int. Cl.[4] E06B *7/02*

U.S. Cl. 98—98 **7 Claims**



1. A ventilator assembly for sliding sash window comprising an elongate ventilator housing of U-shaped cross-section providing a substantially vertical base portion and two substantially horizontal side portions spaced apart bey said base portion, said base and side portions defining a channel, the housing having an air passage between inner and outer faces of the base portion and an elongate facing member mounted adjacent said inner face by a parallel motion linkage connected to said ventilator housing such that lengthwise movement of said facing member produces movement of said facing member towards or away from said inner face of said housing between a fully closed position obstructing said air passage and a fully open position, said facing member being mounted in said channel between said base and said portions in such manner that even when in its fully open position said facing member remains wholly within said channel.

4,727,798

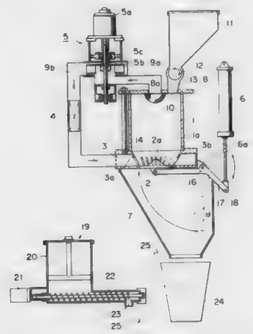
POPCORN PROCESSING MACHINE

Shigeru Nakamura, 15-14, Minami Magome 5-Chome, Oota-Ku, Tokyo-to, Japan

Filed Nov. 24, 1986, Ser. No. 933,895

Int. Cl.[4] A23L *1/18*

U.S. Cl. 99—323.9 **5 Claims**



1. A popcorn processing machine comprising:

a heating chamber for heating and popping corn kernels fed thereinto;

a heating basket forming the bottom of the heating chamber and having a plurality of louver-like slots, the heating basket being fixedly supported relative to the structure defining the heating chamber, and surrounded around the lateral wall thereof by a hot air injection chamber, the heating basket having an openable bottom which is closed for heating by a heating tray serving doubly as a dumper;

means for supplying hot air under positive pressure through said slots and upward into the heating chamber, said slots being so formed as to direct said hot air as a vigorously whirling stream in the heating chamber thereby to agitate, heat, and pop said corn kernels in said heating chamber, said means for supplying hot air comprising air circulating means for drawing air from the heating chamber and returning said air via a duct into said hot air injection chamber and air heating means installed within said duct;

means for feeding a metered quantity of raw corn kernels into the heating chamber; and

dumping means operable by drive means to open the bottom of the heating chamber after the corn kernels have been popped thereby to dump the popcorn thus popped into a receiving structure and to close said bottom thereafter, said dumping means comprising said heating tray, said drive means, and a transmission mechanism for transmitting driving movement from said drive means to the heating tray.

4,727,799

COOKING APPLIANCE WITH SENSOR MEANS

Itiro Ohshima, Nara, and Akinori Kitajima, Yao, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 1, 1986, Ser. No. 880,749

Claims priority, application Japan, Jul. 1, 1985, 60-100884[U]; Jul. 1, 1985, 60-100885[U]

Int. Cl.[4] A47J *27/62*

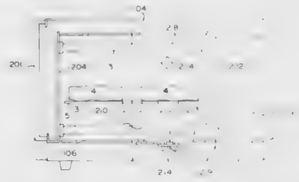
U.S. Cl. 99—331 **6 Claims**

1. A cooking appliance comprising:

an internal, cooking chamber for housing food being cooked;

an external housing unit enclosing said internal, cooking chamber and defining a space therebetween;

sensor means for detecting surface temperature of the food being cooked; and



means for mounting said sensor means in said space at a position located beneath the food being cooked in said internal, cooking chamber, said position of said sensor means avoiding interference with said detecting by said sensor means due to heat rising from said food being cooked.

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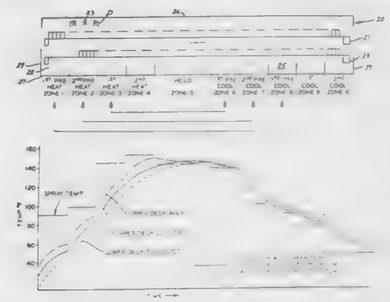
PASTEURIZATION APPARATUS

Donald W. Richmond; Carl W. Clyne, and Tod M. Holben, all of St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Division of Ser. No. 737,871, May 28, 1985, Pat. No. 4,693,902, which is a continuation-in-part of Ser. No. 620,471, Jun. 14, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 846,010

Int. Cl.[4] A61L *2/04*

U.S. Cl. 99—361 **22 Claims**



1. An improved tunnel pasteurizer capable of pasteurizing product in packages with a high degree of P.U. input control to each package and a low maximum cold spot temperature comprising,

(a) a tunnel having top, bottom, end, and side walls and a deck along which filled sealed packages of product are moved;

(b) spray nozzles positioned above said deck for applying heat and cooling water to said packages;

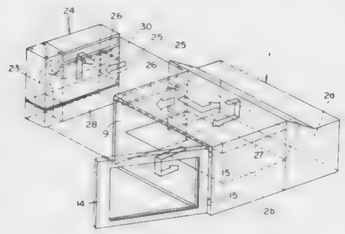
(c) reservoir means beneath the deck for collecting water which has passed over the packages;

(d) pump, conduit, heating, and cooling means interposed between the reservoir means and the spray means for reusing the water in the reservoir and for adding heat and cold to the said water at appropriate locations in the system;

(e) the spray nozzles being positioned in a predetermined pattern such that they are on about 9" to about 12" longitudinal centers and about 3" to about 6" transverse centers, said nozzles constructed and arranged to deliver water in a spray density of above about 6 gal./min./ft^2 to the deck.

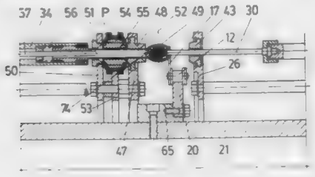
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DEFROSTING CABINET
Genkichi Yokoi; Noriyuki Harada; Kozo Shimba, and Kenyo Matsushita, all of Ihara, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan
Filed Sep. 5, 1985, Ser. No. 772,691
Int. Cl.[4] A23L *1/00*; H05B *1/00*
U.S. Cl. 99—476 10 Claims



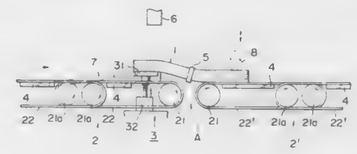
1. A defrosting cabinet comprising a defrosting chamber for containing frozen food to be defrosted, a humidifying compartment separate from said defrosting chamber and in communication therewith at spaced apart ports opening into said defrosting chamber, means for circulating a flow of air from said defrosting chamber through said humidifying compartment via said spaced-apart ports and back to said defrosting chamber, and pump-operating spray means disposed in said humidifying compartment between said ports for projecting plural streams of water into the path of said flow of air passing through said humidifying compartment.

4,727,802
FRUIT PITTING MACHINE
Clemente del ser Gonzalez, Paseo de Talleres, 36, Madrid, Spain
Filed Jan. 8, 1987, Ser. No. 1,967
Int. Cl.[4] A23N *4/08*
U.S. Cl. 99—494 20 Claims



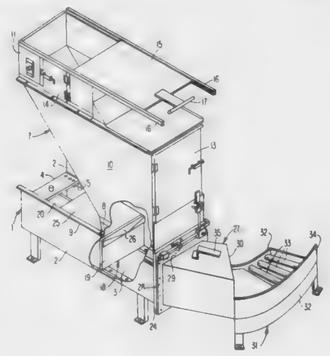
1. A fruit pitting machine, comprising:
fruit conveying means for conveying fruit along a feed path to a portion of said feed path at which core caps and pits are removed from the fruit and for conveying pitted fruit to a subsequent point along said feed path at which the pitted fruit is discharged from said fruit conveying means;
feeding means disposed along said feed path for feeding fruit one at a time to said fruit conveying means;
pitting means disposed along said portion of said feed path from removing core caps and pits from the fruit;
core cap and pit receiving means disposed along said portion of said feed path for cutting core caps in the fruit and for receiving core caps and pits removed from the fruit by said pitting means; and
pit conveying and separating means disposed along said portion of said feed path for separating pits from core caps by receiving pits with their associated core caps attached thereto from said core cap pit receiving means and conveying the pits away from said feed path to strip the pits from their associated core caps.

4,727,803
CONVEYOR DEVICE WITH AN ARTICLE LIFTING UNIT
Yousuke Nobuta, and Kouichi Yamashita, both of Kanagawa, Japan, assignors to Kabushikikaisha Tokyo Kikai Seisakusho, Tokyo, Japan
Filed Aug. 6, 1986, Ser. No. 893,702
Int. Cl.[4] B65B *13/18*
U.S. Cl. 100—7 13 Claims



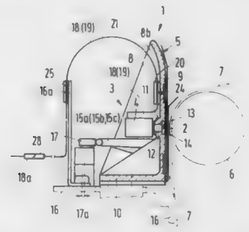
1. A conveying device comprising:
(a) a conveying member which on a first article to be conveyed is placed;
(b) means for driving the conveying member;
(c) means for sensing an end of an article on the conveying member;
(d) mechanical means for lifting the first article to separate a part of the article from a surface of the conveying member, the lifting means located substantially under an end of the said conveying member;
(e) means for raising the lifting member vertically in response to a signal from the sensing means, and
(f) a collision preventing member located along the conveying member before the lifting means, the collision preventing member actuated synchronously with the lifting member so as to prevent the lifting member from colliding with a second conveyed article which follows said first conveyed article.

4,727,804
TRASH COMPACTOR WITH OBLIQUELY DISPOSED COMPACTION CHAMBER AND CONVEYOR
Frank Tondo, Allendale; John B. Reilly, Dover, and Rudy Tondo, Ringwood, all of N.J., assignors to Arrow Steel Inc., Paterson, N.J.
Filed Jan. 29, 1987, Ser. No. 8,362
Int. Cl.[4] B30B *15/04, 15/32*
U.S. Cl. 100—215 2 Claims



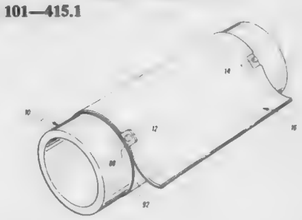
1. A trash compactor comprising a receiving chamber having an inlet opening for receiving trash to be compacted and an outlet opening for compacted trash on a centerline transverse to the centerline of said inlet opening, an upwardly open hopper for receiving trash and disposed over said receiving chamber, said hopper having an opening connected to the inlet opening of said receiving chamber for delivering trash into said receiving chamber, a ram mounted for linear movement through said receiving chamber toward and from said outlet opening on a line defined by the centerline of said outlet opening, means for imparting linear movement to said ram, said ram having a trash-engaging face and a skirt extending from the periphery and substantially parallel to the centerline of said trash-engaging face in the direction away from said outlet opening for closing and opening said inlet opening as said ram moves toward and away from said outlet opening, a compacting chamber associated with said receiving chamber and having an inlet end connected to the outlet opening of said receiving chamber, a portion of said compacting chamber having a substantially uniform cross-section perpendicular to the centerline thereof and extending obliquely relative to the center of the outlet opening of said receiving chamber to an outlet end, and conveyor means adapted to receive compacted trash from the outlet end of said compacting chamber upon movement of said ram toward said outlet opening and having a portion extending obliquely to the centerline of said compacting chamber, whereby said compacting chamber and said conveyor means are adapted to deliver compacted trash at substantially a right angle to the centerline of the outlet opening of said receiving chamber.

4,727,805
SHUTTLE FOR MATRIX PRINTERS
Josef Pichler, Ebreichsdorf, and Karl Puchegger, Foehrenau, both of Austria, assignors to Mannesmann Tally GmbH, Vienna, Austria
Filed Sep. 18, 1985, Ser. No. 777,538
Claims priority, application European Pat. Off., Sep. 18, 1984, 84111106.5
Int. Cl.[4] B41J *3/12*
U.S. Cl. 101—93.04 9 Claims



1. In a matrix line printer having a printing platen, a plurality of electromagnetic actuators and a plurality of print elements actuated by the actuators, all being mounted in chains the improvement comprising:
a reciprocating carrier and shuttle element of elongated construction and essentially L-shaped cross-section having an upright wall and an essentially horizontal bottom wall integral therewith, the carrier element positioned so that the upright wall faces the platen;
a plurality of projections extending from said carrier in a rearward direction away from said platen; there being guide rollers journaled in the chassis of the printer engaging the projections for holding the carrier in an upright position;
a plurality of bores accurately spaced and arranged along a line in said upright wall;
a plurality of fastening means arranged in said bores and being accessible from the side of the upright wall facing the platen;
the electromagnet actuators and print elements being secured to said fastening means and located in a space as defined between said bottom wall and said upright wall, the print elements projecting through the upright wall and in a direction toward the platen that is opposite a direction of extension of the bottom wall of the L-shaped carrier; and
means for reciprocating said L-shaped carrier in a direction of the line as established by said bores.

4,727,806
PIN REGISTER SYSTEM FOR FLEXOGRAPHIC PRINTING PLATES
Eugene L. Green, Sr., Dallas, Tex., assignor to Wilson Engraving Company, Inc., Dallas, Tex.
Division of Ser. No. 769,367, Aug. 26, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 14,109
Int. Cl.[4] B41F *27/12*
U.S. Cl. 101—415.1 1 Claim



1. An improved print cylinder assembly including a roller having a tubular sidewall for supporting a flexographic printing plate, characterized in that:
said roller having first and second bores formed in said tubular sidewall at separate locations which are spaced apart by a distance L;
first and second index pins received within the first and second bores, respectively, each index pin having a head portion projecting outwardly from the tubular sidewall external surface;
a layer of adhesive material disposed about the external surface of said tubular sidewall;
a flexographic printing plate mounted on said roller sidewall having first and second index holes formed thereon at separate locations which are substantially spaced apart by a distance L corresponding to the spacing L of the first and second bores in said roller sidewall, said first and second index pins being received within said first and second index holes of the flexographic printing plate, and said flexographic printing plate being bonded to said tubular sidewall by said adhesive layer; and,
said flexographic printing plate having a foundation sheet of flexible material contacting said adhesive material and a layer of photosensitive material bonded to said flexible foundation sheet, said first and second index holes being formed through said flexible foundation sheet, with a portion of the photosensitive material of said flexographic plate being removed from first and second areas coincident with said first and second index holes, respectively, thereby defining first and second windows coincident with said first and second index holes, respectively, said first and second index pins projecting into said first and second windows, respectively.

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4,727,807

APPARATUS FOR AUTOMATICALLY MOUNTING AND REMOVING PRINTING PLATES IN ROTARY PRINTING PRESS

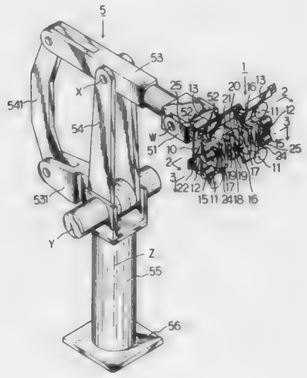
Kunio Suzuki, Yokohama; Yukitoshi Takahashi, and Nobuaki Hashimoto, both of Kawasaki, all of Japan, assignors to Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Jul. 28, 1986, Ser. No. 891,251

Claims priority, application Japan, Sep. 30, 1985, 60-216329; May 20, 1986, 61-115990

Int. Cl.⁴ B41F *27/12*; B41U *29/14*

U.S. Cl. 101—415.1 **3 Claims**



1. An apparatus for automatically mounting and removing a printing plate in a rotary press, said apparatus comprising:

(a) a mechanical hand including a retainer mechanism having a suction disc for retaining the plate, an inserter mechanism for forcing a gripping-side bent end of the plate into a gripping groove of a plate cylinder, a pusher mechanism for pushing the plate against a peripheral surface of the plate cylinder, a shaft supporting said retainer mechanism, said inserter mechanism and said pusher mechanism, a base supporting said shaft such that the latter is movable when thrusted, a positioning mechanism for pivotally moving said shaft relative to said base to thereby position the plate on said plate cylinder at a predetermined position;

(b) a main body having a support shaft and an arm for supporting and moving said mechanical hand;

(c) an angular displacement mechanism for angularly moving a printing-plate gripping and releasing shaft of said plate cylinder;

(d) a control mechanism for controlling motions of said mechanical hand, said main body and said angular displacement mechanism in time relative to one another for mounting and removal of the plate;

(e) a magazine attached to said main body and including a detachable fresh-plate cassette containing a purality of fresh printing plates superposed in upright posture with a gripping-side bent end of each fresh printing plate, a hanger disposed at a position ahead of said cassette, a detachable used-plate cassette mounted at a rear lower portion of said hanger for temporarily storing the used plates, and said fresh-plate cassette having means for advancing the fresh plates forwardly in order, and

(f) said mechanical hand being actuated by said main body for reciprocating between said magazine and said plate cylinder.

4,727,808

NON-PRIMARY EXPLOSIVE DETONATOR

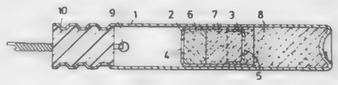
Quicheng Wang; Xianquan Li; Guowen Hu; Xiqin Zhang, and Tianrui Xu, all of Wuhan, China, assignors to China Metallurgical Import & Export Corporation, Beijing and China Metallurgical Safety Technology Institute, Wuhan, both of, China

Filed Aug. 23, 1985, Ser. No. 768,835

Claims priority, application Sweden, Aug. 23, 1984, 8404208

Int. Cl.⁴ F42B *3/10*

U.S. Cl. 102—202.5 **45 Claims**



1. A non-primary explosive detonator comprising a hollow tube with a closed end having a chamber containing a base charge of a secondary explosive, an opposite open end adapted for the insertion of an igniting means, and an intermediate confinement adjacent said chamber and containing a pressed, initiating charge of a secondary explosive, the base charge being arranged to detonate by activation of the igniting means to ignite said initiating charge, wherein the confinement is thin-walled and contains said initiating charge, the confinement having an access permitting ignition of said initiating charge via the igniting means, and wherein an intermediate charge of a secondary explosive is arranged between the initiating charge and the base charge, said intermediate charge having a lower pressing density than said initiating charge.

4,727,809

DETONATION SAFETY MECHANISM

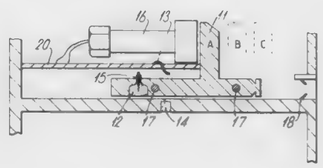
Robert C. M. Watson, Camberley, England, assignor to The Marconi Company Limited, England

Filed Dec. 4, 1986, Ser. No. 938,079

Claims priority, application United Kingdom, Dec. 6, 1985, 8530141

Int. Cl.⁴ F42C *15/34, 15/40*

U.S. Cl. 102—254 **11 Claims**



1. A safety mechanism for use in the detonation of an explosive charge and comprising a carrier, there being a first and a second safe position and an intermediate active position for said carrier, triggering means for detonating said charge and motive power means for urging the carrier continuously from said first safe position through said active position to said second safe position, the mechanism permitting detonation of said charge only while said carrier is occupying said active position.

4,727,810

SAFE AND ARM DEVICE FOR A SECONDARY-EXPLOSIVE DETONATOR

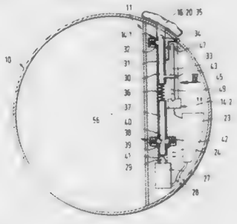
Wilhelm Furst, Buchberg; Anton Brunner, Pappenheim; Manfred Klare, Neunkirchen a.Sand; Hartmut Gessler, Lauf; Dietmar Kugler, Ottensoos, and Werner Rudenauer, Roth, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 27, 1987, Ser. No. 20,107

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610358

Int. Cl.⁴ F42C *9/00, 11/04, 15/24, 15/32*

U.S. Cl. 102—263 **9 Claims**



1. In a safe and arm device for an air deployable carrier including a submunition separable from said carrier, said safe and arm device being disposed in an electrical series circuit between a controlled switch and a secondary-explosive detonator, the improvement comprising first and second switches disposed in electrical series with each other in said electrical series circuit, said first switch having a normally open position, a closed position, a switch element adapted to actuate said first switch from said normally open position to said closed position, and first means operatively coupled to said switch element of said first switch and responsive to the presence of an air onflow against said carrier after ejection of the carrier caused by a submunition ejecting command for actuating said switch element to move said first switch from said normally open position to said closed position, said second switch having a normally open position, a closed position, and a switch arm adapted to move said second switch from said normally open position to said closed position, and second means operatively connected to said switch arm of said second switch and responsive to the separation of said submunition from said carrier for actuating said switch arm of said second switch to move said second switch from said normally open position to said closed position when the submunition separates from said carrier, whereby said closed first and second switches electrically connect said controlled switch to said secondary explosive detonator.

4,727,811

SMOKE CANISTER WITH CAPILLARY BORES

Willi Lübbers, Trittau, Fed. Rep. of Germany, assignor to Nico-Pyrotechnik Hanns-Jürgen Diederichs GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP86/00096, § 371 Date Nov. 21, 1986, § 102(e) Date Nov. 21, 1986, PCT Pub. No. WO86/05582, PCT Pub. Date Sep. 25, 1986

PCT Filed Feb. 25, 1986, Ser. No. 5,437

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510367

Int. Cl.⁴ F42B *13/44*

U.S. Cl. 102—334 **11 Claims**

1. A smoke canister, comprising:

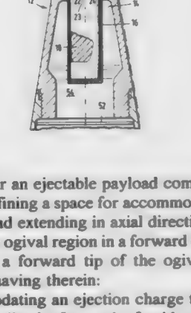
a casing;

a smoke-generating charge in the casing;

a lid attached to the casing, the lid having a periphery;

electrical contact rings on the periphery of the lid;

a container having first and second end faces and having a high-pressure proof propellant chamber between the end faces, the container being mounted in the lid with the first end face oriented toward the smoke-generating charge, the first end face having a first capillary bore, the second end face having a single second capillary bore, the diameter of the second capillary bore ranging from about 1 mm to about 1.4 mm;



a propellant charge in the propellant chamber; and

an ignition charge in the propellant chamber, the ignition charge being electrically connected to the contact rings.

4,727,812

PAYLOAD PROJECTILE FOR EJECTABLE SECONDARY AMMUNITION

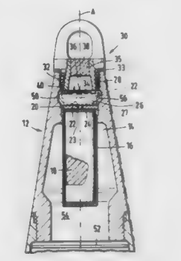
Siegmar Fischer, and Günter Sikorski, both of Düsseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 48,684

Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616410

Int. Cl.⁴ F42B *41/00*

U.S. Cl. 102—481 **4 Claims**



1. A projectile for an ejectable payload comprising:

a carrier body defining a space for accommodating an ejectable payload and extending in axial direction, said carrier body having an ogival region in a forward end thereof and an opening at a forward tip of the ogival region, said ogival region having therein:

a space accommodating an ejection charge therein;

a disc seat immediately forward of said ejection charge, having a forward extending outer surface portion, said outer surface portion having given radial dimensions;

a disc seated in said seat, said disc having a peripheral surface seated against said outer surface portion of said seat, and a central axially extending bore, said disc having a forwardly facing front face;

a lifting ring screw in said opening so as to close said forward tip of the ogival region, said screw having a passage

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therein at least partially filled with a melting fuse, and a rearwardly facing rear face;

a chamber reserved for an igniter, defined between said rear face of said screw and said front face of said disc, said chamber having radial dimensions wider than those of said outer surface portion of said seat such that said disc is movable forwardly in said axial direction, peripherally unimpeded in said chamber; and

means for ensuring that upon completion of movement of said disc from said seat, a passage of greater cross section than that of said bore is defined from said ejection charge to said melting fuse.

4,727,813

LINEAR INDUCTION PROPELLED TRACK GUIDED RUNNER

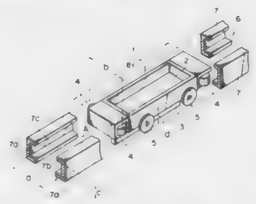
Yukito Matsuo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

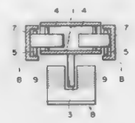
Filed Jan. 24, 1986, Ser. No. 822,235

Claims priority, application Japan, Jan. 26, 1985, 60-13200; Jan. 26, 1985, 60-13201

Int. Cl.[4] B60L *13/02*

U.S. Cl. 104—290 **14 Claims**





1. A transport apparatus, comprising:

a track including a predetermined transport path;

a first runner adapted to travel on the transport path when subjected to an external impelling force, said first runner including a first housing, an actuator attached to the first housing and receiving the impelling force from the magnetic field generating means, and set of first wheels rotatably mounted on the first housing and arranged to hold the transport path from both upper and lower sides thereof;

a plurality of magnetic field generating means arranged at predetermined intervals along the transport path and adapted to produce changes of magnetic fields, whereby an impelling force is applied to the first runner for moving; and

a second runner including transport means mounted therein for transporting said second runner on the transport path by a driving force.

4,727,814

INTERCHANGEABLE DRIVEABLE LEADING OR TRAILING RAILWAY CAR

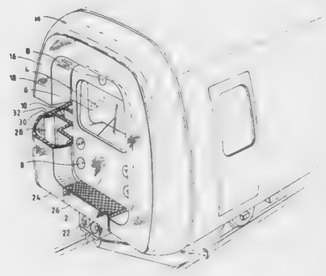
Jens Nielsen, Copenhagen Ö., Denmark, assignor to Danske Statsbaner, Copenhagen, Denmark

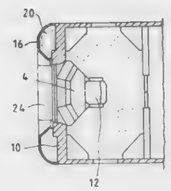
Filed Aug. 7, 1985, Ser. No. 763,398

Int. Cl.[4] B61D *17/20, 17/02*

U.S. Cl. 105—1.1 **17 Claims**

1. A railroad car for use selectively as a leading car and as an after-coupled through-passage car, comprising a front gable, a driver's compartment behind the front gable, an openable front door in a front door opening in the front gable, and shielding means arranged generally in front of at least the side and top edges of said door opening so as to be operable to form, together with similar shielding means of another car, a shielded passageway between the cars, characterized in that the driver's compartment is constituted by the space immediately behind the said front door, which is at least partially transparent, and





that the driver's control equipment is located in a movable unit, which is shiftable between an operative position wherein the front door is closed and the movable unit is disposed just behind the closed front door and an inoperative position wherein the front door is opened to form said passageway and the movable unit is stowed away at a location where it is removed from said passageway behind the front gable to form a generally unobstructed walkway through the passageway.

4,727,815

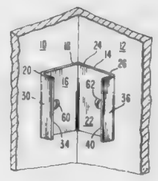
CORNER SHELF ASSEMBLY

Stephen A. Miller, P.O. Box 28, New Brunswick, N.J. 08903

Continuation-in-part of Ser. No. 915,425, Oct. 6, 1986, abandoned, and Ser. No. 767,086, Aug. 19, 1985, abandoned, said Ser. No. 915,425, is a continuation-in-part of Ser. No. 767,086,. This application May 21, 1987, Ser. No. 52,512

Int. Cl.[4] A47B *23/00*

U.S. Cl. 108—42 **12 Claims**



1. A corner shelf assembly adapted to be mounted to a wall corner having a first wall surface and a second wall surface, said corner shelf assembly comprising:

(a) a bracket means including:

(1) a first plate means being securable with respect to the first wall surface, said first plate means including a first inner edge and a first outer edge;

(2) a second plate means being securable with respect to the second wall surface, said second plate means including a second inner edge and a second outer edge, said second inner edge being attached with respect to said first inner edge with said second plate means and said first plate means being at an angle of approximately ninety (90) degrees with respect to one another;

(3) a first lip means attached with respect to said first outer edge of said first plate means and extending outwardly therefrom at an angle of 45 to 90 degrees with respect thereto, said first lip means defining a first abutment edge at the outermost end thereof spatially disposed with respect to said second plate means;

(b) a shelf means including:

(1) a floor member extending generally horizontally to provide a surface for placement of articles upon said shelf means;

(2) a rear mounting section secured to said floor member and extending rearwardly therefrom;

(3) a mounting means located on said rear mounting section and which includes:

(a) a first abutment wall including a first abutment surface positionable in abutment with the first wall surface;

(b) a second abutment wall including a second abutment surface positionable in abutment with the second wall surface and being at approximately ninety (90) degrees with respect to said first abutment surface to provide continuous abutment of said corner shelf assembly with respect to the surrounding wall corner surfaces;

said mounting means defining a mounting recess positioned between said first abutment surface and said second abutment surface adapted to receive said bracket means therein to be fixedly secured thereto to mount said shelf means fixedly with respect to the wall corner with said first abutment surface in abutment with respect to the first wall surface and with said second abutment surface in abutment with respect to the second wall surface, said mounting recess being large enough to completely receive said bracket means therein to facilitate flush contact of the first abutment surface with respect to the first wall surface and of said second abutment surface with respect to the second wall surface;

(c) a first slot means located within said mounting recess adjacent said first abutment surface, said first slot means being adapted to receive said first lip means fixedly secured therein; and

(d) a second slot means located within said mounting recess adjacent said secord abutment surface, said second slot means being adapted to receive said second lip means fixedly secured therein.

4,727,816

TABLE

Julian A. Virtue, Los Angeles, Calif., assignor to Virco Mfg. Corporation, Los Angeles, Calif.

Filed Oct. 14, 1986, Ser. No. 918,486

Int. Cl.[4] A47B *7/00*

U.S. Cl. 108—91 **7 Claims**

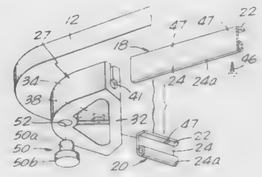
1. A table construction, comprising:

(a) a generally planar top;

(b) an apron assembly connected to said top, comprising:

(i) at least three elongated angle members each having a base and a generally perpendicularly extending wall connected to said base, said wall having end portions terminating in a curved lower edge portion; and

(ii) at least three one-piece, injection molded corner members attached to said planar top, each having a top wall, a spaced apart bottom wall, external side walls interconnecting said top and bottom walls, said external walls being provided with at least two vertically extending slots adapted to closely receive said end portions of said walls of said elongated angle members, internal side walls spaced from said external walls, and reinforcing means connected to said internal walls for structurally reinforcing said internal walls; and



(c) leg assemblies interconnected with said apron assembly for supporting said top in an elevated, generally horizontal plane, said lower edge portion of said wall of said angle members being generally circular in cross-section and the vertically extending slots formed in said external walls being formed to closely receive said angle members.

4,727,817

BUTTONHOLE SEWING MACHINE

Kouichi Sakuma, Yamagata, Japan, assignor to Suzuki Manufacturing, Ltd., Yamagata, Japan

Filed Sep. 11, 1985, Ser. No. 775,008

Claims priority, application Japan, Sep. 14, 1984, 59-194346

Int. Cl.[4] D05B *3/00, 69/00*

U.S. Cl. 112—65 **14 Claims**



1. A buttonhole sewing machine for sewing buttonholes in a workpiece comprising:

a machine body including a bed stand, a bed and an arm, said bed and said arm being fixed to said bed stand;

a motor mounted on said machine body;

an arm shaft mounted in arm;

a stitch forming device, for stitching the buttonholes, comprising:

a needle bar for supporting a needle;

a needle;

needle reciprocating drive means for driving said needle bar with vertically reciprocating motion;

vibrating means for laterally vibrating said needle bar; and

a looper and spreader and a bed shaft for driving said looper and spreader; and

workpiece clamping means slidably mounted on said bed, for moving the workpiece across the path of the needle;

a stitch feeding mechanism;

a camming mechanism for driving said work clamp carrier;

a vertical shaft operatively connected to said arm shaft, said bed shaft and said camming mechanism; and

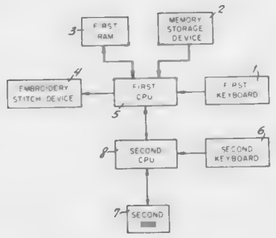
a clutch for transmitting torque from said said motor to said

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camming mechanism to drive said work clamp carrier in a rapid feed mode and for transmitting the torque from said motor, through at least one of said arm, vertical and bed shafts, to drive said stitch forming device in a stitch feeding mode.

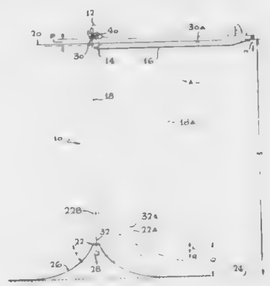
7. A buttonhole sewing machine for sewing buttonholes in a workpiece comprising:
a machine body including a bed, a bed stand and an arm;
an electric motor mounted on said machine body for driving said sewing machine;
an arm shaft mounted in said arm and driven by said motor;
workpiece clamping means for slidably mounted on said bed for moving the workpiece across the path of the needle;
a stitch forming device for stitching buttonholes in the workpiece, said stitch forming device comprising:
a needle bar for supporting a needle;
needle reciprocating drive means for driving said needle bar with vertically reciprocating motion;
vibrating means for laterally vibrating said needle bar;
a looper and spreader and a bed shaft for driving said looper and spreader;
a turning mechanism for turning said needle bar, said looper and said spreader;
a vertical shaft operatively connected to said arm shaft and to said bed shaft;
a stitch feeding mechanism, driven by said vertical shaft;
a rapid feed mechanism;
a camming mechanism driven by said stitch feeding mechanism, in a stitch feeding mode and by said rapid feed mechanism, in a rapid feed mode, to drive said work clamp carrier;
a clutch for selectively transmitting the torque of said motor either to an intermediate shaft to drive said rapid feed mechanism, in a rapid feed mode, or to one of said arm, vertical and bed shafts, to effect stitch forming, in a stitch feeding mode; and
intermittent brake means for braking said camming mechanism when the needle is engaged with the workpiece and for releasing the camming mechanism for stitch feeding.

4,727,818
EMBROIDERY MACHINE APPARATUS
Takashi Mizuno, and Akihiro Kobayashi, both of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Sep. 17, 1986, Ser. No. 908,241
Claims priority, application Japan, Sep. 30, 1985, 60-218322
Int. Cl.[4] D05C *5/06*
U.S. Cl. 112—78 **1 Claim**



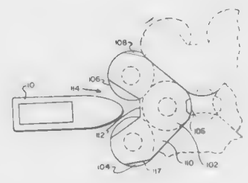
1. In an automatic embroidery machine wherein the embroidery mechanism is controlled by stitch data read out from a stitch data storage means by a first reading means and stored in a first memory means by a first storage means according to selected data codes input through a first code input means, a control device comprising:
a secondary code input means to input codes;
a secondary memory means to store codes input by said secondary code input means; and
a secondary reading means to read codes input to said secondary memory means.

4,727,819
SINGLE LINE MOORING SYSTEM
Jack Pollack, Reseda, Calif., assignor to Amtel, Inc., Providence, R.I.
Continuation-in-part of Ser. No. 603,434, Apr. 24, 1984, Pat. No. 4,637,335, which is a continuation-in-part of Ser. No. 438,322, Nov. 1, 1982, abandoned. This application Jan. 27, 1985, Ser. No. 802,860
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 **7 Claims**



2. In a mooring system wherein a vessel-mooring transfer structure near the sea surface is connected through a primarily vertical anchor line extending along most of the sea height to a chain table that is nearer the sea floor than the sea surface, the chain table being anchored by a plurality of chain device extending in different directions in catenary curves to the sea floor, the improvement comprising:
a weight and a chain device hanging said weight directly under said chain table, said chain device being short enough that the weight always lies a distance spaced above the sea floor when the transfer structure moors a vessel.

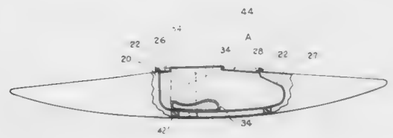
4,727,820
FLOATING DOCK
Damian Klaus, 21746 Comida Way, Topanga, Calif. 90290
Filed Sep. 15, 1986, Ser. No. 907,484
Int. Cl.[4] B63B *35/72*
U.S. Cl. 114—263 **5 Claims**



1. A floating dock comprising:
a. a generally flat, buoyant member having front and rear spaced-apart ends and sides connecting the front and rear ends;
b. a sufficiently large indentation in the rear end of the buoyant member to receive one end of a vessel; and
c. wherein the buoyant member comprises three inflatable rings arranged in a triangular configuration with a space

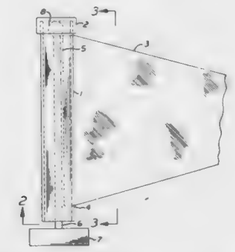
between two of the rings, a sheet of material on the rings and securing means associated with the sheet of material for holding the rings in their configuration.

4,727,821
DETACHABLE POD AND KAYAK
William E. Masters, P.O. Box 686, Liberty, S.C. 29657
Filed Sep. 29, 1986, Ser. No. 912,610
Int. Cl.[4] B63B *35/71*
U.S. Cl. 114—347 **35 Claims**



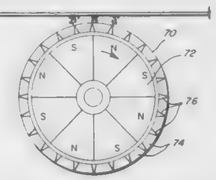
1. A kayak comprising:
an elongated hull having a fore and aft section and a hull interior;
a hull flange carried about a perimeter of an upper portion of said hull defining a deck opening;
a detachable pod unit carried by said hull including a pod deck carried in said deck opening and a pod compartment carried below said pod deck within said hull interior;
a pod deck rim carried by said pod deck mating with said hull flange in a manner that said hull and said pod unit may be releasably interconnected together;
a cockpit opening formed in said pod deck adapted for accommodating a boater in a seated position within said pod unit; and
attachment means securing said hull flange and pod deck rim together in a releasable manner so that said pod unit may be detached and separated from said hull to permit emergency egress from said kayak.

4,727,822
FLAG STAFF
Lance Wikkerink, 4908 62nd Ave. S., St. Petersburg, Fla. 33707
Filed Sep. 2, 1986, Ser. No. 902,490
Int. Cl.[4] G09F *17/00*
U.S. Cl. 116—174 **7 Claims**



1. A flagstaff comprising the combination of a tubular sleeve having an upper end and a lower end and a longitudinal axis, wherein said sleeve being provided with a cap having a bottom interior surface, said cap covering the upper end of said sleeve, said sleeve having a hollow interior, and a slot communicating with said hollow interior and running longitudinally over a substantial length of said sleeve parallel to the longitudinal axis of said sleeve; and (b) a generally stationary supporting staff having a linear axis and an upper end, said staff extending substantially vertically and adapted to fit into the interior of said sleeve whereby the bottom surface of said cap rests upon the upper end of said supporting staff in a manner so that the sleeve is free to rotate about the linear axis of said supporting staff.

4,727,823
MAGNETIC ROLL STRUCTURE FOR TRANSPORTING SINGLE COMPONENT MAGNETIC DEVELOPER
Michael D. Thompson, Rochester, and Clifford W. Imes, IV, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 28, 1985, Ser. No. 737,973
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—652 **5 Claims**



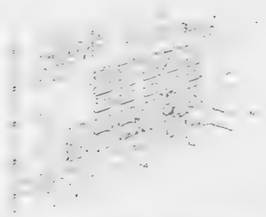
1. Developer transporting apparatus for moving single component magnetic developer between a charge-retentive surface and a sump, said apparatus comprising:
a sump for containing a quantity of developer particles;
a roll magnet having at least one north and one south pole for creating an oscillating magnetic field in the vicinity of said charge-retentive surface; and
a magnetic field amplifying structure comprising plurality of magnetic members embedded in a non-magnetic support and equally spaced therein and being narrower than the spacing between adjacent magnetic members, said structure being disposed intermediate said chargeretentive surface and said roll magnet, said magnetic members being pointed at the end thereof closest to said charge-retentive surface.

4,727,824
ABSORBENT COMPOSITION, METHOD OF MAKING AND USING SAME
Cyril L. Ducharme, Long Lake; Ralph C. Eickhof, Erskin; David A. Heider, St. Paul; Denny W. Neiberger, Minnetonka, all of Minn., and Fred Maass, Wheaton, Ill., assignors to Personal Pet Products Partnership, Minneapolis, Minn.
Filed Sep. 22, 1986, Ser. No. 909,966
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **16 Claims**

1. An absorbent composition comprising
(i) a major amount of a cellulosic component,
(ii) a minor amount of about 2–25% by weight of a binder based on the total weight of cellulosic material and binder; and
(iii) a nitrogenous compound absorber;
said binder consisting essentially of a material selected from the group consisting of carbohydrate, protein and mixtures thereof;
said cellulosic component comprising:
(a) from 50–100% by weight of a cellulosic hull material selected from the group consisting of cereal grain hulls, peanut hulls, soybean, rapeseed, sunflower and cottonseed hulls, and mixtures thereof and
(b) up to 50% by weight of plant pulp;
said nitrogenous compound absorber being cyclodextrin.

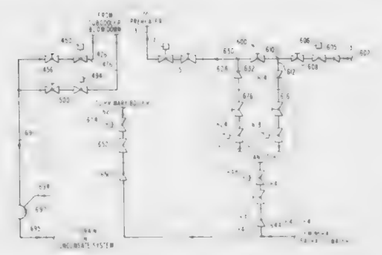
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4,727,825
PRIMATE EDUCATION DEVICE
Paul Houghton, 16230 Skyline Blvd., Woodside, Calif. 94062
Filed Jun. 26, 1986, Ser. No. 878,999
Int. Cl.[4] A63F 9/06
U.S. Cl. 119—29 9 Claims



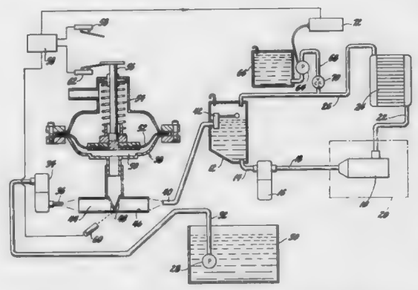
1. A device for enriching the environment of a contained primate, comprising a container means having a variable maze through which a primate can move an object, said maze being programmable to varying degrees of difficulty and said container means provided with a rear panel, an opposing front panel, and an interior therebetween, said front and rear panels having a plurality of substantially oppositely disposed access ports through which access to said interior of said container means may be had through each of said front and rear panels, wherein said device includes a means for instructing the primate as to the location of the correct path through the maze, said instructing means comprising a means for manipulating said object within said device through said rear panel, primate access to said object being through said front panel.

4,727,826
MODEL STEAM GENERATOR HAVING AN IMPROVED FEEDWATER SYSTEM
Robert Draper, Churchill Boro, and Donald G. Lorentz, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 636,449, Jul. 31, 1984, Pat. No. 4,635,489. This application Jun. 19, 1986, Ser. No. 876,036
Int. Cl.[4] F28G 9/00
U.S. Cl. 122—379 3 Claims



1. A process for testing the effects of feedwater additives on the rate of corrosion of the heat exchange tubes of a nuclear steam generator by means of a model steam generator having a feedwater system that includes a reservoir, a blow-down means operable at an adjustable rate, and at least one sample heat exchange tube, comprising the sequential steps of:
(a) collecting a sample of the feedwater flowing into the nuclear steam generator in the reservoir;
(b) mixing an additive into the feedwater in the reservoir, and
(c) circulating the resulting feedwater from the reservoir through the model steam generator, and
(d) operating the blow-down means at a rate high accelerates the accumulation of sludge within the model steam generator in order to operate the model steam generator in a mode which will predict the corrosion rate of the sample tube on an accelerated basis.

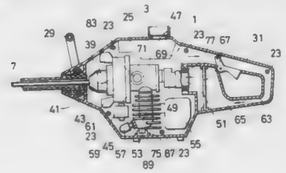
4,727,827
FUEL ADDITIVE METERING SYSTEM
Mark B. Hoffman, Orchard Lake, and Paul D. Ryan, Mount Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 25, 1986, Ser. No. 934,772
Int. Cl.[4] F02B 75/12
U.S. Cl. 123—1 A 5 Claims



1. A fuel additive metering system for an engine having a fuel injection pump that draws fuel from a fuel supply, delivers a portion of the fuel to the engine, and directs excess fuel back to said supply, said fuel additive metering system comprising a reservoir forming said supply and including means for controlling admission of additional fuel to said reservoir to maintain a constant volume of fuel therein, a fuel metering unit measuring the rate at which such additional fuel is admitted to said reservoir, an additive pump delivering an additive to said reservoir for mixing with the fuel therein, and means for controlling said additive pump to proportion the rate at which additive is fed to the reservoir to the rate at which such additional fuel is admitted to said reservoir, whereby the amount of additive delivered to the engine is proportioned to the amount of fuel consumed by the engine.

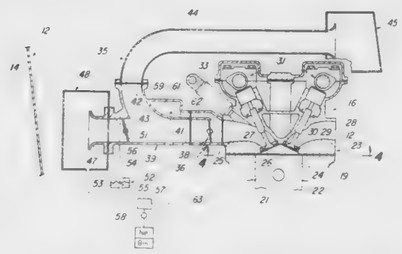
4,727,828
PORTABLE ENGINE UNIT
Tetsuo Ueno, Tokyo; Katsumi Kiyooka, Saitama; Hideko Inomata, Tokyo; Akira Gamoh, Tokyo; Keiko Iramina, Tokyo, and Takashi Ooniwa, Tokyo, all of Japan, assignors to Komatsu Zenoah Company, Japan
Filed Mar. 26, 1986, Ser. No. 844,539
Claims priority, application Japan, Mar. 29, 1985, 60-63814; Mar. 29, 1985, 60-63815; Mar. 29, 1985, 60-44951[U]; Apr. 19, 1985, 60-57412[U]; Apr. 19, 1985, 60-57413[U]; Apr. 26, 1985, 60-61845[U]; Apr. 26, 1985, 60-61846[U]; Apr. 26, 1985, 60-61849[U]
Int. Cl.[4] F02B 63/00
U.S. Cl. 123—2 25 Claims

1. A portable engine unit comprising:
an engine including a clutch, a crankcase enclosing a crank shaft, and engine cylinder having a piston and a piston rod, a carburator, an air filter, a recoil starter, and a muffler;
a connection pipe through which a transmission shaft rotated by said engine is rotatably inserted, and said connection pipe having two ends; and
a housing for enclosing said engine, said housing having a front portion and a rear portion, and further comprising a fitting portion provided on the front portion of the housing and supporting one end of the connection pipe therein fixedly, and a handle provided on the rear portion of the



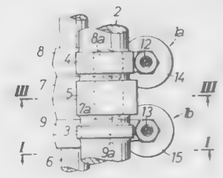
housing, wherein said housing is divisable into two portions along a plane including said fitting portion, said handle and the axis of the transmission shaft.

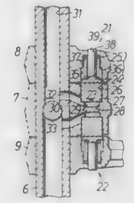
4,727,829
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE
Takeo Kondo, Iwata; Tetsuji Yamazaki, Kakegawa, and Keiichi Sugiyama, Shizuoka, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Apr. 21, 1986, Ser. No. 854,151
Claims priority, application Japan, Apr. 23, 1985, 60-85354; Apr. 23, 1985, 60-85355
Int. Cl.[4] F02B 27/02
U.S. Cl. 123—52 MB 14 Claims



1. An intake system for an internal combustion engine having a cylinder head defining in part a variable volume chamber, an inlet port extending from an inlet opening in one side of said cylinder head and serving said chamber, a first intake passage affixed to said one side of said cylinder head and serving said inlet port opening, said first intake passage extending outwardly of said one side of said cylinder head and forming an extension of said inlet port, a second intake passage serving said inlet port, said second intake passage having a first U shaped section communicating at one end with said first intake passage and communicating at its other end with a generally straight section extending across said cylinder head and terminating at an opposite side of said cylinder head, said second intake passage having a substantially greater length than said first intake passage, throttle valve means for selectively controlling the flow through said intake passages, and a common inlet device for supplying air to both of said intake passages.

4,727,830
VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION ENGINE
Kenichi Nagahiro; Yoshio Ajiki; Masaaki Katoh, all of Saitama, and Kazuo Inoue, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 31, 1986, Ser. No. 891,753
Claims priority, application Japan, Jul. 31, 1985, 60-168716; Jul. 31, 1985, 60-168714; Jul. 31, 1985, 60-168718
Int. Cl.[4] F01L 1/26
U.S. Cl. 123—90.16 18 Claims





1. A valve operating mechanism for operating a pair of valves of an internal combustion engine, comprising:
a camshaft rotatable in synchronism with rotation of the internal combustion engine and having a plurality of cams of different cam profiles;
a plurality of rocker arms held in sliding contact with said cams, respectively, for operating the valves according to the cam profiles of said cams; and
means for independently selectively interconnecting and disconnecting selected of said rocker arms to operate the valves at different valve timings in low, medium and high speed ranges of the internal combustion engine.

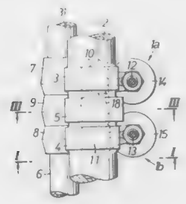
4,727,831
VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION ENGINE
Kenichi Nagahiro; Yoshio Ajiki; Masaaki Katoh, all of Saitama, and Kazuo Inoue, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 31, 1986, Ser. No. 891,754
Claims priority, application Japan, Jul. 31, 1985, 60-168717
Int. Cl.[4] F01L 1/26
U.S. Cl. 123—90.16 14 Claims

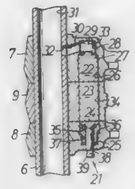
1. A valve operating mechanism for operating a pair of valves of an internal combustion engine, comprising:
a camshaft rotatable in synchronism with rotation of the internal combustion engine and having a first low-speed cam, a second low-speed cam, and a high-speed cam which have different cam profiles, respectively, said first and second low-speed cams being disposed one on each side of said high-speed cam;
a rocker shaft;
first, second, and third rocker arms rotatably mounted on said rocker shaft and held in sliding contact with said first

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low-speed cam, said second low-speed cam, and said high-speed cam, respectively, for operating the valves according to the cam profiles of said cams; and

means operatively disposed in and between said first, second, and third rocker arms for selectively interconnecting the first, second, and third rocker arms to allow angular movement thereof in unison and disconnecting said first, second, and third rocker arms to allow separate angular movement thereof.





4,727,832

ROLLER ROCKER ARM

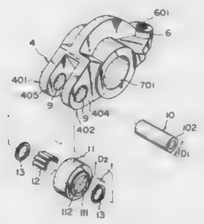
Noriyuki Miyamura, and Shuji Nagano, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 12, 1987, Ser. No. 61,693

Claims priority, application Japan, Jun. 13, 1986, 61-137733; Jun. 13, 1986, 61-90419; Jun. 13, 1986, 61-90420; Jun. 13, 1986, 61-90421; Jun. 13, 1986, 61-90423

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.44 **11 Claims**



1. A roller rocker arm comprising a rocker arm body having a rocking center hole through which a rocker shaft is inserted and a pair of forked projections, and adapted to be rockably supported to said rocker shaft; a hollow roller pin inserted into a pair of pin holes formed through said pair of forked projections, and fixed between said pair of forked projections in a direction perpendicular to a tangent of a circle about a rocking center axis of said rocker arm body; a cam follower roller through which said roller pin is inserted; a plurality of needle rollers interposed between said cam follower roller and said roller pin for rotatably supporting said cam follower roller to said roller pin in such a manner as to extend in parallel one another in a longitudinal direction of said roller pin; a pair of disk-like spacers rotatably supported to said roller pin and interposed between ends of said needle rollers and said projections; and an adjuster mounted in said rocker arm body and adapted to abut against a valve.

4,727,833

SEALING STRUCTURE OF CYLINDER HEAD COVER

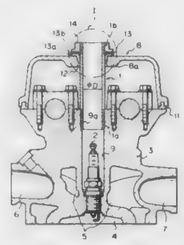
Nakashima Mikio, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 12, 1986, Ser. No. 930,303

Claims priority, application Japan, Nov. 18, 1985, 60-176186[U]

Int. Cl.[4] F02F *7/00*

U.S. Cl. 123—195 C **4 Claims**



1. A structure for mounting a cylinder head cover on a cylinder head of an internal combustion engine, the cylinder head having plug holes for mounting ignition plugs therethrough, a plug tube fixedly inserted into each of the plug holes and protruding upward from the cylinder head, the cylinder head cover being mounted on the cylinder head via a sealing gasket arranged therealong, wherein said mounting structure comprises:

the cylinder head cover having plug mounting holes, each of which is formed in substantially reversed-conical surface having a diameter that becomes gradually smaller toward the lower portion thereof, the plug tube having a male thread portion at an upper end thereof protruding upward from the cylinder head cover through the plug mounting hole, a grommet having an annular sealing lip fitted to the upper end of the plug tube, and a fastening nut engaged with and fastened to a male thread portion of the plug tube to urge the grommet downward so that said sealing lip of the grommet is sealingly pressed into a gap between the reverse-conical surface of the cylinder head cover and an outer peripheral surface of the plug tube, so as to tightly seal away oil contained in the cylinder head cover.

4,727,834

VERTICAL ENGINE FOR WALK BEHIND LAWN MOWER

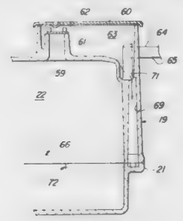
Yoshiharu Isaka, and Kiyohiko Oguri, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jun. 9, 1987, Ser. No. 60,068

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 W **29 Claims**

1. In a lubricating system for an internal combustion engine adapted to power an implement such as a lawn mower operated normally in an erect position and tiltable on its side to a service position, said engine comprising a crankcase defining a crankcase chamber, an engine output shaft journaled within said crankcase for rotation about a generally vertically extending axis when the associated implement is in its normal erect operating position and movable toward a generally horizontal position when said implement is tilted on its side to its service position, said crankcase defining a reservoir for engine lubricant, an induction system for providing combustion air for said engine, said induction system including an air inlet device for receiving atmospheric air for delivery to said engine, and a crankcase ventilating system for said crankcase chamber comprising a crankcase air inlet for receiving gases from said crankcase and conduit means extending from said crankcase air inlet to said air inlet device for recirculating crankcase gases to said engine through said induction system, said crankcase air inlet lying above the level of lubricant in said crankcase regardless of whether the associated implement is in its normal erect position or on its side in its service position for precluding lubricant from flowing into said air inlet device.



4,727,835

FUEL INJECTION DEVICE IN DIESEL ENGINE

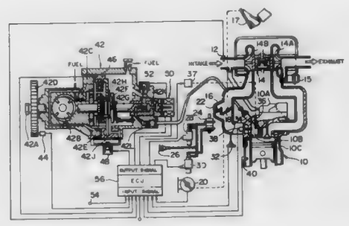
Fumiaki Kobayashi, Toyota; Mamoru Kobashi, Aichi; Mamoru Takata, Toyota; Masahiko Miyaki, Oobu, and Takashi Hasegawa, Tazimi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Ltd., both of Aichi, Japan

Filed Mar. 4, 1986, Ser. No. 836,079

Claims priority, application Japan, Mar. 4, 1985, 60-42143

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—198 DB **9 Claims**



1. A fuel injection device in a diesel engine wherein a fuel injection quantity fed to the engine is controlled by spilling a part of fuel fed from a high pressure chamber of a fuel injection pump using a high pressure electromagnetic valve, said valve being on-off controlled in accordance with the engine operating conditions, comprising:

fuel cut means for cutting said fuel injection quantity fed to the engine;

switch means provided between said high pressure electromagnetic valve and power source:

a driving circuit provided between said high pressure electromagnetic valve and ground, for on-off controlling said electromagnetic valve; and

trouble detecting means for monitoring a signal for driving said electromagnetic valve, and opening said switch means to keep said electromagnetic valve in a constantly deenergized condition and drive said fuel cut means to cut the fuel injection quantity fed to the engine when said electromagnetic valve is placed in an enegizing condition by said signal for driving said electromagnetic valve for more than a predetermined period.

4,727,836

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

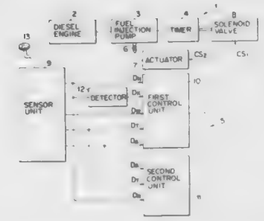
Hidekazu Oshizawa, and Kenji Okamoto, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Continuation of Ser. No. 686,726, Dec. 27, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 940,188

Claims priority, application Japan, Dec. 27, 1983, 58-244825

Int. Cl.[4] F02M *59/20*

U.S. Cl. 123—357 **9 Claims**



1. A fuel injection apparatus for an internal combustion engine in which the fuel injection timing and the amount of fuel injection are controlled in response to at least one condition signal indicating the operating condition of the engine, comprising:

a first control means for controlling the fuel injection timing by timing data provided in response to said condition signal; and

a second control means for controlling the amount of fuel injection in response to said condition signal and timing data concerning the fuel injection timing set by said first control means, said second control means being provided with a first means for producing first fuel injection data for setting the maximum fuel injection amount at each instant and ajusting said timing data in such a way that the engine torque corresponding to the maximum fuel injection does not substantially change even when the fuel injection timing is adjusted by said first control means.

4,727,837

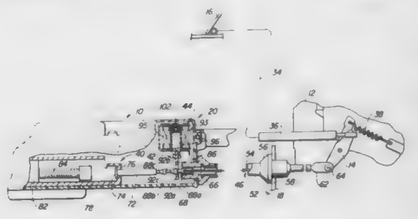
ENGINE GOVERNOR WITH EMERGENCY THROTTLE LIMITER

Harry D. Sturdy, Wilmington, N.C., assignor to Sturdy Corporation, Wilmington, N.C.

Filed Apr. 30, 1987, Ser. No. 44,225

Int. Cl.[4] F02D *31/00*

U.S. Cl. 123—361 **4 Claims**



1. In a governor for an engine having a throttle movable between an open throttle position and a close throttle position for regulating the flow of fuel to the engine, said governor being of the type comprising an overriding throttle closing

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means, a control means including engine speed sensing means, and actuating means for moving said throttle closing means to a position for limiting the engine speed to a predetermined governed value, said governor being of the type which requires electrical power supply for operation and including an electrical conductor for supplying electrical power to the governor from a power source, the improvement comprising:

holding means for arresting said overriding throttle closing means against movement in the open throttle direction,

and control means for operating said holding means to arrest said overriding throttle control means in response to interruption of the supply voltage to said governor,

whereby movement of the throttle in the open throttle direction is prevented.

4,727,838

APPARATUS FOR CONTROLLING INTERNAL COMBUSTION ENGINE

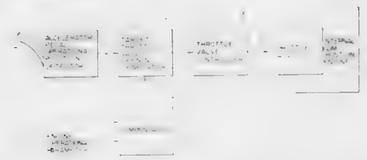
Katsunori Oshiage, Yokohama; Satoshi Takizawa, Yokosuka; Nobuo Kurihara, Hitachiota, and Yasunori Mouri, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of, Japan

Filed May 5, 1987, Ser. No. 46,142

Claims priority, application Japan, May 9, 1986, 61-104879

Int. Cl.[4] F02D *41/10*

U.S. Cl. 123—361 **1 Claim**



1. An apparatus for controlling an internal combustion engine comprising an accelerator pedal operational position detector for detecting an operational position of an accelerator pedal that is operated by a driver; a target throttle valve opening generator for generating a target throttle valve opening in accordance with a predetermined function in response to the operational position of the accelerator pedal; and a throttle valve controller for controlling an opening of a throttle valve of an engine to said target throttle valve opening, wherein means is provided for compensating, during acceleration operation, for the target throttle valve opening in response to operational positions of the accelerator pedal immediately before and after the acceleration operation and an operational parameter of the engine immediately before the acceleration.

4,727,839

PNEUMATIC DIAPHRAGM CONTROL ELEMENT FOR A FUEL INJECTION APPARATUS IN INTERNAL COMBUSTION ENGINES

Werner Brühmann, Stuttgart; Werner Lehmann, Gerlingen, and Matthias Schmidt, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

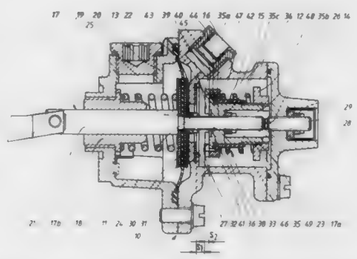
Filed Mar. 10, 1986, Ser. No. 938,070

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508519; Dec. 7, 1985, 3543334

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—383 **13 Claims**

1. A pneumatic diaphragm control element for a fuel injection apparatus having a control member in internal combustion engines, particularly supercharged Diesel engines, comprising a housing, a thrust rod arranged to act on said control member of said fuel injection apparatus, said thrust rod being connected to a diaphragm fastened in said housing and arranged to protrude into a pressure chamber defined on one side by said diaphragm and on the other side by housing cover, a restoring spring in said housing adapted to cooperate with said thrust rod and an adjustable abutment in said housing, said pressure chamber arranged to enclose first and second end stops for limiting the axial displacement of said thrust rod, said first end stop including a screw means adjustably supported in said housing cover in axial alignment with an end of said thrust rod and arranged to define a position of repose assumed by said thrust rod determined by a pressure-free condition in said pressure chamber, said second of said end stops disposed in said pressure chamber is adapted to define the operating position of said thrust rod assumed at a pre-specified pressure in said pressure chamber, said second end stop further arranged to cooperate with a counterpart stop that is adjustable relative to said thrust rod and is coupled therewith over at least a portion of the displacement travel thereof, said counterpart stop being further embodied as part of a prestressed spring



assembly which contains at least one compression spring having at least two axially disposed stop positions, said spring assembly is disposed in the pressure chamber and embodied as a pre-assembled unit with infinitely adjustable spring prestressing force of the compression spring, said spring assembly includes two components that are coaxial with said thrust rod and said compression spring is disposed axially therebetween, said two components being displaceable relative to one another and operatively connected to said thrust rod so that a relative movement that compresses said compression spring does not begin until after the attainment of first stop position whereby a first displacement travel (S_1) of said thrust rod upon attaining said first stop position and after the spring pre-stressing force of the compression spring is overcome, a further displacement travel (S_2) of said thrust rod is available up to the attainment of said second stop position at said second end stop.

4,727,840

THROTTLE VALVE CONTROL DEVICE

Minoru Nishida, and Hideaki Katashiba, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 34,974

Claims priority, application Japan, Apr. 4, 1986, 61-78764

Int. Cl.[4] F02D *9/08*

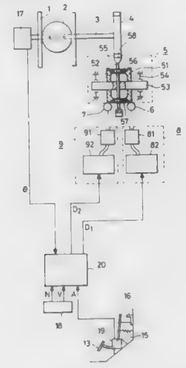
U.S. Cl. 123—399 **2 Claims**

1. A throttle valve control device comprising:

a valve shaft for operating a throttle valve adapted to vary the output of an engine;

a differential gear device for driving said valve shaft, said differential gear device having first and second drive gears;

first and second electronic control actuators for rotating said first and second drive gears of said differential gear device, respectively; and



an opening degree sensor for detecting a degree of opening of said throttle valve.

4,727,841

SYSTEM FOR CONTROLLING INTERNAL COMBUSTION ENGINE USING KNOCKING AND OVERTEMPERATURE PREVENTING FUEL CORRECTION

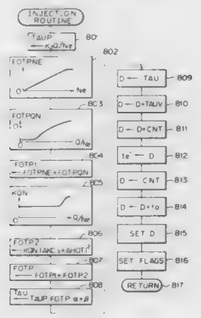
Kiyoo Hirose, and Yoshihiko Matsuda, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 29, 1986, Ser. No. 902,962

Claims priority, application Japan, Aug. 29, 1985, 60-188345

Int. Cl.[4] F02D *43/04*

U.S. Cl. 123—425 **10 Claims**



1. A method for controlling an internal combustion engine comprising the steps of:

calculating a base fuel amount in accordance with first predetermined parameters of said engine;

calculating a base ignition timing in accordance with second predetermined parameters of said engine;

calculating a retard amount of said base ignition timing in accordance with third predetermined parameters of said engine;

calculating a fuel incremental amount by using a curvilinear function having a positive secondary differential value with respect to said retard amount of said base ignition timing;

adjusting an actual air-fuel ratio in accordance with said base fuel amount corrected by said fuel incremental amount; and

controlling an actual ignition timing in accordance with said base ignition timing corrected by said retard amount of said base ignition timing.

4,727,842

ENGINE IGNITION TIMING CONTROL APPARATUS

Nobutaka Takahashi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 19, 1986, Ser. No. 943,806

Claims priority, application Japan, Dec. 20, 1985, 60-285812

Int. Cl.[4] F02P *5/14*

U.S. Cl. 123—425 **5 Claims**



1. An apparatus for controlling the timing of ignition of an internal combustion engine including at least one cylinder, comprising:

sensor means sensitive to combustion pressure in said cylinder for providing a sensor signal indicative of a sensed cylinder combustion pressure; and

a control circuit including means coupled to said sensor means for measuring a crankshaft angle at which the cylinder combustion pressure is at maximum, means for retarding the ignition timing in response to the measured crankshaft angle being less than a first value, means for retaining the ignition timing in response to the measured crankshaft angle being between the first and a second value greater than the first value, and means for advancing the ignition timing in response to the measured crankshaft angle being greater than the second value.

4,727,843

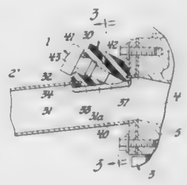
MOUNTING RETAINER FOR ELECTROMAGNETIC FUEL INJECTOR

Tim K. Petersen, Clarkston, and Ronald J. Frawley, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1982, Ser. No. 427,665

Int. Cl.[4] F02M *61/14*

U.S. Cl. 123—470 **4 Claims**



1. A retainer for supporting a fuel injector in position for the

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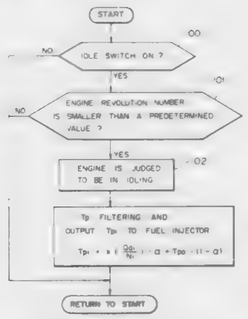
discharge of fuel from its discharge end portion through a retainer opening in an inlet manifold of an internal combustion engine, said retainer, molded of elastomeric material being in the form of a grommet and including a base portion of a configuration and size so as to overlie the retainer opening in the inlet manifold and; having a circumferential extending groove around its outer peripheral surface whereby it is adapted for mounting in the retainer opening in the inlet manifold; said retainer further including an integral boss extending from one side of said base portion; and, a socket bore extending through said base portion and said boss which is adapted to sealingly receive the discharge end portion of the fuel injector.

4,727,844

APPARATUS FOR CONTROLLING IDLING SPEED OF MOTOR VEHICLE ENGINE

Kiyomi Morita, Katsuta, and Junji Miyake, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,375
Claims priority, application Japan, Apr. 9, 1986, 61-81649
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—480 **3 Claims**



1. An apparatus for controlling at the time of idling the rotational speed of an engine having an injector for injecting fuel in proportion to the width of an input pulse, comprising: a rotational speed sensor for cyclically detecting the rotational speed (N) of said engine; an airflow meter for cyclically detecting the quantity (Qa) of air being sucked into said engine; an idle switch for detecting the complete closing of a throttle valve; a judging means for judging that said engine is in the idling condition on the basis of the output of said idle switch and the output of said rotational speed sensor; and an operating means for cyclically outputting to said injector a fuel injection pulse having a width (Tp) obtained by the following expression on the basis of the output of said rotational speed sensor and the output of said airflow meter when said judging means has judged that said engine is in the idling condition:

$$Tp_1 = k(Qa_1/N_1)\cdot\alpha + Tp_0(1-\alpha)$$

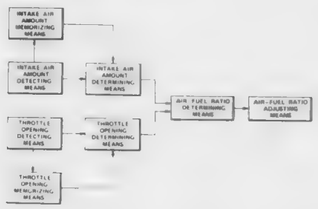
Tp_1: width of a pulse to be output at the present time
Tp_0: width of a pulse which was output the previous time
Qa_1: the presently detected value for the quantity of air being sucked in
N_1: the presently detected value for the engine rotational speed
α: filter constant, $0<\alpha<1$
k: constant,

4,727,845

AIR-FUEL RATIO CONTROL APPARATUS FOR ENGINES

Masanori Misumi; Masashi Marubara; Makoto Hotate, and Hiroyuki Oda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1987, Ser. No. 42,505
Claims priority, application Japan, Apr. 28, 1986, 61-96913
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—488 **12 Claims**



1. An air-fuel ratio control apparatus for an engine comprising:
intake air amount detecting means for detecting an amount of intake air supplied to the engine and providing a signal corresponding to said amount of intake air;
intake air amount memorizing means for memorizing the amount of intake air detected by said intake air amount detecting means;
throttle opening detecting means for detecting an opening degree of a throttle valve mounted in an intake passage of the engine and providing a signal corresponding to the throttle opening;
throttle opening memorizing means for memorizing the throttle opening detected by said throttle opening detecting means;
intake air amount determining means for determining a smoothed amount of intake air so as to reflect a predetermined ratio of a former amount of intake air memorized in said intake air amount memorizing means to a current amount of intake air corresponding to an output from said intake air detecting means;
throttle opening determining means for determining a smoothed throttle opening so as to reflect a ratio of a former throttle opening memorized in said throttle opening memorizing means to a current throttle opening at said predetermined ratio;
air-fuel ratio determining means for the air-fuel ratio of an air-fuel mixture supplied to the engine on the basis of the respective outputs from said intake air amount determining means and said throttle opening determining means; and
air-fuel ratio adjusting means for adjusting an air-fuel ratio of the air-fuel mixture supplied to the engine so as to become the air-fuel ratio determined by said air-fuel ratio determining means.

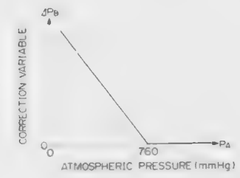
4,727,846

METHOD OF CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AT DECELERATION

Akihiro Yamato, Shiki, and Takafumi Nishikawa, Utsunomiya, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,218
Claims priority, application Japan, Oct. 15, 1984, 59-214215
Int. Cl.[4] F02D *41/10*
U.S. Cl. 123—493 **8 Claims**

1. A method of controlling the fuel supply to an internal combustion engine at deceleration, said engine having an intake passage, wherein (i) the fuel supply to said engine is decreased when said engine is in a first predetermined operating region where leaning of the air-fuel mixture is required when the pressure in said intake passage is lower than a first predetermined value, and (ii) the fuel supply to said engine is cut when said engine is in a second predetermined operating region where fuel cut is required when the pressure in said intake passage is lower than a second predetermined value, said second predetermined value being lower than said first predetermined value, the method comprising the steps of:
(1) prestoring a correction variable look-up table having a one-to-one correlation between atmospheric pressure and a correction variable which decreases in value as the atomspheric pressure increases;



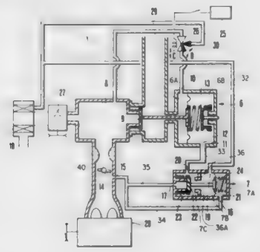
(2) detecting the atmospheric pressure encompassing said engine;
(3) selecting from said look-up table a correction value corresponding to the detected atmospheric pressure;
(4) setting said first predetermined value to a value equal to the difference between a first basic value corresponding to standard atmospheric pressure and said correction value; and
(5) setting said second predetermined value to a value equal to the difference between a second basic value corresponding to standard atmospheric pressure and said correction value,
whereby only a single look-up table is employed, and the same correction value is applied to both said first and second predetermined values.

4,727,847

PRESSURE CONTROLLER FOR SUPERCHARGED INTERNAL COMBUSTION ENGINES

Toshio Takeda; Noriyoshi Shibata, both of Nagoya, and Toru Tamura, Obu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 7, 1986, Ser. No. 837,274
Claims priority, application Japan, Mar. 8, 1985, 60-46131
Int. Cl.[4] F02B *33/38*
U.S. Cl. 123—564 **2 Claims**



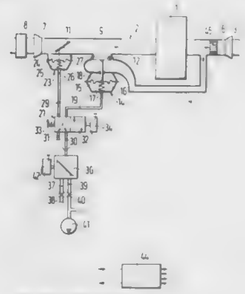
1. A supercharged pressure controller for an internal combustion engine having an engine air intake passageway including a carburetor with a throttle valve, comprising:
a supercharger located upstream of the carburetor,
a surge tank located between said supercharger and the carburetor,
a relief valve connected to said surge tank for releasing air from the surge tank when it opens,
a switch valve communicating with ambient air, and a port formed downstream of the throttle valve,
a vehicle speed sensor;
a solenoid controlled valve connected to said vehicle speed sensor and communicating with ambient air, said surge tank and said relief valve,
said switch valve being so constructed as to supply a negative pressure or an ambient air pressure to said relief valve according to a pressure generated at said port formed downstream of the throttle valve,
said relief valve being so constructed as to be opened when the difference between the pressure in the surge tank and the pressure supplied to the relief valve from said switch valve exceeds a predetermined degree, and
said solenoid controlled valve being so constructed as to make said relief valve communicate with said surge tank when the vehicle speed exceeds a predetermined value to assist the opening action of the relief valve.

4,727,848

DEVICE FOR AND METHOD OF SUPPLYING CASES INTO A COMBUSTION SPACE OF A SELF-IGNITING INTERNAL COMBUSTION ENGINE

Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 763,356, Aug. 7, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,523
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1984, 3429909; Dec. 8, 1984, 3444877
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—569 **21 Claims**



5. A method of controlling supply of gas including air and returned exhaust gas components, into a combustion space of a self-igniting internal combustion engine, comprising the steps of supplying, in a first operational condition of the engine, an unthrottled quantity of sucked-in air and a controlled quantity of returned exhaust gas component to a quantity of fuel to be injected into the combustion space whereby the quantity of supplied exhaust gas component is pneumatically controlled in dependency on said quantity of fuel such as to match for optimum combustion the supplied air with the supplied fuel and, in a second operational condition of the engine supplying to a quantity of fuel to be injected into a controlled quantity of air while interrupting the supply of the exhaust gas component whereby the supplied air is pneumatically throttled in dependency on operational variables of the engine.

11. A device for controlling the supply of gases including air and recycled exhaust gas components into a combustion space

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of a self-igniting internal combustion engine, comprising an air intake system, an exhaust gas collection system, an exhaust gas return conduit communicating with the air intake system; a control member arranged between the exhaust gas return conduit and the air intake system, the control member being arranged for controlling communication between said return conduit and said air intake system, a first pressure activated setting motor including a control pressure chamber, a reference pressure chamber and a movable wall therebetween, said movable wall being connected to said control member, a first source of pressure and a second source of reference pressure, an electrically activated pressure transformer having input ports connectable respectively to said first and a second pressure sources and an output port providing a control pressure formed from said first and second pressure sources and being connectable by connecting means to said control pressure chamber an electric control circuit for generating a control signal corresponding to operational variables of the engine, particularly to a sucked in quantity of air and to a supplied quantity of fuel, the control signal controlling the actuation of said pressure transformer, said air intake system including an air throttle normally biased into open position to freely pass fresh air into the engine, a second pressure activated setting motor including a control pressure chamber, a reference pressure chamber and a movable wall therebetween, the movable wall of the second setting motor being liked to said air throttle, the control pressure chamber of said second setting motor being connectable by connecting means to the output port of said electrically activated pressure transformer which output port being connectable to said control pressure chamber of said first setting motor, said pressure transformer including a single electrically controlled pressure transforming unit and said connecting means including an electrically controlled directional control valve having a first port connected to the output port of said pressure transforming unit, a second port connected to said reference pressure source, a third port connected to said control pressure chamber of the first setting motor and a fourth port connected to the control pressure chamber of said second setting motor to selectively connect one of said control pressure chambers to said output port of said pressure transforming unit, said electric control circuit being connected to said connecting means and to said electrically controlled pressure transformer to apply pressure into the control chambers of respective setting motors in such a manner that in one operational condition of the engine during which exhaust gas is recycled the control pressure chamber of the second setting motor is supplied with reference pressure from said second pressure source and the control pressure chamber of the first setting motor is supplied via said output port of said pressure transforming unit with control pressure, and in another operational condition of the control pressure chamber of the first setting motor is supplied with reference pressure from the said second pressure source and the control pressure chamber of the second setting motor is supplied via said output port of said pressure transforming unit with control pressure.

4,727,849

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Minoru Nishida, and Noriyuki Inoue, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,422

Claims priority, application Japan, Apr. 24, 1986, 51-95608; Aug. 6, 1986, 51-185735

Int. Cl.⁴ F02M *25/06*

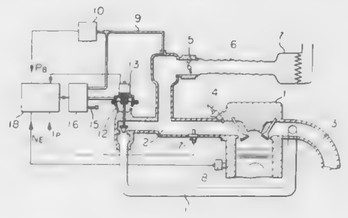
U.S. Cl. 123—571 **5 Claims**

1. An exhaust gas recirculation control system for an internal combustion engine which comprises;

an exhaust gas recirculation control valve for controlling a recirculation rate for exhaust gas to be mixed with intake air which is supplied to the internal combustion engine,

an oxygen sensor disposed in an intake air passage downstream of said control valve to detect the concentration of oxygen in the intake air,

a control means which compares the oxygen concentration detected by said oxygen sensor with a desired oxygen concentration previously determined depending on operational conditions of the engine and controls the degree of opening of said exhaust gas recirculation control valve so as to cancel the deviation between the detected oxygen concentration and the desired oxygen concentration,



a detecting means for detecting the exhaust gas recirculation rate being zero to supply a signal to said control means on the basis of the detection, and

a correcting means for correcting the corresponding relation between the output of said oxygen sensor and the detected oxygen concentration on the basis of the output of the oxygen sensor when the exhaust gas recirculation rate is zero.

4,727,850

SECONDARY AIR CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

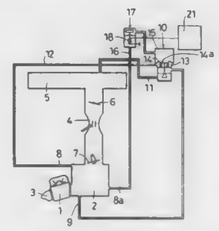
Hideo Kobayashi; Haruo Shimamura, and Hiroshi Hasebe, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,475

Claims priority, application Japan, Oct. 3, 1984, 59-207551

Int. Cl.⁴ F02M *23/10*

U.S. Cl. 123—588 **6 Claims**



1. A secondary air control system for an air intake passage of an internal combusion engine connected to a transmission of a vehicle comprising, a secondary air passage connected to the air intake passage, a secondary air control valve connected to said secondary air passage for controlling air flow therethrough, means for detecting two conditions, namely, a low engine temperature and a neutral position of the transmission, and for causing closing of said secondary air control valve upon the occurrence of both said conditions but allowing opening of said secondary air control valve upon the lack of either of said conditions detected, said detecting and closing means including a solenoid operated valve disposed within a vacuum air passage connected to said secondary air control valve for causing said closing and allowing said opening of said secondary air control valve.

4,727,851

MAGNETO IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

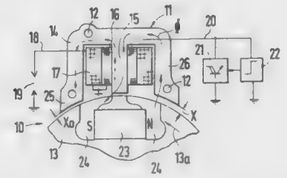
Josef Orova, Schwabach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1986, Ser. No. 926,636

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541737

Int. Cl.⁴ F02P *3/06*

U.S. Cl. 123—601 **12 Claims**



1. Magneto ignition system for an internal combustion engine having

a magneto generator driven by the internal combustion engine (ICE) including a pole wheel having a magnet (**23**) thereon, driven by the ICE;

an ignition circuit armature core (**14**, **14***a*) of generally E shape, having a center leg (**15**) and—with reference to the direction of rotation of the ICE and hence of the pole wheel a leading leg (**26**, **26***a*) and a trailing leg (**25**);

a primary winding (**16**) and a secondary winding (**17**) wound on the core;

a spark plug (**19**) coupled to the secondary winding;

a controlled switching element (**21**) coupled to the primary winding (**16**);

a control circuit (**22**) coupled to the primary winding and controlling the switching element (**21**) to change state at an ignition instant determined by the control circuit, to thereby induce a high-voltage pulse in the secondary winding (**17**) and cause a spark at the spark plug (**19**), and comprising, in accordance with the invention,

means to prevent spurious advance flash-over or spark at the spark plug as the magnet (**23**) on the pole wheel (**13**) passes the leading leg (**26**, **26***a*) of the core (**14**, **14***a*), including

forming the leading leg (**26**, **26***a*) of the E core (**14**, **14***a*) to have a lower inductivity than the trailing leg (**25**) of the E core.

4,727,852

MULTI-WAFER SLICING WITH A FIXED ABRASIVE

Frederick Schmid, Marblehead; Chandra P. Khattak, Danvers, and Maynard B. Smith, Amesbury, all of Mass., assignors to Crystal Systems Inc., Salem, Mass.

Division of Ser. No. 491,997, May 5, 1983, Pat. No. 4,646,710, which is a continuation-in-part of Ser. No. 421,120, Sep. 22, 1982, abandoned, which is a continuation of Ser. No. 201,247, Oct. 27, 1980, abandoned. This application Aug. 5, 1985, Ser. No. 762,493

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.⁴ B28D *1/02*

U.S. Cl. 125—16 R **13 Claims**

1. In a cutting machine comprising

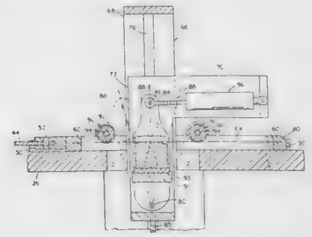
a wire cutting blade,

means for moving said blade through a longitudinally-extending cutting region,

a workpiece holder mounted to move a workpiece towards and into cutting contact with a longitudinally-extending portion of said blade along a movement axis generally perpendicular to the portion of said blade facing towards said workpiece, and

means for biasing said workpiece holder along said movement axis towards and into said cutting contact with said blade,

that improvement comprising means for rocking said workpiece holder about a rocking axis perpendicular to the longitudinally-extending portion of said blade in cutting contact with said workpiece and to said movement axis



while said workpiece is in cutting contact with said blade, whereby said rocking decreases the contact length of said longitudinally-extending portion of blade and said workpiece and thus increases the pressure between said blade and said workpiece without increasing the force applied to said blade by said means for biasing.

4,727,853

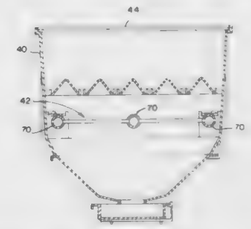
SEAR GRID FOR PORTABLE GRILL

James C. Stephen, Arlington Heights; Charles W. Lohmeyer, Barrington, and Erich J. Schlosser, Lindenhurst, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 8, 1985, Ser. No. 763,858

Int. Cl.⁴ A47J *37/00*

U.S. Cl. 126—41 R **7 Claims**

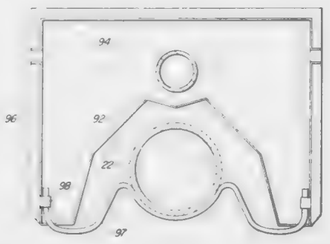


1. In combination with a gas grill including a cooking vessel having a housing with a burner assembly including a plurality of elongated burner tubes adjacent a lower end of said housing and a cooking grid spaced above said burner assembly with the grid adapted to support food products that produce grease drippings during the cooking process and direct said grease drippings toward said lower end, the improvement of a sear grid located between said burner assembly and said cooking grid, said sear grid comprising a plurality of sear bars at least equal in number to said burner tubes and having lower edges spaced above said burner assembly, said housing having support means in opposed walls with said support means including positioning means so that at least one of said sear bars is positioned directly over and covers a burner tube, each sear bar comprising an inverted V-shaped member having first and a second flat inclined walls merging in an upper apex with the upper apex lying directly above each said burner tube and defining an included angle of less than 90° to define outwardly-inclined flat surfaces for receiving and vaporizing grease drip-

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pings while flowing along said inclined surfaces and preventing uncontrolled flare-ups during the cooking process.

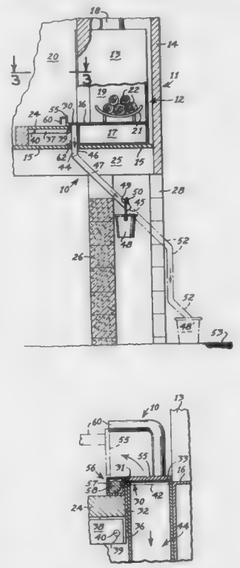
4,727,854
HIGH EFFICIENCY INFRARED RADIANT ENERGY HEATING SYSTEM AND REFLECTOR THEREFOR
Arthur C. W. Johnson, 2611 Lake Charnwood, Troy, Mich. 48084
Filed May 8, 1986, Ser. No. 860,901
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 B **15 Claims**



1. In combination:
an elongate tubular conduit adapted to be heated by a hot gaseous effluent and capable of emitting infrared radiation when so heated; and
an insulated reflector mounted in spaced and partially surrounding relationship above said conduit to direct radiation downwardly therefrom, said reflector having spaced inner and outer concave reflective structures and a substance therebetween which produces relatively low thermal conductivity and a relatively high insulation value,
said inner reflective structure comprising a first concave metal member having an inner surface which is highly reflective to infrared radiation,
said outer reflective structure comprising a second concave metal member providing a highly reflective inner surface and a layer of insulation material on the outer surface of said second metal member.

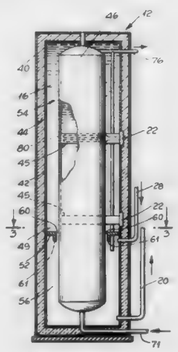
4,727,855
FIREPLACE ASH DISPOSAL DEVICE
Victor Morsette, 1003 50th Ave., North, Nashville, Tenn. 37209
Filed Feb. 18, 1987, Ser. No. 15,994
Int. Cl.[4] F23J *1/00*
U.S. Cl. 126—242 **8 Claims**

1. A fireplace ash disposal device comprising:
(a) a building comprising a sub-floor structure at a predetermiend elevation,
(b) a fireplace in said building having a front opening and a fireplace floor supported on said sub-floor structure,
(c) an elongated base member having an elongated top planar sweep surface substantially as long as the width of said front opening of said fireplace adjacent said fireplace floor,
(d) support means mounting said base member along the front portion of said fireplace floor so that said sweep surface is substantially coplanar with said fireplace floor,
(e) an ash opening in said sweep surface,
(f) an elongated chute having one end in open communication with said ash opening and another open ash discharge end below said base member,
(g) an elongated planar lid member having an elongated front edge portion and adapted to fit flush against said sweep surface, and
(h) hinge means connecting said front edge portion of said lid member to said base member in front or said ash opening, to permit said lid member to swing between a closed position in which said lid member fits flush against said sweep surface and over said ash opening and an open position in which said lid member projects upward from



said sweep surface to provide a barrier to ashes swept forward over said sweep surface and toward said ash opening.

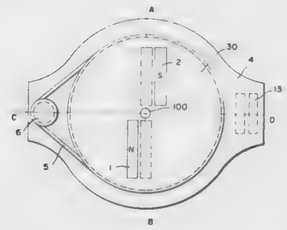
4,727,856
SOLAR WATER HEATING AND STORAGE SYSTEM
Dwain E. Morse, 3463 State St., Santa Barbara, Calif. 93105
Continuation of Ser. No. 757,142, Jul. 22, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 915,495
Int. Cl.[4] F24J *2/04*
U.S. Cl. 126—437 **9 Claims**



1. An improved solar water heating system for use with a solar collector comprising:
a first tank defining
a first reservoir storing a fluid transfer medium therein,
an ingress port receiving the fluid transfer medium from the solar collector into the tank at a point dividing the tank into upper and lower portions, and

an egress port returning the fluid transfer medium to the solar collector from a point within the lower portion of the tank;
a second tank defining a second reservoir enclosed within the first tank and storing a quantity of domestic water therein;
means for turbulently circulating the fluid transfer medium from the ingress port through the first reservoir lower portion turbulently across the second tank to the egress port so as to by the turbulent circulation aid heat transfer between the first reservoir and the second reservoir; and
a baffle in the first reservoir above the ingress port, which baffle substantially isolates the turbulently circulating fluid transfer medium within a lower portion of the first reservoir below the baffle from an upper portion of the first reservoir above the baffle, the baffle allowing only a small circulation of the fluid transfer medium from the first reservoir upper portion above the baffle to the first reservoir lower portion below the baffle, the small circulation substantially transpiring only as laminar flow over the second tank.

4,727,857
DEVICE FOR PRODUCING PULSATING MAGNETIC FIELDS FOR THERAPEUTIC PURPOSES
Alois Hörl, Munich, Fed. Rep. of Germany, assignor to Dieter Rau, Bad Ueberkingen, Fed. Rep. of Germany
Filed Apr. 19, 1985, Ser. No. 724,901
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414938
Int. Cl.[4] A61B *17/52*
U.S. Cl. 128—1.3 **19 Claims**



1. A device for producing pulsating magnetic fields for therapeutic purposes in which, on a substrate rotatable about an axis, at least one pair of magnets is disposed in such a way that first pole faces of opposite polarity, which face in one direction of the rotational axis and have a direction of magnetisation substantially parallel to the rotational axis at a surface thereof, are provided in such configuration and position that rotation of the substrate by 180 degrees about the rotational axis will substantially transfer the magnetic fields produced by the first pole faces into each other with a reversal of the field direction, wherein the first pole faces occupy only a minor portion of the angular range swept by them upon rotation of the substrate about the rotational axis and are arranged and shaped such that the field produced thereby at any time has no radial symmetry, i.e., has no plane including the rotational axis as the plane of symmetry.

4,727,858
HIGH INTENSITY SELECTABLE POLY OR MONOCHROMATIC SLIT LIGHT SOURCE APPARATUS FOR OPTICAL INSTRUMENTS
Rudames K. H. Gebel, Fairborn; Thomas R. Connon; Willi J. Buehring, both of Dayton, and Gregory R. Bothe, West Carrollton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 8, 1986, Ser. No. 883,222
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **2 Claims**



1. A retinascope, comprising:
(a) a light source;
(b) a fiber optic bundle having an input end and an output end, the input end optically connected to the light source;
(c) means for aligning all the optical fibers at the output end substantially in the shape of a rectangle;
(d) means for supporting the aligning means;
(e) a retinascope head attached to the supporting means; and,
(f) wherein the supporting means includes:
(i) means for adjusting the linear position of the fiber optic bundle output end in relation to the retinascope head; and,
(ii) means for adjusting the rotational orientation of the fiber optic bundle output end in relation to the retinascope head.

4,727,859
RIGHT ANGLE DETACHABLE PRISM ASSEMBLY FOR BORESCOPE
Raymond A. Lia, Auburn, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Dec. 29, 1986, Ser. No. 947,428
Int. Cl.[4] A61B *1/00*; G02B *7/18*
U.S. Cl. 128—6 **11 Claims**



1. A right angle detachable prism assembly for a small diameter borescope of the type that includes an insertion tube with a viewing head at its distal end, the head having a protruding member containing an optical image pickup device oriented along the axis of the head and through a flat front surface thereof, said protruding member having a peripheral cutout and radially projecting retaining means thereon; the prism assembly comprising
a reflecting side-looking prism dimensioned to match said optical imager and having one flat face to be disposed against the flat front surface of the viewing head protruding member;
a generally cylindrical housing disposed over said prism and having an open proximal end to fit over the viewing head protruding member with cooperating means therein which engage said retaining means;

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a prism holder slidably disposed in said housing including means securing said prism and oriented so that said one flat face is positioned against said protruding member front surface;

a proximally extending projection which engages said cutout in said viewing head protruding member when said prism flat face is disposed against said front surface;

means manually actuable from outside said housing to release said projection from said cutout; and

resilient means for yieldably urging said prism holder proximally relative to said housing.

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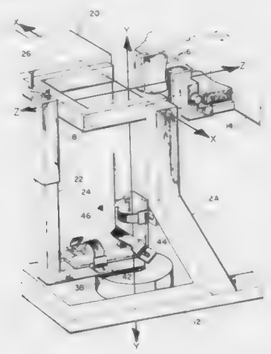
EXERCISE APPARATUS FOR THE KNEE

Donald R. McIntyre, Chapel Hill, N.C., assignor to Isotechnologies, Inc., Hillsborough, N.C.

Filed Jun. 6, 1986, Ser. No. 871,514

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 R **10 Claims**



1. An apparatus for exercising the knee of a user and comprising:

a stationary frame:

a knee exercise assembly pivotably mounted to said frame and including a pivotably movable support member and means depending downwardly therefrom for securing a foot of a user said support member being pivotably movable relative to said frame about a horizontal axis which corresponds to an axis of rotation which is coaxial with the axis of flexion/extension movement of the knee, and said means for securing the foot being pivotably movable relative to said support member about an axis of rotation which is generally perpendicular to said horizontal axis and coaxial with the axis of tibial rotation movement of the knee so as to permit simultaneous multi-axial pivotal movement of the knee about its natural axes;

first resistance means operatively connected to and cooperating with said support member of said knee exercise assembly for resisting flexion/extension movement of the knee of a user;

second resistance means, which can act simultaneously with said first resistance means, operatively connected to and cooperating with said foot securement means of said knee exercise assembly for resisting tibial rotation movement of the knee of a user; and

restraint means for securing the knee of a user relative to said knee exercise assembly during exercise of the knee.

4,727,861

JOINT FOR ORTHOTIC DEVICE

Douglas Yeomans, Birmingham, and Barry Martin, Tamworth, both of England, assignors to Weston Hydraulics Limited, Birmingham, England

Continuation of Ser. No. 791,524, Oct. 25, 1985, abandoned.

This application Jul. 13, 1987, Ser. No. 73,317

Claims priority, application United Kingdom, Dec. 6, 1984, 8430832

Int. Cl.[4] A61H *3/00*

U.S. Cl. 128—80 C **14 Claims**



1. An orthotic device comprising:

a first member;

a second member;

a pivotal joint interconnecting said first and second members;

an abutment member mounted on said first member and having first and second abutment surfaces;

first limit means on said second member adapted to contact said first abutment surface to limit pivotal movement between said first member and said second member in a first pivotal direction;

second limit means on said second member and adapted to contact said second abutment surface to limit pivotal movement between said first and said second members in a second pivotal direction opposite to said first pivotal direction;

first and second adjustment means to adjust the position of said first and second limit means to limit the maximum angular movement of said first and said second members to a predetermined desired angle;

first and second locking means operative to prevent undesired movement of said first and second limit means respectively;

release means having an operating member operation of which moves said first abutment surface to a position out of range of contact with said first limit means to permit of relative movement of said first and second members beyond the limit position, provided by said first limit means.

4,727,862

FLOATING CENTER SPLINT OR HINGE

Thomas P. Waddell, 1306 Broadview West, Downingtown, Pa. 19335, and Robin Renzetti, 2985 Hibernia Rd., Coatesville, Pa. 19320

Filed Dec. 1, 1986, Ser. No. 936,291

Int. Cl.[4] A61F *5/04, 5/01*

U.S. Cl. 128—80 C **20 Claims**

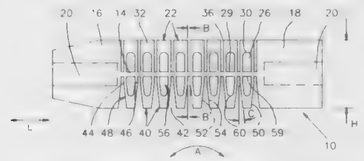
1. A floating center, variable radius splint, for adjustably permitting angular motion of a body joint to which said splint is connected through a preselected angular range terminating at adjustably preselectable minima and maxima and preventing joint motion outside said range, comprising:

a. a longitudinally extending spine adapted to flexibly bend, in response to joint motion, in a first transverse direction;

b. means, connected to said spine adjacent respective ends therof, for imparting adjustably predetermined initial minimum flex to said spine in said first transverse direction, including:

1. a first filament extending generally parallel with and displaced laterally from said spine;

2. means selectably engaging said first filament at a continuum of positions along first filament longitudinal length,



for adjustably varying effective length of first filament connected to said spine;

c. means, connected to said spine adjacent respective ends thereof, for limiting spine flexure to an adjustably predetermined maximum of said angular range, including:

1. a second filament extending generally parallel with and displaced laterally from said spine;

2. means selectably engaging said second filament at a continuum of positions along second filament longitudinal length, for adjustably varying effective length of second filament connected to said spine.

4,727,863

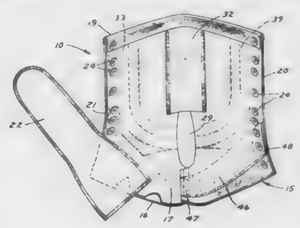
REINFORCED ANKLE BRACE

Ronald E. Nelson, 405 Sunset La., Cambridge, Minn. 55008

Filed May 30, 1986, Ser. No. 868,937

Int. Cl.[4] A61F *3/00, 13/00*

U.S. Cl. 128—80H **19 Claims**



1. An ankle brace to be worn on a foot and ankle in encompassing relationship to the lateral malleolus and medial malleolus of the ankle on the lateral and medial sides of the foots respectively, comprising:

a base of flexible sheet material shaped to encompass an ankle and at least the middle portion of a foot, having lateral and medial forward edges that come toward one another over the superior portion of the foot, and a portion that extends beneath the sole of the foot;

means cooperating with the forward edges of the base for tightly securing the base relative to a foot;

a support strap for protection of the anterior talofibular ligament of the foot, said strap having a first end secured to the inside of the base at a location generally beneath the sole of the foot, and a second end fixed to the inside of the base at a location proximate the lateral edge of the base to locate the support strap over the lateral side of the foot, the section of support strap between the first and second ends being unconnected to the base and of a length to bind together the upper and lower portions of the foot and ankle on opposite sides of the anterior talofibular ligament upon closure of the forward edges of the base over the superior portion of the foot.

4,727,864

PROTECTIVE SLEEVE FOR THE LEAK-PROOF COVERAGE OF BODY PARTS

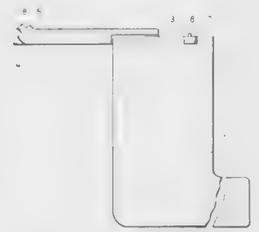
Peter Wiesenthal, and Beatus Ille, both of Winsen, Fed. Rep. of Germany, assignors to IIIe GmbH, Fed. Rep. of Germany and Chemie Lenz AG, Austria

Filed Dec. 2, 1985, Ser. No. 803,546

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444626

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—82 **3 Claims**



1. A protective cover for the leakproof coverage of a body part, comprising a sock-shaped sleeve made of thin-walled foldable plastic foil and having a top opening defining a slip-in entrance extended into said sleeve and a rim surrounding the opening, an elastic band-shaped sealing strip of elastic material having an adhesive surface along its length and one end portion which is adhesively secured to the outside of said sleeve adjacent the rim and extending beyond said rim and extending around at least a part of the circumference of said sleeve, said sealing strip projecting beyond said rim on one side of said sleeve and extending by a length sufficient so that it may encompass the complete rim and overlap the opposite end of said sealing strip and be adhered thereto and to the body part when said strip is engaged around the body part, and including a spot adhesive surface means adhered to a minor portion of the inside of said sleeve close to said entrance for adhesion of said sleeve to the body part, said spot adhesive surface means for adhesion of said sleeve directly to the body part prior to the closure of the opening of said sleeve, said sleeve being closed by the adhering of said sealing strip around said opening, so as to allow said sleeve to be retained relative to the body part by said spot adhesive means prior to the adhering of said sealing strip as said sealing strip encompasses the complete rim of the opening.

4,727,865

REPLACEABLE RIGID CAST WITH INTEGRAL FASTENERS

Christopher R. Hill-Byrne, 2690 Drew St., Apt. 861, Clearwater, Fla. 33519

Filed Mar. 7, 1985, Ser. No. 709,184

Int. Cl.[4] A61F *5/04*

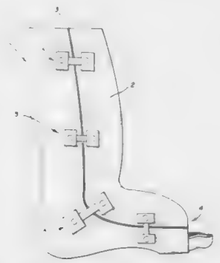
U.S. Cl. 128—89 R **9 Claims**

1. A rigid cast which is useful for immobilizing an injured body part, which is readily removable and subsequently replaceable after removal by a user, comprising:

two rigid body part immobilizing parts adapted to surround and conform exactly to an injured body part, said rigid body part immobilizing parts having been custom formed by applying a casting medium to said body part so that said casting medium conforms exactly to said body part,

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allowing said casting medium to harden on said body part to form a unitary rigid supporting shell, making two longitudinal cuts in said unitary rigid supporting shell to form said two rigid body part immobilizing parts which each have opposing and cooperating cut faces along each of said two cuts and integrally attaching a plurality of cooperating releasable fastener means to each of said rigid body part immobilizing parts on opposite sides of at least one of said longitudinal cuts for releasably and replaceably



securing said rigid body part immobilizing parts along said cooperating cut faces, said cooperating releasable fastener means being capable of mechanically compressing said two rigid body part immobilizing parts onto said injured body part; and

at least one soft inner material located on the interior of said cast which is shaped to conform exactly to the contour of said body parts thereby allowing said rigid body part immobilizing parts to achieve immobilization and compression of said body part.

4,727,866

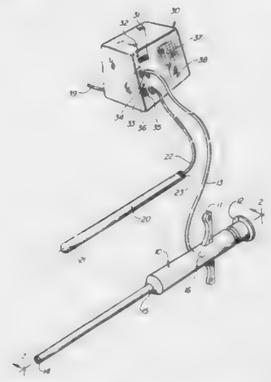
INTRAUTERINE DEVICE DETECTION AND REMOVAL SYSTEM

Billy R. Livesay; Howard J. Tatum, both of Atlanta, Ga., and Melvin R. Toews, Ontario, Canada, assignors to Ortho Pharmaceutical (Canada) Ltd., Don Mills, Canada

Continuation of Ser. No. 573,073, Jan. 23, 1984, Pat. No. 4,572,162. This application Sep. 3, 1985, Ser. No. 772,235

Int. Cl.⁴ A61F *5/46*

U.S. Cl. 128—130 **8 Claims**



1. A device for the detection, location and translocation of a non-spherical magnet which comprises three Hall effect generators disposed perpendicularly to each other, a three-dimensional display indicator means indicating distance to the magnet which responds to the output voltage of all of the Hall effect generators in electrical connection with said generators, and grasping means for temporary attachment of the magnet to the device.

4,727,867

MANDIBULAR LATERAL MOTION INHIBITOR

William R. Knoderer, 4613 Stonewall, Greenville, Tex. 75401

Filed Feb. 24, 1986, Ser. No. 832,472

Int. Cl.⁴ A61F *5/46*

U.S. Cl. 128—136 **17 Claims**



1. An appliance for inhibiting lateral movement of the lower jaw with respect to the upper jaw in a person's mouth, said appliance comprising, in combination:

a frame member;

a wing member disposed on said frame member; and,

means for securing said frame member onto a selected lower or upper tooth with the appliance being held within the oral cavity in a predetermined position between the person's teeth and tongue, said wing member extending vertically between a first position adjacent to the bottom teeth and a second position adjacent to the top teeth, whereby lateral movement of the lower jaw is opposed by engagement of one of the upper or lower teeth against said wing member.

4,727,868

ANISOTROPIC WOUND DRESSING

Michael Szycher, Lynnfield, and Jonathan L. Rolfe, North Easton, both of Mass., assignors to Thermedics, Inc., Woburn, Mass.

Continuation of Ser. No. 726,809, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 670,810, Nov. 13, 1984, Pat. No. 4,614,787. This application May 20, 1987, Ser. No. 54,112

Int. Cl.⁴ C08G *18/10;* **A61F** *13/00*

U.S. Cl. 128—156 **30 Claims**

1. An anisotropic wound dressing comprising a polyurethane encapsulated fabric layer comprising:

a crosslinked non-thermoplastic polyurethane; and

a knitted reinforcing anisotropic fabric defining a network of interstices having a void area between the range of 0.5 mm to 4 mm across and formed from yarns having a diameter in the range of 0.025 to 0.203 mm embedded in and encapsulated by said polyurethane; wherein the thickness of the polyurethane in the area of the wound dressing where the polyurethane fills the interstices of said knitted reinforcing fabric is 0.0254 mm or less.

4,727,869

METHOD AND APPARATUS FOR IMMOBILIZING AN EYELID

David Leonardi, 2320 Plaza del Grande, Las Vegas, Nev. 89102

Continuation of Ser. No. 781,457, Sep. 30, 1985, Pat. No. 4,677,974. This application Jul. 2, 1987, Ser. No. 69,182

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.⁴ A61F *13/12*

U.S. Cl. 128—163 **7 Claims**



1. An eyelid splint adapted to immoblize an eyelid of only one eye of a patient comprises a flexible, resilient pad member adapted to press against the exterior of a patient's eyelid, said pad having a thickness of at least 10 mm, a backing member secured to the pad member, and means for maintaining a pressure of 23–40 mm Hg on the eyelid, said means consisting essentially of elastic strap means attached to the backing member for encircling the head of a patient, the strap means comprising first and second elastic strap members each having an end portion, first and second interengaging fastening members comprising a plurality of mating hooks and loops mounted on the end portions of said straps for fastening said straps at adjustable lengths, the strap means and backing member being fabricated from a single piece of flexible material.

4,727,870

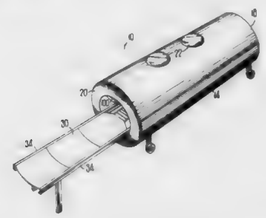
HYPERBARIC CHAMBER

George E. Krasle, Atlanta, Ga., assignor to Hyperbaric Systems, Inc., Atlanta, Ga.

Filed Jun. 10, 1986, Ser. No. 872,612

Int. Cl.⁴ A61G *10/00*

U.S. Cl. 128—202.12 **5 Claims**



1. An improved hyperbaric apparatus, comprising:

a chamber having an access opening, said opening defining a sealing surface peripherally located about said opening, said sealing surface located on the inside of said chamber;

a self-sealing hatch assembly within said chamber, said assembly comprising:

an elongate sliding bar having a first and a second end;

clamp means for rigidly mounting said first and second end of said sliding bar to an interior wall of said chamber, such that said bar is spaced a distance away from said interior wall;

a slide mount slidably mounted to said sliding bar along a sliding axis parallel to the longitudinal axis of said sliding bar;

an elongate brace bar having a first and a second end, said brace bar being pivotally mounted to said slide mount at a location intermediate said first and said second end of said brace bar, said brace bar being mounted to said slide mount about a pivoting axis substantially perpendicular to the longitudinal axis of said sliding bar;

a hatch rigidly attached to said first end of said brace bar and configured to mate with said opening of said chamber such that when said hatch is in a closed position relative to said chamber, said hatch encounters said peripheral sealing surface, and said chamber and said hatch define an enclosed cavity;

a counter weight attached to said second end of said brace bar and having a mass such that the center of gravity of the combination of said brace bar, said hatch, and said counter weight is approximately along said pivoting axis;

hatch guiding means for guiding said hatch along a hatch path, said hatch patch including a linear portion and an arcuate portion, said linear hatch path portion being substantially parallel to said sliding axis and extending from said closed position to an intermediate position, and said arcuate hatch path portion extending from said third intermediate position to said second open position, said open position being such that a person may enter and exit said chamber through said opening; and

means for increasing gas pressure within said enclosed cavity such that said hatch is encouraged to bias against said peripheral sealing surface, thus sealing said enclosed cavity.

4,727,871

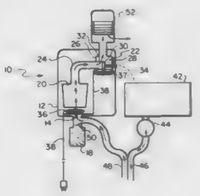
VENTILATOR EXHALATION SYSTEM

Paul R. Smargiassi, Oceanside, and Guy Gansel, Santa Ana, both of Calif., assignors to Infrasonics, Inc., San Diego, Calif.

Filed Oct. 28, 1985, Ser. No. 791,688

Int. Cl.⁴ A61M *16/00;* **A62B** *7/00*

U.S. Cl. 128—204.17 **9 Claims**



1. An exhalation system for connection in the exhalation path of a ventilator for use in assisting a patient's breathing, the system comprising:

a housing having a first end and a second end, an inlet at the first end and an outlet at the second end;

means for connecting the housing inlet to the exhalation side of the breathing circuit of the ventilator;

a bacteria filter mounted in the housing and having an inlet and an outlet, means for connecting the filter inlet to the housing inlet;

first passageway means in the housing for connecting the bacteria filter outlet to the housing outlet;

second passageway means for connecting the housing outlet to a respiration monitoring device;

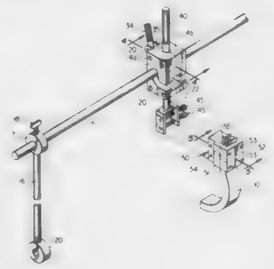
first heating means for heating the bacteria filter to heat gas passing through it to a temperature high enough to substantially avoid condensation; and

second heating means for heating said first passageway means along at least part of its length to a temperature high enough to maintain gas passing through it at a high

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enough temperature to substantially avoid condensation in said second passageway means.

4,727,872
ENDOTRACHEAL INTUBATION SYSTEM
Pablo Hawk, Ferrocarril Viejo No. 31, Coyoacan 21, D.F., Mexico (04000)
Filed Oct. 20, 1986, Ser. No. 920,776
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.14 8 Claims



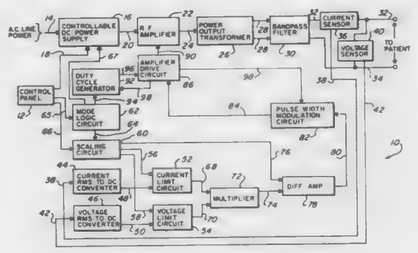
1. An endotracheal intubation system comprising:
an endotracheal cannula;
bridge means connectable with a patient table over a patient on said table;
means connected with said cannula for adjustably supporting said cannula on said bridge means suspended in the mouth and the throat of a patient on said table, said supporting means comprising a mounting block connected with said cannula, a mounting body connected with said mounting block, and means coupling said mounting body on said bridge means for selectively positioning said body with said cannula and mounting block at desired angular positions on said bridge means; and
said means for coupling said mounting body on said bridge means comprises an annular indexing gear having circumferentially spaced peripheral teeth on said bridge means, means defining a slot in said mounting body sized to receive an indexing latch member and an indexing latch finger pivotally secured in said body for releasable engagement with said teeth of said indexing gear permitting said mounting body to be positioned and locked at a plurality of angles on said bridge means.

4,727,873
EMBOLUS TRAP
Kazi Mobin-Uddin, 483 Delegate Dr., Worthington, Ohio 43085
Continuation-in-part of Ser. No. 601,220, Apr. 17, 1984, Pat. No. 4,643,184, which is a continuation-in-part of Ser. No. 428,254, Sep. 29, 1982, abandoned. This application Nov. 26, 1986, Ser. No. 935,242
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R 12 Claims



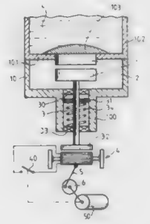
1. An embolus trap for positioning in spaced relation in a fluid passageway in the human body comprising a central column and one or more axially spaced tiers of radially outwardly urged elongated loops of metal wire filaments spaced around the column inclined thereto and attached thereto at one end, the other ends of at least some of said loops comprising two lengths of wire each bent away from each other to form an offset and then outwardly to form hooks, said two lengths of wire being joined at their outer ends adjacent their hooks by a short length of small diameter tubing threaded over them so as to limit the penetration of the hook into the wall of the fluid passage.

4,727,874
ELECTROSURGICAL GENERATOR WITH HIGH-FREQUENCY PULSE WIDTH MODULATED FEEDBACK POWER CONTROL
William J. Bowers, and Phillip D. Hardwick, both of Aurora, Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Sep. 10, 1984, Ser. No. 649,261
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.13 34 Claims



1. In a electrosurgical generator including means for supplying a surgical signal at a predetermined high frequency to perform a surgical procedure, and means for regulating the power content of the surtgical signal, and an improved feedback means for controlling the power regulating means comprising:
means for creating a current delivered signal related to the current of the surgical signal;
means for establishing a current limit signal;
voltage limit means receptive of the current limit signal and the current delivered signal and operative for supplying a first signal corresponding to one of either the current limit signal or the current delivered signal, said voltage limit means operatively supplying the current delivered signal as the first signal when the current delivered signal is greater than the current limit signal and operatively supplying the current limit signal as the first signal when the current delivered signal is less than the current limit signal;
means for creating a voltage delivered siganl related to the voltage of the surgical signal;
means for establishing a voltage limit signal;
curret limit means receptive of the voltage limit signal and voltage delivered signal and operative for supplying a second signal corresponding to one of either the voltage limit signal or the voltage delivered signal, said current limit means operatively supplying the voltage delivered signal as the second signal when the voltage delivered signal is greater than the voltage limit signal and operatively supplying the voltage limit signal as the second signal when the voltage delivered signal is less than the voltage limit signal;
multiplier means receptive of the first and second signals and operative for multiplying the first and second signals to create a delivered power signal which is the product of the first and second signals; and
means receptive of the delivered power signal and operative for controlling the power regulation means of said generator to regulate the power content of the surgical signal in response to the power delivered signal.

4,727,875
GENERATOR OF HIGH POWER ELASTIC PULSES FOCUSED IN A LIQUID AND OBTAINED BY IMPACT
Jacques Dory, 91, rue des Molveaux, 77450 Coupvray Esbly, France
Filed Jun. 30, 1986, Ser. No. 880,369
Claims priority, application France, Jun. 28, 1985, 85 09865
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 10 Claims



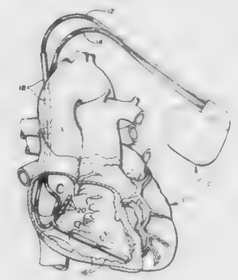
1. The assembly of a high power high frequency elastic pulse generator having an elastic wave radiating surface and a liquid containing enclosure having a wall surface portion in which said elastic wave radiating surface is rigidly mounted for propagating elastic waves within the liquid, wherein said pulse generator comprises:
i. an anvil having said radiating surface and an impact surface opposite said radiating surface and at a distance therefrom;
ii. a hammer comprising a thrust part and an impact part of a thickness substantially lower than said thrust part, said impact part having an outer impact surface facing said impact surface of the anvil and parallel thereto;
iii. and actuating means for periodically propelling and returning the hammer alternately at said high frequency to bring the hammer to an active position of cooperation with the anvil and return it to a rest position far from the anvil, said actuating means comprising means for propelling the thrust part from the rest position to the active position then stopping the thrust part in the active position in which said outer impact surface of the impact part does not engage the impact surface of the anvil and immediately returning the thrust part towards its rest position while the impact part moves towards the anvil until engagement of the impact surface thereof with the impact surface of the anvil and
iv. resetting means for disengaging the impact part from the anvil immediately after said engagement.

4,727,876
MEDICAL FORCEPS OR CLAMPS
Michael Porat, and Amir Porat, both of 2 Kufman St., P.O.B. 50355, Tel Aviv 61500, Israel
Filed Feb. 22, 1985, Ser. No. 704,335
Claims priority, application Israel, Sep. 26, 1984, 73078
Int. Cl.[4] A61B *17/30*
U.S. Cl. 128—354 3 Claims

1. A medical forceps defining a handle from which extend two integral gripping members and comprising a core of metal and wherein the metal core of said gripping members is at least partially covered by a molded-on layer of plastics material in a sandwich-like manner, said layer of plastics being shaped to define the gripping members, wherein guiding means are provided on the plastic gripping members on both sides of a longitudinal median line, comprising on one side of said line a cylinder having a depression and, on the other, a cylinder from which a pin extends, the diameter of the pin corresponding substantially to that of the depression.



4,727,877
METHOD AND APPARATUS FOR LOW ENERGY ENDOCARDIAL DEFIBRILLATION
Michael J. Kallok, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Continuation of Ser. No. 683,298, Dec. 18, 1984, abandoned.
This application Aug. 12, 1986, Ser. No. 894,753
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D 24 Claims



1. A method for controlling cardiac ventricular fibrillation or other tachyarrhythmias by passing an electric current through the heart which comprises:
disposing a first electrode pair along the longitudinal axis of the heart;
disposing a second electrode pair laterally between the ventricle and the region of the coronary sinus of the heart; and
sequentially pulsing each of said electrode pairs at a voltage or voltages providing a temporal and spatial summation of delivered current above the threshold level sufficient to effect defibrillation or cardioversion of the heart.

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FUNCTIONAL ELECTRICAL STIMULATION FOR PRESSURE SORE INHIBITION

Simon P. Levine, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Filed Sep. 26, 1985, Ser. No. 780,565
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—419 R 11 Claims

1. A method of inhibiting development of pressure sores in the tissue of a living being, the method comprising the steps of:

first applying to an area of skin of the living being an electrode in the vicinity of a region of the tissue where development of the pressure sore is to be inhibited, whereby electrical communication is established between said electrode and the tissue of the living being;

second applying to the skin of the living being in the vicinity of said region of the tissue where the development of a pressure sore is to be inhibited an external force whereby the tissue in said region is distorted and blood flow therethrough is diminished; and

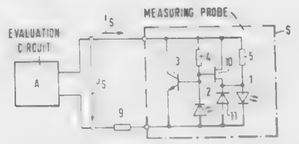
delivering an energizing electrical signal to the skin of the living being via said electrode whereby an undulation of the tissue is achieved in said region, said undulation of the tissue being operative to relieve at least intermittently said external force in response to said energizing signal.

4,727,879

MEASUREMENT DEVICE FOR INTRACARDIAL ACQUISITION OF BLOOD OXYGEN SATURATION

Hans-Dieter Liess, Muensing, and Roland Heinze, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,675
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3537017; May 16, 1986, 3616524
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—633 12 Claims



1. A probe for acquiring signals for intracardial measurement of blood oxygen saturation for use with an evaluation circuit having two outputs for charging said probe with a constant electrical operating parameter, said probe comprising:

two input terminals connectable to evaluation circuit output terminals;

a light transmitter means for transmitting light at blood connected across said input terminals;

a light receiver means for receiving light from said light transmitter reflected by said blood connected across said input terminals; and

a transistor means connected in parallel with said light transmitter for shunting current around said transmitter means and said receiver means; and

means for decreasing the current conductability of said transistor means in response to any increase of current through said light receiver means.

7. A measuring probe for acquiring signals for intracardial measurement of blood oxygen saturation for use with an evaluation circuit having two outputs for charging said probe with a constant electrical operating parameter, said probe comprising:

two input terminals connectable to evaluation circuit output terminals,

a light transmitter means for transmitting light at blood connected across said input terminals;

a light receiver means for receiving light from said light transmitter reflected by said blood connected across said input terminals;

a resistor connected in series with said light transmitter means across said input terminals; and

means connected across said resistor for conducting current in parallel to said resistor; and

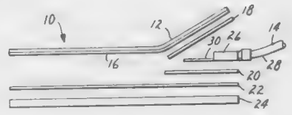
means for reducing the resistance of said means for conducting in response to any increase in current flow through said light receiver means.

4,727,880

FLAT, CONFORMABLE, BIOMEDICAL ELECTRODE

Charles W. Roberts, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 1, 1986, Ser. No. 892,691
Int. Cl.[4] A61B *5/04*; A61N *1/04*
U.S. Cl. 128—640 11 Claims



1. A biomedical electrode adapted to be applied to a body, comprising:

a protective, electrically insulative web;

an electrically conductive adhesive adjacent one side of said protective, insulative web, said one side adapted to be oriented toward said body;

a removable release liner between said protective, electrically insulative web and said electrically conductive adhesive, said release liner having a release agent facing said conductive adhesive, said release liner covering only a portion of the surface area of said protective, electrically insulative web; and

an electrical lead wire having a flat distal uninsulated portion and a proximate insulated portion, said distal uninsulated portion of said electrical lead wire being between said conductive adhesive and said protective, electrically insulative web and at least part of said proximate insulated portion of said electrical lead wire extending under an edge of said protective, electrically insulative web;

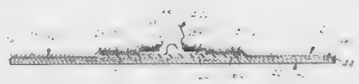
whereby said removable release liner may be discarded, said electrical lead wire may be positioned, said protective, electrically insulative web may be secured over said uninsulated portion of said electrical lead wire and secured in place by said electrically conductive adhesive.

4,727,881

BIOMEDICAL ELECTRODE

Lawrence W. Craighead, Mendota Heights, and Clarence A. Niven, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 551,068, Nov. 14, 1983, abandoned. This application May 21, 1986, Ser. No. 865,520
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—641 6 Claims



1. A biomedical electrode comprising:

a. an electrical terminal member comprising a base having upper and lower surfaces and a post integral with said upper surface of said based and extending therefrom, said post presenting an exposed surface adapted for direct physical and for electrical connection to a lead wire of an electromedical device;

b. an ionically conductive layer in direct physical and electrical contact with the entire lower surface of said base and extending peripherally beyond said base; and

c. a conformable retainer sheet having upper and lower major surfaces bound together by an edge surface, having a surface area larger than that of the terminal base, and being dimensioned with an external perimeter larger than the largest perimeter of the base, and having an aperature therethrough surrounding the post, the aperature being spaced apart from the edge surface and dimensioned with a perimeter larger than the largest perimeter of the post and smaller than the largest perimeter of the base such that a portion of the lower surface of the retainer sheet contacts the upper surface of the base and the remainder of the lower surface the retainer sheet contacts the portion of the ionically conductive layer extending peripherally beyond the base to positionally confine said electrical terminal member betweon said retainer sheet and said ionically conductive layer;

d. a medical tape comprising a backing and a pressure sensitive adhesive coating on at least one major surface thereof, said tape having an aperature therethrough dimensioned to receive said post, a portion of said adhesive-coated surface being adhered to said upper surface of said retainer sheet and the remaining portion of the adhesive coated surface extending beyond the peripheral edges of said retainer sheet and said ionically conductive layer to assist in securing said electrode to skin;

e. a first release liner having a surface area and shape at least as large as the surface area of the ionically conductive layer and the retainer sheet and having a perimeter at least as large as the perimeter of the ionically conductive layer, the first release liner being adhered to said ionically conductve layer opposite said retainer sheet;

f. a second release liner adhered to the portion of the adhesive coated surface of said tape which extends beyond the periphery of said retainer sheet and said ionically conductive layer, said second release liner having at least one aperature therethrough, the size and shape of the aperature being coextensive with the size and shape of the first release liner; and

g. a protective sheet adhereed to said first release liner opposite said ionically conductive layer and adhered to said second release liner opposite said medical tape.

4,727,882

METHOD FOR PROVIDING A MAGNETIC RESONANCE IMAGE FROM RESPIRATION-GATED IMAGE DATA

Siegfried Schneider, Erlangen; Axel Wirth, Nuremberg; Wilfried Schajor, Erlangen, and Helmut Reichenberger, Eckental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 17, 1986, Ser. No. 853,310
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, 3514542
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 12 Claims

1. A method for composing an MR image from respiration-gated scan data, comprising performing the following steps on an MR unit which derives spin echoes from MR scans and which utilizes a phase coding gradient to identify locations from which such spin echos originate:

changing the phase coding gradient in steps through its entire range at most once per respiration cycle;

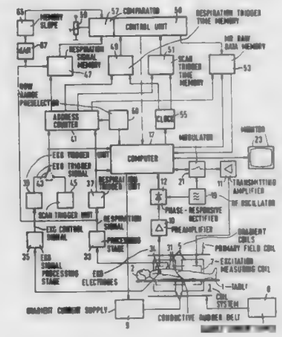
conducting a plurality of MR scans at each phase coding gradient;

storing, for each scan, all the spin echos;

storing, for each scan, information relating to respiratory motion;

comparing said information with a reference value in accordance with a predetermined criterion;

determining, for each phase coding gradient, a best scan in which said criterion is best satisfied; and



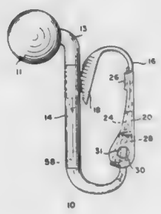
using only spin echos from said best scans to compose the MR image.

4,727,883

JEWELRY MOUNTING CONSTRUCTION

Leonardo Moody, Downers Grove, Ill., assignor to Luc-Co., Inc., Chicago, Ill.

Division of Ser. No. 832,843, Feb. 24, 1986, Pat. No. 4,655,055, which is a continuation of Ser. No. 728,447, Apr. 30, 1985, Pat. No. 4,574,595, which is a division of Ser. No. 460,284, Jan. 24, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 2,134
Int. Cl.[4] A44C *1/00, 27/00*
U.S. Cl. 63—20 4 Claims



1. An improved jewelry mounting construction for adapting a pierced-ear earring for use as a stickpin, the earring being of the kind having a smooth surfaced, linear earring post with an attached decorative piece, the construction comprising, in combination:

an earring post receptacle defining a generally cylindrical smooth sided bore compatable with the earring post and adapted for slidable insertion and removal of an earring post into and out of the bore;

means for frictionally mounting the earring post within the post receptacle bore to restrain sliding insertion and removal of the earring post and attach the post within the bore, said means comprising an elastic material contained within the bore of the receptacle to retain the earring post within the bore by a friction fit; and

an elongated decorative pin affixed to the receptacle and having upper and lower longitudinal ends, the lower end of the pin tapering generally to a point for insertion of the pin into clothing and retain the pin in the clothing, the upper end of the pin being affixed to the earring post receptacle to prevent movement between the pin and the receptacle, the pin being of a length sufficient to support

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the post receptacle in the clothing and to restrict motion of the pin in the clothing when interwoven into that clothing by puncturing insertion by the lower tapered end whereby a pierced-ear earring having a decorative piece may be inserted by its earring post into the earring post receptacle and the combination of the elongated post receptacle and the elongated pin may be inserted into and restrained within clothing so that a pierced-ear earring may be used as a stickpin.

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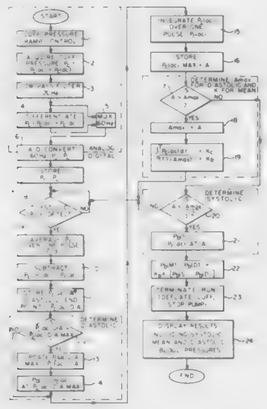
TECHNIQUE FOR OBTAINING THE MEAN BLOOD PRESSURE CONSTANT FOR AN INDIVIDUAL'S BLOOD PRESSURE

William T. Link, 130 The Uplands, Berkeley, Calif. 94705

Continuation of Ser. No. 868,252, May 28, 1986, abandoned. This application Jun. 10, 1987, Ser. No. 60,666

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—681 **9 Claims**



1. A non-invasive method of approximating at least one specific parameter associated with the actual blood pressure pulse in a particular artery of a given subject, which parameter is the mean blood pressure $P_{(b)}M$ of said subject, said method comprising the steps of:

(a) by non-invasive means, generating a particular cuff pulse from said actual blood pressure pulse by

(i) placing blood pressure cuff means adjacent said particular artery of said subject, and

(ii) pressurizing said cuff means to a number of different pressure levels including a specific level and generating from said different pressure levels cuff pulses having peak to peak amplitude values corresponding to and dependent on said different pressure levels, said specific pressure level being one which corresponds to the cuff pulse having a maximum peak to peak amplitude value, said last-mentioned cuff pulse serving as said particular cuff pulse;

(b) determining the mean value under said particular cuff pulse by integrating said particular cuff pulse and solving for the equations

$$P_c(M) = \frac{\int_0^T P_c dt}{T}$$

$$K_b = K_c = \frac{P_c(M) - P_c(D)}{P_c(S) - P_c(D)}$$

where $P_c(M)$ is said mean value, T is the duration in time of said cuff pulse, P_c is the cuff pulse pressure amplitude, $P_c(D)$ and $P_c(S)$ are the minimum and maximum pressures, respectively, of the cuff pulse, K_b is the subject's blood pressure constant and K_c is the cuff pressure constant of said cuff pulse;

(c) by non-invasive means, determining the diastolic and systolic pressure points $P_b(D)$ and $P_b(S)$, respectively, of said actual blood pressure pulse; and

(d) using the blood pressure constant K_b of said subject, and said diastolic and systolic pressure points $P_b(D)$ and $P_b(S)$, calculating the subject's mean blood pressure value $P_b(M)$ by solving the equation

$$P_b(M) = P_b(D) + K_b(P_b(S) - P_b(D)).$$

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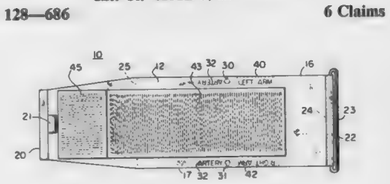
SELF APPLIED BLOOD PRESSURE CUFF

Gray E. Ruff, Hillsboro, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Dec. 24, 1986, Ser. No. 946,471

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—686 **6 Claims**



1. A self applied blood pressure cuff adapted to be positioned on an arm of a body comprising:

an elongated flexible band having first and second ends, a buckle attached to said second end of said band, said band having a body side face intended for engagement with the arm and an outward face joined together with the body side face along lengthwise edges, said band having a compartment therein which is partially open to ambient atmosphere through a pair of openings in said band, each of said openings located opposite one another on opposite lengthwise edges; and

an inflatable bladder adapted to be removably confined within said compartment, said bladder having a portion protruding out from said compartment through one of said openings, said protruding portion protruding through a first one of said openings when said cuff is to be applied to a left arm and through a second one of said openings when said cuff is to be applied to a right arm.

4,727,886

INHALATION DETECTION APPARATUS

John E. Conrardy, Milwaukee; Bruce J. Fiorani, New Berlin; Robert H. Pedersen, Milwaukee, and Mark P. Steinert, New Berlin, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 758,916, Jul. 25, 1985, abandoned. This application Mar. 27, 1987, Ser. No. 31,191

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—725 **10 Claims**

1. Apparatus for detecting and indicating the commencement of gas flow in a predetermined direction in a flow path, comprising:

a flow housing adapted to contain a gas flow in a predetermined direction;

a light source;

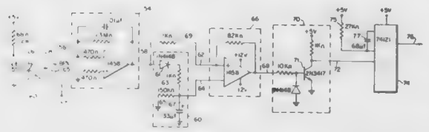
a light receptor adapted to provide an output signal in response to incident light from said light source;

said light source and said receptor defining a light path therebetween transverse to said gas flow;

a vane movably positioned in said gas flow and normally biased to a vane position substantially clear of said light path, said vane being responsive to gas flow in said predetermined direction to assume a vane position blocking at least a fraction of said light path;

an amplifier coupled to receive said light receptor output signal;

a peak detector coupled to the output of said amplifier, said



peak detector including means for storing a signal having a magnitude slightly reduced from the magnitude of the amplifier output signal, and means for maintaining the level of the stored signal upon a sudden decrease in the amplitude of said amplifier output signal; and

means responsive to the output signal from said peak detector and said amplifier output signal for providing an indication when said vane moves from one to the other of said vane positions.

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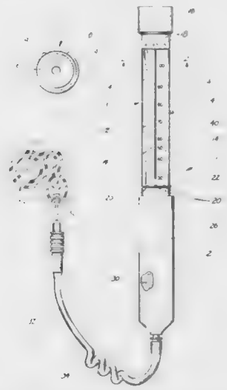
HYPODERMIC MANOMETER

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jul. 8, 1985, Ser. No. 752,955

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—748 **13 Claims**



1. A hypodermic manometer comprising a fluid filled sleeve and piston assembly means for movement through said sleeve to force fluid outwardly therefrom for delivery to a hollow occlusion cuff to be implanted in engagement with the urethra of an incontinent patient for applying occlusive pressure thereto, said piston assembly means comprising a fluid channel and a fluid filled flexible bellows, said bellows and said channel communicating with one another,

said piston assembly means further comprising pressure indicating means being movable with said piston assembly means through said sleeve to indicate the occlusive pressure being applied to the patient's urethra by said cuff, said indicating means being responsive to the height of the bellows fluid within said fluid channel when said flexible bellows is compressed during the movement of said piston assembly means through said sleeve.

4,727,888

SMOKING ARTICLES

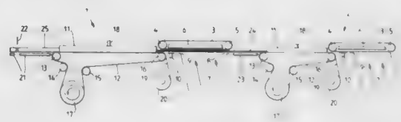
John A. Luke, Eastleigh, Great Britain, assignor to British-American Tobacco Company Limited, London, England

Filed Jan. 22, 1986, Ser. No. 821,542

Claims priority, application United Kingdom, Feb. 1, 1985, 8502651

Int. Cl.[4] A24C *5/18*

U.S. Cl. 131—84.1 **10 Claims**



1. A method of making composite smoking article rod, wherein there are fed simulataneously to the garniture of a rod making machine a web of first wrapper material, a stream of smoking material and a preformed rod comprising filler material wrapped in second wrapper material, whereby in said garniture said preformed rod is surrounded by said smoking material and said first wrapper material is wrapped about said smoking material.

4,727,889

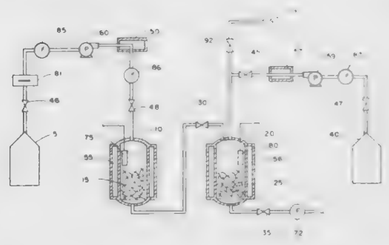
TOBACCO PROCESSING

Benjamin F. Niven, Jr., Winston-Salem, and Charles D. Mays, Lewisville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 22, 1986, Ser. No. 944,076

Int. Cl.[4] A24B *15/24, 15/26*

U.S. Cl. 131—297 **9 Claims**



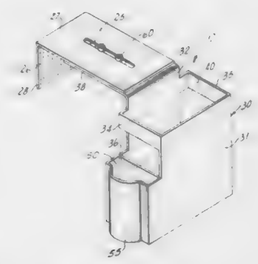
1. A process for providing a flavored smoking material, the process comprising:

(a) extracting tobacco components from tobacco material with a fluid under supercritical conditions thereby providing extracted tobacco components within the fluid; and then directly

(b) contacting the extracted tobacco components within the fluid, while the fluid is in a supercritical or subcritical state, with a smokable material under conditions sufficient to provide smokable material in intimate contact with the extracted tobacco components.

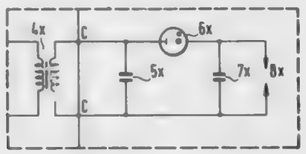
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4,727,890
CIGARETTE AND LIGHTER HOLDER
John A. Vincent, 10600 SW. 146th Ave., Miami, Fla. 33186
Filed Jun. 26, 1984, Ser. No. 624,755
Int. Cl.[4] A24F *15/10*
U.S. Cl. 131—329 5 Claims



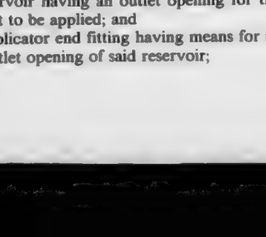
1. A cigarette and lighter holder comprising:
A. a housing defining two compartments having front and rear wall surface members in parallel planes that are spaced apart from each other by a plurality of lateral spacer members, including a compartment divider member dividing said two compartments vertically, and the outer lateral and bottom ends of said compartments being defined by said spacer members; and
B. an L-shaped member, means for mounting said L-shaped on said rear wall, said L-shaped member being mounted rearwardly on said rear wall, with one of its legs pointing downwardly so that said compartments may be in an upright position.

4,727,891
IGNITION SYSTEM
Albert Schmidt, Bietigheim; Roland Gaisser, Ludwigsburg; Dieter Teutsch, Sachsenheim; Hans Albrecht, Waiblingen; Rudolf Maly, Sindelfingen, and Eberhard Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to BERU Ruprecht GmbH & Co. KG, Ludwigsburg, Fed. Rep. of Germany
Filed Apr. 15, 1986, Ser. No. 852,285
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513422
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—627 7 Claims



1. An ignition system having a low voltage source serving as a starting point for producing of an ignition voltage at at least one ignition spark gap via at least one ignition branch, said branch including a said ignition spark gap, a high voltage capacitor, a high voltage transformer for producing a voltage at the high voltage capacitor of at least the same order of magnitude as said ignition voltage, an auxiliary spark gap having a breakdown threshold, and timing control means for controlling voltage delivery timing to said branch; wherein said auxiliary spark gap is disposed at an output side of said high voltage transformer and said high voltage capacitor is coupled to said auxiliary spark gap in a manner causing the high voltage capacitor to discharge to said ignition spark gap when the breakdown threshold of the auxiliary spark gap is exceeded; wherein the high voltage transformer has minimum inductances and minimum impedances; wherein a medium voltage transformer for producing a voltage between the low voltage and the ignition voltage and a medium voltage storage capacitor that is chargeable by said medium voltage transformer are provided between the low voltage source and the high voltage transformer; and wherein a controllable element is provided in said branch at an input side of said high voltage transformer, said controllable element being controlled by the timing control means in a manner operable for separating and interconnecting said high voltage transformer and said medium voltage storage capacitor.

4,727,892
VENTILATED CIGARETTE
Ahmed Abdelgawad, Colombier, Switzerland, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland
Filed Feb. 14, 1986, Ser. No. 829,154
Claims priority, application European Pat. Off., Mar. 7, 1985, 85301586.5
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 10 Claims

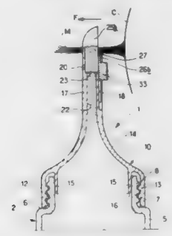


1. A filter cigarette having a controllable degree of ventilation, comprising:
a rod of filter material, said rod having an air-permeable circumferential surface;
a coaxial and abutting rod of smokable material; and
a wrapper surrounding the filter rod and retaining it on the end of the rod of smokable material, and having a controllable degree of ventilation; wherein
at least one portion of the wrapper overlying the air-permeable surface of said filter material and comprising an annular strip extending circumferentially completely around the cigarette at a distance from the mouth end thereof is delimited by at least one line of weakness in the wrapper to constitute at least one tear strip, each tear strip being at least partly removable with severance of said line of weakness to expose a portion of the surface of the filter, whereby ventilating air can pass beneath the wrapper to reach the mouth end of the cigarette.

4,727,893
DEVICE FOR APPLYING A TREATMENT PRODUCT TO A HEAD OF HAIR, WITH A TRESS BY TRESS APPLICATION PROCEDURE
Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France
Filed Oct. 8, 1986, Ser. No. 917,073
Claims priority, application France, Oct. 31, 1985, 85 16194
Int. Cl.[4] A45D *24/22*
U.S. Cl. 132—88.7 11 Claims

1. A device for use in applying to a head of hair, in tress by tress manner, a treatment product with a consistency ranging from liquid to pasty, said device comprising:
(a) a reservoir having an outlet opening for the treatment product to be applied; and
(b) an applicator end fitting having means for mounting on said outlet opening of said reservoir;

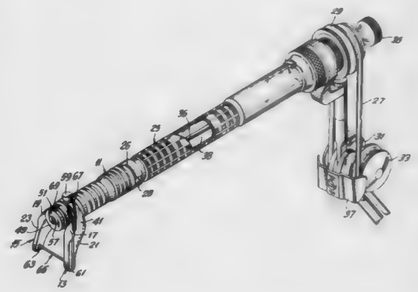
wherein said applicator end fitting comprises:
(i) outlet orifice means for dispensing the treatment product;
(ii) at least one fork at the free end of the applicator end fitting, said at least one fork having two prongs with a space between them at their base, and said prongs being able to be guided from end of a hair tress to the other when the tress is placed between said two prongs of said fork, said outlet orifice means being located adjacent said base of said prongs whereby when the treatment product is provided at said outlet orifice means, and the hair tress is placed between said prongs, the treatment product will be applied over the tress; and
(iii) storage receptacle means for the treatment product, said space separating the two prongs at their base opening directly into said storage receptacle means for the product, and said storage receptacle means being in



communication with the outlet orifice means for the treatment product;
said applicator and fitting comprising a first part and a second part mounted for movement relative thereto; said storage receptacle means being delimited by (a) means defining a cavity in said first part of said applicator end fitting and (b) said second part of said applicator end fitting; and said device including means movably mounting said second part relative to said first part to enable said second part to occupy a first end position in which said second part defines a portion of said storage receptacle means for supplying the treatment product for applying the produce over a hair tress and a second end position, remote from said prongs, wherein said storage receptacle means opens laterally immediately below said prongs in a plane parallel to the median plane containing the prongs thereby leaving free access to said cavity means when in said second end position.

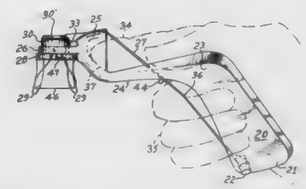
4,727,894
DENTAL PROPHYLAXIS DEVICE AND PROCESS
Robert H. Meibauer, 234 Rte. 537 East, Colts Neck, N.J. 07722
Filed Feb. 28, 1985, Ser. No. 706,649
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—91 10 Claims

1. In a device for dental prophylaxis, the combination comprising:
housing means provided with an axial cavity, a pair of spaced, stationary tynes provided with slotted openings disposed on said housing means and projecting outwardly therefrom, stationary support means located on said tynes in the vicinity of the base thereof and a circular rotatable disk located on said housing means between the bases of said tynes and centrally supported on a rotatable mandrel disposed axially within said cavity, said disk having a groove disposed around the circumference thereof which is shallow in one portion and deep in the portion opposite the shallow portion, said rotatable mandrel being adapted to be connected to driving means to drive said circular, rotatable disk and impart rotating motion thereto; and dental flossing thread provided with a non-elastic loop at one end and an elastic loop at the opposite end supported in said slotted openings of said tynes and across the space therebetween with said elastic loop being supported on said stationary support means and said non-elastic loop



being supported in the circumferential groove of said disk, whereby said dental flossing thread reciprocates between said tynes when said circular, rotatable disk is rotated by said driving means through said rotatable mandrel.

4,727,895
DENTAL FLOSS APPLICATOR
James P. Berarducci, 6340 Pottsburg Plantation Blvd., Jacksonville, Fla. 32216
Filed May 5, 1986, Ser. No. 859,367
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—91 35 Claims



35. A dental floss applicator comprising an elongated pistol grip handle having a lower end portion and an upper end portion, a pair of posts projecting laterally from said lower end portion and adapted to receive a portion of the dental floss thereabout, an elongated arm having rearward and forward end portions, said rearward end portion being connected to said upper end portion and extending generally horizontally, a thimble member attached to said forward end portion and having a cavity therein opening rearwardly to receive an index fingertip therein of a hand gripping said handle, a ring support attached to and extending forwardly of said thimble member, a selectively attachable floss stretcher having a base member with a passageway therethrough and positioned within said ring support in an upright position and alternately in a downright position, a pair of spaced oppositely facing generally vertical finger members projecting from said base member and having bifurcated free ends adapted to receive a portion of floss therein, selective locating means between said base member and said ring support to selectively orient said base member in various rotative positions with respect to said ring support in either said upright and downright positions, and a continuous loop of dental floss having a portion spanning between said finger members and passing through said passageway in said base member and looped about one said post when said stretcher is in said upright position and looped about the other said post when said stretcher is in said downright position, said

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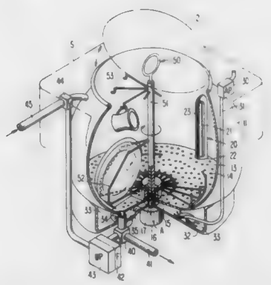
thimble including a guideway engageable by said floss when said stretcher is in said downright position.

4,727,896

ULTRASONIC WASHING MACHINE FOR TABLEWARE

Masao Kanazawa, 6-10, Nakakagaya 4-chome, Suminoe-ku, Osaka, and Yukio Ooka, 2-1-708, 1-chome, Minamisakurazuka Toyonaka-shi, Osaka, both of Japan, assignors to Masao Kanazawa, Osaka, Japan

Filed Sep. 25, 1985, Ser. No. 780,080
Int. Cl.[4] B08B 3/12
U.S. Cl. 134—184 6 Claims



1. An ultrasonic washing machine for washing tableware and the like, said washing machine comprising:

a metal tub in which the tableware is placed to be washed, said metal tub having a bottom, and fluid inlet means through which water is suppled to said metal tub;

an ultrasonic generator within said tub for generating ultrasound in the water supplied to said metal tub through said fluid inlet means, said metal tub being substantially spherical for reflecting ultrasound generated by said ultrasonic generator to diffuse the ultrasound through said tub onto the tableware; and

bubble supplying means at the bottom of said tub for supplying and dispersing bubbles throughout the water supplied to said tub some of which dissolve in the water to replace air that has been removed from the water due to cavitation when said ultrasonic generator generates ultrasound and the remainder of which also reflect the ultrasound to diffuse the ultrasound throughout said tub and onto the articles to be washed in said tub.

4,727,897

STABILIZING BRACKET FOR AN AWNING OF A RECREATIONAL VEHICLE

Randolph T. Watts, 8517 Pine Glade La., Richmond, Va. 23237

Filed Nov. 12, 1986, Ser. No. 929,728
Int. Cl.[4] E04H 15/08; E04F 10/06; B65H 75/18, 18/00
U.S. Cl. 135—89 6 Claims

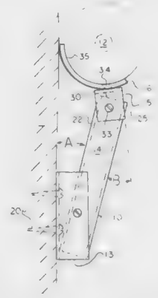
1. A bracket device for attachment to the sidewall of a recreational vehicle below the storage position of an awning comprising:

(a) a mounting base of monolithic structure comprising a flat rear panel, and flat side panels perpendicularly emergent from said rear panel in spaced apart parallel relationship, said mounting base being adapted to be attached by said rear panel to said sidewall in a manner to vertically dispose said rear and side panels, said side panels having a pair of horizontally aligned apertures,

(b) an extension arm of monolithic structure adapted to be disposed in an upright position and comprising a flat rear panel and flat side panels perpendicularly emergent from said rear panel in spaced apart parallel relationship, a lower portion of said extension arm being configured to fit between the side panels of said mounting base in close-fitting parallel relationship therewith, the side panels of said extension arm being provided with horizontally aligned paired upper holes and paired lower holes, and said extension arm being pivotably joined to said mounting base by a bolt that extends through the apertures of said mounting base and the lower holes of the extension arm,

(c) a mounting head of monolithic structure comprised of a flat upper panel and opposed flat side panels perpendicularly emergent from said upper panel and closely embracing the side panels of said extension arm, said mounting head being pivotably joined to said extension arm by a bolt that penetrates the paired upper holes of said extension arm and aligned paired holes in the side panels of said mounting head, said pivotable joinder disposing the flat upper panel of the mounting head above the upper extremity of the extension arm and

(d) a trough-like holding panel of circular cylindric contour having a radius of curvature between 1½ and 4 inches, having forward and rearward parallel straight edges separated by between 120 degrees and 140 degrees of circular arc, and a length in the axial direction of between about 8 and 12 inches, said holding panel being attached adjacent its forward edge to the upper panel of said mounting head to dispose the axis of said holding panel in a direction perpendicular to the side panels of said mounting base, extension arm and mounting head,



(e) the dimensions, configurations and interactions of the aforesaid components being such that when the rear panel of the mounting base is affixed to the sidewall of a vehicle and the extension arm is in its forwardmost pivoted position away from the sidewall while the holding panel is in its rearwardmost pivoted position, the holding panel will support a rolled awning, and

(f) when the holding panel is in its forwardmost pivoted position, and when said extension arm is in its rearwardmost pivoted position proximate the sidewall the holding panel will discharge said rolled awning.

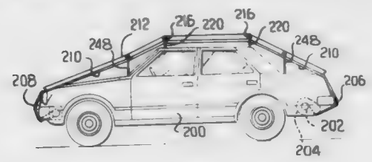
4,727,898

PORTABLE AUTOMATIC COVER

Tesfa Guma, 7709 Newcastle Dr., Annandale, Va. 22003

Continuation of Ser. No. 715,021, Mar. 22, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 9,581
Int. Cl.[4] B60J 7/20
U.S. Cl. 135—87 16 Claims

1. A motor vehicle and cover mechanism combination comprising a motor vehicle, a cover adapted to be moved from a stored position to an in-use position in generally spaced overlying relationship to at least an upper surface portion of said motor vehicle, means for moving said cover along a reciprocal path of travel in opposite predetermined directions between the in-use and stored positions, means responsive to movement of said cover in at least one of said predetermined directions for automatically raising said cover above said motor vehicle upper surface portion during movement of said cover therealong whereby contact/damage to the motor vehicle upper surface is precluded, said raising means including a plurality of support means carried by said motor vehicle for movement between a first position for holding said cover raised relative to said object upper surface portion and a second lowered cov-



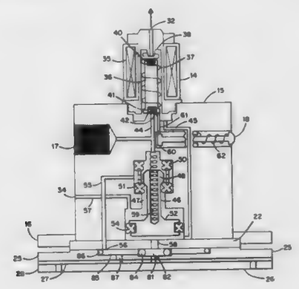
ered position, means for pivotally mounting said support means for pivoting movement about an axis generally normal to said predetermined directions, and means for selectively adjusting the length of said plurality of support means to provide a selected one from a plurality of predetermined spacings between said cover and said upper surface portion.

4,727,899

PILOT VALVE ASSEMBLY

Roger G. Massey, Exeter, and David G. Holloway, Concord, both of N.H., assignors to Parker & Harper Manufacturing Company, Inc., Worcester, Mass.

Filed Oct. 16, 1986, Ser. No. 919,478
Int. Cl.[4] F15B 13/044
U.S. Cl. 137—270 6 Claims



5. A solenoid operated pilot valve assembly comprising:

(a) at least one inlet connection (17) for receiving fluid under pressure;

(b) at least one outlet (32 and/or 34) for fluid exhasut;

(c) a first operating passage (45);

(d) a second operating passage (55);

(e) a coupling interface (25, 27, 28) connected to said first operating passage and said second operating passage for coupling to a fluid pressure driven actuator (11);

(f) a spring-loaded solenoid armature (36) having first sealing means (40) at one end for closing a connecting passage between said first operating passage and said one outlet (32) and a second sealing means (41) at a second end for closing a connecting passage between said first operating passage and said inlet (17);

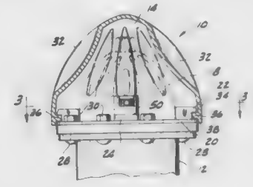
(g) a spring loaded servo piston (46) having a lobe (48) bearing against a third sealing means (50) for blocking a connecting passage between said second operating passage and said inlet, and bearing against a fourth sealing means (51) for blocking a connecting passage between said second operating passage and said outlet (34), said coupling interface including an inner channel (81) connecting to said first operating passage and an outer channel (85) concentric with said inner channel connecting to said second operating passage, all whereby fluid pressure to a driven actuator can be supplied through one passage and exhausted through a second passage then, by operation of a single solenoid, reversed so that its exhaust is through the first passage and supply is through the second.

4,727,900

TAMPER-PROOF HYDRANT COVER

Joseph S. Dooling, 507 N. Wood River Ave., Wood River, Ill. 62095; Kenneth F. Vanek, 114 Glenwood Dr., Glen Carbon, Ill. 62034, and Gene R. Vanek, 86 Crestview Dr., Glen Carbon, Ill. 62034

Filed Dec. 11, 1986, Ser. No 940,747
Int. Cl.[4] E03B 9/06; F16K 35/06
U.S. Cl. 137—296 36 Claims



26. A tamper-proof cover for the operating nut of a hydrant, the cover comprising:

a domed-shaped housing adapted to be positioned above the operating nut and completely covering the operating nut, an extension on a side portion of the housing and a circular hole in the housing within the extension;

a housing mounting ring securable to the hydrant, the ring having means providing a cylindrical recess therein positionable in alignment with the opening in the housing;

the ring and the housing each having a plurality of mating flanges which are covered by the housing when mutually engaged and which are radially spaced around the housing and ring such that rotation of the housing relative to the mounting ring causes engagement and disengagement of the flanges; and

locking means for preventing rotation of the housing relative to the ring, including a cylindrical pin positionable in the hole in the housing and matingly engageable with the cylindrical recess when the recess and a hole are aligned, the means providing the recess having a frangible shoulder within the recess spaced from but adjacent the pin, the pin having a groove therein adjacent the shoulder and a ring fitted in the groove and engaging the shoulder when the pin with the ring is inserted in the recess whereby the pin cannot be removed without the ring breaking the shoulder, the pin being slidably removable from the recess upon breaking the shoulder so that the housing can be removed to provide access to the operating nut.

4,727,901

BALL VALVE

Knut Horvei, Sandnes, Norway, assignor to Den Norske Stats Oljeselskap A.S., Norway

Filed Mar. 12, 1987, Ser. No. 25,007
Claims priority, application Norway, Mar. 12, 1986, 860923
Int. Cl.[4] F16K 43/00, 25/00
U.S. Cl. 137—315 7 Claims

1. A ball valve comprising:

(a) a housing having an upper housing and a lower housing, said lower housing having an inlet and an outlet;

(b) an upper ball member rotatably mounted in said upper housing, said upper ball member rotatably movable between an open position where said valve is open and a closed position where said valve is closed;

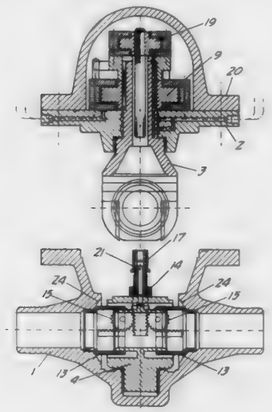
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(c) a lower ball member rotatably mounted in said lower housing, said lower ball member having a port therethrough along a longitudinal axis, said lower ball member in releasable engagement with said upper ball member such that said lower ball member rotatably moves with said upper ball member between said open position and said closed position;

(d) a first sleeve slidably mounted in said lower ball member, said first sleeve having a port therethrough along said longitudinal axis, said first sleeve movable between a first position where said first sleeve is in engagement with said inlet of said lower housing and a second position where said first sleeve is withdrawn within said lower ball member;

(e) a second sleeve slidably mounted in said lower ball member, said second sleeve having a port therethrough along said longitudinal axis, said second sleeve movable between a first position where said second sleeve is in engagement with said outlet of said lower housing and a second position where said sleeve is withdrawn within said lower ball member;

(f) a ball actuator means for moving said upper ball member



and said lower ball member between said open position and said closed position, said ball actuator means mounted in said upper housing and connected to said upper ball member;

(g) a sleeve actuator means for moving said first and second sleeve between said first position and said second position, said sleeve actuator means housed in said upper housing and releasably connected to said first and second sleeve through said upper ball member;

(h) said first position being such that said upper and lower ball member are in said open position, a tight continuous passageway is formed between said inlet and said outlet, and such that said upper housing, said upper ball member, said ball actuator means and said sleeve actuator means are removable as a single unit while, said lower ball member and said first and second sleeve remains within said lower housing thereby allowing for inspection and maintenance while in such open position; and

(i) said second position being such that said first and second sleeve are withdrawn within said lower ball member and said ball actuator means can move said upper and lower ball member between said open position and said closed position.

4,727,902

VALVE ARRANGEMENT

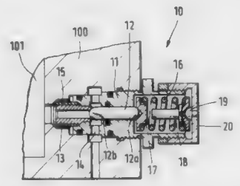
Klaus Unterstein, Duesseldorf, and Sigfrid Büchele-Buecher, Meerbusch-Struemp, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,424

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531189

Int. Cl.[4] F16K *17/06*

U.S. Cl. 137—454.5 **3 Claims**



1. A valve arrangement including pressure relief means for use as a pressure valve in a combustion chamber of a hot gas generator, comprising in combination,

a combustion chamber housing,

a valve body threadably mounted in said combustion chamber housing; said valve body defines an axial cylindrical bore;

a rod-shaped piston is slidably mounted in said bore; the axial ends of said rod-shaped piston are hemispherically shaped;

a coil spring coaxially mounted in said valve body behind said piston as viewed in a longitudinal axial direction from the combustion chamber outwardly through the axial bore; the diameter of said rod-shaped piston being substantially smaller than the diameter of said coil spring;

a pair of end pieces, each end piece of said pair of end pieces abuts against one end of said coil spring, one of said end pieces also abuts against the axial end of said rod-shaped piston which confronts the combustion chamber and the other end piece abuts against said valve body; a housing nut having a bottom and an internally threaded blind bore; and a hemispherical projection axially extending from the bottom into said valve body, a first axial recess in said other end piece, said hemispherical projection extending into said first axial recess; whereby the axial end of said rod-shaped piston which abuts against the end piece lifts therefrom upon the occurrence of a pressure peak of predetermined magnitude in said combustion chamber; said piston, said valve seat member, said end pieces and said hemispherical projection are made of a material having poor heat conductivity characteristics;

wherein said valve seat member has the shape of a bottle, the portion of said bottle-shaped valve seat member of maximum diameter has a frusto-conical surface which sealingly abuts against a frusto-conical counter surface in said housing.

4,727,903

FLUID SHUTOFF VALVE

Malcolm B. Sturgis, 6227 Rosebury Ave., St. Louis, Mo. 63105, and Richard E. Hoffman, Overland Park, Kans., assignors to Malcolm B. Sturgis, St. Louis, Mo.

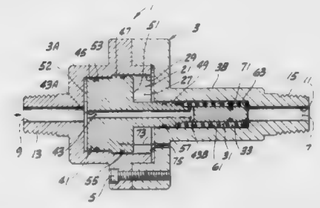
Filed Jun. 26, 1987, Ser. No. 67,718

Int. Cl.[4] F16K *31/12*

U.S. Cl. 137—461 **25 Claims**

1. A fluid shutoff valve comprising a valve housing having an axial bore therethrough with inlet and outlet ends, said bore being enlarged between said inlet and outlet ends to form a valve chamber comprising a first portion bounded by a first annular wall extending generally axially of the valve housing and a second portion downstream from the first portion

bounded by a second annular wall extending generally axially of the valve housing, said second annular wall having an inside diameter greater than the inside diameter of said first annular wall thereby to form internal shoulder means in the valve chamber, valve means in said valve chamber having a passage for the flow of pressurized fluid from the inlet end of the bore to the outlet end of the bore, said valve means having a first valve portion received in said first portion of the valve chamber and a second valve portion downstream from the first valve portion received in said second portion of the valve chamber, said second valve portion having an outside diameter greater than the outside diameter of said first valve portion thereby to form external shoulder means on said valve means, first seal means providing a sealing fit between said first valve portion and said first annular wall of the valve chamber and



second seal means providing a sealing fit between said second valve portion and said second annular wall of the valve chamber, said valve means being movable in the valve chamber between an open position permitting flow from the inlet end of the bore to the outlet end of the bore via said valve passage and a shutoff position blocking said flow, and spring means biasing said valve means toward said open position, the arrangement being such that said valve means is responsive to an increase in upstream fluid pressure of predetermined magnitude to move downstream in the valve chamber a sufficient distance relative to said internal shoulder means to break the sealing fit provided by said first seal means whereby said external shoulder means on said valve means is exposed to said upstream fluid pressure and said valve means is adapted to move further downstream to said shutoff position.

4,727,904

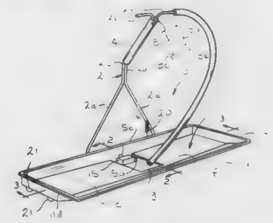
DRAIN TRAY APPARATUS

Daryl C. Lease, 6700 Tucker, Eaton Rapids, Mich. 48827

Filed Mar. 23, 1987, Ser. No. 29,266

Int. Cl.[4] F16N *31/02*

U.S. Cl. 137—565 **15 Claims**



1. An improved drain tray apparatus adapted for collecting coolant or other liquids from an internal combustion engine or radiator and for recycling the liquid to the engine or radiator or disposing of the liquid which comprises:

(a) a pan having a bottom and sides which is adapted to be positionable beneath the internal combustion engine or radiator so as to collect liquids which flow from the engine or radiator and having a low section in the bottom of the pan in which the liquid collects;

(b) an elongate handle pivotably attached to the pan at one end of the handle and extending from the pan and with a pair of spaced apart hand grips so as to be usable in a standing position to move the pan beneath the internal combustion engine or radiator;

(c) a pump mounted in the low section of the pan so as to produce a flow of the collected liquid from the pan into an inlet of the pump and through an outlet from the pump;

(d) a conduit leading from the outlet of the pump between the handle and the grips and through a flexible hose extending away from one of the hand grips, wherein liquid is drained into the pan from the engine or radiator and then recycled into the engine or radiator through the conduit or disposed of through the conduit by activating the pump.

4,727,905

PNEUMATIC CONTROL DEVICE FOR CONTROLLING PNEUMATIC SYSTEM

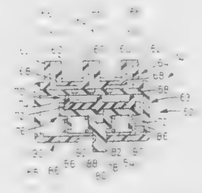
Akihiko Kitamura, Aichi, Japan, assignor to Kojima Press Industry Co., Ltd., Aichi, Japan

Division of Ser. No. 861,918, May 12, 1986, Pat. No. 4,688,602. This application Jan. 15, 1987, Ser. No. 3,416

Claims priority, application Japan, May 14, 1985, 60-70825; May 17, 1985, 60-74031

Int. Cl.[4] F16K *11/065*

U.S. Cl. 137—625.48 **5 Claims**



1. A changeover switch for controlling a pneumatic system, comprising:

a housing including a front wall having an elongate slot extending in one direction, and a rear wall parallel to said front wall;

a wall member cooperating with said rear wall of said housing to define a double-walled structure, one of said wall member and said rear wall of said housing forming an inner member of said double-walled structure having three mutually independent through-holes which are formed through said inner member, said three through-holes being spaced apart from each other in said one direction, the other of said wall member and said rear wall forming an outer member of said double-walled structure having three ports which are connected to said three through-holes, respectively;

a valve member disposed in said housing and movable in said one direction between a first and a second position thereof such that an outer surface of said valve member is fluid-tightly slidable on an inner surface of said inner member of said double-walled structure, said valve member having two mutually independent recesses in said outer surface thereof, one of said two recesses communicating with two adjacent through-holes of said three through-holes to thereby connect said two adjacent through-holes, while the other of said two recesses communicating with the remaining one of said three through-holes to thereby inhibit fluid communication of said remaining one through-hole with said two adjacent through-holes, when said valve member is placed in said first position, said other recess communicating with said remaining one through-hole and one of said two adjacent through-holes

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which is the central through-hole, while said one recess communicating with the other one of said two adjacent through-holes, when said valve member is placed in said second position, whereby the central port is brought into communication with one of the other two ports, selectively;

an actuator member disposed in said housing movable in said one direction, said actuator member having an operating portion which extends from one of opposite surfaces thereof through said elongate slot formed in said front wall of said housing, such that said elongate slot permits said operating portion to be moved in said one direction when said actuator member is moved between a first and a second positions thereof, said actuator member holding at the other of said opposite surfaces thereof said valve member to move said valve member between said first and second positions thereof when said actuator member is moved between said first and second positions thereof, respectively;

a sliding member disposed in said housing and movable in said one direction, said sliding member being immovable relative to said valve member and said actuator member and having a slot formed therethrough through which said operating portion of said actuator member extends; and

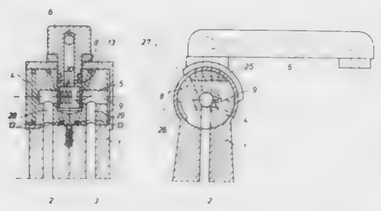
biasing means including a compression coil spring, said compression coil spring being disposed between said sliding member and said actuator member and biasing said valve member by a predetermined force via said actuator member to hold said valve member in pressed fluid-tight sliding contact with the inner surface of said inner member of said double-walled structure, said compression coil spring also biasing said sliding member by said predetermined force to hold said sliding member in pressed sliding contact with an inner surface of said front wall.

4,727,906

GRIPLESS WATER MIXER UNIT

Walter Holzer, Drosteweg 19, Meersburg, Fed. Rep. of Germany (7758)

Filed Mar. 25, 1986, Ser. No. 844,029
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512116; Apr. 22, 1985, 3514488
Int. Cl.⁴ F16K *31/58*
U.S. Cl. 137—636.2 **16 Claims**



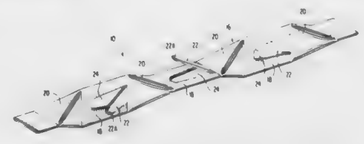
1. A grip-less mixer unit, from metal or plastic, including a valve body; at least one each of hot and cold water supplies; first and second regulating elements for the regulating, respectively, of the mixing temperature and the quantity of the water outflow; and a water outlet pivotable about one or two axes for operation of the regulating elements, where said second regulating element is positioned transversely to said first regulating element, and said outlet is connected to said first and second regulating elements and that by rotating the outlet about one of said axes, said quantity of water may be regulated, and by rotating the outlet about the other of said axes, said mixing temperature of the water may be regulated.

4,727,907

TURBULATOR WITH INTEGRAL FLOW DEFLECTOR TABS

Donald C. Duncan, Pomona, Calif., assignor to Dunham-Bush, Riverside, Calif.

Filed Mar. 30, 1987, Ser. No. 31,725
Int. Cl.⁴ F15D *1/02;* **F28F** *13/12*
U.S. Cl. 138—38 **7 Claims**



1. An improved turbulator for insertion in a heat exchanger pipe having a substantially straight longitudinal internal wall, said turbulator comprising:

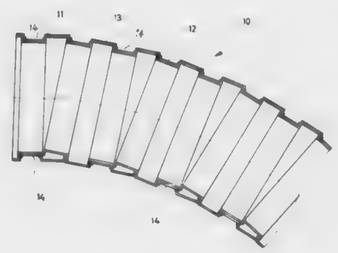
a cylindrical metal tube being flattened at longitudinally spaced positions along said tube to form flats offset circumferentially by 90°, and hollow tubular transition portions of said tube connecting said flats together said transition portions being of generally triangular shape in plan configuration, and an elongated tab partially struck out of each flat at an acute angle to the plane of the flat and defining a fluid passage hole within each flat leading from one side of the turbulator to the other.

4,727,908

FLEXIBLE TUBE OR HOSE OF RECTANGULAR CROSS-SECTION, PARTICULARLY ENERGY SUPPLY CONDUITS

Walter Förster, Stein, Fed. Rep. of Germany, assignor to Witzenmann GmbH Metallschlauch-Fabrik Pforzheim, Pforzheim, Fed. Rep. of Germany

Filed Apr. 28, 1986, Ser. No. 856,946
Int. Cl.⁴ F16L *11/18*
U.S. Cl. 138—120 **15 Claims**



1. Flexible hose, particularly to carry cables, tubes and the like for placement between a fixed first terminal end and a movable second terminal end, having

a plurality of essentially ring-shaped links (2,11,15,21,25,35,36,40,45,48,49,50,54,58,61,63) which have, in radial cross-section, interlocking, interengaging essentially rectangular shape defining rectangular sides, and which are formed with marginal radial ribs interlocking with each other; and

connection means for connecting said links together and shaped to permit bending of the hose from a straight-in-line position of the respective links only in one direction, which direction is perpendicular to one of the rectangular sides of the cross-section of the hose,

wherein, in accordance with the invention,

the links (2,11,15,21,25,35,36,40,45,48,49,50,54,58,61,63) are formed with a separating line or joint at one of the sides subject to bending;

locking-and-closing elements (6,7,12,13,16,17,20,23,27,37,38,41,46,47,51,55,59,62,64) are provided connecting the respective links and locking and closing the separating line or joint; and

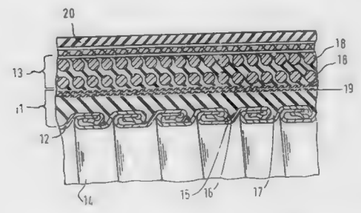
wherein at least every second locking-and-closing element has a width dimension which prevents mutual movement of links which are adjacent each other, when in longitudinal direction of the hose, the hose is deformed from a straight line position upon extending or upon buckling of the hose, said locking and closing elements forming a locking, closing and separating element for said adjacent links.

4,727,909

HOSE

Alan D. Griffiths, Binbrook, England, assignor to Dunlop Limited a British Company, United Kingdom

Continuation of Ser. No. 680,474, Dec. 11, 1984, abandoned. This application Feb. 11, 1987, Ser. No. 14,163
Claims priority, application United Kingdom, Aug. 21, 1984, 84/21238
Int. Cl.⁴ F16L *11/08*
U.S. Cl. 138—127 **13 Claims**



1. A flexible high pressure oil transportation hose for transportation of crude oil under high pressure, said hose comprising a layer of flexible polymeric material of a kind which when exposed to crude oil will swell by at least 10% of its original volume in the absence of external constraint, a radially inner support layer and a radially outer support layer between which said layer of polymeric material is disposed such that said support layers resist any tendency for the polymeric material to expand in response to contact with corrosive fluid, the inner support layer comprising at least one helically wound element, the successive turns of which are interlocked and arranged to define in the radially outer surface of the inner support layer at least one helically extending crevice of a wedge-like shape in cross-section, as considered in a plane containing the longitudinal axis of the hose, wherein the width of the crevice, in a direction parallel to the longitudinal axis of the hose, increases with increasing distance from the longitudinal axis, and said layer of flexible polymeric material being arranged to extend into and substantially wholly fill said at least one helically extending crevice.

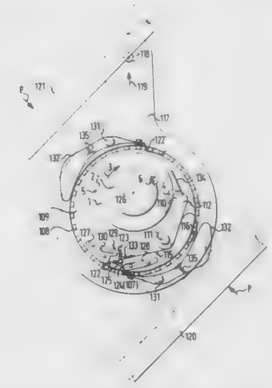
4,727,910

DRIVE CONNECTION FOR A RECIPROCATING A CONNECTING ROD FROM A DRIVE SHAFT THROUGH AN ECCENTRIC CAM

Paul Surkamp, Kempen, Fed. Rep. of Germany, assignor to Kaiser GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 28,963
Int. Cl.⁴ D03C *1/00*
U.S. Cl. 139—76 **17 Claims**

1. A drive connection for reciprocating an operating member such as a harness frame of a textile loom by transmitting intermittent rotation of a drive shaft through an eccentric cam into reciprocation of a connecting rod, said drive connection comprising an annular drive ring fixed on the drive shaft and having a recess formed therein, a pawl pivotally mounted on the eccentric cam for engagement in and disengagement from said recess for selective drive connection and disconnection of said cam to said drive shaft, pawl locking means for releasably locking said pawl in engagement in said recess for driving connection of said drive shaft to said cam, actuating means mounted on said connecting rod and engagable with said lock-



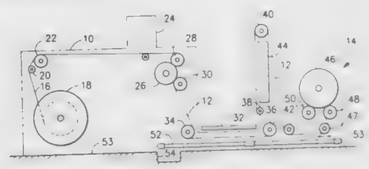
ing means to disengage said pawl from said recess and thereby disconnect said eccentric cam from the drive of said drive shaft upon programed operation of said actuating means, and blocking means mounted on said eccentric cam for blocking said actuating means from engagement with or disengagement from said locking means except when said eccentric cam is positioning said connecting rod in a predetermined position, such as a shed position of a harness frame.

4,727,911

LOOM TAKE-UP TRAY

James D. Crawford, and Richard A. Rubel, both of McCormick, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

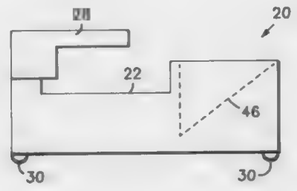
Continuation of Ser. No. 45,422, May 4, 1987, abandoned. This application Jul. 24, 1987, Ser. No. 77,954
Int. Cl.⁴ D03D *49/20*
U.S. Cl. 139—304 **6 Claims**



1. A loom arrangement comprising: a loom to manufacture woven fabric, a fabric take-up mechanism spaced from said loom, a first means to supply fabric from said loom to said take-up mechanism and a second means located between said loom and said take-up mechanism to prevent fabric from falling on the floor of area in which said loom arrangement is located, said second means being a tray located below the line of travel of fabric from said loom to said take-up mechanism and having an open construction to allow dirt, etc. to fall through.

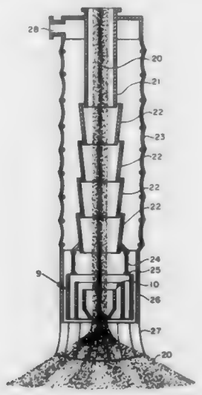
VOL 1088 ISS 1 MR 1 1988 UMI

4,727,912
LEAD STRAIGHTENER AND FLATTENER FOR SEMICONDUCTOR DEVICES
Victor M. Gonzalez, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.
Filed Nov. 17, 1986, Ser. No. 931,309
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 10 Claims



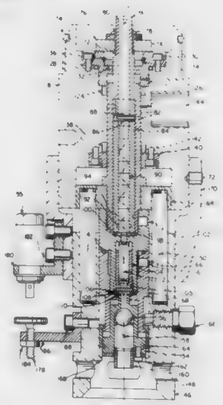
1. A lead straightener and flattener for semiconductor devices comprising:
a female die including means for supporting the body of a semiconductor device, means for supporting the leads of said semiconductor device having openings therebetween and means for holding said semiconductor device stationary so that said leads and said body are supported; and
a male die having a top plate, a plurality of teeth connected to and extending from said top plate, said teeth including means for penetration between said leads of said semiconductor device and into said openings of said female die, said male die further including lead locating means movably mounted thereon.

4,727,913
DUST CONTROL LOADING DEVICE
James A. Bliss, Tonawanda, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.
Filed Mar. 3, 1986, Ser. No. 835,502
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—7 6 Claims



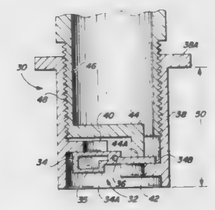
6. A method for reducing the dust created during the transfer of particulate material by gravity flow through a discharge chute which comprises causing the flow of material to part through a dust suppressing device attached directly below the output end of the discharge chute, said chute and dust suppressing device being position within an outer conduit for the vacuum removal of dust, said dust suppressing device comprising:
(a) a central hopper having a receiving end for receiving the stream of particulate material and a discharge end having a narrower diameter than the receiving end, whereby the flow of particulate material therethrough is retarded in bottleneck fashion to cause a pile-up of material within and above the hopper and the resultant deflection of excess particulate material;
(b) a first outer tubular member coaxially disposed and concentrically spaced outward with respect to said hopper and having a length greater than said hopper, providing an annular space between the hopper and first tubular member for the passage of said excess particulate material;
(c) a second tubular member coaxially disposed and concentrically spaced outward with respect to said hopper and said first tubular member and having a length greater than said first tubular member, providing an annular space between the first tubular member and the second tubular member for the passasge of additional excess particulate material; each of said first and second tubular members having a receiving end and a discharge end for the passasge of particulate materials therethrough, the discharge end of said tubular members being substantially on a plane with the discharge end of said hopper.

4,727,914
APPARATUS FOR FORMING AND PACKAGING A DELAYED FORMING GEL
John Anderson, III, Wilmington, and David R. Knowlton, Ipswich, both of Mass., assignors to The Gillette Company, Boston, Mass.
Division of Ser. No. 620,220, Jun. 13, 1984, Pat. No. 4,651,503.
This application Sep. 12, 1986, Ser. No. 906,707
Int. Cl.[4] B65B *1/04, 3/04*
U.S. Cl. 141—105 19 Claims



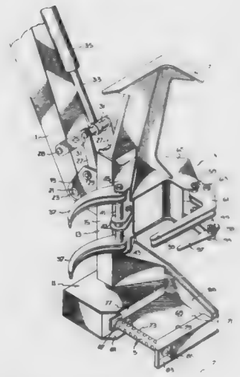
1. Apparatus for forming and packaging, in a suitable container for the dispensing thereof, a delayed foaming gel, said delayed foaming gel being formed by intimately mixing at least first and second ingredients, said apparatus comprising
a first metering system for receiving a first ingredient and for producing therefrom predetermined dosages of said first ingredient, said first metering system including a first metering chamber with a first metering piston slidably mounted therein;
a second metering system for receiving a second ingredient, said second metering system including a second metering chamber and a second metering piston slidably mounted therein;
filling head structure coupled to said first and second metering systems, said filling head structure having mixing chamber structure and a passageway for communication with a suitable container for said delayed foaming gel;
first valve means for controlling flow of said first ingredient from said first metering system into said filling head structure;
second valve means for establishing fluid communication between said second metering system and said filling head structure concurrent with delivery of said first ingredient by said first metering means to said filling head structure;
third valve means responsive to movement of a container to be filled to a filling position adjacent said filling head structure for creating a pressure differential across said first metering piston of said first metering means to commence flow of a metered amount of said first ingredient into said filling head structure; and
mechanical coupling means connected between said first and second metering pistons for moving said second piston in response to movement of said first piston for flowing said second ingredient into said filling head structure concurrently with said first ingredient for intimate mixing and ejection as a mixture in liquid form into the container.

4,727,915
AUTOMATIC SHUT-OFF LIQUID DISPENSING NOZZLE
Richard L. Grant, 13211 N. 19th Way, Phoenix, Ariz. 85022
Continuation-in-part of Ser. No. 715,747, Mar. 25, 1985, abandoned. This application Sep. 10, 1986, Ser. No. 905,874
Int. Cl.[4] F16K *31/18*
U.S. Cl. 141—201 6 Claims



1. A filling device for mounting on a first liquid container used for containing a liquid for filling a second liquid container, the filling device comprising:
nozzle means for transferring said liquid from the first liquid container to the second liquid container, said nozzle means further comprising:
a tubular member having a valve means therein for automatically responding to a rise in a liquid level in an output end of said nozzle means, said valve means further comprising:
a butterfly valve having a central pivot axis within said tubular member, a first portion of said butterfly valve being on one side of said central pivot axis and a second portion of said butterfly valve being on another side of said central pivot axis, said first valve portion having a first buoyancy and said second valve portion having a second buoyancy, said first buoyancy being greater than said second buoyancy whereby said rising level of liquid in said tubular member causes the valve means to close.

4,727,916
TREE HARVESTER
Roger Sigouin, 601 route 111 ouest, Amos, Quebec, Canada J9J 2Y1
Filed Aug. 8, 1986, Ser. No. 894,611
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—3 D 12 Claims

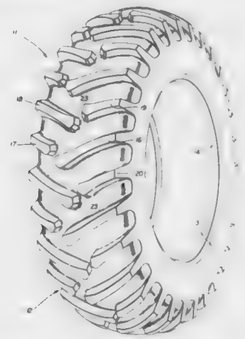


1. A tree harvester comprising:
a head boom having a lower free end;
a tree felling head comprising an elongated post having a longitudinal axis and a platform structure fixedly mounted at one end of said post and extending laterally therefrom; said platform structure defining a storage enclosure including a flat bottom wall having a straight front edge and a circumscribing wall upstanding from and around said bottom wall, said circumscribing wall extending at least up to the ends of said straight front edge;
a rotary cylindrical cutting knife and means solidly mounting said knife on said platform structure immediately adjacent and parallel to said bottom wall front edge outside said storage enclosure, said cylindrical knife having a top longitudinal edge essentially flush with the top face of said bottom wall;
means pivotally mounting said post on said lower end of said head boom for holding said tree felling head with said rotary cutting knife in essentially horizontal position and applied against one side of a butt end of a tree to be felled;
first gripping arm means comprising at least one first gripping arm above said storage enclosure and adjacent thereto; means mounting one end of said first arm on said tree felling head for pivotal movement of said first arm about an axis parallel to said post longitudinal axis, and first power means for pivoting said first gripping arm along an arc of circle of sufficient length to allow said first arm to close in around the other side of said butt end to the tree to be felled whereby to press said rotary cutting knife against the tree butt end to cut a kerf thereacross and thereafter to move said tree into said storage enclosure in vertical position against said circumscribing wall.
a tree support fixed to said post above at least part of said circumscribing wall for holding said cut tree in said vertical position; and
second gripping arm means beneath said tree support for releasably holding said felled tree in said storage enclosure while a further tree is being felled,
wherein said second gripping arm means is independent of said first gripping arm means and comprises:
a lever, first pivot means mounting said lever on said post for pivotal movement about an axis parallel to said post longitudinal axis; second pivot means on said lever, away from said first pivot means, and a power jack connected respectively to said second pivot means and

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to said post for pivoting said lever about said first pivot means; a second gripping arm having a tree gripping end and an operating end; a third pivot means on said lever, away from said first and second pivot means and mounting said second gripping arm on said lever between said tree gripping end and said operating end for pivotal movement thereof about an axis parallel to said post longitudinal axis; and biassing means joining said lever and said operating end for applying biassing pressure to said felled tree as said lever is pivotally drawn toward said felled tree in said storage enclosure.

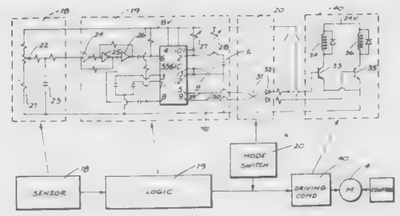
4,727,917
ALTERNATING LUG TIRE
David L. Stewart, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 2, 1983, Ser. No. 500,468
Int. Cl.[4] B60C *11/03*
U.S. Cl. 152—209 B **4 Claims**



1. An off-the-highway vehicle tire comprising:
(a) carcass means having a tread area for receiving a tread means;
(b) tread means comprising:
(i) a first lug extending transverse to a mid-circumferential line about said tire, said first lug extending from the edge of said tread area through said mid-circumferential line, and
(ii) a second lug extending transverse to a mid-circumferential line about said tire said second lug extending from the opposite edge of said tread area to a point short of said mid-circumferential line of said tire, wherein said second lug is disposed directly opposite said first lug such that said first and second lugs are substantially symmetrical about said mid-circumferential line;
(c) tie bar means disposed between said first and second lugs, wherein said first lug is at a substantially constant angle with respect to said mid-circumferential line.

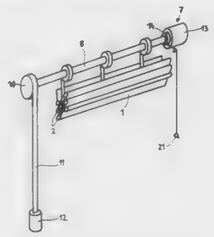
4,727,918
BLIND ADJUSTER
Frederick S. Schroeder, New South Wales, Australia, assignor to Vermont Management Pty Ltd., New South Wales, Australia
PCT No. PCT/AU86/00002, § 371 Date Sep. 16, 1986, § 102(e) Date Sep. 16, 1986, PCT Pub. No. WO86/04382, PCT Pub. Date Jul. 31, 1986.
PCT Filed Jan. 2, 1986, Ser. No. 916,495
Claims priority, application Australia, Jan. 16, 1985, PG8897
Int. Cl.[4] E06B *9/322*
U.S. Cl. 160—5 **6 Claims**

1. A system for automatic control of ambient heat penetration into a room through a window or door opening thereof, said system comprising a slatted blind within said opening having rotatable adjustment means to open and close the slats of said blind, a reversible electric motor having a driving shaft connected to said adjustment means to effect opening and closing of said slats, a heat sensing device external to said room and producing high and low output signal levels indicative of whether ambient temperature detected thereby is respectively above or below a predetermined level, two energizing circuits connected in opposite sense to said motor for driving the motor in respective ones of its two directions of rotation, a switching circuit including a timer responding to said signal levels and providing energizing power for a predetermined



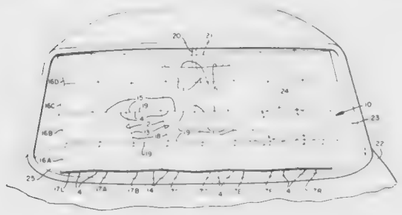
time period to a respective one of said energizing circuits depending upon whether the signal level is high or low, a manual override circuit connected to said energizing circuits in parallel with said switching circuit for manual control of said blind and limit switches in series with respective ones of said energizing circuits and operating in response to said slats attaining predetermined opened and closed conditions to disconnect said energizing power from said motor.

4,727,919
SAFETY AND EMERGENCY ACTUATOR DEVICE FOR A CONCERTINA TYPE DOOR
Bernard Kraeutler, Dunieres, France, assignor to Nergeco, Dunieres, France
Filed Nov. 7, 1985, Ser. No. 795,957
Claims priority, application France, Nov. 7, 1984, 84 16949
Int. Cl.[4] E05F *15/00*
U.S. Cl. 160—84 R **3 Claims**



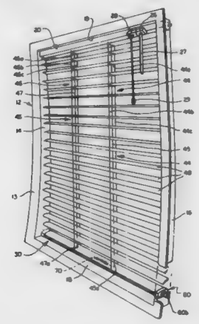
1. A safety and emergency actuator device for a concertina type door, comprising:
a flexible curtain stiffened at regular intervals by horizontal stiffener rods and guided between two door risers;
door-lifting belts fixed to the bottom of the curtain and passing vertically through guides fixed at regular intervals along the curtain;
a horizontally extending belt-winding shaft disposed over the top of the door and connected to said belts;
an electric motor and brake unit drivably connected to the shaft and comprising an electric motor means and an electric brake means;
manual means actuatable for disengaging the brake means of said motor and brake unit; and
at least one counterweight means coupled through suspension means to a drum fixed on one end of the shaft;
wherein said counterweight means (1) raises the bottom of said curtain to a predetermined fraction of the curtain's height when said manual means is actuated and when said motor means of said motor and brake unit is out of operation, (2) prevents said curtain from completely closing and keeps it open to said predetermined fraction of the curtain's height when said shaft is accidentally disconnected from said motor and brake unit, and (3) cooperates with said motor means when said motor means operates, said predetermined fraction of the curtain's height being substantially equal to the height of a human being, and
wherein said brake means brakes said belt-winding shaft when said motor means does not operate.

4,727,920
COMPACT FOLD WINDSHIELD SUNSHADE
Lawerence D. Siegler, 3827 Vinecrest Dr., Dallas, Tex. 75229
Filed Mar. 17, 1987, Ser. No. 26,544
Int. Cl.[4] A47H *5/00*
U.S. Cl. 160—84 R **12 Claims**



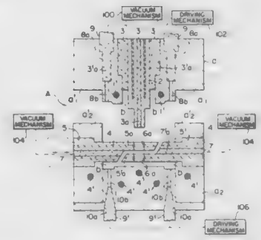
1. A compact fold windshade comprising: a single sheet of material including a plurality of planar parallelogram segments having spaced parallel opposite side edges and spaced parallel top and bottom edges and with acute and obtuse angles between segment sides and segment tops and bottoms; said planar parallelogram segments arranged in a plurality of horizontal tiers and in a plurality of vertical columns; and with adjoining planar segments joined through generally horizontal fold lines and through vertically extended fold lines that form acute and obtuse angles with said generally horizontal fold lines.

4,727,921
WINDOW BLIND ASSEMBLY
Francis Vecchiarelli, 482 Bogert Rd., River Edge, N.J. 07661
Filed Feb. 13, 1986, Ser. No. 829,286
Int. Cl.[4] E06B *9/30*
U.S. Cl. 160—168 R **11 Claims**



1. A Venetian blind assembly comprising:
a top rail member, and a bottom rail member spaced in parallel relation from the top rail member, the bottom rail member being movable toward or away from the top rail member;
a collapsible ladder and slat structure extending between and interconnecting the rail members;
two or more lift cords engagable with the ladder and slat structure, and extending between and interconnecting the rail members, manipulation of the lift cords by a user moving the bottom rail member toward or away from the top rail member; and
spring means contained within the bottom rail member, the spring means being in an unloaded condition and retaining lower end portions of the lift cords within the bottom rail member when it is moving toward or away from the top rail member, wherein when the bottom rail member is held at a fixed distance from the top rail member, the lower end portions of the lift cords can be partially pulld from within the bottom rail member to load the spring means which applies a tensioning force on the lift cords, the tensioned lift cords maintaining and stabilizing the position of the ladder and slat structure.

4,727,922
MOLD FOR HIGH-TEMPERATURE MOLTEN METAL AND METHOD OF PRODUCING HIGH-MELTING METAL ARTICLE
Akio Nakano, 14-1, Ichikawaminami 3-chome, Ichikawa-shi, Chiba-ken, Japan
Filed Nov. 25, 1986, Ser. No. 934,659
Claims priority, application Japan, Nov. 30, 1985, 60-270436
Int. Cl.[4] B22D *27/15, 17/08*
U.S. Cl. 164—61 **10 Claims**



1. A mold for a high-temperature molten metal, comprising:
a pair of male and female molds provided with a core part or liner part, one or both of said male and female molds formed of a ceramic,
a main vent provided by incorporating a heat-resistant, porous, gas-permeable material into said core part or liner part,
an auxiliary vent leading from a predetermined part of mold cavity surfaces of said male and female molds to the exterior of said mold,
a well provided in said auxiliary vent in the vicinity of said mold cavity surfaces,
a vent plug provided at the outlet of said auxiliary vent so as to be capable of being freely inserted and drawn out, said vent plug formed of a heat-resistant material,
means for sucking out gases or the like, generated in a solidification process of a molten metal poured into said mold cavity, through said main vent so as to remove said gases from said mold cavity, and
means for drawing out said vent plug at a predetermined timing from a starting time of pressurization of said mold and by a minute amount.

9. A method of producing a high-melting metal article comprising the steps of pouring a molten metal into a mold cavity of a pair of male and female molds, pressurizing the interior of said mold cavity, removing gases or the like generated in the solidification process of said molten metal in said mold cavity

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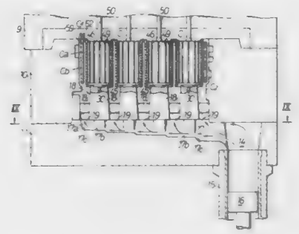
by sucking out said gases or the like through a vent provided by incorporating a heat-resistant, porous, gas-permeable material into a part of said molds, and drawing outward, at a predetermined timing from the start of said pressurization and by a minute amount, a vent plug provided so as to be capable of being freely inserted and drawn out, thereby discharging internal gases generated at a predetermined part of the interior of said mold cavity to the exterior of said mold cavity.

4,727,923

CASTING PROCESS

Masuo Ebisawa, Kawagoe; Masaaki Kurosawa; Toshio Hamashima, both of Sakado, and Shigeo Kaiho, Oomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,119
Claims priority, application Japan, Nov. 21, 1984, 59-246933
Int. Cl.[4] B22D *17/00*
U.S. Cl. 164—113 **8 Claims**



1. A casting process comprising placing a breakable core into a cavity in a mold and pouring a molten metal into said cavity under a pressure by means of a plunger, wherein the speed of displacement of said plunger is controlled at three states of first, second and third velocities, said second velocity being higher than said first velocity and said third velocity being lower than said second velocity, and wherein the pressure applied to the molten metal by said plunger after its complete displacement at said third velocity is controlled to a primary pressure and a secondary pressure higher than said primary pressure, so that a solidified film of molten metal is formed on the surface of said core to surround said core under said primary pressure and the molten metal is completely solidified under the secondary pressure, the magnitude of said primary pressure and its time of application being related to the breakable core to achieve the formation of said solidified film of molten metal on the surface of said core and enable said core to resist the subsequent application of the higher secondary pressure and prevent breakage of the core.

4,727,924

MOLD OSCILLATOR

William J. Dobinski, Myrtle Beach, and Aubrey K. Rogers, Jr., Georgetown, both of S.C., assignors to Georgetown Steel Corporation, Georgetown, S.C.

Filed Oct. 8, 1986, Ser. No. 916,591
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—416 **14 Claims**

1. In a continuous casting machine in which a mold is mounted for vertical reciprocation on a mold table frame, said machine having an enclosed spray chamber beneath the mold for spray cooling of a continuous casting therein as it emerges from said mold, an improved mold oscillator mechanism comprising;

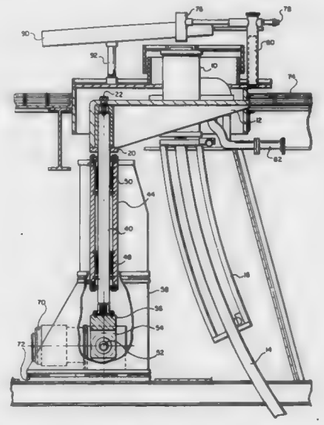
a drive motor;

an oscillator cam connected to said drive motor;

first and second vertical shafts fixed to said mold table frame at their upper ends; and

means connected to said shafts for imparting vertical oscillatory motion to said shafts through said cam;

first and second vertical oscillator shaft guide means, said first and second shafts being seated within and vertically oscillatable within said guide means; each vertical oscillator shaft guide means comprising a vertical tube having at



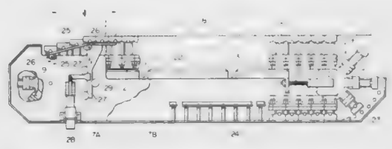
least a pair of vertically spaced bushings with said tube for seating, guideing and controlling the alignment of said shaft within said tube; and an upper tube cover plate fixed to the upper end of said tube and being provided with a central hole therethrough adapted for receiving said shaft therein.

4,727,925

ENDLESS TRACK CONTINUOUS CASTING MACHINE

Takashi Asari, Takarazuka; Takashi Okazaki, Ibaraki, and Masakazu Koide, Chiba, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed May 27, 1986, Ser. No. 866,649
Claims priority, application Japan, Mar. 28, 1986, 61-70445
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—431 **8 Claims**



1. An endless track continuous casting machine comprising:

a pair of upper and lower endless belts having surfaces facing each other in a spaced apart relationship and travelling in a downwardly slanted direction;

a pair of sprockets disposed at each side of said endless belts, each sprocket of each pair of sprockets being spaced from each other in the longitudinal direction of travel of said endless belts and each sprocket rotating around an axis perpendicular to the surfaces of said endless belts;

a pair of endless chains, each endless chain formed by a plurality of connected links and rotating around one of said pair of sprockets;

a dam block mounted on each of said links on each side of said endless belts and together with said endless belts defining a mold for casting a cast piece there between,

each of said dam blocks being pinched and supported between edges of said pair of endless belts and travelling with said pair of endless belts along a path advancing, from an inlet side of said mold to an outlet side of said mold,

supporting means for supporting each of said dam blocks on a corresponding one of said links such as to enable each dam block to be movable in a direction perpendicular to each link;

guiding means disposed on the inlet side of said mold and guiding each dam block in accordance with the advancing movement of each of said endless chains such as to gradually increase the distance between each dam block and its corresponding link;

fixing means for fixing each of said dam block supporting means relative to said corresponding one of said links when each said dam block is pinched and supported between said pair of endless belts; and

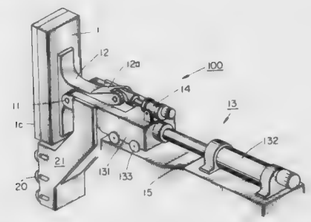
adjusting means for controlling said guiding means to adjust the increased distance between each said dam block and its corresponding link, thereby adjusting the width of said mold as defined between said dam blocks on each side of said endless belts while said pair of endless chains are moving.

4,727,926

APPARATUS FOR CHANGING WIDTH OF SLAB IN CONTINUOUS CASTING

Kazuhiko Tsutsumi; Wataru Ohashi; Takeyoshi Ninomiya, and Masami Temma, all of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 783,589, Oct. 3, 1985, abandoned. This application Jul. 29, 1986, Ser. No. 883,395
Claims priority, application Japan, Nov. 9, 1984, 59-236474; Dec. 10, 1984, 59-260381; Dec. 17, 1984, 59-265905; May 21, 1985, 60-109508; May 21, 1985, 60-109509
Int. Cl.[4] B22D *11/04, 11/10*
U.S. Cl. 164—436 **10 Claims**



1. A variable-width type composite continuous casting mold apparatus comprising:

two broad faces in opposing spaced apart relation;

at least one narrow face movable between said broad faces to vary the width of a slab under continuous casting conditions;

horizontal driving means for transversely moving said narrow face;

connector means for connecting said horizontal driving means to said narrow face, said connector means including a connector portion connected to said horizontal driving means, a bearing portion on the back side of said narrow face, and a rotary shaft rotatably connecting said bearing portion to said connector portion substantially at the balancing point among the whole reaction forces acting on said narrow face during width changing movements; and,

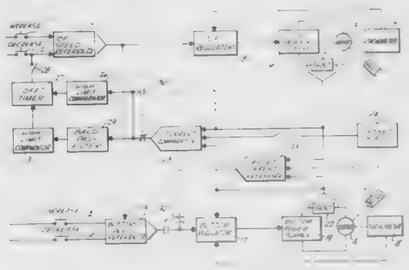
rotary driving means carried by said connector portion for rotationally moving said narrow face through said bearing portion, said rotary shaft defining the only axis for rotational movement of said narrow face between said broad faces, and said rotational axis extending orthognally to the casting direction and to the direction of transverse movement of said narrow face.

4,727,927

CASTING MACHINE CONTROL

Stephen E. Popik, Riverside, Calif., assignor to Hunter Engineering Company, Inc., Riverside, Calif.

Filed Jan. 20, 1987, Ser. No. 5,446
Int. Cl.[4] B22D *11/06, 11/16*
U.S. Cl. 164—452 **35 Claims**



1. A control system for a dual drive casting machine having a master roll driven by a master motor, a slave roll driven by a slave motor, means for feeding molten metal into the nip of the rolls and means for withdrawing cast sheet from between the rolls, the control system comprising:

means for setting a desired rotational speed of the master motor;

means for controlling rotation of the slave motor at a selected offset from the master motor;

comparator means for comparing the torque for driving the master roll with the torque for driving the slave roll;

first means connected to the comparator means for decreasing speed of the master roll when the differential torque exceeds a selected high limit;

band pass means connected to the comparator means for excluding changes in differential torque at a rate greater than a given higher frequency and lower than a given lower frequency and passing changes in differential torque between the lower and higher frequencies; and

second means for decreasing speed of the master roll when the differential torque passed by the band pass means is greater than a selected magnitude.

31. A method for controlling a dual drive casting machine having a master roll driven by a master motor, a slave roll driven by a slave motor, means for feeding molten metal into the nip of the rolls and means for withdrawng cast sheet from between the rolls, the method comprising the steps of:

setting a desired rotational speed of the master motor;

controlling rotation of the slave motor at a selected offset from the master motor;

sensing torque driving the master roll;

decreasing speed of the master roll when a change in torque exceeds a selected high limit;

sensing changes in torque at a rate between a given higher frequency and a given lower frequency; and

decreasing speed of the master roll when the rate of change of the torque between the lower and higher frequencies is greater than a selected magnitude.

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4,727,928

PROCESS FOR THE PREPARATION OF REFINED TANTALUM OR NIOBIUM

Ivan A. De Vynck, Ghent, and Pierre D. E. De Backer, Wilrijk, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

Filed Jul. 8, 1986, Ser. No. 883,496
Claims priority, application Luxembourg, Sep. 23, 1985, 86090
Int. Cl.[4] B22D *11/00*; C22B *34/00*
U.S. Cl. 164—469 6 Claims

1. A process for the preparation of refined metal, this metal being tantalum or niobium, from a starting material composed of this metal in the form of powder or pieces containing volatile impurities, comprising the steps of

(a) melting the starting material as such or in compacted state by contacting it with a plasma of a gas, that is inert towards said metal, in order to convert the starting material into crude cast metal; and

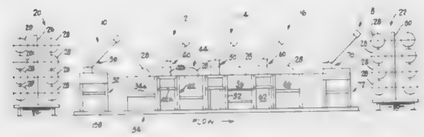
(b) submitting said crude cast metal to at least one electron beam melting to produce refined cast metal.

4,727,929

INVESTMENT SHELL MOLDING APPARATUS AND METHOD

John H. Simmons, Lyndhurst, Ohio, and Jerald J. Seymer, Manchester, Wis., assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Filed Oct. 11, 1985, Ser. No. 786,896
Int. Cl.[4] B22C *9/04*, *13/08*
U.S. Cl. 164—516 14 Claims



1. An apparatus for automatically forming ceramic shell molds comprising:

(a) a first support structure for supporting a plurality of set ups;

(b) a pickup arm assembly movable about a substantially transverse axis between a set up receiving position and a set up discharging position, said discharging position located at a slurry unit;

(c) means for imparting rotation to said set up while at the slurry unit;

(d) a first transfer arm assembly operative to engage said set up and transfer said set up to a slurry spin-off tank;

(e) means for rotating said set up at said spin-off tank to drive off excess slurry from said set up;

(f) a second transfer arm assembly for transferring said set up from said spin-off tank to a stucco tank;

(g) means for rotating said set up at said stucco tank;

(h) a third transfer arm assembly for transferring said set up from said stucco tank to a scraper unit for scraping stucco material from predetermined regions on said set up;

(i) a discharge arm assembly for engaging said set up at said scraper unit and transferring it to a second support structure;

(j) all of said transfer arm assemblies arranged in juxtaposed positions such that a substantially rectilinear processing line for said setups is provided.

14. A method for coating a set up in an investment casting process, comprising the steps of:

(a) positioning a plurality of set ups in spaced vertical relationship;

(b) positioning a slurry tank, a slurry spin-off tank, a stucco tank and a scraper unit in a juxtaposed relationship whereby a substantially rectilinear processing line for processing said set ups is provided;

(c) transferring one of said set ups from said vertical spaced position to said slurry tank by moving said set up assembly through a substantially vertical arc;

(d) rotating said set up for a predetermined time at said slurry tank;

(e) transferring said set up from said slurry tank to said slurry spin-off tank by moving it along a substantially vertical ar;

(f) rotating said set up for a predetermined time at said spin-off tank to drive off excess slurry;

(g) transferring said set up from said spin-off tank to said slurry tank;

(h) rotating said set up for a predetermined time at said stucco tank;

(i) transferring said set up from said stucco tank to said scraper unit and scraping slurry and stucco material from portions of said set up; and,

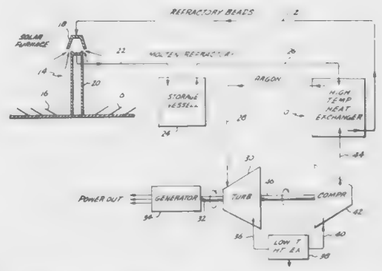
(j) transferring said set up from said scraper unit to a set up support structure.

4,727,930

HEAT TRANSFER AND STORAGE SYSTEM

Adam P. Bruckner, Seattle; Abraham Hertzberg, Bellevue, and David J. Shaw, Seattle, all of Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Aug. 17, 1981, Ser. No. 293,196
Int. Cl.[4] F28C *3/14*; F28D *19/02*
U.S. Cl. 165—1 7 Claims



1. A method for exchanging heat between a first liquid heat exchange medium and a second gaseous heat exchange medium that is immiscible with and substantially insoluble in said first medium comprising:

causing the first heat exchange medium to traverse a heat transfer zone in the form of droplets, said first heat exchange medium being injected into said heat transfer zone as a plurality of relatively small diameter liquid streams, the liquid streams being sized and the first heat exchange medium being selected to cause each of the streams to break into a plurality of droplets of substantially uniform size as they enter the heat transfer zone, said liquid streams further being externally mechanically excited to produce said droplets of substantially uniform size, and

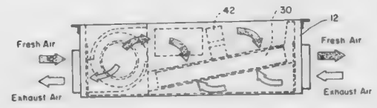
causing the second heat exchange medium to traverse the heat transfer zone in countercurrent flow relationship to said first heat exchange medium and allowing the heat exchange medium to make intimate thermal contact with each other.

4,727,931

AIR EXCHANGING APPARATUS AND METHOD

Erling Berner, Loretohohe 5, CH-6300 Zug, Switzerland

Continuation-in-part of Ser. No. 709,458, Mar. 8, 1985, abandoned. This application May 16, 1986, Ser. No. 864,056
Int. Cl.[4] F28D *19/00*
U.S. Cl. 165—8 1 Claim



1. A method for reducing the static pressure loss across a heat recovery rotor of an air exchanging apparatus in which incoming air enters the apparatus in a substantially horizontal stream, said method comprising the step of:

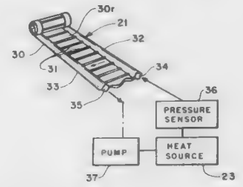
inclining the plane of rotation of said rotor so that said plane and said incoming airstream form an acute included angle.

4,727,932

EXPANDABLE PULSE POWER SPACECRAFT RADIATOR

Edward T. Mahefkey, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 18, 1986, Ser. No. 875,808
Int. Cl.[4] B64G *1/50*; F28D *15/02*
U.S. Cl. 165—41 11 Claims



1. A heat rejection system for temporarily storing and radiating heat generated by a source of heat on a spacecraft or like vehicle, comprising:

(a) a fluid heat exchange medium for contacting said source in operative heat exchange relationship with said source, said medium comprising a fluid material for absorbing heat by conversion of said medium from the liquid phase of said medium to the vapor phase of said medium;

(b) means defining an expandable and collapsible volume having an inlet and an outlet, said volume defining means including an extensible and retractable sleeve, said sleeve being coilable along the length thereof, and comprising a thin flexible film defining along a first edge of said sleeve a first passageway communicating with said inlet and along a second edge opposite said first edge a second passageway communicating with said outlet, said sleeve further defining between said first passageway and said second passageway and along said length of said sleeve a region of said volume defined by confronting inner surfaces of said film defining condensation surfaces for said medium, the outer surfaces of said film defining heat radiating surfaces for said sleeve;

(c) means communicating with said first passageway through said inlet for conducting said medium in said vapor phase from said source to said first passageway;

(d) means on said condensation surfaces for promoting condensation of said heat exchange medium from said vapor phase to said liquid phase and for facilitating flow by capillary action transversely along said condensation surfaces in a direction from said first passageway toward said second passageway of the liquid condensate formed by said condensation; and

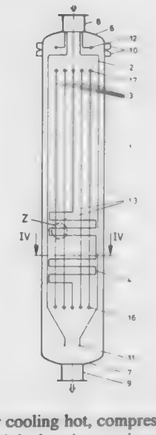
(e) means communicating with said outlet for conducting said liquid condensate from said outlet into said heat exchange relationship with said source.

4,727,933

DEVICE FOR COOLING HOT, DUST-LADEN GASES

Eckhard Hell, Oberhausen, and Manfred Förster, Essen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,462
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538515
Int. Cl.[4] F22B *37/24*
U.S. Cl. 165—82 7 Claims



1. Apparatus for cooling hot, compressed, dust-laden gases, comprising: a gas-tight housing; an inner structure of cooled tubes located within said housing; said housing being pressurized; a plurality of straight planar tube partitions with tubes in said structure and parallel to a longitudinal axis of said structure; said planar partitions comprising heating surfaces in the form of webs; at least one of said tube partitions having substantially horizontal pipe sections bent out into a nest of tubes extending over the cross-section of said inner structure through the other partitions, said nest of tubes being supported by the remaining unbent tube partitions, part of vertical planar tube partitions comprising simultaneously heating surfaces and a support means, the remaining part of vertical planar tube partitions comprising a substantially horizontally-lying nest of tubes, said support means, vertical heating surfaces and horizontal heating surfaces being all formed from a single tube system.

4,727,934

DATA COLLECTION TERMINAL DESIGNED FOR A HOSTILE ENVIRONMENT

Carl C. Eckel, and Jay A. Kaplan, both of Wayland, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 538,048, Sep. 30, 1983, abandoned. This application Oct. 7, 1986, Ser. No. 916,144
Int. Cl.[4] H05K *7/20*; F28F *7/00*
U.S. Cl. 165—104.33 3 Claims

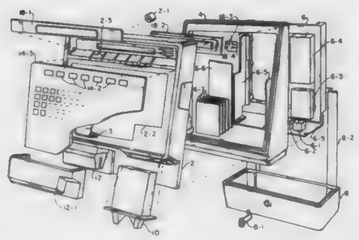
1. A data entry terminal housing for mounting and sealing electronic equipment for use in a hostile environment and the terminal is made up of a number of parts that are attached together in more than one physical arrangement so that said

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terminal housing may be wall mounted or desk top located, said terminal housing having openings to mount and seal with input/output equipment for interfacing with said electronic equipment, said terminal housing comprising:

a bottom piece in which are contained said electronic equipment, said bottom piece having opposite first and second sides that are not parallel to each other, and said first side is a wall having a plurality of cooling fins as part thereof and facing the outside of said terminal housing,

a front panel means fastenable to said second side of said bottom piece in more than one position while creating a hermetic seal between them to thereby protect said electronic equipment from the hostile environment, said front panel means having a plurality of openings for receiving and sealing with said input/output equipment which interfaces with said electronic equipment, ones of said openings being sealed when a piece of input/output equipment is not mounted therein, said front panel being fastened to said bottom piece in a first position when said terminal housing is wall mounted to facilitate access to said input/output equipment, and said front panel being fastened to said bottom piece in a second position when said terminal housing is to be desk top located to facilitate access to said input/output equipment, and



air circulating means inside said sealed terminal housing to move air over said electronic equipment to remove heat therefrom, said heated air also being circulated over said first side wall of said bottom piece to transfer said heat therethrough to said fins which dissipate the heat to air outside said terminal housing.

4,727,935

HEAT EXCHANGER AND METHOD FOR MAKING SAME

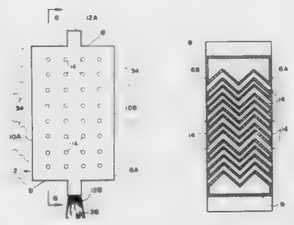
James M. Lapeyre, Orleans Parish, La., assignor to Laitram Corporation, New Orleans, La.

Filed May 13, 1985, Ser. No. 733,205
Int. Cl.[4] B22C *13/14*
U.S. Cl. 165—163 **6 Claims**

1. An improved heat exchanger comprising:

an enclosed, fluid tight flow chamber having an entry port and an exit port, and a first face and a second face, for passing a first fluid from said entry port through said fluid chamber to said exit port;

a plurality of fluid tight convoluted passages extending from said first face to said second face, for providing a plurality of flow paths for a second fluid through said chamber containing said first fluid, such that said first and second fluids are maintained separate from each other;



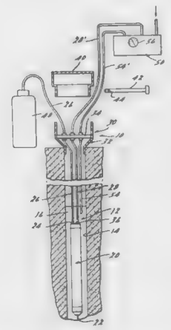
said flow chamber and said convoluted passages being formed as a unitized seamless shell.

4,727,936

RECOVERY AND CONTROL SYSTEM FOR LEACHATE COLLECTION

David Mioduszewski; David A. Fischer, both of Ann Arbor, and David H. Edwards, Munith, all of Mich., assignors to Q.E.D. Environmental Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 672,495, Nov. 19, 1984, Pat. No. 4,585,060, which is a division of Ser. No. 470,305, Feb. 28, 1983, Pat. No. 4,489,779. This application Apr. 24, 1986, Ser. No. 855,437
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—53 **14 Claims**



1. In a system for removing a flowable liquid material from a contaminated landsite having at least one in-ground well, a gas-operated submersible pump for withdrawing the liquid material from the in-ground well, and a source of pressurized gas, the improvement comprising a gas control apparatus for selectively actuating and deactuating the gas-operated pump, said gas control apparatus including:

well level sensing means for sensing the level of the liquid material in the in-ground well, said level sensing means including a static head conduit having an open end extending below the surface of said liquid material in the in-ground well and a second end in fluid communication with a source of a first measuring fluid, said level sensing means including means for supplying said first measuring fluid to asid static head conduit at a pressure sufficient to force a portion of said first measuring fluid out of said open end against the static head of the liquid material, and means for measuring and controlling the pressure of said first measuring fluid in order to determine the level of the liquid material in the in-ground well;

first control means for selectively actuating the gas-operated pump in response to the sensing of a predetermined high liquid material level in the in-ground well and for selectively deactating the gas-operated pump in response to the sensing of predetermined low liquid material level in the in-ground well in order to thereby control the level of the liquid material level in the in-ground well;

a liquid collection tank and means for conveying the liquid material from the gas-operated pump to said collection tank for collection therein; and

tank level sensing means for sensing the level of the liquid material collected in the collection tank, said tank level sensing means including a second static head conduit having an open end extending below the surface of said liquid material collected in the collection tank and a second end in fluid communication with a source of a second measuring fluid, said tank level sensing means including means for supplying said second measuring fluid to said second static head conduit at a pressure sufficient to force a portion of said second measuring fluid out of said open end of said second static head conduit against the static head of the liquid material, and means for measuring and controlling the pressure of said second measuring fluid in said second static head conduit in order to determine the level of the liquid material collected in the collection tank; and

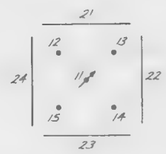
second control means for selectively preventing actuation of the gas-operated pump in response to the sensing of a predetermined high liquid material tank level in said collection tank and for permitting actuation of the gas-operated pump in response to the sensing of a liquid material tank level in said collection tank below said predetermined high liquid material tank level.

4,727,937

STEAMFLOOD PROCESS EMPLOYING HORIZONTAL AND VERTICAL WELLS

Yick M. Shum, Armonk, N.Y.; Margaret A. Hight, and Alfred Brown, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 2, 1986, Ser. No. 914,435
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—245 **5 Claims**



1. A method of recovering hydrocarbons from an underground formation by employing a modified five-spot pattern, which comprises:

drilling and completing four substantially horizontal wells, each horizontal well approximately located along each of the four sides of a substantially rectangular well pattern;

said substantially rectangular well pattern containing a substantially vertical central injection well and four substantially vertical infill wells located approximately midway between the central well and each of the four corners of the rectangular well pattern;

injecting steam into the formation through the central injection well;

producing hydrocarbons at the four infill wells;

after injecting enough steam through the central injection well to fill about 0.5 to about 1.0 pore volumes of the formation located within a pattern formed by the four infill wells, converting the infill production wells to injection wells;

injecting water instead of steam into the formation through the central injection well;

injecting steam into the formation through the infill wells; and

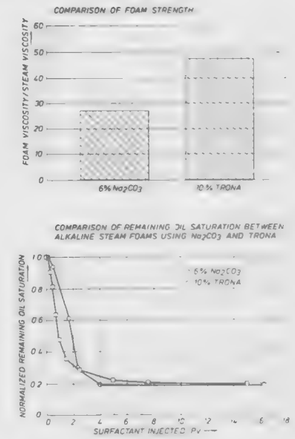
producing hydrocarbons from the horizontal wells.

4,727,938

TRONA-ENHANCED STEAM FOAM OIL RECOVERY PROCESS

Hon C. Lau, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 17, 1987, Ser. No. 15,243
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—270 **9 Claims**



1. In a process in which steam and steam-foaming surfactant are injected into a subterranean reservoir for displacing a relatively acidic oil toward a production location, which process includes injecting into the reservoir, at least as soon as at least some portion of the steam is injected, (a) a kind and amount of water soluble, alkaline material effective for ion-exchanging multivalent ions from the reservoir rocks and precipitating compounds containing those ions and for causing the aqueous liquid phase of the injected fluid to form soaps of substantially all of the petroleum acids in the reservoir oil, and (b) at least one surfactant arranged for foaming the steam and providing a preformed cosurfactant material capable of increasing the salinity requirement of an aqueous surfactant system in which soaps derived from the reservoir oil comprise a primary surfactant, an improvement comprising:

using as said water soluble alkaline material, a material consisting essentially of a substantially equal molar mixture of alkali metal carbonates and bicarbonates which is, or is substantially equivalent to, trona.

4,727,939

TOOL FOR CLOSING A PRODUCTION COLUMN IN A WELL

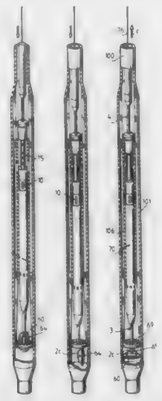
Peter J. Airey, Volaines, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Feb. 10, 1987, Ser. No. 12,962
Int. Cl.[4] E21B *34/14*
U.S. Cl. 166—332 **13 Claims**

1. A tool for closing a production column in a well containing fluid under pressure and designed to be lowered on the end of a suspension cable and to be temporarily fixed coaxially inside a sleeve of a tool connector incorporated in the production column, said connector being of greater diameter than the remainder of said column, said tool including the improvement

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of a valve member for co-operating with a corresponding valve seat fixed across the inside of said connector in order to close or to open the fluid-passing orifice therethrough; said orifice and said valve member being oblong in outline with the valve member being narrower than the width of said orifice; the valve member being orientable and capable of being positioned in a first orientation in which it extends longitudinally



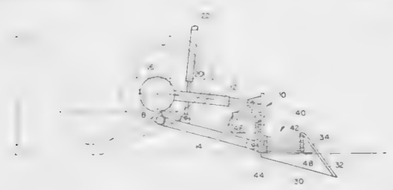
with the long axis of its outline being substantially parallel to the longitudinal axis of the tool thereby enabling the valve member to pass through said orifice, and along a second orientation where it extends transversely to the longitudinal axis of the tool thereby enabling it to co-operate with said valve seat after passing therethrough for closing said production column.

4,727,940

TANK MOUNTED MINE-FIELD CLEARING APPARATUS

Simcha Bar-Nefy, Omer; Michael Tiomkin, and Aron Klipper, both of Beersheva, all of Israel, assignors to Israel Aircraft Industries, Ltd., Lod, Israel

Continuation of Ser. No. 557,530, Dec. 2, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,372
Claims priority, application Israel, Dec. 9, 1982, 67437
Int. Cl.[4] F41H *11/16*
U.S. Cl. 171—84 **9 Claims**



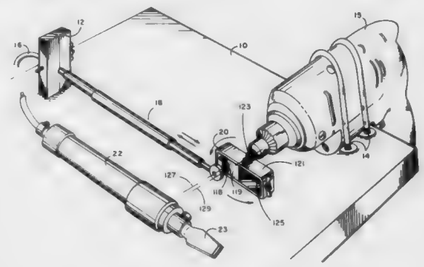
1. A tank having a selectably operated mine clearing capability comprising:
a tank;
a frame mountable onto said tank for selectable positioning in a raised or lowered orientation;
apparatus mounted onto the frame for raising and shunting aside mines along the entire width of tank including:
a plow section disposed in front of the tank and extending along the entire width of the tank and generally perpendicular to the direction of movement of the tank;
a conveyor apparatus located directly behind the plow section, extending generally in a horizontal plane along the length thereof and generally coextensive therewith;
a protective plate underlying said conveyor apparatus;
said plow section defining a plurality of spaced plow teeth including a forwardly extending lower portion which, in a operation extends from below the ground surface to the conveyor surface, and a sharply slanted upper portion which leads to the conveyor surface, said protective plate separating said upper portion of said teeth from said lower portion of teeth, said plow section including said plow teeth and said conveyor apparatus cooperating to convey the contents of the earth raised by the plow section to one side of said vehicle.

4,727,941

POWER OPERATED RECIPROCATING HAND TOOL

Charles E. Fulton, 11 Whiffletree Rd., West Yarmouth, Mass. 02673

Filed Feb. 24, 1986, Ser. No. 832,366
Int. Cl.[4] B25D *11/10*
U.S. Cl. 173—29 **4 Claims**



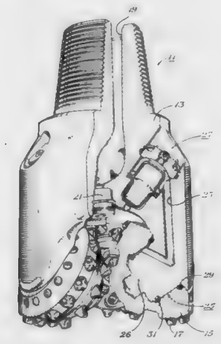
1. A power operated reciprocating hand tool adapted for receiving cutting tools comprising in combination:
a. a flexible sleeve;
b. a base;
c. means for attaching one end of said sleeve to said base;
d. a flexible cable slideably disposed in said sleeve, one end of said cable extending beyond the end of said sleeve attached to said base;
e. means for mounting a rotational power source on said base;
f. a rotatable eccentric adapted to be rotated by said power source whereby said cable will be reciprocated within said sleeve upon rotation of said power source;
g. means for attaching said cable to said eccentric;
h. handle means for attaching a cutting tool to the opposite end of said cable from said eccentric arranged to provide intermittent reciprocation of said tool, said handle means comprising in combination:
1. a hollow body;
2. a first cap attached to one end of said body, said cap having a port for receiving said sleeve and said cable;
3. means for attaching said sleeve to said cap;
4. a shaft positioned within said body attached to said cable;
5. a mallot slideably mounted in said body, said mallot having a port for slideably receiving said shaft;
6. spring retaining means mounted upon said shaft;
7. a coil spring surrounding said shaft positioned between said spring retaining means and said mallot;
8. a second cap slideably mounted on the opposite end of said body from said first cap;
9. means to limit the travel of said second cap;
10. means to attach a cutting tool to said second cap;
11. a coil spring positioned between the end of said body and said second cap whereby said second cap is forced forward of said body; and
12. a striker attached within said cap positioned to be contacted by said mallot whereby said cutting tool will be intermittently impacted upon the reciprocation of said cable.

4,727,942

COMPENSATOR FOR EARTH BORING BITS

Edward M. Galle, Friendswood, and Anton F. Zahradnik, Sugarland, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Nov. 5, 1986, Ser. No. 927,789
Int. Cl.[4] E21B *7/00*
U.S. Cl. 175—228 **12 Claims**



1. In combination with an earth boring bit having a rotatable cutter secured to a bearing shaft on a head, an improved pressure compensating and relief system which comprises:
seal means between the cutter and the bearing shaft;
the head including a lubricant passage extending between the bearing shaft and a compensator cavity;
the compensator cavity having one end exposed, by means of a mud passage, to mud in a borehole during drilling;
a flexible diaphragm having a periphery sealingly secured in the compensator cavity to form a mud region and a lubricant region -- and to induce upon the lubricant the hydrostatic pressure of the mud in a borehole;
a central portion of the diaphragm having a perforated protrusion extending into the mud region to form a self energizing configuration exposed to the mud region that seals the perforation when the pressure of the lubricant is less than or substantially equal that of the mud but that opens when the lubricant pressure exceeds the mud pressure by a selected value;
a wall at the end of the compensator cavity surrounding the mud passage and engaging an area around the protrusion only when the diaphragm is extended by lubricant pressure build-up that exceeds the mud pressure to open the perforation by the selected value to release lubricant.

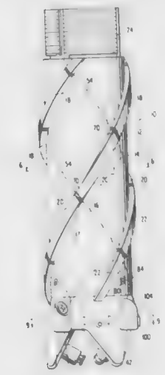
4,727,943

ROTARY DRILL BIT

Roy W. Wood, 119 Persimmon St., Birmingham, Ala. 35214

Filed Jan. 15, 1987, Ser. No. 3,439
Int. Cl.[4] E21B *10/18, 10/20, 10/24, 10/44*
U.S. Cl. 175—229 **14 Claims**

1. A drill bit having cutting cones for drilling into earth formations comprising:
a plurality of helical sections having connecting means to connect said helical sections to form a unitary drill bit;
means in said helical sections for storing and delivering lubricants to said cutting cones; and



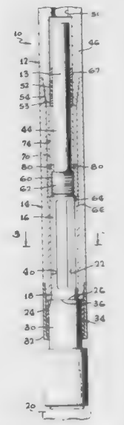
wear bar segments on said helical sections for forming a plurality of continuous parallel wear bars about the periphery of said unitary drill bit.

4,727,944

PERCUSSION DRILL STRING ASSEMBLY

Clifford C. Bottoms, Rte. 2, Box 384L, McKinney, Tex. 75069

Filed Nov. 26, 1986, Ser. No. 935,178
Int. Cl.[4] E21B *10/36*
U.S. Cl. 175—293 **7 Claims**



1. In a percussion drill apparatus which includes a drill string having an outer barrel near its lower end extending along an axis, and a lower inner barrel lying partially within the outer barrel and coupled to the outer barrel by spline means which allows the outer barrel to move along said axis relative to the inner barrel while causing them to rotate together about said axis, the inner barrel having means for holding a drill bit at its lower end, the inner barrel forming an upwardly facing anvil surface and the outer barrel forming a downwardly facing hammer surface which pounds on the anvil surface when the drill string drops, the improvement wherein:
said anvil surface lies below said spline means on said inner

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barrel, and said inner barrel has a cylindrical outer surface extending downwardly from said anvil surface; and

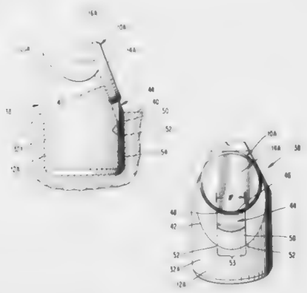
said outer barrel includes a cage lying below said hammer surface and around said cylindrical outer surface of said inner barrel, and a lower seal lying below said hammer surface and within said cage and slideably sealingly mounted against said cylindrical outer surface of said inner barrel.

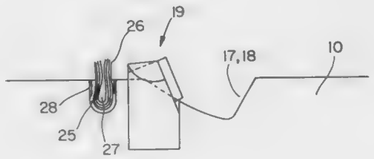
4,727,945

CUTTING ELEMENT HAVING DIAMOND CUTTING BLANK REINFORCED BY A SHOULDER

Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Dec. 29, 1986, Ser. No. 947,175
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **9 Claims**





1. A cutting element positionable within a drill bit body, said cutting element comprising:

a stud having a cylindrical side surface and an inclined supporting surface disposed at a forward end of said stud, said supporting surface oriented at an acute angle relative to a longitudinal axis of said stud and intersecting said side surface to form an edge,

a cutting member bonded to said supporting surface and comprising a substrate having thereon a cutting surface of polycrystalline diamond, said cutting member including a peripheral surface, and

a reinforcing shoulder projecting from said supporting surface adjacent a rear portion of said peripheral surface of said cutting member, said shoulder including a contact face engaging said rear portion, and a side surface intersecting said edge along a region of said edge, a forwardmost point of said region being spaced rearwardly from a rearwardmost point of said cutting member and also being spaced rearwardly from said contact face, said side surface of said shoulder being substantially cylindrical and contiguous with said side surface of said stud so as to define a continuation thereof.

4,727,946

ROTARY DRILL BITS

John D. Barr, Cheltenham, and Terry R. Matthias, Gloucester, both of England, assignors to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 665,071, Oct. 26, 1984. This application Jun. 20, 1986, Ser. No. 876,847
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—379 **20 Claims**

1. A rotary drill bit, for drilling wells in subsurface earth formations, and designed for rotation in a given direction, comprising:

a bit body having an internal passageway for drilling fluid, an operating end face, and at least one opening through said operating end face communicating with said passageway;

cutting means on said bit body forming at least one elongate cutting region extending generally radially along a substantial portion of said operating end face, said cutting region having cutting surface means facing in a forward direction with respect to said direction of rotation and generally continuous cutting edge means at the other extremity of said cutting surface means;

said cutting means comprising a plurality of cutting elements arranged in a row along said cutting region, each of said cutting elements having an outer cutting edge, said outer cutting edges jointly forming said cutting edge means and the total combined length of said outer cutting edges in said row equalling at least 80% of the overall length of the row;

a flexible elongate fence carried on said bit body, extending generally parallel to said cutting region, and spaced from said cutting region in a leading direction;

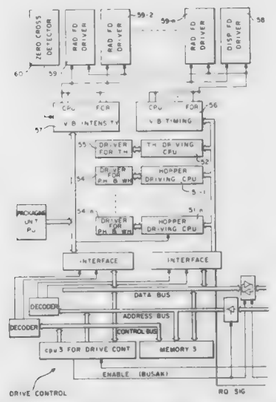
said at least one opening being positioned to deliver drilling fluid from said passageway to the area between said cutting region and said fence.

4,727,947

SPAN ADJUSTMENT SYSTEM AND METHOD

Kazufumi Naito, Ohtsu, Japan, assignors to Ishida Scales Manufacturing Company, Ltd., Kyoto, Japan
Scales Manufacturing Company, Ltd., Kyoto, Japan

Division of Ser. No. 772,244, Sep. 3, 1985, Pat. No. 4,694,920.
This application Feb. 5, 1987, Ser. No. 11,520
Int. Cl.[4] G01G *23/14*
U.S. Cl. 177—164 **6 Claims**



1. A span adjustment unit for a weighing device comprising

an analog-to-digital converter serving to convert an analog weight signal from said weighing device to a digital value,

a computing means serving to perform a predetermined calculation by receiving a digital signal from said analog-to-digital converter, and

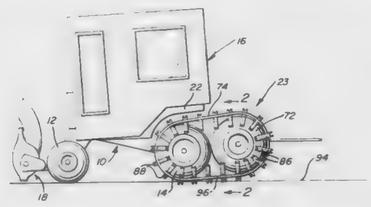
a memory means associated with the computing means for storing data including a desired digital span value N_S corresponding to a standard weight, a no-load value N_0 outputted from said analog-to-digital converter corresponding to an analog weight signal when said weighing device is not loaded, and a load value N outputted from said analog-to-digital converter corresponding to an analog weight signal when said weighing device is loaded with said standard weight.

4,727,948

REAR CRAWLER TRACK RETROFIT FOR GARDEN AND LAWN TRACTORS

Richard A. Julseth, Rte. 2, Box 59, Brandon, Minn. 56315

Filed Aug. 6, 1986, Ser. No. 893,643
Int. Cl.[4] B62D *55/04*
U.S. Cl. 180—9.26 **10 Claims**



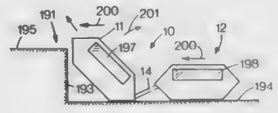
1. In combination with a tractor of the type including steerable front wheels and a solid transverse rear axle housing journalling opposite side rear driving wheels from opposite ends thereof, a crawler track assembly for said tractor including an elongated mounting arm extending longitudinally of said tractor rearwardly of said housing and including a front end securely anchored and braced relative to said housing and against angular displacement relative thereto, said mounting arm including a rear end disposed and facing rearwardly of said housing, laterally spaced opposite side rear idle wheels disposed in front-to-rear alignment with and spaced rearwardly of said driving wheels, journal means journalling said idle wheels from said rear end about axes located at permanent elevations relative to said housing to position the lower peripheral portions of said idle wheels at elevations visually ascertainable as spaced above a horizontal plane containing the lower peripheral portions of said front and driving wheels, and opposite side endless track assemblies trained about corresponding drive and idle wheels and including guide structures spaced therealong guidingly engaged with the outer peripheral portions of said driving and idle wheels for maintaining said track assemblies trained thereabout.

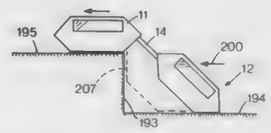
4,727,949

ALL TERRAIN VEHICLE AND METHOD OF OPERATING SAME

Kenneth A. Rea, and Alan H. Reynolds, both of Vancouver, Canada, assignors to Watercraft Offshore Canada Ltd., Richmond, Canada

Division of Ser. No. 704,427, Feb. 22, 1985, Pat. No. 4,645,023.
This application Jan. 12, 1987, Ser. No. 2,571
Claims priority, application Canada, Mar. 5, 1984, 448862
Int. Cl.[4] B62D *55/06;* **B60D** *7/00*
U.S. Cl. 180—9.32 **12 Claims**





4. A method of operating an articulated vehicle combination to negotiate an obstacle having a steep wall, the method including the steps of:

(a) providing an articulated vehicle combination having front and rear vehicle units and an articulating link means which interconnects the two vehicle units, the articulating link means having two longitudinally spaced apart pitch hinge assemblies cooperating with respective vehicle units to permit relative rotation between each vehicle unit and the link means about respective front and rear generally horizontal pitch axes, each vehicle unit having a body having a pair of spaced parallel crawler tracks,

(b) powering the crawler tracks of each vehicle unit for movement in a forward direction,

(c) applying a rotating force between the articulating link means and the front vehicle unit to rotate the front vehicle upwardly about the front pitch axis relative to the articulating link means to cause a front portion of the front vehicle unit to rise,

(d) concurrently permitting the articulating link means to

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rotate downwardly about the rear pitch axis relative to the rear vehicle unit,

(e) engaging the obstacle with the crawler tracks of the front vehicle unit and drawing the front vehicle unit upwardly on the obstacle,

(f) concurrently permitting the articulating link means to rotate upwardly about the rear pitch axis relative to the rear vehicle unit,

(g) concurrently applying with the rear vehicle unit a generally forward force to the articulating link means which becomes a generally upward force applied to the front vehicle unit to assist in moving the front vehicle unit upwardly on the obstacle concurrently with driving force from the crawler tracks of the front vehicle unit,

so that the front vehicle unit eventually assumes a relatively stable position on the obstacle spaced above the rear vehicle unit.

4,727,950

ELECTRIC POWER STEERING SYSTEM FOR VEHICLES

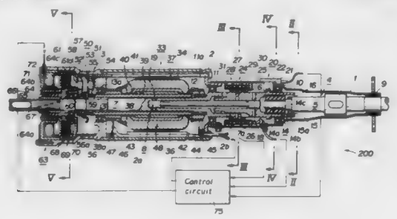
Yasuo Shimizu, and Toshitake Kawai, both of Tochigi, Japan, assignors to Honda Giken Koygo Kabushiki Kaisha, Tokyo, Japan

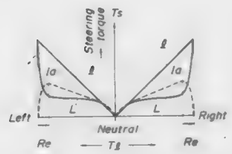
Continuation of Ser. No. 827,687, Feb. 10, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 77,961

Claims priority, application Japan, Feb. 12, 1985, 60-24925

Int. Cl.⁴ B62D *5/04*

U.S. Cl. 180—79.1 **7 Claims**





1. An electric power steering system for vehicles comprising:

an input shaft operatively connected to a steering wheel;

an output shaft operatively connected to a steered wheel;

an electric motor for operatively supplying auxiliary torque to said output shaft;

steering torque detection means for detecting steering torque acting on said input shaft;

driving control means for feeding said electric motor with a motor drive signal based on an output signal from said steering torque detecting means;

steering angle detection means for detecting a steering angle of said steering wheel; and

correction means for gradually decreasing said motor drive signal to reduce said auxiliary torque to be developed at said electric motor, when said steering angle of said steering wheel is detected to be exceeding a predetermined angle by said steering angle detection means, said predetermined angle being slightly less than a maximum steering angle of said steering wheel.

4,727,951

MOTORCYCLE FRONT AND REAR WHEEL SHOCK ABSORBER ASSEMBLY

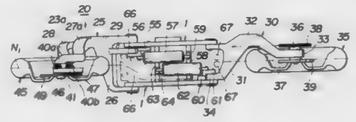
Minoru Morioka, Saitama; Toshiaki Kishi, Tokyo, and Toshiharu Yoshioka, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 684,058, Dec. 20, 1984, Pat. No. 4,638,881. This application Sep. 2, 1986, Ser. No. 902,684

Claims priority, application Japan, Dec. 26, 1983, 58-249773

Int. Cl.⁴ B62K *25/16, 25/20*

U.S. Cl. 180—219 **5 Claims**



1. A body structure for a motorcycle with a front wheel and a rear wheel, comprising:

an engine;

a body frame assembly having said engine mounted thereon;

a front leading arm for supporting said front wheel;

said front leading arm being vertically swingably joined at a rear portion thereof to said body frame assembly;

a first shock absorber operatively connected to said front leading arm;

a steering mechanism for steering said front wheel;

said steering mechanism including a handlebar;

a rear trailing arm for supporting said rear wheel;

said rear trailing arm being vertically swingably joined at a front portion thereof to said body frame assembly;

a second shock absorber operatively connected to said rear trailing arm;

said first shock absorber and said second shock absorber are arranged, under said body frame assembly having said engine disposed thereon, to be oriented forwardly and rearwardly, respectively; and

said first and second shock absorbers are positioned on opposite sides of a longitudinally extending center line of said motorcycle and longitudinally overlap each other along said longitudinal center line of said motorcycle.

4,727,952

MOTORCYCLE, AND BODY STRUCTURE THEREFOR

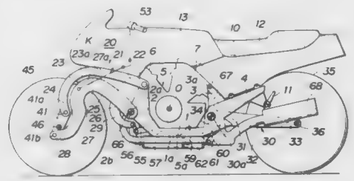
Minoru Morioka, Saitama; Toshiaki Kishi, Tokyo, and Toshiharu Yoshioka, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 684,058, Dec. 20, 1984, Pat. No. 4,638,881. This application Sep. 2, 1986, Ser. No. 902,702

Claims priority, application Japan, Dec. 26, 1983, 58-249773

Int. Cl.⁴ B62K *11/04*

U.S. Cl. 180—219 **3 Claims**



1. A body structure for a motorcycle with a front wheel and a rear wheel, comprising:

an engine;

a rigid body frame assembly having said engine mounted thereon;

a front leading arm for supporting said front wheel;

said front leading arm being vertically swingably joined at a rear portion thereof to said rigid body frame assembly;

a first shock absorber operatively connected to said front leading arm;

a steering mechanism for steering said front wheel;

said steering mechanism including a handlebar;

a rear trailing arm for supporting said rear wheel;

said rear trailing arm being vertically swingably joined at a front portion thereof to said rigid body frame assembly;

a second shock absorber operatively connected to said rear trailing arm;

said rigid body frame assembly integrally including left and right front standing portions and left and right rear standing portions which are spaced apart from each other so as to be shaped as a whole in a substantially concave form in side view and said engine being disposed in said rigid body frame assembly substantially between said front standing portions and said rear standing portions;

said engine being a V-type engine with at least a pair of internal combustion cylinders substantially vertically arranged to be forwardly inclined and rearwardly inclined, respectively;

said V-type engine being secured at a front part thereof to said front standing portions of said rigid body frame assembly and at a rear part thereof to said rear standing portions of said rigid body frame assembly, and

said rigid body frame assembly further integrally includes rearwardly extending step brackets having steps, said step brackets being provided on said rear standing portions.

4,727,953

BODY FRAMES FOR AUTOMATIC TWO-WHEELED VEHICLES

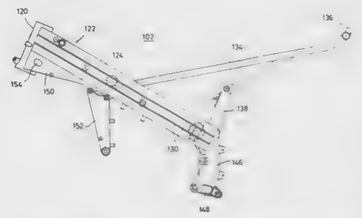
Takashi Kudo, Shiki; Shigeki Mizumachi, Fujimi; Shusaku Noguchi, Tokorozawa; Hiroo Takemura, Asaka, and Tatsuo Kurosawa, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 804,957, Dec. 2, 1985, abandoned. This application May 29, 1987, Ser. No. 56,293

Claims priority, application Japan, Dec. 5, 1984, 59-183638[U]; Feb. 28, 1985, 60-27239[U]; Mar. 5, 1985, 60-43370; Mar. 5, 1985, 60-43371; Mar. 5, 1985, 60-43372; Mar. 6, 1985, 60-44251; Mar. 6, 1985, 60-44253

Int. Cl.⁴ B62K *11/02*

U.S. Cl. 180—219 **18 Claims**



1. A body frame for an automatic two-wheeled vehicle, said body frame comprising:

a head pipe; and

a pair of main frames having front ends, said front end of said main frame being fixed to said head pipe for forming a front wheel-steering mechanism, said pair of main frames extending downwardly at a given interval and in a linear manner toward a rear portion of said body frame, said pair of main frames each including at a lower portion a downwardly extending hanger, each of said main frames being a rectangular cross section having a vertical cross sectional length longer than a horizontal cross sectional length, said rectangular cross section forming a top wall, bottom wall and side walls, said main frame including at least one partition, said partition extending within said main frame in a longitudinal direction and being parallel to said bottom wall of said main frame, each of said main frames further including a groove at an outer surface of said side walls at a location corresponding to a junction of said partition and said side walls, said groove being located on said outside surface of said main frame to avoid abnormal deformation during bending to said main frame.

4,727,954

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

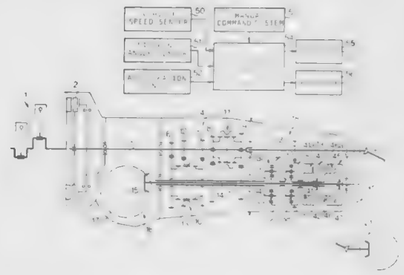
Rempei Matsumoto, Oota, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1987, Ser. No. 18,456

Claims priority, application Japan, Feb. 28, 1986, 61-43600; Feb. 28, 1986, 61-43601; Jul. 18, 1986, 61-169271

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—249 **10 Claims**



1. A power transmitting system for a four-wheel drive vehicle having first and second drive wheels and having a transmission, the latter having an output member, the system comprising

first and second differential gear devices, each of said gear devices having an input member and two output members;

the input member of the first differential gear device being operatively connected to the output member of the transmission,

the imput member of the second differential gear device being connected to one of the output members of the first differential gear device,

first and second clutch means, each of said clutch means being capable of continuously changing its transmitting torque,

said first clutch means being arranged so as to engage said output members of the second differential gear device with each other,

means for operatively connecting one of the output members of the first differential gear device to the first drive wheels, and

means for operatively connecting one of the output members of the second differential gear device to the second drive wheels,

the second clutch means being arranged so as to transmit a part of the output of the second differential gear device to the first drive wheels of the vehicle, whereby torque distribution to the drive wheels is continuously changeable.

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CARBON CANISTER DRAINED VAPOR DIFFUSING DEVICE

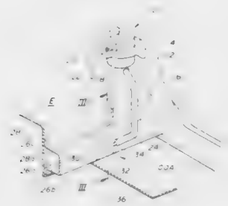
Masazi Honda; Akio Chiba, both of Hatano, and Hirotaka Tomioka, Kawasaki, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Dec. 12, 1986, Ser. No. 941,220

Claims priority, application Japan, Dec. 28, 1985, 60-203630[U]

Int. Cl.⁴ B60K *13/04*

U.S. Cl. 180—296 **19 Claims**



1. In a motor vehicle having in an engine room a vapor diffusing device connected to a carbon canister for adsorbing vapors from a fuel tank, said device including

a front side channel member extending in said engine room from a front portion of the vehicle toward a passenger room of the same, said carbon canister having an evaporated gas tube connected to the fuel tank, a vacuum line connected to an intake manifold and a purge line connected to the intake manifold, and a first means extending from a purge air opening in the canister to the vapor diffusing device, the front side channel member functioning to vent fuel vapors in the canister to atmosphere, the improvement comprising

a structure including wall means mounted to a part of said channel member to define an enclosed chamber with said part;

said first means fluidly connecting the interior of said enclosed chamber with the purge air opening of said carbon canister; and

second means defining a vapor diffusing opening through which the interior of said enclosed chamber is exposed to the interior of the engine room, said vapor diffusing opening being positioned sufficiently apart from the passenger room so as to prevent vapor from the engine room from reaching the passenger room.

4,727,956

METHOD AND APPARATUS FOR SIGNAL IMPROVEMENT IN MARINE SEISMIC EXPLORATION

Willem Huizer, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 568,021, Jan. 4, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 895,540

Claims priority, application United Kingdom, Jan. 19, 1983, 8301986

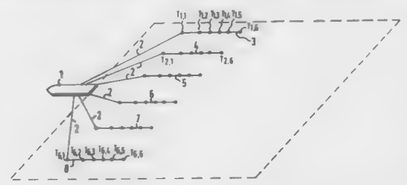
Int. Cl.⁴ G01V *1/38*

U.S. Cl. 181—111 **21 Claims**

1. A method for improving signal strength from a seismic array having at least two subarrays, each such subarray containing a plurality of seismic sources comprising:

characterizing each seismic source by parameters $T_{A,N}$ and $T_{B,N}$ where A and B are each a non-zero number representing a different preselected subarray and N is a non-zero number greater than one representing a preselected seismic source in said subarray, and where T is functionally related to at least one of the physical operating parameters of operating pressure, volume, or towing depth that characterize each seismic source, for a given parameter T, and

modifying said seismic array to provide an improved pri-



mary-to-bubble ratio and signature shape of the signals from such an array by changing said at least one physical operating parameters for each seismic source to cause T to satisfy the relation,

$$\frac{T_{A,N}}{T_{A,N-1}} = \frac{T_{B,N}}{T_{B,N-1}} = c_N,$$

where c_N is a preselected constant, and $T_{A,N} \neq T_{B,N}$ and $A \neq B$.

4,727,957

RUBBER VIBRATION ISOLATOR FOR MUFFLER

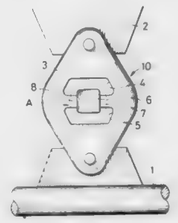
Akio Fujita, Fujisawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,752

Claims priority, application Japan, Dec. 25, 1985, 60-296192

Int. Cl.⁴ F16F *15/00*

U.S. Cl. 181—208 **3 Claims**



1. A rubber vibration isolator adapted for use between a body of a car and a muffler, comprising:

a unitary body made of rubber-like elastic material having a central area and a high damping factor for suspending the muffler from the car body and dampening low frequency vibrations;

an upper hole and a lower hole formed in the center of the body of rubber-like elastic material;

a dynamic damper comprising a metal weight having opposite sides and supported between said upper and lower holes for dampening high frequency vibrations; and

rubber-like elastic members connecting said body of rubber-like elastic material and said opposite sides of said weight for supporting said weight between said upper and lower holes.

4,727,958

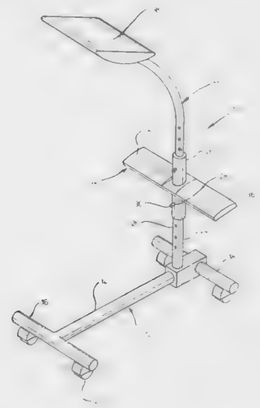
MECHANIC'S BODY SUPPORT DEVICE

Roger N. Botello, 4709 Candletree La., Austin, Tex. 78744

Filed Nov. 17, 1986, Ser. No. 930,900

Int. Cl.⁴ B25H *5/00*

U.S. Cl. 182—15 **9 Claims**



1. A new and improved mechanic's body support comprising:

base support means;

upstanding support means attached to said base support means;

knee support means attached to and extending laterally outwardly from said upstanding support means; and

torso support means attached to a topmost portion of said upstanding support means.

4,727,959

ASSEMBLY OF LARGE STRUCTURES

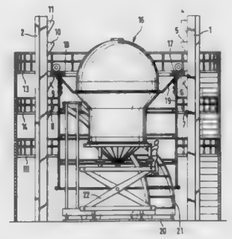
Karl-Heinz Kummer, Stuhr, Fed. Rep. of Germany, assignor to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,782

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607507

Int. Cl.⁴ B64G *5/00;* **E04G** *1/24, 1/15*

U.S. Cl. 182—36 **4 Claims**



1. Device for assembling large or large scale structures, particularly rocket stages, comprising:

at least three columns or towers arranged on a circle and being provided with radially inwardly extending support projections;

a plurality of vertically spaced assembly annuli circumscribing said towers in concentric relationship;

an annular assembly ring mounted on particular ones of the support projection on the inside of a circle delineated by said towers or columns; and

a spiral staircase looping around a particular axis and mounted for running on a circular track that extends around said axis.

4,727,960

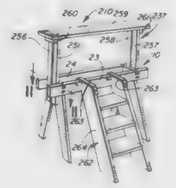
SUPPORT STRUCTURE

William H. Chaffee, 6135 S. Oak Park Ave., Chicago, Ill. 60638, and Thomas B. Dilworth, Lynnwood Farm, Port Republic, Va. 24471

Filed Jul. 6, 1987, Ser. No. 69,718

Int. Cl.⁴ B27B *21/00*

U.S. Cl. 182—182 **23 Claims**



1. A support structure comprising:

a pair of first wood leg boards defining a pair of first legs, each first leg board having a longitudinally elongated midportion, a lower end portion, and an upper end portion, said upper end portion defining an inner edge extending at a preselected angle to the longitudinal extent of said midportion, an outer edge defining a rectangular recess having an inner face extending parallel to said inner edge, and an upper end edge extending perpendicularly to said inner edge and inner face of said outer edge, said lower edge portion defining a lower end edge extending parallel to said upper end edge, the inner edges of said pair of said first leg boards facially abutting with said first legs extending downwardly from said upper end portion in downwardly widening angular relationship;

a pair of second wood leg boards defining a pair of second legs, each second leg board having a longitudinally elongated midportion, a lower end portion, and an upper end portion, said upper end portion defining an inner edge extending at a preselected angle to the longitudinal extent of said midportion, an outer edge defining a rectangular recess having an inner face substantially parallel to said inner edge, and an upper end edge extending perpendicularly to said inner edge and inner face of said outer edge, said lower edge portion defining a lower end edge extending parallel to said upper end edge, the inner edges of said pair of second leg boards facially abutting with said second legs extending downwardly from said upper end portions thereof in downwardly widening angular relationship;

a first horizontally extending sideboard having a first end portion received in said recess of said upper end portion of one of said first leg boards and a second end portion received in said recess of said upper end portion of one of said second leg boards, said first sideboard end portions each having a vertical slot snugly receiving a portion of the leg boards defining the inner end of the recesses;

a second horizontally extending sideboard having a first end portion received in said recess of said upper end portion of the other of said first leg boards, and a second end portion received in said recess of said upper end portion of the other of said second leg boards, said second sideboard end portions each having a vertical slot snugly receiving the portion of the second leg board defining the inner end of the recesses thereof, said upper end portions of the first leg boards and said first end portions of said first sideboards having aligned first through bores extending parallel to

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the flatwise extent of said first leg boards and perpendicularly to the flatwise extent of said first sideboards, said upper end portions of the second leg boards and said second end portions of said second sideboards having aligned second through bores extending parallel to the flatwise extent of said second leg boards and perpendicularly to the flatwise extent of said second sideboards;

first threaded securing means extending through said first through bores for securely clamping said upper ends of said first leg boards between said first end portions of said first sideboards; and

second threaded securing means extending through said second through bores for securely clamping said upper ends of said second leg boards between said second end portions of said second sideboards.

4,727,961

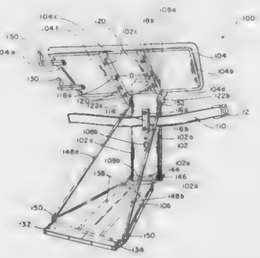
HUNTING TREE STAND

Howard D. Dawson, Rte. 2, Box 657, High Point, N.C. 27260

Continuation-in-part of Ser. No. 654,398, Sep. 26, 1984, abandoned. This application Jun. 27, 1986, Ser. No. 879,785

Int. Cl.⁴ A45F *3/26;* **A47C** *9/10*

U.S. Cl. 182—187 **5 Claims**



1. A portable foldable tree stand upon which a hunter may be seated, comprising:

(a) a vertical rigid back member for positioning against a tree, said back member including a back member opening for receiving fastening means for securing said back member to said tree;

(b) a pivotally mounted seat, said seat being mounted on said back member in a manner whereby said seat may travel over a first edge of said back member as said seat pivots about an axis; and

(c) a foldable footrest means having a rear edge selectively connectable proximate a second edge of said back member, said footrest means having a rigid support brace, one end of said support brace being pivotally connectable to said footrest means and the remaining end of said brace being pivotally connectable to said vertical back member, said footrest being foldable to a storage configuration by detaching said rear edge of said footrest means from said back member and sliding said rear edge of said footrest means upwardly towards said first edge of said back member such that said footrest means pivots with respect to its connection to said support brace until a bottom surface of said footrest is substantially parallel to and proximate said back member.

4,727,962

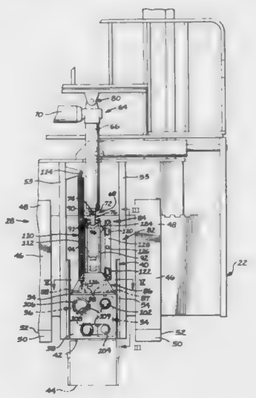
MOVABLE SENSING APPARATUS

David E. Nelson, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 29, 1986, Ser. No. 913,835

Int. Cl.⁴ B66F *9/24*

U.S. Cl. 187—9 R **23 Claims**



1. A movable sensing apparatus for a lift mast assembly, comprising:

an elevationally movable carriage assembly;

a housing mounted on said carriage assembly;

first signaling means for delivering a first signal and receiving a reflection of said first signal, said first signaling means being connected to said housing;

trackway means for guiding said housing along a preselected guide path between first and second elevationally spaced apart positions relative to said carriage assembly;

an actuator having a body and an output member movably connected to said body, said actuator body being mounted on the carriage assembly and said output member being controllably movable between spaced apart positions relative to said body;

coupling means for connecting said output member to said housing and releasing said output member from said housing for movement relative to said carriage assembly along said guide path in response to an external force of a preselected magnitude being applied to said housing in a direction substantially along said guide path.

4,727,963

FRICTION COUPLING INCORPORATING WEAR COMPENSATING MEANS

Gino Villata, Buttigliera D'Asti, Italy, assignor to Valeo, Paris, France

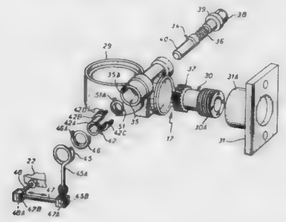
Filed Nov. 12, 1985, Ser. No. 796,994

Claims priority, application France, Nov. 13, 1984, 84 17302

Int. Cl.⁴ F16D *65/56*

U.S. Cl. 188—71.9 **11 Claims**

1. A friction coupling comprising a yoke member accommodating friction means arranged for selective engagement with an external member, a control member for controlling the selective engagement of a said friction means with such an external member, an extendable plunger, said control member being cooperable with said extendable plunger, a clamping member carrying said friction means and linked to said extendable plunger, means for compensating wear in said friction means adapted to maintain substantially constant forward and return travel of said clamping member, said means for compensating wear comprising a rotary member mounted in said plunger, gear means providing meshing engagement between said plunger and said rotary member, and a mechanism linking said rotary member to said control member and comprising two one-way circumferentially-acting friction members, each of said friction members acting in a single circumferential direction opposite that of the other friction member, one of said friction members being linked to said plunger and mounted on said rotary member in a position tending to prevent it rotating relative to said plunger during a forward stroke thereof and the other of said friction members being linked to said control member and mounted on said rotary member in a position tending to rotate it during a return stroke of said plunger in a direction tending to extend said plunger, said



mechanism further comprising means for absorbing forces applied by said control member when the travel of said plunger is below a specified value, said means for absorbing forces comprising a flexible part integral with one of said friction members, said rotary member comprising a lead screw adapted to control extension of said plunger and a bush that slides on said lead screw and cooperates with said circumferentially-acting friction members; a third circumferentially-acting friction member between said lead screw and said bush operable in a single circumferential direction so as to transmit rotational torque from said bush to said lead screw and to limit the torque transmission.

4,727,964

AIR DISC BRAKE ASSEMBLY WITH SHORTENED END CAP AND INTEGRAL CAST AIR CHAMBER BRACKET

James L. Weber, W. Bloomfield, and Donald J. Davidson, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 8, 1986, Ser. No. 916,928

Int. Cl.⁴ F16D *65/32*

U.S. Cl. 188—72.8 **4 Claims**

1. An end cap for a disc brake air cylinder comprising

a cast housing having an inner cylindrical surface for receiving a bearing, a first generally flat end face at one axial end of said cast housing and a second end face for abutting the air cylinder in which a brake applying piston slides at an end of said cylinder opposite the end from which the piston extends;

said first end face having plural peripheral depressed areas for receiving bolt heads of bolts which extend through said end cap and into said cylinder to bolt said end cap to said cylinder;

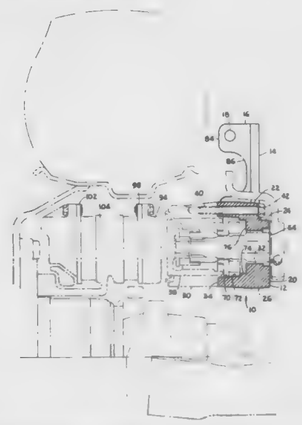
an outer surface of said end cap located between said first end face and said second end face from which an integrally formed mounting bracket extends and which bracket supports the air cylinder in which the brake applying piston slides;

an integrally formed mounting bracket extending outwardly from the outer surface of said end cap which is provided with an integrally formed flange having mounting holes to receive mounting bolts connecting said end cap to said air chamber at said flange;

said integrally formed flange of said mounting bracket having a web portion of generally triangular shape extending beyond the outer surface of said end cap for supporting a flange plate which is outwardly spaced from said end cap;

a flange plate to support said air chamber in a predetermined position to permit the piston to drive a lever linkage between said air cylinder and a means applied to the brake shoes;

plural radially stepped, generally cylindrical surfaces extending inwardly from said inner cylindrical surface of said end cap for receiving bearings which are located on the radial axis of said end cap;



and an inner radially extending face between said cylindrical inner surface and the innermost of said plural stepped surfaces to support bolts which interconnect said cap and said cylinder to withstand the thrust of said piston and lever linkage within the cylinder and end cap.

4,727,965

GEARED HUB WITH FREEWHEEL, ESPECIALLY FOR WHEEL-CHAIRS

Wolfgang Zach, Bremen, and Alfred Giesau, Stuhr, both of Fed. Rep. of Germany, assignors to Sanitatshaus Heinrich Oesterreich GmbH, Del.X

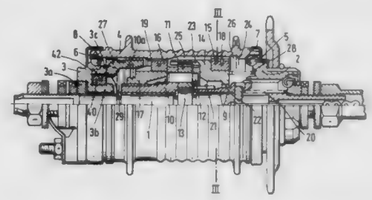
PCT No. PCT/EP84/00353, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02155, PCT Pub. Date May 23, 1985

PCT Filed Nov. 7, 1984, Ser. No. 757,835

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340407

Int. Cl.⁴ B62M *11/16;* **B62L** *5/04;* **A61G** *5/02;* **F16D** *41/30*

U.S. Cl. 192—6 A **14 Claims**



1. A geared hub with a freewheel adapted for use with a wheelchair vehicle having a frame by which the hub is supported, containing:

a hub axle and a driver supported on the hub axle;

a hub sleeve supported at one side on the driver and at the other side on a rotatable lever-cone, said lever-cone being mounted to the frame of the vehicle;

an epicyclic gear having a pinion cage accommodated

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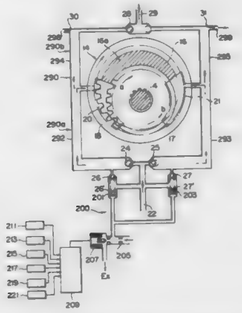
within the hub sleeve, a ring gear, a planet pinion and a braked sun gear;
a coupling sleeve adapted to connect the driver alternatively to the ring gear or to the pinion cage of the epicyclic gear;
a thread on the pinion cage having a brake cone screwed axially thereon which, upon turning the driver backwards, spreads a brake member against the hub sleeve;
at least one first ratchet gear having a ratchet wheel and spring-loaded pawls for the transmission of the driving torque introduced by the driver via the epicyclic gear into the hub sleeve in the forward direction of rotation;
characterized by a second ratchet gear between the brake member and the frame of the vehicle, said second ratchet gear adapted to freewheel when a torque in the backwards direction of rotation is transmitted from the driver via the coupling sleeve, the epicyclic gear, the brake cone and the spread brake member to the hub sleeve.

4,727,966

DIFFERENTIAL WITH DIFFERENTIAL MOTION LIMITING MECHANISM

Takeo Hiramatsu, Nagaokakyo; Bonnosuke Takamiya, Joyo, and Yoshimasa Nagayoshi, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,571
Claims priority, application Japan, May 30, 1984, 59-109872; May 21, 1985, 60-109065
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] B60K *17/35;* **F16D** *25/02, 25/063, 43/284*
U.S. Cl. 192—0.033 **27 Claims**



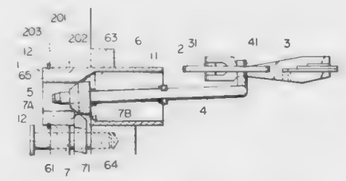
1. A differential with a differential movement limiting mechanism for a vehicle having an engine for producing a driving force, a transmission connected to the engine, front wheels and rear wheels, comprising:
a differential mechanism including an input shaft and a pair of output shafts for receiving the driving force through the input shaft thereof from the transmission connected to the engine and for distributing the driving force to the pair of output shafts, one of the pair of output shafts comprising a front-wheel output shaft for driving the front wheels and the other comprising a rear-wheel output shaft for driving the rear wheels;
an oil pump interposed between two of the three input and output shafts and being driven by said two shafts so as to produce a discharge pressure having a certain characteristic proportional to a differential revolving speed between said two shafts;
a clutch mechanism interposed between said two of the three shafts for coupling the two shafts in response to the discharge pressure applied thereto from said oil pump so as to reduce the revolving speed difference between said two shafts;
a hydraulic circuit for sucking hydraulic fluid into said oil pump and supplying the discharge pressure from said oil pump to said clutch mechanism;
and hydraulic control means arranged in said hydraulic circuit for modulating the characteristic of the discharge pressure supplied from said oil pump to said clutch mechanism according to the rotational direction of said front-wheel output shaft relative to said rear-wheel output shaft.

4,727,967

PARKING MECHANISM OF A TRANSMISSION

Tsunehiko Ogasawara, Kariya, and Koji Sumiya, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 1, 1984, Ser. No. 585,126
Claims priority, application Japan, Mar. 31, 1983, 58-057497
Int. Cl.[4] B60K *41/26;* **B60T** *1/06*
U.S. Cl. 192—4 A **17 Claims**



1. A parking mechanism of a transmission comprising:
a latch displaceable to engage and disengage with teeth which are operatively coupled to an output shaft of the transmission;
a cam surface formed on an inner surface of a stationary sleeve;
a shaft member having a working portion engageably and disengageably disposed with respect to said cam surface, said shaft member displaceable axially in cooperation with a shift lever of the transmission so as to displace the working portion of said shaft member engagingly and disengagingly with said cam surface;
means for mounting said latch with a portion of said latch positioned relative to said cam surface so that engagement and disengagement of said working portion with said cam surface causes said latch to engage and disengage with said teeth, whereby the movement of said shaft member to engage said working portion with said cam surface produces a wedging action displacing the latch in a direction to engage itself with said teeth; and
a cylindrical guide portion formed on an inner surface of said sleeve continuously extending from said cam surface for guiding said working portion of said shaft member when the working portion of the shaft member is disengaged from said cam surface;
wherein said cam surface and said cylindrical guide portion are made of an integral body.

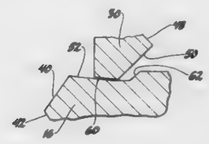
4,727,968

SYNCHRONIZER CLUTCH ASSEMBLY

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1986, Ser. No. 918,323
Int. Cl.[4] F16D *23/02*
U.S. Cl. 192—53 F **2 Claims**

1. A synchronizer clutch for use in a power transmission having a ratio gear rotatably disposed on a shaft, said ratio gear being longitudinally movable upon a torque reversal through the transmission, said synchronizer clutch comprising: synchronizer teeth formed on said ratio gear; a hub member drivingly connected to said shaft; a sleeve member slidably disposed on said hub member for longitudinal movement thereon and having means for continuously drivingly connecting said hub member and said sleeve member for unitary rotation; synchronizer sleeve teeth formed on said sleeve member and being axially aligned for selective mating with said synchronizer teeth; and means for moving said sleeve member longitudinally on said hub member to effect mating of said synchronizer sleeve teeth and said synchronizer teeth, said synchronizer teeth each having diverging oblique surfaces facing said sleeve member and converging oblique surfaces facing opposite said diverging surfaces and being immediately adjacent and intersecting therewith, said synchronizer sleeve teeth each



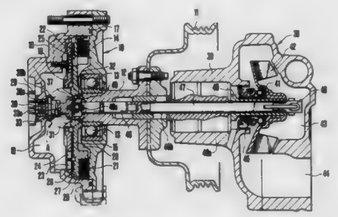
having leading diverging oblique surfaces facing said diverging surfaces of said synchronizer teeth, converging oblique surfaces facing opposite said leading diverging surfaces and being adjacent thereto and intersecting therewith, and tooth flat means extending longitudinally from said converging oblique surfaces on said synchronizer sleeve teeth for accommodating relative longitudinal movement between said ratio gear and said sleeve member when said sleeve teeth and said synchronizer teeth are in interdigital mating relation and for preventing longitudinal movement of said ratio gear from being transmitted to said sleeve member.

4,727,969

VISCOUS FLUID COUPLING

Masaharu Hayashi; Kenji Hattori, and Toshiaki Shirai, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 29, 1985, Ser. No. 770,583
Claims priority, application Japan, Aug. 30, 1984, 59-182266; Sep. 26, 1984, 59-201379
Int. Cl.[4] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **1 Claim**



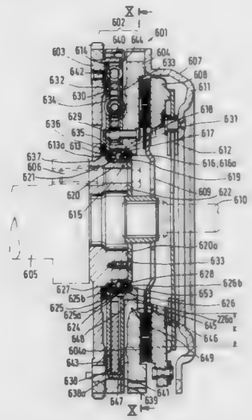
1. A viscous fluid coupling comprising:
an input member driven by an engine and having a rotor,
an output member supported rotatably on said input member,
a partition fixed to said output member and separating the internal space of said output member into a reservoir chamber for viscous fluid and a working chamber that accommodates said rotor,
a first return hole and a second return hole which are formed in said partition for refluxing viscous fluid from said reservoir chamber to said working chamber,
valve means comprising a single valve plate to control the opening and closing of said first and second return holes so that the transmission of torque from said input member to said output member is performed in three stages, and
said valve means controlling the opening and closing of said first return hole with a rotating movement on the partition by being associated with a spiral bimetal that operates by detecting the temperature of the air passing the radiator; and controlling the opening and closing of said second return hole with a movement in an axial direction of the rotor by being associated with a thermostat that operates by detecting the temperature of the water in a vortex chamber of a water pump.

4,727,970

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, and a continuation-in-part of Ser. No. 799,006, Nov. 18, 1985, abandoned, and a continuation-in-part of Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Jan. 5, 1987, Ser. No. 470
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479
Int. Cl.[4] F16F *15/12, 15/30;* **F16D** *3/14*
U.S. Cl. 192—70.17 **96 Claims**



1. A torque transmitting and torsion damping apparatus, especially for taking up and compensating for fluctuations of torque which is transmitted between an internal combustion engine and a change-speed transmission in a motor vehicle, comprising first and second flywheels movable angularly relative to each other, said first flywheel being connectable to the engine and said second flywheel being connectable to the transmission; bearing means comprising an antifriction bearing interposed between said flywheels and having coaxial first and second races and at least one row of antifriction rolling elements between said races; a friction clutch operable to receive torque from said second flywheel and to transmit torque to the transmission with attendant generation of heat, said secod flywheel and said clutch having cooperating first and second friction- and heat-generating surfaces; means for yieldably opposing angular movements of said flywheels relative to each other; and means including at least one thermal barrier for impeding the transfer of heat from said first surface to said bearing means, said one barrier constituting a ring-shaped thermal barrier including an axially extending section overlapping said first race and a radial section extending from said

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axially extending section toward said second race, and means for biasing said second section axially of said flywheels against said second race, said biasing means comprising a spring.

4,727,971

PRESSURE PLATE UNIT FOR A FRICTION CLUTCH

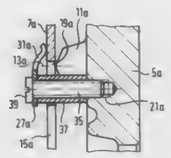
Peter Janda, Seanfeld; Alfred Schraut, Waigolshausen, and Günther Rostin, Dittelbrunn, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,366

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417224

Int. Cl.⁴ F16D *13/50*

U.S. Cl. 192—70.27 **1 Claim**



1. A pressure plate unit for a pulled-type friction clutch, comprising:

(a) an annular clutch cover which defines a clutch rotation axis,

(b) an annular presser plate movable axially in relation to the clutch cover,

(c) a diaphragm spring of substantially annular disc form which is supported on it side axially remote from the presser plate along its external circumference on the clutch cover and radially within its external circumference along a circle of application on the presser plate,

(d) retaining means securing the presser plate on the diaphragm spring having a plurality of retaining elements extending axially within the circle of application from the diaphragm spring to the presser plate, each of said elements engaging with a first end adjacent to the presser plate in an aperture of the presser plate and each of said retaining elements being fixed non-rotatably on at least one of the diaphragm spring and the presser plate,

the diaphragm spring comprises in the region of the circle of application a plurality of holes offset in relation to one another in the circumferential direction and the presser plate comprises a plurality of threaded openings with axes parallel to the rotation axes and aligned axially each with one of the holes, and wherein the retaining elements are formed as threaded bolts which reach through the holes of the diaphragm spring and are screwed by the first end, each into one of the threaded openings, said threaded bolts each having a second end carrying a separate leaf spring element which abuts resiliently on the diaphragm spring axially remote from the presser plate, each threaded bolt carries a head at its second end and passes through a distance sleeve, said leaf spring element separate from said distance sleeve being clamped in between the distance sleeve and the head, each leaf spring element is of U-form and comprises a cross-piece region secured to the second end of one of the threaded bolt and two spring tongues protruding substantially radially outwardly in relation to the clutch rotation axis from the cross-piece, said spring tongues abutting on the diaphragm spring.

4,727,972

ASBESTOS FREE CLUTCH FACINGS HAVING CROWN GROOVING

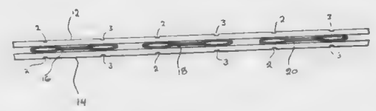
Ulrich Mueller, Haseluenne, Fed. Rep. of Germany, assignor to H. K. Porter Co. (Nederland) N.V., Klazienaveen, Netherlands

Filed Jul. 3, 1986, Ser. No. 882,096

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523768

Int. Cl.⁴ F16D *13/60, 69/00*

U.S. Cl. 192—107 C **11 Claims**



1. An asbestos-free clutch plate assembly having a reduced break-in phase and wherein the clutch facing is substantially uniformly supported by the clutch plate, said assembly comprising:

a clutch plate defining a first surface having a plurality of cambered portions, each cambered portion defining a peak; and

a substantially rigid, wear resistant, asbestos-free clutch facing attached to said first surface, said clutch facing having a plurality of grooves formed therein with each groove located substantially along the peak of one of said cambered portions thereby reducing the break-in-phase, said grooves further enabling said clutch facing to conform to the contour of said surface so as to be substantially uniformly supported thereby.

4,727,973

SPINDLE PRESS WITH REPLACEABLE CLUTCH PADS

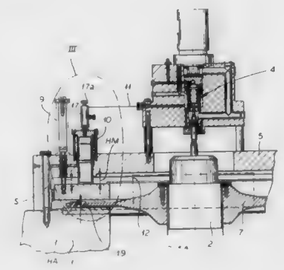
Marian Estreicher, Essen; Dietrich Ronge, Grefrath, and Klaus Hilgers, Krefeld, all of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 826,134

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503917

Int. Cl.⁴ F16D *13/00*

U.S. Cl. 192—70.13 **7 Claims**



1. A press comprising:

a frame;

a flywheel rotatable on the frame about an axis;

a spindle rotatable on the frame about the axis;

an axially displaceable ram and nut carried on the frame and threadedly engaging the spindle, whereby rotation of the spindle axially displaces the ram;

a clutch between the flywheel and the spindle and including a clutch housing formed with a radially open service port,

a flywheel clutch plate in the housing rotationally fixed to the flywheel,

a spindle clutch plate in the housing rotationally fixed to the spindle, one of the plates being formed with axially open cavities and one of the plates being axially movable through a relatively long stroke between an outer position with the plates spaced apart and an inner position with the plates close together,

respective high-friction coupling elements releasably received in the cavities and of a predetermined axial height shorter by a working distance than the long plate stroke,

means including a coupling mechanism engaged between the movable clutch plate and the housing for displacing the movable plate through the long axial stroke and thereby effectively pressing the clutch plates axially together and rotationally linking the spindle and flywheel; and

means including at least one stop operatively engageable with the clutch and displaceable between an operative position for limiting displacement of the movable plate to the working distance and an inoperative position permitting the movable plate to move through the entire axial stroke, the service port being oriented such that in the outer position of the movable plate the coupling elements can be displaced axially out of the respective cavities and removed radially from the clutch housing through the service port.

4,727,974

ELECTROMAGNETIC CLUTCH WITH IMPROVED FRICTIONAL SURFACES

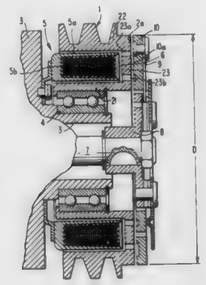
Koitabashi Takatoshi, Annaka, Japan, assignor to Sanden Corporation, Japan

Filed Aug. 27, 1986, Ser. No. 900,888

Claims priority, application Japan, Aug. 27, 1985, 60-186538

Int. Cl.⁴ F16D *27/00*

U.S. Cl. 192—84 C **8 Claims**



1. In an electromagnetic clutch including a first rotatable member of magnetic material rotatably supported on a bearing, an annular electromagnetic device disposed in a stationary position in a hollow portion of said first rotatable member, said annular electromagnetic device including an annular magnetic housing and an annular magnetic coil disposed therein, a second rotatable member, a hub secured on said second rotatable member, a magnetic armature plate supported on and around said hub at a predetermined radial gap, said magnetic armature plate being capable of limited axial movement and facing said first rotatable member at a predetermined axial air gap, said magnetic armature plate further being attracted to said first rotatable member when said annular magnetic coil is energized such that a first frictional surface of said first rotatable member contacts a second frictional surface of said magnetic armature plate, the improvement comprising said first frictional surface having grooves forming a spiral pattern and having a layer of metal plating with a hardness lower than that of said magnetic material.

4,727,975

USE-CONTROL SYSTEM

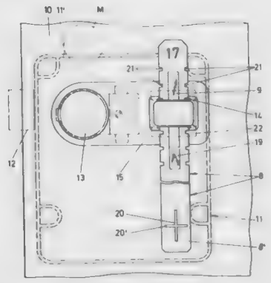
Armin Eisermann, Velbert, Fed. Rep. of Germany, assignor to Schulte-Schlagbaum Aktiengesellschaft, Velbert, Fed. Rep. of Germany

Filed Aug. 23, 1985, Ser. No. 768,899

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431113

Int. Cl.⁴ G02F *7/08*

U.S. Cl. 194—205 **8 Claims**



1. A system for the unsupervised control of the use of lockers and the like having locker doors, comprising

a deposit lock on each of the locker doors of the lockers adapted for depositing a deposit coin,

the deposit lock having memory means for receiving and storing therein any code of a plurality of codes,

the deposit lock including locking means and the memory means being connected to the locking means,

the deposit lock being lockable and unlockable upon said memory means receiving said code and upon presenting the same code to the deposit lock, respectively,

means for automatically erasing the stored code from said memory means upon return of the deposit coin,

control elements each containing a respective code,

the deposit lock includes means for reading the code from the control elements,

said memory means of said deposit lock enters therein said code, read by the reading means, of any of said control elements,

each of said control elements is cooperatable with said deposit lock so as to enable locking every deposit lock of unused lockers of the system, and

means on the respective deposit lock for providing the control element cooperating therewith with visible identification of the respective deposit lock.

4,727,976

WORKPIECE CONVEYOR

Hiroshi Tsuchiya; Satoshi Komaki; Taminori Yanagisawa, and Masami Sano, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Taiho Seiki Kabushiki Kaisha, both of Toyota, Japan

Filed Aug. 11, 1986, Ser. No. 895,230

Int. Cl.⁴ B65G *47/24, 25/00*

U.S. Cl. 198—403 **3 Claims**

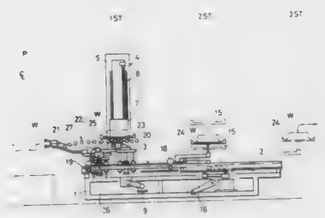
1. A workpiece conveyor, comprising:

first, second and third stations disposed in such a manner as to lie between a press of a preceding step and a press of a next step;

a carriage adapted for moving between said first, second and third stations;

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first workpiece receiver means disposed at said second station and adapted for moving up and down;
an unloader lifter;
workpiece receiving lifter means disposed adjacent said unloader lifter at one end portion of said carriage;
an unloader mechanism disposed on said unloader lifter;
second workpiece receiver means disposed on said workpiece receiving lifter;



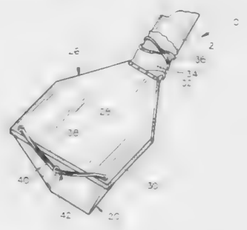
third workpiece receiver means disposed at a second end of said carriage spaced apart from said second workpiece receiver means by a same distance as a distance between each of said stations; and
leaf cam means disposed adjacent said first station for meshing with said unloader lifter and removing said workpiece along a curved path.

4,727,977

COVER FOR A GRAIN CONVEYOR HOPPER

Robert S. Arnson, Rte. 2, Box 46D, Williston, N. Dak. 58801

Filed Aug. 18, 1986, Ser. No. 897,213
Int. Cl.[4] B65G *47/18*
U.S. Cl. 198—550.01 **1 Claim**



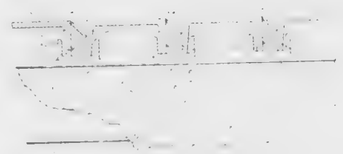
1. In combination,
an inclined grain conveyor means having upper and lower ends,
said grain conveyor means having a grain discharge means at its upper end,
said grain conveyor means having a grain intake means at its lower end,
a hopper means mounted on the lower end of said grain conveyor means having an open upper end, and an interior portion in communication with said grain intake means,
and a hopper cover means mounted on said hopper means for selectively closing the open upper end of said hopper means, when said conveyor means is not being utilized to convey grain, for preventing rain water from entering the interior of said hopper means,
said cover means having the same general shape as the upper end of said hopper means,
said cover means having upper and lower ends, first connection means for pivotally securing the upper end of said cover means to said grain conveyor means, and second connection means selectively securing the lower end of said cover means to said hopper means,
said first connection means comprising a flexible sleeve means connected to the upper end of said cover means, said sleeve means being wrapped around said grain conveyor means above said hopper means for preventing rain from running down said grain conveyor means into the interior of said hopper means.

4,727,978

RECIPROCATING CONVEYOR FOR PARTICULATE MATERIAL

Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141

Filed Apr. 11, 1986, Ser. No. 850,645
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—737 **10 Claims**



1. A reciprocating conveyor, comprising:
(a) a base,
(b) at least one group of at least three elongated parallel slat members each of inverted U-shaped cross section defining an intermediate load-bearing support section and a pair of laterally spaced, downwardly extending side sections, the slat members being spaced apart laterally above the base for longitudinal reciprocation on a sequence wherein at least a majority of the slat members are moved simultaneously in the same direction to move a load longitudinally in a conveying direction and a minority of the slat members are moved in the opposite direction to retract the slat members without retracting a load, the adjacent side sections of adjacent slat members forming a pair of mutually facing side sections,
(c) an elongated fines removal trough underlying each pair of said mutually facing side sections, whereby fines collected in said trough are moved along the latter during simultaneous movement of the associated pair of mutually facing side sections in the load-conveying direction of the slat members, and
(d) an elongated seal member secured to one side section of each said pair of mutually facing side sections and extending laterally therefrom to a position closely adjacent the other side section of the pair.

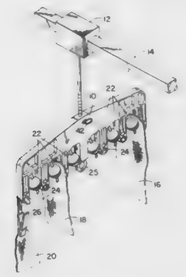
4,727,979

CONVEYOR HANGER WITH A PLURALITY OF MOVABLE GRIP ELEMENTS

Lawrence S. Wolfson; David R. Pearl, both of West Hartford; Richard P. Ray, Coventry; Roald P. Nymark, Simsbury; Harold Osthus, S. Willington, all of Conn., and David Vickers, Worsley, England, assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Continuation-in-part of Ser. No. 6,651,425, Sep. 17, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,630
Int. Cl.[4] B65G *47/86*
U.S. Cl. 198—803.3 **20 Claims**

1. A hanger for use in a conveyorized system for transporting limp material from work station to work station, with a body having an upper portion and a plurality of grippers associated with said body for each releasably holding a unit of work material, said body being horizontally elongated in a given vertical plane, a plurality of finger portions spaced from one another along the length of said body and extending downwardly from said upper portion, and said plurality of grippers each comprising a generally vertically extending stationary gripping surface generally perpendicular to said vertical plane on a respective one of said finger portions, a grip element located adjacent said gripping surface, and a support means carried by said body and including an elongated support member of generally circular cross-section receiving and supporting said grip element for movement in said vertical plane along a path such that as said grip element moves upwardly relative to said gripping surface it moves horizontally away from said gripping surface and such that as said gripping element moves downwardly relative to said gripping surface it moves horizontally toward said gripping surface so that when a unit of work material is inserted between said gripping surface and said grip member the weight of said work unit and the engagement



between said work unit and said grip element urges said grip element downwardly relative to said gripping surface and at the same time urges said grip element toward said gripping surface to increase the grip of said grip element and gripping surface on the said work unit,
each of said grip elements being a body of revolution rotatably supported on its associated support member with said support member extending through said body of revolution along its axis of revolution so that said body of revolution may rotate relative to said support member when a unit of work material received between said grip element and said gripping surface is pulled horizontally from said hanger, each of said elements having a given maximum diameter, and each of said fingers having a thickness measured horizontally perpendicular to said vertical plane of approximately the same size as said maximum diameter of grip element.

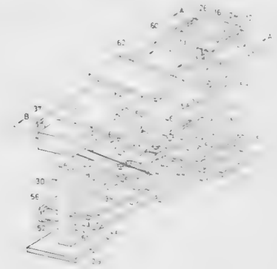
4,727,980

APPARATUS FOR CONVEYING THE MATERIAL TO BE SEWN

Moriya Ochi, and Masahiro Sahashi, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 25, 1987, Ser. No. 29,960
Claims priority, application Japan, Mar. 25, 1986, 61-64787
Int. Cl.[4] B65G *21/14*
U.S. Cl. 198—812 **7 Claims**

1. An apparatus for conveying an article which comprises:
a first support;
a pair of driving pulleys supported on said first support rotatably simultaneously by an electric motor, said pulleys being spaced apart from each other transversely of the apparatus;
a pair of first fixed intermediate pulleys supported rotatably simultaneously on said first support below said driving pulleys;
a pair of first movable intermediate pulleys supported rotatably simultaneously on said first support between said driving pulleys and said fixed intermediate pulleys;
a second support spaced apart from said first support longitudinally of the apparatus, said first and second supports being horizontally movable to and away from each other;
a pair of driven pulleys supported rotatably simultaneously on said second support and spaced apart from each other transversely of the apparatus;
a pair of second fixed intermediate pulleys supported rotatably simultaneously on said second support below said driven pulleys;
a pair of second movable intermediate pulleys supported rotatably simultaneously on said second support between



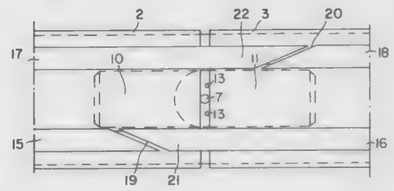
said driven pulleys and said second fixed intermediate pulleys, said first and second movable intermediate pulleys being horizontally movable to and away from each other, each of said pairs of intermediate pulleys being spaced apart from each other transversely of the apparatus; and
a pair of endless conveyor belts spaced apart from each other transversely of the apparatus and each wound around one of said driving pulleys, one of said driven pulleys and one pulley of each of said pairs of intermediate pulleys, each of said belts having an effective conveyor portion travelling horizontally from one of said driven pulleys to one of said driving pulleys upon operation of said motor.

4,727,981

FLEXIBLE CONVEYOR

Lars J. Johansson, Eskilstuna, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

Filed Feb. 18, 1986, Ser. No. 829,981
Claims priority, application Sweden, Mar. 28, 1985, 8501538
Int. Cl.[4] B65G *15/60*
U.S. Cl. 198—841 **3 Claims**



1. A conveyor incorporating a flexible conveyor track (4), guided and supported by at least two beams obliquely adjustable relative to each other and in a row one after the other with an interspace therebetween and interconnected by a pivotal link means, characterized therein, that the conveyor track is guided and supported by sliding ledges (15, 16, 17, 18) of

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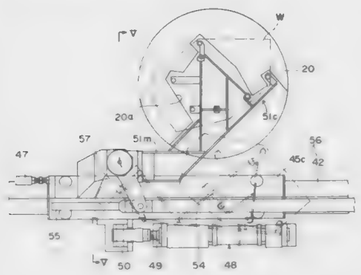
generally U-shaped cross section arranged in two substantially parallel tracks along supporting edges of the beam, each of said sliding ledges being split and provided with gap (19, 20) situated one on each side of the interspace between two beams, whereby one sliding ledge portion of the two longitudinally gapped portions has a flexible portion, which always entirely overlaps the interspace between the beams, and the part (21, 22) of the sliding ledge, which extends from the interspace to the gap is slidably arranged on a supporting edge of the beam on which the gap between the ledge portions is located and is fixedly arranged on a supporting edge of the other beam.

4,727,982

WORKPIECE TRANSFER APPARATUS

Takehiko Hayashi, Toyota, and Fumio Sakamoto, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 27, 1987, Ser. No. 7,401
Claims priority, application Japan, Jan. 24, 1986, 61-14172
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—346.1 **8 Claims**



1. A workpiece transfer apparatus for a plurality of machine tools arranged to make a line in a first horizontal direction and each having a work table onto which workpieces are loaded one after another, said transfer apparatus comprising:

a transfer unit disposed alongside said work tables of said machine tools and reciprocatively movable in said first horizontal direction and a vertical direction;

a plurality of transfer jigs provided on said transfer unit at the same interval as said machine tools and each capable of carrying a workpiece to be loaded onto one of said work tables;

jig support means for supporting each of said transfer jigs to be movable in a second horizontal direction which extends substantially across said first horizontal direction;

first feed means drivingly connected to said transfer unit for moving the same up and down to raise and lower the workpieces relative to said work tables;

second feed means drivingly connected to said transfer unit for reciprocatively moving the same in said first horizontal direction to advance the workpieces from work table to work table; and

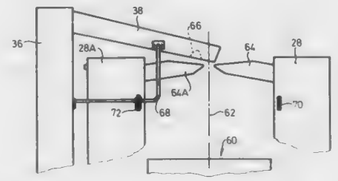
third feed means drivingly connected to said plurality of transfer jigs for moving the same in said second horizontal direction to move the workpieces laterally into or out of said work tables.

4,727,983

BOBBIN LOADING ARRANGEMENT

André Lattion, Seuzach, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jan. 3, 1986, Ser. No. 816,043
Claims priority, application United Kingdom, Jan. 3, 1985, 8500120
Int. Cl.[4] B65G *47/44*
U.S. Cl. 198—360 **11 Claims**



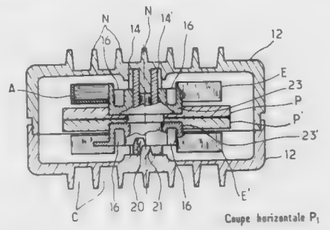
1. An arrangement for supplying bobbins to at least one tender situated at one of two loading stations disposed at opposite sides of a central longitudinal plane of an elongated textile machine from one another, comprising means for sequentially delivering the bobbins from one of the machine sides into a first path leading across the central longitudinal plane to the tender then situated at that of the two loading stations which is located at the other machine side; and means for selectively diverting the bobbins at a delivery location near the central longitudinal plane from said first path into a second path leading to the tender then situated at that of the loading stations which is located at the one machine side, the tender having a bobbin receiving member also extending to the delivery location near the central longitudinal plane and forming the second path into which the bobbins are diverted from the first path.

4,727,984

IMPREGNABLE LOCKING SYSTEM

Gilbert Bennardo, Nice, France, assignor to Microtechnic S.A.M, Monaco

Continuation-in-part of Ser. No. 755,149, Jul. 15, 1985, Pat. No. 4,577,750. This application Feb. 18, 1986, Ser. No. 830,328
Claims priority, application France, Dec. 11, 1984, 84 19035; Nov. 5, 1985, 85 16475
Int. Cl.[4] A45C *13/10*
U.S. Cl. 206—1.5 **5 Claims**



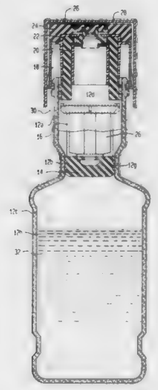
1. Impregnable locking system for the fastening of display boxes called "blisters" consisting of a box of two halves having on a side opposite a hinge thereof fastening flaps intended to be held one against the other, comprising in combination a clip arranged to cover said flaps, and between which there is attached a transverse shaft; a notch formed in the flaps allowing said shaft to pass through when said clip is put into place, two gears being slid onto said shaft between an outer side of each flap and a corresponding side of said clip, means being provided so that said gears are constantly pushed towards each other, and once said clip is placed on said flaps, said gears come to rest in lodgings made in outer sides of the flaps, thereby immobilizing the clip onto said flaps, external means being provided to push said gear in an opposite direction to take them out of said lodgings so as to allow the extraction of said clip and to free the flaps of the blister to allow its opening, and wherein the hinged halves of the housing are in the shape of shells forming, respectively, a bottom and a cover, which together provide an opening adapted to let through the neck of a bottle to be protected against theft, the pair of shells forming a recess for a strong wire whose ends are fastened to said bottom and crossed so as to form a loop in the position of the said opening, means tightening up and locking said loop around said neck being fitted slidingly in the said recess so as to be brought into a position where it applies its tightening and locking action irreversibly, when said housing is closed, and is free to abandon this position so as to release the neck when the housing is opened.

4,727,985

MIXING AND DISPENSING APPARATUS

John McNeirney, Madison, Wis., and Charles Huck, Pottersville, N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Feb. 24, 1986, Ser. No. 832,204
Int. Cl.[4] B65D *25/08*
U.S. Cl. 206—221 **16 Claims**



1. An apparatus comprising

a container including first and second chambers which are adapted to house a liquid and a solid, respectively, first sealing means fabricated from a resiliently flexible material for forming a sealing engagement with an internal surface of the container intermediate the first and second chambers so as to form a barrier between the chambers, a dispenser plunger means comprising sequentially in the upward vertical direction:

a second sealing means portion fabricated from a resiliently flexible material;

a hollow substantially cylindrical body portion; and

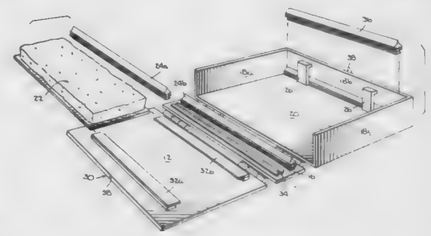
a substantially flat top portion; and wherein said second sealing means portion of said dispenser plunger forms a sealing engagement with an internal surface of the container intermediate the second chamber and a peripheral space external to the container; and wherein a transmitting means comprising a collar portion is adapted to selectively contact the underside of said second sealing means portion to transmit force applied from said dispenser plunger means to said first sealing means, whereby the first sealing means can be displaced into the first chamber so as to allow the two chambers to communicate one with the other and thus allow a mixing of said solid which is housed in the second chamber with said liquid which is housed in the first chamber, and wherein following said mixing, the dispenser plunger permits the sterile withdrawal of mixed solution through its top portion without unsealing said second sealing means.

4,727,986

SQUEEGEE

Jeffrey E. Feldstein, 19 Dumond Pl., Coram, N.Y. 11727

Filed Feb. 2, 1987, Ser. No. 10,076
Int. Cl.[4] B65D *3/00*; B60S *3/04*
U.S. Cl. 206—229 **12 Claims**



1. A squeegee, comprising:

a housing, having an inner side and an outer side which is capable of being opened and closed, said housing having at least two surfaces, said surfaces being a first surface and a second surface, said surfaces being dimensionally-spaced from one another by a plurality of panels; a sponge removable affixed to the side of said first surface which is part of said inner side of said housing when said housing is closed;

a first flexible connection between one panel of said plurality of panels of said housing and said second surface of said housing; at least one wiper blade removably affixed to the side of said panel which is part of said inner side of said housing when said housing is closed; and

a second flexible connection between said panel having said first flexible connection and said first surface of said housing, with said plurality of panels, other than said panel having said first and second flexible connections, being affixed only to said second surface, so that said sponge and said wiper blade are capable of being removably contained within the inner side of said housing when said housing is closed and when said housing is opened, the sponge and the wiper blade are capable of cleaning a window or other surface.

4,727,987

GARMENT RETAINING APPARATUS

Carlo Zezza, Annapolis, Md., assignor to Delsey Luggage Company, Jessup, Md.

Filed Feb. 21, 1986, Ser. No. 831,919
Int. Cl.[4] A45C *5/12, 13/30*
U.S. Cl. 206—293 **8 Claims**

1. A bag for garments disposed on respective hangers, the bag having two major opposing sides joined by a top end portion and by two side portions, the bag being disposed to retain garments therein with their respective hangers proximate the top end portion, the bag comprising:

a pair of support means coupled to the top end portion and disposed on either side of the hangers;

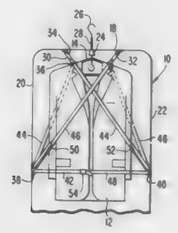
a pair of connecting rings coupled to the two side portions, each of said connecting rings being individually coupled to a respective one of the two side portions; and

means coupled between said pair of support means and said pair of connecting rings for retaining the garments within the bag, said retaining means encircling the garments and

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maintaining the garments on their respective hangers by compressing the garments against the hangers,

said retaining means comprising a pair of straps, each strap serially being (a) coupled to a respective one of said connecting rings, (b) disposed in back of said garments, (c) coupled to the nearer one of said support means, (d) disposed in front of said support means, and (e) coupled to the other one of said connecting rings.



4,727,988

FOLDED ENVELOPE AND BLANK FOR FORMING SAME

Joyce M. Erickson, 1324 Hillcrest Dr., Fredrick, Md. 21701

Filed Jan. 2, 1986, Ser. No. 815,553
Int. Cl.[4] B65D *27/06, 27/34, 27/38*
U.S. Cl. 206—610 **18 Claims**



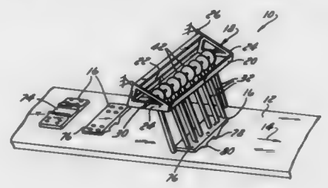
1. A suitably cut and scored blank adapted to be folded for forming a folded envelope and comprising a sheet of foldable material such as paper cut and scored for defining a planar rectangular main body of predetermined height and width and bounded by three straight side score lines and a cut edge; at least one dividing score line crossing said main body for dividing said main body into at least two body portions of substantially equal height which are hingedly connected one to the other along said score line; right and left flap panel means extending vertically of said main body and hingedly connected thereto along right and left ones of said side score lines for folding leftwardly and rightwardly respectively into juxtaposition with said body portions; a closure flap panel of predetermined height extending horizontally of and substantially coextensively with said main body and hingedly connected to an adjacent one of said body portions along the one of said side score lines remote from and parallel to said cut edge; at least one line of perforations extending parallel to said one side score line and crossing said closure flap panel at a predetermined distance from said one side score line for facilitating separation of said closure flap panel into a reclosable flap portion and a reinforcing strip portion, said line of perforations being of a predetermined length; and a linear cut line formed in and extending generally horizontally of a body portion remote from said closure flap panel and adjacent to said one body portion to which said closure flap panel is connected, said cut line being of such a predetermined length and so positioned relative to said dividing score line as to have the majority thereof spaced from said dividing score line at distances which, when added to the distance at which said perforation line is spaced from said side score line, is equal to or greater than the height of one of said body portions.

4,727,989

AUTOMATIC TIE PLATE ORIENTATION SENSING SYSTEM

Dennis J. Cotic, Waukesha, and Andrew M. Dieringer, Waterford, both of Wis., assignors to Oak Industries, Inc., Rancho Bernardo, Calif.

Filed Jan. 27, 1987, Ser. No. 6,865
Int. Cl.[4] B07C *5/00*
U.S. Cl. 209—546 **20 Claims**



1. An apparatus for sensing the orientation of a conveyed article having a detectable top and bottom comprising:

a conveyor surface;

a sensor means comprising:

a sensor frame mounted in operational proximity to said conveyor surface;

a transverse pivot axis mounted to said sensor frame;

a plurality of sensor fingers, each pivotably mounted to said transverse pivot axis and positioned to intercept said conveyed articles on said conveyor surface and to freely pivot upon said axis in response to said interception;

biasing means to return said fingers to an operating position close to said conveying surface;

a plurality of sensor actuator means, each of said actuator means constructed and arranged to be electronically activated by the pivoting action of said sensor fingers; and

logic circuit means connected to said actuator means;

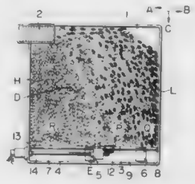
wherein the top-to-bottom orientation of said conveyed article is sensed by the pattern of said fingers intercepting said conveyed articles, said fingers transmitting said pattern to said actuators, and said logic means receiving said patterns from said actuators and sending a signal indicating the top side up or bottom side up orientation of said conveyed article.

4,727,990

AUTOMATIC CONTROL DEVICE FOR A BOUNDARY PLATE OF A GRAIN SEPARATOR

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,369
Claims priority, application Japan, Sep. 22, 1979, 54-131568; Jan. 12, 1980, 55-2476
Int. Cl.[4] B07B *13/10, 13/16*
U.S. Cl. 209—557 **2 Claims**



1. An automatic control device for a boundary plate of a grain separator comprising a separator plate provided with a roughened surface and mounted at inclinations in both of

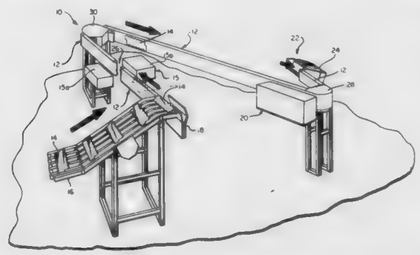
longitudinal and lateral directions with respect to the horizontal plane, means for supplying a mixture of different grains to the lateral higher portion of the longitudinal higher side of the separator plate, means for imparting lateral movement to the grains on said separator plate, and a grain transfer trough provided with boundary plates and mounted at the longitudinal lower end of the separator plate, wherein the flow flux of one of the different grains is deflected to the lateral higher side of said separator plate while the flow flux of the other grains is deflected to the lateral lower side of said separator plate by said lateral movement imparted to said grains, due to the difference in physical properties between said different grains, while the flow flux of grains mixture moves from the longitudinal higher side to the logitudinal lower side of the separator plate through the area between said flow fluxes of said different grains, said fluxes being separated from one another by said boundary plates as said fluxes drop into and flow through said grain transfer trough, characterized in that said automatic control device comprises a photoelectric detector disposed at an area in said grain transfer trough near the boundary between one of the fluxes of different grains and said flux of grain mixture, in such a manner that the light transmitting surface of said photoelectric detector is disposed substantially vertically so that one of said boundary plates associated with said photoelectric detector is moved and adjusted in accordance with the result of detection of the light reflected by or transmitted through the grains flowing through said area, while said light transmitting surface of said photoelectric detector is continuously contacted slidingly by the grains flowing through said area, wherein said light-transmitting surface of said photoelectric detector is disposed on the wall of a grain flow sleeve mounted in said grain transfer trough and wherein said grain flow sleeve on which said photoelectric detector is disposed is spaced at a slight offset distance from said one of said boundary plates.

4,727,991

SCROLL STRIP CONVEYOR SYSTEM

Wallace W. Mojden, and Andrew E. Mojden, both of Hinsdale, Ill., assignors to Fleetwood Systems, Inc., Ill.

Filed Nov. 1, 1985, Ser. No. 794,042
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—588 **32 Claims**



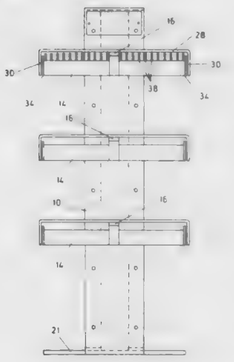
1. A scroll strip conveyor system comprising: conveyor belt means for carrying a series of relatively flat scroll strips thereon in a flat, edge-to-edge spaced apart condition; means for inspecting said scroll strips to identify rejects; reject means for ejecting said rejects from said conveyor belt means; and hopper feed means located at a terminal end of said conveyor belt means for receiving said scroll strips therefrom one by one in said edge-to-edge condition and for redirecting said scroll strips into a parallel, surface-to-surface spaced apart condition to be stacked in flat, surface-to-surface abutting condition in a hopper; wherein said hopper feed means comprises; an enclosure having a bottom wall and a pair of opposite side walls, said walls collectively defining a cross-sectional configuration similar to the maximum peripheral dimension of said scroll strips; entrance opening means for receiving said strips on edge from said conveyor; and strip alignment means for redirecting said strips to said parallel spaced apart condition within said hopper feed means, such that the flat surfaces of said scroll strips are substantially perpendicular to said bottom and side walls.

4,727,992

DISPLAY STANDS

John M. Sharp, Leicester, United Kingdom, assignor to Carter Design Group, Ltd., Foxton, England

Filed Feb. 12, 1987, Ser. No. 13,945
Claims priority, application United Kingdom, Mar. 21, 1986, 8607115
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **16 Claims**



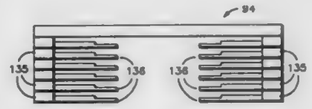
1. A display stand suitable for personal adornments, chains, bangles and watches at point of sale characterized by an upright member, a number of fixed arms projecting forward from the upright member and provided with article support means, a bar movable in relation to each arm from a first position in which the bar renders it impossible to remove an article from the support means to a second position in which an article can be removed, and means for locking the bar in the first position, each arm being provided with a fixed bar cross member having the article support means, and the bar with a corresponding cross member.

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WAFER CASSETTE HAVING MULTI-DIRECTIONAL ACCESS

Ninko T. Mirkovich, Novato, and John Zajac, San Jose, both of Calif., assignors to Tegal Corporation, Novato, Calif.

Continuation of Ser. No. 818,141, Jan. 9, 1986, abandoned, which is a division of Ser. No. 588,027, Mar. 9, 1984, Pat. No. 4,632,624. This application Mar. 2, 1987, Ser. No. 18,770
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 **3 Claims**



1. In a load lock for containing a plurality of semiconductor wafers in a controlled ambient, said load lock being accessed by at least two transfer spatulas, the improvement comprising a multi-wafer cassette enabling said spatula to load and unload wafers of predetermined diameter in two directions wherein said cassette includes

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a substantially horizontal mounting plate having a perimeter, a plurality of support means each having a substantially horizontal arm extending from a base portion, said arms extending toward a center of the area below said mounting plate but without intersecting the center area itself;

said support means being arranged in at least three groups, each group comprising a stack of vertically aligned, interengaged individual support means extending from said perimeter in a direction perpendicular to said mounting plate, each stack being attached only to said mounting plate, with each stack separated from the other by a distance sufficient to allow the horizontal passage of a wafer between any two of said stacks and said arms extend a distance toward the center area to support an edge of a wafer, so that said wafers can be loaded in a first direction defined by a first pair of said groups and unloaded in a second direction defined by a second pair of said groups.

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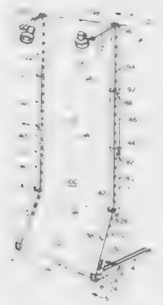
COLLAPSIBLE SUPPORT AND ATTACHMENT STRUCTURE

Bryan J. Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.

Continuation of Ser. No. 792,122, Oct. 28, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 68,104

Int. Cl.[4] A47B *47/00*

U.S. Cl. 211—198 **15 Claims**



1. A reflexively collapsible, portable, self-supporting structure for display panels, walls, podiums, tables, and the like, comprising at least two sides each side having

(a) footing means for supporting the structure;

(b) a first brace, said first brace attached to said footing means;

(c) a second brace, said second brace pivotably attached to said first brace so that said second brace is pivotable in a first direction;

(d) a first releasable locking means for releasably locking said first brace to said second brace, said first releasable locking means connected to said first and second braces;

(e) a third brace, said third brace pivotably attached to said second brace so that said third brace is pivotable in a second direction, said third brace having a first aligned release button;

(f) a second releasable locking means for releasably locking said second brace to said third brace, said second releasable locking means connected to said second and third braces, said second releasable locking means spaced equidistance from said first releasable locking means and said first aligned release button;

(g) a further brace, said further brace pivotably attached to said third brace so that said further brace is pivotable in said first direction, said further brace having a further aligned release button; and

(h) a third releasable locking means for releasably locking said third brace to said further brace, said third releasable locking means connected to said third and further braces, said third releasable locking means spaced equidistance from said second releasable locking means and said further aligned release button whereby the structure is collapsible by releasing said third releasable locking means, which allows said further brace to pivot and said further aligned release button to automatically and reflexively cooperate with and release said second releasable locking means, which in turn allows said third brace to pivot and said first aligned release button to automatically and reflexively cooperate with and release said first locking means, which in turn allows said second brace to pivot to reduce the structure to a collapsible form.

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CRANE WITH PIVOTAL BOOM

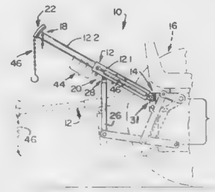
Franklin S. Louw, Wychwood, South Africa, assignor to Peter Povall, Bedfordview, South Africa

Filed Mar. 25, 1986, Ser. No. 843,650

Claims priority, application South Africa, Apr. 10, 1985, 85/2658

Int. Cl.[4] B66C *23/44*

U.S. Cl. 212—180 **6 Claims**



1. A tractor crane which includes

a boom having a root end adapted for pivotal mounting on a tractor, a load end which is adjustable in position relative to the root end, and strut connecting means intermediate its ends, and stays connected to and diverging laterally away from the boom on either side of the boom, the stays having connecting means at their ends remote from their connection to the boom for pivotal connection to the tractor to provide lateral stability in use to the boom;

load attachment means at or near the load end of the boom for attaching a load thereto; and

a strut having an upper end pivotally connected via the strut connecting means to the boom about an axis transverse to the boom and parallel to the pivotal axis at the root end, and having a lower end with mounting means for connection to the lifting arms of the three-point hitch of the tractor.

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VARIABLE GRIP LIFTING MECHANISM

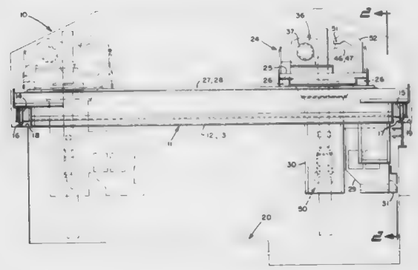
Ronald L. Fenn, Hudson; Tim Abblett, Alliance, and John Sanor, Kensington, all of Ohio, assignors to AMCA International Corp., Hanover, N.H.

Continuation of Ser. No. 503,533, Jun. 13, 1983, abandoned. This application Jul. 21, 1986, Ser. No. 887,289

Int. Cl.[4] B66C *17/12*

U.S. Cl. 212—213 **19 Claims**

1. A gripping mechanism comprising complemental article engaging members mounted for movement towards and away from one another, powered means for relatively moving said members forceably to grip an article, holding means operable to maintain applied gripping force, multiple limit means operable to effect such operation of said holding means in response to gripping force reaching respective predetermined values, and selector means for rendering operative any selected one of said limit means, said powered means including an electric motor, and said multiple limit means including respective relay means selectively operably connectable in circuit with said motor by said selector means for monitoring motor current and



effecting operation of said holding means in response to respective loads on said motor.

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SYNTHETIC-RESIN HOLLOW CONTAINER WITH GRIP

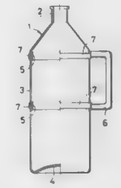
Yoshinori Nakamura; Yoshiki Miyazawa, and Shigeo Yoshizawa, all of Nagano, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Filed Feb. 4, 1987, Ser. No. 11,277

Claims priority, application Japan, Feb. 6, 1986, 61-24856

Int. Cl.[4] B65D *23/10, 25/28*

U.S. Cl. 215—100 A **4 Claims**



1. A synthetic resin hollow container with a grip, the container comprising a hollow injection molded, axially stretched, biaxially oriented synthetic resin container body; annular grooves formed in the outer periphery of said container body; connecting rings received in said annular grooves; and a synthetic resin grip injection molded relative to the container body together with said connecting rings, said grip integrally mounted on the side of the container body by fitting engagement between said connecting rings and said annular grooves.

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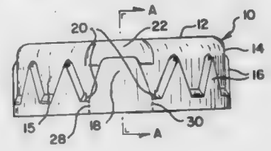
TAMPER EVIDENT CLOSURE

B. Kenneth Simon, 40 Woodhaven Dr., Pittsburgh, Pa. 15228

Continuation-in-part of Ser. No. 879,478, Jun. 27, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 18,285

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—230 **40 Claims**



1. In combination, a container having a neck portion and a closure therefor, said neck portion having an outer cylindrical neck surface, exterior threads on said outer cylindrical neck surface, first engaging means extending from said outer cylindrical neck surface at a level below said exterior threads, said closure having a circular top and a cylindrical skirt depending therefrom, said cylindrical skirt having an outer skirt surface and an inner skirt surface, interior threads on said inner skirt surface for mating engagement with said exterior threads, second engaging means extending from said inner skirt surface at a level below said interior threads, said second engaging means adapted for engagement with said first engaging means upon clockwise rotation of said closure on said neck portion and for becoming interlocked against counterclockwise rotation, rupturable means on said skirt on each side of said second engaging means, an indentation on said outer skirt surface above said rupturable means, tear tab means extending from said rupturable means and along said indentation for tearing away a segment of said skirt containing said second engaging means at said rupturable means, said tearing away freeing counterclockwise rotation of said closure means and leaving a circumferential gap on said skirt, said gap providing visual evidence of tampering.

4,727,999

SAFETY DISPENSING CLOSURE-CONTAINER PACKAGE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastic Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 879,487, Jun. 27, 1986, Pat. No. 4,682,702. This application Mar. 9, 1987, Ser. No. 23,832

Int. Cl.[4] B65D *41/32*

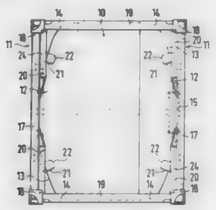
U.S. Cl. 215—232 **15 Claims**



1. A safety dispensing closure and container package comprising, in combination: a container having a neck with a shoulder at the base of the neck and an annular groove above said shoulder; a closure including a base cap, a lid, and a spaced apart post and slot hinge connecting said lid to said base cap permitting separate molding of said base cap and lid and assembly together at said hinge; said base cap having a flat top with a dispensing orifice therethrough and an annular outer skirt extending from the periphery of said top, said outer skirt having an annular bead projecting inwardly therefrom for force-fitting, snap-on retention within said container neck groove, said skirt having a length that when said base cap is snapped onto said container neck, the bottom of said outer skirt will be in such close proximity to said shoulder so as to prevent the insertion of a tool in an attempt to remove said base cap from said container; said base cap having an inner skirt concentric with said outer skirt extending from said cap top for sealing engagement with said container neck; and said lid being movable about said hinge from a closed position covering said orifice to an open dispensing position.

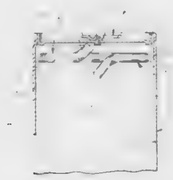
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4,728,000
TRANSPORT CONTAINER
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Weitefeld, Fed. Rep. of Germany
Filed May 28, 1987, Ser. No. 55,039
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1986, 3618900
Int. Cl.[4] B65D *88/06*
U.S. Cl. 220—71 **10 Claims**



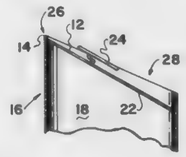
1. A transport container comprising
a cylindrical tank, the tank ends of which each include a spherically curved main portion,
two rectangular end frames each having four diagonal struts for bridging the corners thereof, and
mounting structures inserted between the spherical main portion of each tank end and the diagonal struts of the respective end frame,
each mounting structure comprising four circular-cylindrical tubular sections each extending at an acute angle to the tank axis and being joined with its one cut edge to the main portion of the respective tank end and with its other cut edge to a diagonal strut of the respective end frame, each tubular section having a diameter which is smaller by a multiple than the diameter of the tank and a length which is substantially of the order of its diameter.

4,728,001
BEVERAGE CONTAINER AND PACKAGING METHOD
Henry S. Serba, 4343 N. Clarendon, Apt. 1512, Chicago, Ill. 60613
Filed Mar. 9, 1987, Ser. No. 23,542
Int. Cl.[4] A47G *19/22*
U.S. Cl. 220—90.2 **20 Claims**



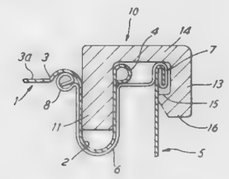
1. A beverage container having a drinking straw packaged with a beverage therein, comprising:
a hollow container having a top end and a bottom end joined by a side wall, said top end having means defining a pour opening therein and including means normally sealing said pour opening, said hollow container being filled with said beverage to a level near said top end thereof;
said sealing means being releasable upon demand to expose said pour opening for access to said beverage in said hollow container; and
a drinking straw disposed in said hollow container, said drinking straw comprising a tube having an open drinking passage extending completely therethrough and initially being bent intermediate opposing ends thereof into a generally circular configuration substantially disposed in a plane with said opposing ends in generally adjacent relation, said drinking straw floating on said beverage near said top end of said hollow container;
said drinking straw including means for bending said tube into said generally circular configuration, said bending means being adapted to maintain said tube in said generally circular configuration with said drinking passage open, said bending means also being adapted to accommodate bending of said tube into a generally straight configuration for use of said drinking straw;
at least one of said opposing ends of said tube being bent to project at an angle to said plane defined by said tube in said generally circular configuration, said one of said opposing ends of said tube projecting upwardly of said plane and inwardly of said generally circular configuration, said one of said opposing ends of said tube projecting upwardly of said plane by a distance sufficient to extend through said pour opening for removal of said tube upon release of said sealing means;
said tube being at least partially removable from said hollow container through said pour opening, said tube being substantially bent from said generally circular configuration into said generally straight configuration during said at least partial removal from said hollow container, said tube thereafter being reinsertable into said hollow container through said pour opening;
whereby said drinking straw can be packaged in said beverage container with said beverage in a first configuration and can be at least partially removed from said beverage container for reinsertion for drinking said beverage in a second configuration.

4,728,002
BEVERAGE CAN
Israel G. Ybanez, HCR 7, Box 52, Los Ybanez, Tex. 79331
Filed Feb. 2, 1987, Ser. No. 9,509
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—90.4 **3 Claims**



1. A beverage can comprising:
a. a cylindrical body having
b. an axis,
c. a bottom normal to said axis,
d. a planner top angled to the axis so that there is:
i. a high side of the top, and
ii. a low side of the top, and
e. a frangible spot at the high side of the top so that beverage may be drunk from the can without the necessity of tilting the head.

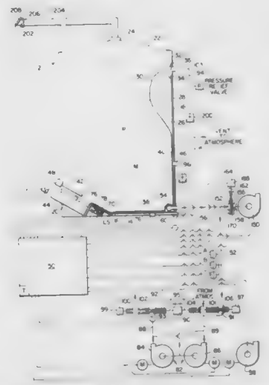
4,728,003
REMOVABLE RETAINING DEVICE FOR A CONTAINER LID
Kenneth G. Davey, 12 Brantwood Road, Herne Hill, London SE240D5, England
Filed May 13, 1987, Ser. No. 49,115
Claims priority, application United Kingdom, May 22, 1986, 8612445
Int. Cl.[4] B65D *45/32*
U.S. Cl. 220—319 **4 Claims**



1. A removable retaining device for a container lid having a continuous strengthening recess therearound in its outer surface adjacent its rim, and being a press fit in a corresponding aperture in a container such as a paint can, which device is a continuous ring-like member made of springy substantially rigid material having a substantially U-shaped cross-section, of which the innermost limb is continuous or substantially continuous and the outermost limb is interrupted at intervals to provide a plurality of spaced apart fingers extending from the base of the member spaced from and substantially parallel to the innrmost limb, with each finger having a tooth-like projection extending therefrom, at or adjacent its outermost end, towards the innermost limb, so that with the lid fitted in the container aperture the member can be fitted thereover with the innermost limb projecting into and at least substantially filling the lid strengthening recess to strengthen the container, with the base fitting over the lid rim and container rim to provide further cushioning and protection for the lid and container rims against a blow on the container rim, and with the outermost limb fingers fitting around the container exterior with the tooth-like projections releasably clipping under the container rim removably to retain the member on the interfitting lid and container end to provide a retaining action on the lid against internal pressure on the lid due, for example, to a blow on the container base, tending to force the lid out of the container aperture and off the container.

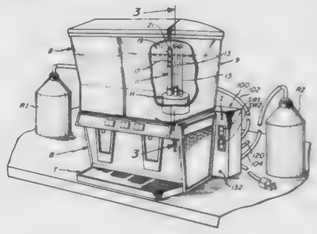
4,728,004
MATERIAL-HANDLING AND DISCHARGE BIN OF THE TYPE HAVING A FLUID-EXPANDABLE FLEXIBLE MEMBRANE FOR DISCHARGE ASSISTANCE
Timothy C. Bonerb, Orchard Park, N.Y., assignor to Bonerb, Vincent C., Buffalo, N.Y.
Continuation-in-part of Ser. No. 500,821, Jun. 3, 1983, Pat. No. 4,574,984. This application Dec. 26, 1984, Ser. No. 686,532
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] B65D *88/62*
U.S. Cl. 222—61 **18 Claims**

13. A material-handling and storage bin of the type having a fluid-inflatable flexible membrane for assisting in gravity discharge of material after such material discharges to the extent allowed by gravity wherein said membrane assists in material discharge by nudging material into a discharge cavity through cyclical inflation of said flexible membrane such that the material discharges through a discharge opening where the membrane is secured to the bin, with improvements in controls for the bin comprising; means for applying fluid pressure to said flexible membrane; a first sensor for sensing the discharge of material, said first sensor controlling said means for applying fluid pressure to said membrane so that fluid pressure is applied to said membrane when discharge of material is not sensed and application of fluid pressure to said membrane is stopped when discharge of material is sensed; means for turning off said means for applying fluid pressure to said flexible membrane if membrane-damaging pressure is applied, said means for turning off said means for applying fluid pressure to said flexible membrane including a timer set to turn off said means for applying fluid pressure after a period of time of continuous



fluid pressure application has passed which indicates the application of membrane-damaging pressure, a second sensor for sensing when the membrane has inflated to an extent indicative of a substantially empty silo; means for applying vacuum to retract said flexible membrane, said second sensor controlling activation of said means for applying vacuum; and means for turning off said means for applying vacuum when said flexible membrane has returned to its non-inflated position.

4,728,005
SELF-FILL SYSTEM
Leonard Jacobs, Chestnut Hill; William Arzberger, Medfield; Peter Coppola, Burlington, and Thomas A. O. Gross, Lincoln, all of Mass., assignors to Jet Spray Corp., Norwood, Mass.
Continuation of Ser. No. 590,992, Mar. 19, 1984, abandoned. This application May 20, 1986, Ser. No. 865,141
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—64 **32 Claims**



1. An automatic self-fill apparatus for a machine that dispenses a liquid comprised of water and a flavored concentrate syrup mixed with the water, said apparatus comprising;
a tank that is adapted to be automatically filled with the liquid,
a sensor member disposed in the tank in a position so as to be responsive to the rise and fall of liquid in the tank,
pump means adapted to pump the syrup to the tank under selective control,
water filling means for introducing water into said tank, said

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water filling means including a solenoid valve for controlling the flow of water to said tank,

said sensor member having a low probe means for detecting a low predetermined level of liquid in the tank and a high probe means for detecting a high predetermined level of liquid in tank and adapted to respectively generate low and high probe signals,

and control circuit means receiving and responsive to said low and high probe signals for controlling said pump means to operate when said low probe is uncovered and terminating said pump means operation when the liquid level reaches the high probe position,

whereby the liquid level in the tank is maintained at a level between said low and high probes,

said tank having at least one fill pipe for directing liquid to the tank,

said sensor member comprising a post member and means supporting the post in an upright position in the tank and adjacent to the fill pipe,

said probe means comprising a probe ring with the high probe ring disposed on the post member a spaced distance above the low probe ring,

said control circuit means comprising a bistable logic gate device having one input for receiving the low probe signal and another input for receiving the high probe signal,

whereby said bistable logic gate device assumes its operative state for operating said pump means only when both said high and low probe rings are uncovered,

a relay for operating the pump means and means coupling the output of the bistable logic gate device to the relay for activation thereof,

said bistable logic gate device comprises a pair of cross-coupled gates,

said means coupling the output of the bistable device includes a NAND type gate,

a sensor for determining when the machine is out-of-syrup for generating an out-of-syrup signal coupled to said NAND gate to close said solenoid valve and stop said pump means in the event that the machine is out of syrup,

means for priming said pump means including control means that closes said solenoid valve to interrupt water flow during said priming so as not to dilute the liquid in the tank,

a prime switch initially used to operate the pump means to prime the pump means with syrup and initiate automatic filling of said tank under control of said control circuit means.

4,728,006

FLEXIBLE CONTAINER INCLUDING SELF-SEALING DISPENSING VALVE TO PROVIDE AUTOMATIC SHUT-OFF AND LEAK RESISTANT INVERTED STORAGE

James L. Drobish, and Leo E. Taske, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 604,782, Apr. 27, 1984, abandoned. This application Oct. 1, 1984, Ser. No. 656,397

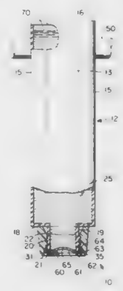
Int. Cl.⁴ B05B *11/04*

U.S. Cl. 222—181 **35 Claims**

1. A flexible package for storing and dispensing a fluid material through a discharge orifice in response to manually applied forces and for automatically ceasing the dispensing operation when said manually applied forces are removed, said package also being resistant to leakage when stored with its discharge orifice downwardly oriented intermediate dispensing cycles, said package comprising:

(a) a resiliently deformable container for housing said fluid material, said container exhibiting a degree of flexibility sufficient to permit deformation thereof in response to manual forces applied thereto and a degree of resilience sufficient to return automatically to its undeformed condition when said manually applied forces are removed therefrom, said container including said discharge orifice; and

(b) a self-sealing dispensing valve which opens at a predetermined threshold pressure which is greater than the maximum hydraulic head pressure of the fluid material in said container when said discharge orifice is downwardly oriented, said self-sealing dispensing valve being sealingly secured about its periphery across said discharge orifice of said container, said dispensing valve having a centrally located portion comprised of resilient material, said centrally located portion exhibiting a predetermined concave shape while in a substantially unstressed condition when said valve is sealingly secured across said discharge orifice of said container, said valve being oriented relative to said discharge orifice so that said centrally located resilient portion is inwardly concave when said container is in an undeformed condition, said concave shaped resilient portion of said valve including at least one substantially linear slit extending through its thickness from its innermost surface to its outermost surface, said valve exhibiting an ability to undergo inversion from a closed, inwardly concave, sealed and leak-resistant position to an open, outwardly convex, unsealed position when said manually applied forces increase the pressure inside said container beyond the threshold opening pressure of said valve, whereby fluid material is discharged from said container through said slit in said valve as long as said manually applied forces on said container maintain an internal pressure exceeding said threshold opening pressure of said valve, said valve further exhibiting an ability to automatically cut-off said fluid material discharge by returning to a closed, inwardly concave, sealed and leak-resistant position whenever said manually applied forces are removed from said container.



4,728,007

DISPENSING ASSEMBLY WITH NOZZLE STORAGE

Bruce E. Samuelson, West Lakeland Township, Washington County; Carl S. Ahlberg, Minneapolis, and Daryl E. Vosberg, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 16, 1986, Ser. No. 919,855

Int. Cl.⁴ B67D *5/06*

U.S. Cl. 222—182 **7 Claims**

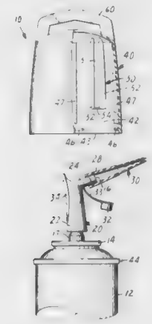
1. A dispensing assembly comprising:

an internally pressurized container of viscous liquid;

valve means mounted on said container including a hollow projecting stem having an outlet opening, said valve means retaining said liquid within said container when said stem is in a central position, and allowing flow of the pressurized liquid from the container through said stem when the stem is pivoted relative to the container about the end of the stem adjacent the container;

means engaged with said stem and having an outlet opening for directing liquid discharged from said stem;

an elongate hollow application nozzle having a through opening, an inlet end adapted for engagement with said means for directing with said outlet opening communicating with said through opening, and an outlet end opposite said inlet end; and



an overcap comprising a wall having an inner surface defining a cavity adapted to receive said means for directing and having a lip defining an inlet opening to said cavity, said lip being adapted to releasably engage said container with said means for directing received in said cavity, said wall of said overcap having a socket along said inner surface, and said nozzle being releasably retained within said socket.

4,728,008

DISPENSER FOR FLOWABLE MEDIA

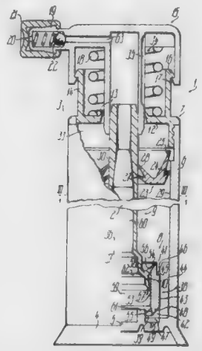
Lothar Graf, Worblingen, and Karl-Heinz Fuchs, Radolfzell, both of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,415

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 3530486

Int. Cl.⁴ B65D *88/54*

U.S. Cl. 222—321 **27 Claims**



1. A dispenser for flowable media comprising:

a thrust piston pump (**8**) having a casing (**3**);

a pump piston (**10**) having a means to be displaceably guided on a piston path (**53**) of a pump cylinder over a pump stroke and a return stroke between a starting position and a pump stroke end position;

a pump chamber (**59**) formed by the pump cylinder, the pump chamber being connected to a discharge opening (**20**) of said dispenser, so that the flowable media flows within the pump chamber and a discharge duct during discharge of the flowable media;

a media inlet (**39**) issuing into said pump chamber (**59**) and being closed during the pump stroke and open in at least one position of the return stroke of said pump piston (**10**), wherein the means to be displaceably guided on a piston path (**53**) is defined by a dosing chamber body (**38**) surrounding said pump chamber (**59**), said dosing chamber body (**38**) being movable commonly with said pump piston (**10**) with respect to said casing (**3**), in driving directions between two end positions, said dosing chamber body closing the media inlet (**39**) during relative movement of the pump piston (**10**) in the dosing chamber body during the pump stroke.

4,728,009

SPRAY PUMP WITH CONTAINER CONNECTOR

Karl-Heinz Schmidt, Im Wiehagen 5, 5870 Hemer, Fed. Rep. of Germany

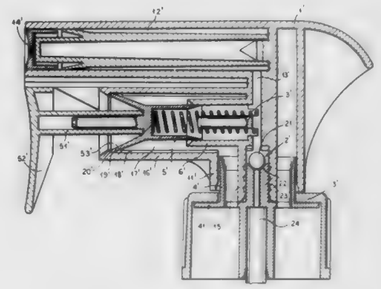
PCT No. PCT/DE84/00257, § 371 Date Aug. 13, 1985, § 102(e) Date Aug. 13, 1985, PCT Pub. No. WO85/02563, PCT Pub. Date Jun. 20, 1985

PCT Filed Nov. 30, 1984, Ser. No. 768,117

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 8335862[U]; Oct. 23, 1984, 8431062[U]

Int. Cl.⁴ B05B *11/02, 1/00*

U.S. Cl. 222—321 **3 Claims**



1. A spray pump, comprising:

a housing formed with a connector connectable with a container and provided with a passage opening through said connector;

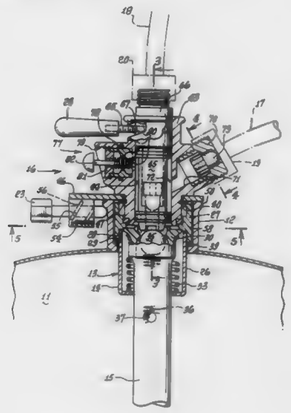
a checkvalve in said housing along said passage blocking return flow through said passage to said container but permitting flow through said passage to an outlet of the spray pump, said housing being formed with a small-diameter cylindrical chamber communicating with said passage between said valve and said outlet, and with a large-diameter cylindrical chamber axially aligned with said small-diameter cylindrical chamber and connected with said small-diameter cylindrical chamber, said large-diameter cylindrical chamber communicating with said container outside said passage;

a pump piston displaceable along a common axis of said chambers, said pump piston being hollow at least at one end thereof turned toward said passage and formed with a cavity opening at said end toward said passage and closed by a transverse wall, said end of said pump piston being formed with a frustoconically outwardly diverging lip of outward progressively diminishing wall thickness sealingly engaging an inner wall of said small-diameter chamber, said pump piston having another lip frustoconically outwardly divergent and of progressively diminishing wall thickness toward the opposite end of the piston and

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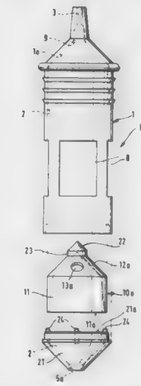
engaging an inner wall of said large-diameter chamber and venting said container during a stroke of said piston;
a coil spring at least partly received in said cavity and seated directly against said transverse wall and biasing said pump piston away from said passage; and
a manual operator connected to said opposite end of said pump piston for actuating same.

4,728,010
KEG TAPPER
Mack S. Johnston, 1065 Lomita Blvd., #220, Harbor City, Calif. 90710
Filed Jul. 22, 1986, Ser. No. 888,774
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—397 **3 Claims**



1. In a keg tapper for use with a keg having a neck with a closure valve carried therein, said neck having a flange with a tapered edge,
said closure valve including a tube carrier fixed in said neck and having a first valve seat, a tube slidingly carried in said tube carrier, a first annular seal at the end of said tube, a first valve member positioned within said tube, a first spring for urging said first valve member against said first annular seal, and a second spring for urging said first annular seal against said first valve seat,
said tapper including in combination:
a body having an axial bore and a plate for resting on said neck with at least three bosses for engaging said neck flange tapered edge at spaced locations;
a plunger slidingly disposed in said axial bore of said body with said plunger engaging said first valve member of said keg closure valve;
lever means carried on said tapper body for moving one of said bosses toward and away from said neck whereby movement of said one boss toward said neck moves said body and plunger toward said first valve member of the keg closure valve;
said plunger including a second valve member with an axial passage and at least one radial passage through said second valve member, with said radial passage providing a flow path between the interior of said tube and said axial passage of said plunger when said second valve member is moved into sealing engagement with said first annular seal and said plunger moves said first valve member away from said first annular seal;
means for moving said plunger axially in said body to bring said plunger into engagement with said first annular seal and move said tube away from said neck and move said first annular seal away from said first valve seat to provide a flow path between said valve body axial bore and the interior of said keg; and
a relief valve carried in said body, said relief valve including:
sleeve means defining a flow path from said body bore to the atmosphere and having a restricted passage;
a plunger slidingly mounted in said sleeve means;
a passage seal carried by said plunger and positioned in said restricted passage in sealing relation;
a third spring positioned on one side of said passage seal and urging said passage seal away from said body; and
a fourth spring positioned on the other side of said passage seal and urging said passage seal toward said body;
with said plunger exposed for manual actuation of said passage seal.

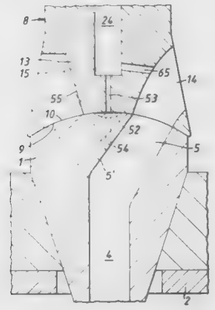
4,728,011
METERING STOPPER
Wilhelm Schuster, and Fritz Deak, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to AHK Alkohol Handelskontor GmbH & Co. KG, Fed. Rep. of Germany
Filed Jul. 18, 1986, Ser. No. 886,893
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525814; European Pat. Off., Jun. 19, 1986, 86108369.9
Int. Cl.[4] G01F *11/28*
U.S. Cl. 222—439 **6 Claims**



1. A metering stopper for the neck of a bottle for the metered delivery of a liquid medium, comprising: a substantially tubular metering housing which encloses a metering chamber having an outlet bore for the medium in its front surface and having recesses for the filling of the metering chamber passing through a wall of the metering housing; and a float having at least one lateral flooding bore which is inserted in the metering chamber, and wherein the density of the float is greater than that of the medium to be delivered and its end facing towards the outlet bore interacts with a valve seat allocated on the outlet bore, and wherein an open end of the metering housing and of the metering chamber, which end is located opposite the outlet bore, is closed by an inserted sealing cap which has a vent bore which is suitable for being aligned with the outlet bore of the metering housing, and wherein the float comprises a hollow body open on one side and having a cylindrical part and, integrally formed thereon, a tapered cone, the tip of the cone which fits a valve seat abutting the outlet bore as a sealing taper, and another floodlng bore through at least one wall of the cone, wherein the float has said sealing taper positioned away from said another flooding bore of said tapered cone, and wherein said sealing taper is offset from the tapered cone by an annular shoulder for preventing the float from adhering to the metering housing and for providing a circumferential gap between the float and the metering stopper.

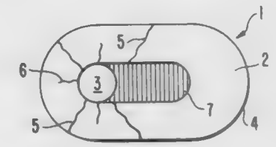
6. A metering stopper for the neck of a bottle for the metered delivery of a liquid medium comprising: a substantially tubular metering housing which encloses a metering chamber having an outlet bore for the medium in its front surface and having recesses for the filling of the metering chamber passing through a wall of the metering housing; and a freely moving float having at least one lateral flooding bore which is inserted in the metering chamber, and wherein the density of the float is greater than that of the medium to be delivered and its end facing towards the outlet bore interacts with a valve seat allocated on the outlet bore, and wherein an open end of the metering housing and of the metering chamber, which end is located opposite the outlet bore, is closed by an inserted sealing cap which has a vent bore which is suitable for being aligned with the outlet bore of the metering housing, and wherein the float comprises a hollow body open on one side and having a cylindrical part and, integrally formed thereon, a tapered cone, the tip of the cone which fits a valve seat abutting the outlet bore as a sealing taper, and another flooding bore through at least one wall of the cone, the valve seat defined by a tube which is pushed through the outlet bore into the metering chamber and can be displaced therein, and wherein the tube has a free end and an end projecting into the metering chamber which is made with a tapered valve seat for the cone of the float.

4,728,012
OUTLET VALVES FOR MELT CONTAINING VESSELS
James Monks, Middlesbrough, England, assignor to British Steel Corporation, London, England
Filed Mar. 19, 1986, Ser. No. 841,152
Claims priority, application United Kingdom, Mar. 26, 1985, 8507880; Oct. 2, 1985, 8524328
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—598 **14 Claims**



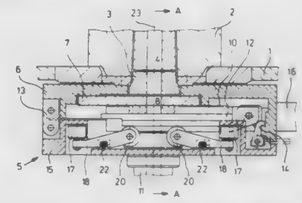
1. An oultet valve for a melt-containing vessel comprising a lower insert piece of refractory material rigidly mounted in the base of the vessel and having an outlet bore passing therethrough from the inside to the outside of the vessel, the bore opening into an orifice in an upper face of said insert piece, an elongate refractory shaft located over and pressed down from above upon the lower insert piece, the shaft having on its underside a lower face mating with the upper face of the lower insert piece, the shaft being rotatable about its elongate axis upon the lower insert piece, the bore through the lower insert piece being offset, at least at its upper end, from the axis of rotation, the orifice of the bore in the upper face of said insert piece being inset from the side edges of the overlaying lower face of the shaft and the shaft having a side opening at the lower end thereof capable of aligning with the orifice of the bore through the lower insert piece in at least one rotational position.

4,728,013
REFRACTORY PLATE FORMED WITH EXPANSION JOINTS
Manfred Winkelmann, Krefeld, and Udo Muschner, Tönisvorst, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany
Filed Aug. 29, 1985, Ser. No. 770,775
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432613
Int. Cl.[4] B22D *41/10*
U.S. Cl. 222—600 **6 Claims**



1. In a refractory plate assembly, particularly for use as a movable refractory plate in a sliding closure unit for regulating the discharge of molten metal from a metallurgical vessel, said unit being of the type including a refractory plate having therethrough at least one discharge opening and a sheath tightly fitted around the periphery of said plate, the improvement of means for reducing the formation in said plate of cracks resulting from thermal stress during use of said assembly, said means comprising:
said plate being formed of plural separate plate portions separated along respective confronting planar surfaces extending outwardly from said discharge opening, each said planar surface extending from said discharge opening to said periphery;
said planar surfaces being separated by compressible refractory packing material, thereby forming expansion joints, said refractory packing material being compressible at all operating temperatures of said refractory plate assembly;
said sheath compressing said packing material and maintaining said expansion joints sealed during expansion of said plate portions during operation of said refractory plate assembly;
and whereby said expansion joints are formed at positions where thermal stress cracks would normally occur if said plate were of unitary construction.

4,728,014
SLIDING CLOSURE UNIT WITH IMPROVED PLATE PRESSING STRUCTURE
Werner Keller, Steinhausen, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland
Filed Dec. 26, 1985, Ser. No. 813,554
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500863
Int. Cl.[4] B22D *41/08, 37/00*
U.S. Cl. 222—600 **11 Claims**



1. In a sliding closure unit for controlling the discharge of

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molten metal from a metallurgical vessel, said sliding closure unit including a stationary refractory plate having therethrough a discharge opening, a stationary housing assembly for mounting said stationary refractory plate on the metallurgical vessel, a movable refractory plate having therethrough a discharge opening, said stationary and movable refractory plates having complementary, abutting relative sliding surfaces, a movable frame mounting said movable refractory plate for movement with respect to said stationary refractory plate, said movable frame including guide means cooperable with said housing assembly for guiding movement of said movable frame, and means for pressing said movable refractory plate toward said stationary refractory plate, the improvement wherein said pressing means comprises:

two pairs of levers mounted in said housing assembly for pivotal movement about axles fixed to said housing assembly and extending transverse to the direction of movement of said movable frame and said movable refractory plate;

spring means, mounted in said housing assembly, for urging said levers to pivot about respective said axles against said guide means and toward said movable frame and thereby for urging said movable frame and said movable refractory plate toward said stationary refractory plate;

each said lever and the respective said spring means being arranged in an elongated configuration extending in a direction substantially parallel to said direction of movement; and

at least said levers being positioned below said guide means.

4,728,015

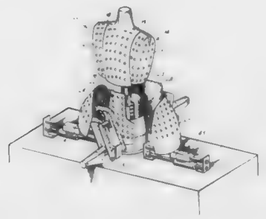
GARMENT SHAPING SYSTEM

Michael Holzapfel, Buford, Ga., and Shannon Cooper, San Antonio, Tex., assignors to Hotec Incorporated, Buford, Ga.

Filed Jan. 5, 1987, Ser. No. 559

Int. Cl.[4] D06F *71/18, 71/40*

U.S. Cl. 223—70 **14 Claims**



1. A method of removing wrinkles from a garment of the type worn about the upper body which includes neck and arm openings and an open lower portion comprising the steps of:

draping the garment downwardly about a mannequin,

mechanically gripping and distending the lower portion of the garment outwardly,

mechanically distending the garment upwardly,

mechanically distending the upper portion of the garment outwardly,

while the garment is distended outwardly and upwardly introducing steam and air within the garment in a volume sufficient to inflate the garment and sufficient for at least some of the steam to pass from within the garment outwardly through the garment, terminating the introduction of steam and continuing to introduce air within the garment in a volume sufficient for at least some of the air to pass from within the garment outwardly through the garment, and

relieving the distending and inflation of the garment.

4,728,016

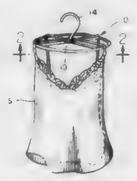
CLOTHES DRYING HANGER

Charles J. McPhee, 8562 Larthorn Dr., Huntington Beach, Calif. 92646

Filed Dec. 27, 1985, Ser. No. 800,722

Int. Cl.[4] A47G *25/28*

U.S. Cl. 223—85 **12 Claims**



1. A hanger for supporting washed garments for rapid air drying, said hanger comprising a hoop portion having at least one coplanar arm portion extending inwardly to a central hub portion; and a hook having a stem pivotally connected to said hub portion for pivotal movement of said hook between a retracted position lying along the plane of said hoop portion and an extended position projecting in a direction generally normal to the plane of said hoop portion; said hub portion being provided with a recess defined by a pair of spaced parallel side walls extending axially through said hub portion; said walls having apertures and said stem of said hook portion being provided with a pair of projections pivotally received in said apertures.

4,728,017

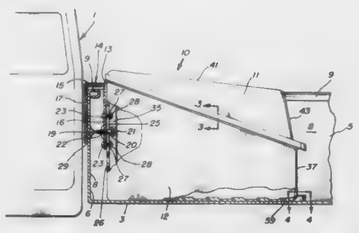
CLAMP-ON STORAGE CONTAINER FOR PICKUP TRUCKS

Randall J. Mullican, 894 N. Judge Ely St., Abilene, Tex. 79601

Filed May 22, 1987, Ser. No. 52,869

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—42.42 **10 Claims**



1. A portable clamp-on storage container for mounting in the load bed of a conventional pickup truck without any structural or cosmetic alterations of the load bed and without the use of tools, the load bed conventionally having an elongated rectangular floor, a pair of upstanding side panels extending longitudinally along opposite sides of said floor, an upstanding front panel and a tailgate panel extending between said side panels at opposite ends of the load bed, said upstanding front and side panels each having an upstanding main wall portion and an inwardly projecting upper edge portion at the top of said upstanding wall portion, said storage container comprising mating top and bottom sections which form an enclosure for articles to be stored therein, said bottom section having a bottom and an upstanding perimeter wall, an opening in said perimeter wall, means connecting said top and bottom sections for relative movement thereof between an open and a closed position, lock means for locking said top and bottom sections in

said closed position, and at least one clamping means secured to said bottom section for clamping said container to one of the upstanding panels of said load bed, said clamping means having fixed jaw means having a first portion and a bend portion extending upwardly and outwardly respectively from said bottom section for engaging over the inwardly projecting upper edge of said one of the upstanding panels and a depending jaw portion extending downwardly along an outside surface of the main upstanding wall portion of said one upstanding panel, and a cooperating movable jaw mounted on a threaded stem which extends inside of said container through said opening in said perimeter wall of said bottom section, said threaded stem having a handle at one end inside of said container for turning said stem, said stem being threadedly mounted in said first portion of said fixed jaw means for reciprocally moving said movable jaw relative to said depending jaw portion.

4,728,018

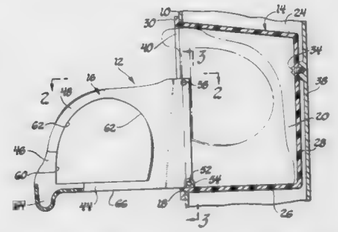
BEVERAGE HOLDER FOR VEHICLE

Barry R. Parker, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1987, Ser. No. 61,458

Int. Cl.[4] B60R *7/00*

U.S. Cl. 224—273 **3 Claims**



1. A beverage holder for holding a beverage container in an upright position in a motor vehicle, comprising:

a housing adapted to be mounted on the vehicle and having spaced apart side walls defining a narrow vertical extending slot;

and a retainer movably mounted in said housing for movement between a stored position located inside the housing and a deployed position projecting outwardly from the slot of the housing to support the bottom surface of a beverage container, said retainer having plastic wings yieldable relative one another to a spaced apart relation by which the wings resiliently cradle a beverage container inserted therebetween, said wings being further yieldable relative one another to a closely spaced relation enabling storage of the retainer between the spaced apart side walls of the housing and movement of the retainer through the slot between stored and deployed positions.

4,728,019

AUTOMOBILE ROOF CARRIER

Michael J. Olliges, 5325 Ravenna Pl. NE., Apt. 1, Seattle, Wash. 98105

Continuation of Ser. No. 694,694, Jan. 25, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 920,903

Int. Cl.[4] B60R *9/00*

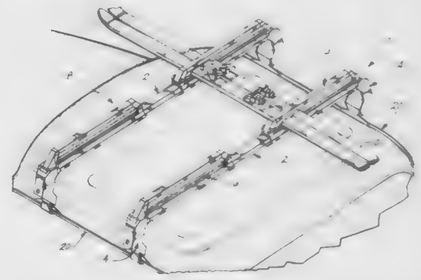
U.S. Cl. 224—329 **5 Claims**

1. In an automobile roof carrier having an elongated carrier bar extending in a transverse direction across the automobile's roof, said carrier bar being supported at each end by a supporting leg attached to a generally trough-shaped rain gutter on a lateral border of the roof, said supporting leg comprising:

an upper member fixedly connected to the carrier bar;

a lower member having a rain gutter-engaging end shaped to fit adjacent an inner surface of said rain gutter through;

a connecting member having a portion pivotally connected to said upper member, and having another portion pivotally connected to said lower memberr, wherein said pivotally connection between said upper member and said connecting member is defined by a first axis extending generally upwardly relative to said roof, and wherein said pivotal connection between said lower member and said connecting member is defined by a second axis extending generally laterally outwardly relative to said roof, in a manner so that pivotal movement of said upper member relative to said connecting member permits adjustment of the transverse direction of said carrier bar relative to said lower member's rain gutter-engaging end, and so that



pivotal movement of said lower member relative to said connecting member permits vertical adjustment of said upper member and said carrier bar relative to said rain gutter-engaging end;

a clamping member having a lower end portion positioned in abutting relationship against an outside surface of said rain gutter trough, said lower end portion being shaped to complementarily fit adjacent said trough's outside surface; and including

means, connected to said upper member, for forcing said clamping member's lower end portion against said trough's outside surface, thereby causing said clamping member to cooperate with said lower member's gutter-engaging end to clamp said supporting leg to said rain gutter.

4,728,020

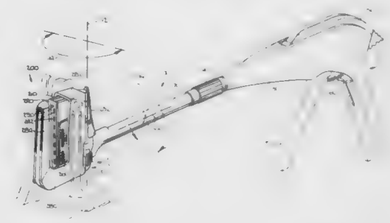
ARTICULATED SURGICAL FASTENER APPLYING APPARATUS

David T. Green, Norwalk, and Ernie Aranyi, Shelton, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Aug. 30, 1985, Ser. No. 771,845

Int. Cl.[4] A61B *17/00*

U.S. Cl. 227—19 **23 Claims**



1. Surgical fastener applying apparatus comprising:

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a distal fastener applying assembly including a fastener holding part initially containing at least one surgical fastener, (b) an anvil part movable relative to the fastener holding part for clamping tissue to be fastened between the fastener holding part and the anvil part, and (c) first means for driving the fastener from the fastener holding part at least partially through the clamped tissue to the anivil part;

a proximal actuator assembly including second means for producing the work necessary to operate the first means; and

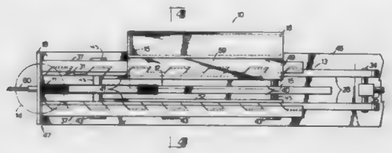
a longitudinal shaft assembly for supporting the fastener applying assembly relative to the actuator assembly and for transmitting the work produced by the second means to the first means, the shaft assembly including a first articulation for allowing rotation of the fastener applying assembly relative to the actuator assembly about a first axis which is transverse to the longitudinal axis of the shaft assembly, the shaft assembly being operative to transmit work from the second means to the first means at any rotational position of the first articulation, and the shaft assembly being substantially inflexible about all other axes parallel to the first axis, the shaft assembly further including first stop means for preventing the fastener applying assembly from rotating relative to the acutator assembly for more than a predetermined amount in either direction about the first axis.

4,728,021

FASTENING MACHINE

George W. Kennedy, Pompano Beach, Fla., assignor to Kentec, Inc., Decatur, Ga.

Filed Jul. 7, 1986, Ser. No. 882,345
Int. Cl.[4] B25C *1/04*
U.S. Cl. 227—120 21 Claims



1. A fastening machine of the type used to drive fasteners from an end of a clip of fasteners into a work product, the clip of fasteners comprising fasteners connected to one another in an enlogated clip of aligned, parallel fasteners, said fastener machine including a guide means having a fastener discharge end, a drive element at the discharge end of said guide means for driving the endmost fastener at one end of the clip from the clip of fasteners on said guide means, and fastener advancing means for maintaining the endmost fastener of the clip of fasteners on said guide means at a position adjacent said drive element, the improvement therein comprising,

said fastener advancing means including at least one clip engaging element positioned out of alignment with the length of the clip of fasteners, and means for intermittently urging said clip engaging element into contact with an intermediate portion of said clip and moving the clip engaging element toward the drive element for frictionally engaging the clip and urging the clip along the length of the guide means toward the drive element.

13. A method of feeding fasteners to a position at the drive element of a fastening machine including a guide means and a driver element at one end of the guide means, the fasteners arranged in a clip of connected series of fasteners and with the sides of the fasteners forming side surfaces of the clip, comprising the steps of;

placing a clip of fasteners on said guide means,

moving a friction member from a position spaced from the clip laterally into engagement with the side surfaces of the clip and toward the driver element and urging the side surfaces of the clip with the moving friction member along the length of the guide means toward the position of the driver element,

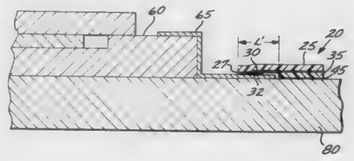
and after the clip is engaged and is being urged by the friction member toward the driver element, driving the leading fastener of the clip with the driver element.

4,728,022

MASK AND SOLDER FORM

John W. Jamison, Palm Springs, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 19, 1986, Ser. No. 909,756
Int. Cl.[4] B23K *3/00*
U.S. Cl. 228—56.3 9 Claims



1. A mask and solder form for securing a rectangular multileaded integrated circuit carrier device against corresponding printed lines on a printed wiring board during a soldering process, comprising:

a rectangular frame structure adapted to enclose the periphery of the carrier device and engage against the leads of the carrier device, said structure comprising:

a rectangular, open center top layer made of translucent polymer sheet material adapted to withstand the temperatures sustained during a soldering process, said open center being defined by an inner edge spaced wider than the carrier device, said top layer having a bottom surface;

a solder strip disposed along the bottom surface of said top layer adjacent said inner edge and parallel to said inner edge;

an adhesive layer under said solder strip and on the bottom surface of said top layer;

a rectangular, open center divider layer adhesively attached under said top layer and under said solder strip, said divider layer having an inner edge substantially in alignment with said inner edge of said top layer, said divider layer comprising a sheet of polymer material adapted to withstand the temperatures sustained during the soldering process, said divider layer having a thickness at least equal to the thickness of the leads on the carrier device, said divider layer having walls defining a plurality of slots extending to said inner edge of said divider layer adjacent the periphery of the carrier device in visually confirmable spatial correspondence with the lead pattern of the carrier device, each of said slots being arranged to accept a corresponding lead; and

a coating of pressure-sensitive adhesive applied to the lower surface of said divider layer to hold said mask and the carrier leads in place on the printed wiring board.

4,728,023

ROSIN-FREE SOLDER COMPOSITION

Felix Barajas, Huntington Beach, and Donald W. Bridges, Irvine, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 821,231, Jan. 22, 1986, Pat. No. 4,673,532.
This application Feb. 24, 1987, Ser. No. 18,055
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—180.1 11 Claims

1. A process for vapor phase soldering of electronic components to a substrate, which comprises

applying a solder cream to the surface of said substrate or to the surface of components on said substrate, said solder cream comprising 85 to 90% of finely divided solder metal and 10 to 15% of a fluorinated tertiary alkylamine containing from 4 to 8 carbon atoms, by weight of the sum of the two components, and which alkylamine is semi-solid at room temperature and which confers a creamy consistency on the composition at room temperature,

positioning electronic components on said substrate, with contacts of such components on the solder cream-coated surface,

placing said substrate in a chamber in contact with the boiling vapors of a second liquid fluorinated tertiary alkylamine in said chamber, having a lower boiling point than the fluorinated tertiary alkylamine in said solder cream,

melting the solder metal in said solder cream and fusing the solder joints of said electronic components to form solder joints substantially free of organic residue, and

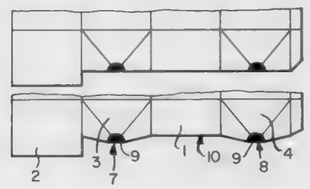
dissolving the fluorinated tertiary alkylamine in said solder cream in the liquid fluorinated tertiary alkylamine of lower boiling point in said chamber.

4,728,024

LIQUID PACKAGING CONTAINER WITH FILMED-OVER NOTCHES

Jürgen Farber, Kaarst, Fed. Rep. of Germany, assignor to PKL Papier-und Kunstoff, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,031
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113044
Int. Cl.[4] B65D *5/62*
U.S. Cl. 229—3.1 2 Claims



1. In a die-cut cardboard blank coated on at least one side with a thermoplastic coating and capable of being folded into a liquid packaging container having a planar, rectangular folded bottom sealed in a liquid-tight manner with an overlapped seam and a protected edge on the inner bottom fold-in panel, the improvement which comprises providing the blank with an inner bottom fold-in panel and triangular fold flaps, the triangular fold flaps having tips which in folded condition abut one another and cover the inner bottom fold-in panel, the tips being die cut to form notches which are filmed over with coating material, whereby the coating material filmed over each notch directly contacts coating material on the adjacent panels.

4,728,025

CARTON HAVING END PANELS AND FOR PACKAGING PRIMARY ARTICLES OF CUBICAL SHAPE

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 27, 1987, Ser. No. 78,405
Int. Cl.[4] B65D *5/08*
U.S. Cl. 229—40 4 Claims



1. A carton for packaging a plurality of articles comprising a bottom wall having opposite side edges and opposite end edges and having at least one locking aperture therein, a generally rectangular end panel having opposite end edges and opposite side edges and foldably joined to each end of said bottom wall along a side edge thereof, a side panel foldably joined to one side edge of said bottom wall, a first side wall having bottom, top and end edges and foldably joined along its bottom edge to the other side edge of said bottom wall, a top wall having opposite side edges foldably joined along one side edge to the top edge of said first side wall, a second side wall having top and bottom edges foldably joined along its top edge to the other side edge of said top wall, a locking panel foldably joined to said second side wall along the bottom edge thereof and having at least one locking tab arranged for insertion into said locking aperture, a tucker flap foldably joined to each end edge of said first side wall and disposed in flat face contacting relation thereto, each of said tucker flaps having a free end and an end adjacent said end panels respectively, a tucker panel foldably joined to one end edge of each of said end panels and to the end of each tucker flap which is adjacent each of said end panels along a diagonal fold line and being disposed in flat face contacting relation to said tucker flap, a tucker panel having a side edge foldably joined to the opposite end edge of each of said end panels and having an end edge normal to said side edge, and a tucker web foldably joined to each end edge of said side panel along a diagonal fold line and to said end edge of the adjacent tucker panel, said tucker webs being interposed between said side panel and the associated tucker panel and being in flat face contacting relation therewith, and a slit formed in each of said tucker flaps in normal relation to the edge thereof remote from the fold line between each such tucker flap and said first side wall.

4,728,026

HANDLE FOR SLEEVE-TYPE CARRIER

Richard L. Schuster, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Sep. 18, 1986, Ser. No. 908,548
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 B 8 Claims

1. A sleeve-type article carrier, comprising:

a top panel;

a bottom panel;

side panels foldably connected to the top and bottom panels;

end panels between the top, bottom and side panels;

the top panel containing a handle opening comprising two elongated spaced edges extending across the entire width of the top panel between the foldable connections between the side panels and the top panel;

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each elongated edge of the handle opening being foldably connected to a flap, the edges of the flaps opposite their foldable connections to the elongated handle opening edges meeting intermediate the elongated edges of the handle opening; and

the length of the meeting edges of the flaps being substantially less than the width of the top panel, whereby substantial portions of the handle opening in the top panel



adjacent the foldable connection between the side panels and the top panel are exposed; and

the handle opening extending into the side panels adjacent the foldable connections between the side panels and the top panel;

whereby either flap can be pressed down and folded about its foldable connection by the fingers of a person lifting the carrier, and upon the carrier being lifted the top panel adjacent the folded-down flap will bow upwardly.

4,728,027

SHORT LENGTH MAILER STRUCTURE AND METHOD OF MANUFACTURE

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Jun. 18, 1986, Ser. No. 875,549
Int. Cl.[4] B65D *27/10*
U.S. Cl. 229—69 **5 Claims**



1. A business form having a plurality of fold lengths for mailer usage comprising top and bottom piles having longitudinally extending edges, at least one edge being equipped with a control margin,

at least one intermediate ply between said top and bottom piles and including a series of at least two form lengths constituting a fold length,

said top and bottom piles having transverse lines of weakness every form length and a line of potential folding at each fold length,

said intermediate ply terminating a spaced distance short of said lines of potential folding and further being partially discontinuous about each line of weakness, and

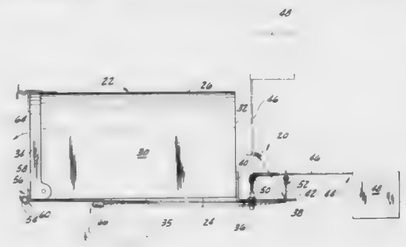
adhesive means joining said plies together.

4,728,028

DELIVERY SIGNAL DEVICE FOR A MAILBOX

Randy G. Barnes, and Eukal U. Gardner, both of R.R. 1, Ava, Mo. 65608

Filed May 4, 1987, Ser. No. 45,090
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **16 Claims**



1. In combination with a mailbox having a bottom, a top, opposing sides, a back, and a door pivotally mounted to the box near the bottom and closing the front, a resettable signal for indicating that the door has been opened, the signal comprising:

a bracket extending from the back of the mailbox, the bracket including a guide means;

a signal flag;

means for mounting the signal flag on the bracket forward of the guide means, the mounting means including means for resiliently biasing the signal flag to a signal position;

a cord attached at one end to the signal flag, extending through the guide means in the bracket and forward under the bottom of the mailbox toward the door;

means on the exterior of the door for releasably securing the end of the cord thereto whereby the cord holds the signal flag out of the signal position, the securing means releasing the cord when the door is opened thereby allowing the signal flag to move to the signal position.

4,728,029

FLAMELESS HEATER FOR OPERATOR'S CAB

Francis J. Griebel, Lexington, and Douglas W. Endres, Nicholasville, both of Ky., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 13, 1986, Ser. No. 873,930
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 R **3 Claims**

1. A flameless heating system for the opertor's cab of a machine having at least one hydraulically-actuated device powered by a source of pressurized hydraulic fluid connected with said device by a supply line; said system comprising:

a hydraulic reservoir mounted on said machine;

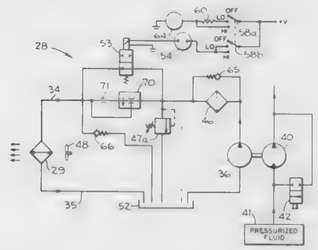
a hydraulic motor interposed in and in constant communication with said supply line;

a hydraulic pump mechanically connected to and driven by said motor and having an intake conduit connecting said pump to said reservoir;

a heat exchanger mounted adjacent said cab; an output conduit connecting said pump and said heat exchanger;

a flow restrictor interposed in said output conduit to increase the temperature of hydraulic fluid flowing therethrough;

on-off valve means selectively movable between a heat position in which fluid from said source is forced to flow through said motor causing said pump to circulate hydraulic fluid through said heat exchanger and a no-heat position in which fluid from said source bypasses said motor and said pump is not driven;



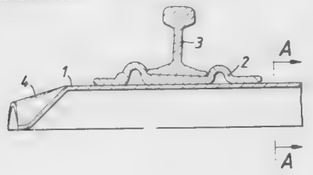
bypass valve means connected in parallel with said flow restrictor and responsive to the temperature of the hydraulic fluid in said reservoir reaching a predetermined high temperature for directing the output from said pump to said heat exchanger, whereby the work done by said pump, except for piping losses, is limited to circulation of said hydraulic fluid through said heat exchanger whenever the temperature of the hydraulic fluid in said reservoir is at or above said high temperature.

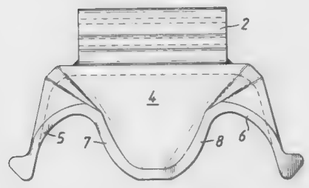
4,728,030

RAILWAY SLEEPER WITH SPADE-LIKE END CONTOURS

William H. Hodgson, Keswick, Great Britain, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 735,486, May 20, 1985, abandoned.
This application Dec. 15, 1986, Ser. No. 941,832
Claims priority, application United Kingdom, May 24, 1984, 8413333
Int. Cl.[4] E01B *3/16*
U.S. Cl. 238—61 **9 Claims**





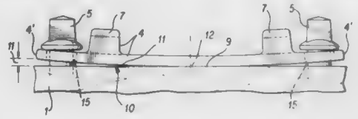
1. A railway sleeper having an inverted rolled steel channel-shaped section the ends of which have their upper surfaces downwardly inclined and inwardly tapered over their central region towards the sleeper extremities whereby to define at said extremities a corrugated contour to add strength and rigidity to the sleeper, said ends being press formed, the sleeper being of consistent width and continuous form along its entire length.

4,728,031

APPARATUS FOR FASTENING RAILS TO RAILROAD TIES

Armin Heim, Kreuzlingen, Switzerland; Johannes Horn, Wiesbaden, and Karl-H. Schwiede, Daisendorf, both of Fed. Rep. of Germany, assignors to Schwihag, Gesellschaft fur Eisenbahnoberbau mbH, Tagerwilen, Switzerland and Firma Karl Richtberg KG, Rein, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 206,717
Int. Cl.[4] E01B *9/40*
U.S. Cl. 238—303 **13 Claims**



1. Apparatus for fastening rails on ties in railroad permanent way, comprising:

(a) at least two rail screws for flushly mounting an abutment face of a bedplate against the upper surface of a tie, and

(b) a pre-stressed, elastically deformable bedplate having a convex curved abutment face for frictionally engaging said upper surface of a tie, for applying a spring force against said rail screws when said rail screws are used to brace said curved abutment face flush against said tie and for preventing relative movement between said bedplated and tie.

4,728,032

LOADING MEMBERS FOR RAILROAD TRACK

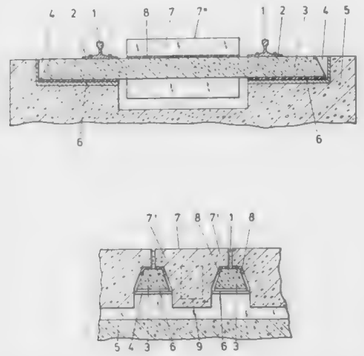
Gert Beigl, Salzburg; Peter Burtscher, Bludenz; Martin Dietrich, Übersaxen, all of Austria; Karl A. Kobler, Gruenwald, Fed. Rep. of Germany; Karl Konzett, Buers, and Karl H. Ruedisser, Nueziders, both of Austria, assignors to Getzner-Chemie Gesellschaft m.b.H.

Filed Sep. 26, 1986, Ser. No. 912,591
Claims priority, application Austria, Oct. 2, 1985, 2851/85
Int. Cl.[4] E01B *26/00*
U.S. Cl. 238—382 **9 Claims**

1. In a railroad track including rails and ties extending transversely of and connected to the rails, the ties having end portions and portions extending between the rails the end portions of the ties placed on a rigid substructure, sound-insulating intermediate layers placed between the ties and the substructure, and solid loading members of concrete placed on the portions of the ties extending between the rails for reducing sound emission, the improvement which comprises that the

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loading members have an essentially T-shaped cross-section defining outwardly projecting horizontal portions, wherein the



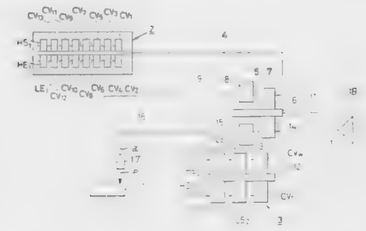
outwardly projecting horizontal portions of the loading members are placed on adjacent ties of the railroad track.

4,728,033

CLEANING METHOD UPON COLOR-CHANGE IN AN ELECTROSTATIC MULTI-COLOR COATING APPARATUS

Teruaki Matsumura, Nagoya; Noriyasu Suzuki, Toyoda; Michitaka Moritani, Toyoda, and Hirotsugu Takaba, Toyoda, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,864
Int. Cl.[4] B05B *15/04*
U.S. Cl. 239—1 1 Claim



1. Cleaning method upon color-change in an electrostatic multi-color coating apparatus adapted to supply paints of a multiplicity of colors, a cleaning air and a cleaning thinner selectively from a color-change device by way of a paint supply channel and a paint hose to the atomizing cup of an electrostatic multi-color coating machine, which method comprises successive steps of:

(a) changing the connection of said paint supply channel from that with said paint hose to that with a first liquid discharge channel leading to a liquid discharge tank upon completion of paint coating,

(b) supplying a cleaning air and a cleaning thinner from said color-change device to said paint supply channel, thereby discharging the paint remaining in said paint supply channel to said liquid discharge tank and cleaning the inside of said paint supply channel, while

(c) connecting said paint hose to a second liquid discharge channel leading to said tank,

(d) sucking the paint remaining in said electrostatic coating machine and in said paint hose and discharging said paint by way of an ejector disposed in said second liquid discharge channel to said liquid discharge tank, and then

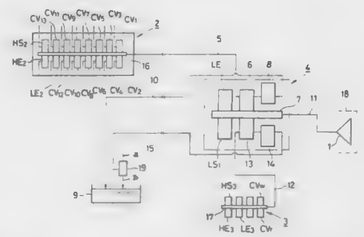
(e) supplying a cleaning thinner and a cleaning air to said paint hose and said electrostatic coating machine thereby cleaning the insides thereof.

4,728,034

CLEANING DEVICE UPON COLOR-CHANGE IN AN ELECTROSTATIC MUTLI-COLOR COATING APPARATUS

Teruaki Matsumura, Nagoya; Noriyasu Suzuki, Toyoda; Michitaka Moritani, Toyoda, and Hirotsugu Takaba, Toyoda, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,865
Int. Cl.[4] B05B *15/02*
U.S. Cl. 239—112 2 Claims



1. A cleaning device upon color-change in an electrostatic multi-color electrostatic coating apparatus comprising:

a first color-change device comprising a first manifold including valves for supplying respective paints of different colors, a cleaning air and a cleaning thinner selectively through a first paint supply channel;

a second color-change device smaller in size than said first color-change device, disposed near the electrostatic coating machine and comprising a second manifold including valves for supplying respective paints of different colors, a cleaning air and a cleaning thinner selectively through a second paint supply channel; and

a valve mechanism disposed near said electrostatic coating machine for supplying a paint supplied from said first color-change device or said second color-change device selectively through said first paint supply channel or said second paint supply channel to an electrostatic coating machine by way of a common paint hose,

wherein said valve mechanism comprises a third manifold in communication with said hose and including

a first switching valve having two exit channels selectively connectable to said first paint supply channel,

a second switching valve having two exit channels selectively connectable to said second paint supply channel, and

a low pressure air supply valve and a low pressure thinner supply valve,

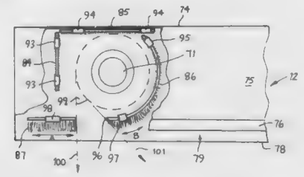
in which one of the exit channels of said first switching valve and one of the exit channels of said second switching valve are connected by way of said third manifold to said paint hose, while the other of the exit channels of said switching valves are connected by ON-OFF valves to a liquid discharge channel which leads to a liquid discharge tank.

4,728,035

APPLICATION OF PARTICLES TO A SUBSTRATE

John W. Cruse, Robertsbridge, and William O'Callaghan, Gerrards Cross, both of United Kingdom, assignors to P.T. Chemicals Limited, Buckinghamshire, England

PCT No. PCT/GB86/00380, § 371 Date Feb. 25, 1987, § 102(e) Date Feb. 25, 1987, PCT Pub. No. WO87/00090, PCT Pub. Date Jan. 15, 1987
PCT Filed Jun. 30, 1986, Ser. No. 29,049
Claims priority, application United Kingdom, Jul. 1, 1985, 8516638
Int. Cl.[4] B05B *1/28, 3/02, 1/26*
U.S. Cl. 239—122 11 Claims



1. An apparatus for producing a spray of particles comprising means for generating a spray of particles and shrouding means arranged about the spray-producing means leaving a restricted arc or arcs over which particles can be ejected from the apparatus, characterised in that the shrouding means includes a shielding element or elements (**84** to **87**) comprising, or each comprising, an array of bristles and arranged about the spray-producing means so that the spray of particles produced thereby impinges directly on the array or arrays of bristles and is thereby intercepted except in the arc or arcs over which particles are to be ejected from the apparatus.

4,728,036

ATOMIZING NOZZLE ASSEMBLY

Adam J. Bennett; Charles E. Capes, both of Ottawa; John D. Hazlett; Kevin A. Jonasson, both of Orleans, and William L. Thayer, Ottawa, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Nov. 17, 1986, Ser. No. 931,557
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—132.1 2 Claims



1. An atomizing nozzle assembly comprising:

(a) a frustum of a cone shaped, diflector core of a wear resistant ceramic material, said deflector having an outwardly diverging surface leading to a chamfered extremity, in a downstream direction for liquid-to-be-atomized, an outer portion of the diverging surface of the deflector core forming an outwardly deflecting surface for, in operation, an atomizing fluid jet to flow in an unobstructed manner along the whole length thereof,

(b) a nozzle rim of a wear resistant ceramic material, the rim having a wedge-shaped inward protrusion with a downstream side of the wedge-shaped protrusion having an outwardly flared, inner surface which is substantially parallel to, and co-extensive with, a downstream portion of the outwardly diverging surface of the deflector core to form therewith a mixing zone leading to an atomizing nozzle orifice outlet so that, in operation, liquid-to-be-atomized will be held against the surfaces bounding the mixing zone, until it is substantially completely mixed, and atomized as it emerges from the orifice outlet,

(c) a deflector core holder having a screw threaded upstream end and a flared socket portion at a downstream end, the flared socket portion having an outer, cylindrically shaped extremity, the flared socket having an upstream portion of the deflector core closely fitting and aligned therein, the flared socket portion, in operation, providing a smooth outer surface for guiding atomizing fluid towards and along the outwardly deflecting surface of the outer portion of the deflector core protruding from the flared socket portion,

(d) securing means securing the deflector core in the flared socket portion,

(e) an inner, cylindrical sleeve having a screw threaded, inner, upstream end portion, which is in close proximity to the mixing zone and is in threaded engagement in an adjustable manner with the screw threaded, upstream end portion of the deflector core holder, the inner cylindrical sleeve having a downstream end portion with an enlarged bore and terminating at a downstream end having inner and outer chamfers, the downstream end portion being around the flared socket portion to form a fluid passage around the cylindrically shaped extremity of the deflector core holder for, in operation, passing a substantially constant stream of atomizing fluid therealong to an atomizing fluid orifice formed between the inner chamfer and the outer deflecting surface of the flared socket so that, in operation, a jet of the atomizing fluid will issue from the atomizing fluid orifice and be directed along the outer portion of the outwardly deflecting surface of the deflector core,

(f) an upstream collar forming a mounting means on the front end of the inner, cylindrical sleeve,

(g) an outer, cylindrical sleeve sealed on, and secured against relative movement by the upstream collar on the front end of the inner sleeve and having a stepped, annular recessed portion at the downstream end with the nozzle rim mounted therein and protruding radially inwardly therefrom, a portion of the outer sleeve having a relatively larger bore diameter than the outside diameter of the inner sleeve and forming therearound an unobstructed, liquid passage for, in operation, conveying liquid-to-be-atomized towards the upstream side of, and inwardly around, the wedge-shaped protrusion of the nozzle rim,

(h) means securing the nozzle rim in the stepped, annular recessed portion,

(i) an adjustment means connected to the deflector core holder for adjusting the screw threaded engagement between the deflector core holder and the inner cylindrical sleeve to thereby adjust the width (W) of the mixing zone,

(j) means for delivering atomizing fluid to the fluid passage,

(k) means for delivering liquid-to-be-atomized to the liquid-to-be-atomized passage, and

(l) a differential thermal expansion accommodating gland slidably mounting an intermediate portion of the inner, cylindrical sleeve in a rear end portion of the outer cylindrical sleeve.

4,728,037

SAFE, EFFECTIVE SELF-DEFENSE DEVICE

Robert Mainhardt, Danville, Calif., assignor to Trebor Corporation, Dublin, Calif.

Continuation of Ser. No. 546,904, Oct. 31, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 898,745
Int. Cl.[4] B05B *11/04*
U.S. Cl. 239—154 3 Claims

1. A safe, effective self-defense device including container means, and a deterrent fluid including at least one of a lachrymal agent, a dye and an olefactory agent disposed in said container means, said container means being formed of a flexible material having sufficiently thin walls to enable collapsing at said walls by one hand of a user to enable selective discharge

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of said deterrent fluid by said user for self-defense, wherein the improvement in said self-defense device comprises:

said container means being provided with nozzle means having an inlet portion, an outlet portion and a throat portion of reduced diameter disposed therebetween, said nozzle means being formed to produce a coherent stream of said fluid upon manual collapsing of the walls of said container means; and

nozzle sealing and closure means mounted to said nozzle means and including cap means mounted to said nozzle means and a sealing substance positioned in said throat



portion downstream of said inlet portion of said nozzle means, said nozzle sealing and closure means being formed to prevent accidental discharge of said deterrent fluid from said container means, and said cap means further being formed for rapid removal from said nozzle means with the hand of the user used to collapse said walls and said sealing substance being selected for rapid ejection from said throat portion and said nozzle means upon collapsing of said container for discharge of said deterrent fluid through said nozzle means after ejection of said sealing substance upon continued collapsing of said container by the user.

4,728,038

SUSPENSION OF A DISTRIBUTING DEVICE ON AN AGRICULTURAL VEHICLE

Pierre C. C. Allaeys, Poperinge, Belgium, assignor to Multinorm B. V., Nieuw Vennep, Netherlands

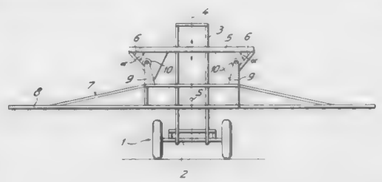
PCT No. PCT/EP83/00045, § 371 Date Sep. 6, 1983, § 102(e) Date Sep. 6, 1983, PCT Pub. No. WO83/02544, PCT Pub. Date Aug. 4, 1983

Continuation-in-part of Ser. No. 541,340, Sep. 6, 1983, abandoned. This PCT application Jan. 28, 1983, Ser. No. 869,446

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1982, 3203210; Jul. 8, 1982, 3225601

Int. Cl.[4] A01M *7/00*

U.S. Cl. 239—164 **16 Claims**



1. Suspension of a distributing appliance comprising an elongated spraypipe guided above the ground for the purpose of spraying substances from a chassis of an agricultural vehicle and projecting from both sides of the vehicle, said vehicle having a longitudinal axis and having, seen in the direction of travel of the vehicle at the rear of its chassis, a vertically extending column rigidly secured to said chassis, cross-beam means secured adjacent the top of said column, said cross-beam means extending transversely to said axis, at least two suspension means, each disposed at one end of said cross-beam means and together freely and movably supporting said appliance above its center of gravity within a vertical plane passing through the longitudinal axis of the distributing appliance, said suspension means comprising path means extending angularly with respect to each other and downwardly and forming together a path for said distributing appliance, and members for traversing said path means, wherein the cross-beam means are secured to said column on said chassis in such manner as to be adjustable in height.

4,728,039

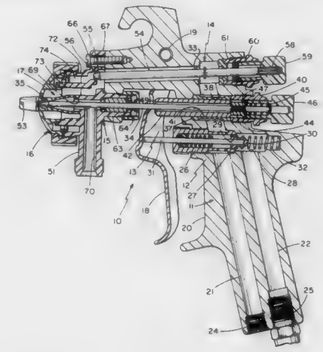
PAINT SPRAY GUN NOZZLE ASSEMBLY

Myron J. Johnson, Arlington Heights, and Robert L. Maggio, Elmhurst, both of Ill., assignors to Stewart Warner Corporation, Chicago, Ill.

Filed Dec. 8, 1986, Ser. No. 939,357

Int. Cl.[4] B05B *1/28*

U.S. Cl. 239—296 **11 Claims**



1. A paint spray gun, comprising: a valve body having an air passage therethrough adapted to be connected to a source of compressed air, a control valve in the passage for controlling the flow of air, a unitary plastic nozzle body including an air inlet passage, a paint inlet passage and an elongated nozzle tip receiving portion connected to receive paint from the paint inlet passage, a nozzle tip separate from the nozzle body pivotally mounted on the nozzle tip receiving portion, an air cap mounted on and covering the nozzle body and adapted to receive air from the nozzle unit air inlet, said air cap having a central orifice into which the separate nozzle tip projects, and interengaging means on the air cap immediately adjacent the orifice and the forward end of the nozzle tip for pivoting and aligning the plastic nozzle tip in the air cap orifice by relative movement between the nozzle tip and the nozzle body even though the nozzle tip is not perfectly concentric with the orifice.

4,728,040

INTERCHANGEABLY CONNECTABLE SPRINKLER DEFLECTOR AND HOSE

Mark Healy, Orlando; Fred Elliott, Winter Garden; William McFadden, and Thomas Senninger, both of Orlando, all of Fla., assignors to Senninger Irrigation, Inc., Orlando, Fla.

Filed Sep. 29, 1982, Ser. No. 426,723

Int. Cl.[4] B05B *1/26, 15/06*

U.S. Cl. 239—390 **10 Claims**

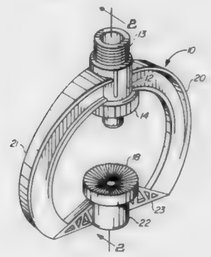
1. A sprinkler head apparatus comprising in combination:

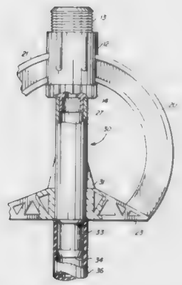
a base member for attachment to a water line having a passageway therethrough;

a nozzle attached to said base member to control the water flow and to direct water from the outlet of said passageway through said base, said nozzle having an extension extending therefrom adapted to couple to a water hose;

a water deflector pad support;

at least one arm attached to said base member and to said water deflector pad support to position said pad support in line with said nozzle;





a water deflector pad removably attached over a passageway through said water deflector pad support; and

means to removably attach a water hose to said sprinkler head for receiving the output of said nozzle when said water deflector pad is removed from over the passageway, whereby the sprinkler head can be coverted to an irrigation hose discharge device.

4,728,041

FLUID SPRAY APPARATUS

Daniel R. Draxler, Hockley, and Michael J. Woodward, Houston, both of Tex., assignors to Weatherford U.S., Inc., Houston, Tex.

Filed Apr. 15, 1987, Ser. No. 38,608

Int. Cl.[4] B05B *3/16*

U.S. Cl. 239—754 **19 Claims**

1. Fluid spray apparatus with self-oscillating mount means comprising

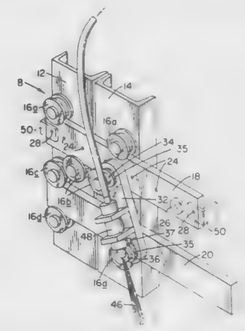
mount means for receiving and holding fluid discharge means,

first support means supporting said mount means, said mount means pivotably connected to said first support means at a first pivot point,

second support means supporting said mount means, said mount means pivotably connected to said second support means at a second pivot point spaced apart from the first pivot point,

lost motion means for said second support means, for permitting reversal of direction of movement, and

body member means, said first support means movably mounted on said body member means and said second support means spaced apart from said first support means and movably mounted on said body member means so that as fluid is discharged beyond the second support means the support means move on the body member means, the



mount means thereby alternately transversing about the two pivot points.

4,728,042

DRIP IRRIGATION PROCESS

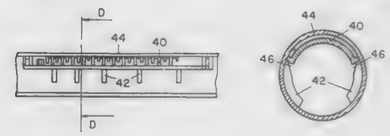
Moshe Gorney, and Eldad Dinur, both of Kibbutz Naan, Israel, assignors to Naan Mechanical Works, Israel

Division of Ser. No. 396,409, Jul. 8, 1982, Pat. No. 4,519,546. This application May 1, 1985, Ser. No. 729,194

Claims priority, application Israel, Jul. 15, 1981, 63341

Int. Cl.[4] B05B *15/00*

U.S. Cl. 239—542 **3 Claims**



1. Drip irrigation apparatus comprising;

a continuous unseamed outer tube and a plurality of flow rate determining inserts located at desired locations therealong interiorly of said outer tube, said flow rate determining inserts each defining a water inlet communicating with the interior of said outer tube and a part of a flow rate determining pathway which is also defined by the cooperating inner surface of said outer tube, said insert extending over less than the entire circumference of the inner surface of said outer tube.

4,728,043

MECHANICAL SORTING SYSTEM FOR CRUDE SILICON CARBIDE

Harald Ersdal, and Kjell A. Stole, both of Lillesand, Norway, assignors to Norton Company, Worcester, Mass.

Filed Feb. 25, 1982, Ser. No. 352,440

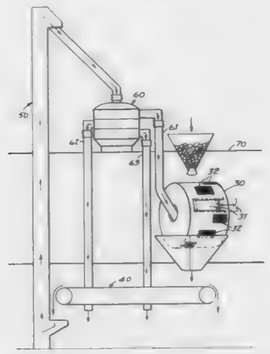
Int. Cl.[4] B02C *17/02*

U.S. Cl. 241—14 **3 Claims**

1. A method for separating unreacted and partially reacted material from a crude silicon carbide resistance furnace pig comprising breaking the pig into lumps, agitating said lumps in a horizontal drum having screen openings in its cylindrical surface, collecting the material passing said screen and recircu-

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lating a portion of said material, larger than a fixed minimum size, back to said drum, and collecting as product material



retained in said drum after a predetermined period of operation.

4,728,044

APPARATUS FOR THE COMMINUTION AND GRINDING OF BRITTLE GRINDING STOCK, PARTICULARLY OF DAMP INITIAL MATERIAL

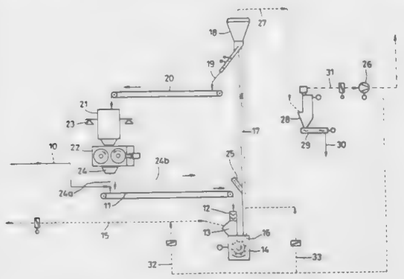
Helmut Duill, and Josef W. Brummer, both of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,457

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538385; Dec. 18, 1985, 3544798

Int. Cl.[4] B02C *23/38*

U.S. Cl. 241—18 **17 Claims**



1. A grinding system for the comminution and grinding of brittle grinding stock selected from the group consisting of initial material for raw cement meal, cement clinker and coal including damp initial materials comprising in combination:

a comminution mechanism;

supply means for supplying an initial grinding stock to said comminution mechanism;

a comminution product discharge conduit connected to said comminution mechanism;

a classifier connected to receive the output from said comminution discharge conduit and having a coarse material output and a fine material output;

a high pressure roll press connected to receive output of coarse material from said classifier;

and a crushed product discharge leading from said roll press and connected to deliver respective portions of said crushed product to said supply means and to said comminution product discharge conduit so that one portion of said crushed product from said roll press is delivered back to said classifier and a remaining portion is delivered to said comminution mechanism.

4,728,045

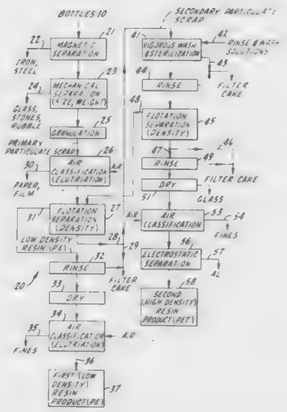
METHOD FOR RECLAIMING BONDED, TWO-RESIN ARTICLES

Thomas R. Tomaszek, Blackstone, Mass., assignor to Nelmor Co., Inc., North Uxbridge, Mass.

Filed Jan. 12, 1987, Ser. No. 2,123

Int. Cl.[4] B02C *19/14*

U.S. Cl. 241—19 **26 Claims**



1. A process for reclaiming reusable resin materials from scrap articles each comprising at least one component formed of a first resin having a first, low density, bonded to at least one component formed of a second resin having a second, higher density, comprising the following steps:

A. comminuting the scrap articles to form a primary particulate scrap;

B. separating particles of the two resins by flotation of the primary particulate scrap in a liquid having a density intermediate the first and second resin densities, producing a reusable first resin material and a secondary particulate scrap;

C. vigorously washing the secondary particulate scrap to break down the bonds in particles containing both of the first and second resins;

D. and again separating particles of the two resins, by flotation of the washed secondary particulate scrap from step C in the same manner as in Step B, producing a reusable second resin material and a residual low density scrap.

4,728,046

METHOD OF AND AGRICULTURAL MACHINE FOR PRODUCING POWER FODDER

Dirk Bruer; Hermann Garbers, and Franz Heidjann, all of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

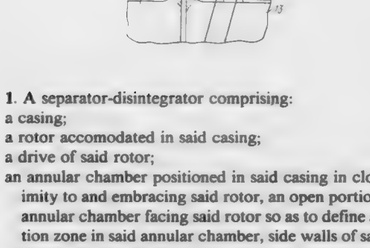
Filed Jun. 30, 1986, Ser. No. 880,007

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528638

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—24 **5 Claims**

1. A method of producing a storable power fodder of grain and stalk product, comprising the steps of cutting a grain containing stalk products; threshing the cut product and simultaneously separating from the cut product during threshing only a part composed of stalk and leaf fraction; throwing the separated part composed of the stalk and leaf fraction onto a



chute; and comminuting the remaining part of the cut product, composed only of grains and short straw.

4,728,047

SEPARATOR-DISINTEGRATOR

Bella U. Shagarova; Olev G. Reemet, both of ulitsa Mustamvae, 149, kv. 113; Ott F. Alasoo, bulvar Svpruse, 198, kv. 87, and Mart A. Perv, ulitsa Pukhkekodu, 63, kv. 11, all of Tallin, U.S.S.R.

Filed Sep. 10, 1986, Ser. No. 905,559

Int. Cl.[4] B02C *13/286*

U.S. Cl. 241—79.1 **5 Claims**

1. A separator-disintegrator comprising:

a casing;

a rotor accomodated in said casing;

a drive of said rotor;

an annular chamber positioned in said casing in close proximity to and embracing said rotor, an open portion of said annular chamber facing said rotor so as to define a separation zone in said annular chamber, side walls of said annular chamber having openings;

an outlet pipe to discharge fine fraction of material communicating with said annular chamber by means of said openings in said side walls;

at least one of a first pipe or a second pipe to discharge coarse fraction of material communicating with said annular chamber;

a damper mounted in each of said at least one of said first or second pipes for discharging coarse fraction of material and capable of longitudinal movement; and

an inlet pipe to charge material to be separated, being in communication with said first pipe for discharging coarse fraction of material.

4,728,048

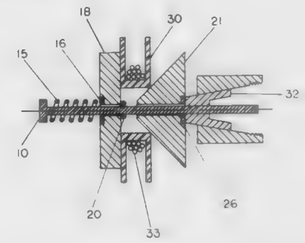
SPOOLING DEVICE

Jerry W. Batson, 13 Rim Rd., Kilgore, Tex. 75662

Filed Jun. 11, 1987, Ser. No. 60,529

Int. Cl.[4] B65H *54/00, 54/40*

U.S. Cl. 242—47 **5 Claims**



1. A line spooling device comprising:

a spindle member having one end thereof adapted for gripping reception in a rotatable drive source and having an opposite terminal end providing a spring stop,

a first annular ring member slidably disposed on said spindle member,

a second annular ring member slidably disposed on said spindle member,

said first ring member and said second ring member respectively having a first facing surface perpendicular to the central axis of the spindle member and a second facing surface with a frusto conical configuration relative to the central axis of the spindle, said first and second facing surfaces being adapted to centrally mount therebetween spool member with a bore sized to engage the frusto conical configuration, and

spring means on said spindle member resiliently biasing said first and second ring members toward one another when the spindle member is in a drive source so as to rotatably support a spool member for rotation with said spindle member.

4,728,049

DEVICE FOR LAYING-OUT A CONVOLUTE WEB OF MATERIAL

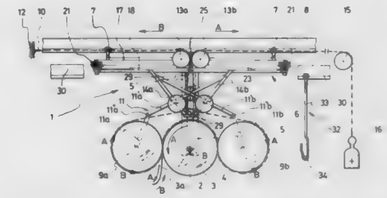
Gustav G. Veith, and Götz U. Veith, both of Frasdorf, Fed. Rep. of Germany, assignors to Gustav Georg Veith GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 2, 1986, Ser. No. 847,433

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519590

Int. Cl.[4] B65H *16/10*

U.S. Cl. 242—55 **25 Claims**



1. A device for winding or unwinding a web of material with respect to a winding shaft, comprising an elongated stationary support structure, a frame movable longitudinally with respect to said support structure, suspension means on said frame for supporting said winding shaft and driving means, comprising

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at least two first guide rolls supported on said frame, being arranged on both sides of said winding shaft, rope means, having a first and a second end, said first end being fixed with respect to said movement of said frame, and said second end being connected to tensioning means for holding said rope means under tension, said rope means between said first and said second end contacting at least a part of said guide rolls and the web wound on said winding shaft, said rope means also being in frictional engagement with said wound web, said rope means further being adapted to being displaced in the direction of the circumference of said guide rolls and said web when said frame is moved relative to said support means in order to rotate said wound web on said winding shaft for winding or unwinding said web.

4,728,050

WINDING APPARATUS FOR USE WITH WINDING SLEEVES OF DIFFERING DIAMETERS

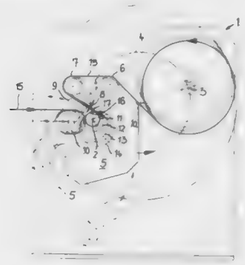
Dieter Lättge, Hameln; Helmut Spötter, Extertal, and Erwin Cichon, Hameln, all of Fed. Rep. of Germany, assignors to Stahlkontor Maschinenbau GmbH, Hameln, Fed. Rep. of Germany

Continuation of Ser. No. 740,657, Jun. 3, 1985, abandoned. This application Jul. 15, 1987, Ser. No. 73,869

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425490

Int. Cl.[4] **B65H** *19/26*

U.S. Cl. 242—56 A **8 Claims**



1. A winding apparatus comprising a rotatable assembly having a plurality of winding sleeves mounted thereon in spaced relation to one another, each of said sleeves being moved between a predetermined winding position and a predetermined unloading position by rotation of said assembly through a turning circle, the axes of rotation of each of said sleeves being on said turning circle, said apparatus including means for feeding a web of material to an unwound first one of said sleeves at said winding position to be wound thereon, means for rotating said assembly to move said first sleeve and the web material wound thereon from said winding position to said unloading position when a desired quantity of said material has been wound on said first sleeve and for simultaneously moving an unwound second one of said sleeves into said winding position, said rotatable assembly including mounting means for mounting unwound sleeves of a plurality of different diameters on said turning circle, the axes of rotation of different diameter ones of said unwound sleeves being noncoincident with one another, said mounting means including means for selecting a unique position for the axis of rotation of each unwound sleeve on said turning circle as a function of the diameter of said unwound sleeve to so position each said sleeve on said turning circle that the periphery of each unwound sleeve of each of said different diameters passes through the same predetermined point on said turning circle when said unwound sleeve is at said winding position, said sleeve being retained at said unique position while said material is being wound thereon and until it is moved to said unloading position by said menas for rotating said assembly, a web transfer unit mounted at a fixed location adjacent said turning circle and operative to direct said web of material from a wound sleeve at said unloading position to an unwound sleeve at said winding position across said turning circle at a crossing point on said turning circle that is closely adjacent to the said predetermined point through which the peripheries of all of said different diameter unwound sleeves pass, and a cutter mechanism mounted at a fixed location relative to said turning circle adjacent to said winding position, the respective locations of said web transfer unit and cutter mechanism relative to said turning circle being the same regardless of changes in the diameter of the unwound sleeve at said winding position, said cutter mechanism being operative to sever said web at substantially the same location closely adjacent to said web crossing point on said turning circle regardless of the diameter of the unwound sleeve that is at said winding position.

4,728,051

REVERSIBLE REEL ASSEMBLY

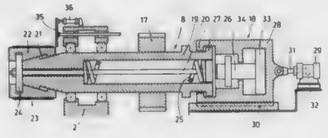
Manfred Rothenpieler, Siegen, and Gerhard Diehl, Burbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,312

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538677

Int. Cl.[4] **B65H** *75/34;* **B21C** *47/02*

U.S. Cl. 242—64 **11 Claims**



1. A reversible reel assembly comprising a rotatable head plate, two rotatable reels for successive, continuously winding rolled strip, the two reels mounted on the rotatable head plate and rotatably driven independently from each other, wherein each reel is movable by a rotation of the head plate between an initial position and a strip coil transfer position, each reel comprising a drum including a plurality of segments movable between a first position of rest and a second spread-apart position, the segments defining conically-shaped sliding surfaces, a tubular reel shaft mounted on the head plate for each reel, each shaft having an axis and an end facing the reel drum, the sliding surfaces axially slidably contacting the end of the shaft, a plunger extending axially through each reel shaft, a flange attached to an end of the plunger for connecting the plunger to the segments, so that an axial movement of the plunger moves the segments between the first and second positions thereof, a compression spring mounted in each tubular shaft, the spring acting on the plunger so as to bias the segments into the spread-apart position, at least one stationary positioning drive including a positioning member, the positioning member capable of acting on the plunger for moving the plunger in axial direction against the force of the compression spring so as to move the segments into the first position of rest, the positioning drive further including a coupling jaw, the reel shaft defining coupling elements, wherein the coupling elements is movable with play into the coupling jaw when the head plate is rotated, so that a locking engagement is effected between the positioning drive and the reel which is in the position for moving the segments into the first position.

4,728,052

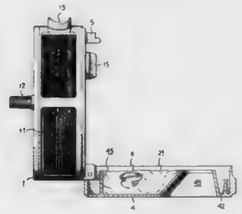
COMBINED BAIT CASE AND FISHING REEL

Shih-Yuan Yeh, No. 2-4, Chen-Hsing Road, Tai-Ping Hsiang, Taichung Hsien, Taiwan

Filed May 20, 1987, Ser. No. 52,618

Int. Cl.[4] **A01K** *89/00*

U.S. Cl. 242—84.1 K **2 Claims**



1. A combined bait case and fishing reel comprising a fishing reel portion and a bait case portion, wherein:

one side of the fishing reel portion comprises a fishing line therein and a rotating handle, another side of the fishing reel portion has a plate wall which has two holes bored on an upper portion thereof and two holes bored on a lower portion thereof and also has a dial; a connecting arc plate set on top of the fishing reel portion used for fixing the combined bait case and fishing reel on a fishing rod; a circumference of the plate wall being inclined outward so as to provide better fixture of the bait case portion;

the bait case portion comprising a cylindrical cover which has a hollow cavity on a corresponding position with the dial; the hollow cavity being substantially cone-shaped and an outer diameter thereof being larger than an inner one; an engagement plate being installed above the hollow cavity in the cover and a lower portion of a front end of the engagement plate has a slot; a rectangular engaged block with an extended engagement strip, said engagement strip being screwed on an upper portion of the plate wall of the fishing reel portion by threading screws through the holes of the upper portion thereof; the front end of the extended engagement strip having a protuberance which is engageable with the slot of the engagement plate to prevent the cover from slipping out;

the cover being pivotal about the side wall of the fishing reel portion by passing a pin through a central hole of a pivotted block and a pivotal hole on the lower portion in the cover; the pivotted block being threadably secured on the lower portion of the side wall of the fishing reel by screws through the holes on the lower portion of the fishing reel portion; a recess is set on the top of the outer of the cover for opening the cover.

4,728,053

DRAG MECHANISM FOR A SPINNING FISHING REEL

Yasuhiro Hitomi, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 913,316, Sep. 30, 1986, abandoned. This application Jun. 29, 1987, Ser. No. 68,765

Claims priority, application Japan, Oct. 9, 1985, 60-154754[U]; Jul. 8, 1986, 61-104609[U]

Int. Cl.[4] **A01K** *89/01. 89/02*

U.S. Cl. 242—84.5 A **14 Claims**

1. A spinning reel comprising:

a spool shaft,

a spool rotatably supported at a lengthwise front portion of said spool shaft, and

a drag mechanism, said drag mechanism comprising:

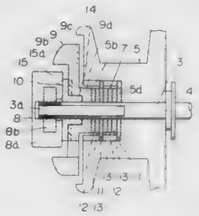
(a) spool-side braking members supported to rotate with said spool relative to said spool shaft,

(b) spool shaft-side braking members fixed non-rotatably relative to said spool shaft,

(c) a first adjuster means mounted on a front end portion of said spool shaft, for setting a minimum braking force applied against rotation of said spool relative to said spool shaft,

(d) a second adjuster means mounted on said spool shaft and interposed between said first adjuster means and said spool, for adjusting said braking force applied by said first adjuster means up to a predetermined maximum braking force, and

(e) a transmission member supported non-rotatably and axially movable relative to said spool shaft to transmit to said spool-side braking members and said spool shaftside braking members said braking force applied by said first adjusting means.



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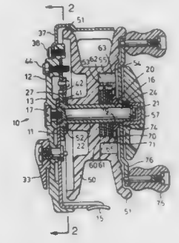
FISHING REEL

Albert H. Pisapio, Mississauga, Canada, assignor to Judith A. Pisapio, Mississauga, Canada

Filed May 23, 1986, Ser. No. 866,312

Int. Cl.[4] **G10F** *1/12*

U.S. Cl. 242—84.51 A **19 Claims**



1. A fishing reel, comprising:

a back plate having a generally circular frame member attached to it;

a cylindrical shaft defining a longitudinal axis, the shaft extending from an inner surface of the back plate;

a spindle mounted on the shaft and rotation about the longitudinal axis thereof, the spindle having a longitudinal flat surface and being threaded toward its outer end;

a ratchet wheel positioned adjacent the inner surface of the back plate and being rotatable with the spindle;

a pawl pivotally mounted on the inner surface of the back plate;

means for biasing the pawl toward engagement with the ratchet wheel to prevent rotation of the spindle in one direction, the pawl and ratchet wheel being reversible to accommodate a ratcheted reeling rotation of the spindle in either of the two possible directions;

a cam engaging the pawl so that rotation of the cam causes the pawl to engage or disengage the ratchet wheel;

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a spool positioned on the spindle and being freely rotatable on the spindle, the spool having circular rims extending beyond the periphery of the frame so that manual pressure may be applied thereto for the purpose of imparting drag to the unreeling rotation of the spool, the spool defining a cylindrical recess about the axis of said shaft, the recess being open to the threaded end of the spindle;

a drag brake being capable of providing a frictional engagement of the spool and the spindle, comprising a first washer rotatable with the spindle being positioned at the bottom of the recess, over which is positioned a washer rotatable with the spool, over which is positioned a second washer rotatable with the spindle, and a washer of a friction material being provided over all said washers;

a handle coacting with the spindle so that the spindle may be rotated by the handle; and

a drag brake knob threaded to screw onto the end of the spindle for applying pressure to the washers of the drag brake.

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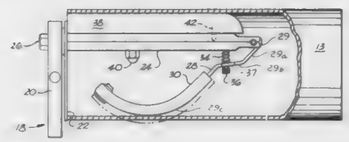
YARN PACKAGE HOLDER

Joe Wright, Jr., P.O. Box 6763, and Lang S. Ligon, P.O. Box 5578, Station B, both of Greenville, S.C. 29606

Filed Nov. 17, 1986, Ser. No. 931,266

Int. Cl.[4] B65H *49/04*

U.S. Cl. 242—130 **16 Claims**



1. A holder for receiving and frictionally securing packages of yarn, wound onto hollow tubes of various inner diameters, comprising:

(a) a base support, adapted to be attached to a creel for a textile machine;

(b) a contact arm for contacting an inside wall of a yarn tube, one end of which is rigidly connected to said base support, said contact arm extending from said base support in a cantilevered manner;

(c) a contoured support arm, a pivot connecting one end of said contoured support arm to said contact arm at a point remote from the point where the end of said contact arm is rigidly connected to said base support and a distal free end extended in the direction of said base support terminating short thereof; and

(d) resilient means interposed between said contact arm and said contoured support arm at a distance from said pivot towards said base support, said resilient means urging the end of said contoured arm which is remote from said pivot away from said contact arm in a manner that said contoured support arm and said contact arm are urged against opposite inside walls of a hollow tube placed about said contact arm and said contoured support arm to secure said hollow tube to the base support.

4,728,056

MAGNETIC TAPE CASSETTE WITH IMPROVED HUB LOCKING MEANS

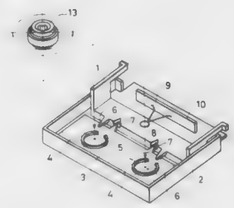
Shozo Onmori, and Shingo Katagiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1986, Ser. No. 911,597

Claims priority, application Japan, Oct. 18, 1985, 60-158681[U]

Int. Cl.[4] G03B *1/04*

U.S. Cl. 242—198 **5 Claims**



1. A magnetic tape cassette for housing a magnetic tape, having a upper half case (2), said magnetic tape cassette comprising:

(a) a window member (3) supported by said upper half case and disposed adjacent a back wall of said case, receiving portions (4) located on said window member for supporting rotatable hubs, and at least one protrusion (5) extending laterally from said window member towards a front wall of said case; and

(b) a spring loaded locking member (1) movable in a horizontal direction and supported by said upper half case (2), said locking member being movable to a first position for preventing at least one hub (13) from rotating and movable to a second position for allowing rotation of said hub, said locking member having at least one recess (7) for receiving said protrusion (5), said locking member having a bottom surface (11) defining a portion of the recess furthest from the magnetic tape, wherein said locking member is prevented from moving in a vertical direction toward the magnetic tape by contact between said bottom surface and said protrusion of said window member.

4,728,057

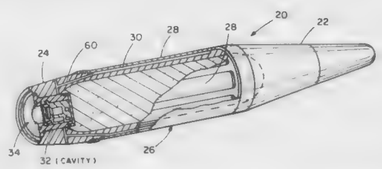
SPIN-STABILIZED PROJECTILE WITH PULSE RECEIVER AND METHOD OF USE

Brian B. Dunne, La Jolla, Calif., assignor to Ship Systems, Inc., San Diego, Calif.

Filed Nov. 22, 1985, Ser. No. 801,171

Int. Cl.[4] F41G *7/26*

U.S. Cl. 244—3.16 **12 Claims**



1. A spin-stabilized projectile the trajectory of which can be improved to increase accuracy, said projectile being controlled by a source of electromagnetic radiation providing pulses carrying encoded information, said spin-stabilized projectile comprising;

a nose end;

a midportion having a periphery disposed about which are a plurality of spaced masses and a high explosive charge associated with each mass for high explosive detonation acceleration of its corresponding mass to provide an impulse to said projectile which is applied substantially normal to the longitudinal axis of said projectile;

a boatail defining a cavity open at the rear end of said boatail; and

a pulsed electromagnetic radiation processor and receiver mounted in said cavity and including:

(a) means for determining approximate elapsed time from firing of the projectile;

(b) means for determining the direction of the source of electromagnetic radiation with respect to said projectile which provides an indication of true vertical;

(c) means for determining approximate vertical;

(d) means for counting the times between adjacent electromagnetic pulses in a series of such pulses;

(e) means for determining projectile rotational rate; and

(f) microprocessor means responsive to said means for determining the approximate elapsed time, said means for determining direction, said means for determining approximate vertical and said means for counting the times between adjacent electromagnetic pulses, said microprocessor means controlling selective high explosive detonation acceleration of said masses to improve said trajectory, said microprocessor means including means responsive to said means for determining the direction and said means for determining approximate vertical to provide a difference between approximate vertical and true vertical.

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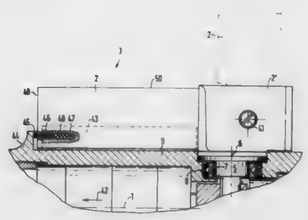
AIRBORNE BODY WITH OVER-CALIBER SIZED GUIDANCE MECHANISM

Bernd Brieseck, Henfenfeld, and Josef Nagler, Rothenbach-/Pegn., both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,547

Int. Cl.[4] F42B *15/053*

U.S. Cl. 244—3.28 **4 Claims**



1. Airborne body comprising a projectile with a flight guidance mechanism which is over-caliber sized in the operative position of said mechanism, said guidance mechanism including extendable control surfaces, said control surfaces being retracted against a tail end structure of the projectile before firing of the projectile from a launch tube and substantially radially extended from said projectile subsequent to said projectile exiting from said launch tube; and locking pin means extending from intermediate the tail end structure and respectively to each of said control surfaces, said locking pin means engaging in a bore provided in an end surface of each said control surfaces and extending in the direction of travel of said projectile for maintaining said control surfaces in a caliber-maintaining retracted position of each said control surface; a protuberance extending radially outwardly from said tail end structure; a detent on said protuberance facing towards said bore; and resilient biasing means in said bore for biasing said locking pin means into latching contact with said detent prior to the firing of said projectile, said locking pin means being displaced into said bore opposite the resilient biasing means in response to acceleration force acting thereon upon firing of said projectile so as to cause said locking pin means to disengage from said detent and facilitate the outward extension of said control surfaces.

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PRESSURIZED WALL IN AIRCRAFT

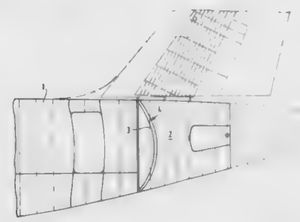
Gerhard Stephen, Bremen, and Joachim Wrobel, Oyten, both of Fed. Rep. of Germany, assignors to MBB GmbH, Bremen, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 913,079

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534719

Int. Cl.[4] B64C *1/10*

U.S. Cl. 244—119 **2 Claims**

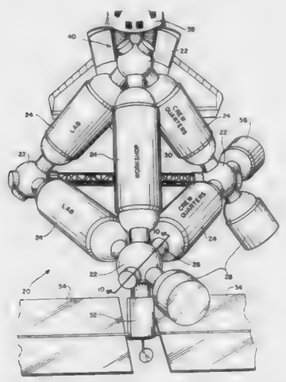


1. In combination with a partioning wall structure for walls in the interior of an aircraft, separating compartments being maintained under different pressure, such as the rear wall in a passenger compartment, the improvement comprising:

a holding and capturing structure comprised of a narrow meshed net fastened to the fuselage of the aircraft adjacent to points of the fuselage to which the wall is fastened such that the net is tensioned against said wall and being arranged on the low pressure side of said wall to serve as a safety and wall capturing structure; said net being made of woven or braided belts; the belts being made of synthetic material.

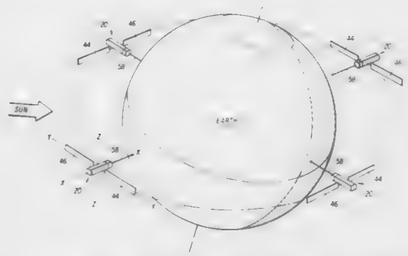
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4,728,060
SPACE STATION ARCHITECTURE, MODULE, BERTHING HUB, SHELL ASSEMBLY, BERTHING MECHANISM AND UTILITY CONNECTION CHANNEL
Marc M. Cohen, Palo Alto, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 9, 1984, Ser. No. 588,036
Int. Cl.[4] B64G *1/12, 1/64*
U.S. Cl. 244—159 **33 Claims**



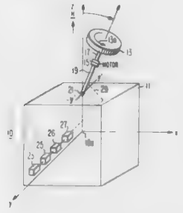
27. A controlled atmosphere environment, which comprises a plurality of elongated controlled atmosphere modules interconnected with substantially globular-walled hubs in a two-dimensional triangular configuration.

4,728,061
SPACECRAFT OPERABLE IN TWO ALTERNATIVE FLIGHT MODES
Caldwell C. Johnson; Maxime A. Faget, both of Dickinson, and David J. Bergeron, III, Houston, all of Tex., assignors to Space Industries, Inc., Webster, Tex.
Filed Mar. 20, 1985, Ser. No. 713,816
Int. Cl.[4] B64G *1/34, 1/24, 1/36*
U.S. Cl. 244—164 **21 Claims**



1. A spacecraft adapted for orbital flight in two alternative modes, one of said modes being an earth-oriented mode, and the other of said modes being a quasi sun-oriented mode, said spacecraft comprising:
a spacecraft body;
at least one solar array extendible outwardly from the spacecraft body;
passive attitude control means utilizing gravity gradient stabilization means which is extendible and retractable relative to the spacecraft body; and
active attitude control means comprising means for sensing the spacecraft attitude and means operable in response to outputs from said attitude sensing means for producing attitude control torques;
said gravity gradient stabilization means when extended being effective to stabilize the spacecraft in the earth-oriented mode, and said active attitude control means being effective to stabilize the spacecraft in the quasi sun-oriented mode.

4,728,062
PIVOT ACTUATED NUTATION DAMPING FOR A DUAL-SPIN SPACECRAFT
Carl H. Hubert, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Nov. 12, 1985, Ser. No. 797,127
Int. Cl.[4] B64G *1/38*
U.S. Cl. 244—170 **8 Claims**



1. An active nutation damping system for a dual-spin spacecraft comprising:
a spinning body pivotally mounted in a given plane to a platform body with said spinning body pivoted about a pivot axis extending orthogonal to the angular momentum axis of the spacecraft;
means for sensing motion of the platform body in inertial space about an axis transverse to the spin axis of the spinning body for providing control signals; and
drive means coupled between said spinning body and said platform body and responsive to said control signals for pivoting said spinning body about said pivot axis relative to said platform body a given amount in one direction, and a half nutrition period later pivoting said spinning body said same given amount in the opposite direction to return the spinning body to its original position to produce a reaction moment on the platform body to counter nutational motion thereby providing nutation damping.

4,728,063
RAILWAY SIGNALLING SYSTEM ESPECIALLY FOR BROKEN RAIL DETECTION
William A. Petit, Spencerport, and John H. Auer, Jr., Fairport, both of N.Y., assignors to General Signal Corp., Rochester, N.Y.
Filed Aug. 7, 1986, Ser. No. 894,223
Int. Cl.[4] B61L *21/06*
U.S. Cl. 246—34 R **8 Claims**

1. A railway signalling system which detects a broken rail in a block of track which is insulated from adjacent portions of track only at the ends of the block, said system comprising means for transmitting and also means for receiving alternating current signals of different frequency along the rails in a plurality of successive sections of said block, said sections being end sections at the opposite ends of said block and a plurality of intermediate sections between the end sections, said transmitting and receiving means including a plurality of repeaters having receivers and transmitters and being connected to said intermediate sections, each of said repeaters having its receiver tuned at a frequency different from any other of the receivers of any other of said repeaters and having its transmitter tuned to a frequency different from any other of the transmitters of said repeaters said receivers connected to said intermediate section, and the receiving means connected to the rails at one of the end sections being tuned to the frequency of the transmitter of the preceeding section for enabling the transmitter of

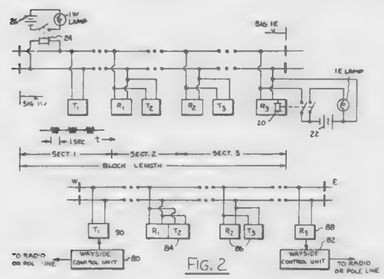
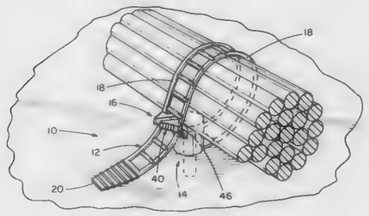


FIG. 2

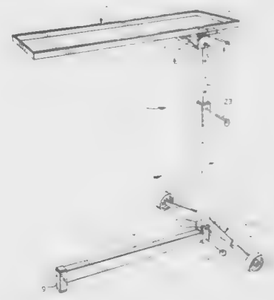
a succeeding section in response to a signal received from a preceeding section to repeat the received signal at a different frequency from the frequency of the signal transmitted along the rails from their preceding sections, and means connected to the receiving means which is connected to one of the end sections and responsive to the absence of a received signal from said transmitting means of the section which precedes said one end section for signalling a condition representing a broken rail in said block.

4,728,064
RELEASABLE CABLE TIE
Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corp., Tinley Park, Ill.
Filed Jun. 13, 1986, Ser. No. 874,261
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.3 **12 Claims**



1. A releasable ladder fastener, comprising:
a ladder strap portion including a pair of elongate parallel side rails joined by a plurality of spaced interposed rungs;
fastener mounting means for securing the fastener to a mounting surface formed adjacent an end of the strap portion; and
resilient latching means for engaging the side rails of the strap portion formed on the fastener mounting means, the latching means including two spaced apart opposed resiliently mounted locking members that each engage on of the side rails within respective side rail latching recesses of the locking members to releasably lock the resilient latching means within the ladder strap portion, the locking members as molded being spaced apart an amount greater than the inner width of the spaced apart rails such that as the locking members are inserted between the rails the locking members are displaced inwardly whereby the locking members are resiliently biased outwardly to releasably engage the side rails within the side rail latching recesses, said locking members being moveable from a first latched position wherein said locking members are spaced apart an amount greater than the inner width of said spaced apart side rails to a second position wherein said locking members are biased toward one another and spaced apart an amount less than the inner width of said spaced apart side rails whereby said locking members may be biased toward one another and removed from said side rails.

4,728,065
FOLDABLE MACHINIST'S TOOL TRAY
David J. Coote, 50 Lorne Street, St. Catharines, Ontario, Canada L2P 3C4
Filed Aug. 10, 1987, Ser. No. 83,316
Int. Cl.[4] A47K *1/04*
U.S. Cl. 248—129 **6 Claims**



1. A machinists' tool tray comprising a pan, a first leg pivoted at its upper end adjacent one end of said pan, a second leg pivoted at its one end to the lower end of said first leg, an axle fixed transvers to said first leg at its lower end, a pair of wheels mounted on each end of said axle, first removeable locking means for locking said pan at right angles to said first leg, second removeable locking means for locking said second leg at right angles to said first leg and substantially parallel to said pan and projecting from said first leg in the same direction as said pan whereby, when the tool tray is placed with the wheels on the ground and the other end of said second leg touching the ground the pan is maintained substantially parallel to the ground.

4,728,066
COLLAPSIBLE TRIANGULATED TENSION SUPPORT STRUCTURE
Donald Lang, 382 Franklin St., Cambridge, Mass. 02139, and Joseph S. Shortlidge, 132 Bay State Rd., Melrose, Mass. 02176
Continuation-in-part of Ser. No. 695,906, Jan. 29, 1985, Pat. No. 4,632,344. This application Dec. 29, 1986, Ser. No. 947,048
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[4] F16M *11/32*
U.S. Cl. 248—165 **16 Claims**

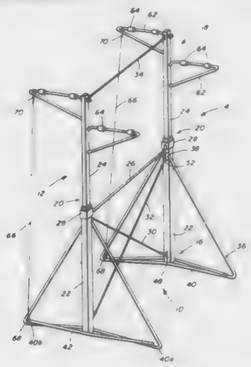
1. A triangulated tension support structure comprising:
a first linear means having a base Portion, an end portion and an intermediate portion therebetween;
a second linear means having a base portion, an end portion and an intermediate portion therebetween;
a linear compression means positioned between and connected to the intermediate portion of said first and second linear means to form therewith a generally "H"-shaped

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planar structure and with each such connection permitting rotational movement of the corresponding linear means about a rotational axis normal to the plane of said generally "H"-shaped structure;

a first tensioning member connected between the intermediate portion of said first linear means and the base portion of said second linear means;

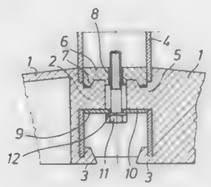
a second tensioning member connected between the intermediate portion of said second linear means and the base portion of said first linear means, said first and second tensioning members diagonally crossing each other in a generally "X" configuration and lying in the plane formed by said first and second linear means and said linear compression means; and,



an upper tensioning member extending between and connected to the end portions of said first and second linear means;

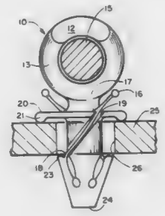
means for adjusting the tension of at least one of said first, second and upper tensioning members whereby the tensioning produces rotation of each one of said linear means about its rotational axis thereby putting said diagonally crossed first and second tensioning members and said upper tensioning member under tension and said linear compression means under compression to produce a rigid structure without slack between and among the components thereof.

4,728,067
COMPOSITE LEG-SUPPORT
Karl Steinmetzer, and Laszlo Schetl, both of Jönköping, Sweden, assignors to Stilexo Industrial AB, Skillingaryd, Sweden
PCT No. PCT/SE86/00110, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05373, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 13, 1986, Ser. No. 933,525
Claims priority, application Hungary, Mar. 13, 1985, 933/85
Int. Cl.[4] F16M *11/32*
U.S. Cl. 248—188.7 **7 Claims**



1. A composite leg support having a vertical shank and at least three legs or the like arranged approximately perpendicularly to the longitudinal axis of the shank, extending radially thereto, and connected to the shank (**4**) in a force-locking but releasable manner, the end of each leg connectable to said shank being provide with upper and lower claw-like arresting means (**2, 3, 13, 18, 18', 18''**), which are locked to the shank in position by means of an upper disc (**6, 22, 52**) and a lower disc (**10, 15, 25, 53**) or the like, these discs being provided with threaded bore means (**8, 11, 21, 51, 56**) for moving to and from each other thereby entering respectively into and out of engagement with upper and lower arculated grooves (**14**) formed by said arresting means (**2, 3, 13, 18, 18', 18''**) via circumferential flanges (**7, 23, 26, 56**) or the like, said arresting means indirectly forming at least both sides of said grooves for absorbing outer loads in this area in a shape-force-locking manner, at least one circumferential edge of which being inclined in relation to said axis, the dimensions of at least one of said flanges being greater than those of said arculated grooves (**14**) in order to insure tight fitting and to compensate for material wear; the end of the legs (**1, 19**) facing the shank (**4, 31**) being formed with a curved concave surface in compliance with the curvature of the shank (**4**) so that in the assembled state said concave surfaces interact with the shank (**4, 31**), the arresting means (**2, 3, 13, 18, 18', 18''**) and the discs (**6, 10, 15, 22, 25, 52, 52**) in the shape-force-locking manner; and a flange (**17**) is provided on the lower part of the curved surface of the legs (**1, 19**), the width of which corresponds to the wall-thickness of the shank (**4**), and said flange (**17**) bearing against the lower end of the shank (**4**) of the leg-support in the assembled state.

4,728,068
REMOVABLE ANCHORS FOR PERFORATED PANEL HANGERS
Bernard Rivkin, Poway, Calif., assignor to PPMD, Inc., Del Mar, Calif.
Filed Aug. 23, 1985, Ser. No. 768,676
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—220.4 **8 Claims**



1. A removable and reusable anchor which when inserted through at least one perforation of a perforated panel has surfaces on opposite sides thereof for securing and stabilizing perforated panel hangers to said perforated panel said panel having opposing surfaces, said anchor comprising:

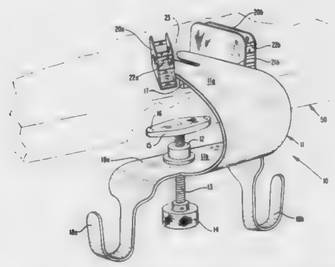
a body member having upper and lower ends and two opposing resilient barbs, said barbs having a first end and a second end, said first end extending upwardly away from said lower end of said body member for engaging one of said opposing surfaces of said perforated panel and a resilient base member on the opposite, upper end of said body for engaging the other opposing surface of said perforated panel including a perforated panel hanger attaching means, said body and base member having elongated slots on opposite sides thereof extending angularly across said body member and being partially open along the length thereof;

pull tab means formed and originating from the second end of said resilient barbs, said pull tab means being located within said slots and extending angularly across said body member and extending through said panel perforations

and at least one of said base member slots said body member, base member, barbs and pull tabs being molded and of one piece construction;

whereby when said anchor is pressed through a panel perforation said resilient base member and resilient barbs engage opposite sides of said perforated panel locking said anchor to said panel, and when said pull tab means are pulled upwardly said resilient barbs are pulled against said body member and said anchor can be removed from panel perforation for subsequent reuse.

4,728,069
ARTICLE ATTACHMENT FOR BARS, TABLES AND THE LIKE
John P. Semcer, 1 Prospect St., South Orange, N.J. 07079
Filed Dec. 16, 1986, Ser. No. 942,256
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—231.7 **10 Claims**



1. An article attachment assembly particularly adapted for association with the horizontal plane of bars, tables, and the like comprising,

a. a generally C-shaped member having an upper section and a lower section;

b. a clamping assembly connected to said C-shaped member for securing the same to a side edge of the bar, table, or the like;

c. at least one receptacle connected to said upper section of said C-shaped member for holding cigarettes, cards or similar articles at a point above the horizontal plane of the bar, table or the like;

d. said upper section having slot means for holding a book of matches, pad of paper or similar articles at a point above the horizontal plane of the bar, table or the like; and

e. at least one hook member depending outwardly from said lower section of said C-shaped member for holding handbags, towels or the like at a point below the horizontal plane of the bar, table or the like.

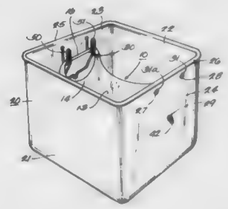
4,728,070
BAG HOLDER
Billy L. Engelbrecht, 910 S. 39th St., Manitowoc, Wis. 54220
Filed Jan. 29, 1987, Ser. No. 8,284
Int. Cl.[4] B65D *90/04*
U.S. Cl. 248—303 **5 Claims**

1. A holder for supporting a flexible, collapsible handle-bag in a trash container, said holder consisting entirely of a single continuous piece of wire, said wire being bent to form

(a) a pair of horizontally spaced upper support prongs

(b) a leg extending downwardly from each prong

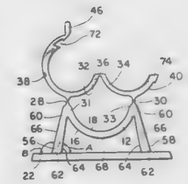
(c) an upstanding finger connected to each leg and spaced horizontally from the plane of the legs



(d) a downward extension extending from each finger and ending in the plane of the legs

(e) a lower locking prong connecting the extensions.

4,728,071
HEAVY DUTY CLAMPING SYSTEM
Frank Salacuse, New York, N.Y., assignor to Super Glue Corporation, Hollis, N.Y.
Continuation of Ser. No. 678,614, Dec. 6, 1984, Pat. No. 4,624,432. This application Nov. 12, 1986, Ser. No. 929,534
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—316.5 **9 Claims**



1. A multi-purpose holding system for relatively heavy loads, in combination, comprising:

a body produced in one piece from plastic, said body including,

a resilient spring member having two end portions and two film hinges, each of said two film hinges being connected to one of said end portions, said spring member having opposed open and closed sides,

two interconnected control levers, movable, one with respect to the other, each of said control levers being connected to one of said two film hinges and disposed on said open of said spring member,

at least one gripping member connected at one of said end portions to one of said two control levers, said one gripping member and said control levers being movable between an open and a closed position, for forming with said gripping member and the other of said control levers a gripping cavity for holding an object,

said spring member's end portions being spaced apart to a greater distance when said two control levers are being moved between said open and closed postions than when the levers are in either the open or the closed positions,

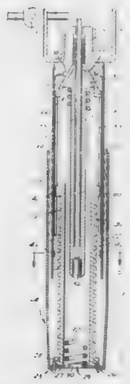
two resilient mounting members having opposed connecting ends and base ends, said connecting ends being secured to said end portions of said spring member, and being spaced apart to a greater distance when said two control levers are being moved between said open and closed positions than when the levers are in either the open or the closed positions, and

a substantially flat base connected to said base ends of said

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mounting members, said base being disposed on said closed side of said spring member.

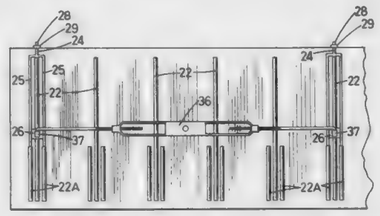
4,728,072
HEIGHT ADJUSTMENT APPARATUS
Terry L. Mitchell, Jenison, Mich., assignor to Quest Product Development, Ltd., Grand Rapids, Mich.
Filed Feb. 9, 1987, Ser. No. 12,602
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—406.1 3 Claims



1. A mechanical height adjustment apparatus comprising:
a threaded tubular shaft element;
an outer tube connected to said shaft at one end;
a nut meshed with the threads on said threaded shaft and one of said nut and said shaft movable vertically and axially;
an inner tube in coaxial lineal journalled relation to said outer tube and telescopically movable axially in said outer tube in accord with the vertically movable of said nut and shaft;
a spring-loaded tapered friction brake lock having a mating brake sleeve and brake cone in one end of said height adjusting apparatus and said brake sleeve operably connected to said vertically movable of said shaft and said nut thereby bearing against said inner tube on one side and against said spring-loaded brake cone on the other side, said brake cone applying spring pressure to said brake sleeve and said inner tube in prevention of vertical movement; and
a release lever selectively engageable with said brake lock releasing spring pressure on said brake sleeve permitting relative telescoping vertical movement of said inner tube and said outer tube attending rotation and vertical displacement of one of said shaft and said nut.

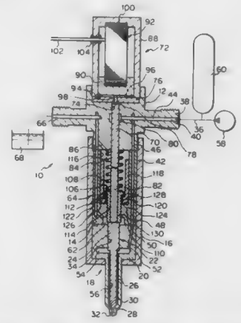
4,728,073
FORMWORK FOR FORMING RESERVOIRS AND POOLS
Brian R. Smith, P.O. Box 4336, Darwin, N.T., Australia (5790)
Filed May 16, 1986, Ser. No. 863,947
Claims priority, application Australia, May 20, 1985, PH00637; Oct. 1, 1985, PH02691
Int. Cl.[4] E04G *11/10*
U.S. Cl. 249—189 5 Claims

1. Formwork assembly against which a wall may be molded, comprising:
an elongate rectangular flexible panel having a form surface at one side of said panel;
a plurality of panel stiffeners spaced along the opposite side of said panel, said stiffeners including a tubular socket mounted to said panel, a rigid fork connector having a central prong slidably engageable in said tubular socket and outer prongs slidably engageable in further sockets fixed to a lower portion of said panel and a bridging member extending between said outer prongs;
a plurality of connector means each being mounted on a respective bridging member for connecting locating means thereto for holding said panel in a selected configu-



ration, said locating means including adjustable elongate turn-buckles spanning between and connecting to a pair of said connector means and in overlapping relationship with connector means intermediate said pair of connector means, to thereby maintain a panel intermediate said pair of connector means in a selected configuration.

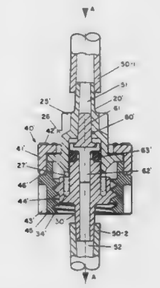
4,728,074
PIEZOELECTRIC FLOW CONTROL VALVE
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Kazuhide Watanabe, Toyohashi, and Nobuyuki Murate, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Oct. 31, 1986, Ser. No. 925,251
Claims priority, application Japan, Nov. 2, 1985, 60-245313
Int. Cl.[4] F02M *51/06*
U.S. Cl. 251—57 6 Claims



1. In a piezoelectric flow control valve of the class having a fluid inlet for receiving a fluid under pressure, a fluid outlet, a fluid passage communicating said inlet with said outlet, a movable valve member for controlling the flow of fluid through said passage, a plunger responsive to the fluid pressure in a first pressure chamber for biasing the valve member in a closing direction thereof, said first pressure chamber being in fluid communication with said fluid inlet to reflect the fluid pressure at said inlet therein, and a piezoelectric pump having a pumping chamber in fluid communication with said first pressure chamber, said piezoelectric pump being operable to vary the volume of said pumping chamber in response to control signals applied thereto, whereby the valve member is opened and closed in response to pressure variation in said first pressure chamber, the improvement comprising:
spring biased pressure means for biasing said valve member in the closing direction thereof; and

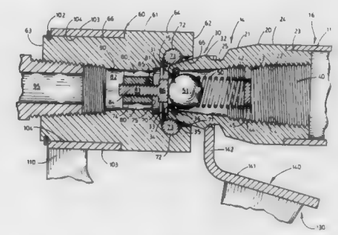
override means responsive to the fluid pressure at said fluid inlet for overriding said pressure means.

4,728,075
CONTROL OF FLUID FLOW
Joseph R. Paradis, 60 Plymouth Rd., Holden, Mass. 01520
Filed Jan. 28, 1981, Ser. No. 229,110
Int. Cl.[4] F16K *1/38, 1/52*
U.S. Cl. 251—122 5 Claims



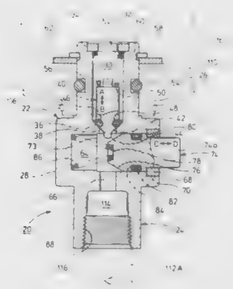
1. A flow control valve comprising
a base member having at least one guide recess therein and a flow channel therethrough;
a transitional member having a flow channel therethrough and at least one finger that extends into said guide recess, said transitional member being axially movable with respect to the base member;
a flow control ring for axially moving the transitional member with respect to said base member;
and a tapered metering plug positioned within the channel between the two members, with the taper of said metering plug being identical to that of said low channel and extending over a shorter interval;
said metering plug having a blunt end insertable into said flow channel in order to enhance the precision control overflow through said channel provided by the movement of said metering plug into said channel.

4,728,076
PRESSURE DISCHARGE APPARATUS
Goerge H. Ganshorn, 345 N. Fine, and Richard D. Bower, 5089 E. Hammond, both of Fresno, Calif. 93727
Filed Sep. 29, 1986, Ser. No. 912,807
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.6 9 Claims



1. A hand held pressure discharge apparatus adapted to release pressure from a fluid pressure connector having a substantially frusto-conically shaped nipple portion and a reduced diameter neck portion, the fluid pressure connector having a fluid release position comprising:
a fluid receiving conduit having a main body which has a reduced diameter portion, and an annular connector seat, said connector seat dimensioned to receive the nipple portion of the fluid pressure connector;
a hand held grasping assembly for supporting the fluid receiving conduit in an operational attitude, the grasping assembly having a handle; and
a mount borne by the handle for slidably engaging and urging the fluid pressure connector in a substantially arcuate path of travel into the pressure release position internally of the annular connector seat.

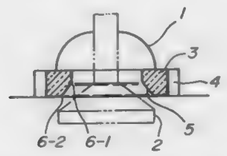
4,728,077
DRAINAGE VALVE UNIT
Katsuaki Takahashi, Sohka, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1986, Ser. No. 842,221
Int. Cl.[4] F16K *31/524*
U.S. Cl. 251—257 5 Claims



1. A valve unit for use with a casing for collecting a drain, comprising:
a valve body adapted to be mounted on the casing and having a fluid passage and a chamber defined therein perpendicular to the passage, said chamber and said passage communicating with each other;
a valve member disposed in said fluid passage and movably axially of said fluid passage for opening and closing the fluid passage; and
a pusher body disposed in said chamber and movably axially of said chamber, said pusher body being displaceable from outside of said valve body for causing said valve body to open said fluid passage to discharge the drain from the casing through the fluid passage;
said valve member having a projection on an end thereof, said pusher body having an inclined surface on an end thereof, said projection being engagable and displaceable by said inclined surface to move said valve member to open said fluid passage in response to the displacement of said pusher body; and
a resilient member disposed in said chamber in engagement with said pusher body for normally urging said pusher body to hold the pusher body spaced from said projection of said valve member, said resilient member comprises a coil spring having a diameter progressively smaller toward said pusher body, said coil spring having an end seated in a recess defined in the end of said pusher body.

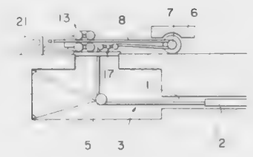
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4,728,078
CERAMIC VALVE SEATS
Isao Oda and Yoshihiko Ishida, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan
Filed Jul. 31, 1987, Ser. No. 80,068
Claims priority, application Japan, Aug. 8, 1986, 61-185336
Int. Cl.[4] F16K *31/00*
U.S. Cl. 351—360 12 Claims



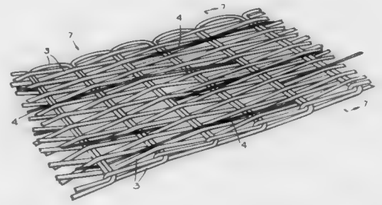
1. A ceramic valve seat wherein at least a face at which the ceramic valve seat is to contact with a valve is made of a ceramic material and edge portions of the face of the valve seat at which the valve seat and the valve contact with each other are rounded.

4,728,079
CABLE PULLING APPARATUS
Tadanori Nitta; Takami Terai; Yasutaka Hasegawa, all of Mura; Takeshi Kurashima, Yokohama; Nobuo Sekiguchi, and Tsutomu Enari, both of Sagamihara, all of Japan, assignors to Nippon Telegraph & Telephone, Corp. and Showa Elec. Wire & Cable Co., both of, Japan
Filed Sep. 24, 1985, Ser. No. 779,419
Claims priority, application Japan, Oct. 11, 1984, 59-213112
Int. Cl.[4] B65H *59/00*
U.S. Cl. 254—134.3 FT 7 Claims



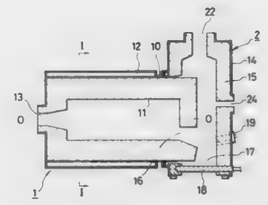
1. A cable pulling apparatus comprising:
a driving sheave which is adapted to receive, wound thereon, a tow line detachably connected to one end of a cable to be pulled;
a prime mover for driving said driving sheave;
pulling means adapted to pull the tow line received from said driving sheave;
stationary tension monitoring means disposed for contacting the tow line and detecting the tension in the tow line prior to its reaching said driving sheave and for generating a tension control signal representative of said detected tension; and
control means for controlling the pulling speed of said pulling means responsive to said tension control signal to regulate slip of the cable on said driving sheave so that the tension imparted to said tow line by said pulling means allows the tow line to slip on said driving sheave when the detected tension is above a predetermined value and does not allow said slip at a detected tension below said predetermined value.

4,728,080
ELECTRIC FENCE WIRE CONSTRUCTION
Felix Kurschner, Mississauga, and Richard J. Goodings, Milton, both of Canada, assignors to Bay Mills Limited, Brampton, Canada
Continuation-in-part of Ser. No. 531,720, Sep. 13, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 684,118
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—10 26 Claims



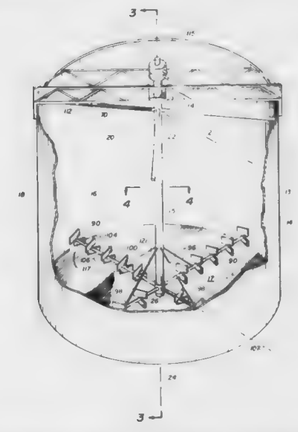
1. An improved electric fence wire construction comprising
a. an elongated support member comprising a core material, which provides a significant amount of strength to the support member, and a coating material coating the core material; and
b. an elongated conductive member intermeshed with and supported by the support member with a substantial portion of the conductive member exposed to the outer surface of the construction, said support member being characterized by a breaking elongation which is substantially equal to or less than the breaking elongation of the conductive member.

4,728,081
INCINERATING AND MELTING APPARATUS
Haruo Nishino, Kawasaki; Yoshiharu Tanaka, Houya; Yoshiharu Matsui, Yokosuka, and Madoka Kawakami, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Kanagawa, Japan
Filed Dec. 23, 1985, Ser. No. 812,654
Claims priority, application Japan, Dec. 24, 1984, 59-270792; Dec. 24, 1984, 59-270793; Nov. 8, 1985, 60-248956
Int. Cl.[4] C21C *5/38*
U.S. Cl. 266—158 13 Claims



1. A rotary incinerating and melting apparatus comprising a cylindrical or polygonal horizontal furnace body, driving means for rotating the furnace body is both directions of rotation about a longitudinal axis thereof of burning means, wherein the furnace body has a material charging port formed in a longitudinal end wall thereof and a melt discharge port formed in the other longitudinal end wall thereof at an eccentric position from said longitudinal axis and wherein a hood provided with a flue is disposed on the side of said melt discharge port of the furnace body, said furnace body being rotatably fitted in said hood, the melt discharge port being opened in the interior of said hood, a melt receiver being removably and sealably mounted to the bottom of said hood.

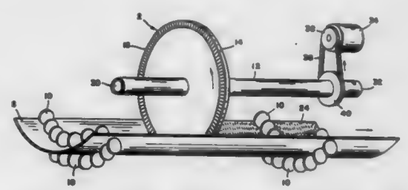
4,728,082
APPARATUS FOR BIOLOGICAL PROCESSING OF METAL CONTAINING ORES
Robert C. Emmett, Jr., Salt Lake City, and Lawrence T. O'Connor, Midvale, both of Utah, assignors to Envirotech Corporation, Salt Lake City, Utah
Division of Ser. No. 827,324, Feb. 7, 1986, abandoned. This application Jul. 10, 1986, Ser. No. 884,205
Int. Cl.[4] C22B *3/02*
U.S. Cl. 266—168 24 Claims



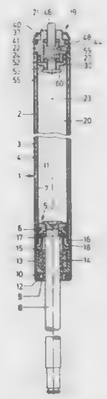
1. A reactor vessel for use in processing metal-ladened solids through use of a bioleaching process, said vessel comprising:
a container means, having a base member, adapted to contain a metal-bearing solids slurry; and
an oxygen supply means mounted within said container means, said supply means including a plurality of uprightly oriented, planar faced diffusers mounted to rotate above said container base member about a vertical axis, each of said diffusers including a vertically mounted porous membrane adapted to receive a supply of oxygen gas and to produce therefrom gas bubbles in clear water having a maximum mean diameter of approximately two millimeters, said membrane being adapted to introduce and disperse oxygen-containing gas into said slurry.

4,728,083
METHOD AND APPARATUS FOR SCRIBING GRAIN-ORIENTED SILICON STEEL STRIP
Richard L. Ruediger, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.
Filed Dec. 16, 1985, Ser. No. 809,647
Int. Cl.[4] C21B *3/00*
U.S. Cl. 266—274 5 Claims

1. An apparatus for scribing grain-oriented silicon steel strip to improve the watt losses thereof, said apparatus comprising:
a carriage body rotatable about an axis and having a diameter at least as great as the strip width;
means for rotating said body;
means for scribing mounted on said body at or about the periphery thereof and movable therewith;
means for forming the strip into an arcuate shape about an axis parallel to the direction of strip movement, said means including a plurality of separate adjustable nondriven rollers positioned on opposite sides of the strip and having minimal line contact therewith to provide a strip pass line substantially conforming to the arc defined by the periphery of said rotatable body and for bringing the concave surface of the moving arcuate-shaped strip into scribing contact with said scribing means;
means for regulating the relative speed of the strip movement and speed of rotation of the carriage body with said scribing means thereof; and
means for adjustably orienting the carriage body such that the plane of rotation of the scribing means on the rotating body forms an angle of between 5 and 15 degrees from a plane perpendicular to the direction of strip movement in relation to the speed of strip movement;
said strip initially contacted by said scribing means at a rearward area of the moving strip such that said scribing means moves across the strip transversely to the direction of strip movement to form a scribe line which is at a selected spaced-apart distance from an adjacent scribe line.



4,728,084
ADJUSTABLE-LENGTH GAS SPRING
Hans-Peter Bauer; Hans J. Bauer, and Ludwig Stadelmann, all of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer and Söhne oHG, Altdorf, Fed. Rep. of Germany
Filed Aug. 12, 1986, Ser. No. 896,179
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 8524995[U]
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—64.11 12 Claims



1. An adjustable-length gas spring comprising:
an inner cylinder and an outer cylinder concentrically disposed with a common axis and having first and second ends, said cylinders defining an annular chamber between them and being at least partially filled with a compressed gas, and means for holding said cylinders in a concentric relationship;
a piston arranged to slide in the inner cylinder, said piston

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including an seal and means for retaining said seal against the inner wall of the inner cylinder;

said piston being connected to a piston rod extending to the outside through said first end of said inner cylinder, and a seal and means for mounting said seal at said first end of said inner cylinder so that said piston rod is sealed with respect to said first end of said inner cylinder, and said piston dividing the interior of the inner cylinder into a first housing chamber adjacent said first end and a second housing chamber adjacent said second end, said gas spring having an overflow conduit effecting communication between the annular chamber and said first housing chamber in the vicinity of where the piston rod emerges;

said gas spring having a valve closing off the cylinders from the outside at said second end and joining said annular chamber to said second housing chamber;

said valve having a valve body provided with a first outer ring seal disposed in a first outer groove and resting on the inner wall of said inner cylinder, and at least one second outer ring seal disposed in a second outer groove and resting on said inner wall of said outer cylinder;

an interior valve body chamber communicating with said annular chamber formed in said valve body and axially penetrated by a valve pin;

said interior valve body chamber being sealed with respect to the outside by a first inner ring seal and means for retaining said inner ring seal on said valve pin and sealed with respect to said second housing chamber by a second inner ring seal and means for disposing said second inner ring seal spaced apart from the first inner ring seal and against the valve pin;

a cap at said second end comprising supporting structure for said second inner ring seal in the direction of said second housing chamber and comprising a part of said means for disposing said second ring seal against the valve pin, said cap further comprising supporting structure for said first outer ring seal in the direction of said second housing chamber and defining with said valve body said first outer groove within which is disposed said first outer ring seal;

said cap being undetachably joined to said valve body;

said valve body comprising injection-molded plastic and tapering towards its axial ends without radial protrusions; and a separate ring firmly joined to said valve body and defining therebetween said second outer groove within which is disposed said second outer ring seal.

4,728,085

DIAPHRAGM-LIKE ELEMENT

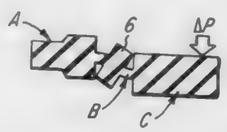
Jürgen Bebermeier, Hanover, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,709

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528158

Int. Cl.⁴ F16F *5/00*

U.S. Cl. 267—122 **10 Claims**



1. A flexible balancing-out diaphragm-like element made of rubber or rubber-like synthetic material structurally simplified as a molded part within close tolerances thus also reducing overall manufacturing costs, with or without reinforcing elements, comprising:

three concentrically disposed and completely interconnected ring-shaped zones all of the same material including namely a radially inner zone, a central zone, and a radially outer zone, the a thickness of said central zone for deformation bending with built-in freedom of movement and axial play in an annular groove being considerably less axially than a greater thickness axially of said inner and outer zones respectively; and

projecting elements that are formed integrally on said lesser thickness central zone that extend substantially in axial direction thereof as well as being located in the annular groove having a radial width only slightly greater than width of said projecting elements and that are distributed over the periphery thereof with reciprocal spacing to provide a precisely built-in freedom of movement of axial play of said central zone subject to limitation by said projecting elements so that such limitation comes about because every time said central zone of less thickness is deflected these projecting elements formed on said central zone become increasingly inclined relative to the axial direction until the projecting elements alternately abut against respective sides of said radially inner zone and said radially outer zone each of greater thickness so as to interrupt further movement of said central zone.

4,728,086

VIBRATION ISOLATING APPARATUS

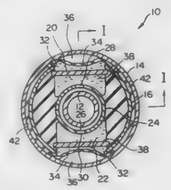
Tatsuro Ishiyama, and Michihiro Orikawa, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 2, 1987, Ser. No. 126

Claims priority, application Japan, Jan. 20, 1986, 61-9705

Int. Cl.⁴ F16F *1/48*

U.S. Cl. 267—140.1 **20 Claims**



1. A vibration isolating apparatus comprising:

an inner tube which is able to be connected to either one of a vibration generating portion and a vibration receiving portion;

an outer tube disposed on the outer peripheral portion of said inner tube so that said inner and outer tubes are coaxial or axially parallel with each other, said outer tube being able to be connected to the other of said vibration generating portion and said vibration receiving portion;

a vibration absorbing resilient member interposed between said inner and outer tubes;

a pair of liquid chambers provided in said resilient member so as to oppose each other across said inner tube;

a limiting passage for providing communication between said pair of liquid chambers;

a flexible membrane for partitioning each of said liquid chambers and an air chamber from each other, said air chamber being provided adjacent to said liquid chamber; and

a partition for partitioning each of said liquid chambers into a plurality of small liquid chambers, said partition having a flow passage for providing communication between said small liquid chambers.

4,728,087

ANCHORING ARRANGEMENT FOR HEAVY COIL SPRINGS, PRIMARILY IN COIL SPRING CARRIED PLAYGROUND DEVICES

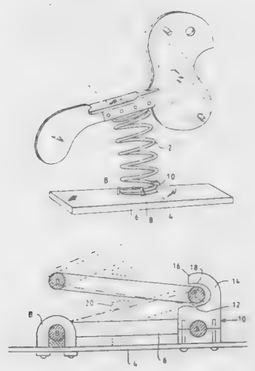
Tom L. Wils, Fruens Böge, Denmark, assignor to Multikunst Design Aps, Denmark

Filed Feb. 4, 1986, Ser. No. 825,894

Claims priority, application Denmark, Feb. 7, 1985, 549/85

Int. Cl.⁴ F16F *1/06, 1/12;* **A63G** *17/00*

U.S. Cl. 267—178 **4 Claims**



1. A playground device comprising a generally vertically oriented coil spring, a ground supported base means for rigidly fixedly anchoring a lower end of said coil spring to a ground supported base member, a user support structure provided at a top end of the coil spring, said coil spring being adapted to carry out resilient transverse oscillations from the lower rigidly fixedly anchored end thereof in response to the user support structure being caused to rock to and fro, whereby the coil spring is bent in opposite directions between opposite bent-out positions with an operative maximum amplitude defined by a maximum degree of bending during use of the playground device, rigid abutment means are disposed adjacent the lowered rigidly fixedly anchored end of the coil spring, said rigid abutment means being associated with said base member and being adapted to cooperate with a portion of the coil spring carrying out a vertical displacement by the oscillating bending of the coil spring so as to permit the portion of the coil spring to freely carry out vertical movements to respective sides of a rest position thereof and for effectively preventing the vertical movements of the portion of the coil spring from exceeding 10–90% of a free vertical displacement of said coil spring portion by said maximum degree of bending of the coil spring during use of the playground device.

4,728,088

HELICALLY WOUND BUSHING

Joseph E. Smith, Birmingham, Mich., assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.

Continuation of Ser. No. 664,362, Oct. 23, 1984, abandoned. This application May 12, 1986, Ser. No. 862,288

Int. Cl.⁴ B60G *11/14;* **F16F** *1/06;* **F16C** *13/02;* **B24B** *1/04*

U.S. Cl. 267—286 **16 Claims**

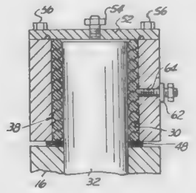
1. In an assembly comprising an element having a bore of predetermined diameter and a cylindrical member of predetermined diameter disposed in said bore, an improved helical bearing bushing interposed between said bore and said cylindrical member, said bushing comprising:

a tubular member having an internal surface for engagement with said cylindrical member and an external surface for engagement with said bore, said tubular member comprising a length of spring wire having a circular cross section helically wound into consecutive coils having a predetermined tensile force,

wherein each coil has at least one arcuate surface for abutting an arcuate surface of an adjacent coil and the tensile force elastically holds a portion of said arcuate surfaces in mutual abutment such that lubricant under pressure can overcome said tensile force and pass from one to the other of said internal and external surfaces by elastically separating said butting arcuate surfaces, and

wherein non abutting portions of said arcuate surfaces define a spiral lubricant groove formed in at least one of said internal and said external surfaces and at least one of said internal and external surfaces is machined.

5. A method for making a helical bearing bushing for use between a cylindrical member and an element having a bore



disposed around said cylindrical member, said method comprising:

forming a tubular member by helically winding a length of spring wire having a circular cross section into consecutive coils having a predetermined tensile force, wherein each coil has at least one arcuate surface for abutting an arcuate surface of an adjacent coil and the tensile force elastically holds a portion of said arcuate surfaces in mutual abutment such that lubricant under pressure can overcome said tensile force and pass from one to the other of said internal and external surfaces by elastically separating said abutting arcuate surfaces, and wherein non abutting portions of said arcuate surfaces define a spiral lubricant groove formed in at least one of said internal and said external surfaces, and

machining at least one of said internal and external surfaces.

4,728,089

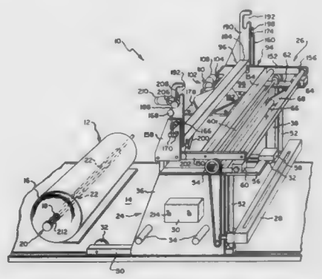
CLOTH SPREADING APPARATUS

Robert C. Barrett, Angola, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Aug. 28, 1986, Ser. No. 901,304

Int. Cl.⁴ B65H *29/46, 25/22*

U.S. Cl. 270—31 **36 Claims**



1. A cloth spreading apparatus for spreading a plurality of superimposed layers of cloth from a cloth roll assembly onto a

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transversely extending work surface, said apparatus comprising

a carriage assembly at least partially supported on a work surface and capable of being moved across the work suface between first and second locations; and

a mounting frame assembly supported on said carriage and including

a subassembly pivotal about an axis transverse to the direction of movement of said carriage assembly, said subassembly including a pair of spaced apart outwardly extending arm means, said arm means being capable of supporting a cloth roll assembly and being movable with the subassembly between an upright operative cloth spreading position and a downwardly extending cloth roll assembly loading and unloading position, and

operating means capable of causing said subassembly to pivot about said axis so as to cause said arm means to be moved between said upright operative cloth spreading position and said downwardly extending cloth roll assembly loading and unloading position, said operating means including a screw operated scissors jack assembly.

4,728,090

BANKNOTE DISTRIBUTING AND DISPENSING MACHINE

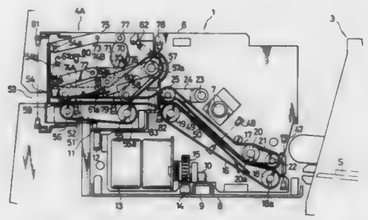
Yoshihiko Oota, and Yutaka Arai, both of Tokyo, Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,927

Claims priority, application Japan, Jul. 8, 1985, 60-149842

Int. Cl.⁴ B65H *5/22*

U.S. Cl. 271—7 **3 Claims**



1. A banknote distributing and dispensing machine, wherein banknotes are selectively dispensed through one of dispensing ports, said banknote distributing and dispensing machine comprising:

a plurality of dispensing port mechanisms arranged adjacent to each other;

a dispensing port provided in each of said dispensing port mechanisms;

a dispensing machine body for dispensing banknotes;

a distributing mechanism movably mounted between said dispensing port mechanisms and said dispensing machine body for receiving banknotes from said dispensing machine body and transferring the banknotes to one of said dispensing port mechanisms, said distributing mechanism being movable from one position where said distributing mechanism is in alignment with one of said dispensing port mechanisms to another position where said distributing mechanism is in alignment with another of said dispensing port mechanisms;

first conveyor belt means disposed within said distributing mechanism for conveying the banknotes received from said dispensing machine body toward one of said dispensing port mechanisms;

second conveyor belt means disposed within each of said dispensing port mechanisms for conveying the banknotes received from said first conveyor belt means to its respective dispensing port; and

transmission means for selectively transmitting movement of said first conveyor belt means to said second conveyor belt means of said dispensing port mechanisms.

4,728,091

SHEET REMOVAL DEVICE

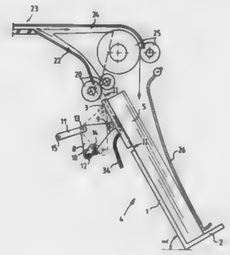
Franciscus A. C. M. Couwenberg, Zuringbeek 10, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Aug. 1, 1986, Ser. No. 892,343

Claims priority, application Netherlands, Aug. 5, 1985, 8502185

Int. Cl.⁴ B65H *3/14*

U.S. Cl. 271—97 **6 Claims**



1. A device for the removal of a sheet from a stack of sheets in a holder comprising:

a removal element with a surface thereof facing the stack of sheets which surface is provided with at least a first recess and at least a second recess which is connected to the first recess near a blow opening in a side of the first recess;

a means for blowing air through the blow opening and through the first recess such that the air stream from the blow opening is not blown into the second recess thereby producing a partial vacuum in both recesses such that the sheet to be removed is drawn against the surface of the removal element; and

a drive means for displacing the removal element to remove the sheet firmly held thereon from the stack.

4,728,092

SUCTION CONTROL SYSTEM FOR SUCTION CUP SHEET FEEDING APPARATUS

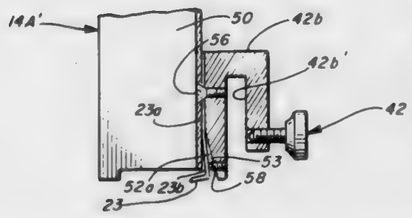
Martin Selak, Des Plaines, Ill., assignor to Astro Machine Corporation, Elk Grove Village, Ill.

Filed Mar. 21, 1986, Ser. No. 842,314

Int. Cl.⁴ B65H *3/08*

U.S. Cl. 271—100 **7 Claims**

1. In a sheet feeding apparatus comprising: adjustable stacking means for supporting an end portion of a stack of sheets in confronting relation to a feed opening having a length encompressing many widths of a narrowest sheet to be accommodated thereby, so that one or more stacks of such material can be supported along said feed opening and the longitudinal center line of any stack thereof can be positioned along different selected points along the length of said feed opening, sheet withdrawal means for engagig the bottom surface of the bottom sheet in any stack of sheets located at almost any position along the length of the feed opening, said sheet withdrawal means comprising suction cup units each having a body and a flexible suction cup portion projecting from said body, said suction cup units being aligned parallel to the length of said feed opening and distributed over said length of said feed opening, a source of suction, suction control means for selectively connecting or disconnecting said source of suction to and from, respectively any selected suction cup body, and carrier means for supporting and moving said suction cup units toward and away from said feed opening to simultaneously bring said flexible suction cup portions of the units into and out of engagement with the bottom sheet in said stack and then withdraw the sheet therefrom, said carrier means for the suction cup units including a common support member for all the suction cup units, said common support member being raised and lowered to simultaneously bring the flexible suction cup portions of said units into and out of engagement with the bottom sheet in said stack, the improvement in said suction



control means comprising: separate conduit means connecting said source of suction of each of said suction cup unit bodies, and a single manual control member movable into a number of distinct positions for coupling said source of suction to different combinations of said suction cup unit bodies independently of the position of said adjustable stacking means, so that differently sized sheets or stacks of sheets variously positioned with respect to the centerline of said feed opening can be accommodated.

4,728,093

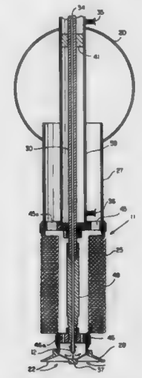
AUTOMATIC BATTERY STACKER

William J. Eberle, Irving, Tex., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 390,806, Jun. 22, 1982, Pat. No. 4,534,549. This application Dec. 12, 1984, Ser. No. 680,782

Int. Cl.⁴ B15H *3/08*

U.S. Cl. 271—103 **13 Claims**



1. A method of selecting a topmost element from a plurality of elements by an accessing means which may be extended or retracted from said topmost element comprising the steps of:

(a) extending said accessing means in a direction of said topmost element of said plurality of elements,

(b) applying a negative pressure to said accessing means so that it is drawn therethrough,

(c) simultaneously applying a positive pressure to said accessing means that is emitted therethrough,

(d) said topmost element being captured by the accessing means when in proximity thereto by said negative pressure and further emission of said positive pressure from said accessing means being blocked by said capture, thereby initiating retraction of said accessing means away from said plurality of elements.

4,728,094

ARRANGEMENT FOR SETTING A PAPER FEEDING CASSETTE

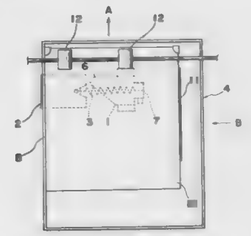
Takeshi Yoshida, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 3, 1986, Ser. No. 816,060

Claims priority, application Japan, Jan. 8, 1985, 60-1329[U]; Jan. 8, 1985, 60-1330[U]; Jan. 25, 1985, 60-9700[U]

Int. Cl.⁴ B65H *3/06, 1/08*

U.S. Cl. 271—119 **6 Claims**



1. A paper feeding device comprising:

a paper feeding cassette detachably inserted in a paper feeding section of a copying apparatus in a direction orthogonal to a paper feeding dircetion of said copying apparatus;

a paper holder tray for placing copy papers thereon, said paper holder tray being mounted rotatably within said paper feeding cassette;

a paper feeding means provided in said paper feeding section for feeding said copy papers from said paper feeding cassette into said copying apparatus;

a pushing arm rotatably mounted in said paper feeding section rotatable in a direction orthogonal to the rotational direction of said paper holder tray, wherein said pushing arm rotation through an opening in said paper feeding cassette pushes said paper holder tray such that said paper holder tray is in a position that allows said paper feeding means to feed paper.

4,728,095

SEPARATOR FOR A DOCUMENT FEEDER

Robert Irvine, Riverside, and Harry E. Luperti, Wilton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 506,155, Jun. 20, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 850,423

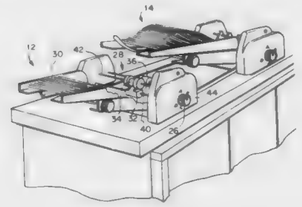
Int. Cl.⁴ B65H *3/52*

U.S. Cl. 271—124 **8 Claims**

1. In an apparatus for feeding documents, a separator assembly for separating and feeding individual documents comprising a rotatably mounted feed roller and a spaced, opposed retarding roller defining a bite therebetween, said retarding roller being rotatable between at least first and second positions wherein in one of said positions a positive gap is established at the bite of said retarding roller and said feed roller for

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forming a gap-type separator and in the other of said positions said retarding roller having an interfering member projecting



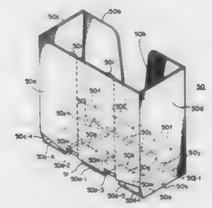
from said retarding roller into said bite for forming an interference type separator.

4,728,096

COMPACT APPARATUS FOR DISPENSING A PRESELECTED MIX OF PAPER CURRENCY OR THE LIKE

Theodore Winkler, Levittown, Pa., and Fredric W. Burger, Cherry Hill, N.J., assignors to Brandt, Inc., Bensalem, Pa.

Division of Ser. No. 699,044, Feb. 7, 1985, Pat. No. 4,660,822. This application Dec. 12, 1986, Ser. No. 941,228
Int. Cl.[4] B65H *1/24*
U.S. Cl. 271—166 **19 Claims**



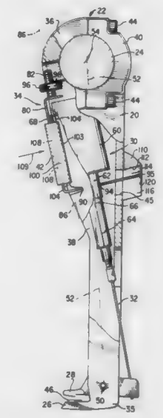
1. Apparatus for dispensing rectangular sheets of flexible material such as sheets of paper currency one at a time in a direction generally perpendicular to the smaller dimension thereof including in combination, a cassette for receiving a stack of said sheets, said cassette having a generally rectangular floor somewhat larger than the size of the sheets to be dispensed, a front wall and a back wall and side walls extending upwardly from said floor, an elongated dispensing slot defined by the lower edge of said front wall and the edge of said floor adjacent to the front wall lower edge to permit the bottom sheet of a stack to pass out of the cassette in a direction transverse to its smaller dimension, a plurality of guide slots at spaced intervals along the edge of said floor adjacent to said rear wall, said guide slots spanning a distance greater than half the longer dimension of said sheets, a feed slot in the floor of said cassette adjacent to said dispensing slot, feed means extending through said feed slot when said cassette is present in said cavity, and a plurality of projections in said cavity extending respectively through said guide slots when said cassette is placed in said cavity to align said cassette in said cavity and directly to engage the lowermost sheet of a stack of sheets in said cassette along the edge of the lowermost sheet adjacent said back wall and to raise the entire stack of sheets from said floor while inclining the lowermost sheet to cause the edge thereof adjacent the front wall to engage said feed means, operation of said feed means freeing the lowermost sheet of said stack from the weight of the stack before the lowermost sheet moves out through said dispensing slot.

4,728,097

ADJUSTABLE GRIPPER ARM

Gary L. Vandersyde, Naperville; Kenneth G. Viani, Morton Grove; Paul J. Beatty, Chicago, all of Ill., and Winston A. Orsinger, Nazareth, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 5, 1986, Ser. No. 826,397
Int. Cl.[4] B65H *5/10*
U.S. Cl. 271—268 **20 Claims**



1. In a gripper arm for selectively engaging and retrieving articles from a station proximate the gripper arm, said gripper arm having:
- a gripper arm housing having a first end and a second end;
- means at the second end of said housing for securing said gripper arm to a drive shaft;
- a first jaw member proximate said first end of said gripper arm housing;
- a second jaw member proximate said first end of said gripper arm housing, said second jaw member being selectively movable with respect to said first jaw member for the engagement of articles therebetween;
- an actuator mounted with respect to said gripper arm housing, said actuator being actuatable to a first position and to a second position;
- linkage means for connecting said actuator to said movable second jaw member whereby said movable second jaw is selectively moved toward and away from said first jaw member in response to the position of said actuator, said first jaw member and said second jaw member being separated by a gap of a predetermined distance when said actuator is in the one of said positions whereat said second jaw member is moved away from said first jaw member; wherein the improvement comprises:
- adjusting means for displacing said actuator and said linkage means relative to said oscillating drive shaft, thereby adjusting the magnitude of the predetermined distance associated with said gap and facilitating the accommodation of articles of differing thicknesses between said jaws.

4,728,098

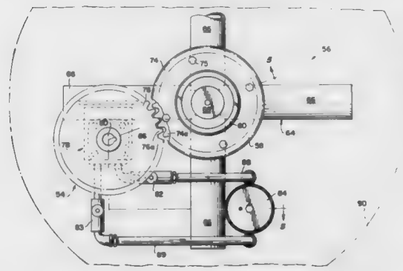
ROTATING PLAYGROUND EQUIPMENT ASSEMBLY

William H. Shannon, Fort Payne, Ala., assignor to Game Time, Inc.

Division of Ser. No. 681,587, Dec. 14, 1984. This application Jul. 11, 1985, Ser. No. 753,899
Int. Cl.[4] A63G *1/12*
U.S. Cl. 272—33 R **21 Claims**

1. A rotating user-propellable playground equipment assembly comprising:

a support base,
a spindle secured to said support base,
a user-propellable rotatable platform assembly supported at least in part by said support base,
said rotatable platform assembly including a hub assembly rotatable about said spindle,
a drive gear secured to and rotatable with said hub assembly,
a fluid pump means connected in a closed hydraulic system and offset from and driven by said drive gear, for slowing the rotation of said rotatable platform and for limiting the maximum rotational speed thereof, and



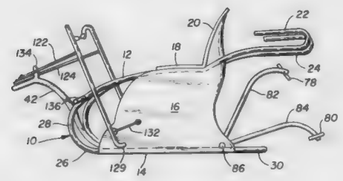
a connecting means for operatively connecting said drive gear and said pump means,
said pump means including a hydraulic bi-directional pump, a hydraulic fluid reservoir, a fluid connecting means for interconnecting said pump and said reservoir, said fluid connecting means including at least one fixed capacity valve means for allowing free fluid flow in one direction and for restricting the flow in the opposite direction, said hydraulic pump, said reservoir and said fluid connecting means defining said closed hydraulic system.

4,728,099

VARIABLE RESISTANCE EXERCISE APPARATUS

John H. Pitre, 908 Kose St., Honolulu, Hi. 96825

Filed Apr. 23, 1985, Ser. No. 726,057
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—72 **18 Claims**



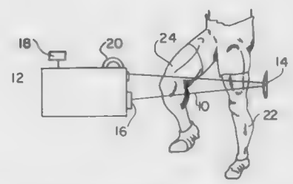
1. An exercise apparatus, comprising:
- a longitudinally oriented frame having a front end and a rear end;
- a seat carried on said frame in a forward facing position such that it is capable of carrying a user in a forward facing position with respect to the frame;
- a foot rest carried by the frame forward of said seat and adapted to receive, in use, the user's feet with legs in a generally forwardly extended position;
- a pair of hand engagable handles having one handle located on each of the right and left sides of said seat, each handle being carried by said frame for longitudinal movement approximately between at least the longitudinal positions of the seat and foot rest and for lateral movement approximately between at least a juxtaposed central position and a separated position;
- a variable resistance means for bidirectionally, automatically variably opposing forces applied longitudinally to said handles in proportion to the applied forces; and
- diverting means coupling said handles to said resistance means for, in use, receiving forces applied longitudinally to the handles and for laterally redirecting a portion of the forces to yieldably urge the handles to move laterally.

4,728,100

EXERCISE PACER

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95128

Filed Mar. 13, 1986, Ser. No. 839,085
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—93 **6 Claims**



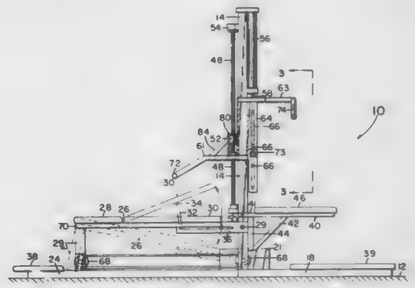
1. An exercise apparatus which comprises:
- a photocell light source having a photocell beam;
- a photocell sensor on which shines said photocell beam which is located so that a user performing repetitions of an exercise interrupts said beam shining on said sensor when he assumes a desired position during each repetition and so that a repetition period between successive interruptions of said beam is the time required to perform each repetition;
- means for preregistering an arbitrary pacer period;
- means for comparing each said repetition period to said pacer period;
- a signalling means which emits a signal each time any said repetition period is longer than said pacer period.

4,728,101

PNEUMATIC EXERCISING DEVICE

David M. King, 21088 Pitts Rd., Wellington, Ohio 44090

Filed Apr. 6, 1987, Ser. No. 34,660
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 **1 Claim**

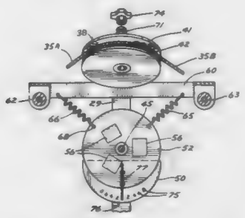


1. A pneumatic exercising device for providing a plurality of body exercises, comprising:
- an upright tubular frame member,
- leg support members secured to said upright tubular frame

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member, said leg support members forming an air chamber for the containment of a pressurized fluid,
means for providing pressurized fluid to said air chamber,
a handle bar means mounted coaxially around said upright tubular member so as to slide up and down said member,
said handle bar means including two handle bar assemblies disposed on opposite sides of said upright member,
a two way pneumatic device connected adjacent the upper portions of said tubular upright member, said two way pneumatic device including a plunger generally parallel to a longitudinal axis of said upright tubular frame member, said plunger secured to said handle bar means,
said two way pneumatic device including means for regulating the direction of resistance of said plunger,
means for adjusting the distance of said handle bar means along said upright member from said plunger, and
a plurality of adjustable support means connected to said upright tubular frame member below said handle bar means for supporting a human body when engagement is made with said handle bar assemblies, said handle bar assemblies resisting motion in a direction set forth by said means for regulating said two way device.

4,728,102
RESISTANCE INDICATOR FOR FRICTIONALLY RESISTANT EXERCISE DEVICE
Edward A. Pauls, Excelsior, Minn., assignor to P.S.I. Nordic Track, Inc., Chaska, Minn.
Filed Apr. 28, 1986, Ser. No. 856,192
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—132 4 Claims



1. A resistance force indicating device for an exerciser having a frame where exercising movement actuates a rotating drum under a variable load, comprising a rotating drum having at least one flange surface, said drum being mounted about a drum axis, a platelike reaction member having a surface complemental to the flange surface for reacting the load applied to the rotating drum during the exercising movement, means to mount said reaction member on the frame for rotational movement in two directions about said axis relative to a reference position, spring means acting between the reaction member and the frame to resist rotational movement of said reaction member in each direction, friction pad means to frictionally couple the reaction member directly to the flange surface of the drum so that rotational movement of the drum causes the reaction member to tend to rotate until the load from the drum exceeds a desired level after which the drum can rotate relative to the reaction member, and indicator means operable between the reaction member and the frame for indicating the amount of movement of the reaction member permitted by the spring before the drum rotates relative to the reaction member.

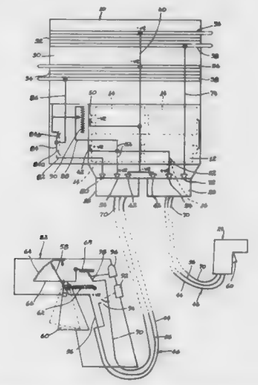
4,728,103
LEG AND ANKLE EXERCISING DEVICE
Robert S. Fulton, Glenns Ferry, Id., assignor to T.F.S. Inc., Gooding, Id.
Filed Jan. 9, 1986, Ser. No. 817,503
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 7 Claims



1. An exercising device for exercising the joints of the leg, particularly the ankle joint, which device comprises:
(a) a substantially planar-shaped plate;
(b) means for detachably securing the plate to the foot of a user;
(c) a plurality of connection means one on each side of the plate and at least one at either the toe or heel of the plate, thereby defining at least three spaced connection points around the periphery of the plate;
(d) a plurality of elongate elastic limbs, each limb including a first end and a second end;
(e) the first ends of the limbs being detachably securable to the plate at the three spaced connection points such that a substantially triangular-shaped pattern is formed;
(f) the second ends of the elastic limbs being provided with handle means for gripping by the hands of the user; and
(g) whereby stretching of the elastic limbs by the user causes the triangular-shaped plane of the plate to provide controlled resistance against all angular and directional movements of the joint.

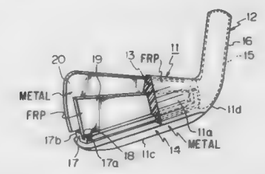
4,728,104
TOY SLOT RACING VEHICLE SETS
Chi F. Cheng, Hong Kong, Hong Kong, assignor to Artin Industrial Company Limited, Kowloon, Hong Kong
Filed Dec. 5, 1986, Ser. No. 938,485
Claims priority, application United Kingdom, Dec. 9, 1985, 8530282
Int. Cl.[4] A63F *9/14*
U.S. Cl. 273—86 B 5 Claims

1. A toy slot racing vehicle set including a track, at least one slot for guiding an electrically-driven toy vehicle around said track, at least one vehicle having a downward projection extending into said slot and an electric motor for powering said vehicle around said track, a pair of conductors inset into the track, means on said vehicle for picking up electrical power from said conductors, electrical power supply means for those conductors, said means including at least one hand-held controller having means to vary the electrical power applied across the conductors so as in turn to vary the speed of the toy vehicle, and switch means on said hand-held controller for providing a short circuit between said two conductors, whereby when said switch means are operated and the two conductors short-circuited, said electrical motor in said vehicle will act in a regenerative sense producing an electrical current



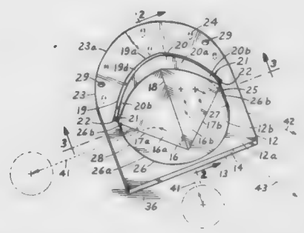
which is short-circuited and thereby provides braking for said vehicle.

4,728,105
GOLF CLUB HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Oct. 24, 1986, Ser. No. 922,964
Claims priority, application Japan, Oct. 31, 1985, 60-242860
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—169 3 Claims



1. A club-head for a golf club including a hitting portion having a front surface for hitting a golf ball, a rear surface, a sole surface and heel and toe ends, and a hosel portion extending obliquely upward from said heel end of said hitting portion, said hitting portion comprising:
a main body made of a fiber-reinforced plastic for defining at least a part of said front and rear surfaces of said hitting portion;
a metal sole member having a specific gravity greater than that of said main body and integrally joined to said main body along the underside of said main body for defining at least said sole surface of said hitting portion; and
a reinforcing plate having a lower end portion fitted into said sole member and extending upwardly from said sole member into said main body substantially in parallel to said front surface of said hitting portion, said reinforcing plate having a specific gravity less than that of said sole member and a strength greater than that of said main body.

4,728,106
GOLF PUTTING PRACTICE DEVICE
Robert E. Shore, 6731 Leland Way, Apt. 423, Los Angeles, Calif. 90028
Filed Aug. 12, 1985, Ser. No. 764,597
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—177 R 3 Claims



1. A golf putting practice device comprising:
a bottom surface **15** which is substantially flat and which comprises at least a portion of the bottom area of the device so that said bottom surface **15** may support the device as it rests on a playing surface **36**;
a ball support **12** located in the front portion of the device and extending sufficiently rearwardly to support a golf ball as it rolls rearwardly thereon to any adjacent member of the device, the width of said ball support **12** being at least the approximate width of a regular golf hole and the thickness being at least sufficient to support a golf ball, the upper surface to said ball support **12** being substantially parallel to said bottom surface **15** of the device, the front edge of said ball support **12** being disposed substantially normal to the longitudinal center of the device;
a sloping area **16** located rearward of the front face of said ball support **12** and comprising two side portions, each of which slopes upwardly in a rearward and inward direction so that the two side portions join at the longitudinal center of the device, the respective outer edges of the front portion of said sloping area **16** extending outwardly from front to rear and being positioned so that the height of said outer edges is substantially no greater than the height of the upper surface of said ball support **12**, so that a golf ball may roll rearwardly therefrom onto said sloping area **16** with substantially a minimum of impedance to the travel of the ball;
a barrier **19** located rearward of said sloping area **16** and said ball support **12**, the front face of said barrier **19** extending outwardly approximately equidistantly from the longitudinal center of the device and having a total width substantially the width of a regular golf hole, the front face of said barrier **19**, as seen in the plan view, having an overall concave shape, with the respective outer portions thereof being disposed at an angle leading forwardly and outwardly from the central portion thereof, said barrier **19** having means for providing a predetermined amount of resistance to the travel of a golf ball rolling rearwardly on said sloping area **16** or said ball support **12**, the amount of said resistance being such that the center of a rearwardly rolling golf ball will pass rearward of the front face of said barrier **19** if the speed of the ball as it strikes said front face is greater than a predetermined approximate maximum speed pertaining to the particular location struck, while the center of the ball will not pass rearward of said front face if the ball strikes said front face at a speed which is not greater than said approximate maximum speed pertaining to said particular location struck, the amount of said resistance to the rearward travel of a ball being greater in the central portion of said barrier **19** than in the respective outer portions thereof;

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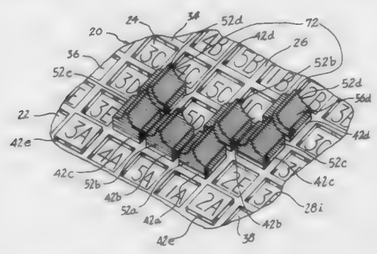
means for enabling the device to be sufficiently stabilized against rearward tipping and sliding so that the device may be useful for practicing putting.

4,728,107

BOARD GAME APPARATUS AND METHOD

Robert E. Dvorak, 7021 Date Palm Ave. S., Saint Petersburg, Fla. 33707, and Richard D. Dvorak, 6250 Telegraph Rd. #5-04, Ventura, Calif. 93003

Filed May 30, 1986, Ser. No. 869,000
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—273 **43 Claims**



1. A game apparatus comprising in combination:
a game board with a playing surface displaying a plurality of interconnected first symbols, each first symbol displays coded first indicia thereon, each coded first indicia displayed on at least two first symbols;
a plurality of first playing pieces with a surface adapted for placement on the playing surface at selected first symbols, each first playing piece correspondingly displaying one of the coded first indicia; and,
a plurality of second playing pieces with a surface adapted for placement on any of the first playing pieces, second playing pieces are distinguishable from first playing pieces by the absence of first indicia, at least two types of second playing pieces are distinguishable by the presence of different fourth indicia, the minimum number of second playing pieces provided displaying each distinguishable fourth indicia equals the smallest whole number that is a majority of the total number of first symbols displayed on the playing surface.

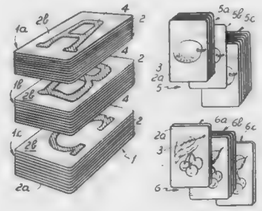
35. A method for playing a game comprising in combination.
a game board with a playing surface displaying a plurality of interconnected first symbols, each first symbol displays coded first indicia thereon, each coded first indicia displayed on at least two first symbols;
a plurality of first playing pieces with a surface adapted for placement on the playing surface at selected first symbols, each first playing piece correspondingly displaying one of the coded first indicia;
a plurality of second playing pieces with a surface adapted for placement on any of the first playing pieces, second playing pieces are distinguishable from first playing pieces by the absence of first indicia, at least two types of second playing pieces are distinguishable by the presence of different fourth indicia; and
where at least two different players in turn position at least one first playing piece on the game board at a selected first symbol displaying a correspondingly coded first indicia, on the first playing piece is positioned one second playing piece, turns continue until second playing pieces displaying one coded fourth indicia are positioned on first playing pieces at a majority of the first symbols displayed on the playing surface of the game board.

4,728,108

PACK OF PLAYING CARDS

Nicolaas Neuwahl, Bagno A Ripoli, Italy, assignor to NFFX Design di Vanna Gazzeri & C.S.a.s., Bagno A Ripoli, Italy

Filed Dec. 24, 1986, Ser. No. 947,763
Claims priority, application Italy, Jan. 7, 1986, 11507/86[U]
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—296 **5 Claims**



1. A pack of playing cards comprising: a plurality of cards having obverse faces, first markings on said obverse faces, reverse faces oppositely from said obverse faces, and second markings selectively applied to said reverse faces, a plurality of card suits, each comprising cards carrying like first markings, at least some of said suits being also diversified from one another by the number of the cards comprising them, a plurality of card sets, each comprising cards carrying said second mutually alike markings, said sets including an equal number of cards, and a plurality of sub-suits of cards, each comprising cards carrying both first and second mutually alike markings, each said suit including a number of said sub-suits which at least approximate the number of said sets, and at least some of said suits including sub-suits which differ from one another by the number of their cards.

4,728,109

BALLISTIC PROJECTILE-ARRESTER, HAVING A REGENERATION AND/OR RECOVERY SYSTEM FOR THE IMPACT MATERIAL

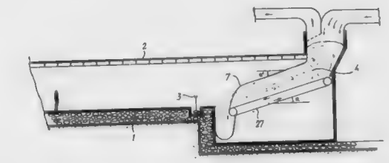
Andrea Simonetti, Rome, Italy, assignor to Impresa Costruzioni Soc. FRA. SA. S.r.l., Rome, Italy

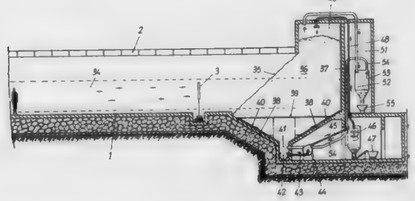
PCT No. PCT/IT85/00004, § 371 Date Jan. 29, 1986, § 102(e) Date Jan. 29, 1986, PCT Pub. No. WO85/05672, PCT Pub. Date Dec. 19, 1985
PCT Filed May 31, 1985, Ser. No. 845,275
Claims priority, application Italy, Jun. 1, 1984, 48308 A/84; Jan. 4, 1985, 47522 A/85
Int. Cl.[4] F41J *1/12*
U.S. Cl. 273—410 **34 Claims**

1. A ballistic projectile arrester, comprising:
granular material for absorbing the kinetric energy of projectiles;
supporting means for supporting a quantity of said granular material and said supporting means including at least one supporting surface in a sloped relationship with a horizontal plane defined as being essentially parallel to the path of the projectiles;
first driving means for placing said supporting means in motion such that the motion of said supporting means results in the movement of the quantity of granular material supported by said supporting means in a specific direction;
receiving means for receiving a mixture of granular material and projectiles departing from said supporting means;
second driving means for transporting the mixture received by said receiving means to a separation zone;
separating means found within the separation zone and providing the means for separating the components of the mixture of granular material and projectiles;
delivery means for delivering the granular material separated from the mixture back to the supporting means and thereby acting to replenish the granular material lost to the receiving means; and collecting means for collecting the projectiles separated from the mixture.

16. A ballistic projectile arrester, comprising:
granular material for absorbing the kinetic energy of projectiles;
supporting means for supporting a quantity of said granular material;
first driving means for placing said supporting means in motion such that the motion of said supporting means results in the movement of the quantity of granular material supported by said supporting means in a specific direction;
receiving means for receiving a mixture of granular material and projectiles departing from said supporting means;
second driving means for transporting the mixture received by said receiving means to a separation zone;
separating means for separating the components of the mixture of granular material and projectiles;
delivery means for delivering the granular material separated from the mixture back to the supporting means and thereby acting to replenish the granular material lost to the receiving means; and collecting means for collecting the projectiles separated from the mixture.

16. A ballistic projectile arrester, comprising:
granular material for absorbing the kinetic energy of projectiles;
supporting means for supporting a quantity of said granular material;
first driving means for placing said supporting means in motion such that the motion of said supporting means results in the movement of the quantity of granular material supported by said supporting means in a specific direction;
receiving means for receiving a mixture of granular material and projectiles departing from said supporting means;
second driving means for transporting the mixture received by said receiving means to a separation zone;
separating means for separating the components of the mixture of granular material and projectiles;
delivery means for delivering the granular material separated from the mixture back to the supporting means and thereby acting to replenish the granular material lost to the receiving means; and collecting means for collecting the projectiles separated from the mixture.





with fluid being driven in said first conduit by said fluid driving means and forced away from the separation zone and towards the supporting means; and
collecting means for collecting the projectiles separated from the mixture.

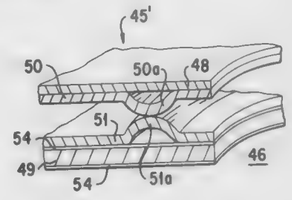
34. A ballistic projectile arrester, comprising:
granular material for absorbing the kinetic energy of projectiles;
supporting mean for supporting a quantity of said granular material said supporting means including at least one supporting surface in a sloped relationship with a horizontal plane defined to be essentially parallel to the path of the projectiles, with the slope of said supporting surface being substantially the same as the slide angle of the quantity of granular material being supported on the supporting surface;
first driving means for setting said supporting means in motion such that the motion of said supporting means results in the movement of the quantity of granular material downwardly along the supporting surface;
receiving means for receiving a mixture of granular material and projectiles departing from said supporting means;
second driving means for transporting the mixture received by said receiving means to a separation zone;
separating means found within the separation zone and providing the means for separating the components of the mixture of granular material and projectiles;
delivery means for delivering the granular material separated from the mixture back to the supporting means and thereby acting to replenish the granular material lost to the receiving means and;
collecting means for collecting the projectiles separated from the mixture.

4,728,110

LAMINATE TYPE MANIFOLD GASKET

Hidetaka Nakasone, Omiya, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1986, Ser. No. 835,905
Claims priority, application Japan, Jan. 13, 1986, 61-00287[U]
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—213 **9 Claims**



1. A manifold gasket for an internal combustion engine adapted to be placed between a manifold and a cylinder head to surround an exhaust hole for an exhaust fluid passage, comprising:
a first outer plate having a first hole corresponding to the exhaust hole, said first outer plate abutting against the manifold and being made of a stainless steel plate having high heat resistance and low heat conductivity against exhaust gas and Micro Vickers Hardness of about 180 Hmv,
a second outer plate having a second hole corresponding to the exhaust hole, said second outer plate abutting against the cylinder head and being made of a mild metal plate having an outer surface with anti-rust property and Micro Vickers Hardness of about 120 Hmv, said second outer plate being thicker than the first outer plate, and
at least two inner plates situated between the first and second outer plates, each inner plate having a third hole corresponding to the exhaust hole and a bead adjacent the third hole to surround the third hole, said bead extending substantially perpendicularly to the horizontal plane of the inner plate and having a top portion, said first and second outer plates and inner plates being arranged and connected together so that portions of the inner plates slide relative to the first and second outer plates due to expansion and contraction properties of the plates as they are effected by the temperature and pressure they are under and the beads of the two inner plates absorb pressure applied perpendicularly to the inner plates and seal between the manifold and the cylinder head, said first and second outer plates being softer than the inner plates to thereby prevent damage of the beads of the inner plates when an extreme high pressure is applied to the beads.

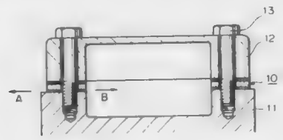
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4,728,111

COMPRESSED ASBESTOS SHEET GASKET WHICH SWELLS IN PRESENCE OF LIQUIDS

Kazuya Yoshijima, Okazaki, and Tsutomu Hayakawa, Yamanashi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Asahi Asbestos Co., Ltd., Tokyo, both of, Japan

Filed Nov. 10, 1986, Ser. No. 928,979
Claims priority, application Japan, Nov. 22, 1985, 60-179184
Int. Cl.⁴ F16J *15/10*; C09K *3/10*
U.S. Cl. 277—235 B **13 Claims**



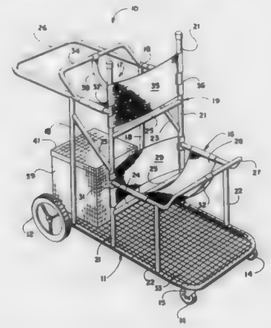
1. A gasket comprising
a swelling sheet having opposed surfaces;
a non-swelling layer having two opposed faces, one face being laminated to one of said opposed surfaces of the swelling sheet; and
an adhesive layer coated on the other face of said non-swelling layer.

4,728,112

TANDEM TWO SEAT CHILD'S STROLLER

Barbara M. Wynens, 4195 Wellington Hills Dr., Snellville, Ga. 30278

Filed Dec. 29, 1986, Ser. No. 947,173
Int. Cl.⁴ B62B *7/00, 9/28*
U.S. Cl. 280—47.4 **4 Claims**



1. A stroller for children comprising a forward portion and a rearward portion,
a generally rectangular frame having a longitudinal axis along a centerline transversing the major length direction of the rectangular frame,
rear wheel means integral with the frame at the rearward portion,
front wheel means integral with the frame at the forward portion,
a vertically disposed support frame having a pair of spaced apart upstanding support legs attached to the rectangular frame,
flooring means overlying the rectangular frame,
a first lower forward facing seat means affixed to the rectangular frame,
the first lower seat means including a generally U-shaped seat support frame,
a flexible saddle seat attached to each opposed leg of the support frame and a frontal seat strap attached to the forward edge of the saddle seat and to the connecting leg of the lower seat support frame,
a flexible lower seat back having opposed ends attached to the respective spaced apart upstanding legs of the vertically disposed support frame, thereby forming a seat back for the first lower forward facing seat means,
a second raised rearward facing seat means affixed to the rectangular frame,
the second raised seat means including a generally U-shaped seat support frame,
a flexible saddle seat attached to each opposed leg of the support frame and a frontal seat strap attached to the forward edge of the saddle seat and to the connecting leg of the lower seat support frame,
a flexible lower seat back having opposed ends attached to the respective spaced apart upstanding legs of the vertically disposed support frame, thereby forming a seat back for said second rearward seat means,
said second seat means being mounted vertically and rearwardly of the first seat means and facing toward the rearward portion of the stroller,
a vertically disposed support frame being the common support member for a portion of both the first and second seat means, said support member comprising a pair of spaced apart upstanding legs,
a substantially U-shaped handle means affixed to the second seat means,
a container means removably positioned to the flooring means on the rearward portion thereof wherein said flooring means comprises an open-weave mesh material, and
said container means including a selectively removable access lid that provides flooring means for the second seat means.

4,728,113

PIPE CONNECTOR FOR A TUBULAR FRAME BICYCLE

Alfred Thun, Jr., Ennepetal-Rüggeberg, Fed. Rep. of Germany, assignor to Alfred Thun & Co. GmbH, Ennepetal, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,717
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527685
Int. Cl.⁴ B62K *19/28, 19/22*
U.S. Cl. 280—281 R **2 Claims**



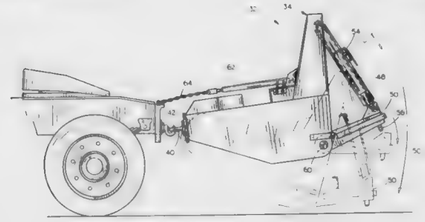
1. A tubing assembly for a bicycle frame, comprising:
a tubular metal connector formed with a cylindrical wall and a plurality of spaced apart hemispherical bulges protruding radially exteriorly from said cylindrical wall;
respective tubes adapted to define said frame and each having an end closely fitted over and wholly receiving a respective one of said bulges whereby an end face of each tube substantially meets said cylindrical wall at a base of the respective bulge, whereby each of said hemispherical bulges is wholly received in a respective one of said tubes; and
respective circular weld seams welding each end face to said wall at the base of the respective hemispherical bulge.

4,728,114

DEVICE FOR RAISING, LOWERING AND POSITIONING A PINTLE EYE STYLE DETACHABLE GOOSENECK TRAILER HITCH ASSEMBLY

Joseph W. Bills, Mitchell, S. Dak., assignor to Dakota Manufacturing Co., Mitchell, S. Dak.

Filed Jan. 16, 1987, Ser. No. 4,552
Int. Cl.⁴ B62D *53/06*
U.S. Cl. 280—425 A **2 Claims**



1. In combination with a truck having rearward and forward ends, said truck having a pintle hook hitch member at its rearward end,
a wheeled trailer having rearward and forward ends,
a hydraulically operated gooseneck hitch assembly detachably secured to the forward end of said trailer and having rearward and forward ends, said hitch assembly having a pintle eye hitch member at its said forward end for detachable connection with said pintle hook hitch member,
a substantially horizontally disposed, hydraulic cylinder having rearward and forward ends,
said hydraulic cylinder being connected at its rearward end to said gooseneck hitch assembly above and rearwardly of said pintle eye hitch member,
first and second elongated connection means having rearward and forward ends,
said first elongated connection means being connected at its rearward end to the forward end of said hydraulic cylinder and extending forwardly and outwardly therefrom, the forward end of said first connection means being secured to said truck laterally of said pintle hook hitch member,
said second elongated connection means being connected at its rearward end to the forward end of said hydraulic cylinder and extending forwardly and outwardly therefrom, the forward end of said second connection means being secured to said truck laterally of said pintle hook hitch member,
said first and second connection means defining a substantial V-shape,
and means for extending and retracting said hydraulic cylinder for pivotally lowering and raising the rearward end of said gooseneck hitch assembly, about said pintle eye hitch member and said pintle hook hitch member to selectively vertically position the rearward end of said gooseneck hitch assembly when said gooseneck hitch assembly is detached from said trailer.

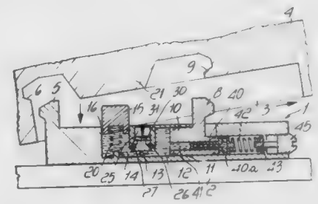
4,728,115

CONCEALABLE SKI BINDING

Alessandro Pozzobon, Paderno Di Ponzano Veneto, and Roberto Gorza, Pedavena, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Nov. 19, 1986, Ser. No. 932,809
Claims priority, application Italy, Dec. 2, 1985, 23046 A/85
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—613 **11 Claims**

1. In combination, a concealable ski binding and a ski boot, said ski boot having a sole, said sole defining a lower face, said lower face having formed thereon a recess having at least one end and at least one other end, said at least one end of said recess having formed thereon at least one first abutment, said at least one other end of said recess having formed thereon at least one second abutment, said concealable ski binding comprising at least one body, at least one fixed coupling element, at least one movable coupling element, at least one first piston, at least one fluid containing chamber, at least one tank chamber, and at least one operating piston, said body being fixable to a ski and removably accommodatable in said recess, said fixed coupling element being defined on said body and adapted for engagement with said first abutment, said movable coupling element being supported by said body, adapted for releasable



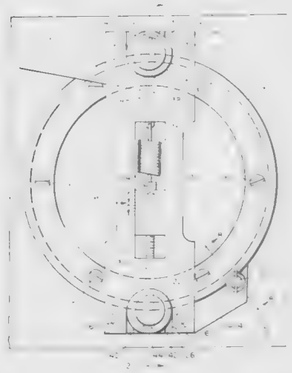
engagement relationship with said second abutment, and connected to said first piston, said first piston being sealingly movable in said fluid containing chamber, said fluid containing chamber communicating with said tank chamber, said operating piston being sealingly movable in said tank chamber and adapted for protruding from said body, said operating piston being further adapted to be pushed into said tank chamber by at least a portion of said recess upon application of said ski boot to said concealable ski binding, to feed fluid from said tank chamber into said fluid containing chamber with consequent motion of said movable coupling element, for causing said movable coupling to engage with said second abutment.

4,728,116

RELEASABLE BINDING FOR SNOWBOARDS

Kurt J. Hill, 1060 Fairway Court #3, Boulder, Colo. 80303

Filed May 20, 1986, Ser. No. 865,118
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—618 **3 Claims**



1. A releasable foot binding in combination with a snowboard and a boot having a toe interface plate and a heel interface plate, comprising:
ring means adapted to be fixedly secured to the snowboard;
friction block means rotatably mounted on said ring means;

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rail means located in apertures at opposed ends of said friction block means;

first and second interface plug means mounted in said apertures for movement along said rail means, said first interface plug means having an annular groove therein for releasably receiving a projecting portion of said toe interface plate and said second interface plug means having an annular groove therein for releasably receiving a projecting portion of said heel interface plate;

spring means for resiliently urging said first and second interface plug means toward one another for releasably retaining the boot therebetween;

rotational block means for rotatably securing said friction block means to said ring means; and

lever release means for moving one of said interface plug means away from said other interface plug means.

4,728,117

TOE IRON FOR SAFETY SKI BINDINGS

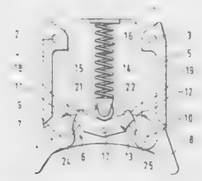
Premek Stepanek, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Marker Deutschland GmbH, Garmish-Partenkirchen, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,335

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539969

Int. Cl.[4] A63C 9/085

U.S. Cl. 280—625 **4 Claims**



1. A toe piece for holding a ski boot in a safety ski binding wherein said toe piece is pivotable laterally against a biasing force when excessive side forces occur, said toe piece comprising:

a base plate;

a pair of elongated, generally parallel side members, each pivotally mounted at one end to said base plate;

a connecting link having an elongated edge surface with a detent depression therein, said link pivotally connecting the other ends of said side members to each other to form a linkage which is laterally movable relative to said base plate about said pivotally mounted ends of said side members;

a pair of side jaws for laterally holding the sole of said boot, said jaws pivotally connected to said connecting link on opposite sides of said depression and movable between a ski boot holding position and a ski boot release position;

a lever including:

a cam surface comprised of an intermediate cam portion corresponding dimensionally to said detent depression and end cam portions protruding beyond said intermediate portion and,

end surfaces dimensioned to engage said side jaws, said lever being pivotally connected to said link about an axis centrally disposed between said side jaws wherein said end surfaces of said lever are in operative engagement with said side jaws and said intermediate cam portion on said lever is generally adjacent and aligned with said detent depression with said end cam portions projecting beyond said edge surface, said lever being movable between a first jaw holding position where said end surfaces of said lever engage said side jaws and maintain said jaws in said holding position and a second jaw releasing position; and,

detent means biased into engagement with said detent depression and said intermediate cam portion, said detent means urging said linkage to a central position relative to said base plate and said lever to said jaw holding position, said detent means engaging one of said end cam portions of said lever when said linkage is laterally moved a predetermined distance from said central position wherein said lever is shifted to said jaw release position thereby releasing the jaw in the direction of movement of the linkage.

4,728,118

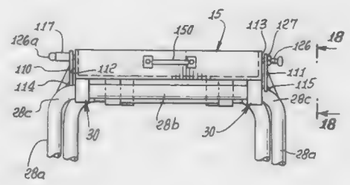
COLLAPSIBLE CARRIER STAND FOR HEAVY MACHINE

John L. Haas, Rowland Heights, Calif., assignor to Roco Tool Group, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 700,490, Feb. 11, 1985, Pat. No. 4,611,823. This application Apr. 21, 1986, Ser. No. 853,904

Int. Cl.[4] B62B 3/02

U.S. Cl. 280—641 **10 Claims**



1. A collapsible carrier for a heavy machine comprising:

(a) an upper platform adapted to support the machine,

(b) first leg means pivotally attached to the platform and extending downwardly and forwardly relative to the platform,

(c) second leg means having upper extent located to support the platform and extending downwardly and rearwardly relative to the platform,

(d) the first and second leg means pivotally interconnected below the level of said platform,

(e) there being a slide surface integral with the platform and presented to transmit loading to said second leg means upper extent as said upper extent travels therealong between first and second positions corresponding to raised and lowered positions of the platform, and there being stops associated with the platform to limit said travel at said first and second positions,

(f) releasable means to lock said second leg means upper extent to the platform,

(g) and counterbalance means operatively connected with said first and second leg means to yieldably resist downward movement of the platform, thereby counterbalancing the weight of said machine,

(h) said releasable lock means including at least one arm integral with the second leg means upper extent and projecting upwardly adjacent at least one of said stops in said first position of the second leg means upper extent, and at least one plunger carried by said arm to releasably attach to structure integral with the upper platform and block movement of the platform relative to said second leg means,

(i) and including a second arm integrally carried by the second leg means upper extent, said one arm and said second arm projecting in guiding relation with the platform in all positions of said travel of the second leg means upper extent between said stops, whereby the second leg means upper extent and said platform have mutually guided relation during said travel,

(j) said arms projecting upwardly at opposite sides of the platform to form with said second leg means upper extent a channel in which the platform is received and travels relative to the second leg means upper extent,

(k) and an adjustable set screw carried by the second arm to engage a side of the platform.

4,728,119

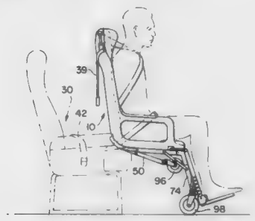
TRAVEL CHAIR FOR THE ELDERLY AND PHYSICALLY HANDICAPPED

Roland Sigafoo, Tallahassee, Fla., assignor to Trav-L-Chair, Inc., Tallahassee, Fla.

Continuation of Ser. No. 765,449, Aug. 14, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,475

Int. Cl.[4] B62B 7/06

U.S. Cl. 280—657 **20 Claims**



1. Transportation means for handicapped and elderly persons comprising a shell and a wheeled dolly, said shell comprising a unitary molded back, seat and arm support, said seat having at least a front and two opposite sides, hand holds mounted at each side of the back and at the front of each side of the seat, restraint means for the person to be transported attached to the shell and further a restraining belt secured to the shell and releasably securable about the seat back of a vehicle, said dolly including a top frame sized to receive the seat portion of the shell, said top frame including side rails on opposite sides of said dolly, said side rails extending lengthwise front to back along said seat, a pair of front and a pair of rear legs, the pair of front legs having upper ends pivotably attached to said top frame by front pivots at a front of said side rails, the pair of rear legs having upper ends pivotably attached to said top frame by rear pivots at a rear of said side rails, said rear pivots spaced from said front pivots, each of said pairs of legs independently foldable inwardly to extend lengthwise along the underside of said top frame, wheels at the lower ends of each of said pairs of front and rear legs, lock bars for the said pairs of front and rear legs, and latching means for attaching the dolly to said shell, and wherein, upon inward folding of the pair of rear legs, the dolly and shell are operable for placement upon a chair of a transportation vehicle with the seat and back of the shell respectively extending along a seat and a back of the chair and with the front legs extending down in front of the chair, and upon unlatching of said latching means, said dolly is removable from said shell such that said shell is operable for placement upon a chair of a transportation vehicle with the seat and back of the shell respectively extending along a seat and a back of the chair and wherein said dolly is compactable when unlatched from said shell with its rear legs folded forwardly such that the wheels of said rear legs are disposed at the front of said side rails and with its front legs folded backwardly such that the wheels of said front legs are disposed at the rear and to the outside of said side rails.

4,728,120

SUSPENSION CONTROLLER

Shuuichi Buma, Toyota; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Masami Itou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 30, 1986, Ser. No. 913,419

Claims priority, application Japan, Oct. 3, 1985, 60-221656; Nov. 22, 1985, 60-263556

Int. Cl.[4] B60G 11/26

U.S. Cl. 280—707 **4 Claims**



1. A suspension controller for a vehicle comprising:

a vehicle height detection means for detecting a vehicle height at a front wheel and for generating vehicle height signal;

a vehicle height determination means for receiving said vehicle height signal and comparing said vehicle height signal with a predetermined reference value so as to generate a vehicle height determination signal;

a cycle time determination means for detecting a cycle time of each said vehicle height signal, said cycle time being indicative of the vibration of the vehicle, and comparing the detected cycle time with a predetermined reference value corresponding to a period of resonant vibration of an unsprung mass of said vehicle, so as to generate a cycle time determination signal;

a control means for receiving said vehicle height determination signal and said cycle time determination signal so as to generate a suspension characteristic alteration signal based on said vehicle height determination signal and said cycle time determination signal; and

a suspension characteristic alteration means for altering a suspension charteristic of said vehicle in response to said suspension characteristic alteration signal.

4,728,121

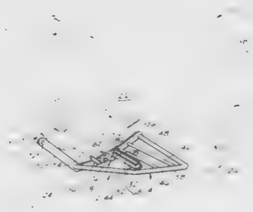
FOOT PROTECTOR APPARATUS FOR MULTI-WHEELED RECREATIONAL VEHICLES

Elmer L. Graves, 1501 SW. 68th, Oklahoma City, Okla. 73159

Filed Feb. 9, 1987, Ser. No. 12,365

Int. Cl.[4] B62J 25/00

U.S. Cl. 280—748 **7 Claims**



1. A foot protector apparatus for a multi-wheeled recre-

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ational vehicle wherein the recreational vehicle is provided with two rearward wheels and a foot peg positioned on each side of the recreational vehicle so as to be disposed forward the rearward wheels such that an operator's foot is positionable on each foot peg of the recreational vehicle, the foot protector apparatus comprising:

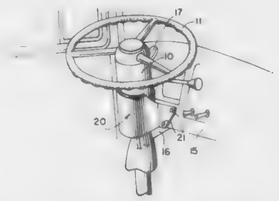
grille means for supporting each of the operator's feet and preventing the passage of the operator's feet beyond a barrier plane thereof; and prevent contact of the operator's feet with the rearward wheels of the recreational vehicle.

4,728,122

DRIVER KNEE SHIELD TO COVER STEERING COLUMN PROTRUSIONS BELOW STEERING WHEEL OF TRACTOR-TRAILER RIGS

James N. Wright, Rte. 3, Box 330, Wytheville, Va. 24382

Filed Apr. 7, 1986, Ser. No. 848,648
Int. Cl.[4] B60R *21/05*
U.S. Cl. 280—750 **1 Claim**



1. A tractor for a tractor-trailer rig, comprising a cab for a driver, a steering wheel, a substantially vertical steering column supporting the steering wheel at the upper end of the column, controls for an air valve system, a bracket assembly containing said controls, and mounted on the steering column beneath the steering wheel at about the level of the knees of a driver holding the steering wheel a dashboard extending horizontally within the cab beneath the level of the steering wheel and facing the driver on the opposite side of the steering column, and knee guard means between said assembly and the position of a driver's knees, said knee guard means comprising an elongated metal sheet curved around the steering column and said assembly and secured at its opposite ends to the dashboard, said knee guard means also comprising a layer of foam rubber next to the curved portion of the metal sheet, said knee guard means also comprising a layer of leather-like material next to the metal sheet, the metal sheet being secured between the foam rubber and the leather-like material with the foam rubber closest to the steering column and said assembly.

4,728,123

RELEASABLE STRAP SYSTEM

Randy Kassal, 2519 N. Ocean Blvd., #316, and Jim Juday, 940 Sweetwater La., #501, both of Boca Raton, Fla. 33431

Filed Mar. 30, 1987, Ser. No. 32,296
Int. Cl.[4] A63C *11/22*
U.S. Cl. 280—822 **1 Claim**

1. A releasable strap system comprising:

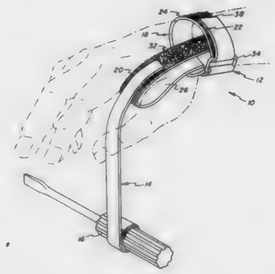
a hand strap and a device strap said hand strap including a straight wrist portion and a curved generally U-shaped portion,

said curved loop portion having two ends connected to the straight portion at separated intervals,

said curved loop portion including a first mating surface of a hook and loop type connector,

said straight wrist portion including a connector ring at one end and one mating surface of a hook and loop type connector at the other end and a second mating surface of the hook and loop type connector positioned along the surface of the straight portion,

said straight portion being engageable around the wrist of a user, with at least one finger of the user's hand inserted through said curved loop portion, by threading the other end through said connector ring and folding back said one mating surface on said second mating surface for tightening and locking the straight portion to the wrist of the user,



said device strap including a mating surface of the hook and loop type connector on one side for releasably connecting the device strap to the first mating surface of said curved loop portion, and

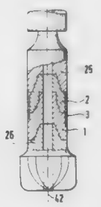
said device strap including connector means for securing items thereto.

4,728,124

CONNECTION FOR DRILLING

Hervé Righi, Saint Jean de Moirans, and Georges Obrecht, Seyssins, both of France, assignors to Alsthom, Paris, France

Filed Mar. 10, 1987, Ser. No. 24,279
Claims priority, application France, Mar. 10, 1986, 86 03377
Int. Cl.[4] E21B *17/06*
U.S. Cl. 285—2 **7 Claims**



1. In a drilling connection for connecting a drilling tool to a drive member rotatable about an axis at the leading end of a drilling string, and for transmitting working forces to said tool, i.e. forces comprising rotary torque and axial thrust to enable the tool to perform its work, and occasionally for transmitting limited withdrawal traction thereto in order to withdraw the tool together with the drive member, said connection comprising:

a first tool connection structure on said tool;

a leading connection body having a second tool connection structure at its leading end complementary to said first tool connection structure;

a first drive connection structure on said drive member in order to connect the tool to the drive member;

a trailing connection body having a second drive connection structure at its trailing end complementary to said first drive connection structure; and

separable connection means for transmitting said working forces and said withdrawal traction from said trailing connection body to said leading connection body, and for separating said bodies under the action of axial separation traction greater than said withdrawal traction in such a manner as to enable said bodies to be separated from each other in the event of the tool becoming accidentally jammed downhole sufficiently to resist said limited withdrawal traction, thereby enabling the drive member to be withdrawn while at least temporarily abandoning solely said leading connection body, said tool, and any parts that may be situated therebetween;

the improvement wherein said separable connection means between said connection bodies comprise a plurality of calibrated traction links angularly distributed around said axis and having calibrated breaking forces;

each of said links comprising a shank extending axially between a leading head and a trailing head and having limited traction strength so as to break at a predetermined force which is the calibrated or rated force for said link;

said leading and trailing bodies having leading and trailing housings for receiving said leading and trailing heads respectively, and for holding them against a force greater than said calibrated force; and

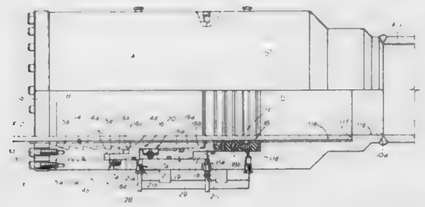
said separable connection means further including means for transmitting torque and thrust between said two bodies.

4,728,125

GRIP AND SEAL MECHANICALLY LOCKING FLOWLINE CONNECTOR

Bobby J. Reneau, 15527 Morales, Houston, Tex. 77032, assignor to Bobby J. Reneau and Luther L. Manchester, both of Houston, Tex.

Filed Jan. 10, 1986, Ser. No. 818,090
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—18 **21 Claims**



1. Apparatus for connecting together flowlines, comprising:

a generally cylindrical housing having a first end for connection to a first flowline and having a bore therethrough, said generally cylindrical housing having a second, open end to receive a second flowline in said bore;

a generally cylindrical gripping means mounted within said bore for receiving said second flowline member, said gripping means being movable radially inwardly into gripping engagement with said second flowline;

camming means mounted within said housing bore in engagement with said gripping means for moving said gripping means into gripping engagement with said second flowline in response to relative movement between said camming means and said gripping means;

gripper actuator means mounted within said housing bore for axial movement from an initial to an actuated position in engagement with said gripper means to effect relative movement between said gripping means and said camming means to move said gripping means into gripping engagement with said second flowline;

grip position lock means mounted in said housing bore in engagement with said gripper actuator means for locking said gripper actuator means in said actuated position;

a generally cylindrical sealing means mounted within said housing bore for radial expansion in response to axial compression to seal between said second flowline and said housing bore;

seal actuator means which is generally cylindrical and mounted wihtin said housing bore for axial movement from an initial to an actuated position in sufficient engagement with said seal means to axially compress said sealing means to effect a seal between said second flowline and said housing bore;

seal position lock means mounted in said seal actuator means in engagement with said gripper actuator means for locking said seal actuator means in said actuated position; and

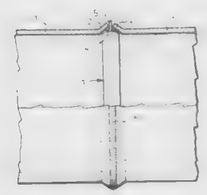
fluid actuator means for using pressurized fluid to move said grip actuator means and said seal actuator means to said actuated position.

4,728,126

WELD JOINT

Göran Sundholm, Helsingforsv. 23 A, SF-02700 Grankulla, Finland

Continuation-in-part of Ser. No. 892,935, Aug. 4, 1986, abandoned. This application Aug. 22, 1986, Ser. No. 899,390
Int. Cl.[4] F16L *13/02*
U.S. Cl. 285—22 **6 Claims**



1. A weld joint for metal pipe comprising:

first and second metal pipes each having a flared end, each flared end having inner conical surfaces;

a substantially cylindrical metal sealing ring positioned in abutment with said inner conical surfaces of said first and second pipes, an outer diameter of said ring being dimensioned so that an axial compressive force transmitted by said flared ends of said first and second pipes bends a wall of said ring into tight elastic abutment against said inner conical surfaces of said first and second pipes; and

yieldable guiding means for guiding said flared ends of said first and second pipes onto said sealing ring, said guiding means comprising a peripheral flange on said sealing ring projecting out between said flared ends and having a plurality of yieldable members produced by cutting said flange and bending said cuts in opposited directions, said flared ends contacting said guiding means before compressing said ring, said members yielding to said axial force to allow said ring to be compressed; whereby said ring is correctly positioned between said flared ends.

4,728,127

PIPE JOINT

Alvar T. Westberg, Svärdsjö , Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Oct. 24, 1986, Ser. No. 922,670
Claims priority, application Sweden, Oct. 25, 1985, 8505031
Int. Cl.[4] A16L *35/00*
U.S. Cl. 285—39 **7 Claims**

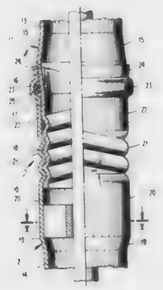
1. A pipe joint comprising:

a first thin-walled pipe having a first end provided with a first thread portion, said first thread portion being formed with a first thread portion wall which has a thickness substantially identical to the thickness of the wall of said first thin-walled pipe, said first thin-walled pipe including a first inner portion which is formed axially inward from said first thread portion and which at least partially coni-

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cally decreases towards said thread portion and means for engagement by a holding tool;

a second thin-walled pipe having a second end provided with a second thread portion adapted to matingly receive said first thread portion, said second thread portion being formed with a second thread portion wall which has a thickness substantially identical to the thickness of the wall of said second thin-walled pipe, said second thin-walled pipe including a conically enlarged portion formed



axially outward from said second thread portion and an annular extension provided adjacent said conically enlarged portion; and

a seal ring arranged to be received in said annular extension and to be tightened between said extension of said second thin-walled pipe and said first inner portion of said first thin-walled pipe when said extension and said inner portion move toward one another during threaded connection of the first and second thin-walled pipes.

4,728,128

CONNECTION ASSEMBLY FOR JOINING TWO PARTS

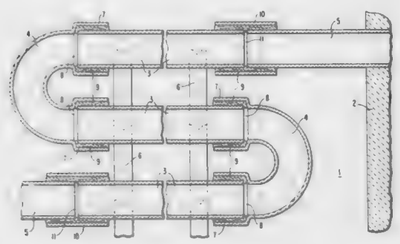
Alfred Frey, Wattenheim, and Robert Burger, Monsheim, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,214

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1985, 3543311

Int. Cl.[4] F16C *49/00*

U.S. Cl. 285—157 **20 Claims**



1. In an assembly of two parts having confronting ends defining therebetween a joint and a connection joining said two parts, said assembly intended for operation at an operating temperature from approximately 200° C. to approximately 800° C., the improvement wherein said connection comprises:

a dimensionally stable coupling member surrounding said joint and at least one of said ends, said coupling member and said at least one said end defining therebetween a space; and

ceramic fiber mat material positioned within said space and containing approximately 40–60 weight % of a swelling agent capable of volume expansion when subjected to said operating temperature, thereby forming means for, upon said assembly being subjected to said operating temperature, swelling said mat material and compressing said mat material between said coupling member and said at least one end, thereby connecting said two parts.

4,728,129

HYDRIL-TYPE CONNECTOR

James B. N. Morris, 22 Colony Rd., Gretna, La. 70053

Division of Ser. No. 409,059, Aug. 18, 1982, Pat. No. 4,598,455, which is a division of Ser. No. 871,336, Jan. 23, 1987, Pat. No. 4,496,175, which is a division of Ser. No. 736,492, Oct. 28, 1976, Pat. No. 4,085,951. This application Mar. 24, 1986, Ser. No. 843,023

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—334 **7 Claims**



1. A joint for interconnecting a pair of pipes, said joint comprising coaxial pin and box members respectively including interengaged external and internal first threads, and interengaged external and internal second threads, said first threads on said pin member being adjacent the free terminal forward end of said pin member and being of smaller outer diameter than said second threads, said threads holding the pipes against separation, said first threads and said second threads having substantially the same pitch and outline characteristics, said pin member being screwed about its axis longitudinally forwardly into box member, metal-to-metal seating surfaces on said pin and box members, said surfaces in interengagement when undamaged, an annular pin member shoulder providing a stepped portion on said pin member between said first threads and said second threads, an annular box member shoulder providing a stepped portion on said box member shoulder providing a stepped portion on said box member between said first threads and said second threads, said pin member shoulder being contiguous with an annular groove opening radially outwardly and extending about said pin member, and an annularly continuous ring of relatively rigid, internally tenacious plastic or rubber material received in said groove, the axial relationship between undamaged metal-to-metal seating surfaces, the first and second threads, the ring and the pin member shoulder and the box member shoulder being such that when the said joint is made up to cause said metal-to-metal seating surfaces to interengage, the ring is compressed between said pin member and said box member to form a seal.

4,728,130

LOCKING ASSEMBLY FOR PUSH-ON FITTINGS

George S. Corzine, 2556 Barrett Ave., Naples, Fla. 33962

Continuation-in-part of Ser. No. 2,437, Jan. 12, 1987, abandoned. This application Jun. 10, 1987, Ser. No. 60,233

Int. Cl.[4] F16L *19/02*

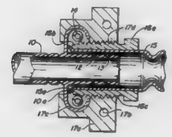
U.S. Cl. 285—351 **9 Claims**

1. A locking assembly for securing the connection between a push-on fitting having a flared end fitted into a cage and surrounded by a garter-type coil spring housed within the cage of a pipe with an O-ring sealing the connection between the push-on fitting and the pipe comprising

an axially split externally flanged male fitting, the two halves of said split male fitting being sized to snugly encircle the push-on fitting with one end of each of the two halves

resting against the flared end of the push-on fitting and forcing the coil spring away from the push-on fitting,

and an axially split and recessed locking nut, the two halves of said nut formed to snugly encircle the cage housing the coil spring and also engage the flange of the two halves of the male fitting,



the two halves of the locking nut being securely joined together by a pair of screws threaded into aligned holes in both halves of the locking nut,

whereby inwardly directed pressure is applied to the outside surface of the push-on fitting to exert an inwardly directed pressure on the O-ring and the pipe.

4,728,131

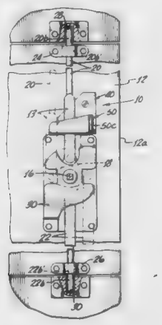
CAMPER SHELL INSIDE DOOR LOCK

Russel D. Burns, 11872 Beach Blvd., Stanton, Calif. 90680

Continuation-in-part of Ser. No. 683,482, Dec. 19, 1984, abandoned. This application May 12, 1986, Ser. No. 862,109

Int. Cl.[4] E05C *5/00*

U.S. Cl. 292—7 **18 Claims**



1. An inside door lock apparatus for a pickup truck camper shell having a pivotable door with a locking mechanism including at least one locking bar adjacent an interior surface of the door actuable by an external door handle, the locking bar being configured for engagement with a part of the shell or truck which is in fixed relation to the door, said at least one locking bar having one end thereof pivotably secured to an end of an actuating lever pivotable by said door handle and the other end thereof slidably restrained adjacent an edge of said door, said at least one locking bar being operable between first and second positions, said at least one locking bar, in said first positon having the other end thereof in engagement with a part of the shell or truck which is in fixed relation to the door with the longitudinal axis of said at least one !ocking bar lying along a line generally parallel to another edge of the door and, in said second position, having the one end displaced relative to the edge of the door and having the other end thereof out of engagement with a part of the shell or truck with the longitudinal axis of said at least one locking bar lying along a line at an angle to the edge of the door, said appartus comprising:

a plate member having means for securing the same to an interior surface adjacent said locking bar;

a latch arm member pivotally coupled to said plate member between a closed position and an open position, said latch arm member having a portion thereof configured for defining an opening positionable over said locking bar only with said at least one locking bar in said first position for captively retaining said locking bar from actuation with said latch arm member in the closed position and for enabling actuation of said locking bar with said latch arm member in the open position; and

coacting means on said plate member and said latch arm member for frictionally retaining said latch arm member in an open position whereby to prevent inadvertent closing of said latch arm member with the vehicle in motion.

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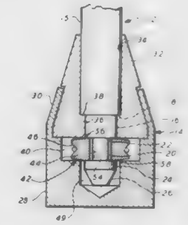
BOLT LOCK

Terrence N. Brammall, Angola, Ind., assignor to Trans-Guard Industries, Inc., Angola, Ind.

Filed Dec. 2, 1985, Ser. No. 803,317

Int. Cl.[4] F16B *21/07*

U.S. Cl. 292—329 **2 Claims**



1. A locking device for locking an elongated member having a head and an annular channel defining a locking shoulder, said locking device comprising:

a housing, said housing including a first housing portion and a second housing portion, said first housing portion including a bore which defines a cavity for receiving the head of said elongated member, said first housing portion further including a counterbore which is coaxial with said bore and which cooperates with said second housing portion to define a cavity, said second housing portion including a bore which is coaxial with said bore and counterbore of said first housing portion;

a locking jaw assembly disposed within said cavity, said locking jaw assembly comprising a plurality of radially movable locking jaws and spring means engaging said radially movable locking jaws, said spring means tending to urge said locking jaws radially inwardly to cooperate to define a generally centrally disposed opening, said locking jaws when displaced fully radially inwardly being receivable within said annular channel of said elongated element to lock said elongated element within said housing; and

said plurality of locking jaws being provided with tapered surfaces for engaging said head and locking shoulder of said elongated member and said first and second housing portion whereby when said locking jaws are disposed within said annular channel in said elongated member, any attempt to displace said elongated member axially within said housing will generate forces tending to displace said locking jaws radially inwardly thereby maintaining said elongated element locked within said housing.

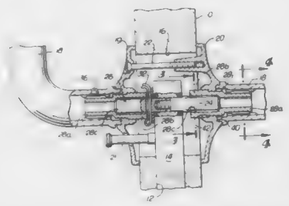
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DOOR HANDLE ATTACHMENT APPARATUS

Harold J. Valley, Mission Viejo, Calif., assignor to Unatech, Escondido, Calif.

Filed Jun. 5, 1985, Ser. No. 741,447
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—336.3 **6 Claims**



1. A door handle apparatus actuating a latching mechanism in a door, comprising:

a spindle having first and second ends, said first end extending into said mechanism and having means thereat for engaging said mechanism and for applying a turning moment thereto, said second end defining a non-circular cross-sectional geometry and projecting outwardly from said mechanism;

a rosette mounted to said door, said rosette having a cylindrical aperture therethrough and outward-facing and inward-facing recessed aperture faces on opposite sides thereof, said aperture being disposed concentrically with respect to said spindle with said inward-facing recessed aperture face disposed at a predetermined position away from said door;

an adapter slidably disposed on said second end of said spindle between said mechanism and said rosette, said adapter having first and second cylindrical portions, said first portion having first and second outer diameters rotatably seated on said inward-facing recessed aperture face of said rosette and an axial bore defining a non-circular cross-sectional geometry generally conforming to that of said spindle second end, said bore slidingly receiving said end therein to a depth adjustable to seat said adapter in said rosette in doors of varying thickness, said second portion extending through said aperture and having an exterior surface defining a plurality of longitudinal splines;

a door handle disposed on said second portion of said adapter with said rosette sandwiched between said handle and said adapter, said handle being rotatably seated within said outward-facing recessed face of said rosette and having a bore therein, said bore defining a splined interior surface generally conforming to said splined exterior surface of said adapter second portion and slidingly-receiving said portion therein in one of a plurality of relative angular positions; and

means for securing said handle longitudinally on said adapter second portion in said one relative angular position.

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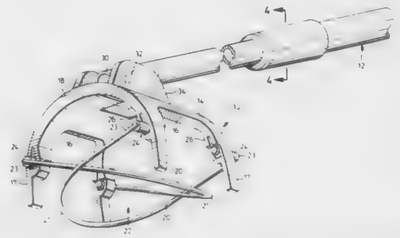
GOLF BALL RETRIEVER

Frank R. Allen, 51 Renfield Crescent, Whitby, Ontario, Canada L1P 1B2

Filed Jun. 15, 1987, Ser. No. 61,719
Int. Cl.[4] A63B *47/02*; A47F *13/06*
U.S. Cl. 294—19.2 **8 Claims**

1. A device for retrieving a golf ball comprising: an elongate handle; and

a cup carried at one end of the handle to receive the golf ball and comprising an inverted U-shaped frame with a base and a pair of opposed resilient side members, the base being pivotally mounted on the handle, a pair of bails one mounted on each of the side members of the frame, the bails each extending downwardly towards the opposing side member and crossing one with the other to form an opening having the distance between the crowns of the bails slightly less than the diameter of a golf ball, the bails



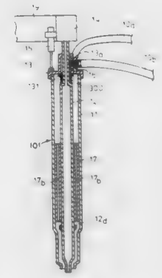
being laterally resilient to enlarge the opening and pass the ball on pressure of the ball against the bails and to spring back to entrap the ball in the cup, the side members being laterally resilient to release the ball from the cup when pressed laterally to enlarge the opening.

4,728,135

COMPONENT SUCKING AND HOLDING MACHINE

Toshiaki Sugimura, Osaka; Yoshihiko Misawa, Katano, and Makito Seno, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 682,844, Dec. 18, 1984, abandoned.
This application Jun. 29, 1987, Ser. No. 9,593
Claims priority, application Japan, Dec. 20, 1983, 58-240228
Int. Cl.[4] B25J *15/06*
U.S. Cl. 294—64.1 **15 Claims**



1. A component sucking and holding machine comprising:

a first sucking pipe having a first sucking opening at one end thereof for sucking and holding a component wich has a suction surface area larger than the area of said first opening;

a second sucking pipe disposed coaxially within said first pipe and having a second sucking opening at one end thereof for sucking and holding a component which has a suction surface area larger than the area of said second opening, the area of said first opening being larger than that of said second opening;

first means for moving said first pipe axially relative to said second pipe between a first position where said one ends are at least substantially coplanar and a second position where said one end of said second pipe projects out of said first opening; and

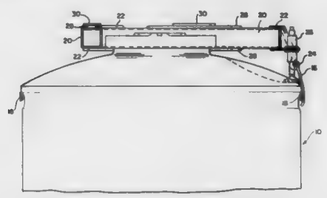
vacuum pump means for selective sucking of the air in said first sucking pipe and the air in said second sucking pipe.

4,728,136

GRAPPLE AND LIFT BEAMS FOR HIGH INTEGRITY CONTAINERS FOR RADIOACTIVE WASTE

Harold L. Newhouse, Gaithersburg, and Charles W. Mallory, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1985, Ser. No. 701,048
Int. Cl.[4] B66C *1/00*; G21F *5/00*
U.S. Cl. 294—68.3 **4 Claims**



1. A container assembly for the storage, handling, transport, and ultimate disposal of radio-active waste containing material, said container assembly comprising:

a. a waste container having a plurality of lifting lugs associated therewith capable of bearing the weight of the container and its contents and having an opening in the top of said container for the insertion of waste material,

b. a top for sealing the container opening after the waste material is inserted, and

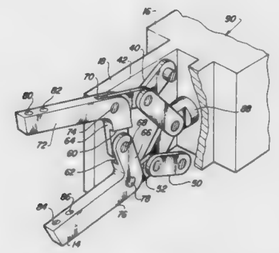
c. a grapple beam having means for attaching and holding the container lifting lugs, having tensioning means for applying continuously stress between the means for attaching and holding the container lifting lugs and the lugs to prevent inadvertent release, and having sockets that can be remotely engaged and latched to lifting a device for handling the container and its contents, the grapple beam comprised of at least three members joined at their ends forming a polygon of a predetermined size such that the top can be inserted into the polygon interior and secured to the waste container.

4,728,137

COMPOUND TOGGLE ROBOTIC GRIPPER

Nihad Hamed, Pontiac, and Hazem Hamed, Westland, both of Mich., assignors to American Engineering and Trade, Inc., Redford Township, Wayne County, Mich.

Filed Jul. 22, 1986, Ser. No. 888,145
Int. Cl.[4] B25J *15/08*
U.S. Cl. 294—88 **10 Claims**



1. A robotic gripper comprising:

a pair of spaced, opposed gripping jaws each pivotally mounted to a base;

a compound toggle mechanism comprising

a first toggle including first and second arms pivotally joined at one end for movement from a released position to a locked position,

a second toggle including third and fourth arms pivotally joined at one end and operably connected to the free end of the first arm for movement from a released position to a locked position, the free end of the third arm operably connected to one of the gripping jaws, the free end of the fourth arm operably connected to the base, and

a third toggle including fifth and sixth arms pivotally joined at one end and operably connected to the free end of the second arm for movement from a released position to a locked position, the free end of the fifth arm operably connected to the other gripping jaw, the free end of the sixth arm operably connected to the base; and

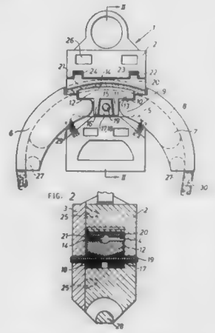
an actuator operably connected to the first toggle for shifting the first, second and third toggles from their respective released positions to their respective locked positions, thereby moving the gripping jaws from an unclamped position to a clamped position.

4,728,138

AUTOMATICALLY ACTING, LOCKABLE HOISTING BLOCK

Mats Samuelsson, Selebovägen 23, S-122 48 Enskede, Sweden

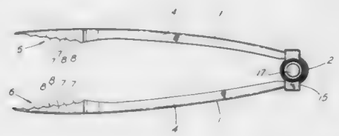
PCT No. PCT/SE86/00259, § 371 Date Feb. 3, 1987, § 102(e) Date Feb. 3, 1987, PCT Pub. No. WO86/07343, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 4, 1986, Ser. No. 33,158
Claims priority, application Sweden, Jun. 5, 1985, 8502782; Japan, Jan. 22, 1986, 61-12943
Int. Cl.[4] B66C *1/12*
U.S. Cl. 294—82.12 **12 Claims**



1. A hoisting block, which is lockable and automatically acting in relation to a hoisting member, said block being freely movable along the member, which extends from a load to be moved and to the block, such that the block can assume a desired position in relation to the load, characterized in that the block includes at least one locking mechamism, said locking mechanism comprising two arms, which are pivotable in relation to the block and mutually independently, said hoisting member being arranged onto said arms, at least one plunger actuable by at least one locking mechanism, a seat disposed in the region of the plunger, a section of said hoisting member running through a groove commonly formed by the plunger and seat, said section of the hoisting member being locked between said plunger and said seat influenced by said locking mechanism.

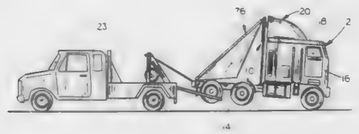
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4,728,139
TONGS
John E. Oretti, Doncaster, Australia, assignor to Peter Fanning & Company Pty. Ltd., Deepdene, Australia
Filed Jul. 28, 1986, Ser. No. 891,216
Claims priority, application Australia, Aug. 7, 1986, PH1826
Int. Cl.[4] A47G *21/10*; A47J *43/28*
U.S. Cl. 294—99.2 8 Claims



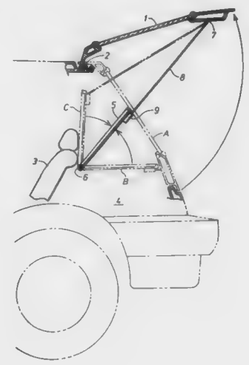
1. Tongs, formed from a material having inherent flexibility, comprising: an arms section comprising a pair of similar-length arms each having an inner face and an outer face, an integral junction portion, each arm merging at one, thereby inner end thereof with the integral junction portion for flexing to bring the respective, thereby-defined inner faces of the arms into contact at free, opposite-end portions of the arms, and a retaining shoulder projecting from the inner face of each arm at the merger of the arm and the junction portion; and a fulcrum block nestable within the junction portion for bearing against the junction portion and retaining shoulders, whereby, when the free, opposite-end portions of the arms are urged together to grip an object, to cantilever the arms from the retaining shoulders bearing against the fulcrum block.

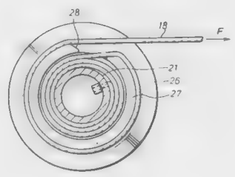
4,728,140
MEANS FOR SHIELDING A TRUCK MOUNTED AERODYNAMIC DRAG REDUCER
James P. Lucht, 834 Hidden Hills Dr., Bellevue, Nebr. 68005
Filed May 11, 1987, Ser. No. 48,637
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S 13 Claims



1. In combination,
a truck comprising a wheeled frame means having rearward and forward ends, a cab mounted on said wheeled frame means at the forward end thereof and including a roof, and an aerodynamic drag reducer mounted on the cab roof and extending upwardly therefrom,
an upstanding support means removably positioned behind the cab and having upper and lower ends,
the lower end of said support means being operatively secure to said wheeled frame means, the upper end of said support means being positioned rearwardly of said drag reducer,
and an air deflection means operatively secured to said support means for preventing air from striking the rearward end of said drag reducer when said truck is being towed in a rearward manner.

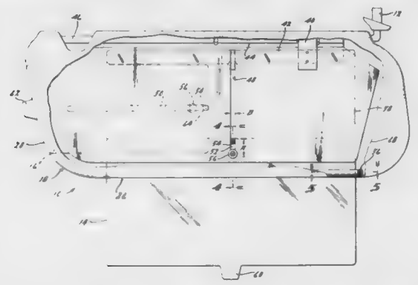
4,728,141
AUTOMOTIVE REAR SHELF STRUCTURE
Yasuki Motozawa, Tochigi; Tatsuo Masuda, and Shuichi Yamamoto, both of Kanagawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 28, 1986, Ser. No. 868,137
Claims priority, application Japan, May 31, 1985, 60-82355[U]; Jun. 1, 1985, 60-119474
Int. Cl.[4] B60R *5/00*
U.S. Cl. 296—37.16 10 Claims





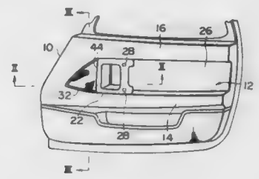
1. A rear shelf structure for lifting a rear shelf provided behind a rear seat cooperative with the opening action of a tail gate, comprising:
a winding device attached to either one of the tail gate and the rear shelf;
cable means having one end wound by the winding device and another end connected to the other one of the tail gate and the rear shelf;
the winding device comprising a reel for winding the cable means and spring means for biasing the reel so as to wind the cable means onto the reel, the length of the cable means being such that a certain part of the cable means is still left wound on the reel even when the tail gate is fully open, and the spring means applying an effective tension on the cable means that increases at a rate substantially linearly in proportion to the length of the cable means wound off the reel until the tail gate reaches a position near its fully open position and the increase rate of the effective tension of the cable means increases substantially when the tail gate is at the position near its fully open position in such a manner that the rear shelf is lifted to its substantially fully lifted position without any substantial drooping when the tail gate is fully open.

4,728,142
VISOR WITH RETRACTABLE GLARE SHIELDS
James A. Gavagan, Centerline, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.
Filed Mar. 30, 1987, Ser. No. 32,312
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97 G 7 Claims



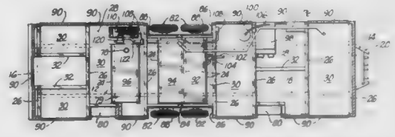
1. A visor for a motor vehicle having one or more retractable auxiliary glare screens, said visor of the type having a center board member which is enclosed by an outer board member, said visor comprising:
a pair of edge reinforcement members each engaging an edge of said outer board member to define a locally separated clearance slot for said auxiliary glare screen,
said center board defining an elongated guide slot aligned substantially with the center of said clearance slot, and
a slot follower affixed to said glare screen and traveling in said guide slot to guide said glare screen and to limit the range of motion of said glare screen.

4,728,143
DOOR FOR VEHICLE WHICH INCORPORATES LOUDSPEAKER
Masaharu Tanino, and Ikuo Ishii, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 815,638, Dec. 31, 1985, abandoned. This application Apr. 2, 1987, Ser. No. 33,879
Claims priority, application Japan, Jan. 10, 1985, 60-1550[U]
Int. Cl.[4] B60J *5/04*
U.S. Cl. 296—153 16 Claims



1. A door for a vehicle which incorporates a loudspeaker, comprising:
a door trim disposed at the innermost side of said door and having a raised portion which extends horizontally along an upper edge of said door trim, and an armrest portion which extends horizontally along an approximate longitudinal centerline of said door trim, said door trim having a recess forming a channel which extends substantially horizontally from a rear end of said door trim at a position slightly closer to the upper edge of said door trim than the centerline of said door trim and which terminates at a position adjacent a front end of said door trim, said raised portion forming an upper channel wall of said recess and said armrest portion forming a lower channel wall of said recess;
a door grip extending between said upper and lower channel walls and located adjacent to a front terminating position of said recess for grasping by an occupant to open and close said door; and
a loudspeaker secured to said door trim and said door grip such that said loudspeaker is disposed between the front terminating position of said recess and said door grip and between said upper and lower channel walls.

4,728,144
TRAILER CONSTRUCTION
John C. Crean, Corona del Mar, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.
Filed Oct. 20, 1986, Ser. No. 921,369
Int. Cl.[4] E03D *13/00*; B60P *3/32*
U.S. Cl. 296—168 8 Claims



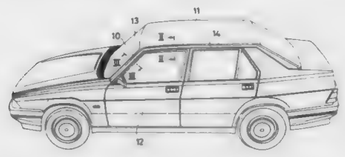
1. A trailer including an elongated chassis having front and rear ends and sides. means for towing the trailer attached to the front end of said chassis so as to extend therefrom, undercarriage means including wheels attached to said chassis between the ends thereof, said undercarriage means including wheels for supporting said trailer extending beneath said chassis and a trailer body having an internal floor mounted on said chassis so as to extend upwardly therefrom, said body extending from the front to the rear of said chassis and having sides corresponding to the sides of said chassis in which the improvement comprises:
a series of spaced, parallel joist means mounted on said chassis, said floor being supported by said joist means and being spaced from said chassis by said joist means, said floor being continuous and flat between the sides and ends of said body,
all of said joist means extending transverse to the length of said chassis,
all of said joist means except those adjacent to said undercarriage means extending between the sides of said body,
said undercarriage means being constructed so that said wheels extend generally upwardly from said chassis means adjacent to the sides of said body,
those of said joist means adjacent to said undercarriage means terminating within the sides of said body so as to provide spaces located generally above said undercarriage means for said wheels at the sides of said body, and
tank means for holding fluids associated with the use of said trailer located between those joist means generally above said undercarriage means.

4,728,145
CAR WITH DRIP CHANNEL AND RELATED DRIP CHANNEL COVER TRIM
Carmelo Benedetto, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy
Continuation of Ser. No. 826,326, Feb. 5, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 62,398
Claims priority, application Italy, Feb. 19, 1985, 20839/85[U]
Int. Cl.[4] B60R *13/02, 13/07*
U.S. Cl. 296—213 15 Claims

1. A car comprising a roof having side edges, said roof side edges each terminating in an edge section including a projecting terminal leg, said roof adjacent each edge section including

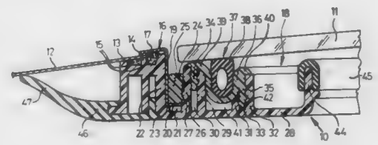
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an inwardly offset longitudinal recess, a finishing trim, said finishing trim including a side wall shaped to match the contour of the roof and a mounting bracket disposed generally parallel to said projecting terminal leg, said finishing trim being directly mounted on said terminal leg by a fastener extending through said mounting bracket and said terminal leg, said side wall overlying and masking said edge section and a portion only of said longitudinal recess, and a gasket disposed remote from said mounting bracket and positioned between an end region of said side wall and said longitudinal recess in sealed relation to said longitudinal recess to define part of said recess exteriorly of said gasket as a drip channel.



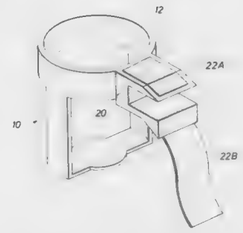
9. A car comprising a roof and pillars, at least certain of said pillars having a side edge terminating in an edge section including a projecting terminal leg, each said certain pillar adjacent said pillar edge section having an inwardly offset longitudinal recess, a pillar finishing trim portion secured directly to said pillar terminal leg, said pillar finishing trim portion including a pillar finishing trim portion side wall shaped to match the contour of said pillar, said pillar finishing trim portion side wall overlying and masking said pillar edge section and a portion of said pillar longitudinal recess, and a gasket positioned between an end region of said pillar finishing trim portion side wall and said pillar longitudinal recess in sealed relation to said pillar longitudinal recess to define part only of said pillar longitudinal recess exteriorly of said gasket as a drip channel.

4,728,146
LIFTING AND/OR SLIDING ROOF FOR INSTALLATION IN VEHICLES
Klaus-Peter Srdinko, Unterschleissheim, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany
Continuation of Ser. No. 831,858, Feb. 24, 1986, abandoned.
This application May 19, 1987, Ser. No. 53,587
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506408; Dec. 23, 1985, 3545973
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—216 **33 Claims**



1. A displaceable roof, for installation into vehicles, having a frame for seating against the underside of a roof skin of a vehicle so as to be disposed below the roof skin, a seal running along the peripheral area of a roof opening formed in the roof skin and a cover mounted on the frame for displacement between a position closing the roof opening, wherein an edge of the cover is placed on the seal, and at least one position at least partially uncovering the roof opening; wherein a clamping connection is provided as a means for connecting the frame with the roof skin by pressing the frame against the underside of the roof skin, said clamping connection comprising a trim ring having an outer portion for overlying the exterior of the roof skin and an inner portion for being secured with the frame, said frame having a recess with at least one holding detent and means lockingly engageable with said detent of said frame by being inserted through an open end of the recess for holding said inner portion of the trim ring to said frame in a manner establishing the clamping connection of the frame to the roof skin with the roof skin being disposed between the frame and the outer portion of the trim ring, wherein the frame is continuous at its underside in an area underlying the recess in a manner closing said recess from below and limiting access to said recess and said detent to via said open end.

4,728,147
LAWN CHAIR ACCESSORY
Ronald W. Dutton, 5614 Circlegate, Spring, Tex. 77373
Filed Jul. 31, 1986, Ser. No. 890,926
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—194 **1 Claim**



1. Apparatus adapted for releasably mounting to an arm of a lawn chair which comprises:
a service tray,
a rigid U-shaped clamp means sized for mounting of the service tray to the lawn chair arm,
a strap connector means disposed on said clamp means for adjustably and releasably fastening of the service tray to the chair arm independent of other fastening devices
said strap connector means includes a hook portion and a loop portion,
said clamp means having a first leg and a second leg, and
said hook portion fixedly secured to one of said legs and one end of said loop portion fixed to the other of said legs, the other end of said loop portion adapted for adjustably fastening to said hook portion to operably allow adjustable mounting of said service tray to a plurality of lawn chair arm sizes.

4,728,148
SUPPORTING STRUCTURE OF THE LUMBAR PORTION OF THE FOAM CUSHION MEMBER IN AN AUTOMOTIVE SEAT
Tetsuo Saito, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1986, Ser. No. 939,476
Int. Cl.[4] A47C *7/46*
U.S. Cl. 297—284 **6 Claims**

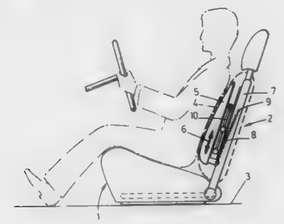
1. A structure of the foam cushion member at the lumbar support portion of an automotive seat comprising a plurality of spring members extending across the right and left sides of a frame said spring members being arranged vertically thereon, and a foam cushion member connecting to said spring members, and further having a foam block member integrally provided in the lumbar support portion of said foam cushion member by means of partially impregnating said foam block member with a foam solution for forming a hard and a soft

section therein, said impregnated portion of said foam block member corresponding to said spring member for positioning



said foam block member at a set peak line of the body pressure responsive force of said foam cushion member.

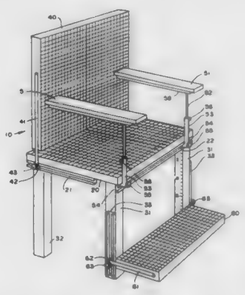
4,728,149
SEAT FOR VEHICLE, NOTABLY MOTOR VEHICLE
Marcel Neve de Mevergnies, La Pasture, 6419 Marbix-la-Tour, Belgium
Filed Oct. 21, 1985, Ser. No. 789,496
Claims priority, application Belgium, Oct. 23, 1984, PV 0/213873
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—285 **1 Claim**



1. A vehicle seat comprising:
a frame,
a seat mounted on said frame for resiliently supporting a passenger and having a natural frequency, and
a back support mounted on said frame and having a natural frequency for reciprocation with the back of the passenger only in a direction toward and away from said seat,
said back support having its natural frequency at least 1.3 times the natural frequency of said seat when bearing passengers of all weights so that said back support follows the oscillating motion of the back of the passenger with the same amplitude as the back of the passenger when the back of the passenger is subjected to vibrations caused by bumps in a road over which the vehicle seat travels.

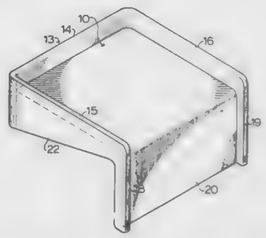
4,728,150
APPARATUS FOR WHEELCHAIR FITTINGS
Charles H. Gaudreau, Jr., 2736 Octavia St., New Orleans, La. 70115
Filed Oct. 8, 1986, Ser. No. 916,887
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—383 **5 Claims**

1. An adjustable chair for fitting a wheelchair to an individual, said adjustable chair comprising:
a seat section having an upper surface and a front edge;
a back section having a front surface which is disposed substantially perpendicularly to the upper surface of the seat section, wherein said seat section and said back section are transparent; and
means for laterally adjusting distance from the front surface of the back section to the front edge of the seat section while retaining the substantially perpendicular relation-



ship between the front surface and the back section and the upper surface of the seat section.

4,728,151
CHILD'S FEET RECEIVING DEVICE FOR USE ON A VEHICLE SEAT
Rodney G. Neufeld, Box 1685, Morden, Manitoba, Canada R0G 1J0
Filed Apr. 29, 1987, Ser. No. 43,801
Claims priority, application Canada, May 6, 1986, 508506
Int. Cl.[4] A47C *9/12*
U.S. Cl. 297—438 **11 Claims**



1. A device for resting on the seat of a vehicle and for receiving the feet of a child on the seat, the device comprising an integral unitary semirigid plastic moulding defining a generally horizontal receiving surface, and upstanding wall member surrounding said receiving surface at a rear edge and along opposed side edges thereof, a downturned apron portion at a front edge of said receiving surface and a support surface for engaging an upper surface of the seat, said support surface being inclined to said receiving surface at an acute angle thereto whereby said support surface resting on the seat said receiving surface is inclined slightly forwardly from said wall member at said rear edge toward said apron portion.

4,728,152
BOREHOLE EXTRACTION OF MINERALS
William C. Pike, Caterham, and Timothy R. Woolmington, Sunbury-on-Thames, both of England, assignors to British Petroleum Company p.l.c., London, England
Filed May 30, 1986, Ser. No. 868,723
Claims priority, application United Kingdom, Jun. 4, 1985, 8514005
Int. Cl.[4] E21B *43/24*; E21C *37/12*
U.S. Cl. 299—17 **5 Claims**

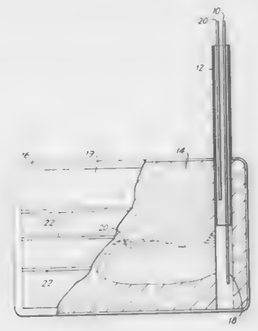
1. A method for the extraction of a mineral from an under-

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ground unconsolidated formation which method comprises the steps of:

(a) driving a casing through the overburden and initially to the bottom of the mineral bearing pay zone using a sonic vibration generator,

(b) passing a high pressure water jet head and associated supply line down through the casing so that an annulus is formed between the casing and the supply line and the jet head projects just beyond the casing,



(c) directing water from the jet head into the pay zone to cause disintegration of the latter,

(d) recovering desired product through the annulus between the piping and the casing,

(e) raising the casing with the water jet head to a different level in the pay zone when the previous level is effectively exhausted such that the jet head remains in the same operating position with respect to the casing with the jet head projecting just beyond the casing.

4,728,153

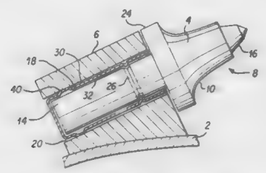
CYLINDRICAL RETAINER FOR A CUTTING BIT

Randall W. Ojanen, Bristol, Tenn., and John R. Anderson, Naugatuck, Conn., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 22, 1986, Ser. No. 944,785

Int. Cl.[4] E21C *25/12*

U.S. Cl. 299—92 **18 Claims**



1. A cylindrical retainer for use with a cutting bit having a first end which forms a cutting head and a second end which forms a cylindrical shank, said cutting bit being mountable to a bit mount by inserting said cylindrical shank into said cylindrical retainer and inserting said cylindrical retainer into a cylindrical bore of said mount, said cylindrical bore having a cylindrical surface, said cutting head being wider than the diameter of said cylindrical bore to prevent said cutting head from entering said cylindrical bore, and said cylinrical shank including a circumferential groove extending about the peripheral surface of said cylindrical shank, said cylindrical retainer comprising:

an outer cylindrical wall having a diameter which is less than the diameter of said cylindrical bore and an inner cylindrical wall having a diameter which is greater than the diameter of said cylindrical shank, the length of said walls being sufficient to completely separate said shank from said cylindrical surface, said cylindrical retainer having one end which is open and an opposite end which is closed;

means protruding from said inner cylindrical wall having a diameter which is less than the diameter of said cylindrical shank but which can be expanded by said cylindrical shank and then caused to snap into said circumferential groove, when said cylindrical shank is inserted at said open end into said cylindrical retainer, for retaining said cylindrical shank within said cylindrical retainer; and,

means protruding from said outer cylindrical wall having an effective diameter which is greater than the diameter of said cylindrical bore but which can be depressed by said cylindrical surface of said cylindrical bore and caused to bear against said cylindrical surface, when said cylindrical retainer is inserted at said closed end into said cylindrical bore, for retaining said cylindrical retainer within said cylindrical bore.

4,728,154

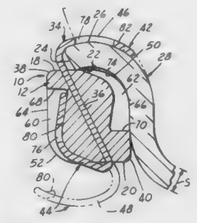
BALANCE WEIGHT FOR VEHICLE WHEEL

Brendan J. Boyle, Menlo Park, Calif., and James M. Kutt, Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Feb. 4, 1987, Ser. No. 10,697

Int. Cl.[4] B60B *13/00*

U.S. Cl. 301—5 B **11 Claims**



1. A balance weight for balancing first and second sizes of automobile wheels of the type having a tire rim of a given size range and having a generally radially extending tire bead retaining flange portion terminating in a generally axially outwardly extending flange portion, said balance weight comprising a body of heavy metallic material having first and second faces one of which is shaped to fit against the outboard corner of said rim flange portions, and a weight attachment clip cast into said body and having oppositely disposed first and second legs protruding from said first and second body faces, said first leg projecting from said first body face to define a predetermined first clearance space between said first leg and said first body face adapted to provide an attachment fit with said first size range tire rim, said second leg projecting from said second body face to define a second predetermined clearance space between said second leg and said second body face, said second clearance space being selected for fitting said balance weight to said second size range wheel rim flange portions.

4,728,155

PRESSURE MODULATOR ARRANGEMENT FOR A BOOSTING OF BRAKE FORCE AND FOR ANTILOCK CONTROL

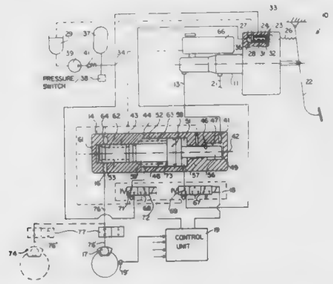
Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengeselischaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1986, Ser. No. 847,223

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3511972

Int. Cl.[4] B60T *8/44, 17/18*

U.S. Cl. 303—114 **15 Claims**



1. A pressure modulator system for use with a statically operated, power-assisted, hydraulic brake sytem of a vehicle including brake pressure control device for providing a pedal pressure, a proportional control device for providing a proportional pressure which is proportional to and substantially greater than said pedal pressure, an auxiliary pressure source, a statically operated brake circuit and antilock control unit, said pressure modulator system comprising:

a modulator housing;

a modulator piston means in said modulator housing for defining a modulator output pressure space, which can be coupled to said brake circuit, from a first driving pressure space, into which said pedal pressure can be coupled to decrease said output pressure space, from a second driving pressure, space, into which said proportional pressure can be coupled to boost decreasing of said output pressure space, and from a counterpressure space into which an auxiliary pressure can be coupled to increase said output pressure space; and

control valve means connectable to said brake pressure control device, said proportional control device, said auxiliary pressure source and said modulator housing for connecting said proportional pressure to said second driving space and relieving pressure in said counterpressure space in a normal braking position and for connecting said auxiliary pressure to said counterpressure space and relieving pressure from said second driving space in an antilocking position.

4,728,156

APPARATUS FOR MONITORING THE AUXILIARY ENERGY PRESSURE OF A SLIP-CONTROLLED BRAKE SYSTEM AND SWITCH FAILURE INDICATING ARRANGEMENT THEREFOR

Jochen Burgdorf, Offenbach-Rumpenheim, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,652

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3418042

Int. Cl.[4] B60T *8/88*

U.S. Cl. 303—92 **2 Claims**

1. Apparatus for monitoring the pressure of the auxiliary energy source of a slip-controlled brake system for a motor vehicle having vehicle wheels including wheel brakes, comprising, in combination:

a master cylinder having a cylinder housing forming at least one pressure fluid chamber;

a pedal-operated hydraulic brake booster operatively coupled to said master cylinder;

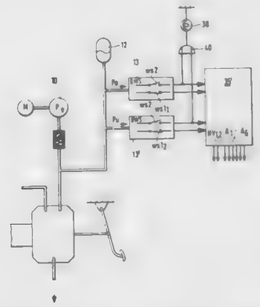
an auxiliary energy pressure source connected to said brake booster;

a plurality of wheel sensors respectively coupled to each of said vehicle wheels;

a plurality of pressure fluid lines respectively connecting one of said master cylinder and said brake booster with said wheel brakes;

a plurality of electromagnetically operated control valves respectively provided in said fluid lines;

means coupled to said sensors for providing at least one output signal indicative of wheel rotational behavior;



means responsive to said output signal for controlling said control valves to provide slip control;

a pressure-operated warning switch coupled to said auxiliary energy source and providing a warning output signal when the pressure of said auxiliary energy pressure source falls below a predetermined limit value;

means coupled to said control valves and responsive to said warning output signal for varying said slip control;

detecting means coupled to said pressure-operated warning switch for detecting a failure of said warning switch;

means coupled to said detecting means and responsive thereto for providing an error signal indicative of said failure of said warning switch; and,

wherein said pressure-operated warning switch comprises a normally open set of contacts coupled between a voltage source and a brake warning light and a normally closed set of contacts coupled between said voltage source and the means for varying said slip control.

4,728,157

EJECTABLE AUDIO COMPACT DISC CASE

Felix David, Jr., 326 Gifford Pl., Teaneck, N.J. 07666

Filed Oct. 10, 1985, Ser. No. 786,302

Int. Cl.[4] A47B *81/06;* G11B *1/02*

U.S. Cl. 312—12 **7 Claims**

1. A holder for a disk having a hole at a center thereof, and a side on which recorded data is stored, said holder comprising:

a rigid box having a top wall, a bottom wall and front and rear walls;

means for hinging said front wall to one of said top wall and said bottom wall;

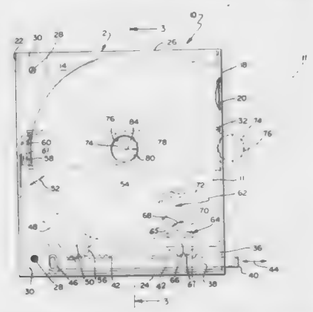
a track disposed within said rigid box;

an actuator bar having an end portion;

means for slidably mounting said actuator bar within said box for movement between a retracted position and an

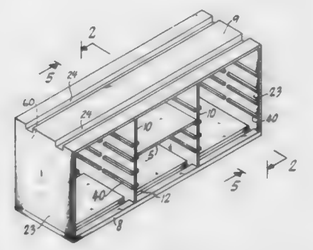
VOL 1088 ISS 1 MR 1 1988 UMI

extended position in which said end portion projects beyond said front wall;
a slide member slidably disposed with in said track;
a spindle pivotally mounted on said slide member;
means for permitting movement of said spindle between an upper location and a lower location, said spindle being configured to conform to said hole of said disc;
said slide member being slidable along said track to carry said spindly between a retracted position within said rigid box, and an extended position adjacent said front wall of said rigid box;
means for displacing said spindle into said upper location when said slide member is in said retracted position and



into said lower location when said slide member is in said extended position;
a drive member;
cooperating means on said actuator bar and said drive member for rotating said actuator bar about a first end thereof in response to motion of said actuator bar;
means at a second end of said drive member for moving said slide member between said retracted and extended positions in response to rotation of said drive member; and
said cooperating means including means for moving said slide member toward said extended position in response to depression of said end portion projecting beyond said front wall, thereby bringing said spindle to said extended position with said spindle in said lower location.

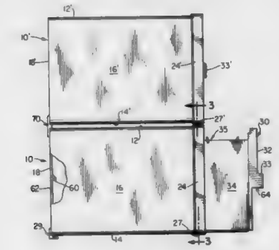
4,728,158
MODULAR RACK STORAGE SYSTEM AND ITS METHOD OF ASSEMBLY
Ronald J. D'Elia, Greenwich, and Philip N. DeVries, Roxbury, both of Conn., assignors to Delco Associates, Inc., Greenwich, Conn.
Filed May 9, 1985, Ser. No. 732,383
Int. Cl.[4] A47B *87/02*
U.S. Cl. 312—108 **22 Claims**



1. A modular storage system comprising
an elongated base part having two spaced continuous channels extending generally parallel to one another longitudinally of said base part, said base part including a longitudinal rim extending along each channel and projecting over a portion of the width thereof, the rims of the two channels projecting in opposite directions towards one another,
an upright member extendable transversely of said base part, said upright member having a lower edge and including a pair of spaced, downwardly projecting lug means at said lower edge respectively engaged in said channels in said base part, said pair of lug means facing in opposite directions away from one another and being spaced apart in relation to the spacing of said channels so as to be fitted with interference in said channels beneath said rims with the upright member extending in a vertical plane disposed transversely of the base part,
said lug means being freely insertable into and removable from said channels, without interference from said rims, when the upright member extends in a vertical plane which is angularly offset around a vertical axis from the vertical plane extending transversely of the longitudinal channels, said lug means having engaging surfaces when operatively engaged in said channels with interference fit when the vertical plane containing the upright member extends transversely of the longitudinal channels to elastically and tightly hold said upright member transversely of said longitudinal channels,
a back member
two side members,
said back member having upper and lower edges extending longitudinally of said base part, said side members having front and rear edges, said upright member having front and rear edges, and
means extending longitudinally along said upper and lower edges of the back member and the rear edges of said upright and side members for resiliently securing the same together in snap-engagement to lock said side members and said upright member to said back member as a rigid assembly on said base part, said means including respective lips and recesses which cooperate so that the lips on one member can engage in the recesses of another member with snap-fit, the parts with the lips including resilient portions on which said lips are formed to provide snap action for engaging lips in the respective recesses,
the snap engagement of said upright member and said back member acting in combination with the interference fit of the lug means in said channels to resiliently secure the upright member on said rigid assembly on said base part at any selected location along the length of said base part.

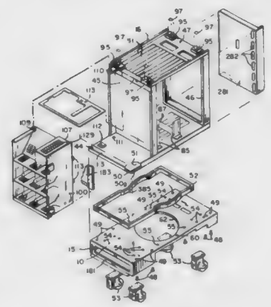
4,728,159
STACKABLE FILE STORAGE UNIT
Jack Solomon, Long Beach; Monte L. Levin, New York; Andrzej L. Soporowski, Freeport, and Michael D. Jones, Rockville Center, all of N.Y., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Jul. 11, 1985, Ser. No. 754,372
Int. Cl.[4] A47B *67/04*
U.S. Cl. 312—111 **12 Claims**

1. A file storage unit comprising
a frame having a top, bottom, back and two side walls, said frame having an open front, the back wall of said frame having a hand opening at a certain distance above the bottom wall and being of sufficient size to receive a user's hand, the upper edge of the hand opening being bordered by a flange projecting inwardly of said frame;
a reinforcing rim located about the periphery of the open front of said frame ; and
a drawer having at least two spaced-apart, downwardly projecting narrow ridges, said drawer being slidable into the open front of said frame with the ridges sliding along the interior of the bottom wall of said frame, a reinforced drawer handle extending from a front panel of said drawer



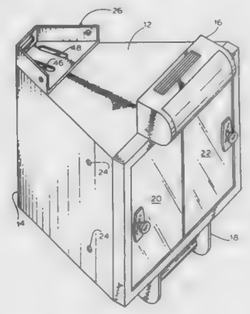
at approximately the same distance above the bottom wall of the frame as the flange of the hand opening.

4,728,160
CABINET FOR A COMPUTER ASSEMBLY
Robert M. Mondor, Sutton; Mark Howards, Belmont; Charles R. Barker, III, Harvard, and Alan R. Selling, Franklin, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 22, 1986, Ser. No. 922,095
Int. Cl.[4] A47B *77/08*
U.S. Cl. 312—236 **45 Claims**



1. A cabinet adapted for housing a computer assembly in a relatively compact manner, wherein said assembly is of a type having a power supply, a central processor unit, and mass storage means, comprising:
a base;
a frame secured to said base;
outer panels removably positioned on said frame; means for mounting said power supply on said frame whereby said power supply is carried by said frame;
means for mounting said central processor unit on said frame, whereby said central processor unit is carried by said frame;
means for mounting said mass access and storage means on said frame, whereby said means are carried by said frame; and
means for cooling said components of said assembly, such that the central processor unit, the power supply, and the mass storage means are provided adequate cooling, wherein said cooling means include a fan mounted on said base and air paths positioned in said frame whereby air for cooling is brought through and over said central processor unit, the power supply, and the mass storage means by said fan, thereby cooling these components of the computer assembly, wherein said frame includes a front unit pivotally positioned thereon, said front unit swingable from a closed position, where said front unit is in line with the rest of said frame, and an open position, where said front unit is swung away from the rest of said frame, and said mounting means for mounting said mass storage means and said mass storage means are disposed in said front unit, whereby the rear portions of said mass storage means are accessible when said front unit in its open position.

4,728,161
CORNER CABINET
Roy D. Murphy, 140 W. Prima Vista Blvd., Port St.Lucie, Fla. 33452
Filed Jul. 24, 1986, Ser. No. 888,853
Int. Cl.[4] A47B *97/00*
U.S. Cl. 312—238 **10 Claims**



1. A corner cabinet, comprising:
a. a cabinet housing having two side walls and a roof interconnecting upper portions of said side walls, said roof having inner and outer surfaces, said side walls disposed at such an angle to one another as to facilitate the mounting of said cabinet housing to walls forming a corner;
b. a mounting bracket slidably and adjustably affixed to said outer surface of said roof of said cabinet housing, said mounting bracket comprising a plurality of upstanding flange portions, said upstanding flange portions being partially engageable to said walls forming said corner, said flange portions having means for enabling attachment to said walls forming a corner, said mounting bracket further comprising a mounting bracket floor, said plurality of upstanding flange portions being integrally and substantially orthoganally attached to said mounting bracket floor;
c. a fastening means for slidably and adjustably affixing said mounting bracket to said outer surface of said roof; and,
d. at least one elongated fastener receiving slot formed in said mounting bracket floor, said fastener receiving slot being alignable with at least one through-extending aperture formed in said roof of said cabinet housing, said fastening means being positioned through and about said fastener receiving slot and said through-extending aperture to effect a fixed securement of said mounting bracket to said housing.

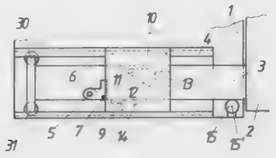
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4,728,162

DEVICE FOR THE COMPENSATED GUIDANCE AND GRADUATED OPENING OF THE DOOR OF A VERTICAL FILING CABINET FOR SUSPENDED PLANS

Alain Bruneau, Montferrand le Chateau, France, assignor to Alpia S.A., Besancon, France

Filed Feb. 20, 1987, Ser. No. 17,141
Claims priority, application France, Mar. 12, 1986, 86 04116
Int. Cl.[4] A47B *88/16*
U.S. Cl. 312—333 **13 Claims**



1. A device for the compensated guidance and graduated opening of the pending part of a cabinet composed of a fixed part, namely a frame, and of a movable part, namely a door, which, supported by at least one guide arm, moves away from the cabinet in a plane parallel to its largest wall, the guide arms each sliding in a slide track fastened to the frame, and means being provided for graduating the opening of the door, wherein each guide arm (3) is equipped, at its end opposite the door, with at least one roller bearing on the runways of the corresponding slide track (4) fastened to the frame (1), wherein each slide track has, on its end nearest the door, at least one track roller fastened to the frame and controlling the guide arm in its slide track, wherein blocking means for said door comprise a magnetic catch keeping the door in a closed position, a first stop (6) movable on the guide arm and a second stop (13) fastened to a plate (10) partially closing off the respective slide track, and wherein the first movable stop interacts with an ejector (12) controlled by the movement of the door so as to assume two positions corresponding to two programmed degrees of opening of the door,

said door (2) of the cabinet being supported by two guide arms (3), wherein at least one of these guide arms has on its free end two guide rollers (30, 31), on its lower face a limit stop (9) and, on its lateral face directed towards the inside of the filing cabinet, a journal (5), on which is articulated a movable stop (6) having a recess (16), and wherein a spring stud (7) penetrating into a hole (8) in the guide arm is fastened to the movable stop.

4,728,163

DUAL GENDER ELECTRICAL PLUG

Bruce E. Kittinger, 400 S. Howes St., Ste 3, Fort Collins, Colo. 80521; Patrick J. Burns, 1718 Burnwood Dr., Fort Collins, Colo. 80525, and James M. Kincaid, III, 3124 Placer St., Fort Collins, Colo. 80526

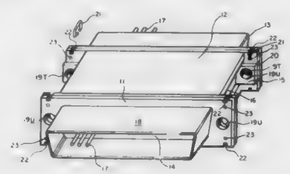
Filed Apr. 25, 1985, Ser. No. 727,113
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—172 **11 Claims**

1. An electrical plug adaptable by the user for use as either a male or female plug comprising:

a male member having electrically conductive male contacts embedded in parallel in electrically non-conductive support means of predetermined thickness, said male contacts being adapted, on one end, for connection to electrical wire conductors and extending, on the other end, a distance sufficient to extend through a female member and beyond a predetermined distance;

a female member having electrically conductive parallel sleeve means embedded in non-conductive support means of predetermined thickness and in predetermined positions within the non-conductive support means to permit the male contacts and the male support means to penetrate, and electrically contact the sleeve means in the female support means;

and positioning means adapted to position the male and



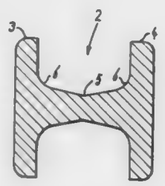
female members adjacently to provide a male plug means and at a predetermined distance apart suitable for the combination of male support means and female support means to be utilized as a female plug.

4,728,164

ELECTRICAL CONTACT PIN FOR PRINTED CIRCUIT BOARD

Johan C. W. Lemmens, Udenhout, and Hendricus J. A. Van Ierland, Tilburg, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1986, Ser. No. 885,045
Claims priority, application Netherlands, Jul. 16, 1985, 8502046
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—870 **3 Claims**



1. An electrical pin for mounting in a hole of an electrical component such as a printed circuit board, said pin comprising a longitudinal contact section which interacts with the hole when inserted therein, said contact section being of generally H-shape in cross-section formed by four projecting fins extending generally parallel to the longitudinal axis of the pin and interconnected by a central crossbar along the length of the contact section, said fins and crossbar defining two longitudinal recesses disposed on both sides of the crossbar, each longitudinal recess having a V-shaped floor along said crossbar with the V-shape extending parallel to the longitudinal axis of the pin, the fins on both sides of each longitudinal recess being of the same height and thickness and the transition from the V-shaped floor to the pins on both sides of each recess being rounded.

4,728,165

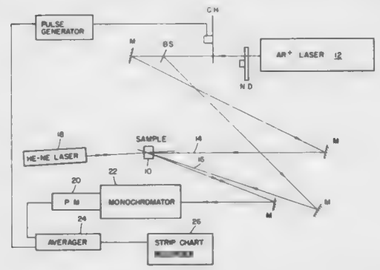
SUPERIMPOSED FAST TRANSIENT AND PERMANENT HOLOGRAPHIC GRATINGS

Richard C. Powell; Edward G. Behrens, and Frederic M. Durville, all of Stillwater, Okla., assignors to Research Corporation, N.Y.

Filed Nov. 5, 1986, Ser. No. 927,892
Int. Cl.[4] G03H *1/02*; G03C *1/72*
U.S. Cl. 350—364 **10 Claims**

1. A method of producing a superimposed fast transient grating on a permanent holographic grating which provides

high scattering ability, fast modulation response times, and the capability of writing and erasing signals therein, comprising doping a glass host with trivalent rare earth ions, and placing



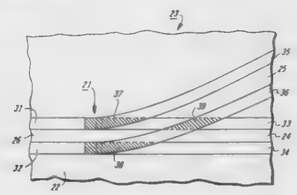
the doped glass host in the crossed field of two coherent radiation beams to resonantly pump the trivalent rare earth ions at a frequency in resonance with one of the absorption transitions of the rare earth ions.

4,728,166

BRANCHING ELECTRO-OPTIC WAVEGUIDES

William D. Turner, San Marino, and Robert A. Sprague, Saratoga, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1982, Ser. No. 376,979
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 **9 Claims**



1. An optical waveguide comprising

an electro-optic element, and

a multiple layer electrode structure located on one side of said electro-optic element, said electrode structure being intimately associated with said electro-optic element for producing electric fringe fields to create a plurality of waveguiding channels within said electro-optic element;

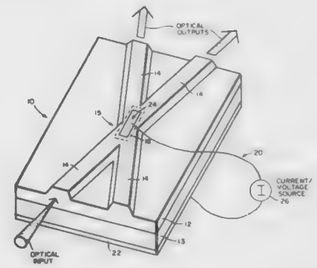
said electrode structure having at least two electrically independent pairs of electrodes which reside within first and second layers, respectively, of said electrode structure and which branch out from one another as viewed from the electro-optic element, said layers of said electrode structure being disposed one above the other relative to said electro-optic element.

4,728,167

ELECTRICALLY CONTROLLED INTEGRATED OPTICAL SWITCH

Richard A. Soref, Newton Centre, and Joseph P. Lorenzo, Stow, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force., Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,895
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **8 Claims**



1. An electrically-controlled integrated optical switch, comprising:

a body made up entirely of crystalline silicon,

an X-like channel waveguide structure having a first leg and a second leg formed within said silicon body, said first and said second legs intersecting to form an intersection cross-over region of predetermined size; and

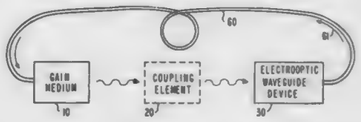
means associated with said body for altering the index of refraction of said silicon body and therefore changing the cross-coupling of light between said first leg and said second leg of said X-like channel waveguide structure.

4,728,168

COMPOSITE CAVITY LASER UTILIZING AN INTRA-CAVITY ELECTROOPTIC WAVEGUIDE DEVICE

Rodney C. Alferness, Holmdel; Gadi Eisenstein, Middletown, and Steven K. Korotky, Toms River, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 572,634, Jan. 20, 1984, Pat. No. 4,667,331.
This application Nov. 26, 1986, Ser. No. 935,028
Int. Cl.[4] H01S *3/10*
U.S. Cl. 350—96.14 **6 Claims**



1. An optoelectronic device for generating optical signals including an electrooptic waveguide means being electrically controllable for varying a predetermined characteristic therein and including at least one optical waveguide, a gain medium being optically coupled to a first end surface of the at least one optical waveguide, means being optically coupled to both the gain medium and a second end surface opposite said first end surface of the at least one optical waveguide for transferring optical signals between the electrooptic waveguide means and

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the gain medium such that a single resonant optical cavity is formed in the optoelectronic device.

4,728,169

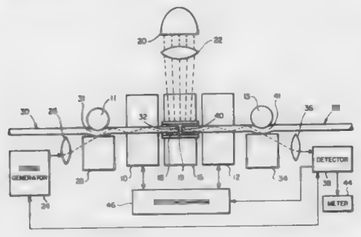
METHODS AND APPARATUS FOR OPTICAL FIBER SYSTEMS

Bruce D. Campbell, Portola Valley; James T. Triplett, Livermore, and Richard E. Tylor, Fremont, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Division of Ser. No. 437,053, Oct. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 370,321, Apr. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,079, Apr. 27, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 602,242

Int. Cl.[4] G02B 6/26

U.S. Cl. 350—96.15 34 Claims



1. A method of withdrawing an optical signal from a core of an optical fiber, the fiber comprising the core, a cladding, and a buffer, comprising the steps of:

bending a portion of the optical fiber about a bend radius sufficiently small such that core light can be withdrawn from the fiber core at the bent fiber portion by using an optical coupler, the buffer having a refractive index greater than the cladding;

withdrawing part of the optical signal from the optical fiber core through the buffer and into the optical coupler at the bent fiber portion; and

detecting the withdrawn optical signal part.

4,728,170

SINGLE MODE OPTICAL FIBRE ATTENUATORS

Alexander J. Robertson, Gu Dunmow, United Kingdom, assignor to Standard Telephones and Cables Public Limited Co., London, England

Filed Apr. 17, 1985, Ser. No. 724,112

Claims priority, application United Kingdom, May 11, 1984, 8412034

Int. Cl.[4] G02B 6/26

U.S. Cl. 350—96.15 8 Claims



1. A single mode optical fibre preset attenuator which includes, fusion spliced between an end of a first length of single mode glass optical fibre and an end of a second length of single mode glass optical fibre, a stub length of glass fibre that possesses no internal waveguiding structure.

4,728,171

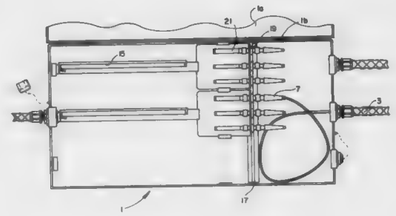
SYSTEM FOR USE IN TEMPORARY REPAIR OF MULTIPLE FIBER CABLE

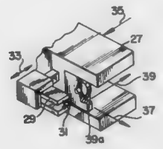
Philip W. Schofield, Geneva, Ill.; Donald W. Duda, Williams Bay, Wis.; Peter Chang, Lisle, and Darrin J. Bergman, Naperville, both of Ill., assignors to Amphenol Corporation, Wallingford, Conn.

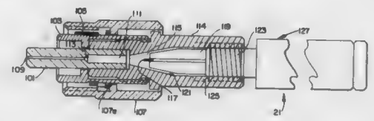
Filed Oct. 20, 1986, Ser. No. 921,292

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 8 Claims







1. A fiber optic cable restoration system for restoring severed fiber optic cables, comprising: at least two hermetically sealable restoration connector containers having lids to permit access to the interiors thereof; said containers interconnected by at least one fiber optic cable containing multiple optical fibers extending therein; each fiber of said cable terminated by a respective fiber optic connector, with each of said connectors mounted connected to adapters mounted on a panel in said respective containers for connection to compatible respective connectors through the adapters; cable attachment means arranged on each container for passing the end of a severed fiber optic cable into each one of said containers and attaching the severed cable in a hermetically sealed manner to the respective connector; and a plurality of temporary fiber terminating connectors, corresponding to the number of fibers in the respective severed cable for terminating the respective severed fibers and for connecting the thus terminated fibers to the connectors and fibers mounted on said panel.

4,728,172

SUBASSEMBLIES FOR DISPLAYS HAVING PIXELS WITH TWO PORTIONS AND CAPACITORS

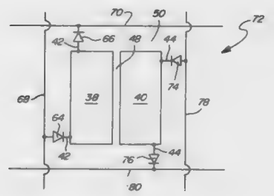
Vincent D. Cannella, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 639,001, Aug. 8, 1984. This application Oct. 14, 1986, Ser. No. 918,741

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.[4] G02F 1/133

U.S. Cl. 350—332 7 Claims



1. A pixel subassembly for use in a light influencing display having a plurality of pixels wherein at least one of the pixels has an auxiliary capacitance arranged to be electrically in parallel with the pixel capacitance of said one pixel subassembly in the completed display, the light influencing display comprising:

a. first and second substrates substantially parallel to and spaced from each other;

b. first address lines formed on the first substrate;

c. second address lines formed on the first substrate and insulated from said first address lines; and

d. said at least one pixel subassembly including:

(1) a segmented first electrode on the first substrate having at least two spaced apart electrode portions adapted to be at different polarity, with one of the first electrode portions being coupled through first isolation device means to one of the first address lines and with another one of the first electrode portions being coupled through second isolation device means to one of the second address lines;

(2) a common second electrode on the second substrate, spaced from, insulated from, and facing the segmented first electrode, the common second electrode being electrically insulated from all external circuit connections and from all other pixel subassemblies;

(3) light influencing display material between and in contact with the segmented first electrode and the common second electrode, the segmented first electrode, the common second electrode, and the light influencing material forming the pixel capacitance of the completed display; and

(4) an auxiliary, third, capacitance electrode spaced from and facing the segmented first electrode opposite the light influencing material, the auxiliary, third, capacitance electrode being on the first substrate, separated from the segmented first electrode by a solid electrically insulating layer, and electrically insulated from all external circuit connections and from all other pixels, the third capacitance, auxiliary electrode and the segmented first electrode forming the auxiliary capacitance in parallel with the pixel capacitance of the completed display.

4,728,173

OPTICAL FILTER FOR PROTECTIVE WELDING LENS ASSEMBLIES

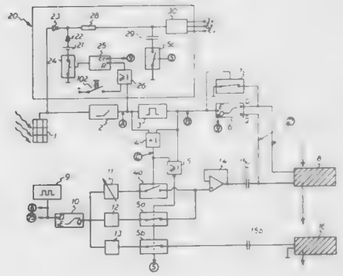
Peter Toth, Smålandsgatan 9, S-293 00 Olofström, Sweden

Filed Feb. 22, 1985, Ser. No. 704,189

Claims priority, application Sweden, Feb. 24, 1984, 8401003

Int. Cl.[4] G02F 1/133; B23K 9/22

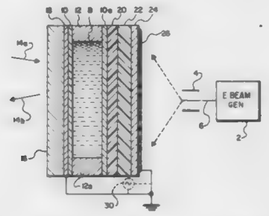
U.S. Cl. 350—332 6 Claims



1. An optical filter in a protective welding lens assembly having a predetermined field of vision, comprising two parallel electro-optical cells, each of which covers substantially the entire field of vision of the protective welding lens assembly and each of which has a light transmission which is dependent on the voltage applied across two transparent electrodes included in the respective cell and having intermediate layers of liquid crystals, one of said cells being light-transmitting when voltage is applied and light-absorbing when voltage is not applied, the other of said cells being light-transmitting when substantially no voltage is applied and light-absorbing when voltage is applied, wherein at least a first of said cells is nematic with an admixture of dye molecules with anisotropic light absorption, the optical filter further comprising a contrast-enhancing filter sheet which also covers said entire field of vision of the protective welding lens assembly, said filter sheet being disposed in the ray path of the cells and allowing transmission of visible light within a wave-length range in which the first cell is absorbing light in its absorbing condition, and said filter sheet preventing transmission of light within a wavelength range within which the first cell is transmitting light in its absorbing condition, said optical filter having an electric circuit for controlling the transmission of the optical filter by selecting voltages for applying across the electro-optical cells, said electric circuit having a timing circuit for applying a voltage of a short duration which is higher than the subsequent working voltage to said other cell when the optical filter is caused to switch from the transmitting to the absorbing condition, the electric circuit further comprising a high-pass filter and a photodetector whose output serves a voltage supply for said electric circuit and, via said high-pass filter, is connected to the trigger input of the timing circuit for triggering the timing circuit when the photodetector receives light modulated by frequencies above the limit frequency of the high-pass filter.

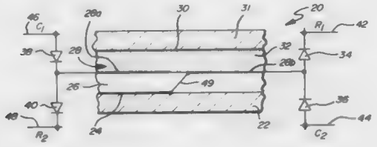
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4,728,174
ELECTRON BEAM ADDRESSED LIQUID CRYSTAL LIGHT VALVE
Jan Grinberg, Los Angeles; Nobuo J. Koda, Vista; Phillip G. Reif, Chatsworth; William P. Bleha, Jr., Carlsbad; Murray S. Welkowsky, Chatsworth, and Arno G. Ledebuhr, Pleasanton, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 6, 1986, Ser. No. 927,580
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 **19 Claims**



1. A liquid crystal light valve (LCLV) adapted to be addressed by a scanning electron beam, comprising:
a liquid crystal layer adapted to be addressed by a readout optical beam,
a flat electrically resistive membrane supported in proximity to the liquid crystal layer on the opposite side thereof from the readout beam,
a layer of partially conductive material supported by the membrane and adapted to be addressed by the electron beam, the accumulation of electric charge in the partially conductive material from the electron beam producing a voltage across the liquid crystal,
means for collecting charge received by the partially conductive layer as a result of electron beam scanning of the layer, and
circuit means connected to dissipate charge received by the collecting means from the partially conductive layer,
the resistance of at least one of the liquid crystal light valve layers being high enough to produce a substantially AC voltage across the liquid crystal following each electron beam scan.

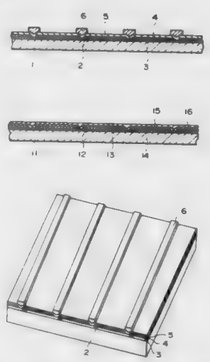
4,728,175
LIQUID CRYSTAL DISPLAY HAVING PIXELS WITH AUXILIARY CAPACITANCE
Yair Baron, Oakland, Mich., assignor to Ovonic Imaging Systems, Inc., Troy, Mich.
Filed Oct. 9, 1986, Ser. No. 916,914
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—336 **31 Claims**



1. A light influencing display including at least one pixel having a pixel capacitance and an auxiliary capacitance, said pixel comprising:
a first electrode including at least two spaced apart electrode portions;
a second electrode spaced from and facing said first electrode portions in substantially parallel relation thereto, said second electrode also being electrically insulated from all external circuit connections and from all other pixel electrodes, said first and second electrodes being arranged to allow light influencing display material to be placed therebetween; and
means, electrically connected to said first electrode for providing said auxiliary capacitance.

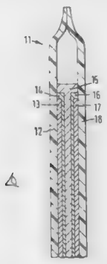
26. A method for constructing a pixel in a light influencing display having a plurality of pixels comprising the steps of:
(a) forming above a substrate a first conductor for providing current to said pixel and to at least one other pixel of said display, at least a first auxiliary capacitance electrode for said pixel, and at least one isolation device associated with said pixel;
(b) providing a layer of insulating material which extends over substantial portions of said conductor and substantial portions of said electrode and which substantially protects and isolates said isolation device from unintended contact with other conductors in said display; and
(c) providing on top of said layer at least a portion of a second conductor for providing current to said pixel and to at least one other pixel of said display arranged so as to cross said first conductor, and a first portion of a pixel electrode disposed at least in part above said first auxiliary electrode for forming a first auxiliary pixel capacitance therewith,
whereby said layer of insulating material performs at least three distinct functions, namely insulating said first and second conductors from one another at the location where they cross, acting as the dielectric material of said auxiliary pixel capacitance, and substantially protecting and isolating said isolation device.

4,728,176
FERROELECTRIC LIQUID CRYSTAL DEVICE WITH METALLIC AUXILIARY ELECTRODES PROVIDED ADJACENT TO THE TRANSPARENT ELECTRODES
Akira Tsuboyama, and Hiroyuki Kitayama, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 14, 1986, Ser. No. 918,377
Claims priority, application Japan, Oct. 17, 1985, 60-229973
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **15 Claims**



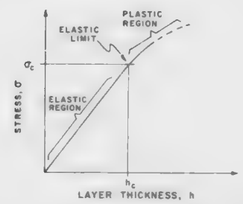
1. In a ferroelectric liquid crystal device having a cell structure comprising two base plates each provided with transparent electrodes, and a ferroelectric liquid crystal disposed between the base plates; the improvement wherein an auxiliary layer is provided adjacent to the transparent electrode; said auxiliary layer comprising insulating films and auxiliary electrodes disposed alternately; said auxiliary electrodes being respectively connected to the transparent electrodes.

4,728,177
ELECTROCHROMIC DEVICE
Mino Green, London, United Kingdom, assignor to National Research Development Corporation, London, England
Filed Sep. 4, 1985, Ser. No. 772,456
Claims priority, application United Kingdom, Sep. 4, 1984, 8422261
Int. Cl.[4] G02F *1/01*; G06K *7/14*
U.S. Cl. 350—357 **20 Claims**



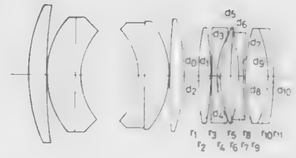
1. An electrochromic device comprising at least one electrochromic zone and means for selectively supplying to and withdrawing from said zone guest atoms which produce a colour change in said zone, which means is substantially inoperable at room temperature but is operable at elevated temperature.

4,728,178
FACETED MAGNETO-OPTICAL GARNET LAYER AND LIGHT MODULATOR USING THE SAME
Devlin M. Gualtieri, Ledgewood, and Paul F. Tumelty, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 627,013, Jul. 2, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 832,276
Int. Cl.[4] G02F *1/09*; G11B *7/24*
U.S. Cl. 350—377 **8 Claims**



1. A magneto-optical element comprising a magnetic garnet layer on a crystalline substrate, characterized in that the lattice constant of said garnet layer exceeds the lattice constant of the substrate by a least about 0.5%, and wherein the thickness of said garnet layer is such that the lattice constant mismatch is effective to produce stress between the substrate and said garnet layer that exceeds the critical stress whereby stress no longer increases linearly with said garnet layer thickness and garnet layer deformation becoming plastic with facets forming.

4,728,179
REAR CONVERSION LENS SYSTEM
Hikaru Hayashi, Nagano, and Hiroshi Takase, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jun. 7, 1985, Ser. No. 742,522
Claims priority, application Japan, Jun. 8, 1984, 59-116575
Int. Cl.[4] G02B *9/60*
U.S. Cl. 350—465 **7 Claims**



1. A rear conversion lens system comprising a front lens group and a rear lens group in the order from the object side and said front lens groups comprising a first lens component arranged as a biconvex lens, a second lens component arranged as a negative lens having a surface with a small radius of curvature on the image side, and a third lens component arranged as a positive meniscus lens convex toward the object side, and said rear lens group comprising a fourth lens component arranged as a biconcave lens, and a fifth lens component arranged as a positive lens component formed that the foremost surface thereof is convex toward the object side and the rearmost surface thereof is convex toward the image side, said rear conversion lens system having a magnification higher than 1.6 and fulfilling the conditions (1) and (2) shown below:

$$-0.2 < \frac{r_2 + r_1}{r_2 - r_1} < 0.2 \quad (1)$$

$$-3.0 < \frac{r_6 + r_3}{r_6 - r_3} < -0.5 \quad (2)$$

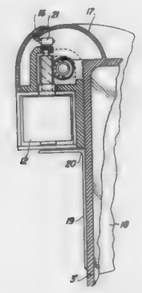
where, reference symbols r_1 and r_2 respectively represent radii of curvature of the surfaces on the object side and on the image side of the first lens component, reference symbol r_3 represents the radius of curvature of the surface on the object side of the second lens component, and reference symbol r_6 represents the radius of curvature of the surface on the image side of the third lens component.

4,728,180
REAR VIEW MIRROR WITH TWO MIRRORS JOINED BY PIVOT MEANS COVERED BY A HOUSING
Miroslaw Janowicz, Schöneberg Feurigstrasse 46, 1000 Berlin 62, Fed. Rep. of Germany
Filed Jul. 31, 1986, Ser. No. 891,149
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600869
Int. Cl.[4] G02B *5/08, 7/18*; B60R *1/06, 1/08*
U.S. Cl. 350—626 **3 Claims**

1. A side rearview mirror for an automotive vehicle comprising:
a first mirror mounted on said vehicle;
a second mirror mounted in a stored position behind the first mirror;
pivot means disposed proximate a corner of said first mirrors and connected between said first and second mirrors for pivoting said second mirror out from behind said first mirror into a use position adjacent the first mirror; drive means for operating said pivot means; and a housing for covering said pivot means and said drive means, said housing comprising a first portion connected to said first mirror and a second portion connected to said second

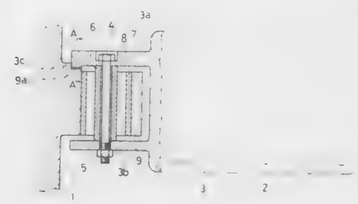
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mirror, said first mirror and a second portion connected to said second mirror, said first and second housing portions



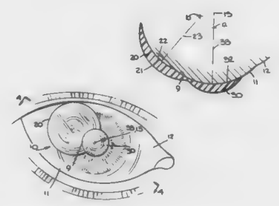
being arranged to pivot adjacent and relative to one another as said second mirror pivots relative to said first mirror between said stored and use positions.

4,728,181
SHOCK ABSORBING APPARATUS FOR A DOOR MIRROR OF AUTOMOBILES
Mikio Kakinuma, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Jul. 24, 1985, Ser. No. 758,459
Claims priority, application Japan, Jan. 22, 1985, 60-8541; Apr. 24, 1985, 60-61382[U]
Int. Cl.[4] B60R *1/06*; F16C *11/12*; G02B *7/18*
U.S. Cl. 350—632 **7 Claims**



1. A shock absorbing apparatus for a door mirror of an automobile comprising:
an outer cylinder;
an inner cylinder rotatably mounted about a supporting axis and disposed within said outer cylinder, said inner cylinder having a length which is longer in the axial direction than that of said outer cylinder;
an upper flange and a lower flange respectively mounted on either one of a door or a mirror case for defining said axis between said upper flange and said lower flange, the opposed ends of said inner cylinder being fastened to said upper and lower flanges;
a shock absorbing member fixed to and disposed between the outer and inner cylinders; and
means for biasing the mirror case to a normal position so that upon impact to the mirror case rotation of the mirror case occurs to the extent that the shock absorbing member is movable due to its resiliency.

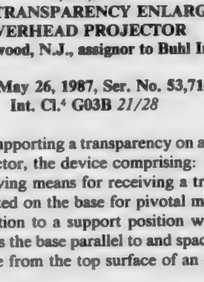
4,728,182
BI-FOCAL CONTACT LENS
Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y. 11005
Filed Nov. 25, 1985, Ser. No. 801,604
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—161 **13 Claims**



1. A bi-focal contact lens of soft polymeric material comprising:
a first lens portion having a posterior surface curved to fit the cornea of a patient to which the lens is applied with a tendency for said first lens portion to remain centered thereon, said first lens portion being powered on the anterior surface thereof for distance vision with respect to the cornea of the patient;
a second lens portion integral with said first lens portion and having a posterior surface also curved to fit said cornea of said patient with a tendency for said second lens portion to remain centered thereon when it is applied to said cornea, said second lens portion being powered on the anterior surface thereof for near vision with respect to such cornea, said second lens portion being located with respect to said first lens portion such that part of said second lens portion extends into one quadrant of said first lens portion and the remainder of said second lens portion extends outwardly beyond the periphery of said first lens portion; and
said lens being adapted to be shifted on the eyeball horizontally between a first position in which said first lens portion is seated on and centered with respect to said cornea and said second lens portion is horizontally spaced from the optical axis of said first lens portion and a second position in which said second lens portion is seated on and centered with respect to said cornea and said first lens portion is horizontally spaced from the optical axis of said second lens portion, said lens being adapted to be shifted horizontally between said first and second positions thereof by horizontal movement of the eyeball engaging said lens with a respective corner of the eye, and said lens being adapted to be only rotated about the optical axis of the seated one of said lens portions and not be shifted vertically, in response to up or down movement of the eyeball engaging said lens with an eyelid.

4,728,183
OPHTHALMIC LENS FOR OBSERVING THE FUNDUS OF THE EYE
Gregory L. Heacock, Bellevue, Wash.; Martin A. Mainster, Lenexa, Kans., and Phillip J. Erickson, Kirkland, Wash., assignors to Ocular Instruments, Inc., Bellevue, Wash.
Filed Oct. 1, 1986, Ser. No. 914,007
Int. Cl.[4] A61B *3/10*; G02B *3/04*; G02C *7/04*
U.S. Cl. 351—219 **9 Claims**

1. An ophthalmic lens for observing the fundus of the eye comprising:
a contact lens having a posterior surface and an anterior surface, said posterior surface having a radius of curvature substantially the same as the anterior surface of a cornea, the anterior surface of the contact lens having a radius of curvature such that the light rays emerging from the patient's eye through the crystalline lens and cornea are substantially parallel as they exit in an anterior direction from the contact lens,
an entry lens positioned anterior to the contact lens, the optical axis of the contact lens and said entry lens being



substantially coincident, said entry lens being aspheric, the posterior and anterior surfaces of said entry lens being constructed and said entry lens being spaced from said contact lens so as to collect said parallel light rays emerging from the contact lens and produce an aerial image anterior to and in close proximity to the entry lens, the surfaces of said entry lens being defined by the formula:

$$Z = \frac{CK^2}{1 + \sqrt{1 - C^2EK^2}},$$

wherein

$C=(1/R)$,

$E=b+1$,

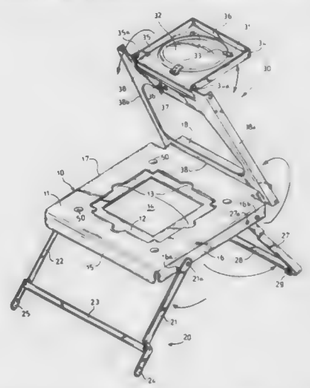
and

$K^2=x^2+y^2$,

wherein for the anterior surface of the lens R ranges from 14 mm to 50 mm and b ranges from −54 to −4, and wherein the posterior surface of said lens, R ranges from 10 mm to 25 mm and b ranges from −0.6 to −2, and
holder means for interconnecting and fixing said lenses relative to each other.

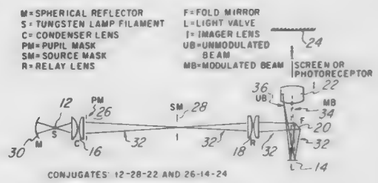
4,728,184
FOLDABLE TRANSPARENCY ENLARGER FOR OVERHEAD PROJECTOR
Henry Kyhl, Englewood, N.J., assignor to Buhl Industries, Inc., Fair Lawn, N.J.
Filed May 26, 1987, Ser. No. 53,714
Int. Cl.[4] G03B *21/28*
U.S. Cl. 353—96 **7 Claims**

1. A device for supporting a transparency on a top surface of an overhead projector, the device comprising:
a planar base having means for receiving a transparency;
leg means mounted on the base for pivotal movement from a storage position to a support position wherein the leg means supports the base parallel to and spaced a predetermined distance from the top surface of an overhead projector;
lens holding means pivotally mounted on the base and having a planar lens holding member movable from a storage position to a working position wherein the lens holding member is parallel to and spaced from the base in alignment with the transparency receiving means;



whereby the device is foldable into a desired working configuration and is collapsible into a compact structure for storage.

4,728,185
IMAGING SYSTEM
David A. Thomas, Columbia, Md., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 752,227, Jul. 3, 1985, abandoned. This application Feb. 20, 1987, Ser. No. 18,795
Int. Cl.[4] G03B *21/00*
U.S. Cl. 353—122 **9 Claims**



1. An optical system for a light valve, comprising:
(a) a source of light;
(b) a lens system, said lens system directing a beam of light from said source onto a light valve;
(c) said light valve reflecting said beam, with the portion of said reflected beam unmodulated by said light valve forming an image of said source plus diffraction orders at a first region in a plane and with the portion of said reflected beam modulated by said light valve forming an image of said source at a second region in said plane, said first and second regions disjoint; and
(d) an imaging system located at said plane, said imaging system imaging said light valve onto a receptor with said reflected beam.

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4,728,186

UNEVEN-SURFACE DATA DETECTION APPARATUS

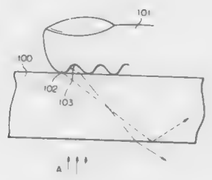
Shin Eguchi, Atsugi; Seigo Igaki, Inagi; Hironori Yahagi, Yokohama; Fumio Yamagishi, Ebina; Hiroyuki Ikeda, Yokohama, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 27, 1986, Ser. No. 833,276

Claims priority, application Japan, Mar. 3, 1985, 60-041437; Mar. 25, 1985, 60-059801; Aug. 20, 1985, 60-181066; Sep. 27, 1985, 60-212571; Sep. 27, 1985, 60-212568; Sep. 27, 1985, 60-212565; Dec. 16, 1985, 60-282319; Jan. 13, 1986, 61-004852; Jan. 13, 1986, 61-004853; Jan. 16, 1986, 61-006750

Int. Cl.[4] G06K *9/74*

U.S. Cl. 356—71 33 Claims



1. An uneven-surface data detection apparatus for detecting an uneven-surface having projection portions and recess portions, comprising:

a transparent plate having upper and lower surfaces and having an uneven-surface contact portion against which an uneven-surface to be detected is pressed;

a light source for illuminating the entire area of said uneven-surface contact portion through said transparent plate;

an uneven-surface image drawing out optical element for drawing out the light reflected on said uneven-surface contact portion of said transparent plate; and

a detector for detecting the light drawn out from said transparent plate by said optical element, light reflected by the projection portions of said uneven-surface on said uneven-surface contact portion diverges from a propagation direction of light reflected by the recess portions of said uneven-surface on said uneven-surface contact portion, and said optical element is arranged to guide the light reflected by said projection portions into said detector, said light source simultaneously illuminating said projection portions and recess portions over said uneven-surface contact portion and the light reflected by said projection portions being totally reflected at least one time at a surface opposite the surface where the uneven-surface contact portion is located and then guided to said detector through said uneven-surface image drawing out optical element.

4,728,187

METHOD FOR THE RECIPROCAL POSITIONING OF AN OPTICAL FIBER AND A SEMICONDUCTOR LASER AND A POSITIONING APPARATUS USING THIS METHOD

Georges Dubroeucq, Enghein les Bains; Frantz Martin, Les Ulis; Michel Georgeot, Orsay, and Thierry Chamfrault, Ste Genevieve des Bois, all of France, assignors to Thomson-CSF, Paris, France

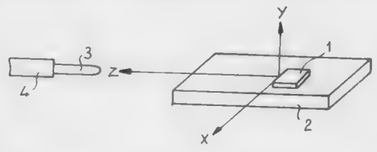
Filed Dec. 8, 1986, Ser. No. 939,115

Claims priority, application France, Dec. 10, 1985, 85 18256

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—153 8 Claims

1. A method for reciprocally positioning an optical fiber and a semiconductor laser, the wafer of the laser being mounted in a case without cover and the fiber substantially parallel to the emissive axis of the laser, being introduced into the case through one of its walls, in which process the laser and the fiber are located with respect to a fixed reference system formed by the optical axis common to an image forming optical device and to a differential optical detector which picks up



the energy radiated by the laser in a direction perpendicular to the emission axis of the laser.

4,728,188

LIGHT SOURCE DEGERADATION DETECTING APPARATUS FOR LASER DEVICE

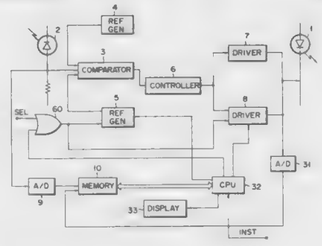
Seizi Kitagawa, Ina; Shozi Yoshikawa, and Haruhiko Takemura, both of Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,334

Claims priority, application Japan, Mar. 20, 1985, 60-56891

Int. Cl.[4] G01J *1/18*

U.S. Cl. 356—218 5 Claims



1. A light source degradation detecting apparatus for a laser device, comprising:

means for supplying a plurality of drive signals of a plurality of different levels to the laser device;

means for measuring respective output signals which the laser device produces in response to the drive signals;

first calculating means for calculating efficiencies of the laser device, each of the efficiencies being a ratio of a difference in level between two of the plurality of drive signals to a difference between levels of two corresponding output signals of the laser device;

second calculating means coupled to the first calculating means for calculating a ratio of the efficiences; and

third means coupled to the second calculating means for determining the life of the laser device based on said ratio.

4,728,189

ATOMIC ABSORPTION SPECTROPHOTOMETER

Konosuke Oishi, Mito; Koichi Uchino, Katsuta; Hideo Yamada, Katsuta; Seigo Kamitake, Katsuta, and Masao Hashimoto, Katsuta, all of Japan, assignors to Hitachi, Ltd. Hitachi Instrument Eng., Japan

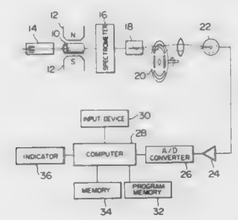
Filed Jan. 23, 1987, Ser. No. 6,170

Claims priority, application Japan, Jan. 24, 1986, 61-12012

Int. Cl.[4] G01J *3/42;* G01N *21/74*

U.S. Cl. 356—312 9 Claims

1. An atomic absorption spectrophotometer including atomizer means for heating a sample which is to be analyzed, to atomic vapor, a light source for irradiating the atomic vapor with light, and a detector for detecting light having passed through the atomic vapor, for forming an absorption profile indicative of a relation between the absorbance due to atomic vapor of a desired element contained in the sample and time, on the basis of a signal from the detector, to determine the concentration of the desired element from the peak value of the absorption profile, said atomic absorption spectrophotometer comprising means for previously determining the half-width w of absorption profile from data which is obtained by measuring



a standard sample, and for determining the true peak value h of the absorption profile of the desired element contained in the to-be-analyzed sample, on the basis of the time width v of said absorption profile at a predetermined absorbance k and the previously-determined half-width w.

4,728,190

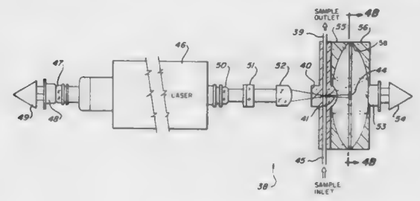
DEVICE AND METHOD FOR OPTICALLY DETECTING PARTICLES IN A FLUID

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Oct. 15, 1985, Ser. No. 787,602

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—336 20 Claims



1. A device for optically detecting particles in a fluid, said device comprising:

light means for providing a light beam;

fluid passage means for providing a fluid passage through a monitoring region, said fluid passage means being substantially formed by transparent wall means at said monitoring region with said transparent wall means being effectively precluded from reflecting light within said monitoring region;

light passage enabling means in the path of said light beam for permitting passage of said light beam through said fluid passage means in said monitoring region, said light passage enabling means providing interfaces that are outside the depth of field for detecting particles in a fluid within said fluid passage means at said monitoring region; and

light collecting means for collecting light scattered by particles in said fluid within said fluid passage means at said monitoring region, said collecting means providing an output that is substantially free of light reflections at said monitoring region so that said output is effectively indicative of at least one predetermined parameter of said particles detected in said fluid.

4,728,191

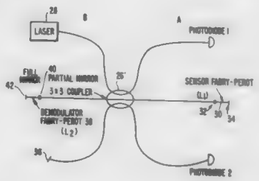
DIVIDED INTERFEROMETER EMPLOYING A SINGLE 3×3 COUPLER/SPLITTER

Clarence J. Zarobila, Herndon, Va., assignor to Optical Technologies, Incorporated, Herndon, Va.

Filed Oct. 22, 1986, Ser. No. 921,586

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—345 4 Claims



1. A fiber optic sensor comprising a source of coherent light, at least one fiber optic sensor interferometer; means connecting the coherent light to said at least one sensor, said connecting means including a single 3×3 C/S; a demodulator fiber optic interferometer, means connecting said coherent light to the demodulator interferometer, said connecting means including said 3×3 C/S, a first optical detector for said sensor interferometer connected through said 3×3 C/S, a second optical detector for the demodulator interferometer connected through said 3×3 C/S.

4,728,192

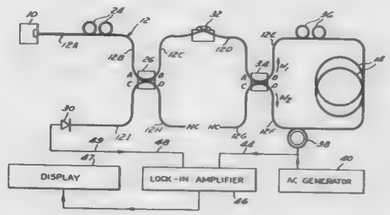
GATED FIBER OPTIC ROTATION SENSOR WITH EXTENDED DYNAMIC RANGE

Herbert J. Shaw, and Byoung Y. Kim, both of Stanford, Calif., assignors to Stanford University, Stanford, Calif.

Filed Feb. 17, 1984, Ser. No. 581,304

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 29 Claims



1. A method of determining the rotation rate of an optical loop having counter-propagating light waves which are phase modulated at a first frequency and which are combined to form an output signal, wherein the method comprises the steps of:

blanking at least a component of the output signal at selected times to provide a gated signal;

biasing the phase of the counter-propagating light waves at a second substantially fixed frequency, to substantially null a component in the gated signal which is produced by loop rotation; and

measuring the amount of bias to determine the rotation rate.

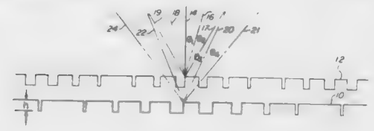
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4,728,193

PRECISION AUTOMATIC MASK-WAFER ALIGNMENT SYSTEM

John L. Bartelt, Camarillo, and Ross D. Oleny, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 11, 1986, Ser. No. 940,390
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—356 33 Claims



33. A position detector for determining relative location of an object, comprising;

a composite diffraction grating provided with the object;

means for providing a collimated coherent light beam directed so as to impinge on the composite diffraction grating;

means for collecting at least two pairs of diffracted light beams from the composite diffraction grating;

means for coherently combining the pairs of diffracted light beams to provide interference fringe patterns; and

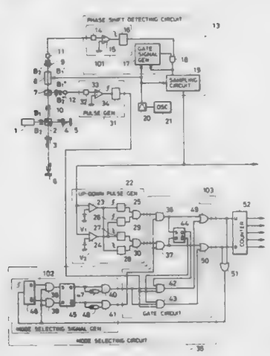
means for detecting the interference fringe patterns to provide a measurement of the intensity distribution from which the relative location can be established.

4,728,194

METHOD OF AND APPARATUS FOR OPTICALLY MEASURING DISPLACEMENT

Sadao Mori; Toshio Akatsu, and Chyuuichi Miyazaki, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,765
Claims priority, application Japan, Oct. 16, 1985, 60-228616
Int. Cl.[4] G01B 11/02; G01C 3/06
U.S. Cl. 356—358 10 Claims



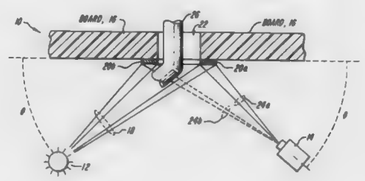
1. In an apparatus for optically measuring a displacement wherein a light beam from a light source is projected on a reference plane and an object to-be-measured, and the displacement of the object to-be-measured is measured by utilizing interference of reflected lights from the reference plane and the object to-be-measured; an apparatus for optically measuring a displacement characterized by comprising a phase shifter which cyclically and forcibly changes a phase difference of the reflected lights with an amplitude of at least π radian, phase shift detecting means to detect a magnitude of phase shift of the phase of the reflected lights from a level of a drive signal applied to said phase shifter at a moment at which the change of the phase difference of the reflected lights generated by the displacement of the object to-be-measured has been compensated by said phase shifter, an up-down pulse generator which generates an up pulse or a down pulse in accordance with a direction of the displacement of the object to-be-measured upon detecting a discontinuous change in the magnitude of phase shift arising each time the phase difference of the reflected lights generated by the displacement exceeds a fixed value, a pulse generator which generates a pulse upon sensing a change in brightness of an interference signal of the reflected lights, a mode selecting circuit which selects the output pulse of said up-down pulse generator when a displacement speed of the object to-be-measured is low and which selects the output pulse of said pulse generator when the speed is high, and a counter which counts the output pulses selected by said mode selecting circuit, whereby when the displacement speed of the object to-be-measured is low, an output value of said phase shift detecting means and an output value of said counter are added to find the displacement of the object to-be-measured, and when the displacement speed is high, the displacement of the object to-be-measured is found from the output value of said counter.

4,728,195

METHOD FOR IMAGING PRINTED CIRCUIT BOARD COMPONENT LEADS

William M. Silver, Medfield, Mass., assignor to Cognex Corporation, Needham, Mass.

Filed Mar. 19, 1986, Ser. No. 841,287
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—394 5 Claims



1. A method for generating a component pin signature for an assembled printed circuit board, the method comprising the steps of

(A) simultaneously illuminating with a light source at least a substantial portion of a solder pad of the circuit board, said solder pad being associated with a component hole in the board and being arranged for electrical connection with a component lead passed through the component hole,

(B) receiving with a photoreceptor emissions reflected from the illuminated portion of said solder pad, said photoreceptor being so arranged that passage of the component lead through the component hole occludes or shadows a portion of the solder pad from which the photoreceptor would otherwise receive reflected emissions, and

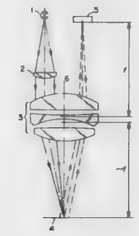
(C) generating an imaging signal representative of emissions received at the photoreceptor.

4,728,196

ARRANGEMENT FOR DETERMINING A SURFACE STRUCTURE, ESPECIALLY FOR ROUGHNESS

Oskar Gerstorfer, Dachau, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,499
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304780
Int. Cl.[4] G01B 11/30
U.S. Cl. 356—446 23 Claims



1. An arrangement for determining at least a surface structure of a specimen in which angular dependence of radiant energy reflected from said surface structure for angles about a reflection angle of an ideal surface is measured, comprising

a detector array means comprised of a plurality of individual detectors sensing radiant energy received from said surface structure for producing output signals,

first lens means

having a focal distance and whose distance from said surface structure of the specimen is approximately equal to said focal distance of said first lens means

for focusing a substantially parallel radiant energy beam received from a radiant energy source onto said specimen in such a manner that an axis of the said focussed light beam subtends an angle not equal to zero with respect to a line substantially perpendicular to said surface structure of the specimen,

second lens means receiving radiant energy at multiple angles of reflection from said surface structure and having a focal distance substantially equal to the distance between said second lens means and said detector array means and, for plural angles of said multiple angles of reflection imaging at a predetermined location on the radiant energy detector array means radiant energy reflected from said surface structure at a given angle of reflection, and

an evaluator circuit responsive to said output signals from said individual detectors for calculating measurement elements for roughness of the surface structure.

4,728,197

APPARATUS FOR PRODUCTION OF MOLDING MATERIALS

Peter Reinhard, Weingartenstrasse 8, Spreitenbach, Switzerland

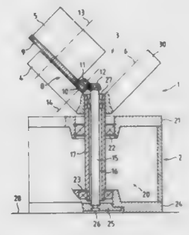
Filed Jun. 19, 1986, Ser. No. 876,174
Claims priority, application Switzerland, Jun. 20, 1985, 2628/85
Int. Cl.[4] B01F 9/00
U.S. Cl. 366—219 6 Claims

1. Apparatus for mixing a powder and a liquid, said apparatus comprising: a hollow casing;

an electric motor mounted in the casing, said motor having a vertical first drive shaft having a vertical hollow channel extending completely therethrough, the first shaft and channel having a common vertical axis which is a first axis of rotation, the first shaft being rotated about the first axis when the motor is operative, said first shaft having an upper end extending out of and above the casing;

first and second oppositely disposed arms extending inclinedly upwards in counter-balancing position from a common portion having inner surfaces likewise inclined and facing each other, the bottom portion having a vertical bore in which the upper end of the first shaft is disposed, the bore having an axis aligned with the first axis, the first shaft being secured to the bottom portion, the arms with said portion being spaced above the casing so that rotation of the first shaft causes said arms to rotate about the first axis, each arm serving as a counterbalance for the other;

a second vertical shaft disposed non-rotatably in said channel, the second shaft being axially aligned with and spaced from the first shaft, the second shaft extending through the vertical bore and having an upper end disposed above the common portion, the second shaft being spaced from said arms;



a hollow cylindrical mixing vessel having a second axis of rotation whch extends at right angles to the inner surface of one of said arms and is not parallel to the first axis, said powder and said liquid being mixed in this vessel;

first means securing the vessel to the inner surface of said one arm, the first means and the vessel being rotatable together about the second axis; and

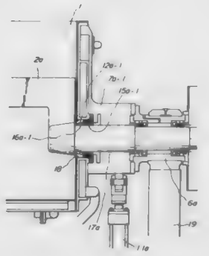
second means coupled to the first means and to the upper end of the second shaft to cause the vessel to rotate about the second axis when the first shaft is rotated about the first axis.

4,728,198

KNEADER

Hideya Maekawa, Tokai, and Hifuo Noiri, Hashima, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Aug. 26, 1986, Ser. No. 900,392
Claims priority, application Japan, Sep. 3, 1985, 60-133989[U]
Int. Cl.[4] B01F 7/02
U.S. Cl. 366—279 3 Claims



1. A kneader including a vessel in which a material is mixed, at least one mixing blade provided in said vessel for mixing the material supplied in said vessel, at least one sealing means for sealing a shaft of said mixing blade extending out of the vessel,

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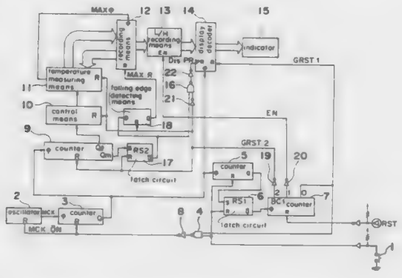
and blade driving means for driving the shaft of said mixing blade, wherein said sealing means is provided on the side of said vessel with at least one air purge opening along the periphery of said shaft, and an air supply source connected to said opening through which air is caused to flow toward an interior of said vessel to form said sealing means as an air sealing construction.

4,728,199

TEMPERATURE MEASUREMENT DEVICE

Toshio Murai, Iizuka; Junzo Murata; Masahiro Hosono, both of Fukuoka, and Isao Imagawa, Nougata, all of Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Dec. 31, 1985, Ser. No. 815,058
Int. Cl.[4] G01K *7/00*
U.S. Cl. 371—170 **5 Claims**



1. A temperature measurement device comprising:
a single operator actuatable switch manipulatable from outside the device, said switch having open and closed states;
temperature measurement means for measuring a temperature of interest and developing a temperature signal representative thereof;
judging means, monitoring said operator actuable switch, for detecting whether said dswitch is in said open state or in said closed state;
recording means for storing sid temperature signal developed by said temperature measurement means; and
display means for displaying a temperature represented by a temperature signal provided thereto;
said judging means, upon detecting said switch is in said closed state, recalling the temperature signal representative of a previous temperature stored in said recording means and supplying said temperature signal to said display means for display thereon, said judging means, upon detecting an open state of said switch subsequent to said closed state, supplying the temperature signal developed by said temperature measurement means and representative of a current measured temperature to said display means for display thereon;
said previous temperature being displayed on said display means for as long as said switch is held in said closed state.

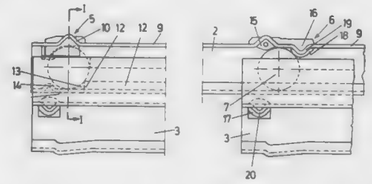
4,728,200

EXTENSION PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

Erich Röck, Höchst, and Felix Schwärzler, Hohenems, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 1, 1986, Ser. No. 915,124
Claims priority, application Austria, Oct. 21, 1985, 3037/85
Int. Cl.[4] F16C *29/10*
U.S. Cl. 384—19 **8 Claims**

1. An extension pull-out guide assembly for use on each of opposite sides of a drawer to enable the drawer to be slidably insertable into and withdrawable from a cabinet or article of furniture, said assembly comprising:
a supporting rail to be fixed to the body of the cabinet or article of furniture,
a pull-out rail to be fixed to the drawer;
a center rail mounted between said supporting and pull-out rails and slidable relative thereto, said center rail having mounted thereon at least one runner roller rollingly positioned within said supporting rail;
whereby said pull-out rail is slidable relative to said center rail and said center rail is slidable relative to said supporting and pull-out rails during insertion and withdrawal movements of the drawer relative to the cabinet or article of furniture; and



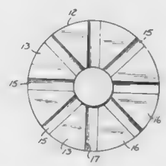
front stop means on said supporting rail for limiting withdrawal movement of said center rail relative to said supporting rail and for holding said center rail at a maximum pull-out position relative to said supporting rail, said front stop means comprising a first stop member to be abutted by said runner roller to thereby limit normal relative withdrawal movement of said center rail, said first stop member being passable by said runner roller upon further withdrawal movement of said center rail, and a second stop member to be abutted by said runner roller upon said further withdrawal movement and unpassable thereby, whereby said runner roller is clamped between said first and second stop members, thereby preventing unintentional movement of said center rail relative to said supporting rail in either the insertion or withdrawal directions.

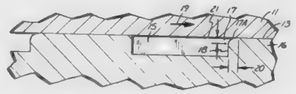
4,728,201

LOW VELOCITY ENERGIZED GAS PARTICLE BEARING

David C. Abbe, El Cajon, Calif., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Dec. 17, 1986, Ser. No. 943,248
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—121 **5 Claims**





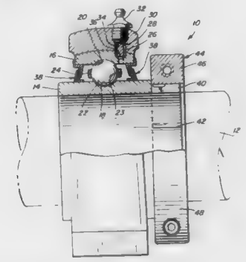
1. A gas energized particle bearing between two facing, relatively movable, complementally shaped surfaces operating in a gas environment, wherein one surface at times has a velocity relative to the other, comprising a set of a plurality of grooves and lands formed in at least one of the complementally shaped surfaces, said set being at least partially transverse to the direction of relative movement between the complementally shaped surfaces, the lands having land surfaces facing the other surface, the facing surfaces including the land surfaces each being sufficiently true to its desired cross-sectional profile so that the spacing of the surfaces is between 1 and 5 molecular mean-free paths of the gas forming the gas environment at rest, wherin the land surface of each of the lands has a leading edge portion with respect to the direction of relative movment of the surfaces, and the leading edge portions are tapered and start at a spacing from the complementally shaped surface in the range of 10 molecular mean-free paths of the gas environment and taper toward the complementally shaped surface and extend in direction of relative movement for no more than 10% of the respective land surfaces.

4,728,202

SHAFT LOCKING COLLAR FOR BEARING ASSEMBLIES

Albert M. LaRou, Naperville, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 14, 1987, Ser. No. 3,378
Int. Cl.[4] F16C *19/06*
U.S. Cl. 384—537 **4 Claims**



1. A bearing assembly comprising:
an inner and an outer race, each race having a raceway;
anti-friction means between said races and contacting said raceways;
said inner race being cylindrical, having a slotted extension which form fingers, and being adapted to receive a shaft to be connected thereto;
means connecting said inner race to said shaft comprising a two part collar encircling said inner race slotted extension;
said collar parts each having a pair of threaded openings with each opening in one part being concentric with a corresponding opening in the other part; and
a pair of differential screws, one screw being received in each pair of concentric openings, each screw having a body with one portion of one thread size and a portion with a different thread size, whereby tightening said screws draws said collar parts together to compress said fingers toward said shaft to lock said bearing thereto.

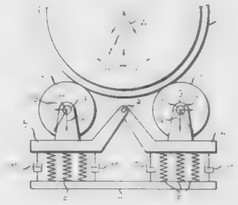
4,728,203

RADIAL LOAD BEARING SYSTEM OF ROTARY KILN

Hiroshi Okamoto, Funabashi, and Muneto Yamashita, Ichikawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 802,249, Nov. 27, 1985, abandoned.
This application Jul. 29, 1987, Ser. No. 80,202
Claims priority, application Japan, Nov. 27, 1984, 59-250229
Int. Cl.[4] F16C *27/04*
U.S. Cl. 384—549 **8 Claims**

1. A radial load bearing system of a rotary kiln comprising:
a plurality of rollers located on the left and right of a vertical plane through the center of the rotary kiln, said rollers supporting the rotary kiln;
a plurality of roller holder means each for holding one of said plurality of rollers at a roller shaft thereof;
a plurality of resilient means for supporting, through one of



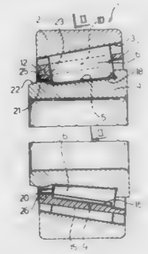
said roller holder means, one of said plurality of rollers; and
connecting means including a member for connecting said plurality of roller holder means on a straight line connecting the center of the roller shafts of said plurality of rollers.

4,728,204

TAPER ROLLER BEARING, PARTICULARLY FOR RAILWAY USE

Franco Colanzi, Turin, and Bruno Pizzi, San Mauro Torinese, both of Italy, assignors to Riv-SkF Officine di Villar Perosa S.p.A., Italy

Filed Nov. 5, 1986, Ser. No. 927,797
Claims priority, application Italy, Nov. 22, 1985, 67982 A/85
Int. Cl.[4] F16C *33/58, 33/46, 33/56*
U.S. Cl. 384—572 **6 Claims**



1. A rolling element bearing (1,40) of a taper roller type, particularly for railway use, comprising:
an outer ring (2) having an associated inner conical track, an inner ring (4) having an associated outer conical track, a plurality of taper rollers (6) freely disposed between said inner and outer rings and guided between said tracks, and a spacer cage (9) interposed between said inner and outer rings, the spacer cage having a pair of end rings (11, 12) respectively being a larger ring (11) and a smaller ring (12), and a plurality of rectilinear bridges (15) connecting said end rings together and being disposed equidistantly and adjacent along generatrices of a conical surface in such a way as to define, with said end rings, respective pockets (10) for freely housing said taper rollers, and operable to maintain the taper rollers separated from one another and their axes of rotation disposed in a ring along a circumference, said bridges (15) extending both above said circumference in such a way as to retain said rollers (6) in the pockets (10) on a side of the bearing toward the outer ring (2), and beneath said circumference, in such a

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way as to retain said rollers (6) in the pockets on a side of the bearing toward the inner ring (4) also, and said pockets (10) being adapted to receive and snap-engage said rollers, wherein said cage (9) is made of resiliently deformable synthetic plastic material and wherein said inner ring (4) of the bearing is provided with a conventional shoulder (18) for said rollers (6) on a side adjacent said larger end ring (11) of the cage and with means (21, 41) for axially snap-engaging said cage (9) with the rollers (6) therein to said inner ring (4) on a side adjacent said smaller end ring (12) of the cage, said smaller end ring (12) being provided with respective frontal cavities (25) formed in correspondence with each said pocket (10) on a base of said smaller end ring (12) opposite that directed towards each said roller (6) and said larger end ring (11) being of smaller thickness than the smaller ring (12) so that said cage (9) is made resiliently deformable in a circumferential sense.

4,728,205

POSITIONING OF DAMPENERS IN A WIRE MATRIX PRINT HEAD

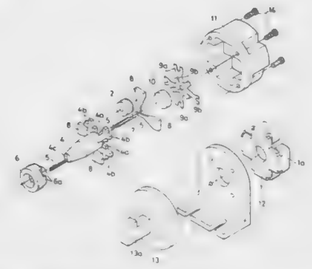
Hitoshi Hasumi, and Hirofumi Hirano, both of Saitama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 732,627, May 10, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,236

Claims priority, application Japan, May 15, 1984, 59-95720; May 15, 1984, 59-95721; May 15, 1984, 59-95722

Int. Cl.⁴ P41J *3/12*

U.S. Cl. 400—124 **6 Claims**



1. An impact type dot head comprising:
a plurality of printing wires;
wire drive means having a plurality of armatures to move said printing wires toward a projecting direction and an electromagnetic member for operating said armatures;
first stopping means having a first surface which is impacted by said armatures when said wires are moved in the projecting direction for limiting movement of said armatures in said projecting direction;
second stopping means having a second surface which is impacted by said armatures when said wires are returned in an opposite direction to said projecting direction for limiting movement of said armatures in said opposite direction;
guide means for guiding said wires movably in said projecting direction and said opposite direction, said guide means including a cylindrical guide portion whose axis is in said projecting direction, positioning means extending radially from said cylindrical guide portion and having a first positioning surface for engaging the first surface of said first stopping means to determine the position of the first surface relative to said guide means in the projecting direction, and a second positioning surface for engaging the second surface of said second stopping means to determine the position of the second surface relative to said guide means in a direction axially opposite from the projecting direction; and
means engaging and fixing said positioning means, said first stopping means and said second stopping means in a state where said first surface engages said first positioning surface and said second surface engages said second positioning surface.

4,728,206

PRINTING CONTROL DEVICE AND METHOD

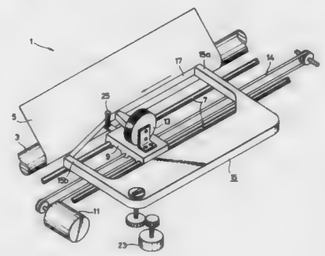
Isao Mori, and Hisaki Okada, both of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 17, 1986, Ser. No. 853,152

Claims priority, application Japan, Apr. 19, 1985, 60-59423[U]

Int. Cl.⁴ B41J *33/34, 33/36*

U.S. Cl. 400—225 **4 Claims**



1. A printing device, comprising:
a printing ribbon;
a printing head for impacting the ribbon incident to a printing operation;
printing head driving means for reciprocating the printing head along a line in first and second directions, wherein said head reciprocates at a first speed;
ribbon driving means for moving the ribbon only in said second direction at a second speed; and
control means for starting the printing operation according to a first parameter, wherein the first parameter includes the printing head moving in the second direction and the second speed being greater than the first speed.

4,728,207

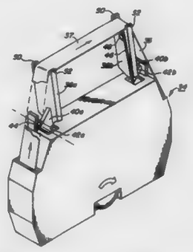
RIBBON CARTRIDGE WITH PIVOTABLE RIBBON GUIDE ARMS

Harold S. Foster, Fremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 25, 1986, Ser. No. 900,102

Int. Cl.⁴ B41J *32/00, 35/08*

U.S. Cl. 400—248 **4 Claims**



1. A ribbon cartridge for use in a printing machine, said cartridge including a body within which is housed a supply of ribbon and used ribbon, an opening in said body through which a portion of said ribbon exits said cartridge from said supply and an opening in said body through which said used ribbon reenters said cartridge, and a pair of ribbon support arms secured to said body for pivotable movement, each arm having one end over which said portion of said ribbon is guided to define an active marking region between the two edges of said ribbon, the cartridge being characterized by comprising:
pivot means on the opposite ends of said support arms and said support arms for compound movement, said pivot means being oblique to an axis extending between said arms at said opposite ends, so that as said one ends move in a plane generally normal to the plane to said body they also swing toward and away from each other so as to define paths of movement of equal length for said two edges of said ribbon.

4,728,208

RIBBON LIFTING MECHANISM FOR SELECTIVELY PLACING A PRINTING RIBBON AND A CORRECTION RIBBON AT A PRINTING POSITION OF A TYPEWRITER

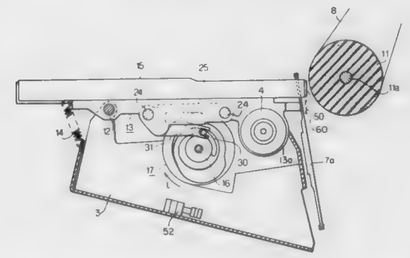
Takayuki Iwase, Chiryu, and Yuuichi Harada, Nagoyo, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,299

Claims priority, application Japan, Dec. 29, 1984, 59-277662

Int. Cl.⁴ B41J *35/22, 29/36*

U.S. Cl. 400—697.1 **13 Claims**



1. A ribbon lifting mechanism for a typewriter comprising:
a frame;
a holder supported rotatably on said frame, for holding a printing ribbon and a correction tape;
a first means for normally urging said holder toward a predetermined direction;
a ribbon lifting cam having a plurality of cam sections formed threon, said cam sections allowing the holder to turn so as to selectively assume an operative state where the printing ribbon is located at a printing position, an operative state where the correction tape is located at said printing position and an inoperative state where both the printing ribbon and the correction tape are located out of the printing position;
a first cam follower connected to said holder for being controlled by said cam sections;
driving means for rotating the ribbon lifting cam in both normal and reverse directions in response to actuation of a key such as a letter key or the like;
a movable stopper member engageable with and disengageable from the holder, said stopper member and a means for restricting an extent of turning movement serving to restrict an extent of turning movement of the holder within a predetermined range of movement when said stopper member is engaged with the holder; and
means for displacing the stopper member to selectively assume the engagement position where the stopper member is engaged with the holder and the disengagement position where the stopper member is disengaged from the holder when the ribbon lifting cam is rotated; wherein the means for displacing the stopper member comprises:
a second cam follower disposed on the stopper member; and
a groove-shaped stopper cam section for engaging said second cam follower, said stopper cam section being rotatable in both the normal and reverse directions, and the stopper cam section including an annular second cam section for guiding relative movement of the second cam follower during a printing operation as well as during a non-printing operation, an arch-shaped third cam section designed coaxial relative to said second cam section to guide relative movement of the second cam follower when a corrective printing operation is performed and two introduction cam grooves by way of which said second cam section is connected with said third cam section to guide relative movement of the second cam follower during corrective printing operation.

4,728,209

PRINTING APPARATUS HAVING A MEMORY FOR STORING COMPOSITE AND PRINTED CHARACTER INFORMATION FOR SUBSEQUENT ERASURE

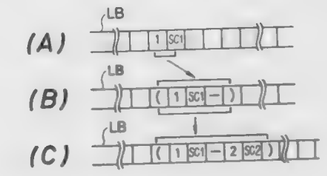
Michihisa Kumamoto, Tokyo, and Hiroyuki Ueda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 904,814, Sep. 8, 1986, abandoned, which is a continuation of Ser. No. 685,977, Dec. 28, 1984, abandoned, which is a continuation of Ser. No. 414,890, Sep. 3, 1982, abandoned. This application Mar. 23, 1987, Ser. No. 29,387

Claims priority, application Japan, Sep. 24, 1981, 56-149381; Sep. 24, 1981, 56-149382; Sep. 25, 1981, 56-150680

Int. Cl.⁴ B41J *29/16*

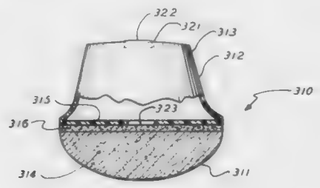
U.S. Cl. 400—697.1 **13 Claims**



1. A printing apparatus comprising:
printing means for printing characters on a printing paper;
memory means for storing a plurality of character information, each representing a character, in the same order as characters represented thereby are printed by said printing means, said memory means being capable of storing a sub-plurality of character information and a pair of special codes one of which is stored at the beginning of the sub-plurality of character information and the other of which is stored at the end of the sub-plurality of character information, said special codes indicating that the sub-plurality of character information stored therebetween is composite character information;
correcting means for erasing characters printed by said printing means;
a correction key for signaling that erasure by said correcting means is to be initiated; and
control means for reading the pair of special codes and the composite character information stored therebetween from said memory means in response to actuation of said correction key and for controlling said correcting means to erase the composite characters printed on a printing paper and represented by the composite character information stored between the special codes.

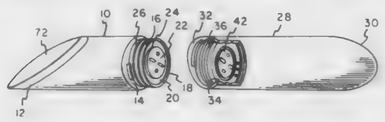
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4,728,210
PACKAGE AND APPLICATOR FOR SOLID PRODUCT
Robert A. Barish, Trenton, and Frederick G. Searby, Freehold, both of N.J., assignors to Carter-Wallace, Inc,
Filed Sep. 10, 1986, Ser. No. 905,532
Int. Cl.[4] A46B *5/02*
U.S. Cl. 401—6 14 Claims



1. A package for a solid product, comprising:
a container; a removable cover for the container, said cover including a gripping handle; a support member attached to the cover, said support member including a plurality of openings, said support member having a first surface facing the cover and spaced therefrom to define an open space between the support member and cover, said support member having a second surface which faces the container; and a solid personal care product in the container, said solid personal care product extending through said openings into said open space and covering at least a portion of said first surface whereby the solid product is held by said support member and is removable from the container with the cover.

4,728,211
COSMETIC POWDER DISPENSER AND APPLICATOR
James E. Ladd, Jr., Rowayton, Conn., assignor to Laura Lupton, Inc., Rowayton, Conn.
Continuation-in-part of Ser. No. 752,133, Jul. 5, 1986, Pat. No. 4,626,119. This application Sep. 2, 1986, Ser. No. 902,767
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] A46B *11/00*
U.S. Cl. 401—123 5 Claims



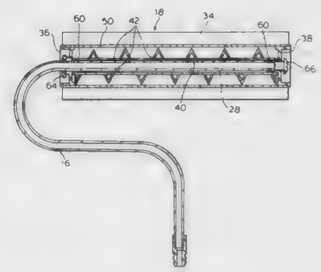
1. A cosmetic powder dispenser and applicator comprising:
a first elongated hollow member having a first closed end and an open second end, the second end having a centrally disposed curved outer surface of circular shape with a first group of small spaced apart openings therein which communicate with the first member interior;
a hollow elongated capsule adapted to be filled with cosmetic powder, the capsule being closed at one end and open at the other, the capsule being removably slidable into and out of the first member, the capsule, when inserted in the first member, having its open end adjacent the second end of the first member and its closed end closing the first end of the first member;
a second elongated hollow member having a closed third end and an open fourth end, the third end having a centrally disposed curved outer surface of circular shape with a second group of openings and a third group of openings spaced from the curved circular surface;
the second and third groups of openings communicating with the second member interior, the first and second groups of openings each containing like pluralities of like openings;
one of the second and third ends having a recessed outer surface while the other of said second and third ends has a flush outer surface, the said other of the second and third ends extending within the said one of the second and third ends in a connection at which said surfaces are in conforming mating engagement;
one of the first and second members adjacent the correspopnding one of the second and third ends having a plurality of spaced circular rings, the other of said first and second members having adjacent the corresponding other of the second or third ends a like plurality of spaced circular grooves, each groove being engaged rotatably by the corresponding circular ring whereby the either one of the first and second members can be rotated with respect to the other of the first and second members;
the first and second members having a first position of relative rotation at which the openings in the first and second groups are aligned and a second position of relative rotation at which the openings in the first and second groups are out of alignment;
a third elongated hollow member having a fifth open end detachably engaging the fourth end and an oppositely disposed sixth closed end; and
a brush having a plurality of essentially parallel bristles with powder applying tips, the brush being disposed in the third member with the tips adjacent the second member and, when the third member is detached from the second member, being manually slidable in the third member back and forth along a line parallel to the direction of elongation of the third member.

4,728,212
NOVELTY WRITING PEN
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Continuation-in-part of Ser. No. 70,512, Aug. 28, 1979, Pat. No. 4,283,011. This application May 18, 1981, Ser. No. 264,808
Int. Cl.[4] B43K *7/00, 23/00, 29/00*
U.S. Cl. 401—88 3 Claims



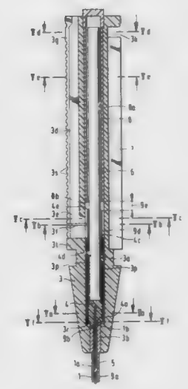
1. A novelty pen comprising:
A. a standard writing pen having a tubular ink reservoir encased in a sheath and terminating in a writing tip projecting from one end of the sheath;
B. a supply of ink in said reservoir incorporating an odor-producing component compatible with the ink, the odor simulating the characteristic smell of an odor-producing object whereby when the user writes on a surface with the pen, the inked surface exudes the odor of said object; and
C. a molded body having a bore therein to receive at least the upper section of the pen, so that the body is carried by the pen, the body having a configuration representing the object whose odor is exuded by the ink whereby the user appears to be writing with the odor-producing object, said body, being composed of two parts which together represent the object, the upper part being carried by the upper section of the pen, the lower part being carried by the tip section of the pen and being removable therefrom.

4,728,213
POWER ROLLER ASSEMBLY
John D. Geberth, Jr., 10 Goose Cove Lane, Ramsey, N.J. 07446, assignor to Sanyo Electric Co., Ltd., Japan
Filed Mar. 10, 1986, Ser. No. 838,174
Int. Cl.[4] B05C *17/02, 1/12*
U.S. Cl. 401—197 1 Claim



1. A power roller assembly comprising:
a control valve communicating with a source of coating material under pressure;
a handle to which said control valve is mounted and having extending therefrom a roller applicator support rod having a roller applicator axle;
a roller applicator assembly rotatably mounted to the roller applicator axle of said support rod and including a cylindrically shaped roller applicator having an absorbent roller applicator surface on a cylindrical support therefor and end caps having bushings therein for the rotatable mounting of said roller applicator assembly on said axle, said cylindrical support having a plurality of perforations in the cylindrical wall thereof permitting fluid communication between the interior of the roller applicator assembly and the absorbent roller applicator surface;
conduit means communicating between said control valve and the roller applicator axle of said support rod for delivering paint to the interior of the roller applicator assembly;
a paint supply manifold axially arranged in the interior of said roller applicator assembly consisting of a cylindrically shaped tube co-axially disposed on said roller applicator axle and axially spaced therefrom and having a plurality of paint supply openings arranged along the length thereof;
an auger-shaped spiral arranged along the length of the interior of said roller applicator assembly, said auger-shaped spiral having an axial opening therein permitting the disposition of said spiral on said paint supply manifold so that said spiral extends radially from said manifold to the inner surface of said cylindrical support; and
an axially, inwardly extending stop disposed on each end cap adapted to engage an end of said auger-like spiral so as to prevent rotation thereof relative to said roller applicator assembly.

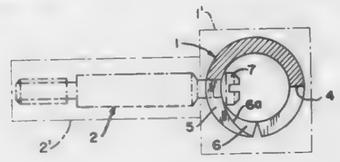
4,728,214
INK DUCT FOR TUBULAR STYLUSES
Otto Mutschler, Ludolf-Krehl-Strasse 21, D-6900 Heidelberg, Fed. Rep. of Germany
Filed Dec. 17, 1985, Ser. No. 810,013
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445944
Int. Cl.[4] B43K *1/06, 1/10, 8/00*
U.S. Cl. 401—258 3 Claims



1. Ink duct for tubular styluses in writing implements comprising a plastic element with a compensating system of lamellar construction, with grooves (*3h, 3i*) separated by webs (*3t*) for the access and escape of air with collecting chamber halves arranged on a tubular element (3) which have air access grooves and air escape grooves (*3h*) separated fluidtightly by two parallel webs (*3t*) to the central air groove (*3i*), which are closed in front by a flange (*3l*) and connected at the rear via a transverse groove (*3k*) to the central air groove (*3i*), the improvement comprising that an annular gap (*9a*) which is provided in the writing tube (1) between a wire and the interior wall of the writing tube (1), merges in an annular gap (*9b*) between a conical bore of the writing tube (1) and a cone (*4a*) of a wire housing (4) and a plane gap (9c) between an annular plane surface (*3c*) of the plastic lamellar element (3) and an annular plane surface (*4b*) of the wire housing (4), whilst the plane gap (9c) is adjoined by a capillary annular gap (*9d*) between the external surface (*4c*) of the wire housing (4) and the bore (*3a*) of the plastic lamellar element (3), which exhibits a lateral perforation (*3e*) which penetrates the plastic lamellar element (3) in the front lamellar region as far as the bore (*3a*) and is connected via a capillary gap (*3d*) in the lamellar region of the plastic lamellar element (3) to a storage tank, that longitudinal fins (*3p*) shaped integrally on the plastic lamellar element (3), which extend to the perforation (*3e*) and to the narrow guidance of the wire housing (4) are provided, that cams (*3r*) are shaped integrally on the annular plane surface (*3c*), on which the annular plane surface (*4b*) of the wire housing (4) is constructed to limit the stroke (*9e*) of the wire housing (4) forwards and to form the plane gap (9c), that a plug (8) is provided, the front annular plane surface (*8b*) of which can be brought into contact with the rear end (*4e*)of the wire housing (4) to limit the stroke (*9e*) to the rear, that the writing tube (1) extends with its rear end to the plane gap (9c) and that the wire (5) is guided in the writing tube (1) in its total length.

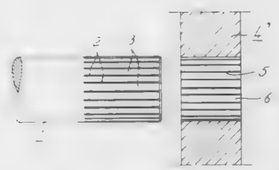
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4,728,215
CORNER CONNECTION FOR FURNITURE
Vinko Martinčič, and Anton Martinčič, both of Pudob 33, 61386 Stari Trg Pri Ložu, Yugoslavia
Filed Sep. 5, 1986, Ser. No. 903,921
Claims priority, application Yugoslavia, Sep. 6, 1985, 1400/85
Int. Cl.[4] B25G *3/00*; F16B *7/08*
U.S. Cl. 403—231 4 Claims



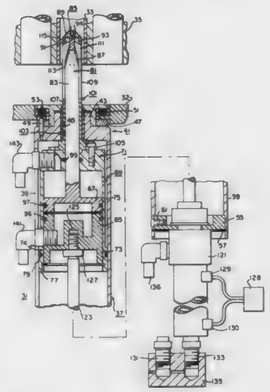
1. Corner connector for non-metal parts of furniture, comprising:
a rotary eccentric worm formed as a sleeve member and a binding bolt having a head, said sleeve member including a slit at one end of said sleeve member, a pair of oblique surface portions for receiving said head, arranged along a gap cutout on an inner side of said sleeve member substantially perpendicular to said slit, another cutout facing said gap cutout, extending circumferentially and substantially perpendicular to said slit, said another cutout terminating at another end of said sleeve member, and wherein a bottom of said oblique surface portions begins at a mouth of said gap cutout substantially on a mantle surface of said sleeve member and ends at a semicircular termination of said cutout, substantially on an inner surface of said sleeve member.

4,728,216
APPARATUS HAVING CONTROLLED FRICTION CONNECTION BETWEEN TWO PARTS
Lennart Disborg, Linköping, Sweden, assignor to FFV Transmission AB, Linkoping, Sweden
Filed Nov. 19, 1986, Ser. No. 932,336
Claims priority, application Sweden, Nov. 21, 1985, 8505509
Int. Cl.[4] B25E *3/28*
U.S. Cl. 403—282 6 Claims



1. Apparatus comprising a pair of parts, one of which has a continuous even surface that is engaged under a force against an opposing continuous even surface on the other part to frictionally inhibit relative motion in at least one direction between said parts, said apparatus being characterized by:
A. said one part
(1) having at its said surface, when in a nonengaged condition,
(a) a plurality of strip-like hard zones which do not protrude from said even surface, have their lengths substantially transverse to said direction and which are laterally spaced apart and
(b) strip-like soft zones between said hard zones which do not protrude from said even surface, and
(2) having substantially greater hardness in said hard zones than in said soft zones; and
B. the material of the other of said parts at said opposing surface thereof being of such hardness that when in an engaged condition under said force the differences in hardness as between said hard zones and said soft zones tend to produce in said opposing surface undulations in said direction.

4,728,217
GRIPPER APPARATUS AND METHOD
David J. Fink, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 26, 1986, Ser. No. 832,940
Int. Cl.[4] B23Q *3/00*; B66C *1/24*; F16B *2/14*
U.S. Cl. 403—290 12 Claims

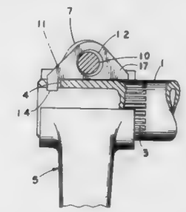


1. Gripper apparatus for engaging or disengaging work pieces to be processed, said apparatus including hollow gripper means, said gripper means having gripper fingers actuable by diverging to engage said work pieces and actuable by converging to disengage said work pieces said gripper means including a support and resilient connecting means, connecting the fingers to said support, actuating means for said gripper means, advancing-and-retracting means, connected to said actuating means, for advancing said actuating means to an advanced position and for retracting said actuating means to a retracted position, said actuating means including positive diverging means, within said gripper means, to engage said fingers in said advanced position of said actuating means, for flexing said connecting means in one direction about said support from an unflexed condition for positively diverging said fingers to cause said fingers to engage said work pieces and said actuating means also including positive converging means, to engage said fingers directly in said retracted position of said actuating means, for flexing said connecting means in the opposite direction about said support from said unflexed condition for positively converging said fingers to disengage said work pieces, said actuating means including means for limiting the flexing of said connecting means both in said one direction and in said opposite direction so that the range of said flexing in each said direction is within the elastic limit of the material of said connecting means.

4,728,218
LOCKING KEY MECHANISM
Roger O. Durham, 1370 Thompson St., Glendale, Calif. 91201
Filed May 7, 1986, Ser. No. 860,456
Int. Cl.[4] F16B *21/10*; F16D *1/08*
U.S. Cl. 403—319 6 Claims

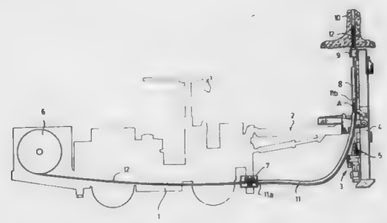
1. In a bicycle crankshaft, wherein a slotted, internally-serrated crank arm boss is secured to a correspondingly-serrated

spindle by a pinch bolt, including a locking key mechanism the combination comprising:
(a) a tang aperture in said spindle, in alignment with said slot of said crank arm boss;
(b) a locking key positioned within said slot of said crank arm boss, said locking key including:
(i) a tang portion for insertion into said tang aperture of said spindle;



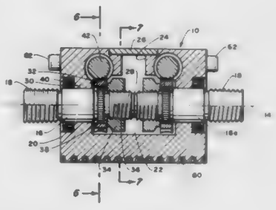
(ii) a pinch bolt engagement means for engaging said pinch bolt;
(iii) an anti-rotation tab for preventing rotation of said locking key and for preventing the emergence of said tang portion from said tang aperture of said spindle,
whereby axial movement of the crank arm in relation to the spindle is prevented.

4,728,219
METHOD OF AND A DEVICE FOR GUIDING A WIRE IN THE WIRE BOLTING OF A ROCK
Jarmo Leppänen, Ylöjärvi, Finland, assignor to Oy Tampella Ab, Tampere, Finland
Filed Oct. 21, 1986, Ser. No. 921,155
Claims priority, application Finland, Nov. 7, 1985, 854375
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—260 9 Claims



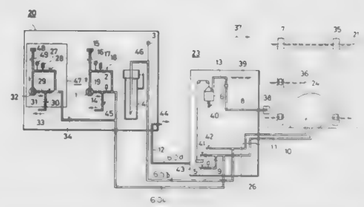
1. A method of guiding a wire for rock bolting of a rock comprising the steps of:
feeding said wire from a wire magazine on a carrier through a single feeding mechanism;
passing said wire from said feeding mechanism through a flexible, nonpowered guide pipe;
moving said wire from said guide pipe into a guide head, said guide head being supported on a feeding beam mounted on said carrier; and
inserting said wire from said guide head into a hole in said rock;
said feeding, passing, moving and inserting being powered solely by said feeding mechanim.

4,728,220
JOINT FOR RAILS
Bernard J. Navarro, 3252 E. Chevy Chase Dr., Glendale, Calif. 91206
Filed Aug. 8, 1986, Ser. No. 894,416
Int. Cl.[4] F16B *7/18*
U.S. Cl. 403—118 5 Claims



1. Coupling member comprising:
a hexahedron body having a cavity and first, second and third faces;
a lead screw journaled in said body and having a threaded portion projecting from said body outwardly beyond said first face;
a worm gear fixedly secured to said lead screw;
a worm journaled in said body, emerging from said body at said second face adjacent to said first face, and meshing with said gear to provide means for rotating said lead screw;
an access opening communicating with said cavity through said third face adjacent to said first and second faces; and
a cover plate secured over said opening.

4,728,221
FLEXIBLE MEMBRANE DAM
Yoshiomi Tsuji; Ichiro Maruyama, and Haruhiko Matsuoka, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 818,752, Jan. 14, 1986, abandoned. This application Oct. 6, 1986, Ser. No. 915,572
Claims priority, application Japan, Jan. 19, 1985, 60-7866
Int. Cl.[4] E02B *7/02*
U.S. Cl. 405—115 4 Claims



1. An inflatable and collapsible dam for selectively blocking the flow of a stream or river, comprising:
a flexible membrane weir element having a base and being positioned such that when it is inflated, it will block the flow of water;
an upper section control chamber, at least partially above ground, containing therein dam means for supporting the weir element;
a sealed lower section control chamber including therein a means for collapsing the weir element from a self-supported condition, said lower section being positioned lower in height than said upper section and being separated therefrom and at least partially underground;

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a feed and exhaust pipeline connected to said weir element and adapted to discharge into said lower control chamber, said feed and exhaust pipeline being disposed horizontally at a level lower than that of the base of said weir element, said feed and exhaust pipeline also being provided at one end thereof with a first valve; and

means, mounted in said lower control chamber, for collapsing said dam by opening said first valve.

4,728,222

ARRANGEMENT FOR COLLECTING SEEPAGE WATER FROM DEPOSITORIES

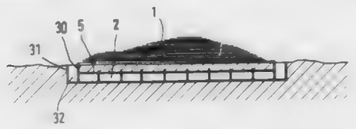
Klaus Wiemer, Kronberg, Fed. Rep. of Germany, assignor to ED. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,999

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423438

Int. Cl.⁴ B65G *5/00;* **E02D** *3/00*

U.S. Cl. 405—128 **27 Claims**



1. An arrangement for collecting seepage water from a waste depository body, comprising:

sealing means including a planar sealing body underlying the depository body for controlling the spread of seepage water from a region about said depository body;

drainage means in contact with said depository body for drawing off seepage water therefrom; and

means for facilitating direct visual inspection and repair of said sealing body, said means for facilitating including a control room large enough to contain an adult human being in a walking posture, said control room underlying a major portion of said sealing body and a major portion of said depository body.

4,728,223

METHODS OF RENOVATING SEWERS

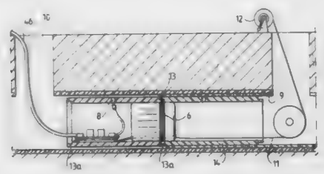
Nigel L. Rice, Nr. Doncaster, England, assignor to Pirelli Construction Co. Ltd., London, England

Filed Nov. 23, 1983, Ser. No. 554,784

Claims priority, application United Kingdom, Nov. 24, 1982, 8233618

Int. Cl.⁴ E03F *3/06*

U.S. Cl. 405—154 **12 Claims**



1. A method of relining a sewer from a fixed control station with a plurality of thermoplastic rigid pipe liners, comprising:

passing a first pipe liner along the sewer to a predetermined starting position within the sewer, each pipe liner including at one end a spigot and at its other end a socket, the spigot of each pipe liner being adapted to slidably fit into a socket of an adjacent pipe liner, the socket including on its inner surface an electrically conductive strip extending circumferentially therearound;

passing a further liner along the sewer to a jointing position wherein the spigot thereof lies within the socket of the first pipe liner with the conductive strip lying between the first pipe liner and the further pipe liner; and

forming a permanent joint between the first pipe liner and the further pipe liner while in situ within the sewer by inducing a current in the conductive strip to cause fusion welding of the further pipe liner to the first pipe liner, all of said steps being controlled from said control station.

4,728,224

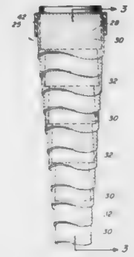
ARAMID COMPOSITE WELL RISER FOR DEEP WATER OFFSHORE STRUCTURES

Mamdouh M. Salama, Ponca City, Okla., and John A. Mercier, London, England, assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 631,127, Jul. 16, 1984, Pat. No. 4,589,801. This application Apr. 28, 1986, Ser. No. 856,322

Int. Cl.⁴ E02B *17/00*

U.S. Cl. 405—195 **14 Claims**



1. In a floating tension leg platform wherein a plurality of substantially vertically oriented, tensioned well risers are connected so as to be constantly in tension between a subsea template located on a sea bottom and said floating platform, the improvement which comprises each of said well risers being a lightweight composite structure of a plurality of longitudinally and circumferentially oriented first aramid fibers embedded in a resin matrix, the aramid fibers having an elastic modulus of less than about twenty million psi, said composite structure having a resulting low axial stiffness permitting sufficient elongation of said riser to accommodate variations in distance between said subsea template and said floating platform without the use of a conventional riser tensioner.

4,728,225

METHOD OF REHABILITATING A WATERFRONT BULKHEAD

Ernest D. Brandl, Houston, Tex., and Robert C. Houghton, Bedford, N.H., assignors to Schnabel Foundation Company, Bethesda, Md.

Continuation of Ser. No. 700,800, Feb. 11, 1985, abandoned. This application Mar. 21, 1986, Ser. No. 843,923

Int. Cl.⁴ E02D *29/02;* **E21D** *20/02*

U.S. Cl. 405—262 **2 Claims**

1. A method of rehabilitating an existing bulkhead located between a body of water and land comprising the steps of:

(a) reinforcing the existing bulkhead by:

(i) installing a plurality of substantially vertical piles at horizontally spaced locations in front of the existing bulkhead;

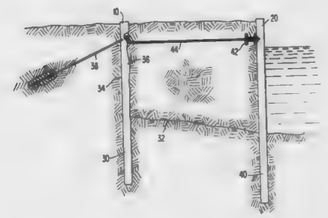
(ii) connecting said vertical piles to the existing bulkhead;

(iii) installing tiebacks through the existing bulkhead and into the land behind the existing bulkhead; and

(iv) connecting the tiebacks to the vertical piles;

(b) installing a new bulkhead facing a predetermined distance in front of the existing bulkhead and supporting the new bulkhead in part with the reinforced existing bulkhead by:

(i) inserting the bottom of said facing into the earthen bottom below the body of water;



(ii) securing connecting members between said vertical piles and said new bulkhead facing; and

(iii) backfilling the area between the existing bulkhead and said new bulkhead facing.

4,728,226

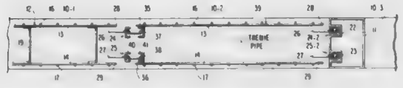
METHOD AND APPARATUS FOR FORMING REINFORCED CONCRETE WALLS WITH CONTINUOUS STEEL REINFORCEMENT

Arturo L. Ressi di Cervia, New York, N.Y., assignor to Finic, B.V., Rotterdam, Netherlands

Filed Apr. 10, 1984, Ser. No. 598,632

Int. Cl.⁴ E02D *5/20;* **E04B** *1/16*

U.S. Cl. 405—267 **17 Claims**



1. In a slurry trench method of constructing an underground concrete wall in a plurality of panel sections with continuous steel reinforcement, wherein a first panel section is excavated, an end stop pipe is placed in an end of said first panel section after excavation thereof, said end stop molding pipe has at least one concrete forming surface extending to the full length thereof, the improvement comprising,

providing at least one groove in said concrete forming surface of said molding pipe with an expandable steel reinforcing cage in said groove, said expandable steel reinforcing cage having a concrete anchor means projecting therefrom beyond said concrete forming surface and into a body of concrete cast thereagainst,

casting concrete in said first panel section to surround said concrete anchor means and against said concrete forming surface,

removing said molding pipe from said first panel section,

excavating an adjacent panel section,

expanding said expandable steel reinforcing cage into said adjacent panel section, and

filling said adjacent panel section with concrete.

4,728,227

RETAINING WALL STRUCTURE

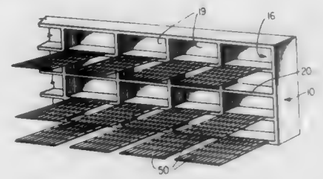
Hugh G. Wilson, 2006-28 Crescent, Vernon, British Columbia, Canada V1T 1V2, and Wayne D. Rains, 923 McCartney Road, Kelowna, British Columbia, Canada V1Z 1R9

Filed Mar. 10, 1986, Ser. No. 837,809

Claims priority, application Canada, Jan. 15, 1986, 499,622

Int. Cl.⁴ E02D *29/02*

U.S. Cl. 405—284 **6 Claims**



1. A soil reinforcing structure comprising:

an upright soil retaining wall member having a front surface and a rear surface;

at least one flexible first grid member extending rearwardly from said rear surface to reinforce compacted soil located behind said wall, said first grid member including a plurality of transversely extending rows of apertures, said apertures being spaced from one another along said transversely extending rows by a first intervening web;

a second flexible grid member horizontally anchored in said rear surface, having therein at least one row of apertures extending parallel to and outside said rear surface, each of said apertures being spaced from one another by a second intervening web; and

rod means inserted within a channel formed by an interfingering of said first and second intervening webs to interconnect said flexible first grid member and said upright wall member.

4,728,228

MILLING CUTTER

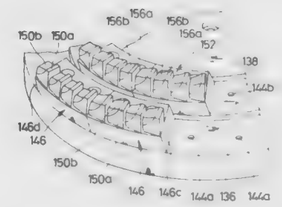
Hiromu Okunishi, Iruma, and Shigenari Shino, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,289

Claims priority, application Japan, Sep. 29, 1984, 59-204721; Sep. 29, 1984, 59-204723; Nov. 22, 1984, 59-177933[U]; Nov. 22, 1984, 59-177934[U]

Int. Cl.⁴ B26D *1/12*

U.S. Cl. 407—35 **14 Claims**



1. A milling cutter comprising:

a cutter body having an outer peripheral edge and a plurality of circular steps defined concentrically along said outer peripheral edge, said steps including a radially inner step and a radially outer step, said radially inner step being higher than said radially outer step in the axial direction of said cutter body;

a first plurality of cartridges disposed successively on said

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radially inner step by fastening means without substantial gaps therebetween, each of said first cartridges having a body portion and a cutting edge portion with at least two finishing cutting edges with first flutes, said first cutting edges of said cartridges being spaced at equal intervals fully around said cutter body, said cartridge body including leading and trailing surfaces slanted complementarily in the direction of rotation of said cutter body, said cartridges being arranged on said first step with said leading surfaces being pressed by said trailing end surfaces of adjacent said cartridges, said first flutes being in communication with each other for discharging cutting oil therethrough; and

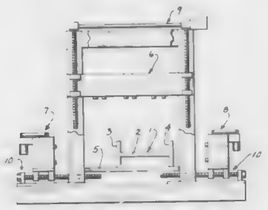
a second plurality of cartridges disposed successively on said radially outer step by fastening means without substantial gaps therebetween, each of said second cartridges having a body portion and a cutting edge portion with at least two roughly cutting edges with second flutes, said second cutting edges of said cartridges being spaced at equal intervals fully around said cutter body, said cartridge body including leading and trailing surfaces slanted complementarily in the direction of rotation of said cutter body, said cartridges being arranged on said second step with said leading surfaces being pressed by said trailing end surfaces of adjacent said cartridges, said second flutes being in communication with each other for discharging cutting oil therethrough.

4,728,229

POSITIONING MECHANISM FOR A MULTIPLE HEAD DRILLING ASSEMBLY

Lawrence C. Memmel, Mequon, and Donald E. Thiede, Hartland, both of Wis., assignors to Super Tool and Mfg. Corporation, Brookfield, Wis.

Filed Dec. 5, 1985, Ser. No. 804,830
Int. Cl.⁴ B23B *39/18*
U.S. Cl. 408—46 **18 Claims**



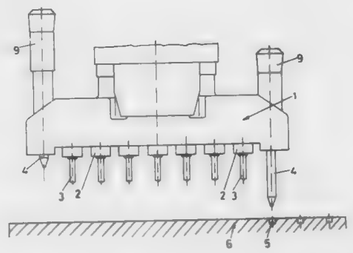
1. A positioning apparatus for positioning a head of a multiple head working apparatus, comprising a frame, a plurality of spindle blocks mounted in side-by-side relation on the frame, guide means for guiding the spindle blocks in movement on said frame in a given direction, a spindle to carry a working member and connected to each spindle block, means for rotating each spindle about its axis means for moving each spindle axially relative to the respective block, screw means extending in said direction, nut means associated with each spindle block, each nut means being threadedly engaged with said screw means, and clamping means for selectively clamping each nut means to the respective spindle block, whereby rotation of the screw means when the nut means is engaged with the respective spindle block will cause movement of the spindle block in said direction and rotation of said screw means when said nut means is disengaged with said spindle block will not cause movement of said spindle block.

4,728,230

MULTISPINDLE-DRILLING MACHINE

Dietmar Blum, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 11, 1986, Ser. No. 941,623
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 8536432
Int. Cl.⁴ B23B *39/18*
U.S. Cl. 408—53 **14 Claims**



1. In a multispindle drilling machine for drilling series of holes in a workpiece, particularly a furniture part, said machine including a drilling head having drilling spindles, feed means for moving said drilling head toward and away from the workpiece between a maximum drilling depth position and a withdrawn position, and at least one positioning pin mounted on said drilling head, said drilling head being slidable relative to said positioning pin in opposite directions between a projected position of said positioning pin, whereat an end of said positioning pin extends beyond drills supported by said drilling spindles such that said end may be positioned in a hole previously drilled in the workpiece, and a retracted position of said positioning pin, whereat said end of said positioning pin is spaced further from the workpiece than are the drills, whereby during a drilling operation said drilling head moved relative to the workpiece from said withdrawn position to said maximum drilling depth position and thereby relative to said positioning pin from said projected position of positioning pin to a middle position of said positioning pin intermediate said projected and retracted positions, the improvement comprising:

means for, upon completion of the drilling operation, retaining said positioning pin in said middle position relative to said drilling head, and thereby for, upon operation of said feeding means to move said drilling head from said maximum drilling depth position to said withdrawn position, automatically removing said end of said positioning pin from the previously drilled hole.

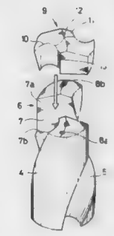
4,728,231

DRILL BIT STRUCTURE

Nagatoshi Kunimori; Yoshikatsu Mori, and Masaaki Jindai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 4, 1985, Ser. No. 707,970
Claims priority, application Japan, Mar. 12, 1984, 59-34145
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.⁴ B23B *27/10, 27/18, 51/06*
U.S. Cl. 408—59 **15 Claims**

1. A drill bit structure comprising a drill bit body having lands with a given first circumferential width (a) and, between the lands, flutes with a second circumferential width (b), said lands being interconnected by a web having a thickness (c), said drill bit body further having a diamter (d), a shank at one end thereof and a tip at the other end of said drill bit body, a groove in said drill bit tip, a hard tip member fitted and fixed in said groove, said web thickness (c) corresponding to 25–35% of said drill bit diameter (d), said drill bit body further having a flute width ratio in the range of 0.4:1 to 0.8:1, whereby said flute width ratio is defined as said flute width (b) divided by said land width (a), and wherein said drill bit body tip is formed



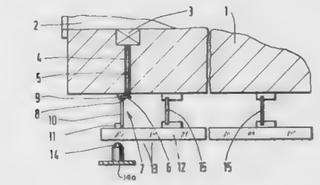
so that its radial rake angle of an outer peripheral cutting lip as measured at positions spaced at least ⅓ of the drill bit diameter radially outwardly from a central drill bit axis is in the range of −5° to positive values.

4,728,232

DEVICE FOR TEMPERATURE-RESPONSIVE ADJUSTMENT OF THE MEASURING POINTS OF TWO MACHINE TOOL PARTS

Werner Babel, Pfronten-Meilingen, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,058
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604550; European Pat. Off., Jul. 29, 1986, 86110454
Int. Cl.⁴ B23B *49/00*; B23C *9/00*
U.S. Cl. 409—135 **7 Claims**



1. A device for the temperature-responsive adjustment of the measuring points of two relatively movable machine tool parts, said device comprising:

rule means mounted for limited longitudinal movement on a first machine part;

a scanning head mounted on a second machine part;

at least one thermally sensitive element mounted to said first machine part in such a way as to be thermally responsive to that portion of said first machine part that is particularly subject to being heated; and

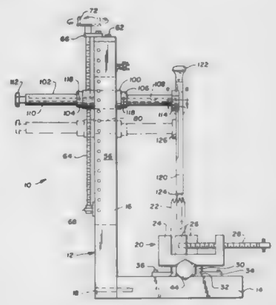
a reversing drive for coupling said thermally sensitive element to said rule means to longitudinally adjust the zero position of said rule means in response to thermally caused positional changes in said thermally sensitive element, said reversing drive comprising said thermally sensitive element and said coupling means combined in the form of a bimetallic element.

4,728,233

DEVICE AND METHOD FOR SHAPING AN ARCUATE EDGE

Alton L. Stanford, 9 Willow La., Stafford, Va. 22554

Filed Apr. 21, 1986, Ser. No. 853,923
Int. Cl.⁴ B23D *5/02*
U.S. Cl. 409—293 **5 Claims**



5. A device for shaping an arcuately concave portion of a workpiece comprising

a frame assembly,

a multi-positional jig assembly positioned on said frame assembly to support and position a workpiece including an arcuate edge portion,

a tool for shaping the arcuate edge portion,

mounting means for adjustably mounting said tool to said frame asembly relative to said jig assembly and for establishing th Raxis about which the tool can pivot,

means for incrementally adjusting the relative position of said tool to said arcuate edge portion, and

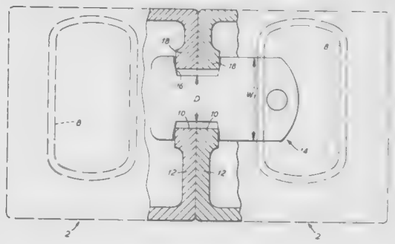
sensing means for sensing the position of said tool relative to said arcuate edge portion so that through the relative mutual positioning of said jig and said mounting menas the tool can engage and move along the length of the arcuate edge portion.

4,728,234

MEANS FOR SECURING TOGETHER FREIGHT CONTAINERS

Kenneth Reynard, Thirsk, England, assignor to George Blair Public Limited Company, Newcastle upon Tyne, England

Filed Nov. 6, 1986, Ser. No. 928,267
Claims priority, application United Kingdom, Nov. 13, 1985, 8528027
Int. Cl.⁴ B65D *90/00*
U.S. Cl. 410—82 **3 Claims**



1. Means for securing together a pair of freight containers each provided with corner fittings of the type described, the containers including a pair of abutting corner fittings the abutting walls of which each have formed therein aligned, elongate

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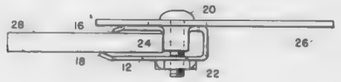
apertures, the securing means comprising an elongate locking member of generally rectangular shape in transverse section, the length of the major transverse axis being less than the length of the major axis of said apertures but greater than the length of the minor axis of said apertures, the locking member having opposed sidewalls, said sidewalls defining therein opposed grooves, one to each end of the major axis of the transverse section of the locking member, the widths of the grooves considered in the longitudinal direction of the locking member tapering inwardly of the locking member from the top to the bottom of the grooves, the arrangement being such that, on passage of the locking member through the apertures in the abutting walls with the major axes of the locking member and the apertures aligned to being the grooves into axial alignment with said walls, and on rotation of the locking member through 90° about its central longitudinal axis, the edge regions of said walls bounding the apertures are received within, to be urged into locking engagement with one another by the sidewalls of, said grooves.

4,728,235

NON-ROTATABLE ATTACHMENT CLIP

Anthony J. Patti, Hayward, Calif., assignor to Wheel Masters Inc., San Leandro, Calif.

Filed Jun. 23, 1986, Ser. No. 877,488
Int. Cl.⁴ F16B *37/02, 21/18*
U.S. Cl. 411—174 **5 Claims**



1. A clip for clamping a first component to the edge of a second component, said first component being attachable to the clip by a screw in said clip, said second component having no screw hole for attachment to said clip, said clip comprising:

first and second legs each interconnected at one end by a connecting leg to form a substantially U-shaped member, said first and second legs having exterior surfaces and facing interior surfaces spaced at distance substantially equal to the thickness of the second component;

side tabs extending from at least one of said first and second legs, said tabs being bent toward the inner surface of the other of said first and second legs and separated therefrom for limiting the minimum spacing between said first and second legs, said tabs being positionable to abut against the edge of said second component for preventing rotation of the clip;

a female threaded member connected to the exterior surface of said second leg, said threaded member being axially aligned with holes through the surfaces of said first and second legs; and

a screw passing through said holes in said first and second legs and threaded into said female threaded member, the tightening of said screw operating to force together said first and second legs.

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FASTENING DEVICE FOR USE ON THREADED BOLTS OR STUDS

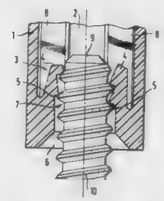
Willibald Kraus, Grunstadt, Fed. Rep. of Germany, assignor to TRW United Carr GmbH, Alsenborn, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,666
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525865; Jul. 11, 1986, 3618486
Int. Cl.⁴ F16B *37/00*
U.S. Cl. 411—437 **7 Claims**

1. A fastening device for connection to an associated threaded bolt comprising:

a molded plastic body having an inwardly extending opening with an entrance end sized to receive the associated bolt;

at least one resilient elastic catch projection member mounted on said opening adjacent said entrance end and extending radially and axially inward relative to said entrance end, said at least one catch projection member terminating in a free end lying at a diameter significantly less than the diameter of the associated bolt; a series of graduated forms formed on a radially inward facing surface of said catch projection member and adapted to engage between adjacent threads of the associated bolt as



said bolt is moved axially into said opening and said catch projection is deflected radially outward; said graduated forms comprising step-like protuberances formed such that when said elastic catch projection member is in its undeflected position each successive protuberance inwardly of said entrance end lies progressively closer to the axis of said opening and is defined by a pair of intersecting faces which respectively lie in planes generally perpendicular and parallel to the axis of said opening; and,

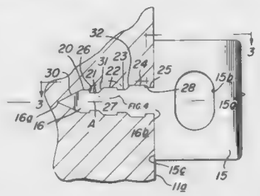
at least one guide rib formed in said opening to extend parallel to said at least one catch projection member.

4,728,237

DRIVABLE PICTURE FRAME HANGER

Eugene Lorincz, Cinnaminson, N.J., and Marlin J. Hoskinson, Philadelphia, Pa., assignors to Moore Push-Pin Company, Wyndmoor, Pa.

Filed Sep. 10, 1986, Ser. No. 905,769
Int. Cl.⁴ A47G *1/16;* **F16B** *15/00*
U.S. Cl. 411—451 **13 Claims**



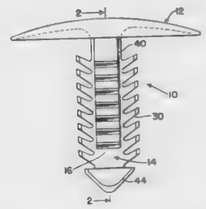
1. A hanger for connection to a wooden frame, comprising a one-piece, stamped metal member having a flat, elongate shank with a longitudinal axis and a head permitting the shank to be driven longitudinally into the wooden frame, said head having at least one distal shoulder extending laterally of the longitudinal axis of the shank and adapted to engage the surface of the wooden frame when the shank is driven therein, said shank having a proximal tapered tip and edge means providing as a series of lands and grooves disposed on at least one side of said axis between the shank tip and head shoulder, the lands and grooves including land surfaces and groove surfaces each disposed parallel to the longitudinal axis of the shank, each distally successive land surface being spaced further from said axis than its proximally preceding land surface, each distally successive groove surface being spaced further from the axis of the shank than its proximally preceding groove surface, means providing an inclined camming surface between the distal end of each groove surface and the proximal end of its succeeding land surface, and a distally facing transverse gripping surface located distally of each land surface, whereby the camming surfaces cooperate with the lands and grooves to effect elastic displacement of the wood fibers laterally of the shank as it is driven into the wood for effecting a positive gripping action that enables the hanger to resist disengagement from the wooden frame.

4,728,238

PLASTIC DRIVE FASTENER

Lisa E. Chisholm, Chicago Heights, and John F. Nelson, New Lenox, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 159,899, Jun. 16, 1980, abandoned.
This application Jul. 30, 1982, Ser. No. 403,385
Int. Cl.⁴ F16B *19/00*
U.S. Cl. 411—510 **3 Claims**



1. One-piece plastic drive fastener comprising a head and shank, said shank having an axially extending generally polygonal body portion providing a plurality of radial outward facing flat surfaces, a first plurality of integral independent resilient wings extending radially outwardly from at least one of said surfaces at axially spaced intervals, the juncture of said first plurality of said wings along said at least one of said surfaces being along a straight line forming a bend line for flexure of said wings during introduction of the fastener into a complementary aperture workpiece, a second plurality of integral resilient independent wings extending from one of the other of said surfaces with an angular orientation tilting in the direction of said head, each of said second plurality of wings having a thickened section formed on its upper surface at its juncture with said one surface, where said thickened section on the upper surface of each of said second plurality of wings extending the same distance from said one surface to define a bend line along which each wing flexes that is radially spaced from said one surface.

4,728,239

CAP LINING MACHINE

Thomas G. Kieran, Tempe, and Newton Rickenbach, Mesa, both of Ariz., assignors to Top Seal Corporation, Phoenix, Ariz.

Filed Oct. 17, 1986, Ser. No. 920,113
Int. Cl.⁴ B21D *51/46*
U.S. Cl. 413—64 **5 Claims**

1. A cap-lining machine including in combination:

liner punching means having a hollow body with openings in the top and bottom thereof and moveable between retracted and punching positions for punching cap inserts from a liner located adjacent the bottom of said punching means;

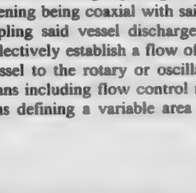
liner supply means for supplying liner to said liner punching means;

tamper assembly means inserted into the hollow body of said punching means and having a portion resting on the top of said punching means to support said tamper assembly means in the hollow body of said punching means, said tamper assembly means having a tamper carried thereby for reciprocating movement within said tamper assembly means and said punching means to deliver inserts from said punch means to caps located beneath said punching means when said punching means is in the punching position thereof;

means in said tamper assembly for normally biasing said tamper upwardly within said punching means to a retracted position therein;

abutment means mounted in a fixed position relative to said punching means;

a rocker arm mounted on a pivot for movement with said punching means and comprising a lever extending on one side of said pivot for engagement with said tamper and extending on the other side of said pivot for engagement with said abutment means, said rocker arm lever moving said tamper downwardly through said tamper assembly



and said punching means to an extended position below the bottom of said punching means to seat inserts in caps located beneath said punching means as said punching means completes movement from its retracted position to its punching position; and

including a removable projection on said rocker arm lever extending over said abutment means for engaging said abutment means when said punching means is moved downwardly for causing said rocker arm lever to pivot in one direction about said pivot, and wherein removal of said removable projection permits said rocker arm lever to be pivoted in the opposite direction to a position out of engagement with same tamper for permitting removal of said tamper assembly from said punching means by lifting said tamper assembly from the top of said punching means.

4,728,240

CHARGING INSTALLATION FOR A SHAFT FURNACE

Rene Mahr, Howald; Emile Lonardi, Bascharage; Gilbert Bernard, Hemldange; Marc Solvi, Ehlange s/Mess, and Pierre Mailliet, Howald, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Mar. 17, 1986, Ser. No. 840,386
Claims priority, application Luxembourg, Mar. 15, 1985, 85811
Int. Cl.⁴ F23K *3/16*
U.S. Cl. 414—21 **16 Claims**

1. A charging installation for a shaft furnace, the furnace having an axis, the furnace further having a charge material supply opening which is coaxial with said axis, said furnace also having a rotary or oscillating chute for distributing charge material from the charge material supply opening into the furnace, said charging installation comprising:

an intermediate charge material storage vessel, said vessel having an axis, said vessel further having an upper end and a lower end with a discharge opening at its lower end, said discharge opening being coaxial with said vessel axis;

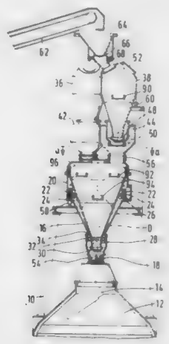
means for coupling said vessel discharge opening to the furnace to selectively establish a flow of charge material from said vessel to the rotary or oscillating chute, said coupling means including flow control means, said flow control means defining a variable area orifice which is

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generally symmetrical with respect to a prolongation of the furnace axis;

means for rotating said intermediate storage vessel and said flow control means about said vessel axis;

sealed chamber means, said sealed chamber means enclosing said intermediate storage vessel, said sealed chamber means having a lower end associated with said lower end of said intermediate storage vessel and an upper end associated with said upper end of said intermediate storage



vessel, said upper end of said sealed chamber means including a plurality of loading openings, said loading openings communicating with said upper end of said intermediate storage vessel;

at least two lock means, each lock means having an upper and lower sealing means for entry and exit of charge material, said lock means being positioned above said upper end of said sealed chamber means and each of said lower sealing means selectively communicating with one of said loading openings of said sealed chamber means.

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APPARATUS FOR LIFTING AND REMOVING GARBAGE CONTAINERS FROM GARBAGE TRUCKS

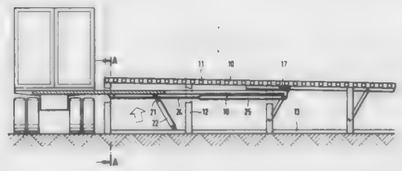
Gustav D. Edelhoff, Iserlohn, Fed. Rep. of Germany, and Fred T. Smith, Palos Verdes Pen, Calif., assignors to Edelhoff Polytechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,864

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420059

Int. Cl.[4] B65F *1/00*

U.S. Cl. 414—392 **5 Claims**



1. Apparatus for lifting detachably mounted containers from garbage-collecting vehicles having load carrying platforms and for carrying said containers away from said vehicles, the containers being provided on their undersides with laterally disposed, longitudinally extending skids which are adapted to cooperate with brake rails disposed between said skids, said apparatus comprising an inclined roller conveyor for conveying said containers in a direction transverse to their longitudinal direction, the rollers of said conveyor being arranged in laterally disposed pairs and provided at their ends with flanges having radially and axially inwardly beveled inside surfaces and being axially spaced apart at their inner ends at least by a width equal to the width of a skid on a container, said skid on the container being supported by a roller between the flanges thereof, a receiving end of said roller conveyor having substantially the same elevation as the load-carrying platform of a garbage-collecting vehicle and being provided with arms having tines which are moved under a container when the container has been unlocked, and means to lift and lower the arms and to extend the arms beyond the receiving end of said conveyor and to retract the arms into or beyond said receiving end, and braking means located adjacent to a delivery end of said roller conveyor and which comprise a brake beam disposed in the middle portion of the width of said roller conveyor, or two brake beams disposed adjacent to the sides of said conveyor, said brake beam or said brake beams being provided with brake linings, and said brake beam or beams being adapted to be lifted above and to be lowered below the plane of conveyance by said rollers.

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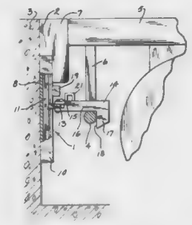
VEHICLE RESTRAINT HAVING DOWNWARDLY FACING HOOK

Kjell I. Erlandsson, Milwaukee, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Apr. 14, 1986, Ser. No. 851,970

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—401 **7 Claims**



1. A vehicle restraint for preventing accidental movement of a vehicle away from a fixed structure, comprising vertical guide means mounted on a vertical surface of said structure, a slide having a non-circular erase-section mounted for sliding vertical movement in said guide means and having a portion extending outwardly beyond said guide means, said slide being fixed against rotational movement relative to said guide means at all vertical positions of said slide, a restraining member pivotally connected to said portion about a generally vertical pivot axis, said restraining member being constructed and arranged to pivot relative to said slide from a first storage position located outwardly of said guide means and generally parallel to said structure to a second operating position where said restraining member extends outwardly from the structure, and means on said restraining member for receiving an implement to manually effect vertical or pivotal movement of said restraining member relative to said slide, said restraining member having a notch in its lower surface disposed to engage an abutment on said vehicle, engagement of said notch with said abutment preventing accidental movement of said vehicle away from said structure.

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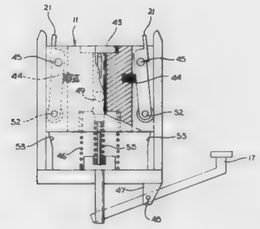
CARRIER MANUAL LOAD/UNLOAD WORK STATION

Michael J. Kliewer, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 5, 1986, Ser. No. 871,069

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—417 **13 Claims**



1. An apparatus for use in loading and unloading a packaged semiconductor device from a carrier, said carrier having clips to hold said device in said carrier, said apparatus comprising:

retention means for retaining said carrier, said retention means including members to spread said clips when said carrier is inserted into said retention means such that said device may be inserted into and removed from said carrier;

ejector means coupled to said retention means for removing said device from said carrier.

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COMBINED ROOF RACK FOR A CAR AND TWO-WHEEL CART

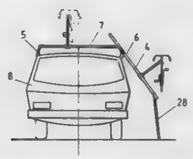
Svend Stokkendal, Slependveien 8, N-1300 Sandvika, Norway

Filed Feb. 7, 1986, Ser. No. 827,052

Claims priority, application Norway, Jul. 5, 1985, 852732

Int. Cl.[4] B60R *9/04*

U.S. Cl. 414—462 **4 Claims**



4. Combined car roof rack and two-wheel cart comprising two tubular bars adapted to be attached to the top of a car, so that they run in spaced parallel relationship to one another over the roof of the car transversely to its longitudinal direction, said bars being provided at one end with a rotatable roller, whose axis runs transversely to the longitudinal direction of the bar, and wherein a rectangular rack frame having at least one attachment bar for baggage, particularly a bicycle, is movably mounted between the bars, there being two opposing frame elements running parallel with and close to the bars and consisting of metal lengths having a C-profile with their profile openings facing their respective bars and in engagement with the rollers thereof, characterized in that the rollers are rotatably fastened about a shaft journal which is disposed at a right angle on a plug which is adapted for easily releasable attachment in the open end of each of the tubular bars, the end surface of the plug facing away from the tube end having a threaded hole into which is screwed a screw bolt whose interior tip is in contact with a loose lock piece resting at an angle, which lock piece is adapted to be moved by means of the screws at its interior end along the bottom of an outward opening cavity provided in the plug, and with the side surface thereof which faces away from the screw bolt resting against the interior limiting wall of the cavity.

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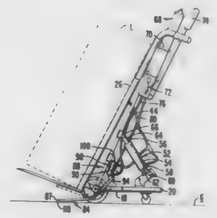
POWER ASSISTED HAND TRUCK

James A. Shelton, 1124 Sutter Ave., Modesto, Calif. 95315

Filed May 30, 1986, Ser. No. 868,971

Int. Cl.[4] B60P *1/18*

U.S. Cl. 414—490 **12 Claims**



1. A hand truck comprising:

a frame including a first, lower portion and a second, upwardly extending portion pivotally mounted to the first portion for movement about a pivot axis between a first, generally upright orientation and a second, rearwardly tilting orientation;

wheels mounted to the first portion for supporting the frame on a support surface;

a power source;

first, axially extendable actuator means, coupled to the power source and mounted between a first position on a first portion of the frame and a second position on the second portion of the frame, for moving the second portion from its second orientation to its first orientation;

a stabilizer secured to the frame for movement between a support surface engaged orientation and a support surface disengaged orientation, said stabilizer contacting said support surface at a fulcrum point forward of said pivot axis, said stabilizer and said wheels simultaneously supporting said frame on said support surface while in said supprort surface engaged orientation; and

a second, axially extendable actuator means, coupled to the power source and mounted between a third position on the stabilizer and a fourth position on the frame, for moving the stabilizer into the support surface engaged and disengaged orientations and for moving the second portion from its first orientation to its second orientation.

4,728,246

WAFER BOAT TRANSFER TOOL

William R. Mello, Huntington Beach, Calif., assignor to Thermco Systems, Inc., Orange, Calif.

Filed May 16, 1986, Ser. No. 863,963

Int. Cl.[4] B65G *1/10*

U.S. Cl. 414—592 **10 Claims**

1. A wafer boat transfer tool for use with an automated drive, said tool comprising:

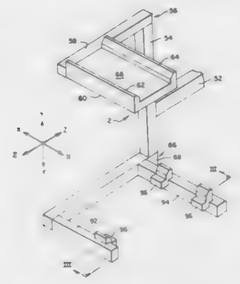
an upper fork means disposed in a generally horizontal plane;

a lower fork means underlying said upper fork means in spaced parallel relation thereto,

each of said fork means having a pair of tines adapted to support a boat, each pair of tines having a centerline extending in a direction fore-and-aft of the tool,

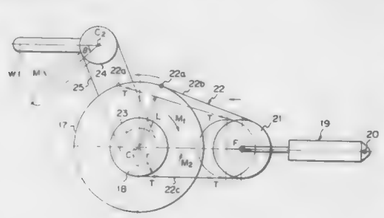
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a normally upright post rigidly interconnecting said upper and lower fork means,
said post being laterally offset from said centerlines,



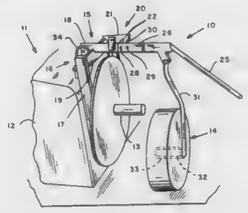
drive coupling means on said post intermediate said upper and lower fork means for connecting said tool to said drive.

4,728,247
INDUSTRIAL ROBOT
Seiichiro Nakashima; Kenichi Toyoda, both of Hino; Nobutoshi Torii, Hachioji, and Hitoshi Mizuno, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP85/00366, § 371 Date Feb. 20, 1986, § 102(e) Date Feb. 20, 1986, PCT Pub. No. WO86/00255, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 28, 1985, Ser. No. 834,274
Claims priority, application Japan, Jun. 29, 1984, 59-133001
Int. Cl.⁴ B66C *23/72*
U.S. Cl. 414—680 **6 Claims**



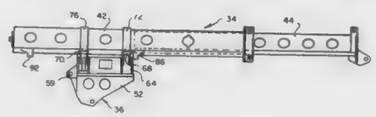
1. An industrial robot, comprising:
a robot body;
a lower arm provided on said robot body pivotably about a first horizontal axis;
a forearm provided on said lower arm pivotably about a second horizontal axis; and
means of rotationally driving said forearm;
said robot body having provided thereon a rotating disk interlocked with the pivoting of said forearm about said second axis and which is rotatable about said first axis, said rotating disk having secured thereon a first wheel having a diameter smaller than that of said rotating disk, there being provided a tension spring assembly having one end mounted on the robot body and the other end being free and having a second wheel mounted thereon, said second wheel having a same diameter as that of said first wheel, also a chain means having one end thereof connected to said rotating disk and the other end connected to said first wheel and engaged on the outer circumference thereof being engaged on the outer circumference of said second wheel while pulling said tension spring assembly, the one end of said chain means being so disposed on said rotating disk that when the upper end of said forearm is directed normally downward, the chain portion between said rotating disk and said second wheel is generally parallel to the chain portion between said first and second wheels.

4,728,248
HUB-LIFTING AND ALIGNMENT APPARATUS
Mario F. Martins, 95 Tuckahoe Dr., Huntington, Conn. 06484
Filed Feb. 9, 1987, Ser. No. 12,433
Int. Cl.⁴ B66C *23/00*
U.S. Cl. 414—684 **8 Claims**



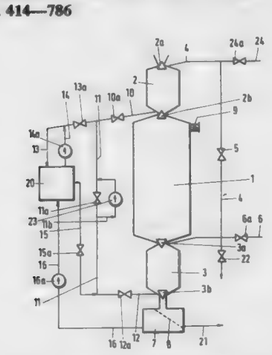
1. An assembly, designed for use in association with an apparatus having an elevated horizontal receiving shaft, for facilitating the lifting, alignment and transfer of a heavyweight narrow reel having a shaft-engaging bore onto said shaft, said assembly comprising a pivot support means designed to be mounted in vertical alignment above the receiving shaft by a distance greater than the radius of the reel to be mounted thereon, an elongate lever arm having an attachment end, a handle end and an intermediate depending pivotally-attached swivel extension arm terminating in a hub support means, means for pivotally attaching the attachment end of said lever arm to said pivot support means in vertical alignment above the receiving shaft of an apparatus so that said swivel extension arm depends from said lever arm and said hub support means extends from said swivel extension arm in a horizontal direction towards said receiving shaft, manual lifting of the handle end of said lever arm causing said lever arm to pivot on said pivot support means and raise said swivel extension arm and its hub support means between horizontal lower position, in which the hub support means can be engaged adjacent the bore of a heavyweight narrow reel, and horizontal raised position in which the bore is in alignment with the receiving shaft, to permit manual transfer of the reel onto the receiving shaft, and means for locking said lever arm in raised position.

4,728,249
TELESCOPING BOOM ASSEMBLY WITH LONGITUDINALLY DISPLACEABLE BASE BOOM SECTION
John W. Gano, New Philadelphia, Ohio, assignor to The Gradall Company, New Philadelphia, Ohio
Filed Dec. 11, 1985, Ser. No. 807,553
Int. Cl.⁴ E02F *3/20*; B66C *23/00*
U.S. Cl. 414—718 **25 Claims**



1. A boom assembly for a material handling apparatus comprising:
a. a telescoping boom comprising a base boom section and at least one extensible boom section telescopingly received within said base boom section and having a free end adapted to receive a work implement;
b. a boom support element supported by said material handling apparatus, said boom support element comprising:
(i) a boom cradle having first and second transverse cradle arms, said cradle arms extending perpendicularly of the axis of said telescoping boom; and
(ii) means for releasably attaching said base boom section to said cradle arms;
c. means for longitudinally displacing said base boom section relative to said boom cradle when said base boom section is released from engagement therewith;
d. at least one first stop means secured to said base boom section intermediate the length thereof, said first stop means being releasably attachable to said first cradle arm;
e. at least one second stop means secured to said base boom section adjacent the end thereof remote from the free end of said extensible boom section, said second stop means being releasably attachable to said second cradle arm; and
f. said means for displacing said base boom section comprises means for reversably displacing said base boom section between a first position in which said first stop means is disposed adjacent said first cradle arm and a second position in which said second stop means is disposed adjacent said second cradle arm.

4,728,250
PROCESS OF FILLING AND EMPTYING A CONSTANTLY PRESSURIZED CONTAINER
Joachim Wilhelm, Frankfurt, and Rainer Reimert, Idstein, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Sep. 18, 1986, Ser. No. 909,134
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533202
Int. Cl.⁴ B01J *3/00*; C11B *1/10*; B01D *11/02*
U.S. Cl. 414—786 **4 Claims**



1. A method of filling a container while continuously under a superatmospheric pressure with flowable granular solids and removing flowable granular solids from said container, said method comprising the steps of:
(a) introducing said flowable granular solids into an entrance lock chamber which is open and in a pressure-relieved state, and then substantially completely filling said chamber with a liquid and sealing said entrance lock chamber;
(b) connecting a discharge lock chamber, containing flowable granular solids in a closed state and under a pressure of a gas approximately as high as the pressure in said container, with said entrance lock chamber by a gas line to equalize pressures between said chambers;
(c) conducting liquid from said entrance lock chamber to said discharge lock chamber through a liquid line, thereby displacing gas from said discharge lock chamber to said entrance lock chamber through said gas line, and thereafter closing said lines;
(d) transferring said flowable granular solids from said entrance lock chamber to said container while supplying gas from said container to said entrance lock chamber to pressurize said entrance lock chamber;
(e) relieving pressure in said discharge lock chamber and transferring liquid and solids therefrom to a liquid/solid separator from which separated liquid is supplied to a storage tank.;
(f) thereafter filling said discharge lock chamber with liquid and opening said gas line to effect pressure equalization between said chambers;
(g) subsequently opening said liquid line to transfer liquid from siad discharge lock chamber to said entrance lock chamber and displace gas from said entrance lock chamber to said discharge lock chamber;
(h) thereafter closing said lines and transferring the flowable granular solids from said container to said discharge lock chamber; and
(i) relieving pressure in said entrance lock chamber and transferring liquid therefrom to said storage tank.

4,728,251
COMPLETE SWIVEL TYPE BACKHOE VEHICLE
Akira Takashima, Sakai, and Takafumi Wada, Kaizuka, both of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Feb. 18, 1987, Ser. No. 15,832
Claims priority, application Japan, Feb. 28, 1986, 61-45090
Int. Cl.⁴ E02F *3/28*
U.S. Cl. 414—694 **5 Claims**



1. A backhoe vehicle comprising;
a chassis (3) including traveling devices (1) on lateral sides thereof,
an upper carriage (5) including a driver's section (6) on a front portion thereof and swivellable 360 degrees on said chassis (3),
an excavating assembly (4) including a boom (10), a bucket arm (11) and a bucket (12), said boom (10) defining a first bent portion (18) and a second bent portion (21) so that a distal end of said boom (10) is inclined in a direction in which said boom (10) is lowered,
an excavating assembly holder (14) attached to a front region of said upper carriage (5) and adjacent a transversely mid-position of the vehicle to be pivotable on a vertical axis (Y), said boom (10) being connected to said holder (14) to be pivotable on a horizontal rotary shaft (20), and
a boom cylinder (13A) for causing pivotal movements of said excavating assembly (4), said boom cylinder (13A) being connected at one end to said boom (10) and at the other end selectively to one of a first pivot member (19A) and a second pivot member (19B) defined on said holder (14), said second pivot member (19B) being disposed at a

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lower rearward position with respect to said first pivot member (19A),

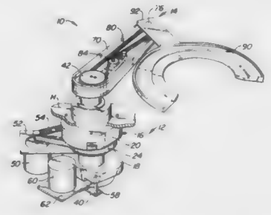
wherein said first bent portion (18) is defined substantially at a longitudinally mid-position of said boom (10), and said second bent portion (21) is defined between said first bent portion (18) and said rotary shaft (20), a distance between said rotary shaft (20) and said second bent portion (21) being substantially equal to a distance between said rotary shaft and said first pivot member (19A).

4,728,252

WAFER TRANSPORT MECHANISM

Christopher O. Lada, Palo Alto; Raymond L. Degner, Los Altos, and Robert T. LoBianco, Sunnyvale, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Aug. 22, 1986, Ser. No. 899,563
Int. Cl.[4] B65H *5/00*
U.S. Cl. 414—744 R **21 Claims**



1. An apparatus for transporting a workpiece relative to a housing, said apparatus comprising:

a sleeve mounted to rotate relative to the housing;

a shaft mounted coaxially within the sleeve;

a bearing assembly mounted to rotate relative to the sleeve but fixedly coupled to the shaft;

a linking arm fixedly attached at one end to the sleeve;

a workpiece transport arm rotatably secured to the other end of the linking arm;

means mounted on the bearing assembly for rotating the sleeve relative to the shaft and for rotating the sleeve and shaft relative to the housing; and

means for coupling the workpiece transport arm to the shaft so that rotation of the sleeve relative to the shaft causes the workpiece transport arm to rotate relative to the linking arm.

4,728,253

APPARATUS FOR ADVANCING AND RETURNING FEED BARS FOR A TRANSFER PRESS

Susumu Oba; Kenji Kurishima; Masaharu Kusunoki; Tadao Odaka, all of Sagamihara, and Toshihiko Arai, Kanagawa, all of Japan, assignors to Aida Engineering, Ltd., Sagamihara, Japan

Filed Jul. 23, 1986, Ser. No. 888,438
Claims priority, application Japan, Jul. 31, 1985, 60-169272; Feb. 25, 1986, 61-26911[U]
Int. Cl.[4] B30B *15/30*
U.S. Cl. 414—749 **12 Claims**

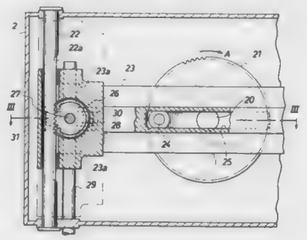
1. Feed bar advance and return driving apparatus having a press crown, said apparatus comprising:

an upper slider reciprocally vertivcally movable in said press crown in synchronization with the operation of the press;

a pinion rotatably mounted on said upper slider so as to rotate alternatingly in opposite directions with the upward and downward vertical movement of said upper slider;

a drive rack vertically slidably supported on said upper slider and connected to said pinion at a position on said pinion which is eccectric to the axis of rotation of said pinion and for being reciprocally vertically driven by the rotation of said pinion, said drive rack having a lower end extending downwardly;

a drive pinion rotatably mounted on said press and engaged by said lower end of said drive rack for being rotated by said drive rack alternatingly in opposite directions during the reciprocal vertical motion of said drive rack;



a drive lever means connected to said drive pinion at a position eccentric to the axis of rotation of said drive pinion and pivotally mounted on said press; and

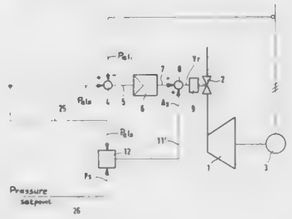
a lower slider for supporting feed bars of said press and connected to said drive lever means and driven in advancing and returning directions by the swinging motion of said drive lever means during rotation of said drive pinion.

4,728,254

METHOD AND APPARATUS FOR CONTROLLING A STEAM TURBINE OF A POWER STATION UNIT

Paul Schmitz-Josten, Heroldsberg, and Rainer Nürnberger, Nürnberg, both of Fed. Rep. of Germany, assignors to M A N Gutehoffnungshütte GmbH, Nürnberg, Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,597
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528292
Int. Cl.[4] F01D *17/04*
U.S. Cl. 415—13 **3 Claims**



1. A method of controlling a steam turbine of a power station unit that includes steam turbine and a steam generator, with the output signal of a turbine controller of a control system acting on an adjusting mechanism of a turbine inlet valve arrangement, said method according the steps of:

adding to said output signal of said turbine controller, at a summation point, a further signal as to valve opening rated value;

computing said further signal from the load setpoint of said turbine controller according to the following division relationship, which governs said steam turbine: electrical ouput/steam pressure=inlet valve opening; and

supplying said further signal to said summation point at a value based on said computed magnitude and a magnitude derived by multiplying said computed magnitude by a factor which deviates from unity;

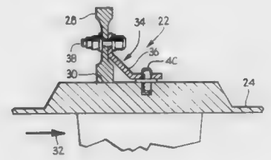
said computing being carried out for division of electrical output rated value and pressure rated value relatively into the electrical output rated value for controlling the valve arrangement not only initially but rather during entire output operation with which magnitude of valve adjusting value is decoupled from dynamics of the entire operation including actual output and with which advantageously via course of rated values via said computing there is anticipation of adjusting magnitude changes of said turbine controller that is relieved thereof and then must only compensate for disturbing influences of the control system.

4,728,255

REMOVABLE STIFFENING DISK

Ralph A. Kirkpatrick, Mason, and Gerard P. Kroger, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1985, Ser. No. 704,972
Int. Cl.[4] F01D *5/26*
U.S. Cl. 415—119 **8 Claims**



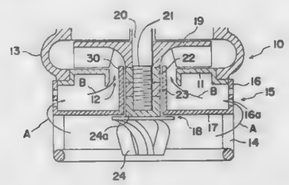
1. A removable stiffening member for an annular casing in a turbomachine comprising a substantially rigid disk coaxial and slideably engagable with said casing at ambient conditions, wherein said disk radially contacts said casing during turbomachine operation generally continuously along an entire circumferential surface of said casing so as to provide circumferential and axial restraint of said disk and increased stiffness to said casing.

4,728,256

UNDERWATER PUMP

Toshinobu Araoka, 7-10, Norimatsu 1-chome, Yahatanishi-ku, Kitakyushu-shi, Fukuoka, Japan

Continuation of Ser. No. 847,791, Apr. 3, 1986, abandoned. This application May 20, 1987, Ser. No. 53,592
Claims priority, application Japan, Jul. 26, 1985, 60-166335
Int. Cl.[4] F04D *29/70*
U.S. Cl. 415—121 G **13 Claims**



1. An underwater pump for excavating or sucking sands or gravel from the bottom of a sea or a river comprising a pump casing having a lower end, a motor water-tightly encased in said pump casing, an impeller casing integrally attached to the lower end of said pump casing, a cylindrical strainer disposed below said impeller casing and having a plurality of apertures formed on a wall thereof, a rotary shaft extending downwardly from said motor, a rotory head fixedly secured to the lower end of said rotary shaft, said rotary shaft extending through an inlet opening formed on a bottom plate of said impeller casing and a central opening of said cylindrical strainer,

said rotary shaft including a rotary-head mounting portion disposed in a water flow path defined within said cylindrical strainer, and a stationary flexible-piece-winding preventing member encasing the rotary head mounting portion of said rotary shaft,

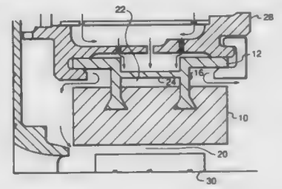
said flexible-piece-winding preventing member being made of a circular sleeve having a diameter smaller than a diameter of said rotary head, said circular sleeve having a lower end thereof integrally connected with a circular rim portion of said bottom plate of said cylindrical strainer and an upper end thereof extending into said impeller casing through said inlet opening of said impeller casing wherein a circumferential gap is provided between said circular sleeve and said roatary head mounting portion.

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THERMAL STRESS MINIMIZED, TWO COMPONENT, TURBINE SHROUD SEAL

Robert F. Handschuh, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 18, 1986, Ser. No. 875,798
Int. Cl.[4] F01D *11/08*
U.S. Cl. 415—136 **10 Claims**



1. In a turbomachine of the type having rotating blades within a housing adapted to expose to variable speeds and very high temperature operating conditions, the improvement comprising a shroud consisting of:

a ceramic member having a hot gas face and a cooling flow face, said cooling flow face having an annular opening therein;

a metallic alloy member contiguous to said ceramic member and moveable relative thereto, and having an aperture therethrough correspondingly aligned with said annular opening in said ceramic member;

an antirotational pin member having a diameter smaller in size than said ceramic member annular opening, inserted substantially perpendicularly through said metallic alloy member aperture and through said ceramic member annular opening, thereby restraining circumferential motion of said ceramic member at ambient temperature; and

means for slideably mounting said metallic alloy member onto said ceramic member.

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TURBINE ENGINE COMPONENT AND METHOD OF MAKING THE SAME

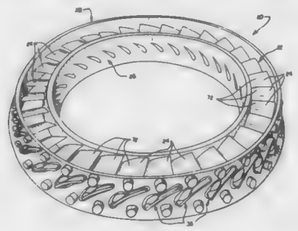
William S. Blazek, Valley City, and Jerry L. Hasch, Minerva, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 25, 1985, Ser. No. 727,372
Int. Cl.[4] F01D *9/02*
U.S. Cl. 415—137 **34 Claims**

1. A method of making a turbine engine component having a plurality of airfoils disposed in an annular array between inner and outer shroud rings, said method comprising the steps of positioning a plurality of airfoils having leading and trailing edge portions extending between inner and outer end portions of the airfoils in an annular array with outer end portions of the airfoils at least partially embedded in an outer shroud ring formed of wax and with inner end portions of the airfoils at

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least partially embedded in an inner shroud ring formed of wax, covering the airfoils and wax shroud rings with ceramic mold material to form a mold, removing the wax material of the shroud rings from the mold to leave inner and outer shroud ring mold cavities having configurations corresponding to the configurations of the wax shroud rings, the inner and outer end portions of the airfoils being at least partially disposed in the shroud ring mold cavities, filling the inner and outer shroud ring mold cavities with molten metal, said step of filling the inner and outer shroud ring mold cavities with molten metal including the steps of at least partially enclosing the inner end portions of the airfoils with a first annular body of molten metal having a configuration corresponding to the configuration of the inner shroud ring and at least partially enclosing the outer end portions of the airfoils with a second annular body of molten metal having a configuration corresponding to the configuration of the outer shroud ring, holding the airfoils in a predetermined spatial relationship with the inner and outer



shroud ring mold cavities during filling of the shroud ring mold cavities with molten metal by engaging the airfoils with the ceramic mold material, and solidifying the molten metal in the inner and outer shroud ring mold cavities to form the inner and outer shroud rings, said step of solidifying the molten metal including solidifying the molten metal in the inner shroud ring mold cavity around the inner end portions of the airfoils and solidifying the molten metal in the outer shroud ring mold cavity around the outer end portions of the airfoils.

14. A method comprising the steps of providing a turbine engine component having a plurality of airfoils extending between inner and outer shroud rings, heating the airfoils to a temperature above the temperature of the outer shroud ring, thermally expanding the airfoils in an outer direction relative to the outer shroud ring during performance of said step of heating the airfoils, and moving tapered surfaces on outer end portions of the airfoils out of engagement with tapered surfaces on the outer shroud ring during performance of said step of thermally expanding the airfoils.

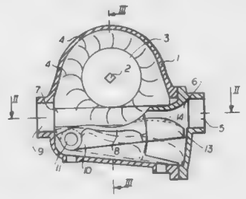
4,728,259

ADJUSTABLE TURBINE

Wilhelm Wolfbauer, Fernitz, and Franz D. Podesser, Voitsberg, both of Austria, assignors to Rohren- und Pumpenwerk Rudolf Bauer Gesellschaft m.b.H., Voitsberg, Austria

Filed Jun. 25, 1986, Ser. No. 878,125
Claims priority, application Austria, Jun. 25, 1985, 1890/85
Int. Cl.[4] F01D *17/14*
U.S. Cl. 415—151 **7 Claims**

1. A turbine, particularly for a sprinkler system, comprising:
- a turbine housing formed with a turbine chamber surrounding an axis and formed with an inlet and an outlet generally aligned along a tangent to a circle centered on said axis;
- a rotor in said chamber rotatable about said axis and having a wheel formed with a rim and a circumferential array of curved vanes attached to said rim and tangentially entrained by a generally tangential flow of water traversing a substantially linear path from said inlet to said outlet, said housing defining an annular clearance with said rotor;
- a nozzle formed at said inlet and training said flow of water against said vanes; and
- a control device in said housing including an elongated member extending substantially from said outlet to said



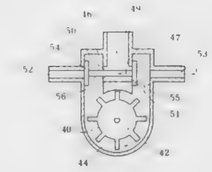
inlet and displaceable toward and away from said rotor for simultaneously controlling said clearance in a region between said inlet and outlet and a flow cross section of said nozzle to regulate the velocity of said flow over a region of said rotor between said inlet and said outlet.

4,728,260

DIRECTION-SELECTABLE SENDING-OUT PUMP

Fumio Ishii, Ueda, Japan, assignor to Maruko Keihouki Kabushiki Kaisha, Chiisagata, Japan

Filed Apr. 21, 1987, Ser. No. 40,967
Claims priority, application Japan, Apr. 30, 1986, 61-100247
Int. Cl.[4] F01D *1/30*
U.S. Cl. 415—152 A **9 Claims**



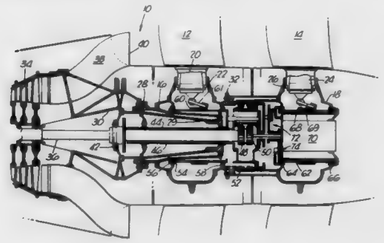
1. A direction-selectable sending-out pump comprising:
- a housing;
- an impeller, which is set rotatably within said housing, is provided on its circumferential wall with a number of blades, and forms a functional path, to send out liquid by pump action, between the inner wall of said housing and the outer circumference of said blades.
- a reversible motor, which rotates reversibly said impeller connected to its output shaft;
- two valve chambers adjacently connected with a partition, each of which is located at each of both end sides of said functional path in communication with the functional path;
- a liquid introducing path, which not only connects to an external liquid tank but also extends into said partition dividing said two valve chambers;
- inlets opened on said partition to communicate said liquid introducing path with both said valve chambers;
- outlets each provided, on the inner walls of both said valve chambers, facing each of said inlets; and
- a valve body, which is provided with a valve rod, inserted slidably in said partition and projectable into said valve chambers, and with valves, fixed each at both ends of said valve rod and capable of allowing a shift of said valve rod to result in opening said inlet and closing said outlet of one of both said valve chambers and simultaneously closing said inlet and opening said outlet of the other one of both said valve chambers.

4,728,261

PROPELLER MODULE FOR AN AERO GAS TURBINE ENGINE

William B. Wright, and Martyn Richards, both of Derby, England, assignors to Rolls-Royce plc, London, England

Filed Oct. 1, 1986, Ser. No. 914,163
Claims priority, application United Kingdom, Nov. 2, 1985, 8527056
Int. Cl.[4] B64C *11/48*
U.S. Cl. 416—127 **11 Claims**



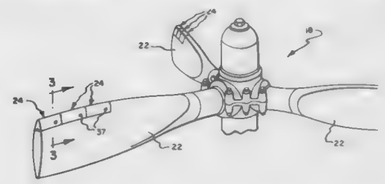
1. A propeller module for a gas turbine engine comprising a first multi-bladed propeller, a second multi-bladed propeller, a shaft and a reduction gear train,
- the first and second multi-bladed propellers being coaxial and driven in contra-rotation by the shaft via the reduction gear train,
- the reduction gear train being positioned axially between the first and second multi-bladed propellers, the reduction gear train comprising a sun gear, a plurality of planet gears and an annulus gear, the sun gear being driven by the shaft, the planet gears being driven by the sun gear and the annulus gear being driven by the planet gears, the planet gears being rotatably mounted in and driving the carrier member, the annulus gear and the carrier member being driven in contra-rotation by the planet gears,
- a first pitch change means to change the pitch of the blades of the first multi-bladed propeller, a second pitch change means to change the pitch of the blades of the second multi-bladed propeller and a pitch change power unit, the pitch change power unit being mounted on the second multi-bladed propeller to operate the first and second pitch change means,
- the first pitch change means comprising first drive means, first pitch change gears and compensating gears,
- the first drive means being rotatably mounted on the first multi-bladed propeller and being adapted to rotate the blades of the first multi-bladed propeller,
- the first pitch change gears comprising first gears, second gears and spindles, the spindles extending axially through the carrier member, the first gears and second gears being secured to opposite ends of the spindles, the spindles being rotatably mounted on the carrier member, the first gears of the pitch change gears being arranged to drive the first drive means, the compensating gears being rotatably mounted on the carrier member and being arranged to drive the second gears of the first pitch change gears so that a fixed blade pitch of the first drive rotates in the same direction and at the same speed as the first multi-bladed propeller,
- the pitch change power unit being adapted to drive the compensating gears so that relative rotation occurs between the first drive means and the first multi-bladed propeller to change the pitch of the blades of the first multi-bladed propeller,
- the compensating gears allowing the pitch of the blades of the first multi-bladed propeller to be set independently of the differential speed between the first and second multi-bladed propellers.

4,728,262

EROSION RESISTANT PROPELLERS

Darwin Marshall, Tonawanda, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Jan. 22, 1986, Ser. No. 821,327
Int. Cl.[4] F01D *5/14*
U.S. Cl. 416—224 **5 Claims**



1. A propeller blade which when operating is subjected to high velocity impacts of environmental material particulates causing erosion of its leading edge sectional profile, and is carried by a rotatable hub in radially extending relation therefrom whereby said blade undergoes substantial bending in cantilever fashion and twists axially of its length during propeller operation, including the improvement comprising:
- said blade being cut away along its leading edge portion so as to accommodate in serially aligned relation a plurality of erosion resistant implants which are formed of a silicon-based ceramic material and which are externally shaped so as to complement in profile continuity the prescribed sectional profile of said blade throughout the range of the array of said implants which extends to the tip of said blade;
- the cut away portion of said blade being periodically interrupted by a series of spaced apart integrally outstanding abutments occupying the recessed portions of said implants and accommodating therebetween integral tongue portions of said implants extending longitudinally intermediately thereof into the spaces beween said abutments and thereby cooperating to resist radially directed forces tending to dislodge and spin off said implants in radial directions when said blade is in operation; and
- pin means locking each of said implants relative to one of said abutments to resist tendencies of said implants to dislodge in response to circumferentially directed inertial forces thereon, said pin means extending in each case through one of said abutments and the side wall portions of the associated implant at longitudinal locations inboard thereof toward said hub relative to the center of mass of said associated implant.

4,728,263

WIND TURBINE BLADE CONSTRUCTION

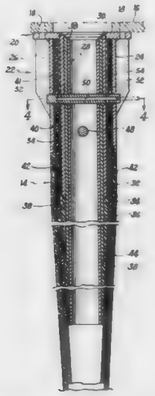
Robert J. Basso, 3635 Afton Rd., San Diego, Calif. 92123

Filed Aug. 25, 1986, Ser. No. 900,085
Int. Cl.[4] B64C *11/20*
U.S. Cl. 416—226 **11 Claims**

1. A blade for the rotor of a wind turbine or the like having a root end mounted on the rotor and extending generally radially outwardly from the rotor out to a distal end, said blade comprising:
- (a) a cuff at the root end of the blade for mounting on the rotor, and having a generally cylindrical, radially outwardly directed collar;
- (b) a generally cylindrical reinforcing strut mounted generally coaxially to said collar, and extending radially outwardly from said rotor throughout a portion of the length of said blade;

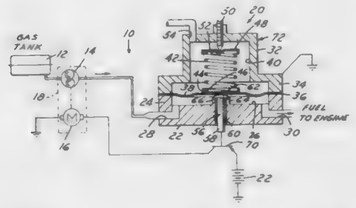
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(c) a hollow spar coaxially mounted around said strut and extending substantially the full length of said blade;
(d) an elongated, rigid aerodynamic skin defining the exterior, wind-encountering surfaces of said blade, and being mounted over and bonded to said strut and defining the distal end of said blade;



(e) said reinforcing strut being of decreasing diameter toward the distal end of said blade; and,
(f) said reinforcing strut comprising a plurality of telescoping tubes of graduated length with the larger diameter tubes being longer than the smaller diameter tubes.

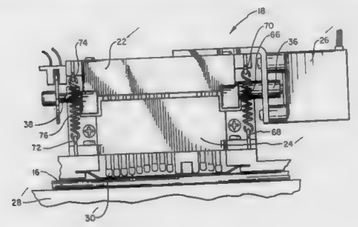
4,728,264
FUEL DELIVERY SYSTEM WITH PRESSURE-CONTROLLED ELECTRIC PUMP
Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.
Filed Oct. 10, 1986, Ser. No. 917,633
Int. Cl.[4] F04B *49/06*; H01H *35/40*
U.S. Cl. 417—44 **1 Claim**

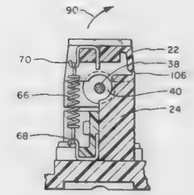


1. A fuel delivery system for gasoline engine and like applications comprising:
a pump having an input for coupling to a fuel supply, an output for fuel delivery and a d.c. motor having an output drivably coupled to said pump,
a pressure switch comprising a housing of electrically conductive metallic construction including a base having an essentially flat internal wall and a peripheral lip upstanding from said wall, a cup-shaped cap having a periphery opposed to said base lip to define an open internal cavity between said base and said cap, means for connecting said housing to electrical ground, a diaphragm of electrically conductive construction mounted within said housing spanning said cavity and cooperating with said housing to divide said cavity into first and second chambers on opposite sides of said diaphragm, said diaphragm having a flat central portion parallel to said base internal wall and a peripheral portion captured between said lip and said cap periphery and electrically connected thereto, said diaphragm being spaced by said lip from said flat internal wall, a fuel inlet in said base adjacent to said peripheral portion of said diaphragm at one side edge of said first chamber for feeding fuel from said pump to said first chamber, a fuel outlet in said base adjacent to said peripheral portion of said diaphragm at an opposing side edge of said first chamber from said inlet such that fuel flows from said inlet to said outlet through said first chamber across and generally parallel to said flat central portion of said diaphragm and said essentially flat base wall, a switch electrode of electrically conductive construction having a convex head and a shank extending therefrom, insulating means mounting said switch electrode to said base with said head positioned within said first chamber in opposition to said flat central portion of said diaphragm and said shank extending through said base wall, said base including means spacing said head from said base wall so as to permit free flow of fuel from said inlet to said outlet between said wall and said diaphragm with said diaphragm in abutment with said switch electrode head, a coil spring in said second chamber having an axis aligned with said electrode head, a pair of opposed cupshaped means capturing opposed ends of said coil spring, one of said cupshaped means being in engagement with said diaphragm central portion within said second chamber, adjustment means threadably received in said cap across said second chamber from said diaphragm and engaging the other of said cup-shaped means within said second chamber coaxially with said spring, said coil spring being captured in compression between said diaphragm and said adjustment means for urging said diaphragm central portion into abutting engagement with said switch electrode head within said first chamber, and means venting said second chamber to atmosphere,
a source of d.c. power, and
solid state switch means having primary current conducting electrodes connected between said source of d.c. power and said motor, and a control electrode coupled to said switch electrode shank externally of said housing, said solid state switch means being responsive to connection of said control electrode to electrical ground through said switch electrode, said diaphragm and said housing of said pressure switch to feed electrical power from said d.c. power source to said motor.

4,728,265
PERISTALTIC PUMP WITH CAM ACTION COMPENSATOR
Raymond Cannon, Poway, Calif., assignor to Fisher Scientific Group Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 9,265, Jan. 30, 1987. This application Feb. 24, 1987, Ser. No. 17,846
Int. Cl.[4] F04B *43/12*; E05D *1/00*
U.S. Cl. 417—363 **30 Claims**

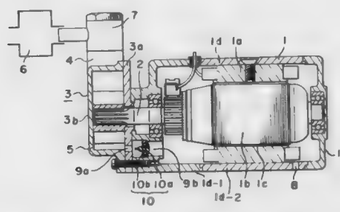
1. An apparatus for pumping fluids through a tube which comprises:
a base for supporting said tube in a substantially linear orientation;
means for generating a peristaltic action on said tube; and
a flexure connecting said base with said peristaltic means for pivotal movement of said peristaltic means between a first position and a second position about an axis substantially parallel to the longitudinal axis of said tube, said flexure biased to yieldably urge said peristaltic means toward said





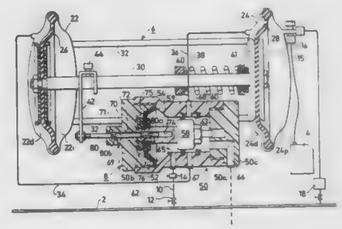
first position and against said base for operative engagement of said peristaltic means with said tube.

4,728,266
MOTOR DRIVE VACUUM PUMP
Akio Matsumoto, Hyogo, and Kiminki Seki, Kasai, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 906,617, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 535,328, Sep. 23, 1983, abandoned. This application Mar. 9, 1987, Ser. No. 22,522
Claims priority, application Japan, Oct. 9, 1982, 57-153901[U]; Oct. 9, 1982, 57-153902[U]
Int. Cl.[4] F04B *17/00, 35/00*
U.S. Cl. 417—366 **6 Claims**



1. A motor driven vacuum pump comprising:
(a) a hollow housing having a front end and a rear end, said hollow housing having a drain hole therein near its rear end;
(b) a stator mounted on the inner periphery of said hollow housing between the front end of said housing and said drain hole, said stator being mounted in said hollow housing in a fashion which does not permit air to pass between said stator and said housing;
(c) a rotor rotatably mounted in said housing and positioned inside said stator in a fashion which leaves a small air gap between said rotor and said stator;
(d) a pump chamber having an intake port and a discharge port mounted on the front end of said housing;
(e) a rotary shaft mounted on said rotor and extending into said pump chamber in an air-tight fashion;
(f) a vacuum pump mounted on said rotary shaft and positioned in said pump chamber between said intake port and said discharge port;
(g) a first path of fluid communication connecting said discharge port in said pump chamber to the interior of said hollow housing between said front end of said hollow housing and said small air gap;
(h) said first path of fluid communication, said small air gap, and said drain hole comprising a discharging passage means; and
(i) a sound deadening discharge valve mounted in said drain hole, said sound deadening discharge valve comprising an umbrella-type valve which is resiliently biased to close a plurality of air vent holes, said discharge valve being resiliently biased to close said discharging passage means but being sized and shaped so that it is opened by the passage of air through said drain hole,
whereby air forced out of said pump chamber through said discharge port by rotation of said vacuum pump is forced exclusively through said small air gap and said sound deadening discharge valve, both of which function as silencers.

4,728,267
FLUID DRIVEN RECIPROCATING PUMP
Alexander Ruttenberg, Haifa, and Alexander Zur, Kfar Bialik, both of Israel, assignors to T.M.B. Fertilizer Pumps Ltd., Kiryat Bialik, Haifa, Israel
Filed Jan. 27, 1987, Ser. No. 7,354
Claims priority, application Israel, Feb. 19, 1986, 77935
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—395 **15 Claims**

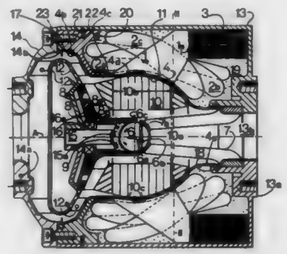


1. A fluid driven reciprocating pump, comprising:
a pair of heads each containing a displaceable member defining a drive chamber and a pump chamber on opposite sides of the displaceable member in one head, and a drive cahmber and an inactive chamber on opposite sides of the displaceable member in the other head;
a first mechanical coupling connecting the two displaceable members for reciprocation together;
a control valve assembly connecting the drive chambers of both heads to a source of pressurized fluid for driving them through forward strokes;
a spring for driving said heads through return strokes;
and means connecting the pump chamber of said one head to a source of material to be pumped;
said control valve assembly comprising:
a housing having a displaceable diaphragm defining a pressure chamber and a control chamber on opposite sides thereof;
an inlet port leading to said pressure chamber for connecting it to said source of pressurized fluid;
a drain port leading to said control chamber for draining said control chamber;

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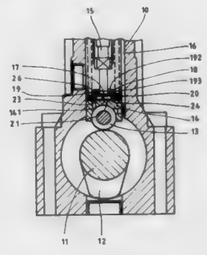
outlet port means leading from said pressure chamber for connecting it to the drive chambers of the two heads;
a main valve coupled to said diaphragm of the control valve assembly so as to be movable thereby either to an open position establishing communication between said pressure chamber and said outlet port means to drive said pump through its forward strokes, or to a drain position interrupting said communication and thereby to permit said spring to drive the pump through its return strokes;
a pilot valve member within said housing and comprising a stem passing through said diaphragm;
and a second mechanical coupling connecting said pilot valve member stem to said first mechanical coupling so as to be moved thereby at the end of the pump forward strokes to establish communication between said control chamber and said drain port to drain said control chamber, and at the end of the return strokes to interrupt said communication and thereby to permit the control chamber to rise to the pressure of the pressure chamber to move the main valve member to its open position and to cause the pressurized water to drive the pump through its forward strokes.

4,728,268
ROTODYNAMIC PUMP
Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011
Continuation-in-part of Ser. No. 667,653, Nov. 2, 1984, abandoned. This application Jul. 29, 1986, Ser. No. 891,807
Int. Cl.⁴ F04B *17/00, 35/04*
U.S. Cl. 417—420 **18 Claims**



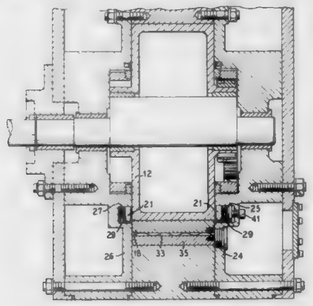
1. A canned pump-motor-unit, whose motor consists of a stator and a rotor, the stator being separated from the rotor by a magnetically permeable separation wall, and whose pump consists of an impeller and a pump housing, the impeller forming a unit with the rotor of the motor, said pump-motor unit having co-axial through flow from one axial end to the other, whereby fluid enters a suction conduit, passes the rotor to an impellar inlet, accelerates within the impeller and finally exits the pumphousing, said unit's separation wall having a spherical portion which separates a wet part from a dry part of the pump, the motor having a stator with coils arranged in the dry part, said stator forming a spherical magnetic gap with the rotor, the rotor being built as a spherical ring made mainly of ferromagnetic metal, an inner bore of which forms a part of the suction conduit characterized in that
(a) the impeller (**8**) being pivoted radially and axially in the direction of the suction side (**13***b*);
(b) the bearing consisting of a rotating spherical concave bearing cap (**9**) and a stationary spherical convex member (**6**) with a spherical sliding surface, the surface defining a center of rotation (**6***a*);
(c) said sliding bearing (**6,9**) being positioned within the bore (**10***a*) of said rotor (**10**);
(d) the diameter of the bearing (**6,9**) being considerably smaller than the diameter of the bore (**10***a*) of the rotor (**10**);
(e) the rotor (**120**) being mounted on the impeller (**8**);
(f) the center of rotation (**6***a*) being positioned between the two axial ends of the spherical portion of the separation wall (**4**);
(g) the separation wall (**4**) being funnel-shaped with increasing diameter from the small diameter part forming a suction conduit (**4***e*) to maximum diameter in the equatorial plane (**6***c*) containing the center of rotation (**6***a*);
(h) the spherical convex member (**6**) of the bearing being fixed on a stationary pedestal (**7**) located in the suction conduit (**4***e*, **13***b*);
(i) said pedestal (**7**) allowing almost free throughflow of the fluid conveyed; and
(j) the coils (**2***a*, **2***b*, **2***c*) being arranged around the separation wall (**4**), a considerable part of the coils being in thermal contact with said separation wall (**4**).

4,728,269
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES
Walter Häfele, Fellbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 13, 1986, Ser. No. 929,864
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605056
Int. Cl.⁴ F04B *7/04, 39/10*
U.S. Cl. 417—490 **7 Claims**



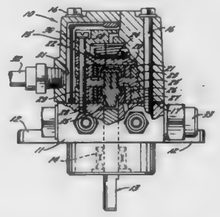
1. A fuel injection pump for internal combustion engines, having at least one axially displaceable pump piston including a tappet, which reciprocates by means of a cam for driving the pump piston, and having a pressure spring for positively keeping the cam, tappet and pump piston in engagement, which pressure spring is supported at one end on the housing and at another end on a spring plate so as to grip an annular flange on a piston bottom of the pump piston the annular flange protruding radially therefrom and further having a pressure plate located in between the piston bottom and the tappet, characterized in that the spring plate has a, cup shape and a plate bottom thereof having an assembly aperture for insertion therethrough of the piston bottom and the annular flange, the piston bottom being arranged to rest in a cup-shaped interior of said spring plate while the plate bottom grips the annular flange, that at least two inwardly-projecting protrusions project from an inner wall defining a cylindrical cup portion, said protrusions being spaced apart from the spring plate bottom, and that the pressure plate is provided with a collar means on an end oriented toward the pressure plate bottom, a diametric extent of which collar means is smaller than an inside diameter of the cylindrical cup portion and greater than an internal radial spacing between the at least two protrusions, and a diameter of a body portion of the pressure plate is smaller than the interior radial spacing of the at least two protrusions from one another, whereby the body portion of the pressure plate may extend outwardly through the interior space between said protrusions while the collar means is retained thereon.

4,728,270
APPARATUS AND METHOD FOR REPLACING APEX SEALS IN A ROTARY DEVICE
Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Trochoid Power Corporation, Eden Prairie, Minn.
Filed Oct. 20, 1986, Ser. No. 920,722
Int. Cl.⁴ F01C *1/00, 21/00*
U.S. Cl. 418—1 **15 Claims**



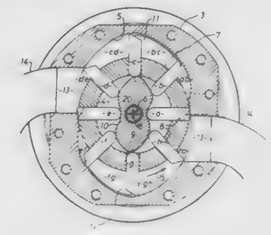
1. A rotary device comprising a rotor, a housing having a cavity in which the rotor rotates, the cavity defined by an inner peripheral surface and two side walls, the inner peripheral surface including a plurality of slots having disposed therein an insert, wave spring, and apex seal, the apex seal extending radially outward from the slot and being spring biased by the wave spring, the wave spring being sandwiched between the apex seal and insert member, at least one of the side walls of the housing including an access aperture for accessing the insert, wave spring, and apex seal, the access aperture being covered by removable cap, the side wa'ls also having apertures in which are disposed a plurality of spring biased button seals, the button seals being biased outwardly from the side walls against a portion of the apex seal, and at least one of the side walls further including means for relieving the spring pressure on the button seal, the means including a plate, located at one end of the aperture between the button seal and spring, and a rotatable bolt that causes the plate to move towards the button seal when the bolt is rotated in a first direction and causes the plate to be biased away from the button seal when it is rotated in a second direction.

4,728,271
GEAR PUMP WITH IMPROVED PINION MOUNTING
Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.
Filed Sep. 2, 1986, Ser. No. 902,938
Int. Cl.⁴ F04C *18/02*
U.S. Cl. 418—9 **8 Claims**



1. A gear pump comprising a body, an elongated shaft rotatably supported by said body and having an axially facing free end, a pinion gear telescoped onto the free end portion of said shaft with a press fit, a slot formed radially through the free end portion of said shaft and opening axially out of the free end of said shaft, said slot extending along said shaft from the free end thereof to a point beyond said gear and dividing the free end portion of said shaft into two cantilevered halves, an axially elongated element made of resiliently yieldable material disposed within said slot, a portion of said element being split axially and defining two cantilevered fingers projecting toward the free end of said shaft, said fingers pressing resiliently in opposite directions against opposite sides of said slot so as to resiliently spread the two halves of said shaft away from one another and enhance the press fit between said gear and said shaft, and means for captivating said element in said slot.

4,728,272
ROTARY FLUID DISPLACEMENT MACHINE WITH REVOLVING WORKING CHAMBERS OF PERIODICALLY VARYING VOLUME
Knud Simonsen, Strudsbergsvej 44, DK-4200 Slagelse, Denmark
Filed Dec. 13, 1985, Ser. No. 808,813
Claims priority, application Denmark, Dec. 21, 1984, 6226/84
Int. Cl.⁴ F04C *18/344, 29/00*
U.S. Cl. 418—152 **8 Claims**



1. A rotary fluid machine of the kind comprising
(a) a rotor supported for rotation about a stationary axis and with
(a1) a rotor ring placed coaxially with said axis and having a number of at least partially radially extending vane slots substantially equally angularly distributed about said stationary axis, and
(a2) slidably supported in each vane slot a vane,
(b) a machine housing with a housing chamber of a non-circular cross-sectional shape, a part of which is situated outside of said rotor ring and is divided into a number of working chambers of periodically varying volume by said vanes, which for this purpose are in substantially fluid tight engagement with the inner wall of the housing, said working chambers following the rotor ring during its rotary movement and passing in succession at least one inlet port and at least one outlet port, as well as
(c) a substantially rigid cam member situated non-rotatably within said rotor ring and shaped with a non-circular cross-section guiding surface, against which the vanes may abut with their radially innermost ends and thereby be kept in said substantially fluid tight engagement with said inner wall of said housing, wherein
(d) the cam member is supported concentrically with said rotor ring and in a floating manner between the radially innermost ends of said vanes, and wherein
(e) said vanes are present in a number of at least four.

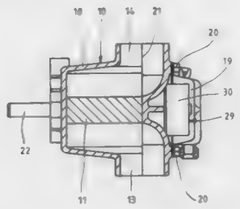
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4,728,273

ROTARY PISTON COMPRESSOR

Ernst Linder, Mühlacker; Helmut Rembold, Stuttgart, and Walter Teegen, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1986, Ser. No. 915,314
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545674
Int. Cl.[4] F01C 1/18, 1/24
U.S. Cl. 418—206 3 Claims



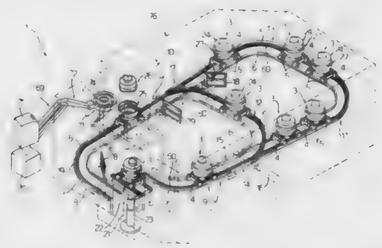
1. A rotary piston compressor, particularly Root's type compressor, comprising a housing having a suction connection and a pressure connection both formed on said housing; two rotary pistons positioned in said housing and rotating in two opposite directions; and a control drive for forcibly coupling a rotational movement of said two pistons, said housing being formed as a two-part element and including only a cup-shaped first portion and a second portion closing said first portion; said suction and pressure connections being formed by said first and second portions which are connected to each other and positioned relative to each other so that they abut each other along a separation plane which extends centrally of said suction and pressure connection, said control drive being accommodated in said second portion, said drive including two meshing gears which are positioned on said shafts, respectively, for joint rotation therewith.

4,728,274

TIRE CURING SYSTEM

Karl J. Siegenthaler, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 18, 1987, Ser. No. 50,661
Claims priority, application Italy, May 20, 1986, 67414 A/86
Int. Cl.[4] B29C 35/04
U.S. Cl. 425—34 R 11 Claims



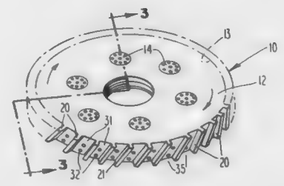
1. A tire curing apparatus comprising a number of mobile curing units, each designed to receive a respective green tire; loading means and unloading means for respectively loading said tires on and unloading said tires off respective ones of said curing units, inclined guide means defining a loop path for said mobile units; said path extending between said loading means and said unloading means; means for feeding the said units along the said path; and individual coupling means provided on each said curing unit for releasably and independently coupling the same to said guide means; each of said curing units incorporating a mold for a respective green tire, a closed circuit means designed to receive, at the said loading means, a given supply of curing medium under pressure, means for circulating the said curing medium supply inside the said closed circuit means, and individual heating elements for both the said mold and the said curing medium supply.

4,728,275

MULTI-BLADED DISC CUTTER FOR UNDERWATER PELLETIZERS

Robert J. DiLullo, Paoli, Pa., and David E. Ofstein, Williamsburg, Va., assignors to ARCO Chemical Company, Newtown Square, Pa.

Filed Sep. 18, 1986, Ser. No. 909,048
Int. Cl.[4] B29B 9/06
U.S. Cl. 425—67 10 Claims



6. In an underwater pelletizer, the combination of a die plate and a multi-bladed disc cutter; said die plate having a flat face and passageways therethrough through which thermoplastic pellet-forming material is extrudable, said passageways terminating in at least one circular array of extrusion orifices in the flat face of said die plate; said multi-bladed disc cutter comprising:

a. a rotatable circular disc backplate having a center axis of rotation coaxial with said flat face of said die plate, said axis being parallel with the direction of extrusion through said orifices, said backplate having openings therethrough for passage of water;

b. a plurality of spaced-apart cutter blades integrally formed with said backplate at the periphery thereof, said cutter blades projecting radially outwardly therefrom;

c. said cutter blades having a dimension in the axial direction of said backplate substantially greater than the axial thickness of said backplate forming an axially projecting portion and forming at the end thereof a cutting surface for severing thermoplastic strand as it exits from the extrusion orifices in said die plate;

d. shroud members integrally formed with said backplate having a width extending the full axial length of said axially projecting portion of said cutter blades, said shroud members integrally interconnecting sidewall surfaces of adjacent cutter blades; and

e. at least one radially extending opening in each of said shroud members for allowing passage of water therethrough.

4,728,276

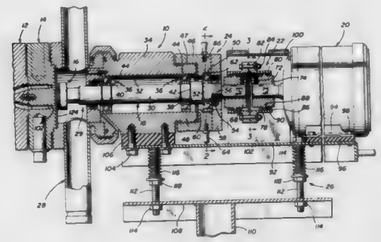
UNDERWATER PELLETIZER

General J. Pauley, Daleville; Donald W. Smith, Troutville, both of Va.; Dennis M. Chaney, Scott Depot, W. Va.; Samuel F. Hannah, Eagle Rock, and J. Wayne Martin, Buchanan, both of Va., assignors to Gala Industries, Inc., Eagle Rock, Va.

Filed Jan. 31, 1986, Ser. No. 824,645
Int. Cl.[4] B29C 47/00
U.S. Cl. 425—67 7 Claims

1. In an underwater pelletizer having a housing, a rotatable

shaft supported in the housing, means driving the shaft and a cutter blade assembly on one end of the shaft for association with an extrusion die plate for cutting extruded polymer into pellets, the improvement comprising bearing means supporting the shaft for axial adjustment, means interconnecting the shaft and housing for adjusting the shaft axially, said drive means including an output shaft member in axial alignment with the outer end of said shaft, and a coupling between the shaft and the output shaft member of said drive means enabling axial adjustment of the shaft for adjusting the cutting blade assembly and enabling compensation for blade wear, said bearing means supporting the shaft from the housing including a pair of spaced ball bearing assemblies spaced axially from said adjustment means, each ball bearing assembly including an inner race secured to the shaft in a manner to prevent relative axial movement therebetween, said housing including a hollow interior



engaging the outer race of the ball bearing assemblies in a manner to enable axial movement of the outer race of the ball bearing assemblies in relation to the housing thereby enabling the shaft to be adjusted axially, said means to axially adjust the shaft including a thrust bearing having an inner race securely mounted on the shaft in a manner to prevent relative axial movement between the inner race of the thrust bearing and shaft, said thrust bearing being located adjacent the coupling and spaced axially from the ball bearing assemblies, the outer race of the thrust bearing being mounted in a cup-shaped member in a manner to prevent relative axial movement between the outer race of the thrust bearing and the cup-shaped member, said cup-shaped member being screw threadedly connected to the housing to move the cup-shaped member axially in response to rotation thereof with axial movement of the cup-shaped member causing axial movement of the thrust bearing and shaft.

4,728,277

FILM-HANDLING DEVICES FOR THIN FLEXIBLE FILMS

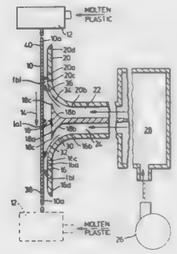
Mirek Planeta, 228 McCraney St. W., Oakville, Ontario, Canada L6H 1H7

Filed Dec. 30, 1986, Ser. No. 947,778
Int. Cl.[4] B29C 53/18, 53/20
U.S. Cl. 425—72.1 18 Claims

1. A film-handling device for handling a thin flexible film of material moving in a predetermined direction in a movement path for the film, and for maintaining the said film in the path in predetermined spatial relation to the device, the device being for that purpose disposed closely adjacent to the said path, the device comprising:

first and second members having respective first and second front surfaces facing and spaced from a corresponding facing surface of a film passing in the said path, the first and second members forming between themselves a respective first air discharge orifice extending parallel to the said film facing surface transverse to its direction of movement and directing a corresonding first stream of air to contact the film facing surface and to pass between it and the said first front surface in the direction of motion of the film;

a third member having a respective third front surface facing and spaced from the said film facing surface, the second and third members forming between themselves a respective second air discharge orifice extending parallel to the said film facing surface and the said first orifice and directing a corresponding second stream of air to contact the film facing surface and to pass between it and the said third front face in the direction opposite to the direction of motion of the film;



the said second member front face being spaced further from the film facing surface than both of the said first and third member front surfaces, providing between the first and second orifices as the result of the oppositely directed first and second air streams a reduced pressure zone urging the film toward the second member front face for stabilization of the movement thereof; and

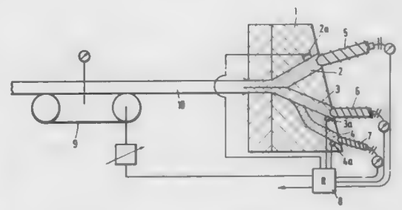
means for supplying air under pressure to the said first and second orifices.

4,728,278

APPARATUS FOR MONITORING DEVIATIONS IN THE DIMENSIONS OF A CONTINUOUSLY EXTRUDED PROFILE STRIP

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 770,231, Aug. 28, 1985, Pat. No. 4,680,152.
This application Apr. 10, 1987, Ser. No. 37,235
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434903
Int. Cl.[4] B29C 47/96
U.S. Cl. 425—131.1 1 Claim



1. Apparatus for monitoring deviations in the weight per unit length of a profiled strip formed by feeding together and extruding a plurality of separately extruded mixtures into a common profile strip, comprising:

(a) a profile strip extruding nozzle to which said mixtures are fed,

(b) means for measuring the extrusion pressure and temperature of each mixture after being separately extruded and before the strip is extruded by the strip extruding nozzle,

(c) a control device for storing the desired pressure and

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temperature values of each mixture, the desired weight per unit length value of the profile strip, and the desired percentages of mixtures comprising the strip,

(d) means for simultaneously feeding each mixture to the strip extruding nozzle to produce an extruded profile strip comprises of said mixtures,

(e) means for continuously weighing the extruded profile strip to determine the weight per unit length of the profile strip,

(f) said control device comparing the actually determined weight per unit length of the strip with the stored desired weight per unit length, and determining the variation, comparing the actually measured pressure and temperatures of each mixture with the corresponding control value for each such mixture, and determining the variation, and adjusting the feed rate of one or more of said mixtures where deviations exist,

whereby the desired percentages of mixtures are reestablished an the measured weight per unit length of the strip is made equal to the desired weight per unit length of the strip.

4,728,279

EXTRUSION HEAD INCLUDING A SEALING MECHANISM FOR A FILTER CHANGING DEVICE

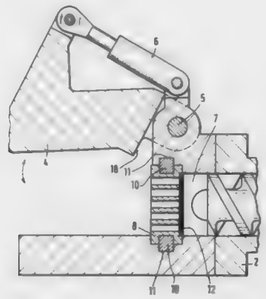
Klaus Bellmer, Ronnenberg, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Filed Sep. 25, 1986, Ser. No. 911,666

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535269

Int. Cl.⁴ B29C *47/68*

U.S. Cl. 425—185 **7 Claims**



1. A sealing mechanism for a filter changing device in an extruder, comprising:

(a) an extrusion head comprising at least one fixed head portion and at least one displaceable head portion mounted for pivotal movement relative to said fixed head portion,

(b) means for pivoting said at least one displaceable head portion between an inoperative position wherein said at least one displaceable head portion is remotely spaced from said at least one fixed head portion, and an operative position wherein said at least one displaceable head portion is disposed with respect to said at least one fixed head portion to jointly define flow channel means therebetween,

(c) filter means disposed in said flow channel means for filtering extruded material exiting said flow channel means,

(d) holder means for retaining said filter means, said holder means comprising at least two perforated plates and guide means mounting said plates for displacement in a direction substantially at right angles to the direction of flow of said material exiting said flow channel means,

(e) means for moving said plates in said guide means in said direction to replace one of said perforated plates from the flow path of said material and to position the other of said plates in such path, and wherein

(f) said displaceable head portion is formed with a pressure surface which in the operative position of said displaceable head portion applies pressure to said plates for preventing the flow of material into said guide means.

4,728,280

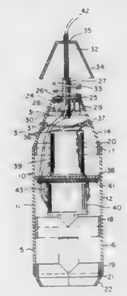
CHIMNEY LINING SLIP FORM

Michael J. Wosje, 1100 S. 2nd Ave., Sioux Falls, S. Dak. 57105

Filed Sep. 8, 1986, Ser. No. 904,621

Int. Cl.⁴ B05C *17/08, 17/06;* **B28B** *1/29*

U.S. Cl. 425—460 **12 Claims**



1. An apparatus for lining pipes with cementitious material comprising:

(a) a longitudinally split hollow circular body having a concical leading cone and an inwardly tapered trailing edge,

(b) means connecting the portions of said body, cone and trailing edge along their longitudinal split into a unitary structure,

(c) a movable cap member positioned over the said conically shaped leading cone,

(d) means yieldably spacing said cap member from said cone along a longitudinal line,

(e) a vibrator carried within said body for distributing the cementitious material about the apparatus as the material is poured over said cap, and

(f) actuating means carried by said cone and operable by said cap as said cap is yieldably forced by the cementitious material upon said cone to actuate said vibrator.

4,728,281

KEY CONTROLLED BEVERAGE MAKING DEVICE

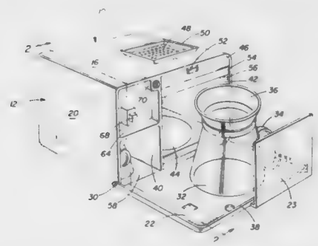
George B. McGuffin, P.O. Box 1914; Harold L. Nichols, P.O. Box 1503, and Gilbert E. Black, P.O. Box 1581, all of Morristown, Tenn. 37814

Filed Jul. 21, 1986, Ser. No. 887,202

Int. Cl.⁴ A23F *5/00;* **A47J** *31/00*

U.S. Cl. 426—433 **8 Claims**

8. The method of limiting the use of beverage making apparatus to a single cycle of operation to make a single quantity of beverage consisting of the steps of conditioning the apparatus for a single cycle of use to make a single quantity of beverage, and providing a user with means enabling one-time use of the apparatus to make a quantity of beverage with said means being rendered inoperative to enable subsequent use in response to said one-time use.



4,728,282

METHOD AND APPARATUS FOR CONDUCTING A SUBSTANTIALLY ISOTHERMAL COMBUSTION PROCESS IN A COMBUSTOR

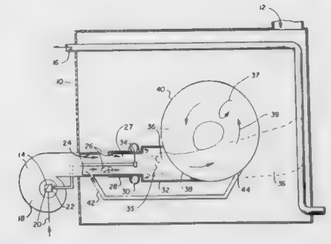
Michael G. May, Bel Air, Switzerland, assignor to Air, Ltd., Arlington, Va.

PCT No. PCT/US85/01730, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/01876, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 12, 1985, Ser. No. 862,356

Int. Cl.⁴ F23M *3/00*

U.S. Cl. 431—9 **16 Claims**



1. A method for controlling the rate of heat release in a flame of combustible products undergoing a combustion process comprising generating an air flow in an air conduit extending into a furnace;

directing a supply of fuel into a nozzle means in said air conduit for feeding combustible products into said air conduit;

recirculating products of combustion generated in said furnace back through at least one orifice in said air conduit located within said furnace;

variably controlling the opening size of said orifice to control a ratio of the mass flow of the recirculated products of combustion to the mass flow of the air flow,

increasing the rate of flow of said recirculated products of combustion during warm-up of said furnace to an operating temperature, and increasing said ratio in a predetermined response to a value essentially dependent on the temperature generated by the heat released.

4,728,283

BURNER CONTROL DEVICE, SYSTEM AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress; George A. Yeaman, and Richard W. McKinney, both of Lakewood, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

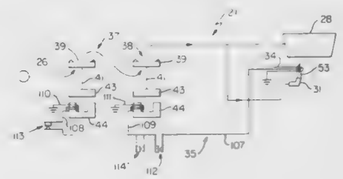
Division of Ser. No. 767,721, Aug. 20, 1985, Pat. No. 4,640,676.

This application Oct. 14, 1986, Ser. No. 918,525

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ F23Q *9/08*

U.S. Cl. 431—54 **14 Claims**



1. In a control system supplying fuel to a main burner means from a source of said fuel, said system comprising a fuel line means leading from said source to said main burner means, said fuel line means having a branch means being interconnected to a pilot burner means for said main burner means, and first and second control valve means disposed in series in said line means to connect said source to said main burner means only when both of said control valve means are in an open condition thereof each said control valve means comprising a movable valve member resiliently biased closed and an independent electromagnetic valve member latching means energizable to hold its respective said valve member open and deenergizable to allow its respective said valve member to close, each said control valve means having movable means to open its respective said valve member to a latching position so as to be held open by its respective said latching means when its respective said latching means is energized, the improvement wherein means are operatively interconnected to said source control valve means so that said control valve means are adapted to interconnect said source to said branch means only when both of said control valve means are in an open condition thereof.

4,728,284

ADJUSTABLE COMBUSTION RATE AIR/FUEL PROPORTIONED BURNER ASSEMBLY

William P. Coppin, Muncie, Ind., assignor to Maxon Corporation, Muncie, Ind.

Filed Feb. 12, 1987, Ser. No. 14,239

Int. Cl.⁴ F23M *9/00*

U.S. Cl. 431—182 **27 Claims**

1. An improved adjustable combustion rate, air/fuel proportioned burner comprising:

an oxidizing gas housing defining an oxidizing gas chamber for containing an oxidizing gas;

said oxidizing gas chamber including an oxidizing gas exit wall with a plurality of oxidizing gas exit openings therein;

a gaseous fuel tube defining a gaseous fuel chamber, said gaseous fuel chamber disposed within said oxidizing gas chamber;

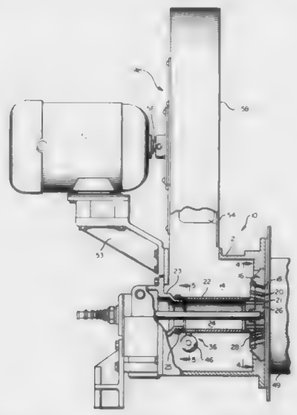
said gaseous fuel chamber having a wall generally coextensive with said oxidizing gas exit wall of said oxidizing gas chamber, and having gaseous fuel openings therein;

a rotatable face plate covering a portion of said coextensive wall of said oxidizing gas chamber and simultaneously said wall of said gaseous fuel chamber, and having openings therein substantially corresponding in shape, size and location to said oxidizing gas openings in said wall of said oxidizing gas chamber and said gaseous fuel openings in said wall of said gaseous fuel chamber, said rotating face

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plate being connected to said gaseous fuel tube and being rotatable by rotation of said fuel tube;

whereby upon rotation of said rotatable face plate a selected and variable cross-sectional area of said oxidizing gas



openings and said gaseous fuel openings are simultaneously opened to the ambient atmosphere for respective flow therefrom of oxidizing gas and gaseous fuel to maintain the preselected ratio of oxidizing gas to the gaseous fuel upon combustion thereof.

4,728,285

DEVICE FOR THE COMBUSTION OF FLUID COMBUSTIBLE MATERIALS

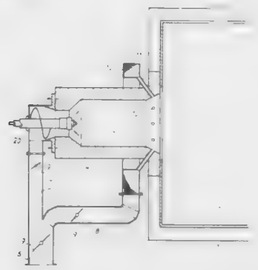
Friedrich Kamelreiter; Josef Landauf; Adalbert Marko, all of Vienna, Austria; Helmut Bormann, Sehnde, Fed. Rep. of Germany; Jochen Bosse; Werner Kirschning, both of Hanover, Fed. Rep. of Germany; Dieter Lischitzki, Neustadt, and Detlef Zwetz, Isernhagen, both of Fed. Rep. of Germany, assignors to Dumag Offene Handelsgesellschaft Dr. Techn. Ludwig Kaluza & Co., Vienna, Austria and Karl-Chemie*, Hanover, Fed. Rep. of Germany

Filed Dec. 27, 1985, Ser. No. 814,106

Claims priority, application Austria, Jan. 25, 1985, 198/85

Int. Cl.[4] F23C *7/00*

U.S. Cl. 431—187 **7 Claims**



7. In a device for the combustion of fluid materials, in particular particulate solid fuels suspended in a fluid, such as coal particles suspended in water, comprising:

a fuel atomization nozzle,

a combustion chamber, and

means for supplying combustion air to the device, the improvement wherein said fuel atomization nozzle is located in a precombustion chamber having a mouth which opens into said combustion chamber and comprises a nozzle body having three mutually concentric nozzle orifices opening into said precombustion chamber, including:

a first, innermost, nozzle orifice having an axial outlet at an end of said body connected to a means for supplying thereto a viscous liquid fuel mixture to be burned;

a second nozzle orifice outwardly of said first nozzle orifice and connected to a means for delivering a further liquid combustible fuel, said second nozzle orifice coverging toward said first orifice;

a third, outermost, nozzle orifice connected to a means for delivering a pressurized gas to said nozzle body; and

means defining a nozzle cavity communicating with said third orifice and provided with a member positioned in the region of said first and second orifices and impinged upon by the pressurized gas flowing from said third orifice so that impact of said pressurized gas upon said member generates an ultrasonic vibration in said cavity which, in the regions of said first and second orifices, causes atomization by said vibration of the fluid fuel mixture emerging from said first orifice and of said further combustible fuel emerging from said second orifice.

4,728,286

LAMP FOR LIQUID FUEL

Jan G. Olsen, Halden, Norway, assignor to Scandinavian Design Studio A/S, Halden, Norway

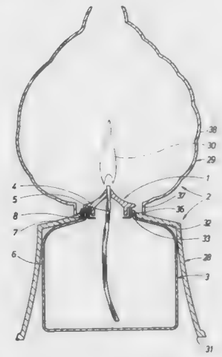
PCT No. PCT/NO86/00002, § 371 Date Sep. 26, 1986, § 102(e) Date Sep. 26, 1986, PCT Pub. No. WO86/04133, PCT Pub. Date Jul. 17, 1986

PCT Filed Jan. 6, 1986, Ser. No. 913,653

Claims priority, application Sweden, Jan. 7, 1985, 8500042

Int. Cl.[4] F23D *3/24*

U.S. Cl. 431—320 **3 Claims**



1. A lamp for liquid fuel comprising: frame means, a fuel container carried in the frame means and having an upwardly turned neck forming an opening, a wick support positioned in said opening of the container, wick means supported by the wick support and extending into the container for leading fuel by capillary action from the container, said frame means being bowl-shaped with a wide, downwardly turned opening and an upper portion opposite thereto and including an opening said wick support having a securing means, said container being dimensioned to be introduced through the downwardly turned opening of the frame means and having securing means at said opening of the container to cooperate both with the securing means of the wick support and the opening in the upper portion of said frame means for securing the container to the wick support at the upper portion of the frame means in a hanging position within the bowl-shaped frame means.

4,728,287

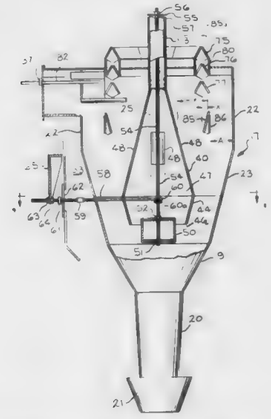
APPARATUS FOR UNIFORMLY DRAWING AND COOLING PYROPROCESSED PARTICULATE MATERIAL

Lee H. Niems, 2702 Brassie, Flossmoor, Ill. 60422

Filed Dec. 22, 1986, Ser. No. 944,971

Int. Cl.[4] F27D *15/02, 1/08*

U.S. Cl. 432—69 **22 Claims**



13. Apparatus for cooling hot particulate material comprising in combination

a kiln from which such hot particulate material is supplied,

a refractory lined cooling shaft positioned in association with said kiln for receipt of and containment of a bed of such hot particulate material,

a conical hopper underlying said cooling shaft for flow therethrough of particulate material of said bed to a lower discharge outlet of the hopper,

means for forcing cooling air under pressure through material in said bed,

said hopper comprising a circular uniform angled wall section,

material flow guiding means within said hopper section comprising a centrally located frustoconical section diminishing in cross-sectional dimension toward a lower edge above said outlet to guide the flow of such material along the wall of said uniform angled wall section,

a particle flow distribution regulator body lying in space outlined by and extending below the lower edge of said frustoconical section for contact on all sides by material flowing down and around said edge,

means for lateral positioning of said regulator body,

said regulator body being positionable by said positioning means in said space in a location to balance the flow of particles in said hopper around said regulator for establishment of a minimum of temperature differential of material within the cross-section at each level of the hopper.

4,728,288

APPARATUS FOR UNIFORMLY COOLING PYROPROCESSED PARTICULATE MATERIAL

Lee H. Niems, 2702 Brassie Dr., Flossmoor, Ill. 60422

Filed Dec. 22, 1986, Ser. No. 944,972

Int. Cl.[4] F27D *15/02*

U.S. Cl. 432—78 **11 Claims**

1. Apparatus for cooling hot particulate material comprising in combination a kiln from which such hot particulate material is supplied,

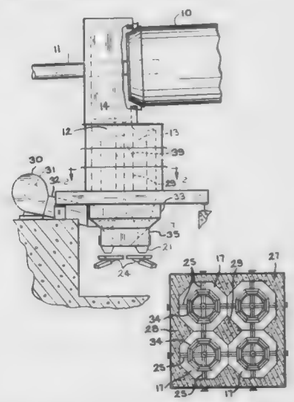
a cooling shaft positioned in association with said kiln for continuous receipt and containment of a bed of such hot particulate material,

said shaft having flat vertical sidewalls forming in cross-section an octagonal shape,

a hopper underlying said cooling shaft for receipt and flow therethrough of particulate material of said bed to a lower discharge outlet of the hopper,

said hopper comprising a circular uniform angled wall section leading to said outlet,

flow guiding means centrally located in a position in a range extending from within said hopper wall section and immediately above to form an annular passageway for flow of said material adjacent said wall section,



said flow guiding means comprising a centrally located frustoconical section with its smallest diameter toward said outlet,

the wall of said frustoconical section being generally parallel to the adjacent wall of said hopper,

a flow dispersing cone mated at its broadest diameter to the top of said frustoconical section to channel the downward flow of material in said hopper radially outward toward said annular passageway and

air supply means for supplying cooling air under pressure to said hopper to force said air upwardly in said bed in sufficient amount to cool said particles to an acceptable handling temperature upon discharge from said outlet.

4,728,289

AXIAL SEAL SYSTEM FOR ROTARY COMBUSTOR

Edward Samera, Jr., Orange, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 10, 1987, Ser. No. 26,931

Int. Cl.[4] F27B *7/24;* **F27D** *1/18;* **F26B** *25/00*

U.S. Cl. 432—115 **17 Claims**

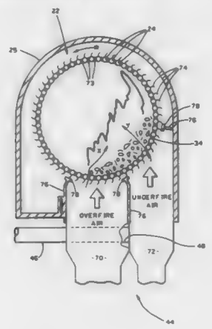
12. An apparatus for providing a seal for a passage providing a combustion fluid to a portion of a rotatable cylindrical drum in a rotary combustor, the rotatable cylindrical drum having a plurality of axial seals extending from the outer periphery thereof, said apparatus comprising:

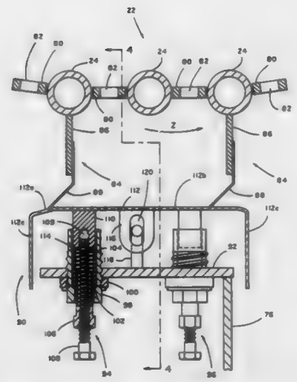
a movable shoe positioned along a portion of the outer periphery of the rotatable cylindrical drum; and

means for biasing said movable shoe so that said movable shoe is urged into contact with at least one of the axial seals to provided a seal against the escape of the combustion fluid along the axial seal, said biasing means including: a support positioned along a portion of the outer periph-

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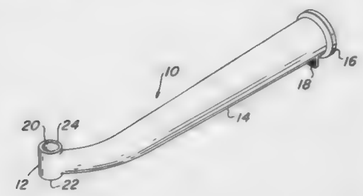
ery of the rotatable cylindrical drum at a predetermined distance from the axial seals; and





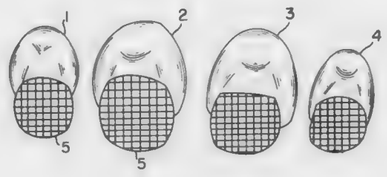
spring means, coupled to said support and said movable shoe, for urging said movable shoe into contact with the at least one of the axial seals.

4,728,290
DENTAL HAND PIECE SHIELD OR PROPHYLACTIC
Mark R. Eisner, 3130 Turner St., Allentown, Pa. 18104, and James M. Hatfield, Jr., 45 Linden Pl., Summit, N.J. 07901
Filed Apr. 28, 1987, Ser. No. 43,497
Int. Cl.[4] A61C *1/16*
U.S. Cl. 433—116 **34 Claims**



1. A removable disposable sterile dental hand piece shield or prophylactic for placement over and in proximate contact with a dental hand piece, having head, arm, and handle portions, for significantly reducing the spread of communicable diseases which may be transmitted by or through contact with human body fluids and tissues during a first and subsequent uses of the dental hand piece in conjunction with the treatment of two or more patients eliminating the need for repeated sterilization of said dental hand piece between such uses for the two or more patients comprising a head portion and a skirt or sleeve portion; said head portion being substantially cylindrical, having opposed substantially annular apertures in the top and bottom thereof and having an extension protruding outward from the side of the head portion for connecting to and mating with the skirt or sleeve portion, said bottom aperture providing an opening with clearance sufficient for attachment, detachment and operation of a dental bur or other tool without contacting the rim of the opening, said top aperture providing an opening with clearance sufficient for manipulation of the dental bur or other tool releasable securing means and for exhaust of the air from the dental bur or other tool turbine drive means; said skirt or sleeve portion being substantially annular over its entire length along the arm and handle portions of the dental hand piece, having an extension at its proximal end over the arm portion of the dental hand piece for connecting to and mating with the extension of the head portion and having at its distal end a reinforcing collar.

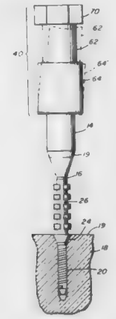
4,728,291
CLOTH WRAP DENTAL PROCESS
Jeff E. Golub, 128 E. 71st St., New York, N.Y. 10021
Filed Jun. 26, 1986, Ser. No. 878,640
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—215 **3 Claims**



1. The process for reshaping teeth as follows:
(a) apply soft orthodontic wax to approximate and mock-up the final restoration, a study model of the waxed mock-up is optional,
(b) pumice the teeth, etch them on all surfaces and then use standard lavage and drying techniques,
(c) cut cloth in ¼ inch lengths measured as wide as the proximal incisal corners, less about ¼ mm from each edge, cut two for each tooth and hold aside, affix the cloth about half way up the tooth even for a 1 or 2 mm, extension, for bruxers, even the tiniest extension requires a cloth wrap, the cloth ribbons can actually be any length, incisal excess to be cut later, the cloth extending to within ¼ mm of the final bonded length,
(d) apply light-cured bonding liquid to the enamel surface and cure,
(e) apply a non-light cured luting agent,
(f) place a cellophane strip loosely adjacent to the lingual surface wrapping labially through the two interproximals, place autocured adhesive paste on the ligual enamel and onto the sides, wet the cloth thoroughly with the paste, compress the parts together with the strip insuring that the extended cloth is following the imaginary inclined plane of the lingual surface of the tooth, remove any paste adhesive which spills onto the labial surface,
(g) apply a new mix of adhesive paste on the labial enamel and on a second piece of cloth, compress again with a clear plastic strip against the hardened lingual cloth-resin complex,
(h) once set, reduce the cloth structure with a dry medium diamond stone to within ¼ millimeter of the ultimate bonded length and width and check the occlusion,

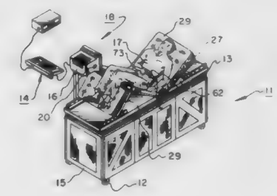
(i) roughen cloth-resin material which appears shiny and add light cured bonding adhesive to the cloth structure and to the remaining enamel surface and cure it,
(j) add the composite resin, choosing a macrofill for the lingual surface for strength and a microfill for the labial surface for polish and luster,
(k) sculpt and finish normally, the outer bonding composite resin should envelope the cloth entirely and should be firmly attached to the labial, lingual and proximal enamel surfaces, as well as to the cloth-resin complex,
(l) polish and finish.

4,728,292
DENTAL APPARATUS
Leopold P. Lustig, Newton, Mass.; Peter Malata, Salzburg, Austria, and Walter Kracht, Lemgo, Fed. Rep. of Germany, assignors to Gebr. Brasseler, Postach, Fed. Rep. of Germany
Filed Dec. 19, 1985, Ser. No. 810,984
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—225 **14 Claims**



1. A tool operator for removably holding an elongated dental tool at a manipulative end thereof and rotating said tool around its longitudinal axis, comprising
a rigid tubular socket open at its first end for receiving said manipulative end of said tool into said socket through said first end thereof,
resilient annular tool-retaining means in said socket near said first end thereof adapted to engage the sides of said tool near said manipulative end thereof for resiliently and removably holding said tool in said socket, and
tool driving means operative through the second end of said socket for engaging said manipulative end of said tool so as to rotate said tool around said longitudinal axis,
in combination with an elongated dental tool removably received in said socket and intended in use to be rotated around its longitudinal axis,
the external diameter of said manipulative end of said tool being smaller than the internal diameter of said tubular socket,
said tool having on its side wall annular groove means removably received by said resilient tool-retaining means by pushing said tool into said socket in its axial direction,
said tool having means axially extending from said manipulative end thereof remote from said groove means and operative upon entrance of said tool into said socket to engage said tool driving means.

4,728,293
LEARNING DEVICE
James S. Kole, Jr., 421 San Bruno, Garland, Tex. 75043
Filed Apr. 27, 1987, Ser. No. 42,832
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 **5 Claims**



1. A learning device for accelerated learning by a person comprising:
a. an induced gravitational force accelerator/decelerator mechanism for stressing the cells of the person's body, comprising:
i. support means for supporting the body in a predetermined position under increased gravitational force and adapted to be moved reciprocally in a vertical direction for providing increased and decreased accelerational and gravitational force on the cells;
ii. reciprocal means for moving said support means and body reciprocally such that increased and decreased accelerational and gravitational forces are exerted on said support means and cells of the body sufficiently to stress the cells above 1G, the force due to the earth's gravitional field, during a portion of the movement;
b. an audio means for presenting an educational message in audio form audibly discernable by the person;
c. a visual display means for presenting an educational message in visual form visually discernable by the person; and
d. means for energizing said visual display means at least when the gravitational force from the body cells, including the brain cells is greater than 1G.

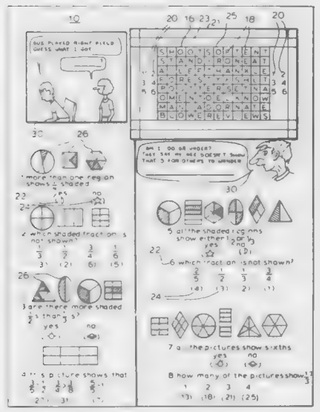
4,728,294
EDUCATIONAL-TEACHING DEVICE
George J. Bredehorn, 713 Francis Dr., Wantagh, N.Y. 11793
Filed May 1, 1986, Ser. No. 858,450
Int. Cl.[4] G09B *3/00*
U.S. Cl. 434—327 **10 Claims**

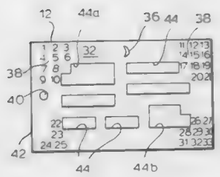
1. An educational device with which a user can learn and employ useful information in stepwise and correct collation of such information to decipher an unintelligible source of such intelligence, said device comprising
a generally flat base member, said base member having intelligence conveying indicia thereon arranged in a normally unintelligible array thereof, said base member further having a pattern of locator indicia thereon, and additionally carrying a printed listing thereon of useful information in the form of questions and plural answers to each question only one answer of which is correct,
a first mask positionable over the base member unintelligible indicia array, said first mask having two opposed faces, each of said two faces carrying indicia markers thereon, that on one face being distinctive from that on the other face, said first mask further having windows therein and a locator opening, the locator indicia pattern on said base member being associated with positioning of the mask locator opening in register over a select one of the indicia in said pattern, the windows in said mask uncovering a portion only of said card unintelligible indicia array when the mask locator opening is registered with said select one indicium, said mask having a placement indicia formation on each of its opposed faces the correct answers to certain

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of the useful information questions on said base member being denotive of the face of said first mask which must be upright when said first mask is positioned over said array and the said one indicium with which said first mask locator opening is to be registered, and

at least one additional mask positionable over the first mask, said additional mask having two opposed faces, each of said two faces carrying indicia markers thereon, that on one face being distinctive from that on the other face, said additional mask further having windows therein and a locator opening, the placement indicia formation on said first mask being associated with positioning of the additional mask locator opening in register over a certain one of the indicia in said formation and when the additional mask locator opening is registered over such certain one indicium, the windows of said additional mask uncovering only so much of the unintelligible intelligence array framed by the first mask windows as presents an intelligible message, the correct answers to others of the useful information questions on said base member being denotive of the face of said additional mask which must be upright when positioned over said first mask and the said certain one indicium on the first mask with which said additional mask locator opening is to be registered.





4,728,295

CONNECTOR BLOCK FOR ELECTRICAL DEVICES

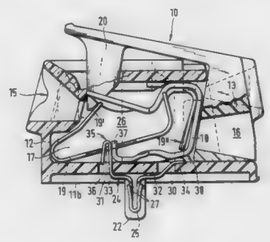
Dieter Henrici, and Hans Wedding, both of Arnsberg, Fed. Rep. of Germany, assignors to Brokelmann, Jaeger & Busse, GmbH & Co., Arnsberg, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 895,834

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528980; Jun. 26, 1986, 3621369

Int. Cl.⁴ H01R *23/72*

U.S. Cl. 439—84 **11 Claims**



1. An electrical connector block assembly, comprising:

a connector block support formed with a plurality of openings at least one of which is a hole adapted to afford an electrical contact;

an insulating body formed with:

a plurality of conductor terminals for respective conductors,

means for mounting said body on said connector block support and including insulating plug members receivable in some of said openings, and

a protective terminal for engaging a further conductor and comprising a bent metal member in said body having an end bent away from a base of said body adapted to lie against said block support, and a recess formed in said member; and

an additional contacting member for said protective terminal, formed in one piece from sheet metal, mountable on said body from the exterior of said base, and comprising:

a bend section projecting outwardly away from said base of said body and engaging in said hole of said block support to form an electrical connection therewith, said bend section having a pair of shanks separated by a bight,

a first connecting leg extending inwardly of said body from said base, said end of said bent metal member being braced laterally against said first connecting leg, and

a second connecting leg extending inwardly of said body from said base, spaced from said first leg, reaching through said recess and in electrical contact with said bent metal member at a location thereon spaced from said end.

4,728,296

ELECTRICAL ADAPTOR FOR DOWNHOLE SUBMERSIBLE PUMP

Bradley C. Stamm, P.O. Box 240, Sandia, Tex. 78383

Filed Sep. 5, 1986, Ser. No. 905,767

Int. Cl.⁴ H01R *13/52*

U.S. Cl. 439—275 **20 Claims**

1. An electrical connector for connecting a cable having multiple insulated conductors to a feed through socket, comprising

an elongate housing made of rigid material and having an axis, the housing having an upstream end and a downstream end;

means on the downstream end of the housing for gripping the exterior surface of the cable and immobilizing the cable;

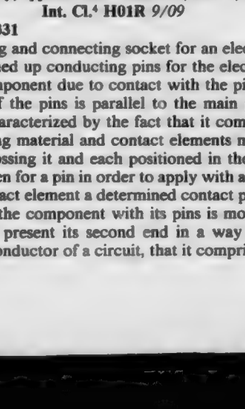
means at the upstream end of the housing for securely connecting the electrical connector to the feed through socket;

a contactor assembly comprising

a contactor support body made of a dielectric material substantially filling the upstream end of the housing;

an electrically conductive contactor tube, for each of the conductors, supported within the body, the tubes being aligned in an upstream-downstream direction and having

a downstream opening for receiving one of the conductors of the cable, and



an upstream electrical contactor portion for mating with a corresponding contactor in the feed through socket;

a pair of spaced rigid dielectric alignment bodies in the housing providing aligned pairs of passages for each of the insulated conductors, a first alignment body being juxtaposed to the contactor support body;

a resilient dielectric conductor seal body between the alignment bodies having a passage aligned with each of the aligned pairs of passages of the alignment bodies for receiving the insulated conductors therethrough; and

means for axially moving the rigid alignment bodies toward each other for compressing the resilient conductor seal body against the insulated conductors.

4,728,297

SOCKET FOR AN ELECTRONIC COMPONENT

Salomon Cohen, Lausanne, Switzerland, assignor to CFG S.A., Morges, Switzerland

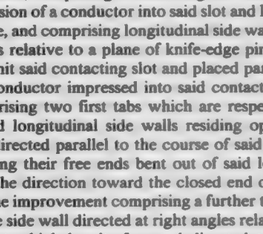
Continuation of Ser. No. 882,200, Jul. 3, 1986, which is a continuation of Ser. No. 729,266, May 1, 1985, abandoned. This application Jul. 22, 1987, Ser. No. 77,034

Claims priority, application Switzerland, Feb. 1, 1985, 475/85

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 439—331 **18 Claims**

1. A fastening and connecting socket for an electronic component with lined up conducting pins for the electric connection of the component due to contact with the pins, whereby the free end of the pins is parallel to the main plane of the component, characterized by the fact that it comprises a carrier of insulating material and contact elements maintained in the carrier, crossing it and each positioned in the face of the position foreseen for a pin in order to apply with a first flexible end of the contact element a determined contact pressure onto the pin, when the component with its pins is mounted in the socket, and to present its second end in a way allowing to solder it to a conductor of a circuit, that it comprises further a comb of insulating material with teeth, which are narrower than the free space between two adjacent pins of the component and are disposed for corresponding to the contact elements whereby the back of the comb glides in a gliding guidance of the carrier oriented in the direction of the alignment of the contact elements, whereby before the insertion of the component the comb is in a position where its teeth are between the contact elements and that after reception of the component in the socket and adequate displacement of the comb, each tooth is in the face of a contact element and applies pressure to the corresponding pin of the inserted component against that contact element.



4,728,298

CONTACT MEMBER

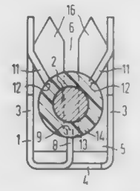
Franz Grueber, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,533

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3522072

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 439—401 **4 Claims**



1. In a contact member formed by bending from a one-piece sheet metal blank, comprising a contacting slot which is fitted for the impression of a conductor into said slot and has a closed end at one side, and comprising longitudinal side walls directed at right angles relative to a plane of knife-edge pinch contact legs which limit said contacting slot and placed parallel to the course of a conductor impressed into said contacting slot, as well as comprising two first tabs which are respectively cut free from said longitudinal side walls residing opposite one another and directed parallel to the course of said contacting slot, and having their free ends bent out of said longitudinal side walls in the direction toward the closed end of said contacting slot, the improvement comprising a further tab bent out of a transverse side wall directed at right angles relative to said contacting slot which has its free end directed toward said contacting slot projecting slightly from said closed end of said slot into the slot region such that a conductor which is pressed into the slot is also pressed against said free end of said further tab and held there by a spring back action of said first tabs and wherein said longitudinal side walls are formed by the U-legs of and said transverse side wall is formed by the base of the sheet metal blank bent into a U-shaped configuration; and in

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that the knife-edge pinch contact legs are a component part of a portion of one of the two U-legs of the sheet metal blank which is angled off door-like into the region of the U-shaped configuration.

4,728,299

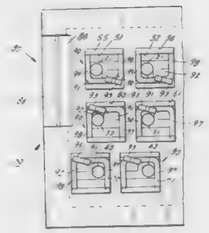
INSULATION DISPLACEMENT CONNECTOR FOR FLAT CABLE HAVING CLOSELY SPACED WIRES

Sidney V. Worth, Flourtown, Pa., assignor to Continental-Wirt Electronics Corporation, Southampton, Pa.

Continuation of Ser. No. 770,064, Aug. 28, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 942,928

Int. Cl.[4] H01R *4/24, 9/11*

U.S. Cl. 439—405 **9 Claims**



1. An insulation displacement connector for a flat flexible multi-conductor cable; said multi-conductor cable comprising a plurality of wires laterally spaced from one another by a first distance and contained within a flexible insulation sheath, said connector comprising an insulation housing which contains a plurality of openings arranged in at least three parallel rows, each of said rows having at least two openings, each of said openings containing one of a plurality of identical electrical contacts; each of said contacts being of a fixed size and configuration and comprising an insulation piercing end and an oppositely disposed nose end, each of said piercing ends comprising a slot portion and being operable to pierce the insulation sheath of said multi-conductor cable, whereupon said slot portion electrically engages a respective one of said plurality of wires; each of said plurality of openings being operable to receive a respective pin of a multi-pin header to be connected to said connector, said pins being arranged in at least three rows having at least two pins per row and spaced apart by a second distance larger than said first distance; each of said contacts having a lateral center line, with the slot portion of each contact being offset from the contact's lateral center line by a distance equal to one-half of said first distance; each of said nose ends of said contacts including first and second pin engaging portions, said first and second pin engaging portions of each contact being located on opposite sides of said center line and spaced therefrom by a distance equal to one-half of said first distance, and with said second pin engaging portion of each contact being axially aligned with the slot portion thereof; said contacts being disposed so that each contact in one row is located in a respective opening therein and oriented in a first common direction and manner, with its respective first pin engaging portion axially aligned with the header pin to be received in said respective opening, each contact in a second row is located in a respective opening and oriented in a second common direction and manner, with its second pin engaging portion axially aligned with the header pin to be received in said respective opening, and each contact in a third row is located in a respective opening and oriented in a third common direction and manner, with its first pin engaging portion axially aligned with the header pin to be received in said respective opening, the center lines of corresponding contacts of said first and second rows being aligned while the center lines of the corresponding contacts of said third row are offset from said aligned center lines by said first distance, whereupon when said header is connected to said connector, some of the pins of said header engage some of the first pin engaging portions of the associated contacts in good electrical continuity while some of the pins of the header engage some of the second pin engaging portions of the associated contacts in good electrical continuity therewith.

4,728,300

SURFACE COVERING ALLOWING AN ELECTRIC RECEIVER TO BE SUPPLIED WITH POWER AT VARYING POSITIONS ON THE SURFACE

Richard P. Shillito, Gif sur Yvette; Maurice Behar, Paris, and Jean-Louis Mutte, Montmorency, all of France, assignors to Heuga France S.A.R.L., Les Ulis Cedex, France

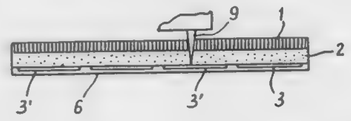
PCT No. PCT/FR86/00031, § 371 Date Oct. 8, 1986, § 102(e) Date Oct. 8, 1986, PCT Pub. No. WO86/04742, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 5, 1986, Ser. No. 916,842

Claims priority, application France, Feb. 8, 1985, 85 01766

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—426 **16 Claims**



1. A carpet tile surface covering for supplying an electric receiver with power at variable positions on said surface by means of a variable position current sensor having at least two feelers able to contact conducting strips beneath the surface covering, said feelers being in the form of metal contact needles passing through an insulating material layer forming an upper covering applied to said conducting strips, said covering being characterized in that it is in the form of ready-to-lay elements and comprising:

(a) a fibrous layer (**1, 10, 17, 24**) having an upper surface forming the visilbe face of the covering;

(b) at least one insulating material layer (**2, 12, 18, 25**) integrally bonded to the lower surface of the upper layer;

(c) two assemblies means of generally flat, wide conducting strips (**3, 3'–14, 14' 19, 19' 30, 30', 30''–33, 33', 33''**) adapted to be connected to a power supply source, these two assemblies means being fixed under said insulating material layer the said strips of generally equal width and of alternating different electrical polarities, and each of said strips in the same general plane and generally equally spaced apart from each other by a small, free gap; and

(d) connecting means to provide for ensuring the electric continuity between two adjacent elements.

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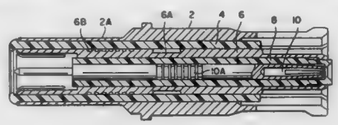
PIN/SOCKET, PIN/PIN TRIAXIAL INTERFACE CONTACT ASSEMBLY

Valentine J. Hemmer, Unadilla, and Lloyd G. Ratchford, Oneonta, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 14, 1987, Ser. No. 49,742

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—578 **11 Claims**



1. An interface contact assembly comprising:

an inner contact;

an inner insulator concentrically surrounding the inner contact;

an intermediate contact concentrically surrounding the inner insulator;

first means arranged with the intermediate contact and the inner contact so that when the intermediate contact is staked the inner insulator is compressed into the inner contact to provide an initial assembly;

an outer insulator concentrically surrounding the intermediate contact;

an outer contact concentrically surrounding the outer insulator; and

second means arranged with the intermediate insulator so that when the outer contact is staked the outer insulator is compressed into the intermediate contact to provide a final assembly.

4,728,302

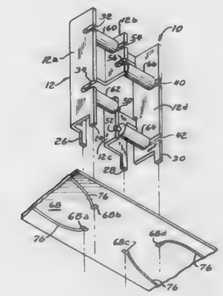
MOUNTING COUPLING AND HEAT SINK ASSEMBLY FOR AXIAL LEAD COMPONENTS

George Wozniczka, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 17, 1986, Ser. No. 887,577

Int. Cl.[4] H05U *3/30*

U.S. Cl. 439—620 **11 Claims**



1. An electronic apparatus mounted to a support structure and coupled in circuit, said electronic apparatus comprising:

a frame comprised of an electrically and thermally conductive material and divided generally into a plurality of sections and adapted to be bent along a plurality of parallel, spaced linear axes such that each of said sections is then oriented in facing, spaced relation from an adjacent section, with each of said sections including an aperture therein aligned with an aperture in an adjacent facing section and further including removable jumper means for coupling adjacent sections of said frame such that with said jumper means removed from said frame following the bending of said frame along said axes, each of said sections is electrically isolated and mechanically detached from the other frame sections;

an electronic component positioned between adjacent facing frame sections and having first and second axial leads extending from respective ends thereof, said first and second axial leads positioned within respective apertures in said adjacent facing sections and electrically coupled thereto; and

mounting/coupling means integral with and extending from each of said sections for mounting the electronic apparatus to the support structure and electrically coupling the electronic apparatus in circuit.

4,728,303

TEMPERATURE SENSING POWER PLUG AND METHOD OF MANUFACTURE

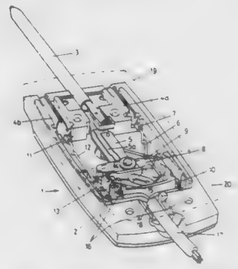
Douglas J. Slack, Smithfield Plains, Australia, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 159,579, Jun. 16, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,523

Claims priority, application Australia, Jun. 15, 1979, PD9222

Int. Cl.[4] H01R *13/11*

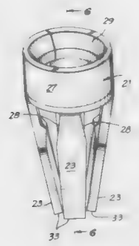
U.S. Cl. 439—620 **3 Claims**



1. An easily shipped subassembly for a temperature sensitive electrical control to be completed after shipment where the control is adapted to be releasably connected to terminals of a home appliance to regulate electrical operation of the appliance in accordance with appliance temperature, the subassembly comprising a base of rigid electrical insulating material, temperature sensitive means carried on as first portion of the base to be disposed in heat-sensing relation to the appliance when the control is releasably connected to the appliance terminals, a pair of electrical contacts carried on the first portion of the base to be electrically connected to an electrical power source, and electrical switch means carried on the first portion of the base to be responsive to the temperature sensitive means for opening and closing an electrical circuit between the contacts to regulate appliance operation in response to selected changes in appliance temperature, characterized in that, a pair of wires are electrically coupled to the respective contacts and extend from the first portion of the base to locate first ends of the respective wires over another selected portion of the base for use in connecting the contacts to the power source, a pair of electrically conductive metal connectors each having a U-shaped crimpable portion extending from one end of the connector are electrically connected to said one ends of the respective wires so that the U-shaped crimpable connector portions extend from the wires over said other selected portions of the base, the base has U-shaped anvils integrally formed of the rigid electrically insulating base material upstanding from said other selected base portions receiving the respective U-shaped crimpable portions of the connectors in nested relation therein, first electrically insulating cover means are secured to the base over the first portion of the base enclosing the contacts, temperature sensitive means and switch means during shipment of the subassembly and thereafter while leaving the U-shaped crimpable connector portions accessible to subsequently receive ends of respective conductors from a power source therein to be crimped into engagement with the respective conductor ends by user deformation of the crimpably connector portions against the integral base anvils, and additional electrically insulating cover means are detachably secured to the base over the other base portions to accommodate and enclose and protect said crimpable connector portions before they are crimped during shipment of the subassembly, to be removable to allow crimping of the connector portions against the integral anvils after shipment, and to be again secured to the base thereafter to enclose the crimped connector portions and said conductor ends.

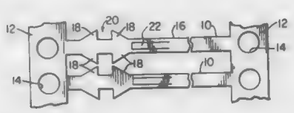
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4,728,304
LOW INSERTION FORCE LEAD SOCKET INSERT
Charles P. Fischer, Mickelton, N.J., assignor to Micro Stamping Corp., Maplewood, N.J.
Filed Apr. 2, 1985, Ser. No. 718,973
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—842 18 Claims



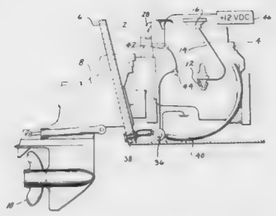
1. A lead socket insert comprising a collar and a plurality of fingers, each finger having a first and a second end, each said finger being joined to said collar at said first end, and each of said fingers being bent at a fulcrum position toward each other so that said fingers converge and are disposed in registry with each other to permit the fingers to converge about a lead that is inserted therebetween, said first end at said fulcrum position where said fingers are bent toward each other being structurally weakened to reduce the flexible strength of each finger so that the friction force of said fingers is reduced when a lead is inserted therein.

4,728,305
SOLDER-BEARING LEADS
Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corp., College Point, N.Y.
Continuation-in-part of Ser. No. 793,654, Oct. 31, 1985, Pat. No. 4,679,889, which is a continuation-in-part of Ser. No. 737,830, May 24, 1985, Pat. No. 4,605,278. This application Apr. 11, 1986, Ser. No. 850,754
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] H01R *4/02, 9/09*
U.S. Cl. 439—876 24 Claims



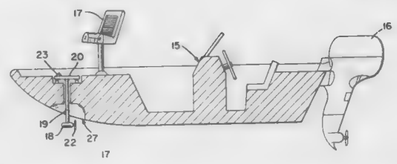
1. A solder-bearing lead adapted to be soldered to a conductive surface, comprising:
an integral elongated strip-like essentially planar body portion,
said body portion having on one edge thereof a laterally extending tab integral therewith,
said tab being bent into a plane substantially perpendicular to the plane of said body portion,
said bent tab having a partially curved form along one edge, extending in a direction longitudinally of said body portion and,
a solder mass retained between said curved edge and said body portion.

4,728,306
MARINE PROPULSION AUXILIARY COOLING SYSTEM
Charles R. Schneider, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Dec. 29, 1986, Ser. No. 946,756
Int. Cl.[4] F01D *7/14;* B63H *21/38*
U.S. Cl. 440—1 9 Claims



1. In a marine propulsion system having a water-cooled internal combustion engine having on and off conditions and including fuel supply means for supplying fuel to said engine, means for sensing said off condition of said engine, and off-condition cooling means responsive to said sensing means sensing said off condition of said engine and preventing vaporization of said fuel otherwise caused by heat from said engine after said engine is turned off.

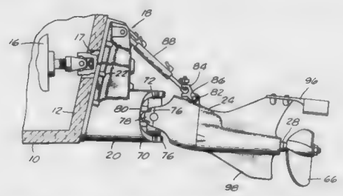
4,728,307
TROLLING MOTORS FOR BASS BOATS
Dennis F. Burgess, Box 142, Henrietta, N.C. 28076
Filed Aug. 29, 1986, Ser. No. 901,632
Int. Cl.[4] B63H *25/02*
U.S. Cl. 440—7 14 Claims



9. An electric trolling motor for a fishing boat having a deck, the motor mounted on one end of a rotatable position control shaft extending through the hull of the boat in a position accessible by a fisherman, and a foot-operable disc directly mounted on the other end of the position control shaft to control the rotation of the shaft by the fisherman when fishing with both hands on a rod, the foot-operable disc oriented to be recessed in and substantially level with the deck to permit comfortable control of the trolling motor when the fisherman is in both standing and sitting positions.

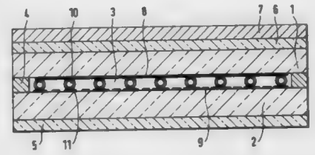
4,728,308
STERN DRIVE
Peter H. Weismann, Santa Ana, Calif., assignor to Kaama Marine Engineering, Inc., Costa Mesa, Calif.
Continuation of Ser. No. 235,572, Feb. 18, 1981, abandoned. This application Dec. 28, 1983, Ser. No. 565,526
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—57 2 Claims

1. A power train for a boat having a hull, a transom, and an inboard motor, comprising
a propeller shaft housing;
a mount rigidly fixable to the outboard side of the transom, said propeller shaft housing being mounted to said mount to provide universal pivotal motion of said propeller shaft housing relative to said mount;
a steering control mechanism coupled with said propeller shaft housing for steering said propeller shaft housing relative to the hull;
an input propeller shaft in said propeller shaft housing and extending toward said mount for power coupling through said mount with the inboard motor;



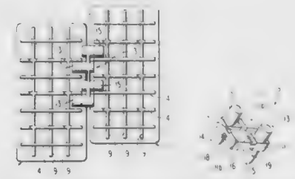
an output propeller shaft mounted in said propeller shaft housing and extending from said housing at a distal end thereof, said output propeller shaft being located below said input propeller shaft and generally extendable to a surface drive position with said output propeller shaft substantially in a direct line with the bottom of the hull; and
a gear pair coupled with said input and said output propeller shafts and located within said propeller shaft housing.

4,728,309
METHOD FOR THE MANUFACTURE OF A DISPLAY DEVICE, PARTICULARLY A LIQUID CRYSTAL DISPLAY
Holm Baeger, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany
Division of Ser. No. 689,908, Jan. 9, 1985, Pat. No. 4,692,231. This application Sep. 5, 1986, Ser. No. 905,095
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1984, 3400429
Int. Cl.[4] G02F *1/133*
U.S. Cl. 445—25 9 Claims



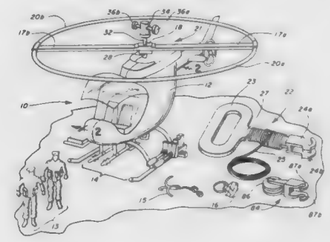
1. A method for producing of a display device, particularly a liquid crystal display, including two support plates which are parallel to each other, and a medium which can be switched between two optically different states enclosed between the two plates, and wherein the support plates are spaced apart by an outer spacing frame; the method comprising the steps of
forming spacers of such a size and nature that they are invisible to the eye,
providing the spacers between the support plates,
uniformly distributing the spacers in the viewing field between the support plates,
bonding the plates to each other by a plurality of the spacers between the support plates,
the method including the steps of coating the spacers with two components of a two-component adhesive, and separating components of the adhesive from each other by a barrier layer.

4,728,310
TOY CONSTRUCTION DEVICE
Costante Valtolina, Via Don Marzorati, 2, 221047 Saronno (Varese), and Marco Velati, Via Tortona, 72, 20144 Milan, both of Italy
Filed Jan. 23, 1986, Ser. No. 824,347
Int. Cl.[4] A63H *33/08*
U.S. Cl. 446—111 3 Claims



1. A toy construction device comprising, in combination:
a flat plate having two sets of resilient ribs arranged on each side of said plate, a first set of ribs being arranged parallel with one another, having an equal pitch therebetween and spaced substantially across the entire plate, a second set of ribs also being arranged parallel to each other, having an equal pitch therebetween and spaced substantially across the entire plate in a direction perpendicular to the direction of said first set of ribs, both first and second sets of ribs being integrally formed on said plate and defining a plurality of modular units wherein one set of ribs has a greater height than said other set of ribs; and
a connection element for frictionally fitting in said modular units for connecting a plurality of said plates, said connection element comprising a connection plate having oppositely disposed faces, orthogonally disposed incisions on at least one face of said connection plate and each face having rigid pins extending perpendicularly therefrom for a frictional fit within said modualr units,
wherein said flat plates are connected together by inserting said pins of the connection element into said modular units of the flat plates to be connected and said ribs defining said modular units are elastically deformed by said pins and said set of ribs having the greater height are disposed in said incisions when said pins are secured in said modular units.

4,728,311
TOY HELICOPTER
Ronald G. Magers, 79 Eastern Ave., Essex, Mass. 01929
Filed Feb. 7, 1986, Ser. No. 827,774
Int. Cl.[4] A63H *21/02, 27/00, 33/26*
U.S. Cl. 446—228 13 Claims

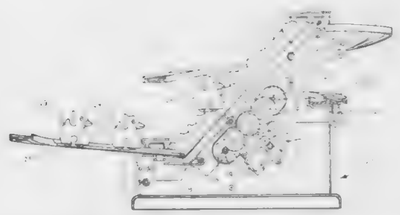


1. A toy comprising:
a body;
a motor having a rotating shaft with a pinion gear mounted on its distal end;

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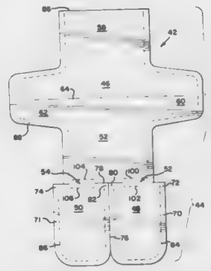
a switch for actuating said motor;
a gear assembly in mesh with said pinion gear, said gear assembly comprising at least one gear;
a tubular drive shaft projecting from the central portion of said at least one gear;
a rotor having a hub with a bore formed therein, said rotor mounted on and loosely frictionally engaging said drive shaft;
an actuating shaft passing through said rotor hub and within said tubular shaft and through the central portion of said at least one gear;
an actuating arm operatively associated at one end with the internally projecting end of said actuating shaft, said actuating arm operatively associated at said arm's other end with said switch;
whereby axial movement of said actuating shaft actuates said motor to induce rotation of said tubular drive shaft to thereby induce gradual rotational acceleration of said rotor as a result of frictional interaction between cooperating surfaces of said drive shaft and said rotor hub.

4,728,312
LIFT DEVICE FOR TOY TRACK WAY
Nobuyoshi Ohnuma, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 3, 1987, Ser. No. 21,211
Claims priority, application Japan, May 9, 1986, 61-69611
Int. Cl.[4] A63H *11/04*
U.S. Cl. 446—314 **5 Claims**



1. An endless toy track way, comprising:
(a) a rail having a first end and a second end, the second end being elevated relative to the first end;
(b) a moving body provided for movement via gravity on the rail and having a pair of lateral projections; and
(c) a lift device, including
(i) a pair of parallel, spaced, fixed stairs,
(ii) first and second vertically, movable plates formed with engaging steps at one edge thereof and arranged longitudinally inside the pair of fixed stairs, and
(iii) drive means operatively connected to the first and second movable plates,
wherein, the first and second vertically movable plates are each moved by the drive means to ascend and descend alternatively, and
wherein said projections of the moving body are engaged with the engaging steps of the first and second vertically movable plates so that the moving body is carried onto each succeeding stair of the pair of fixed stairs, one projection after the other.

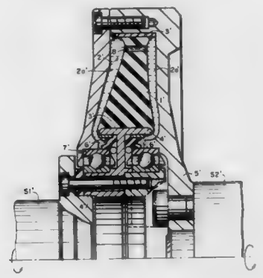
4,728,313
PRE-SEWN DOLL BODY AND BLANK FOR MAKING THE SAME
Martha N. Thomas, Louisville, Ky., assignor to Fibre-Craft Materials Corp., Niles, Ill.
Filed Feb. 26, 1985, Ser. No. 705,918
Int. Cl.[4] A63H *3/02, 3/08*
U.S. Cl. 446—369 **4 Claims**



1. A body blank adapted to provide a doll body when sew, stuffed and formed, said body blank being made from a single piece of woven cloth material and including three principal panel portions, one being a generally cruciform shaped body-forming panel subdivided into back and chest-forming panel partions, said body forming panel being adapted to be folded along a line transverse to the axis of the blank to form the torso and arms of said body, said body-forming panel being symmetrical about said transverse fold line so that the chest and back-forming panel portions of said body-forming panel are adapted to have their counterpart outer margins in overlying registered relation when folded about said fold line and seamed so as to form a body with outwardly extending arms, and a pair of substantially identical, leg forming panels each connected at its inner end to the bottom edge of said chest-forming panel, said leg forming portions having laterally outer corners of increased lateral width with respect to said chest forming panel, said leg forming panels being separated from each other by a longitudinally extending slit terminating in left and right, laterally extending slits forming inner leg panel corners which are generally laterally aligned with said outer corners, with said leg forming panels each also being adapted to be folded along a longitudinal leg panel center line into a position such that said inner and outer leg panel corners of each leg overlie each other in aligned relation and thereafter seamed so as to form leg portions, said blank also providing an opening adjacent the lower edge of said back forming panel adapted to receive a fiber stuffing material when said blank is assembled.

4,728,314
ELASTIC AXIAL-ROTATION COUPLER
Hans G. Eckel, Hirschberg, and Benno Jörg, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany
Filed Jul. 29, 1986, Ser. No. 891,650
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1985, 3527990
Int. Cl.[4] F16D *3/78*
U.S. Cl. 464—89 **20 Claims**

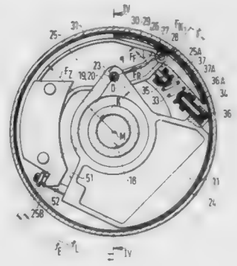
1. An elastic axial-rotation coupler, comprising:
two inelastic devices for respective, inelastic connection to two axially rotatable structures, at least one of the devices defining an inelastic annular chamber therein which is closed axially in both directions and radially outwardly;
at least one resilient, elastomeric element and a liquid in the annular chamber, the elastomeric element connected in the chamber to each device for rotatably coupling them in a resilient manner, thereby so coupling the axially rotatable structures, said elastomeric element being surrounded, on axially opposite sides and radially outwardly, by said annular chamber;
whereby the liquid, at least when the structures rotate, is

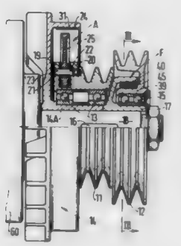


distributed radially outwardly in the chamber, said liquid filling a radial outward boundary of the chamber where a free space exists between the elastomeric element and at least one of the inelastic devices to a location radially toward the axis of rotation in which the elastomeric element is at least partially covered.

4,728,315
TWO-SPEED DRIVE WITH TWO BELT PULLEYS AND A CENTRIFUGAL TYPE FRICTION-CLUTCH COUPLING
Walter Schlagmüller, Schwiebergingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 3, 1986, Ser. No. 926,961
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1985, 3540408
Int. Cl.[4] F16H *7/02;* **F16D** *21/04*
U.S. Cl. 474—13 **5 Claims**

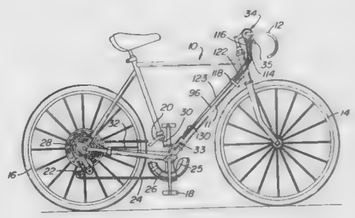
1. A two-speed drive for a generator of an internal combustion engine, comprising two coupling belt pulleys of different diameters; a centrifugal type friction-clutch coupling, said coupling including a friction surface, an acutating lever formed a a flyweight and having a first pivot axis on which said lever is pivotally supported, a spring acting on said lever against a centrifugal force, and a coupling jaw connected to said lever so as to be pressed thereby against the friction surface of said coupling, said lever having a second pivot axis, said coupling jaw being pivotally supported on said second pivot axis, said first and second pivot axes lying on a straight line which forms with a resulting normal force (F_N) of said coupling jaw, acting against said friction surface, an angle which corresponds to a friction angle (ϕ) which occurs at a static friction between said coupling jaw and said friction surface; and free-wheeling means positioned between said two coupling belt pulleys, said





genreator having a driving side, said coupling being positioned immediately at the driving side of said generator.

4,728,316
CONTROL MEANS FOR SHIFTING GEARS ON DUAL SHIFT BICYCLES
Jack B. Darby, 518 First St. E., Scott City, Mo. 63780
Continuation of Ser. No. 751,583, Jul. 3, 1985, Pat. No. 4,619,631. This application Oct. 24, 1986, Ser. No. 923,116
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] F16H *9/00*
U.S. Cl. 474—80 **25 Claims**



1. In a device such as a dual shift bicycle or the like having a plurality of drive gears and including a drive chain means, a front derailleur associated with a front drive gear means and movable to positions for shifting the drive chain means into selected drive positions, a rear derailleur associated with a rear drive gear means and movable to position for shifting the drive chain means into selected drive positions, a front derailleur shift means operatively connected at one end to the front derailleur and movable for positioning the front derailleur, and rear derailleur shift means operatively connected at one end to

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the rear derailleur and movable for positioning the rear derailleur, the improvement comprising:

means for shifting between the drive positions by moving the front and rear derailleur shift means to position the front and rear derailleurs, including:

control means including a front control member operatively engaged with said front derailleur shift means and movable through shifting movements between a plurality of control positions and rear control member operatively engaged with said rear derailleur shift means and movable through shifting movements between a plurality of control positions, selector/actuator means for selecting for each of said front and rear control members a selected control position to which said front and rear control members are to be moved in a gear shifting movement from a present control position to a selected control position and engageable with said front and rear control members for actuating the same through said shifting movement,

said control position selection operation being independent of said actuation of said control members through said shifting movement so that the shifting between the drive gears can be performed in two sequential operations,

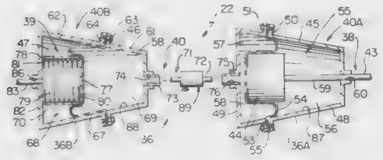
and means for holding said front and rear control members in selected control positions thereof after said shifting movement.

4,728,317

BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

Vernon H. Martz, Brookline, and Leslie B. Wilson, Reeds Spring, both of Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,696
Int. Cl.⁴ F16H *7/12*
U.S. Cl. 474—110 **30 Claims**



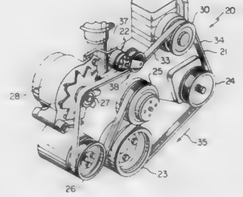
1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, force producing means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means in a belt tensioning direction and against said belt with a force to tension said belt, and a fluid operated transmitting means operatively associated with said force producing means and said belt engaging means for translating forces therebetween whereby said force producing means is adapted to be disposed remote from said belt engaging means, said fluid operated transmitting means including a piston and cylinder means having a cylinder member and a piston member disposed in said cylinder member, one of said members being adapted to be fixed to define part of said support means with the other of said members being movable relative thereto and being operatively associated with said belt engaging means, the improvement wherein said cylinder member has opposed ends and a tapering chamber defining a substantially straight line tapering internal peripheral side wall of said cylinder member that extends substantially completely between said opposed ends, and a rolling diaphragm carried by said cylinder member for rolling against said tapering side wall throughout substantially the entire normal tensioning range of movement of said belt engaging means relative to said support means, said diaphragm having opposed sides and an outer peripheral means secured to said cylinder member intermediate said opposed ends thereof whereby said tapering chamber extends from said opposed sides of said diaphragm, said piston member being operatively associated with said rolling diaphragm whereby said relative movement changes the effective area of said rolling diaphragm and, thus, the tensioning force on said belt engaging means in a substantially linear manner throughout substantially the normal tensioning range of movement of said belt engaging means relative to said support means.

4,728,318

BELT TENSIONER AND METHOD OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 827,572, Feb. 7, 1986, Pat. No. 4,661,087, which is a division of Ser. No. 643,504, Aug. 23, 1984, Pat. No. 4,596,538. This application Jan. 27, 1987, Ser. No. 7,255
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.⁴ F16H *7/12*
U.S. Cl. 474—135 **5 Claims**



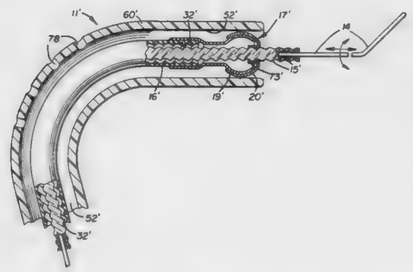
1. In a method of making, a tensioner for a power transmission belt that is adapted to be operated in an endless path, said method comprising the steps of forming a support means for being fixed relative to said belt, forming a belt engaging means to be carried by said support means and be movable relative thereto, operatively associating mechanical spring means with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, forming said spring means to have a longitudinal axis and be spiraled about said axis thereof, forming said support means to comprise a shaft means having a longitudinal axis and be fixed from movement relative to said belt engaging means, forming said belt engaging means to have a portion thereof rotatably carried by said shaft means so as to rotate relative to said shaft means, forming said portion of said belt engaging means to have a slot therein, and forming said spring means to have an inner coil provided with an inner end bent at an angle relative to said inner coil and received in said slot to interconnect said spring means to said portion of said belt engaging means, the improvement comprising the step of disposing a protective member between said portion of said belt engaging means and said inner coil of said spring means adjacent said inner end thereof to tend to protect said inner coil.

4,728,319

INTRAVASCULAR CATHETER

Helmut Masch, 764 Asbury St., San Jose, Calif. 95126

Continuation-in-part of Ser. No. 841,879, Mar. 20, 1986, Pat. No. 4,696,667. This application May 21, 1986, Ser. No. 865,962
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.⁴ A61B *17/20*
U.S. Cl. 604—22 **18 Claims**



11. An intravascular catheter for clearing a blockage in a blood vessel or the like comprising

a flexible first tube,

a rotary flexible second tube rotatable relative to said first tube and having said first tube mounted therein to define a passage therebetween, and

rotary cutting means for engaging and cutting said blockage into fragments including

an outer cutting head secured on said first tube,

an inner cutting head secured on said second tube for simultaneous rotation therewith and rotatably mounted in protected relationship within said outer cutting head,

cooperating blade means formed on each of such inner and outer cutting heads for cutting said blockage into fragments in response to rotation of said second tube and,

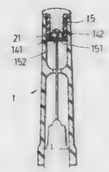
conveying means defined between said first and second tubes and responsive to relative rotation therebetween for mechanically inducing and conveying said fragments away from said cutting means and through said passage.

4,728,320

SYRINGE CAP WITH HAMMER

Chang-Cheng Chen, No. 211, Sec. 2, Chiu-Ru Rd., Chiu-Ru Hsiang, Pingtung Hsien, Taiwan

Filed Apr. 17, 1987, Ser. No. 42,222
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—110 **4 Claims**



1. A syringe cap comprising:

a hollow cap body having a surrounding wall for encasing a needle of a syringe, a first open end to be mounted on the syringe and a second open end to extend beyond the needle;

a hammer body having a hitting end with a concaved surface and an opposite end; and

a fitting member which has an open end, an opposite closed end that can be pierced by the needle and a cavity opening at said open end of said fitting member and closed by said closed end;

said fitting member being fitted slideably in said second open end of said cap body for telescoping movement between an extended position and a retracted position, said hammer body being held in said cavity, said concaved surface being facing said closed end, said fitting member being forced to move to said retracted position when an impact force is applied and said caoncaved surface hitting the needle which pierces said closed end.

4,728,321

SYRINGE CAP WITH ADHESIVE HOLDING PLUG

Chang-Cheng Chen, Pingtung Hsien, Taiwan, assignor to Ming-Chiu Wu, Taiwan

Filed Apr. 16, 1987, Ser. No. 39,067
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—110 **1 Claim**



1. A syringe cap comprising:

a hollow cap body having a surrounding wall for encasing a needle of a syringe, a first open end to be mounted on the syringe and a second open end to extend beyond the needle;

an adhesive holding plug means mounted slideably on said second open end for moving between an extended position and a retracted position, said means having an outer closed end, an opposite inner closed end that can be pierced by the needle, and a cavity closed by said inner and outer closed ends; and

an adhesive contained in said cavity,

said inner closed end being pierced by the needle when a pressure is applied on said plug means, and said adhesive means bonding said needle to said plug means.

4,728,322

ADJUSTABLE CATHETER ASSEMBLY

Jack M. Walker, Portola Valley, and Neil J. Sheehan, Emmeryville, both of Calif., assignors to Menlo Care, Inc., Palo Alto, Calif.

Filed Feb. 5, 1986, Ser. No. 826,439
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—165 **35 Claims**

1. A catheter assembly, comprising:

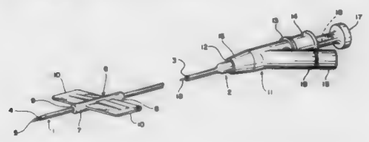
a cannula having a distal end portion, a proximal end portion, and a longitudinal duct therethrough from the distal end portion to the proximal end portion;

a needle having a distal and a proximal end and having a sharpeded insertion tip at the distal end, the needle being positioned within the distal end portion of the longitudinal duct of the cannula with the insertion tip extending beyond the distal end of the cannula;

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a catheter inserter having inserter distal and proximal ends and having a cannula guide channel extending from the inserter distal end to the inserter proximal end, the cannula being positioned in slidable relationship through the channel such that the distal end portion of the cannula extends beyond the distal end of the channel; and

a means for selectively restricting the cannula and needle from sliding relative to the channel;



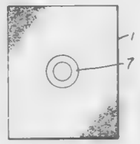
wherein at least a portion of the cannula is of a material selected such that an outer circumference of the duct increases to form an enlarged outer circumference such that it restricts the cannula from sliding relative to the channel when at least a part of the distal end portion of the cannula is inserted into a body of a living subject and maintained therein and/or when the duct is contacted by a liquid, for a period of time sufficient for the enlarged outer diameter to form.

4,728,323

ANTIMICROBIAL WOUND DRESSINGS

Charles J. Matson, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 24, 1986, Ser. No. 889,671
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—304 **22 Claims**



1. An article useful as a wound dressing comprising a conformable substrate vapor coated with an antimicrobially effective film of silver chloride, said substrate having a low enough moisture vapor transmission to maintain a moist environment around the wound during healing so as to substantially prevent the formation of a hardened scab over the wound.

4,728,324

URINE METER VALVE WITH TAMPER INDICATOR

Carl J. Steigerwald, Fox River Grove, and Terry N. Layton, Arlington Heights, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Oct. 15, 1986, Ser. No. 919,290
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—323 **13 Claims**

1. A multiple use valve assembly having means for permitting only small samples to be taken therefrom and further means for permitting larger samples therefrom, said valve comprising:

a housing having a front portion and a rear portion, said housing having a generally longitudinal opening therethrough;

an intake opening at one end of said housing and a large sample discharge opening at the other end of said housing;

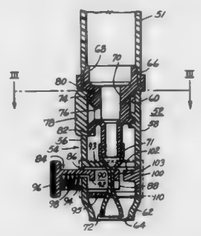
a sealable sampling port for taking small urine samples from said housing, adjacent its intake opening;

a biased release means in said housing adjacent its discharge opening for the discharge of large samples of urine thereby;

a tamper evident means associated with said housing and said biased release means to indicate any discharge of urine through said larger sample means by the use of said biased release means;

an elongated adapter comprising the intake opening of said housing, said elongated adapter having a generally longitudinally directed bore therethrough;

said elongated adapter having said sampling port through a sidewall thereof, said sampling port being in fluid communication with said bore; and



a flexible tube secured to the discharge end of said elongated adapter, said flexible tube extending through said biased release means and open at the discharge opening said housing;

said tamper evident means comprising a frangible panel disposed in said rear portion of said housing, in alignment with said biasing means disposed through said front housing, wherein displacement of said biased means so as to undistort said flexible tube to permit the flow of urine therethrough, will fracture said frangible panel in said rear housing, thus indicating the large sampling means' use.

4,728,325

DIAPER BACKSHEET

Russell A. Spiller, Crystal Lake, Ill., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 3, 1986, Ser. No. 849,074
Int. Cl.[4] A61F *13/16, 13/18, 13/20*
U.S. Cl. 604—372 **7 Claims**

1. A disposable diaper having a diaper backsheet of polyolefin, a non-woven top sheet, an absorbent inner layer and refastenable adhesive closure tabs, said polyolefin backsheet having a 45° gloss of less than 9 and a tape peel force greater than 600 grams on the surface exposed to said adhesive tabs, said polyolefin comprising from 30 to 95 wt.% linear low density polyethylene containing hexene-1 comonomer in an amount up to 20 wt.% and from 5 to 70 wt.% of a low density polyethylene or a mixture of low density polyethylene and up to 30 wt.% high density polyethylene.

4,728,326

ADJUSTABLE DIAPER

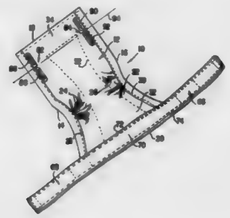
Jennifer A. Gilles, 10591 Bridgeport, Richmond, B.C., Canada V6X 1S9

Filed Jan. 2, 1986, Ser. No. 815,740
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—391 **2 Claims**

1. An adjustable diaper comprising:

a generally rectangular body portion of two layers of a flexible, sheet-like material having opposite sides, a back end, a front end, the back end being wider than the front end, a central part for fitting under the crotch of the infant, a front part adjacent the front end for fitting about the front of the infant, the sides being parallel near the front end, and a back part adjacent the back end for fitting about the back of the infant, the central part having non-elastic gathers formed along the sides of the body portion and secured by stitching extending along the sides of the body portion, making the central part concave and narrower than the front part and the back part, the front part having two pairs of slot-like openings which extend lengthwise in a direction parallel to the sides, the openings of said each pair being near opposite sides of the body portion, the openings of each pair being spaced apart the same amount so the openings of said each pair coincide when the body portion is folded parallel to the front end between the openings of said each pair of openings;

a pluraliy of layers of moisture absorbent material between the layers of material of the body portion and sewn thereto;



a pair of strap members extending from said sides of the body portion near the back end;

the strap members being relatively thin and each having a width slightly less than the length of each said slot-like openings and being sufficiently long to extend through the slot-like openings of the front part and double back to overlie the back part;

and hook and loop-type fastener means on the straps and the back part for releasably securing each said strap member to the back part of the body portion when the straps are doubled back, the fastener means having hook portions on sides of the straps which face inwardly when the straps are doubled back.

4,728,327

MIDDLE-EAR PROSTHESIS

Michel Gersdorff, 24, Avenue des Myrtilles, B-1950 Kraainem, Belgium

Filed Jan. 14, 1987, Ser. No. 3,088
Claims priority, application France, Jan. 27, 1986, 86 01073
Int. Cl.[4] A61F *2/18*
U.S. Cl. 623—10 **14 Claims**



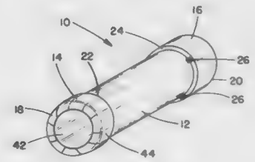
1. A prosthesis (16) for in vivo implantation in the middle ear cavity for transmitting sound between the tympanic membrane (3) and a constituent part of the stapes (8), which prosthesis (16) comprises a sound transmission means, a fastening means (23) and a flexible elongated suspension means (22), said sound transmission means comprising a first arm (17) representing the malleus (4) adapted to make contact with the tympanic membrane (3) and a second, shorter arm (19) representing the incus (6), the two arms (17, 19), joined together by a connecting member (18), being directed in two planes parallel to one another and being seen to form an acute angle between them when viewed in a direction at right angles to said planes, the free end of the second arm (19) being adapted to be connected to a constituent part of the stapes (8), said fastening means (23) being adapted to be inserted in the middle ear cavity into a bony part of the ear, said suspension means (22) being orientable and adjustable, said sound transmission means being connected to said fastening means (23) by said suspension means (22), one end of said suspension means (22) being connected to said fastening means (23) and the other end of said suspension means (22) being connected to the sound transmission means at a point close to the junction of the two arms (17, 19).

4,728,328

CUFFED TUBULAR ORGANIC PROSTHESES

Howard C. Hughes, Cornwall, and Jacob T. Kissinger, Mechanicsburg, both of Pa., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 663,008, Oct. 19, 1984, abandoned. This application Jun. 3, 1985, Ser. No. 740,358
Int. Cl.[4] A61F *2/04*
U.S. Cl. 623—12 **26 Claims**



1. A cuffed tubular organic prosthesis for repairing or replacing tubular organs comprising:

a flexible tubular body having an inside diameter substantially equal to the inside diameter of an organ to be repaired or replaced; and

a prosthesis cuff on each distal end of said tubular body integral with said tubular body distal ends, each of said prosthesis cuffs having a rounded end for insertion within an open end of the organ and a free end bonded to said tubular body thereby forming a continuous smooth surface extending from the inner surface of the tubular body to the outer surface of the cuff, each of said prosthesis cuffs being adapted to be secured to the end of the tubular organ overlapping each distal end of said tubular body;

said tubular body and each of said prosthesis cuffs together forming a unitary, non-resorbable member adapted to extend permanently between open ends of a tubular organ.

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PROSTHETIC BAND

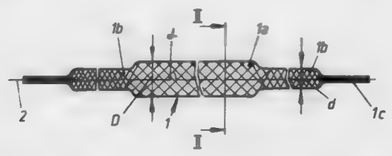
Christian Mansat, Balma, France, assignor to Sulzer Brothers Ltd., Winterthur and Protek AG, Berne, both of, Switzerland

Filed Apr. 18, 1986, Ser. No. 853,617
Claims priority, application Switzerland, May 3, 1985, 1891/85
Int. Cl.[4] A61F *2/08*
U.S. Cl. 623—13 **15 Claims**

1. A prosthetic band comprising a plurality of concentric sleeve-like elements defining a shaft having a central flexible

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zone and a pair of rigid end zones, said central flexible zone having a diameter of from 1.2 to 2.0 times the diameter of a



respective rigid end zone, said central zone being axially stretchable.

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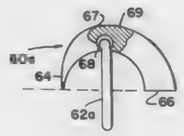
PROSTHETIC BONE OR TOOTH IMPLANT AND A METHOD OF SURGICALLY IMPLANTING THE SAME

John E. Comparetto, 108 Cropper St., Chincoteague, Va. 23336

Continuation of Ser. No. 32,311, Apr. 23, 1979, Pat. No. 4,349,058, and a continuation-in-part of Ser. No. 763,623, Jan. 28, 1977, Pat. No. 4,150,675. This application Jun. 4, 1981, Ser. No. 270,467

Int. Cl.⁴ A61F *2/28*

U.S. Cl. 623—16 **17 Claims**



1. A physiologically acceptable prosthetic implant for repairing bones or teeth which comprises:

(a) a generally semi-cylindrical U-shaped flexible cap, said cap including a lower generally curved surface along the underside thereof and at least one flange portion, so that said cap will fit snugly over a portion of bone or tooth which has been complimentary shaped, said cap further including a generally curved upper surface;

(b) a flexible pin attached to said curved surface along the underside of said cap, said pin including means for snugly retaining said implant;

(c) means for angulating said cap with respect to said pin so that said prosthesis can be aligned into a position so that the cap will lie flush upon the upper surface of a bone which has been complimentary shaped;

(d) said angualtion means comprising a ball and socket connection between said pin and said cap; and

(e) said pin being formed of nitinol and having a diameter at least equal to a diameter of a medullary canal into which it will be inserted so that when said pin is inserted into said canal it will fit snugly therein and assist in the retention of said cap.

4,728,331

ENDO-EXTRACORPOREAL IMPLANT AND FIBRO-INDUCTIVE AND/OR OSTEO-INDUCTIVE SEAL THEREFOR

Jean-Jacques Russier, 11 avenue Champ de Mars, Valence (Drome), France

Filed Aug. 29, 1985, Ser. No. 770,685

Claims priority, application France, Aug. 31, 1984, 84 13947

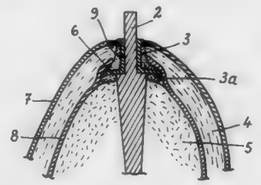
Int. Cl.⁴ A61F *2/28*; A61C *8/00*

U.S. Cl. 623—16 **6 Claims**

1. A device for implantation in an animal organism having bone tissue covered by connective tissue, said device comprising:

an implant adapted to penetrate into said bone tissue and having a shank extending through said connective tissue and projecting therefrom;

a sleeve affixed to said shank and surrounding same over a



portion of the length of said shank within said connective tissue, said sleeve having an outwardly projecting annular flange juxtaposed with said bone tissue; and

an annular body of a fibroinductive material of dental origin affixed to and mounted on said sleeve in direct contact with said connective tissue and separated by said flange from said bone tissue.

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ARTIFICIAL MENISCO-TIBIAL JOINT

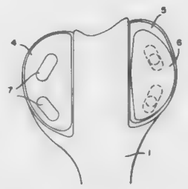
Björn Albrektsson, Rödhakevägen 1, S-430 41 Kullavik, Sweden

Filed Nov. 26, 1985, Ser. No. 801,706

Claims priority, application Sweden, Nov. 28, 1984, 8405990

Int. Cl.⁴ A61F *2/38*

U.S. Cl. 623—20 **4 Claims**



1. In an artificial menisco-tibial joint for a knee joint prosthesis of the kind which includes at least one tibial component on which the meniscus is movably disposed and wherein the meniscus has a largely flat sliding surface against the tibial condyle the improvement comprising:

a steering means including two locating pins spaced a predetermined distance from each other and protruding from said sliding surface; and,

said tibial condyle having at least one cavity forming a running track therein, said cavity being completely enclosed and wherein said running track defines substantially two longitudinal axes therethrough subtending an angle therebetween and said locating pins are disposed in each of said running track allowing longitudinal movement of the meniscus in a slightly curved path along said condyle as determined by said angle of the axes and spacing of said pins.

4,728,333

MODULAR PROSTHESIS KIT

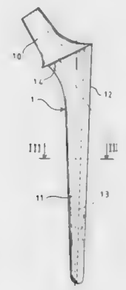
André A. Masse, 21, rue Brizeux, 35000 Rennes, and Christian J. Malet, 14, rue Sarrette, 75014 Paris, both of France

Filed Apr. 7, 1986, Ser. No. 848,505

Claims priority, application France, Apr. 5, 1985, 85 05348

Int. Cl.⁴ A61F *2/32*

U.S. Cl. 623—23 **2 Claims**



1. A prosthesis kit, intended for emplanting in a femur, comprising an elongated body adapted to be inserted into a prepared intramedullary cavity and having means at one end thereof for receiving a joint head, said elongated body having a generally rectilinear shape defining anterior-posterior and medial-lateral surfaces, one of said surfaces having a longitudinally extending dovetail groove formed therein, said groove having a width tapering from a distal end to a proximal end; and a series of elongated modular strips each having different thicknesses and being adapted for connection to said body to constitute assemblies of different widths, wherein each of said modular strips has a longitudinally extending dovetail tongue adapted for interfitting in a complementary dovetail groove on said body, said interfitting ensuring that said body and said modular strip are mutally fixed against sideways displacement, and wherein said taper enables said modular strip displacement, and wherein said taper enables said modular strip to be fitted to said body prior to the prosthesis being implanted such that the surgeon may impact the assembly as a unit in the cavity, whereby frictional forces between bone tissues and said unit tend to enhance wedging effect between said tapered dovetail groove and tongue during implantion.

4,728,334

SHAFT FOR HIP JOINT PROSTHESIS

Lorenzo Spotorno, Ligure, Italy, assignor to Protek AG, Bern, Switzerland

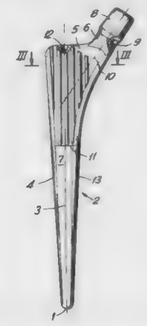
Continuation of Ser. No. 644,533, Aug. 27, 1984, abandoned. This application Aug. 29, 1986, Ser. No. 903,854

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1983, 3331162

Int. Cl.⁴ A61F *2/32*

U.S. Cl. 623—23 **16 Claims**

1. In a femur component of a hip joint prosthesis consisting essentially of a straight shaft member defining a longitudinal axis, having a distal end, a proximal end, an anterior side, a posterior side, a medial side and a lateral side, said shaft member widening conically from said distal to said proximal end and from said medial to said lateral side, the improvement comprising said shaft member having in a proximal portion a plurality of distinct blades, having recesses therebetween wherein said blades and resecces are disposed substantially parallel to said longitudinal axis, each said blade having a broad surface extending a distance perpendicularly to the anterior posterior plane of said shaft and wherein said distance and depth of each of said blade and recess increases in a direction from said medial to said lateral side to yield a generally conical configuration; and said recesses between said blades



having a depth which gradually decreases in a direction from said lateral to said medial side.

4,728,335

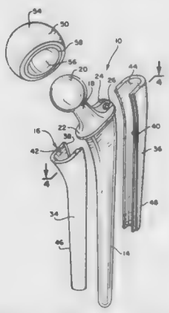
HIP PROSTHESIS

John A. Jurgutis, 1304 15th St., Suite 405, Santa Monica, Calif. 90404

Filed Dec. 15, 1986, Ser. No. 941,599

Int. Cl.⁴ A61F *2/32*

U.S. Cl. 623—23 **12 Claims**



1. A hip prosthesis for implantation into the medullary canal of a resected femur, said prosthesis comprising:

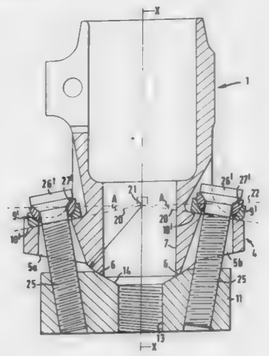
an elongated and substantially rigid femoral component having a head and an elongated stem; and

an elongated, longitudinally split sleeve including a pair of sleeve halves with mating side margins having at least partially overlapping mating lips to define an elongated channel of closed cross sectional shape;

said femoral component stem being received into said split sleeve channel and said stem and sleeve being receivable as a unit into the medullary canal of the resected femur, whereby normal postoperative patient function wedges said stem tightly into said sleeve to wedge said sleeve into tight intimate contact with the bone surface lining the medullary canal.

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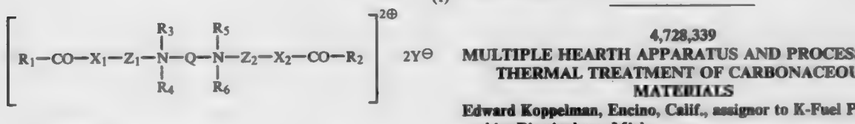
4,728,336
ALIGNMENT DEVICE FOR ARTIFICIAL LIMBS
John E. Cooper, Leatherhead, England, assignor to J. E. Hanger & Company Limited, London, England
Filed Nov. 21, 1986, Ser. No. 933,176
Claims priority, application United Kingdom, Nov. 25, 1985, 8528992
Int. Cl.[4] A61F 2/80
U.S. Cl. 623—38 13 Claims



1. An adjustable coupling for joining together parts of a limb prosthesis comprising:
a first member having an end face, a convex surface protruding in a longitudinal direction from the middle of the end face, flange means extending transversely from the end of the first member, at least two apertures through the flange means at locations disposed symmetrically about the convex surface; means defining a concave or convex bearing surface on the face of the flange means that faces away from the convex surface on the end of the first member, each means overlying an aperture;
a second member having an end face formed with a concave seat that conforms to but is shallower than the convex surface of the first member so that the first member is supported with its flange means at a clearance from the second member whereby the first member can tilt on the second member, at least two threaded bores being formed in the second member at locations disposed symmetrically about the concave surface and conforming to the locations of the apertures, said bores converging at a small angle with increasing depth;
a member overlying each aperture having a hole therethrough, a generally planar top face and a convex or concave lower face tiltably received in the respective concave or convex bearing surface means; and
at least two clamping screws passed through the holes in the tiltable members and the apertures in the flange means with their heads seating on the tiltable members and their theaded portions received in the bores of the second member, the first and second members being adjustable to a desired angular position when the screws are slack and being maintained at that angular position when the screws are tight.

4,728,337
ASSISTANT COMBINATION AND USE THEREOF AS WOOL TEXTILE FINISHING AGENT
Heinz Abel, Reinach; Rosemarie Töpfl, Dornach, and Franz Günter, Rieben, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 30, 1986, Ser. No. 925,027
Claims priority, application Switzerland, Nov. 8, 1985, 4802/85
Int. Cl.[4] D06M 13/46, 15/37; D06P 1/66, 3/16
U.S. Cl. 8—606 15 Claims

1. An assistant combination for use as textile finishing agent, which comprises
(1) a diquaternary ammonium salt of formula

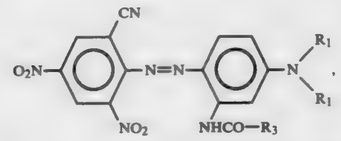


(1)

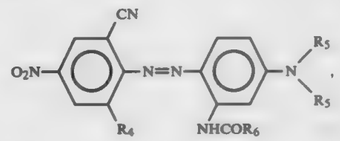
wherein
Q is a divalent aliphatic hydrocarbon radical of 2 to 12 carbon atoms which may be interrupted in the chain by oxygen atoms and is unsubstituted or substituted by hydroxy,
R_1 and R_2 are each independently of the other an aliphatic radical of 6 to 24 carbon atoms,
R_3 to R_6 are each independently of the other lower alkyl, hydroxy-lower alkyl or lower alkoxy-lower alkyl,
X_1 and X_2 are each oxygen or —NH—,
Z_1 and Z_2 are each independently of the other C_2–C_6 alkylene, and
$Y^{\ominus}$ is an anion of a strong inorganic or organic acid, and
(2) (A) a mono- or polyquaternary ammonium salt which carries at least one hydrocarbon radical of not less than 7 carbon atoms attached to the nitrogen atom, or
(B) a polymeric ammonium salt, or
(C) a basic non-quaternised nitrogen-containing polycondensate.

4,728,338
MIXTURES OF AT LEAST ONE MONOAZO COMPOUND HAVING A 2-CYANO 4,6-DINITROPHENYL DIAZO COMPONENT RADICAL AND AT LEAST ONE MONOAZO COMPOUND HAVING A 2-CYANO-6-HALO-4-NITROPHENYL DIAZO COMPONENT RADICAL AND THEIR USE
Beat Henzi, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland
Filed Jul. 28, 1986, Ser. No. 889,995
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527795
Int. Cl.[4] C09B 29/08, 67/22; D06P 1/18, 3/54
U.S. Cl. 8—639 20 Claims

1. A composition comprising
(a) 30–70% by weight of one or more compounds of the formula

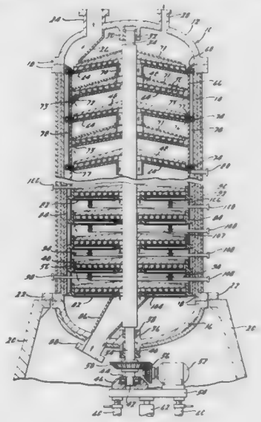


wherein each R_1 is independently C_2-$_4$alkyl, and R_3 is methyl or ethyl, and
(b) 30–70% by weight of one or more compounds of the formula



wherein R_4 is chloro, bromo or iodo, each R_5 is independently C_2-$_4$alkyl, and R_6 is methyl or ethyl,
each percentage being based upon the dry weight of Components (a) and (b).

4,728,339
MULTIPLE HEARTH APPARATUS AND PROCESS FOR THERMAL TREATMENT OF CARBONACEOUS MATERIALS
Edward Koppelman, Encino, Calif., assignor to K-Fuel Partnership, Birmingham, Mich.
Continuation-in-part of Ser. No. 683,591, Dec. 19, 1984, Pat. No. 4,626,258. This application Nov. 17, 1986, Ser. No. 930,929
Int. Cl.[4] F26B 17/12; C10L 9/08
U.S. Cl. 44—1 R 14 Claims



14. A process for the thermal treatment of moist organic carbonaceous materials under pressure which comprises the steps of:
(a) introducing a supply of moist carbonaceous feed material to be processed under pressure into a preheating chamber and preheating the feed material to a temperature of from about 200° about 500° by countercurrent heat transfer contact with heated volatile gases,
(b) extracting any liquid formed in the preheating chamber from said chamber under pressure,
(c) introducing the preheated feed material under pressure into a multiple hearth apparatus comprising a pressure vessel containing a plurality of superimposed annular hearths,
(d) distributing the preheated feed material on the uppermost hearth and transferring the feed material radially along each hearth in an alternating inward and outward direction to effect a downward cascading of the feed material from one hearth to the next hearth therebelow,
(e) heating the feed material in said apparatus to an elevated temperature by injecting a heated gas in heat exchange contact with the feed material on at least some of the

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annular hearths for a period of time sufficient to vaporize at least a portion of the volatile substances therein to form volatile gases and a solid thermally restructured product,

(f) transferring the heated volatile gases in a countercurrent direction to the feed material through the pressure vessel and into said preheating chamber, and

(g) discharging the solid thermally restructured product under pressure from said apparatus.

4,728,340

FUEL COMPOSITION

Bron Vos, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 27, 1987, Ser. No. 20,010

Claims priority, application United Kingdom, Mar. 6, 1986, 8605535

Int. Cl.⁴ C10L *1/18, 1/22*

U.S. Cl. 44—62 **15 Claims**

1. A fuel composition comprising a major amount of base fuel and a minor amount of two additives comprising (1) a polyhydric alcohol ester of a succinic acid derivative having as substituent on at least one of its α-carbon atoms an unsubstituted or substituted aliphatic hydrocarbon group having from 20 to 500 carbon atoms or a succinic acid derivative having on one of its α-carbon atoms an unsubstituted or substituted aliphatic hydrocarbon group having from 20 to 500 carbon atoms connected to a second α-carbon atoms of said succinic acid derivative by means of a hydrocarbon moiety having from 1 to 6 carbon atoms forming a ring structure, and (2) a minor amount of an additive comprising an aliphatic polyamine having alkylene radicals connecting amino nitrogen atoms and containing at least one hydrocarbon chain having an average molecular weight in the range from 500 to 10,000 attached to a nitrogen and/or carbon atom of said alkylene radicals connecting the amino atoms of the aliphatic polyamine.

4,728,341

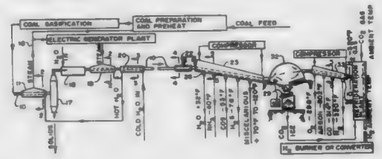
METHOD FOR TREATING, IN TRANSIT, HYDROCARBON GASES CONTAINING CARBON DIOXIDE AND POTENTIAL ATMOSPHERIC POLLUTANTS

Jay P. Nielsen, 3490 Monte Verde Dr., Salt Lake City, Utah 84109

Continuation-in-part of Ser. No. 315,131, Oct. 26, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,898

Int. Cl.⁴ F17D *0/2*

U.S. Cl. 48—190 **3 Claims**



1. A method of treating a gas containing potential atmospheric pollutants to make it safe for burning or for release into the atmosphere, comprising introducing such a gas into a cross-country pipeline having extensive heattransfer surface area exposed to said gas, for transmission to a desired location; progressively removing heat from the gas as it flows along said pipeline by passing coolant fluid along respective longtitudinal portions of said pipeline in heat exchange relationship therewith; refrigerating at least a portion of said coolant fluid so that the extent of heat removal along certain of said portions is such as to change the state of various of said potential atmospheric pollutants from the gaseous to the liquid or solid phase; and separating said pollutants in their liquid or solid form from the residual gas substantially at the respective portions of said pipeline, wherein the flow of gas contains carbon dioxide; wherein the gas is cooled to or about the subliming temperature of the carbon dioxide; and wherein the cooled gas is passed into a gravity settlement expansion chamber for sublimation into carbon dioxide snow and settlement along with other particulate matter carried by the gas.

4,728,342

PROCESS FOR SEPARATING SUBSTANCES IN THE EVAPORATED STATE FROM AIR AND/OR GAS MIXTURES

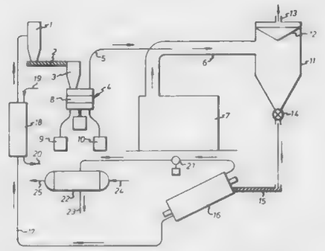
Jan J. V. Abom, 12, Poppelgatan, S-421 74 Västra Frölunda, Sweden

Filed Jan. 27, 1987, Ser. No. 6,786

Claims priority, application Sweden, Jan. 29, 1986, 8600395

Int. Cl.⁴ B01D *53/10*

U.S. Cl. 55—59 **6 Claims**



1. A process for separating substances, such as solvents, polyaromatic hydrocarbons, sulphur dioxide (SO_2) and/or nitrogen compounds (NO_x), in the evaporated state from an air and/or gas mixture, by supplying to said mixture adsorbing powder which, after adsorption, is separated from said mixture and liberated from adsorbed substances and then reused, characterised in that the adsorbing powder is supplied pulsewise in finely divided form, whereby the agglomeration tendency of the powder particles is eliminated.

4,728,343

ABSORPTION OF HYDROCARBON VAPORS BY VULCANIZED RUBBER

Robert H. Snyder, Grosse Pointe Park, Mich., assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Jul. 11, 1986, Ser. No. 884,580

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—59 **9 Claims**

1. A method of substantially precluding accumulation of combustible hydrocarbon vapors in the air of a closed substantially empty holding tank comprising:

placing an effective combustion preventing amount of vulcanized rubber particles in the size range from 6 mesh to 200 mesh in contact with said hydrocarbon vapors within said holding tank, and, absorbing said vapors emanating from residue in said tank whereby a sufficient amount of said vapors are absorbed into said vulcanized rubber particles to ensure that the hydrocarbon vapor/air ratio is below the explosive envelope.

6. A method of substantially precluding accumulation of combustible hydrocarbon vapors in the air of a closed substantially empty holding tank comprising:

(a) placing an effective combustion preventing amount of vulcanized rubber particles in the size range from 6 mesh to 200 mesh in contact with said hydrocarbon vapors within said holding tank, and,

(b) absorbing said vapors emanating from residue in said tank whereby a sufficient amount of said vapors are absorbed into said vulcanized rubber particles to ensure that the hydrocarbon vapor/air ratio is below the explosive envelope;

(c) removing said vulcanized rubber particles with the absorbed hydrocarbon vapors from said container; and,

(d) desorbing said hydrocarbon vapors from said vulcanized rubber particles.

4,728,344

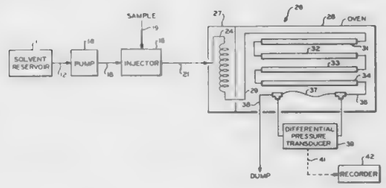
POLYMER ANALYSIS

Carl J. Stacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 26, 1984, Ser. No. 634,924

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 55—67 **6 Claims**



1. A method for determining the relative concentration of a component in a polymer which is soluble only above about 150° C., said method comprising the steps of:

injecting a desired volume of a sample of said polymer into a carrier fluid at a time T_1, wherein said injection is accomplished at a first temperature and wherein said carrier fluid is a solvent for said polymer;

heating said carrier fluid containing said sample of said polymer until said polymer is completely in solution, wherein the temperature at which said polymer is soluble in said carrier fluid (second temperature) is greater than said first temperature;

providing the heated carrier fluid containing said sample of said polymer in solution to the fluid inlet of the first one of a plurality of chromatographic columns in series to thereby provide said sample of said polymer to the fluid inlet of said first one of said plurality of chromatographic columns in series, wherein said plurality of chromatographic columns are maintained at at least said second temperature; and

providing said carrier fluid from the fluid outlet of the last one of said plurality of chromatographic columns in series to the fluid inlet of a detector capable of providing an output signal which is responsive to the concentration of components of said polymer, wherein said detector provides an output signal at time T_2 which is responsive to the relative concentration of the component of said polymer in said detector at said time T_2 and wherein said time T_2 is later in time than said time T_1.

4,728,345

MULTICOMPONENT GAS SEPARATION MEMBRANES HAVING POLYPHOSPHAZENE COATINGS

Milton K. Murphy, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,132

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 55—158 **13 Claims**

1. In a multicomponent membrane for gas separation comprising a coating in occluding contact with a porous separation membrane of material, which material exhibits selective permeation of at least one gas of a gaseous mixture over that of one or more remaining gases of a gaseous mixture, said porous separation membrane having a substantial void volume, wherein, with respect to one pair of gases, the material of the porous separation membrane exhibits a determined intrinsic separation factor greater than the determined intrinsic separation factor of the material of said coating, and the multicomponent membrane exhibits a separation factor significantly greater than the determined intrinsic separation factor of material of said coating and greater than the separation factor exhibited by the porous separation membrane; the improvement comprising a polyphosphazene coating material having the formula:



where R and R′ are the same or different organic substituents and n is an integer of two or more, said polyphosphazene coating material swells no more than about 25% by volume when exposed to aliphatic and aromatic hydrocarbons contained in said gaseous mixture.

4,728,346

PERMEATION MODIFIED ASYMMETRIC GAS SEPARATION MEMBRANES HAVING GRADED DENSITY SKINS

Milton K. Murphy, Clayton, Mo., assignor to Permea Inc., St. Louis, Mo.

Filed Aug. 15, 1986, Ser. No. 897,162

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—158 **37 Claims**

1. A multicomponent gas separation membrane exhibiting significantly enhanced gas separation selectivity and increased permeability comprising:

a preformed asymmetric gas separation membrane having a graded density skin and macrovoid-free morphology comprised of glassy, hydrophobic polymers, the membrane having increased free volume as evidenced by the membrane first heat T_g which is greater than the T_g of a bulk sample of the glassy hydrophobic polymers, the polymers of the membrane having a separation factor for one gas of a gaseous mixture over that of one or more remaining gases of the gaseous mixture which when contacted on one or both sides with an effective amount of a permeation modifier and when combined with a coating in occluding contact with the graded density skin provides a multicomponent gas separation membrane which exhibits a separation factor greater than the determined intrinsic separation factor of the bulk sample of the polymers of the asymmetric separation membrane, greater than the determined separation factor of the preformed asymmetric separation membranes, and greater than the determined intrinsic

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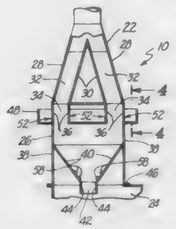
separation factor of the material of the coating with respect to at least one pair of gases in the mixture.

4,728,347

APPLICATION OF WATER TO PARTICULATE MATTER IN A GAS STREAM TO FACILITATE SEPARATION OF THE SAME

John E. Leibrock, Button Willow, and Willie F. Rutledge, Taft, both of Calif., assignors to Excel-Mineral Company, Inc., Goleta, Calif.

Filed Jan. 6, 1984, Ser. No. 568,890
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—227 5 Claims



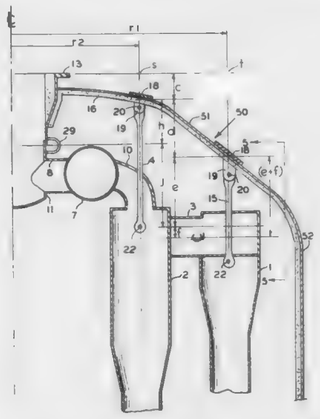
1. An apparatus for applying water to particulate matter in a gas stream, said apparatus having a vertically extending conduit and water distribution means for introducing water into said conduit in which the improvement comprises:
- the inlet to said conduit being located above the outlet from said conduit,
- said conduit including a section located between said inlet and said outlet within which water is introduced into said gas stream by said water distribution means,
- said section of said conduit has an elongated shape having ends and includes an internal divider having an inverted V-shaped cross-sectional configuration extending between the ends of said section and dividing said section into two spaced parallel portions having an elongated narrow, slot-like configuration, each of said portions having opposed sides,
- said water distribution means including horizontally extending tray means for holding water located adjacent to said section and opening means leading from said tray means into the interior of said section through which water can flow,
- the portions of said section adjacent to said opening means are of a narrow, slot-like configuration and have opposed sides, and
- said opening means comprise a series of openings located adjacent to one another and extending in a horizontal path along the length of said portions, said opening means and said section being shaped so that substantially all of a gas stream flowing through said conduit is contacted by water from within said tray means,
- said conduit is shaped so as to create turbulent flow within said gas stream generally within said section, such turbulent flow serving to promote the wetting of particulate matter flowing through said conduit.

4,728,348

LOW STRESS CYCLONE GAS COLLECTION SYSTEMS

Norman W. Nelson, Chester; Wilbur H. Hild, Jr., Boonton, and Donald F. Shaw, Denville, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 18, 1986, Ser. No. 897,720
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—345 10 Claims



1. A vessel having a non-horizontal roof and including:
- a plurality of primary cyclones each having a gas inlet and a gas outlet disposed within the vessel below said roof;
- a plurality of secondary cyclones equal in number to said primary cyclones, said secondary cyclones being disposed within the vessel below said roof, each of said secondary cyclones having a gas inlet and a gas outlet;
- means for operably connecting the gas outlet of a primary cyclone to a secondary cyclone;
- a pair of support rods for suspending each primary and each secondary cyclone from the roof of said vessel, the length of the support rods for said secondary cyclones being different than the length of the support rods for the primary cyclones and at least a part of the support rod for said secondary cyclones having a different thermal coefficient of expansion than said support rods for said primary cyclones such that under thermally induced expansion or contraction the elevation of operably connected cyclones relative to each other is substantially constant.

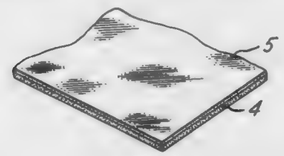
4,728,349

AIR FILTER MEDIUM

Yoshimi Oshitari, 1-10-8, Honcho, Tanashi-shi, Tokyo-To, Japan

Continuation of Ser. No. 449,208, Dec. 13, 1982, abandoned, which is a continuation of Ser. No. 282,245, Jul. 13, 1981, abandoned. This application Mar. 22, 1985, Ser. No. 715,113
Claims priority, application Japan, Aug. 14, 1980, 55-110996
Int. Cl.[4] B01D *39/14*
U.S. Cl. 55—487 3 Claims

1. An air filter medium comprising:
- a supporting fiber layer made of polypropylene fibers and of low dust-collecting efficiency for particles having a diameter less than 0.3 μm and low pressure drop; and
- a dust-collecting layer of glass fibers of a diameter necessary for obtaining a desired dust-collecting efficiency formed on said supporting fiber layer to a thickness less than one third the thickness of said supporting fiber layer and sufficiently thick to obtain a dust-collecting efficiency of 99.9999% for 0.1 to 0.12 μm diameter particles and a pressure drop of 10 mm to 23 mm of water at an air flow



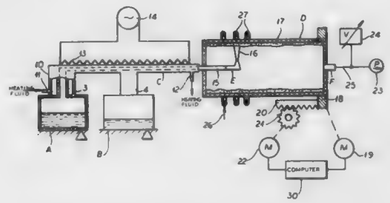
velocity of 2.5 cm/sec, and said air filter medium having a total thickness less than 0.4 mm.

4,728,350

PROCESS AND APPARATUS FOR PRODUCING OPTICAL-FIBER PREFORMS FOR MID-INFRARED RANGE FIBERS

Giuseppe Cocito, Turin, Italy, assignor to Cselt-Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Mar. 25, 1987, Ser. No. 30,777
Claims priority, application Italy, Apr. 10, 1986, 67290 A/86
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.11 20 Claims



1. A method of making an optical preform capable of being drawn into an optical fiber for operation in a mid-infrared spectral range, said method comprising the steps of:
- heating one or more halides to an elevated temperature at a controlled pressure to transform the halides to vapor and conducting vapors of the halides without condensation into the interior of a cooled tube;
- directing said vapors against an inner wall of said tube whereby said vapors directly condense on said wall to a solid state deposit; and
- removing nonhalide-based portions of said tube to yield said preform with at least said deposit being adapted to be drawn to form said optical fiber.

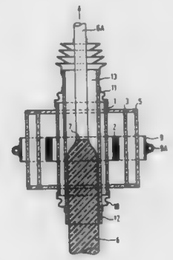
4,728,351

METHOD FOR DENSIFYING A PREFORMED POROUS BODY OF A MATERIAL THE MAIN CONSTITUENT OF WHICH IS SiO_2

Wilhelmus C. P. M. Meerman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 694,569, Jan. 24, 1985, abandoned. This application Nov. 4, 1985, Ser. No. 794,865
Claims priority, application Netherlands, Nov. 7, 1984, 8403380
Int. Cl.[4] C03B *23/20, 21/00, 11/00*; C03C *10/00*
U.S. Cl. 65—18.1 12 Claims

1. A method of densifying a preformed porous body of an optically transparent glass having a main constituent of SiO_2 comprising the steps of
- surrounding a preformed porous body of an optically transparent glass by a quartz glass guide tube, said guide tube fitting against said porous body to prevent warping of said porous body,
- applying infrared radiation to said porous body by a hollow cylinder radiation source to form a sintered zone, said infrared radiation having a wavelength smaller than wavelengths absorbed by said transparent glass, said hollow cylinder radiation source coaxially surrounding and being spaced from said porous body and said guide tube.
- rotating said hollow cylinder radiation source about said porous body,



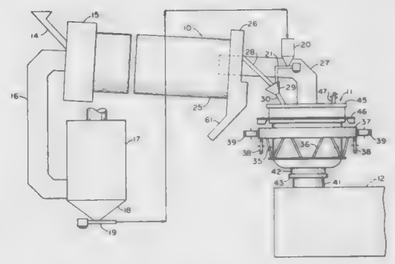
- moving said hollow cylinder radiation source relative to said porous body and said guide tube in a direction parallel to a longitudinal axis of said porous body, and
- preventing said porous body from being heated by at least one of convection and of infrared radiation having wavelengths absorbed by said transparent glass, said step of preventing heating being carried out by a cylinder of silica glass between said guide tube and said hollow cylinder radiation source.

4,728,352

GLASS BATCH FEED ARRANGEMENT WITH DIRECTIONAL ADJUSTABILITY

Henry C. Goode, Decatur, Ill.; Wayne H. Gonzalez, Tumwater, Wash.; Steven H. Anderson, Mt. Zion, Ill.; Gary N. Hughes, Ross Township, Allegheny County, and Donald P. Michelotti, Hampton Township, Allegheny County, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1986, Ser. No. 914,414
Int. Cl.[4] C03B *3/00*
U.S. Cl. 65—27 17 Claims



1. Apparatus for liquefying pulverulent material comprising a vessel mounted for rotation about a central axis, means for feeding pulverulent material onto interior side wall portions of the vessel, and means for heating the interior of the vessel so as to liquefy the pulverulent material, characterized by the means for feeding pulverulent material comprising an elongated housing defining a path for guiding pulverulent material from the exterior to the interior of the vessel, the housing including a

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longitudinal portion extending into the vessel at an angle having a substantial vertical component sufficient to permit flow of the pulverulent material by gravity and a lower end portion within the vessel extending from the longitudinal portion at a more horizontal angle relative to the longitudinal portion and oriented at a direction substantially tangential to the rotation of the most adjacent portion of the rotating vessel.

14. A method of feeding glass batch material to a heating vessel in which a lining is rotated about a central cavity, comprising guiding a stream of batch material into the vessel along a first path having a substantial vertical component sufficient to permit flow of the batch material by gravity, changing the direction of the batch stream after entry into the vessel to a more horizontal direction so that the batch stream is directed onto the lining along a second path substantially parallel to the tangential velocity of an adjacent portion of the lining.

4,728,353

PROCESS AND APPARATUS FOR PYROLYTICALLY COATING GLASS

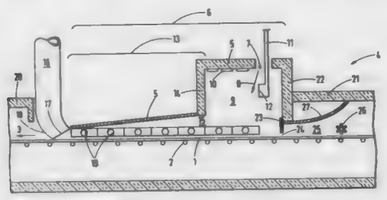
Jean-Francois Thomas, Ottignies; Robert Terneu, Thiméon; Albert Van Cauter, Charleroi, and Robert Van Laethem, Loverval-Gerpinnes, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Nov. 14, 1986, Ser. No. 930,755

Claims priority, application United Kingdom, Dec. 20, 1985, 8531425

Int. Cl.⁴ C03C *17/00*; B05B *15/12*

U.S. Cl. 65—60.1 **38 Claims**



1. A pyrolytic coating process in which a hot glass substrate in sheet or ribbon form travels in a downstream direction beneath a coating chamber which opens downwardly towards the substrate and in which a coating is formed on the upper face of said substrate from coating precursor material, characterised in that the temperature of the gaseous environment in the immediate vicinity of the upper face of the substrate at least in the zone at which such coating formation commences, is controlled by feeding preheated gas in a downstream direction into said chamber to enter the chamber in contact with the substrate and form a blanket layer which covers the substrate at least as far as that zone, the coating chamber is substantially closed at its downstream end to prevent interchange of atmospheric material between the downstream end of the coating chamber and a further downstream region of the substrate path, and, over at least part of the length of the coating chamber, flow of atmospheric material past the side edges of the substrate and between zones vertically above and vertically below the substrate is inhibited.

20. Apparatus for pyrolytically forming a metal compound coating on an upper face of a hot glass substrate in sheet or ribbon form comprising conveyor means for conveying a said substrate along a path in a downstream direction, a roof structure defining a coating chamber opening downwardly onto said path and means for discharging coating precursor material into said chamber, characterised in that upstream of said coating chamber there is an antechamber which communicates with the coating chamber via an entry slot which is defined in part by the path of the substrate, and via which gas can be caused to flow into the coating chamber so as to form (when the apparatus is in use) a blanket layer having a controlled temperature which covers the upper face of the substrate along a first part of the length of said chamber, and in that means is provided for controllably preheating the gas forming said blanket layer, a barrier wall is provided above the substrate path extending across the full width of and substantially closing the downstream end of said coating chamber, and, over at least part of the length of the chamber, means is provided for inhibiting flow of atmospheric material past the sides of the substrate path and between zones vertically above and vertically below that path.

4,728,354

APPARATUS FOR STRAIGHT-LINE SHEARING OF MOLTEN GLASS GOBS

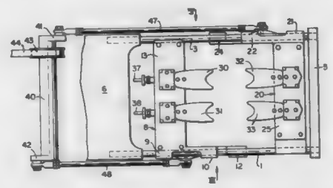
Peter Vilk, London, and Alan Stephens, Greenford, both of England, assignors to BH-F (Engineering) Limited, England

Continuation of Ser. No. 729,148, Apr. 30, 1985, abandoned. This application Feb. 18, 1987, Ser. No. 17,008

Claims priority, application United Kingdom, May 14, 1984, 8412249

Int. Cl.⁴ C03B *7/10*; B26D *5/08*

U.S. Cl. 65—334 **9 Claims**



1. Apparatus for straight-line shearing of molten glass gobs wherein first and second carriage members having mounted thereon one or more opposing pairs of shear blades are caused reciprocally to move towards each other and then away from each other along a substantially straight line between an open position and a closed, cutting position, which apparatus comprises:

first and second carriage members,

one or more opposing pairs of shear blades mounted on said carriage members,

a rotatably driven shaft,

means for rotatably driving said shaft through a cycle having a complete 360° revolution, and,

a crank on said shaft and pivotally connected to each of said carriage members; each crank during one complete revolution of the shaft, being driven through a complete 360° revolution whereby the carriage members reciprocally move from an open to a closed position and back to the open position

wherein said crank comprises diametrically opposed crank arms, a first crank arm being pivotally connected by a rod to the first carriage member and the second crank arm being pivotally connected by a rod to the second carriage member.

4,728,355

PYRIDAZINYLUREA PLANT REGULATORS

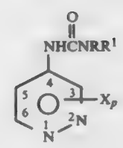
Robert N. Henrie, II, East Windsor, N.J., assignor to FMC Corporation, Philadelphia, Pa.

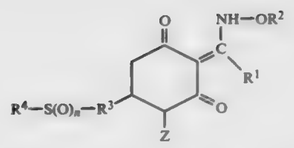
Filed Oct. 10, 1985, Ser. No. 786,262

Int. Cl.⁴ A01N *43/58*; C07D *237/12, 237/20, 237/22*

U.S. Cl. 71—92 **8 Claims**

1. A method of retarding senescence in soybean and cotton plants which comprises applying to the plant a plant regulating amount of a pyridazinylurea compound of the formula:





I

and acid addition salts thereof; wherein R is alkyl(C_1–C_8) or cycloalkyl(C_3–C_{10}), R^1 is hydrogen or alkyl(C_1–C_8), each X independently is halogen, alkoxy(C_1–C_8), alkyl(C_1–C_8)thio or alkyl(C_1–C_8)sulfonyl, and p is 0, 1 or 2.

4,728,356

NOVEL SUBSTITUTED AZOLYLVINYL KETONES AND CARBINOLS AS FUNGICIDES AND PLANT GROWTH REGULATORS

Hans-Ludwig Elbe; Wolf Reiser; Erik Regel, all of Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen; Klaus Lürssen, Bergisch-Gladbach, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

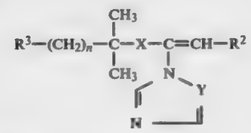
Division of Ser. No. 518,866, Aug. 1, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,788

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229274

Int. Cl.⁴ C07D *249/08, 233/60*; A01N *43/50, 43/653*

U.S. Cl. 71—92 **4 Claims**

1. A substituted azolylvinyl ketone or carbinol of the formula



in which

R^2 is phenyl; phenyl substituted or phenylalkyl with 1–4 carbon atoms in the alkyl part optionally substituted with at least one substituent selected from the group consisting of fluorine, chlorine, methyl, isopropyl and tert.-butyl,

R^3 is vinyl, propargyl,

X is a CO or a CH(OH) group,

Y is a nitrogen atom or a CH group,

Z is O, S, SO or SO_2, and

n is 0, 1 or 2,

or an addition product thereof with an acid or metal salt.

4,728,357

CYCLOHEXANE-1,3-DIONE DERIVATIVES, THEIR PREPARATION AND HERBICIDES CONTAINING THESE COMPOUNDS

Rainer Becker, Bad Duerkheim; Dieter Jahn, Edingen-Neckarhausen; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 515,897, Jul. 21, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,925

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 3227389

Int. Cl.⁴ A01N *31/06*; C07C *83/06*

U.S. Cl. 71—98 **3 Claims**

1. A cyclohexane-1,3-dione derivative of the formula

wherein R^1 is alkyl of from 2 to 4 carbon atoms, R^2 is vinyl or allyl, R^3 is ethylene or 1,2-propylidene, R^4 is phenylethyl, Z=H, and n is O, or a salt thereof.

2. A herbicide for combating grasses in broad-leaved crops and monocotyledon crops, which do not belong to the family of grasses (Gramineae), and in cereals, which comprises: a carrier or diluent and, as active ingredient, an effective amount of a cyclohexane-1,3-dione derivative as defined in claim 1.

4,728,358

IRON BEARING BRIQUET AND METHOD OF MAKING

Glean E. Hoffman, Pineville, and Bradford G. True, Charlotte, both of N.C., assignors to Midrex International, B.V. Rotterdam, Zurich Branch, Zurich, Switzerland

Continuation-in-part of Ser. No. 780,463, Sep. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 718,587, Apr. 1, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 857,685

Int. Cl.⁴ C22B *1/24*

U.S. Cl. 75—0.5 R **11 Claims**

1. An iron-bearing briquet product consisting essentially of from 50% to 88% metallized direct reduced iron fines, which fines are from 60% to 97% metallized, from 7% to 35% silica, from 5% to 15% carbon in solid form, and up to 3.5% impurities.

4,728,359

METHOD OF PRODUCING A DISPERSION-HARDENED METAL ALLOY

Werner Huther, Karlsfeld; Wolfgang Betz, Gauting, and Gerhard Andrees, Munich, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Muchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 4, 1986, Ser. No. 926,956

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540225

Int. Cl.⁴ B22F *3/12, 5/00*

U.S. Cl. 75—0.5 A **12 Claims**

1. A method of producing a metal powder suitable for the production of a dispersion-hardened metal alloy, the metal powder having a dispersed phase of metal oxide in a metal alloy, said method comprising:

forming a liquid solution in which a metal alloy is dissolved;

adding to said liquid solution first particles which are not reactive with said metal alloy and which are also not reactive with said solution,

adding a deglomerating agent to said solution so that the first particles are suspended therein and form a resultant colloidal suspension,

atomizing said colloidal suspension to form atomized second particles of the dissolved metal alloy and also atomizing said first particles,

drying the said first and second atomized particles; and

reducing said atomized second particles to produce metal alloy powder particles in which the oxide form of said first particles is uniformly dispersed

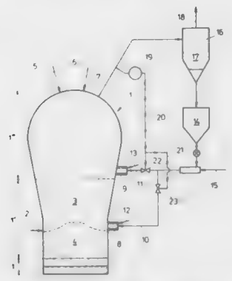
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4,728,360

PROCESS FOR THE PRODUCTION OF MOLTEN PIG IRON AND STEEL PRE-PRODUCTS

Rolf Hauk, Düsseldorf; Gero Papst, Buehl-Weitenung; Klaus Langner, Meerbusch Osterath, all of Fed. Rep. of Germany; Michael Nagl; Werner Kepplinger, and Leopold Seirlehner, all of Linz, Austria, assignors to Voest-Alpine Akt., Austria and Korf Engineering GmbH, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 797,820
Claims priority, application Austria, Nov. 15, 1984, 3613/84
Int. Cl.[4] C21B *11/08*
U.S. Cl. 75—26 5 Claims



1. A method of producing molten pig iron or steel pre-products and reduction gas in a melt-down gasifier utilizing coal having a C_{fix} content of less than 80%, comprising the steps of:

(a) forming a fluidized bed of coke particles having a lower part, said fluidized bed being located in said melt-down gasifier and being formed by adding coal having said C_{fix} content and injecting an oxygen-containing gas, heat being generated and reducing gas produced in said fluidized bed;

(b) adding ferrous material from above to said fluidized bed material and reducing said ferrous materials in said fluidized bed to slag and molten pig iron or steel pre-products, said ferrous material comprising at least one of iron sponge particles and pre-reduced iron are particles with a substantial portion of particle sizes of more than 3 mm;

(c) withdrawing said reducing gas containing coal particles from said gasifier;

(d) separating said coal particles from said reducing gas;

(e) generating additional heat by burning or gasifying said separated coal particles;

(f) supplying said additional heat to said gasifier in a horizontal plane in the lower part of said fluidized bed to supplement the heat generated in said fluidized bed, said oxygen-containing bed being injected at points below said horizontal plane; and

(g) separately drawing off said slag and said molten pig iron or said steel pre-products which collect at the bottom of said gasifier.

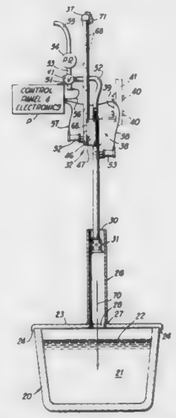
4,728,361

IRON ALLOYS, PROCESS AND APPARATUS FOR INTRODUCING HIGHLY REACTIVE METALS INTO MOLTEN METAL AND PROCESS AND PRODUCT FOR REMOVING IMPURITIES FROM MOLTEN METAL

George A. Calboreanu, Augusta, Ga., assignor to G. I. W. Industries, Inc., Atlanta, Ga.

Division of Ser. No. 756,417, Jul. 18, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,244
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—53 15 Claims

1. A bullet for use in injecting substances into molten metal comprising an elongated body and a nose affixed to one end of said body, said body containing a substance which will react in molten metal to form a reaction product, said reaction product being emmisible with said molten metal, said substance having an exterior which is continuously in an exposed condition to said molten metal so as to react with said molten metal



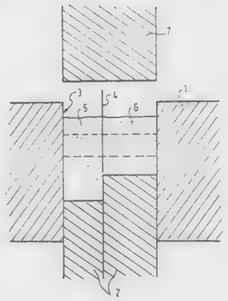
throughout the period in which said body of said bullet is in remains contacted by but unreacted with said molten metal, and said nose being composed of a metal for alloying with said molten metal.

4,728,362

HIGH VOLTAGE ELECTRODES FOR THE IGNITION SYSTEM OF INTERNAL COMBUSTION ENGINES AND METHOD FOR MAKING THE SAME

Werner Grünwald, Gerlingen; Hans-Peter Koch, Stuttgart; Gundmar Leuze, Heimsheim, and Hans Neu, Vaihingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00508, § 371 Date Apr. 22, 1986, § 102(e) Date Apr. 22, 1986
PCT Filed Dec. 5, 1985, Ser. No. 887,132
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447342
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—231 9 Claims



1. High voltage electrode for the ignition stystem of internal combustion engines, comprising 50–90% by weight iron and 50–10% by weight calcium silicide.

4,728,363

ACICULAR MAGNETIC PARTICLES

Jacob Crane, Woodbridge; George J. Muench, West Haven, and Yousef Saleh, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 803,379, Dec. 2, 1985, Pat. No. 4,657,583, which is a continuation-in-part of Ser. No. 773,484, Sep. 9, 1985, abandoned. This application Nov. 18, 1986, Ser. No. 932,098
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—251 6 Claims

1. Free acicular magnetic particles characterized by a face-centered cubic structure, a length in the range of 100Å to about 2000Å and an aspect ratio up to about 10:1.

4,728,364

ELECTRODE FOR THE PRODUCTION OF TITANIUM ARTICLES THAT ARE FREE FROM LOW DENSITY INCLUSIONS

Paul J. Bania, Boulder City, Nev., assignor to Titanium Metals Corporation of America (TIMET), Pittsburgh, Pa.

Division of Ser. No. 895,446, Aug. 11, 1986, Pat. No. 4,678,506. This application Apr. 29, 1987, Ser. No. 43,957
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—256 6 Claims

1. A charge of titanium sponge adapted for melting to produce titanium articles, said charge having a maximum titanium sponge size of −6 mesh and finer.

4,728,365

ROOM TEMPERATURE BLACKENING SOLUTION

Paul Jarvi, Orange, Conn., assignor to Mitchell Bradford International Corp., Milford, Conn.

Filed Aug. 11, 1986, Ser. No. 895,176
Int. Cl.[4] C23C *22/00, 22/48*
U.S. Cl. 106—1.05 16 Claims

3. In a room temperature blackening solution comprising a selenium dioxide, inorganic copper salt, acid, and water, the improvement wherein said solution contains:

selenium dioxide anhydrous	25–35 gram/liter
copper sulfate pentadydrate	10–20 gram/liter
ammonium nitrate anhydrous	5–15 gram/liter
sulfamic acid anhydrous	10–30 gram/liter
polyoxyethylene ether alcohol	1 gram/liter.

4,728,366

STORAGE STABLE PAPER SIZE COMPOSITION CONTAINING ETHOXYLATED CASTOR OIL

Emil D. Mazzarella, Mountainside; Walter Maliczyszyn, Somerville, and Jeffrey Atkinson, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 783,903, Oct. 3, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 49,032
Int. Cl.[4] C08L *91/00*
U.S. Cl. 106—243 4 Claims

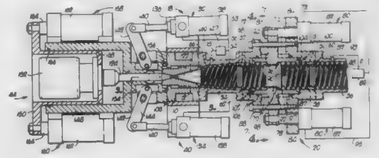
1. A paper size comprising a self-emulsifiable mixture of 85 to 99 parts by weight of a cyclic dicarboxylic acid andydride having hydrophobic substitution and 1 to 15 parts by weight of an ethoxylated castor oil containing at least 5 moles ethylene oxide per mole castor oil.

4,728,367

EXTRUSION METHOD AND APPARATUS FOR ACID TREATMENT OF CELLULOSIC MATERIALS

Gordon R. Huber; LaVon G. Wenger; Bobbie W. Hauck; Galen J. Rokey, all of Sabetha; Lawrence E. Schmeizle, Oneida, and Timothy R. Hartter, Sabetha, all of Kans., assignors to Wenger Manufacturing, Inc., Sabetha, Kans.

Continuation of Ser. No. 697,416, Jan. 31, 1985, abandoned, which is a continuation of Ser. No. 467,878, Feb. 18, 1983, abandoned. This application Oct. 1, 1986, Ser. No. 914,553
Int. Cl.[4] C13K *1/02, 1/06;* B01J *3/03*
U.S. Cl. 127—1 4 Claims



1. In an extruder having a material inlet and a material outlet, the combination comprising:

a tubular extruder barrel having an outlet end and an outlet port defined therein;

a cylindrical, rotatable, axially fixed, flighted extruder screw received in said barrel, said screw having an end;

a first die element affixed to said end of said screw and extending outwardly through said outlet port;

a tubular head section having an input end and an output end and including an inner wall surface defining a continuous bore through said head section, said inner wall surface including an input surface defining an output surface defining an output end opening in said output end,

said input surface being configured correspondingly with said first die element;

coupling means coupling said input end of said tubular head section with said outlet end of said barrel with said first die element extending at least partially into said input end opening and correspondingly aligned with said input surface,

said coupling means including means for shifting said head section relative to said first die element for selectively varying the size of said input end opening;

a second die element, said output surface being configured correspondingly with said second die element;

mounting means mounting said second die element with said second die element extending at least partially into said output end opening and correspondingly aligned with said output surface,

said mounting means for rotating said second die element about an axis of rotation and for shifting said second die element relative to said output surface for selectively varying the size of said output end opening; and

means defining said material outlet in the vicinity of said outlet end opening, said second die element including structure defining an output end passageway communicating said bore with said material outlet.

4,728,368

ULTRASONIC CLEANING IN LIQUID PURIFICATION SYSTEMS

Edward A. Pedziwiatr, 50 Glenview Ter., Cresskill, N.J. 07626

Filed Apr. 25, 1986, Ser. No. 856,166
Int. Cl.[4] C04F *1/32, 1/36*
U.S. Cl. 134—1 17 Claims

1. In a liquid purification system of the type in which the liquid to be purified is passed through a conduit and at least one ultraviolet radiation emitting device extends into the conduit so as to provide active surfaces from which ultraviolet radia-

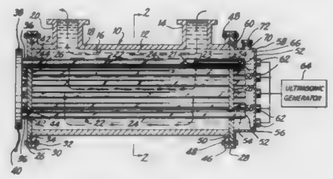
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tion will emanate to purify the liquid passed through the conduit, the improvement comprising:

means for extending a portion of the emitting device outside the conduit such that said portion is essentially isolated from the liquid in the conduit;

ultrasonic means for generating ultrasonic vibrations; and

coupling means for coupling the ultrasonic means with the portion of the emitting device extending outside the conduit so as to induce ultrasonic vibrations in the emitting device and effect the cleaning of unwanted ultraviolet radiation inhibiting deposits from the active surfaces.



14. The method of cleaning ultraviolet radiation inhibiting deposits from the active surfaces of an ultraviolet radiation emitting device extending within a conduit of a liquid purification system such that ultraviolet radiation will emanate from the active surfaces to purify liquid passed through the conduit, the emitting device including a portion extending outside the conduit, said method comprising:

providing ultrasonic vibrations; and

coupling the ultrasonic vibrations with the portion of the emitting device extending outside the conduit such that said portion is essentially isolated from the liquid in the conduit to induce ultrasonic vibrations in the emitting device for cleaning the deposits from the active surfaces.

4,728,369

THERMOCOUPLE PROBES

Julius G. Hammerslag, 27011 Calle Esperanza, San Juan Capistrano, Calif. 92675, and Gary R. Hammerslag, 6202 W. Oceanfront, Newport Beach, Calif. 92663

Continuation of Ser. No. 719,600, Apr. 3, 1985, abandoned. This application Apr. 8, 1987, Ser. No. 37,075

Int. Cl.⁴ A01L *35/02*; **G01K** *7/00*

U.S. Cl. 136—230 **11 Claims**



1. In a thermocouple probe for electrical thermometers comprising an elongated thin body, thermal responsive elements extending lengthwise of said body, means forming a thermocouple junction between said elements at one end of said body, and said elements providing electrical contacts at the other end of said body, the improvement wherein said elements are united with said body and extend there along at opposite sides of a thin wall of said body and spaced apart by said thin wall wherein said thin wall thickness is limited to prevent significant cooling of the contacted tissue, and said electrical contacts on said other end of said body provide an internal and external orientation on said thin wall for properly polarized connection with a display device.

4,728,370

AMORPHOUS PHOTOVOLTAIC ELEMENTS

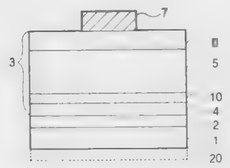
Masayuki Ishii; Nobuhiko Fujita, and Hajime Hitotsuyanagi, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

Filed Aug. 28, 1986, Ser. No. 901,286

Claims priority, application Japan, Aug. 29, 1985, 60-190500

Int. Cl.⁴ H01L *31/06*

U.S. Cl. 136—258 **5 Claims**



1. A photovoltaic element of pin type structure comprising a pair of electrodes and an amorphous silicon body sandwiched between the pair of electrodes, the amorphous silicon body including a p-type amorphous silicon layer, an i-type amorphous silicon germanium layer, and an n-type amorphous silicon layer laminated in the named order, characterized in that an i-type amorphous silicon buffer layer having a thickness of 100 to 500 angstroms is disposed between the p-type layer and the i-type layer, and in that germanium is added to the portion of the buffer layer at the side adjacent to the i-type over a thickness of from 50 to 150 angstroms, said portion having a germanium concentration gradient which gradually increases towards the i-type layer.

4,728,371

METHOD FOR MANUFACTURING REGIONS HAVING ADJUSTABLE UNIFORM DOPING IN SILICON CRYSTAL WAFERS BY NEUTRON IRRADIATION

Ernst W. Haas; Joachim Martin, both of Erlangen; Heinz Mitlehner, and Reinhold Kuhnert, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,326

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511363

Int. Cl.⁴ H01L *21/263*

U.S. Cl. 437—17 **15 Claims**



1. A method for manufacturing geometrically selected regions with adjustable uniform doping in a silicon crystal wafer by neutron irradiation according to the nuclear reaction Si^{30} (n, γ) $Si^{31}\beta-P^{31}$ comprising the steps of:

selecting a neutron absorbing material of isotopic composition having a high absorption cross-section which in said nuclear reaction yields stable isotopes or radio-nuclides having slight or short-lived activity;

applying said absorbing material in a selected pattern and thickness on at least one side of said wafer for a photolighographic process exposing said geometrically selected regions; and

irradiating said wafer with said absorbing material thereon at a neutron flux density selected to achieve a desired doping concentration in said regions in accordance with the type and thickness of said absorbing material.

4,728,372

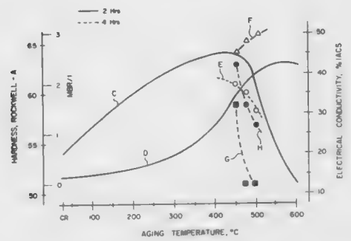
MULTIPURPOSE COPPER ALLOYS AND PROCESSING THEREFOR WITH MODERATE CONDUCTIVITY AND HIGH STRENGTH

Ronald N. Caron, Branford, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 727,463, Apr. 26, 1985, Pat. No. 4,594,221. This application Dec. 30, 1985, Ser. No. 814,701

Int. Cl.⁴ C22F *1/08*

U.S. Cl. 148—2 **32 Claims**



1. A process for manufacturing a copper base alloy having an improved combination of strength and conductivity, said process comprising:

(a) providing a copper base alloy consisting essentially of from about 2 to about 4.8% by weight nickel, from about 0.2 to about 1.4% by weight silicon, from about 0.05 to about 0.45% by weight magnesium and the balance copper;

(b) casting said alloy into a desired shape;

(c) hot working said alloy from a temperature of from about 750° to about 950° C.;

(d) cold reducing said alloy at least about 30%;

(e) aging said alloy at a temperature of from about 350° to 700° C. for a period of up to about 8 hours; and

(f) finally reducing said alloy from about 10 to about 90% reduction.

4,728,374

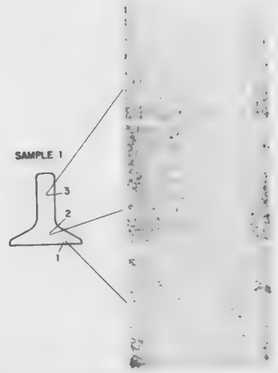
SOLUTION HEAT TREATED ENGINE POPPET VALVES

Jay M. Larson, Marshall; Lawrence F. Jenkins, Battle Creek, both of Mich., and James E. Belmore, Kearney, Nebr., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 766,047, Aug. 15, 1985, abandoned, which is a division of Ser. No. 607,530, May 7, 1984, Pat. No. 4,547,229. This application Sep. 3, 1986, Ser. No. 903,158

Int. Cl.⁴ F01L *3/00*

U.S. Cl. 148—320 **1 Claim**



1. A solution heat treated poppet valve of the type including a stem and a head having a combustion face, said valve being heat treated to a controlled depth from its combustion face and having a microstructure characterized by a coarse grain size at the combustion face that is suitable for high temperature valve operating conditions and becomes progressively finer through a specific transition zone in the head to a fine size in the stem consistent with good low temperature properties, the grain size at the combustion face being in a range of from about ASTM 2 to 5 and the grain size in the stem being about ASTM 8 or finer.

4,728,373

SOLUTION AND PROCESS FOR COLD FORMING TITANIUM

Hiroyoshi Nakagawa, Yao; Eiichi Nishi, Monoh, and Haruo Kurishima, Suita, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,454

Claims priority, application Japan, Sep. 19, 1985, 60-205447

Int. Cl.⁴ C23C *22/34*

U.S. Cl. 148—6.15 R **4 Claims**

1. A process for cold forming an article of titanium or titanium alloy comprising contacting the surface of the article with an aqueous chemical treatment solution which contains fluoride ion and from 0.1 to 5.0 g/l of at least one type of metal ion selected from the group consisting of magnesium, calcium, manganese, iron, cobalt, nickel, zinc and molybdenum and in which the pH value is 1.5–4.5; said solution additionally comprising at least one chemical selected from among the group consisting of the organic chelating compounds, the aqueous organic macromolecular compounds and the surfactants in an amount sufficient to reduce the peeling of the applied film during cold forming and thereafter subjecting the article to cold deformation.

4,728,375

PYROTECHNIC COMPOSITION FOR PRODUCING RADIATION-BLOCKING SCREEN

Geoffrey M. Simpson, Nottingham, United Kingdom, assignor to Haley & Weller Limited, Draycott, United Kingdom

Filed Apr. 4, 1984, Ser. No. 639,685

Claims priority, application United Kingdom, Apr. 5, 1983, 8309219

Int. Cl.⁴ C06B *45/30*

U.S. Cl. 149—5 **6 Claims**

1. A pyrotechnic composition which, when ignited, explosively produces an infrared radiation blocking screen for an intended target, said pyrotechnic composition comprising a phosphorus and other combined components of composition, form and size as to constitute means for producing an infrared radiation blocking screen operating in a first and a second mode, said first mode being provided substantially instantaneously following the explosion of the composition and comprising a cloud of high temperature gas and particles producing a broad infrared target masking the intended target, said second mode being provided immediately following said first mode and comprising a cloud of radiation absorbent particles dispersed within said cloud to provide a large infrared absorbent area to mask the intended target for a further period.

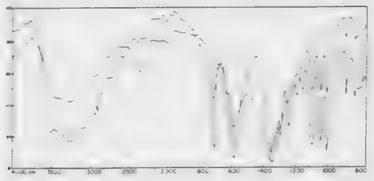
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4,728,376

EXPLOSIVE COMPOSITION AND METHOD

Earl F. Kurtz, Las Vegas, Nev., assignor to Golden Power of Texas, Inc., Dallas, Tex.

PCT No. PCT/US84/01647, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/02347, PCT Pub. Date Apr. 24, 1986
Continuation-in-part of Ser. No. 437,965, Nov. 1, 1982, Pat. No. 4,497,676. This PCT application Oct. 10, 1984, Ser. No. 890,146
Int. Cl.[4] C06G *45/02*
U.S. Cl. 149—21 35 Claims



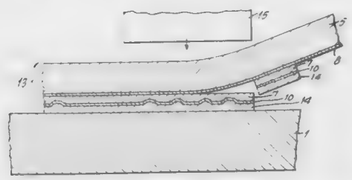
1. A consumable cartridge comprising:
(a) priming means
(b) projectile means; and
(c) a molded cartridge case containing said priming means for receiving said projectile for use in a firearm, said molded cartridge case consisting essentially of a composition produced by heating a mixture comprising nitrate-containing oxidizer and an organic acid or acid salt or mixtures thereof selected from the group consisting of ascorbic acid, erythorbic acid and alkali metal salts and alkaline earth salts thereof, to a temperature below about 480° F. but sufficiently high to initiate an observable reaction.

4,728,377

PROCESS FOR PROVIDING HOLOGRAMS ON DOCUMENTS OR THE LIKE

Terence J. Gallagher, Brookfield, Conn., assignor to American Bank Note Company, New York, N.Y.

Division of Ser. No. 439,935, Nov. 8, 1982, abandoned. This application Feb. 7, 1986, Ser. No. 827,656
Int. Cl.[4] B44C *1/16, 1/17;* G02B *5/18;* B32B *3/00*
U.S. Cl. 156—58 11 Claims



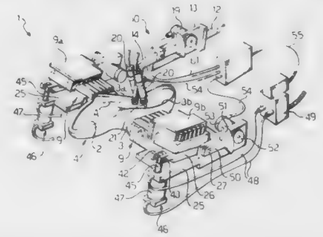
1. A process for providing a hologram on a document or like supportive substrate having a surface, comprising the successive steps of
(a) establishing a laminate comprising a thin layer of transparent material capable of receiving a three-dimensional light-diffracting pattern, a support layer, and a heat-sensitive release layer bonding the transparent material layer to the support layer, such that a surface of the transparent material layer is exposed;
(b) forming, on said exposed surface, a three-dimensional light-diffracting pattern comprising a hologram while maintaining the transparent material layer bonded to the support layer by the release layer, said exposed surface being vacuum deposited with a reflective coating of metal and said pattern being formed in said metal as well as in said exposed surface;
(c) applying, to said exposed surface, a layer of heat-sensitive adhesive capable of providing a bond having a shear strength greater than that of the transparent material layer;
(d) juxtaposing the laminate and the supportive substrate such that the adhesive layer is in contact with the substrate surface and the support layer is exposed;
(e) applying heat and pressure to at least a region of the juxtaposed laminate and substrate in register with said pattern for simultaneously activating the adhesive layer and the release layer in said region to adhere the transparent material layer to the substrate surface in said region while releasing the transparent material layer from the support layer in said region; and
(f) removing the support layer, together with any nonadhered portion of the transparent material layer, from the adhered transparent material layer in said region, leaving the adhered transparent material layer bearing said pattern bonded to said substrate.

4,728,378

METHOD OF GLUING, TO THE INSOLE OF A FOOTWEAR BLANK, THE SIDES OF A RESPECTIVE UPPER, AND A SIDE-LASTING MACHINE FOR IMPLEMENTING THE METHOD

Carlo Bianchi, Gambolo' , Italy, assignor to Officine Meccaniche Molina & Bianchi, S.p.A., Vigevano, Italy

Filed Feb. 26, 1986, Ser. No. 833,910
Claims priority, application Italy, Feb. 26, 1985, 19644 A/85
Int. Cl.[4] B32B *31/00;* A43D *21/00, 25/18*
U.S. Cl. 156—64 5 Claims



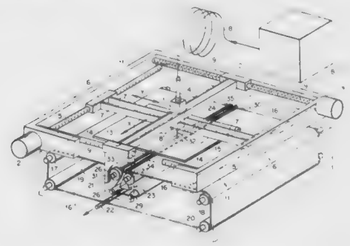
2. A side-lasting machine for gluing, to the insole of a footwear blank, the sides of a respective upper comprising, a frame, a holder for a footwear blank mounted to said frame, adapted to hold said blank in an operational setting position, a member mounted to said frame for spreading adhesive over and along the insole of said blank, a plurality of pressure members adjustably settable on said frame around said operational setting position adapted to upturn and press onto a margin of said insole coated with said adhesive a flap of the upper of said blank, characterized in that it comprises, a surveyor adapted to measure the curvature of said insole in a plane perpendicular to said insole to produce a signal proportional to the curvature of said insole, motive setting members for said pressure members, a transducer connected to the surveyor for converting the signal received therefrom into an electric signal, a microprocessor fed with said electric signal from the transducer, and shut-off members on a power circuit to said motive members driven electrically by said microprocessor.

4,728,379

PROCESS FOR MANUFACTURING LAMINATED GLASS

Josef Audi; Kurt Blank, both of Aachen; Friedrich Halberschmidt, Hersogenrath; Heinz Kunert, Cologne, and Paul Roentgen, Roetgen-Rott, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Oct. 29, 1984, Ser. No. 666,072
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339320
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—106 6 Claims



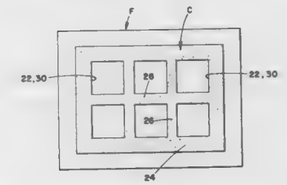
1. A process for manufacturing a laminate of glass and plastic sheets, which comprises:
providing a glass sheet having predetermined dimensions;
accurately and precisely cutting a polyvinyl butyral sheet to predetermined final dimensions by high pressure water jet means, the predetermined final dimensions of said polyvinyl butyral sheet being no greater than the predetermined dimensions of said glass sheet;
stacking said glass and polyvinyl butyral sheets in contact relation and in alignment for formation of the laminate;
subjecting said stacked sheets to the action of elevated temperature and pressure so as to form a laminate, whereby the polyvinyl butyral sheet does not extend beyond a peripheral dimension of the glass sheet, thus avoiding trimming and further cutting of said polyvinyl butyral sheet; and further whereby the adherence of said polyvinyl butyral sheet to said glass sheet is unaffected and the optical properties of said polyvinyl butyral sheet remain unaffected for clear viewing through the laminate.

4,728,380

TRANSFER METHOD OF APPLYING ADHESIVE TO SUBSTRATES

Wallace R. Jones, Waite Hill Village; Robert A. Isaksen, Chardon, and Paul A. Krieger, North Ridgeville, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation of Ser. No. 671,769, Nov. 15, 1984, abandoned. This application Aug. 1, 1986, Ser. No. 892,472
Int. Cl.[4] A61F *13/02;* B32B *3/02;* C09J *7/02;* A47G *1/06*
U.S. Cl. 156—230 4 Claims



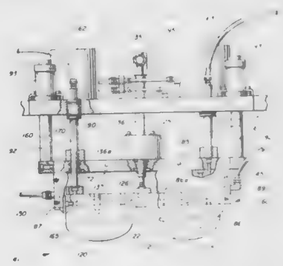
1. A method of applying adhesive to substrates having a plurality of spaced-apart openings therein comprising the steps of:
(a) providing a pad of adhesive sandwiches stacked on top of one another, each sandwich including a flexible carrier sheet having a pressure-sensitive adhesive layer releasably bonded to one surface thereof in a predetermined discontinuous pattern including openings corresponding in size and shape to the spaced-apart openings in said substrates and having an opposite surface to which the adhesive layer is bondable with substantially less tenacity than the tenacity with which the adhesive layer is bonded to the one surface, said sandwiches being stacked on top of one another with the adhesive layer on one sandwich releasably bonded to an opposite surface of a carrier sheet on an adjacent sandwich; stripping a sandwich from said pad;
(b) positioning the adhesive layer on the stripped sandwich against a one of said substrates;
(c) pressing on the carrier sheet of the stripped sandwich to bond its adhesive layer to the substrate with substantially greater tenacity than the tenacity of the bond between the adhesive layer and its carrier sheet;
(d) pulling the carrier sheet to strip same from its adhesive layer which remains bonded to the substrate; and,
(e) repeating the steps of stripping, pressing, and pulling with each sandwich in the pad.

4,728,381

MACHINE AND METHOD FOR MANUFACTURING A DISPOSABLE ABSORBENT CONTINENCE PAD

Arthur D. Jezuit, Wood Dale, and Richard M. Oldendorf, Westmont, both of Ill., assignors to Hooper, Inc., Itasca, Ill.

Filed May 12, 1986, Ser. No. 861,859
Int. Cl.[4] A61F *13/18;* B29C *51/08, 51/20;* B32B *31/08*
U.S. Cl. 156—245 13 Claims



1. A machine for manufacturing a disposable absorbent continence pad comprising, means for advancing a web of thermoplastic material through a series of stations, including a shell-forming station, means at said shell-forming station for molding a series of shells with compound curved side walls in said web of thermoplastic material, a sealing station, a slitting station in advance of the sealing station through which a length of facing material travels, means at the slitting station for making less than full-width transverse cuts in the facing material spaced apart lengthwise of the facing material to overlie said web of thermoplastic material at locations between shells at said sealing station, and means at the sealing station for sealing said facing material to the perimeter of said shells.

12. The method of making a disposable absorbent continence pad having a pre-formed shape for conformance with the body of a wearer including a shell with a curved bottom wall and compound curved side walls defining a pocket to hold a fibrous absorbent material and a fluid-transmitting facing material sealed to the perimeter of the shell to enclose the fibrous

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absorbent material in the shell comprising, molding a plurality of said shells at a shell-forming station, inserting the fibrous absorbent material in said shells at a stuffing station, advancing a web of said facing material to a slitting station, slitting said facing material at spaced locations along the length thereof at said slitting station to form a series of transverse slits, and sealing said facing material to said shells at a sealing station with the slits in the facing material disposed between successive shells to completely seal the absorbent material in the shell and permit the facing material to adjust to the shape of the shell.

4,728,382

METHOD FOR THE CONTINUOUS PRODUCTION OF A LONG STATOR LINEAR MOTOR

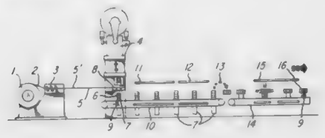
Hans-Georg Raschbichler, Ottobrunn, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 580,228, Feb. 15, 1984, abandoned, which is a continuation of Ser. No. 358,574, Mar. 16, 1982, abandoned, which is a division of Ser. No. 777,942, Sep. 19, 1985, Pat. No. 4,665,329. This application Oct. 18, 1985, Ser. No. 788,686

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110339

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—264 **3 Claims**



1. In a method of producing a bundle of laminations for a long-stator linear motor exclusively operable at higher operating frequencies up to 250 Hz as absolutely necessary for a high speed magnetic propulsion rail system including a magnetic suspension vehicle and support magnets, the improvements in combination therewith comprising the steps of:

unwinding from a drum a thin sheet of metal being coated on both sides with thermosetting adhesive material prehardened in a layer thickness ranging from 5 to 8 μm simultaneously effecting insulation and cohesion of said sheet metal therewith to ensure mechanical strength and rigidity;

feeding said sheet to a punch;

first punching from said metal sheet a configuration of laminations substantially free of waste prior to any stacking thereof, said laminations including teeth interspaced with cut-out grooves to subsequently receive therein a three-phase cable winding in combination therewith;

then stacking said laminations one on top of another in such a way as to completely cover each other to avoid point-like clamping connections otherwise resulting in gaps between individual laminations, whereby said gaps can take up moisture and other media by capillary action and can lead to corrosion in the interior thereof;

adhesively joining said stacked laminations adhering to each other to form a bundle of laminations particularly for electromagnetic propulsion of the magnetic suspension vehicle as well as for electromechanical support and guiding of the magnetic suspension vehicle for the high speed magnetic propulsion rail system;

thereafter conveying said bundle of laminations through different thermal treatment zones arranged one after the other; and

finally further coating said thermally treated bundle with a corrosion resistant protective plastic layer of epoxy resin compound hardenable by an additional step of curing thereby forming a self-supporting bundle of laminations exclusively for the high speed magnetic-propulsion rail system with which the bundle of laminations per se without any housing is relied upon for magnetic flux guidance in operation as a long-stator linear motor, for magnetic supporting of rail vehicles and during breakdown situations as a mechanical emergency gliding surface for the support magnets;

said conveying of said bundle of laiminations through different thermal treatment zones for hardening includes sequentially heating said bundle and curing same as well as leaving a residual heat remaining in said bundle of laminations after said curing, and subsequently cooling off said bundle of laminations;

said finally further coating including electrostatically applying a hardenable epoxy resin compound on said bundle of laminations for lacquering thereof as said corrosion resistant protective layer, and purposely only using the residual heat remaining in said bundle of laminations after said curing step for thereby curing and hardening said corrosion protective layer therewith.

4,728,383

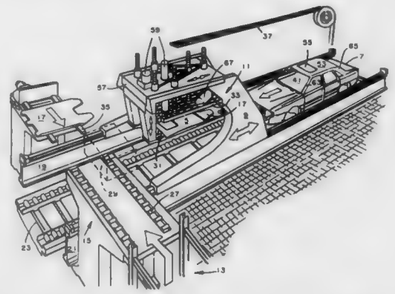
METHOD OF MOUNTING READY-MADE HEADLINERS INTO BODIES OF AUTOMOTIVE VEHICLES

Adolf Kaller, Baar; Wilfried Michel, Stammham, and Josef Motzet, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi AG., Ingolstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 760,151, Jul. 29, 1985, abandoned, which is a division of Ser. No. 550,597, Nov. 8, 1983, abandoned. This application Apr. 6, 1987, Ser. No. 34,761

Int. Cl.⁴ B32B *31/04, 31/20, 31/26*

U.S. Cl. 156—285 **10 Claims**



1. A method of automatically mounting ready-made headliners into automotive bodies consecutively moved by a conveyor between first and second positions along an assembly line, comprising the steps of:

placing a headliner having an upper surface provided with a coating of adhesive onto a support mounted for movement along the assembly line,

inserting the support with the headliner thereon into the interior of an automotive body through a window cut-out thereof;

connecting the support to the conveyor at said first position for synchronous movement therewith;

raising the support with the headliner thereon to press the adhesive coating into bonding engagement with the ceiling of the automotive body;

substantially simultaneously with the raising of the support lowering a support member into engagement with the roof of the automotive body to counteract the pressure of the headliner against the ceiling;

moving the support member and the support out of engagement with the roof and the headliner, respectively;

withdrawing the support from the interior of the body;

disconnecting the support from the conveyor at said second position; and

returning the support to the first position.

4,728,384

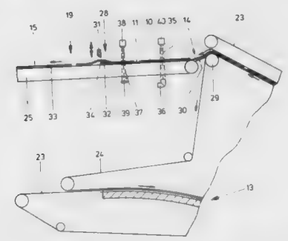
TWO COMPONENT EPOXY STRUCTURAL ADHESIVES WITH IMPROVED FLEXIBILITY

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,600

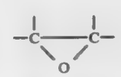
Int. Cl.⁴ C09J *5/02*

U.S. Cl. 156—307.3 **7 Claims**



1. A process for preparing an improved epoxy adhesive composition comprising mixing

(a) an epoxy resin component containing a polyepoxide resin having more than one group of the formula



and the partial reaction product of a polyepoxide with phenol, with

(b) a hardener component composed of either a primary and secondary amine containing polyamine or a poly amido-amine, and a tertiary amine containing epoxy curing catalyst.

7. The process for adhering two or more SMC surfaces to each other comprising placing the adhesive composition of claim 1 between said surfaces and curing the resulting material at a temperature in the range of from about 25° C. to about 200° C.

4,728,385

APPARATUS FOR PRODUCING TEXTILE UNITS CONSISTING OF TEXTILE ARTICLES BONDED TO ONE ANOTHER

Günther Hell, Herford, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,265

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519871; Aug. 14, 1985, 3529098

Int. Cl.⁴ G01N *21/22;* **B26D** *5/20*

U.S. Cl. 156—353 **10 Claims**

1. Apparatus for production of textile units comprised of sheet-like textile articles bonded to one another, in which strip-shaped outer fabric pieces are laid onto belt conveyed interlining fabric and, through heat and pressure from a heat and pressure means, are bonded to one another to form a continuous moving textile strip, wherein the textile strip, consisting of bonded textile pieces, is cut by a cutting apparatus in the interlining strip in the region between the successive pieces of outer fabric subsequent to the heat and pressure means, whereby the cutting apparatus is controlled through automatic sensing means (photocell), which senses the conveyed textile strips, thereby characterized, that regulating means (38/39, 41–43) are connected to sensing means (36/40) to provide for automatic adjustment of the sensitivity of said sensing means, and that said regulating means comprises a comparator (43), which compares the output voltage of the sensing means (36/40) with a signal generated by a peak value memory (41) controlled threshold signal generated (44).

4,728,386

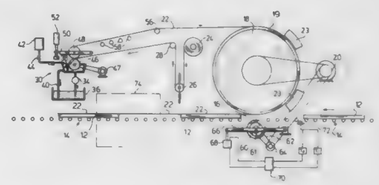
APPARATUS FOR APPLYING PLASTIC FILM MATERIAL TO A GLASS SHEET

Steven C. Horvath, Mississauga, Canada, assignor to 528569 Ontario Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 664,724, Oct. 25, 1984, abandoned. This application Nov. 26, 1985, Ser. No. 801,891

Int. Cl.⁴ B26D *5/28*

U.S. Cl. 156—361 **6 Claims**



1. Apparatus for applying plastic film material having a thickness in the range of from about 0.001 to about 0.01 inch to a glass sheet comprising a first roller mounted for rotation about its longitudinal axis, said first roller having a rubber-like surface and a diameter of at least about 30 inches (75 cm), means for rotating the roller about its longitudinal axis, a second roller mounted for rotation about its longitudinal axis adjacent to the first roller to form a nip between the first and second rollers, means for supplying a length of said plastic film material having adhesive on one surface under controlled tension to said first roller at a position remote from the second roller, with the opposite surface of the film material in contact with the first roller, to cause the film material to pass around a substantial portion of the circumference of the first roller to a position adjacent the second roller, and means for feeding the glass sheet through the nip to cause the second roller to press the glass sheet towards the first roller and cause the film material to be adhered to the glass.

4,728,387

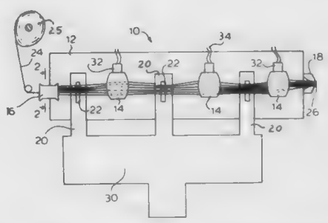
RESIN IMPREGNATION OF FIBER STRUCTURES

William Hilakos, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 15, 1986, Ser. No. 941,653

Int. Cl.⁴ B32B *17/04*

U.S. Cl. 156—441 **9 Claims**



1. An assembly for impregnating a continuous length of glass fibers with a polymeric resin, which comprises;

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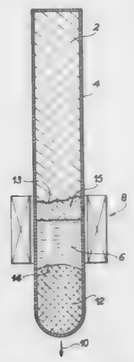
a base member;
a convex surface mounted on the base member and having a first contact point;
a non-convex, surface positioned apart from and in association with the convex surface, said non-convex surface having a second contact point;
said first and second contact points being on a path line along which the continuous length is free to travel;
said path line extending both before and after each of the first and the second contact points;
said path line changing direction toward the center of the arc of the convex surface at the first contact point;
said path line changing direction away from the center of the second contact point;
means for tracting the continuous length under tension along the extended path line, whereby the glass fibers are spread apart as the length changes direction at the first contact point and whereby the spread glass fibers are reconsolidated as the length changes direction at the second contact point; and
means for applying the polymeric resin or a polymeric resin forming composition to the spread glass fibers.

4,728,388

PROCESS FOR PRODUCING A MONOCRYSTAL OF A COMPOUND BY CRYSTALLIZING A POLYCRYSTAL OF SAID COMPOUND BY TRANSFERRING A SOLVENT ZONE

Alain Fillot, St. Ismier; Jean Gallet, St. Laurent du Pont; Sylvain Paltrier, Meylan, and Bernard Schaub, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 29, 1985, Ser. No. 759,758
Claims priority, application France, Aug. 17, 1983, 83 13388
Int. Cl.[4] C30B *13/02, 29/48, 9/06*
U.S. Cl. 156—604 **6 Claims**



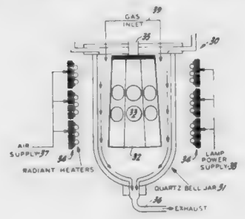
1. A process for producing a monocrystal of a ternary semiconductor with the formula $Cd_xHg_{0.5-x}Te_{0.5}$ with $0<x<0.5$, having a composition S in cadmium, mercury and tellurium, by recrystallizing a feed polycrystal of said formula at a temperature T_1 no more than 650° C. from a ternary liquid zone in thermodynamic equilibrium with said polycrystal, said process comprising the steps of:
(i) providing said polycrystal;
(ii) selecting temperature T_1 at which said recrystallization will occur;
(iii) plotting said composition S on a phase diagram of the HgCdTe system plotted for the pseudobinary axes HgTe and CdTe, said phase diagram containing a plurality of isotherms including the isotherm for T_1, and an isochrome curve (BB') representing the different compositions of the solvent zones in thermodynamic equilibrium with said polycrystal;
(iv) constructing a line from S through the intercept of the isotherm for T_1 and said curve (BB'), said line intercepting the HgTe axis of said phase diagram;
(v) establishing an initial binary solvent having the composition of Hg and Te determined by the intercept of step (iv);
(vi) heating said initial binary solvent to said temperature T_1;
(vii) dissolving said polycrystal in said heated initial binary solvent until said ternary liquid zone is obtained; and
(viii) displacing said ternary liquid zone at T_1 along said polycrystal in order to transform said polycrystal into said monocrystal.

4,728,389

PARTICULATE-FREE EPITAXIAL PROCESS

Roger E. Logar, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 20, 1985, Ser. No. 735,556
Int. Cl.[4] C30B *23/06, 25/10;* **B08B** *3/12;* **B32B** *3/02*
U.S. Cl. 156—612 **19 Claims**



1. In a cold purge process for preparing a reactor chamber for the gas phase formation of an epitaxial layer on a wafer positioned within the reactor chamber by communicating a flow of conditioning gas into the reactor chamber, the reactor chamber system including radiant energy lamp means for heating the chamber to effect said gas phase processing, the improvement comprising: during said gas flow step, operating the radiant energy lamp means at a power level below that used for said gas phase processing heating to supply radiant energy at a relatively low flux intensity to substantially eliminate static-induced particle transport to the wafer.

4,728,390

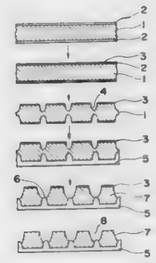
FILMY COIL AND A MANUFACTURING METHOD FOR SUCH COIL

Kunitoshi Yamamoto, Kusatsu; Yasuji Mori, Kyoto, and Torayoshi Iwata, Ootsu, all of Japan, assignors to Nissha Printing Co., Ltd., Kyoto, Japan

PCT No. PCT/JP85/00334, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00167, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 13, 1985, Ser. No. 832,719
Claims priority, application Japan, Jun. 15, 1984, 59-124303
Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—630 **6 Claims**

1. A method of manufacturing a filmy coil, which comprises forming a photoresist layer of a patterned line on each side of a metal conductive foil or sheet, the line pattern of each side being the mirror image of the other and where the interval between adjacent photoresist lines is less than the metal foil thickness, etching both of said photoresist layers to a depth of 30 to 40% of the thickness of the metal conductive foil or sheet by means of chemical etching, forming an insulating substrate

layer over all of one side of said photoresist layer, and etching the other side of said photoresist layer by means of chemical



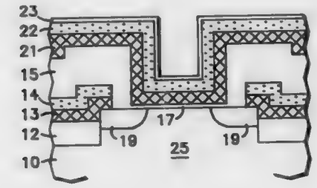
etching until the etching grooves on both sides pass through to connect with each other.

4,728,391

PEDESTAL TRANSISTORS AND METHOD OF PRODUCTION THEREOF

Israel A. Lesk, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 11, 1987, Ser. No. 48,345
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*
U.S. Cl. 156—649 **22 Claims**



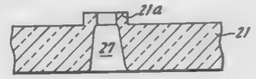
1. A method of producing an MOS pedestal transistor comprising the steps:
forming a substrate having a pedestal;
depositing a first polysilicon layer of a first conductivity type;
depositing a first tungsten silicide layer on said first polysilicon layer;
depositing a silicon dioxide layer on said first tungsten silicide layer;
producing an opening through said silicon dioxide, first tungsten silicide, and first polysilicon layers to said pedestal of said substrate, said opening being defined by a side wall;
forming a gate dielectric on said pedestal;
forming a side wall insulator about said side wall defining said opening;
depositing a second polysilicon layer;
depositing a second tungsten silicide layer on said second polysilicon layer;
baking said MOS pedestal transistor causing a portion of said first impurity of said first polysilicon layer to diffuse into a portion of said pedestal; and
implanting a second impurity into said second polysilicon layer.

4,728,392

INK JET PRINTER AND METHOD FOR FABRICATING A NOZZLE MEMBER

Masayoshi Miura; Kenji Akami, both of Kawasaki; Gen Oda, Sagamihara; Tamotsu Kojima, Kawasaki, and Hiroshi Naito, Machida, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 725,354, Apr. 19, 1985, abandoned. This application Sep. 27, 1985, Ser. No. 781,058
Claims priority, application Japan, Apr. 20, 1984, 59-80419; Apr. 27, 1984, 59-86418; May 8, 1984, 59-92249; Jul. 27, 1984, 59-157823; Jul. 27, 1984, 59-157828; Jul. 27, 1984, 59-157812; Aug. 29, 1984, 59-179820; Sep. 12, 1984, 59-191010; Sep. 28, 1984, 59-203406; Jul. 23, 1985, 60-162403; Aug. 13, 1985, 60-177911; Sep. 5, 1985, 60-196290
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—644 **21 Claims**



1. A method for fabricating a nozzle of an ink jet print head, comprising the steps of:
(a) etching a substrate according to a first pattern from a first surface thereof to a predetermined depth to form a projecting nozzle having a nozzle opening therein; and
(b) etching said substrate according to a second pattern from a second, opposite surface thereof to form a bore extending to and axially aligned with said nozzle opening.

4,728,393

METHODS FOR OBTAINING DEICERS FROM BLACK LIQUOR

Terence E. Peel, Quebec, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Nov. 20, 1985, Ser. No. 799,865
Int. Cl.[4] D21C *11/00;* **C09K** *3/18*
U.S. Cl. 162—29 **10 Claims**

1. A method for making and using a deicing product from black liquor, which comprises:
(a) using a black liquor having a pH of at least 6.5 and containing lignin, lignin degradation products and including lignin cellulose fragments and hemicelluloses, acids of the group consisting of acetate, carbonate, formate, pseudolactate, and having at least one cation selected from the group consisting of sodium, potassium, magnesium and calcium, as obtained from a pulp mill operation using a pulping process,
(b) fractionating said black liquor from step (a) into a low molecular weight fraction wherein the compounds present in said fraction have molecular weight, of less than 500 and wherein said fraction comprises based upon the total weight of solid in said fraction, between 12% and 75% acetate salts, trace amounts and 36% carbonate salts, 1 and 24% formate salts, 1 and 32% pseudolactate salts and wherein the cation of said salts is at least one member selected from the class consisting of: sodium, potassium, magnesium and calcium, with the proviso that when lignin fractions having molecular weights of less than 500 and sugars having molecular weight of about 150 to 180 are present, the weight of said sugars and said lignin are less than 25% based upon said total weight of salts, said step (b) thereby maximizing the production of said salts,
said fractionating in step (b) being selected from one of the group of methods consisting of:
(i) control of partial wet oxidation of the black liquor under pressure and at a temperature between 140° and 230° C. to breakdown the high molecular weight fraction containing lignin, lignin degradation products and including lignin cellulose fragments and hemicelluloses, into low molecular weight fractions consisting of compounds having mo-

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lecular weight of less than 500, and simultaneously during said control of partial wet oxidation, to favourably increase said salts, said control being obtained by the oxidation period, the temperature and pressure, and the amount and nature of the oxidation source, and

(ii) direct membrane filtration to obtain the low molecular weight fraction wherein the compounds present have a molecular weight of less than 500 collected as the permeate, and said permeate as a whole constitutes said deicer, and wherein prior to said membrane filtration, said black liquor is filtered to remove large suspended particles and part of the high molecular weight fractions,

(c) concentrating said low molecular weight fraction as obtained from step (b) to produce a concentrated deicing product having between 20% and 100% total solid concentration, wherein the compounds present have a molecular weight of less than 500 and wherein said fraction comprises based upon the total weight of solid in said fraction, between 12% and 75% acetate salts, trace amounts and 36% carbonate salts, 1 and 24% formate salts, and 32% pseudolactate salts and wherein the cation of said salts is at least one member selected from the class consisting of: sodium, potassium, magnesium and calcium, with the proviso that when lignin fractions having molecular weights of less than 500 and sugars having molecular weight of about 150 to 180 are present, the weight of said sugars and said lignin are less than 25% based upon said total weight of solids, and applying the product obtained from step (c) to a road surface in an amount sufficient to deice said surface.

4,728,394

SEMIPERMEABLE MEMBRANE SUPPORT AND PROCESS FOR PREPARATION THEREOF

Ietsugu Shinjou, Shiga, and Rikuo Shoji, Moriyama, both of Japan, assignors to Firma Carl Freudenberg, Weinheim/-Bergstr., Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,244
Claims priority, application Japan, Mar. 29, 1985, 60-67420
Int. Cl.⁴ D21H *1/02, 5/12*
U.S. Cl. 162—129 **5 Claims**

1. A process for preparing a semipermeable membrane support having a layered structure comprising: laminating a dry processed web, which comprises entirely polyester fibers containing 20 to 80% of undrawn polyester fiber or conjugate polyester fibers having an average fiber denier of 1 to 3 denier formed through a dry process, and an un-presstreated wet processed web, which comprises entirely polyester fibers containing 30 to 90% of undrawn polyester fibers or conjugate polyester fibers having a fiber denier of 0.1 to 1.5 denier formed through a paper making process and subsequent drying process with hot air to self-bond lightly, pressing said laminated dry processed web and wet processed web with a heated calender at a sufficient temperature for bonding firmly the laminated webs.

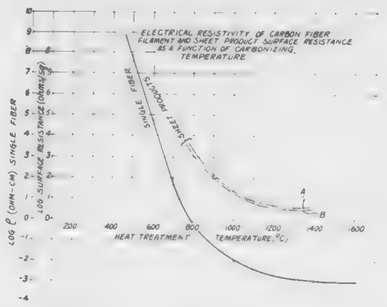
4,728,395

CONTROLLED RESISTIVITY CARBON FIBER PAPER AND FABRIC SHEET PRODUCTS AND METHOD OF MANUFACTURE

George P. Boyd, Jr., North Attleboro, Mass., assignor to Stackpole Fibers Company, Inc., Lowell, Mass.

Filed Oct. 12, 1984, Ser. No. 660,051
Int. Cl.⁴ D21H *5/12*
U.S. Cl. 162—138 **32 Claims**

1. A method of manufacturing a plurality of different value controlled resistivity carbon fiber sheet products employing a carbonizable fiber starting material; said method comprising oxidizing and stabilizing the carbonizable fiber starting material at an elevated temperature of the order of 220 degrees Centigrade to effect molecular aromatic rearrangement of the fibers, selectively carbonizing the oxidized and stabilized fiber starting material for a predetermined time period in an oxygen free atmosphere within a furnace at a selected temperature within a temperature range from 370 degrees Centigrade to about 1300 degrees Centigrade by soaking the stabilized fiber starting material at the selected temperature for the predetermined period of time to provide a desired electrical resistivity



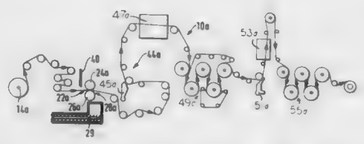
to the carbonized fibers, and thereafter processing the carbonized fibers into desired electrical resistivity carbon fiber sheet products having the form of non-woven paper or woven or knitted fabric sheet products having preselected desired surface electrical resistivities.

4,728,396

METHOD OF OPERATING AND THREADING A COATER

Robert J. Alheid, Beloit, Wis., assignor to Beloit Corp., Beloit, Wis.

Filed Dec. 2, 1986, Ser. No. 936,851
Int. Cl.⁴ D21G *9/00*; B05D *3/12*
U.S. Cl. 162—193 **10 Claims**



1. A method of operating a coater which comprises the sequential steps of:

separating a first tail from a full width web unwound from an unwind stand at threading velocity;

threading the first tail at the threading velocity through a pull stack;

widening the first tail to the full width of the web so that a full width web extends through the pull stack;

dumping the full width web emerging from the pull stack into a first broke chute disposed below the pull stack;

accelerating the full width web extending through the pull stack and accelerating a coating apparatus to coating velocity so that both the full width web and the coating apparatus attain coating velocity;

cutting a second tail in the full width web between the unwind stand and the pull stack;

threading the second tail emerging from the pull stack through the coating apparatus while the second tail is moving at coating velocity and while continuing to dispose of the full width web less the second tail into the first broke chute;

widening the second tail to full width so that a full width web extends through the coating apparatus;

coating the full width web during passage through the coating apparatus; and

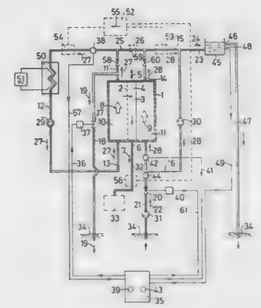
reeling the coated web onto a windup reel.

4,728,397

APPARATUS FOR DESALINATING SALT WATER BY MEMBRANE DISTILLATION

Nils Kjellander, Solna, and Bo Rodesjö, Täby, both of Sweden, assignors to Svenska Utvecklings AB, Sweden

PCT No. PCT/SE86/00290, § 371 Date Mar. 3, 1987, § 102(e) Date Mar. 3, 1987, PCT Pub. No. WO87/00160, PCT Pub. Date Jan. 15, 1987
PCT Filed Jun. 16, 1986, Ser. No. 44,503
Claims priority, application Sweden, Jul. 4, 1985, 8503335
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 202—180 **7 Claims**



1. An apparatus for desalinating salt water comprising: a distillation unit including a porous hydrophobic membrane which is pervious to steam but impervious to water; a condensation surface located at a distance from the membrane; a first unit for heating and conducting the water to be distilled on one side of the membrane; a second unit arranged to conduct water which is colder than the water to be distilled on the side of the condensation surface; means for drawing-off distilled water between said membrane and said condensation surface; a closed pipe loop (**11', 12, 13**) which is connected in series with the warm side (**10**) of the distillation unit (**1**); a closed pipe loop (**14, 15, 16**) which is connected in series with the cold side (**11**) of the distillation unit (**1**); a drainage valve (**17**) for drawing water from the pipe loop (**11, 12, 13**) in the warm side of the distillation unit a filling valve (**20**) for filling with water in the cold side of the distillation unit; a pipe line (**23**) for drawing water from the pipe loop (**14, 15, 16**) of the second unit; a connecting line (**25**) connecting the respective pipe loops of the first and the second units; and a heat exchanger (**50**) connected to the pipe loop (**11', 12, 13**) of the first unit for supplying energy to the water present in the pipe loop of the first unit.

4,728,398

ELECTROPLATING BATH FOR SIMULTANEOUS DEPOSITION OF METAL AND A PERMANENT SOLID LUBRICANT

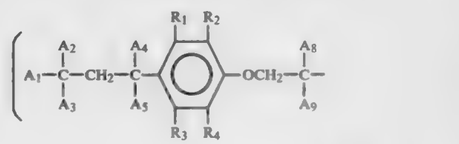
Jean-Francois Paulet, Siblingen; Jean-Claude Puippe, Wallisellen, both of Switzerland, and Heinz Steup, Donaueschingen, Fed. Rep. of Germany, assignors to Werner Flühmann AG, Dübendorf, Switzerland

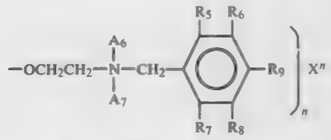
PCT No. PCT/CH86/00052, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06419, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 18, 1986, Ser. No. 4,472
Claims priority, application Switzerland, Apr. 22, 1985, 1718/85
Int. Cl.⁴ C25D *5/02*
U.S. Cl. 204—16 **10 Claims**

1. An aqueous electroplating bath containing solid lubricant particles and a water soluble surfactant which, at the pH of the electroplating bath, exhibits cationic properties, for simultaneous deposition of at least one metal and a permanently lubri-



cating solid lubricant, in which, the water-soluble, cationic surfactant is a compound consisting essentially of





where A_1–A_9 is H or an alkyl radical, R_1–R_9 is H, OH or an alkyl radical, X is a halogen or SO_4 and n is the valency of X.

4,728,399

PREPARATION OF LAMINATES OF METALS AND ELECTRICALLY CONDUCTIVE POLYMERS

Helmut Moehwald, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,109
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507419
Int. Cl.⁴ C25D *5/00*
U.S. Cl. 204—38.3 **4 Claims**

1. A process for the preparation of a laminate of an aluminum or copper containing metal layer and an electrically conductive polymer which comprises:

applying a solution of the polymer-forming monomer and a conductive salt onto the surface of the metal;

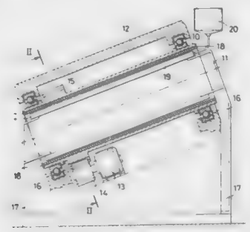
treating the solution of the polymer-forming monomer and conductive salt with an oxidizing agent for a time sufficient to form a polymer of the selected monomer on the metal layer surface, and

immersing the polymer film coated metal as an anode into a solution containing an anodically polymerizable monomer and a conductive salt, and

applying a current to the solution to anodically polymerize the monomer and form an additional polymer film on the coated metal layer.

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4,728,400
METHOD AND APPARATUS FOR EXTRACTION OF AMALGAMATABLE METALS FROM A SLURRY
Antonio Ferro, Via Maraini 7, Lugano Svizzera, Italy
Division of Ser. No. 821,979, Jan. 24, 1986, Pat. No. 4,668,368.
This application Jan. 14, 1987, Ser. No. 3,280
Claims priority, application Italy, Apr. 11, 1985, 20302 A/85
Int. Cl.[4] C25D *3/02*
U.S. Cl. 204—45.1 9 Claims



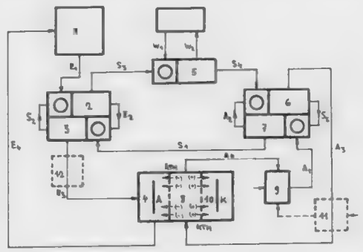
1. Method for extracting metals amalgamatable with mercury from fluid material containing said metals in the form of metal particles, said method comprising:
contacting a slurry or aqueous solution containing metal particles of a metal to be recovered by amalgamation with a surface of a support amalgamated with mercury to form on said surface an amalgam with said metal to be recovered;
continuously removing a surface film from said surface of said support; and
continuously restoring said surface of said support on which said amalgam is formed by electrolytic deposition of mercury thereon.

4,728,401
ELECTROLYTIC POST-TREATMENT OF PHOSPHATED SURFACE
Toshi Miyawaki, Yokohama; Atsunori Yoshida, and Yoshikazu Saito, both of Tokyo, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan
Filed Apr. 20, 1987, Ser. No. 40,432
Claims priority, application Japan, Apr. 26, 1986, 61-95909
Int. Cl.[4] C25D *11/00*
U.S. Cl. 204—56.1 13 Claims

1. A process for the post-treatment of a phosphated metal surface prior to painting comprising immersing the surface as cathode in an aqueous chromating solution containing 0.05–10 g/l of hexavalent chromium and having a weight ratio of Cr^{3+}/Cr^{6+} of less than 1.0.

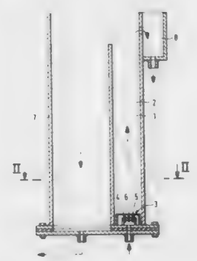
4,728,402
ELECTROLYTIC SILVER REFINING PROCESS
Adalbert Prior, Gerolfingen-Biel, Switzerland, assignor to Ogussa Osterreichische Gold- und Silber-Scheideanstalt Scheid und Roessler Gesellschaft m.b.H. & Co. K.G., Vienna, Austria
Filed Jul. 17, 1986, Ser. No. 887,420
Claims priority, application Austria, Jul. 24, 1985, 2196/85
Int. Cl.[4] C25C *1/12*
U.S. Cl. 204—109 6 Claims

1. In a process for regenerating a used electrolyte from a Moebius or Balbach/Thum silver refining process in which used electrolyte is regenerated in a joint electrolysis step by cathodically removing contaminants and anodically dissolving silver therein, the improvement which comprises charging extracted metal contaminants to the membrane electrolysis cell in a diffusion zone provided between each cathode and anode of the cell, said diffusion zone being separated from the anode



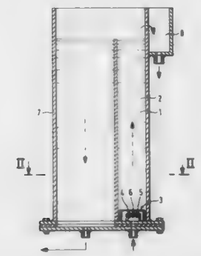
zone by an anionic separating membrane and from the cathode zone by a cationic separating membrane.

4,728,403
PROCESS FOR THE REGENERATION OF CLEANING AND DEGREASING BATHS AND DEVICE FOR APPLICATION OF THE PROCESS
Edgar Renzler, Siegstrasse 2, Köln 40, 5000, Fed. Rep. of Germany
PCT No. PCT/DE85/00264, § 371 Date Jun. 11, 1986, § 102(e) Date Jun. 11, 1986, PCT Pub. No. WO86/01233, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 6, 1985, Ser. No. 865,734
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429612; Oct. 9, 1984, 3437055; Nov. 12, 1984, 3444074; Apr. 26, 1985, 3515095; Jul. 20, 1985, 3525963
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 6 Claims



1. A process for the regeneration of an aqueous neutral or alkaline cleaning and degreasing emulsion containing soap or detergent emulsified constituents as an impurity comprising charging said emulsions into an electrolytic cell, said cell having at least one pair of inert electrodes, said inert electrodes having at least one non-electric touching decomposable hydroxyl producing metal structure between said electrodes, said metal being decomposable under neutral to alkaline conditions of between a pH of 7 to a pH of 12, impinging a D.C. current on said electrodes of 0.1 to 4 Ah/dm^3 whereby said metal structure is decomposed as a metal hydroxyl complex and wherein said thus produced metal hydroxyl complex combines with said emulsified constituents and float upwardly, thereafter separating said emulsified constituents from said emulsion thereby regenerating the latter.

4,728,404
PROCESS FOR THE SEPARATION OF EMULSIONS CONTAINING WATER AS A CONTINUOUS PHASE AND DEVICE FOR THE APPLICATION OF THE PROCESS
Edgar Renzler, Siegstrasse 2, Köln 40 5000, Fed. Rep. of Germany
PCT No. PCT/DE85/00263, § 371 Date Jun. 11, 1986, § 102(e) Date Jun. 11, 1986, PCT Pub. No. WO86/01124, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 6, 1985, Ser. No. 865,735
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429612; Oct. 7, 1984, 3437055; Nov. 12, 1984, 3444074; Apr. 26, 1985, 3515095; Jul. 20, 1985, 3525963
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 4 Claims

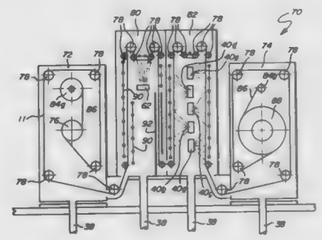


1. A process for the purification of an aqueous effluent containing a fatty-oil substance as an impurity comprising charging said effluent into an electrolytic cell, said cell having at least one pair of inert electrodes, said inert electrodes having at least one non-electric touching decomposable hydroxyl producing metal structure between said electrodes, said metal being decomposable under acidic to alkaline conditions of between a pH of 4 to a pH of 12, impinging a D.C. current on said electrodes of 0.1 to 4 Ah/dm^3 whereby said metal structure is decomposed as a metal hydroxyl complex and wherein said thus produced metal hydroxyl complex combines with said fatty-oily substance, thereafter separating said fatty-oil substance-complex from said effluent.

4,728,405
PROCESS OF PRODUCING MAGNETIC RECORDING MEDIUM
Shiro Kaneko, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 2, 1986, Ser. No. 847,332
Claims priority, application Japan, Apr. 3, 1985, 60-069207
Int. Cl.[4] C25D *13/00, 13/06*
U.S. Cl. 204—181.4 5 Claims

1. A process of producing a magnetic recording medium, comprising:
continuously circulating a magnetic coating composition prepared by dispersing a ferromagnetic powder in a solution of a high molecular binder while applying an ultrasonic treatment to the circulating magnetic coating composition;
drawing out and filtering an amount of the ultrasonically treated magnetic coating composition necessary for coating from the circulating stream; and then
coating the magnetic coating composition which is drawn out on to a non-magnetic support.

4,728,406
METHOD FOR PLASMA - COATING A SEMICONDUCTOR BODY
Arindam Banerjee, Madison Heights; Prem Nath, Rochester, and Herbert C. Ovshinsky, Oak Park, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.
Filed Aug. 18, 1986, Ser. No. 897,246
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.29 16 Claims



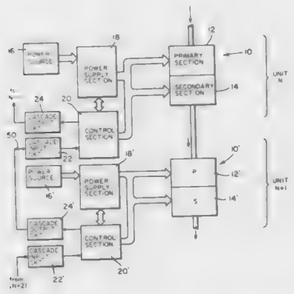
1. A method of manufacturing a semiconductor device of the type including a layer of transparent, electrically conductive material in electrical communication with and in superposed relationship to a body of semiconductor material; said method including the steps of:
providing said semiconductor body;
depositing said layer of transparent conductive material in a two step process; the first step of the two step process comprises: depositing a layer of protective transparent conductive material atop the body of semiconductor material by a first set of deposition parameters, said protective material adapted to substantially prevent damage to the semiconductor body by energetic vaporized species developed during th esubsequent sputtering deposition of transparent conductive material;
and the second step of said two step process comprises: sputtering said transparent, conductive material atop the layer of protective material; said sputtering step differing in at least one material deposition parameter from the deposition parameters of said first set, whereby the transparent conductive material is coated upon the semiconductor body at a high rate of deposition without damaging said semiconductory body.

4,728,407
MULTIPLE CHAMBER SILVER EXTRACTION SYSTEM
Ronald C. Nusbaum, 1110 Delaware Ave., Ste. E, Longmont, Colo. 80501
Continuation-in-part of Ser. No. 715,377, Mar. 25, 1985, Pat. No. 4,619,749. This application Sep. 30, 1986, Ser. No. 913,403
Int. Cl.[4] C25C *1/20, 7/06;* C25B *15/02*
U.S. Cl. 204—228 19 Claims

1. In combination with apparatus for recovering metal from a body of electrolytic liquid conducting plating current therethrough between at least two electrodes, including adjustable current control means connected to one of the two electrodes for changing said plating current supplied thereto from a voltage source, resistive means connected in series with the other of the two electrodes for establishing an electrode potential on the other of the electrodes dependent on resistance characteristics of the liquid, and reference voltage selection means connected to said source for selectively generating a reference potential, the improvement comprising control means connected to said one of the two electrodes and the reference

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voltage selection means for adjusting the current control means in accordance with the reference potential and means



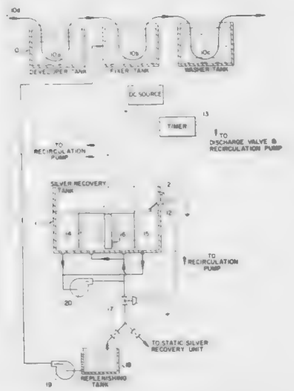
connected to both of the electrodes for regulating the reference potential to correctively change the plating current.

4,728,408

COMPACT ELECTROLYTIC SILVER RECOVERY SYSTEM

James C. Palazzolo, 1815 Lakewood Dr., Salt Lake City, Utah 84117, assignor to James C. Palazzolo, Salt Lake City, Utah

Continuation-in-part of Ser. No. 619,634, Jun. 11, 1984, Pat. No. 4,561,957. This application Dec. 27, 1985, Ser. No. 813,690
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.[4] C25G *15/00*
U.S. Cl. 204—229 **6 Claims**



1. An electrolytic silver recovery unit for recovering silver from film fixer solutions comprising:

container means for holding film processing system fixer solution from which silver is to be removed;

at least one removable cathode assembly sized to fit within the container means;

at least one anode assembly sized and shaped to cooperate electrolytically with the cathode assembly;

circulation means for circulating the fixer solution around the cathode and anode assemblies;

switch means for both activating the circulation means and a timer unit when the switch means is in an on position and later deactivating the circulation means and a discharge valve when the switch means is in an off position, the switch means being activated to an on position by the fixer solution's attainment of a predetermined greater amount in the container means and being deactivated to an off position by a decrease in the fixer solution's volume to a predetermined lesser amount in the container means;

a timer unit connected to and activated by the switch means, the timer unit also connected to an electrode switch which controls electrical energization of the cathode and anode assemblies, the timer unit preset to control flow of electrical energy to the anode and cathode assemblies for a predetermined time period, the timer also activating a discharge control valve; and

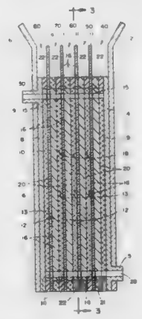
discharge valve-controlled drain means for draining desilvered fixer solution from the container means, the discharge valve-controlled drain means being opened by the timer unit at the conclusion of the predetermined time period and being closed by the switch means being deactivated to an off position.

4,728,409

PERFORATED BIPOLE ELECTROCHEMICAL REACTOR

Colin W. Oloman, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 2, 1985, Ser. No. 803,248
Claims priority, application Canada, Jan. 25, 1985, 472861
Int. Cl.[4] C25B *1/30*
U.S. Cl. 204—256 **11 Claims**



1. An electrochemical reactor, comprising:

(a) spaced apart anode and cathode monopolar electrodes; and

(b) at least one bipolar electrode disposed between said monopolar electrodes, each bipolar electrode having openings therethrough occupying a sufficient surface area thereof, such tat gases from one side of said bipolar electrode can become disengaged therefrom by passing through the openings; and

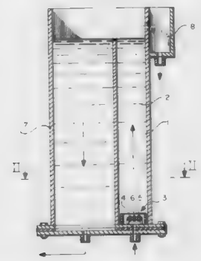
(c) an electronically insulating and electrolytically conducting separator which suppresses gas flow therethrough, disposed against a first side of each bipolar electrode such that each bipolar electrode is separated from the next adjacent electrode.

4,728,410

PROCESS FOR THE SEPARATION OF EMULSIONS CONTAINING WATER AS A CONTINUOUS PHASE AND DEVICE FOR THE APPLICATION OF THE PROCESS

Edgar Renzler, Siegstrasse 2, Köln 40 5000, Fed. Rep. of Germany

Division of Ser. No. 865,735, Apr. 11, 1986. This application Dec. 19, 1986, Ser. No. 943,508
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429612; Oct. 7, 1984, 3437055; Nov. 12, 1984, 3444074; Apr. 26, 1985, 3515095; Jul. 20, 1985, 3525963
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—275 **3 Claims**



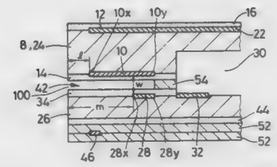
1. An apparatus for the purification of an aqueous effluent containing a fatty-oil substance as an impurity comprising an electrolytic cell, said cell having at least one pair of inert electrodes, said inert electrodes having at least one non-electric touching decomposable hydroxyl producing metal structure therebetween, said metal structure being decomposable under acidic to alkaline conditions of between a pH of 4 to a pH of 12, electric means to impinge a D.C. current on said electrodes of 0.1 to 4 Ah/dm^3 whereby said metal structure is decomposed as a metal hydroxyl complex and wherein said thus produced metal hydroxyl complex combines with said fatty-oily substance for separating said fatty oil substance complex from said effluent.

4,728,411

ELECTROCHEMICAL DEVICE

Syunzo Mase, Tobishima, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 17, 1985, Ser. No. 809,745
Claims priority, application Japan, Dec. 20, 1984, 59-270043
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—425 **22 Claims**



1. An electrochemical device for determining the concentration of a component in a measurement gas, comprising:

a plurality of superposed planar layers;

an electrochemical pumping cell including a first planar solid electrolyte body and at least a first electrode and a second electrode disposed in contact with said first planar solid electrolyte body, said first electrode having an innermost transverse end and an outermost transverse end;

an electrochemical sensing cell including a second planar solid electrolyte body, and a third electrode and a fourth electrode disposed in contact with said second planar solid electrolyte body, said third electrode having an innermost transverse end and an outermost transverse end; and

means for defining a transverse measurement-gas space having a transverse axis, said measurement-gas space communicating with an external space in which the measurement gas exists through an inlet opening, said inlet opening and transverse measurement-gas space having a predetermined diffusion resistance to said component in the measurement gas which is to be measured, said first electrode of the electrochemical pumping cell and said third electrode of the electrochemical sensing cell communicating with said measurement-gas space, wherein said outermost transverse end of said first electrode is located a distance "l" from said inlet along said transverse axis and said outermost transverse end of said third electrode is located a distance "m" from said inlet along said transverse axis, and said first and third electrodes are located on opposite sides of said measurement-gas space and are separated by a distance "w", such that the following relationship is satisfied:

$$m-l \geq 5w,$$

such that an average oxygen concentration along a transverse direction of said third electrode in communication with said measurement-gas space is less than an average oxygen concentration along a transverse direction of said first oxygen concentration along a transverse direction of said first electrode in communication with said measurement-gas space.

4,728,412

POUR-POINT DEPRESSION OF CRUDE OILS BY ADDITION OF TAR SAND BITUMEN

David J. Söderberg, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 19, 1986, Ser. No. 909,637
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—22 **12 Claims**

1. A process for reducing the pour point of a crude oil which comprises adding a pour-point depressant selected from the group consisting of a raw tar sands bitumen and hydrotreated tar sands bitumen to form a blend possessing a relatively lower pour point.

4,728,413

AGITATED DEWAXING EMPLOYING MODIFIED AGITATOR MEANS

Thomas E. Broadhurst, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 653,202, Sep. 24, 1984, abandoned. This application May 21, 1986, Ser. No. 865,426
Int. Cl.[4] C10G *43/08*
U.S. Cl. 208—33 **15 Claims**

1. A method for improving the filtration performance of a wax/oil slurry resulting from dewaxing waxy hydrocarbon oil under agitated conditions in a dewaxing plant which method comprises using an agitator means during the formation of the wax/oil slurry which agitator means possesses openings in the frontal area presented to the slurry during agitation which openings reduce the characteristic dimension of said agitator means so that the dimensionless number which results when the characteristic dimension of the agitator means is divided by the average wax crystal particle size is about 1500 or less.

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SOLVENT DEWAXING USING COMBINATION POLY (N-C_{24}) ALKYLMETHACRYLATE-POLY (C_8–C_{20}ALKYL (METH-) ACRYLATE DEWAXING AID

Theodore H. West, Sarnia, Canada, and David J. Martella, Princeton, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 21, 1986, Ser. No. 933,126
Int. Cl.[4] C10G *73/04*
U.S. Cl. 208—33 4 Claims

1. In solvent dewaxing process wherein a waxy hydrocarbon oil is contacted with a dewaxing solvent and a dewaxing aid and chilled so as to precipitate at least a portion of the wax present in said waxy hydrocarbon oil and the preciptated wax is removed by means of liquid/solid separation means yielding a dewaxed oil, the improvement consisting of using as the dewaxing aid a combination of (A) poly(n-C_{24}) alkylmethacrylate polymer and (B) a lower melting point poly (C_8–C_{20}) alkyl(meth)acrylate polymer.

4,728,415

PROCESS FOR THE MANUFACTURE OF LUBRICATING OILS

Eugene E. Unmuth; Ralph J. Bertolacini, both of Naperville, and John A. Mahoney, Glen Ellyn, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 686,096, Dec. 24, 1984. This application Dec. 22, 1986, Ser. No. 945,084
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] C10G *67/04*
U.S. Cl. 208—87 25 Claims

14. A process for reducing the pour point of a hydrocarbon feedstock containing nitrogen and sulfur-containing compounds which comprises:

passing the hydrocarbon feedstock to a solvent extraction zone wherein the hydrocarbon feedstock is extracted with a solvent to remove a portion of the aromatic compounds contained in the hydrocarbon and thereby form an extraction zone raffinate;

passing at least a portion of the extraction zone raffinate to a hydrotreating zone wherein hydrogen is contacted with hydrocarbon feedstock in the presence of a hydrotreating catalyst at hydrotreating conditions wherein a substantial portion of the nitrogen and sulfur-containing compounds are converted to hydrogen sulfide and ammonia to form a hydrotreating zone effluent;

passing at least a portion of the effluent from the hydrotreating zone to a stripping zone wherein hydrogen sulfide and ammonia are removed from the hydrotreating zone effluent to form a stripping zone effluent;

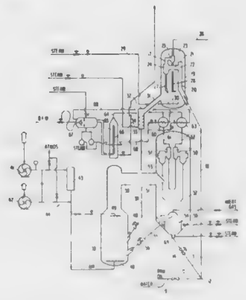
passing at least a portion of the stripping zone effluent to a dewaxing zone wherein hydrogen is contacted with the stripping zone effluent at catalytic dewaxing conditions in the presence of a catalyst composition comprising a borosilicate molecular sieve dispersed within a porous refractory inorganic oxide matrix comprising silica-alumina wherein alumina is present in the silica-alumina in an amount ranging from about 5 to about 50 wt. % based on the total amount of silica-alumina present, and at least one hydrogenation component selected from the group consisting of Group VIB and Group VIII metals.

4,728,416

CRACKING BLENDS OF GAS OIL AND RESIDUAL OIL

George D. Myers, deceased, late of Ashland, Ky. (by Virginia K. Myers, administratrix), assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 94,216, Nov. 14, 1979, Pat. No. 4,341,624, and a continuation-in-part of Ser. No. 94,092, Nov. 14, 1979, Pat. No. 4,332,673, and a continuation-in-part of Ser. No. 246,751, Mar. 23, 1981, Pat. No. 4,376,696, and a continuation-in-part of Ser. No. 246,782, Mar. 23, 1981, Pat. No. 4,375,404, and a continuation-in-part of Ser. No. 246,791, Mar. 23, 1981, Pat. No. 4,376,038. This application Apr. 28, 1981, Ser. No. 258,264
Int. Cl.[4] C10G *11/02*
U.S. Cl. 208—120 18 Claims



1. In a catalytic cracking process unit wherein a gas oil feed is cracked in a cracking zone at an elevated temperature in the presence of a cracking catalyst, the cracking catalyst is regenerated in a regeneration zone by burning coke off the catalyst, and catalyst is circulated between the cracking zone and the regeneration zone, the improvement for obtaining a naphtha product of improved octane number comprising introducing sufficient of a nickel and vanadium metals-containing heavy feedstock with said gas oil feed introduced into the cracking zone to deposit nickel and vanadium metals on said catalyst and raise the nickel and vanadium metals-content of said catalyst to a level ranging from about 1500 to about 6000 parts per million of said metals expressed as equivalent nickel, based on the weight of the catalyst, and maintaining said nickel and vanadium metals level on the catalyst by withdrawing high nickel and vanadium metals-containing catalyst and adding low nickel and vanadium metals-containing catalyst to the regeneration zone.

4,728,417

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Arthur W. Aldag, Jr.; Simon G. Kukes, and Stephen L. Parrott, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1986, Ser. No. 887,689
Int. Cl.[4] C10G *45/04, 45/60*
U.S. Cl. 208—216 R 49 Claims

1. A process for hydrofining a hydrocarbon-containing feed stream comprising the steps of:

introducing an additive comprising a mixture of at least one decomposable molybdenum compound selected from the group consisting of molybdenum dithiophosphates and molybdenum dithiocarbamates and at least one decomposable nickel compound selected from the group consisting of nickel dithiophosphates and nickel dithiocarbamates into said hydrocarbon-containing feed stream;

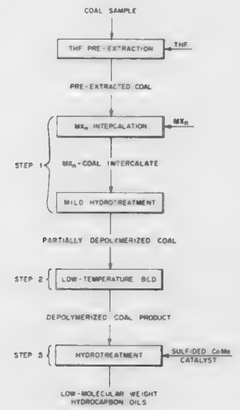
contacting the hydrocarbon-containing feed stream containing said additive under suitable hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table.

4,728,418

PROCESS FOR THE LOW-TEMPERATURE DEPOLYMERIZATION OF COAL AND ITS CONVERSION TO A HYDROCARBON OIL

Joseph S. Shabtai, Salt Lake City, Utah, and Ikuo Saito, Sakuramura, Japan, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 23, 1985, Ser. No. 790,430
Int. Cl.[4] C10G *1/06*
U.S. Cl. 208—413 20 Claims



1. A process for the low temperature depolymerization and liquefaction of fine particles of coal comprising the combined, sequential steps of:

intercalating the fine particles of coal with a catalytic amount of a metal chloride catalyst;

a first mild hydrotreating of the intercalated coal to produce a partially depolymerized coal as a first intermediate product mix, said product mix comprising depolymerized coal particles containing catalyst and an organic liquid;

separating substantially said coal particles from said organic liquid;

removing substantially said catalyst from said coal particles;

recombining said substantially catalyst depleted coal particles and organic liquid;

reacting said first intermediate product with a base-catalyzed depolymerization agent consisting essentially of an alcoholic solution of an alkali metal hydroxide to produce depolymerized coal as a second intermediate product; and

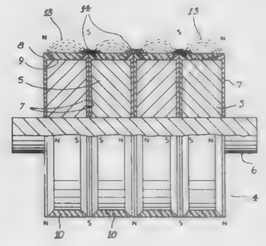
hydroprocessing the second intermediate product with a sulfided cobalt molybdenum catalyst to produce a hydrocarbon oil as a final product.

4,728,419

MAGNETIC ROLL-TYPE SEPARATOR

Bronislaw Grun, 1 Protea Close, Malanshof Extension 4, Randburg, South Africa

Continuation-in-part of Ser. No. 558,939, Dec. 7, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 781,954
Claims priority, application South Africa, Dec. 17, 1982, 82/9287
Int. Cl.[4] B03C *1/12*
U.S. Cl. 209—219 5 Claims



1. A magnet roll including a plurality of axially disposed substantially cylindrical permanent magnets, each magnet comprising an axial segment of the roll, each segment having a peripheral surface and having axially opposed ends, the segments being disposed in the roll so that adjacent magnet roll segment ends are of like polarity, and pole pieces disposed between adjacent ends of the segments, each pole piece comprising a laminate of two discs disposed adjacent one another, each disc being sufficiently thin to be saturated by magnetic flux lines, each disc defining a peripheral flange which projects from the disc in an axial direction, so that the pole piece has a larger cross-sectional area at its periphery, and so that the axial width of the flange of a disc is no more than five times the axial width of the disc; the discs of each laminate of two discs having their flanges projecting away from each other; each disc extending axially partially over the adjacent segment; the flanges further being shaped and disposed for directing magnetic flux lines toward the surface of the roll the flange of each disc has a radially innermost portion thereof which is at a maximum axial width, the flange of each disc has a radially outermost portion thereof at the periphery of the disc which is at a minimum axial width, the axial width of the flange of each disc tapers from the maximum width at the radially innermost portion to the minimum width at the radially outermost portion at the peripheral edge of the flange, and the flanges of adjacent discs of a pole piece thus defining a frusto-triangular section.

4,728,420

AIR AND WATER FLOW SYSTEM FOR AQUARIUM

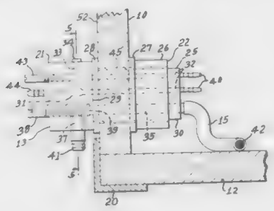
Ralph Abercia, Jr., 12472 Memorial Dr., Houston, Tex. 77024

Filed Oct. 30, 1985, Ser. No. 793,125
Int. Cl.[4] A01K *63/00;* F16K *21/00*
U.S. Cl. 210—169 18 Claims

15. A fixture for an aquarium to couple a plurality of fluid conduits for delivery into and out of an aquarium, said fixture being adapted to be positioned through an opening in a wall of the aquarium and extending outwardly from both sides of the wall of the aquarium and sealed in watertight relation to the wall of the aquarium, said fixture comprising an elongated body generally conforming to the opening in the wall of the aquarium and including adjacent one end thereof a head portion larger than the opening in the wall of the aquarium and at the other end thereof external screw threads, a nut threadedly engaged with said external screw threads, a plurality of elongated passageways extending lengthwise through said body, a lateral passageway connecting at least two of said elongated

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passageways for delivery of air thereto, internal threads in said at least two of said elongated passageways, and adjustable



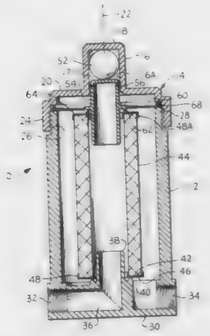
screws threadedly connected with said internal threads and adapted to control the flow of air therethrough.

4,728,421

FILTER APPARATUS FOR UTILIZATION WITH HOLLOW CYLINDRICAL FILTER ELEMENTS

Henry Moddemeyer, Los Angeles County, Calif., assignor to Penguin Pumps, Inc., San Valley, Calif.

Filed May 14, 1986, Ser. No. 862,973
Int. Cl.⁴ B01D *27/08*
U.S. Cl. 210—232 **3 Claims**



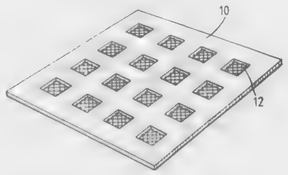
1. Filter apparatus comprising:
a hollow cylindrical filter element having a first open end and a second open end;
a cylindrical shell member terminating at a first end in means defining a base having a filter inlet and a filter outlet and terminating at a second end in means defining a threaded longitudinal surface,
said base defining means including means adapted to receive the first open end of the filter element so as to form a seal therewith between said inlet and said outlet;
a cap terminating in a hollow cylindrical portion closed at one end thereof,
said cap having means defining a threaded portion remote from said hollow cylindrical portion,
said threaded cap portion being complementary to said shell threaded longitudinal surface,
whereby said cap may be selectively screwed onto or off of said shell member;
a resilient compressor ball disposed within the cap hollow cylindrical portion so as to abut the closed end thereof;
a tubular compressor axially disposed within the cap hollow cylindrical portion so as to contain the resilient ball therewithin; and
sealing means formed on said tubular compressor so as to be operable to engage the second open end of the filter element to form a seal thereacross in response to compression of the resilient ball between the tubular compressor and the cap hollow cylindrical portion closed end when the cap is screwed onto the shell.

4,728,422

SIFTING FRAME ASSEMBLY WITH DIFFERENTIALLY TENSIONED SCREENS

Marshall G. Bailey, Larachmor, Scotland, assignor to Thule United Limited, Aberdeen, Scotland

Filed Jul. 19, 1985, Ser. No. 756,714
Claims priority, application United Kingdom, Jul. 21, 1984, 8418658
Int. Cl.⁴ B01D *33/22*
U.S. Cl. 210—314 **9 Claims**



1. A sifting screen assembly for use in a vibratory sifting machine comprising:
a frame;
upper and lower cloth screens each made up of sets of strands, the strands of each set crossing the strands of the other set, said cloth screens being adhesively secured at their peripheries around the frame under different tensions which enable said upper and lower cloth screens to vibrate differentially,
said upper and lower screens being relatively positioned having regard to their mesh sizes such that strands of the lower cloth screen align with the openings in the upper cloth screen,
a supporting cloth screen adhesively secured along its periphery to the frame to underlie the said lower cloth screen under a tension greater than the tensions of said upper and lower cloth screens, and
said supporting cloth screen being of coarser mesh than the meshes of the lower and upper cloth screens and serving as a support for maximizing the unclogging action which occurs as the upper and lower differentially vibrating cloth screens strike one another, with the strands of the lower cloth screen penetrating the openings of the upper cloth screen to significantly improve the unclogging action of the screen;
said frame being a rectilinear frame of rigid struts similar to a picture frame with transversely extending intermediate struts to define apertures within the frame,
said frame comprising a plate of fiber reinforced material having apertures formed therein which are much greater in area than the openings in the cloth screens, said cloth screens being bonded by a bonding agent to said frame over substantially the entire surface area of said frame, thereby securing the screens to said frame and maintaining the differential tensioning of the screens.

4,728,423

PLURAL CYLINDRICAL FILTER UNITS WITH DISPLACEMENT SUPPORT

Soichi Kuwajima, Urawa, Japan, assignor to Nihon Schumacher Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 887,021
Claims priority, application Japan, Jul. 17, 1985, 60-155991
Int. Cl.⁴ B01D *29/26, 29/32*
U.S. Cl. 210—323.2 **5 Claims**



1. A filter element for use in a filter apparatus, comprising:
a plurality of cylindrical filter units having perforated surfaces for removal of contaminants from a fluid to be cleaned, said filter units being coaxially aligned and held end-to-end in the axial direction thereof to form an integral tubular structure, which has top and bottom openings at upper and lower ends thereof;
a top end cap provided over the top opening for tight sealing thereof and having support means for the tubular structure;
a bottom end cap provided over the bottom opening for tight sealing thereof, said bottom end cap having a central aperture for passage therethrough of said fluid after filtration thereof; and
a cylindrical displacement member disposed coaxially within said tubular structure between the top and bottom end caps, a small clearance being left between the displacement member and the inner wall surface of the tubular structure, said cylindrical displacement member being a hermetically enclosed hollow cylindrical body connected to the top and bottom end caps so as to function to couple and pull together the two end caps and apply a compressive force to said filter units, whereby a fluid can flow radially inwardly through the filter units and out through the bottom end cap.

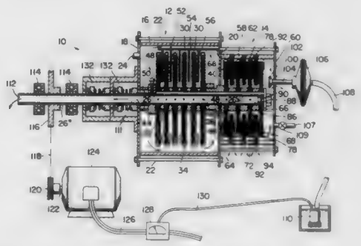
4,728,424

DYNAMIC SOLID-LIQUID FILTER APPARATUS

Kaname Miura, Tokyo, Japan, assignor to International Metal Finishing, Inc., Palm Beach, Fla.

Filed Oct. 9, 1985, Ser. No. 785,752
Claims priority, application Japan, Oct. 11, 1984, 59-213100
Int. Cl.⁴ B01D *29/26*
U.S. Cl. 210—331 **9 Claims**

1. A dynamic filter apparatus for the separation of a slurry into solid and liquid comprising:
(a) a housing having a slurry inlet for admitting the slurry to be filtered;
(b) a hollow shaft rotatably mounted within the housing and having at least one row of bores formed therethrough at constant longitudinal spacings;
(c) a plurality of rotary filter discs mounted on the hollow shaft for joint rotation therewith and positioned in register with the respective bores in the hollow shaft, each filter disc comprising a carrier disc of solid construction and a meshed filter element enveloping the exterior surfaces of the carrier disc for the passage of filtrate therethrough onto the surfaces of the carrier disc;
(d) a gap between the hollow shaft and each carrier disc for the passage of the filtrate into the hollow shaft through the bores therein;
(e) a plurality of baffles mounted in fixed relation to the housing and arranged alternately with the filter discs to



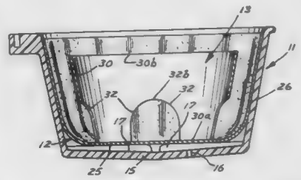
regulate the flow of the slurry over the filter elements of the filter discs; and
(f) at least one flow accelerating member formed on each filter disc so as to protrude therefrom, the flow accelerating members being effective to create cavities in the slurry within the housing and hence to expedite the flow of the slurry between the filter discs and the baffles.

4,728,425

COFFEE FILTER AND ANNULAR RETAINER

Larry G. Sandvig, 6821 Russell Ave., S., Richfield, Minn. 55423

Filed Sep. 26, 1986, Ser. No. 912,994
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—477 **10 Claims**



1. Filter apparatus for containing coffee grounds from which favoring components are separated by liquid and permitting the discharge of liquid with dissolved flavoring components while blocking the passage of ground coffee with the dissolved flavoring components, comprising a basket for receiving liquid therein and having a bottom wall and a perimetric wall joined to the basket bottom wall to extend thereabove, the basket bottom wall having at least one liquid discharge opening, a paper filter in the basket for containing coffee grounds while permitting the passage of liquid with dissolved flavor components therethrough, said filter having a bottom wall supported by the basket bottom wall and a perimetric wall portion joined to the filter bottom wall to extend thereabove and upwardly along the basket perimetric wall, and an annular retainer within the basket to limit collapsing movement of the filter perimetric wall portion, said retainer being surrounded by the filter perimetric wall portion and having a bottom edge, an inner peripherial surface, a top edge, and means defining a plurality of openings adjacent to the retainer bottom edge for permitting liquid flow to and from within the confines of the retainer, the retainer having a non-perforated, vertically extending wall portion that has the inner surface and is of an area substantially greater than the area of said openings, the retainer bottom edge being adjacent to the filter bottom wall and sup-

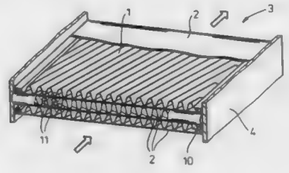
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ported by the filter bottom wall, the retainer top edge extending to a higher elevation than the basket bottom wall and the maximum level that the liquid rises to in the basket, the filter bottom wall being located vertically between the retainer bottom edge and the basket bottom wall and said retainer being removable from the basket separate from the filter to leave the filter bottom wall in contact with the basket bottom wall.

4,728,426
FILTER PACK

Volker Rüdinger, Stutensee; Hans Leibold, Ettlingen; Ulrich Schlör, Darmstadt, and Werner Alken, Weinheim, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,715
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3542963
Int. Cl.⁴ B01D *27/06*
U.S. Cl. 210—493.3 **9 Claims**



1. In a filter pack for fluid filtration, comprising means defining filter medium surfaces forming a folded filter medium and a plurality of spacers, with each surface having two sides and being disposed between a respective pair of the spacers and wherein each spacer has two connecting edges and a corrugated configuration, the improvement wherein:
   the corrugations of each respective pair of spacers adjacent the two sides of one filter medium surface are locally oriented at an angle toward one another;
   respective pluralities of the corrugations of each of the spacers of each respective pair of spacers intersect the respective two connecting edges; and
   each spacer and the connecting edges thereof are disposed on a same side of one of the filter medium surfaces in contact therewith and the connecting edges have a straight uncorrugated termination terminating on said same side.

4,728,427
REDUCTION OF TRACE ELEMENTS TO THE ELEMENTAL FORM BY MICROORGANISMS

Nathaniel W. Revis, 1060 W. Outer Dr., Oak Ridge, Tenn. 37830; Suzanne B. Benson, 73 Paint Rock Ferry Rd., Apt. 12, Kingston, Tenn. 37763; Tanya R. Osborne, 108 Lynwood La., and Charles T. Hadden, 165 Waddell Cir., both of Oak Ridge, Tenn. 37830

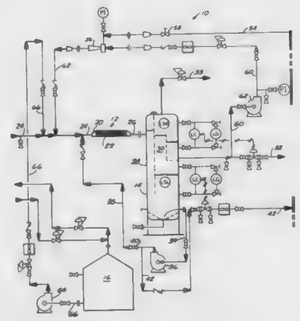
Continuation-in-part of Ser. No. 918,768, Oct. 14, 1986. This application Apr. 3, 1987, Ser. No. 34,329
Int. Cl.⁴ C02F *3/34*
U.S. Cl. 210—611 **10 Claims**

1. A process for reducing the concentration of ionic species of mercury in an aqueous waste solution by conversion to elemental mercury, comprising contacting the waste solution containing ionic species of mercury with a culture of *Pseudomonas maltophilia* ATCC 53510 in the presence of an amount of nutrient medium sufficient to satisfy nutritional requirements of cells of the culture of *Pseudomonas maltophilia* ATCC 53510.

4,728,428
WATER DEGREASING SYSTEM AND METHOD

Paul C. Broussard, Sr., Lafayette, La., assignor to Paul C. Broussard, Inc., Lafayette, La.

Filed Dec. 5, 1986, Ser. No. 938,397
Int. Cl.⁴ B01D *12/00*
U.S. Cl. 210—634 **17 Claims**

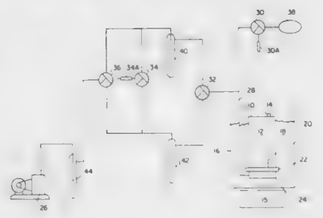


1. A water degreaser system comprising:
(a) absorber means for receiving and treating produced-water with absorbing fluid;
(b) processing separator means for receiving treated water from said absorbing means and separating decontaminated water from said absorbing fluid;
(c) means connected to said absorber means and processing separator means for recycling unspent absorbing fluid to said absorber means;
(d) means connected to said processing separator for receiving spent absorbing fluid and reclaiming said absorbing fluid for further use; and
(e) means connected to said absorbing fluid reclaiming means, said processing means and said absorber means for reintroducing reclaimed absorbing fluid into said system, said reintroducing means including an eductor jet pump driven by decontaminated water from said processing separator means.

4,728,429
MEMBRANE PERMEATION PROCESS FOR DEHYDRATION OF ORGANIC LIQUID MIXTURES USING SULFONATED ION-EXCHANGE POLYALKENE MEMBRANES

Israel Cabasso, 131 Buckingham Ave., Syracuse, N.Y. 13210, and Emmanuel Korngold, P.O. Box 1025, Beer-Sheva 84110, Israel

Filed Jun. 27, 1985, Ser. No. 749,503
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—638 **30 Claims**

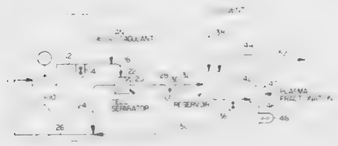


1. In a process for dehydrating a feed mixture comprised of organic liquids using a polymer membrane having an upstream side and a downstream side wherein a permeant, which is a component of the feed mixture or a mixture comprised of the feed mixture enriched in one of its components, is caused to selectively sorb into the upstream side of the membrane and diffuse or flow through the membrane, and the permeant is desorbed on the downstream side of the membrane, the improvement which comprises:
   using as said membrane a sulfonated ion-exchange polyalkene prepared by reacting, in the liquid or gas phase, chlorine and sulfur dioxide with a linear poly (C_2–C_{18} alkene) in the presence of a free radical initiating catalyst or light to produce a chlorsulfonated polyalkene and subsequently either hydrolyzing the chlorsulfonated polyalkene to produce a cation-exchange sulfonated polyalkene or quaternarizing or treating the chlorsulfonated polyalkene with an amine to produce an anion-exchange sulfonated polyalkene, the sulfonated ion-exchange polyalkene having a degree of sulfonation which will permit said permeant to be selectively sorbed into said membrane, the ion-exchange polyalkene containing a counter-ion, said membrane being at least 20% amorphous in structure and having a charge density between about 0.2 meq/gr and about 4.5 meq/gr.

4,728,430
DIAFILTRATION METHOD

Anthony J. DiLeo, Westford; Gastón de los Reyes, Framingham, and Lisa M. Waranch, Sudbury, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 10, 1986, Ser. No. 828,105
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—639 **4 Claims**



1. The process for separating whole blood into a cellular component and a plasma component and for separating said plasma component into a high molecular weight plasma fraction and a low molecular weight plasma fraction consisting essentially of:
(a) withdrawing whole blood from a patient,
(b) continuously introducing anticoagulant into whole blood,
(c) passing the mixture of whole blood and anticoagulant through a first separating means adapted to separating whole blood to form a cellular component and a plasma component,
(d) adding a physiologically acceptable liquid diluent to said plasma component at a diluent flow rate defined by Equation 1:

Equation 1

$$Q_D = \frac{\alpha(1-h_o)}{\alpha(1-h_o)+1} Q_{PI}\left[(R''-1)+\sigma R''\left(\frac{1}{R}-1\right)+\left(\frac{1}{x}-\frac{\sigma R''}{R}\right)\exp\left(-\frac{R}{R-1}\ln[1+(R-1)r]\right)\right]-\frac{Q_{PI}}{\alpha(1-h_o)+1}$$

thereby to form a mixture of said diluent and said plasma component,
(e) separating said mixture of diluent and said plasma component into a high molecular weight plasma fraction and a low molecular weight plasma fraction,
(f) recycling at least a portion of said high molecular weight fraction to be admixed with said mixture of diluent and said plasma component, and
(g) recycling said cellular component and said low molecular weight plasma component directly to said patient.

4,728,431
PERVAPORATION METHOD FOR SEPARATING LIQUIDS IN MIXTURE

Shigehiro Nagura; Minoru Takamizawa, and Akira Yamamoto, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 771,985
Claims priority, application Japan, Sep. 21, 1984, 59-198373
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—640 **4 Claims**

1. A pervaporation method for the separation of ethyl alcohol from or enrichment of ethyl alcohol in a liquid mixture of water and ethyl alcohol which comprises the steps of:
(a) partitioning the liquid phase from the adjacent vapor phase with a membrane; and
(b) producing a pressure difference between the liquid mixture and the vapor phase, the pressure being higher in the liquid mixture than in the vapor phase, in which the membrane is made of a polymeric composition comprising from 50 to 95 percent by weight of an organosilyl-substituted polyenic polymer composed of the monomeric moieties represented by the general formula

$$+CR^1=C+,$$
$$\quad\quad\quad |$$
$$\quad\quad\quad SiR_3$$

the group denoted by R^1 being a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms and the groups denoted by R each being a hydrogen atom, a monovalent hydrocarbon group having 1 to 8 carbon atoms or a silicon-containing organic group represented by the general formula

$$—CH_2—SiMe_2R^2,$$

in which Me is a methyl group and R^2 is a lower alkyl group having 1 to 4 carbon atoms, and from 50 to 5 percent by weight of a poly(trimethyl vinyl silane).

4,728,432
METHOD FOR DECONTAMINATING BLOOD

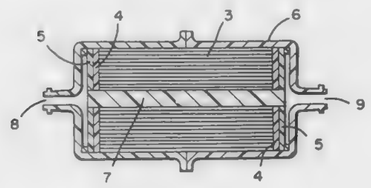
Masafumi Sugiyama, and Hideki Kawanishi, both of Hiroshima, Japan, assignors to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Continuation-in-part of Ser. No. 667,410, Nov. 5, 1984, abandoned, which is a continuation of Ser. No. 514,842, Jul. 18, 1983, abandoned. This application May 14, 1986, Ser. No. 863,470
Claims priority, application Japan, Aug. 10, 1982, 57-137914
Int. Cl.⁴ B01D *13/00, 15/00*
U.S. Cl. 210—646 **17 Claims**

1. A method for removing soluble poisonous substances contained in blood by hemoperfusion comprising
providing a support;
attaching a porous membrane to said support, said membrane having a thickness in the range of approximately 10–400 microns and containing a powdery or fine particu-

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late adsorbent for removing soluble poisonous substances from blood; and



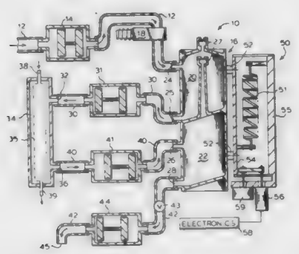
bringing blood into contact with said adsorbent-containing membrane, thereby effectively removing said poisonous substances from said blood.

4,728,433

ULTRAFILTRATION REGULATION BY DIFFERENTIAL WEIGHING

Robert J. Buck, Fairfield; John Burbank, Ridgefield, and John R. Montgomery, Fairfield, all of Conn., assignors to CD Medical, Inc., Miami Lakes, Fla.

Filed Feb. 2, 1984, Ser. No. 576,230
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—646 **14 Claims**



8. A method for regulating ultrafiltration during hemodialysis comprising:

supplying blood to and removing blood from a hemodialyzer;

supplying fresh dialysate to an inlet chamber of a differential weighing receptacle and concurrently removing spent dialysate from an outlet chamber of said receptacle;

weighing said fresh dialysate in said receptacle, and, upon reaching a pre-selected weight level when said outlet chamber is substantially empty, preventing the further flow of fresh dialysate into said inlet chamber;

allowing only said fixed amount of fresh dialysate, by weight, to flow through said hemodialyzer;

collecting spent dialysate including ultrafiltrate, emerging from said hemodialyzer into said outlet chamber and weighing it over a time period not greater than the time period for said fixed amount of dialysate to flow through said hemodialyzer;

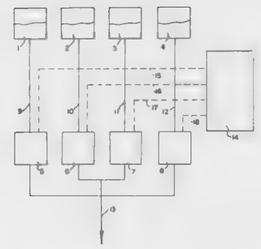
determining the weight differential between said fixed amount of fresh dialysate and said spent dialysate to monitor and control the amount and rate of ultrafiltrate removed from blood in the hemodialyzer.

4,728,434

LIQUID CHROMATOGRAPHY

Paul F. Trafford, Northampton, United Kingdom, assignor to Magnetopulse Limited, Northants, United Kingdom

Filed Feb. 4, 1987, Ser. No. 10,854
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—656 **4 Claims**



1. A method of mixing solvents providing an eluent in a process of liquid chromatography in order to provide a predetermined elution gradient having a desired rate of flow and containing a plurality of liquids in desired proportions, wherein the respective liquids are each supplied to a common conduit via an adjustable flow control valve presenting a resistance to fluid flow that varies in a known relationship to the setting of the valve, a predetermined pressure drop (ΔH) is maintained for each liquid across the corresponding control valve, and each valve is adjusted to a setting corresponding to a predetermined known flow resistance (L) in order to produce a corresponding rate of flow (I) of the liquid through the control valve such that the relationship between the individual rates of flow of the respective liquids corresponds to the desired proportions of the liquids in the final mixture and the total of the individual rates of flow corresponds to the desired rate of flow of the liquid mixture, the setting position of each valve being determined by calculation according to the formula

$$L \propto \sqrt{\frac{\Delta H/S}{I}}$$

where S is the specific gravity of the liquid flowing through the valve.

4,728,435

DECOLORIZATION OF AQUEOUS GLYOXAL SOLUTIONS

Guenther Mueller, Ludwigshafen; Rolf Ramsteiner, Neuhofen; Fritz Graf, Speyer, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,723
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536263
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—670 **14 Claims**

1. A process for decolorizing an aqueous glyoxal solution which process comprises:

passing said solution over a granulated active carbon which is arranged in a fixed bed and which has a maximum differential pore radius distribution of from 10 to 100 A, the Peclet number being from 500 to 5000,

discharging the decolorized glyoxal solution from said bed, then regenerating the active carbon bed at a temperature up to 90° C. by first treating it with an aqueous solution of an alkaline agent and then with an aqueous acid, and again passing further glyoxal solution to be decolorized over the active carbon bed regenerated in this manner.

4,728,436

ANIONIC POLYMERS CONTAINING 3-ACRYLAMIDO-3-METHYLBUTANOIC ACID AS SCALE INHIBITORS FOR PREVENTING OR REDUCING CALCIUM PHOSPHATE AND OTHER SCALES

James F. Kneller, LaGrange Park, and Donald A. Johnson, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 29, 1987, Ser. No. 67,590
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—701 **2 Claims**

1. A method for preventing calcium phosphate and calcium carbonate scales in industrial cooling waters which comprises treating such waters with a few parts per million of a water-soluble acrylic acid copolymer which contains from 10–80 mole percent of 3-acrylamido-3-methylbutanoic acid, said polymer having a molecular weight within the range of 5–100,000.

4,728,437

TREATMENT AND DISPOSAL OF WASTEWATERS CONTAINING CARBON BLACK AND ASH

Hans Gettert, Moerlenbach; Knut Kaempfer; Bruno Sander, both of Ludwigshafen; Siegfried Marquardt, Bobenheim-Roxheim, and K. Robert Mueller, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,808
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528598
Int. Cl.[4] C02F *1/54*
U.S. Cl. 210—710 **4 Claims**

1. A process for treating and disposing of wastewater which contain carbon black and ash and originate from high temperature processes and in which the carbon black is present in a very finely divided state and in which the ash contains vanadium and/or nickel, wherein

(a) calcium carbonate or calcium hydroxide is added, in an amount of from 2 to 10 kg/m^3, to the wastewaters,

(b) an aqueous solution of an organic flocculant is thoroughly dispersed in the wastewaters in the course of from 1 to 2 second to flocculate said carbon black.

(c) the wastewaters are flocculated in a flow-through stirred container for from 30 to 180 seconds while stirring at speeds of from 5 to 20 min^{-1},

(d) immediately thereafter the wastewaters are subjected to gravity filtration to obtain a carbon black sludge,

(e) the carbon black sludge is then immediately dewatered further by pressure filtration under from 0.5 to 15 bar, filter cake being obtained, and

(f) the resulting filter cake is aftertreated to convert the vanadium and nickel present into a water-insoluble or non-elutable form by dripping onto it, or spraying it with, an aqueous trivalent iron salt solution, in an amount corresponding to 1–20 kg of iron salt (calculated as 100%) per 1000 kg of filter cake, while retaining the solid, lumpy state.

4,728,438

PROCESS FOR REDUCING THE CONCENTRATION OF SUSPENDED SOLIDS IN CLARIFIED GEOTHERMAL BRINE

John L. Featherstone; Stefan T. Spang, both of El Centro, and David G. Newell, Palm Desert, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 27, 1985, Ser. No. 814,099
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—713 **23 Claims**

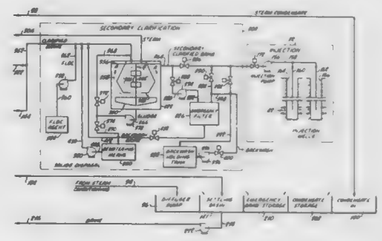
1. A process for reducing the concentration of residual solids suspended in geothermal brine overflow from a primary brine clarification stage in which a mixture of hot, flashed, silica-rich geothermal brine and suspended siliceous material is separated so as to provide a siliceous sludge and said geothermal brine overflow having a residual amount of solids still remaining suspended therein, and ferrous ions, the process comprising:

(a) flowing geothermal brine overflow, comprising at most about 300 ppm solids by weihgt, from said primary clarification stage into a secondary clarifier vessel;

(b) blanketing the geothermal brine overflow from the primary clarification stage in the secondary clarifier vessel with steam in order to prevent oxidation of ferrous ions in the geothermal brine;

(c) contacting said geothermal brine overflow from the primary brine clarification stage in the secondary clarifier vessel with a flocculating agent;

(d) discharging from the secondary clarifier vessel an underflow of flocculated solids and brine, and an overflow;



(e) combining a portion of said underflow of flocculated solids and brine with the geothermal brine overflow from the primary brine clarification stage to provide a preestablished solids concentration in reaction and flocculating regions of the secondary clarifier vessel in which the flocculating agent and brine are contacted;

(f) discharging from the secondary clarifier vessel a secondarily clarified brine overflow in which the concentration of residual suspended solids is substantially reduced over the concentration of residual solids suspended in the geothermal brine overflow from the primary clarification stage; and

(g) preventing circulation of the secondary clarifier vessel overflow and the secondary clarifier vessel underflow to the primary brine clarification stage.

4,728,439

METHOD FOR FLOCCULATING SUSPENSIONS CONTAINING SWELLED LAYERED CHALCOGENIDE

Garry W. Kirker, Washington Township, Gloucester County, and Sowmithri Krishnamurthy, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1987, Ser. No. 44,184
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—727 **15 Claims**

1. A method for flocculating an aqueous suspension comprising (1) a solid layered chalcogenide material having ion exchange sites and swelled with an intercalated hydrophobic swelling agent and (2) nonintercalated, excess hydrophobic swelling agent; which method comprises (a) contacting said suspension with ketone, water, and a cationic organic polymeric flocculant; (b) maintaining the resulting mixture at a sufficiently alkaline pH to prevent exchange of said intercalated hydrophobic swelling agent; and (c) separating said swelled layered chalcogenide material from said aqueous mixture; whereby said layered chalcogenide material remains swelled after said separating.

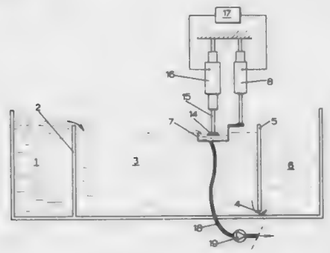
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4,728,440

APPARATUS AND METHOD FOR REMOVING A LIQUID FROM A MIXTURE OF LIQUIDS

Herman C. van Kuijeren, Heerhugowaard, Netherlands, assignor to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Oct. 10, 1986, Ser. No. 917,613
Claims priority, application Netherlands, Oct. 14, 1985, 8502799
Int. Cl.[1] B01D 17/02, 17/032
U.S. Cl. 210—744 12 Claims



1. Apparatus for removing a liquid from a mixture of liquids comprising a collecting tank for the mixture of liquids, a drain box in the collecting tank, the drain box having a weir for passage of liquid being removed from the collecting tank into the drain box and a conduit extending from the drain box for discharge of the liquid from the drain box, height-adjusting means rigidly attached to the drain box for vertically moving the drain box in the collecting tank, means for sensing the level of liquid in the drain box and control means for said height-adjusting means operating in dependence on the liquid level measured by the sensing means.

10. Method for removing a liquid from a mixture of liquids in a collection tank comprising the steps of

(a) flowing a portion of said mixture of liquids in said collection tank into a drain box within said collection tank,
(b) measuring the liquid level in the drain box to provide an output signal which is a measure of the liquid level,
(c) providing a rigid height-adjusting means,
(d) processing the output signal to obtain a control signal for said drain box height-adjusting means, and
(e) operating the height-adjusting means in dependence on the control signal to adjust the vertical location of the drain box, and continuing this adjustment until the liquid level in the box reaches a desired level.

4,728,441

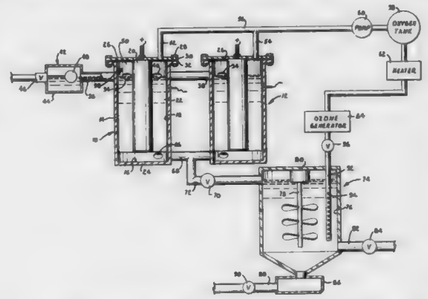
ELECTRICAL WASTE WATER TREATMENT SYSTEM EMPLOYING OXYGEN RECOVERY AND OZONE INJECTION MEANS

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Sep. 12, 1986, Ser. No. 906,794
Int. Cl.[4] C02F 1/78
U.S. Cl. 210—748 2 Claims

1. In a method of treating waste water containing organic substances, the steps of:

exposing the waste water to an electric field to produce electrolysis;
capturing oxygen gas released from the waste water during electrolysis;
aerating the waste water after electrolysis;
introducing oxygen gas captured during electrolysis into the waste water during the aerating step to reduce the biological oxygen demand of the waste water,
said capturing step including maintaining an enclosed accumulation space above the level of the waste water during electrolysis thereof within which to collect the oxygen gas; and transforming diatomic oxygen molecules released during electrolysis into ozone before introducing the oxygen gas



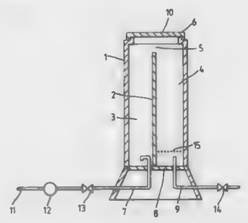
in the form of ozone into the waste water during the aerating step.

4,728,442

WATER TREATMENT

Victor C. Shuttlewood, Tarvin, and Roy K. Taylor, Royston, both of England, assignors to Chlor-Chem Ltd., Great Britain

Continuation of Ser. No. 733,992, May 14, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 930,984
Claims priority, application United Kingdom, May 17, 1984, 8412595
Int. Cl.[4] C02F 1/76
U.S. Cl. 210—755 7 Claims



1. In a method of sanitizing and disinfecting swimming pool water by adding an effective sanitizing and disinfecting amount of a sanitizing and disinfecting agent to the water, the improvement which comprises passing the water through or over a bed of said agent consisting of particles of trichloroisocyanuric acid having a mass median particle diameter of from 1 to 20 mm, not more than 10% by weight of which consists of particles of a diameter above the upper limit of the specified mass median particle diameter range, and not more than 10% by weight of which consists of particles of a diameter below the lower limit of the specified mass median particle diamerter range, said bed being contained in a chlorinator unit through which the water is passed, and thereby smoothing out variations in chlorine concentration in said swimming pool water as the particles dissolve and wherein the flow rate of the water is such as to dissolve 5 kg of the trichloroisocyanuric acid over a period of from 30 minutes to 12 hours.

4,728,443

TEXTILE SOFTENING DETERGENT COMPOSITION

Hans-Peter Rieck, Hofheim; Jürgen Grosse, Erftstadt, and Werner Gohla, Niederkassel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,376
Claims priority, application Fed. Rep. of Germany, May 5, 1984, 3416669
Int. Cl.[4] D06M 11/00
U.S. Cl. 252—8.6 8 Claims

1. A textile softening detergent composition containing from 5 to 70 wgt % of at least one surfactant, from 0.5 to 50 wgt % of at least one builder, from 1 to 20 wgt % of at least one crystalline laminated silicic acid or its alkali metal salt, and standard detergent aids, the crystalline laminated silicic acid or its alkali metal salt being of the general formula

$$M_2Si_xO_{2x+1}\cdot yH_2O$$

in which x stands for a number larger than 7.0, M stands for sodium, potassium or hydrogen, and y stands for a number of from 0 to 25, showing one or more reflexes unassignable to quartz, tridymite and cristobalite in the X-ray diffraction diagram in the range of the d-values of $3.0\text{–}4.0\cdot10^{-8}$ cm.

4,728,444

FILTRATION CONTROL ADDITIVE FOR INVERT EMULSION DRILLING FLUIDS AND METHOD OF PREPARATION

Dennis K. Clapper, Houston, and Darrell P. Salisbury, Sugarland, both of Tex., assignors to Milchem Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 798,965, Nov. 18, 1985. This application May 27, 1986, Ser. No. 867,083
Int. Cl.[4] C09K 7/06
U.S. Cl. 252—8.511 1 Claim

1. The method of drilling a well into a subsurface formation in which a water-in-oil emulsion drilling fluid containing a filtrate control additive is circulated into, through, and out of said well, said filtrate contial additive comprising: the pyrolyzed amine salts of humic acid obtained by intermixing and heating from about 185° C. to about the decomposition temperature of the resultant pyrolysis products for from between about three hours to about sixteen hours: (a) a finely-divided humic acidcontaining material selected from the group consisting of leonardite and lignite; and (b) a primary amine having alkyl radicals ranging from ten to twenty carbon atoms, or a primary amine having one alkyl-substituted phenyl radical, the alkyl radical having ten to twenty carbon atoms, or a secondary amine having at least one alkyl radical of eight to twenty carbon atoms, the said pyrolyzed amine salts of humic acid having high thermal stability in such water-in-oil emulsion drilling fluid at a temperature of not less than about 230° C., said method comprising the steps of: (1) introducing into said well said water-in-oil emulsion drilling fluid; and (2) circulating said drilling fluid into, through, and out of said well.

4,728,445

WELL DRILLING FLUIDS AND PROCESS FOR DRILLING WELLS

Arthur H. Hale, Sands Springs, Okla., assignor to Pony Industries, Inc., New York, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,717
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] C09K 7/02
U.S. Cl. 252—8.514 6 Claims

1. A composition comprised of

(a) an aquous base,
(b) a clayey material suspended in said aqueous base,
(c) a water-soluble sulfonated styrene-itaconic acid copolymer having a pre-sulfonation molecular weight of about 500 to about 10,000,
(d) a water-soluble polymer having a molecular weight of about 500 to about 30,000 prepared from acrylic acid, acrylamide, methacrylic acid, alkali metal salts of acrylic acid, alkali metal salts of methacrylic acid, alkyl esters of acrylic acid, alkyl esters of methacrylic acid, acrylamido alkyl sulfonate and mixtures of these,

the combined total weight of the polymers of (c) and (d) present in the composition being in the range of about 0.05 to about 10.0 pounds per barrel of composition and the weight ratio of the polymer of (c) to the polymer of (d) being in the range of about 90:10 to about 5:95.

4,728,446

CORROSION INHIBITOR FOR BRINES

Peter A. Doty, and William A. Larson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 636,436, Jul. 31, 1984, abandoned. This application Jul. 17, 1986, Ser. No. 886,455
Int. Cl.[4] E21B 43/00; C23F 11/18
U.S. Cl. 252—8.551 28 Claims

1. A composition for inhibiting corrosion of ferrous metals and alloys thereof comprising a solution of at least one alkali or alkaline-earth metal halide in water, said solution having a density equal to or less than about 16 pounds per gallon and further having corrosion inhibiting concentrations of zinc ions and thiocyanate ions, the total zinc ion concentration of said solution independently lying in the range of from about 0.05 percent by weight to about 5.0 percent by weight, and said thiocyanate ion concentration independently lying in the range of from about 0.05 percent by weight to about 1.5 percent by weight.

4,728,447

PROCESS AND PRODUCT FOR DISSOLVING SULFUR

Yves Labat, Pau, France, assignor to Societe Nationale Elf Aquitaine, France

Filed Dec. 3, 1985, Ser. No. 804,665
Claims priority, application France, Dec. 3, 1984, 84 18388
Int. Cl.[4] E21B 37/00; C23G 5/02
U.S. Cl. 252—8.552 16 Claims

1. A method of dissolving sulfur from a sulfur eposit, which comprises the steps of:

(a) contacting a liquid dialkyl disulfide with a reagent which reacts with and removes or blocks the basicity of basic substances contained in the liquid;
(b) contacting the sulfur deposit with the treated liquid dialkyl disulfide, the liquid being kept at a temperature of 50° to 100° C.;
(c) maintaining said liquid and the deposit in contact until 1.5 to 4.5 grams of the sulfur from the deposit is dissolved in the liquid per gram of sulfur in the dialkyl disulfide;
(d) cooling the solution thus obtained; and
(e) recovering the sulfur which precipitates as a consequence of the cooling.

4,728,448

CARBIDE/FLUORIDE/SILVER SELF-LUBRICATING COMPOSITE

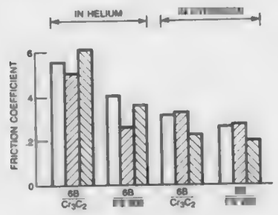
Harold E. Sliney, Parma, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 859,688, May 5, 1986, abandoned. This application May 28, 1987, Ser. No. 54,983
Int. Cl.[4] F16C 33/12
U.S. Cl. 252—12.2 11 Claims

1. A self-lubricating, friction and wear reducing composite material for use over a wide temperature spectrum from cryogenic temperature to about 900° C. in a chemically reactive environment, consisting essentially of:

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(a) a first component comprising between about 60–80 percent by weight metal-bonded chromium carbide;
(b) a second component comprising between about 10–20 percent by weight soft noble metal; and,



(c) a third component comprising between about 10–20 percent by weight metal fluoride mixture.

4,728,450
TORQUE GREASE
Masanori Toya, and Hiroshi Kimura, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan
Filed Jun. 21, 1984, Ser. No. 622,932
Claims priority, application Japan, Jul. 13, 1983, 58-127088
Int. Cl.[4] C10M *175/00*
U.S. Cl. 252—49.6 **8 Claims**

1. A torque grease comprising:
(A) 100 parts by weight of a polyorganosiloxane represented by the general formula:

$$\left(R_a^1SiO_{\frac{4-a}{2}}\right)_n$$

wherein R^1 is a $C_{(1-12)}$ monovalent radical selected from the group consisting of alkyl radicals, alkenyl radicals, and substituted or unsubstituted aryl radicals; a equals 1.9 to 2.7; n is a positive number; and
(B) 10 to 200 parts by weight of a polyorganosilsesquioxane represented by the general formula:

$$R^2SiO_{3/2}$$

wherein R^2 is a monovalent selected from the group consisting of alkyl radicals, alkenyl radicals and substituted or unsubstituted aryl radicals.

4,728,451
LUBRICATING OIL COMPOSITIONS CONTAINING POLY(OXYALKYLENE) AMINOETHER CARBAMATES AS DISPERSING AGENTS
Frank Plavac, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Sep. 30, 1982, Ser. No. 429,693
Int. Cl.[4] C10M *145/26*
U.S. Cl. 252—51.5 A **11 Claims**

1. A lubricating oil composition comprising a major portion of oil of lubricating viscosity, and a minor amount of poly(oxyalkylene) aminohydrocarbyloxyhydrocarbyl carbamate having a molecular weight of about 500 to 10,000;
wherein the poly(oxyalkylene) moiety of said carbamate is comprised of oxyalkylene units selected from C_2–C_5 oxyalkylene units of which a sufficient number are branched-chain oxyalkylene units to render said carbamates soluble in lubricating oil; and
said aminohydrocarbyloxyhydrocarbyl moiety of said carbamate being derived from a diaminoether having from 2 to 60 carbon atoms.

4,728,452
METAL CORROSION INHIBITION IN CLOSED COOLING SYSTEMS
Gerald D. Hansen, Holicong, Pa., assignor to Pony Industries, Inc., New York, N.Y.
Filed Jan. 17, 1986, Ser. No. 819,649
Int. Cl.[4] C09K *5/00*
U.S. Cl. 252—75 **8 Claims**

1. A metal corrosion inhibited coolant composition, comprising:
(1) a water-soluble nitrite or a mixture of a water-soluble nitrite and a water-soluble nitrate, a water-soluble azole selected from triazoles, thiazoles and mixtures of these and a water-soluble molybdate,
(2) sufficient dilution water to provide from about 200 to about 500 ppm of nitrite or mixture of nitrite and nitrate, from about 2 to about 8 ppm azole and from about 2 to about 10 ppm molybdate, and
(3) a buffer present in said composition in an amount sufficient to maintain the pH of said composition to between about 7.5 and 10.5;
wherein said composition is silicate-free.

4,728,453
TIMED-RELEASE BLEACH COATED WITH AN INORGANIC SALT AND AN AMINE WITH REDUCED DYE DAMAGE
Clement K. Choy, Walnut Creek, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Jan. 13, 1987, Ser. No. 2,806
Int. Cl.[4] C11D *3/30, 3/395, 11/00, 17/06*
U.S. Cl. 252—91 **10 Claims**

1. A delayed-release hypohalite bleach comprising:
a halogen-substituted hydantoin capable of releasing hypohalite ion, the hydantoin forming a granular core;
a substantially water soluble inorganic salt coated on the granular core and being in an amount from about 0.5 wt. % about 50 wt % of the total composition; and
a substituted amine coated on the inorganic salt and having limited solubility in water at 25° C. of from about 0.001 wt. % to about 5 wt. %, and being in an amount from about 0.5 wt. % to about 50 wt. % of the total composition the amine being substituted with a hydrocarbon moiety having at least 5 carbon atoms.
7. Dry delayed-release bleach encapsulates comprising:
a halogen-substituted isocyanurate or hydantoin forming a granular core of the encapsulates;
a substantially water-soluble inorganic salt coated on the granular core and being in an amount from about 0.5 wt. % to about 50 wt. % of the encapsulates; and
a substituted amine coated on the inorganic salt having a solubility in water at 25° C. of from about 0.001 wt. % to about 5 wt. %, and being in an amount from about 0.5 wt. % to about 50 wt. % of the encapsulates.

4,728,454
RAPIDLY DISSOLVING GRANULAR HYDRATED CALCIUM HYPOCHLORITE
David C. Dodge, Guilford; David F. Knoop, Bethany, both of Conn.; George T. Thomas, Martinez, Ga., and James P. Newman, Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.
Continuation of Ser. No. 667,174, Nov. 1, 1984, Pat. No. 4,605,508. This application Aug. 8, 1986, Ser. No. 894,989
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] C11D *3/395*
U.S. Cl. 252—95 **4 Claims**

1. A rapidly dissolving granular hydrated calcium hypochlorite product consisting essentially of hydrated calcium hypochlorite particles having at least 97 percent of said particles within a size range of no greater than about 850 microns and having a packed bulk density of no greater than about 1.05 grams per cubic centimeter.

4,728,455
DETERGENT BLEACH COMPOSITIONS, BLEACHING AGENTS AND BLEACH ACTIVATORS
Mark E. Rerek, Fanwood, N.J., assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 7, 1986, Ser. No. 837,613
Int. Cl.[4] C11D *7/18*
U.S. Cl. 252—99 **42 Claims**

1. A detergent bleach composition comprising:
(a) from about 2% to about 50% by weight of the composition of a surface active agent selected from the group consisting of nonionic, anionic, cationic, and zwitterionic detergents and mixtures thereof;
(b) from about 1% to about 85% by weight of the composition of a detergent builder; and
(c) a bleaching agent containing
(i) from about 5% to about 30% by weight of the composition of a peroxide compound having a bleaching action; and
(ii) a catalyst for the bleaching action of the peroxide compound, comprising a complex of manganese (III) and a multidentate ligand supplied by a complexing agent, said agent selected from the group consisting of hydroxy carboxylic acids containing at least 5 carbon atoms and the salts, lactones, acid esters, ethers an boric esters thereof, and wherein the molar ratio of complexing agent to manganese is at least about 1:1, the catalyst being present in an amount such that the manganese content is about 0.005% to about 0.2% of the weight of the composition.

4,728,456
ALUMINUM SURFACE CLEANING AGENT
Katsuyoshi Yamasoe, Chiba; Kiyotado Yasuhara, and Satoshi Ikeda, both of Kanagawa, all of Japan, assignors to Amchem Products, Inc., Ambler, Pa.
Filed Oct. 30, 1985, Ser. No. 793,019
Claims priority, application Japan, Oct. 30, 1984, 59-229296
Int. Cl.[4] C11D *7/08*
U.S. Cl. 252—142 **11 Claims**

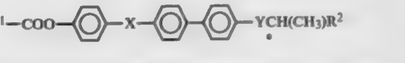
1. An aqueous chromium free cleaning composition for aluminum and aluminum alloy surfaces consisting of:
A. from about 0.2 to about 4 g/l of ferric ions;
B. a sufficient quantity of sulfuric and/or nitric acid to produce a pH of 2 or less for the composition; and
C. from about 0.001 to about 0.5 g/l of fluoride ions.

4,728,457
PROCESS FOR MAKING A SILICONE-CONTAINING SHAMPOO
George M. Fieler, and Larry V. Stacy, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Aug. 25, 1986, Ser. No. 900,033
Int. Cl.[4] C11D *9/36*
U.S. Cl. 252—174.15 **5 Claims**

1. A process for making a slicone-containing shampoo composition comprising the steps of:
(a) preparing a first premix comprising:
(i) from about 0.5% to about 5% ethylene glycol distearate;
(ii) from about 1% to about 10% of an anionic surfactant;
(iii) from about 0.1% to about 5% of a viscosity modifier;
(iv) from about 0.1% to about 5% cocomonoethanol amide; and
(v) from about 1% to about 10% water;
(b) preparing a second premix comprising:
(i) from about 0.01% to about 10% of a silicone conditioning agent;
(ii) from about 0.1% to about 5% ammonium xylene sulfonate;
(iii) from about 0.01% to about 5% cetearyl alcohol;
(iv) from about 0.01% to about 5% tricetyl methyl ammonium chloride;
(v) from about 1% to about 10% of an anionic surfactant; and
(vi) from 0.3% to about 3% xanthan gum.
(c) preparing a main mix comprising all other desired ingredients, including adjuvants;
(d) heating the premixes separately to a temperature of from about 150° F. to about 170° F.;
(e) injecting the premixes sequentially into the main mix, which is at ambient temperature; and
(f) allowing the composition to cool.

4,728,458
POLYPHENYL-BASED ESTER COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS CONTAINING SAME
Ryoichi Higuchi, Tokyo; Takao Sakurai; Tatsuro Tabohashi, both of Kawasaki; Naoko Mikami, Yokohama; Kiriko Akaiwa, Tokyo; Eri Yamamoto, and Koji Takeuchi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Ltd., Tokyo, Japan
Filed Feb. 10, 1986, Ser. No. 827,449
Claims priority, application Japan, Feb. 8, 1985, 60-22920; Apr. 24, 1985, 60-87034; May 30, 1985, 60-117053; Jul. 23, 1985, 60-162656
Int. Cl.[4] C09K *19/12;* **G02F** *1/13;* **C07C** *69/78, 69/86*
U.S. Cl. 252—299.65 **4 Claims**

1. A smectic liquid crystal compound having the following formula:



wherein R^1 represents straight or branched C_{1-18} alkyl group with or without optically active carbon, R^2 represents straight or branched C_{1-6} group, X is —COO— or —OCO—, Y is —$COOCH_2$—, —COO—, —$OCOCH_2$, the carbon atom marked with * is an asymmetric carbon atom.

3. A liquid crystal composition containing a smectic liquid crystal compound according to claim 1.

4,728,459
TUNGSTEN-CONTAINING ZINC SILICATE PHOSPHOR
Albert K. Fan, and Vincent Chiola, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 252,100, Apr. 8, 1981, abandoned. This application Oct. 24, 1984, Ser. No. 664,198
Int. Cl.[4] C09K *11/38*
U.S. Cl. 252—301.5 **3 Claims**

1. A manganese-activated zinc silicate phosphor containing tungsten dispersed throughout the phosphor matrix.

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AMINOMETHYLENEPHOSPHONIC ACID SOLUTIONS

Michel A. O. Ledent, Saint Marc, and Bronislav H. May, Overijse, both of Belgium, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 659,593, Oct. 11, 1984, Pat. No. 4,615,840, which is a continuation-in-part of Ser. No. 294,872, Aug. 21, 1981, Pat. No. 4,477,390. This application Apr. 24, 1986, Ser. No. 855,293

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] C07F *9/38*

U.S. Cl. 260—502.5 E 8 Claims

1. An aqueous solution comprising an aminomethlenephosphonic acid selected from diethylenetriaminepenta-(methylenephosphonic acid), diethylenetriaminetetra(methylenephosphonic acid), diethylenetriaminetri(methylenephosphonic acid) and mixtures thereof and a non-oxidizing mineral acid, characterized in that said non-oxidizing mineral acid is present in an amount sufficient to inhibit crystallization of said aminomethylene-phosphonic acid from the solution, said non-oxidizing mineral acid comprising sulfuric acid, phosphoric acid, hydrobromic acid, and mixtures containing sulfuric acid, phosphoric acid or hydrobromic acid which non-oxidizing mineral acid is at least about 12% by weight of the solution.

4,728,461

THERMOPLASTIC COMPOSITION OF POLYPHENYLENE ETHER, ETHYLENEMETHACRYLIC ACID COPOLYMER, AND STYRENE-GLYCIDYL METHACRYLATE COPOLYMER

Susumu Fujii, Shimodate, Japan, and Sai-Pei Ting, Delmar, N.Y., assignors to General Electric Company, Selkirk

Filed Nov. 26, 1985, Ser. No. 801,731

Int. Cl.[4] H01B *1/06;* C08L *71/04*

U.S. Cl. 252—511 14 Claims

1. A thermoplastic composition comprising

(a) a polyphenylene ether resin hydrogenated block copolymer of styrene and butadiene or a combination of the polyphenylene ether resin, the hydrogenated block copolymer of styrene and butadiene with one or more alkenyl aromatic polymers; and

(b) less than 50 percent by weight, based upon 100 percent by weight of (a) and (b) combined of a combination of (i) a copolymer of ethylene and methacrylic acid and (ii) a copolymer of styrene and glycidyl methacrylate.

13. The composition of claim 1, which includes from 1 to 20 parts by weight of a styrene-ethylene/ butylene-styrene copolymer, from 1 to 40 parts by weight of an ethylene-methacrylic acid copolymer and from 0.1 to 10 parts by weight of a styrene-glycidyl methacrylate copolymer based on 100 parts by weight of the polyphenylene ether resin and rubber modified, high impact polystyrene combined.

4,728,462

FERROPHOSPHORUS COMPOSITION HAVING IMPROVED CONDUCTIVITY AND PASSIVATION RESISTANCE

George T. Miller, Lewiston, and Gerald L. Evarts, Tonawanda, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 3, 1986, Ser. No. 848,012

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—513 13 Claims

1. A process for treating ferro alloy particles to provide passivation resistance and enhanced conductivity to the particles, said process comprising the steps of:

(a) contacting ferro alloy particles having an average size within the range of about 1 to about 15 microns with an aqueous solution containing a dilute mineral acid having a solution concentration within the range of about 1% to about 12%, and ions of chromium and a metal selected from the group consisting of zinc, strontium, calcium, barium, lead, copper and mixtures thereof, said solution having a concentration of chromium and metal ions in the range of about 0.5 grams/liter to about 20 grams/liter,

(b) separating the treated ferro alloy particles from the solution after a contact time of from about 1 to about 30 minutes, and

(c) drying the treated Ferro alloy particles.

4,728,463

BROMINATED FIRE RETARDANT COMPOSITION

Burton J. Sutker, Edison; Gen-Shing Ti, Piscataway, and Mo A. Khuddus, Matawan, all of N.J., assignors to Ethyl Corporation, Richmond, Va.

Filed Aug. 18, 1986, Ser. No. 897,582

Int. Cl.[4] C09K *21/00;* C08L *25/14, 27/00;* C08F *14/00*

U.S. Cl. 252—609 19 Claims

1. An organobromine fire retardant comprising a brominated styrene-maleate copolymer which contains in excess of 60 weight percent bromine.

4,728,464

1-AMINO-4-(3'-PHENYLSULPHONYL-AMINO-PHENYLAMINO) ANTHRAQUINONE-2-SULPHONIC ACIDS USEFUL AS ANIONIC DYESTUFFS

Roland Mislin, Village-Neuf, France, assignor to Sandoz Ltd., Basel, Switzerland

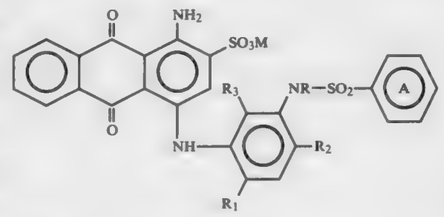
Filed Apr. 18, 1983, Ser. No. 486,033

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214963

Int. Cl.[4] C09B *1/26;* D06P *1/20*

U.S. Cl. 260—374 15 Claims

1. A compound of the formula



in which

R is hydrogen, methyl, or ethyl,

R_1 is methyl, ethyl, C_{1-4}alkoxy, fluorine, chlorine or bromine

R_2 is hydrogen, methyl or ethyl,

R_3 is hydrogen, methyl or ethyl, provided that at least one of R_2 and R_3 is hydrogen,

M is hydrogen or a cation and

ring A is unsubstituted or substituted by up to three substitutents selected from C_{1-4}alkyl, C_{1-4}-alkoxy, fluorine, chlorine, bromine and acetylamino.

4,728,465

NICKELBORIDE-POLYMER CATALYST USED IN HYDROGENATION OF FATTY COMPOUNDS

Rudolph O. DeJongh, The Hague, and Cornelis VanDijk, Zwijndrecht, both of Netherlands, assignors to Internationale Octrooi Maatschappij*, Rotterdam, Netherlands

Division of Ser. No. 722,383, Apr. 12, 1985, Pat. No. 4,600,701. This application Jan. 24, 1986, Ser. No. 821,977

Claims priority, application Netherlands, Apr. 19, 1984, 8401301

Int. Cl.[4] C11C *3/12*

U.S. Cl. 260—409 7 Claims

1. In a process for the catalytic hydrogenation of an unsaturated fatty compound, the improvement which comprises using, as the catalyst, a finely dispersed nickel boride stabilised with a linear organic polymer, said catalyst being prepared by a process in which an at least partly dissolved nickel salt containing less than 6 molecules of crystal water in the presence of an at least partly dissolved polar linear polymer of vinylpyrrolidone is reduced with the aid of an alkali borohydride.

4,728,466

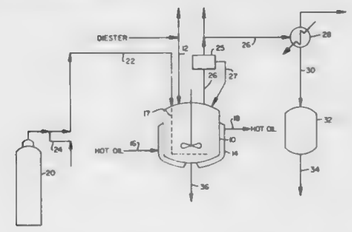
PROCESS FOR THE PRODUCTION OF ALIPHATIC PHOSPHONIC ACIDS

Kai W. Young, Cary, N.C., and John J. Zullo, Flemington, N.J., assignors to Rhone-Poulenc Nederland B.V., Amsteiveen, Netherlands

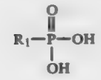
Continuation of Ser. No. 789,025, Oct. 18, 1985, abandoned. This application May 26, 1987, Ser. No. 54,381

Int. Cl.[4] C07F *9/38*

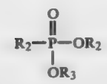
U.S. Cl. 260—502.4 R 19 Claims



1. In the process for the manufacture of an aliphatic phosphonic acid of the formula:



of the type wherein a diester of the aliphatic phosphonic acid of the general formula:



is introduced into a reaction vessel as a liquid phase and reacted with a flow of anhydrous hydrogen halide selected from the group consisting of hydrogen chloride, hydrogen bromide, hydrogen iodide and hydrogen fluoride to produce a reaction product containing the corresponding aliphatic phosphonic acid and the corresponding aliphatic halides, wherein R^1, R_2 and R_3 are each independently selected from the group consisting of substituted and unsubstituted aryl, alkyl, alkenyl, halosubstituted alkyl and halosubstituted alkenyl, having from 1 to 6 carbon atoms, and wherein the diester and the anhydrous hydrogen halide are reacted at a temperature of at least about 100° C., a pressure of about 30 psig to 150 psig with vigorous agitation, for a first period of time to form a first reaction product; and subsequently reacting the first reaction product and the anhydrous hydrogen halide for a second period of time to form at least about 90 percent of the aliphatic phosphonic acid; the sum of said first period of time and second period of time constituting the total reaction time and wherein aliphatic halides are continuously discharged from the reaction vessel, the improvement comprising maintaining the volume of liquid phase in the reaction vessel at about 80 to 95 percent volume capacity of the reaction vessel by continuously adding sufficient amount of the diester of the aliphatic phosphonic acid reactant during the first about 50 to 60 percent of the total reaction time.

4,728,467

INNER AIR VENT SYSTEMS FOR FLOAT CHAMBERS IN CARBURETORS

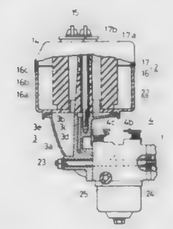
Tomozo Nakagawa; Nsotake Nii, both of Akashi, and Kozo Watanabe, Ono, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 24, 1987, Ser. No. 17,556

Claims priority, application Japan, Mar. 3, 1986, 61-30395[U]

Int. Cl.[4] F02M *5/08*

U.S. Cl. 261—72.1 1 Claim



1. In an internal combustion engine for vehicles including an air cleaner, an air intake pipe for supplying atmospheric air through said air cleaner to said engine, a carburetor, and a float chamber for supplying fuel to said carburetor, said air cleaner being mounted above said carburetor, said air cleaner, said air intake pipe and said carburetor being supported on a train of connected mounting bosses, respectively, an inner air vent system comprising an air passage defined in said mounting bosses and connected between said air cleaner and carburetor, said air passage having a lower end opened into the air space in said float chamber, thereby subjecting both said air space of said float chamber and the venturi tube of said carburetor to the downstream side of said air cleaner.

4,728,468

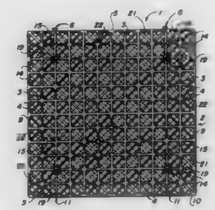
FLUID CONTACT PLATE

Eddie D. Duke, P.O. Box 276, Tenaha, Tex. 75974

Filed Jul. 18, 1986, Ser. No. 886,823

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—111 9 Claims



1. A plurality of fluid contact plates, each of said fluid contact plates comprising a first array of vertical fins provided in spaced relationship; a second array of horizontal fins provided in spaced relationship with respect to each other, said horizontal fins intersecting said vertical fins, respectively; a first plurality of diagonal fins positioned in spaced relationship with respect to each other, said first plurality of diagonal fins intersecting said vertical fins and said horizontal fins in angular relationship to define a plurality of discreet junctions, respectively; a second plurality of diagonal fins positioned in spaced relationship with respect to each other, said second plurality of

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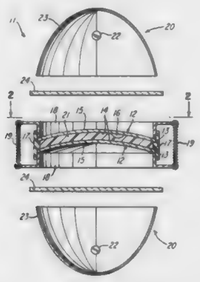
diagonal fins intersecting said first plurality of diagonal fins, said vertical fins and said horizontal fins in angular relationship at said junctions, respectively, said vertical fins, said horizontal fins and said diagonal fins defining a front matrix surface and a back matrix surface in said fluid contact plate; front connecting means provided in said front matrix surface and back connecting means provided in said back matrix surface, said front connecting means adapted to engage said back connecting means for joining first selected ones of said fluid contact plate to each other in front-to-back relationship, said plurality of fluid contact plates joined in vertical, abutting, assembled relationship to define an assembly, with means to pass liquid vertically down through the assembly and means to pass air horizontally therethrough.

4,728,469

METHOD AND APPARATUS FOR MAKING A PLASTIC LENS

Michael E. Danner, Kenton Hills, and Nathan T. Lipscomb, Louisville, both of Ky., assignors to Sperti Drug Products, Inc., Erlanger, Ky.

Filed Jan. 28, 1986, Ser. No. 823,339
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 **19 Claims**



1. In a method for making a plastic lens comprising the steps of disposing a lens forming material comprising a liquid monomer and a photosensitive initiator into a mold cavity defined in part between a pair of spaced apart mold members each having a lens forming surface means facing said cavity and an outer opposed surface means, and then directing rays of ultraviolet light from a source thereof against said outer surface means of at least one of said mold members so as to pass therethough to act on said lens forming material in said cavity to produce said lens therefrom, the improvement comprising the step of frosting said outer surface means of said one mold member to cause said ultraviolet light directed thereagainst to be substantially evenly distributed throughout said lens forming material in said cavity in order to tend to prevent optical distortions in said lens being formed therefrom.

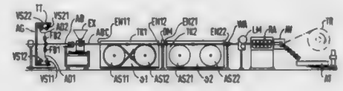
10. In an apparatus for making a plastic lens from a lens forming material that comprises a liquid monomer and a photosensitive initiator, said apparatus comprising a mold cavity defined in part as a pair of spaced apart mold members defining part of a mold cavity therebetween, each mold member having a lens forming surface means facing said cavity and an outer opposed surface means, and means for directing rays of ultraviolet light against said outer surface means of at least one of said mold members so as to pass therethrough to act on said lens forming material in said cavity to produce said lens therefrom, the improvement wherein said outer surface means of said one mold member has been frosted to cause said ultraviolet light directed thereagainst to be substantially evenly distributed throughout said lens forming material in said cavity in order to tend to prevent optical distortions in said lens being formed therefrom.

4,728,470

APPARATUS AND METHOD OF PROCESSING A LIGHT WAVEGUIDE PRODUCT

Guenter Einsle, Munich; Ernst Mayr, Starnberg; Ulrich Oestreich, Munich; Gernot Schoeber, Munich, and Wolfgang Schrey, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 834,768
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508185
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.5 **10 Claims**



1. A process for treating a product having a strand element of at least one waveguide loosely received in a sheath extruded thereon, said process including providing first and second treating chambers, each treating chamber having an inlet, an outlet disposed on a line, at least two storage disks aligned one after another along said line and mounted for rotation on axes spaced along said line in the chamber and means for driving at least one disk of each chamber so that a precise length allocation between the light waveguide and sheath is obtained, said first chamber being positioned with its inlet receiving the product as it leaves the last extruder, said second chamber being arranged with its inlet positioned to receive the product leaving the outlet of the first chamber; providing a coolant in the first chamber and a second coolant in the second chamber; maintaining the coolants at the desired temperatures for each chamber; passing the product sequentially through the first chamber and into the second chamber then looping the product around at least one storage disk in the second chamber before passing it out of the outlet of the second chamber, positively rotating at least one of the disks in each chamber, and then collecting the treated product by winding the product onto a drum.

5. A device for further processing a product having a strand element of at least one light waveguide loosely received in a sheath applied by at least one extruder, said device having two independently operated tempering chambers disposed one after another downstream of the last extruder with the improvements comprising that each of the chambers having an input and an output disposed on a line and at least two storage disks being disposed below the line and spaced therealong, said disks being mounted for rotation on spaced axes in the chamber, at least one storage disk of each chamber being provided with an auxiliary drive having a torque control so that a precise length allocation between the light waveguide and the elements is provided.

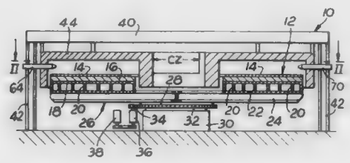
4,728,471

TREATMENT OF EXPANSIBLE MATERIALS TO FORM LIGHTWEIGHT AGGREGATE

Robin A. Kyffin, Porthmadog, Wales; Peter A. Young, Harrogate, and Allen C. Day, Low Worsall, both of England, assignors to J. W. Greaves & Sons Limited, Gwynedd, Wales

Filed Nov. 20, 1986, Ser. No. 932,885
Claims priority, application United Kingdom, Nov. 23, 1985, 8528902
Int. Cl.[4] E29C *27/60*
U.S. Cl. 264—43 **8 Claims**

1. A method of heat-treating expansible particular materials to expand the same and produce a lightweight granular product comprising: precluding adherence of at least partially fused particles of said material to each other and the lining of a kiln by, providing a moving hearth within said kiln, feeding said material to said moving hearth at a charging zone so as to be distributed over said hearth, and moving the hearth successively through a treatment zone of elevated temperature sufficient to at least partially fuse and expand said material and thereafter, a discharge zone, at which the resultant expanded product is discharged from said hearth.

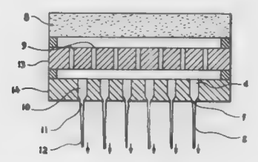


4,728,472

CELLULAR FIBERS VIA SOLUBLE FLUID INJECTION

William T. Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1986, Ser. No. 860,249
Int. Cl.[4] D01F *1/02*
U.S. Cl. 264—53 **14 Claims**



1. A process for making a fiber with cells comprising the steps of:

(a) mixing a fluorocarbon blowing agent into molten polymer and shearing the molten polymer at greater than about 8,000 reciprocal seconds; thereafter

(b) extruding the molten polymer through a spinneret capillary at a jet velocity of 5–150 cm/min. and a differential capillary pressure of less than 0.5 kg/cm^2 resulting in substantial development of voids within the polymer internally of the spinneret; and

(c) drawing down the polymer extrudate at a total extension of greater than 1000.

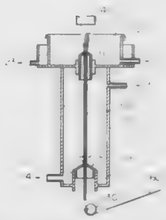
4,728,473

PROCESS FOR PREPARATION OF POLYPARAPHENYLENE TEREPHTHALAMIDE FIBERS

Eiji Satoh, and Jun Yamaguchi, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaki, Japan

Filed Feb. 27, 1984, Ser. No. 583,659
Claims priority, application Japan, Feb. 28, 1983, 58-31001; Oct. 24, 1983, 58-197600
Int. Cl.[4] D01D *5/06*
U.S. Cl. 264—101 **13 Claims**

1. A process for the preparation of poly-p-phenylene terephthalamide fibers having improved mechanical properties at high spinning speeds according to the wet spinning method comprising passing an optically anisotropic solution of a poly-p-phenylene terephthalamide type polymer through a non-coagulating fluid layer and guiding the solution to a coagulating bath, characterized in that (a) filaments are taken out together with a steam of coagulating solution from a first fine tube or fine hole arranged in the lower portion of the coagulating bath and the filaments travel through a second fine tube or fine hole arranged below and spaced from said first fine tube or fine hole, wherein the first fine tube or fine hole arranged in the lower portion of the coagulating bath and the second fine tube or fine hole are arranged on the upper and lower ends, respectively, of an interal sealed chamber, and the pressure in the sealed chamber is reduced by an evacuating device to accelerate the stream of the coagulating solution flowing out together with the filaments through the first fine tube or fine hole arranged in the lower portion of the coagulaing bath and decrease the speed of the steam of the coagulating solution accompanying the filaments in the lower second fine tube or fine hole.

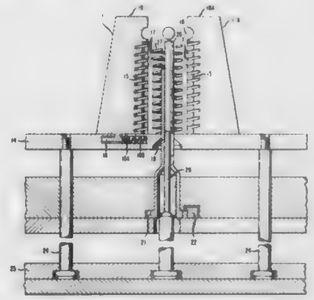


4,728,474

METHOD FOR MAKING A PLASTIC SPRING

Glenn L. Beall, Gurnee, Ill., assignor to Plough, Inc., Memphis, Tenn.

Filed Sep. 28, 1982, Ser. No. 425,804
Int. Cl.[4] B29C *45/38*
U.S. Cl. 264—161 **6 Claims**



1. A method for molding a plastic spring having a plurality of turns comprising:

(a) disposing at least two mold sections in a closed position around a hollow sleeve, the mold sections, when in said closed position, forming a central opening for the sleeve and a cavity having a plurality of turns forming the shape of the spring around the sleeve, the sleeve having sufficient opening such that its hollow portion is in fluid communication with individual turns of the cavity,

(b) flowing molten plastic into the hollow portion of the sleeve, through the sleeve's opening, into individual turns of the cavity,

(c) allowing the plastic to solidify to form solidified plastic in the hollow portion of the sleeve and a solidified plastic spring in the cavity,

(d) providing relative motion between the sleeve and the mold sections so as to separate the solidified plastic in the hollow portion of the sleeve from the solidified plastic spring,

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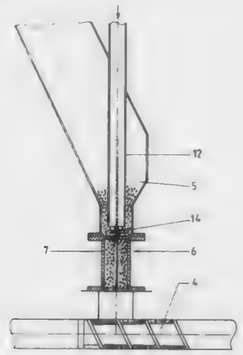
(e) moving the mold sections to an open position away from the spring, and
(f) removing the plastic spring from the sleeve.

4,728,475

METHOD OF AND DEVICE FOR ADMIXING FINELY DIVIDED DYE STUFF INTO A SYNTHETIC GRANULATE

Arnold Beck, Neumuenster, Fed. Rep. of Germany, assignor to Neumuensterche Maschinen-und Apparatebau GmbH, Neumünster, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,567
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534403
Int. Cl.[4] B29B *7/88;* **B29C** *47/10*
U.S. Cl. 264—211 **9 Claims**



1. A method of admixing a finely divided dye stuff to a stream of synthetic granulate comprising the steps of feeding a densely packed stream of said granulate through an interspace formed between an inner wall of a fall shaft and an outer wall of an upright filling channel, the fall shaft communicating with an inlet of an extruder and the filling channel having an outlet opening into the fall shaft at a distance above said inlet, whereby a sloping cavity is continuously formed within said stream of granulate below the outlet of said filling channel; and dosing the dye stuff and feeding said dye stuff by free fall through said filling channel into said cavity.

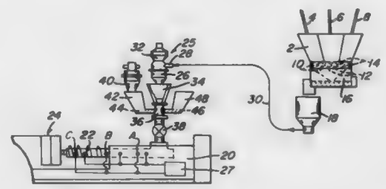
3. A device for mixing a finely divided dye stuff into a stream of synthetic granulate fed into an extruder, comprising a filling shaft for the synthetic granulate, the filling shaft including an inclined upper part and a vertical lower part communicating with an intake opening of the extruder; a vertical filling channel for the dye stuff arranged above and communicating with the vertical lower part of the filling shaft; the ratio of cross-sections of said lower part of the filling shaft and said filling channel being smaller than 6:1 to produce a funnel-shaped cavity in the stream of synthetic granulate below said filling channel; and said vertical filling channel having an inlet provided with a funnel for feeding against sloping walls of said cavity a narrow string of the dye stuff free falling substantially along a center axis of the filling channel.

4,728,476

METHOD OF SUPPLYING A MOLDABLE MIXTURE OF MATERIALS TO AN ARTICLE FORMING MOLD OF AN INJECTION MOLDING MACHINE

Douglas J. Boring, and Richard V. Reib, both of Franklin, Pa., assignors to Resin Stretchers, Reno, Pa.

Continuation-in-part of Ser. No. 659,518, Oct. 12, 1984, abandoned, which is a continuation of Ser. No. 455,110, Jan. 3, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,505
Int. Cl.[4] B29C *45/74, 45/78*
U.S. Cl. 264—328.18 **9 Claims**



1. The method of supplying a moldable mixture of material to an article forming mold of an injection molding machine which machine has an elongated material feed screw selectively rotatable within an elongated chamber and which chamber has longitudinally contiguous inlet, intermediate and discharge zones and which machine has controllable heating means for independently heating material within such zones, respectively, the improvement comprising:
mechanically mixing a granular thermoplastic resin with a granular filler to form a granular mixture,
supplying said mixture to such an inlet zone,
conveying said mixture sequentially through such inlet, intermediate and discharge zones,
heating said mixture within such a chamber by supplying heat to such inlet, intermediate and discharge zones to initially convert the resin contained in said mixture as supplied into a molten state and maintain said converted resin in a molten state throughout said chamber and to simultaneouslky heat the filler contained in said mixture with said filler remaining as a heated solid throughout said chamber,
said heating of said zones being of a magnitude that the temperature of the molten resin and said heated solid filler in such intermediate zone is lower than the temperature of said molten resin and said heated solid filler in such inlet and discharge zones,
and discharging said molten resin and said heated solid filler from said discharge zone to such an article forming mold.

4,728,477

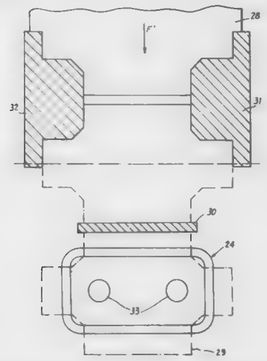
PROCESS FOR MANUFACTURING OBJECTS BY INJECTION OF SYNTHETIC MATERIAL AND MACHINE FOR CARRYING OUT SAID PROCESS

Pierre Dromigny, 54, avenue de Versailles, 75016 Paris, France

Filed Jul. 15, 1986, Ser. No. 885,688
Claims priority, application France, Jan. 13, 1986, 86 00367
Int. Cl.[4] B29C *43/22*
U.S. Cl. 264—509 **6 Claims**

1. Process for forming, by injection molding of synthetic material, an object recipient and simultaneously for integrally molding onto the object a label constituting at least a partial coating of said object, by means of an injection machine incorporating a mold comprising a punch and a die, at least one nozzle for injecting synthetic material, and a first cutter which precuts the label shape and a second cutter which slices the web to separate the label from the web, these cutters preceding the mold, the process comprising the following steps of:

advancing a web of the label material step by step towards the mold;
after advance of said web by a step the length of which corresponds to one dimension of the label to be cut out, cutting out a label by means of the first cutter from said web in the desired format in that part of the web immediately preceding the mold, the label not being separated from said web;



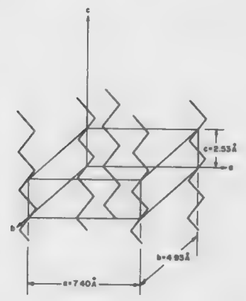
further advancing said web with the result that the label cut out to the chosen format lies between the punch and the die at the instant when the mold is closed, and separating said label by means of the second cutter;
injecting synthetic material into the space, between the punch and the die, existing when the mold is closed;
allowing said synthetic material to cool and harden in the mold in order to form said molded object incorporating said label as an integral part thereof; and
ejecting the molded object from the mold.

4,728,478

POLYMER FILMS CONTAINING PLATELET PARTICLES

William Sacks, Gillette; John P. Sibilia, Livingston; Abraham M. Kotliar, Westfield, all of N.J.; Harold D. Oltman, and Shu P. Chen, both of Baton Rouge, La., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 709,264, Apr. 15, 1985, Pat. No. 4,618,528, which is a division of Ser. No. 405,225, Aug. 5, 1982, Pat. No. 4,528,235. This application Sep. 29, 1986, Ser. No. 912,726
Int. Cl.[4] B29C *47/06*
U.S. Cl. 264—514 **23 Claims**



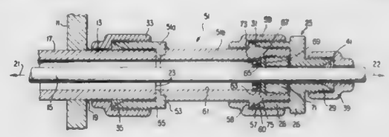
7. A process to make a film laminate comprising the steps of: coextruding at least one polymer layer with at least one additional polymer layer, the one polymer layer and the additional polymer layer being different thermoplastics, the one polymer layer comprising one thermoplastic having a melt index of from 0.01 to 10 g/10 minutes at 190° C. to 250° C. as measured on ASTM Test No. D-1238 at a load of 1000 to 2160 grams and from 10 to 50 weight percent based on the polymer and filler of a platelet filler wherein the filler has an average equivalent diameter of from 1 to 8 micrometers, a maximum equivalent diameter of 25 micrometers, and a thickness of less than 0.5 micrometers, the filler being homogeneously distributed through the one polymer layer, and the at least one additional polymer layer comprising the additional thermoplastic having a melt index of from 0.01 to 10.0 g/10 minutes at 190° C. to 250° C. as measured in ASTM Test No. D-1238 at a load of 1000 to 2160 grams, and from 10 to 50 weight percent, based on the polymer and filler, of a platelet filler wherein the filler has an average equivalent diameter from 1 to 8 micrometers, a maximum equivalent diameter of 25 micrometers, and thickness of less than 0.5 micrometers, the filler being homogeneously distributed through the additional polymer layer, the laminate having a thickness of from 10 to 100 micrometers; stretching the film laminate in the axial direction, and stretching the film laminate in the transverse direction the film layers being stretched until the major plane of filler is substantially parallel to the major plane of the film.

4,728,479

HIGH PRESSURE SEAL FITTING WITH BUILT-IN LOW PRESSURE SEAL ARRANGEMENT

Daniel Merkovsky, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1986, Ser. No. 817,366
Int. Cl.[4] G21C *13/00*
U.S. Cl. 376—203 **13 Claims**



1. A high pressure seal fitting with a built-in low pressure seal arrangement for sealing a space defined by an inner diameter of a pipe and a rod slidably disposed within the pipe and extending beyond an end of the pipe, said fitting comprising:
a fitting body provided with an axial passage for slidably accommodating the rod and having a first and region constructed for engaging the end of the pipe for forming a high pressure seal between the pipe and said fitting body, and a second end region opposite said first end region and including an outer circumferential protrusion having the shape of a ferrule for cooperating with components utilized to form a releasable high pressure compression seal; and
low pressure seal means disposed in the axial passage at said second end region of said fitting body for maintaining a low pressure seal between said fitting body and the rod when said releasable high pressure seal is disconnected, said fitting body being disposed radially intermediate said releasable high pressure compression seal and said low pressure seal means.

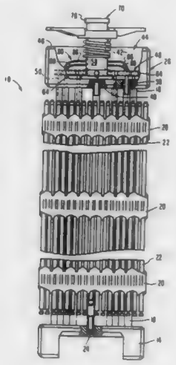
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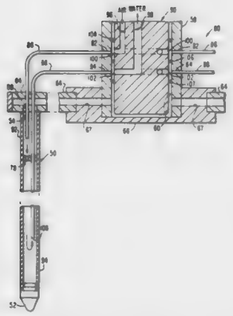
4,728,480

APPARATUS AND METHOD FOR REFURBISHING A SPECTRAL SHIFT MECHANISM FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Frank J. Baloh, Dawson, and James A. Sparrow, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1985, Ser. No. 701,052
Int. Cl.[4] G21C *7/26*
U.S. Cl. 376—209 **11 Claims**





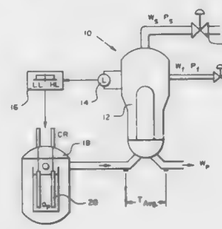
1. In combination with a nuclear reactor spectral shift mechanism having at least one elongated hollow water displacer rod being substantially filled with a moderator/coolant liquid, a refurbishing apparatus comprising:
(a) first means disposed in flow communication with an upper portion of the interior of said hollow rod;
(b) second means disposed in flow communication with a lower portion of the interior of said hollow rod; and
(c) means interconnectable with said first means and second means so as to provide an entrance path for air under pressure to said upper portion of said hollow rod via said first means and an exit path for water from said lower portion of said hollow rod via said second means, said exit path being separate from said entrance path, whereby the introduction of air under pressure along said entrance path into said upper portion of said hollow rod will force the liquid within said hollow rod to flow along said exit path from said lower portion of said hollow rod until the level of the liquid within said hollow rod lowers to the level of said second means in said lower portion of said hollow rod;
(d) said interconnectable means including
(i) a generally cylindrical member having an opening defined at one end thereof, a pair of first and second ports displaced from one another and a central plenum communicating with said end opening and said ports, and
(ii) a generally cylindrical charging tool having defined therein a pair of first and second flow passageways with corresponding first and second flow openings, said tool being insertable within said central plenum of said cylindrical member through said end opening therein so as to place said first and second flow openings of said tool in flow communication with said first and second ports of said cylindrical member.

4,728,481

FULL RANGE NUCLEAR POWER PLANT STEAM GENERATOR LEVEL CONTROL SYSTEM

Jacques M. Geets, Delmont, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 19, 1986, Ser. No. 932,245
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 **17 Claims**



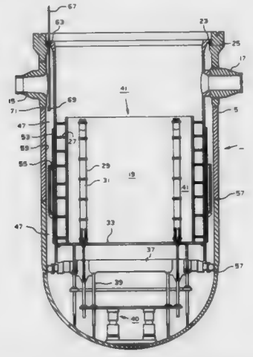
1. In a method of controlling feedwater level in a steam generator of a pressurized water reactor nuclear power plant, said steam generator having secondary loop feedwater lines, said method including the steps of outputting a first signal from a first three-mode controller to control feedwater flow through the secondary loop feedwater lines at reactor power levels below a predetermined percentage, and outputting a second signal from a second three-mode controller to control feedwater flow through the secondary loop feedwater lines at reactor power levels above the predetermined percentage, the improvement in combination therewith comprising:
receiving the first and second signals at a transition controller means;
generating a first feedwater temperature-dependent function;
operating on the first input signal with said first temperature-dependent function to produce a third signal;
generating a second feedwater temperature-dependent function;
operating on the second input signal with said second temperature-dependent function to produce a fourth signal; and
adding said third and fourth signals resulting from said operating steps to control the feedwater flow through the secondary loop feedwater lines throughout an entire range of reactor load.

4,728,482

METHOD FOR INTERNAL INSPECTION OF A PRESSURIZED WATER NUCLEAR REACTOR PRESSURE VESSEL

David E. Boyle, Kiski Twp., and Edward J. Rusnica, Hempfield Twp., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 10, 1986, Ser. No. 850,197
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—249 **11 Claims**



9. A method for inservice inspection of predetermined welds present in the wall of a pressurized water nuclear reactor pressure vessel wherein said nuclear reactor has a substantially cylindrical pressure vessel wall, with a plurality of inlet and outlet nozzles therein, and a generally cylindrical, vertically oriented core barrel having an upper flange disposed within said pressure vessel, with an annular chamber formed between said pressure vessel wall and said barrel, said upper flange resting upon a ledge about the inner periphery of the upper section of said pressure vessel wall, comprising:
providing access to said annular chamber through the flange of said core barrel, while said core barrel is disposed within said pressure vessel, and wherein the upper flange of said core barrel has a plurality of apertures therethrough which communicate with said annular chamber and a removable plug within each said aperture, by removing at least one of said plugs;
inserting a means for inspecting a weld, present in the wall of the pressure vessel, through said aperture with said plug removed;
positioning said inspecting means in proximity to said weld in said pressure vessel wall to be inspected; and
inspecting said weld by said inspecting means while said barrel remains disposed within said pressure vessel.

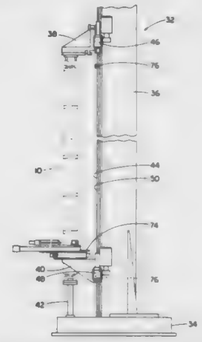
4,728,483

APPARATUS FOR INTEGRATED FUEL ASSEMBLY INSPECTION SYSTEM

Hassan J. Ahmed, and Steven R. Burchill, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1986, Ser. No. 855,266
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—258 **15 Claims**

1. In a fuel assembly inspection apparatus, the combination comprising:
(a) an elongated fixture mounted in a stationary upright position;
(b) upper means mounted to an upper portion of said fixture and lower means mounted adjacent to a lower portion of said fixture, said upper and lower means being disposed outwardly from a side of said fixture for supporting a nuclear fuel assembly therebetween and extending along said side of said fixture;
(c) a bottom carriage having a central opening adapted to receive the fuel assembly therethrough when supported between said upper and lower means such that said bottom carriage extends about said fuel assembly, said bottom carriage being connected only to, and extending in cantilever fashion outwardly from, said side of said fixture for



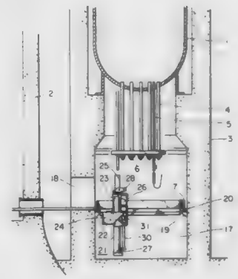
generally vertical movement along said side of said fixture and along said fuel assembly extending along said side of said fixture;
(d) drive means for selectively moving said bottom carriage; and
(e) means disposed on said bottom carriage for measuring the envelope of said fuel assembly when said bottom carriage is moved to and stationed at selected axial positions along said fuel assembly.

4,728,484

APPARATUS FOR HANDLING CONTROL ROD DRIVE

Toshihiro Kodama, Hitachi; Yoshimi Ishii, Kitaibaraki; Isao Kouga, Hitachi; Noriaki Mase, Hitachi, and Noriaki Hattori, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,594
Claims priority, application Japan, Jul. 4, 1984, 59-139517
Int. Cl.[4] G21C *19/20*
U.S. Cl. 376—260 **9 Claims**



1. An apparatus for handling a control rod driving mechanism (CRD), comprising:
a turn carriage provided in a pedestal space below a pressure vessel of a nuclear reactor;
a truck adapted to run along a rail arranged on said turn carriage;
CRD conveyor means arranged for being transferred into and out of said pedestal space with said CRD contained

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therein from and to a space for at least one of inspection and maintenance of said CRD, said CRD conveyor means including lifter means movable therein in a longitudinal direction of said conveyor means with said CRD mounted thereon so as to shift said CRD to and from a CRD housing disposed under said pressure vessel;

holding means for removably holding said conveyor means, said holding means being mounted on said truck and being rotatable between an upright position and a horizontal position in said pedestal space;

CRD mounting/demounting means for enabling mounting of said CRD to said CRD housing and for enabling demounting of said CRD from said CRD housing, said mounting/demounting means including means fixedly attached to said holding means and means movable transversely of said holding means onto and from said lifter means, said mounting/demounting means being arranged for vertical shifting by said lifter means; and

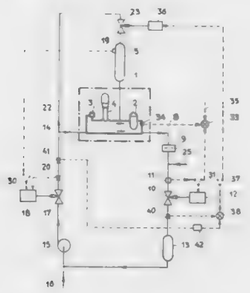
CRD supporting means arranged on said holding means for temporarily supporting said CRD during movement of said CRD between sid CRD conveyor means and said CRD mounting/demounting means.

4,728,485

METHOD FOR REGULATING THE PRESSURE OF THE PRIMARY CIRCUIT DURING THE SHUT-DOWN PHASES OF A PRESSURIZED WATER NUCLEAR REACTOR

Pierre Ruiz, Le Blanc-Mesnil, France, assignor to Framatome, Courbevoie, France

Continuation of Ser. No. 534,265, Sep. 22, 1983, abandoned, which is a continuation of Ser. No. 254,369, Apr. 15, 1981, abandoned. This application Sep. 3, 1985, Ser. No. 771,186
Claims priority, application France, May 14, 1980, 80 10874
Int. Cl.⁴ G21C *9/00*; G21D *3/00*
U.S. Cl. 376—307 **2 Claims**



1. In a method for regulating the pressure of the primary circuit of a pressurized water nuclear reactor during shutdown phases, for use in an installation comprising, as a branch circuit to the primary circuit, a volume control circuit with a discharge valve of the primary circuit, a volume control tank, and a pump for reinjection to the primary circuit through a charging valve, the primary circuit being connected to a steamliquid pressurizer provided with a circuit for sprinkling the vapor phase controlled by a valve supplied from the charging pipe of the volume control circuit, according to which method, during cooling of the circuit by discharge of secondary steam, continuous sprinkling of cold water on the steam contained in the pressurizer is effected, the discharge flow rate is regulated as a function of a pressure measurement taken immediately upstream of the discharge valve and after an upstream expansion stage, and the charging flow rate is regulated as a function of the liquid level in the pressurizer, the improvement comprising the steps, when the liquid level reaches the upper part of said pressurizer where level detection becomes inoperative, of

(a) maintaining a constant flow rate at the charging pipe;

(b) regulating the discharge flow rate by rapid acting regulation from direct measurement of the pressure of said primary circuit;

(c) performing a first one of a series of successive sprinklings at said pressurizer to reduce the discharge flow rate to a reference value;

(d) detecting after said first sprinkling the reduction in discharge flow rate which is immediately caused by the pressure reduction due to the condensation in the pressurizer;

(e) continuing alternatingly successive sprinklings and detections until further sprinkling has no further effect on the discharge flow rate; and

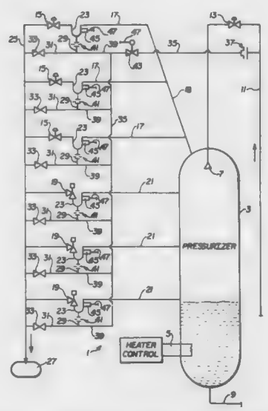
(f) continuing cooling of the pressurizer with pressure regulation by said discharge valve.

4,728,486

PRESSURIZED WATER NUCLEAR REACTOR PRESSURE CONTROL SYSTEM AND METHOD OF OPERATING SAME

Nicholas W. Kish, Munhall, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1985, Ser. No. 765,465
Int. Cl.⁴ G21C *9/00*
U.S. Cl. 376—307 **15 Claims**



1. In a pressure control system of a pressurized water nuclear reactor, containing a pressurizer, water sprayers and means for charging water to said water sprayers, heaters, power operated relief valves and safety relief valves, wherein the valves each are connected to the pressurizer through a conduit forming a loop seal upstream from each valve for accumulation of a water seal for the valve seat thereof, and the valves discharge through a line to a pressurizer relief tank, the improvement comprising:

means for charging water to each of said loop seals;

means for sensing a variation in temperature in each of said loop seals resulting from the discharge of the water seal therefrom and passage of steam therethrough, or formation of a water seal replacing steam therein; and

means responsive to said means for sensing a variation in temperature to activate said means for charging water to charge water to at least one of said loop seals upon a rise in temperature therein, and deactivate said means for charging water thereto upon a drop in temperature therein.

12. A method for effecting the closing of power operated relief valve or safety valve of a pressure control system for a nuclear reactor plant containing such valves, and a pressurizer, with water supplied to the pressurizer through a conduit to water sprayers which valves have a water-filled loop seal connected therewith, the water in said water-filled loop seal being discharged therefrom when the valve is opened and steam passed therethrough comprising:

sensing the temperature rise in the area of said loop seal, above a predetermined temperature, caused by the discharge of water therefrom and passage of steam therethrough;

charging water to said loop seal upon sensing of said temperature rise in an amount to produce a replacement water seal therein and lower the temperature to below said predetermined temperature in the area of said loop seal; and

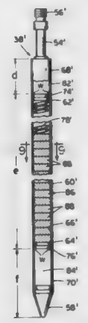
stopping the flow of said charging water to said loop seal upon lowering of the temperature of the area of the loop seal below said predetermined temperature.

4,728,487

STANDARDIZED REDUCED LENGTH BURNABLE ABSORBER RODS FOR A NUCLEAR REACTOR

Barry F. Cooney, Pittsburgh, and Thomas M. Camden, Jr., Washington, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,902
Int. Cl.⁴ G21C *7/10*
U.S. Cl. 376—327 **7 Claims**



1. A burnable poison type control rod for use in a fuel assembly of a nuclear reactor, comprising:

(a) an upper end portion including

(i) an upper end plug, and

(ii) an elongated upper hollow tubular extension having opposite upper and lower ends with said upper end plug sealably and rigidly connected to said upper end thereof;

(b) a lower end portion including

(i) a lower end plug, and

(ii) an elongated lower hollow tubular extension having opposite upper and lower ends with said lower end plug sealably and rigidly connected to said lower end thereof;

(c) an intermediate portion including

(i) an elongated middle hollow tubular section having opposite upper and lower ends and a chamber defined therein between said opposite ends,

(ii) a pair of upper and lower end caps rigidly attached respectively to said upper and lower ends of said middle tubular section so as to seal said chamber, and

(iii) a burnable poison material disposed in said chamber of said middle tubular section, said upper and lower hollow tubular extensions being devoid of nuclear fuel material and burnable poison material;

(d) an upper connection fixedly connecting said upper end portion to said intermediate portion by rigidly connecting said elongated upper tubular extension at its lower end with said upper end of said middle tubular section adjacent said upper end cap; and

(e) a lower connection fixedly connecting said lower end portion to said intermediate portion by rigidly connecting said elongated lower tubular extension at its upper end with said lower end of said middle tubular section adjacent said lower end cap.

4,728,488

WEAR RESISTANT ZIRCONIUM BASE ALLOY ARTICLE FOR WATER REACTORS

James E. Gillett, Greensburg; Donald G. Sherwood, Monroeville, and Larry A. Shockling, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1985, Ser. No. 798,193
Int. Cl.⁴ G21C *5/00, 7/10*
U.S. Cl. 376—327 **4 Claims**



1. In a water reactor operating environment, the combination having improved fretting wear resistance comprising:

an elongated tubular water displacer rod; having a low neutron absorption cross section

guide support plates distributed along the length of said water displacer rod;

said water displacer rod intersecting said guide support plates through apertures in said guide support plates;

said water displacer rod having a plurality of spaced apart annular electrospark deposited coatings, each said coating facing the wall of a respective said aperture, said electrospark deposited coatings comprising Cr_2C_3;

wherein said water displacer rod has a tube wall composed of a zirconium base alloy;

and wherein said guide support plates are composed of a stainless steel alloy.

4,728,489

SUPPORT GRID WITH INTEGRAL VANES

Stephen C. Hatfield, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

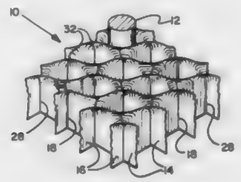
Filed Jun. 20, 1986, Ser. No. 876,592
Int. Cl.⁴ G21C *3/34*
U.S. Cl. 376—439 **6 Claims**

1. In a fuel element support grid for supporting a plurality of nuclear fuel elements intermediate their ends in spaced relation for fluid flow therebetween, said grid including a polygonal perimeter and a plurality of fuel element compartments defined by pairs of first and second intersecting and slottedly inter-

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locked grid-forming strips attached to said perimeter and to each other, the improvement comprising:

at least some of said compartments defined by two pairs of intersecting and slottedly interlocked strips and said compartments each including two pairs of intersecting and



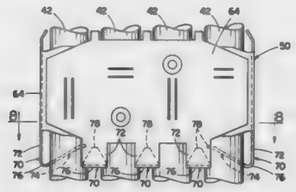
welded together integral fluid flow directing vanes along adjacent edges of each of the strips of the two pairs with each of the adjacent integral fluid flow directing vanes curved from the planes of their respective strips and intersecting with the adjacent vane of an intersecting strip to form a substantially continuous smooth surface.

4,728,490

FUEL ROD SPACER WITH PERIMETER SCOOPS FOR DIVERTING LIQUID COOLANT FLOW

Rusi P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 17, 1986, Ser. No. 908,140
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—439 **13 Claims**



1. An improved fuel rod spacer for use in a nuclear reactor fuel assembly containing a plurality of elongated fuel rods, said spacer comprising:

(a) inner means defining a plurality of inner cell openings for receiving therethrough respective ones of said fuel rods in spaced apart and generally parallel extending relation, said inner means having outer spaced apart terminal end portions;

(b) outer peripheral means attached to said respective outer terminal end portions of said inner means to define a number of perimeter cell openings for receiving therethrough other ones of said fuel rods in spaced apart and generally parallel extending relation, said perimeter cell openings being arranged to encompass said inner cell openings as a group, said inner means defining a border which surrounds said inner cell openings as a group and separates them from said perimeter cell openings; and

(c) a plurality of coolant flow diverting scoops mounted on said outer peripheral means in spaced apart relation and along a common coolant flow receiving side thereof so as to extend inwardly along and in spaced relation from a common coolant flow receiving side of respective ones of said inner means terminal end portions and within the respective spaces between said other ones of said fuel rods when received through said perimeter cell openings, said scoops terminating at inner ends being disposed generally proximate said border defined by said inner means;

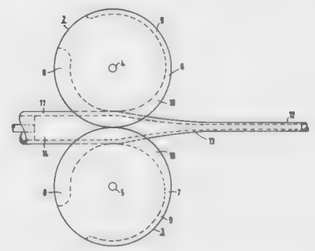
(d) said each scoop including a mounting portion and a flow deflecting portion, said mounting portion being attached to said outer peripheral means, said flow deflecting portion including said inner end of said scoop and being connected at an outer end to said mounting portion, said outer end of said flow deflecting portion being spaced farther from a respective one of said inner means terminal end portions than said inner end of said flow deflecting portion such that said flow deflecting portion extends from said mounting portion of said scoop in an inclined relation and toward said respective one of said inner means terminal end portions.

4,728,491

CLADDING TUBE OF A ZIRCONIUM ALLOY ESPECIALLY FOR A NUCLEAR REACTOR FUEL ROD AND METHOD FOR FABRICATING THE CLADDING TUBE

Siegfried Reschke, Duisburg, and Eckard Steinberg, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim and NRG Nuklearrohtgesellschaft mbH, Duisburg, both of, Fed. Rep. of Germany

Filed Aug. 1, 1985, Ser. No. 761,561
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428954
Int. Cl.[4] C22F *1/18*
U.S. Cl. 376—457 **6 Claims**



1. A nuclear reactor fuel rod having a cladding tube formed solely of a zirconium alloy, characterized by the feature that the geometric mean of the grain diameters in the zirconium alloy is smaller than or equal to 3 μm to minimize deep cracks in the cladding tube caused by chemically active nuclear fission products liberated from nuclear fuel in the cladding tube.

4,728,492

ROOF REFLECTOR FOR A SMALL HIGH TEMPERATURE REACTOR

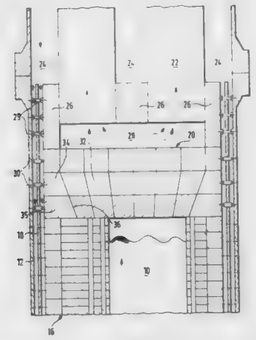
Josef Schoening, Hambruecken, Fed. Rep. of Germany, assignor to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 553,035, Nov. 18, 1983, abandoned. This application Feb. 4, 1986, Ser. No. 827,205
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245021
Int. Cl.[4] G21C *11/06*
U.S. Cl. 376—458 **2 Claims**

1. A roof reflector in combination with a small high temperature nuclear reactor having a reactor core, a hot gas collector space arranged above said roof reflector and laterally surrounding said reactor core, and a thermal side shield laterally surrounding said side reflector and said roof reflector, said roof reflector comprising:

a central support portion consisting essentially of individual, mutually supporting, wedge-shaped graphite blocks supported against each other;

an annular outer portion laterally surrounding and supporting said central support portion; and



springingly elastic means for fastening said annular outer portion to said thermal side shield in a radially expandable manner.

4,728,493

CHROMIUM BASED CORROSION RESISTANT HARD-FACING ALLOY

Donald C. Vreeland, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1987, Ser. No. 37,906
Int. Cl.[4] C22C *27/06, 30/00*
U.S. Cl. 420—428 **2 Claims**

1. A chromium based alloy resistant to sea water corrosion consisting of by weight percent: Cr-45–60; Ni-25–44; Mo-6.5–12; Cb-2.0–4.5; C-1.5–2.8; and Si-0.4–1.2.

4,728,494

SPECTACLE FRAMES MADE OF NI ALLOY

Lorenz Berchtold, Hanau, and Gernot Jäckel, Hasselroth, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 27, 1985, Ser. No. 813,825
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500554
Int. Cl.[4] C22C *19/03*
U.S. Cl. 420—457 **8 Claims**

1. A spectacle frame made of an alloy consisting of 5 to 20% copper, 2 to 6% aluminum, 0 to 1% beryllium, 0 to 0.5% carbon and balance nickel.

4,728,495

REMOVABLE DENTAL APPLIANCES

Leo Rademacher, Witten, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,606
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510331
Int. Cl.[4] C22C *30/00*
U.S. Cl. 420—583 **7 Claims**

1. Removable dental appliances consisting of a cobalt-chromium cast alloy consisting essentially of (in % by weight):

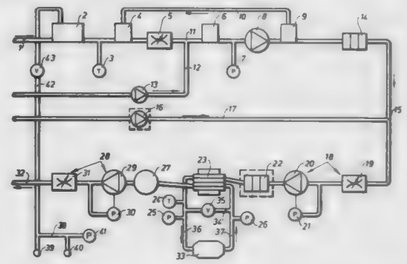
0,1 to 1,0% carbon
0,05 to 0,5% nitrogen
0,5 to 3,0% silicon
0,3 to 10,0% manganese
20 to 35% chromium
2 to 10% molybdenum
5 to 40% iron
at least 20% cobalt as residue including incidental impurities.

4,728,496

APPARATUS AND METHOD FOR CONTROL AND STERILIZATION OF FLUID FLOW

Preben A. Petersen, Bjarred, and Jan P. Steruby, Lund, both of Sweden, assignors to Gambro AB, Sweden

Filed May 29, 1986, Ser. No. 868,353
Claims priority, application Sweden, Jun. 4, 1985, 8502758
Int. Cl.[4] F16K *49/00*
U.S. Cl. 422—1 **9 Claims**



1. A method for controlling the flow of a fluid through a medical treatment device which subjects said fluid to contamination and in which said fluid is normally maintained at a predetermined treatment temperature, said method comprising flowing said fluid through a fluid flow inlet path, controllably supplying heat to said fluid at a predetermined heating location in said fluid flow inlet path, feeding said heated fluid to said medical treatment device, withdrawing said contaminated fluid from said medical treatment device, and intermittently recirculating at least a portion of said heated fluid from a point upstream of said medical treatment device to a point in said fluid flow inlet path upstream of said predetermined heating location so that said at least a portion of said heated fluid again passes through said predetermined heating location whereby said fluid flow inlet path may be disinfected or sterilized by recirculating said fluid through said predetermined heating location so as to raise the temperature of said fluid to a temperature above said predetermined heating temperature while said intermittent recirculation does not take place from a point downstream of said medical treatment device where said contaminated fluid normally flows.

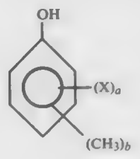
4,728,497

USE OF AMINOPHENOL COMPOUNDS AS OXYGEN SCAVENGERS IN AN AQUEOUS MEDIUM

John A. Muccitelli, Feasterville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 15, 1980, Ser. No. 216,392
Int. Cl.[4] C23F *11/06*
U.S. Cl. 422—16 **22 Claims**

1. A method for reducing the amount of oxygen in an oxygen-containing aqueous medium comprising adding to said medium an effective amount of a hydrazine-free aqueous solution of an aminophenol compound or acid addition salt thereof having the formula:

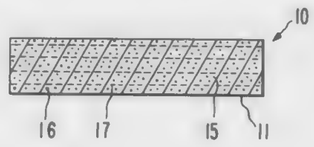


wherein
a=1, 2, or 3;

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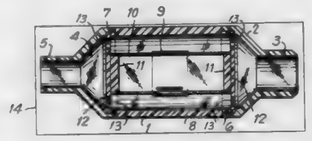
b is 0 or 1; and
X=amino or alkylamino wherein the alkyl group is C_1–C_4.

4,728,498
PROCESS FOR DISINFECTING ARTICLE WITH DEVICE DISPENSING CHLORINE DONOR AND CHLORINE ACCEPTOR
Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 317,528, Nov. 2, 1981, Pat. No. 4,418,038. This application Nov. 1, 1982, Ser. No. 438,049
Int. Cl.⁴ A61L *2/18*
U.S. Cl. 422—29 **1 Claim**



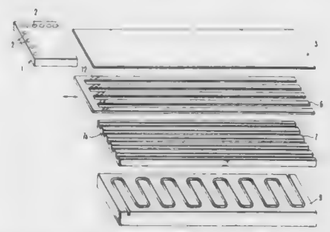
1. A process for disinfecting an article of manufacture in need of disinfecting, which process comprises placing the article of manufacture in an environment consisting essentially of a dispensing device in contact with an aqueous liquid, which dispensing device consists essentially of a polymeric body consisting of two compounds dispersed in the polymeric body, consisting of a first unreacted compound comprising chlorine that is a chlorine donor and a second unreacted compound comprising nitrogen that is a chlorine acceptor, which first donor compound and second acceptor compound on their release by at least one of the process of diffusion, the process of osmotic bursting and the process of erosion, from the dispensing device in the aqueous liquid contact and react with each other in stoichiometric ratio and produce a biocidal compound comprising chlorine for disinfecting the article of manufacture.

4,728,499
CARBON DIOXIDE INDICATOR DEVICE
Carl G. Fehder, 11 Millhouse La., Cherry Hill, N.J. 08003
Filed Aug. 13, 1986, Ser. No. 896,360
Int. Cl.⁴ G01N *33/52*
U.S. Cl. 422—56 **13 Claims**



1. A combination rapid response device for the detection of carbon dioxide in a gas mixture which comprises an enclosure defined by walls and having a transparent window in one of said walls, an inlet, an outlet and atmospheric sealing means, said enclosure having mounted therein an indicator component positioned and arranged so as to be viewed through said transparent window, said component comprising a carrier having fixedly attached thereto an indicating element formed from (1) an aqueous solution of a colorless compound which provides an alkaline solution; (2) a hygroscopic, high boiling transparent, colorless, water-miscible liquid; and (3) a chromogenic pH-sensitive indicator which changes color relative to a change in pH of the solution and which has a pK which is lower by 1.0–1.5 pH units than the pH of the solution, wherein the nature and concentration of the colorless compound in (1) is correlated to the nature and concentration of the indicator (3) so that no color change occurs for at least 15 minutes when the indicating element is exposed to an atmosphere having a concentration of 0.03% carbon dioxide, but a color change is produced within 5 to 20 seconds when said indicating element is exposed to an atmosphere containing at least 2% carbon dioxide, said sealing means enclosing said device and being constructed so as to be opened immediately prior to use of the device.

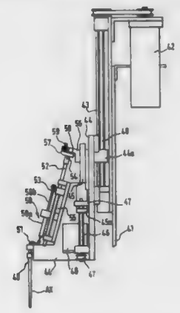
4,728,500
STIRRER FOR BIOCHEMICAL REACTIONS
Yuji Higo, Nagoya, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan
Filed Aug. 6, 1986, Ser. No. 893,620
Claims priority, application Japan, Aug. 7, 1985, 60-173896
Int. Cl.⁴ B01F *13/08*; G01N *33/543*
U.S. Cl. 422—99 **4 Claims**



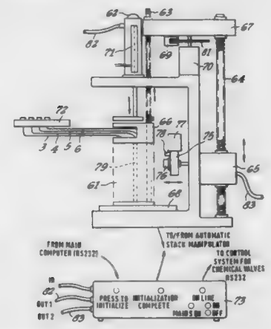
1. A stirrer for biochemical reactions, comprising:
at least one vessel formed of magnetically permeable material for containing a solution of a biochemically reactive substance;
at least one magnetic bead positionable in each said at least one vessel;
means for generating a regularly oscillating magnetic field in each said at least one vessel for oscillating said at least one bead, said generating means comprising a bar having pieces of magnet implanted thereon and positioned relative to said at least one vessel so as to magnetically affect said at least one bead in said at least one vessel, and drive means for regularly oscillating said bar, whereby said at least one bead is regularly oscillated.

4,728,501
ADJUSTABLE LIQUID SAMPLING APPARATUS
Minoru Atake, 579-6, Ohoiso, Ohoiso-macchi, Naka-gun, Kanagawa-ken, Japan
Filed Nov. 27, 1984, Ser. No. 675,350
Claims priority, application Japan, Jul. 27, 1984, 59-157868; Jul. 27, 1984, 59-157869
Int. Cl.⁴ B01L *3/02*; G01F *1/20*; G01N *1/14*
U.S. Cl. 422—100 **4 Claims**

1. A liquid sampling apparatus for drawing and/or expelling a test liquid of a predetermined amount into a hollow cylinder, comprising:
a support;
a vertically movable carriage;
motive means mounted on said support to reciprocally move said carriage by a predetermined distance in a vertical direction relative to said support, wherein the motive means comprises a motor;
a hollow cylinder fixed to said support with a longitudinal axis of said hollow cylinder being inclined at an acute angle to said vertical direction;
a piston means movable in said cylinder to draw a liquid sample into or expel it from said cylinder;
a rod having one end coupled to said piston means, the axis of said rod being parallel to the axis of said cylinder;
a push member mounted on said carriage and positioned to engage the other end of said rod as said carriage is reciprocated vertically, said push member extending in a generally horizontal direction, wherein the push member and the other end of said rod are in abuttment with each other as the carriage is moved downward;
adjustment means for pivoting said push member to vary an angle between said push member and the horizontal direction, and wherein said adjustment means comprises a plate connected at one end of the carriage and extending therefrom at a generally horizontal direction, a pivot rod connected at said one end of the plate and accommodated in a means defining an opening of said push member locted at one end thereof, and a setting means at the other end of said plate for vertically moving the other end of said push member relative to said plate to pivot said push member around said pivot rod; and
a bias means coupled between the support and the rod to urge the rod to an upwardly extended position of the rod.

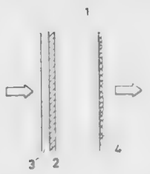


4,728,502
APPARATUS FOR THE CHEMICAL SYNTHESIS OF OLIGONUCLEOTIDES
Brendan J. Hamill, 11, Napier Square, Livingston EH54 5DG, Scotland
Filed Apr. 26, 1985, Ser. No. 727,446
Claims priority, application United Kingdom, May 2, 1984, 8411301; Mar. 4, 1985, 8505448
Int. Cl.⁴ C07K *1/04*
U.S. Cl. 422—116 **5 Claims**



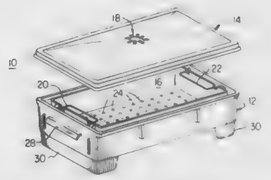
1. Apparatus for simultaneously carrying ot a multiplicity of different chemical and biochemical syntheses on solid supports comprising a multiplicity of support plates each formed with passageways therethrough, one of said passageways through each plate containing a reaction chamber having a solid support; said other passageways each providing a by-pass channel without a solid support, said by-pass channels and reaction chamber being disposed equi-angularly and at the same radial distance about an axis of each plate, means for holding said plates in rotatable alignment about said axis in compression and in face-to-face fluid tight relationship, holding means including end plates complementary to the plates and each formed with a blank position and passages for at least one reactant stream, and means for independently rotating each plate whereby each rotation chamber of each plate may be isolated from or positioned in a selected reactant stream.

4,728,503
FILTER MEDIUM FOR TREATING AN EXHAUST GAS
Yukio Iida; Mitsuhiro Horaguchi; Yuji Kaihara, and Shigechika Tomisawa, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1986, Ser. No. 854,936
Int. Cl.⁴ B01D *50/00*
U.S. Cl. 422—169 **8 Claims**



1. A filter medium for treating an exhaust gas comprising a porous ceramic substrate having a first and second side, positioned on said first side of said substrate a pre-coat layer of a material which prevents clogging of the porous substrate, and a layer of a mixture of slaked lime or calcium carbonate and calcium chloride formed on said pre-coat layer and a layer of denitrating catalyst for eliminating nitrogen oxides positioned on said second side of said substrate for contacting exhaust gas which flows from said first side to said second side of said substrate.

4,728,504
STACKABLE MEDICAL INSTRUMENT STERILIZER CONTAINER
Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766
Continuation-in-part of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617,178. This application Apr. 1, 1985, Ser. No. 718,293
Int. Cl.⁴ B65D *51/16*
U.S. Cl. 422—297 **9 Claims**



1. A medical instrument sterilization container comprising:
a housing having a bottom and sidewalls and dimensioned for receiving medical instruments for sterilization by gas or steam, said housing bottom sloping to at least one location to drain condensate generated during the sterilization process to said at least one location;
at least one pedestal member coupled to said housing bottom for supporting the container and for interacting with a portion of another similarly constructed container to permit stacking of a plurality of containers;
a removable dome-shaped lid for said housing for enabling access to said housing and for creating a sealed volume

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therein to thus maintain the sterility of the interior of said housing;

one filtered outlet port disposed in said housing bottom at each of said at least one location for allowing the passage of condensate therethrough and for also allowing air compressed toward the housing bottom by the passage of steam through said lid to exit said housing; and

a filtered inlet port disposed at the highest point of said lid for allowing the passage of the sterilizing gas or steam therethrough, said inlet port disposed at a height such that it is vertically above and laterally offset from each of said at least one outlet port of an upper container when a plurality of containers are arranged in a stacked configuration.

4,728,505

PROCESS FOR PRODUCING GALLIUM-CONTAINING SOLUTION FROM THE ALUMINUM SMELTING DUST

Akio Era; Shingo Matsui, and Hidetsugu Ikeda, all of Fukuoka, Japan, assignors to Mitsui Aluminium Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 812,438, Dec. 23, 1985, abandoned. This application Jun. 11, 1987, Ser. No. 62,349

Int. Cl.⁴ C01G *15/00*

U.S. Cl. 423—132 **5 Claims**

1. A process for producing a gallium-containing solution from aluminum smelting dust comprising leaching aluminum smelting dust with a mineral acid selected from the group consisting of sulfuric acid, hydrochloric acid and nitric acid, adding an oxidizing agent to the aluminum smelting dust at the time of leaching to preferentially leach and extract gallium from the aluminum smelting dust without extracting aluminum from the aluminum smelting dust, said oxidizing agent being selected from the group consisting of potassium permanganate, manganese dioxide, hydrogen perioxide, ozone, potassium chromate, potassium dichromate, ammonium persulfate, sodium hypochlorite, sodium chlorite and sodium chlorate, and filtering the leached aluminum smelting dust to obtain a gallium-containing solution of dissolved gallium.

4,728,506

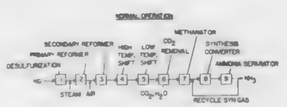
START-UP METHOD FOR AMMONIA PLANTS

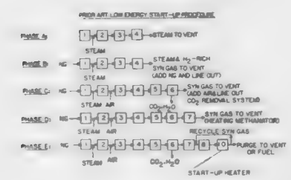
Robert Habermehl, Shelbyville, Ky., and Donald Gill, Geismar, La., assignors to Catalyst Services, Inc., Shelbyville, Ky.

Filed May 16, 1986, Ser. No. 863,796

Int. Cl.⁴ C01C *1/04*

U.S. Cl. 423—359 **7 Claims**





1. In a start-up procedure for a plant comprising in sequence at least one reformer stage, a CO conversion stage, a CO_2 removal stage and a methanization stage; wherein said plant synthesizes a hydrogen-containing synthesis gas from a stream of hydrocarbon feedstock and reforms the thus produced hydrogen containing synthesis gas at least partially into recoverable ammonia, the improvement wherein a gaseous stream of ammonia is employed as the start-up media during the start-up procedure by introducing the ammonia into the reformer stage to form an ammonia containing start-up synthesis gas, passing the ammonia containing start-up synthesis gas through a start-up heater, thereby heating the ammonia containing start-up synthesis gas with said start-up heater and cycling the thus heated ammonia containing start-up synthesis gas through the sequential stages of the plant until the plant is brought to operating temperature.

4,728,507

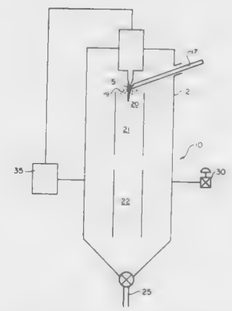
PREPARATION OF REACTIVE METAL HYDRIDES

Samuel A. Worcester, Ogden, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1987, Ser. No. 2,058

Int. Cl.⁴ C01B *6/02*

U.S. Cl. 423—645 **11 Claims**



1. A method for producing powder metallurgy particulate hydrides principally of a transition metal selected from Groups IV-b and V-b of the periodic table of elements, said method comprising:

introducing solid bar or chips principally of a Group IV-b or V-b metal to a melting zone under conditions which form and then disperse individual droplets of said metal, wherein said droplets are predominantly within the size range of about −20 mesh to about +60 mesh (Tyler);

solidifying said droplets while maintaining said droplets dispersed;

maintaining said solidified droplets in a hydriding zone while cooling from solidification in the presence of hydrogen at a temperature within the range maintained to effect a solidified droplet temperature of between about 300° C. to about 700° C., for sufficient duration for said solidified droplets to become friable; and

recovering said solidified droplets from said hydriding zone.

4,728,508

DENTAL CREAM IN PACKAGE

Harry Hayes, Warrington, and Marie D. Brett, Stockport, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,755

Int. Cl.⁴ A61K *7/16*

U.S. Cl. 424—49 **7 Claims**

1. A packaged dental cream wherein said dental cream is in direct contact with a low or medium density polyethylene or polypropylene surface, wherein syneresis occurs in said dental cream due to said direct contact when said dental cream comprises as ingredients an aqueous vehicle comprising about 10–50% by weight of the dental cream of water and about 15–50% by weight of the dental cream of glycerine and sorbitol, the weight ratio of glycerine to sorbitol being from about 0.25:1 to about 3:1, about 0.05–10% by weight of gelling agent and about 20–75% by weight of a dentally acceptable water-insoluble alkaline earth metal salt polishing agent and as an additive which prevents syneresis upon said direct contact, said liquid vehicle comprises at least about 2% by weight of said dental cream of propylene glycol, the weight ratio of the total amount of glycerine and sorbitol to propylene glycol being from about 60:1 to 6:1.

4,728,509

AQUEOUS LIQUID PREPARATION

Hisayoshi Shimizu, Ibaraki; Mitsuaki Oshima, Suita, and Hideo Terayama, Itami, all of Japan, assignors to Takeda Chemical Industries, Ltd. and Senju Pharmaceutical Co., Ltd., both of Osaka, Japan

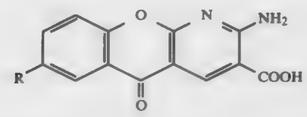
Filed Aug. 5, 1986, Ser. No. 893,161

Claims priority, application Japan, Aug. 19, 1985, 60-182383

Int. Cl.⁴ A61K *31/44, 31/78*

U.S. Cl. 424—81 **12 Claims**

1. An aqueous liquid composition, which comprises a therapeutically effective amount of a compound of the formula;



wherein R is an alkyl having 1–6 carbon atoms, and at least one solubilizer selected from the group consisting of polyvinylpyrrolidone in an amount of about 0.2–20% (W/V), cyclodextrin in an amount of about 0.2–5% (W/V), and caffeine in an amount of about 0.1–2% (W/V).

4,728,510

BATH PREPARATIONS AND METHOD FOR PRODUCING THE SAME

Ichiro Shibanai, Tokyo, and Kenji Nakamura, Osaka, both of Japan, assignors to Japan Liquid Crystal Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,745

Claims priority, application Japan, Jun. 13, 1985, 60-129444

Int. Cl.⁴ A61K *37/52, 35/12, 31/715;* **C08B** *30/18*

U.S. Cl. 424—94.5 **21 Claims**

1. A stable Bath preparation comprising a cyclodextrin clathrate compound of a component of milk.

4,728,511

COMPOSITION AND METHOD FOR THE TREATMENT OF CANCER

Daniel M. de la Torre, Isabel la Catolica No. 271, Colonia Obrera, Mexico 8, D.F., Mexico

Continuation of Ser. No. 723,986, Apr. 16, 1985, abandoned, which is a continuation of Ser. No. 360,541, Mar. 22, 1982, abandoned, which is a division of Ser. No. 145,419, May 1, 1980, abandoned. This application May 12, 1986, Ser. No. 863,804

Int. Cl.⁴ A61K *35/36, 33/06*

U.S. Cl. 424—95 **7 Claims**

1. A composition of matter for the treatment of adenocarcinoma in conjunction with daily dosages of gamma globulin and calcium phosphate, said composition of matter comprising an iodine sterilized colloidal or semi-colloidal suspension of finely divided brain tissue derived from a bovine, equine or primate animal in a dosage sufficient for involuting the adenocarcinoma at any stage of evolution.

4,728,512

FORMULATIONS PROVIDING THREE DISTINCT RELEASES

Atul M. Mehta, Ramsey, N.J.; Lizbeth A. Bachand; Thomas W. Leonard, both of Plattsburgh, N.Y., and Ronald N. Warner, Grand Isle, Vt., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 731,175, May 6, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 836,033

Int. Cl.⁴ A61K *9/52, 9/54, 9/58*

U.S. Cl. 424—458 **9 Claims**

1. A therapeutic composition for once daily oral administration consisting essentially of a pharmaceutical gelatin capsule containing a powder blend of an active medicinal substance subject to extensive presystemic metabolism and two groups of coated spheroids each also containing such active medicinal substance, wherein

(a) said powder blend comprises 10% to 50% by weight of active medicinal substance in admixture with pharmaceutical excipients for immediate release of active medicinal substance to provide a loading dose of such substance,

(b) said first group of spheroids comprises film coated spheroids, which spheroids prior to coating comprise 20% to 75% by weight of active medicinal substance in admixture with non-water swellable cellulose, said film coating comprising (i) a copolymer based on methacrylic acid and methacrylic acid methyl ester or (ii) polyvinyl acetate phthalate, said first group of film coated spheroids having a pH sensitive coating to provide a delayed second dose of such substance and

(c) said second group of spheroids comprises film coated spheroids, which spheroids prior to coating comprise 10% to 60% by weight of active medicinal substance in admixture with non-water swellable microcrystalline cellulose, and said film coating comprising (i) an undercoat selected from the group consisting of hydroxypropyl methylcellulose and hydroxypropyl methylcellulose containing as a disintegrant carboxymethylcellulose sodium or sodium starch glycolate and (ii) an overcoat consisting of a neutral copoylmer based on polymethacrylic acid esters containing metallic stearates, said second group of film coated spheroids being double coated with an effective thickness to provide a further delayed third dose of such substance.

4,728,513

GRANULAR DELAYED-RELEASE FORM OF PHARMACEUTICALLY ACTIVE SUBSTANCES

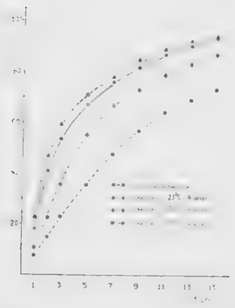
Kimon Ventouras, Le Lignon, Switzerland, assignor to Zyma SA, Nyon, Switzerland

Filed Jul. 23, 1986, Ser. No. 888,610

Claims priority, application United Kingdom, Jul. 31, 1985, 8519310

Int. Cl.⁴ A61K *33/14, 31/78*

U.S. Cl. 424—461 **22 Claims**



1. A process for the manufacture of a granular delayed-

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release form of a pharmaceutically active substance, or mixtures thereof, wherein a granulated or crystalline pharmaceutically active substance, or mixtures thereof, is coated with a coating material mixture consisting essentially of a homogeneous mixture of a poly(H+meth)-acrylic acid-(methyl+ethyl) eater which is insoluble but dispersible in water and ethyl cellulose which is insoluble but dispersible in water in the weight ratio of 20:1 to 1:5, characterised in that the dry coated granules are then heated for at least 5 minutes at elevated temperature ranging from between 50° to 120° C. whereby the instant heat treated coated granules have improved storage stability, slower release of active substance, and release rate kinetics closer to zero order kinetics than identical granules not so heat treated.

4,728,514

METHOD FOR COLORING LIVE BAIT

Al M. Lechnir, P.O. Box 6917, Gulfport, Miss. 39506

Filed Jul. 14, 1986, Ser. No. 885,211
Int. Cl.⁴ A23L *1/275*
U.S. Cl. 426—1 **4 Claims**

1. A method for coloring a live bait species within an aqueous medium comprising:

A. forming an aqueous dye medium from the combination comprising:

i. water;

ii. salt in a volumetric quantity equal to or less than an amount required to form a saturated solution of salt within the water; and

iii. an edible dye in a volumetric quantity in dry form not greater than four time the volume of the salt;

B. immersing the live bait into the medium for a period between two minutes and ten minutes.

4,728,515

LOW MOISTURE CHEWING GUM COMPOSITIONS AND METHODS OF PREPARATION

Mansukh M. Patel, Downers Grove; Michael A. Reed, Evanston; William J. Wokas, Bollingbrook, and Vasek J. Kures, Willow Springs, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Division of Ser. No. 788,078, Oct. 16, 1985, Pat. No. 4,671,961, which is a continuation-in-part of Ser. No. 611,991, May 18, 1984, abandoned. This application Apr. 7, 1987, Ser. No. 35,506
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.⁴ A23G *3/30*
U.S. Cl. 426—3 **39 Claims**

1. A method of preparing a chewing gum composition comprising the steps of:

(a) combining a syrup, containing water and carbohydrate solids having less than about 30% solids with a degree of polymerization (DP) of 1 and at least about 20% solids with a DP of 4 or greater, with a plasticizing agent consisting of glycerine, propylene glycol or a mixture thereof at a weight ratio of between about 0.5:1 and about 100:1 carbohydrate solids to plasticizing agent;

(b) evaporating moisture initially present in the syrup-plasticizer composition so that the total water content of the evaporated syrup-plasticizer composition is less than about 20% by weight;

(c) providing a chewable gum base; a bulking agent selected from the group consisting of sugars, sugar alcohols and mixtures thereof; optional flavors; artificial sweeteners; colors; preservatives and processing aids; and

(d) combining the gum base in amount from about 5% to about 75% by weight of the chewing gum composition, the sweet bulking agent in amount from about 5% to about 75% by weight of the chewing gum composition, and the evaporated syrup-plasticizer composition in amount from about 5% to about 75% by weight of the chewing gum composition, and the optional ingredients to form a finished chewing gum composition having a total moisture content of less than 2%.

4,728,516

METHOD FOR THE PRESERVATION OF CREAMED COTTAGE CHEESE

Donald P. Boudreaux; Mark W. Lingle, both of Sarasota; Ebenezer R. Vedamuthu, Bradenton, all of Fla., and Carlos F. Gonzales, College Station, Tex., assignors to Microlife Technigs, Inc., Sarasota, Fla.

Filed Aug. 11, 1986, Ser. No. 895,302
Int. Cl.⁴ A23C *19/02, 19/14*
U.S. Cl. 426—38 **4 Claims**

1. An improved method for inhibiting mold and psychrotrophic bacteria in creamed Cottage cheese which comprises:

(a) inoculating cream dressing for Cottage cheese or creamed Cottage cheese with a mixture of *Streptococcus lactis* subspecies *diacetylactis* and *Propionibacterium shermanii* at a concentration sufficient to inhibit mold and the psychrotrophic bacteria; and

(b) storing the creamed Cottage cheese at refrigeration temperatures, wherein the mold and psychrotrophic bacteria are inhibited for an extended period of time during storage, said extended time period being longer than that achieved by *Streptococcus lactis* subspecies *diacetylactis* alone in the dressing.

4,728,517

CONVERSION OF BIOLOGICAL SLUDGE AND PRIMARY FLOAT SLUDGE TO ANIMAL PROTEIN SUPPLEMENT

William M. Markham, P.O. Box 685, Verona, Va. 24482, and John H. Reid, 1211 Caroline St., Fredericksburg, Va. 22401

Filed Dec. 3, 1984, Ser. No. 677,556
Int. Cl.⁴ A23K *1/04, 1/10*
U.S. Cl. 426—53 **33 Claims**

1. A conversion process for producing an animal feed supplement of high protein content and adequately low fat content from the wastewater of a proteinaceous food preparation plant, comprising the following steps:

A. producing, by successive admixture of a coagulation agent, compressed air, and a flocculation agent with said wastewater and then by air flotation of said admixed wastewater:

(1) a float sludge, which contains protein and is high in sludge fat, and

(2) a partially purified wastewater;

B. producing an activated sludge from said partially purified wastewater;

C. mixing said float sludge with said activated sludge and a bulking agent to form a bulked mixture;

D. heating and drying said bulked mixture, while absorbing a portion of said sludge fat with said bulking agent, to form a dried mixture in which the dried and partially defatted sludges are in the form of a meal which adheres at least partially to said bulking agent; and

E. separating said meal from said fat-containing bulking agent and recovering said meal which has utility as said animal feed supplement.

4,728,518

METHOD FOR DEVELOPING A RED COLOR IN CURED MEAT

Carlos F. Gonzalez, College Station, Tex.; Mark A. Matrozza, Sarasota, Fla., and Kelly B. Pratt, Neustradt, Fed. Rep. of Germany, assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Jun. 23, 1986, Ser. No. 877,233
Int. Cl.⁴ A23L *1/31*
U.S. Cl. 426—56 **12 Claims**

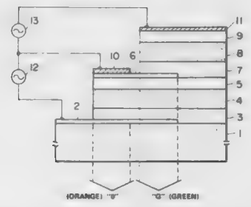
1. In a method for curing meat by inoculating the meat with a bacterium which in the presence of a food grade preservative selected from the group consisting of nitrite, nitrate and mixtures thereof develops a cured red color in the meat the improvement which comprises inoculating the meat with an effective number of cells of a mixture of a *Streptococcus lactis* subspecies *diacetilactis* and a nitrate reducing bacterium in the presence of an effective amount of the food grade preservative to develop the red color, wherein the mixture develops the cured red color in the meat earlier than with the nitrate reducing bacterium alone.

4,728,519

POLYCHROMATIC ELECTROLUMINESCENT PANEL

Satoshi Tanimoto, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 16, 1984, Ser. No. 672,208
Claims priority, application Japan, Dec. 9, 1983, 58-231343
Int. Cl.⁴ B05D *5/06*
U.S. Cl. 427—66 **7 Claims**



1. In a method of producing a polychromatic luminous panel having a plurality of electrodes and a transparent substrate, the first steps of:

forming a first light emitting element that emits light of a first color on said transparent substrate using a lift off technique; and

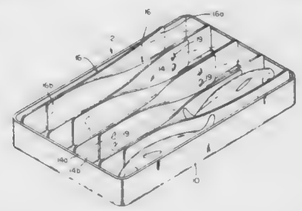
forming a second light emitting element that emits light of a second color on said transparent substrate in a non-overlapping relationship with said first light emitting element using a lift off technique.

4,728,520

PROCESS OF PREPARING INSTANT NOODLES

Tazuo Yamaya, Moriyama; Ryutaro Kubo, and Masahiro Yamazaki, both of Ohtsu, all of Japan, assignors to Nissin Food Products Co., Ltd., Osaka, Japan

Filed Jan. 22, 1986, Ser. No. 821,264
Claims priority, application Japan, Jan. 25, 1985, 60-13228
Int. Cl.⁴ A23L *1/16*
U.S. Cl. 426—94 **6 Claims**



1. A process for preparing an instant noodle food product, comprising the steps of forming a brick of dried noodles, adding a powdered or granular mixture of seasonings, spices, flavors and a hydroscopic caking component onto the brick of dried noodles and thereafter sticking and fixing said powdered or granular mixture on said brick of noodles by moistening said noodles and said mixture.

4,728,521

FISH STORAGE TRAY AND DIVIDERS AND METHOD OF STORING FROZEN FISH

Patrick J. Mitchell, P.O. Box 88943, Seattle, Wash. 98188

Filed Mar. 10, 1987, Ser. No. 24,267
Int. Cl.⁴ B65D *5/48;* **A22C** *25/00, 25/12;* **A23B** *4/06*
U.S. Cl. 426—119 **12 Claims**

1. A fish storing rack and dividers, comprising:

a tray member having side walls and end walls and a bottom surface;

a plurality of elongated, flexible divider strips positioned in said tray member upright along their longitudinal edge, said divider strips interconnected adjacent alternating opposite ends to form alternating converging compartments and opposite open ends, said converging compartments facing in alternating opposite directions, each having a common strip therebetween,

said strips interconnected by means interconnecting said divider strips to normally compress said divider strips into engagement with one another such that the compartments formed when the divider strips are forced apart will snugly conform to the sides and tail of the smallest fish being stored.

8. The method of freezing and storing fish, comprising:

connecting a first upright elongated flexible plastic strip at one end to a second upright elongated flexible plastic strip, separating the opposite unconnected ends of the two strips to form a fish-receiving compartment whose walls converge toward the connected end;

connecting the opposite ends of the second strip to the first end of a third elongated flexible plastic strip lying on the opposite side of the second strip away from said fish-receiving compartment to form a second fish receiving compartment having side walls converging toward said connections between said second and third strips and with the converging ends of the first and second-fish-receiving openings alternately facing in opposite directions;

connecting additional elongated flexible plastic strips in the same manner as above to form a matrix of alternatively facing fish-receiving compartments, said connecting steps interconnecting said strips to normally compress said strips into engagement with one another such that the compartments formed when the strips are forced apart will snugly conform to the sides and tail of the smallest fish being stored;

placing the interconnected strips within a tray upright along their longitudinal edges;

placing fish within the fish-receiving openings, with the fish lying on a lengthwise edge and supported by the strips; and

freezing the fish in the tray.

4,728,522

PROCESS FOR TREATING HULLED OILSEEDS

Frederick C. Wear, St. Louis County, Mo.; Hal E. Bland, Raleigh, N.C., and Sadru Dada, Freehold, N.J., assignors to McDonnell Douglas Corporation, St. Louis, Mo.; Aeroglide Corporation, Raleigh, N.C. and Continental Grain Company, New York, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,356
Int. Cl.⁴ A23L *1/20, 3/16*
U.S. Cl. 426—242 **2 Claims**

1. A process for treating hulled oilseeds comprising the steps of

(a) heating hulled seeds with microwave energy to a temperature of about 135° to about 160° F. and removing about 0.5–1% moisture,

(b) moving the heated seeds to a cracking station and immediately cracking the heated oilseeds on a two-high cracking rolls at a temperature of about 135° to 160° F. to form a mix of hulls, fines and meats with no more than about 5% fines on a dry solids basis with respect to the meats,

(c) moving the mix directly from the cracking station to a

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separating station and immediately separating and removing the hulls and fines from the meats at a temperature of about 135° to 160° F. by an air stream separator without passing through a primary vibrating screen, the air stream at the separating station being heated by air heated by magnetron cooling fluid from the microwave heating of step (a), and



(d) moving the meats at said temperature directly to a flaking station without passing through a conditioner and flaking the meats at a temperature of about 135° to 160° F., and returning the fines from step (c) to the flakes means to recover a product having no more than about 5% fines.

4,728,523
PROCESS FOR PREPARING DYED COLLAGEN SAUSAGE CASING

William L. Baldwin, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Apr. 4, 1986, Ser. No. 848,667
Int. Cl.[4] A23L *1/275*
U.S. Cl. 426—250 **3 Claims**

1. A process for the manufacture of a dyed, unfilled, edible collagen casing, from an extrudable collagen gel comprising adding a dye to the collagen in the casing, prior to the shirring of the casing, said dye comprising chocolate liquefied in a vegetable oil, said casing containing from 1 to 15% chocolate based on the weight of the collagen in the casing, and drying the casing.

4,728,524
RESTRUCTURED MEAT PRODUCTS AND METHODS OF MAKING SAME

Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Creativators, Inc., West Chester, Pa.

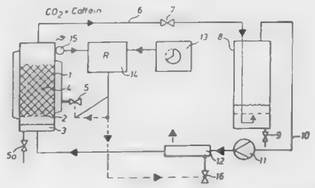
Continuation of Ser. No. 808,672, Dec. 16, 1985, abandoned, which is a continuation of Ser. No. 596,760, Apr. 4, 1984, abandoned. This application May 5, 1987, Ser. No. 51,265
Int. Cl.[4] A23L *1/314*; A23P *1/00*
U.S. Cl. 426—272 **12 Claims**

1. A method of preparaing a restructured meat product of substantially uniform consistency and tenderness and substantially deviod of chunks or cubes comprising the steps of:
(a) slicing meat parts into thin slices having a thickness of about 1 to 3 mm and a major surface area greater than about 10 cm^2;
(b) kneading said slices together in a tangled mass to cause the juices of the meat to exude from said slices until said slices begin to stick together by means of said juices, said kneading step comprising working of the meat mass in and out, with successive squeezing, releasing, flattening and folding in a manner which simulates the hand kneading of dough; and
(c) forming said tangled mass of meat slices into a restructured meat product, said product being held together by the adhesive nature of meat juices and the entanglement of said slices.

4,728,525
PROCESS FOR THE DECAFFEINATION OF GREEN COFFEE

Pablo Toro, Transversal 44 B No. 101-01, and Marco Quijano, Calle 26 A No. 37-28, both of Bogota, Colombia

Continuation of Ser. No. 680,806, Dec. 12, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 850,075
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345006
Int. Cl.[4] A23F *5/20*
U.S. Cl. 426—481 **15 Claims**



1. A process for the decaffeination of green coffee wherein at least 93% of the original caffeine content is extracted by treatment of the coffee with carbon dioxide gas saturated with water in the supercritical state at a high pressure and at a temperature of at least 40° C. the improvement comprising the steps of:
a. providing a quantity of green coffee with a moisture content of 40 to 50% to be treated;
b. circulating an extractant consisting of carbon dioxide gas saturated with water in the supercritical state through said quantity of green coffee;
c. maintaining said extractant in contact with said quantity of green coffee at a selected pressure in the range of 200 to 300 bar;
d. heating said quantity of green coffee for a first predetermined period of time at a temperature at least above 40° C. and up to and including 70° C. and heating for a second predetermined period of time above 70° C. and below 85° C. to permit said carbon dioxide gas to extract caffeine from the green coffee, said second period of time being one fifth to one-third of the total decaffeination time, the majority of the extractable caffeine being extracted during said first period and the remainder of the extractable caffeine being extracted during said second period; and
e. subsequently removing said caffeine from said carbon dioxide;
whereby a high quality of decaffeinated coffee is obtained without the use of any additives to the extractant.

4,728,526
GRAVITATIONALLY-STABILIZED PEANUT-CONTAINING COMPOSITION

Fitzhugh L. Avera, Alameda, Calif., assignor to Jack W. Kuehn, Sr., Burnsville, Minn.

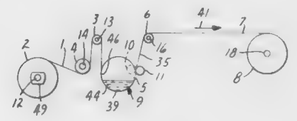
Filed Dec. 18, 1986, Ser. No. 943,681
Int. Cl.[4] A23L *1/38*
U.S. Cl. 426—633 **20 Claims**

1. A gravitationally-stabilized hydrophilic peanut-containing composition that is compatible with aqueous food systems which comprises a homogeneous dispersion of:
(a) about 40–50% by weight of unextracted ground peanuts including their peanut oil;
(b) about 30–50% by weight of a water-soluble edible polydextrose; and
(c) about 7.5–20% by weight of added water; wherein said polydextrose is dissolved in said water; and wherein said polydextrose includes polycarboxylic acid cross-linking agents.

4,728,527
ONE-SIDE WEB TREATMENT METHOD AND APPARATUS WITH SELF-FORMING TREATMENT VESSEL

Alan J. Herbert, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1986, Ser. No. 905,625
Int. Cl.[4] B05D *1/28, 3/12*; B05C *3/12*
U.S. Cl. 427—8 **40 Claims**

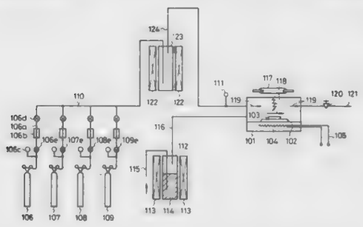


22. A method for treating one side of a moving web with a flowable material, comprising the steps of:
(a) passing a running length of said web in a downwardly extending partial loop in sealing engagement with the lower arcuate edges of vertically positioned transversely spaced end members to form a flowable-material retaining trough therebetween;
(b) introducing a flowable treating material into said formed trough; and
(c) drawing said web around said arcuate edges of said end members to expose only the upper surface of said web to said flowable treating material in said formed trough.
25. The method according to claim 22, further comprising: the step of monitoring a property of the treated web and controlling the speed at which said web is drawn in step (c) to maintain said property at a desired value.

4,728,528
PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai; Shunri Oda, both of Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 829,804, Feb. 14, 1986, abandoned. This application Dec. 18, 1986, Ser. No. 943,071
Claims priority, application Japan, Feb. 18, 1985, 60-29806; Feb. 19, 1985, 60-31049; Feb. 20, 1985, 60-32210; Feb. 21, 1985, 60-33274; Feb. 22, 1985, 60-34776; Feb. 25, 1985, 60-35607
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **23 Claims**



1. A process for forming a deposited film, which comprises introducing into a film forming space housing a substrate therein an active species (A) formed by decomposition of a compound containing carbon and a halogen and an active species (B) formed from a chemical substance for film formation which is reactive with said active species (A) separately from each other, then irradiating them with light energy and thereby allowing both the species to react with each other thereby to form a deposited film on the substrate.

4,728,529
METHOD OF PRODUCING DIAMOND-LIKE CARBON-COATINGS

Heinz-Werner Etzkorn, Neu-Anspach, and Werner Ronge, Mörfelden/Walldorf, both of Fed. Rep. of Germany, assignors to Battelle-Institut E.V., Frankfurt am Main, Fed. Rep. of Germany

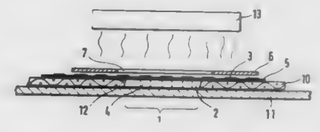
PCT No. PCT/EP85/00275, § 371 Date Dec. 13, 1985, § 102(e) Date Dec. 13, 1985, PCT Pub. No. WO86/00093, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 7, 1985, Ser. No. 813,280
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **14 Claims**

1. Method of producing diamond-like carbon coatings in which hydrocarbons and hydrogen, possible in the presence of a noble gas, are ionized by plasma discharge, comprising placing a substrate to be coated in a coating apparatus and evacuating the apparatus to a residual gas pressure of below 2×10^{-5} mbar, then passing a hydrocarbon gas or a mixture of hydrocarbon gases and pure hydrogen onto the substrate to be coated which is at room temperature or cooled down to −100° C., and producing around the substrate an oxygen-free plasma discharge by high-frequency excitation which is sustained by the gases admitted, the gases being excited, dissociated, ionized and accelerated toward the substrate during the plasma discharge, wherein the partial pressure of the hydrocarbon gas is adjusted between 10^{-3} and 1 mbar.

4,728,530
METHOD FOR MENDING DAMAGED AREAS IN PAPERMACHINE FABRICS

Hartmut Waldvogel, and Georg Borel, both of Reutlingen, Fed. Rep. of Germany, assignors to Hermann Wangner GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

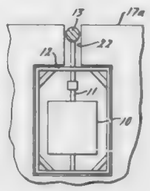
Filed Jan. 9, 1987, Ser. No. 1,732
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600577
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **6 Claims**



1. A method for mending damaged areas in papermachine fabrics comprising:
filling the damaged area with a radiation curable resin;
irradiating the damaged area with the exception of a plurality of spaced apart dot-like areas in order to crosslink the resin in the irradiated areas; and
rinsing the area filled with resin to remove the noncrosslinked areas of the photosensitive resin.

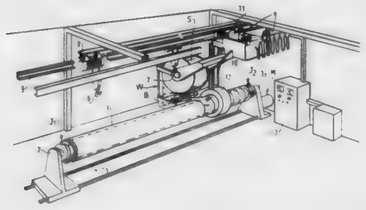
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4,728,531
METHOD OF DRYING REFRACTORY COATED FOAM PATTERNS
Bruno Matz, Milford, and Dolores C. Kearney, Inkster, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Nov. 4, 1986, Ser. No. 926,758
Int. Cl.[4] G05D *3/02*
U.S. Cl. 427—45.1 16 Claims



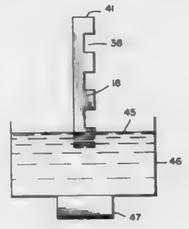
15. A method of dehydrating polystyrene foam pattern assemblies coated with a water based ceramic slurry in a thickness range of 0.031-0.120 inches, said pattern assemblies having hidden internal surfaces, the method comprising:
(a) subjecting said coated assembly to a single cycle of convective airflow at a temperature and time sufficient to dehydrate at least 60% of the vaporizable content of said coating at a temperature below that at which the substrate is thermally affected; and
(b) thereafter subjecting said partially dehydrated coated assembly to microwave energy to substantially remove the remainder of said vaporizable content in the coating in a manner to avoid nonuniformity in the smoothness of the coating.

4,728,532
METHOD OF EXTERNALLY COVERING METAL OBJECTS
Hendrik Koopman, Puttershoek, Netherlands, assignor to Troost Pernis Groep B.V., Netherlands
Continuation of Ser. No. 589,055, Mar. 15, 1984, abandoned, which is a continuation of Ser. No. 408,780, Aug. 17, 1982, abandoned. This application Aug. 21, 1986, Ser. No. 898,500
Claims priority, application Netherlands, Aug. 21, 1981, 8103899
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—46 6 Claims



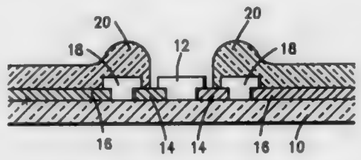
1. The method of covering metal objects such as pipes with a sealing and insulating layer which comprises the steps of:
(a) providing the object at room temperature in supported relation about its longitudinal axis;
(b) rotating the object while at room temperature about its longitudinal axis while wrapping a layer of resin-impregnated tape which does not readily flow at room temperature to the outer surface of the pipe, said resin comprising a synthetic thermosetting resin;
(c) inductively heating the object substantially uniformly through its thickness beneath its wrapping a plurality of times progressively from one end to the other end thereof subsequent to the wrapping of step (b), while rotating the object about its axis, to elevate the temperature of the object in a plurality of stages from room temperature to a temperature below the curing temperature of the resin but which is sufficiently in excess of room temperature to allow the resin to flow on the outer surface of the object;
(d) terminating the heating of step (c);
(e) further inductively heating the object substantially uniformly throughout its thickness progressively from one end to the other end thereof to elevate the temperature of the object to a temperature at which the resin will cure;
(f) allowing the resin to cure; and then
(e) cooling the object to room temperature.

4,728,533
PROCESS FOR FORMING INTEGRAL EDGE SEALS IN POROUS GAS DISTRIBUTION PLATES UTILIZING A VIBRATORY MEANS
Haim Feigenbaum, Highland Park, and Sheldon Pudick, Sayreville, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.
Filed Sep. 30, 1982, Ser. No. 430,291
Int. Cl.[4] H01M *2/08*
U.S. Cl. 427—57 8 Claims



1. Process for producing an integral edge seal in a gas distribution plate for a fuel cell comprising providing a porous gas distribution plate; and forming a sealing layer along an edge thereof by impregnating said pores in said layer with a material adapted to provide a seal which is operative dry and when wetted by an electrolyte of said cell, said impregnating step being carried out while vibratory energy is applied to said material whereby said pores in said edge are more uniformly sealed throughout the cross-section of the edge said plate.

4,728,534
THICK FILM CONDUCTOR STRUCTURE
Roland K. Ho, Elgin, and Richard H. Jung, Park Ridge, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 4, 1986, Ser. No. 892,629
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—103 15 Claims



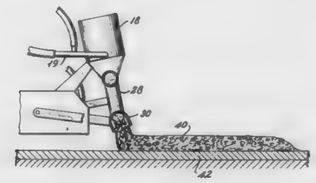
1. A method for coupling a resistive material to a conducting layer on a supporting carrier, comprising the steps of:
forming a terminating layer on the carrier;

positioning the conducting layer on the carrier such that it is separated from the terminating layer by a gap;
forming a barrier layer in the gap such that it couples the conducting layer to the terminating layer; and, thereafter,
coupling the resistive material to the terminating layer, such that the conducting layer is coupled to the resistive material.

4,728,535
METHOD OF MANUFACTURING THIN CARBON PRODUCTS
Louis A. Joo', Johnson City; Kenneth W. Tucker, Elizabethton, and Frank E. McCown, Jr., Bristol, all of Tenn., assignors to Great Lakes Carbon Corporation, Briarcliff Manor, N.Y.
Continuation of Ser. No. 501,633, Jun. 6, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,672
Int. Cl.[4] B05D *5/12;* C01B *31/00;* D01F *9/16*
U.S. Cl. 427—113 16 Claims

1. A process for the production of thin carbon plates useful in primary and secondary electrochemical cells and having a thickness from 0.25 mm to 5 mm and a porosity of 30% to 85% by volume comprising: (1) impregnating a cellulose sheet material consisting essentially of cotton linters with a carbonaceous impregnant selected from the group consisting of coal tar, solvent-cut coal tar pitch, slurry oil, creosote oil and mixtures thereof, (2) curing said impregnated material in air at a temperature from 90° to 300° C., and (3) baking said material in an inert or reducing atmosphere to carbonize the impregnant.

4,728,536
METHOD FOR INSULATING AN ICE RINK
William G. Burley, Salix, Pa., and John S. Burley, R.D. #1, Box 431, Apt. B-13, Beautyline Dr., Salix, Pa. 15952, assignors to John S. Burley, Salix, Pa.
Filed Oct. 29, 1986, Ser. No. 924,319
Int. Cl.[4] B05D *1/30*
U.S. Cl. 427—154 6 Claims

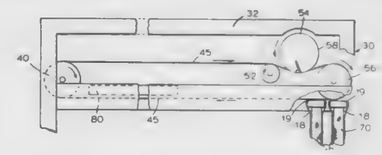


1. A method for reducing the refrigeration load on frozen surface during non-operating periods which comprises:
applying a metastable liquid foam directly on the frozen surface upon commencement of a non-operating period of time, thereby insulating the frozen surface from the ambient air;
allowing the foam layer to remain quiescent throughout the non-operating period, during which period the foam undergoes aging and at least partial freezing; and
at the expiration of the non-operating period removing the aged and frozen foam from the frozen surface.

4,728,537
ORE PELLETIZATION
Anthony P. Allen, Leeds, England; Sten Forsmo, Malmberget, Sweden, and John G. Langley, Shipley, England, assignors to Allied Colloids Limited, Great Britain
Continuation-in-part of Ser. No. 935,006, Nov. 26, 1986, Pat. No. 4,684,549. This application May 29, 1987, Ser. No. 55,701
Claims priority, application United Kingdom, Nov. 29, 1985, 8529418; Mar. 24, 1987, 8706932
Int. Cl.[4] B05D *7/00;* C22C *1/04;* H01F *1/02*
U.S. Cl. 427—221 22 Claims

1. A process in which mineral ore pellets are made by adding binder comprising organic polymer to particulate iron ore having substantially all particles below 250 μm and stirring in the presence of 5 to 15% by weight water (based on total mix) to form a substantially homogeneous moist mixture and pelleting the moist mixture, and in which the binder comprises about 0.002% to about 0.5% by weight, based on total mix, of a water soluble synthetic polymer and that is added to the ore as dry, free flowing beads that are substantially all above 20 μm and below 300 μm and that are made by reverse phase bead polymerisation from a water soluble ethylenically unsaturated monomer or blend of monomers.

4,728,538
METHOD AND APPARATUS FOR IMPRINTING NON-SLIP COMPOSITION ON A GARMENT
Peter D. Kaspar, and Wilbert Melvin, Jr., both of Dover, Del., assignors to Danpen, Inc., New York, N.Y.
Continuation of Ser. No. 659,042, Oct. 9, 1984, abandoned. This application Jun. 24, 1986, Ser. No. 879,547
Int. Cl.[4] B05D *5/02, 1/28;* B05C *1/02*
U.S. Cl. 427—288 21 Claims



1. Apparatus for continuously applying a dot pattern of a non-slip composition to a plurality of garments, said apparatus including delivery means for delivering said plurality of garments and transfer means for continuously imprinting said dot pattern onto said plurality of garments, said transfer means including a transfer roller comprising a screen with a plurality of holes provided therein arranged in the dot pattern which is to be imprinted onto said garments, means for introducing said composition into said transfer roller, means for forcing said composition through said plurality of holes, a rotating transfer belt positioned adjacent to said transfer roller and adapted to continuously receive said dot pattern of said composition from said transfer roller and transfer the dot pattern of said composition onto said garments delivered by said delivery means, and heating means adapted to heat said rotating transfer belt to accelerate the drying of the non-slip composition imprinted onto said garments while said garments are in contact with said belt.

16. A method for applying dot patterns of a non-slip composition continuously to a plurality of garments, said method comprising the steps of:
delivering said plurality of garments by conveyor means to a transfer apparatus for applying said non-slip composition in said dot patterns;
introducing said composition into a transfer roller provided in said transfer apparatus, said transfer roller including a screen in the form of a cylinder with a plurality of holes provided therein arranged in the dot patterns to be transferred to said garments;

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forcing said composition through said holes onto a rotating transfer belt positioned adjacent said transfer roller;
transferring said dot patterns from said transfer belt to said garments;
heating said transfer belt to accelerate drying of the non-slip composition imprinted onto said garments while said garments are in contact with said belt; and
removing said garments from said conveyor means.

4,728,539

PAPER COATING APPARATUS AND METHOD

Patrick A. C. Gane, Callington, United Kingdom, assignor to E.C.C. International Limited, United Kingdom

Filed Mar. 25, 1986, Ser. No. 843,985
Claims priority, application United Kingdom, Apr. 1, 1985, 8509431
Int. Cl.⁴ B05C *3/18;* **B05D** *1/26*
U.S. Cl. 427—356 **9 Claims**



1. A trailing blade paper-coating apparatus which comprises, means providing a resilient curved surface for supporting a moving web of cellulosic material, an applicator for a paper-coating composition, and a trailing blade which is biased for contact with the moving web of cellulosic material, and which further includes a flexible blade mounted so that, in operation of the trailing blade paper-coating apparatus, the flexible blade will be in tangential contact with the moving web of cellulosic material to be coated at a location which is upstream relative to the trailing blade and downstream relative to the applicator for the coating composition, and the distance between said blades is such that the time which will be required for a fixed point on the web of cellulosic material moving at a predetermined rate to travel between the line of contact of the flexible blade and the line of contact of the trailing blade will be at most 15 milliseconds.

4,728,540

PROCESS FOR INTRODUCING USEFUL ADDITIVES INTO ALREADY MANUFACTURED AND FABRICATED FLEXIBLE VINYL PRODUCTS

Robert C. Gasman, 60 Kitchell Lake Dr., West Milford, N.J. 07480

Filed Jan. 14, 1987, Ser. No. 3,563
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—385.5 **19 Claims**

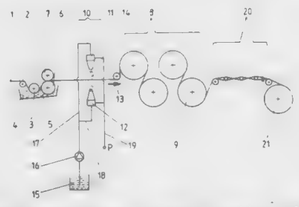
1. A process that can be employed in the field for introducing a special function additive selected from the group of substances consisting of UV stabilizers, mildewcides, fragrances, germicides, insecticides, antioxidants, water repellents, anti-fogging agents, biocides, fungicides, thickeners, lubricants, disinfectants, surfactants, bacteriacides, vinyl heat stabilizers, antistats, release agents, and antiblocking agents into an already manufactured and fabricated vinyl film, vinyl sheet, or vinyl coated fabric which process comprises:
(1) spreading on the vinyl surface at ambient temperature a uniform coating of a solution consisting of
A. a permanent, plasticizer carrier liquid which
(a) has a vapor pressure less than 150 mm Hg at 200° C.,
(b) has a solubility parameter between 7.7 and 12.5 (calories/cc.)×0.5,
(c) has an absorption time less than 10 days at room temperature,
(d) has a viscosity measured at 20° C. which is less than 79 cp., and
(e) does not physically or chemically attack flexible polyvinyl chloride products, and
B. a special function additive which
(a) imparts to the vinyl some property that it did not possess before,
(b) is soluble at least to the extent of 0.001 pphr in the plasticizer at 4° C.,
(c) does not at a minimum concentration of 0.001 pphr increase the absorption time of the plasticizer solution to greater than 30 days at room temperature; and
(2) said vinyl surface to remain undisturbed at ambient temperature until the plasticizer solution has been absorbed into the interior of said vinyl.

4,728,541

METHOD FOR OPERATING A FINISHING MACHINE

Gerhard Voswinckel, Aachen, Fed. Rep. of Germany, assignor to Gebrüder Sucker & Franz Müller GmbH and Co., Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 811,774
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446332
Int. Cl.⁴ B05D *3/02, 1/36, 3/12, 7/24*
U.S. Cl. 427—387 **3 Claims**



1. Method of operating a finishing machine, which comprises impregnating all of the threads of an undivided warp formed of individual threads at full thread density with liquid sizing, directly spraying all of the threads of the undivided warp at full thread density with a post-treatment separating agent while the sizing is still in the liquid state, and subsequently drying the individual threads of the warp in an undivided manner at full thread density.

4,728,542

IONICALLY MODIFIED PUR SPREADING PASTES AND THEIR USE

Klaus Nachtkamp, New Martinsville, W. Va.; Wilhelm Thoma, Leverkusen; Josef Pedain, Cologne; Walter Schröer; Rolf Langel, both of Leverkusen, and Klaus Noll, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 874,326
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521762
Int. Cl.⁴ B05D *3/02;* **C08F** *8/30, 283/04*
U.S. Cl. 427—389 **13 Claims**

1. An optionally pigmented spreading paste which is a multiphase mixture comprising
(A) about 5 to 50% by weight of a hydraulic polyurethane and/or polyurethane urea containing about 0.01 to 0.5% by weight of chemically incorporated groups convertible into salts wherein at least a portion of said groups are present in salt form and about 1 to 30% by weight of a synthesis component containing at least two terminal and/or lateral NCO-reactive groups and comprising a silicone resin, an aromatic hydroxypolyether, an aromatic hydroxypolyester or a perfluorocarbon resin or mixtures thereof,
(B) 0 to about 30% by weight of a hydraulic polyurethane and/or polyurethane urea containing about 0.01 to 0.5% by weight of groups convertible into salts wherein at least a portion of said groups are present in salt form and which do not contain said synthesis component,
(C) about 5 to 50% by weight of an organic solvent for (A) and (B),
(D) 0 to 40% by weight of an organic non-solvent for (A) and (B),
(E) 0 to about 5% by weight of a crosslinking agent or a hydrophobicizing agent and
(F) about 10 to 70% by weight of water.

13. A process for the preparation of a coating permeable to water vapor on a fabric or leather substrate which comprises applying the spreading paste of claim 1 to said fabric or leather substrate by the direct or transfer method and curing the coating using the technique of evaporation coagulation.

4,728,543

MULTILAYER COATING HAVING A CLEAR TOP COAT FORMED ON A COLOR BASE COAT AND METHOD OF FORMING THE SAME

Takeo Kurauchi, Neyagawa; Atsushi Yamada, Nishinomiya, and Jun Nozue, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 660,813, Oct. 15, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 852,481
Claims priority, application Japan, Oct. 26, 1983, 58-201224; Oct. 26, 1983, 58-201225
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—407.1 **11 Claims**

1. In a wet-on-wet method of forming a multicoat on a substrate comprising the sequential steps of (a) applying on said substrate a metallic color base coat composition comprising a first film-forming acrylic polymer having a plurality of cross-linkable functional groups, a volatile organic liquid diluent carrier for said first film-forming polymer, a cross-linking agent and a metallic flake pigment; (b) applying wet-on-wet onto said base coat a clear top coat composition comprising a second film-forming acrylic polymer having a plurality of cross-linkable functional groups, a volatile organic liquid diluent carrier for said second film-forming polymer and a cross-linking agent; and (c) curing both coats simultaneously, the improvement wherein said metallic base coat composition and said clear top coat composition each contains internally cross-linked polymer microgel particles having a particle size from 0.01 to 10 μm, in an amount from 0.5 to 20% by weight based on the combined weight of said film-forming polymer, said cross-linking agent and said microgel particles, wherein said microgel particles are insoluble in the mixture of said film-forming polymer, said diluent and said cross-linking agent but stably disperisble in said mixture, and wherein intermixing of the two coats is prevented by employing as said second film-forming polymer an acrylic polymer which has a molecular weight and composition which is different from those of said first film-forming polymer.

4,728,544

METHOD FOR COATING STEEL STRUCTURES IN WATER

Eishi Asoshina; Masato Shimizu; Kazufumi Hamabuchi, all of Osaka; Shunichi Hitoshi, Kanagawa; Kotaro Yoshida, Kanagawa, and Kazuyuki Doi, Kanagawa, all of Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 30, 1986, Ser. No. 880,430
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—407.3 **8 Claims**

1. A method for coating steel structures in water which comprises
coating as a first layer an underwater-curable composition comprising
(1) a two-pack resin blend system comprising
(a) a blend system comprising an epoxy-based resin, and
(b) a blend system comprising an underwater-curable curing agent capable of hardening the epoxy-based resin blend system, and
(2) from 5 to 75% by weight, based on the total weight of the underwater-curable composition, of a metal powder having an ionization tendency greater than that of iron,
on the steel structures, and
coating an underwater-curable composition comprising the two-pack resin blend system but not containing the metal powder, a coloring pigment and a glass flake on the first layer as a second layer.

4,728,545

METHOD OF FORMING METALLIC COATINGS

Takeo Kurauchi, Neyagawa; Atsushi Yamada, Yawata; Nobuhisa Sudo, Yokohama, and Hidefumi Okuda, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 914,383
Claims priority, application Japan, Oct. 2, 1985, 60-220885
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—409 **17 Claims**

1. In a method of forming a multilayer metallic coating on a substrate comprising the steps of applying a base coating composition comprising a first film-forming polymer having a plurality of cross-linkable functional groups, a cross-linker reactive with said first film-forming polymer, a volatile organic liquid diluent and a metallic pigment on said substrate, applying on the base coating wet-on-wet a clear top coating composition comprising a second film-forming acrylic polymer having a plurality of cross-linkable functional groups, a crosslinker reactive with said second film-forming polymer and a volatile organic liquid diluent, and curing both coatings simultaneously, the improvement wherein said first and second film-forming polymers have a number average molecular weight of from 1,000 to 4,000; and wherein said base coating composition and said top coating composition each contains an amount of internally crosslinked polymer microparticles which are insoluble in the mixture of said film-forming polymer, said cross-linker and said organic liquid diluent but stably dispersible in said mixture, and a catalytically effective amount of an organic acid catalyst which is a combination of an organic sulfonic acid having a pKa below 4.0 and an amount of organic secondary or tertiary amine sufficient to neutralize at least 60% of said sulfonic acid.

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METHOD AND SUBSTANCE FOR PROTECTION OF FREE METALLIC SURFACES, ESPECIALLY STEEL SURFACES AGAINST CORROSION

Oystein E. Rasmussen, Hosleveien 119, N-1340, Berkkestua, Norway

Continuation-in-part of Ser. No. 595,904, Apr. 2, 1984. This application Oct. 10, 1985, Ser. No. 786,180
Claims priority, application Norway, Apr. 6, 1983, 831212; Sep. 5, 1983, 833165
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—409 24 Claims

1. A method for coating a free previously uncoated surface selected from the group consisting of metallic surfaces and asbestos cement surfaces, comprising, keeping the surface in a wet condition by binding a water layer to the surface by means of a gel-forming hydrophilic material, which after gelling and cure is essentially insoluble in water.

4,728,547

LIQUID CRYSTAL DROPLETS DISPERSED IN THIN FILMS OF UV-CURABLE POLYMERS

Nuno A. Vaz, West Bloomfield, and George W. Smith, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 742,983, Jun. 10, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,212
Int. Cl.[4] B05D 3/06; C09K 19/00
U.S. Cl. 428—1 4 Claims

1. An optically responsive film comprising birefringent nematic and/or brirefringent chiral nematic liquid crystal microdroplets dispersed in a film of the ultraviolet radiation cured reaction product of a polyallyl compound and a polythiol taken from the group consisting of $Z[OCO(CH_2)_nSH]_m$, where Z=a polyvalent organic moiety which is the CH_{0-3} group containing nucleus of a tri- or tetravalent alcohol of the type of glycerol or pentaerythritol, m=3 or 4, and n=1 to 5, said microdroplets displaying positive dielectric anisotropy and/or positive diamagnetic anisotropy, said film being capable of undergoing repeated thermally and electrically or magnetically induced transitions between opaque and transparent.

3. A method of making an optically responsive film containing microdroplets of a birefringent nematic and/or birefringent chiral nematic liquid crystal material dispersed in a polymer film comprising

mixing a liquid crystal material with the UV-curable liquid precursor mixture comprising a polyallyl compound and a polythiol taken from the group consisting of $Z[OCO(CH_2)_nSH]_m$, where Z=a polyvalent organic moiety which is the CH_{0-3} group containing nucleus of a tri- or tetravalent alcohol of the type of glycerol or pentaerythritol, m=3 or 4, and n=1 to 5, and thereafter

curing the mixture in the form of a film with high intensity ultraviolet radiation to thereby form a cured polymer matrix which is a reaction product of said allyl compound and polythiol containing dispersed therein droplets of liquid crystal material displaying positive dielectric anisotropy and/or positive diamagnetic anisotropy.

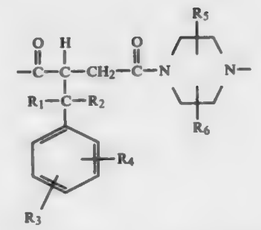
4,728,548

POLYAMIDE COMPOSITIONS

Burns Davis, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

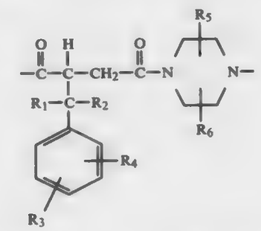
Filed Feb. 9, 1987, Ser. No. 12,928
Int. Cl.[4] B65D 1/00; B32B 27/34; C08G 69/26
U.S. Cl. 428—35 14 Claims

1. A container which is formed from a polyamide comprising recurring units of the formula



wherein R_1 and R_2 are hydrogen or methyl and R_3, R_4, R_5 and R_6 are selected from hydrogen and lower alkyls.

6. A fiber- and film-forming polymer comprising recurring units of the formula



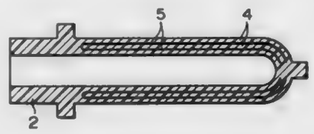
wherein R_1 and R_2 are hydrogen or methyl and R_3, R_4, R_5 and R_6 are selected from the group consisting of hydrogen and lower alkyl; the inherent viscosity of said polymer being at least 0.4.

4,728,549

MULTILAYERED CONTAINER

Senzo Shimizu, Odawara; Mitsuyasu Nagano; Tsutomu Ishizeki, both of Hiratsuka, and Yoshiaki Momose, Hadano, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 793,095
Claims priority, application Japan, Oct. 31, 1984, 59-229656
Int. Cl.[4] B27N 5/02; B32B 27/36, 27/28, 27/08
U.S. Cl. 428—35 1 Claim



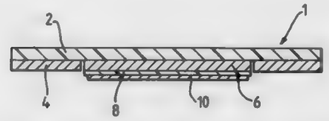
1. A multilayered container wherein the terminal portion of the mouth opening is a single-layered structure of polyethylene terephthalate (resin A), and the wall portion is a five-layered structure composed of two layers of a m-xylylene group-containing polyamide resin (resin B) and three layers of resin A in which the middle layer and the innermost and outermost layers are formed of resin A and the two intermediate layers between the middle layer and the innermost and outermost layers are formed of resin B, said container being formed by biaxially stretching a parison obtained by sequentially injection-molding two resins A and B, the thickness of the wall portion ranging from 200 to 500 microns, and the ratios of the thicknesses of the innermost and outermost layers, middle layer and intermediate layers being in the ranges of 50–70:30–50:3–20.

4,728,550

COATED RECOVERABLE ARTICLES

Jos Van Beersel, Tense, and Eddy Alaerts, Herselt, both of Belgium, assignors to NV Raychem SA, Kessel-lo, Belgium

Filed Mar. 18, 1986, Ser. No. 841,063
Claims priority, application United Kingdom, Mar. 21, 1985, 8507374
Int. Cl.[4] F16L 55/18, 58/00
U.S. Cl. 428—36 11 Claims



1. A sleeve for sealing an end of a joint between two insulated pipes from which the insulation has been removed at the ends thereof exposing uninsulated end portions over which a hollow casing capable of accommodating a foam insulation material has been positioned so as to overlap the pipe insulation at each end of the joint, said sleeve comprising a heat-recoverable polymeric sheet having:

(a) a first layer of a heat-activatable adhesive at a region of a principal surface of the sheet, the adhesive being arranged so as to provide a substantially annular bond between the polymeric sheet and the pipe insulation at one side of the joint;

(b) a layer of sealant at a second region of the said principal surface; and

(c) a layer of a sealing material which overlies at least a portion of the layer of sealant, and which has an elongation modulus that is greater than that of the sealant;

each of said sealant and said sealing material being arranged so as to bridge said casing and the pipe insulation at said one side of the joint.

4,728,551

FLOWABLE PRESSURE COMPENSATING FITTING MATERIALS

Eric C. Jay, 855 Circle Dr., Boulder, Colo. 80302

Filed Feb. 24, 1987, Ser. No. 17,711
Int. Cl.[4] A47C 7/02; A43B 5/04; C08L 91/00
U.S. Cl. 428—76 8 Claims

1. A deformable, pressure-compensating pad comprising:

a flexible protective envelope having confined therein a predetermined amount of viscous flowable, pressure-compensating material;

said envelope being shaped to allow flow therein of confined material in response to continuously applied, deforming pressure loads exerted on the pad;

said confined pressure-compensating material having a substantially homogeneous, flowable, continuous phase comprising an oil; a colloidal silica product, said silica product being uniformly distributed throughout said flowable, continuous phase; and hollow discreet glass microbeads, said oil being substantially non-hardening, said glass microbeads having a density lower than the combined density of said oil and said silica product, said glass microbeads being uniformly distributed throughout said flowable, continuous phase;

said confined pressure-compensating material being characterized:

by being flowable in response to continuously applied pressure, but being essentially non-flowable in the absence of such pressure;

by a substantially homogeneous consistency which does not vary substantially in viscosity in response to ambient temperatures and ambient temperature changes; and

by being resistant to phase separation.

4,728,552

SUBSTRATE CONTAINING FIBERS OF PREDETERMINED ORIENTATION AND PROCESS OF MAKING THE SAME

Elmer W. Jensen, Jr., Norwalk, Conn., assignor to Rodel, Inc., Newark, Del.

Filed Jul. 6, 1984, Ser. No. 628,354
Int. Cl.[4] B24D 3/26, 11/00; B32B 5/08, 5/18
U.S. Cl. 428—91 25 Claims

1. A poromeric article of manufacture comprising a felt sheet of fibers impregnated with microporous elastomer having a work surface, side surfaces joining the work surface and a support surface joining the side surfaces, wherein a majority of the fibers are oriented primarily transverse to the work surface such that the majority of fiber ends adjacent to the work surface form an angle of between about 45° and about 135° with respect to the work surface.

4,728,553

PRISONER LEG RESTRAINT

Jerry Daniels, 4308 Ooltewah-Ringgold Rd., Ooltewah, Tenn. 37363

Continuation-in-part of Ser. No. 803,650, Dec. 2, 1985, Pat. No. 4,643,932. This application Jan. 12, 1987, Ser. No. 2,212
Int. Cl.[4] A62B 35/00; B60R 22/00
U.S. Cl. 428—100 14 Claims



1. Apparatus for restraining the lower limbs of a prisoner or the like to an anchor fixed to a support surface, said apparatus comprising an elongated laminated strap having first and second plies of material bonded together, the first ply comprising a plastic sheet having hook and loop fastener elements extending from a surface thereof, the hooks extending from a location on said sheet toward one end and the loops extending from proximate said location toward the other end, said second ply comprising a vinyl sheet of the same size as said first ply, a grommet fastened to one of said ends of said strap, the second of said ends being a free end, said grommet being of a size for receiving said free end of said strap and permitting said free end to be drawn therethrough and folded over said grommet with portions of said hook and loop elements disposed in facing relationship so as to cooperatively adhere together when engaged, whereby said strap may be adjustably disposed about the lower limbs of said prisoner to lock said limbs together, and a belt of finite length having a first end connected to said strap and having hook means secured at another end, said hook means having latch means for rapid attaching to said anchor.

4,728,554

FIBER STRUCTURE AND METHOD FOR OBTAINING TUNED RESPONSE TO HIGH FREQUENCY ELECTROMAGNETIC RADIATION

Harris A. Goldberg, Colonia, and Y. M. Faruq Marikar, Scotch Plains, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 5, 1986, Ser. No. 859,291
Int. Cl.[4] B65D 45/00; H01Q 15/24, 17/00; H03C 7/00; H05K 9/00
U.S. Cl. 428—113 19 Claims

1. A flexible woven fabric having reduced reflectivity to

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incident, linearly polarized electromagnetic radiation, said fabric comprising:

first fibers comprising a polymer and from 20 to 80 volume percent particulate ferrite fill, said first fibers being oriented generally parallel to one another and generally aligned with the magnetic field of said incident polarized electromagnetic radiation; and

second, non-magnetic dielectric fibers at least partially comprising a polymer, said second fibers being woven in said fabric so that said second fibers are oriented generally parallel to one another and generally aligned with the electric field of said incident polarized electromagnetic radiation.

8. A tunable absorber for microwaves comprising:

a first layer including ferrite fibers oriented generally parallel to one another; and

a second layer overlying said first layer including dielectric fibers oriented generally parallel to one another, said second layer being orientable with respect to said first layer to change the angle between the ferrite fibers and the dielectric fibers to impedance match the absorber to a propagation medium from which the microwaves emanate;

wherein the wavelength of the microwaves is much greater than the combined thickness of the layers.

4,728,555

PROCESS FOR THE PREPARATION OF BETA-HYDROXYPOLYAMINES BY REACTION OF EPOXY RESINS WITH AMMONIA

Hans-Joachim Kiessling, Eppstein/Taunus, and Wilhelm Riemenschneider, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Aug. 15, 1986, Ser. No. 897,492

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529502; Jul. 18, 1986, 3624313

Int. Cl.[4] C08G *59/14;* C07C *89/02*

U.S. Cl. 528—119 **11 Claims**

1. A process for the preparation of a β-hydroxypolyamine consisting essentially of treating at least one polyepoxide compound with liquid ammonia in a first stage at a temperature below 50° C., a homogeneous phase, reacting the homogenous phase in a second stage at 60° to 130° C. in the presence of 0 to 40% by weight of a solvent, based on the weight of the polyepoxide empolyed, and when the reaction is complete, recovering excess ammonia from the reaction mixture to obtain a β-hydroxypolyamine.

4,728,556

ELECTROSTATIC RECORDING MEDIUM

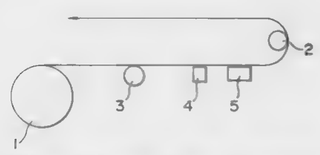
Takao Igawa, Numazu; Susumu Nemoto, Susono; Mitsuru Maeda, Shizuoka; Akihiko Goto, Numazu, and Taeko Maeda, Susono, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,325

Claims priority, application Japan, Aug. 20, 1985, 60-180950; Aug. 21, 1985, 60-181812

Int. Cl.[4] B32B *5/28, 27/06*

U.S. Cl. 427—121 **12 Claims**



1. An electrostatic recording medium, comprising: a substrate, an electroconductive layer and a recording layer which are successively overlaid on said substrate, with the surface of said recording layer being studded with at least one component selected from the group consisting of a polymeric electrolyte, an inorganic salt and a surface active agent.

4,728,557

MOLDED PART AND METHOD OF MAKING THE SAME

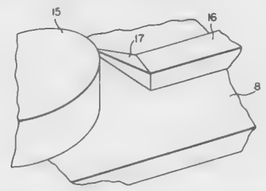
Hideki Asano, Mito; Morimichi Umino, Hitachiota, and Masanori Nemoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,584

Claims priority, application Japan, May 11, 1981, 56-69410

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—138 **2 Claims**



1. A molded part, formed in a mold, comprising:

a metal plate formed with a plurality of through holes; and

a plurality of molded resin structures, each of said resin structures including a first substantially planar surface portion disposed on a first side of the metal plate, a second substantially planar surface portion disposed on a second side of the metal plate, a further portion integrally formed with and interposed between said first and second substantially planar portions, said further portion extending through the respective through holes in the metal plate, and a substantially columnar portion integrally formed with one of said first and second substantially planar surface portions on a side thereof opposite said further portion, said first and second substantially planar surface portions having a cross-sectional surface greater than a cross-section of the through holes and with said further portion securing the columnar portions in place on said metal plate separate from and independent of each other by virtue of a residual thermal stress produced by a difference in a coefficient of thermal expansion between said first and second substantially planar portions, said further portions and said metal plate; wherein said structures are provided to be separate from and independent of each other when said molded part is removd from said mold, and wherein a radially oriented residual thermal stress in each of said first and second substantially planar surface portions and said further portions is symmetrical with respect to a center axis of each of said molded resin structures.

4,728,558

MAGNETIC RECORDING MEDIUM

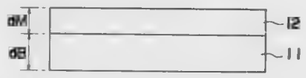
Toshio Ono; Yasuo Tamai; Chiaki Mizuno; Hiroshi Ogawa, and Shinji Saito, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 29, 1986, Ser. No. 890,342

Claims priority, application Japan, Aug. 6, 1985, 60-173757

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—141 **8 Claims**



1. A magnetic recording medium comprising a flexible support and a magnetic recording layer provided on one surface of said support, said magnetic recording layer comprising a ferromagnetic powder and a binder, which is characterized in that the total of the thickness of said magnetic recording layer and the thickness of said support is not larger than 14 μm; the ratio of the thickness of said magnetic recording layer to the thickness of said support is in the range of 0.6–1.0; and said magnetic recording medium has F-3 tensile strength in the range of 6.0–8.5 kg/mm^2.

4,728,559

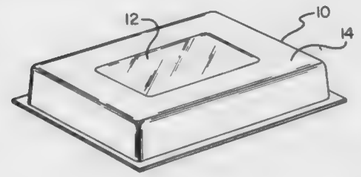
THERMOFORMED PLASTIC CONTAINERS WITH TRANSPARENT WINDOWS AND METHOD OF MAKING SAME

Scott B. Hardenbrook, Kent, and Cynthia L. Desmond, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 16, 1987, Ser. No. 74,175

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—159 **10 Claims**



1. A container component made from substantially opaque microcellular foamed sheet plastic material, said component including a transparent window formed by heating and compressing the corresponding region of said material to eliminate foam in that region, said window being at least 60% as thick as said material in its foamed condition.

4,728,560

ELECTRICAL PRINTED CIRCUIT BOARDS

Kirkor Sirinyan, Bergisch Gladbach; Gerhard D. Wolf, Dormagen; Ulrich von Gizycki, and Rudolf Merten, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,049

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510202

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—195 **5 Claims**

1. An electrical printed circuit board consisting essentially of a base material and a metallic conductor pattern thereon, the circuit board being produced by base materials with an electrolytically produced metal foil, the cladding being removed chemically in a redox bath or electrolytically, the base material being activated with a compound of a precious metal with or without sensitization, metallic conductor patterns being applied to the semifinished products so obtained by using a semi or fully additive technique and annealing at a temperature of 50° C. to 180° C., wherein the activator being an organic compound of a precious metal of the 1st or 8th sub-group of the periodic system of elements and wherein the surface of the base material being characterized by

(a) a specific total pore volume per unit area of 0.015–0.045 dm^3/m^2,

(b) a mean pore diameter of 0.05–12.0 μm and

(c) a mean pore depth of 0.05–12.0 μm.

4,728,561

SHAPED ARTICLE FORMED FROM A COATED POLYARYL ETHER

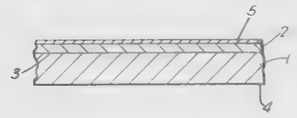
Christopher Crocker, Bolton, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 26, 1985, Ser. No. 801,911

Claims priority, application United Kingdom, Nov. 26, 1984, 8429771

Int. Cl.[4] B32B *27/08;* G03C *1/78*

U.S. Cl. 428—207 **14 Claims**



1. A shaped article consisting essentially of a polyarylether in which at least some of the aryl groups are separated by ketone-groups or which contains the repeat units

—Ph—O—Ph—SO_2—

alone or in conjunction with other repeat units of the general formula

(Ph—A—Ph—O)

where

Ph is phenylene

A is a direct link, a sulphur atom, a divalent hydrocarbon radical or a group

—Q—(Ar—Q^1)n

in which

Q_1 is —CO—, —SO_2— or —O—;

Q is —CO—, —SO_2— or —O—;

Ar is a divalent aromatic radical; and

n is 0, 1, 2 or 3;

said shaped article having on at least a part of one surface a coating of polyester resin containing free sulphonate groups.

4,728,562

DIELECTRIC COMPOSITION

Hans-Jürgen Gesemann, Karl Marx Stadt; Mary Krawietz, and Winfried Schaffrath, both of Dresden, all of German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Filed May 24, 1985, Ser. No. 738,022

Claims priority, application German Democratic Rep., May 28, 1984, 2634363

Int. Cl.[4] C04B *33/26*

U.S. Cl. 428—209 **10 Claims**

1. Dielectric active substance for making dielectric elements, consisting of $Bi_2[A_{2-x}{}^{a+}Nb_x]O_7$, wherein $a(2-x)+5x=8$ and A is one or a plurality of metal ions selected from the group consisting of Mg^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sn^{2+}, Mn^{2+}, Co^{3+}, Mn^{3+}, Al^{3+} and Cr^{3+}.

3. Screen printable dielectric paste for making dielectric elements, containing a dielectric active substance in a binder, the active substance consisting of $Bi_2[A_{2-x}{}^{a+}Nb_x]O_7$, wherein $a(2-x)+5x=8$ and A are one or a plurality of metal ions selected from the group consisting of Mg^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sn^{2+}, Mn^{2+}, Co^{3+}, Mn^{3+}, Al^{3+} and Cr^{3+}, the active substance being contained to an extent up to 83% in the binder and the paste also containing 0 to 3% of the amount of the active substance manganese as well as 0 to 20% of the amount of the active substance of low melting glass with a softening point below 900° C.

5. Condenser, consisting of an electrically insulating substrate, a first electrically conductive layer printed onto said

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electrically insulating substrate by means of screen printing, one or a plurality of superimposed dielectric films printed on said conductive layer by means of screen printing and a second electrically conductive layer printed by means of screen printing onto said dielectric film, said dielectric film consisting from 77 to 100% of a dielectric active substance of $Bi[A_{2-x^{a+}}Nb_x]O_7$, wherein $a(2-x)+5x=8$ and A are one or a plurality of metal ions selected from the group consisting of Mg^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sn^{2+}, Mn^{2+}, Co^{3+}, Mn^{3+}, Al^{3+} and Cr^{3+}, 0 to 3% of the amount of dielectric active substance of manganese, as well as 0 to 20% of the amount of dielectric active substance of low melting glass with a softening point below 900° C.

7. Condenser, consisting of an electrically insulating substrate, a first dielectric film printed onto said electrically insulating substrate by means of screen printing, a first electrically conductive layer printed onto this film by means of screen printing, one or a plurality of further dielectric films printed onto this layer by means of screen printing and a second conductive layer printed onto said further dielectric film or films by means of screen printing, said dielectric films consisting from 77 to 100% of a dielectric active substance of $Bi_2[A_{2-x-a+}Nb_x]O_7$, wherein $a(2-x)+5x=8$ and A are one or a plurality of metal ions selected from the group consisting of Mg^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sn^{2+}, Mn^{2+}, Co^{3+}, Mn^{3+}, Al^{3+} and Cr^{3+}, 0 to 3% of the amount of dielectric active substance of manganese, as well as 0 to 20% of the amount of dielectric active substance of low melting glass with a softening point below 900° C.

9. Multilayer condenser arrangement of individual condensers electrically switched parallel with respect to each other, printed superimposed with each other by means of the screen printing, consisting of more than two electrically conductive layers and a plurality of dielectric films, the dielectric films consisting from 77 to 100% of a dielectric active substance of $Bi_2[A_{2-x^{a+}}Nb_x]O_7$, wherein $a(2-x)+5x=8$ and A are one or a plurality of metal ions selected from the group consisting of Mg^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sn^{2+}, Mn^{2+}, Co^{3+}, Mn^{3+}, Al^{3+} and Cr^{3+}, 0 to 3% of the amount of dielectric active substance of manganese, as well as 0 to 20% of the amount of dielectric active substance of low melting glass with a softening point below 900° C.

4,728,563

MAGNETIC RECORDING MEDIUM

Shinji Saito; Hiroshi Ogawa; Chiaki Mizuno, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo film Co., Ltd., Japan

Filed Aug. 20, 1986, Ser. No. 898,421
Claims priority, application Japan, Aug. 20, 1985, 60-182631
Int. Cl.⁴ G11B *5/70, 5/704*
U.S. Cl. 428—212 **8 Claims**

1. A magnetic recording medium in the form of tape comprising a flexible support and a magnetic recording layer provided on said support, said magnetic recording layer comprising a ferromagnetic powder dispersed in a binder, which is characterized in that said magnetic recording medium has dynamic modulus of not lower than 4.5×10^{10} dyne/cm^2 in the longitudinal direction at 110° C.

4,728,564

SHEET-LIKE STRUCTURES AND PROCESS FOR PRODUCING THE SAME

Takao Akagi, Kurashiki; Itsuki Sakamoto, Hiroshima, and Shinji Yamaguchi, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jan. 2, 1986, Ser. No. 815,623
Claims priority, application Japan, Feb. 5, 1985, 60-21350; Aug. 23, 1985, 60-186028
Int. Cl.⁴ B32B *27/08, 27/28, 27/30, 27/36*
U.S. Cl. 428—247 **6 Claims**

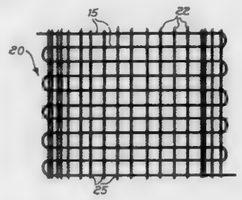
1. A sheet-like structure exhibiting excellent resistance to disperse dye migration and sublimation, said structure comprising a fibrous structure containing not less than 10 weight percent of disperse dye-polyester fiber and having, on at least one side thereof, a resin layer comprising a polymer selected from the group consisting of polyurethane, acrylic polymers, vinyl chloride polymers and synthetic rubbers, with a thin polymer film layer comprising a derivative of a fluorine compound or a silicon-containing compound formed on at least one side of said resin layer, said polymer film layer having a thickness of 100–10,000 angstroms.

4,728,565

ELASTIC SUPPORT MEMBER FOR SUPPORTING STUFFING OF FURNITURE PIECES

Anacleto Fontana, Monza, Italy, assignor to Cintel S.a.s. di Fontana A. & C., Italy

Filed Nov. 19, 1986, Ser. No. 932,722
Int. Cl.⁴ B32B *7/00*
U.S. Cl. 428—255 **5 Claims**



1. An elastic support member for supporting the stuffing or upholstery of furniture pieces wherein said support member is formed of an elastic fabric having at least in one of the transverse longitudinal directions thereof rubber threads, said rubber threads being covered by loops formed by yarn stitches.

4,728,566

HIGH-FREQUENCY LAMINATION OF POLYMER FOAMS

Gerald M. Lancaster, Surfside, and Luis C. Mulford, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 738,006, May 28, 1985, Pat. No. 4,671,992, which is a continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, Pat. No. 4,601,948, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983, Pat. No. 4,600,614. This application May 26, 1987, Ser. No. 54,454
Int. Cl.⁴ B32B *27/00, 3/26*
U.S. Cl. 428—286 **11 Claims**

1. A composite article comprising a polymer foam having HF-bonded thereto at least one surface layer, wherein the HF-bonding is effected by a layer of HF-bondable polymer film between said foam and said surface layer, said HF-bondable polymer film comprising a carbon monoxide-containing olefin interpolymer having a dielectric loss index of about 0.01 or greater,

said polymer foam being selected from the group consisting of foamed olefin polymers, polystyrene foam, polycarbonate foam, latex foam, rubber foam, foamed ABS polymer, foamed PVC, formed PVDC, foamed acrylates, foamed methacrylates, foamed styrenic/olefinic copolymers, and foamed polymer blends.

4,728,567

SILICONE FOAM BACKED POLYIMIDE FILM

John S. Razzano, Cohoes, and Richard B. Bush, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,937
Int. Cl.⁴ B32B *3/26, 27/08*
U.S. Cl. 428—317.1 **10 Claims**

1. A fire resistant composite sheet comprising:

(a) a first layer of plastic polyimide film having firmly adhered to at least one side thereof,

(b) a second layer of silicone foam containing platinum catalyst residue.

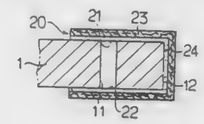
7. The composite sheet of claim 1 which is firmly adhered with a contact or pressure sensitive adhesive.

4,728,568

MASKING TAPE FOR USE IN MANUFACTURING A PRINTED BOARD

Shigeru Sasada, Kusatsu; Tetsuo Ohwada, and Masaru Mishima, both of Tokyo, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto and Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, both of, Japan

Filed Oct. 20, 1986, Ser. No. 920,784
Claims priority, application Japan, Oct. 19, 1985, 60-234348
Int. Cl.⁴ H01L *21/203, 21/306;* **A61L** *15/00*
U.S. Cl. 428—349 **10 Claims**



1. A masking tape for use in a process of filling through-holes in a printed board with a filler material, comprising:

a water soluble paper as a tape base material; and

a water soluble adhesive agent applied to one side of said paper.

8. A method for filling through-holes in a process of manufacturing a printed circuit board, comprising the steps of:

preparing a substrate for use in manufacturing a desired printed circuit board for forming electrically conductive layers on both sides of said substrate and then forming through said conductive layers and substrate both through-holes for conducting electricity between the layers and positioning-holes for positioning said substrate at a desired position;

covering said positioning-holes and peripheral edges of said substrate with a water soluble tape comprising a water soluble paper coated with a water soluble adhesive agent;

filling said through-holes with a filling material capable of hardening in place;

hardening said filling material; and

removing any excess and undesirably located filling material applied on said substrate, and simultaneously removing said water soluble tape by applying water thereto.

4,728,569

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Nobutaka Yamaguchi; Masatoshi Takahashi; Kazuko Hanai; Hideaki Kosha, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1985, Ser. No. 799,759
Claims priority, application Japan, Nov. 19, 1984, 59-242398
Int. Cl.⁴ G11B *5/708*
U.S. Cl. 428—323 **9 Claims**

1. A magnetic recording medium comprising a magnetic layer coated on one side of a non-magnetic support and a backing layer coated on the opposite side of the non-magnetic support, wherein the backing layer is provided after the magnetic layer has been subjected to calendering treatment and the backing layer comprises (i) non-magnetic particles including carbon black particles having an average particle diameter of from 0.1 to 1 μm and (ii) a binder composition comprising from 50 to 95 wt% of a resin having a 100% modulus at 150 kg/cm^2 or less based on the total weight of the binder composition, and the weight ratio of non-magnetic particles to binder composition contained in the backing layer is from 300/100 to 40/100.

4,728,570

CALCIUM-HYDROXIDE-TREATED POLYMEHIC IMPLANT MATRIAL

Arthur Ashman, New York, N.Y., and Itzhak Binderman, Tel Aviv, Israel, assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 29, 1985, Ser. No. 792,352
Int. Cl.⁴ A61K *6/08*
U.S. Cl. 428—327 **23 Claims**

1. An implant material for hard tissue, the implant material comprising a porous matrix comprised of a mass of biologically-compatible polymeric particles, the particles being bonded together to form a unitary prosthetic implant, the prosthetic implant having interstices between the bonded particles forming pores into which bone tissue can grow and a quantity of calcium hydroxide distributed in the pores of the matrix, the pores having dimensions effective to permit the growth of bone tissue into the pores, the quantity of calcium hydroxide being effective to induce the growth of bone tissue in the pores.

4,728,571

POLYSILOXANE-GRAFTED COPOLYMER RELEASE COATING SHEETS AND ADHESIVE TAPES

Lawrence M. Clemens, Minneapolis, Minn.; Steven S. Kantner, Hudson, Wis., and Mieczyslaw Mazurek, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 19, 1985, Ser. No. 757,278
Int. Cl.⁴ C09J *7/02;* **B05D** *3/02;* **B32B** *9/04*
U.S. Cl. 428—352 **27 Claims**

1. A coated sheet material comprising a flexible sheet and a release coating covering at least a portion of one major surface thereof, said coating comprising a copolymer having a vinyl polymeric backbone with a T_g or T_m above about −20° C. and having grafted to said backbone monovalent siloxane weight above about 1,000, the number and composition of said grafted moieties in said copolymer being such as to provide said copolymer a surface release value not greater than about 50N/100 mm.

4,728,572

REMOVABLE HOT MELT PRESSURE SENSITIVE ADHESIVE

Irwin J. Davis, Bridgewater, N.J., assignor to National Starch and Chemical Corp., Bridgewater, N.J.

Division of Ser. No. 852,005, Apr. 14, 1986, Pat. No. 4,680,333. This application Apr. 10, 1987, Ser. No. 36,618
Int. Cl.⁴ C09J *7/02*
U.S. Cl. 428—355 **13 Claims**

1. Paper labels coated with a removeable pressure sensitive hot melt adhesive composition consisting essentially of:

(a) 25 to 50% by weight of an A-B-A block copolymer where the A component is styrene or a homologue thereof and the B component is isoprene;

(b) 20 to 50% by weight of a substantially aliphatic hydrocarbon resin having a softening point less than about 30° C.;

(c) 0 to 30% by weight of a substantially aliphatic hydrocarbon resin having a softening point of about 80° to 150° C.;

(d) 0 to 25% by weight of mineral oil or petrolatum;

(e) 0.25 to 3% by weight of a metallic salt of a C_{14} to C_{19} fatty acid; and

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(f) 0.2 to 2% of an antioxidant.

4,728,573

GLASS FIBERS FOR REINFORCING POLYMERS

Chester S. Temple, McKees Rocks, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 715,841, Mar. 25, 1985, abandoned. This application May 7, 1986, Ser. No. 861,631

Int. Cl.[4] D02G *3/00*; B32B *9/00*

U.S. Cl. 428—378 13 Claims

1. Glass fibers having an aqueous chemical treating composition on a substantial portion of the fibers in the strands, wherein the aqueous chemical treating composition comprises:

a. one or more amino organo coupling agents present in an effective coupling agent amount and having a primary amine with a basicity greater than diethyl ethanolamine,

b. an aqueous emulsion of acid or anhydride modified polyolefin having one or more surfactants, wherein the polyolefin is neutralized with diethyl ethanolamine and wherein the polyolefin emulsion is present in an amount to result in a predominant amount of the solids of the aqueous chemical treating composition being polyolefin,

c. a binder stabilzier,

d. an aqueous dispersion of a film forming polymer selected from the group consisting of water soluble, dispersible or emulsifiable polyurethanes, epoxies, polyesters, and copolymers formed from the monomers used in preheating these homopolymers and blends of the homopolymers or copolymers, wherein the film forming polymer is free of polyvinyl acetate homopolymer and wherein the film forming polymer is present in the aqueous chemical treating composition in an amount less than the polyolefin emulsion, and

e. water in an amount to give a total solids for the aqueous chemical treating composition in the range of about 1 to about 25 weight percent and a viscosity so that the aqueous chemical treating composition can be applied to glass fibers as they are formed, wherein the aqueous chemical treating composition is essentially free of cationic lubricants that are formed from amidated fatty acids formed by the reaction of fatty acids and polyamines.

4,728,574

ELECTRIC CABLE WITH INSULATION OF ETHYLENE VINYL ALCOHOL COPOLYMER AND AMMONIUM POLYPHOSPHATE

Colin K. Alesbury, Southampton, England, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Sep. 15, 1986, Ser. No. 907,591

Claims priority, application United Kingdom, Oct. 1, 1985, 8524113

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—379 4 Claims

1. An insulated electric cable comprising a conductor with a layer of insulation therearound, said layer comprising an ethylene vinyl alcohol copolymer and ammonium polyphosphate.

4,728,575

CONTRAST AGENTS FOR NMR IMAGING

Ronald C. Gamble, Altadena, and Paul G. Schmidt, San Marino, both of Calif., assignors to Vestar, Inc., Pasadena, Calif.

Continuation-in-part of Ser. No. 604,721, Apr. 27, 1984, abandoned. This application Apr. 10, 1985, Ser. No. 720,954

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—402.2 25 Claims

1. Magnetic resonance imaging contrast agents for scanning tissue comprising bilayer vesicles with paramagnetic material encapsulated therein, said vesicles formulated with an agent to promote vesicle stability for a sufficient time to allow biodistribution of said vesicles for scanning of said tissue and formulated to permit adequate water proton exchange across the vesicle bilayer to provide contrast for scanning said tissue.

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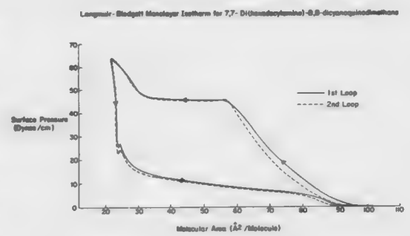
LANGMUIR-BLODGETT COATING PROCESS

Gunilla E. Gillberg-LaForce, Summit, and Anthony Artigliere, Jr., Madison, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 10, 1987, Ser. No. 36,657

Int. Cl.[4] B05D *1/20*

U.S. Cl. 428—411.1 38 Claims



1. A process for forming a continuous film on a solid substrate which comprises coating the substrate surface by Langmuir-Blodgett deposition technique with at least one monomolecular layer of uniaxially aligned surface active organic molecules, wherein the deposition technique comprises (1) compressing the monomolecular layer of surface active organic molecules spread on the water surface in a Langmuir-Blodgett trough until the area per extended organic chain of the uniaxially aligned molecule is less than about 30 $Å^2$/chain; (2) reducing the compression on the monomolecular layer by about 5–40 dynes per centimeter; and (3) dip-coating the substrate with the monomolecular layer while maintaining a constant compression on the area of uniaxially aligned molecules spread on the water surface.

4,728,577

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada, and Yoshito Mukaida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1984, Ser. No. 650,467

Claims priority, application Japan, Sep. 16, 1983, 58-170974

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] G11B *5/704*, *5/706*

U.S. Cl. 428—423.7 35 Claims

1. A magnetic recording medium comprising a non-magnetic support having coated thereon a magnetic layer comprising a magnetic substance and a binder comprising a cellulose derivative, a polyurethane resin and a polyisocyanate, said non-magnetic support having a heat shrinkage of about 0.15% or less and the water content of the medium being at least about 0.35% by weight.

29. The magnetic recording medium claimed in claim 1, wherein said cellulose derivative is selected from the group consisting of nitrocellulose, cellulose acetate butyrate, cellulose propionate and ethyl cellulose and has an average molecular weight of from about 10,000 to 300,000, wherein said polyurethane resin is selected from the group consisting of polyester polyurethane resins and polyether polyurethane resins, said polyisocyanate is an isocyanate or an adduct thereof selected from the group consisting of an aliphatic diisocyanate, an aliphatic diisocyanate having a cyclic group, an aromatic diisocyanate, a triisocyanate and a tetraisocyanate and wherein said cellulose derivative is present in an amount of about 5 to 50% by weight, said polyurethane resin is present in an amount of about 30 to 70% by weight and said polyisocyanate is present in an amount of about 5 to 55% by weight, based on the total amount of the binder composition.

35. The magnetic recording medium claimed in claim 29, wherein said support is a biaxially stretched polyester support, and said heat shrinkage of about 0.15% or less is obtained by continuously conducting heat treating at a winding stress of about 0 to 1.6 Kg/mm^2 at a temperature of about 110° to 130° C. for a period of about 3 to 10 seconds.

4,728,578

COMPOSITIONS CONTAINING BASIC METAL SALTS AND/OR NON-NEWTONIAN COLLOIDAL DISPERSE SYSTEMS AND VINYL AROMATIC CONTAINING POLYMERS

William A. Higgins, Gates Mills, and John Bretz, Parma, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 13, 1986, Ser. No. 896,544

Int. Cl.[4] B32B *15/08*; C09K *3/00*; B05D *3/02*

U.S. Cl. 428—462 108 Claims

1. A composition comprising a mixture of

(B) at least one non-Newtonian colloidal disperse system comprising

(B-1) solid metal-containing colloidal particles,

(B-2) a liquid dispersing medium, and

(B-3) at least one organic compound which is soluble in said dispersing medium, the molecules of said organic compound being characterized by a hydrophobic portion and at least one polar substituent; and

(C) at least one hydrogenated block copolymer of a vinyl aromatic monomer and an aliphatic conjugated diene.

4,728,579

WEAR RESISTANT, COATED, METAL CARBIDE BODY AND A METHOD FOR ITS PRODUCTION

Udo König, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 835,985

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515919

Int. Cl.[4] B32B *15/04*; C23C *14/34*

U.S. Cl. 428—472 12 Claims

1. A wear resistant, coated, metal carbide body comprising a metal carbide basic body, a metallic intermediate layer and at least one metal-free hard substance layer, wherein the metallic intermediate layer comprises at least one metal selected from the group consisting of molybdenum and tungsten and has a thickness of from about 0.1 to 2 μm, said metallic intermediate layer having been applied to the metal carbide basic body by a physical vapor deposition process in which the metal carbide basic body is maintained at a temperature of from 200° to 600° C. during the deposition of the intermediate layer.

4,728,580

AMORPHOUS METAL ALLOY COMPOSITIONS FOR REVERSIBLE HYDROGEN STORAGE

Robert K. Grasselli, Aurora; Michael A. Tenhover, Solon, and Jonathan H. Harris, Shaker Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 29, 1985, Ser. No. 717,428

Int. Cl.[4] B32D *5/14*

U.S. Cl. 428—610 27 Claims

1. A reversible hydrogen storage material comprising a substantially amorphous metal alloy of the formula:

$$A_aM_bM'_c$$

wherein

A is at least one metal selected from the group consisting of Ag, Au, Hg, Pd and Pt;

M is at least one metal selected from the group consisting of Pb, Ru, Cu, Cr, Mo, Si, W, Ni, Al, Sn, Co, Fe, Zn, Cd, Ga and Mn; and

M′ is at least one metal selected from the group consisting of Ca, Mg, Ti, Y, Zr, Hf, Nb, V, Ta and the rare earths; and

wherein

a ranges from greater than zero to about 0.80;

b ranges from zero to about 0.70; and

c ranges from about 0.08 to about 0.95;

said material having a compositional gradient wherein a substantial portion of the A component of said alloy is disposed on or near the surface of said material that will come in contact with hydrogen available for absorption.

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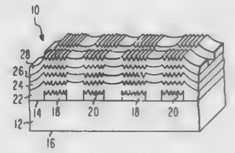
ELECTROLUMINESCENT DEVICE AND A METHOD OF MAKING SAME

James Kane, Lawrence Township, Mercer County, and Mildred Ling, Bridgewater Township, Somerset County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 14, 1986, Ser. No. 918,953

Int. Cl.[4] H05K *33/12*; B32B *17/06*

U.S. Cl. 428—690 16 Claims



1. In an electroluminescent device comprising a first electrode, a first dielectric layer overlying the first electrode, a continuous phosphor layer overlying the first dielectric layer, a second dielectric layer overlying the phosphor layer and a second electrode overlying the second dielectric layer, the improvement comprising: said first electrode comprising tin oxide having a textured surface adjacent the first dielectric layer and an opposed surface which is smooth and said phosphor layer conformally overlying said textured surface.

4,728,582

CERAMIC SLIDING ELEMENT WITH ALUMINUM OXIDE AND SILICON NITRIDE MEMBERS

Hans-Jurgen Comans, Krefeld-Fishein; Ulrich Krohn, Leonberg; Hans Jud, Esslingen, and Hans-Gerd Rittel, Wendlingen, all of Fed. Rep. of Germany, assignors to Feldmuehle Aktiengesellschaft, Dusseldorf II, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,337

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528934

Int. Cl.[4] F16C *33/24*; C23C *7/00*

U.S. Cl. 428—698 10 Claims

1. In a sliding element of the type comprising first and second counter-element members in friction contact and/or sealing contact with each other the improvement comprising forming said first member of a silicon nitride based ceramic material having a content of silicon nitride phase and/or of silicon nitride mixed crystal phase of at least 60 wt.-%, and forming said counter-element second member of an aluminum oxide based ceramic material.

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RADIATION IMAGE STORAGE PANEL AND PROCESS FOR THE PREPARATION OF THE SAME

Hisashi Yamazaki; Akira Kitada, and Kikuo Yamazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 30, 1985, Ser. No. 771,122
Claims priority, application Japan, Aug. 31, 1984, 59-182212; Sep. 28, 1984, 59-203500; Mar. 20, 1985, 60-56672; Mar. 20, 1985, 60-56673
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—690 12 Claims



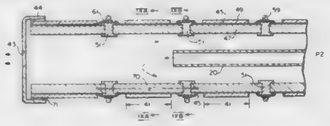
1. A radiation image storage panel comprising a support and a phosphor layer provided thereon which comprises a binder and a stimulable phosphor dispersed therein, characterized in that said phosphor layer consists essentially of one part on the support side which contains the stimulable phosphor and the other part on the panel surface side which does not substantially contain the stimulable phosphor.

4,728,584

FUEL CELL GENERATOR CONTAINING SELF-SUPPORTING HIGH GAS FLOW SOLID OXIDE ELECTROLYTE FUEL CELLS

Arnold O. Isenberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1986, Ser. No. 921,296
Int. Cl.[4] H01M 8/12
U.S. Cl. 429—31 37 Claims



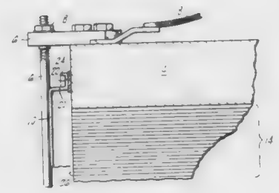
1. A single electrochemical cell, comprising a plurality of cell segments, the cell segments comprising an annular, electronically conductive, porous, inner electrode; solid electrolyte contacting and surrounding said inner electrode; an electronically conductive, porous outer electrode contacting and surrounding said electrolyte; and an annular; electronically conductive, interconnection member disposed between adjacent segments, electronically connecting the inner electrode of one cell segment to the inner electrode of an adjacent cell segment, the outer electrodes being physically and electronically segmented from each other and from the inner electrodes of adjacent cell segments.

4,728,585

FUEL CELL STACK WITH COMBINATION END-PRESSURE PLATES

Tyler A. Briggs, West Hartford, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Dec. 24, 1986, Ser. No. 946,331
Int. Cl.[4] H01M 8/24
U.S. Cl. 429—36 8 Claims



1. A fuel cell stack comprising:
(a) a plurality of thin carbon fuel cell component plates stacked one atop another to provide a reaction portion of the stack;
(b) a steel pressure plate disposed directly atop an uppermost one of said carbon plates, said steel pressure plate being laterally coextensive with said carbon plates at ambient temperatures;
(c) at least one reactant manifold mounted on a side of said stack, said manifold having a peripheral sealing flange which faces side surfaces of said carbon plates and a corresponding side surface of said pressure plate;
(d) a polymeric sealing gasket interposed between said manifold sealing flange and adjacent side surfaces of said carbon plates and said pressure plate to provide a seal between the manifold interior and ambient surroundings; and
(e) a first adhesive layer sandwiched between said gasket and adjacent side surfaces of said carbon and pressure plates to adhere said gasket to said adjacent side surfaces, said first adhesive layer being operable to fill any discontinuity which may occur at adjacent corners of said pressure plate and said uppermost one of said carbon plates due to differential thermal growth of said pressure plate and said carbon plates during operation of the stack whereby the manifold interior remains sealed during periods of elevated operational stack temperatures.

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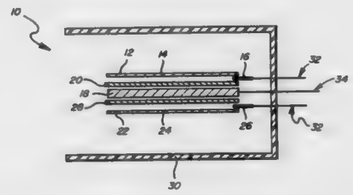
ENHANCED CHARGE RETENTION ELECTROCHEMICAL HYDROGEN STORAGE ALLOYS AND AN ENHANCED CHARGE RETENTION ELECTROCHEMICAL CELL

Srini Venkatesan, Southfield; Benjamin Reichman, Birmingham, and Michael A. Fetcenko, Royal Oak, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 29, 1986, Ser. No. 947,162
Int. Cl.[4] H01M 4/86, 10/34, 12/06
U.S. Cl. 429—94 59 Claims

11. A sealed, rechargeable electrochemical cell comprising:
(a) a positive electrode;
(b) a negative electrode comprising a body of modified multiphase, multicompoennt, reversible electrochemical hydrogen storage alloy comprising titanium, vanadium, zirconium, nickel, and chromium, having the composition $(Ti_{2-x}Zr_xV_{4-y}Ni_y)_{1-z}Cr_z$ where $0.0<x<0.5$, $0.6<y<3.5$, and z is a positive number less then 0.20;
(c) a separator means positioned between the positive and negative electrodes;
(d) electrolyte means in contact with the separator means and the positive and negative electrodes; and
(e) sealed container means containing the positive and negative electrodes, spacer means, and electrolyte means in operative relationship.

15. The electrochemical cell of claim 11 wherein the electrolyte is aqueous alkali metal hydroxide.



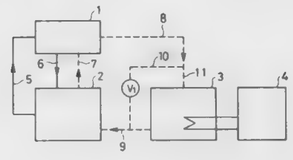
16. The electrochemical cell of claim 15 wherein the electrolyte comprises potassium hydroxide.

4,728,587

BATTERY USING HALOGEN AS ACTIVE MATERIAL

Toshio Horie; Yuichi Watakabe, and Kunihiko Fujiwara, all of Tokyo, Japan, assignors to Furakawa Electric Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,868
Claims priority, application Japan, Jun. 19, 1985, 60-133687; Nov. 1, 1985, 60-246067; Jan. 21, 1986, 61-10915
Int. Cl.[4] H01M 6/14
U.S. Cl. 429—101 16 Claims



1. An improved secondary battery composed of a battery comprising an anode, cathode and electrolyte tank for feeding an electrolyte to said battery and a halogen storage tank containing an organic solvent for absorbing the said halogen as a cathode active material, wherein the halogen storage tank is connected to said electrolyte tank through a gaseous phase, so that during its charging operation, the halogen gas generated from the battery is delivered into the halogen storage tank where it is stored therein by being absorbed in the organic solvent disposed therein, and during its discharging operation, the halogen gas is delivered from said halogen storage tank into said electrolyte tank where it is dissolved in the electrolyte which is to be delivered to the battery.

4,728,588

SECONDARY BATTERY

Stephen A. Noding, Brusly, and Sanford A. Siegel, Baton Rouge, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1987, Ser. No. 56,616
Int. Cl.[4] H01M 10/36
U.S. Cl. 429—127 32 Claims

1. A secondary battery which features:
(a) a polymer film comprised of,
(i) a polymer,
(ii) a plasticizer for said polymer,
(iii) an epoxidized vegetable oil,
(iv) a salt disassociatingly solubilized in said plasticizer, said salt having the formula MX_a wherein,
X is chloride, bromide or iodide,
M is a metal ion having a reduction-oxidation potential greater than that of X, and a is the oxidation number of M, and
(v) graphite; and
(b) first and second collector plates, said first collector plate being in electronic contact with one side of said polymer film and said second collector plate being in electronic contact with the other side of said polymer film.

4,728,589

REVERSIBLE ELECTROCHEMICAL DOPING OF CONJUGATED POLYMERS AND SECONDARY BATTERIES BASED THEREON

Alan G. MacDiarmid, Drexel Hill; Alan J. Heeger, Wynnewood, and Paul J. Nigrey, Philadelphia, all of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 559,738, Dec. 9, 1983, abandoned, which is a continuation of Ser. No. 220,496, Dec. 29, 1980, Pat. No. 4,442,187, which is a continuation-in-part of Ser. No. 129,439, Mar. 11, 1980, Pat. No. 4,321,114. This application Aug. 7, 1985, Ser. No. 763,478
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.[4] H01M 4/60
U.S. Cl. 429—213 4 Claims

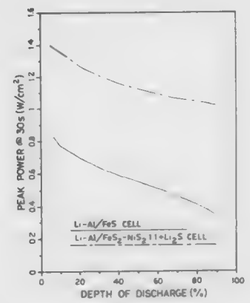
1. A secondary battery comprising an anode means, a cathode means, and an electrolyte at least one of said electrode means including as an electrode active material a conjugated polymer which is characterized as having conjugated unsaturation along a main backbone chain thereof;
said polymer being either oxidized or reduced to an electrically conducting state wherein it is doped with at least one ionic dopant species;
said electrolyte comprising said ionic dopant species or a compound ionizable to form said ionic dopant species; and electrolyte being non-aqueous and inert with respect to the electrodes; wherein the conjugated polymer is doped with an anionic dopant species to a p-type electrically conducting state;
wherein the anionic dopant species is selected from the group consisting of halide ions, ClO_4^-, PF_6^-, AsF_6^-, AsF_4^-, $SO_3CF_3^-$ and BF_4^-.

4,728,590

ELECTROCHEMICAL CELL WITH HIGH DISCHARGE/CHARGE RATE CAPABILITY

Laszlo Redey, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1986, Ser. No. 890,256
Int. Cl.[4] H01M 4/02
U.S. Cl. 429—221 15 Claims



1. A fully charged electrode reactant mixture for use in a positive electrode in an electrochemical cell to impart over-

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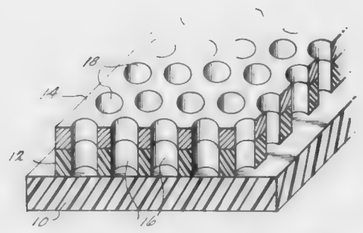
charge protection, said reactant mixture comprises the combination of FeS_2, NiS_2, and Li_2S, wherein Li_2S is in sufficient amount to be present in solid form in all states of charge and discharge, and wherein FeS_2 and NiS_2 are present in molar ratio of about 3;1 to 1;3.

4,728,591

SELF-ASSEMBLED NANOMETER LITHOGRAPHIC MASKS AND TEMPLATES AND METHOD FOR PARALLEL FABRICATION OF NANOMETER SCALE MULTI-DEVICE STRUCTURES

Noel A. Clark; Kenneth Douglas, both of Boulder, Colo., and Kenneth J. Rothschild, Newton, Mass., assignors to Trustees of Boston University, Boston, Mass. and University of Colorado Foundation, Inc., Boulder, Colo.

Filed Mar. 7, 1986, Ser. No. 837,376
Int. Cl.⁴ G03F *9/00*
U.S. Cl. 430—5 **38 Claims**



1. A nanosubstrate for the production of patterns on a nanometer scale comprising:
   a substrate base;
   a self-assembled two-dimensional array overlying said substrate base, said two-dimensional array forming a two-dimensional spatial pattern of at least one of thickness, density and chemical reactivity variation, said pattern having a characteristic dimension of 1–50 nanometers;
   a patterned layer formed on said array and having a pattern which is determined by said spatial pattern of said array; and
   at least one electrode coupled to at least one of said patterned layer and said array.

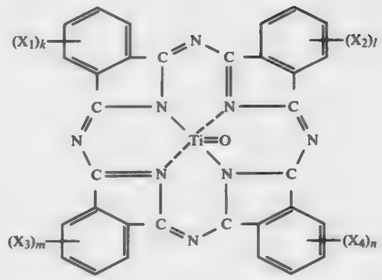
4,728,592

ELECTROPHOTOCONDUCTOR WITH LIGHT-SENSITIVE LAYER CONTAINING ALPHA-TYPE TITANYL PHTHALOCYANINE

Kenichi Ohaku, Oyama; Hiroshi Nakano, Kitamoto, and Masao Aizawa, Hasuda, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jul. 17, 1986, Ser. No. 886,496
Int. Cl.⁴ G03G *5/06*
U.S. Cl. 430—59 **31 Claims**

1. An electrophotoconductor for use in electrophotography, which comprises an electrically conductive support and a light-sensitive layer comprising a titanyl phthalocyanine dispersed in a binder and having the structure represented by the formula:



wherein X_1, X_2, X_3 and X_4 each and independently represent c or Br; and k, l, m and n each and independently represent zero or an integer of 1 to 4 and having the alpha-type crystallographic form.

4,728,593

PHOTOCONDUCTIVE POLYIMIDE-ELECTRON DONOR CHARGE TRANSFER COMPLEXES

Steven C. Freilich, and Stephen Mazur, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 754,809, Jul. 12, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 870,397
Int. Cl.⁴ G03G *5/06, 5/07, 5/09*
U.S. Cl. 430—72 **22 Claims**

1. A photoconductive element comprising a polyimide-electron donor charge transfer complex, the electron donor having an ionization potential of 6 to 9 electron volts and no photoconductivity in the visible light region, the element characterized in that it:
   (i) is photoconductive in the visible light region, and
   (ii) has photoconductivity in excess of the sum of the photoconductivities of the polyimide and donor, individually.

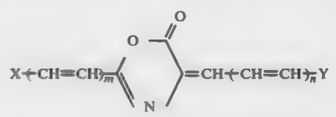
4,728,594

PHOTOSENSITIVE COMPOSITION WITH AZIDE OR BISAZIDE COMPOUND WITH OXAZOLONE GROUP

Saburo Nonogaki; Ryotaro Irie, both of Tokyo; Michiaki Hashimoto, Sayama, and Takao Iwayanagi, Tokyo, all of Japan, assignors to Hitachi Chemical Co., Ltd., Japan

Filed Jan. 14, 1986, Ser. No. 818,686
Claims priority, application Japan, Jan. 18, 1985, 60-5756
Int. Cl.⁴ G03C *1/52, 1/71*
U.S. Cl. 430—197 **6 Claims**

1. A photosensitive composition for providing a negative-type photoresist which is sensitive to light at 436 nm and which is capable of providing a high resolution image, said composition comprising an admixture of a photosensitive azide compound represented by the formula:



wherein each of X and Y is an aromatic substituent group, at least one of X and Y being a p-azidophenyl group, and n and m are zeros or integers of 1, and a polymeric compound; the amount of azide compound ranging from 0.5 to 100% by weight based on the polymeric compound.

4,728,595

PHOTOGRAPHIC ELEMENT

Hiroshi Hayashi; Masaharu Toriuchi; Junichi Yamanouchi, and Junichi Matsuyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 24, 1985, Ser. No. 813,211
Claims priority, application Japan, Dec. 26, 1984, 59-279234; Jan. 17, 1985, 60-6583
Int. Cl.⁴ G03C *5/54, 1/86*
U.S. Cl. 430—220 **3 Claims**

1. A monosheet-type color diffusion transfer photographic element comprising a support having thereon the following layers in sequence:
   an image-receiving layer;
   a layer of a light-reflective organic polymer comprising a hollow latex polymer containing air in the interior of the polymer particles; and
   at least one of a light-sensitive silver halide emulsion layer
   wherein said light reflective layer is composed of at least two layers, and werein at least one layer of said light reflective layers contains a larger amount of a light-reflective organic polymer than the other layer(s), and the other layer(s) of said light reflective layers contain(s) a larger amount of a light-reflective pigment than said layer containing a larger amount of a light-reflective organic polymer.

4,728,596

LIGHT-SENSITIVE ELEMENT FOR SILVER SALT DIFFUSION TRANSFER WITH IODINE TRAPPING LAYER

Hideki Takaki; Yukio Karino, and Noriyuki Inoue, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 22, 1986, Ser. No. 821,354
Claims priority, application Japan, Jan. 22, 1985, 60-9345; Jan. 29, 1985, 60-14956
Int. Cl.⁴ G03C *5/54*
U.S. Cl. 430—248 **6 Claims**

1. In a method for forming an image by silver salt diffusion transfer where an imagewise exposed silver halide photographic element is superposed on an image-receiving element containing a silver-precipitating agent and then an alkaline processing solution containing a solvent for silver halide is introduced between the light-sensitive and image-receiving elements in the presence of a developing agent, the improvement wherein the imagewise exposed silver halide photographic element comprises a support and a light-sensitive silver halide emulsion containing silver iodide provided on the support, further comprising at least one layer capable of trapping iodide ions which is a layer of light-insensitive silver iodobromide having a silver iodide content of from 0.5 to 20 mol% provided between the support and light-sensitive silver halide emulsion layer.

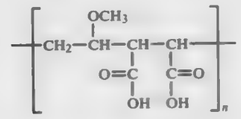
4,728,597

DESENSITIZING SOLUTION FOR LITHOGRAPHIC PRINTING PLATES

Shane Hsieh, Bridgewater, and Wayne A. Mitchell, Bound Brook, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 17, 1987, Ser. No. 14,968
Int. Cl.⁴ G03F *7/00*
U.S. Cl. 430—309 **10 Claims**

1. A method for treating an imagewise exposed lithographic printing plate containing a light sensitive diazo compound which comprises removing the non-image portions of said plate and then contacting said plate with an organic solvent free, phosphate free, lithographic desensitizing composition which comprises:
   (a) from about 0.1% to about 20.0% by weight of the composition of a copolymer of polymethyl vinyl ether and maleic acid having the formula



   which has a molecular weight in an amount of from about 20,000 to about 70,000; and
   (b) from about 0.1% to about 20.0% by weight of the composition of a desensitizing component comprising one or more hydroxy carboxylic acids or salts; and
   (c) sufficient water to formulate a desensitizing composition; and
   (d) sufficient base to adjust the pH of the composition into the range of from about 6.5 to about 7.5.

4,728,598

PHOTOGRAPHIC COLOR COUPLERS, PHOTOGRAPHIC MATERIALS CONTAINING THEM AND METHOD OF FORMING DYE IMAGES

Joseph Bailey, Bushey Heath, and David N. Rogers, Harrow, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB85/00460, § 371 Date May 1, 1986, § 102(e) Date May 1, 1986, PCT Pub. No. WO86/02467, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 14, 1985, Ser. No. 858,147
Claims priority, application United Kingdom, Oct. 19, 1984, 8426447
Int. Cl.⁴ G03C *1/40, 7/38*
U.S. Cl. 430—387 **9 Claims**

7. A process of forming a dye image in an exposed photographic element comprising a support and a photographic silver halide emulsion, said process comprising developing the photographic element with a silver halide color developing agent in the presence of a color coupler which comprises an imidazo-[1,2-b]pyrazole nucleus and which reacts at its 3-position with an oxidized aromatic primary amino color developing agent and said coupler contains a non-coupling-off group in the 7-position.

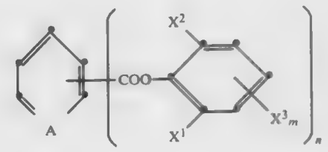
4,728,599

STERICALLY HINDERED PHENOLIC ESTER PHOTOGRAPHIC COUPLER DISPERSION ADDENDA AND PHOTOGRAPHIC ELEMENTS EMPLOYING SAME

Sundaram Krishnamurthy, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,193
Int. Cl.⁴ G03C *1/40, 1/84, 7/32*
U.S. Cl. 430—546 **9 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a dye-forming coupler dispersed in a coupler solvent therefor together with a dispersion addendum having the formula:



wherein

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A is CH or N;
each X^1, X^2 and X^3 can independently be —H, halogen, —R, —CH=NOR, —COR, —SO_2R, —YR, —YCOR, —COYR, —YSO_2R or —SO_2YR, wherein Y is O, S or NR' and R' is H or R;
or two X groups can join together to form a heterocyclic ring;
R can be a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group;
n is 2, 3 or 4 and
each m is 1, 2 or 3;
with the proviso that at least one pair of X^1 and X^2 substituents attached to the same benzene ring must contain a total of two or more non-hydrogen atoms, and with the further proviso that only one of X^1, X^2 and X^3 substituents attached to the same benzene ring may be hydrogen.

4,728,600

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Hiroshi Hara, and Toshiaki Aono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1986, Ser. No. 853,061
Claims priority, application Japan, Apr. 17, 1985, 60-82008
Int. Cl.⁴ G03C *1/40, 5/54*
U.S. Cl. 430—559 **28 Claims**

1. A heat-developable light-sensitive material comprising a support having thereon, at least
(1) a light-sensitive silver halide;
(2) a silver salt oxidizing agent;
(3) silver salt particles having adsorbed thereon at least one compound selected from a cyclic imino compound represented by formula (I)

(I)



wherein Z represents a non-metallic atomic group forming a heterocyclic ring containing an imino group together with the nitrogen atom of formula (I), and a mercapto compound represented by formula (II)

R—S—M (II)

wherein M represents a hydrogen atom or an alkali metal atom; and R represents a substituted or unsubstituted aliphatic hydrocarbon group, a substituted or unsubstituted aromatic hydrocarbon group, or a substituted or unsubstituted heterocyclic group;
(4) a reducing agent; and
(5) a binder.

4,728,601

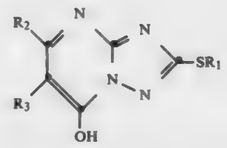
TETRA-AZA INDENE COMPOUNDS

David Rowland, Knutsford; Michael E. Dale, Macclesfield; Geoffrey E. Ficken; William E. Long, both of Wilmslow, and Andrew W. Yates, Knutsford, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 1, 1986, Ser. No. 846,675
Claims priority, application United Kingdom, Apr. 12, 1985, 8509381
Int. Cl.⁴ G03C *1/02, 1/06, 5/46*
U.S. Cl. 430—565 **3 Claims**

1. A photographic silver halide material which comprises at least one silver halide emulsion layer, said material comprising at least one tetra-aza indene compound of the formula

(I)



wherein R_1 is unsubstituted alkyl containing 6 to 11 carbon atoms, cyclohexyl, cycloheptyl or cyclooctyl and the groups R_2 and R_3 are each individually hydrogen or alkyl containing 1 to 4 carbon atoms.

4,728,602

LIGHT-SENSITIVE SILVER HALIDE EMULSIONS

Yoshihiko Shibahara; Shingo Ishimaru, and Jun Okuda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 686,969, Dec. 28, 1984, abandoned.
This application Oct. 7, 1986, Ser. No. 918,672
Claims priority, application Japan, Dec. 29, 1983, 58-248473
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—567 **15 Claims**

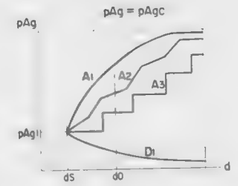
1. A light-sensitive silver iodobromide emulsion containing core/shell silver iodobromide grains having a core substantially comprising silver iodobromide containing at least about 5 mol% of silver iodide and a shell selected from the group consisting of (a) a shell comprising silver iodobromide having a lower silver iodide content than that of the silver iodobromide of the core and (b) a shell comprising silver bromide, wherein the relative standard deviation of the silver iodide content of the individual grains of said silver halide emulsion is lower than about 20%, and wherein at least about 95% (by number) of the grains have a size within about ±40% of the mean grain size.

4,728,603

METHOD FOR THE PRODUCTION OF SILVER HALIDE EMULSION

Toshihiko Yagi, Hino; Toshifumi Iijima, Kokubunji; Syoji Matsuzaka; Hisashi Yamaguchi, both of Hachioji, and Mikio Miura, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Continuation of Ser. No. 786,720, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 530,280, Sep. 8, 1983, abandoned. This application May 22, 1986, Ser. No. 868,156
Claims priority, application Japan, Sep. 9, 1982, 57-157636
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—569 **7 Claims**



1. A method of preparing a silver halide emulsion comprising the steps of:
(a) producing monodispersed silver halide particles of cubic and/or tetradecahedral shape in an aqueous hydrophilic colloidal solution, the silver halide particles consisting essentially of silver iodobromide, silver chloroiodobromide or a mixture therefore containing from 0.5 to 10 mole % of silver iodide;

(b) increasing the pAg value of the aqueous hydrophilic colloidal solution by not less than 0.3 either stepwise involving not less than three steps or continuously by adding an aqueous water-soluble silver salt solution and an aqueous water-soluble halide solution to the hydrophilic coloidal solution to form silver halide particles of octahedronal and/or tetradecahedronal shape.

4,728,604

PROCESS AND REAGENT FOR THE DETERMINATION OF TRANSAMINASE

Gerald Möller, Tutzing, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,423
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1983, 3330246
Int. Cl.⁴ C12Q *1/52, 1/32;* **C12R** *1/01, 1/225, 1/25*
U.S. Cl. 435—16 **13 Claims**

1. A process for the determination of transaminase in a sample comprising contacting said transaminase containing sample with alpha-ketoglutaric acid and at least one amino acid to form glutamate and a transaminated alpha-ketoacid, further contacting said sample with D-lactate dehydrogenase obtained from lactic acid producing bacteria and NADH, said NADH reducing said transaminated alpha-keto acid product to an alpha oxyacid and being oxidized to NAD^+, and determining the type of alpha oxyacid produced or measuring the rate of formation of NAD^+ or alpha oxyacid to determine the type of transaminase or amount of transaminase present.

4,728,605

METHODS FOR RECOGNIZING AND DIAGNOSING SUBSETS OF ALZHEIMER'S DISEASE ASSOCIATED WITH IMMUNE SYSTEM DYSFUNCTION, AND FOR THE IN VITRO TESTING OF POSSIBLE THERAPEUTIC AGENTS FOR TREATMENT OF SAME

Herman H. Fudenberg, P.O. Box 702, Sullivan Island, S.C. 29482; Harrell D. Whitten, 2037 Lake Shore Dr., Charleston, S.C. 29412, and Nemat Khansari, 1721 Ashley Hall Rd., Charleston, S.C. 29407

Filed Jul. 31, 1984, Ser. No. 636,287
Int. Cl.⁴ C12Q *1/02*
U.S. Cl. 435—29 **11 Claims**

1. A method of diagnosing a degenerative disease of the central nervous system associated with the impairment of integrative brain function, comprising
(a) providing a peripheral blood sample from a patient,
(b) measuring the level of interactive T cells of said peripheral blood, and
(c) determining whether the patient suffers from a degenerative disease of the central nervous system associated with the impairment of integrative brain function by comparing said level with a predetermined standard level indicative of the degenerative disease or with a predetermined standard level indicative of normality.

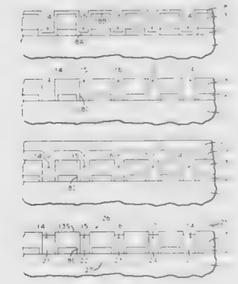
4,728,606

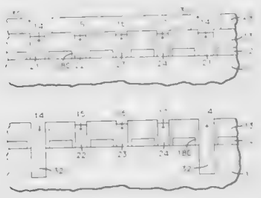
SELF-ALIGNED TRANSISTOR METHOD

Yefim Bukhman, Tempe; Carroll M. Casteel, and Gary F. Witting, both of Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 30, 1987, Ser. No. 31,820
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—33 **20 Claims**

1. A process for forming a semiconductor device having self-aligned device contacts and isolation, comprising:
providing a semiconductor substrate;
forming a first dielectric on said substrate and a second dielectric on said first dielectric, wherein said first and second dielectrics are differentially etchable and said second dielectric is of a material which is substantially impervious to oxygen;
forming a master mask pattern having at least first, second, and third spaced-apart openings for defining device contacts and a fourth opening for defining an isolation region, wherein said first through fourth openings penetrate through said first and second dielectrics to said substrate, wherein said fourth opening laterally surrounds said first through third openings, and wherein edges of said first dielectric are exposed on sidewalls of said first through fourth openings;
forming a third dielectric on said sidewalls of said first through fourth openings and covering said exposed edges of said first dielectric in said first through fourth openings, wherein said third dielectric is differentially etchable with respect to said first dielectric and substantially impervious to oxygen;
filling said first through third openings with a fourth dielectric different from said second dielectric;
anisotropically etching said substrate beneath said fourth





opening to form a trench having exposed sidewalls and bottom in said substrate;
providing a fifth dielectric covering at least said sidewalls of said trench in said substrate;
filling said trench with a polycrystalline semiconductor material;
forming a block-out mask having a fifth opening overlying at least a first region of said substrate including said first and second openings;
implanting said first region of said substrate with a dopant of a first conductivity type;
forming another block-out mask having sixth and seventh openings overlying second and third regions of said substrate, wherein said sixth opening includes said first opening and said seventh opening includes said third opening and neither said sixth or seventh openings includes said second opening; and
doping said second and third, regions of said substrate beneath said first and third openings with a dopant of a second conductivity type opposite said first conductivity type.

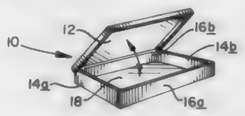
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4,728,607

MINIATURIZED YEAST IDENTIFICATION SYSTEM

Gordon L. Dorn; William H. Fleming, and Karen L. Knezek, all of Dallas, Tex., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Mar. 22, 1984, Ser. No. 592,072
Int. Cl.[4] C12Q *1/04;* C12M *1/22*
U.S. Cl. 435—34 38 Claims



1. A culture container of a size to fit on a conventional microscope viewing stand for the identification of fungal pathogens, comprising:

(a) a well means for containing fungal differentiation media, the dimensions of said well means adapted to contain a quantity of up to about 5.0 milliliters of media at a depth of up to about 4.5 millimeters, for the growth of a specimen; and

(b) a fungal differentiation media present in said well means in the amount of said quantity comprising a composition effective to induce a different observable effect in at least one species of fungi as compared with another species of fungi and effective to induce germ tube production and conventional morphological characteristics, said composition including purified saponin, oxgall, a substrate for phenol oxidase in sufficient quantity to allow differentiation of *Cryptococus neoformans,* water and ammonium ions.

4,728,608

BACTERIAL SCREENING SYSTEM WITH ENHANCED SHELF LIFE

John W. Roberts, Milford, and Karen E. DeBell, Easton, both of Mass., assignors to Cambridge BioScience Corporation, Worcester, Mass.

Filed Apr. 8, 1985, Ser. No. 720,757
Int. Cl.[4] C12Q *1/04, 1/32*
U.S. Cl. 435—34 3 Claims

1. A disposable test system for testing for the presence of bacterial organisms in a specimen, the system consisting essentially of:

a buffered substrate solution, for bacterial dehydrogenases in the specimen; and

an indicator solution for detecting the presence of the bacterial dehydrogenases in the specimen, including

(a) a tetrazolium salt; and

(b) phenazine ethosulfate,

wherein

(i) the indicator solution is buffered to a pH of approximately 3.3, thereby enhancing the shelf life of the indicator solution,

(ii) the substrate solution and the indicator solution are not mixed until shortly before use, wherein the shelf-life of the test system is enhanced, and

(iii) the substrate solution is buffered to a sufficiently high pH so that the test system when mixed has a pH between 8.8 and 9.2, whereby enhanced test sensitivity is achieved without a resulting loss of test specificity.

4,728,609

RECOMBINANT GROWTH HORMONE RELEASING FACTOR

Ram S. Bhatt, Nutley; Kenneth J. Collier, Rockaway; Robert M. Crowl, Little Falls, and Mohindar S. Poonian, West Caldwell, all of N.J., assignors to Hoffmann-La-Roche Inc., Nutley, N.J.

Continuation of Ser. No. 456,660, Jan. 10, 1983, abandoned, and a continuation-in-part of Ser. No. 439,168, Nov. 4, 1982, abandoned. This application Sep. 24, 1985, Ser. No. 778,779
Int. Cl.[4] C12P *21/00, 21/02;* C12N *15/00, 1/20, 1/00;* C07H *15/12*
U.S. Cl. 435—68 27 Claims



1. A recombinant double-stranded DNA molecule having cohesive termini with each terminus comprising a single strand of a double stranded restriction endonuclease recognition site and between the termini, a structural gene coding for human GRF-OH (1-44) or a biologically active fragment of human GRF of at least 37 amino acids that stimulates secretion of human growth hormone releasing factor.

4,728,610

METHOD FOR PRODUCING L-GLUTAMIC ACID

Yukihiro Kanegae; Yoshio Sugiyama, and Isamu Nakatsui, all of Takasago, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 580,636, Feb. 16, 1984, abandoned. This application Oct. 27, 1986, Ser. No. 924,141
Claims priority, application Japan, Mar. 18, 1983, 58-46712
Int. Cl.[4] C12P *13/24, 13/14;* C12R *1/13, 1/15*
U.S. Cl. 435—107 7 Claims

1. A method for producing L-glutamic acid, which comprises cultivating an L-glutamic acid-producing microorganism which requires oleic acid but does not require biotin for growth in a culture medium containing an oleic acid compound and a biotin compound of no less than 100 μg/liter as biotin, with carbohydrate and acetic acid as carbon sources being maintained in a weight ratio of about 70:30 through about 50:50, said microorganisms being from the group consisting of *Brevibacterium thiogenitalis D*248, Ferm BP-433, *Brevibacterium flavum* BN-11, Ferm BP-435, and *Corynebacterium glutamicum* No. 534-MS-023, Ferm BP-434.

4,728,611

PRODUCTION OF PHENYLALANINE WITH IMMOBILIZED CELLS

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Purification Engineering, Inc., Columbia, Md.

Continuation of Ser. No. 518,756, Jul. 29, 1983, Pat. No. 4,600,692, which is a continuation-in-part of Ser. No. 465,551, Feb. 10, 1983, and a continuation-in-part of Ser. No. 358,784, Mar. 16, 1982, Pat. No. 4,436,813. This application Aug. 15, 1985, Ser. No. 765,962
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.[4] C12P *13/22;* C12N *11/02, 11/08, 11/04*
U.S. Cl. 435—108 7 Claims

1. A process for preparing phenylalanine which comprises contacting phenylpyruvic acid or phenylpyruvate with cells having transaminase activity immobilized with a polyazetidine polymer in the presence of an excess of an amine donor in a ratio of at least 1.1:1 amine donor to phenylpyruvic acid or phenylpyruvate and at a pH of 5–10, said process being such as to convert at least 85% of the phenylpyruvic acid or phenylpyruvate to phenylalanine.

4,728,612

BOXAZOMYCIN A AND B, NEW ANTIBIOTICS CONTAINING BENZOXAZOLE NUCLEUS

Kyoichiro Saitoh, Zushi; Masataka Konishi, Kawasaki, and Koji Tomita, Tokyo, all of Japan, assignors to Bristol Myers Company, New York, N.Y.

Division of Ser. No. 825,498, Feb. 3, 1986, Pat. No. 4,690,926. This application Jul. 25, 1986, Ser. No. 889,525
Int. Cl.[4] C12P *17/16;* C12N *1/20*
U.S. Cl. 435—118 3 Claims

1. The method for producing boxazomycin A which comprises cultivating Pseudonocardia strain No. G495-11 (ATCC 53205) or a boxazomycin A-producing mutant thereof under aerobic conditions in an aqueous medium containing assimilable sources of carbon and nitrogen until a substantial amount of boxazomycin A is produced and thereafter recovering boxazomycin A from the culture medium.

2. The method for producing boxazomycin B which comprises cultivating Pseudonocardia strain No. G495-11 (ATCC 53205) or a boxazomycin B-producing mutant thereof under aerobic conditions in an aqeuous medium containing assimilable sources of carbon and nitrogen until a substantial amount of boxazomycin B is produced and thereafter recovering boxazomycin B from the culture medium.

3. A biologically pure culture of the microorganism Pseudonocardia strain No. G495-11 (ATCC 53205), said culture being capable of producing the antibiotics boxazomycin A and B in a recoverable quantity upon aerobic cultivation in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen.

4,728,613

METHOD FOR THE RECOVERY OF EXTRACELLULAR ENZYMES FROM WHOLE FERMENTATION BEER

Jack W. Brewer, Elkhart, Ind.; Charles E. Brothers, Cassopolis, Mich.; Terry F. Farver; Chong Y. Kim, both of Elkhart, Ind., and Eunkyu Lee, Granger, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 775,031, Sep. 4, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 890,620
Int. Cl.[4] C12N *9/56, 9/00, 9/28*
U.S. Cl. 435—222 16 Claims

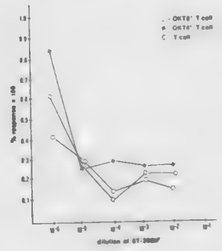
1. A process for the recovery of an extracellular enzyme from whole fermentation beer which comprises adding to whole fermentation beer containing microorganism cells and an extracellular enzyme a mixture of (a) a polymer selected from the class consisting of polyethylene glycol, an amine derivative of polyethylene glycol, a carboxylate derivative of polyethylene glycol, polypropylene glycol, an amine derivative of polypropylene glycol, a carboxylate derivative of polypropylene glycol, poly (ethylene glycol) ester, polyethyleneimine, trimethylamino-polyethylene glycol, polyvinyl alcohol, polyvinylpyrrolidone and mixtures thereof, and (b) an inorganic salt, allowing the whole fermentation beer-polymer-salt mixture to separate into an enzyme-rich polymer phase and an enzyme-poor salt phase, and recovering an enzyme-rich product therefrom.

4,728,614

MUTANT HUMAN T CELL LINE PRODUCING IMMUNOSUPPRESSIVE FACTOR AND METHOD FOR OBTAINING SUCH MUTANTS

Catherine Y. Lau, Unionville, Canada, assignor to Ortho Pharmaceutical, Don Mills, Canada

Continuation-in-part of Ser. No. 495,908, May 18, 1983, abandoned, and a continuation-in-part of Ser. No. 534,526, Sep. 21, 1983, abandoned. This application Mar. 5, 1984, Ser. No. 586,515
Int. Cl.[4] C12N *5/00, 15/00;* A61K *37/02;* C12R *1/91*
U.S. Cl. 435—240.2 24 Claims



1. The stable 6-thioguanine resistant mutant T lymphoblastoid cell line ATCC CRL 8296, which mutant secretes constitutively a high titer of a T-cell suppressor inducer factor which is:

(i) non-mitogenic;

(ii) non-cytotoxic;

(iii) inactivated by 30 minutes at 56° C.;

(iv) suppresses at least 90% of mitogen-induced T cell proliferation at a dilution of 10^{-6};

(v) does not suppress mitogen-induced B cell proliferation at a dilution of 10^{-6}; and

(vi) does not suppress pokeweed mitogen induced Ig synthesis by B cells at 10^{-1} dilution.

4,728,615

METHOD FOR PRODUCING THIN-FILM PHOTOELECTRIC TRANSDUCER

Yoshiyuki Uchida; Masaharu Nishiura, and Toshio Hama, all of Yokosuka, Japan, assignors to Fuji Electric Company Ltd. and Fuji Electric Corporate Research and Development Ltd., both of, Japan

Filed Sep. 16, 1985, Ser. No. 776,670
Claims priority, application Japan, Oct. 17, 1984, 59-217571
Int. Cl.[4] H01L *31/18, 27/14*
U.S. Cl. 437—2 7 Claims

1. A method for manufacturing thinfilm photoelectric transducers, comprising:

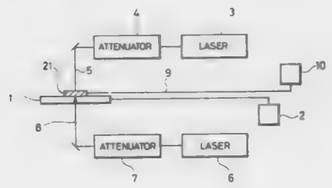
positioning a piece of transparent substrate material on a support table mounted for movement in two directions, which are substantially at right angles;

forming a transparent conductive film on a surface of said substrate;

operating a Nd:YAG laser along the outer surface of said film to pattern it;

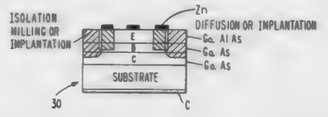
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subsequently depositing an a-Si layer on said film and scribing said layer with the Nd:YAG laser;
forming a metal layer on the outer surface of the a-Si layer and scribing the metal layer with the Nd:YAG laser;
applying a reverse bias to the then-formed transducer and measuring the leakage current to detect any defective transducer;



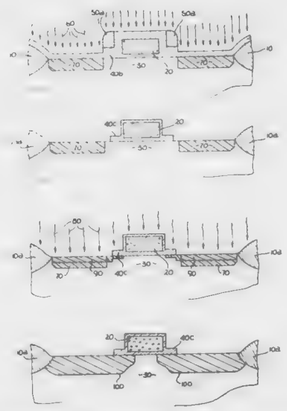
moving the table and scanning the surface of any defective transducer through the transparent substrate with a visible light laser to locate each defect; and
operating the Nd:YAG laser over each defect to eliminate that defect.

4,728,616
BALLISTIC HETEROJUNCTION BIPOLAR TRANSISTOR
David G. Ankri, Paris, France; Lester F. Eastman, and Walter H. Ku, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Division of Ser. No. 771,169, Sep. 3, 1985, Pat. No. 4,672,404, which is a continuation of Ser. No. 419,293, Sep. 17, 1982, abandoned. This application Feb. 20, 1987, Ser. No. 16,893
Int. Cl.[4] H01L *21/22, 21/26, 29/205*
U.S. Cl. 437—22 **5 Claims**



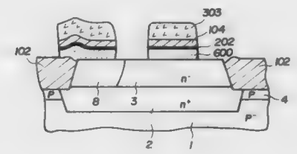
1. A method for producing a high-speed heterojunction bipolar semiconductor device, comprising:
forming a base region of a first semiconductor material having a first conductivity type;
forming emitter and collector regions on opposite sides of and adjacent said base region, said emitter and collector regions being of a semiconductor material having a second conductivity type to produce an emitter-base junction and a collector-base junction, respectively, said emitter region being doped to a first doping level;
the step of forming said base region including doping said base semiconductor material to a doping level higher than the doping level of said emitter material to produce an emitter-base conduction band step having a high potential barrier and a sharp potential drop on the base side of said emitter-base junction, the height of said barrier being sufficient to produce a high kinetic energy level in electrons thermally injected by a forward bias applied across said emitter-base junction over said barrier from said emitter region into said base region, said barrier height being selected to produce in said injected electrons a kinetic energy level close to but slightly lower than the energy level required for injection of said electrons into an upper valley energy level in said base, said base region being formed to have a thickness substantially equal to the mean distance of travel of injected electrons so that said high kinetic energy level provides substantially ballistic transport of said electrons through said base region substantially without collision; and
forming an interface region in said emitter material at said emitter-base junction to produce in said potential barrier a predetermined width gradient sufficient to prevent electron tunnelling through said barrier.

4,728,617
METHOD OF FABRICATING A MOSFET WITH GRADED SOURCE AND DRAIN REGIONS
Been-Jon Woo, Saratoga; Mark A. Holler, Palo Alto; Ender Hökelek, Santa Clara, and Sandra S. Lee, Los Altos, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.
Filed Nov. 4, 1986, Ser. No. 926,733
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—30 **5 Claims**



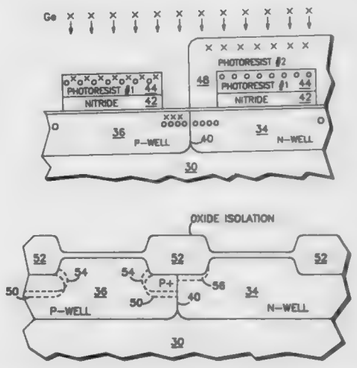
1. A method of fabricating a metal-oxide-semiconductor integrated circuit where an insulated gate electrode member is formed on a portion of a semiconductor substrate, comprising the steps of:
(a) forming a thermal oxidation insulating layer over said substrate, including over opposite sides and upper surface of said gate member;
(b) forming low temperature oxide spacer members on said opposite sides of said gate member over said insulating layer;
(c) causing first ions of a conductivity type determining impurity to impinge on the structure resulting from step (b) wherein ion implanted regions of said first ions are formed in said substrate, said spacers and gate member functioning as a mask and preventing said first ions from reaching said substrate such that first ion implanted regions are formed away from said substrate underlying said spacers and gate member;
(d) removing said spacers but retaining a portion of said thermal oxidation insulating layer underlying said spacers;
(e) causing second ions of a conductivity type determining impurity of the same conductivity type as said first ions to impinge on the structure resulting from step (d), wherein said gate member functions to mask its underlying substrate from said second ions and said thermal oxidation insulating layer previously underlying said spacers retards penetration of said ions by scattering;
(f) heating said substrate to diffuse at least a portion of said ions underneath said opposite sides of said gate member and to activate said ions, said substrate adjacent to said gate member having lower concentration of ions than substrate disposed further from said gate member,
whereby graded source and drain regions are formed.

4,728,618
METHOD OF MAKING A SELF-ALIGNED BIPOLAR USING DIFFERENTIAL OXIDATION AND DIFFUSION
Tadashi Hirao, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 25, 1986, Ser. No. 833,327
Claims priority, application Japan, Apr. 10, 1985, 60-77682; Jun. 28, 1985, 60-143206
Int. Cl.[4] H01L *21/265, 21/302, 21/283, 21/20*
U.S. Cl. 437—33 **20 Claims**



10. A method for manufacturing a semiconductor device which has a collector and an emitter/base region on a first conductivity-type semiconductor substrate, the method comprising the steps of:
(a) depositing a silicon layer, a nitride layer and a first oxide layer in sequence to form isolated islands on the collector and the base/emitter regions of the surface of said semiconductor substrate;
(b) selectively side-etching the first oxide layer to recess the oxide layer from the island side walls of the underlying nitride and silicon layers;
(c) forming a second oxide layer on the semiconductor substrate to isolate the collector and base/emitter islands by selective oxidization using the nitride layer as a mask;
(d) selectively etching away the nitride layer and the silicon layer to expose the substrate and form a collector contact area in the collector region and an emitter area in the base/emitter region by using the first oxide layer as a mask;
(e) removing the first oxide layer;
(f) forming a third oxide layer between the silicon layer in the collector area and the emitter area and the second oxide layer on the surface of the substrate by selective oxidation using the nitride layer as a mask;
(g) removing the nitride layer to leave the silicon layer exposed;
(h) implanting a first conductivity type impurity in the silicon layer in the collector contact and the emitter areas using the third oxide layer as a mask;
(i) removing the third oxide layer to expose the substrate surface in the collector region and the base/emitter region;
(j) implanting a second conductivity type impurity into the entire surface of the semiconductor device, including the collector contact area, the emitter area and the exposed substrate surface;
(k) heat-treating the semiconductor substrate to cause the first conductivity impurity to diffuse from the silicon layer in the emitter area into the substrate to form an emitter and to cause the second conductivity type impurity to diffuse from the silicon layer into the substrate in the emitter area to form an active base area under the emitter area and to cause the second conductivity impurity to diffuse into the substrate around the emitter area to form an external base area; and
(l) forming electrical connections to the silicon layer in the emitter area, to the collector contact area and to the substrate surface in the external base area.

4,728,619
FIELD IMPLANT PROCESS FOR CMOS USING GERMANIUM
James R. Pfiester; John R. Alvis, both of Austin, Tex., and Orin W. Holland, Oak Ridge, Tenn., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 19, 1987, Ser. No. 63,934
Int. Cl.[4] H01L *21/263, 21/22*
U.S. Cl. 437—34 **22 Claims**



1. A process for providing isolation structures between areas of different conductivity types in a complementary metal oxide semiconductor (CMOS) integrated circuit comprising the steps of:
providing a semiconductor substrate having a surface containing areas of different types comprising p-conductivity areas and n-conductivity areas adjacent one another at interfaces;
providing germanium/second dopant regions in one type of the areas in the substrate, and providing second dopant regions without germanium in the other type of areas in the substrate, where the second dopant is selected from the group consisting of boron and phosphorus, and where the germanium/second dopant regions and the second dopant regions without germanium are adjacent to the interfaces between the different conductivity areas;
providing a mask over the substrate, where the mask exposes at least the interfaces or structures overlying the interfaces between the p-conductivity areas and the n-conductivity areas; and
forming field isolation structures at the interfaces between the p-conductivity areas and the n-conductivity areas, where channel stop regions containing the second dopant form beneath the field isolation structures.

4,728,620
PROCESS FOR THE PRODUCTION OF A MIS-TYPE INTEGRATED CIRCUIT
Pierre Jeuch, Seyssins, France, assignor to Commissariat a l'Energie Atomique, Paris, France
PCT No. PCT/FR85/00208, § 371 Date Mar. 18, 1986, § 102(e) Date Mar. 18, 1986, PCT Pub. No. WO86/01336, PCT Pub. Date Feb. 27, 1986
PCT Filed Jul. 29, 1985, Ser. No. 857,752
Claims priority, application France, Aug. 3, 1984, 84 12300
Int. Cl.[4] H01L *21/425*
U.S. Cl. 437—41 **49 Claims**

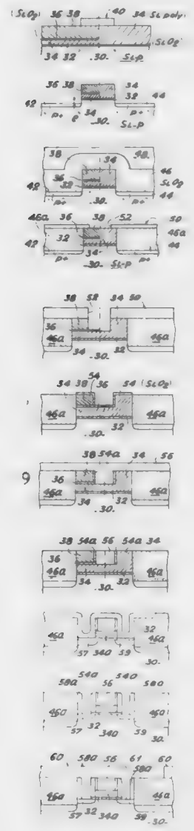
1. Process for the production, on a semiconductor substrate, of an integrated circuit having reciprocally electrically insulated active components in which gates of said components do not extend above electrical insulations used for the reciprocal

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insulation of said components, said process comprising, in sequence, the following steps:

(a) covering said semiconductor substrate with a first layer of insulating material in which gate insulatings will be formed,

(b) depositing on the first layer of insulating material a second layer including a semiconductor or conductor material in which will be formed said gates of said active components,



(c) forming a field oxide of the circuit used for electrically insulating said active components from one another,

(d) producing said gates of said active components in said second layer,

(e) producing active zones of said components by a doping of the substrate, said doping having an opposite conductivity to that of the substrate,

(f) forming insulating edges on the edges of said gates of said components,

(g) producing electrical contact holes of the circuit, and

(h) producing connections of the circuit.

4,728,621

FABRICATING A FIELD EFFECT TRANSISTOR UTILIZING A DUMMY GATE

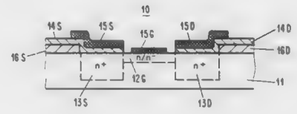
Volker Graf, Wollerau, and Albertus Oosenbrug, Langnau am Albis, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,372

Claims priority, application European Pat. Off., Dec. 6, 1985, 85115572.1

Int. Cl.⁴ H01L *21/265, 21/285*

U.S. Cl. 437—41 **17 Claims**



1. A process of fabricating-a fully self-aligned field effect transistor, said transistor being formed on a semiconductor substrate and comprising a current channel and associated source gate and drain electrodes, characterized in that the process comprises the steps of

defining the current channel at a surface of said semiconductor substrate,

forming over said current channel of said substrate a patterned multi-layer mask including portions of a first and a second dielectric layer, the portion of said second layer being deposited on and being narrower than the portion of said first layer, the cross-section of said multi-layer mask thus representing the shape of an inverted T,

depositing an ohmic contact metallization onto horizontal surfaces of the structure resulting from the preceding steps,

removing said portion of said second dielectric layer and the then exposed center section of said portion of said first dielectric layer that is not covered by said ohmic contact metallization, whereby a mask for the gate contact is provided,

depositing a gate metallization through said gate contact mask, and

removing the remaining portions of said first dielectric layer together with those sections of the ohmic contact metallization and of the gate metallization deposited on the remaining portions of said first dielectric layer.

4,728,622

CHARGE TRANSFER DEVICE HAVING A WIDTH CHANGING CHANNEL

Takao Kamata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 703,556, Feb. 20, 1985, abandoned. This application Mar. 12, 1987, Ser. No. 42,091

Claims priority, application Japan, Feb. 23, 1984, 59-32854

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 437—44 **4 Claims**

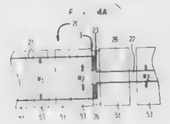
1. A method for manufacturing a charge transfer device comprising steps of:

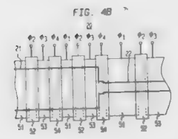
forming a channel region in a semiconductor substrate of one conductivity type, said channel region having a wide part and a narrow part, said wide and narrow parts contacting with each other at a contact portion to form a path of charges transferring from said wide part to said narrow part;

forming a first set of transfer electrodes on said semiconductor substrate to cover said channel region, said contact

portion being arranged to be positioned between predetermined two of said first set of transfer electrodes;

introducing impurities of said one conductivity type into said semiconductor substrate between said predetermined two of said transfer electrodes to extend said narrow part





of said channel region to an edge of one of said predetermined two of said transfer electrodes; and

forming a second set of transfer electrodes on said semiconductor substrate between said first set of transfer electrodes to cover said channel region.

4,728,623

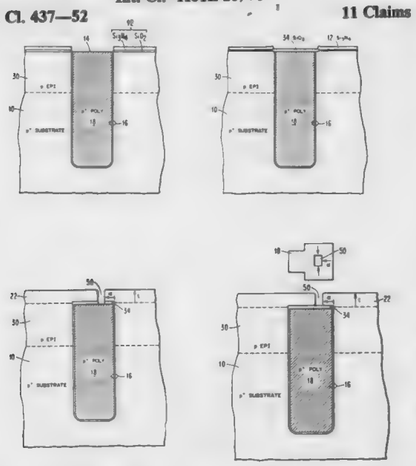
FABRICATION METHOD FOR FORMING A SELF-ALIGNED CONTACT WINDOW AND CONNECTION IN AN EPITAXIAL LAYER AND DEVICE STRUCTURES EMPLOYING THE METHOD

Nicky C. Lu, Yorktown Heights, N.Y., and Brian J. Machesney, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1986, Ser. No. 915,310

Int. Cl.⁴ H01L *21/70*

U.S. Cl. 437—52 **11 Claims**



1. A fabrication method for forming a layer of epitaxial material on a monocrystalline substrate and over a region of insulator layer to produce a self-aligned contact window through the insulator region comprising the steps of:

A. growing a layer of insulator material on a predetermined region of the surface of a monocrystalline substrate,

B. growing a layer of epitaxial material on said monocrystalline substrate and laterally over said insulator material region in a direction of growth toward the center of said insulator region,

C. stopping said growth of said layer of epitaxial material when an exposed region of desired area remains in the center of said insulator material region, the sides of said layer of epitaxial material surrounding said exposed region of insulator material area being a window to said exposed insulator material, and

D. using said epitaxial layer window as an etching mask for etching away said exposed region of insulator material to produce an opening in said exposed region of insulator material which is aligned with said epitaxial layer window.

4,728,624

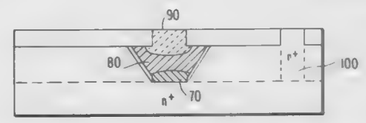
SELECTIVE EPITAXIAL GROWTH STRUCTURE AND ISOLATION

Victor J. Silvestri, Hopewell Junction, and Paul J. Tsang, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,612

Int. Cl.⁴ H01L *21/22, 21/20*

U.S. Cl. 437—90 **10 Claims**



1. A method of fabricating dielectrically isolated integrated circuit devices, comprising the following steps:

(i) forming a plurality of subcollector regions in a monocrystalline silicon substrate having upper and lower portions, said step (i) including the step of doping said upper portion of said substrate in accordance with types of devices to be formed, said lower portion of said substrate forming said subcollector regions, said step (i) further including the following steps:

(i)(a) forming a masking layer over said substrate;

(i)(b) etching a plurality of holes in said masking layer; and

(i)(c) anisotropically etching a plurality of active device regions in said substrate through said holes;

(ii) growing an oxide layer in said active device regions over portions of said substrate where said devices are to be formed;

(iii) etching first regions in said oxide layer over said subcollector regions by anisotropically etching a self-aligned hole in said oxide layer in each of said active device regions, said self-aligned hole being directly beneath a corresponding one of said holes in said masking layer; and

(iv) forming said devices by selective epitaxial growth at least in said first regions.

4,728,625

METHOD OF FABRICATING BURIED CRESCENT SEMICONDUCTOR LASER DEVICE BY REMOVING A SURFACE PORTION OF SUBSTRATE AROUND A GROOVE THEREIN

Hirofumi Namizaki, and Yasushi Sakakibara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,808

Claims priority, application Japan, Sep. 19, 1984, 59-198121

Int. Cl.⁴ H01L *21/208*

U.S. Cl. 437—91 **8 Claims**

1. A method of fabricating a semiconductor laser comprising the steps of:

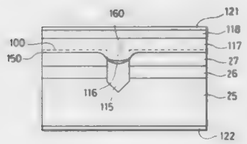
preparing a semiconductor wafer composed of a semiconductor substrate of a first conductivity type and a current blocking layer formed on said semiconductor substrate,

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said current blocking layer comprising at least one semiconductor layer of a second conductivity type, a groove being formed in an upper surface of said wafer having a depth corresponding to at least a thickness of said current blocking layer,

applying a melt-back etching process to the upper surface of said semiconductor wafer such that both the surface regions of said wafer and the upper sidewall surface regions of said groove are removed, while the lower surface regions of said groove are substantially not removed, and

growing on said wafer by liquid phase epitaxy, a plurality of semiconductor crystal layers including a layer constituting an active region which is in said groove and is terminated on the etched portions of the side wall of the groove.

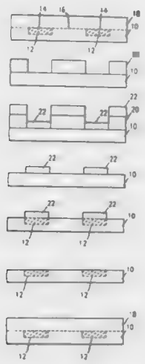


4,728,626

METHOD FOR MAKING PLANAR 3D HETEREPITAXIAL SEMICONDUCTOR STRUCTURES WITH BURIED EPITAXIAL SILICIDES

King-Ning Tu, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,043
Int. Cl.⁴ H01L *29/48, 23/54*
U.S. Cl. 437—126 **24 Claims**



1. A method for forming a 3D , epitaxial structure, comprising the steps of:

providing a first layer of a single crystal semiconductor material,

forming a layer comprised of a composition including at least elements A and B on at least a portion of said first layer, element A being capable of forming a compound with said semiconductor material that is epitaxial with said semiconductor material, element B being chosen as one which does not readily form a compound with said semiconductor material at the temperatures and times used in a heating step to form said epitaxial compound of element A and said semiconductor,

heating said composition and said first said semiconductor layer to form said epitaxial compound in said semiconductor layer, the residue of said composition after said heating step being capable of being etched without undue etching of said epitaxial compound, said epitaxial compound forming an etch stop,

removing said residue by etching to the surface of said epitaxial compound, thereby producing a planar surface comprised of the top surface of said epitaxial compound and the unreacted surface portion of said first layer of semiconductor material, and

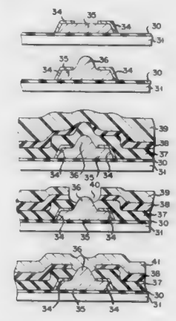
epitaxially forming a top layer of single crystal material over said epitaxial compound and said first layer of semiconductor material.

4,728,627

METHOD OF MAKING MULTILAYERED INTERCONNECTS USING HILLOCK STUDS FORMED BY SINTERING

Yasukazu Mase, Tokyo; Masahiro Abe, Yokohama, and Masaharu Aoyama, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 3, 1986, Ser. No. 870,117
Claims priority, application Japan, Jun. 6, 1985, 60-123002
Int. Cl.⁴ H01L *21/28, 21/302*
U.S. Cl. 437—190 **13 Claims**



1. A method of manufacturing a semiconductor device the steps of:

preparing a semiconductor substrate on which a first insulation film is formed;

forming a first metal layer on said first insulation film;

forming a hillock of said first metal layer;

forming a second insulation film on said first metal layer;

removing that portion of said second insulation film, in self-alignment with said hillock, which is on said hillock, thereby forming a contact hole leading to said hillock; and

forming on said second insulation film a second metal a second metal layer extending into said contact hole and contacting said hillock,

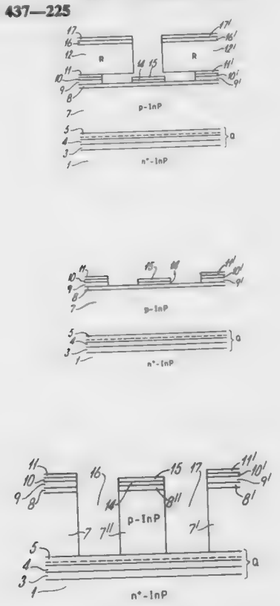
wherein said step of forming a hillock comprises the steps of forming a hillock-suppressing film having a hillock-suppressing function on said first metal layer, forming a hole in said hillock-suppressing film, and thermally treating said first metal layer to form a hillock of said first metal layer, which extends into said hole formed in said hillock-suppressing film.

4,728,628

METHOD OF MAKING RIDGE WAVEGUIDE LASERS

Philip J. Fiddyment; Leslie D. Westbrook, both of Ipswich, and Andrew W. Nelson, Felixstowe, all of England, assignors to British Telecommunications public limited company, Great Britain

Filed Mar. 7, 1985, Ser. No. 709,196
Claims priority, application United Kingdom, Mar. 12, 1984, 8406432
Int. Cl.⁴ H01L *21/308*
U.S. Cl. 437—225 **7 Claims**



1. A method of producing an optical ridge waveguide semiconductor device having a base semiconductor portion and first and second spaced apart elevated semiconductor portions thereon, said method comprising the steps of:

(a) producing an initial semiconductor structure by the steps of (i) depositing dielectric and then resist onto a planar semiconductor surface, (ii) opening a window in the resist over a region corresponding to the uppermost surface of the first elevated portion to be formed, (iii) employing a suitable reagent to undercut the resist down to the level of the semiconductor surface, (iv) depositing metal onto the semiconductor surface thus exposed in the image of the window of the resist, and (v) removing the resist and any metal deposited thereon to thereby form the uppermost portion of the first elevated portion carrying a layer of metal thereon and the uppermost portion of the second elevated portion carrying a layer of dielectric thereon, said uppermost portions of the first and second elevated portions being disposed over first and second semiconductor material regions of said initial semiconductor structure; and

(b) producing the optical ridge waveguide semiconductor device from the initial semiconductor structure by applying an etchant to the initial semiconductor structure so as to remove semiconductor material between said first and second semiconductor material regions without removing the respective layers on the uppermost portions of said first and second elevated portions.

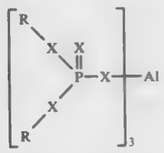
4,728,629

CRACKING CATALYST RESTORATION WITH ALUMINUM COMPOUNDS

Brent J. Bertus; H. Wayne Mark, and Dwight L. McKay, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 840,228, Mar. 17, 1986, Pat. No. 4,664,779, which is a division of Ser. No. 427,256, Sep. 29, 1982, Pat. No. 4,584,283, which is a continuation of Ser. No. 175,622, Aug. 5, 1980, abandoned. This application Mar. 16, 1987, Ser. No. 26,233
Int. Cl.⁴ B01J *29/06*
U.S. Cl. 502—62 **8 Claims**

1. A composition comprising a zeolite modified hydrocarbon cracking catalyst having had deposited thereon a treating agent compound represented by the formula



where R is a hydrocarbyl containing from 1 to about 20 carbon atoms and X is selected from the group consisting of oxygen and sulfur and at least one X is sulfur, in an amount of from about 200 to about 20,000 parts per million, as measured by the weight of aluminum in the treating agent to the total weight of the cracking catalyst composition.

4. A composition comprising a zeolite modified hydrocarbon cracking catalyst having had deposited thereon in excess of 3,000 ppm vandium equivalents of contaminants selected from the group consisting of nickel, vandium, and iron and from about 200 to about 20,000 parts per million as measured by weight of aluminum, of a treating agent composition represented by the formula $((RO)_2PS_2)_3Al$ wherein R is hydrocarbyl having from 1 to about 20 carbon atoms.

4,728,630

RHODIUM ON CARBON CATALYST

Hobe Schroeder, Warrenville, and Ricky L. Wittman, Montgomery, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 785,055, Oct. 7, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 905,758
Int. Cl.⁴ B01J *23/40, 27/06*
U.S. Cl. 502—185 **14 Claims**

1. A method of making a rhodium-on-carbon composition which comprises:

providing an alkaline, granular, porous carbonaceous catalyst support material having a surface area of at least about 600 m^2/gram and a pH value in an aqueous suspension of at least about 9 but no more than about 11; and

contacting said alkaline support material with an aqueous rhodium (3+) salt solution having a pH value of from about 1 to about 4 for a time period to produce a wetted support material containing about 0.01 to about 2 weight percent rhodium, based on the weight of dry catalyst and calculated as elemental metal, wherein the support material and aqueous rhodium salt solution are preselected such that the sum of the pH of the aqueous rhodium salt solution and pH of the aqueous suspension of the support materials is in the range of from about 12 to about 13.5.

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4,728,631

PRESSURE SENSITIVE RECORDING SHEET

Yasuhiro Ogata, and Masakazu Maekawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 867,168, May 27, 1986, abandoned. This application Dec. 17, 1986, Ser. No. 942,890
Claims priority, application Japan, May 24, 1985, 60-111935
Int. Cl.[4] B41M 5/16, 5/22
U.S. Cl. 503—200 5 Claims

1. A pressure sensitive recording sheet which uses a coloring reaction of an electron donating color former with an electron accepting color developer and which comprises as a support raw paper having a fiber length distribution such that the total amount of a percentage by weight of a 24 mesh residue and that of a 42 mesh residue is 65% or less by weight of the total residue as determined in accordance with the fiber classification method established by JIS P-8207.

4,728,632

CARBONLESS PAPER SOLVENT UTILIZING TRIISOPROPYLTOLUENE

Andrew P. Komin, Wichita, Kans., assignor to Koch Industries, Inc., Wichita, Kans.

Division of Ser. No. 821,983, Jan. 23, 1986, Pat. No. 4,680,056. This application Mar. 6, 1987, Ser. No. 23,532
Int. Cl.[4] B41M 5/16, 5/22
U.S. Cl. 503—213 7 Claims

1. A recording sheet comprising a support for carrying written or printed indicia having coated thereon a continuous layer of microcapsules containing chromogenic substance and a solvent for said substance, said solvent comprising triisopropyltoluene.

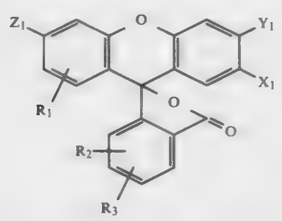
4,728,633

RECORDING MATERIAL

Masato Satomura; Ken Iwakura, both of Kanagawa, and Akira Igarashi, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1986, Ser. No. 890,234
Claims priority, application Japan, Jul. 29, 1985, 60-167257; Jul. 30, 1985, 60-168359
Int. Cl.[4] B41M 5/16, 5/18, 5/22
U.S. Cl. 503—221 20 Claims

1. A recording material comprising a support having provided thereon a fluoran derivative represented by formula (I):



(I)

wherein X_1 repersents a group derived from an amine, or a hydrogen atom; Y_1 represents an alkyl group, an alkoxy group, an aryl group, a halogen atom, a group derived from an amine, an aralkyl group, or a hydrogen atom; Z_1 represents a group derived from an amine; R_1 represents a halogen atom, a lower alkyl group having 6 or less carbon atoms, or a hydrogen atom; R_2 represents an aryloxy group, and R_3 represents a hydrogen atom, a halogen atom, or an alkyl group.

4,728,634

ETHYLENE OXIDE CATALYST

Gosse Boxhoorn; Aan H. Klazinga, and Otto M. Velthuis, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,910
Claims priority, application Netherlands, Jun. 28, 1985, 8501862
Int. Cl.[4] B01J 21/04, 21/08, 23/04, 23/50
U.S. Cl. 502—243 13 Claims

1. A catalyst for the production of ethylene oxide from ethylene and molecular oxygen which comprises silver and an alkali metal promoter supported on a carrier, which carrier is prepared by a process which comprises mixing an aluminum compound with water and an alkali metal salt and with silicon dioxide and calcining the resultant mixture at a temperature between 1200° C. and 1700° C.

4,728,635

ALKALINE EARTH METAL SPINELS AND PROCESSES FOR MAKING

Alakanada Bhattacharyya, Columbia; William E. Cormier, Jr., Ellicott City, and Gerald M. Woltermann, Westminster, all of Md., assignors to Katalistiks International Inc., Baltimore, Md.

Filed Apr. 7, 1986, Ser. No. 848,955
Int. Cl.[4] B01J 21/04, 23/02, 23/10
U.S. Cl. 502—304 70 Claims

1. A process for the production of an alkaline earth metal, aluminum-containing spinel composition, said spinel being combined with a free alkaline earth metal oxide, comprising:
(a) combining (1) an acidic, aluminum-containing composition in which the aluminum is present in a positively charged species, and (2) a basic alkaline earth metal-containing composition to form a mixture; and
(b) calcining said mixture to form said alkaline earth metal, aluminum-containing spinel composition, said spinel being combined with a free alkaline earth metal oxide.

4,728,636

HYDROXYLATED MAGNESIA SUPPORT

John A. Sofranko, Malvern, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 600,940, Apr. 16, 1984, Pat. No. 4,517,398. This application Feb. 19, 1985, Ser. No. 703,151
Int. Cl.[4] B01J 21/10, 23/04, 23/34
U.S. Cl. 502—324 11 Claims

1. A composition of matter comprising:
(a) at least one reducible oxide of at least one metal, which oxide is reduced and produces higher hydrocarbon products and water when contacted with methane at selected temperatures in the range of about 500° to about 1000° C.;
(b) at least one alkali metal; and
(c) a support comprising a magnesia derived from magnesium hydroxide or from a magnesium-containing component contacted with hydroxyl-containing material,
wherein the support has been calcined prior to the addition of said reducible metal oxide.

4,728,637

COMPLEX OF MACROMOLECULES EXTRACTED FROM MESENCHYMAL CELLS FOR TREATING CHRONIC DEGENERATIVE DISEASE

Ralph Silverman, 7701 W. Arcadia, Morton Grove, Ill. 60053

Continuation-in-part of Ser. No. 549,257, Nov. 4, 1983, abandoned. This application Mar. 21, 1986, Ser. No. 842,475
Int. Cl.[4] A61K 37/10, 37/02
U.S. Cl. 514—8 5 Claims

1. A method of treating chronic degenerative diseases of the tissue comprising treating the diseased tissue with a pharmaceutical complex of macromolecules wherein said macromolecules are derived from the culture media of cells selected from the group consisting of animal and human mesenchymal cells and wherein the complex of macromolecules comprises both fibronectins and procollagens.

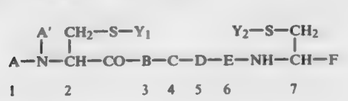
4,728,638

SOMATOSTATINE DERIVATIVES

Wilfried Bauer, Lampenberg; Janos Pless, Basil, and René Huguenin, Reinach, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

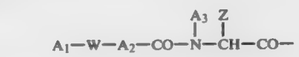
Filed Jan. 7, 1986, Ser. No. 816,663
Claims priority, application Switzerland, Jan. 7, 1985, 36/85; Fed. Rep. of Germany, Mar. 28, 1985, 3511206
Int. Cl.[4] A61K 37/24; C07K 7/26
U.S. Cl. 514—11 10 Claims

1. A polypeptide of formula I,



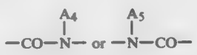
I

wherein A is
(a) is residue of formula Ia



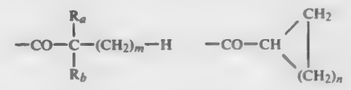
Ia

wherein
W is a group of formula



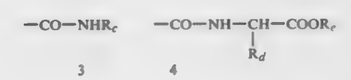
A_1 and A_4 are independently hydrogen, a saturated aliphatic C_{1-19}hydrocarbyl, unsaturated aliphatic C_{2-19}hydrocarbyl, or C_{7-10}phenylalkyl, wherein phenyl is optionally substituted by halogen, trifluoromethyl, nitro, hydroxy, C_{1-3}alkyl and/or C_{1-3}alkoxy,
A_5 is hydrogen or a saturated aliphatic C_{1-12}hydrocarbyl or unsaturated C_{2-12}hydrocarbyl or
A_1+A_5 together signify tetramethylene or pentamethylene,
A_2 is saturated C_{1-19}alkylene or unsaturated C_{2-19}alkylene, whereby A_1, A_2 and A_4 together or A_1, A_2 and A_5 together contain 10 to 20 carbon atoms,
A_3 is hydrogen, a saturated aliphatic (C_{1-12}) hydrocarbyl, a unsaturated aliphatic (C_{2-12})hydrocarbyl or (C_{7-10})phenylalkyl, wherein phenyl is optionally substituted by halogen, trifluoromethyl, nitro, hydroxy, (C_{1-3})alkyl or (C_{1-3}) alkoxy,
>N—CH(Z)—Co— is
(1) an (L)- or (D)-phenylalanine residue optionally ring-substitued by halogen, NO_2, NH_2, OH, C_{1-3}alkyl and-/or C_{1-3}alkoxy, or
(2) the residue of the natural α-amino acid other than defined under (1) above, or of a corresponding (D)-amino acid,
whereby Z in >—N—CH(Z)—CO— represents the remainder of said residue (1) or (2);
A′ is hydrogen and
Y_1 and Y_2 are each hydrogen or together represent a direct bond,

or
(b) hydrogen, C_{1-12}alkyl, C_{7-10}phenylalkyl or RCO,
R is hydrogen, C_{1-12}alkyl, phenyl or C_{7-10}phenylalkyl or
RCO is
(α) a (L)- or (D)-phenylalanine residue optionally ring-substituted by halogen, NO_2, NH_2, OH, C_{1-3}alkyl and-/or C_{1-3}alkoxy or
(β) the residue of a natural (L)-α-amino acid other than defined under (a) above, or of a corresponding (D)-amino acid or
(γ) a dipeptide residue in which the individual amino acid residues are the same or different and are selected from those defined under (α) and (γ) above, the α-amino group of amino acid residues (α) and (β) and the N-terminal amino group of dipeptide residues (γ) being optionally substituted by C_{1-12}alkyl or C_{7-10}phenylalkyl and/or C_{1-11}acyl,
A′ is hydrogen or when A is (C_{1-12})alkyl or (C_{7-10})phenylalkyl, then A′ can also signify (C_{1-12}) alkyl whereby the total number of carbon atoms of A+A′ does not exceed 13 carbon atoms,
Y_1 and Y_2 are independently a group of formula 1, 2, 3, 4 or 5,

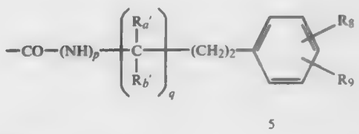


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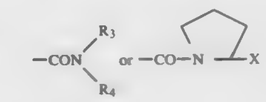


3 4



5

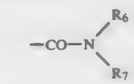
wherein
R_a is methyl or ethyl,
R_b is hydrogen, methyl or ethyl,
m is 1, 2, 3, 4 or
n is 1, 2, 3, 4 or 5
R_c is (C_{1-6})alkyl
R_d represents the substituent attaching to the α-carbon atom of a natural α-amino acid (including hydrogen)
R_e is (C_{1-5})alkyl
R_a' and R_b' are independently hydrogen, methyl or ethyl,
R_8 and R_9 are independently hydrogen, halogen, (C_{1-3}) alkyl or (C_{1-3})alkoxy,
p is 0 or 1,
q is 0 or 1,
r is 0, 1 or 2,
and for both cases (a) and (b)
B is —Phe— optionally ring-substituted by halogen, NO_2, NH_2, OH, C_{1-3}alkyl and/or C_{1-3}alkoxy,
C is (L)—Trp— or (D)—Trp— optionally α-N-methylated and optionally benzene-ring-substituted by halogen, NO_2, NH_2. OH, C_{1-3}alkyl and/or C_{1-3}alkoxy,
D is —Lys— optionally α-N-methylated,
E is Thr, Ser or Val
F is a group of formula —$COOR_1$, —CH_2OR_2,



wherein
R_1 is hydrogen or C_{1-3}alkyl,
R_2 is hydrogen or the residue of a physiologically acceptable, physiologically hydrolysable ester,
R_3 is hydrogen, C_{1-3}alkyl, phenyl or C_{7-10}phenylalkyl,

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but when R_4 is —CH(R_5)—X then R_3 is only hydrogen or methyl,
R_4 is hydrogen, C_{1-3}alkyl or a group of formula —CH(R_5)—X,
R_5 is hydrogen, —$(CH_2)_2$—OH or —$(CH_2)_3$—OH, or represents the substituent attaching to the α-carbon atom of a natural α-amino acid and
X is a group of formula —$COOR_1$, —CH_2OR_2 or



wherein
R_1 and R_2 have the meanings given above,
R_6 is hydrogen or C_{1-3}alkyl and
R_7 is hydrogen, C_{1-3}alkyl, phenyl or C_{7-10}phenylalkyl, whereby the residues B, D and E have the L-configuration, and the residues in the 2- and 7-position and the residues (Y_{14}) and (Y_{24}) each independently have the (L)- or (D)-configuration, as well as the salt forms and complexes thereof.

4,728,639

TYPE-SPECIFIC OPSONIC ANTIBODIES EVOKED WITH A SYNTHETIC PEPTIDE OF STREPTOCOCCAL M PROTEIN CONJUGATED TO POLYLYSINE WITHOUT ADJUVANT

Edwin H. Beachey, Memphis, Tenn., assignor to University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 700,625, Feb. 12, 1985, Pat. No. 4,597,967, which is a division of Ser. No. 503,272, Jun. 12, 1983, Pat. No. 4,521,334, which is a continuation-in-part of Ser. No. 402,355, Jul. 27, 1982, Pat. No. 4,454,121. This application Jan. 2, 1986, Ser. No. 815,693
Int. Cl.[4] A61K *37/02;* **C07K** *7/10*
U.S. Cl. 514—12 **2 Claims**

1. An immunogenic biological composition which comprises a biologically acceptable diluent and in an amount sufficient to elicit opsonic antibodies to *Streptococcus pyogenes* and not be serologically cross-reactive with tissue antigens of the heart, a polypeptide conjugae having the amino acid sequence Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-Ala-Asp-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Ala-Met conjugated to polylysine.

4,728,640

TREATMENT OF DYSMENORRHEA

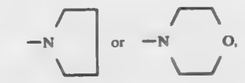
Fernand Labrie, Quebec, Canada, and Jean-Pierre Raynaud, Paris, France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 621,421, Jun. 18, 1984, which is a division of Ser. No. 468,932, Feb. 23, 1983, Pat. No. 4,472,382, which is a division of Ser. No. 189,168, Sep. 22, 1980, abandoned. This application Aug. 11, 1986, Ser. No. 895,179
Claims priority, application France, Sep. 21, 1985, 79 23545
Int. Cl.[4] A61K *37/02*
U.S. Cl. 514—15 **3 Claims**

1. A method of treating dysmenorrhea in female mammals consisting essentially of administering to female mammals an amount of a peptide of the formula

pGlu-His-Trp-Ser-Tyr-X-Y-Arg-Pro-Z I

wherein (a) Z is Gly-NH_2, Y is Leu and X is Gly, (b) Z is Gly-NH_2, Y is Le, X is DN Leu, DN Val, D Abu (α-aminobutyric acid), D Phe, D Ser, D Thr, D Met, D Pgl, D Lys, Leu, Ile, Nle, Val, N Val, Met, Phe, D Leu, D Arg, D Ser (tbu), D Thr (tbu), D Cys (tbu) D Asp (O tbu), D Glu (O tbu), D Orn (boc), D Lys (boc), D Trp, Trp, 2-methyl Ala, D Tyr, ε-lauryl-D Lys, ε-dextran-D Lys, (c) Z is NH-cyclopropyl- or NH-Alk wherein Alk is alkyl of 1 to 3 carbon atoms, Y is Leu and X is D Ser (tbu), D Thr (tbu), D Asp (Otbu), D Glu (Otbu), D Orn (boc), D Lys (boc), (d) Z is —NH—CH_3, —NH—CH_2—CH_3, NH—CH_2—CH_2—CH_3, —NH—CH_2—CH_2—OH,



Y is Leu and X is Gly, (e) Z is —NH—CH_2—CH_3, Y is Leu and X is D Trp, D Leu, D Ala, D Ser (tbu), D Tyr, D Lys, Ala, (f) Z is Gly-NH_2 or —NH—CH_2—CH_3, Y is NαMe Leu and X is Gly, (g) Z is —NH-cyclopropyl, Y is Leu and X is D Leu or (h) Z is Gly-NH_2, —NH-cyclopropyl or —NHAlk' wherein Alk' is alkyl of 1 to 3 carbon atoms, Y is Ser (tbu), Cys (tbu), Asp (Otbu), Glu (Otbu), Orn (boc) Lys (boc) and X is Gly sufficient to treat dysmenorrhea.

4,728,641

GANGLIOSIDE DERIVATIVES

Ezio Tubaro, and Giovanni Cavallo, both of Rome, Italy, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 18, 1984, Ser. No. 632,200
Claims priority, application Italy, Jul. 21, 1983, 48724 A/83
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—54 **4 Claims**

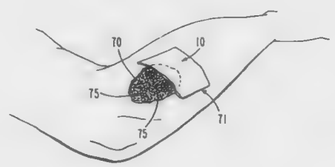
1. A method of treating bacterial infections in a mammal comprising administering to a mammal an effective antibacterial amount of a ganglioside $G_{M1}P$ compound characterised in that:
(a) by thin layer chromatography
(i) it gives a positive reaction to sulphuric acid reagent (concentrated sulphuric acid:water, 1:1), resorcinol reagent, orcinol/$FeCl_3$ and other typical reagents for ganglioside detection,
(ii) it gives litte reaction to ninhydrin reagent (0.2% ninhydrin in ethanol),
(b) it has, when in aqueous solution, a ^{13}C n.m.r. spectrum substantially identical to that shown in FIG. 2,
(c) it has in vivo activity in mice against klebsiella pneumoniae, and
(d) It has in vivo activity in mice against Herpes HSV-1 (strain F) to said mammal.

4,728,642

METHOD OF TREATING WOUNDS WITH GRANULES AND DRESSING

John M. Pawelchak, East Windsor, and Frank M. Freeman, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 705,859, Feb. 27, 1985, Pat. No. 4,538,603, which is a continuation of Ser. No. 370,893, Apr. 22, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 728,421
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—57 **11 Claims**



1. The method of treating a dermal ulcer emitting a large amount of exuadate comprising packing the ulcer with granules capable of interacting with the exudate and then overlaying the ulcer with an occlusive dressing having an adhesive layer which also is capable of reacting with the exudate and of forming a bond with the normal skin surrounding said ulcer wherein said granules have a particle size of from about 10 to about 40 mesh and consist essentially of one or more water dispersible hydrocolloids selected from the group consisting of sodium carboxymethylcellulose, calcium carboxymethylcellulose, pectin, gelatin, guar gum, locust bean gum, collagen and gum karaya, and from zero to 50% by weight of one or more water swellable cohesive strengthening agents, one or more hydratable polymers, and mixtures thereof wherein said water swellable cohesive strengthening agents if present are selected from the group consisting of water-insoluble cross-linked sodium carboxymethylcellulose, water-insoluble starch-acrylonitrile graft copolymer, and water-insoluble cross-linked dextran and wherein said hydratable polymers if present are selected from the group consisting of gluten and long chain polymers of methyl vinyl ether/maleic acid and wherein said occulusive dressing is a multi-layered dressing consisting essentially of an adhesive layer which in use contacts the wound and the surrounding normal skin, an intermediate layer of semi-open cell polymeric foam bonded to the upper surface of said adhesive layer, and an outer moisture impervious polymeric film coated or laminated to the upper surface of said foam layer, wherein said wound and skin contacting adhesive layer consists of from about 35% to about 50% by weight of low molecular weight polyisobutylenes and from about 45% to about 65% by weight of one or more water dispersible hydrocolloids selected from the group consisting of sodium carboxymethylcellulose, calcium carboxymethylcellulose, pectin, gelatin, guar gum, locust bean gum, collagen, and gum karaya.

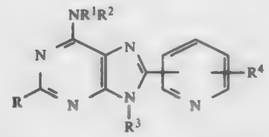
4,728,644

PURINE DERIVATIVE AND PHARMACEUTICAL COMPOSITION

Hiroshi Yuki, Toyonaka; Hiroyuki Sueoka, Buzen; Mitsuyoshi Yasumoto, Fukuoka; Michio Terasawa, Nakatsu, and Tomonori Imayoshi, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP84/00633, § 371 Date Jul. 22, 1985, § 102(e) Date Jul. 22, 1985, PCT Pub. No. WO85/03077, PCT Pub. Date Jul. 18, 1985
PCT Filed Dec. 28, 1984, Ser. No. 768,535
Claims priority, application Japan, Jan. 13, 1984, 59-4986
Int. Cl.[4] C07D *473/04;* **A61K** *31/52*
U.S. Cl. 514—212 **9 Claims**

1. A purine derivative of the formula:



wherein R is a hydrogen atom, C_{1-8} alkyl group or a phenyl group which may be substituted by at least one substituent selected from a halogen atom, a C_{1-4} alkyl group and a C_{1-4} alkoxy group; each of R^1 and R^2 is a hydrogen atom, a C_{1-8} alkyl group, a C_{3-7} cycloalkyl group, a hydroxy-C_{1-8} alkyl group, a di-C_{1-8} alkylamino-C_{1-8} alkyl group, a cyclic amino-C_{1-8} alkyl group wherein the cyclic amino is selected from 1-pyrrolidinyl, piperidino, morpholino, thiomorpholino, 1-piperazinyl, 4-methyl-1-piperaznyl, 4-(2-hydroxyethyl)-1 -piperazinyl and 4-methyl-1-homopiperazinyl, a C_{2-8} alkenyl group or a phenyl-C_{1-3} alkyl group, or R^1 and R^2 together with the adjacent nitrogen atom form a heterocycle selected from 1-pyrrolidinyl, piperidino, 1-piperazinyl, 4-methyl-1-piperazinyl, 4-(2-hydroxyethyl)-1- piperazinyl, 1-homopiperazinyl, 4-methyl-1-homopiperazinyl, morpholino and thiomorpholino, and each of R^3 and R^4 is a hydrogen atom or a C_{1-4} alkyl group, or
a pharmaceutically acceptable acid addition salt thereof.

4,728,643

METHOD OF TREATING PSORIASIS

Michael F. Holick, Sudbury, and Julia McLaughlin, W. Roxbury, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Nov. 2, 1984, Ser. No. 667,813
Int. Cl.[4] A61K *31/59*
U.S. Cl. 514—167 **15 Claims**



1. A method of treating the disease of psoriasis in a patient affected by said disease which comprises administering to said patient by oral or parenteral means an effective amount of a vitamin D compound, which compound when tested in vitro is capable of stimulating the differentiation of cultured tumor cells.

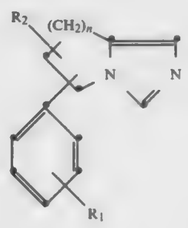
4,728,645

SUBSTITUTED IMIDAZO[1,5-A]PYRIDINE DERIVATIVES AND OTHER SUBSTITUTED BICYCLIC DERIVATIVES, USEFUL AS AROMATASE INHIBITORS

Leslie J. Browne, Morris Plains, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 747,195, Jun. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 622,421, Jun. 20, 1984, Pat. No. 4,617,307, and a continuation-in-part of Ser. No. 451,902, Dec. 21, 1982, Pat. No. 4,588,732. This application Feb. 4, 1986, Ser. No. 825,830
Int. Cl.[4] A61K *31/415;* **C07D** *487/04, 235/02*
U.S. Cl. 514—214 **23 Claims**

1. A compound of the formula



(I*)

wherein

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n denotes 0, 1, 3 or 4;

R_1 represents hydrogen, lower alkyl; lower alkyl substituted by hydroxy, lower alkoxy, lower alkanoyloxy, lower alkanoyl, amino, lower alkylamino or di-lower alkylamino, halogen, sulfo, sulfamoyl, carboxy, lower alkoxycarbonyl, carbamoyl or cyano; nitro, halogen, hydroxy, lower alkoxy, aryloxy, aryl-lower alkoxy, lower alkanoyloxy, aroyloxy, lower alkoxycarbonyloxy, mercapto, lower alkylthio, arylthio, aryl-lower alkylthio, aryl-sulfinyl, aryl-sulfonyl, lower alkyl-sulfinyl, lower alkylsulfonyl, lower alkanoylthio, amino, lower alkylamino, arylamino, aryl-lower alkylamino, lower alkanoylamino, aroylamino, di-lower alkylamino; pyrrolidino, piperidino, morpholino, thiomorpholino or optionally 4-lower alkylsubstituted piperazino; quaternary ammonium derived from a disubstituted amino group mentioned above which contains as quaternary substituent lower alkyl, hydroxy- or halo-lower alkyl or aryl-lower alkyl; sulfo, lower alkoxysulfonyl, sulfamoyl, lower alkylsulfamoyl, di-lower alkylsulfamoyl, formyl or formyl as a di-lower alkyl acetal derivative; iminomethyl which may be N-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, lower alkyl, aryl or amino; C_2–C_{20}-alkanoyl, halo-C_2–C_7-alkanoyl, aroyl, cyano, carboxy, lower alkoxycarbonyl, carbamoyl, lower alkylcarbamoyl, di-lower alkylcarbamoyl or hydroxycarbamoyl;

R_2 represents hydrogen, lower alkyl; lower alkyl substituted by aryl, carboxy or lower alkoxycarbonyl; hydroxy, lower alkoxy, aryloxy, aryl-lower alkoxy, lower alkanoyloxy, aroyloxy, lower alkoxycarbonyloxy, mercapto, lower alkylthio, arylthio, aryl-lower alkylthio, aryl-sulfinyl, aryl-sulfonyl, lower alkylsulfinyl, lower alkylsulfonyl, lower alkanoylthio, C_2–C_{20}-alkanoyl, halo-C_2–C_7-alkanoyl, aroyl, cyano, carboxy, lower alkoxycarbonyl, carbamoyl, lower alkyl-carbamoyl, di-lower alkylcarbamoyl or hydroxycarbamoyl; aroyl within said definitions represents arylcarbonyl; and aryl within any of the above definitions represents 1- or 2-naphthyl, phenyl, or phenyl substituted by lower alkyl, lower alkoxy or halogen;

or a pharmaceutically acceptable salt thereof.

4,728,646

2-(PERHYDRO-1,4-DIAZINO)-PYRIMIDO[5,4-D]-PYRIMIDINES AND SALTS THEREOF

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

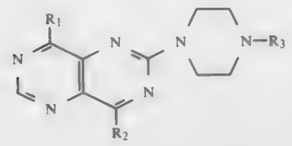
Division of Ser. No. 712,341, Mar. 15, 1985, Pat. No. 4,690,923, which is a continuation of Ser. No. 575,322, Jan. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 350,429, Feb. 22, 1982, abandoned, which is a continuation of Ser. No. 161,010, Jun. 19, 1980, abandoned. This application Jan. 28, 1987, Ser. No. 7,990

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926804; Apr. 11, 1980, 3013930

Int. Cl.[4] A61K *31/54;* **C07D** *417/14, 487/04*

U.S. Cl. 514—222 **8 Claims**

1. A compound of the formula



wherein

R_1 is (unsubstituted phenyl)-(alkyl of 1 to 4 carbon atoms)-amino or N-(alkyl of 1 to 4 carbon atoms)-(unsubstituted phenyl)-(alkyl of 1 to 4 carbon atoms)-amino;

R_2 is thiomorpholino, thiomorpholino-1-oxide or thiomorpholino-1,1-dioxide; and

R_3 is hydrogen or formyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. An antithrombotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,728,647

AMIDES DERIVED FROM QUINOLINE, AND ANXIOLYTIC COMPOSITIONS CONTAINING THEM

Jesus Benavides, Rueil-Malmaison; Marie-Christine Dubroeucq, Enghien-Les-Bains; Gérard Le Fur, Montmorency, and Christian Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

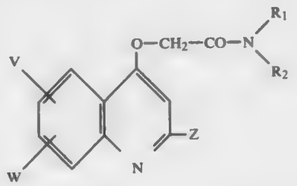
Filed May 28, 1986, Ser. No. 867,474

Claims priority, application France, May 30, 1985, 85 08111

Int. Cl.[4] A61K *31/47;* **C07D** *215/22*

U.S. Cl. 514—222 **9 Claims**

1. A racemic or steroisomeric compound of formula



in which

V and W, which may be identical or different, denote hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, amino, or acylamino of 1 to 4 carbon atoms,

Z denotes phenyl, thienyl, pyridyl, or phenyl substituted by one or two substituents selected from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, nitro, and amino, but not including more than one nitro,

R_1 denotes a linear or branched alkyl of 1 to 6 carbon atoms, alkoxyalkyl in which the alkyl and alkoxy portions each have 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylalkyl in which the alkyl portion has 1 to 4 carbon atoms, or cycloalkylalkyl in which the alkyl has 1 to 3 carbon atoms and the cycloalkyl portion has 3 to 6 carbon atoms,

R_2 denotes a linear or branched alkyl of 1 to 6 carbon atoms, alkoxyalkyl in which the alkoxy and alkyl have 1 to 4 carbon atoms each, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylalkyl in which the alkyl portion has 1 to 4 carbon atoms, or cycloalkylalkyl in which the alkyl has 1 to 3 carbon atoms and the cycloalkyl has 3 to 6 carbon atoms, or a 4-morpholine ring, and R_1 and R_2 can also form, together with the nitrogen atom to which they are attached: pyrrolidino; piperidino unsubstituted or substituted by hydroxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or alkyloxycarbonyl in which the alkyl portion has 1 to 4 carbon atoms; morpholino unsubstituted or substituted by one or two alkyls of 1 to 4 carbon atoms; thiomorpholino; piperazino unsubstituted or substituted on the nitrogen atom by alkyl of 1 to 4 carbon atoms, alkyloxycarbonyl in which the alkyl portion has 1 to 4 carbon atoms, acyl of 2 to 5 carbon atoms, or formyl; or a piperazinone ring unsubstituted or substituted on the nitrogen atom by alkyl of 1 to 4 carbon atoms, and also,

where it can exist, a salt of such a compound with a pharmaceutically acceptable acid.

9. Method of treating anxiety amenable to therapy with a compound capable of binding cerebral type benzodiazepine receptors which comprises administering to a subject in need of anxiolytic therapy an effective amount of a compound as claimed in claim 1.

4,728,648

HISTAMINE ANTAGONIST TRIADIAZOLE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Andrew D. Gribble, Woolmer Green, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, Great Britain

Filed Feb. 4, 1986, Ser. No. 826,158

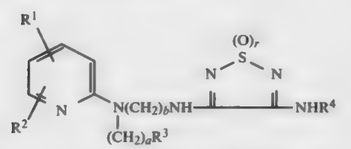
Claims priority, application United Kingdom, Feb. 9, 1985, 8503391; Apr. 2, 1985, 8508606

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/38, 31/425, 31/44, 31/495*

U.S. Cl. 514—252 **22 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where

R^1 and R^2 are the same or different and are hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halogen;

R^3 is optionally substituted phenyl or optionally substituted pyridyl, where the optional substituents are one or more C_{1-6} alkyl, C_{1-6} alkoxy, or hydroxy groups or halogen atoms; or furanyl or thienyl optionally substituted by a C_{1-6} alkyl group;

a is from 1 to 6;

b is from 2 to 4;

R^4 is CH_2R^5 where R^5 is phenyl substituted by sulphonamido or a carboxyl group or an ester thereof, pyridyl substituted with a carboxyl group or an ester thereof and optionally further substituted with a C_{1-6} alkyl group, N-oxo-pyridyl optionally substituted with a C_{1-6} alkyl group, or an imidazolyl, pyridazinyl, pyrimidinyl, pyrazinyl or benzimidazolyl group; and

r is 1 or 2.

21. A pharmaceutical composition for blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

22. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,728,649

3-OXO-PIPERAZIN-1-YL-ERGOLINES EXHIBITING ANTIDOPAMINERGIC ACTIVITY

Sergio Mantegani; Aldemio Temperilli, both of Milan; Gabriella Traquandi, Cornate D'Adda; Alessandro Rossi, and Lorenzo Pegrassi, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

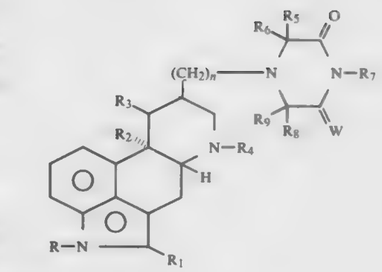
Filed Jan. 8, 1986, Ser. No. 817,135

Claims priority, application United Kingdom, Jan. 16, 1985, 8501078

Int. Cl.[4] A61K *31/445;* **C07D** *457/02*

U.S. Cl. 514—253 **16 Claims**

1. An ergoline compound of the formula I



(I)

wherein

R represents a hydrogen atom or a methyl group;

R_1 represents a hydrogen or halogen atom, a methyl or phenylthio group or an alkylthio group having from 1 to 4 carbon atoms;

R_2 represents a hydrogen atom or a methoxy group and R_3 represents a hydrogen atom, or R_2 and R_3 together represent a chemical bond;

R_4 represents a hydrocarbon group having from 1 to 4 carbon atoms selected from the group consisting of alkyl, cycloalkyl, and ethylenically or acetylenically unsaturated groups;

R_5, R_6, R_8 and R_9 each independently represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, or R_5 and R_8 are as above defined and R_6 and R_9 together represent an ethylene or trimethylene group;

R_7 represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, a phenyl group or a group of the general formula NR'R'' wherein either each of R' and R'' independently represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms or an acyl group selected from the group consisting of C_{1-5} alkanoyl and benzoyl groups, or R' and R'' together with the nitrogen atom to which they are attached represent a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, morpholine, pyrazole, imidazole and pyrrole;

W represents an oxygen atom or two hydrogen atoms; and

n is 0, 1 or 2;

and pharmaceutically acceptable salts of a compound of formula I.

4,728,650

3,4-DIHYDROBENZOPYRAN DERIVATIVES AND MEDICINAL USES THEREOF

Katsushi Eziri, Okayama; Koichi Kanehira, Kurashiki; Manzo Shiono, Kurashiki; Yoshiji Fujita, Kurashiki, and Johji Yamahara, Otsu, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 13, 1986, Ser. No. 862,783

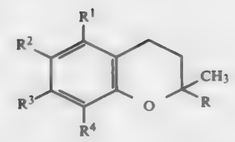
Claims priority, application Japan, May 13, 1985, 60-102421; Jun. 5, 1985, 60-123394; Jun. 17, 1985, 60-132548

Int. Cl.[4] A61K *31/495;* **C07D** *405/08*

U.S. Cl. 514—253 **35 Claims**

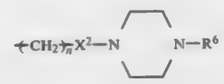
35. A method for treating peptic ulcer, cough or sputum, which comprises administering an effective amount to treat peptic ulcer, cough or sputum, of a 3,4-dihydrobenzopyran derivative of the formula

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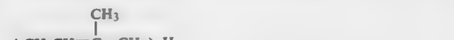
(I)

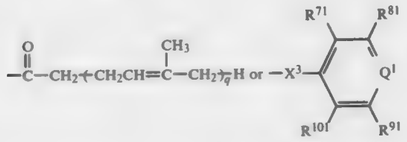
wherein R^1 and R^4 each represent a hydrogen atom or a lower alkyl group; R^2 represents a hydrogen atom, a halogen atom, a lower alkoxyl group or a lower alkenyloxy group; R^3 represents a hydrogen atom, a lower alkyl group or a lower alkoxyl group; R represents a group of the following formula (2)



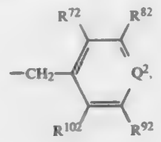
(2)

wherein n represents an integer of 0, 1 or 2; X^2 represents a methylene group or a carbonyl group; when X^2 represents a methylene group, R^6 represents a lower alkyl group or a lower alkyl group substituted by a hydroxyl group,





and when X^2 represents a carbonyl group, R^6 represents



where p and q each represent an integer of 0 to 4; X^3 represents a methylene group or a carbonyl group; Q^1 represents a nitrogen atom (=N—), a carbon atom



where R^{111} represents a hydrogen atom, a lower alkoxyl group, a halogen atom, a di-lower alkylamino group or a nitro group; R^{71}, R^{81}, R^{91} and R^{101} each represent a hydrogen atom or a lower alkoxyl group; Q^2 represents a nitrogen atom (=N—), a carbon atom



where R^{112} represents a hydrogen atom, a lower alkoxyl group, a halogen atom, a di-lower alkylamino group or a nitro group; and R^{72}, R^{82}, R^{92} and R^{102} each represent a hydrogen atom or a lower alkoxyl group; or a pharmacologically acceptable salt thereof.

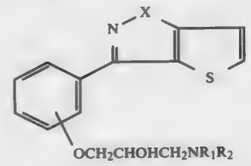
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ANTIHYPERTENSIVE THIENO-ISOXAZOLES AND -PYRAZOLES

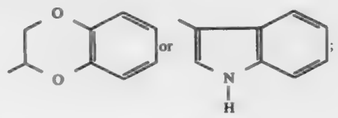
Helen H. Ong, Whippany, and Christine M. Yasenchak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Oct. 24, 1985, Ser. No. 791,019
Int. Cl.[4] A61K *31/495;* **C07D** *413/14, 487/02*
U.S. Cl. 514—253 **90 Claims**

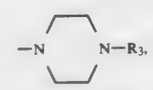
1. A compound of the formula



where X is O or NR,R being hydrogen or loweralkyl; R_1 is hydrogen; and R_2 is loweralkyl, arylloweralkyl, aryloxyloweralkyl or loweralkyl substituted with



or alternatively $-NR_1R_2$ taken together is



R_3 being arylloweralkyl, and the term aryl in each occurrence signifying a phenyl group having O, 1,2 or 3 substituents each of which being independently loweralkyl,loweralkoxy, hydroxy, halogen or CF_3, with the priviso that the aryl group may not have three adjacent tertiary butyl groups or three adjacent iodine atoms as substituents thereon, or an optical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

82. A method of treating a patient in need of relief from high systemic blood pressure, which comprises administering to the patient an effective systemic blood pressure lowering amount of a compound as defined in claim 1.

88. A method of treating a patient in need of relief from high intraocular pressure, which comprises administering to the patient an effective intraocular pressure reducing amount of a compound as defined in claim 1.

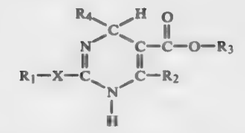
4,728,652

2-SUBSTITUTED THIO OR OXY-4-ARYL OR HETEROCYCLO-5-CARBOXY-1,4-DIHYDROPYRIMIDINES, COMPOSITION CONTAINING THEM, AND METHOD OF USING THEM TO REDUCE BLOOD PRESSURE

Karnail Atwal, Cranbury, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 736,151, May 20, 1985, abandoned. This application Apr. 21, 1986, Ser. No. 854,201
Int. Cl.[4] A61K *31/505, 31/55;* **C07D** *239/22, 417/14*
U.S. Cl. 514—274 **23 Claims**

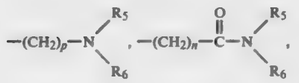
1. A compound of the formula



its 3,4-dihydropyrimidine tautomer form, or a pharmaceutically acceptable salt thereof wherein:

X is oxygen or sulfur;

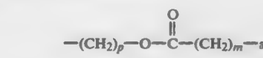
R_1 is lower alkyl, lower alkenyl, lower alkynyl, $-(CH_2)_m$-cycloalkyl, $-(CH_2)_m$-aryl, $-(CH_2)_p$—OH, $-(CH_2)_p$—O—lower alkyl, $-(CH_2)_p$—O—$(CH_2)_m$-aryl, $-(CH_2)_p$—SH, $-(CH_2)_p$—S—lower alkyl, $-(CH_2)_p$—S—$(CH_2)_m$-aryl,



or halo substituted lower alkyl;

R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, $-(CH_2)_m$—cycloalkyl, $-(CH_2)_m$—aryl, $-(CH_2)_n$—OH, $-(CH_2)_n$—O—lower alkyl, $-(CH_2)_n$—O—$(CH_2)_m$—aryl, $-(CH_2)_n$—SH, $-(CH_2)_n$—S—lower alkyl, $-(CH_2)_n$—S—$(CH_2)_m$—aryl,

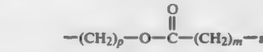




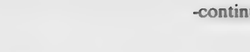
or halo substituted lower alkyl;

R_3 is hydrogen, lower alkyl, $-(CH_2)_m$—aryl, $-(CH_2)_m$—cycloalkyl, $-(CH_2)_p$—OH, $-(CH_2)_p$—O—lower alkyl, $-(CH_2)_p$—O—$(CH_2)_m$—aryl, $-(CH_2)_p$—SH, $-(CH_2)_p$—S—lower alkyl, $-(CH_2)_p$—S—$(CH_2)_m$—aryl,





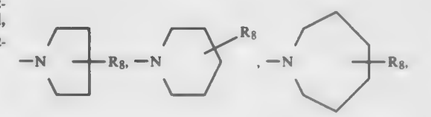
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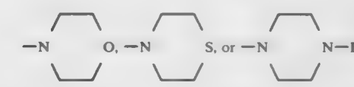


halo substituted lower alkyl, or a pharmaceutically acceptable salt forming ion;

R_4 is aryl;

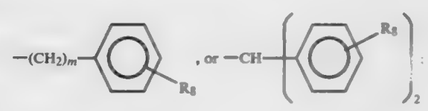
R_5 and R_6 are independently selected from the group consisting of hydrogen, lower alkyl, and $-(CH_2)_m$—aryl or R_5 and R_6 taken together with the N atom to which they are attached complete a heterocyclic ring of the formula





R_8 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, CF_3, or hydroxy;

R_9 is hydrogen, lower alkyl of 1 to 4 carbons,



R_7 is hydrogen, lower alkyl, $-(CH_2)_m$—aryl, or a pharmaceutically acceptable salt forming ion;

m is zero or an integer from 1 to 6;

n is an integer from 1 to 6;

p is an integer from 2 to 6;

the term "lower alkyl" refers to straight or branched chain saturated hydrocarbon radicals of one to eight carbons;

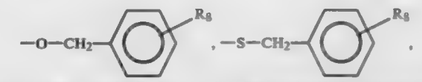
the term "lower alkenyl" refers to straight or branched chain hydrocarbon radicals of two to eight carbons saturated except for one double bond;

the term "lower alkynyl" refers to straight or branched chain hydrocarbon radicals of two to eight carbons saturated except for one triple bond;

the term "cycloalkyl" refers to saturated carbocyclic rings of 4 to 7 carbons;

the term "halo" refers to chloro, bromo, and fluoro; and

the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl, mono substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, nitro, cyano, hydroxy, amino, —NH—alkyl wherein alkyl is of 1 to 4 carbons, $-N(alkyl)_2$ wherein alkyl is of 1 to 4 carbons, CF_3, NCS, $OCHF_2$,

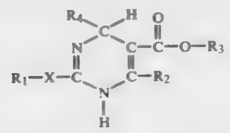


—O—CH_2—cycloalkyl, or —S—CH_2cycloalkyl, and di-substituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituents are selected from the group consisting of methyl, methoxy, methylthio, halo, CF_3, nitro, amino, and $OCHF_2$.

22. A composition useful in reducing blood pressure in a mammal comprising a pharmaceutically acceptable carrier and

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an anti-hypertensively effective amount of a compound or pharmaceutically acceptable salt thereof of the formula



wherein X, R_1, R_2, R_3, and R_4 are as defined in claim 1.

23. The method of reducing blood pressure in a mammal comprising to a hypertensive mammal an effective amount of the composition of claim 22.

4,728,653

6-HETEROARYL QUINOLONE INOTROPIC AGENTS

Simon F. Campbell, Deal, and David A. Roberts, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

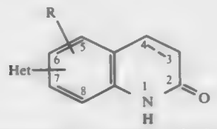
Continuation-in-part of Ser. No. 737,363, May 23, 1985, abandoned. This application Mar. 26, 1986, Ser. No. 844,448

Claims priority, application United Kingdom, May 29, 1984, 8413685; Oct. 26, 1984, 8427167

Int. Cl.[4] A61K *31/47;* **C07D** *401/04*

U.S. Cl. 514—312 **19 Claims**

1. A quinolone compound of the formula:



(I)

or a pharmaceutically acceptable salt thereof, wherein (a) "Het" is attached to the 6-position of the quinolone ring and is an imidazolyl, pyrazolyl, triazolyl or tetrazolyl group attached by a nitrogen atom of said group to the 6-position of the quinolone ring, said groups being optionally substituted on the available ring carbon atoms with up to three substituents each independently selected from C_1–C_4 alkyl, trifluoromethyl, halo, cyano, nitro or amino; and (b) R is attached to the 8-position of the quinolone ring and is hydrogen, C_1–C_4 alkyl, trifluoromethyl or halo; and the dashed line between the 3- and 4-positions represents an optional bond.

4,728,654

QUINOLONE INOTROPIC AGENTS

Simon F. Campbell, Deal, and David A. Roberts, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

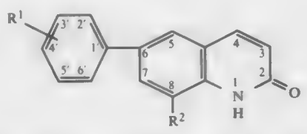
Filed Jan. 27, 1986, Ser. No. 822,575

Claims priority, application United Kingdom, Jan. 30, 1985, 8502267

Int. Cl.[4] A61K *31/47;* **C07D** *215/06, 401/10, 401/12*

U.S. Cl. 514—312 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R^1 is $—NH_2$, $—NHSO_2(C_1$–C_4alkyl), $—S(O)_m(C_1$–C_4alkyl) where m is zero, one or two, $—SO_2NH_2$, $—SO_2NH(C_1$–C_4alkyl), $—SO_2N(C_1$–C_4alkyl)$_2$, —OCONH(C_1–C_4alkyl), —OH, $—O(C_1$–C_4alkyl), $—OCH_2CH_2N(C_1$–C_2alkyl)$_2$, $—OCH_2$-(pyridyl), —COOH, $—COO(C_1$–C_4alkyl), $—CONH_2$, $—CON(C_1$–C_4alkyl)$_2$, $—CON(C_1$–C_4alkyl)$CH_2CH_2N(C_1$–C_2alkyl)$_2$ or imidazol-1-yl, said R^1 being attached to the 2'- or 4'-positions of the benzene ring; and R^2 is hydrogen or methyl.

4,728,655

SULFONAMIDINES, PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Rafael Foguet; Luis Anglada; Josep Castello; Aurelio Sacristan, and Jose Ortiz, all of Barcelona, Spain, assignors to Ferrer Internacional S.A., Barcelona, Spain

Filed Apr. 18, 1985, Ser. No. 724,784

Claims priority, application Spain, Apr. 18, 1984, 531764; Apr. 19, 1984, 532242; Jun. 18, 1984, 533948; Jun. 18, 1984, 533949; Jan. 24, 1985, 540190; Jan. 24, 1985, 540192; Mar. 12, 1985, 541189; Mar. 12, 1985, 541190

Int. Cl.[4] C07D *417/12;* **A61K** *31/445*

U.S. Cl. 514—326 **18 Claims**

1. A compound of the formula (I):

$$R—NH—CH=N—SO_2—R_1 \quad (I)$$

wherein R is a group selected from 2-[[(5-methyl-1H-imidazole-4-yl)methyl]thio]ethyl, 2-[[[5-[(dimethylamino)methyl]-2-furanyl]methyl]thio]ethyl, 2-[[[2-[(aminoiminomethyl-)amino]-4-thiazolyl]methyl]thio]ethyl or 3-[3-(1-piperidinylmethyl)phenoxy propyl and R_1 is lower alkyl having 4 carbon atoms at most, phenyl optionally substituted by lower alkyl having 4 carbon atoms at most, halogen, nitro, lower alkoxy having 4 carbon atoms at most, lower alkanoylamino having 4 carbon atoms at most, carboxylic acid, lowr alkoxycarbonyl the alkoxy group of which having 4 carbon atoms at most, lower dialkylamino the alkyl groups of which having 4 carbon atoms each at most, lower alkylsulphonyl the alkyl group of which having 4 carbon atoms at most, lower alkylsulphonylamino the alkyl group of which having 4 carbon atoms at most, lower alkylthio the alkyl group of which having 4 carbon atoms at most or 1,3,4-thiadiazole-2-yl, with or without being substituted by lower alkanoylamino having 4 carbon atoms at most and the pharmaceutically acceptable salts thereof.

18. A pharmaceutical composition useful for the inhibition of gastric acid secretion which comprises an H_2-receptor blocking-effective amount of a compound according to claim 1, in admixture with a pharmaceutically acceptable excipient.

4,728,656

2,2-ALKYLDIYLBIS(THIO)BIS(IMIDAZOLES) USEFUL FOR INHIBITION OF THE 5-LIPOXYGENASE PATHWAY

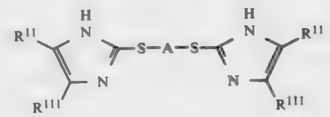
Paul E. Bender, Cherry Hill, N.J., and David T. Hill, North Wales, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 808,396, Dec. 12, 1985, abandoned. This application Apr. 28, 1986, Ser. No. 856,735

Int. Cl.[4] C07D *401/14;* **A61K** *31/415*

U.S. Cl. 514—333 **16 Claims**

1. A compound of the formula



wherein:

A is CH_2CH_2 or $CH_2C(O)CH_2$; and

R^{11} and R^{111} are pyridyl or one is pyridyl and the other is monosubstituted phenyl wherein said substituent is selected from halo;

or a pharmaceutically acceptable salt thereof.

4,728,657

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES

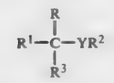
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,572

Int. Cl.[4] C07D *409/14;* **A61K** *31/345*

U.S. Cl. 514—340 **4 Claims**

1. A compound corresponding to the formula



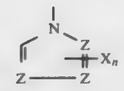
wherein

R represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents thienyl or thienyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,728,658

PYRIDINE DERIVATIVES

Roger Crossley, Reading, and Ian A. Cliffe, Burnham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

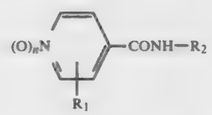
Filed Sep. 3, 1985, Ser. No. 771,949

Claims priority, application United Kingdom, Sep. 5, 1984, 8422461

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—354 **8 Claims**

1. A method of treatment of a subject in need of an anti-ulcer agent or an anti-secretory agent, which comprises administering an effective amount of a compound selected from those having the general formula I



(I)

and their pharmaceutically acceptable salts, wherein R_1 is selected from hydrogen and lower alkyl; R_2 is selected from (a) 2-aminophenyl; (b) 2-aminophenyl substituted at one to three other carbon atoms of the phenyl group by a substituent independently selected from "the class" consisting of halogen, trifluoromethyl, nitro, cyano, and groups having the formulae $—O—Z—OR_3$, $—SO—R_3$, $—SO_2—R_3$, $—O—Z—R_3$, $—CO—R_4$, $—CR_5{=}NR_6$, $—NR_7—Z—R_3$ and $—Z—R_8$ (where Z is —CO— or $—SO_2—$; R_3 is lower alkyl; R_4 is selected from lower alkyl and aryl; R_5 is selected from hydrogen, lower alkyl and aryl; R_6 is selected from hydroxy and lower alkoxy; R_7 is selected from hydrogen and $—Z—R_3$ where Z and R_3 are as defined above; and R_8 is the same as R_6 as defined above or $—NR_9R_{10}$ where R_9 and R_{10} are independently selected from hydrogen and lower alkyl; (c) phenyl substituted by one to three substituents independently selected from "the class" defined above subject to the proviso that one such substituent is present at a position selected from the 3- and 4-positions of the phenyl group; and (d) 2-[[(1-oxido-4-pyridinyl)carbonyl]amino]phenyl substituted at the phenyl group by one to two substituents independently selected from "the class" defined above subject to the proviso that one such substituent is at the 4-position of the phenyl group; and n is selected from 1 and 0 subject to the proviso that where n is 0 then R_2 is selected from meanings (a) and (b).

4,728,659

AMINOMETHYL DERIVATIVES AND PREPARATION PROCESS THEREOF AS WELL AS PLATELET AGGREGATION INHIBITORS CONTAINING SAME

Susumu Sato, Chiba; Tadayuki Kouda, Narita, and Tatsuhiko Katori, Ibaragi, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

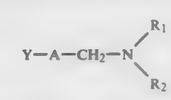
Filed Jun. 25, 1985, Ser. No. 748,686

Claims priority, application Japan, Jun. 27, 1984, 59-132707; Jun. 27, 1984, 59-132708; Sep. 25, 1984, 59-200190

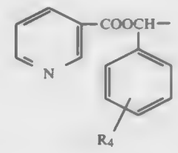
Int. Cl.[4] C07D *213/80;* **A61K** *31/455*

U.S. Cl. 514—356 **4 Claims**

1. An aminomethyl derivative of the formula:

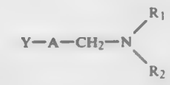


wherein A is selected from the group consisting of —C≡C— and —CH=CH—, Y is the group



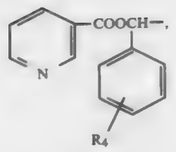
wherein R_4 is a hydrogen atom, a halogen atom, a lower alkyl or alkoxy group, and R_1 and R_2 are, individually, a lower alkyl group.

2. A platelet aggregation inhibitor comprising an effective amount of an aminomethyl derivative of the formula:



wherein A is selected from the group consisting of —C≡C— and —CH=CH—, Y is the group

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wherein R_4 is a hydrogen atom, a halogen atom, a lower alkyl or alkoxy group, and R_1 and R_2 are, individually, a lower alkyl group; and

a pharmaceutically acceptable carrier or excipient.

4,728,660

METHOD OF TREATING DISEASES ARISING FROM PLATELET HYPERACTIVATION

Duncan H. Haynes; Wenche Jy; Yeon S. Ahn, and William J. Harrington, all of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Jun. 11, 1984, Ser. No. 619,212

Int. Cl.[4] A61K *31/455;* **G01N** *33/49;* **C12Q** *1/56*

U.S. Cl. 514—356 **6 Claims**

1. A method of treating venous thrombosis comprising administering to a person having same an amount of nifedipine effective to relieve the symptoms of venous thrombosis and to restore substantially normal circulation in the involved blood vessel or vessels.

6. A method of treating a patient believed to have a thromboembolic disease who has increased Ca^{2+} levels in the patient's blood platelets, comprising the steps of:

(1) determining if the internal Ca^{2+} levels in the patient's blood platelets are elevated by contacting a sample of the patient's platelets with chlorotetracycline, a detectable fluorescent probe, measuring the resulting fluorescence, comparing the value measured with the predetermined fluoresence assessed in a normal platelet, and, when the measured fluoresence is less than the predetermined fluoresence; and then

(2) administering to the patient an amount of nifedipine effective to reduce the internal Ca^{2+} levels in the platelets and thereby restore the platelet aggregation characteristics.

4,728,661

CARDIOTONIC PHENYL OXAZOLONES

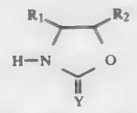
Richard A. Schnettler; Winton D. Jones, Jr., and George P. Claxton, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Nov. 13, 1985, Ser. No. 797,578

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—376 **14 Claims**

1. A method of treating heart failure in a patient in need thereof which comprises administering to the patient a cardiotonically effective amount of a phenyl oxazolone of the formula



wherein Y is an oxygen or sulfur group; and

R_1 is a hydrogen, or a (C_1–C_5)alkyl group, R_2 is a phenyl group optionally substituted with one or two members of the group consisting of (C_1–C_5)alkyl, (C_1–C_5)alkoxy, (C_1–C_5)alkylthio, (C_1–C_5)alkylsulfinyl, (C_1–C_5)alkylsulfonyl, hydroxy, halogen, cyano, carboxy, carb(C_1–C_5)alkoxy, carbamido, (C_1–C_5)alkanoylamino, imidazolyl, trifluoromethyl or with a methylenedioxy group.

4,728,662

1,2-BENZISOXAZOLOXYACETIC ACIDS AND RELATED COMPOUNDS

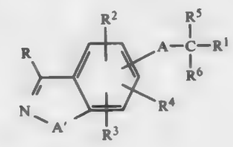
Gregory M. Shutske, Nauheim, Fed. Rep. of Germany; Linda L. Setescak, Somerville, and Richard C. Allen, Flemington, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 201,083, Oct. 27, 1980, Pat. No. 4,673,746, which is a continuation-in-part of Ser. No. 949,128, Oct. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 853,313, Nov. 21, 1977, abandoned. This application Feb. 9, 1987, Ser. No. 16,293

Int. Cl.[4] A61K *31/42, 31/44, 31/425*

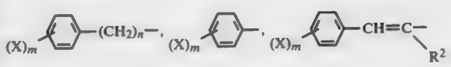
U.S. Cl. 514—379 **33 Claims**

1. A method of producing diuresis comprising administering to a patient in need of diuresis a diuretically effective amount of a compound of the formula

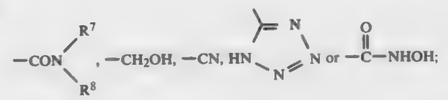


in which

R is naphthyl,



thienyl, furyl, pyrryl, pyridyl or pyridyl N-oxide; R^1 is a free or esterified carboxyl group of from 1 to 8 atoms,



R^2, R^3 and R^4 are the same or different and each can be hydrogen, halogen, or loweralkyl; X is hydrogen, halogen, loweralkyl, loweralkoxy, loweralkylthio, hydroxy, trifluoromethyl, nitro, amino or acylamino;

R^5, R^6, R^7 and R^8 are the same or different and can be hydrogen or loweralkyl;

A and A′ are the same or different and can be O or S; and

m and n are the same or different and each can be the integer 1, 2 or 3; or a physiologically acceptable salt thereof.

4,728,663

N-[(1H-IMIDAZOL-1-YL)ALKYL]BENZ[CD]-INDOL-2-AMINES AND USE IN INHIBITING THROMBOXANE SYNTHETASE ENZYME

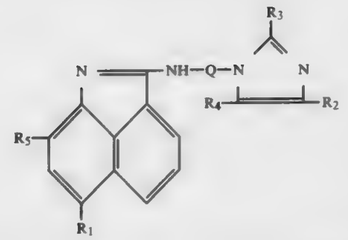
Andrew S. Tomcufcik, Bergen, N.J.; Walter E. Meyer; Peter S. Chan, Suffern, both of N.Y., and David L. Crandall, Highland Mills, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 13, 1986, Ser. No. 818,315

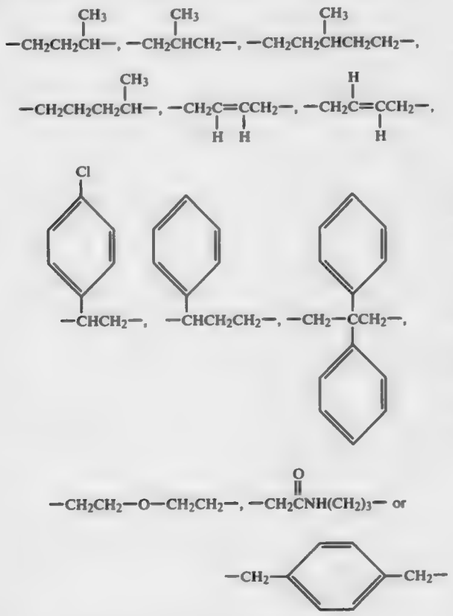
Int. Cl.[4] C07D *403/12;* **A61K** *31/415*

U.S. Cl. 514—394 **23 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, bromo, chloro or dimethylaminosulfonamide; R_2 is hydrogen or alkyl(C_1–C_3); R_3 is hydrogen, alkyl(C_1–C_3) or phenyl; R_4 is hydrogen or when taken together with R_2 is —CH=CH—CH=CH—; R_5 is hydrogen or chloro; and Q is $-(CH_2)_n-$, where n is an integer 2–12,



and the pharmacologically acceptable salts thereof.

20. A method of inhibiting arrhythmia in a mammal which comprises administering internally to said mammal an arrhythmia inhibiting amount of a compound of claim 1.

4,728,664

UNIQUELY NON-MUTAGENIC SUBSTITUTED NITROIMIDAZOLE

Edward S. Bagan, Nutley, and Gerald T. Miwa, Maplewood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 28, 1985, Ser. No. 770,129

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—401 **2 Claims**

1. A method for the non-mutagenic treatment of the protozoal and bacterial diseases trichomoniasis, amoebiasis, trypanosomiasis, enterohepatitis, and schistosome and pleuro-pneumonia like organism infections in animals requiring treatment for such diseases which comprises orally or topically administering from 25 to 1000 mg per day of 1-methyl-2-methylsulfonyl-4-nitroimidazole.

4,728,665

BENZOYLAMINOMETHYLPYRAZOLES AND FURANS, COMPOSITION CONTAINING THEM, AND FUNGICIDAL METHOD OF USING THEM

Margaret C. Shephard, and Patrick J. Crowley, both of Berkshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 23, 1985, Ser. No. 768,837

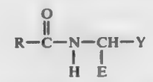
Claims priority, application United Kingdom, Sep. 7, 1984, 8422592

Int. Cl.[4] A01N *43/56, 43/08;* **C07D** *307/54, 231/12*

U.S. Cl. 514—406 **5 Claims**

1. An amide derivative of the general formula (I):

Formula I



or a tautomeric form thereof, wherein

R is a phenyl group substituted in the 4-position by a group of the formula R^1XCH_2—, where R^1 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 alkylcarbonyl, or H, and X is oxygen or sulphur;

E is CN, or $CSNH_2$ or $CONH_2$; and

Y is 1-pyrazolyl or 2-furyl.

5. A method for combating fungi, which comprises applying to the plants, or the locus thereof, a fungicidally effective amount of a compound of the formula (I) as defined in claim 1.

4,728,666

HETEROAROMATIC ACETYLENES USEFUL AS ANTIHYPERTENSIVE AGENTS

John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

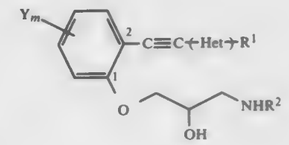
Division of Ser. No. 807,551, Dec. 11, 1985, Pat. No. 4,663,334. This application Nov. 24, 1986, Ser. No. 934,371

Int. Cl.[4] A61K *31/34, 31/38;* **C07D** *333/06, 307/36*

U.S. Cl. 514—438 **19 Claims**

1. A heteroaromatic acetylene of the following formula (I):

(I)



wherein

Y is alkyl of about 1 to 6 carbons, alkoxy of about 1 to 6 carbons, alkoxyalkyl of about 2 to 8 carbons, chloro, fluoro, bromo or carboxamidoalkyl of about 2 to 7 carbons;

m is 0, 1 or 2;

R^1 is hydrogen, alkyl of about 1 to 6 carbons, alkoxy of about 1 to 6 carbons, alkylthio of about 1 to 6 carbons, alkoxycarbonyl of about 2 to 7 carbons, chloro, fluoro or dialkylamino of about 2 to 8 carbons;

R^2 is branched chain alkyl of about 3 to 7 carbons with the carbon alpha to the nitrogen atom being branched; and

Het is thienyl or furanyl; and

the pharmaceutically acceptable acid addition salts thereof.

17. An antihypertensive pharmaceutical composition comprising an antihypertensive amount of an acetylene of claim 1 and a pharmaceutically acceptable diluent or carrier.

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4,728,667

HAIR TREATMENT COMPOSITION FOR PREVENTION OF DANDRUFF IN HAIR

Mitsuo Yanagi, Machida; Masataka Ogawa, Yokohama; Ubei Tamura, Fujisawa, and Tetsuo Sakamoto, Tama, all of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Continuation of Ser. No. 684,569, Dec. 21, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 858,471

Int. Cl.[4] A61K *31/355, 31/17*

U.S. Cl. 514—458 **2 Claims**

1. An aqueous anti-dandruff composition consisting essentially of 0.15% to 0.5% by weight of 3,4,4'-trichlorocarbanilide and 0.04% to 0.3% by weight of vitamin E acetate in an aqueous medium, the weight ratio of 3,4,4'-trichlorocarbanilide to the vitamin E acetate being 12.5:1 to 0.5:1.

4,728,668

ARYL AND HETEROARYL ETHERS AS AGENTS FOR THE TREATMENT OF HYPERSENSITIVE AILMENTS

Utpal R. Chakraborty, Orangeburg, and Raymond D. Youssefyeh, Tarrytown, both of N.Y., assignors to USV Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 723,781, Apr. 16, 1985, Pat. No. 4,631,287. This application Jun. 23, 1986, Ser. No. 877,570

Int. Cl.[4] A61K *31/36*

U.S. Cl. 514—464 **6 Claims**

1. A method for the treatment of hypersensitive, inflammatory or allergic conditions in a mammal, comprising the administration to said mammal of a therapeutically effective amount of a compound having the following formula:

$$(R_1)(R_2)Ar—Z—M—Ar_1(R_3)(R_4)$$

and salts thereof;
wherein
Ar and Ar_1 are independently an unsaturated oxygen heterocylic ring;
Z is an alkylene chain containing from 1 to 5 carbon atoms in the principal chain and up to a total of 10 carbon atoms;
M is oxygen, sulfur or NR_5,
R_1, R_2, R_3 and R_4 are each independently H, lower alkyl, lower alkoxy, hydroxy, halo, trihalomethyl, hydroxy lower alkyl, carboxy, formyl, aryl, aryloxy, benzyloxy, carboxy lower alkoxy, nitro, amino lower alkylamino, dilower alkylamino, cyano, lower alkanoyloxy, carbamoyl, or lower-alkoxyalkoxy; and
R_5 is hydrogen or lower alkyl
in a pharmaceutically acceptable carrier.

4,728,669

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO)-GAMMA-BUTYROLACTONES AND GAMMA-BUTYROTHIOLACTONES

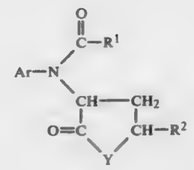
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 847,502, Nov. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 837,121, Sep. 29, 1977, Pat. No. 4,141,989, which is a continuation-in-part of Ser. No. 731,491, Oct. 12, 1976, Pat. No. 4,107,323, which is a continuation-in-part of Ser. No. 631,351, Nov. 12, 1975, Pat. No. 4,012,519, which is a continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Feb. 22, 1979, Ser. No. 13,856

Int. Cl.[4] A01N *43/08;* **C07D** *307/30*

U.S. Cl. 514—472 **10 Claims**

1. A compound of the formula



(I)

wherein Ar is phenyl, naphthyl, or phenyl or naphthyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; R^1 is hydroxymethyl, halomethyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo, cycloalkyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms substituted with 1 to 4 of the same or different substituents selected from alkyl of 1 to 4 carbon atoms, fluoro, chloro, bromo, hydroxy or alkoxy of 1 to 4 carbon atoms; and R^2 is hydrogen, chloro, bromo, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and alkyl of 1 to 6 carbon atoms; and Y is O, with the proviso that when Ar is phenyl or substituted phenyl R^1 is not halomethyl, and with the further proviso that R^1 is not cyclopropyl.

9. A method for controlling the growth of *Phytophthora infestans* fungi which comprises appling to said fungi or their habitats a fungicidally effective amount of a compound of the formula defined in claim 1.

4,728,670

BIPHENYL HYDROXAMIC ACIDS

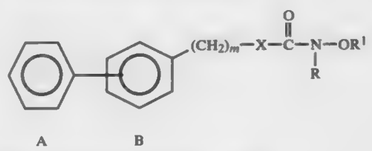
Martin F. Haslanger, Ridgewood; Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 4, 1986, Ser. No. 870,565

Int. Cl.[4] C07C *83/10;* **A61K** *31/265*

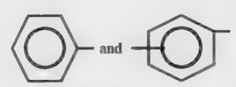
U.S. Cl. 514—484 **13 Claims**

1. A compound having the structure



A B

including all stereoisomers therof, wherein m is 1 to 7; X is S, O or NH; R is H, lower alkyl, aryl, aralkyl; R^1 is H, lower alkyl, aryl, aralkyl, cycloalkyl, alkanoyl or aroyl; and wherein the



groups and aryl by itself or as part of another group is unsubstituted or substituted with 1 or 2 lower alkyl groups, 1 or 2 halogen groups, 1 or 2 lower alkoxy groups, hydroxyamino, alkylamino, dialkylamino or carboxy; and (CH_2)m is unsubstituted or includess 1 or 2 lower alkyl substituents;
lower alkyl or alkyl as employed herein by itself or as part of another group includes both straight and branched chain radicals of up to 12 carbons, and is unsubstituted or substituted with a halo-substituent, CF_3, an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent or an alkylcycloalkyl substituent;
cycloalkyl by itself or as part of another group includes saturated cyclic hydrocarbon groups containing 3 to 8 carbons, and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups;
aralykyl refers to a lower alkyl group having an aryl substituent;
alkanoyl refers to a lower alkyl group linked to a carbonyl group and aroyl refers to an aryl group linked to a carbonyl group.

4,728,671

PROCESS FOR PRODUCING ALCOHOLS

Herve Hinnekens, Sint-Denijs-Westrem, Belgium, assignor to Oleofina, S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 630,038, Jul. 12, 1984, abandoned. This application Apr. 25, 1985, Ser. No. 727,043

Claims priority, application Luxembourg, Jul. 14, 1983, 84912

Int. Cl.[4] C07D *307/44;* **C07C** *29/136, 29/14*

U.S. Cl. 549—503 **23 Claims**

1. A process for producing alcohols comprising hydrogenating compounds selected from the group consisting of acids, esters and aldehydes under sufficient hydrogen pressure and temperature in the presence of a catalyst comprising a copper/-chromite first component prepared in a reducing medium and a second component consisting essentially of copper salt deposited by atomization on a support having surface hydroxyl groups.

4,728,672

PROCESS FOR PRODUCING HYDROCARBONS

Tomohiro Yoshinari; Fujio Suganuma, both of Saitama, and Chikara Sera, Tokyo, all of Japan, assignors to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Continuation of Ser. No. 784,084, Oct. 4, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 940,378

Claims priority, application Japan, Oct. 8, 1984, 59-211137; Jun. 28, 1985, 60-141826

Int. Cl.[4] C07C *27/00, 27/06*

U.S. Cl. 518—717 **17 Claims**

1. A process for producing hydrocarbons which comprises bringing a gas mixture comprising hydrogen and carbon monoxide into contact with a catalyst comprising at least 5% by weight based on the total catalyst a carbon monoxide reduction catalyst at reaction conditions comprising a pressure of from 0 to 100 kg/cm^2G and a temperature of from 100° to 500° C. to produce hydrocarbons, wherein said carbon monoxide reduction catalyst comprises 10 to 99.8 wt % manganese oxide, 0.01 to 8 wt % alkali metal, 0.001 to 3 wt % sulfur, and 0.1 to 50 wt % ruthenium based on the total weight of the carbon monoxide reduction catalyst.

4,728,673

PROCESS FOR THE FOAMING OF THERMOPLASTICS CONTAINING ESTER AND/OR CARBONATE GROUPS

Heinz Hammer, Cologne, and Klaus Kircher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

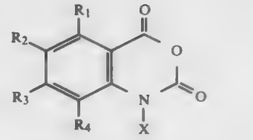
Filed Jan. 20, 1987, Ser. No. 5,536

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602014

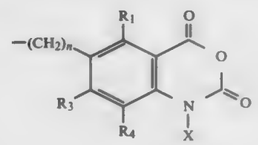
Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—85 **11 Claims**

1. A process for the preparation of a foamed moulding comprising using a composition including
(i) a thermoplastic which is characterized in that its polymer chain contains at least one member selected from the group consisting of an ester group and a carbonate group
(ii) a compound of the formula



in which
R_1–R_4 independently denotes hydrogen, a straight-chain or branched alkyl radical having 1 to 4 carbon atoms, a hydroxyl or nitro group or a halogen atom, and
R_2 may additionally denote a radical of the following formula



wherein
n is an integer of from 0 to 4 and
R_1, R_3 and R_4 have the above-mentioned meaning and
X denotes hydrogen or straight-chain or branched C_1–C_4 alkyl radical and
(iii) a neutral salt of the formula

$$A_pEF_q$$

wherein
A denotes an element of the first main group of the Periodic system,
E denotes an element of the third, fourth or fifth main group or subgroup of the Periodic system,
F represents a fluorine atom,
p is 1, 2 or 3 and
q is 4, 5 or 6 depending on the valence of said E.

4,728,674

MODIFIED POLYPHENYLENE ETHER RESINS HAVING IMPROVED FOAMABILITY AND METHODS OF MAKING THE SAME

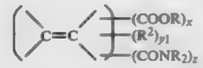
Ronald J. Wroczynski, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 926,429, Nov. 3, 1986, Pat. No. 4,684,669. This application Jun. 16, 1987, Ser. No. 62,907

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—90 **15 Claims**

1. A composition comprising the reaction product of:
(a) a polyphenylene ether resin; and
(b) an effective amount of a functionalizing modifier for (a) comprising:
(i) a compound of the formula:

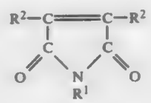


wherein R is selected from alkyl, aryl, alkaryl, haloalkyl, haloaryl or haloalkaryl; R^1 is selected independently from hydrogen, alkyl, aryl or alkaryl; R^2 is the same as defined for R and, in addition, hydrogen or halogen, the total number of carbon atoms in R, R^1, R^2 being up to about 50; x, y and z each being 0 or an

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integer selected from 1, 2, 3 or 4; x÷y÷z being equal to 4 and x+z being at least 2;

(ii) a compound of the formula:



wherein R^1 and R^2 are as above defined; or

(iii) a mixture of (i) and (ii); and

(c) an effective foam generating amount of a foaming agent.

4,728,675

MODIFIED FLAME RETARDANT POLYPHENYLENE ETHER RESINS HAVING IMPROVED FOAMABILITY AND MOLDED ARTICLES MADE THEREFROM

Eric Pressman, East Greenbush, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 900,705, Aug. 27, 1986, Pat. No. 4,695,594. This application Jun. 16, 1987, Ser. No. 62,891

Int. Cl.[4] C08J *9/08*

U.S. Cl. 521—92 **10 Claims**

1. A composition adapted to the production of a flame retardant thermoplastic foam without surface streaking and odor generation, said composition comprising:

(a) a polyphenylene ether, alone, or in combination with a styrene resin;

(b) an effective flame retarding amount of a halogenated flame retardant, alone, or in combination with an antimony compound; and

(c) an effective foam generating amount of a foaming agent comprising-citric acid and sodium bicarbonate.

4,728,676

THERMOSETTING REACTIVE RESIN MIXTURES AND A PROCESS FOR THE PRODUCTION OF MOLDINGS USING THESE MIXTURES

Hanns P. Müller, Odenthal; Dimitrios Kerimis, Cologne; Heinrich Heine, and Walter Uerdingen, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 7, 1987, Ser. No. 1,118

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600764

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—107 **9 Claims**

1. A thermosetting reactive resin mixture comprising:

(a) at least one organic polyisocyanate

(b) at least one organic compound having at least two epoxide groups and

(c) at least one heat activatable catalyst which is a tertiary or quaternary ammonium salt of an alkylating or acidic ester of organic phosphonic acid or phosphoric acid in quantities such that the equivalent ratio of isocyanate groups to epoxide groups is from 1.2:1 to 70:1.

4,728,677

WEATHERABLE VINYL POLYMER COMPOSITIONS

Emilia E. Lacatus, North Olmsted; Elvira B. Rabinovitch, South Euclid, and James W. Summers, Bay Village, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 30, 1986, Ser. No. 868,857

Int. Cl.[4] C08K *5/58*

U.S. Cl. 523—135 **14 Claims**

1. A vinyl halide polymer composition substantially free of TiO_2 comprising:

(a) 100 parts by weight of vinyl halide polymer;

(b) from about 1.0 to about 5.0 parts by weight of tin carboxylate stabilizer having the formula



where R is an alkyl, X is an integer of 1 or 2, R′ is selected from the group consisting of an alkyl having from about 8 to about 30 carbon atoms and an aryl;

(c) a coloring amount of brown infrared reflecting pigment;

(d) a sulfur containing tin stabilizer in an amount less than about 1.0 part by weight;

(e) less than 0.5 part by weight of calcium stearate; wherein said composition has a ΔE color change upon QUV accelerated weathering tester for 350 hours of less than about 4.0, a ΔE less than about 8.0 after 700 hours exposure and a ΔE less than about 12.0 after 1050 hours exposure; and wherein said composition has a dynamic heat stability greater than about 10.0 minutes.

4,728,678

PROCESS FOR GRAFTING UNSATURATED ORGANIC COMPOUNDS TO GLASS PRODUCTS

Roger Chatelin, Lozanne, and Louis Gavet, Lyons, both of France, assignors to Saint-Gobain Recherche, Aubervilliers, France

Filed Nov. 28, 1986, Ser. No. 936,292

Claims priority, application France, Nov. 28, 1985, 85 17578

Int. Cl.[4] C08F *283/2;* **B32B** *17/04*

U.S. Cl. 523—203 **20 Claims**

1. A process for forming a coated glass substrate comprising:

applying to a surface portion of said substrate a solution comprising a silane having a double ethylene bond to form a substrate coated with said silane solution;

contacting said coated substrate with an atmosphere comprising a mixture of oxygen and ozone so as to convert said silane coating to an ozonide; and

contacting said ozonide coated substrate with an unsaturated monomer so as to graft said unsaturated monomer to the surface of said substrate and thus form a coating thereof upon said substrate.

4,728,679

SIZING COMPOSITION, METHOD OF PREPARING SAME AND FIBROUS MATERIAL SIZED WITH SAME

John C. Lark, P.O. Box 321, Eden, N.C. 27288

Filed Jan. 31, 1986, Ser. No. 824,437

Int. Cl.[4] C08K *9/12;* **D02G** *3/00;* **B32B** *7/02*

U.S. Cl. 523—210 **25 Claims**

1. A sizing composition for treating fibrous materials comprising a complex of colloidal silica particles and polymeric resin in an aqueous medium, with said silica particles being substantially encapsulated in said resin.

4,728,680

PIGMENTED LOW TEMPERATURE CURE EMULSIONS

Kenneth G. Hahn, Jr., Hinckley, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 824,241, Jan. 30, 1986, abandoned. This application Dec. 19, 1986, Ser. No. 943,794

Int. Cl.[4] C08J *3/08;* **C08L** *61/00*

U.S. Cl. 523—310 **13 Claims**

1. In a process for producing emulsion polymers by copolymerizing ethylenically unsaturated monomers in an aqueous polymerization medium, and in the presence of surfactants and initiators, the improvements comprising:

copolymerizing ethylenically unsaturated monomers, including carboxyl or hydroxyl functional monomers, but excluding amine monomers, to produce a functionally reactive emulsion polymer; and treating the functional emulsion polymer with an ion exchange resin to remove cations from the functional emulsion polymer and produce a pH of less than 2.5, where said ion exchanged emulsion polymer is adapted to be crosslinked with glycoluril.

4,728,681

COATING COMPOSITIONS FOR PRINTED CIRCUIT BOARDS

Tsutomu Kobayashi, and Masato Kokusho, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,245

Claims priority, application Japan, Feb. 10, 1986, 61-25715; Jun. 2, 1986, 61-125616

Int. Cl.[4] C08K *3/30*

U.S. Cl. 523—411 **8 Claims**

1. A coating composition for use in the manufacture of printed circuit boards, which comprises a composite rubber material comprising a rubber and a phenolic resin, and calcium sulfate in an amount of 3–50 parts by weight of 100 parts of said rubber material.

4,728,682

METAL TERNARY SULFIDES

Josephine Covino, and Marian E. Hills, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1985, Ser. No. 781,615

Int. Cl.[4] C01B *17/42;* **C01F** *17/00;* **C09K** *11/54*

U.S. Cl. 423—511 **6 Claims**

1. A method for producing a metal ternary sulfide represented by the general formula MM'_2S_4, in which stoichiometric amount of nitrate compound precursors selected from the nitrates of M and M′ are introduced in a concentrated nitric acid solvent to obtain a mixture of nitrates in said nitric acid solvent, comprising the following steps:

heating said solvent containing said mixture to about dryness thereby obtaining a desiccated, homogeneous mixture of nitrates,

grinding said desiccated, homogeneous mixture to form a fine powder, partially redissolving said powder in a concentrated nitric acid solvent,

again heating said solvent containing said nitrate mixture to about dryness obtaining a desiccated, homogeneous mixture; and

heating said desiccated, homogeneous mixture under the flow of a gaseous chalcogenide atmosphere to yield said metal ternary sulfide.

4,728,683

SURFACE DRESSING OF ROADS

Jozef A. F. Smits, Aartselaar, Belgium, and Marc P. Plaindoux, Bois Guillaune, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 722,897, Apr. 12, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 875,233

Claims priority, application United Kingdom, Apr. 13, 1984, 8409635

Int. Cl.[4] C08L *31/00*

U.S. Cl. 524—68 **4 Claims**

1. An aqueous emulsion for use in surface dressing of roads, comprising:

from 30% to 80% by weight water; and

a binder composition, wherein said binder composition comprises from 45% to 99% by weight bitumen having a penetration of from 50 to 400, and from 1% to 25% by weight ethylene-vinyl acetate copolymer having a vinyl acetate content of from 1% to 40% and a melt index of from 700 to 10,000.

4,728,684

POLYURETHANE ADHESIVE

Toshio Kadowaki, Amagasaki; Masahito Mori, Otokuni; Masaaki Soh, Ibaraki, and Koichiro Sanji, Takatsuki, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

PCT No. PCT/JP85/00233, § 371 Date Jan. 27, 1986, § 102(e) Date Jan. 27, 1986, PCT Pub. No. WO85/05628, PCT Pub. Date Dec. 19, 1985

PCT Filed Apr. 25, 1985, Ser. No. 830,528

Claims priority, application Japan, May 30, 1984, 59-111648; May 31, 1984, 59-112574

Int. Cl.[4] C08L *51/08, 75/06*

U.S. Cl. 524—271 **4 Claims**

1. A polyurethan adhesive comprising:

(a) 100 parts by weight of a thermoplastic polyester urethane rubber which is grafted with 10 to 70 parts by weight to 100 parts by weight of the urethane rubber of at least one of the compounds selected from the group consisting of acrylic acid, an acrylic ester, methacrylic acid and a methacrylic ester,

(b) 0.5 to 20 parts by weight of a chlorinated rubber to 100 parts by weight of component (a),

(c) 3 to 50 parts by weight of an isocyanate compound selected from the group consisting of triphenylmethane triisocyanate, triisocyanate phenylthiophosphate, an isocyanate compound prepared by adding trimethylolpropane to tolylene diisocyanate, and diphenylmethane diisocyanate, to 100 parts by weight of compound (a), and

(d) a polyoxyalkylene ether polyol having 2 or more ether groups in the molecule in an amount of 5 to 20 parts by weight to 100 parts by weight of the compound (a), in the form of a solution in an organic solvent.

4,728,685

RAPID-CRYSTALLIZING POLYPHENYLENE SULPHIDE COMPOSITIONS

Peter Bier, Pittsburgh, Pa.; Klaus Reinking, Wermelskirchen, Fed. Rep. of Germany; Ludwig Bottenbruch, and Erhard Tresper, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,017

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607713

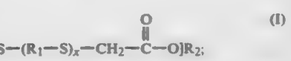
Int. Cl.[4] C08K *5/36*

U.S. Cl. 524—303 **3 Claims**

1. A highly crystalline, rapid-crystallizing, thermoplastic composition comprising

(a) 70–99.5% by weight of a polyphenylene sulphide having a melt viscosity of at least 5 Pas, measured at 306° C. under a shearing stress of 10^3 Pa, and

(b) 0.5–30% by weight, relative to (a) and (b), of a thioether selected from



(I)



(II)

or mixtures thereof

where

R_1 represents a divalent C_1–C_{10}-aliphatic,

C_5–C_{12}-cycloaliphatic, C_7–C_{24}-araliphatic or C_6–C_{24}-aromatic radical,

R_2 represents identical or different C_1–C_{10}-alkyl, C_5–C_{12}-cycloalkyl, C_7–C_{12}-aralkyl,

C_6–C_{24}-aryl radicals which are substantially inert towards polyphenylene sulphide under injection moulding conditions,

x represents the number 0 or 1 and

y represents a whole number from 1 to 50.

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AQUEOUS COATING COMPOSITION BASED ON A CATIONIC BINDER

Chantal H. Guioth, Rantigny; Etienne G. Maze, Breuil Le Vert, and Jean J. Trescol, Nogent Sur Oise, all of France, assignors to Akzo NV, Arnhem, Netherlands

Division of Ser. No. 882,382, Jul. 7, 1986. This application May 29, 1987, Ser. No. 55,257

Claims priority, application Netherlands, Jul. 5, 1985, 8501936

Int. Cl.[4] C08F 2/16

U.S. Cl. 524—458 14 Claims

1. An aqueous coating composition based on a cationic binder obtained by polymerization of a monomer mixture in the presence of 1–45 parts by weight of a polyethylenically unsaturated compound per 100 parts by weight of the monomer mixture,

said monomer mixture consisting of (a) 1–30% by weight of a hydroxy(cyclo)alkyl (meth)acrylate of which the (cyclo)alkyl group has 2–8 carbon atoms, (b) 4–45% by weight of an amino (meth)acrylate of the formula:

$$(R_1)_2NR_2OOC-\underset{\displaystyle R_3}{\overset{\displaystyle |}{C}}=CH_2$$

wherein at least one of the groups R_1 is a hydrocarbon group having 1–12 carbon atoms and the other group R_1 is a hydrocarbon group having 1–12 carbon atoms or a hydrogen atom, or the two groups R_1, together with the nitrogen atom attached thereto, form a heterocyclic group, R_2 is a hydrocarbon group containing 2–12 carbon atoms and R_3 is a hydrogen atom or a methyl group, (c) 0–80% by weight of a monovinyl aromatic hydrocarbon containing 8–14 carbon atoms, and (d) 0–50% by weight of a different monoethylenically unsaturated monomer containing 2–20 carbon atoms;

the polyethylenically unsaturated compound being a butadiene polymer built up of 70–100% by weight of 1,3-butadiene and 0–30% by weight of a copolymerizable monomer and having a number average molecular weight of 460–5400;

amino groups present in said binder being at least partially neutralized with an acid.

4,728,687

SILICONE ELASTOMER COMPOSITION

Junichiro Watanabe; Yuichi Funahashi, both of Ohta; Kazuo Sugiura, and Hironori Matsumoto, both of Tokyo, all of Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Continuation of Ser. No. 787,233, Oct. 15, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 9,597

Claims priority, application Japan, Oct. 22, 1984, 59-221540

Int. Cl.[4] C08K 3/34

U.S. Cl. 524—493 4 Claims

1. A silicone elastomer composition, comprising:

(A) 100 parts by weight of polyorganosiloxane having a polymerization degree of at least 100, wherein the organic groups are selected from monovalent substituted or unsubstituted hydrocarbon groups and are attached to silicon atoms at a rate, on average, in the range of 1.98 to 2.02 per silicon atom, and at least two of said organic groups are alkylidene norbornyl groups.

(B) 5 to 200 parts by weight of an inorganic filler having a specific surface area of at least 50 m^2/g, and

(C) 0.05 to 15 parts by weight of an organic peroxide.

4,728,688

PERFECT BINDING

Richard E. Tizzard, Kent, and George C. Thomas, Middlesex, both of United Kingdom, assignors to Swift Adhesives Limited, England

PCT No. PCT/GB85/00147, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04669, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 3, 1985, Ser. No. 809,884

Claims priority, application United Kingdom, Apr. 6, 1984, 8409015

Int. Cl.[4] C08J 51/00; C08L 31/02

U.S. Cl. 524—504 5 Claims

1. A two-shot adhesive comprising, separately

(a) an aqueous primer emulsion; and

(b) an adhesive composition, solid at ambient temperature, having a softening point in the range 65° to 120° C. and comprising (i) at least one segmented ethylene-vinyl acetate (EVA) copolymer, (ii) at least one tackifying resin, (iii) at least one antioxidant, and (iv) at least one other EVA, said segmented EVA constituting from 25 to 50% by weight of the EVA in said adhesive composition.

4,728,689

OPTIONALLY AND PARTIALLY SALIFIED POLYSTYRENE-SULFONIC ACID AS ANTISTATIC AGENT

Norio Saito, No. 1019 Shimizudani, Takatori-cho, Takaichi-gun, Nara-ken, Japan

Filed Nov. 10, 1986, Ser. No. 928,358

Claims priority, application Japan, Nov. 15, 1985, 60-257355

Int. Cl.[4] C08L 75/00; B05D 3/02

U.S. Cl. 524—507 1 Claim

1. A method for imparting antistatic properties to a plastic material comprising the step of applying a composition which consists essentially of (1) optionally and partially salified polystyrene-sulfonic acid selected from the group consisting of polystyrenesulfonic acid and partially salified polystyrenesulfonic acid; (2) acrylic or urethane resin; and (3) aqueous and organic solvents.

4,728,690

PROCESS FOR PRODUCING MOLDED POLYURETHANE PARTS

Helmut Lammerting, Herbede, and Hans-Joachim Kollmeier, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG

Filed Mar. 18, 1986, Ser. No. 840,911

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509810

Int. Cl.[4] C08G 18/30

U.S. Cl. 524—714 13 Claims

1. In a process for producing molded polyurethane parts by reacting at least one polyol with an organic di- or polyisocyanate in the presence of catalysts and an internal release agent while molding the product, the improvement which comprises using as the internal release agent 0.5 to 10 weight percent, based on the weight of the reaction mixture, of a compound having the average formula:

$$R_2{}^1R^2SiO\left[\begin{array}{c}R^1\\|\\SiO-\\|\\R^1\end{array}\right]_x\left[\begin{array}{c}R^1\\|\\SiO-\\|\\R^2\end{array}\right]_y SiR^2R_2{}^1$$

in which

R^1 may be the same or different and represents an alkyl radical with 1 to 18 carbon atoms or an aryl radical, at least 70% of the R^1 radicals being methyl radicals;

R^2 is the same as R^1 or represents one of the following radicals,

$$-R^3OCH_2\underset{\displaystyle OH}{\overset{\displaystyle |}{C}}HCH_2N\begin{array}{l}\nearrow R^4\\\searrow R^5\end{array},\quad -R^3OCH_2\underset{\displaystyle OH}{\overset{\displaystyle |}{C}}HCH_2(OC_2H_4)_zOR^6 \text{ or}$$

$$-R^3O(C_2H_4O)_n(C_3H_6O)_mR^7 \text{ radical}$$

in which

R^3 is a divalent hydrocarbon radical with 2 to 4 carbon atoms,

R^4, R^5 are univalent hydrocarbon radicals or, taken together are part of a morpholine or a piperazine ring,

R^6 is a low molecular weight alkyl radical with 1 to 4 carbon atoms,

R^7 is a hydrogen, acyl or R^6 radical,

z=1 to 10

n=1 to 20 and

m=1 to 20,

with the proviso that, in the average molecule, at least one R^2 radical represents the

$$-R^3OCH_2\underset{\displaystyle OH}{\overset{\displaystyle |}{C}}HCH_2N\begin{array}{l}\nearrow R^4\\\searrow R^5\end{array} \text{ radical,}$$

x=20 to 300 and

y=1 to 20.

4,728,691

COMPOSITION AND PROCESS FOR POLYMERIZING AROMATIC CYCLIC CARBONATE OLIGOMERS ADMIXED WITH CARBON MATERIALS

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 9, 1986, Ser. No. 940,306

Int. Cl.[4] C08K 3/04; C08L 69/00

U.S. Cl. 524—847 17 Claims

1. A method for producing a high molecular weight polycarbonate admixed with carbon materials which comprises

(a) adding a polymerizing effective amount of an acidic metallic catalyst system to aromatic cyclic carbonate oligomers admixed with a carbon material, and

(b) polymerizing the mixture of carbon material and aromatic cyclic carbonate oligomers to a high molecular weight aromatic polycarbonate.

4,728,692

THERMOPLASTIC ELASTOMER COMPOSITION

Eiji Sezaki, 17-21, Okamura 4-chome, Isogo-ku, Yokohama-shi, Kanagawa-ken; Takashi Mikami, 23-48, Izumihon-cho 3-chome, Komae-shi, Tokyo; Tsuyoshi Kanai, 2253-61, Kamariya-cho, Kanazawa-ku, Yokohama-shi, Kanagawa-ken; Toshio Yoshida, 8-18, Minamina-gata 2-chome, Minami-ku, Yokohama-shi, Kanagawa-ken; Kikuo Tanaka, 17-40, Asahi-cho 3-chome, Kawagoe-shi, Saitama-ken, and Masaaki Saito, 1877-22, Totsuka-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, all of Japan

PCT No. PCT/US86/01306, § 371 Date Feb. 18, 1987, § 102(e) Date Feb. 18, 1987, PCT Pub. No. WO86/07600, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 16, 1986, Ser. No. 19,553

Claims priority, application Japan, Jun. 19, 1985, 60-131670; Jun. 19, 1985, 60-131671

Int. Cl.[4] C08L 23/26, 9/02, 15/02, 51/06

U.S. Cl. 525—74 24 Claims

1. A thermoplstic elastomer composition comprising (A) 10 to 90 parts by weight of crystalline polyolefin, (B) 10 to 90 parts by weight of halogenated butyl rubber, with the total amount of (A) and (B) being 100 parts by weight, (C) 10 to 120 parts by weight of olefin copolymer rubber composed of two or more monoolefins or two or more monoolefins and a non-conjugated diene, and (D) 1 to 90 parts by weight of modified polyolefin formed by reaction with an unsaturated carboxylic acid or a derivative thereof and optionally (E) 2 to 50 parts by weight of nitrile rubber, said composition being at least partially crosslinked in the presence of a crosslinking agent of a metal oxide and/or a metal chloride.

4,728,693

IMPACT-RESISTANT THERMOPLASTIC MOLDING COMPOUNDS BASED ON POLYPHENYLENE ETHERS, POLYOCTENYLENES AND POLYAMIDES

Michael Dröscher, Dorsten; Hans Jadamus; Wolfgang Neugebauer, both of Marl; Martin Bartmann, Recklinghausen; Klaus Burzin; Roland Feinauer, both of Marl; Christian Gerth, Haltern; Wilfried Ribbing, Dorsten, and Jörg Lohmar, Dortmund, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 865,968

Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518278; Dec. 20, 1985, 3545249

Int. Cl.[4] C08L 77/00

U.S. Cl. 525—181 19 Claims

1. A thermoplastic resin composition, which comprises:

(a) from 5 to 85 parts by weight of a preliminary molding compound prepared by the melting of a mixture consisting of from 60 to 98 parts by weight of polyphenylene ethers, 40 to 2 parts by weight of polyoctenylenes, from 0.1 to 5 parts by weight of maleic anhydride and from 0.1 to 5 parts by weight of an acid derivative which has a melting point below 100° C. and which is selected from the group consisting of an unsaturated mono- or dicarboxylic acid having up to 14 carbon atoms, an anhydride thereof, which excludes maleic anhydride, and an ester of said mono- or dicarboxylic acid with an alcohol of up to 6 carbon atoms;

(b) from 95 to 15 parts by weight of an aliphatic homopolyamide or a copolyamide containing a preponderant amount of aliphatic monomer units.

4,728,694

PROCESS FOR MAKING HYDROPHILIC POLYETHYLENE

Christopher D. Batich, and Ali Yahiaoui, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 8, 1987, Ser. No. 47,218

Int. Cl.[4] C08L 51/06

U.S. Cl. 525—246 15 Claims

1. A process for producing hydrophilic polyethylene comprising the grafting of acrylamide to polyethylene by:

A. oxidizing the surface of said polyethylene to form a carbonyl-rich surface;

B. reducing the carbonyl-rich surface to form an hydroxyl-rich surface; and

C. exposing said hydroxyl-rich surface to acrylamide monomer in the presence of a free-radical initiator.

4,728,695

CROSSLINKED RESINS CONTAINING THERMALLY STABLE SULFONIC ACID GROUPS

Dirk M. Brouwer, and Elizabeth M. Van de Vondervoort, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 20, 1986, Ser. No. 831,398

Claims priority, application United Kingdom, Mar. 21, 1985, 8507328

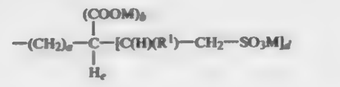
Int. Cl.[4] C08F 257/00

U.S. Cl. 525—291 7 Claims

1. A crosslinked resin composition comprising at least one

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substituted aryl group having a functional substituent group of general formula



(I)

wherein a is 0 or 1, b is 1 or 2, d is 1 or 2, e is 0 or 1, b+d+e=3, R^1 represents H or a C_1 to C_4 alkyl group and M is a proton or another cation.

4,728,696

AMPHIPHILIC MONOMER AND HYDROPHOBE ASSOCIATIVE COMPOSITION CONTAINING A POLYMER OF A WATER-SOLUBLE MONOMER AND SAID AMPHIPHILIC MONOMER

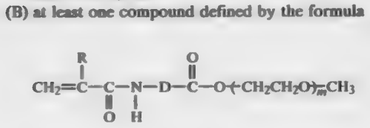
Kien Van Phung, and Syamalarao Evani, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1985, Ser. No. 803,757
Int. Cl.[4] C08F 20/58
U.S. Cl. 526—304 10 Claims

1. A composition comprising a polymerization product of

(A) one or more water-soluble monomers which are sufficiently water-soluble to form at least a 10 weight percent solution when dissolved in water and which undergo addition polymerization to form polymers which are water-soluble; and

(B) at least one compound defined by the formula



wherein R is hydrogen or C_{1-4} alkyl, D is a C_{8-12} divalent alkyl group and m is 2–10 wherein said polymerization product is aqueous-soluble.

4,728,697

NOVEL COPOLYAMIDEIMIDES, PREPOLYMERS THEREFOR AND METHOD FOR THEIR PREPARATION

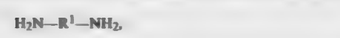
Donald A. Belon, Scotia, and Thomas B. Gorczyca, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 27, 1985, Ser. No. 780,853
Int. Cl.[4] C08G 73/14
U.S. Cl. 525—424 16 Claims

1. A method for preparing a crosslinked polymer which comprises the steps of:

(1) preparing a carboxy-terminated prepolymer by reacting, under conditions whereby all water of reaction is removed:

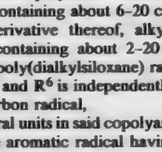
(A) at least one polyamine having the formula



(I)

wherein R^1 is a divalent aromatic hydrocarbon radical containing about 6–20 carbon atoms or halogenated derivative thereof, alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or bis-alkylenepoly(dialkylsiloxane) radical; with

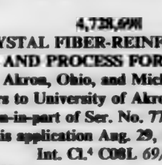
(B) at least one carboxy anhydride having the formula



(II)

wherein R^2 is a trivalent aliphatic radical containing about 2–20 carbon atoms or aromatic radical containing about 6–20 carbon atoms, and

(C) at least one dianhydride having the formula



(III)

wherein R^3 is a tetravalent aliphatic radical containing about 2–20 carbon atoms or aromatic radical containing about 6–20 carbon atoms;

the molar ratio of reagent C to reagent B being at least about 0.25:1 and the ratio of equivalents of reagent A to anhydride equivalents of reagents B and C combined being about 1:1;

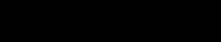
(2) preparing a copolyamideimide by reacting, at a temperature within the range of about 150°–225° C.,

(D) said carboxy-terminated prepolymer with (E) at least one compound selected from the group consisting of polyisocyanates having the formula



(V)

polyamines having the formula



(VI)

and functional derivatives thereof, wherein:

R^4 is a divalent polymeric radical, aromatic hydrocarbon radical containing about 6–20 carbon atoms or halogenated derivative thereof, alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or bis-alkylenepoly(dialkylsiloxane) radical; and

each of R^5 and R^6 is independently hydrogen or a lower hydrocarbon radical,

the structural units in said copolyamideimide containing at least one aromatic radical having at least one alkyl or alicyclic substituent; and

(3) contacting said copolyamideimide with an oxidizing agent and heating said copolyamideimide at a temperature within the range from its glass transition temperature to just below its degradation temperature.

4,728,698

LIQUID CRYSTAL FIBER-REINFORCED POLYMER COMPOSITE AND PROCESS FOR PREPARING SAME

Avraam Isayev, Akron, Ohio, and Michael J. Modic, Houston, Tex., assignors to University of Akron, Akron, Ohio

Continuation-in-part of Ser. No. 773,044, Sep. 6, 1985, abandoned. This application Aug. 29, 1986, Ser. No. 901,573
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—439 13 Claims

1. A process for preparing a self-reinforced polymer composite comprising a thermoplastic flexible chain base polymer and a melt processable liquid crystal polymer which is incompatible with the base polymer, which comprises extruding and mixing a base polymer with from about 2 to about 20 percent by weight based on the combined weight of the base polymer

and the liquid crystal polymer of a melt processable liquid crystal polymer under mixing conditions effective to give a polymer composite in which the liquid crystal polymer is present in the form of essentially unidirectionally oriented fibers in a matrix of said base polymer at a temperature at which both polymers are melt processable, and recovering a self-reinforced polymer composite comprising said base polymer and said liquid crystal polymer, said liquid crystal polymer being in the form of continuous essentially unidirectionally oriented fibers in a matrix of said base polymer and said composite having greater ultimate strength and modulus in the direction of fiber orientation than in the direction perpendicular thereto.

4,728,699

POLYCARBONATE RESINS CONTAINING DIATOMACEOUS EARTH

Ping Y. Liu, Naperville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 4, 1985, Ser. No. 794,703
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—448 10 Claims

1. A composition comprising an aromatic polycarbonate in admixture with a diatomaceous earth, the said diatomaceous earth having a major quantity of cristabolite, the quantity of diatomaceous earth such that the kinetic coefficient of friction is substantially decreased when a self supporting film is prepared from the composition, said composition essentially free of starch.

4,728,700

PROCESS AND COMPOSITION

Dwight J. Patterson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 943,460, Dec. 19, 1986. This application Jul. 13, 1987, Ser. No. 72,949
Int. Cl.[4] C08L 69/00; C08J 3/00
U.S. Cl. 524—611 6 Claims

1. A composition comprising (1) a reinforcing material coated with a catalyst system which can convert aromatic cyclic carbonate oligomers to high molecular weight polycarbonate and (2) an aromatic cyclic carbonate oligomer in contact with said coated reinforcing material.

4,728,701

PROCESS FOR THE POLYMERIZATION OF ACRYLATES

Marvin A. Jarvis, 301 S. Salem Hills, Elk Ridge, Utah 84561, and Lawrence A. Testa, Candlewood Isle, P.O. Box 128, New Fairfield, Conn. 06810

Continuation of Ser. No. 533,455, Sep. 19, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,517
Int. Cl.[4] C08F 2/06
U.S. Cl. 526—65 22 Claims

1. A continuous solution process for the polymerization of monomers comprising at least 40 percent arylate esters of C_1 to C_8 alkanols which comprises:

(a) introducing monomer, initiator and chain transfer agent into admixture with solvent to provide a polymerization medium containing not less than 40 weight percent solvent;

(b) maintaining said polymerization medium under polymerization conditions, in at least one polymerization reactor comprising a temperature from 60 to about 130 degrees C. and sufficient residence time to effect 20 to 95 percent of the total conversion of said monomer and form a crude intermediate polymerizate;

(c) withdrawing said crude, intermediate polymerizate and passing it to at least one succeeding polymerization reactor, including a final polymerization reactor;

(d) stirring said crude intermediate polymerizate in said succeeding polymerization reactor, including said final polymerization reactor, to maintain said polymerizate intimately admixed while maintaining polymerization conditions therein comprising a temperature from 60 to about 130 degrees C., and sufficient residence time to essentially deplete the initiator in said polymerizate, thereby forming, and pumping a crude polymerizate containing solvent, unreacted monomer and less than about 50 weight percent polymer from said final polymerization reactor;

(e) heating said crude polymerizate in a devolatilzer preheater to a temperature between 200 degrees and 270 degrees C., withdrawing the preheated crude polymerizate from said preheater and passing it through a transfer line to a devolatilizer and spraying said preheated polymerizate into said devolatilizer and, flashing the polymerizate therein to remove a volatile stream comprising solvent, unreacted monomer, and oligomers therefrom; and

(f) maintaining a pressure on the crude polymerizate in said transfer line and said devolatilizer preheater which permits vaporization therein to form a mixed two-phase system of vapor and liquid, which pressure is sufficient to prevent incipient solidification in the liquid phase, thereby avoiding formation of foam encrustations on the heat exchange surfaces of said preheater, while heating said polymerizate sufficiently in said preheater to provide a preheated crude polymerizate with sufficient heat to supply the heat of vaporization necessary to produce said molten polymer and permit it to be pumped from said devolatilizer.

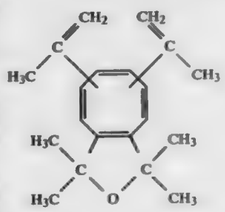
4,728,702

METHOD FOR THE TERMINATION OF LIVING POLYMERS AND COMPOUNDS SUITABLE TO THAT PURPOSE

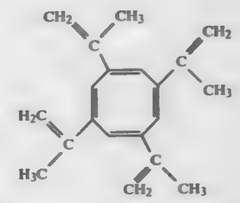
Arnaldo Roggero, and Tito Salvatori, both of S. Donato Milanese, Italy, assignors to Enichem Elastomeri S.p.A., Palermo, Italy

Continuation of Ser. No. 724,157, Apr. 17, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 939,304
Claims priority, application Italy, Apr. 18, 1984, 20588 A/84
Int. Cl.[4] C08F 2/38, 36/06, 36/08, 12/08
U.S. Cl. 526—84 11 Claims

1. A method for the termination of living macroanions obtained by anionic polymerization of diene monomers containing 4 to 12 carbon atoms and/or vinylaromatic monomers containing 8 to 20 carbon atoms which comprises: adding to a polymerization mixture containing said macroanions an effective amount of a coupling agent of the formula:



or



to terminate said living macroanions.

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4,728,703

PREPARATION OF HOMOPOLYMERS AND COPOLYMERS OF ETHENE BY PHILLIPS CATALYSIS

Rainer Konrad, Altrip; Volker Warzelhan, Weisenheim; Hans Gropper, Ludwigshafen, and Guenther Schweier, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,651

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609828

Int. Cl.[4] C08F *2/24, 10/02*

U.S. Cl. 526—105 1 Claim

1. A process for preparing ethene homopolymers and ethene copolymers with minor amounts of copolymerized C_3–C_{12}-α-monoalkenes by polymerizing the monomer(s) at from 30° to 150° C. and from 2 to 150 bar by Phillips catalysis using

(1) a supported catalyst composed of a carrier material which is loaded with chromium in oxide form and titanium in oxide form and

(2) a cocatalyst, the supported catalyst (1) having been obtained by

(1.1) preparing in a first stage a catalyst intermediate (1.1) loaded with desired amounts of chromium and titanium from

(1.1.a) a finely divided porous silicate carrier material,

(1.1.b) a selected, specific chromium compound and

(1.1.c) a selected, specific titanium compound

and then

(1.2) in a second stage maintaining the catalyst intermediate (1.1) obtained in the first stage at from 300° to 900° C. in an anhydrous gas stream which contains oxygen in a concentration of over 10% by volume for from 10 to 1,000 minutes and thereby converting it into the actual supported catalyst (1), which comprises

(1) using a supported catalyst obtained by

(1.1) preparing in a first stage a catalyst intermediate by first

(1.1.1) preparing in a first substage a suspension from

(1.1.1.1) a finely divided porous silicate carrier material which has a particle diameter of 1 to 400 μm, a pore volume of from 0.5 to 3 cm^3/g and a surface area of from 100 to 1,000 m^2/g, and (1.1.1.2) a C_5–C_8-alkane which is present in liquid form with thorough mixing, subject to the proviso that for every 100 parts by weight of carrier material (1.1.1.1), from 150 to 5,000 parts by weight of alkane (1.1.1.2) are present, then

(1.1.2) in a second substage

(1.1.2.1) combining the suspension resulting from substage (1.1.1) with

(1.1.2.2) a finely divided chromium trioxide (CrO_3) having a particle diameter of less than 2,000 Mm with further thorough mixing, subject to the proviso that, for every 100 parts by weight of carrier material (1.1.1.1), from 0.1 to 5 parts by weight of chromium are present from chromium trioxide (1.1.2.2), thereupon

(1.1.3) in a third substage

(1.1.3.1) combining the suspension obtained from substage (1.1.2) with

(1.1.3.2) a C_9–C_{10}-alkanol with continued thorough mixing at from 0° to 60° C., subject to the proviso that, for every 100 parts by weight of carrier material (1.1.1.1), from 3 to 30 parts by weight of alkanol (1.1.3.2) are present, and maintaining the whole at said temperature for from 10 to 300 minutes, thereafter

(1.1.4) in a fourth substage

(1.1.4.1) combining the suspension formed in substage (1.1.3) with

(1.1.4.2) a titanium compound of the formula $Ti(OR)_4$, where R is C_1–C_{12}-alkyl, aryl or cycloalkyl, with uninterrupted thorough mixing at from 0 to 60° C., subject to the proviso that, for every 100 parts by weight of carrier material (1.1.1.1), from 0.1 to 10 parts by weight of titanium are present from titanium compound (1.1.4.2), and maintaining the whole at said temperature for from 5 to 300 minutes, finally

(1.1.5) in a fifth substage evaporating the suspension obtained in substage (1.1.4) to dryness at not more than 150° C. with or without reduced pressure,

and then

(1.2) in a second stage converting the catalyst intermediate obtained from the first stage (1.1) into the actual supported catalyst by first (1.2.1) in a first substage maintaining the catalyst intermediate obtained from the first stage (1.1) at from 150° to 300° C. in an anhydrous nitrogen stream for from 60 to 500 minutes, thereupon

(1.2.2) in a second substage maintaining the intermediate obtained from substage (1.2.1) at from 300° to 900° C. in an anhydrous gas stream which contains oxygen in a concentration of over 10% by volume for from 10 to 1,000 minutes, and finally

(1.2.3) in a third substage maintaining the intermediate from substage (1.2.2) at from 50° to 400° C. in an anhydrous nitrogen stream for from 10 to 300 minutes,

and

(2) using as cocatalyst an alkyllithium of the formula LiR^1, where R^1 is C_1–C12-alkyl, subject to the proviso that the atomic ratio of chromium in supported catalyst (1):lithium in cocatalyst (2) is greater than 1:100.

4,728,704

PREPARATION OF SPHERICAL MAGNESIUM ALKOXIDE PARTICLES

John C. Chadwick, and Jacob C. van der Sar, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 885,496, Jul. 14, 1986, Pat. No. 4,663,299. This application Feb. 13, 1987, Ser. No. 14,556

Claims priority, application United Kingdom, Aug. 28, 1985, 8521431

Int. Cl.[4] C08F *4/02, 10/06*

U.S. Cl. 526—124 5 Claims

1. A process for polymerizing olefins which comprises:

(a) first preparing spherical particles of a compound with the general formula $Mg(OR)_{2-a}(OR')_a$ in which R is an alkyl group with from 2 to 8 carbon atoms, R′ is an alkyl group with from 1 to 7 carbon atoms and a is a number of from 0 to 0.5 which process comprises:

(i) preparing a homogeneous solution of a compound $Mg(OR)_2$ in an aliphatic alcohol with the general formula R′OH.

(ii) spray-drying the resulting solution at a temperature of from 15° to 85° C. therein forming solid particles,

(iii) suspending the spray-dried solid particles in an aliphatic alcohol with the formula ROH in which R is the same alkyl group as present in the said compound $Mg(OR)_2$,

(iv) heating the resulting suspension in order to remove an alcohol with the formula R′OH from the liquid phase by distillation, and

(v) separating the solid particles from the liquid phase,

(b) halogenating the spherical particles produced in (a) with a halide of tetravlaent titanium in the presence of a halohydrocarbon and an electron donor, the halogenation optionally being preceding by converting the spherical Mg-alkoxide particles into a compound with the formula $Mg(OR)_{2-b}X_b$, in which b is a number of from 0.3 to 1.8 and X is halogen, by reacting with a halogenating agent other than a titaniumhalide, and

(c) contacting the halogenated spherical particles with at least one alpha olefin having at least 3 carbon atoms in the presence of an organoaluminum compound.

4,728,705

OLEFIN POLYMERIZATION CATALYST COMPOSITION

Steven M. Nestlerode, Katy; Israel G. Burstain, and Robert C. Job, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 835,079, Feb. 28, 1986, abandoned. This application Dec. 22, 1986, Ser. No. 944,720

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—125 14 Claims

1. A process for the catalytic polymerization of an alphaolefin by contact with a titanium-containing catalyst which contains a solid magnesium halide/titanium halide catalyst component containing no carbonate magnesium compound which has been obtained by

(a) heating a carbonated magnesium compound of the formula $MgR'R''xCO_2$ wherein R′ is an alkoxide or aryloxide group, R″ is an alkoxide group, aryloxide group or halogen, and x has a value between about 0.1 and 2.0 to a temperature above 100° C. for a period of time sufficient to cause complete loss of CO_2;

(b) contacting the resulting product with a halide of tetravalent titanium in the presence of a halohydrocarbon and an electron donor;

(c) contacting the resulting halogenated product with tetravalent titanium halide;

(d) washing the resulting product to remove unreacted titanium compounds; and

(e) recovering the solid products, and

wherein the catalyst also contains an organoaluminum compound and a selectivity control agent.

4,728,706

TITANIUM, ZIRCONIUM- AND HAFNIUM CONTAINING INITIATORS IN THE POLYMERIZATION OF ACRYLIC MONOMERS TO "LIVING" POLYMERS

William B. Farnham, Wilmington, Del., and Walter R. Hertler, Kennett Square, Pa., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1986, Ser. No. 901,769

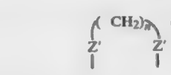
Int. Cl.[4] C08F *4/06*

U.S. Cl. 526—172 24 Claims

1. Process for preparing "living" polymer, the process comprising contacting one ore more acrylic monomers under polymerizing conditions with a polymerization-initiating amount of a tetracoordinate organotitanium, organozirconium or organohafnium polymerization initiator of the formula $(R^4)_{3-a}MZ_{a+1}$ or $O[M(R^4)_2Z^1]_2$ wherein:

each R^4, independently, is $—CH_3$, —F, —Cl, —Br, —I, $—OR^5$, $—NHR^5$, $—NR_2^5$, cyclopentadienyl, $C_{6\text{-}20}$ aryl or $C_{7\text{-}21}$ arylmethyl, or any of the last three groups containing substituents that are inert under polymerizing conditions;

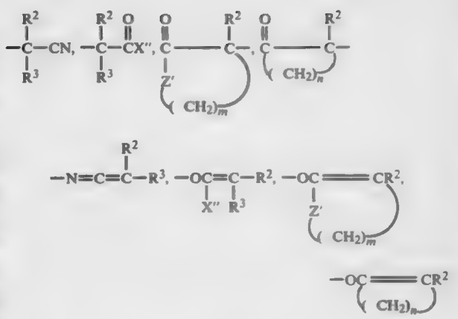
two R^4 groups taken together are



wherein each Z′, independently, is O or NR′, R′, is $C_{1\text{-}4}$ alkyl, and each of m and n is 2 to 4;

each R^5, independently, is hydrocarbyl which is aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic containing up to 20 carbon atoms, or said hydrocarbyl radical containing one or more functional substituents that are unreactive under polymerizing conditions;

Z is an activating substituent selected from the group consisting of



and mixtures thereof;

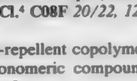
X″ is $—OS(R^1)_3$, $—OR^6$ or $—NR'R''$;

Z′ is O or NR′;

m is 2, 3 or 4;

n is 3, 4 or 5;

Z^1 is



R^6 is

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms;

(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof;

(d) a radical of (a), (b) or (c) containing one or more functional substituents that are unreactive under polymerizing conditions; or

(e) a radical of (a), (b), (c) or (d) containing one or more initiating sites; and

each R^1, independently, is a hydrocarbyl radical which is aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms or —H, provided that at least one R^1 groups is not —H;

each of R^2 and R^3 is independently selected from —H and hydrocarbyl, defined as for R^6 above, subparagraphs (a) to (e);

each of R′ and R″ is independently selected from $C_{1\text{-}4}$ alkyl;

M is Ti, Zr or Hf; and

a is 0, 1 or 2, provided, however, when Z is $—OC(X'')=C(R^2)(R^3)$, one R^4 group and X″, taken together, can be

$$—Z'(CH_2)_2Z'—$$

wherein Z′ is defined as above.

4,728,707

WATER- AND OIL-REPELLENT

Yoshio Amimoto; Hirokazu Aoyama, both of Takatsuki, and Akira Chida, Settsu, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 838,945

Claims priority, application Japan, Mar. 18, 1985, 60-55262

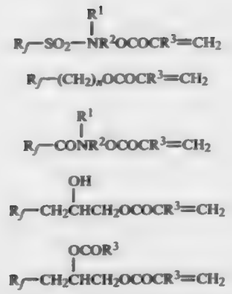
Int. Cl.[4] C08F *20/22, 12/30*

U.S. Cl. 526—243 9 Claims

1. A water- and oil-repellent copolymer, comprising:

(a) at least one monomeric compound selected from the group consisting of:

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wherein R_f is a C_3–C_{21} perfluoroalkyl or perfluoroalkenyl group; R^1 is a hydrogen atom or a C_1–C_{10} alkyl group; R^2 is a C_1–C_{10} alkylene group; R^3 is a hydrogen atom or a methyl group; n is an integer of 1 to 10; and

(b) 5 to 50% by weight, based on the total weight of the copolymer, of a methacrylate selected from the group consisting of isobornyl methacrylate and 4-cyanophenyl methacrylate, a homopolymer of which has a glass transition temperature (Tg) of not lower than 115° C.

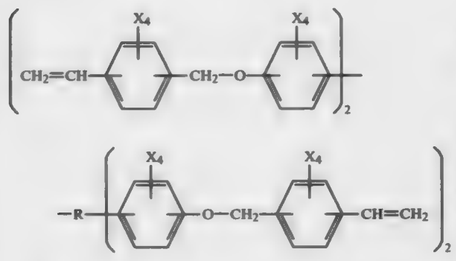
4,728,708

THERMOSET POLYMERS OF STYRENE TERMINATED TETRAKIS PHENOLS

Joseph J. Zupancic, Bensenville; Andrew M. Zweig, Streamwood, and James A. Wrezel, Buffalo Grove, all of Ill., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 29, 1986, Ser. No. 947,007
Int. Cl.[4] C08F *279/00, 112/16, 212/16*
U.S. Cl. 526—293 **10 Claims**

1. A thermoset polymer of a resin which comprises a poly(-vinyl benzyl ether) of a polyphenol having the generic formula:



in which R is selected from the group consisting of alkyl, cycloalkyl, alkaryl and substituted alkaryl radicals and X is independently selected from the group consisting of hydrogen and halogen atoms.

4,728,709

TERMINAL CLUSTER VINYL SILICONES AND ACRYLATE CLUSTER SILICONES THEREFROM

Philip Klemarczyk, Newington, Conn., and Samuel Q. S. Lin, Edgewater, N.J., assignors to Loctite Corporation, Newington, Conn.

Division of Ser. No. 623,759, Jun. 22, 1984, Pat. No. 4,575,546, which is a continuation-in-part of Ser. No. 515,702, Jul. 20, 1983, Pat. No. 4,504,629, and a continuation-in-part of Ser. No. 571,036, Jan. 16, 1984, Pat. No. 4,675,346, and a continuation-in-part of Ser. No. 575,256, Jan. 30, 1984, Pat. No. 4,503,208. This application Mar. 10, 1986, Ser. No. 807,933
Int. Cl.[4] C08F *230/08, 275/00;* C08G *77/20*
U.S. Cl. 528—15 **5 Claims**

1. A polyorganosiloxane polymer having terminal vinyl clusters represented by the formula

$$(DB)_mC^1 \text{ or } [(DB)_m]_nSiR_{(4-n)/2}$$

where the R groups are the same or different organic groups other than acrylic groups or groups co-curable therewith; B is a polyorganosiloxane segment represented by the formula



where x is an integer of at least 100; C^1 is D or a triorganosilyl group; m is an integer of 1 or more; n is 3 or 4; and D is a linear polyorganosiloxane segment containing between 3 and about 50 siloxane repeat units at least 3 of which contain pendant alkenyl or alkynyl groups.

4,728,710

SAG RESISTANT URETHANE ADHESIVES WITH IMPROVED ANTIFOAMING PROPERTY

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 28, 1986, Ser. No. 935,862
Int. Cl.[4] C08G *18/30*
U.S. Cl. 528—58 **8 Claims**

1. An improved antifoaming polyurethane adhesive comprising a mixture of a first component comprising a polyisocyanate prepolymer and a second component comprising a polyol, a polyamine and a bicyclic amide acetal wherein in the second component the weight ratio of polyol to polyamine is in the range of from 99.5:0.5% to 70:30% and the bicyclic amide acetal is present in from 0.2 to 5% by weight based on the total weight of polyol and polyamine.

4,728,711

SWELLABLE COATING COMPOSITIONS

James W. Rosthauser, Imperial, and Peter H. Markusch, McMurray, both of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1986, Ser. No. 816,530
Int. Cl.[4] C08G *18/28, 18/77*
U.S. Cl. 528—73 **5 Claims**

1. A coating composition produced by reacting an organic isocyanate with an active hydrogen containing organic material at an isocyanate group to active hydrogen ratio of from 1:1 to 2:1, said composition:

(i) capable of swelling at least 300% by volume at a film thickness of 3 mils or less within 5 minutes after immersion in a hydrocarbon solvent,

(ii) having a heteroatom content of from 1 to 12% by weight based on the total weight of the composition, and

(iii) having a mean chain length between cross-linking sites of at least 4000.

4,728,712

METHOD OF PRODUCING MERCAPTAN TERMINATED POLYMERS WITH INCREASED REACTIVITY AND REDUCED ODOR

Hakam Singh, Bradburry, and Jack W. Hutt, Tarzana, both of Calif., assignors to Products Research & Chemical Corp., Glendale, Calif.

PCT No. PCT/US85/01105, § 371 Date Jan. 22, 1987, § 102(e) Date Jan. 22, 1987, PCT Pub. No. WO86/07369, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 11, 1985, Ser. No. 12,091
Int. Cl.[4] C08G *18/10*
U.S. Cl. 528—75 **18 Claims**

1. A method for increasing the cure rate of a liquid mercaptan terminated polymer to a solid elastomer, said liquid mercaptan terminated polymer containing from about 0.5 weight percent to about 3 weight percent low molecular weight mercaptan compounds having a molecular weight of less than about 300 and having an obnoxious smell, said method comprising the steps of:

heating said mercaptan terminated polymer at about 135° to 175° C. and for a sufficient length of time to vaporize at least about 50 weight percent of said low molecular weight obnoxious semlling mercaptan containing compounds, but not to decompose said liquid mercaptan terminated polymer, to thereby obtain a stripped liquid mercaptan terminated polymer having an increased cure rate and a reduced obnoxious mercaptan odor;

separating the vapor containing low molecular weight mercaptan compounds from said stripped liquid mercaptan terminated polymer.

4,728,713

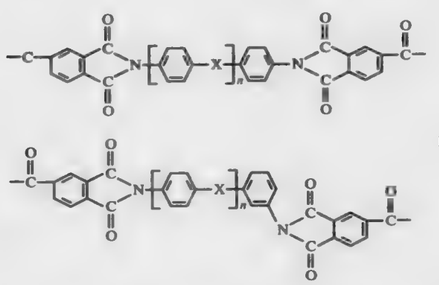
WHOLLY AROMATIC MESOMORPHIC POLYESTER IMIDES AND THE PREPARATION THEREOF

Bernd Hisgen, Limburgerhof; Michael Portugall, Wachenheim, and Udo Reiter, Telgte, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,718
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542857
Int. Cl.[4] C08G *63/54, 69/44*
U.S. Cl. 528—183 **10 Claims**

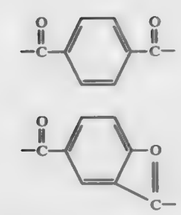
1. A wholly aromatic mesomorphic polyester imide which forms a liquid-crystalline fiber-forming melt below 320° C. and is composed of

(a) from 5 to 35 mole % of repeat units of the formulae I and/or II

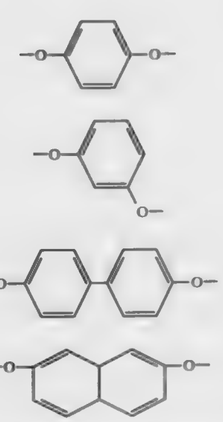


where the Xs and N's can be identical or different, each X being —O—, —S—, $—SO_2—$, —CO—, $—CH_2—$ or $=C(CH_3)_2$ and n being 0 or 1,

(b) from 0 to 30 mole % of repeat units of the formulae III and/or IV



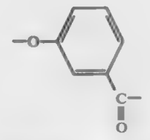
(c) a molar amount corresponding to the total amount of components a and b of one or more of the repeat units of the formula V, VI, VII or VIII



(d) not less than 10 mole % of repeat units of the formula IX



(e) if desired from 5 to 25 mole % of repeat units of the formula X



the molar proportions of components a, b, c, d, and e adding up to 100 mole % in each case.

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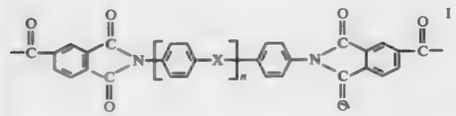
WHOLLY AROMATIC MESOMORPHIC POLYESTER IMIDES, THE PREPARATION AND USE THEREOF

Bernd Hisgen, Limburgerhof, and Hans-Jakob Kock, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

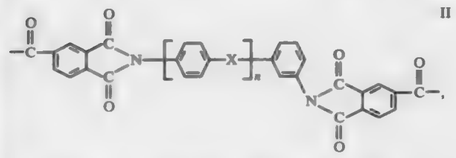
Filed Dec. 4, 1986, Ser. No. 937,719
Int. Cl.[4] C08G 63/54, 69/44
U.S. Cl. 528—183 10 Claims

1. A wholly aromatic mesomorphic polyester imide which forms a liquid-crystalline fiber-forming melt below 320° C., composed of

(a) from 5 to 35 mol % of repeat units of the formulae I and/or II



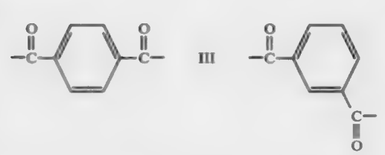
I



II

where x can be identical or different and each is —O—, —S—, —SO_2—, —CO—, —CH_2— or =$C(CH_3)_2$, and n is 0 or 1,

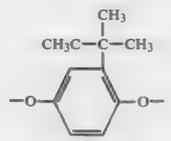
(b) from 0 to 30 mol % of repeat units of the formulae III and/or IV



III

(c) a molar amount corresponding to the total amount of (a) and (b) of repeat units

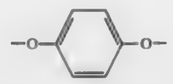
(c1) from 3 to 35 mol % of units of the formula V



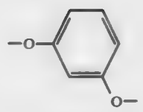
V

and one or more of the repeat units

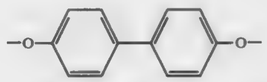
(c2) from 2 to 25 mol % of units of the formula VI



(c3) from 0 to 25 mol % of units of the formula VII

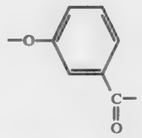


(c4) from 2 to 25 mol % of units of the formula VIII

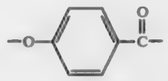


the total of the molar proportions of components (c1), (c2), (c3) and (c4) corresponding in each case to the total in mol % of components (a) and (b),

(d) if desired from 5 to 25 mol % of repeat units of the formula IX



(e) repeat units of the formula X



the molar proportions of components (a), (b), (c), (d) and (e) in each case adding up to 100 mol %.

4,728,715

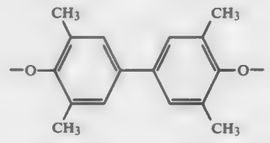
WHOLLY AROMATIC POLYESTERS AND PREPARATION THEREOF

Hans-Jakob Kock, Ludwigshafen; Michael Portugall, Wachenheim, and Juergen Hambrecht, Münster-Hiltrup, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,717
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542815
Int. Cl.[4] C08G 63/02, 63/18
U.S. Cl. 528—193 13 Claims

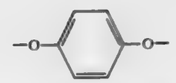
1. A wholly aromatic polyester which forms a liquid-crystalline fiber-forming melt below 300° C. and is composed of

(a) from 10 to 25 mol % of repeat units of the formula I

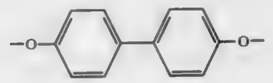


I

(b) from 5 to 15 mol % of repeat units of the formula II



(c) from 5 to 15 mol % of repeat units of the formula III



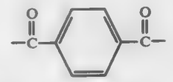
III

(d) not less than 10 mol % of repeat units of the formula IV



IV

(e) a molar amount corresponding to the total amount of (a), (b) and (c) of repeat units of the formula V



V

the molar proportions of components a, b, c, d and e adding up to 100 mol % in each case.

4,728,716

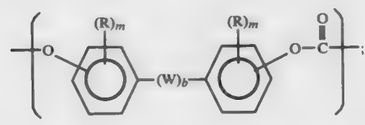
POLYCARBONATE EXHIBITING IMPROVED IMPACT PROPERTIES CONTAINING DIVALENT RESIDUE OF POLYMERIZED ALKADIENE MONOMER

Victor Mark, deceased, late of Evansville, Ind. (by Carol M. Mark, legal representative); Ester H. Mark, legal representative, Springville, N.Y., and Edward N. Peters, Lenox, Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 12, 1985, Ser. No. 797,258
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—196 18 Claims

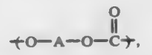
1. An aromatic carbonate resin comprised of:

(i) at least one recurring structural unit represented by the formula



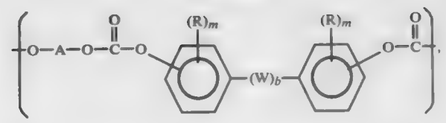
and

(ii) at least one recurring structural unit selected from structural units represented by the formulae



-continued

II



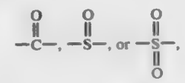
or mixtures thereof;

wherein

R is independently selected from halogen, monovalent hydrocarbon radicals, or monovalent hydrocarbonoxy radicals,

W is selected from divalent hydrocarbon radicals, —O—, —S—, —S—S—,

IV



A is the divalent residue of at least one polymerized conjugated alkadiene and has a weight average molecular weight of at least about 600,

m is independently selected from integers having a value of from 0 to 4, and

b is either zero or one.

4,728,717

POLYESTERS OF TRANS-4,4'-STILBENEDICARBOXYLIC ACID, 1,4-CYCLOHEXANEDIMETHANOL AND 1,4-BUTANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1987, Ser. No. 23
Int. Cl.[4] C08G 63/52, 63/54
U.S. Cl. 528—306 7 Claims

1. A copolyester comprising repeating units from at least 80 mol % trans-4,4'-stilbenedicarboxylic acid, repeating units from about 95–50 mol % 1,4-butanediol and repeating units from about 5–50 mol % 1,4-cyclohexanedimethanol, the total mol % of acid components and glycol components each being 100 mol %, and said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 25/35/40 (wt/wt/wt) phenol/tetrachloroethane/p-chlorophenol at a concentration of 0.1 g/100 mL.

4,728,718

POLYESTERS OF TRANS-4,4'-STILBENEDICARBOXYLIC ACID, 1,6-HEXANEDIOL AND 1,4-CYCLOHEXANEDIMETHANOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1987, Ser. No. 24
Int. Cl.[4] C08G 63/52
U.S. Cl. 528—306 7 Claims

1. A copolyester comprising repeating unit from at leasst 80 mol % trans-4,4'-stilbenedicarboxylic acid, repeating units from about 55–5 mol % 1,4-cyclohexanedimethanol and repeating units from about 45–95 mol % 1,6-hexanediol, the total mole % of said acid components and said glycol components each being 100 mol %, and said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 25/35/40 (wt/wt/wt) phenol/tetrachloroethane/p-chlorophenol at a concentration of 0.1 g/100 mL.

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4,728,719
POLYESTERS OF TRANS-4,4'-STILBENEDICARBOXYLIC ACID, 1,6-HEXANEDIOL, AND ETHYLENE GLYCOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1987, Ser. No. 25
Int. Cl.[4] C08G 63/52
U.S. Cl. 528—306 7 Claims

1. A copolyester comprising repeating units from at least 80 mol % trans-4,4'-stilbenedicarboxylic acid, repeating units from about 95–60 mol %, 1,6-hexanediol and repeating units from about 5–40 mol % ethylene glycol, the total mol % of acid components and glycol components each being 100 mol %, and said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 25/35/40 (wt/wt/wt) phenol/tetrachloroethane/p-chlorophenol at a concentration of 0.1 g/100 mL.

4,728,720
POLYESTERS OF TRANS-4,4'-STILBENEDICARBOXYLIC ACID, ETHYLENE GLYCOL, AND 1,4-BUTANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1987, Ser. No. 27
Int. Cl.[4] C08G 63/52
U.S. Cl. 528—306 7 Claims

1. A copolyester comprising repeating units from at least 80 mol % trans-4,4'-stilbenedicarboxylic acid, repeating units from about 95–60 mol % 1,4-butanediol and repeating units from about 5–40 mol % ethylene glycol, the total mol % of acid components and glycol components each being 100 mol %, and said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 25/35/40 (wt/wt/wt) phenol/tetrachloroethane/p-chlorophenol at a concentration of 0.1 g/100 mL.

4,728,721
POLYMER, PRODUCTION AND USE THEREOF

Masaki Yamamoto; Hiroaki Okada; Yasuaki Ogawa, all of Osaka, and Tsutomu Miyagawa, Saitama, all of Japan, assignors to Takeda Chemical Industries, Ltd. and Wako Pure Chemical Industries, Ltd., both of Osaka, Japan

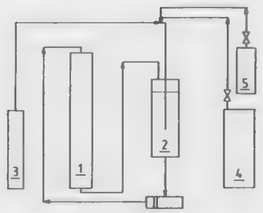
Filed May 1, 1986, Ser. No. 858,040
Claims priority, application Japan, May 7, 1985, 60-97617
Int. Cl.[4] C08G 63/74
U.S. Cl. 528—361 11 Claims

1. A biodegradable high molecular polymer useful as an excipient in producing a pharmaceutical preparation comprising a copolymer or homopolymer of about 50–100 mole percent of lactic acid and about 50–0 mole percent of glycolic acid having a weight average molecular weight of about 2,000 to 50,000 and wherein the content of water-soluble low molecular compounds, as calculated on the assumption that each of said compounds is a monobasic acid, is less than 0.01 mole per 100 grams of said high molecular polymer.

4,728,722
PREPARATION OF POLYOXYBUTYLENE POLYOXYALKYLENE GLYCOLS HAVING A NARROW MOLECULAR WEIGHT DISTRIBUTION AND A REDUCED CONTENT OF OLIGOMERIC CYCLIC ETHERS

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 13,675
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606479
Int. Cl.[4] C08G 65/20
U.S. Cl. 528—413 8 Claims



1. In a process for the batchwise preparation of polyoxybutylene polyoxyalkylene glycols by copolymerizing tetrahydrofuran with a 1,2-alkylene oxide in the presence of compounds containing reactive hydrogen, the polymerization being carried out over a bleaching earth catalyst or zeolite catalyst, and any copolymers containing ester groups which may be formed being hydrolyzed, the improvement which comprises feeding the 1,2-alkylene oxide to the reaction mixture in such a manner that the concentration of the 1,2-alkylene oxide in the reaction mixture is kept below 2% by weight during the polymerization.

4,728,723
PROCESS FOR PURIFICATION OF POLYPHENYLENE-SULFIDE

Yoshiaki Nakamura, Chiba; Kazuo Tedori, Itami, and Hirobumi Ishikawa, Kobe, all of Japan, assignors to Tohpren Co., Ltd., Chiba, Japan

Filed Mar. 20, 1987, Ser. No. 28,584
Claims priority, application Japan, Mar. 24, 1986, 61-066681
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—486 6 Claims

1. A process for the purification of polyphenylene-sulfide, which comprises adding an inorganic acid or organic acid to a slurry of polyphenylenesulfide as-obtained by condensation reaction of an aromatic polyhalide compound with an alkali metal sulfide in the presence of a polar organic solvent, to adjust the pH of the slurry to a value not higher than 6, stirring the pH-adjusted slurry, filtering the slurry, and water-washing and drying the recovered solid.

4,728,724
OPTICAL DATA STORAGE MEDIUM COMPRISING A CHROMOPHORE/POLYMER INFORMATION LAYER

R. Sidney Jones, Jr., Randolph; Michael M. Besso, West Orange, and James E. Kuder, Fanwood, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 8, 1985, Ser. No. 720,605
Int. Cl.[4] G03C 5/24; G03F 7/26
U.S. Cl. 430—19 5 Claims

1. A method of erasing a deformation information pattern of an optical information medium, which deformation pattern is formed in a film deposited on a substrate and with said erasing being achieved by heating or imparting energy to said film, the improvement which comprises said film being comprised of a polymer and a tetracyano quinonedimethane chromophore, with the chromophore being chemically bound to the polymer.

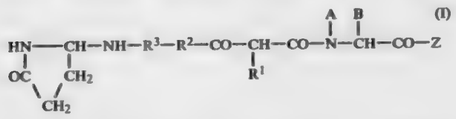
2. A readable information medium comprising a thermally stable substrate having coated thereon a layer comprising an information track comprised of a succession of spaced pits, said layer being comprised of a dimer acid polyamide polymer and a chromophore which is comprised of a functional moiety selected from the group consisting of a triazine, sulfate ester of beta-hydroxyethylsulfone, pyrimidine, quinoxaline, benzthiazole and pyridazone functional moiety, which chromophore is chemically bound to the polymer.

4,728,725
RETRO-INVERTED PEPTIDES ANALOGUES OF BRADYKININ POTENTIATOR BPP_{5a}

Alessandro Sisto, Rome; Antonio S. Verdini, Monterotondo, and Antonino Virdia, Rome, all of Italy, assignors to Eairicerche, S.p.A. and Enichem, S.p.A., both of Milan, Italy

Filed Dec. 20, 1985, Ser. No. 811,487
Claims priority, application Italy, Dec. 21, 1984, 24200 A/84
Int. Cl.[4] C07K 7/18, 7/02
U.S. Cl. 530—314 3 Claims

1. Retro-inverted peptides which are analogues of Bradykinin Potentiating Pentapeptide having the general formula:



effective as antihypertensives and, resistant to angiotensin conversion enzyme, wherein:

R^3 is D-Lysine, R^2 is D-Phenylanine and

R^1 represents the side chain of aminoacid residues present in the chains of natural peptides;

A and B, taken together, are a $—(CH_2)_m—$ residue closed to form a ring on the nitrogen and caron atoms to which they are bonded, with one carbon atom of the $—(CH_{2p'})_w—$ bridge being directly bonded to an o-benzyl or to an -S-phenyl group;

m is equal to 3 or 4; and

z represents a hydroxy, alkylhydroxy or amino group.

4,728,726
GRF ANALOGS IIIB

Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

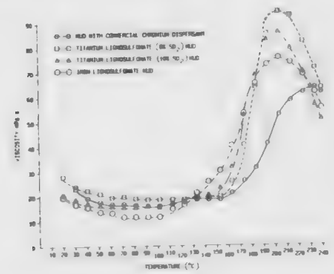
Continuation of Ser. No. 736,180, May 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 432,663, Oct. 4, 1982, Pat. No. 4,563,352, which is a continuation-in-part of Ser. No. 457,862, Jan. 13, 1983, Pat. No. 4,529,595, which is a continuation-in-part of Ser. No. 488,748, Apr. 26, 1983, Pat. No. 4,595,676, which is a continuation-in-part of Ser. No. 532,170, Sep. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 545,094, Oct. 25, 1983, Pat. No. 4,518,586, which is a continuation-in-part of Ser. No. 611,844, May 18, 1984, Pat. No. 4,525,190. This application Dec. 8, 1986, Ser. No. 939,342
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.[4] C07K 7/10
U.S. Cl. 530—324 25 Claims

1. A synthetic peptide, or a nontoxic salt thereof, having the amino acid residue sequence: R_1-R_2-R_3-Ala-Ile-Phe-Thr-R_8-Ser-R_{10}-Arg-R_{12}-R_{13}-R_{14}-R_{15}-Gln-R_{17}-R_{18}-Ala-Arg-Lys-Leu-R_{23}-R_{24}-R_{25}-Ile-R_{27}-R_{28}-R_{29}-R_{30}-R_{31}-R_{32} wherein R_1 is Tyr, D-Tyr, Met, Phe, D-Phe, pCl-Phe, Leu, His or D-His having either a C^{α}Me or N^{α}Me substitution or being unsubstituted; R_2 is Ala, D-Ala or D-NMA; R_3 is Asp or D-Asp; R_8 is Ser, Asn, D-Ser or D-Asn; R_{10} is Tyr or D-Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{14} is Leu or D-Leu; R_{15} is Gly or D-Ala; R_{17} is Leu or D-Leu; R_{18} is Tyr or Ser; R_{23} is Leu or D-Leu; R_{24} is His or Gln; R_{25} is Glu, Asp, D-Glu or D-Asp; R_{27} is Met, D-Met, Ala, Nle, Ile, Leu, Nva or Val; R_{28} is Asn, Ser, D-Asn or desR_{28}; R_{29} is Arg, D-Arg or DesR_{29}; R_{30} is Gln or [desGln] desR_{30}; R_{31} is Gln or DesR_{31}; and R_{32} is Gly or desR_{32}, provided however, that at least one of the following is present: R_2 is D-NMA; R_{27} is Nle; R_{28} is D-Asn.

4,728,727
MODIFIED LIGNOSULFONATE DRILLING FLUID DISPERSANTS AND PROCESS FOR THE PREPARATION THEREOF

Marten Reintjes, Shelton, Wash., and Craig D. Marken, Tananger, Norway, assignors to ITT Corporation, New York, N.Y.

Filed Jan. 28, 1987, Ser. No. 7,772
Int. Cl.[4] C08H 5/02
U.S. Cl. 530—500 26 Claims



1. A method of making an additive for drilling mud from soluble base spent sulfite liquor comprising:

ultrafiltering said soluble base spent sulfite liquor;

separating resulting concentrate and filtrate;

sulfonating the said concentrate; and

reacting said sulfonated concentrate with a metal salt in the presence of an oxidizing agent, said metal salt being selected from the group consisting of chromium, ferrous, ferric, titanium and zirconium salts to produce a metal lignosulfonate additive for drilling mud.

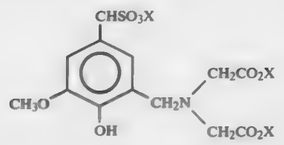
4,728,728
SULFONATED LIGNO-AMINODICARBOXYLATES AND PROCESS FOR MAKING SAME

Stephen Y. Lin, Wausau, and Lin H. Hoo, Schofield, both of Wis., assignors to Reed Lignin Inc., Rothschild, Wis.

Filed May 30, 1986, Ser. No. 869,089
Int. Cl.[4] C08H 5/02
U.S. Cl. 530—501 16 Claims

1. As a composition of matter, a sulfonated lignoaminodicarboxylate comprising a reaction product of a sulfonated lignin material containing 2 to 8 percent by weight of combined organic sulfur, and about 0.5–3 millimoles of ammonia, about 1.5–9 millimoles of formaldehyde, and about 1–6 millimoles of sodium cyanide, per gram of lignin in said material, and of the general formula

Lignin



wherein X is an alkali metal or ammonium cation, and Lignin is a polymeric sulfonated lignin material.

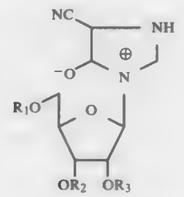
4,728,729

CYANOIMIDAZOLE NUCLEOSIDE DERIVATIVES

Yuzo Tarumi, Nishinomiya; Toshio Atsumi, Kawanishi, and Masaru Fukui, Toyonaka, all of Japan, assignors to Sumitomo Pharmaceuticals Co., Ltd., Osaka, Japan

Filed Mar. 8, 1985, Ser. No. 709,647
Claims priority, application Japan, Mar. 14, 1984, 59-49563
Int. Cl.⁴ C07H *19/067, 19/052*
U.S. Cl. 536—23 **8 Claims**

1. A cyanoimidazole nucleoside of the formula:



wherein R_1, R_2 and R_3 are each a hydrogen atom or an acyl group and a pharmaceutical salt thereof.

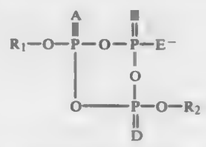
4,728,730

SYNTHESIS OF NUCLEOSIDE THIOPHOSPHOANHYDRIDES

Perry A. Frey, Madison, Wis., and Hsu-Tso Ho, Lowell, Mass., assignors to Wisconsin Alumini Research Foundation, Madison, Wis.

Filed Sep. 12, 1984, Ser. No. 650,299
Int. Cl.⁴ C07H *19/067*
U.S. Cl. 536—28 **6 Claims**

1. A cyclic compound having the following formula:



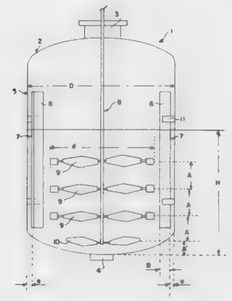
where R_1 and R_2 are nucleoside moieties, where A, B, D and E are selected from oxygen and sulfur, and where one of A, B, D and E is not oxygen.

4,728,731

REACTOR AND ITS USE IN POLYSACCHARIDE ETHER PRODUCTION

Wilfried Raehse, Duesseldorf; Willi Wuest, Ratingen, and Norbert Kuehne, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,231
Int. Cl.⁴ C08B *11/00, 11/08*
U.S. Cl. 536—96 **16 Claims**



1. In a process for the production of cellulose ethers from cellulose suspended in organic solvents and alkyl halides and-/or lower epoxides by alkalization and etherification with stirring, the improvement of conducting said production in a reactor comprising: a vertical cylindrical walled vessel of a diameter D with a convexly curved top and bottom; a vertical, rotatable, axial shaft extending through said vessel; a plurality of pairs of symetrically opposed stirrer elements radially extending from said shaft a total width d, said pairs spaced an interval A from each other along said shaft, the lowest of said pairs being adjacent to and spaced a distance A′ from the bottom of said vessel; a plurality of baffles extending vertically along the inner cylindrical wall of said vessel, permitting said stirrer elements to clear, each said baffle having a width B and an inner edge spaced a radial distance a from said inner cylindrical wall; inlet means at the top of said vessel and outlet means at the bottom of said vessel; the dimensional ratios between D, d, A and a being

d=0.6 to 0.8 D,
A=0.15 to 0.20 D, and
a=0.035 to 0.05 D;

wherein reactants are charged through said inlet means until they fill said vessel to a height H which is 0.1 to 0.33 D above the uppermost pair of stirrer elements; said reactants are continuously stirred by rotation of said shaft and elements at a peripheral speed of 4.5 to 6.7 m.s. during the reaction; and the formed reaction product is discharged through said outlet means.

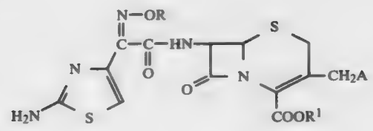
4,728,732

C-3′ACYLSULFONAMIDO CEPHALOSPORIN ANALOGS

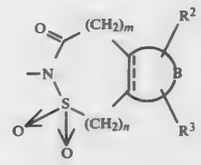
Jerauld S. Skotnicki, Chadds Ford, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,459
Int. Cl.⁴ C07D *501/36;* **A61K** *31/545*
U.S. Cl. 540—227 **7 Claims**

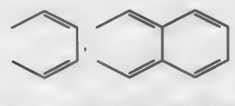
1. A compound having the formula



wherein
R is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclo lower alkyl, or phenyl;
R^1 is hydrogen, lower alkyl or an alkali metal cation;
A is



R^2 and R^3 are each individually lower alkyl, carboxy, lower alkoxycarbonyl, phenoxycarbonyl, amino, mono- or di-lower alkyl substituted amino, hydroxy, lower alkoxy, phenoxy, carbamoyl, mono- or di-lower alkyl substituted carbamoyl, lower alkylcarbonyl, benzoyl, cyano, nitro, lower alkanoylamino or benzamido;
m=0–1;
n=0–1;
B represents



or a thieno or pyrido moiety; and the dotted line denotes an optional double bond.

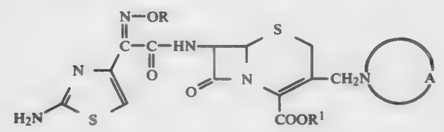
4,728,733

C-3′ THIADIAZINYL CEPHALOSPORIN ANALOGS

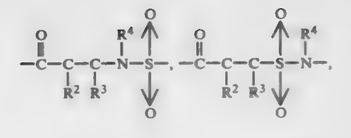
Jerauld S. Skotnicki, Chadds Ford, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,460
Int. Cl.⁴ C07D *501/36;* **A61K** *31/545*
U.S. Cl. 540—227 **5 Claims**

1. A compound having the formula



wherein
R is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclo lower alkyl, or phenyl;
R^1 is hydrogen, lower alkyl or an alkali metal cation;
A is



or



and the dotted line denotes an optional double bond; and R^4 is hydrogen, lower alkyl, phenyl or naphthyl.

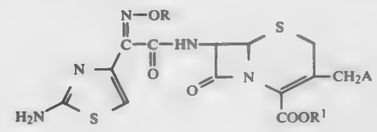
4,728,734

C-3′THIOIMINOSULFONYL CEPHALOSPORIN ANALOGS

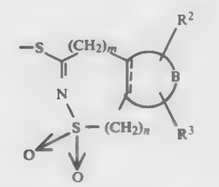
Jerauld S. Skotnicki, Chadds Ford, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,645
Int. Cl.⁴ C07D *501/36;* **A61K** *31/545*
U.S. Cl. 540—227 **3 Claims**

1. A compound having the formula



wherein
R is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclo lower alkyl or phenyl;
R^1 is hydrogen, lower alkyl or an alkali metal cation;
A is

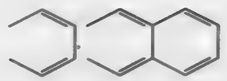


R^2 and R^3 are each individually lower alkyl, carboxy, lower alkoxycarbonyl, phenoxycarbonyl, amino, mono- or di-lower alkyl substituted amino, hydroxy, lower alkoxy, phenoxy, carbamoyl, mono- or di-lower alkyl substituted cabamoyl, lower alkylcarbonyl, benzoyl, cyano, nitro, lower alkanolyamino or benzamido;

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VOL 1088 ISS 1 MR 1 1988 UMI

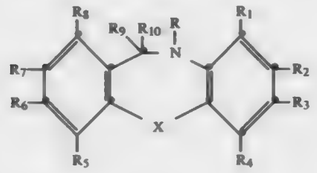
m=0–1;
n=0–1;
B represents



or a thieno or pyrido moiety; and the dotted line denotes an optical double bond.

4,728,735
10,11-DIHYDRO-DIBENZO-[B,F][1,4]-THIAZEPIN DERIVATIVES
Patrice C. Belanger, Dollard des Ormeaux; Joshua Rokach, Laval, and John Scheigetz, Dollard des Ormeaux, all of Canada, assignors to Merck & Co., Inc., Rahway, N.J.
Continuation of Ser. No. 660,596, Oct. 15, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 928,747
Int. Cl.[4] A61K *31/55*; C07D *281/16*
U.S. Cl. 540—488 **11 Claims**

1. Compounds having the formula:

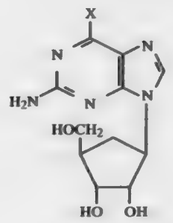


wherein
X is thio, sulfonyl or sulfinyl;
R is C_1 to C_{20} alkyl which may be straight chain, branched chain or cyclic;
R_1 to R_8 are each independently selected from hydrogen, hydroxy, halogen including F, Cl, Br, I, —OR, OCOR, NHR, $N[R]_2$, NO_2, SR, SOR, SO_2R, SO_2NHR, $SO_2N(R)_2$, CN, COOR, CF_3, CF_3S, CHO, COR, CH_2OR, R, phenyl, phenyl substituted by one or more groups selected from OH, C_1 to C_6-alkyl, COOR, CN, NO_2, CF_3, SR, NHR or $N(R)_2$;
R_9 is H or OH;
R_{10} is H, or together
R_9 and R_{10} form a double bonded oxo group;
and pharmaceutically acceptable salts thereof.

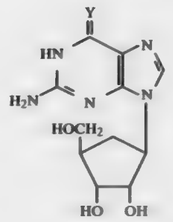
4,728,736
CARBOCYCLIC ANALOGS OF PURINE RIBOFURANOSIDES
Y. Fulmer Shealy, Birmingham, and Joe D. Clayton, Brookside, both of Ala., assignors to Southern Research Institute, Birmingham, Ala.
Filed Mar. 28, 1984, Ser. No. 594,372
Int. Cl.[4] C07D *239/00*
U.S. Cl. 544—254 **8 Claims**

1. A compound having one of the following formulas:

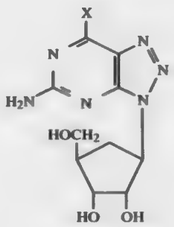
Formula I



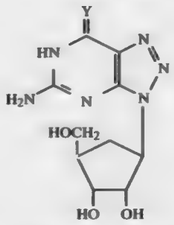
Formula II



Formula III



Formula IV



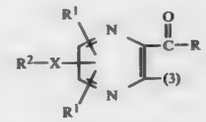
wherein X is fluorine, iodine, bromine, an amino group, an alkylamino group, an alkoxy group or an alkylthio group and Y is sulfur.

4,728,737
HIGH PERFORMANCE TWO-COMPONENT EPOXY STRUCTURAL ADHESIVE WITH CHEMICAL THIXOTROPY
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.
Continuation of Ser. No. 730,142, May 3, 1985, Pat. No. 4,578,424. This application Jan. 21, 1986, Ser. No. 819,963
Int. Cl.[4] C07D *295/04*
U.S. Cl. 544—400 **3 Claims**

1. A tertiary amine containing amide amine composition resulting from the amidification of substantially one mole of dimerized linoleic acid with substantially two moles of a member selected from the group consisting of 2-amino-ethyl piperazine and bis-(amino propyl) piperazine.

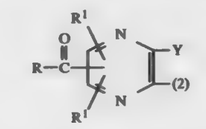
4,728,738
SMOKING COMPOSITIONS CONTAINING ACYLPYRAZINE ETHER FLAVORANTS
David L. Williams; Everett W. Southwick, and Yoram Houminer, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Oct. 1, 1985, Ser. No. 782,545
Int. Cl.[4] C07D *241/16, 241/18, 405/12*
U.S. Cl. 544—405 **11 Claims**

1. An acylpyrazine ether corresponding to the formula:



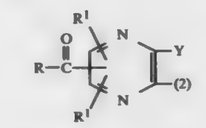
where R is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, R^1 is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, X is etheric oxygen or sulfur, and R^2 is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 1–12 carbon atoms, with the proviso that the position-(3) substituent is not hydrogen.

10. A halo-acylpyrazine corresponding to the formula:



where Y is a chlorine atom, R is a substituent selected from aliphatic, alicylclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, and R^1 is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, with the proviso that the position-(2) substituent is not hydrogen.

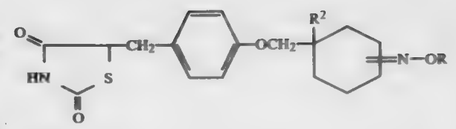
11. A halo-acylpyrazine corresponding to the formula:



where Y is a bromine atom, R is a substituent selected from aliphatic, alicylclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, and R^1 is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, with the proviso that the position-(2) substituent is not hydrogen.

4,728,739
HYPOGLYCEMIC THIAZOLIDINEDIONES
Kenneth L. Kees, West Chester, and Robert S. Cheeseman, Swedeland, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
Filed Jan. 15, 1987, Ser. No. 62,268
Int. Cl.[4] C07D *277/34*
U.S. Cl. 548—183 **4 Claims**

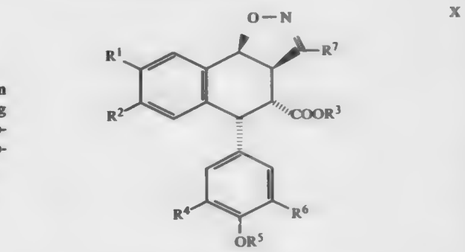
1. A compound of the formula:



in which
R is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or benzyl; and
R^2 is hydrogen or alkyl of 1 to 4 carbon atoms;
or a pharmaceutically acceptable salt thereof.

4,728,740
INTERMEDIATES FOR THE PRODUCTION OF EPIPODOPHYLOTOXIN AND RELATED COMPOUNDS AND PROCESSES FOR THE PREPARATION AND USE THEREOF
Dolatrai M. Vyas, Fayetteville, and Paul M. Skonezny, Clay, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Division of Ser. No. 722,932, Apr. 12, 1985, Pat. No. 4,644,072. This application Sep. 15, 1986, Ser. No. 907,442
Int. Cl.[4] C07D *261/20*
U.S. Cl. 548—241 **7 Claims**

1. A compound of the formula

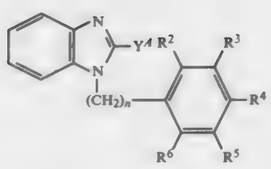


wherein
R^1 and R^2 each are independently hydrogen or (lower)alkoxy, or R^1 and R^2, taken together, is methylenedioxy;
R^3 is hydrogen or a carboxyl-protecting group;
R^4 and R^6 each are independently hydrogen or (lower)alkoxy;
R^5 is hydrogen or a phenol-protecting group; and
R^7 is hydrogen, halogen, (lower)alkoxycarbonyl, carboxyl, cyano, trimethylsilyl, phenylsulfonyl or phenoxycarbonyl in which the phenyl ring of R^7 may have one or two substituents independently selected from (lower)alkyl, halogen, (lower)alkoxy and trifluoromethyl;
or an acid addition salt thereof.

4,728,741
1-SUBSTITUTED-2-MERCAPTO BENZIMIDAZOLE COMPOUNDS AND INTERMEDIATES
Carl Kaiser, Haddon Heights, and Lawrence I. Kruse, Haddonfield, both of N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.
Filed Jan. 8, 1985, Ser. No. 689,680
Int. Cl.[4] C07D *235/28, 235/14*
U.S. Cl. 548—305 **7 Claims**

1. A compound of structure (IA)

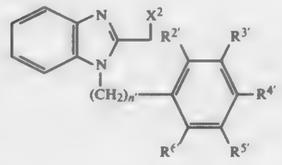
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(IA)

in which:
Y^4 is a group SR;
R is hydrogen or C_{1-4} alkyl;
n is 1;
R^3 and R^5 are hydrogen or halogen;
R^2 and R^6 are hydrogen; and
R^4 is hydroxy; or
a pharmaceutically acceptable salt or hydrate thereof.

7. A compound of structure (XII):



(XII)

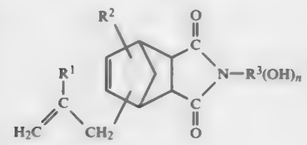
in which:
X^2 is N_3,
n' is 0 to 5 and $R^{2'}$ to $R^{6'}$ are selected from hydrogen, halogen, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, CO_2H, $CONH_2$, CHO, CH_2OH, CF_3, C_{1-4} alkoxy, SO_2C_{1-4} fluoroalkyl or CO_2C_{1-4} alkyl.

4,728,742
SUBSTITUTED, UNSATURATED, BICYCLIC IMIDES CONTAINING HYDROXYL GROUPS, AND POLYMERS THEREOF

Alfred Renner, Muntelier, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

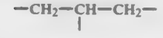
Filed Jun. 19, 1985, Ser. No. 746,428
Claims priority, application Switzerland, Jun. 27, 1984, 3095/84
Int. Cl.⁴ C07D *209/44*
U.S. Cl. 548—435 **13 Claims**

1. An imide of the formula I

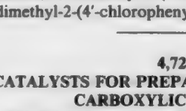


(I)

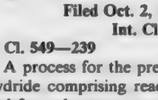
wherein R^1 and R^2 independently of one another are each hydrogen or methyl, n is 1, 2 or 3, and R^3 is a direct bond with n being 1, or C_2–C_{20}-alkylene,



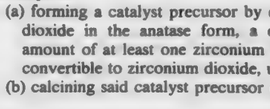
when n is 2,



when n is 2,



when n is 3, $—CH_2—CH_2[OCH_2CH_2]_m$ when n is 1 or $—CH_2CH_2CH_2[OCH_2CH_2CH_2]_m$ when n is 1 with m=1–10, C_5–C_{20} cycloalkylene or bis(C_5–C_{20} cycloalkylene) C_1–C_3 alkane having the OH(s) substituted on the cycloalkylene ring, a C_6–C_{10} aromatic radical or said C_6–C_{10} aromatic radical substituted by C_1–C_4 alkyl, or a group of the formula II



(II)

wherein T is methylene, isopropylidene, CO, O, S or SO_2; the OH groups being bound to different C atoms of R^3.

4,728,743
PROCESS FOR THE PRODUCTION OF 3-OXONITRILES

Karlheinz Drauz, Freigericht; Axel Kleemann, Hanau, and Elizabeth Wolf-Heuss, Mosbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 475,395, Mar. 15, 1983. This application Jul. 13, 1987, Ser. No. 72,707
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209472
Int. Cl.⁴ C07D *333/22;* **C07C** *121/50;* **A01N** *43/02*
U.S. Cl. 549—76 **6 Claims**

1. A compound selected from the group consisting of 1-methylcyclopropanoylacetonitrile, (2,2-dichloro-1-methyl)-cyclopropanoylacetonitrile, 4,4-dimethyl-2-ethyl-3-oxopentanenitrile, 4,4-dimethyl-2-(3'-thienyl)-3-oxopentanenitrile and 4,4-dimethyl-2-(4'-chlorophenyl)-3-oxopentanenitrile.

4,728,744
CATALYSTS FOR PREPARATION OF AROMATIC CARBOXYLIC ANHYDRIDES

Ramzi Y. Saleh, Baton Rouge, La., and Israel E. Wachs, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Oct. 2, 1985, Ser. No. 782,966
Int. Cl.⁴ C07D *307/89*
U.S. Cl. 549—239 **14 Claims**

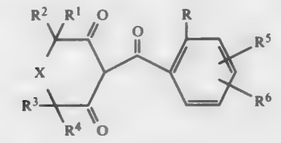
1. A process for the preparation of an aromatic carboxylic anhydride comprising reacting an aromatic hydrocarbon selected from the group consisting of alkyl substituted and unsubstituted aromatic hydrocarbons wherein the alkyl has 1 to 10 carbon atoms and the aromatic hydrocarbon has 6 to 14 carbon atoms, with a molecular oxygen-containing gas in the vapor phase in a reaction zone, in the presence of a solid oxidation catalyst, said solid oxidations catalyst being obtained by the steps of:
(a) forming a catalyst precursor by depositing on titanium dioxide in the anatase form, a continuous monolayer amount of at least one zirconium oxide source which is convertible to zirconium dioxide, upon calcining;
(b) calcining said catalyst precursor under conditions sufficient to convert at least a portion of said zirconium source into zirconium dioxide;
(c) depositing upon the calcined catalyst precursor a catalytically effective amount of a vanadium source which is convertible to vanadium oxide upon calcining; and
(d) calcining the catalyst solids formed in step (c) under conditions sufficient to convert at least a portion of said vanadium compound to vanadium oxide said catalyst containing from about 0.7 to 50 wt. % of vanadium oxides, calculated as V_2O_5 and the mole ratio of vanadium to zirconium is about 0.1:1 to 20,000:1.

4,728,745
SUBSTITUTED 4-BENZOYL-3,5-DIOXOTETRAHYDROPYRANS AND THIOPYRANS USEFUL AS HERBICIDES

Charles G. Carter, San Francisco, and Jeff K. Curtis, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 9, 1986, Ser. No. 872,080
Int. Cl.⁴ C07D *309/10, 335/02*
U.S. Cl. 549—417 **8 Claims**

1. A compound of the formula



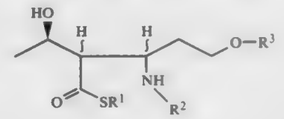
wherein
X is oxygen, sulfur or sulfonyl;
R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_m— wherein m is 0 or 2 and R^a is C_1–C_2 alkyl;
R^1 is hydrogen or C_1–C_4 alkyl;
R^2 is hydrogen or C_1–C_4 alkyl; or
R^1 and R^2 together are alkylene having 2 to 5 carbon atoms;
R^3 is hydrogen or C_1–C_4 alkyl;
R^4 is hydrogen or C_1–C_4 alkyl; or
R^3 and R^4 together are alkylene having 2 to 5 carbon atoms; and
R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) $—NR^cR^d$ wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)—$ wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) $—SO_2NR^cR^d$ wherein R^c and R^d are as defined; or (13) $—N(R^c)C(O)R^d$ wherein R^c and R^d are as defined and their salts.

4,728,746
β-AMINOTHIOL ESTER AND PROCESS FOR PREPARING THEREOF

Masakatsu Shibasaki, Mitaka, and Takamasa Iimori, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,893
Claims priority, application Japan, Nov. 5, 1984, 59-231151; Nov. 5, 1984, 59-231152
Int. Cl.⁴ C07C *153/09;* **C07D** *315/00;* **C07F** *7/02, 7/04*
U.S. Cl. 558—252 **3 Claims**

1. A β-Aminothio ester having the formula (I):



(I)

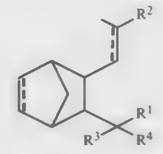
wherein R^1 is an alkyl group having from 1 to 4 carbon atoms or phenyl, R^2 is an amino-protecting group selected from the group consisting of benzyl, methoxyphenyl, and trialkylsilyl wherein each alkyl group has from 1 to 4 carbon atoms, and R^3 is a hydroxy-protecting group selected from the group consisting of benzyl, tetrahydropyranyl, and trialkylsilyl wherein each alkyl group has from 1 to 4 carbon atoms.

4,728,747
NOVEL 2,3-DISUBSTITUTED BICYCLO(2.2.1)HEPTANES AND HEPTENES, THEIR PREPARATION, AND THEIR USE AS SCENTS

Werner Hoffmann, New York, N.Y., and Lothar Janitschke, Kleinniedesheim, Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,928
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1985, 3300057
Int. Cl.⁴ C07C *121/48*
U.S. Cl. 558—428 **9 Claims**

1. A disubstituted bicyclo[2,2,1]heptane or -heptane of the formula:



(I)

wherein R^1 is C_1–C_3-alkyl; R^2 is C_1–C_8-alkyl or alkenyl, R^3 and R^4 together are =CH—CN, =CH—CO—OCH_3 or =CH—CO—OC_2H_5, or R^3 is —CH=CH_2 or —C≡CH, when R^4 is —OH or —O—CO—CH_3, or R^3 is H when R^4 is —CH_2—CO—OCH_3, —CH_2—CO—OC_2H_5 or —CH_2—C≡N and one or both of the dashed lines optionally is a bond.

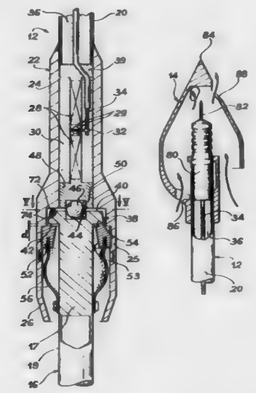
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4,728,748

LIGHTNING CONDUCTOR WITH PIEZOELECTRIC DEVICE FOR STARTING THE CORONA EFFECT

André Robert, Le Mesnil Saint Denis; Michel Roubinet, Paris, and Jacques Baumann, Boutigny sur Essonne, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 13, 1987, Ser. No. 37,712
Claims priority, application France, Apr. 11, 1986, 86 05214
Int. Cl.[4] H02G *13/00*
U.S. Cl. 174—3 14 Claims



1. A lightning conductor comprising a substantially vertical pole, an intercepting point located in the upper part of the pole and electrically connected to the ground, at least one electrode in the vicinity of the intercepting point, at least one piezoelectric crystal electrically connected to said electrode and means for compressing the piezoelectric crystal, wherein the compressing means comprise a fixed support on which the pole is mounted so as to be able to pivot about at least one horizontal axis, a bearing member by means of which the pole rests on the support, said bearing member exerting a reaction force at least in certain pole positions and means for transmitting said reaction force to the crystal, the lightning conductor also having means for limiting the pivoting movement of the pole.

4,728,749

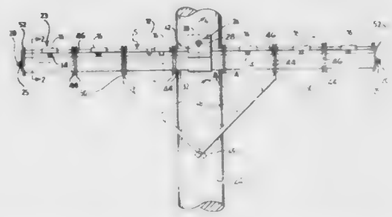
UTILITY POLE ASSEMBLY

John K. Knight, Doncaster, Australia, assignor to R.F.D. Consultants Pty. Ltd., Melbourne, Australia

PCT No. PCT/AU85/00203, § 371 Date Apr. 17, 1986, § 102(e) Date Apr. 17, 1986, PCT Pub. No. WO86/01635, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 27, 1985, Ser. No. 853,022
Claims priority, application Australia, Sep. 3, 1984, PG6896
Int. Cl.[4] H02G *7/20*; E04H *12/24*; H01B *17/16*
U.S. Cl. 174—45 R 9 Claims

1. A utility pole assembly, said assembly comprising:

a utility pole, a cross-arm, a bracket connecting the cross-arm to the pole and a pair of stays which extend from the pole to spaced locations on the cross-arm, said cross-arm comprising a plurality of ceramic elements each including a bore therethrough, said elements being arranged so that their bores are aligned, said cross-arm including spacing means located between adjacent elements, each spacing means having openings therethrough, said cross-arm further including a tension member which passes through said bores and said openings and clamps said elements together, and wherein each element comprises a body having a top portion with conductor support means for supporting an electrical conductor which in use extends transversely relative to the cross-arm, said bracket having an opening therein which is generally complementary in



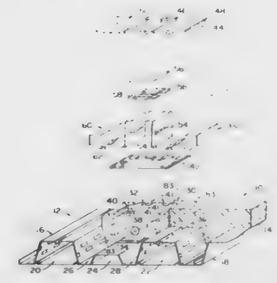
shape to the body so that the cross-arm can extend therethrough and be firmly clamped by the bracket to the pole.

4,728,750

RECEPTABLE SUPPORT ASSEMBLY

John L. Teslovich, Pittsburgh, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Feb. 20, 1987, Ser. No. 16,950
Int. Cl.[4] H02G *3/18*
U.S. Cl. 174—48 6 Claims



1. In a receptacle support assembly for use with an infloor electrical wiring distribution system, said assembly comprising: spaced-apart vertical walls, and a receptacle cover extending generally horizontally between said walls, the improvement comprising:

a receptacle mounting plate extending laterally outwardly from one of said walls in a direction away from the other of said walls and lying generally parallel with said cover, said plate terminating in a downwardly depending outer wall.

4,728,751

FLEXIBLE ELECTRICAL CONNECTION AND METHOD OF MAKING SAME

Michael J. Canestaro, Endicott, and William J. Summa, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

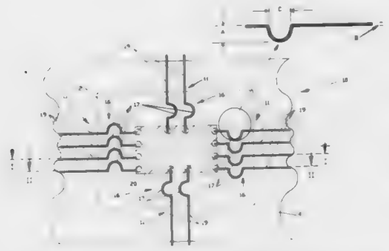
Filed Oct. 6, 1986, Ser. No. 915,485
Int. Cl.[4] H05K *1/02*
U.S. Cl. 174—68.5 2 Claims

1. A flexible electrical connection for mounting an electronic device made primarily of silicon on a circuitized substrate made primarily of an organic material, comprising:

a plurality of adjacent circuit lines each having a terminus floating on a relatively low adhesive area of the circuitized substrate, each terminus having a generally "U" shaped stress relief bend nested within the generally "U"

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shaped stress relief bend of the circuit line adjacent to it, and each circuit line having a portion, extending from its



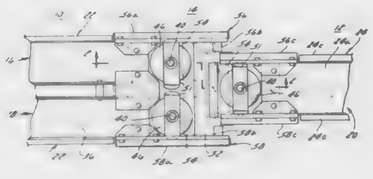
terminus, which is fixed to a relatively high adhesive area of the circuitized substrate.

4,728,752

JOINT ASSEMBLY FOR CONNECTING BUS DUCTS HAVING UNEQUAL NUMBERS OF RUNS

Loy A. Hicks, Jr., Nazareth, and Edward P. Sherwood, Allentown, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 22, 1986, Ser. No. 899,313
Int. Cl.[4] H02G *5/08*
U.S. Cl. 174—88 B **12 Claims**



7. In combination, a first bus duct including a plurality of phases each being carried by a plurality of bus bars located in a plurality of runs, a second bus duct having fewer runs than said first bus duct and the same number of phases as said first bus duct, and a joint assembly connected between said bus ducts and electrically connecting said phases of said first bus duct to corresponding phases of said second bus duct, said joint assembly comprising:

a plurality of bolt assemblies, one for each run of each of said bus ducts, attached at the end of one of said bus ducts and facing the other of said bus ducts, and a plurality of reducer plates, one for each phase, each of said reducer plates having a plurality of tabs thereon, the number of tabs corresponding to the number of bolt assemblies;

each of said bolt assemblies comprising:

a plurality of splice means, each having a central opening and arranged in stacked relationship, the end portion of the individual corresponding bus bar of the respective duct and a tab of one of said reducing plates being secured in conducting contact with a respective one of said splice means;

a plurality of generally flat, elongated insulator plates also having a central opening and arranged in stacked relationship with individual insulator plates being positioned between adjacent phases within said bolt assembly;

threaded fastener means extending through said central openings, said threaded fastener means when tightened urging said splice means into contact pressure with the corresponding bus bars and reducing plate tabs to establish electrical connection from the phases of said first bus duct, through said reducer plates to the phases of said second bus duct; and

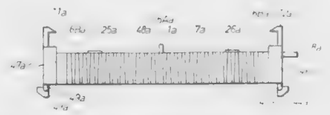
insulator sleeve means closely fitting inside said central openings and located between said threaded fastener means and said splice means.

4,728,753

AFFIXATION DEVICE FOR ELECTRONIC DISPLAY

Yoshihito Nakano, Yokohama, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Mar. 4, 1986, Ser. No. 836,152
Claims priority, application Japan, Apr. 8, 1985, 60-51984[U]
Int. Cl.[4] H05K *7/12, 1/18*
U.S. Cl. 174—138 G **7 Claims**



1. An affixation device for an electronic display which comprises:

a flat platelike rest on which a platelike electronic display may be set;

means for securely positioning and holding an electronic display on a first surface of said platelike rest;

support means for securely positioning and holding said flat platelike rest on a wiring board; and

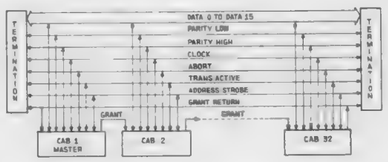
terminal holding means having a plurality of insertion grooves and formed at an edge portion of the platelike rest for holding terminals of the electronic display, wherein said terminal holding means comprise a plurality of terminal holding members extending from said edge portion and defining said plurality of insertion grooves therebetween, each of said insertion grooves extending from an open top end thereof adjacent said first surface of said platelike rest to an open bottom end thereof adjacent a bottom surface of said platelike rest, and wherein said grooves being open at a side thereof opposite said edge portion of said platelike rest and tapering to be smaller in width at said bottom end thereof than at said top end thereof.

4,728,754

INTER-BUS SYSTEM

Glenville C. E. Fowler, and David J. Tozer, both of Dorset, Great Britain, assignors to Plessey Overseas Limited, Ilford, England

Filed Aug. 29, 1986, Ser. No. 902,246
Claims priority, application United Kingdom, Sep. 3, 1985, #521506
Int. Cl.[4] H04Q *3/00*
U.S. Cl. 178—2 C **3 Claims**



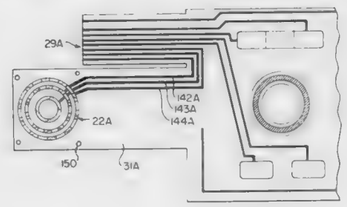
1. An inter-bus system for interconnecting a plurality of communication systems by way of an interfacing means, each communication system is provided with a bus converter for interfacing the inter-bus system with the bus of each communication system, the inter-bus system includes a grant return path, and the bus converters are chained by a grant link arrangement, used to carry a grant pulse which is passed on around the chained bus converters to identify the master converter for an inter-bus system transfer; wherein, when the grant pulse is received by a bus converter wanting to transmit, that bus converter breaks the chain and performs the transmission required, when the transmission is complete the completing bus converter surrenders its master state by generating the grant pulse, said plurality of communication systems are interconnected by a first line which is made active by a transmitter in the system, the converter of which disignated as the master, and remains active throughout the duration of a transmission, after which it is made inactive by the transmitter to allow the grant pulse to be passed on, and, wherein a system in a receiving mode monitors the first line to detect if it is active, and if an active line is detected, a second line which interconnects said plurality of communication systems is monitored to detect if it is in an active state, and if detected, address data being transmitted by another system is interrogated to ascertain if it corresponds to the address of the system in receiving mode, wherein the system in receiving mode continues to receive data if the address corresponds, the data next received indicates the number of bytes being transmitted by the other system, and the system in the receiving mode continues to accept data until a byte count equals the number of bytes received, and if data continues to be sent after the byte count equals the number of bytes received, while the first line is active, an abort signal is generated by the system in receiving mode.

4,728,755

ROTARY SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Daniel L. Fowler, Kentwood, Mich., and John W. Froeb, Riverside, Ill., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 676,440, Nov. 29, 1984, Pat. No. 4,625,084.
This application Jul. 23, 1986, Ser. No. 888,946
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] H01H *19/58*
U.S. Cl. 200—11 DA **16 Claims**



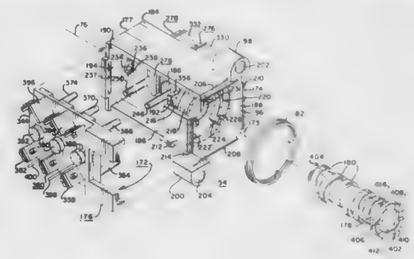
1. In a rotary switch construction comprising a surface means having a substantially circular electrically conductive code pattern thereon, an electrically conductive wiper contact means cooperating with said surface means for making contact with a selected part of said pattern, and a rotary selector operatively associated with said surface means and said wiper contact means for selecting the desired part of said pattern that is to be contacted by said wiper contact means, the improvement wherein said wiper contact means comprises a first pair of electrically connected wiper contacts disposed to respectively contact said pattern on a first substantially circular path thereof at points thereon that are disposed approximately 180° from each other, a second pair of electrically connected wiper contacts disposed to respectively contact said pattern on a second substantially circular path thereof at points thereon that are disposed approximately 180° from each other, and a third pair of electrically connected wiper contacts disposed to respectively contact said pattern on a third circular path thereof at points that are disposed approximately 180° from each other, said wiper contact means comprising a body portion, each wiper contact having opposed ends one of which is connected to said body portion and the other of which engages said code pattern, each wiper contact of the respective pair thereof extending from said body portion in a direction substantially opposite to the extending direction of the other wiper contact of that respective pair thereof, said other ends of said wiper contacts being substantially aligned on a diameter of said circular code pattern with one of the pairs of wiper contacts having each wiper contact thereof extending in a direction substantially opposite to the extending direction of said wiper contacts of the other pairs thereof that are disposed on the same side of said diameter of said circular code pattern therewith, said surface means comprising part of a circuit board means that extends beyond said circular code pattern and having a plurality of conductive paths thereon that are respectively electrically connected to said circular code pattern and lead away from the same.

4,728,756

KEY SWITCH HAVING PIVOTABLE HOUSING MEMBERS AND CONTACT POSITIONING POSTS

Adolf H. Martin, Glenview, Ill., assignor to Adams Elevator Equipment Company, Skokie, Ill.

Filed Apr. 30, 1986, Ser. No. 857,679
Int. Cl.[4] H01H *27/06, 9/02*
U.S. Cl. 200—43.08 **6 Claims**



1. A key switch of modular construction, comprising:

a halo module,

a lock module mounted in said halo module,

an electrical contact module,

said lock and halo modules being assembled with said electrical contact module on a common longitudinal axis,

said electrical contact module including a housing having first and second separable housing members which define axial ends and internal and external sides of said housing,

means mechanically interlocking said first and second housing members at one axial end of the housing with said means including a tab on one housing member and a slot in the other housing member, said tab and slot cooperatively forming a pivotable joint which is operative during assembly and disassembly of said first and second housing members,

means frictionally interlocking said first and second housing members at the remaining axial end of the housing,

said halo module maintaining said first and second housing members in assembled relation at said frictionally interlocked end,

a first contact set carried by said first housing member,

said first contact set including stationary and actuatable contact elements with said stationary and actuatable contact elements each having a rigid electrically conductive member which extends from the internal to the external sides of said housing,

an arbor mounted for rotation in said housing, on said com-

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mon longitudinal axis, with said arbor being actuatable by said lock module,

a first cam member on said arbor for actuating said first contact set,

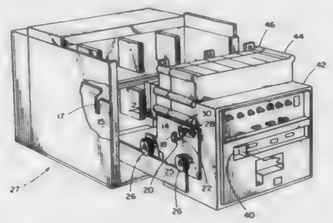
and posts on said second housing member which hold said rigid electrically conductive members against the internal side of said housing and prevent said rigid electrically conductive members from moving in a direction from the external to the internal sides of said housing.

4,728,757

INTERLOCK SCHEME FOR DRAWOUT HIGH AMPERAGE MULTI-POLE CIRCUIT BREAKER

Clifford A. Buxton; David C. Higgins, both of Cedar Rapids, and Gary A. Volesky, Newhall, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Feb. 1, 1985, Ser. No. 697,355
Int. Cl.[4] H01H *9/20*
U.S. Cl. 200—50 AA 5 Claims



1. An interlock assembly for a draw-out circuit breaker having a casing with a front cover and at least one set of contacts carried within said casing, at least one of said contacts carried by a contact carrier movable between a first position in which said contacts are open and a second position in which said contacts are closed, said circuit breaker including a draw-out mechanism that includes a worm gear carried on a driven shaft which extends between a pair of opposite side plates and carries a drive arm assembly at each end, said worm gear driven by a worm operably associated with said worm gear, said front cover carrying a slidably mounted door having a ledge, said door movable between a first door position providing access to said worm through said front cover and a second door position preventing access to said worm through said front cover, said assembly comprising:

a brace assembly including a first brace plate and a second brace plate fastened to said casing, each brace plate having an opening receiving said driver shaft, said worm gear carried on said shaft intermediate said brace plate and said second brace plate,

a slider assembly connected to said brace assembly and including a slider having a stop tab, said slider movable bewtwen a first slider position in which said stop tab is positioned adjacent said ledge preventing movement of said door from said second door position to said first door position and a second slider position in which said stop tab is spaced from said ledge permitting movement of said door from said second door position to said first door position, and a spring biasing the slider towards said second position;

a plunger assembly operably associated with said slider assembly including a plunger movable between a first position and a second position, a spring biasing said plunger towards said first position wherein said plunger holds said slider in said first slider position; and

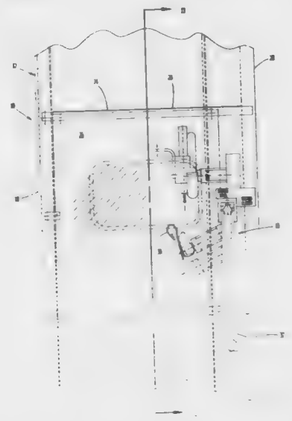
a plunger actuator carried by said contact carrier, said plunger actuator operatively associated with said plunger assembly to move said plunger from said first position to said second position in response to said contact carrier moving from said second position to said first position to release said slider enabling said slider to move to said second slider position.

4,728,758

LOAD BREAK SWITCH AND INTERLOCK ASSEMBLY

Samir F. Farag; John D. Kleinecke, and Thomas R. Little, all of Wichita Falls, Tex., assignors to Siemens Energy & Automation, Atlanta, Ga.

Filed Jan. 15, 1987, Ser. No. 4,372
Int. Cl.[4] H01H *9/22*
U.S. Cl. 200—50 A 2 Claims



1. A load break switch and interlock assembly, comprising:

a cabinet having a rear wall with bus bars attached thereto, a first sidewall, and a front wall having a jamb receiving a door and defining a front wall opening, the door opening outwardly from the cabinet;

a switch assembly having a longitudinal axis, a plurality of switch contacts and a control shaft for controlling the position of the switch contacts, and being connected to the first sidewall with the longitudinal axis oriented generally parallel to the sidewall and generally perpendicular to the rear wall and front wall, the switch assembly being operable between an open and a closed position, the control shaft having an axis of rotation which is parallel to the longitudinal axis; and

an operating handle fixed to the control shaft for operating the swtich assembly between the open and the closed positions, the operating handle being located outside of the cabinet such that the operating handle interferes with the opening of the door when the switch is in the closed position and does not interfere with the door when the switch is in the open position.

4,728,759

STAMPED CIRCUITRY AND ADJUSTABLE ROTARY SWITCH ASSEMBLY

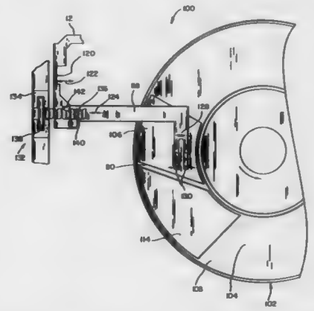
Daniel Nigg, Rolling Meadows; Robert DePass, Naperville; Edward Sammer, Addison; Jack D. Raymer, II, Lisle, and Burke Crane, Bloomingdale, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 771,858, Sep. 3, 1985, Pat. No. 4,659,157.
This application Jun. 26, 1986, Ser. No. 878,945
Int. Cl.[4] H01H *1/48*
U.S. Cl. 200—259 1 Claim

1. A stamped circuitry assembly including an integral metal stamping having a plurality of discrete conductive paths, a dielectric substrate having complementary recesses for receiving said conductive paths,

the improvement comprising:

a switch having a table movably mounted to said substrate, with a surface defining at least one path of movement, a contact pad carried on the table and having a tapered leading edge, disposed along a portion of said path, and said stamping integrally including a cantilevered spring beam, a moveable support arm and an elongated resilient finger-like contact means having a contact surface disposed on said path so as to electrically engage said contact pad as said table is moved, the moveable support arm



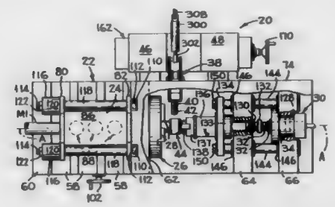
extending in a direction transverse to said path, joined at a first end to said finger-like contact and joined at a second end to said cantilevered spring beam and to screw adjustment means operative to reciprocate said arm in said transverse direction, whereby reciprocation of said arm causes transverse displacement of said finger-like contact, with said finger-like contact engaging said contact pad at different points along its tapered leading edge, to thereby vary a length of the path along said contact pad travelled by said finger-like contact means.

4,728,760

INDUCTION HEATING PRESSURE WELDING WITH ROTARY BUS BAR JOINT

Charles A. Brolin; Dennis A. Jennerjohn, and Richard E. Moeller, all of Cedar Rapids, Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 11, 1986, Ser. No. 895,399
Int. Cl.[4] B23K *13/00*
U.S. Cl. 219—9.5 11 Claims



7. An apparatus for induction heating and pressure welding weldable surfaces of two members together comprising:

a frame;

a hydraulic cylinder secured to said frame and having a piston rod adapted to support a first member and being movable between a surface heating position and a surface upsetting position;

clamping means secured to said frame and adapted to securely clamp second member in fixed position with a weldable surface disposed in alignment with the weldable surface of said first member;

hood means for directing a laminar flow of substantially inert gas past said weldable surfaces for purging air from said surfaces;

means defining an induction heating coil movable between a first position disposed between and spaced a short distance from said surfaces for heating said surfaces to an upsetting temperature, and a second positon out of alignment with said weldable surfaces for allowing said hydraulic cylinder to immediately thereafter force said first member against said second member with sufficient force to upset said heated surfaces and weld said two surfaces together

means for directing a high frequency current through said coil when in said first position to heat said surfaces to an upsetting temperature;

said clamping means including a bodily adjustable sub-frame movable supported by said frame, a first V-block gripper head rigid with said sub-frame, a second V-block gripper head carried by said sub-frame and movable relative to said first V-block gripper head for clamping said second member therebetween, and adjustment means for moving said sub-frame between a position wherein said weldable surfaces of said first and second members are out of alignment with each other to a position wherein said surfaces are in weldable alignment with each other;

said sub-frame abutting a portion of said frame having T-slots therein, a plurality of hydraulic cylinders secured to said sub-frame, a piston rod in each cylinder, a T-bar operatively connected to each piston rod and slidably received in said T-slots,

when said sub-frame is in locked position, each position rod being retracted to rigidly connect said sub-frame to said frame.

when said sub-frame is to be adjusted each piston rod being moved to permit sliding movement of said T-bars in said slides.

4,728,761

METHOD AND APPARATUS FOR HARDENING AXIALLY SPACED CAMS ON A CAMSHAFT

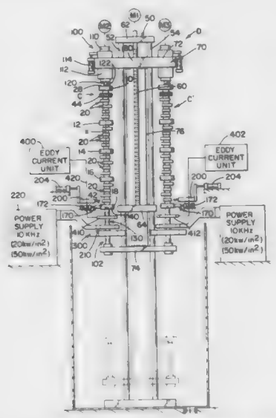
George M. Muchs, Parma Hts.; John R. Laughlin, Broadview Hts., both of Ohio; William Z. Nelson, Attalla, and Robert C. Johnson, Albertville, both of Ala., assignors to Tocco, Inc., Boaz, Ala.

Continuation-in-part of Ser. No. 736,214, May 20, 1985, Pat. No. 4,604,510. This application May 5, 1986, Ser. No. 859,348
Int. Cl.[4] H05B *6/40, 6/14*
U.S. Cl. 219—10.43 54 Claims

1. An apparatus for inductively heating and then quench hardening the surfaces of axially spaced cams on a steel camshaft having a longitudinally extending rotational axis concentric with a plurality of axially spaced bearings with surfaces concentric to said rotational axis, said cams having lobes with differing circumferential locations, said apparatus comprising: means for rotatably mounting said camshaft to rotate about a work axis coinciding with said rotational axis; an induction heating coil having an inner surface surrounding said work axis with an insulation gap and integral quenching openings for directing liquid inwardly from said heating coil toward said work axis; a high frequency power supply means for selectively energizing said heating coil with a power density within said heating coil of over about 20 KW/in^2; an auxiliary cooling assembly fixed with respect to said heating coil at an axially spaced position near said heating coil and including means for spraying a cooling liquid toward said work axis; first drive means for causing relative axial movement of said camshaft and said heating coil to position a cam in said heating coil during a hardening cycle, including an induction heating portion and quench hardening portion: second drive means for rotating said camshaft about said work axis; means for controlling said second drive means for selective rotating said camshaft to an indexed position with said cam in said coil having a

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preselected fixed circumferential orientation during at least said heating portion of said hardening cycle; means for selectively operating said power supply means during said heating portion of said cam hardening cycle; means for selectively operating said cooling assembly during at least said heating portion of said hardening cycle for a cam in said heating coil; control means for repeatedly operating said first drive means,



said second drive means, power supply operating means, said cooling assembly operating means for axially indexing a further cam into said fixed orientation within said heating coil for hardening during a hardening cycle while a previously, axially adJacent, hardened cam is cooled in said cooling assembly; and means for preventing splashing of cooling liquid onto said cam in said heating coil during said heating portion of said hardening cycle.

4,728,762

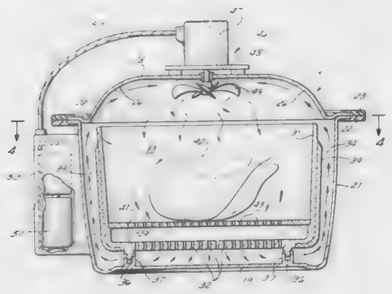
MICROWAVE HEATING APPARATUS AND METHOD

Howard Roth, 206 Devoe Ave., Yonkers, N.Y. 10705, and Robert F. Schiffmann, 149 W. 88th St., New York, N.Y. 10024

Continuation-in-part of Ser. No. 592,234, Mar. 22, 1984, abandoned. This application Mar. 26, 1987, Ser. No. 31,230

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 E **72 Claims**



38. In apparatus for heating and cooking a food product with microwave energy: a chamber in which the food product is placed formed by a closed outer container fabricated of a material at least partially transparent to microwave energy and a closed inner container having a top, bottom and side walls spaced from the corresponding walls of the outer container to define an annulus, the inner container being formed at least in part of a material capable of absorbing microwave energy and being heated thereby, means for introducing a portion of the microwave energy into the inner container to heat the food product directly, and means comprising a fan positioned within the inner container for circulating air past the heated portion of the inner container and about the food product to effect a high degree of heat transfer from the heated portion of the inner container to the outer surface of the food product.

63. In an apparatus for use with a source of microwave energy for heating and cooking a food product: a chamber for receiving the food product, means for introducing a portion of the microwave energy from the source into the chamber to heat the food product directly and preventing the remainder of the microwave energy from entering the chamber, a microwave energy absorber capable of being exposed to the microwave energy for heating air near the absorber, and means for circulating the heated air around the food product to further heat the product.

4,728,763

MICROWAVE OVEN HAVING A SOURCE OF INFRA-RED RADIATION

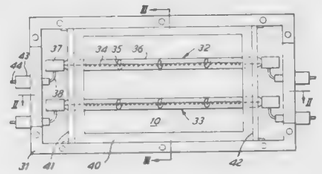
Geoffrey I. Bell; Peter W. Crossley, both of Havant; Alex L. Halberstadt, London; Stephen J. Newton, Haslemere, and Susan M. Crocker, Southsea, all of England, assignors to Thorn EMI Appliances Limited, London, England

Filed Nov. 28, 1986, Ser. No. 935,928

Claims priority, application United Kingdom, Nov. 30, 1985, 8529580; Jul. 12, 1986, 8617056

Int. Cl.⁴ H05B *6/76*

U.S. Cl. 219—10.55 B **7 Claims**



1. A microwave oven comprising a source of microwave energy and at least one source of infra-red radiation, said at least one source of infra-red radiation including an infra-red emissive lamp comprising a halogenated tubular envelope having an internal surface, a tungsten filament and a number of spaced support members supporting the tungsten filament on, or adjacent to, a longitudinal axis of the envelope wherein each said support member consists of a coil of wire of which one part only bears against said internal surface of the envelope and the remaining portion is attached to the filament and extends to said internal surface, said one part extending part-way only around said longitudinal axis of the envelope so as to make an incomplete turn about said axis and thereby inhibit arcing between adjacent regions of the coil during exposure thereof to microwave radiation.

4,728,764

APPARATUS FOR DETECTING DISCHARGE GAP IN ELECTRIC DISCHARGE MACHINING

Katsuhiro Matsumoto, and Akira Fujii, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 31, 1985, Ser. No. 696,780

Claims priority, application Japan, Feb. 1, 1984, 59-17491

Int. Cl.⁴ B23H *1/02*

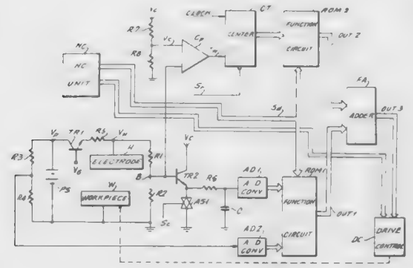
U.S. Cl. 219—69 G **8 Claims**

1. An apparatus for measuring the size of a discharge gap between a machining electrode and a workpiece in electric discharge machining in which a pulse voltage is applied between said machining electrode and said workpiece to thereby machine said workpiece, comprising:

peak detecting means responsive to a discharge voltage which develops between said machining electrode and said workpiece in response to the application of said pulse voltage for detecting a peak value of said discharge voltage;

first converting means for converting said peak value into first digital data;

waiting time detecting means responsive to said discharge voltage between said machining electrode and said workpiece for detecting a waiting time which is measured as the interval between the start of said given pulse voltage and the start of a discharge occurrence;



second converting means for converting said waiting time into second digital data;

first compensating means for compensating said first digital data in accordance with a machining condition to generate first compensated digital data;

second compensating means for compensating said second digital data in accordance with a machining condition to generate second compensated digital data; and

means for determining said gap size solely on the basis of said first compensated digital data for a condition when said gap size is smaller than a predetermined value, and on the basis of the sum of said first compensated digital data and said second compensated digital data, when said gap size is larger than said predetermined value.

4,728,765

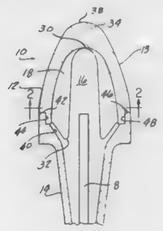
SPOT WELDING ELECTRODE

Bryan P. Prucher, Clarkston, Mich., assignor to Hobie Holding, Inc., Clarkston, Mich.

Filed Sep. 10, 1986, Ser. No. 905,860

Int. Cl.⁴ B23K *11/30, 35/02*

U.S. Cl. 219—120 **4 Claims**



1. A spot welding electrode cap comprising:

a housing having an open bottom, and a tip end and an internal cavity;

a plurality of circumferentially spaced fins on the housing within the cavity;

the fins having first and second ends, the second end of each of the fins meeting in substantial registry to each other at the center of the tip end of the housing.

4,728,766

WELDING MACHINE FOR WELDING TONGUES ONTO SHEET-METAL PARTS

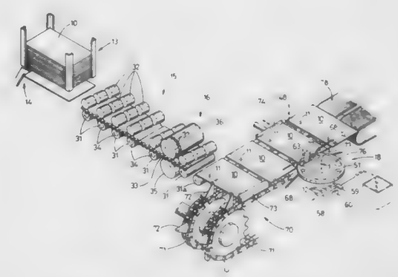
Paul Opprecht, Bergdietikon; Othmar Stieger, Kindhausen, and Felix Kramer, Friedlisberg, all of Switzerland, assignors to Elpatronic AG, Switzerland

Filed Mar. 17, 1986, Ser. No. 840,440

Claims priority, application Switzerland, Mar. 18, 1985, 1183/85

Int. Cl.⁴ B23K *11/00*

U.S. Cl. 219—79 **19 Claims**



1. A machine for use in welding pre-stamped tongues onto sheet metal parts by an electrical resistance welding process, comprising:

a sheet metal conveyor adapted to receive and sequentially move the sheet-metal parts in a step-wise manner in a direction along a conveyor toward a welding position at a welding station, said conveyor including a plurality of opposed rollers through which pass the sheet metal parts;

a means for impressing a plurality of weakening lines in the sheet metal parts in a direction substantially parallel to said conveyor direction, said weakening lines forming a tear off strip;

a punch means sequentially receiving a plurality of pre-stamped tongues, said punch means for detaching a foremost one of said pre-stamped tongues; and

a tongue conveyor means for receiving a pre-stamped punched tongue at a punch position and located said received tongue at said welding position registered between said sheet metal part weakening lines, further registered between welding electrodes, said welding position separated from said punch position.

4,728,767

WELDING GUN APPARATUS

Kenji Hayashi, Kure, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 17, 1986, Ser. No. 920,229

Claims priority, application Japan, Oct. 18, 1985, 60-160578[U]

Int. Cl.⁴ B23K *11/10*

U.S. Cl. 219—89 **2 Claims**

1. A welding gun apparatus for resistance welding, said welding gun apparatus comprising:

fixed electrode means and movable electrode means for welding a workpiece at a welding station between said fixed electrode means and said movable electrode means,

fixed electrode arm means provided with said fixed electrode means,

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fixed plate means to which said fixed electrode arm means is rigidly secured,

driving cylinder means,

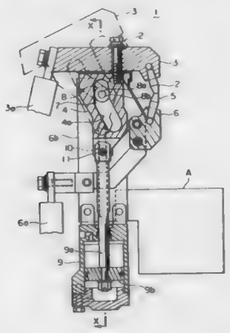
piston means slidable within said driving cylinder means,

piston rod means attached to said piston means and extending upwardly in a substantially vertical direction,

movable electrode arm means provided with said movable electrode means,

carriage means for holding said movable electrode arm means connected with an upper end portion of said piston rod means,

piston rod movement regulating means for restricting the movement of said piston rod means in the substantially vertical direction, said piston rod movement regulating means including first engaging means provided on said piston rod means and first guide track means for guiding said first engaging means, said first guide track means being formed in said fixed plate means and extending in a substantially vertical direction, and



cam means including second guide track means formed in said carriage means and second engaging means provided on said fixed plate means, said second guide track means being arcuate and including a vertical track portion at an upper portion and a sloped track portion at a lower portion, said second engaging means being engaged with said second guide track means, the height of said second engaging means being substantially the same as the height of the welding station, said first engaging means and said second engaging means being aligned with a longitudinal axis of said piston rod means, said cam means forcing said movable electrode arm means to move upwardly in the substantially vertical direction at a first stage and then upwardly and obliquely to locate said movable electrode means at a position apart from said fixed electrode means with a sufficient distance for feeding the workpiece into and from the welding station as said piston means is forced upwardly.

4,728,768

PERCUSSION WELD MONITORING

Michael K. Caenan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1987, Ser. No. 63,941

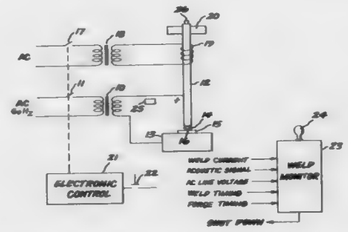
Int. Cl.[4] B23K *11/14*

U.S. Cl. 219—96 **16 Claims**

1. A method of monitoring the quality of percussion welds made on a percussion welding machine comprising:

sensing a weld current passed through parts to be welded, one of which has a nib in contact with the other, as said parts are heated and said nib explodes, and as forge pressure is applied to impact and unite said parts;

measuring nib time from the start of said weld current to nib explosion and dwell time from the nib explosion until said parts are forged together; and



determining weld quality by comparing said nib and dwell times to preselected acceptance limits.

4,728,769

RESISTANCE WELDING ELECTRODE

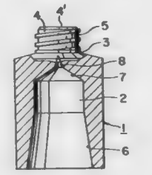
Toshihiro Nishiwaki, Kawasaki, Japan, assignor to Obara Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 763,374, Aug. 7, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 938,330

Claims priority, application Japan, Apr. 16, 1985, 60-55549[U]

Int. Cl.[4] B23K *11/30*

U.S. Cl. 219—120 **5 Claims**



1. A resistance welding electrode, comprising:

a substantially cylindrical barrel shaped body having an end surface and having an axial cooling water passage extending substantially to said end surface thereof, the peripheral wall of said barrel shaped body being free of axially distributed ridges and grooves;

means on said barrel shaped body for preventing deformation of said end surface of said barrel shaped body into a mushroom-like formation, said means comprising a reduced diameter, wearable cylindrical portion integrally formed on the central portion of said end surface of said barrel shaped body and projecting coaxially out therefrom and terminating at a free end for welding engagement with a work piece, the diameter of said cylindrical projection being substantially less than the diameter of said barrel shaped body, said cylindrical projection having axially distributed ridge portions axially separated by groove portions which successively cut off the mushroom-like spread of said free end of the cylindrical projection as said cylindrical projection wears during welding contact with work pieces;

said cylindrical projection having means preventing changes in the cross sectional area thereof during welding despite wearing down of said cylindrical projection axially past successive ones of axially aligned ones of said ridge and groove portions, with said wearing continuing substantially through the length of said cylindrical projection, said change preventing means comprising:

at lesat one helical groove winding around the periphery of said cylindrical projection from said end surface of said barrel shaped body to said free end of said cylindrical projection, said helical groove defining at least one corresponding helical ridge similarly winding around the periphery of said cylindrical projection, such that said free end of said cylindrical projection as it wears during welding always includes and exposes the end of at least one said helical ridge and the end of at least one said helical groove, wherein the exposed helical groove and ridge ends in effect are rotated around the perimeter of said cylindrical projection free end as the latter axially wears away during welding contact with work pieces, wherein said cylindrical projection free end is axially wearable to limit radially outward mushroom-like spread of its work piece contact area but without periodic contraction of said contact area, and such that said contact area remains substantially constant during axial wearing away of said cylindrical projection, said helical ridge and groove being structured like threads on a bolt wherein the radial depth of said helical groove is small compared to the radial thickness of material separating said helical groove from the central axis of said cylindrical projection, said helical groove being entirely offset axially from said water passage such that no part of said helical groove surrounds said water passage, the outside diameter of said helical ridge being substantially less than the outside diameter of said barrel shaped body.

4,728,770

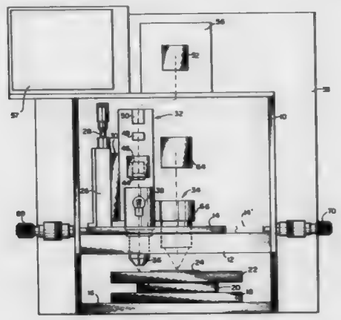
DUAL AXIS OPTICAL SYSTEM

Edward K. Kaprelian, Meadham, N.J., assignor to Questar Corporation, New Hope, Pa.

Filed Apr. 27, 1987, Ser. No. 43,180

Int. Cl.[4] B23K *26/02*

U.S. Cl. 219—121 LZ **17 Claims**



1. An optical device comprising:

a first optical system having a first light source operating at a first wavelength band and a second optical system having a second light source operating at a second wavelength, each of said optical systems having a stationary portion and a movable portion;

movable means supporting the movable portions in fixed relationship to one another, with parallel spaced-apart optical axes for the first and second optical systems and so that the movable portions are movable as a unit relative to the stationary portion; and

means on the stationary portion to index the movable portion in each of two positions such that in one position the axis for the first system assumes the position relative to the stationary system that the axis for the second system occupies in the other position whereby the same point illuminated by the first light source in the one position may be illuminated by the second light source in the other position, and vice versa.

4,728,771

AUTOMATIC CUTTING MACHINE USING LASER RAY

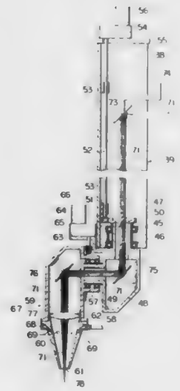
Franco Sartorio, Torino, Italy, assignor to Prima Industrie S.p.A., Italy

Filed Jul. 9, 1985, Ser. No. 753,277

Claims priority, application Italy, Jan. 3, 1978, 67410 A/78

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LN **14 Claims**



1. An automatic cutting machine comprising:

at least one mounting stand linearly movable in a first direction by a first driving means;

a main, cutting laser-beam generator;

a head sending out infrared ray flux generated in the main laser-beam generator after the flux is condensed or focussed;

movable supporting means for supporting the head above the mounting stand, said supporting means moving in the first direction and a second direction perpendicular to the first direction and a third direction perpendicular to both the first and second directions by means of a second and third driving means;

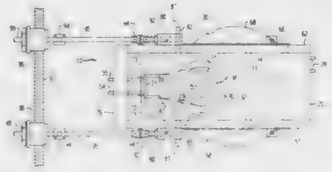
connecting means for rotating said supporting means around the first direction or axis by a fourth driving means in order to rotate the head around the second direction or axis perpendicular to the first direction or axis relative to the connecting means by means of a fifth driving means;

automatic control means for the driving means and the laser-beam generator and a measurement means connected to an input of a computer, the measurement means being adapted to determine a focus point and the direction of infrared ray flux and to transfer the coordinate of the particular periphery of the material to be processed, and the measurement means including a visible noncutting laser-beam generator able to send visible ray flux to the head, wherein said visible noncutting laser-beam is adapted to transmit a second tracing laser-beam through said head in coaxial positional relationship to the cutting laserbeam; and

protective means for defining a cutting area in which area said mounting stand is installed so as to move across the area, said protective means being constructed by material non-transmissive to infrared ray flux.

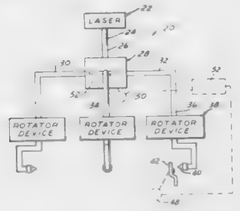
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4,728,772
VAPOR SOURCE ASSEMBLY WITH ADJUSTABLE MAGNETIC POLE PIECES
P. A. Joel Smith, San Pablo, Calif., assignor to The BOC Group, Inc., Montvale, N.J.
Filed Jul. 16, 1986, Ser. No. 886,866
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EF **20 Claims**



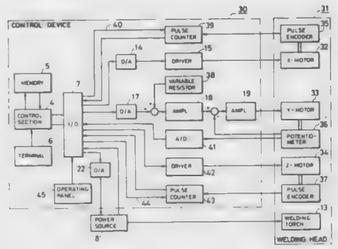
1. A vapor source assembly for operation in vacuum, comprising:
an electron-beam gun,
a crucible for supporting material to be vaporized,
a magnet,
a pair of parallel magnetic pole plates in contact with the magnet and alligned so that the beam from the electron-beam gur is deflected through an angle in the range from 240° to 300° onto the crucible,
a pair of pole rods each of which passes through a clearance hole in one of the pole plates, extends into the space between the plates and is positioned so as to be capable of altering the cross-sectional area of the beam as it impacts on the material supported by the crucible, wherein each pole rod and its clearance hole are sized to enable a constant, low reluctance magnetic path between the pole pieces and the pole rod as the pole rod moves in the clearance hole, and
a rod adjustment means for precisely adjusting the distance separating the pole rods while the vapor source is in vacuum.

4,728,773
LASER PROCESSING CENTER
David A. Roberts, Battle Creek, and John M. Ruselowski, Dearborn, both of Mich., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.
Filed Dec. 8, 1986, Ser. No. 939,324
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LT **14 Claims**



1. In a laser beam sharing system having a laser beam source, an inlet pipe and a plurality of output pipes, the improvement comprising: An enclosure, a rotatable platform supported within said enclosure; a plurality of mirror units located at predetermined circumferential points on said rotatable platform; means for angularly adjusting each of said mirror units with respect to said platform for precisely reflecting the full laser beam from the inlet pipe to one of the output pipes; means for indexably driving said platform so as to selectively position each one of said adjustable mirror units at a point to receive a laser beam from the inlet pipe for selectively directing all of such laser beam to only one of the outlet pipes; and beam rotator means for receiving and directing the laser beam from said enclosure for rotatably applying it to a work piece positioned with respect to the beam rotator means.

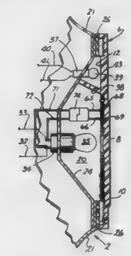
4,728,774
AUTOMATIC WELDING MACHINE CORRECTING FOR A VARIBLE GROOVE WIDTH
Yoshitaka Hayakawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 31, 1986, Ser. No. 891,022
Claims priority, application Japan, Jul. 31, 1985, 60-169016; Jul. 31, 1985, 60-169017; Jul. 31, 1985, 60-169018
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.22 **7 Claims**



1. An automatic welding machine including an oscillating welding head for arc-welding materials which form a welding groove, comprising:
means for providing data descriptive of a configuration of said welding groove at starting and end portions thereof;
means for moving said welding head along said groove to perform a welding operation;
means for determining a present position of said welding head along said groove;
means for calculating a configuration of said groove at said present position of said groove from said data descriptive of said configuration of said groove at said starting and end portions thereof and from said present position of said welding head; and
means for correcting welding conditions at said present position in accordance with the calculated configuration of said groove at said present position.

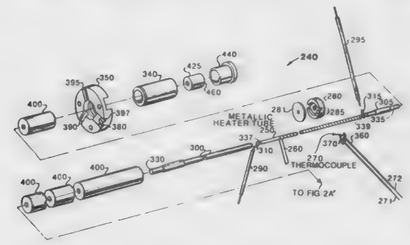
4,728,775
INDICATOR LIGHT COVER FOR VEHICLES AND THE LIKE
George A. Van Straten, Rte. 1, Box 224, Baraga, Mich. 49908
Filed Jul. 24, 1987, Ser. No. 77,499
Int. Cl.[4] B60L *1/02*
U.S. Cl. 219—202 **21 Claims**

1. In an indicator light for vehicles and the like of the type having a self-contained electrical system electrically connected with a bulb portion of the light to selectively illuminate said bulb for indicating vehicle activity, the improvement of a heated cover comprising:
a thermally conductive, translucent cover plate having interior and exterior surfaces through which light from said bulb is transmitted when said bulb is illuminated;
means for operatively connecting said cover plate with said light;
an elongate electrical resistor operatively connected with said cover plate and arranged thereon in a sufficiently widespread pattern to heat at least a major portion of the exterior surface of said cover, yet permit light from said bulb to pass through said cover plate;
means for electrically connecting said resistor with the electrical system of the vehicle to induce an electrical current



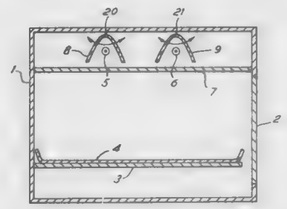
through said resistor and thereby produce sufficient heat in said cover plate to melt frozen particulate on the exterior surface thereof for improved visibility of said indicator light and related vehicle safety.

4,728,776
HEATED TRANSFER LINE FOR CAPILLARY TUBING
Kent D. Vincent, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 581,923, Feb. 21, 1984, Pat. No. 4,650,964.
This application Sep. 29, 1986, Ser. No. 912,727
Int. Cl.[4] F24H *1/10;* **H05B** *3/40*
U.S. Cl. 219—301 **7 Claims**



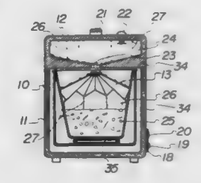
1. An apparatus for heating a length of tubing to a uniform temperature with an electric current, the apparatus comprising:
a heater tube which is electrically conductive and has first and second ends;
first insulating means substantially covering the length of the heater tube for electrically insulating the heater tube;
first and second electrically conductive conduit tubes having a combined length substantially equal to the length of the heater tube, said first and second conduit tubes covering the first insulating means and each having an outer end electrically connected, respectively to the first and second heater tube ends, the opposite inner ends of the conduit tubes coming into closely spaced proximity at a common point along the heater tube;
first and second conductor means electrically connected to the first and second conduit tube inner ends near said common point for supplying electric current to said heater tube through said first and second conduit tube;
second insulating means surrounding and thermally insulating the first and second conduit tubes;
first and second outer tubes substantially covering the second insulating means and having first and second outer tube ends with the opposite inner ends of the outer tubes coming into closely spaced proximity at said common point along the heater tube; and
mounting means connected to the outer tube inner ends in a mounting plane which passes through said common point along the heater tube mechanically mounting the apparatus and providing an exit for the first and second conductor means.

4,728,777
GRILLING ARRANGEMENT
Michael N. Tsisios, London, and Robert D. Smith, Cheshunt, both of England, assignors to Thorn EMI Appliances Limited, London, England
Filed Sep. 8, 1986, Ser. No. 904,609
Claims priority, application United Kingdom, Sep. 18, 1985, 8523027
Int. Cl.[4] H05B *6/00*
U.S. Cl. 219—348 **7 Claims**



1. A grilling arrangement including a grilling surface for supporting food to be grilled, a source of infra-red radiation for grilling said food, means for reflecting infra-red radiation generated by said source towards said grilling surface, and power driven means operative during grilling for imparting movement to said reflecting means so that during grilling said reflected radiation is swept across said surface to enhance the uniformity of distribution of intensity of infra-red radiation over said surface over a predetermined length of time, as compared with the degree of said uniformity that would prevail in the absence of said movement of said reflecting means.

4,728,778
COOKING APPARATUS
Dai S. Choi, and WongJung O. Choi, both of 3101 Palm Ave., Manhattan Beach, Calif. 90266
Filed Nov. 5, 1986, Ser. No. 927,077
Int. Cl.[4] H05B *3/68*
U.S. Cl. 219—438 **3 Claims**



1. An electrical cooking apparatus for cooking natural substances such as rice, herbs soups, and the like, said cooking device being divided into a lower cooking chamber and an upper cooling chamber which comprises:
a cooking container disposed within said lower cooking chamber,
valve means providing communication between said upper cooling chamber and said cooking container whereby the cooking steam rising from the cooking container and

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introduces through said valve means into said cooling chamber is condensed and returned as a liquid to said cooking container,

downwardly inclined baffle means disposed within the cooking container and beneath said valve means for interrupting the flow of condensed liquid through said valve means and directing it to the side walls of the cooking container, said baffle means having a generally circular configuration, with a surface structure comprising a plurality of ridges and valleys, said valleys terminating in pointed end portions which contact side walls of the cooking container and said ridges terminating in portions which extend away from the side walls, and

means for heating said cooking apparatus.

4,728,779

PTC HEATING DEVICE

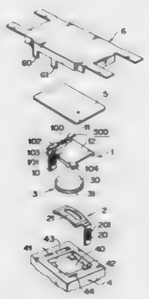
Sho Kotani; Michikazu Takeuchi; Sumihiro Yasuda, all of Tokyo, and Kengo Ogawa, Hiroshima, all of Japan, assignors to TDK Corporation and Fumakilla Limited, both of Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 910,415

Claims priority, application Japan, Sep. 27, 1985, 60-14593[U]; Sep. 27, 1985, 60-14595[U]; Oct. 29, 1985, 60-166345[U]; Dec. 27, 1985, 60-200380[U]; Dec. 27, 1985, 60-200381[U]

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—517 **9 Claims**



1. A PTC heating device comprising:

a PTC thermistor having an upper electrode and a lower electrode on its upper and lower surface, respectively;

an upper and a lower electrode plate comprising a pair of plates between which said PTC thermistor is vertically interposed;

said upper electrode plate comprising a first substantially planar contact section in contact with said upper electrode of said PTC thermistor, a substantially inverted L-shape portion extending at one end thereof from one side of said first contact section and lying in the same plane as said first planar contact section and having as a first terminal a depending portion at an end opposite said one end of said extending portion, said inverted L-shape extending portion having a narrow section comprising an overcurrent fusion section, said lower electrode plate comprising a second contact section in engagement with said lower electrode of said PTC thermistor and having a second contact terminal depending from said second contact section;

a casing of electrically insulating material having a first recess formed at an upper surface thereof and having first and second through-holes, within which first recess, said PTC thermistor and said upper and lower electrode plates are received and through which first and second through-holes said first and second terminals of said upper and lower electrode plates, respectively, project from said porcelain casing;

an insulating plate on said upper electrode plate; and

a heat radiating plate on said insulating plate for covering said casing, and cooperating means on said inverted L-shape portion of said first contact section and said casing for spacing a portion of said narrow section of said inverted L-shape portion from said insulating plate and from said first recess, within which said PTC thermistor is received.

4,728,780

HEATING PIPE FOR PANEL HEATERS

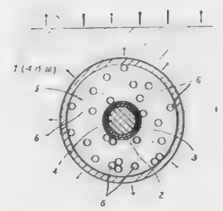
Eiji Uchino, 4-12, Kamo 2-chome, Takaishi-shi, Osaka-pref., Japan

Filed Jul. 14, 1986, Ser. No. 882,955

Claims priority, application Japan, Nov. 25, 1985, 60-181638[U]

Int. Cl.⁴ H05B *3/06*; H01C *1/012*; B05D *5/12*; B32B *9/00*

U.S. Cl. 219—530 **11 Claims**



1. A heating apparatus, comprising:

a pipe;

an electrical resistive heating element positioned within said pipe; and

thermally conductive aluminum spheres packed within said pipe between said electrical resistive heating element and the internal wall of said pipe.

4,728,781

HEATED BACKLIGHTS

Harold E. Donley, Oakmont, and Cheryl E. Belli, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 725,597, Apr. 22, 1985, Pat. No. 4,623,389. This application Aug. 11, 1986, Ser. No. 895,064

Int. Cl.⁴ H05B *3/10*; H01C *1/012*; B05D *1/36*; H01B *1/02*

U.S. Cl. 219—547 **16 Claims**

1. An electrically heated glass product including a glass substrate and an electroconductive coating on at least a portion of said glass substrate, said coating comprising an electroconductive frit fixed to said glass and colloidal silver encapsulated within said glass substrate immediately adjacent to said frit.

4,728,782

LOADING COMPENSATION IN CYCLOMETER REGISTER

Samuel G. Hardy, New Durham, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 9, 1987, Ser. No. 36,317

Int. Cl.⁴ G06C *15/26*

U.S. Cl. 235—133 R **3 Claims**

1. A cyclometer register comprising:

a lowest-order cyclometer drum smoothly rotated at a speed proportional to a quantity to be measured;

a free-counterweight disk freely disposed for rotation on a shaft concentric with said lowest-order cyclometer drum;

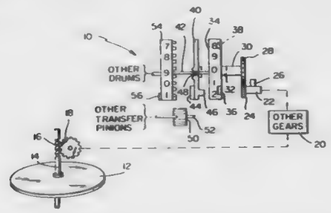
said free-counterweight disk having a first predetermined rotational moment;

at least one superior cyclometer drum;

means for advancing said at least one superior cyclometer drum in response to a free rotation of said free-counterweight disk;

cooperating means on said lowest-order cyclometer drum and said free-counterweight disk for rotating said free-counterweight disk from a stable equilibrium position to an overbalanced position from which it performs said free rotation;

a drum counterweight on said lowest-order cyclometer drum;



said drum counterweight being disposed to produce a second predetermined rotational moment;

said second predetermined rotational moment being at an angular position on said lowest-order cyclometer drum 180 degrees apart from an angular position of said first predetermined moment while said lowest-order cyclometer drum is rotating said free-counterweight disk; and

said second predetermined rotational moment is equal to a predetermined fraction of said first predetermined rotational moment, whereby a peak torque required to rotate said free-counterweight disk is reduced.

4,728,783

METHOD AND APPARATUS FOR TRANSFORMING DIGITALLY ENCODED DATA INTO PRINTED DATA STRIPS

Robert L. Brass, Westport; John Glaberson, Stratford; Richard W. Mason, Cos Cob; Scott Santulli, Danbury; G. Thomas Roth, Fairfield; William M. Feero, Waterbury, and Richard K. Balaska, Jr., Trumbull, all of Conn., assignors to Cauzin Systems, Incorporated, Waterbury, Conn.

Division of Ser. No. 798,312, Nov. 15, 1985, abandoned. This application May 1, 1987, Ser. No. 45,868

Int. Cl.⁴ G06K *7/00*

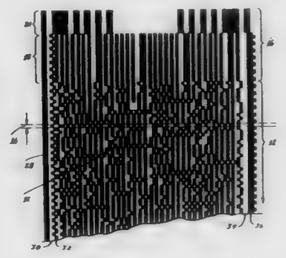
U.S. Cl. 235—456 **5 Claims**

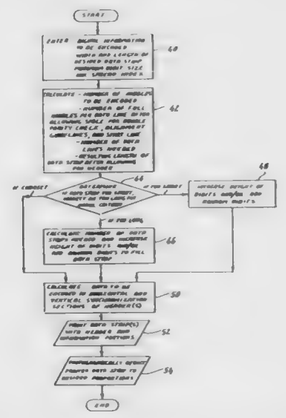
1. Apparatus for transforming data stored in a digital memory of a computer system into printed data strips, said printed data strips having a data portion formed of a plurality of data lines made up of linear printed integral nibbles and in which said previously-stored data has been encoded and a header containing coded instructions for reading said data portions, said apparatus including

receiving means for receiving (a) information as to the desired dimensional parameter for said data strip, (b) said previously-stored data, and (c) the minimum operable width of bits to be imprinted upon said data strip,

a computer associated with said receiving means and programmed to establish data strip format by determining the maximum number of nibbles for each data line and the number of data lines required in said data portion, and to adjust the dimension of said bits so that said data strip will fit said parameter, and to prepare a header containing said coded instructions relating to said format for use by a reader, and

a printer operatively associated with the output of said computer to print a data strip having a header and a data





portion in the form determined by said computer program.

4,728,784

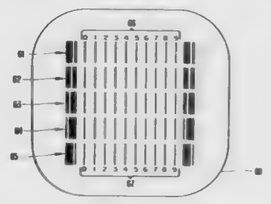
APPARATUS AND METHOD OF ENCODING AND DECODING BARCODES

Stephen R. Stewart, Lakeland, Tenn., assignor to Federal Express Corporation, Memphis, Tenn.

Filed Jan. 30, 1987, Ser. No. 9,203

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 235—462 **30 Claims**



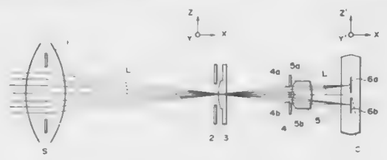
1. A method for reading encoded information from a bar-code wherein the barcode includes bars and spaces comprising the elements of the barcode and each bar and space has a width, the method comprising the steps of:

reading the barcode using a barcode reader to capture data

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for forming a complete image timing sample of the barcode;
generating in a barcode processor the complete image timing sample from the data captured by the barcode reader, the complete image timing sample representing the read barcode including the number of elements in the barcode, whether the element is a space or a bar, and the width of each element; and
processing the complete image timing sample in the barcode processor, the processing step including the substeps of
identifying false elements in the complete image timing sample,
filtering the false elements from the complete image timing sample, and
processing the filtered complete image timing sample to decode the encoded information contained in the elements of the filtered complete image timing sample.

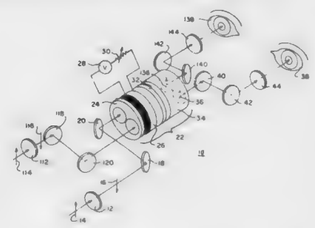
4,728,785
FOCUS DETECTING DEVICE USING ADJUSTABLE INCLINED SENSING MEANS
Ichiro Ohnuki, Tokyo; Yasuo Suda, Yokohama; Akira Ishizaki, Yokohama; Akira Akashi, Yokohama; Keiji Ohtaka, and Takeshi Koyama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 30, 1986, Ser. No. 947,824
Claims priority, application Japan, Jan. 10, 1986, 61-003003; Jan. 10, 1986, 61-003007
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **7 Claims**



1. A device for detecting the focus adjusted state of an objective lens, provided with:
(a) sensing means for sensing a light beam from said objective lens and producing a signal regarding the focus adjusted state;
(b) a first member having an inclined surface inclined with respect to the optic axis of said objective lens; and
(c) a second member having a contact surface which is inclined with respect to the optic axis and which is in surface contact with said first-mentioned surface, and a holding portion for holding said sensing means at a predetermined angle with respect to the optic axis;
said first and second members being rotated relative to each other with respect to the optic axis, thereby adjusting the inclination of said sensing means, and thereafter said first and second members being fixed.

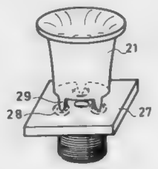
4,728,786
STEREO IMAGE INTENSIFIER
Robert J. Sciamanda, and Joseph T. Sestak, both of Erie, assignors to American Sterilizer Company, Erie, Pa.
Filed Nov. 15, 1985, Ser. No. 798,769
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT **24 Claims**

1. A stereo imaging apparatus using a single image intensifier, comprising:
input means responsive to incident radiation corresponding to first and second views of the same object;



an image intensifier responsive to said input means for simultaneously intensifying the incident radiation corresponding to the first and second views; and
means for outputting said intensified radiation.

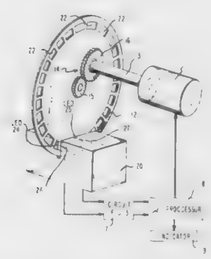
4,728,787
ALIGNMENT PROCESS FOR AN ELECTRO-OPTICAL DEVICE
Raymond Henry, Fontenay-aux-Roses; Jean C. Carballes, Gif-sur-Yvette; Eugène Duda, Villebon-sur-Yvette, and Emmanuel Grard, Les Ulis, all of France, assignors to Thomson-CSF, Paris, France
Continuation of Ser. No. 554,631, Nov. 23, 1983, abandoned. This application Aug. 28, 1986, Ser. No. 902,100
Claims priority, application France, Nov. 30, 1982, 8220043
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **5 Claims**



1. A process for aligning an electro-optical device having a semiconductor light emitting or light receiving component and a light transmission component, comprising:
fixing the light emitting or light receiving component to a first mechanical support;
fixing the light transmitting component to a second mechanical support that is separate and independent from the first mechanical support;
fixing a centering element at a top end thereof to the bottom of the first mechanical support;
providing the centering element with three spaced-apart support lugs that extend outwardly from the bottom of the centering element;
providing the top of the second mechanical support with three cups which are spaced apart from each other a distance corresponding to the spacing between the three lugs on the centering element so that each of such lugs can be received in one of the cups, sizing each of the cups to be larger than the lugs so that the lugs can be moved in at least three orthogonal directions within the cups;
sizing the lugs so that they extend outwardly from the bottom of the centering element a distance sufficient to space the bottom of the centering element from the top of the second mechanical support so the centering element can be freely moved with respect to the second mechanical support in at least three orthogonal directions while the first mechanical support and the centering element remain supported by the lugs on the second mechanical support;

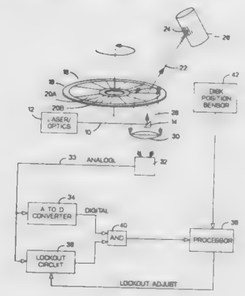
filling each of the cups with a polymeric hardenable material;
causing the polymeric hardenable material to assume a fluid state;
placing the centering element on the second mechanical support with each of the lugs located in one of the filled cups;
movably supporting the centering element and the first mechanical support on the second mechanical support via the lugs;
dynamically adjusting the position of the light emitting or light receiving component with respect to the light transmitting component by moving the centering element and the first mechanical support with respect to the second mechanical support while maintaining the lugs in the fluid material in the cups until the relative position of the light emitting or light receiving component with respect to the light transmitting component is optimum; and
solidifying the material in the cups about the lugs to rigidly fix the lugs to the second mechanical component and to thereby rigidly fix the light emitting or light receiving component and the light transmitting component in the optimum position relative to each other.

4,728,788
POSITION ENCODER APPARATUS
Howard M. Myers, Greensboro, and Benjamin T. Siler, Stokesdale, both of N.C., assignors to Gilbarco, Inc., Greensboro, N.C.
Filed Dec. 28, 1984, Ser. No. 687,279
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **26 Claims**



1. Apparatus for deriving pulses indicative in number of the movement of a mechanical member comprising optical energy source means, a pair of detectors for energy from the source means, an encoder transducer adapted to be mounted for movement with the member, the encoder transducer including plural relatively narrow substantially equi-spaced and equi-length regions spaced from each other by relatively wide substantially equi-spaced and equi-length regions so that as the encoder transducer moves in response to movement of the member, optical energy from the source means is prevented from reaching the detectors by the narrow regions to cast shadows on the detectors and optical energy from the source means is incident on the detector via a path including the wide regions, the detectors and regions being positioned and the field of view of the detectors in response to the optical energy of the source means being such that under normal operation optical energy from the source means is always incident on at least one of the detectors at a particular time and is incident on both of the detectors at other times, the wide regions having an extent sufficiently great to prevent them from being clogged by dirt and other debris.

4,728,789
SYSTEM FOR ADJUSTING HOLOGRAPHIC SCANNER LOCKOUT VOLTAGE
Eric C. Broockman; Robert T. Cato, and George J. Laurer, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 8, 1986, Ser. No. 938,929
Int. Cl.[4] G02B *5/32, 26/10*
U.S. Cl. 250—236 **8 Claims**



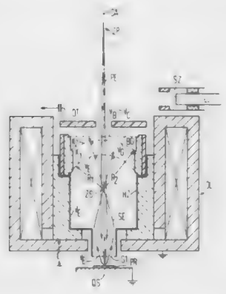
1. For use in an optical scanner of the type having a coherent light beam source, a multifaceted rotating holographic optical element for deflecting the coherent light beam along predetermined scan lines, a photosensitive detector for generating data signals and peak follower circuits for producing first and second peak voltages dependent upon the maximum and minimum values of the data signals produced by the photosensitive detector, an improved lockout circuit for permitting the output of only those signals which exceed the second peak voltage by a predetermined value, said lockout circuit including:
means for generating a signal identifying the currently active facet on the holographic optical element;
means for scaling the first peak voltage by a factor dependent upon the properties of the facet identified by said generating means;
means for comparing the output of said scaling means with the second peak voltage; and
means responsive to the output of said comparing means for enabling the output of data signals whenever the scaling means output is greater than the second peak voltage.

4,728,790
LOW-ABBERATION SPECTROMETER OBJECTIVE WITH HIGH SECONDARY ELECTRON ACCEPTANCE
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 858,919, May 2, 1986. This application Apr. 21, 1987, Ser. No. 41,654
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521439
Int. Cl.[4] H01J *37/252, 49/44*
U.S. Cl. 250—305 **12 Claims**

1. A spectrometer for quantitative measurements of potentials in electron beam mensuration technology, comprising an electron beam source, an objective lens (OL) for focusing a primary electron beam (PE) from said source onto a specimen (PR), an electrostatic opposing field spectrometer which comprises an electrode arrangement (G1) for the extraction of secondary electrons (SE) triggered at the measuring location by the primary electron beam (PE), an electrode means (K1, K2) for generating an electrical opposing field which retards the secondary electrons (SE) from the specimen, and a detector for recording the secondary electrons (SE), characterized in that the opposing field electrode means comprises two spherical-symmetrical electrodes (K1, K2) which have poten-

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tials (V_D, V_E) which are selected such that a spherical-symmetrical opposing field builds up in the space between said electrodes; the centers of said spherical-symmetrical electrodes (K1, K2) coincide at a point (ZS) which lies on the optical axis (OA) of the spectrometer objective above a pole shoe thereof; and said point (ZS) defines the center of the spherical-symmetrical opposing field and lies in a field-free space within the objective lens (OL) so that the secondary electrons (SE) are accelerated in the electrical field of the extraction electrode arrangement (G1) and are focused in the magnetic field of the objective lens (OL), such that they are focused into the center of the spherical-symmetrical opposing field (ZS).

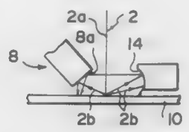


4,728,791

RADIATION IMAGE READ-OUT METHOD

Chiaki Goto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1985, Ser. No. 782,812
Claims priority, application Japan, Oct. 4, 1984, 59-208831
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 250—327.2 **3 Claims**



1. A radiation image read-out method comprising the steps of scanning a stimulable phosphor sheet having radiation image information stored therein with a stimulating light beam, and reading out the radiation image information by photoelectrically detecting the light emitted from the stimulable phosphor sheet upon exposure thereof to the stimulating light beam, wherein the improvement comprises

obtaining in advance the ratio of the amount of said stimulating light beam impinging upon a certain picture element on said sheet to the amount of scattering light from said stimulating light which impinges upon respective other picture elements at the time of said scanning to read out information stored in said certain picture element,

obtaining the amount of scattering light which impinges upon said respective other picture elements at the time of said scanning from said ratio and the amount of the stimulating light beam which impinges upon said certain picture element at the time of said scanning, to read out information stored in said certain picture element,

obtaining the amount of light emitted from said other picture elements upon exposure to said scattering light based on the amount of light emitted from the respective other picture elements upon exposure of those picture elements at the time of scanning, to read out information stored in those picture elements, and the ratio of the amount of scattering light obtained by the previous step, and the amount of the stimulating light beam which impinges upon said respective other picture elements at the time of scanning to read out information stored in those other picture elements, and

subtracting the amount of light emitted from said other picture elements, obtained in the previous step, from the amount of light emitted from the certain picture element upon exposure thereof to said stimulating light beam at the time of scanning to read out information stored in said certain picture element,

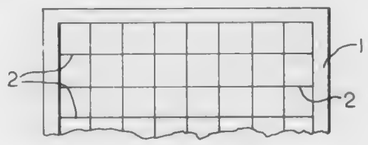
the remainder after the subtraction being treated as a real amount of light emitted from said certain picture element upon exposure thereof to the stimulating light beam at the time of scanning to read out information stored in said certain picture element.

4,728,792

SORPTION SHEET FOR SORBING A PLURALITY OF DISCRETE SAMPLES AND METHOD OF PRODUCING SUCH A SORPTION SHEET AND USE THEREOF

Gerald T. Warner, Staverton, Pullen's Field, and Colin G. Potter, 13 Lime Walk, both of Headington, Oxford, Great Britain

Filed Apr. 24, 1986, Ser. No. 855,443
Claims priority, application Sweden, May 20, 1985, 8502474
Int. Cl.⁴ G01N *35/00*
U.S. Cl. 250—328 **17 Claims**



1. In a sorption sheet for sorbing a plurality of discrete samples that simultaneously emit photons or beta particles, which in contact with a scintillant cause an indirect emission of photons wherein the photon emission from the individual samples is to be monitored, where the improvement comprises barriers of a photon and/or beta particle attenuating material extending through at least a portion of the thickness of the sheet which substantially attenuates optical cross-talk between the samples when so monitored.

4,728,793

SYSTEM FOR MONITORING MATERIAL DISPENSED ONTO A SUBSTRATE

Stephen L. Merkel, Bay Village, Ohio, assignor to Nordson Corporation, Westlake, Ohio

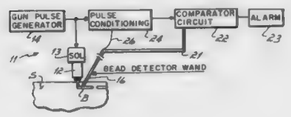
Filed Oct. 7, 1985, Ser. No. 785,332
Int. Cl.⁴ G01J *1/00*
U.S. Cl. 250—338 **24 Claims**

1. A system for monitoring energy radiant from a material dispensed onto a substrate comprising:

a sensor positioned to receive radiant energy from a substrate and from a material dispensed onto the substrate, the sensor having an electrical characteristic whose value varies in part in dependence upon the amount of energy, in at least a given energy band, received by the sensor;

amplifier means electrically connected to the sensor for producing an output signal which varies in dependence upon the value of said electrical characteristic of the sensor, the amplifier means including an amplifier (a) having an input capacitively coupled to the sensor and (b) producing said output signal at an output; and

means for clamping the input of the amplifier to a particular voltage level when the sensor is receiving radiant energy from the substrate and for unclamping the input of the amplifier before the sensor receives radiant energy from material dispensed onto the substrate.

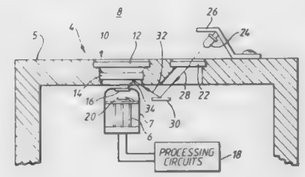


4,728,794

RADIATION SENSING ARRANGEMENTS

Nicholas S. Allen, Windsor, England, assignor to Graviner Limited, Essex, England

Filed May 23, 1986, Ser. No. 866,481
Claims priority, application United Kingdom, May 28, 1985, 8513419
Int. Cl.⁴ G01J *5/08, 5/04*
U.S. Cl. 250—339 **27 Claims**



1. A method of checking for obscuration of a radiation-transmitting window capable of transmitting radiation from relatively hot sources but not from relatively cold sources and which is used in a radiation detection system incorporating radiation sensing means capable of responding to radiation from relatively hot and from relatively cold sources and arranged to sense radiation passing through the said window, comprising the steps of

directing testing radiation to the radiation sensing means from a relatively cold source which is situated on the opposite side of the said window to the radiation sensing means,

the path of the testing radiation by-passing the said window but passing adjacent thereto, and

monitoring an output signal produced by the radiation sensing means in response to the received testing radiation so as to assess the degree of the said obscuration.

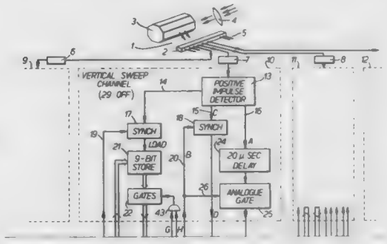
4,728,795

OPTICAL TARGET DETECTION SYSTEMS

Malcolm G. Cross, Colchester, United Kingdom, assignor to The Marconi Company Limited, Chelmsford, England

Filed Oct. 16, 1979, Ser. No. 84,469
Claims priority, application United Kingdom, Oct. 18, 1978, 40967/78
Int. Cl.⁴ G01J *1/00, 1/20;* **G01B** *11/26;* **G01C** *1/00*
U.S. Cl. 250—347 **11 Claims**

1. An optical target detection system comprising means for causing a linear array of optical detectors to scan in one coordinate direction across a field of view in swathes extending in said one coordinate direction with said detectors being arranged so that each scans a different part of a swath, means connected to said detectors for scanning said field of view during each of said swath in another coordinate direction, first means for evaluating the output signal from said detectors and for producing signals representing target responses resulting from said scanning in said one coordinate direction, first storage means for storing a digital address code related to the position in said one coordinate direction at which a target response signal occurs, second means for evaluating the output signals from said detectors and for producing signals representing target responses resulting from said scanning in the other coordinate direction, second storage means for storing a digital address code related to the position in said other coordinate direction at which a target response signal occurs, and means for reading out and utilizing the content of said first and second storage means only if target response signals result from said scanning in both said coordinate directions from the same position in said field of view.

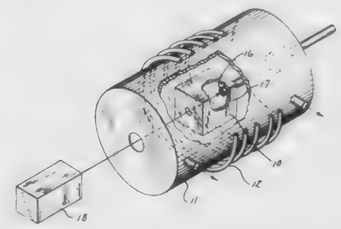


4,728,796

METHOD FOR IONIZATION OF POLYMERS

Charles E. Brown, Hubertus, Wis., assignor to Medical College of Wisconsin, Milwaukee, Wis.

Filed Apr. 10, 1986, Ser. No. 850,293
Int. Cl.⁴ H01T *27/24*
U.S. Cl. 250—423 P **6 Claims**



1. A method of volatilizing, ionizing and depositing a coating of intact and uncontaminated intractable polymer on a target substrate without fragmentation which method comprises forming a layer of the polymer over about 0.03 mm thick on the tip of a probe, placing the probe tip with the layer of polymer and a target substrate in a vacuum chamber, maintaining charge gradient between polymer and the target substrate effective to attact the ionized polymer molecules to the substrate, and then subjecting said polymer to pulsed, high power IR-laser radiation to cause facile ionization of the polymer molecules which because of the charge gradient are deposited as a coating on the target substrate.

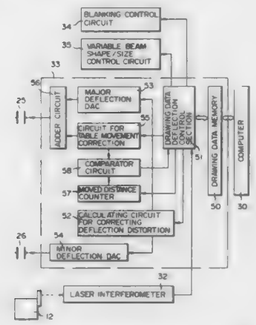
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4,728,797

METHOD FOR DRAWING A PATTERN BY CHARGED BEAM AND ITS APPARATUS

Mineo Goton, Kawasaki, and Hideo Kusakabe, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1986, Ser. No. 943,739
Claims priority, application Japan, Dec. 24, 1985, 60-291324
Int. Cl.[4] H01J *37/304, 37/302*
U.S. Cl. 250—492.2 **6 Claims**



1. A charged beam drawing method for drawing a desired pattern on a specimen placed on a continuously moving table by using a major deflector with a large beam deflection width and a minor deflector with a small beam deflection width, said charged beam drawing method comprising the steps of:
segmenting an area to be drawn into small areas within which the charged beam is deflectable;
setting a major deflection position, as given by said major deflector for a small area;
setting the correction data for minor deflection distortion, in connection with said major deflection position;
drawing a pattern within said small area while correcting a minor deflection distortion on the basis of said correction data;
feeding back to said major deflector the position data of said table when patterns are successively drawn in said small area, thereby to correct an incorrect displacement of the drawing position due to the movement of said table;
interrupting said small area drawing by the minor deflector when said table moves from the position of said table when said small area drawing starts by a distance longer than a predetermined distance;
resetting said major deflection position at a position allowing the drawing of the remaining patterns in said small area;
resetting the minor deflection correction data in connection with the major deflection position after said major deflection position resetting; and
drawing the remaining patterns in said small area.

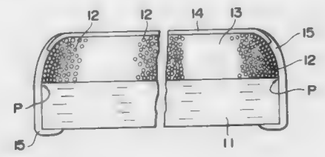
4,728,798

RADIATION IMAGE STORAGE PANEL AND PROCESS FOR THE PREPARATION OF THE SAME

Hideo Fukuda, Fujinomiya; Masamitu Nonomura, and Satoshi Arakawa, both of Kaisei, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 1, 1986, Ser. No. 846,792
Claims priority, application Japan, Apr. 3, 1985, 60-70240
Int. Cl.[4] G01T *1/10*
U.S. Cl. 250—484.1 **8 Claims**

1. In a radiation image storage panel comprising a support, a phosphor layer containing a stimulable phosphor and a binder, and a protective film superposed in this order, the improvement in which the thickness of the phosphor layer at the edge on at least two sides being opposite to each other is thinner than the mean thickness of the phosphor layer and the density



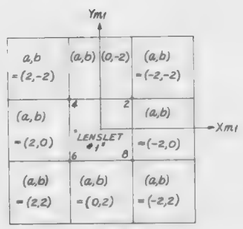
of the stimulable phosphor at said edge is higher than the mean density of the stimulable phosphor in the phosphor layer.

4,728,799

HEIGHT MEASUREMENT AND CORRECTION METHOD FOR ELECTRON BEAM LITHOGRAPHY SYSTEM

James J. Gordon, Pepperell; Kenneth J. Harte, Carlisle, and Vijay K. Singhal, Boston, all of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 749,791, Jun. 28, 1985, abandoned. This application Jan. 5, 1987, Ser. No. 4,235
Int. Cl.[4] G03F *9/00*
U.S. Cl. 250—492.2 **3 Claims**



1. A method of height measurement and correction for an electron beam lithography system having two-stage deflection ("fly's eye" lens type), employing a height measuring transducer and a two-position fiducial calibration grid system; said method comprising:
(1) measuring x and y deflection voltages and deriving switching and registration correction calibration C and D coefficient values for a selected lenslet of the electron beam optical column with the electron beam of that lenslet imaged on a first fiducial calibration grid position LFG1 located above a target surface of the electron beam optical column;
(2) for each four diagonal lenslets of the optical column, performing height measurement iteration using stitching and registration errors measured with respect to a second fiducial calibration grid position LFG2 a known distance δh_l from the position of the first fiducial calibration grid position LFG1;
(3) averaging each set of four values obtained in step (2) above and identifying the results as Δh_{xo} and Δh_{yo};
(4) measuring x and y deflection voltages and deriving stitching and registration correction C and D coefficient values therefrom with the electron beam imaged on the second fiducial calibration grid position LFG2;
(5) for each four diagonal neighbors of a selected lenslet, performing height measurement iteration using the stitching and registration errors measured at the first fiducial calibration grid position LFG1;

(6) averaging each set of four values obtained in step (5) above and identifying the results as Δh_{xo}, and Δh_{yo};
(7) calculating values Δh_{xo} and Δh_{yo} using the following equation

$$\overline{\Delta h_{xo}} = \frac{\Delta h_{xo} - \Delta h_{xo}'}{2 - \frac{\Delta h_{xo}}{1 - \Delta h_{xo}}} \text{ and } \overline{\Delta h_{yo}} = \frac{\Delta h_{yo} - \Delta h_{yo}'}{2 - \frac{\Delta h_{yo}}{1 - \Delta h_{yo}}}$$

(8) using a value of δh_l measured at the center of the selected lenslet, calculating

$$h_x = \delta h_l \sqrt{\Delta h_{xo}} \text{ and } h_y = \delta h_l \sqrt{\Delta h_{yo}} \ ;$$

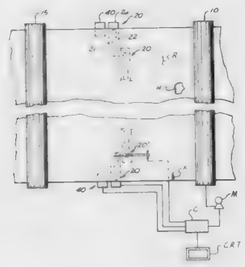
(9) calculating a value of h_x at the center of every lenslet; and
(10) calculating a value of h_y at the center of every lenslet; and
(11) for each lenslet using a value of the height of LFG1 above the target surface δh_c at the center of each lenslet being measured and the values of h_x and h_y, deriving a height correction value h_{xo} and h_{yo} from the expression $\Delta h_{xo} = \delta h_c / h_x$ and $\delta h_{yo} = \delta h_c / h_y$.

4,728,800

APPARATUS AND METHOD FOR DETECTING DEFECTS IN A MOVING WEB

Ebun A. Surka, Spartanburg, S.C., assignor to Young Engineering, Inc., Spartanburg, S.C.

Filed Apr. 24, 1985, Ser. No. 727,284
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—572 **16 Claims**



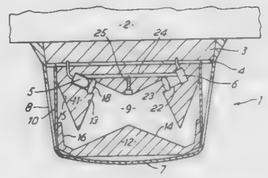
1. Apparatus for detecting discontinuity defects in a moving web comprising a plurality of light sensitive elements located across an intended path of travel for said web with said web being passable thereby between said elements and a source of light, said elements being actuatable by light from said source passing through a discontinuity defect in said web, said elements having a predetermined width and a predetermined spacing therebetween and monitoring substantially the full width of the web, and a programmable controller operatively associated with said elements to receive input therefrom when said elements are actuated by light passing through a discontinuity in said web, to determine the location and magnitude of a discontinuity in said web responsive to said input, to compare said input to preprogrammed defect data, and to control web movement dependent upon said comparison so that web stoppage is achieved only for those detected defects whose location, magnitude, or combined location and magnitude dictate same.

4,728,801

LIGHT SCATTERING SMOKE DETECTOR HAVING CONICAL AND CONCAVE SURFACES

Richard K. O'Connor, London, England, assignor to Thorn EMI Protech Limited, Twickenham, England

Filed May 7, 1986, Ser. No. 860,567
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—573 **6 Claims**



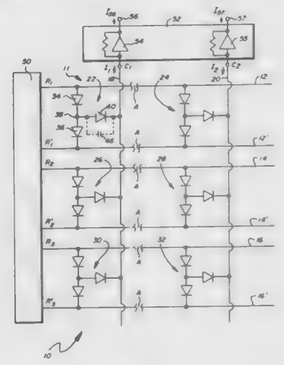
1. A light-scatter smoke detector comprising:
a first member having a generally conical and concave surface to define a recess;
a second member having a generally conical surface; the two members being positioned such that the recess of the first member and the surface of the second member form a chamber therebetween;
a light source positioned to output light towards a region of the chamber corresponding to an acute angle defined by and between the surface of the first member and the surface of the second member such that, when not scattered, the light beam from the light source is first incident on one of said surfaces defining the acute angle, to cause reflection directly onto the other said surface;
a light sensor to detect light scattered by smoke particles within the chamber, the light sensor being positioned away from the direct path of light output from the light source prior to the first incidence with the chamber.

4,728,802

BALANCED DRIVE PHOTOSENSITIVE PIXEL AND METHOD OF OPERATING THE SAME

Yair Baron, Southfield, Mich., assignor to Ovonic Imaging Systems, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 821,023, Jan. 21, 1986. This application Sep. 17, 1986, Ser. No. 908,423
Int. Cl.[4] H01L *27/14*
U.S. Cl. 250—578 **16 Claims**



1. A method of addressing at least one photosensitive pixel adapted to photogenerate a detectable electrical signal responsive to the quantity of radiation incident thereupon; said method comprising the steps of:

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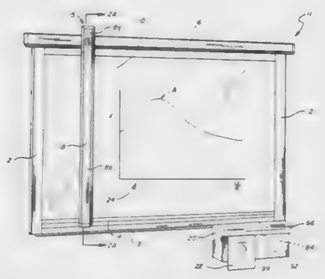
providing a plurality of first address line pairs;
providing a plurality of additional address lines spaced from and crossing said first address line pairs at an angle to form a plurality of cross over points therebetween;
electrically interconnecting, in nonopposing series relation, a pair of discrete isolation means about a common nodal point and between said address line pairs; said isolation means being of the type which provide a low impedence to current flow when forward biased into an on condition;
providing a photosensitive element between each of said nodal points and the associated additional address line;
applying an operating potential of a given magnitude and polarity to a one of said first address line pairs and applying an operating potential substantially equal in magnitude and opposite in polarity to the other of said first address line pairs for biasing said isolation means into said on condition to facilitate the detection of the charge photogenerated by each of said photosensitive elements; and
applying a charging potential to additional address lines during the application of said first operating potentials to said address line pairs to read the photogenerated electric charge in respective photosensitive elements.

4,728,803

SIGNAL PROCESSING APPARATUS AND METHOD FOR PHOTOSENSITIVE IMAGING SYSTEM

Clive Catchpole, Birmingham; John M. Jepsen, Troy; Louis D. Swartz, Holly, and Olivier F. Prache, Ann Arbor, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Jul. 15, 1986, Ser. No. 885,897
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **77 Claims**



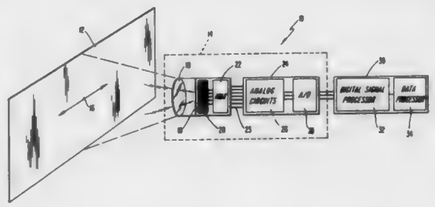
1. An imaging system for generating signals representative of detectable conditions of an image bearing surface, comprising:
sensor means for scanning the surface, said sensor means including an elongated array of photosensitive elements operatively disposed to sense the intensity of light received from a small portion of the surface and generate an electrical signal corresponding thereto;
means for storing individual values representative of the light intensity sensed by at least certain of the photosensitive elements during the scanning of said surface;
first means for comparing the value representing the signal sensed by each of said elements with at least one stored value to determine which of said values represents a greater light intensity, and for causing a sensed signal which said comparison indicates is of greater intensity to be stored in said storage means; and
second means for comparing the sensed signal generated by each element with a threshold value which corresponds to a predetermined fraction of the greatest light intensity yet received by a corresponding element and stored in the storage means; and said second comparing means adapted to produce a corresponding electrical output signal representative of the results of said comparison.

4,728,804

SCANNING SYSTEM WITH LOW SAMPLING RATE

Keith H. Norsworthy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1986, Ser. No. 947,859
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 250—578 **13 Claims**



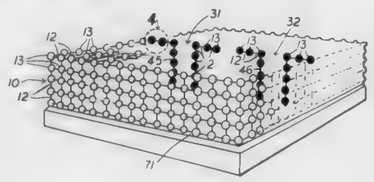
1. A scanning sensor system comprising:
a detector array including a plurality of detector elements positioned at a predetermined spacing in a focal plane, each of said detector elements adapted when sampled to produce a detector output signal value representative of the integrated energy of said radiation applied to said detector element since said detector element was last sampled;
means for scanning said array across a field of view;
means for generating sampling signals to sample each of said detector elements, the sampling signals for each of said detector elements being identical in sampling frequency and having a predetermined time phase relationship;
a plurality of delay means each coupled to one of said detector elements for delaying said detector output signal values of said coupled detector element by a predetermined delay value such that said delayed detector output signal values are out of time phase; and
multiplexer means connected to each of said delay means for time multiplexing said delayed detector signal values as discrete signals on a single multiplexer output terminal.

4,728,805

SYNAPTIC RADIO FREQUENCY INTERACTIVE SYSTEMS WITH PHOTORESPONSIVE SWITCHING

Richard C. Dempsey, Chatsworth, Calif., assignor to California Microwave, Inc., Woodland Hills, Calif.

Filed Nov. 10, 1986, Ser. No. 929,404
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **33 Claims**



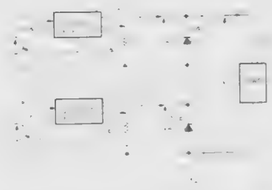
1. In a method of making a radio frequency interactive system variable in response to photon energy stimuli,
the improvement comprising in combination the steps of:
providing a matrix of electrically conductive segments with photoresponsive elements selectively separating numerous adjacent segments from each other and alternatively interconnecting segments with each other in response to photon energy stimuli;
supplying photon energy stimuli to a first array of said photoresponsive elements to provide a first combination of interconnected segments constituting a first radio frequency interactive configuration in said matrix; and
supplying photon energy stimuli to a second array of said photoresponsive elements to provide a second combination of interconnected segments constituting a second radio frequency interactive configuration in said matrix.

4,728,807

POWER SOURCE SYSTEM COMPRISING A PLURALITY OF POWER SOURCES HAVING NEGATIVE RESISTANCE CHARACTERISTICS

Yoshihiko Harafuji; Hideki Yamamoto, and Tsutomu Ogata, all of Tokyo, Japan, assignors to NEC Corporation and Nippon Telegraph and Telephone Corporation, both of, Japan

Filed Aug. 1, 1985, Ser. No. 761,745
Claims priority, application Japan, Aug. 2, 1984, 59-163090; Aug. 2, 1984, 59-163091
Int. Cl.⁴ H02J *9/06*
U.S. Cl. 307—52 **5 Claims**

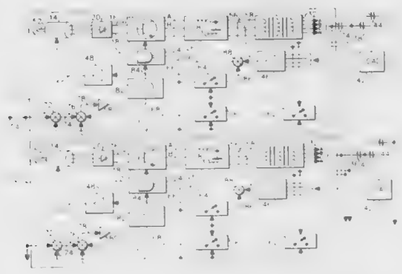


4,728,806

DC LINK VARIABLE SPEED CONSTANT FREQUENCY POWER SOURCE PARALLELING CONTROLS

Donal E. Baker, American Township, Allen County, and Mirza A. Beg, Lima, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1986, Ser. No. 938,661
Int. Cl.⁴ H02J *3/00*
U.S. Cl. 307—43 **28 Claims**



1. A parallel power system comprising:
at least two DC link variable speed, constant frequency power sources each having a Thevenin voltage and a plurality of output phases connected to a multiple phase common bus;
said power sources having substantially the same output frequency;
means for monitoring total real error current flowing in said output phases of each of said power sources;
means for controlling the relative phase angle of the Thevenin voltages of said power sources in response to said total real error current, to reduce the magnitude of said real error current;
means for monitoring reactive error current flowing in at least one of said output phases of each of said power sources;
means for controlling the relative magnitude of the Thevenin voltages of said power sources in response to said reactive error current, to reduce the magnitude of said reactive error current.

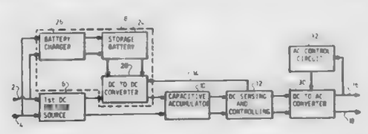
1. A power source system for supplying a load with a load voltage and a load current, said system comprising a plurality of power sources, each of said power sources producing a source voltage and a source current, and coupling means for coupling said power source together in series with said load in order to deliver the source voltages of the respective power sources to said load as said load voltages, with rates determined by the source voltages of the respective power sources and with the source current of each of said power sources being variable when each of said rates is varied between low and high normalized values, each power source comprising:
an electric source for producing said source current as a source signal; and
detecting means coupled to said electric source for detecting said source signal to produce first and second currents in accordance with a negative resistance characteristic which is such that the source current increases when the rate increases from said low normalized value toward said high normalized value;
producing means for producing the first current as said load current; and
a resistor through which said second current is caused to flow and across which a shared voltage is developed, as said source voltage, said shared voltage providing voltage of each of said power sources.

4,728,808

UNINTERRUPTIBLE POWER SUPPLY SYSTEM

Ran Bet-Esh, 3 Hess Street, and Rina Kavia, Borochov Str. 8, both of Jerusalem, Israel

Filed Mar. 10, 1986, Ser. No. 837,818
Claims priority, application Israel, Mar. 13, 1985, 74582
Int. Cl.⁴ H02J *9/06*
U.S. Cl. 307—66 **8 Claims**



1. An uninterruptible power supply system comprising input terminals connectable to an AC power source and leading to an AC to DC converter for producing a first DC voltage source, a second DC voltage source operationally connected

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to said first source, said system supplying at the output of said source a preset voltage normally primarily provided by said first DC source, a capacitive accumulator means connected in parallel with a voltage sensing and controlling circuit and the output of said two DC sources, said sensing and controlling circuit sensing the output of said first DC voltage source and controls the output of at least the second of said DC voltage sources, the arrangement being such that when the voltage of said first DC voltage source deviates from a predetermined value, the difference between said preset voltage of the system and the voltage supplied by said first DC voltage source is provided by said accumulator means until said second DC voltage source supplies said difference.

4,728,809

PULSE CIRCUIT FOR SWITCHING A GRID ELECTRODE OF AN ELECTRON BEAM GENERATOR

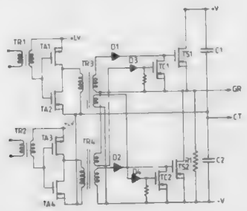
Frank D. Fisher, and Ronald Ovens, both of Edinburgh, Scotland, assignors to Ferranti, Plc, Cheadle, England

Filed Nov. 24, 1986, Ser. No. 933,975

Claims priority, application United Kingdom, Dec. 6, 1985, 8530081

Int. Cl.[4] H03K *3/00*

U.S. Cl. 307—106 **3 Claims**



1. A pulse circuit for switching a grid electrode of an electron beam generator having a cathode electrode at a very high potential relative to ground between two control voltages of opposite polarity, which circuit includes first and second switching devices each operable to connect one of the control voltages to the said grid electrode, first and second control devices each associated with a separate one of the switching devices and operable to switch off the said switching devices, a first pulse transformer having a primary winding to which may be applied pulses substantially at ground potential and a secondary winding operating at the potential of the cathode electrode, a pulse amplifier connected to the said secondary winding, and second and third pulse transformers each having a primary winding connected to the output of the pulse amplifier and a pair of secondary windings one being connected to one of said switching devices and the other being connected to the control device associated with the other of said switching devices, the arrangement being such that the application of a suitable pulse to the primary winding of the first pulse transformer causes the said grid electrode to be disconnected from the control voltage of one polarity and connected to the control voltage of the opposite polarity.

4,728,810

ELECTROMAGNETIC CONTACTOR WITH DISCRIMINATOR FOR DETERMINING WHEN AN INPUT CONTROL SIGNAL IS TRUE OR FALSE AND METHOD

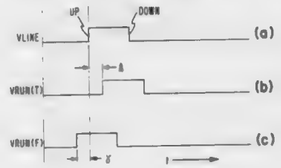
Joseph C. Engel, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1987, Ser. No. 16,426

Int. Cl.[4] H03K *3/00, 5/00*

U.S. Cl. 307—108 **4 Claims**

1. In a circuit of the kind wherein an alternating source voltage is directly connected by way of a first conductor to a first input terminal of a microprocessor for reference and is connected to a second input terminal of said microprocessor through a controlled switch and then a second conductor for signal purposes, where the presence of said alternating source voltage at said second input terminal indicates that said controlled switch is closed, where the absence of said alternating source voltage at said second input terminal normally indicates that said controlled switch is opened, where capacitive coupling between said first conductor and said second conductor provides a path for current from said first conductor to said second conductor which reacts with circuit impedance which is interconnected with said second conductor to provide a false alternating source voltage signal at said second input terminal even when said controlled switch is opened, where said false alternating source voltage signal at said second input terminal electrically leads said alternating source voltage at said first input terminal due to the impedance of said capacitive coupling by an amount γ, apparatus for allowing said microprocessor to determine when the voltage on said second input terminal thereof is the result of said controlled switch being closed or when said voltage on said second input terminal



thereof is the result of said false alternating source voltage signal, comprising:

first capacitive means connected between said first conductor and system common; and

second capacitive means connected between said second conductor and said system common, where the capacitive value of said first capacitive means is smaller than the capacitance value of said second capacitive means so that said alternating voltage at said second input terminal electrically lags said alternating source voltage at said first input terminal when said controlled switch is closed by an amount Δ, where Δ is less than γ, said microprocessor comparing said alternating source voltage on said first input terminal with said alternating voltage on said second input terminal after an alternation of said voltage on said first input terminal but during a time period corresponding to Δ, if said alternating voltages are of different signs during said comparison interval, said alternating voltage signal on said second terminal is the result of a closed controlled switch, if said alternating voltages are of the same sign during said comparison interval, said alternating voltage on said second input terminal is a false signal.

4,728,811

SAMPLE-AND-HOLD CIRCUIT

Tetsuya Iida, and Takayoshi Ikarashi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1986, Ser. No. 912,500

Claims priority, application Japan, Sep. 30, 1985, 60-216689

Int. Cl.[4] H03H *11/12*

U.S. Cl. 307—112 **13 Claims**

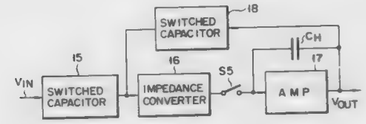
1. A sample-and-hold circuit comprising:

a first switched capacitor receiving an input signal and producing an output signal at an output terminal;

impedance-converting means, having an input terminal receiving said output signal from the first switched capacitor, for presenting said output signal at an output terminal having an output impedance which is lower than an output impedance at the output terminal of said first switched capacitor, said impedance converting means including a unity gain amplifier;

amplifying means having input and output terminals;

first switching means coupled between the input terminal of said amplifying means and the output terminal of said impedance-converting means to selectively connect and



disconnect said amplifying means and said impedance converting means;

output-holding capacitive means coupled between the input and output terminals of the amplifying means; and

a second switched capacitor coupled between the output terminal of the amplifying means and the input terminal of the impedance-converting means.

4,728,812

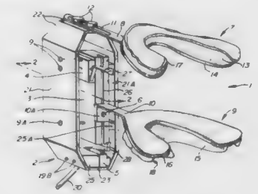
ORAL MACHINE CONTROLLER

Paul S. Sheriff, 1003 Hunakai St., Honolulu, Hi. 96816, and Randal J. York, 1760 Jonquil La., Plymouth, Minn. 55441

Filed Jul. 7, 1986, Ser. No. 882,366

Int. Cl.[4] H01H *35/00*

U.S. Cl. 307—134 **19 Claims**



1. An oral control device for electrical control of the operations of a machine by a human operator, comprising:

(a) a housing;

(b) a variable electrical resistive means carried by said housing and constructed and arranged to be connected to such a machine in voltage-potential controlling relation;

(c) said means including a movable control member movable relative to the remainder of said means and constructed and arranged to vary the voltage-potential of said means as said member is so moved;

(d) a first dentition grip constructed and arranged to be removably attached to the teeth of one jaw of such an operator and connected to said housing in supporting relation; and

(e) a second dentition grip constructed and arranged to be romovably attached to the teeth of the other jaw of such operator, and connected to said control member in movement controlling relation relative to the remainder of said means, whereby opening and closing jaw movements of such operator will move said control member relative to the remainder of said means and thereby controllably vary the voltage-potential of said means.

4,728,813

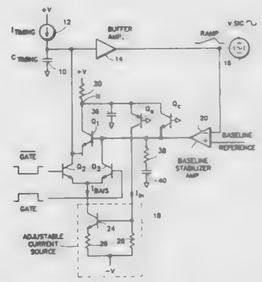
TIMEBASE GENERATOR WITH IMPROVED LINEARITY AND RECOVERY TIME

Calvin D. Diller, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 9, 1986, Ser. No. 905,910

Int. Cl.[4] HO3K *4/50*

U.S. Cl. 307—228 **21 Claims**



1. A circuit for producing a time base sweep comprising:

a timing capacitor,

first current source means for providing a current in a first current flow direction relative to said capacitor for successively generating a time base sweep,

second current source means and means for coupling a current from said second current source means in a second current flow direction relative to said capacitor for establishing a retrace at the end of each time base sweep and for decoupling the same subsequent to the end of retrace for initiating another sweep, and

means for reducing said last mentioned current from said second current source means to a lower level of current magnitude during a period after retrace and at least until the beginning of the next time base sweep.

4,728,814

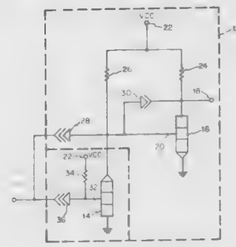
TRANSISTOR INVERSE MODE IMPULSE GENERATOR

George E. Smith, III, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,467

Int. Cl.[4] H03K *4/00, 3/017, 5/01, 3/26*

U.S. Cl. 307—260 **21 Claims**



1. an impulse generator for generating an impulse at an edge of an input pulse, comprising:

an input line for receiving an input pulse;

a gate circuit including a gate transistor with an output terminal, and with a control input terminal for turning said gate transistor on and off, said control input terminal being connected to said input line to turn on said gate transistor at the occurrence of one edge of a pulse on said input line; and

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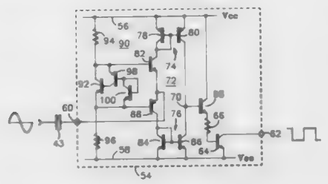
a second transistor connected to operate in its inverse mode so that it has a longer turn-on time than said gate transistor, said second transistor having a control input terminal connected to said input line to turn on said second transistor at the occurrence of said one edge of said pulse on said input line, said second transistor being connected to turn said gate transistor off when said second transistor turns on, to thereby cause an impulse to be generated at the output terminal of said gate transistor, regardless of the width of said input pulse.

4,728,815

DATA SHAPING CIRCUIT

W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1986, Ser. No. 919,349
Int. Cl.[4] H03K *5/00, 5/08;* **G05F** *3/16;* **H03F** *3/45*
U.S. Cl. 307—261 **8 Claims**



1. A data shaping circuit responsive to an alternating input signal supplied to an input thereof through a capacitive element for producing a rectangular output pulse at an output, comprising:

first circuit means responsive to the alternating signal for providing current drive, said first circuit means including a first semiconductor PN junction having a first electrode coupled to the input which is forward biased by the alternating input signal during its positive half cycle to provide current flow therethrough and a second semiconductor PN junction having a first electrode coupled to the input which is forward biased by the alternating input signal during its negative half cycle to provide current flow therethrough;

means for providing biasing to said first and second semiconductor PN junctions in a quiescent operating state;

second circuit means coupled to said first and said second semiconductor PN junctions which is responsive to said currents flowing in said first and second semiconductor PN junctions for providing the output pulse, the output pulse being at a first level when said current flow in said first semiconductor PN junction is greater than said current flow in said second semiconductor PN junction and being at a second level when said current flow in said first semiconductor PN junction is less than said current flow in said second semiconducotr PN junction;

said first semiconductor PN junction is a first transistor the base-emitter path being coupled between a first output terminal of said bias circuit and the input of the data shaping circuit and its collector being coupled to said second circuit means; and

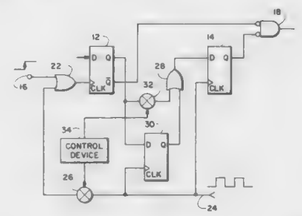
said second semiconductor PN junction is a second transistor of opposite conductivity type from said first transistor the base-emitter path being coupled between a second output of said bias circuit and the input of the data shaping circuit and its collector being coupled to said second circuit means.

4,728,816

ERROR AND CALIBRATION PULSE GENERATOR

William G. Wilke, Arlington, Mass., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 16, 1986, Ser. No. 864,043
Int. Cl.[4] H03K *3/017*
U.S. Cl. 307—265 **11 Claims**



1. An electronic circuit for selectively generating first and second output pulses which differ in duration by a predetermined amount, said circuit having a clock terminal for receiving clock transitions at precisely determined intervals and comprising:

a first sequential logic device having a data input terminal, a clock input terminal, and at least one output terminal, said first sequential logic device having a first state in which the output terminal is at a first of two binary logic output levels and a second state in which the output terminal is at the second of the two binary logic output levels, and said first sequential logic device being placed in its first state when a clock transition is received at the clock input terminal while the data input terminal is at a first of two binary logic input levels and being placed in its second state when a clock transition is received at the clock input terminal while the data input terminal is at the second of said two binary logic input levels,

a second sequential logic device having a data input terminal, a clock input terminal, and at least one output terminal, said second sequential logic device having a first state in which the output terminal is at one of said first and second binary logic output levels and a second state in which the output terminal is at the other of said first and second binary logic output levels, and said second sequential logic device being placed in its first state when a clock transition is received at the clock input terminal while the data input terminal is at one of said first and second binary logic input levels and being placed in its second state when a clock transition is received at the clock input terminal while the data input terminal is at the other of said first and second binary logic input levels,

a combinational logic device having a first input terminal coupled to the output terminal of the first sequential logic device, a second input terminal coupled to the output terminal of the second sequential logic device, and an output terminal,

means coupling the clock terminal of the circuit to the clock input terminals of the first and second sequential logic devices and coupling the output terminal of the first sequential logic device to the data input terminal of the second sequential logic device, and

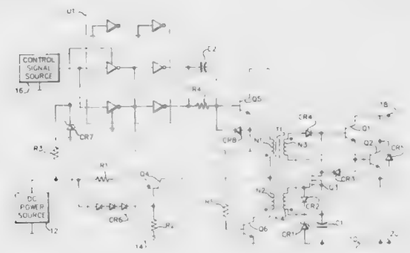
control means for selectively placing the coupling means in a first state such that a change in the state of the first sequential logic device brings about a change in the state of the second sequential logic device after a first predetermined number of clock transitions and the combinational logic device generates said first output pulse at its output terminal, or in a second state such that a change in the state of the first sequential logic device brings about a change in the state of the second sequential logic device after a second predetermined number of clock transitions, said second number being different from said first number, and the combinational logic device generates said second output pulse, having a different duration from said first output pulse, at its output terminal.

4,728,817

POWER TRANSISTOR DRIVE CIRCUIT

Ralph D. Jessee, and Joseph M. Urish, both of Shawnee Township, Allen County, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1987, Ser. No. 12,774
Int. Cl.[4] H03K *17/60, 3/33;* **G05F** *1/56*
U.S. Cl. 307—270 **12 Claims**



1. A transistor drive circuit comprising:

a power switching transistor having a base, an emitter, and a collector;

a driver transistor having a base, an emitter, and a collector, wherein the driver transistor collector is connected to the switching transistor collector and the driver transistor emitter is connected to the switching transistor base;

means for providing turn-on and turn-off pulses;

means for coupling said turn-on pulses to said driver transistor base;

a capacitor;

means for connecting said capacitor between said driver transistor base and said switching transistor emitter when said turn-off pulse is present, wherein the voltage on said capacitor hastens turn-off of said driver transistor and said switching transistor;

means for continuing current flow in said capacitor following turn-off of said driver transistor but prior to turn-off of said switching transistor; and

means for charging said capacitor following turn-off of said switching transistor.

4,728,818

EMITTER FUNCTION LOGIC WITH CONCURRENT, COMPLEMENTARY OUTPUTS

David P. Chengson, Mountain View, and Aurangzeb K. Khan, San Bruno, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Dec. 17, 1986, Ser. No. 942,669
Int. Cl.[4] H03K *3/284, 3/29, 19/086*
U.S. Cl. 307—272.2 **4 Claims**

1. A logic gate comprising:

a first input transistor having a base coupled to an input, a collector coupled to a voltage source and an emitter;

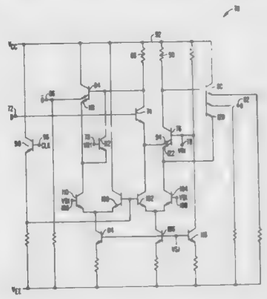
a second reference transistor having an emitter coupled to said emitter of said first transistor, a collector coupled to said voltage source and a base coupled to a voltage reference;

a third output transistor having a base coupled to said collector of said second transistor, a collector coupled to said voltage source and an emitter coupled to a true output;

a fourth complementary output transistor having a base coupled to a collector of said first transistor, a collector coupled to said voltage source and an emitter coupled to a complementary output;

fifth and sixth emitter-coupled transistors, a collector of said fifth transistor being coupled to said emitter of said first input transistor, a collector of said sixth transistor being coupled to a second emitter of said second reference transistor, a base of said fifth transistor being coupled to a clock input and a base of said sixth transistor being coupled to a second voltage reference;

said third true output transistor having a second emitter coupled to said collector of said sixth transistor;



seventh and eighth emitter-coupled transistors, said seventh transistor having a collector coupled to said voltage source and a base coupled to said clock input, said eighth transistor having a base coupled to said second voltage reference;

said fourth output transistor having a second emitter coupled to a collector of said eighth transistor; and

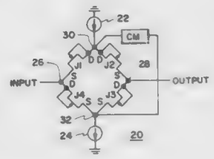
a ninth reference transistor having a collector coupled to said base of said fourth complementary output transistor an emitter coupled to said collector of said eighth transistor and a base coupled to said voltage reference.

4,728,819

SWITCHING NETWORK

Tho T. Vu, Anoka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1986, Ser. No. 900,958
Int. Cl.[4] H03K *17/687;* **G11C** *27/02*
U.S. Cl. 307—353 **17 Claims**



1. A switching network comprising:

an input means;

an output means;

a first FET having its drain electrically connected to its gate and its source electrically connected to the input means;

a second FET having its drain electrically connected to its gate and the drain of the first FET, and its source electrically connected to the output means;

a third FET having its drain electrically connected to its gate and further having its drain and gate electrically connected to the source of the second FET and the output means;

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a fourth FET having its drain electrically connected to its gate, and further having its drain and gate electrically connected to the input means and the source of the first FET, and having its source electrically connected to the source of the third FET;

a first current generating means having first and second terminals wherein the first current generating means first terminal is grounded and its second terminal is electrically connected between the drains of the first and second FETs;

a second current generating means having first and second terminals wherein the second current generating means first terminal is grounded and its second terminal is electrically connected between the sources of the third and fourth FETs; and

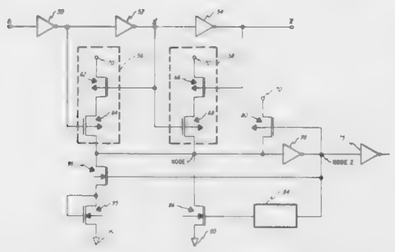
switch control means for gating the four FETs of the switching network on and off.

4,728,820

LOGIC STATE TRANSITION DETECTION CIRCUIT FOR CMOS DEVICES

Jeffrey C. Lee, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 28, 1986, Ser. No. 901,841
Int. Cl.[4] H03K *17/16, 19/017, 19/096, 5/13*
U.S. Cl. 307—443 **6 Claims**



1. A logic transistion detector means for detecting logic signal changes, said transition detector means having an input means adapted to receive said logic signals and an output node, said detector means comprising:

an intermediate node having a first logic level;

a first transition detection means having a control terminal means coupled to said input means and an output means coupled to said intermediate node for providing a second logic level at said node when said logic signal changes from a low to a high logic state;

a second transition detection means having a control terminal means coupled to said input means and output means coupled to said intermediate node for providing said second logic level at said node when said logic signal changes from a high to a low logic state;

output means coupled between said intermediate node and said output node for sensing said intermediate node and providing an output signal to said output node when said intermediate node is at a second logic level;

a latching transistor means coupled between a first power supply terminal and said intermediate node, and having a control terminal coupled to said output node for maintaining said intermediate node at said second logic level; and

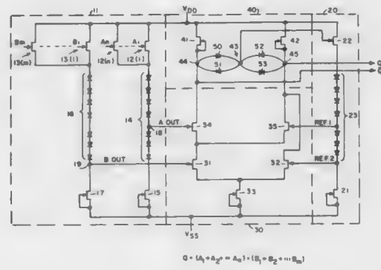
reset means coupled between said output node and said intermediate node for resetting said intermediate node to said first logic level said reset means including a delay circuit, wherein said output signal includes a pulse having a predetermined pulse width.

4,728,821

SOURCE FOLLOWER CURRENT MODE LOGIC CELLS

J. Leon Yang, Palo Alto, Calif., and Joseph P. Zeh, Bolton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 19, 1985, Ser. No. 725,255
Int. Cl.[4] H03K *19/017, 19/086;* **G06F** *7/50;* **G06G** *7/12*
U.S. Cl. 307—448 **13 Claims**



1. A source follower current steering logic circuit for performing a logic operation on a plurality of input signals comprising:

A. first and second input branches each including:

(i) input means for receiving an input signal and for generating a signal in response thereto;

(ii) signal generating means connected to said input means for receiving the signal therefrom and for generating an output signal having a selected voltage level in response thereto, said signal generating means of both said first and second input branches having a corresponding predetermined number of level shifting means each having an output connected serially between a power supply means and said input means, the output signal from signal generating means of one input branch being taken from the output of a different level shifting means than the output of the signal generating means of the other input branch so that output signals from the first and second input branches have different voltage levels;

B. reference branch means also having a plurality of serially-connected level shifting means, each having an output connected to a power supply means, the number of level shifting means in said reference branch means corresponding to the number of level shifting means in said signal generating means in each of said input branches, the reference branch means generating reference voltage signals from the outputs of level shifting means corresponding to the level shifting means in said signal generating means of each of said first and second input branches from which output signals are taken;

C. logic branch means connected to said signal generating means and said reference branch means for generating logic output signals the states of which are determined by a comparision between the voltage levels of said output signals from said signal generating means and the voltage levels of said reference signals; and

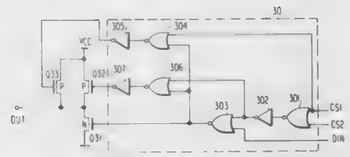
D. output branch means connected to said logic branch means for receiving the logic output signals from said logic branch means for generating digital signals having predetermined voltage levels in response to the logic output signals from said logic branch means.

4,728,822

DATA PROCESSING SYSTEM WITH IMPROVED OUTPUT FUNCTION

Yuko Kusaka, and Keiji Matsumoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,249
Claims priority, application Japan, Apr. 26, 1983, 58-73279
Int. Cl.[4] H03K *19/017, 19/094, 19/00;* **H01P** *1/22*
U.S. Cl. 307—448 **13 Claims**



1. An output circuit comprising a first field effect transistor coupled between a first voltage terminal and an output terminal, a second field effect transistor coupled between said output terminal and a second voltage terminal, a third field effect transistor coupled between said output terminal and said first voltage terminal, a conductive resistance of said third transistor being larger than that of said first transistor, a first terminal receiving a first control signal, a second terminal receiving a second control signal independent of said first control signal, a third terminal receiving a data signal, first control means coupled to said first and second terminals for generating a detection signal at its output when at least one of said first and second control signals is present, second control means coupled to said third terminal and the output of said first means for generating a gated signal in accordance with said data signal when said detection signal is not present, means coupled to said second transistor and said second control means for controlling said second transistor in response to said gated signal, third control means coupled to said first transistor and receiving said gated signal and said detection signal for controlling said first transistor in accordance with said gated signal when said detection signal is not present, and fourth control means coupled to said third transistor and receiving said gated signal and said first control signal for making only said third transistor conducting with said first and second transistors non-conducting when said second control signal is present while said first control signal is not present, wherein said output terminal is set at a high impedance state when said first control signal is present, and set at said predetermined voltage through only said third transistor irrespective of the state of said data signal when said second control signal is present and said first control signal is not present.

4,728,823

LOGIC CIRCUIT TESTABLE AS AN INVERTER PAIR AND OPERABLE AS A FLIP-FLOP

Tsuneo Kinoshita, Kokobunji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 564,193, Dec. 22, 1983, abandoned. This application Jul. 22, 1986, Ser. No. 888,273
Claims priority, application Japan, Dec. 27, 1982, 57-226965
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—451 **4 Claims**

1. A logic circuit on a substrate layer of a gate array device having a surface area with n-type and p-type regions formed therein, comprising:

first and second input terminals;

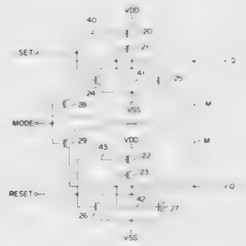
first and second output terminals;

a control input;

a V_{DD} terminal;

a first NOR gate including first p-type and first n-type regions formed in the surface area of said substrate layer and first and second conductive layers each insulatively formed over and across said first p-type and first n-type regions, said first p-type region forming first and second p-channel MOS transistors in cooperation with said first and second conductive layers, said first n-type region forming first and second n-channel MOS transistors in cooperation with said first and second conductive layers, said first and second p-channel MOS transistors and said first and second n-channel MOS transistors being interconnected to have a complementary structure, said first p-channel MOS transistor being coupled to said first input terminal and said V_{DD} terminal, said second n-channel MOS transistor being coupled to said first output terminal;

a second NOR gate including second p-type and second n-type regions formed in the surface area of said substrate layer and third and fourth conductive layers each insulatively formed over and across said second p-type and second n-type regions, said second p-type region forming third and fourth p-channel MOS transistors in cooperation with said third and fourth conductive layers, said second n-type region forming third and fourth n-channel MOS transistors in cooperation with said third and fourth conductive layers, said third and fourth p-channel MOS transistors and said third and fourth n-channel MOS transistors being interconnected to have a complementary structure, said third p-channel MOS transistor being coupled to said second input terminal and said V_{DD} terminal, said fourth n-channel MOS transistor being coupled to said second output terminal; and



first and second transfer gates for selectively cross-coupling and separating said first and second NOR gates under the control of a control signal applied to said first and second transfer gates from said control input, said first transfer gate being located on said substrate layer between said first and second p-type regions, said second transfer gate being located on said substrate layer between said first and second n-type regions, a drain of said first transfer gate being coupled to a gate of said second p-channel MOS transistor by a first metal connector, a drain of said second transfer gate being coupled to a gate of said fourth p-channel MOS transistor by a second metal connection, said first and second metal connections each having a length selected to reduce capacitance between said each metal connection and said substrate layer, said control signal having a timing selected to permit natural discharge of said second and fourth p-channel MOS transistors, an input of said first transfer gate being coupled to an output of said fourth p-channel MOS transistor, an input from said second transfer gate being coupled to an output from said second p-channel MOS transistor.

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4,728,824

CONTROL CIRCUIT OF A PLURALITY OF STL TYPE LOGIC CELLS IN PARALLEL

Francois Van Zantel, Meylan, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 23, 1986, Ser. No. 922,515
Claims priority, application France, Oct. 29, 1985, 85 16048
Int. Cl.[4] H03K *19/013, 19/084, 19/092. 17/04*
U.S. Cl. 307—457 6 Claims





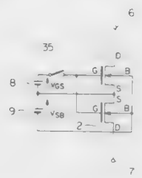
1. A control circuit including a plurality of logic STL cells that are in parallel, each cell comprising a transistor, a first Schottky diode connected between the base and collector of the transistor, at least one second Schottky diode connected to the collector of the transistor, an input terminal connected to the base of the transistor for receiving logic signals, a separate output to each of the second Schottky diodes, a power terminal connected to the base of the transistor through a resistor, and a ground terminal connected to the emitter of the transistor, and switching circuit means, each of the power terminals of the cells being connected to the power source by way of the switching circuit means for switching the voltage level at the power terminal between first and second states under control of the logic signals being applied to the input terminals of each cell.

4,728,825

BIDIRECTIONAL MOS LINEAR SWITCH

Shigeru Sugayama, Hitachi; Tadaaki Kariya, Ibaraki; Tatsuo Shimura, and Sigeo Tomita, both of Hitachi, all of Japan, assignors to Haramachi Semi-Hitachi Ltd., Japan and Hitachi Conductor Ltd.

Filed May 29, 1986, Ser. No. 868,022
Claims priority, application Japan, May 31, 1985, 60-116449
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—570 6 Claims



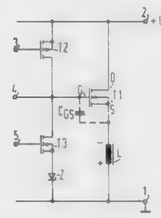
1. A bidirectional linear switch comprising:
first and scond switch terminals; and
two MOS transistors whose sources, gates, and substrates are respectiveley mutually and electrically connected together at predetermined points and whose drains are respectively connected to said first and second switch terminals, wherein a reverse bias voltage s applied between a connecting point of said sourcesand a connecting point of said substrates such that said substrates are reversely biased relative to said sources, and wherein a control signal for controlling said linear switch isapplied between a connecting point of said gates and the connecting point of said sources.

4,728,826

MOSFET SWITCH WITH INDUCTIVE LOAD

Josef Einzinger, Unterschleissheim; Christine Fellinger, Unterhaching; Ludwig Leipold, Munich; Jenoe Tihanyi, Munich, and Roland Weber, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,576
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609235
Int. Cl.[4] H03K *17/04, 17/687*
U.S. Cl. 307—571 5 Claims



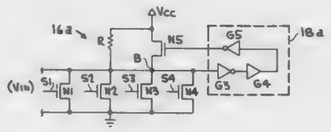
1. A circuit arrangement for aiding the turn-off of a power MOSFET having an inductive load which is connected between the source of the power MOSFET and a first terminal, and having a second terminal which is connected to the drain of the power MOSFET, comprising:
a series connection of a switch and a Zener diode connected between the gate of the power MOSFET and the first terminal, said Zener diode being poled for conduction in its reverse breakdown region so that in combination with conduction of the switch during turn-off of said power MOSFET, the reverse breakdown voltage of said Zener diode limits the voltage at said gate and source of the power MOSFET, thereby aiding energy reduction of said inductor during said turn-off of said power MOSFET and additionally forming a discharge circuit for the gate-source capacitance of the power MOSFET.

4,728,827

STATIC PLA OR ROM CIRCUIT WITH SELF-GENERATED PRECHARGE

Ann K. Woo, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 3, 1986, Ser. No. 937,572
Int. Cl.[4] H03K *19/017*
U.S. Cl. 307—481 14 Claims



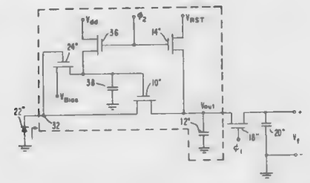
1. A static PLA circuit comprising:
a NOR logic gate having inputs for receiving input select signals and having an output;
a precharge MOS transistor having one of its main electrodes connected to a supply potential and its other main electrode connected to the output of said NOR gate;
said percharge MOS transistor being formed of an N-channel transistor;
a feedback circuit portion formed of inverter means connected between the output of said NOR gate and the gate of said precharge MOS transistor; and
said inverter means including a first inverter, a second inverter and a third inverter,
said first inverter having its input connected to the output of said NUR gate and its output connected to the input of said second inverter, said third inverter having its input connected to the output of said second inverter and its output connected to the gate of said N-channel transistor.

4,728,828

SWITCHED CAPACITOR TRANSRESISTANCE AMPLIFIER

Mark A. Goodnough, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 505,633, Jun. 20, 1983, Pat. No. 4,567,363.
This application Jun. 24, 1985, Ser. No. 748,105
Int. Cl.[4] G06G *7/12;* H03K *17/60;* H03F *3/26*
U.S. Cl. 307—493 7 Claims



1. An improved transresistance amplifier providing low input impedance comprising:
a first transistor having an input terminal, an output terminal and a gate, said input terminal thereof being coupled to an input port of the transresistance amplifier, said output terminal thereof being coupled to an output port of the transresistance amplifier;
a first capacitor coupled to the output port of the transresistance amplifier;
switched voltage means coupled to said first capacitor, said switched voltage means periodically resetting a voltage across said capacitor to a first predetermined reference level; and
feedback amplifier means coupled between said gate and said input terminal of said transistor, said feedback amplifier means having a switched capacitor load operatively coupled thereto and to said gate to provide gain to said amplifier for reducing a voltage across the input port of the transresistance amplifier in response to a current applied to the input port of the transresistance amplifier;
whereby the voltage across said first capacitor may be periodically sampled before being reset to obtain an indication of the current applied to the input port of said transresistance amplifier.

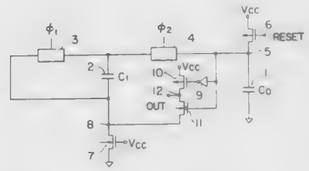
4,728,829

TIMER CIRCUIT

Jun-ichi Tsujimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1985, Ser. No. 724,417
Claims priority, application Japan, Apr. 20, 1984, 59-79655
Int. Cl.[4] H03K *17/296, 17/687*
U.S. Cl. 307—590 5 Claims

1. A timer circuit comprising:
(a) a charge storage capacitor having a first terminal and a second terminal connected to ground;
(b) a charge pumping capacitor having a first terminal and a second terminal;
(c) a first transistor means for connecting the first terminal of said charge storage capacitor to a power supply when a reset signal is applied thereto;
(d) a second transistor means coupled serially between said second terminal of said charge pumping capacitor and ground to keep the potential at said second terminal higher than ground potential by an amount of voltage drop of said second transistor means;
(e) a first transfer gate means connected between the first terminals of said charge storage and charge pumping capacitors to periodically transfer a part of a charge stored in said charge storage capacitor to said charge pumping



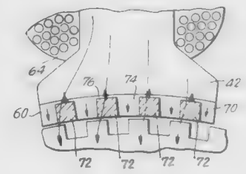
capacitor according to one phase signal of a two-phase clock after application of said reset signal;
(f) a second transfer gate means connected to said second terminal of said charge pumping capacitor to periodically discharge a charge stored in said charge pumping capacitor according to another phase signal of the two-phase clock after application of said reset signal; and
(g) an adjustment circuit including at least one adjusting transistor means which has a low back-bias effect, connected to said charge storage capacitor to control the potential of the stored charge of said charge storage capacitor within a range determined by a threshold voltage of said adjusting transistor means from the potential of the second terminal of said charge pumping capacitor.

4,728,830

ELECTRIC MOTOR WITH MAGNETIC ENHANCEMENT

John G. Gamble, Hingham, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Jun. 4, 1986, Ser. No. 870,624
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 12 Claims



1. An electric motor, comprising:
a stator having a plurality of poles;
a winding on each of said poles;
a mover movable relative to said stator poles;
tooth forming means mounted on said stator pole and facing said mover;
said tooth forming means including a permanent magnetic structure having a plurality of thin portions bonded to said stator poles and a plurality of thicker portions integral with said thin portions and bonded to said stator poles;
said thin portions and said thicker portions being elongated and extending longitudinally in a direction transverse to

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movement of the mover relative to said stator and forming flutings between said thicker portions, said thicker portions projecting toward said mover;

said thin and thicker portions being magnetized in directions toward and away from the mover, said thin portions and said thick portions being magnetized in opposite directions;

a plurality of rods each fitted in the flutings and bonded to said tooth forming means, said rods being of a high permeability ferromagnetic material and forming teeth for said stator poles.

4,728,831

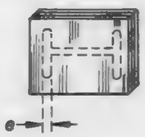
DAMPED VOICE COIL ACTUATOR

Chun-Jer Cheng, Cuppertino, Calif., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Continuation of Ser. No. 648,102, Sep. 7, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,486

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—13 **3 Claims**



1. In a longitudinally movable body, at least one fin of unitary construction, with two sides, a front, and a back, in which said fin is substantially divided by a slot disposed longitudinally between said front and said back, said slot having enlarged ends, such that said slot forms the crosspiece and said ends form the uprights of a substantially "H" shaped hole through said fin and in which fin said slot substantially divides said fin into relatively immovable upper and lower portions and relatively movable front and back flexures wherein:

an area of said fin, greater in size than said "H" shaped lot, is substantially covered by a layer of elastomeric material affixed to at least one of said fin sides, and wherein

said elastomeric layer is substantially covered by stiffening plate attached thereto, and

wherein said fin has a plurality of "H" shaped slots such that the longitudinal axis of each slot is substantially colinear and the back flexure of one is the front flexure of the next slot, said axially colinear plurality of slots substantially dividing said fin into a plurality of substantially coextensive upper portions and substantially coextensive lower portions.

4,728,832

ALTERNATING CURRENT MOTOR WITH DIRECTIONAL ROTATION RELIABILITY

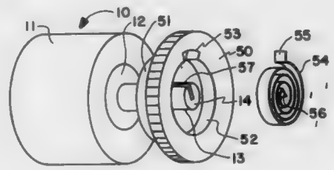
Girts U. Jatnieks, Minneapolis; Robert C. Knutson, Minnetonka, and Laurence C. Rodgers, Circle Pines, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 7, 1986, Ser. No. 894,183

Int. Cl.⁴ H02K *7/10*

U.S. Cl. 310—41 **4 Claims**

1. A bi-directional, alternating current motor, including: permanent magnet rotor means for said motor; stator means having a pair of windings with each winding having a first end connected to a common external connection point; a capacitor having two end connections; each of said windings having a second end with said second ends connected to said capacitor end connections to form a delta connection configuration of said capacitor and said two motor windings; each of said end connections connected to further external connection points; control means for connection of said common external connection point and a first of said further external connection points to a source of alternating current potential to energize said motor to cause said rotor means to rotate in a clockwise direction; said control means for further connection of said common external connection point and a second of said further external connection points to said source of alternating current potential to energize said motor to cause said rotor means to rotate in a counterclockwise direction; said rotor marns having output shaft means; output gear means rotatably mounted on said output shaft means; rotational restraint means coupling together said output shaft means and said output gear means with said rotational restraint means allowing a limited amount of rotational freedom both clockwise and counterclockwise be-



tween said output shaft means and said output gear means; said rotational restraint means includes coupling means mounted to said output shaft means and which rotates with said shaft means; said output gear means engaging said coupling means upon a limited amount of rotation of said output shaft means to then in turn cause said output gear means to rotate with said rotor means; said coupling means mounted to said output shaft means being a flexible member; said output gear means includes slot means to engage said flexible member; and said flexible member being a flat key-like member projecting equally on each side of a center of rotation for said rotor means.

4,728,833

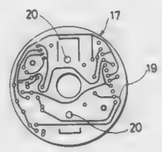
1-PHASE SELF-STARTING BRUSHLESS MOTOR

Manabu Shiraki, and Osami Miyao, both of Kanagawa, Japan, assignors to Shicoh Engineering Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1986, Ser. No. 919,662

Int. Cl.⁴ H02K *29/08*

U.S. Cl. 310—68 R **10 Claims**



1. In a 1-phase energized brushless motor of the type which includes a field magnet as a rotor having 2P alternate north and south magnetic poles, P being an integer equal to or greater than 1, and a coreless armature coil and a position detecting element for detecting the position of said field magnet disposed at stationary positions in an opposing relationship to said field magnet with an air gap left therebetween, and which rotates in one direction utilizing a field magnet attracting and repulsing torque, the improvement comprising a plastic magnet molded in an integral relationship with said armature coil and magnetized to a magnetic north or south pole such that a field magnet attracting and repulsing torque may be generated at a position rearwardly of a dead point by an electric angle of θ degrees defined by an expression $0<\theta<90$ relative to the direction of

rotation of said field magnet thereby to allow self-starting of said motor.

4,728,834

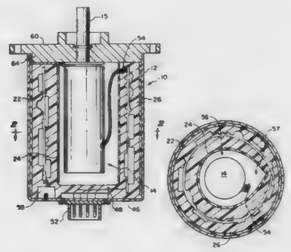
COMPACT DIGITAL RESOLVER/ENCODER ASSEMBLY WITH FLEXIBLE CIRCUIT BOARD

Shalabh Kumar, Kildeer, and Keith R. Johnson, Orland Park, both of Ill., assignors to Autotech Corporation, Carol Stream, Ill.

Filed May 28, 1985, Ser. No. 738,411

Int. Cl.⁴ H02K *11/00, 23/66*

U.S. Cl. 310—68 R **24 Claims**



15. A compact digital resolver/encoder assembly comprising a resolver, electronic circuitry for decoding the resolver being formed in at least one integrated circuit chip mounted on a flexible circuit board; a container having a closed end and an open end; said integrated circuit chip and circuit board being received in said container adjacent a wall of said container; said resolver being mounted in said container separate and spaced from said circuit board; and means for insulating said integrated circuit chip from said resolver and from said container.

4,728,835

ELECTRIC MOTORS

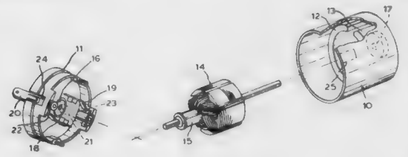
Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Sep. 30, 1986, Ser. No. 913,758

Claims priority, application United Kingdom, Oct. 4, 1985, 8524528

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—71 **6 Claims**



1. A direct current electric motor comprising a cylindrical casing (**10**) of electrically conductive material, a stator magnet means (**12, 13**) and a wound rotor (**14**), provided with a commuator (**15**), accommodated in the casing, an end cap (**11**) in one end of the casing, and brush holding device (**18, 19**) supported by the end cap in electrically non-conductive relationship therewith, the brush holding devices having terminals (**20, 21**) which extend through the end cap for connection to an electric supply, wherein the casing has a deformed portion in contact with one of said terminals (**20**) to provide electrical connection between the casing and said one of the terminals.

4,728,836

STRAIN-RELIEF HOUSING FOR STRAND CONNECTORS OF SMALL ELECTRIC MOTORS

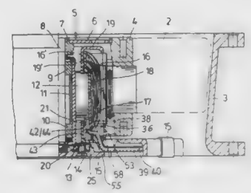
Guenter Wrobel, Villingen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,299

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1986, 3604990

Int. Cl.⁴ H01R *13/58, 27/00;* **H02K** *5/22*

U.S. Cl. 310—71 **18 Claims**



1. An arrangement for mounting reinforced ends of strand connectors with stator winding ends in pocket-type hollow spaces of a coil-insulating part of a stator of a small electric motor comprising: axially extending pocket-type hollow spaces provided in an external shell surface of a cylindrical collar of an end plate arranged on a front surface of a stator plate bundle; an opening for each pocket-type hollow space; the pocket-type hollow spaces being arranged in pairs next to one another and insulatingly separated from one another; a ring-shaped insulating cover plate placed on the cylindrical collar of the end plate opposite openings of the pocket-type hollow spaces; a radial recess means in said ring-shaped insulating coverplate, in the area of the opening of the pocket-type hollow spaces: said recess means being circumscribed in part by an interior edge which is disposed radially outside the hollow spaces for causing bending of a strand connector located in said axial extending pocket-type hollow spaces, and in a first deflection at least approximately at a right angle and radially to the axial direction of the pocket-type hollow spaces; and the recess means, on a radial exterior side, being closed off by a ring wall section means of the ring-shape cover plate which ring wall section means causes bending of the strand connectors in a second deflection in an axial direction when said connectors are located in said axially extending pocket type hollow spaces.

4,728,837

VARIABLE SPEED, VARIABLE MOTION, ELECTRICALLY OPERATED VIBRATOR FOR SCREENING MACHINERY

Krishna Bhadra, Brecksville, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 30, 1984, Ser. No. 677,109

Int. Cl.⁴ H02K *7/06*

U.S. Cl. 310—80 **19 Claims**

1. Apparatus for inducing vibration, comprising:

a housing having a substantially cylindrical interior cavity;

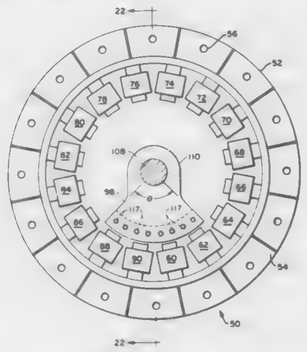
a plurality of electromagnets spaced around the cavity forming a substantially circular array having a horizontal axis with the magnetic poles directed radially inward toward the axis of the array and with an imaginary line segment drawn between the poles of each electromagnet parallel to the axis of the array;

a magnetically attractable mass asymmetrically disposed within the cavity and spanning a sector less than the full inner circumference of said cavity for circular rotation about said horizontal axis;

means connected between the mass and the housing for

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transmitting the centrifugal force generated by the rotation of said mass, to the housing;
means for securing the housing to a process such that vibration energy may be transmitted to the process; and
means for conducting energy from the exterior of the housing to each of the plurality of electromagnets and for energizing and deenergizing individual electromagnets without changing their polarity in a predetermined sequence whereby the magnetically attractable mass rotates around the electromagnets imparting centrifugal force to the housing for transmission of vibration energy.

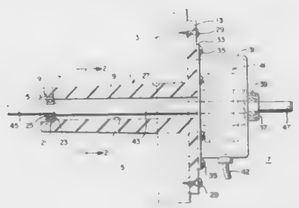


4,728,838

ASSEMBLY FOR MOUNTING A MOTOR TO AN INSULATED WALL

Sheldon W. Mandel, 1703 Bridge Ave., and Chinmoy Banerjee, 1117 Hawkinson Ave. - Apt. 1, both of Galesburg, Ill. 61401

Filed Nov. 6, 1986, Ser. No. 927,385
Int. Cl.[4] H02K *5/08*
U.S. Cl. 310—91 **6 Claims**



1. A motor mount assembly for attachment to a wall separating first and second zones and provided with a hole therethrough, which assembly comprises:
(a) an elongate member having a first end insertable through the hole in the wall for disposition within the first zone;
(b) attachment means carried by a second end of the elongate member for securing the member to the side of the wall facing the second zone;
(c) an axial passageway extending longitudinally through the elongate member;
(d) a motor mounted to the attachment means, the motor including first and second output shafts, the output shafts extending from opposite sides of the motor for rotation about a common axis of rotation;
(e) a first bearing assembly disposed withint he axial passageway and secured to the elongate member adjacent the first end thereof for rotatably supporting the first output shaft;
(f) a second bearing assembly carried by the attachment means for rotatably supporting the second output shaft;
(g) the motor being disposed between the first and second bearing assemblies; and
(h) the length of the elongate member being such that its first end terminates short of the end of the first output shaft for permitting attachment of a fan blade to the end of the first output shaft.

4,728,839

MOTORIZED PAN/TILT HEAD FOR REMOTE CONTROL

Joel B. Coughlan, Knox County, and John R. White, Roane County, both of Tenn., assignors to Remote Technology Corporation, Oak Ridge, Tenn.

Filed Feb. 24, 1987, Ser. No. 17,564
Int. Cl.[4] F41G *1/40;* **H02K** *5/00*
U.S. Cl. 310—112 **20 Claims**



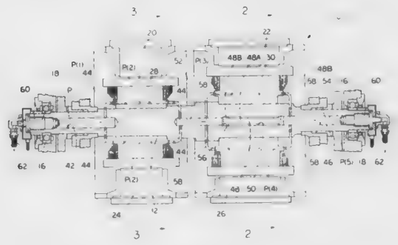
1. A motorized pan/tilt unit, for releasable connection to a support surface that is provided with one half of an electrical connector connected to a power source for providing electrical power to said pan/tilt unit, said pan/tilt unit for the mounting of a video camera and the like, which comprises:
a support member having a first end carrying a complementary half of an electrical connector to mate with said electrical connector of said support surface when said support member is attached to said support surface to receive said power from said power source, and a second end defining an axis of rotation, said support member provided with a passageway extending from said first end to said second end;
a substantially hollow pan/tilt head rotatably mounted on said second end of said support member, said pan/tilt head being substantially U-shaped with a hollow base cross member and a pair of parallel hollow legs each having a first ends attached at opposite ends of said base cross member, and second ends, said pan/tilt head further provided with mounting means for said video camera and the like pivotally supported between said legs proximate said second ends, with first electrical drive means connected between said head and said support member and mounted within said base cross member for panning motion of said pan/tilt head around said axis of said second end of said support member, and with second electrical drive means connected between said head and said pivotal mounting means and mounted within one of said legs for tilting of said mounting means for said video camera and the like; and
electrical leads extending form said first and second drive means of said pan/tilt head through said passageway of said support member to said complementary half of an electrical connector at said first end of said support member.

4,728,840

WATER-COOLED AC AND DC MOTOR-GENERATOR SET ON A COMMON SHAFT WITH SERIES COOLING FLOW PATH

Brian L. Newhouse, Apollo, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1987, Ser. No. 26,250
Int. Cl.[4] H02K *47/18*
U.S. Cl. 310—113 **20 Claims**



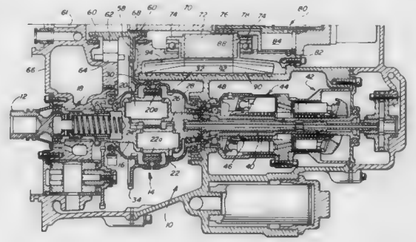
1. In a motor-generator set, the combination comprising:
(a) a rotatable central shaft;
(b) an AC rotor;
(c) a DC rotor, said AC and DC rotors being supported in tandem relationship along said shaft for rotation therewith; and
(d) means defining a coolant flow path in a series relationship through said shaft and rotors wherein liquid coolant flows initially into and through one end portion of said shaft, next through one of said rotors, then through a middle portion of said shaft, thereafter through the other of said rotors, and finally through and from an opposite end of said shaft.

4,728,841

DUAL PERMANENT MAGNET GENERATOR CONSTRUCTION

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 16, 1986, Ser. No. 874,953
Int. Cl.[4] H02K *16/00*
U.S. Cl. 310—114 **9 Claims**



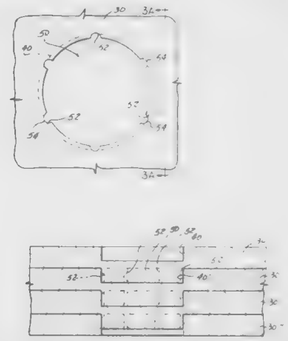
1. A generator comprising:
stator means including first and second side by side armatures:
first and second permanent magnet rotors journalled for rotation within respective ones of said first and second armatures about parallel axes of rotation;
a common drive for said rotors; and
control means for angularly shifting both of said rotors relative to said common drive and in equal angular distances in opposite directions;
said control means comprising a pair of coupled mechanisms operable upon receipt of an input signal to cause the angular shifting of said rotors and said common drive drives said first permanent magnet rotor through one of said mechanisms and drives said second permanent magnet rotor through the other of said mechanisms.

4,728,842

LAMINATED ASSEMBLY FOR A DYNAMOELECTRIC MACHINE AND METHOD FOR MANUFACTURING LAMINATED ASSEMBLIES HAVING RIDGES FORMED ON PROJECTIONS WHICH INTERLOCK WITH RECESSES OF ADJACENT LAMINATIONS

Benson D. Martin, Pontiac, Mich., assignor to Carbet Corporation, Pontiac, Mich.

Filed Sep. 29, 1986, Ser. No. 912,840
Int. Cl.[4] H02K *1/06*
U.S. Cl. 310—217 **8 Claims**



1. In a laminated assembly for a dynamoelectric machine of the type having interlocking projections and recesses for securing adjacent laminations together in interlocking relationship progressively throughout the length of the assembly, the improvement comprising:
an interlocking projection with a smaller cross-sectional area than the recess, and having a plurality of exterior longitudinal ridges protruding from the projection surface for securing adjacent laminations together by compressive interference fit between the ridges and the recess in interlocking relationship throughout the laminated assembly.

4,728,843

ULTRASONIC VIBRATOR AND DRIVE CONTROL METHOD THEREOF

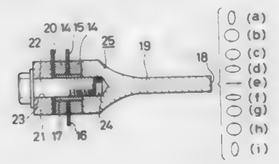
Shoji Mishiro, Kawasaki, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,385
Claims priority, application Japan, Nov. 11, 1985, 60-252526; Dec. 24, 1985, 60-291731
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—325 **1 Claim**

1. A method for drive control of an ultrasonic vibrator, said method comprising the steps of:
(a) providing an electrostrictive element formed of at least one electrostrictive element body polarized in the direction of its thickness (i.e., in the axial direction) with electrodes divided into two divisions disposed on one face thereof and a common electrode disposed on the other face thereof;
(b) integrally fastening metallic members placed on both faces of said at least one electrostrictive element body together by means of a fastening member; and
(c) applying the electrodes of said at least one electrostrictive element body with driving voltages the relative pha-

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ses and amplitudes of which are controlled and changeable in both directions so that composite oscillations in the



axial direction and in the directions perpendicular to the axial direction are obtained.

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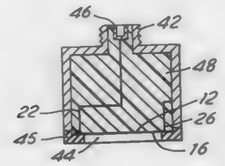
PIEZOELECTRIC TRANSDUCER AND COMPONENTS THEREFOR

Paul Wilson, Berkshire; Peter Kent, Buckinghamshire; Duncan Stewart, and Robert Crocker, both of Berkshire, all of United Kingdom, assignors to Cogent Limited, London, England

Continuation-in-part of Ser. No. 843,672, Mar. 25, 1986. This application Jul. 29, 1986, Ser. No. 890,331

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—327 **5 Claims**



1. A piezoelectric transducer comprising a casing having an opening in one face and a piezoelectric element of a piezoelectric plastics material extending across the opening, the casing containing a backing material in direct contact with the piezoelectric element, the backing material comprising a polymeric composition containing particles of a material of lower specific gravity than the surrounding composition, the distribution of said particles being such that they are most concentrated in a region remote from the piezoelectric element and are least concentrated or essentially absent in the region immediately adjacent the piezoelectric element.

4,728,845

1-3-0 CONNECTIVITY PIEZOELECTRIC COMPOSITE WITH VOID

Michael J. Haun, and Robert E. Newnham, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1987, Ser. No. 67,845

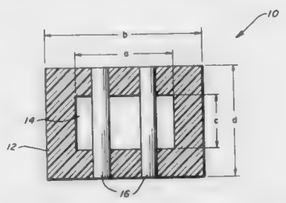
Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—358 **4 Claims**

1. A PZT-polymer composite of 1-3-0 connectivity comprising:

a matrix of a polymer containing a void in the center thereof;

a plurality of PZT rods embedded in said matrix and extending through the void, each member of said pluraity of PZT rods having its longitudinal axis aligned in the same direction; and



means for polarizing the composite with a field parallel to the axes.

4,728,846

ELECTRON GUN IN WHICH THE LARGE DIAMETER PORTION OF THE FIRST ANODE IS RIGIDLY SUPPORTED

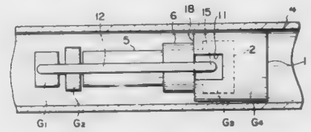
Hidekatsu Yasuda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,535

Claims priority, application Japan, May 28, 1985, 60-114694

Int. Cl.⁴ H01J *29/82*

U.S. Cl. 313—451 **2 Claims**



1. An electron gun for cathode ray tubes comprising an arrangement of a cathode, a control electrode, an accelerating electrode, a first anode, and a second anode mounted in alignment,

said second anode consisting of a small diameter supporting end portion and a large diameter cylindrical portion connected thereto;

said second anode formed with windows in said large diameter cylindrical portion at positions away from where a principal lens is formed;

said first anode being mounted within said small diameter supporting end portion and out of contact therewith and said first anode having a large diameter end portion which is mounted within said windows, and said large diameter end portion forming a component of the principal lens; and

said first anode supported at a position of said large diameter end portion by insulating support members which extend through said windows in said second anode.

4,728,847

ELECTRIC LAMP HAVING AN ENVELOPE WITH AN INTERMEDIATE ZIRCONIUM OXIDE COATED LAYER

Leo F. M. Ooms, and Victor R. Notelteirs, both of Turnhout, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,785

Claims priority, application Netherlands, May 17, 1985, 8501425

Int. Cl.⁴ H01J *61/35, 5/16, 7/24*

U.S. Cl. 313—43 **18 Claims**

1. An electric lamp comprising a lamp vessel of glass having a silica content of at least 95% by weight, which is sealed in a vacuum-tight manner and has a sealed end portion through

which a current supply conductor extends to a lighting source arranged inside the lamp vessel, said current supply conductor being connected to a contact on a lamp cap fixed by a cementing substance disposed around a given area of the sealed end portion of the lamp vessel, characterized by comprising means



for reducing adhesion of the cementing substance to said glass while substantially maintaining anchoring of the end portion in the lamp cap, said means comprising an intermediate coating applied to said glass at said area at which it is surrounded by the cementing substance.

4,728,848

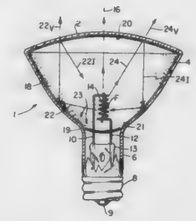
ENERGY-EFFICIENT INCANDESCENT REFLECTOR LAMP

Peter J. Walsh, Stirling, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.

Filed Nov. 9, 1981, Ser. No. 319,223

Int. Cl.⁴ H01K *1/28*

U.S. Cl. 313—113 **21 Claims**



1. An energy-efficient incandescent lamp, comprising:

a hollow envelope having an exit window with an infrared reflecting and visible transmitting filter coating thereon, the exit window on which said filter coating is located having a parabolic first surface which faces the interior of the envelope with a first focal length, a focus, and a focal axis,

reflector means reflective to both infrared and visible energy having a parabolic second surface, a second focal length, a focus and a focal axis, said focus of said second surface being located inside the envelope, the focal axis of each of said first and second surfaces being coaxial and the focus of each said parabolic surface being confocal; and

a filament located inside the envelope for producing energy both in the infrared and visible ranges, the filament being at least in part on said confocal foci of said surface, the infrared energy produced by said filament being reflected at least in part by said first and second surfaces back to said filament to raise its operating temperature and the visible range energy being reflected from said second surface for exiting through said exit window in a substantially collimated beam.

4,728,849

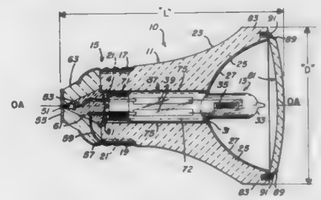
CAPSULE LIGHT SOURCE FOR ELECTRIC LAMP

Merle E. Morris, Lexington; Larry R. Fields, Winchester, and George B. Kendrick, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jul. 7, 1986, Ser. No. 882,553

Int. Cl.⁴ H01J *5/16, 5/48, 5/50*

U.S. Cl. 313—113 **10 Claims**



1. A light emitting capsule for use in an electric lamp means wherein said lamp includes a reflector having a forward, concave reflecting portion, a rear, protruding neck portion, and an opening extending through said rear neck portion, said capsule being of a single unitary construction comprising;

a hollow bulb portion adapted for being positioned within said concave reflecting portion of said reflector and having a light source disposed therein;

said capsule further comprising a sealed end portion of elongated configuration wherein said elongated configuration includes a flattened segment adjacent said hollow bulb portion and a protruding end segment located at the opposite end of said flattened segment from said bulb portion and thereby spaced therefrom, said sealed end portion adapted for being positioned within said opening within said rear neck portion of said reflector and said protruding end segment adapted for engaging the internal surfaces of said opening within said rear neck portion of said reflector to stabilize said capsule within said reflector when said sealed end portion is positioned within said opening, both said hollow bulb portion and said sealed end portion, including said protruding end segment, being of glass material.

4,728,850

MOUNTING MEANS FOR MOUNTING SPIRAL WIRE CATHODES

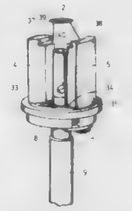
Reinhardt Kraft, Altenstadt, and Horst Ranke, Alzenau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,635

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534793

Int. Cl.⁴ H01J *37/65, 1/18*

U.S. Cl. 313—278 **6 Claims**



1. An electron gun comprising a cathode bent spirally from

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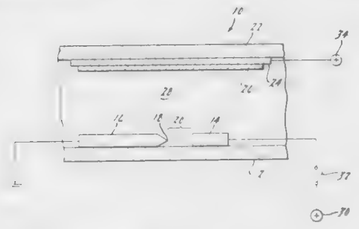
wire and a clamping means, said clamping means comprising a pair of supporting posts, said supporting posts shaped as sections of a hollow cylinder, an end of each post meeting an insulator, and a second end of said posts remote from said insulator meeting end, said remote ends having a circumferential groove adapted for reception of a mounting end of said cathode, each of said grooves defined by a portion of two common circular surfaces and one cylindrical surface, the mounting ends of said cathode configured complementary to said grooves and adapted for lying in said grooves in a spring biased and form-fitting manner.

4,728,851

FIELD EMITTER DEVICE WITH GATED MEMORY

John J. Lambe, Altadena, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 8, 1982, Ser. No. 338,463
Int. Cl.⁴ H01J *1/02*
U.S. Cl. 313—309 **13 Claims**



1. A bistable field emitter comprising:
a filament cathode element having an electron emitting end;
a collector electrode disposed across an evacuated space from said filament cathode in a first direction therefrom;
a gated electrode spaced from the electron emitting end of said filament cathode by a predetermined amount along a plane orthogonal to said first direction;
said electron emitting end of said filament cathode being disposed to point in a second direction orthogonal to said first direction;
whereby a voltage potential of a first predetermined level is applied between said filament cathode and said collector electrode that is not sufficient to cause electron emission from said cathode until a voltage potential of the second predetermined level is applied to said gating electrode, but is sufficient to sustain electron emission from said cathode when said voltage potential of said second predetermined level is subsequently disconnected from said gating electrode.

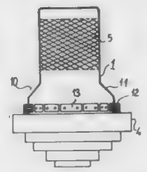
4,728,852

DEVICE FOR FIXING A PYROLYTIC GRAPHITE GRID ONTO THE BASE OF AN ELECTRON TUBE

Roger Hoet, Thonon les Bains, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 25, 1985, Ser. No. 748,544
Claims priority, application France, Jun. 29, 1984, 8410357
Int. Cl.⁴ H01J *1/46*
U.S. Cl. 313—348 **2 Claims**

1. A high frequency electron tube having at least one grid of pyrolytic graphite having a skirt portion which is fixed to the base of the electron tube comprising a first continuous metallic outer ring integral with the base of the electron tube, a plurality of separated metallic abutments for defining an inner segmented ring concentric with and spaced apart from the outer ring by a distance essentially equal to the thickness of the skirt portion of the grid, and means for fixing the inner ring to the outer ring, the skirt portion of the grid being fitted in the space between the inner and outer rings and being provided with recesses for passage therethrough of the means for fixing the inner ring to the outer ring, said fixing means and bolts passing between said inner ring and outer ring through recesses in the



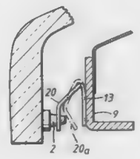
skirt portions, and in which the abutments forming the inner ring are spaced from the base of the electron tube.

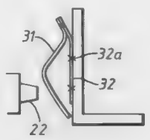
4,728,853

COLOR PICTURE TUBE WITH SUPPORT ARRANGEMENT FOR A RECTANGULAR SHADOW MASK

Toshinao Sone, Kumagaya; Kazunori Nakane, Konosu; Ryuichi Murai, and Hiroshi Urata, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1986, Ser. No. 878,680
Claims priority, application Japan, Jun. 27, 1985, 60-138950
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 313—406 **4 Claims**





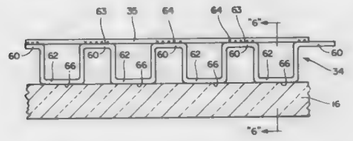
1. A color picture tube comprising an envelope provided with a rectangular-shaped panel, funnel and a neck; a phosphor screen formed inside said panel; an electron gun housed inside said neck which emits electron beams to make said screen luminescence by excitation; a rectangular-shaped shadow mask which has a large number of apertures placed near to and facing said screen and between said screen and said electron gun; and a rectangular-shaped mask frame which supports said shadow mask around its periphery; springs securing said mask frame to stud pins embedded inside walls of said panel; and
wherein each of said springs comprises:
a 1st spring member, which is composed of a secured end, an inclined portion which is bent from the secured end to form an obtuse angle with the plane of said secured end as a reference position of bending, and a supporting portion which is extended by bending from said inclined portion and has a hole in it in which said stud pin is accommodated; and
a plate-shaped 2nd spring member interposed between said mask frame and said 1st member, said plate-shaped 2nd spring member comprising a secured portion which is fixed with welding portions to said mask frame along the surface of said mask frame, an elastic portion which is extended from said secured portion and is elastically deformable, and a joint portion extended from said elastic portion, and secured end of said 1st spring member overlapping and joined to said joint portion of said second spring member with said joint portion interposed between said secured end and said mask frame, said secured end joined on a surface thereof to said joint portion of said second spring member with the joint portion interposed between the secured end and said mask frame at said surface.

4,728,854

UNDULATING SUPPORT STRUCTURE FOR TENSION SHADOW MASK

James R. Fendley, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 29, 1986, Ser. No. 925,656
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 313—407 **20 Claims**



1. A front assembly for a color cathode ray tube including a faceplate having on its inner surface a centrally disposed phosphor screen surrounded by a peripheral area adapted to mate with a funnel, said assembly including a shadow mask support structure for securing a shadow mask in tension on the support structure and spacing the shadow mask from the screen, the support structure comprising an undulated member defining peaks and valleys, the valleys providing means for securing the support structure to the faceplate, and the peaks providing means for securing the shadow mask to the support structure.

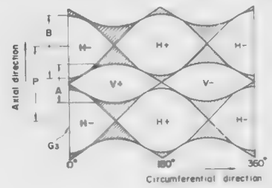
4,728,855

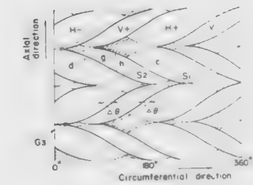
VERTICAL AND HORIZONTAL DEFLECTION ELECTRODES FOR ELECTROSTATIC DEFLECTION TYPE CATHODE RAY TUBE

Takehiro Kakizaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 803,018
Claims priority, application Japan, Nov. 28, 1984, 59-251272
Int. Cl.⁴ H01J *29/74*
U.S. Cl. 313—435 **5 Claims**

1. A cathode ray tube of the electrostatic deflection type, comprising a glass bulb, an electron beam source, and vertical deflection electrodes and horizontal deflection electrodes which are formed in patterns and applied to the inner surface of the glass bulb, wherein the ratio of the area of said horizontal deflection electrodes to the area of said vertical deflection





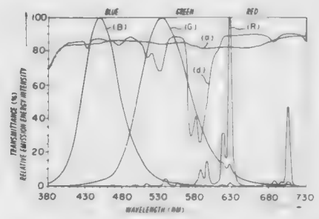
electrodes is substantially equal to the aspect ratio of the deflection of the electron beam which is greater than one.

4,728,856

CATHODE RAY TUBE

Yasuo Iwasaki, and Koji Yajima, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 338,993, Jan. 12, 1982, abandoned. This application May 9, 1984, Ser. No. 607,729
Claims priority, application Japan, Feb. 13, 1981, 56-21151; Feb. 13, 1981, 56-21170
Int. Cl.⁴ H01J *29/20, 29/86*
U.S. Cl. 313—467 **6 Claims**



1. A cathode ray tube having a face plate glass which contains neodymium oxide (Nd_2O_3) and exhibits a sharp main absorption band having a peak at about 580 nm and a sub-absorption at about 530 nm and on the inner surface of which a phosphor screen having blue, green and red phosphors is formed, wherein said blue phosphor is a phosphor of zinc sulfide activated with Ag(ZnS:Ag), said red phosphor is a phosphor of yttrium oxysulfide activated with Eu(Y_2O_2S:Eu), and said green phosphor is a phosphor of zinc sulfide activated with copper and aluminum (ZnS:Cu, Al) to reduce the spectral reflectance of said phosphor screen at the wavelength band of 470–480 nm so that the chromaticity point of a reflected exterior light reflected from said phosphor screen is prevented from displacement with respect to the chromaticity point of an exterior light due to the influence of said main and sub-absorption bands.

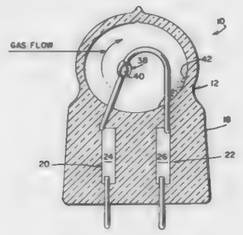
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4,728,857

VERTICAL RUNNING, HIGH BRIGHTNESS, LOW WATTAGE METAL HALIDE ARC LAMP

George J. English, Reading, Mass., and Paul A. Reiser, Manchester, N.H., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 277,798, Jun. 29, 1981, abandoned.
This application Nov. 30, 1983, Ser. No. 557,402
Int. Cl.[4] H01J 61/20, 61/06
U.S. Cl. 313—642 1 Claim



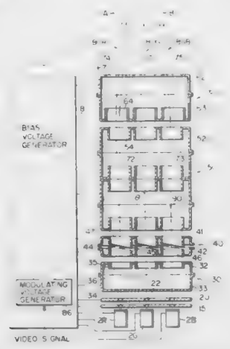
1. A miniature, low-wattage, arc discharge lamp comprising:
a glass body defining an arc chamber, said arc chamber having a volume of about 0.3 cm^3 to about 0.4 cm^3;
a pair of electrodes terminating within said arc chamber and defining an arc gap therebetween;
an arc generating and sustaining medium within said arc chamber, wherein said arc generating and sustaining medium comprises a chemical fill of about 15 mgs of Hg; 0.9 mgs HgI_2; 2.4 mgs ThI_4; 1.1 mgs CsI; and about 250 torr argon; and
a mol ratio of thorium to thorium plus cesium to provide a substantially stable arc which provides a color temperature between about 7000° K. to 9000° K. and a light output of about 4000 to 6000 lumens, said mol ratio of thorium to thorium plus cesiium being greater than 0 up to about 0.4.

4,728,858

COLOR CATHODE RAY TUBE APPARATUS

Shinpei Koshigoe, Fukaya, and Takeshi Fujiwara, Kumagaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1987, Ser. No. 14,612
Claims priority, application Japan, Feb. 14, 1986, 51-28780
Int. Cl.[4] H01J 29/46, 29/56
U.S. Cl. 315—15 8 Claims



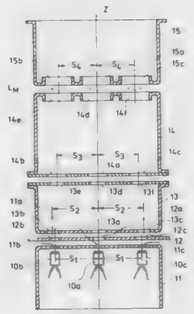
1. A color cathode ray tube apparatus comprising:
an enclosure including a panel section having a phosphor screen and a shadow mask, a funnel section mounted externally with a deflecting yoke and a neck section;
an electron gun assembly provided in the neck section of the enclosure, having
three cathodes for emitting electron beams which are parallel to each other in a first plane, and
a group of electrodes located in front of the cathodes with a predetermined interval between the adjacent electrodes, and having three electron beam paths for passing the electron beams, each electrode having three through-holes which compose the electron beam paths, the group of electrodes including
rear electrodes for forming an auxiliary lens for preliminarily focusing the electron beams, one of the rear electrodes having a pair of electrode members applied with a relatively lower voltage, each member having cylindrical projections defining the through-holes, the cylindrical projections on one of the electrode members facing their counterparts on the other electrode member with a predetermined interval therebetween and each having an oblique surface at its end, each oblique surface having a predetermined angle with respect to a second plane perpendicular to the axis of the electron beam path but standing at right angles with the first plane, whereby the oblique surfaces of the projections have substantially the same inclination with respect to the electron beam paths, and
a front electrode located in front of the rear electrodes to form a main lens, in cooperation with one of the rear electrodes that is adjacent to the front electrode for further focusing the electron beams preliminarily focused by the rear electrodes and for converging the electron beams; and
a device connected to the electrodes for supplying an operating voltage thereto, having means for supplying a modulating voltage for modulating a scanning velocity of the electron beams to the pair of electrode members, when luminance values of a video signal arrive at a predetermined level.

4,728,859

IN-LINE ELECTRON GUN

Masao Natsuhara, Otsu; Hiroshi Suzuki, Nagaokakyo; Hideo Muranishi, Osaka, and Shigeya Ashizaki, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Sep. 8, 1986, Ser. No. 904,270
Claims priority, application Japan, Sep. 9, 1985, 60-198830
Int. Cl.[4] H01J 29/56, 29/50
U.S. Cl. 315—15 7 Claims



1. An in-line electron gun comprising:
a plurality of cathodes disposed parallel to each other, adjacent electron guns having beam axes separated by a first distance S_1;

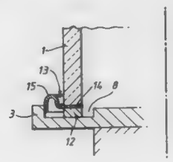
a control grid electrode having a plurality of through-holes, the centers of which are separated by said first distance S_1;
an accelerating electrode having a plurality of through-holes, the centers of which are separted by said first distance S_1, each respective electron gun beam axis being concentric with corresponding respective through-holes of the control grid electrode and the accelerating electrode;
a first focusing electrode having a surface facing the accelerating electrode containing a plurality of through-holes, the centers of which are separated by a second distance S_2 greater than said distance S_1, another surface of said first focusing electrode, opposite the surface facing the accelerating electrode, having a plurality of vertically oblong through-holes, the centers of which are separated by a third distance S_3, which is less than said distance S_1;
a second focusing electrode having a surface facing the first focusing electrode with one or more horizontally oblong through-holes, respective centers of which are coincident with respective centers of the vertically oblong through-holes of said first focusing electrode, another surface of said second focusing electrode, opposite the surface facing the first focusing electrode, having a plurality of through-holes, the centers of which are separated by a fourth distance S_4, which is less than said third distance S_3; and
an anode having a surface facing the second focusing electrode with a plurality of through-holes, the centers of which are separated by said fourth distance S_4 and concentric with the corresponding respective through-holes of said second focusing electrode separated by the distance S_4, wherein:
said first focusing electrode receives a fixed focusing potential and said second focusing electrode receives a dynamic potential which changes to a potential higher or lower than the fixed focusing potential in response to an increase of the electron beam deflection angle.

4,728,860

SLIDABLE SEAL FOR KLYSTRON VACUUM TUBES

Maurice Esterson, Chelmsford, and Jennifer Harley nee May, Leigh-on-Sea, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Feb. 20, 1986, Ser. No. 831,522
Claims priority, application United Kingdom, Mar. 14, 1985, 8506610
Int. Cl.[4] H01J 7/46, 19/80
U.S. Cl. 315—39 19 Claims



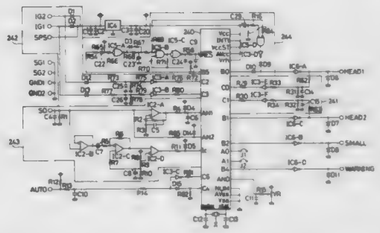
1. An external cavity klystron vacuum tube, comprising
a cylindrical section including a wall transparent to electromagnetic radiation and surrounded by an external resonant cavity, said wall having an end portion;
an annular section positioned adjacent the end portion of said wall said annular section having at its outer periphery an annular recess provided with a bottom surface and opposing outer and inner flanges;
a balance ring member interposed between the end portion of said wall and the bottom surface of said annular recess, said balance ring being spaced from the opposing flanges of said recess; and
a flexible ring having one end sealed to the outer flange of said recess and the other end interposed between the end portion of said wall and said balance ring member, said ring having a U-shaped portion between the ends thereof whereby said balance ring member is slidable in a direction parallel to said bottom surface of said recess and between said flanges, and the U-shaped portion of said ring inhibits arcing.

4,728,861

LIGHT CONTROL APPARATUS FOR A VEHICLE

Norimitsu Kurihara, Wako; Yoshikazu Tsuchiya; Akira Kikuchi, both of Fujimi; Kunio Okazaki, Hatano, and Toru Tanabe, Yokohama, all of Japan, assignors to Honda Motor Co., Ltd. and Stanley Electric Co., Ltd., both of Tokyo, Japan

Filed Nov. 27, 1985, Ser. No. 802,764
Claims priority, application Japan, Dec. 25, 1984, 59-275132
Int. Cl.[4] B60Q 1/02; G08B 21/00
U.S. Cl. 315—83 9 Claims



1. In light control apparatus integrated with a vehicle headlamp driving system using headlamp driving relays, a light sensor, a lighting switch which selects between a manual mode or an automatic mode of operation, and a control unit having power supply and power ground terminals, light sensor terminals connected to said light sensor and operation mode terminals connected to said lighting switch and said relays, which unit controls the driving system relays in accordance with an output of the light sensor when the lighting switch selects the automatic mode for driving the headlamps; the improvement comprising;
two power source systems associated with said control unit and including two power supply lines connected to corresponding power supply terminals and two ground lines connected to corresponding ground terminals of said control unit, and
two headlamp driving systems associated with the headlamps and connected to corresponding headlamp operation mode terminals of said control unit, wherein each headlamp driving system is arranged to apply a drive voltage to a common pair of headlamps,
said control unit including microcomputer means and means for detecting signal levels at at least one set of said power supply terminals and said headlamp operation mode terminals of the control unit, and for coupling the detected levels to the microcomputer means,
wherein said microcomputer means includes means for judging the existence of a fault condition according to a difference between signal levels detected at said at least one set of terminals, and
an alarm indication system including a lamp or buzzer coupled to a warning terminal of said control unit for indicating a trouble condition in response to operation of said signal level detecting means and the judging means of said microcomputer means.

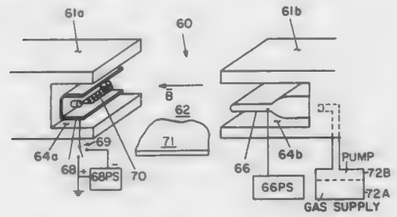
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4,728,862

A METHOD FOR ACHIEVING IGNITION OF A LOW VOLTAGE GAS DISCHARGE DEVICE

Vincent J. Kovarik, Bohemia; Ady Hershcovitch, Mt. Sinai, and Krsto Prelec, Setauket, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1982, Ser. No. 386,370
Int. Cl.[4] H01J 7/24; H05B 31/26
U.S. Cl. 315—111.01 3 Claims



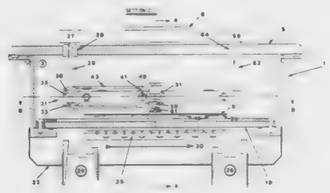
1. A method for achieving relatively low Pd ignition of an ionized gas discharge apparatus, comprising the steps of:
(a) generating a magnetic field in the region between a pair of spaced, opposed, magnetic pole pieces, providing the opposed faces of each of said pole pieces with a recess;
(b) mounting hollow cathode means within one of said recesses, for generating a sheet-type plasma in the region between said pole pieces, and holding said hollow cathode means at a substantially negative potential;
(c) mounting a heat shield within said other recess;
(d) providing means for switching said heat shield between a substantial negative potential and a ground potential;
(e) spacing an anode surface from and operatively associated with said hollow cathode means and heat shield;
(f) providing means for maintaining a pre-selected gas pressure in the region between said pole pieces;
(g) initiating ignition of the apparatus by switching said heat shield to a negative potential to cause the heat shield to act as an auxilliary electrode and to initiate a low-density discharge between the heat shield and the main cathode, whereby the main cathode is heated to start its ignition; and
(h) switching said heat shield to a ground potential after the main cathode ignition is achieved.

4,728,863

APPARATUS AND METHOD FOR PLASMA TREATMENT OF SUBSTRATES

Michael R. Wertheimer, 91 Somerville Avenue, Westmount, Quebec, Canada (H3Z 1J4)

Filed Dec. 4, 1985, Ser. No. 804,536
Int. Cl.[4] H01J 7/24; H05B 31/26
U.S. Cl. 315—111.21 30 Claims



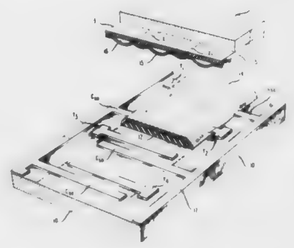
1. An apparatus for treating at least one substrate with a plasma, said apparatus including:
means for producing said plasma along a first direction;
said means for producing said plasma comprising a longitudinally extending microwave support structure having an input coupler at a first end thereof and a second end spaced from said first end, said first direction being the direction from said first end to said second end;
a substrate carrier for carrying said at least one substrate;
means for imparting rotational motion to said substrate carrier about an axis perpendicular to said direction and in a plane substantially parallel to said direction; and
means for imparting translational motion to said substrate carrier in said plane and in a direction perpendicular to said direction;
said means for imparting rotational motion being functionally related to said means for imparting translational motion whereby said rotational motion and said translational motion are applied simultaneously to said substrate carrier;
whereby, said at least one substrate will be substantially uniformly treated by said plasma.
8. A process for treating at least one substrate with a plasma, said process comprising:
mounting said at least one substrate on a substrate carrier;
producing said plasma along a first direction by a means for producing said plasma comprising a longitudinally extending microwave support structure having an input coupler at a first end thereof and a second end spaced from said first end, said first direction being the direction from said first end to said second end;
rotating said substrate carrier in a plane substantially parallel to said direction; and
simultaneously moving said substrate carrier in a translational manner in said plane and in a direction perpendicular to said direction;
whereby, to substantially uniformly treat said at least one substrate by said plasma.

4,728,864

AC PLASMA DISPLAY

George W. Dick, Sinking Spring, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1986, Ser. No. 835,356
Int. Cl.[4] G09G 3/10
U.S. Cl. 315—169.3 12 Claims



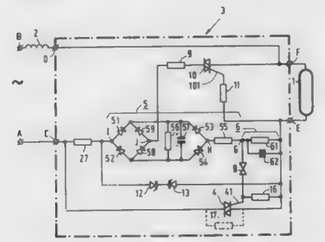
1. A display device comprising:
first and second substrates placed so as to define a gap region between them with a gas capable of forming a glow discharge occupying the gap;
first and second arrays of electrodes formed in the gap region, covered by dielectric layers, and positioned to form crosspoint regions between the electrodes of the two arrays, said first array comprising a plurality of rows of at least pairs of electrodes spaced in at least the crosspoint regions so that a glow discharge may be sustained at the surface of the dielectric in said regions; characterized in that
one electrode in each pair of the first array is capable of being biased independently of all other electrodes in the first array, and the other electrode in each pair is electrically coupled in common to such electrodes in other pairs, the common electrodes being formed in at least two sets of electrodes which are capable of being independently biased.
9. A method of operating a display device which includes first and second substrates placed so as to define a gap region between them with a gas capable of forming a glow discharge occupying the gap, and first and second arrays of electrodes formed in the gap region, which electrodes are covered by dielectric layers and positioned to form crosspoint regions between the electrodes of the two arrays and where the first array comprises a plurality of at least pairs of electrodes spaced at least in the crosspoint regions so that a glow discharge may be sustained at the surface of the dielectric between the electrodes of each pair in the crosspoint regions, the method of sustaining the glow discharge at selected crosspoint regions comprising the steps of applying AC signals to both electrodes of each pair so that adjacent pairs have different signals applied thereto at a particular time.

4,728,865

ADAPTION CIRCUIT FOR OPERATING A HIGH-PRESSURE DISCHARGE LAMP

Johny A. J. Daniels, Turnhout, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,653
Claims priority, application Netherlands, Apr. 9, 1985, 8501025
Int. Cl.[4] H05B 37/02
U.S. Cl. 315—194 17 Claims



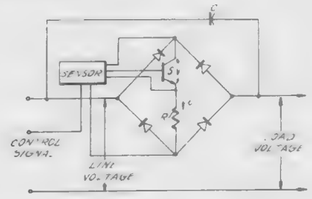
1. An adaptation circuit for operating a high-pressure discharge lamp comprising:
first and second input terminals for connection to a source of supply voltage via a series ballast impedance, first and second output terminals for connection to terminals of a discharge lamp connectable to said output terminals, means connecting a first controlled semiconductor switch between the first input terminal and the first output terminal, means connecting the second input terminal to the second output terminal, a voltage-division circuit coupled between said first input terminal and one of said output terminals so that the first semiconductor switch and the voltage-division circuit provide two parallel paths for current to flow between said first and second input terminals, wherein at least one of said current paths includes a discharge lamp when connected to said output terminals, said voltage division circuit having first and second branches with a junction point therebetween, said first branch including a capacitor, means including a voltage-responsive switch for connecting a control electrode of the first semiconductor switch to said junction point, and wherein the second branch of the voltage-division circuit includes a voltage source whose voltage is primarily determined by the lamp voltage and whose polarity is the same as that of a voltage developed across the voltage division circuit, whereby the firing angle of the first semiconductor switch varies with the lamp voltage in a sense to maintain lamp power constant despite variations in the supply voltage or variations in the lamp operating voltage.

4,728,866

POWER CONTROL SYSTEM

Dennis Capewell, Penllyn; Donald Hausman, Emmaus; Aaron Jungreis, Allentown, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Sep. 8, 1986, Ser. No. 904,874
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—224 62 Claims



1. A power control system comprising:
(a) a control circuit having an input terminal and an output terminal, said control circuit receiving an input AC voltage at said input terminal and supplying an output AC voltage at said output terminal, said control circuit including:
(1) a switching element interconnecting said input and output terminals,
(2) main energy diverting means connected for diverting energy to said output terminal;
(3) variable energy diverting means connected to said output terminal for diverting a controllable amount of energy to said output terminal; and
(4) means for controlling said switching element and said variable energy diverting means;
said variable energy diverting means being activated by said control circuit to divert energy during a controllable period of time while the switching element is off, for controlling the output waveform of said output AC voltage.

4,728,867

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

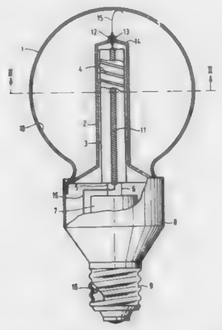
Pieter Postma, and Andreas C. Van Veghel, both of Eindhoven, Netherlands, assignors to U.S Philips Corporation, New York, N.Y.

Filed Mar. 10, 1986, Ser. No. 838,222
Claims priority, application Netherlands, Mar. 14, 1985, 8500738
Int. Cl.[4] H05B 41/16, 41/24
U.S. Cl. 315—248 6 Claims

1. An electrodeless low-pressure discharge lamp comprising a glass lamp vessel which is sealed in a gas-tight manner and is filled with a metal vapour and a rare gas, this lamp vessel being provided with a tubular protuberance, which accommodates a rod-shaped core of magnetic material surrounded by a wire winding connected to a high-frequency supply unit, by means of which during operation of the lamp an electrical discharge is maintained in the lamp vessel, the inner side of the lamp vessel being provided with a transparent conductive layer which is electrically connected by means of a lead-through member to a conductor located outside the lamp vessel, char-

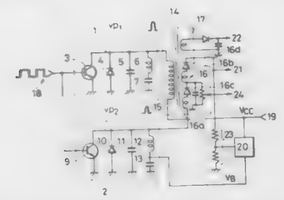
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acterized in that the lead-through member is located in the wall at the end of the tubular protuberance, the lead-through mem-



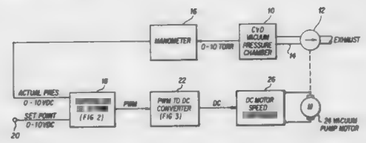
ber being electrically connected to the internal conductive layer.

4,728,868
HIGH VOLTAGE GENERATING CIRCUIT
Katsumi Ishikawa, and Nobuhiko Saegusa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 20, 1984, Ser. No. 602,643
Claims priority, application Japan, Apr. 22, 1983, 58-60483[U]; Apr. 28, 1983, 58-73731; Apr. 28, 1983, 58-73732
Int. Cl.⁴ H01J *29/70, 29/58;* **H04N** *5/63, 5/68*
U.S. Cl. 315—411 **6 Claims**



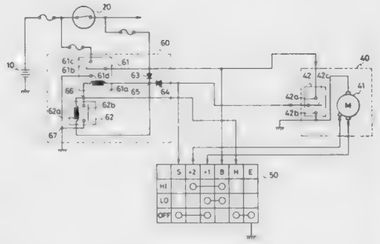
1. A high voltage generating circuit for generating a DC high voltage to be supplied to an anode of a CRT, comprising:
a flyback transformer receiving across a primary coil thereof a flyback pulse from a horizontal deflecting circuit during each horizontal blanking period;
means for generating a compensating pulse at the same time said flyback pulse appears, said compensating pulse having a peak voltage variable in response to a detected level of brightness of a video signal; and
means for summing an output voltage from the secondary coil of the flyback transformer and said compensating pulse and rectifying the sum to form said DC high voltage, which remains nearly constant with a change in said brightness, said secondary coil including a first secondary coil portion having a first end and a second end and a second secondary coil portion series-connected with said first second coil portion with a first end of said second secondary coil portion coupled to said second end of said first secondary coil portion at a junction therebetween, with means coupled to said junction independently of said first secondary coil portion for generating a focus control voltage, wherein said means for summing comprises means for applying said compensating pulse to said first end of said first secondary coil portion and means for rectifying coupled to a second end of said second secondary coil portion to form said DC high voltage.

4,728,869
PULSEWIDTH MODULATED PRESSURE CONTROL SYSTEM FOR CHEMICAL VAPOR DEPOSITION APPARATUS
Noel H. Johnson, San Jose, and Gary C. Elliott, Manteca, both of Calif., assignors to Anicon, inc., San Jose, Calif.
Continuation-in-part of Ser. No. 813,915, Dec. 18, 1985, abandoned. This application Mar. 27, 1986, Ser. No. 845,212
Int. Cl.⁴ H02P *5/16*
U.S. Cl. 318—335 **20 Claims**



1. A pressure control system utilized, for example, in connection with chemical vapor deposition apparatus, comprising in combination:
a reduced pressure chamber;
an exhaust pump coupled to said pressure chamber;
an electric motor coupled to said exhaust pump for powering said pump;
controller means operable in response to the difference between the actual pressure within the pressure chamber and the desired pressure therein and generating a pulsewidth modulated pulse train whose pulsewidth varies in accordance with said difference;
pulsewidth modulation to DC converter means responsive to said pulsewidth modulated pulse train and being operable to generate a control signal whose amplitude varies in accordance with said pulsewidth; and
motor control means coupled to said electric motor and being responsive to said control signal and operable to vary the speed of said motor thereby powering said exhaust system to control the pressure within said pressure chamber.

4,728,870
WIPER CONTROL APPARATUS
Kazuo Hirano; Yukimitsu Hattori, both of Osaka, and Haruhiro Muto, Mie, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Sumitomo Wiring Systems, Ltd., Yokkaichi, both of, Japan
Filed May 7, 1987, Ser. No. 46,709
Claims priority, application Japan, May 8, 1986, 61-69476[U]; May 8, 1986, 61-69477[U]; Jun. 3, 1986, 61-127174
Int. Cl.⁴ B60S *1/08*
U.S. Cl. 318—443 **5 Claims**



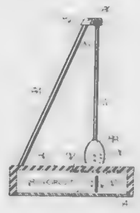
1. A wiper apparatus comprising:
a battery;
an ignition switch connected to said battery;
a wiper having a wiper blade;

a wiper switch having an output terminal, a battery terminal and a stop terminal in which said output terminal is connected to said battery terminal in a closed state and is connected to said stop terminal in an open state;
a wiper driving means having a wiper motor which receives power through said output terminal of said wiper switch from said battery for driving said wiper, and a cam switch having a voltage terminal for receiving power from said battery, a ground terminal, and a movable contact connected to said stop terminal of said wiper switch, said movable contact is connected to said ground terminal while said wiper blade stays in a predetermined position and is connected to said voltage terminal while said wiper blade stays in a position other than said predetermined position;
wiper auto-off means comprising a switch means, first and second diode means, and an ON/OFF decision means, in which said switch means, in an ON state for passing current supplied from said battery, not via said ignition switch, to the voltage terminal of said cam switch and to the battery terminal of said wiper switch, and for cutting off the current in an OFF state; said first diode means for allowing the current passed through said ignition switch from said battery to flow therein; said second diode means for allowing the current passed through said voltage terminal and said movable contact of said cam switch to flow therein; and said ON/OFF decision means for placing said switch means in said ON state provided that said wiper switch is in said open state and that said ignition switch is turned on to thereby causing the current to flow through said first diode means from said ignition switch and thereafter for holding said switch means in the ON state provided that the current is caused to flow from one of said first and second diode means, moreover for turing off said switch means provided that said ignition switch is turned off to stop the flow of the current from said first diode means and that the movable contact of said cam switch is separated from the voltage terminal to stop the flow of current from said second diode means.

4. A wiper control apparatus for controlling the operation of a wiper blade for use in a motor vehicle on receiving voltage supplied by a power supply mounted on the vehicle, said wiper blade being provided with a predetermined stop position and midway positions other than said predetermined position, said wiper control apparatus comprising:
first switch means, in a conductive state thereof, for passing the voltage received from said power supply to make said wiper control apparatus operable;
second switch means, in a conductive state thereof, for passing the voltage received from said power supply to make said vehicle operable;
control means for controlling the ON/OFF operation of said first switch means, said control means operating in response tc the conductive state of said second switch means to render said first switch means conductive and not operating after the passage of a predetermined time in response to a cut-off state of said second switch means to render said first switch means nonconductive;
instruction signal generating means which is operable on receiving the voltage from said first switch means to generate an instruction signal for designating operating modes of said wiper blade;
position detecting means for detecting the position of said wiper blade to generate a detecting signal corresponding to one of said stop position and said midway positions;
selection means for receiving said detecting signal and said instruction signal to pass said detecting signal in response to the cut-off state of said second switch means and to pass said instruction signal in response to the conductive state of said second switch means;
wiper drive means for driving said wiper blade in response to the instruction signal from said selection means; and
alarm generating means which is operable in response to the cut-off state of said second switch means for generating an alarm signal in response to said detecting signal produced by said position detecting means corresponding to said midway positions.

5. A wiper control apparatus for controlling the operation of a wiper blade for use in a motor vehicle on receiving voltage supplied by a power supply mounted on the vehicle, said wiper blade being provided with a predetermined stop position and midway positions other than said predetermined position, said wiper control apparatus comprising:
first switch means, in a conductive state, for passing the voltage received from said power supply to make said wiper control apparatus operable;
second switch means for operating in response to the conductive state of said first switch means and not operating after the passage of a predetermined time in response to a cut-off state of said first switch means, to pass the voltage from said power supply to make said wiper control apparatus operable;
instruction signal generating means for generating an instruction signal which designates an operation mode of said wiper blade;
position detecting means for detecting a position of said wiper blade to generate a detecting signal which designates one of said stop and midway positions;
selection means for receiving said detecting signal and said instruction signal to selectively output one of said detecting and instruction signals;
wiper drive means for driving said wiper blade in response to the signal outputted by said selection means;
control means which is operable in response to the conductive state of said first switch means, for controlling the selective operation of said selection means in response to said instruction signal of said instruction signal generating means, wherein said selection means applies said detecting signal to said wiper drive means when receiving a wiper blade stop signal as said instruction signal from said instruction signal generating means during operational state of said control means, and when receiving a wiper blade operation signal during non-operational state but thereafter becoming operational state thereof;
said predetermined time of said second switch means being set longer than the time required for said wiper blade to travel back to said predetermined stop position.

4,728,871
NOVELTY ELECTRIC MOTOR
Roger W. Andrews, 3110 Portland St., Eugene, Oreg. 97405
Filed Nov. 1, 1985, Ser. No. 794,294
Int. Cl.⁴ H02K *33/00*
U.S. Cl. 318—130 **30 Claims**



1. A novelty electric motor, comprising
(a) a stationary stator coil having an electric circuit,
(b) a magnet armature,
(c) means supporting the magnet armature in spaced proximity to the coil for movement relative to the coil,
(d) a source of electric potential in the electric circuit of the coil,
(e) switch means in said electric circuit operable by coil current induced by movement of the magnet armature for

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releasably connecting the source of electric potential across the coil momentarily to impose a magnetic field on the magnet armature to accelerate the movement thereof, and

(f) an RC time constant circuit connected across the coil for establishing the duration of time the source of electric potential is connected across the coil.

4,728,872

ROBOT PATH ERROR CORRECTION SYSTEM

Hajimu Kishi, Hino; Shinsuke Sakakibara, Komae; Takayuki Ito, and Tatsuo Karakama, both of Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

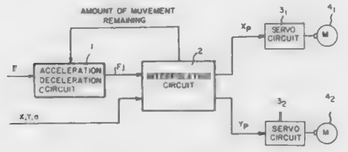
PCT No. PCT/JP85/00724, § 371 Date Aug. 14, 1986, § 102(e) Date Aug. 14, 1986, PCT Pub. No. WO86/04162, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 26, 1985, Ser. No. 899,299

Claims priority, application Japan, Dec. 29, 1984, 59-278385

Int. Cl.⁴ G05B *11/26*

U.S. Cl. 318—568 **2 Claims**



1. A robot path error correction system for performing a pulse distribution calculation along each axis in dependence upon commanded position data on the basis of velocity command pulses for accelerating and velocity command pulses for decelerating a feedrate to a commanded velocity at a predetermined time constant, and driving and controlling a movable element in a specified traveling direction, comprising:

(a) means for sensing a remaining amount of command pulses at deceleration of said movable element;

(b) timing deciding means for specifying start timing of a pulse distribution calculation along a subsequent travel path in dependence upon the sensed amount of said velocity command pulses remaining; and

(c) adding means for adding said velocity command pulses which accelerate the feedrate and said velocity command pulses which decelerate the feedrate in accordance with a commanded velocity and commanded position at the specified timing.

4,728,873

AUTOMATIC SEAT POSITION ADJUSTING ASSEMBLY

Masataka Inoue; Masahito Mutoh, both of Toyota, and Tomoaki Katayama, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 22, 1987, Ser. No. 53,125

Claims priority, application Japan, Jul. 28, 1986, 61-177328

Int. Cl.⁴ G05B *9/02*

U.S. Cl. 318—568 **20 Claims**

1. A seat assembly for automatically adjusting a seat position of a mounted seat comprising:

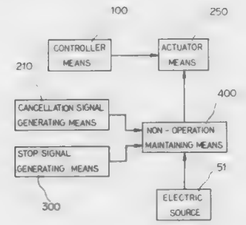
an actuator means for adjusting the seat;

an electric source for supplying electricity to said actuator means;

a controller means for controlling said actuator means, said controller means outputting a controlling signal to said actuator means;

a non-operation maintaining means for maintaining a non-operation condition of said actuator means, said non-operation maintaining means being electrically connected between said actuator means and said electric source, said non-operation maintaining means selectively supplying electricity with said actuator means;

a stop signal generating means for outputting a stop signal to said non-operation maintaining means, said non-operation for maintaining means begins a maintaining of the non-operation condition of said actuator means in accordance with the receipt of the stop signal, whereby once said stop signal generating means outputs the stop signal to said non-operation maintaining means, said non-operation maintaining means maintains the non-operation condition of said actuator means; and



a cancellation signal generating means for outputting a cancellation signal to said non-operation maintaining means, said non-operation maintaining means cancelling the non-operation condition of said actuator means in accordance with the receipt of the cancellation signal, whereby when said cancellation signal generating means outputs the cancellation signal to said non-operation maintaining means, said non-operation maintaining means cancels the non-operation condition of said actuator means, so that said electric source supplies the electricity to said actuator means and said actuator means adjusts the seat in accordance with the controlling signal of said controller means.

4,728,874

METHOD FOR CONTROLLING INTERMITTENT OPERATIONS OF PROCESSING APPARATUS

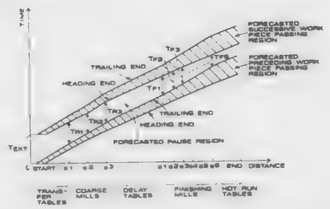
Satoru Kuramoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,220

Claims priority, application Japan, May 20, 1985, 60-106113

Int. Cl.⁴ G05B *19/25*

U.S. Cl. 318—571 **4 Claims**



1. A method for controlling an apparatus which processes work pieces supplied intermittently comprising the steps of:

(a) accepting data indicating a supply interval between supplying of successive work pieces,

(b) forecasting a foreseen pause time between separation of a preceding work piece from the apparatus and the arrival of a succeeding work piece at the apparatus based on a value which indicates a difference between said supply interval and a predetermined period of stay of each work piece at the apparatus,

(c) executing an arithmetic operation for subtracting from said foreseen pause time a value corresponding to a predetermined preparation time required for the apparatus until it reaches a steady state from the start of operation, and

(d) separating said apparatus from a driving source for a time corresponding to the remainder calculated in step (c) only when the foreseen pause time exceeds said preparation time.

4,728,875

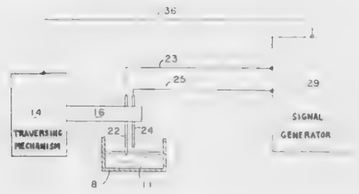
METHOD AND APPARATUS FOR MONITORING A LIQUID LEVEL

Ashok Murthy, Rochester, N.Y., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1986, Ser. No. 921,715

Int. Cl.⁴ G05D *9/00*

U.S. Cl. 318—642 **20 Claims**



1. A method of monitoring the surface level of a liquid, the method comprising:

moving a first sensing means and a second sensing means vertically with respect to the surface level of the liquid;

positioning the lower portion of the second sensing means vertically displaced upwardly with respect to the lower portion of the first sensing means, the amount of vertical displacement being directly related to the accuracy of determining the liquid level;

generating an output signal as a function of each sensing means positon;

then moving the first and second sensing means vertically with respect to the surface level of the liquid in response to the output signal corresponding to each sensing means position; and

determining the liquid level when the first sensing means is in contact with the liquid and the second sensing means is in noncontacting position above the liquid.

4,728,876

ORTHOPEDIC DRIVE ASSEMBLY

Douglas R. Mongeon, Orange, Calif., and Frederick J. Palensky, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 19, 1986, Ser. No. 830,674

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—2 **30 Claims**

1. A drive assembly for driving orthopedic surgical instruments, said drive assembly comprising:

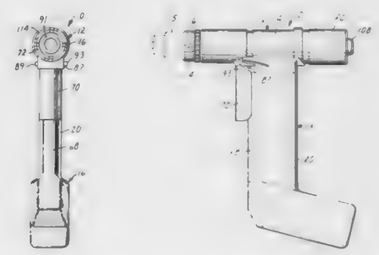
a first housing portion;

an electric direct current activated motor mounted on said first housing portion and having positive and negative electric power contacts;

a second housing portion;

a battery mounted on said second housing portion having at least one cell and electrically positive and negative terminals, said cell comprising walls defining a cavity, electrodes electrically coupled to said terminals within said cavity, a liquid electrolyte within said cavity and in which said electrodes are immersed to provide an electrical potential between said terminals, and a vent assembly mounted in said walls, said vent asssembly having a passageway between said cavity and the atmosphere, means mounted in said passageway for allowing gas in said cavity at a pressure above a predetermined level to escape through said passageway, and a curtain of microporous polymeric material entirely across said passageway that permits movement of gas though said curtain and passageway while restricting the movement of liquid through said curtain and passageway;

a switch assembly mounted on said second housing portion having an input lead coupled to one of said terminals, an output lead, and means including an actuator movable relative to said second housing portion between off and on



positions for making an electrical connection between said input and outlet leads when said actuator is in said one position and for causing said leads to be electrically isolated from each other when said actuator is in said off position, and means for biasing said actuator to said off position; and

means for affording releasing engagement between said first and second housing portions and for causing electrical contact between one of said power contacts and the output lead of said switch assembly and between the other of said power contacts and the other of said terminals.

4,728,877

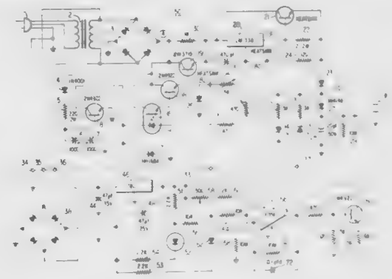
METHOD AND APPARATUS FOR IMPROVING ELECTROCHEMICAL PROCESSES

Hugh P. Adamson, Boulder, Colo., assignor to Adaptive Instruments Corp., Boulder, Colo.

Filed Jun. 10, 1986, Ser. No. 872,690

Int. Cl.⁴ H02J *7/50*

U.S. Cl. 320—21 **41 Claims**



1. Apparatus for improving the operation of an electrochemical system utilizing at least one positive and at least one negative electrode, said apparatus comprising

means for periodically applying a voltage across said electrodes to provide a current in a first direction between the electrodes through the electrolyte of the electrochemical system;

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means for periodically reversing the direction of the current through the electrolyte; and

said means for periodically applying the voltage including current changing means for changing said current in response to voltage changes occurring across said electrodes caused by perturbations in said electrochemical process where the slope of the function representing the current change with respect to a voltage change caused by said perturbations is at least five.

4,728,878

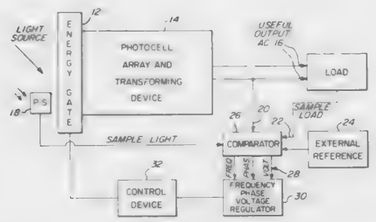
SOLAR ENERGY ELECTRIC GENERATING SYSTEM

John Anthony, P.O. Box 13, Croton, N.Y. 10520

Continuation-in-part of Ser. No. 860,904, May 8, 1986, abandoned. This application Jun. 19, 1987, Ser. No. 65,161

Int. Cl.[4] H02N *6/00*

U.S. Cl. 322—2 R **32 Claims**



1. A solar energy electric generating system, comprising in combination:

(a) an array of photocells;

(b) means for gating the electrical direct current energy produced by said array of photocells;

(c) means for transforming the electrical direct current energy at an output of said array of photocells whereby an alternating current at the output of said transforming means is produced, and which is controlled by a control device for controlling the rate and duty cycle of said gating means; and

(d) a photosensitive sampler which samples light incident upon said photocell array and outputs a proportional signal.

27. A system for converting light energy to electrical energy, comprising:

a photovoltaic cell for converting incident light energy to direct electrical current,

variable shutter means for causing said light energy incident upon said photocell to vary periodically and repetitively from a relatively low value to a relatively high value and back to said relatively low value in a gradual manner.

4,728,879

AUTOMATIC VOLTAGE REGULATOR

William J. Rounce, 24, Cumberland Gardens, Castle Bytham, Grantham, Lincs., England

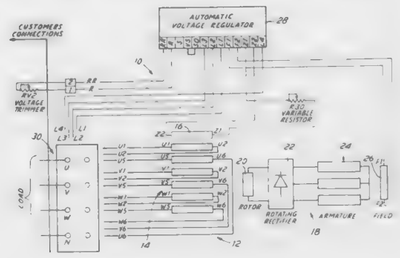
Filed Jun. 11, 1986, Ser. No. 872,976

Claims priority, application United Kingdom, Jun. 12, 1985, 8514859

Int. Cl.[4] H02P *9/30*

U.S. Cl. 322—25 **10 Claims**

1. An automatic voltage regulator for a self-excited brushless AC generator, comprising first input means for receiving a first input signal representative of an output of the generator, second input means for receiving a second input signal representative of the magnitude of the third-harmonic flux component produced by the generator, and output means for producing a regulator output for connection to an exciter field winding of



the generator, said regulator output being dependent on the level of said first input signal and said second input signal.

4,728,880

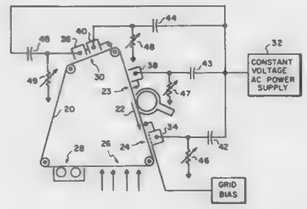
MULTIPLE VOLTAGE-PULSED CORONA CHARGING WITH A SINGLE POWER SUPPLY

George R. Walgrove, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1986, Ser. No. 935,878

Int. Cl.[4] G05F *1/12*

U.S. Cl. 323—267 **11 Claims**



1. Apparatus for driving from a single power supply a plurality of corona chargers, said apparatus comprising:

a substantially constant-potential power supply; and

means electrically interconnecting said power supply to the plurality of corona chargers such that a substantially constant average current is delivered to each of the corona chargers.

4,728,881

CIRCUIT FOR PROVIDING A CONTROLLED RESISTANCE

William A. Evans, and Stuart L. Rowlands, both of Swansea, United Kingdom, assignors to Haven Automation Limited, Swansea, United Kingdom

Filed Feb. 19, 1987, Ser. No. 16,286

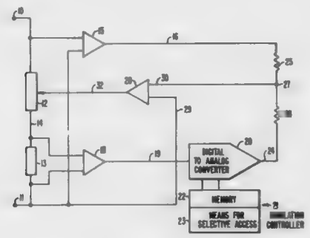
Claims priority, application United Kingdom, Feb. 19, 1986, 8604125

Int. Cl.[4] G01R *27/02*

U.S. Cl. 323—353 **20 Claims**

1. A circuit for providing a controlled resistance, the circuit comprising a pair of terminals for input of an excitation current, variable resistance means connected in the current path between the terminals, means for deriving a first signal representing the value of the voltage appearing across the terminals, means for deriving a second signal representing the value of the excitation current, means for generating a third signal representing a selected value of resistance to be provided between the pair of terminals, means for comparing the ratio of

the first and second signals with the value of the third signal to derive a difference signal, and means for applying the difference signal to cause the variable resistance means to change in value such that said ratio tends towards exact equality with the selected value of resistance.



4,728,882

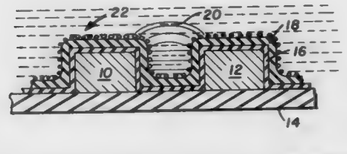
CAPACITIVE CHEMICAL SENSOR FOR DETECTING CERTAIN ANALYTES, INCLUDING HYDROCARBONS IN A LIQUID MEDIUM

William D. Stanbro, Columbia, and Arnold L. Newman, Kensington, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 1, 1986, Ser. No. 846,778

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 R **45 Claims**



1. A device for sensing selected analyte in a liquid medium, comprising:

a concentrating and nucleating material adapted to be exposed to a liquid medium under test, for causing nucleated formation of bubbles in a liquid medium on the surface of said material in response to selected analyte contained in said liquid medium; and,

a means, positioned in association with said concentrating and nucleating material, responsive to the formation of said bubbles.

4,728,883

METHOD OF TESTING ELECTRONIC CIRCUITS

Morris H. Green, Milwaukie, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

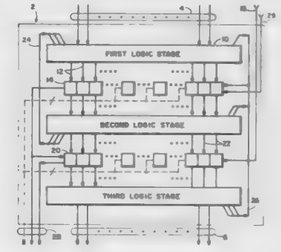
Filed Mar. 15, 1985, Ser. No. 712,586

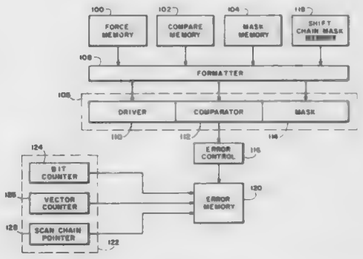
Int. Cl.[4] G01R *31/00, 31/28*

U.S. Cl. 324—73 R **7 Claims**

6. A method of testing an electronic circuit comprising an input logic stage having an input port for applying input vectors to the input logic stage, an output logic stage having an output port for providing output vectors from the output logic stage, storage elements interposed functionally between the input logic stage and the output logic stage, at least one scan input pin for loading a test vector into the storage elements, and at least one serial scan pin for providing at least one serial scan vector reflecting the status of the storage elements, said method comprising:

(a) carrying out a first test by applying at least one test vector to the circuit, examining the serial scan vector after application of the test vector and determining whether a part of the serial scan vector indicates the presence of a defect in the circuit, and





(b) carrying out a second test and utilizing information obtained in the first test concerning the presence of a defect in the circuit to prevent an indication of the presence of the same defect being given in the second test.

4,728,884

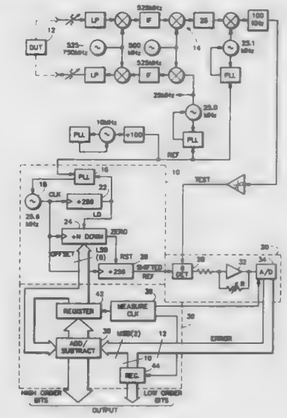
INFINITE DYNAMIC RANGE PHASE DETECTOR

Linley F. Gumm, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 9, 1986, Ser. No. 917,454

Int. Cl.[4] G01R *25/00*

U.S. Cl. 324—83 D **7 Claims**

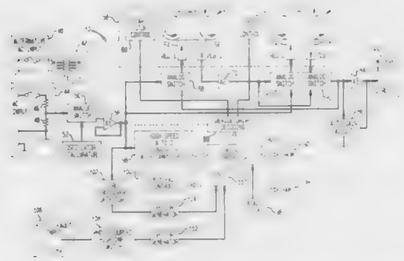


1. An infinite dynamic range phase detector comprising:

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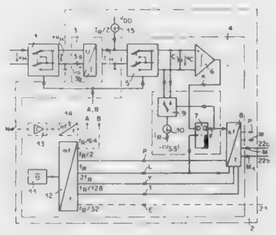
means for phase shifting a reference signal to produce a shifted reference signal;
means for determining the phase difference between the shifted reference signal and a test signal to produce an error signal; and
means for computing from the error signal an accumulated output signal, a portion of the accumulated output signal being used to provide an offset to the phase shifting means such that the shifted reference signal tracks the test signal in phase.

4,728,885
METHOD AND APPARATUS FOR DUPLICATING ELECTRICAL ENVIRONMENTAL CONDITIONS
Joseph J. DeSanto, 14 Hillcrest Rd., Belle Mead, N.J. 08502
Filed Jan. 23, 1986, Ser. No. 821,785
Int. Cl.[4] G01R *13/06*
U.S. Cl. 324—102 **19 Claims**



1. A system for duplicating electrical environmental conditions comprising:
environment recording means for monitoring electrical environmental conditions at a source location and recording said electrical environmental conditions, said environment recording means including:
a first recording means for temporarily recording said electrical environmental conditions;
an electrical environmental condition analyzing means for analyzing said electrical environmental conditions substantially at the same time as said first recording means is recording said electrical environmental conditions and for determining when said electrical environmental conditions exceed certain predetermined limits, said electrical envionmental condition analyzing means including a microprocessor means for processing signals representative of said electrical environmental conditions and memory means for storing said predetermined limits; and,
second recording means connected to said first recording means and to said electrical environmental condition analyzing means for selectively and permanently recording from said first recording means those electrical environmental conditions which exceed said predetermined limits; and,
reproducing means connectable to said environment recording means for reproducing said electrical environmental conditions,
wherein an electrical device may be attached to said reproducing means and tested under substantially the same electrical environmental conditions as though said electrical device were at the location of said source of said electrical environmental conditions and wherein said second recording means only records from said first recording means beginning at a predetermined voltage level and ending at the same predetermined voltage level so that the electrical environmental conditions recorded by said second recording means have substantially continuous beginning and ending transitions.

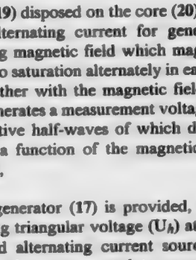
4,728,886
METHOD AND APPARATUS FOR CONVERTING AN ELECTRICAL SIGNAL INTO A PROPORTIONAL FREQUENCY
Jan Petr, Oberwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland
Filed Sep. 4, 1986, Ser. No. 904,045
Claims priority, application Switzerland, Feb. 10, 1986, 00517/86
Int. C.[4] G01R *19/26, 1/02*
U.S. Cl. 324—120 **19 Claims**



7. An apparatus for converting an electrical signal into a proportional frequency comprising,
a first polarity reversing switch for periodically switching the polarity of said electrical signal,
means for adding a first reference signal to a signal proportional to said periodically switched electrical signal to form an addition signal,
a second polarity reversing switch which is switched synchronously with said first polarity reversing switch for periodically switching the polarity of said addition signal,
an integrating capacitor which is successively charged and discharged by means of a current component proportional to said periodically switched addition signal and a selectively switched reference signal whose magnitude corresponds to twice the signal magnitude of said first reference signal,
comparator means for comparing the capacitor voltage with a reference voltage to selectively switch said reference current, thereby enabling production of a signal whose average frequency is proportional to the sum of said electrical signal and said first reference signal, and
means for subtracting a frequency proportional to the first reference signal to produce a signal whose frequency is proportional to said electrical signal.

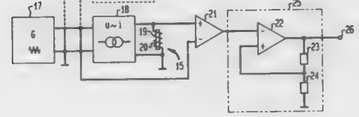
4,728,887
SYSTEM FOR RATING ELECTRIC POWER TRANSMISSION LINES AND EQUIPMENT
Murray W. Davis, 19790 Eastwood, Harper Woods, Mich. 48225
Filed Jun. 22, 1984, Ser. No. 623,842
Int. Cl.[4] G01R *1/22*
U.S. Cl. 324—127 **49 Claims**

1. A sensing device adapted to be clamped to an electrically energized overhead electric power line, comprising:
a housing;
sensing means in said housing;
first and second jaws carried by said housing, said jaws being shiftable relative to each other from a closed position clamping said line therebetween and an open position releasing said line from jaws;
power supply means carried by said housing for supplying electrical power to said sensing means, said power supply means including an electrical transformer for supplying electrical current to said sensing means, said transformer including a magnetic core for inductively coupling said line with said transformer when said jaws are in said closed position thereof;
said magnetic core including first and second core portions shiftable relative to each other,



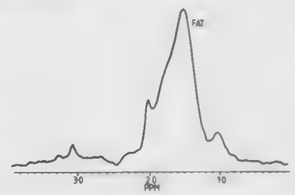
at least said first jaw being shiftable relative to said housing and mounted thereon; and
said first core portion connected to said first jaw.

4,728,888
MAGNETOMETER WITH TIME CODED OUTPUT OF MEASURED MAGNETIC FIELDS
Harald Bauer, Nuremberg, and Gerhard Hettich, Rosstal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE84/00243, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/02911, PCT Pub. Date Jul. 4, 1985
PCT Filed Nov. 14, 1984, Ser. No. 745,771
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345712
Int. Cl.[4] G01R *33/04;* **G01C** *17/28*
U.S. Cl. 324—253 **2 Claims**



1. Magnetometer for time coded measurement of constant magnetic fields, comprising at least one sensor having
a horizontally disposed magnetizable rod-shaped core (20) and
a winding (19) disposed on the core (20), the winding carrying an alternating current for generating an auxiliary alternating magnetic field which magnetizes the core up to and into saturation alternately in each of two directions and, together with the magnetic field that is to be measured, generates a measurement voltage (U_m), the positive and negative half-waves of which deviate from one another as a function of the magnetic field that is to be measured,
wherein
a triangle generator (17) is provided, which generates an alternating triangular voltage (U_A) at one output thereof;
a controlled alternating current source (18) is provided, having an input connected to an alternating triangular voltage output (U_A) of said triangle generator (17) and outputs connected to respective ends of said winding (19) for generating said auxiliary alternating field;
a single winding (19) serves both to generate the auxiliary alternating field and to generate the measurement voltage (U_m), the winding having first and second ends,
an evaluation circuit (12, 13, 21–25) is provided for evaluating the measurement voltage (U_m) that can be picked up at said single winding (19);
the first end of said winding being connected to said controlled alternating current source (18) and
the second end of said winding being connected to said evaluation circuit (12, 13, 21–25);
one output of the triangle generator (17) and one end of the winding (19) are applied to a common reference voltage level;
said first end of said winding (19) is at reference voltage level and said second end is not at reference voltage level;
a subtracting amplifier (21), having first and second inputs, is provided for evaluating the measurement voltage (U_m);
said second end of said winding (19) is connected to said second input of said subtracting amplifier (21);
said triangle generator (17) has a first output that is at reference voltage level and a second output that is not at reference voltage level, and
said second output of said triangle generator is connected with said first input of the subtracting amplifier.

4,728,889
SPECTROSCOPY METHOD
David G. Gadian, Holcot; Edward Proctor, Horsham, and Stephen R. Williams, London, all of England, assignors to Picker International, Ltd., Wembley, England
Filed Aug. 6, 1986, Ser. No. 893,692
Claims priority, application United Kingdom, Aug. 16, 1985, 8520587
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **8 Claims**



1. An NMR spectroscopy method for monitoring a component of a sample, the component having at least two coupled resonances in different spectral regions, the first resonance lying in a first spectral region including a resonance of a second component of the sample, and the second resonance lying in a second spectral region including a resonance of a third component of the sample, comprising: applying two spin-echo pulse sequences consisting of pulses of a predetermined frequency, the sequences each being effective to produce a suppressed resonance signal in the first spectral region, in one of the sequences the echo pulse not exciting the first resonance, and in the other of the sequences the echo pulse exciting the first resonance; recording a spin-echo spectrum produced by each of the sequences; and using the two recorded spin-echo spectra together to determine the second resonance of the first component with the resonance of the third component suppressed.

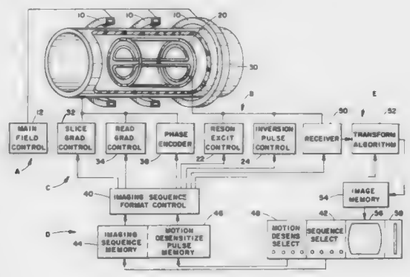
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4,728,890

MOTION ARTIFACT SUPPRESSION TECHNIQUE OF MAGNETIC RESONANCE IMAGING

Pradip M. Pattany, Willoughby Hills, and James E. McNally, Chagrin Falls, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Continuation-in-part of Ser. No. 766,757, Aug. 16, 1985, Pat. No. 4,683,431. This application Jun. 27, 1986, Ser. No. 879,596
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**



15. An apparatus for generating motion desensitized magnetic resonance images, the apparatus comprising:

main magnetic field means for generating a generally uniform magnetic field through an image region;

a radio frequency pulse means for selectively applying radio frequency pulses to the image region, at least some of the radio frequency pulses being configured for exciting magnetic resonance of selected dipoles in the image region;

a slice selection gradient control means for selectively applying magnetic field gradient pulse in a slice select direction across the image region;

read gradient control means for selectively applying magnetic field gradient pulses across the image region in a read direction;

a phase encode gradient control means for selectively applying magnetic field gradients in a phase encode direction across the image region;

an imaging pulse sequence and motion desensitization memory means for storing amplitude and relative timing information for each of a plurality of selectable imaging sequences including RF, slice select gradient, read gradient, and phase encode gradient pulses, and motion desensitization magnetic field gradient pulses to be applied in each of the slice select and read gradient directions;

a pulse sequence format means operatively connected with the imaging pulse sequence and motion desensitization pulse memory means and with the radio frequency pulse means, the slice select gradient control means, the read gradient control means, the phase encode gradient control means for causing the radio frequency pulse control means, the slice select gradient control means, the read gradient control means, and the phase encode gradient control means to apply the selected sequence of imaging and motion desensitization pulses to the image region;

a radio frequency receiving means for receiving radio frequency magnetic resonance signals from the image region; and,

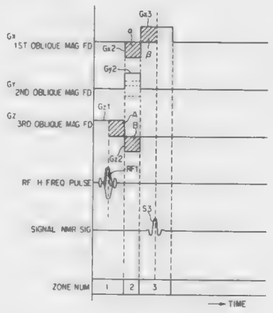
image reconstruction means for forming an image representation from the received magnetic resonance signals.

4,728,891

NUCLEAR MAGNETIC RESONANCE IMAGING METHOD

Satoshi Fujimura, and Kiyoshi Yoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,591
Claims priority, application Japan, Aug. 30, 1985, 60-189494
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**



1. A nuclear magnetic resonance imaging method having the first step of exciting a nuclear spin in a volume of an object in a static magnetic field, the second step of applying first, second and third gradients, and the third step of producing a spin echo signal under the second gradient in accordance with said nuclear spin comprising:

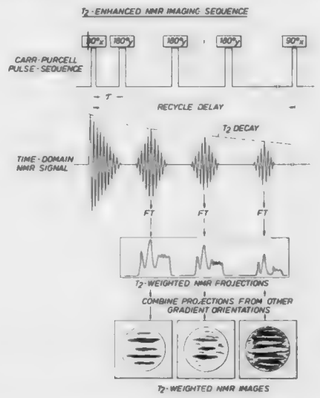
the step of applying a high frequency pulse in which said nuclear spin is approximately tipped at 116° as an exciting pulse in said first step.

4,728,892

NMR IMAGING OF MATERIALS

Harold J. Vinegar, Houston, and William P. Rothwell, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 13, 1985, Ser. No. 765,406
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**



1. A method for obtaining at least one petrophysical property of a porous material containing therein at least one preselected fluid, comprising:

NMR imaging said material to generate signals dependent upon both $M(0)$ and T_1 and $M(0)$ and T_2,

generating separate $M(0)$, T_1 and T_2 images from said signals, and

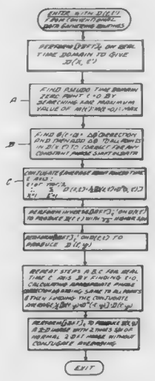
determining said at least one petrophysical property from at least one of said images.

4,728,893

INCREASED SIGNAL-TO-NOISE RATIO IN MAGNETIC RESONANCE IMAGES USING SYNTHESIZED CONJUGATE SYMMETRIC DATA

David A. Feinberg, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 760,833, Jul. 31, 1985, abandoned. This application Jul. 2, 1987, Ser. No. 70,156
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **10 Claims**



1. A method for magnetic resonance imaging of an object, said method comprising the steps of:

(a) acquiring a first data set of complex-valued NMR signals sufficient to determine an NMR image of said object;

(b) deriving from said first data set a second data set of artificial NMR signals based on complex conjugate symmetry relationships between the NMR signal components contained in said first data set;

(c) adding together corresponding signals of said first and second data sets to produce an averaged data set; and

(d) producing an NMR image using said averaged data set.

4,728,894

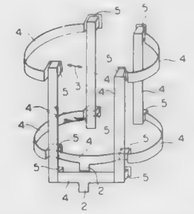
HIGH FREQUENCY COIL FOR AN NMR APPARATUS

Kiyoshi Yoda, Itami; Tadatoshi Yamada, Kobe, and Satoshi Fujimura, Nara, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 21, 1985, Ser. No. 714,218
Claims priority, application Japan, Apr. 23, 1984, 59-80121
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—318 **12 Claims**

1. A high frequency coil for a nuclear magnetic resonance apparatus comprising:

a saddle coil including a plurality of belt-shaped metal sheets, each having end portions, the plurality of metal sheets being arranged serially with an end portion of one metal sheet being disposed adjacent to an end portion of the next metal sheet so as to form the saddle coil, the saddle coil further including electric insulator means for reducing the impedance of the coil, the electric insulator



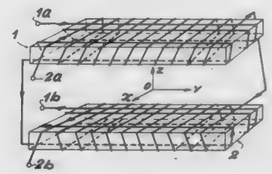
means being interposed between adjacent end portions of said belt-shaped metal sheets.

4,728,895

SYSTEM OF COILS FOR PRODUCING ADDITIONAL FIELDS FOR OBTAINING POLARIZATION FIELDS WITH CONSTANT GRADIENTS IN A MAGNET HAVING POLARIZATION POLE PIECES FOR IMAGE PRODUCTION BY NUCLEAR MAGNETIC RESONANCE

André Briguet, Villeurbanne; Christian Jeandey, Egreve, and Edmond Tournier, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 26, 1985, Ser. No. 780,309
Claims priority, application France, Oct. 5, 1984, 84 15301
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **10 Claims**



1. A system of coils for producing additional fields in a magnet having pole pieces for image production by nuclear magnetic resonance in a configuration where the polarization field $\vec{B}o$, perpendicular to the pole pieces, is parallel to the direction Oz of a trirectangular reference trihedron, and the rectangular or circular pole pieces have their faces parallel to the directions Ox and Oy of said same trihedron and are separated by an air gap, for obtaining resultant polarization fields $\vec{B}$, whose component $\vec{B}z$ in direction Oz has constant gradients Gx, Gy and Gz in three directions in space, said coil system comprises for producing gradients $Gx=(\partial Bz/\partial x)$ and $Gy=(\partial Bz/\partial y)$, two orthogonal winding layers, one on each pole piece, each being constituted by conductors parallel to one of the axes Ox or Oy and uniformly distributed, while being supplied in such a way that the currents flow in the same direction on the faces of the pole pieces facing the air gap, said currents returning on the opposite face of the pole pieces and for producing the gradient $Gz=(\partial Bz/\partial z)$, there are two winding systems having circular symmetry with axis Oz, located on the inner facing faces of the pole pieces and traversed by currents having opposite directions in the individual pole pieces.

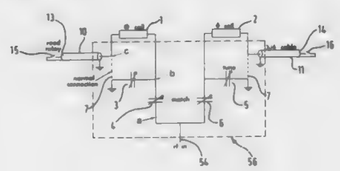
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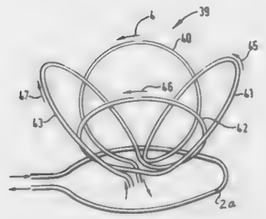
4,728,896

METHOD AND APPARATUS FOR OBTAINING N.M.R. SPECTRA AND COILS FOR USE THEREIN

Max R. Bendall, Burbank, Australia, and Jamie M. McKendry, Kidlington, United Kingdom, assignors to Oxford Research Systems Limited, Abingdon, England

Filed Jul. 29, 1985, Ser. No. 759,881
Claims priority, application United Kingdom, Jul. 31, 1984, 8419466; Jun. 12, 1985, 8514852
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 11 Claims





1. Apparatus for obtaining an N.M.R. spectrum of a sample, which apparatus comprises;
means for generating a static magnetic field;
a sample location space within the magnetic field for containing the sample;
means for applying to the space an Rf field having a wavelength such as to cause perturbation of nuclear spins in the sample space in the presence of the magnetic field;
means for detecting the Rf signal induced in the sample as a consequence of the applied rf field, the apparatus comprising at least two tuned Rf coils, at least one of the said Rf coils being connected to ground via a selectively operable high speed switch, whereby operation of the switch causes the detuning of the said at least one coil and thereby the decoupling of the said coil from the said other coil; said apparatus further comprising processing means for controlling the high-speed switch to cause said detuning.

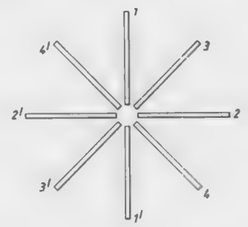
4,728,897

MICROWAVE REFLECTION SURVEY TECHNIQUE FOR DETERMINING DEPTH AND ORIENTATION OF BURIED OBJECTS

David J. Gunton, Stakeford, England, assignor to British Gas Corporation, London, England

Continuation of Ser. No. 788,582, Oct. 17, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,328
Claims priority, application United Kingdom, Oct. 17, 1984, 8426745
Int. Cl.[4] G01V *3/12, 3/17;* G01S *13/06*
U.S. Cl. 324—329 6 Claims

1. A method of producing information indicative of the depth and orientation of an elongated object buried beneath the ground using electromagnetic radiation transmitted from and received by an antenna apparatus comprising mutually electrically orthogonal transmit and receive elements, said radiation being elliptically or circularly polarized or nearly so, said method comprising the following steps:
(a) positioning an elongated reference object at known angular orientation with respect to a reference direction on the ground in a position to intercept radiation emitted from said antenna apparatus with the transmit and receive elements thereof in positions of known angular orientations with respect to the lengthwise direction of said reference object;
(b) energizing the transmit elements of said apparatus with a first electric signal to cause radiation to be transmitted therefrom;
(c) receiving radiation backscattered due to step (a) by means of said receive elements and producing first data corresponding to the received backscattered radiation;
(d) storing said first data;
(e) repositioning said transmit and receive elements at least once to new positions angularly separated from the immediately previous positions by a known angle other than an integer multiple of 90° about an axis transverse to the lengthwise direction of said reference object;
(f) repeating steps (b), (c) and (d) after each repositioning effected by step (e) to obtain at least second data;
(g) algebraically combining at least said stored first data and said second data to reduce clutter and errors due to departure from exact orthogonality of said transmit and receive elements upon each performance of step (f) and based on said algebraic combining producing reference data defining a known orientation of said reference object in relation to a known reference direction;



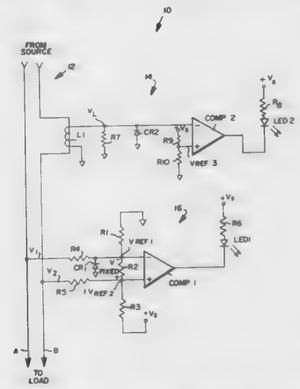
(h) storing said reference data;
(i) positioning said antenna apparatus over the ground with said transmit and receive elements in position at known angular orientations with respect to a reference direction on the ground; and
(j) energizing said transmit elements with a signal identical to said first electrical signal to transmit radiation towards the ground;
(k) receiving radiation back-scattered due to step (j) by means of said receive elements and producing third data corresponding to the received back-scattered radiation;
(l) storing said third data;
(m) repositioning of said transmit and receive elements at least once to new positions angularly separated from the previous positions by a known angle other than integer multiple of 90° about an axis directed into the ground;
(n) repeating steps (j), (k), and (l) after each repositioning effected by step (m) to obtain fourth data;
(o) algebraically combining at least said stored third data and fourth data to reduce clutter and errors due at least to departure from exact orthogonality of said transmit and receive elements and producing search data based on the algebraic combining of said third and fourth data;
(p) storing said search data; and
(q) detecting correlation between said stored reference data and said stored search data to yield said information and further to reduce clutter in said stored fourth data, said correlation being detected using a predetermined filtering technique;
wherein steps (a)–(h) are optionally performed either before or after steps (i)–(p).

4,728,898

METHOD AND APPARATUS FOR DETECTING AND LOCATING FAULTS IN AN AC TRANSMISSION LINE USING TWO INDICATORS

Royce E. Staley, Jr., Little Rock, Ark., assignor to Staley Electric Co., Inc., Little Rock, Ark.

Filed Mar. 17, 1986, Ser. No. 840,001
Int. Cl.[4] G01R *31/08;* G08B *23/00*
U.S. Cl. 324—522 10 Claims



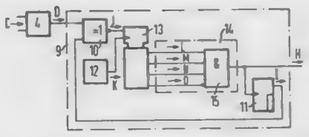
1. Apparatus for providing a visual indication of whether a transmission line connecting an AC source to a load is open-circuited and/or short-circuited comprising:
means disposed along said transmission line for sensing the current and voltage carried by said line;
first and second discrete visual indicators; and
control means, operatively coupled to said sensing means and said first and second visual indicators, for selectively illuminating said first and second visual indicators in response to said sensed current and voltage as follows:
(a) illuminating both said first and second indicators when the source is delivering an AC signal to the line and the line is not open or shorted
(b) illuminating said first indicator and darkening said second indicator when said line is discontinuous somewhere between the point along said line at which said sensing means is disposed and said load,
(c) darkening said first indicator and illuminating said second indicator when said line is shorted somewhere between the point along said line at which said sensing means is disposed and said load, and
(d) darkening both said first and second indicators whenever any one of the following conditions exist:
(1) said source is not delivering a signal to said line
(2) said line is shorted somewhere between said source and the point along said line line at which said sensing means is disposed, and
(3) said line is discontinuous somewhere between the source and the point along said line at which said sensing means is disposed.

4,728,899

CIRCUIT ARRANGEMENT FOR THE CONVERSION OF ANALOG SIGNALS INTO BINARY SIGNALS

Erik Solhjell, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Aug. 29, 1986, Ser. No. 902,178
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530949
Int. Cl.[4] H03K *5/01*
U.S. Cl. 328—150 8 Claims



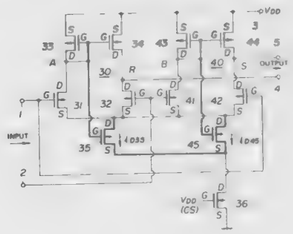
1. A circuit arrangement for conversion of analog signals into binary signals, comprising:
means for generating rectangular signals from said analog signals wherein edges of said rectangular signals are allocated to zero axis crossings of said analog signals;
a control means for always normally generating binary signals from said rectangular signals when said rectangular signals change their binary values;
said control means having delay means for delaying said rectangular signals and a plurality of parallel outputs at which delayed rectangular signals are output, the delayed rectangular signals being delayed in steps by a prescribed time duration which is significantly shorter than a period duration of said rectangular signals;
said control means having a processing means at which said delayed rectangular signals are present for generating a binary signal when said delayed rectangular signals simultaneously have prescribed binary values; and
said delay means being preceded by an exclusive-OR element at whose first input said rectangular signals are connected and at whose second input an output signal of a flip-flop means is connected, said flip-flop means flipping into a respectively opposite position with every appearance of a binary signal.

4,728,900

BALANCED DIFFERENTIAL AMPLIFIER

Akira Nakagawara, and Kazuo Watanabe, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 3, 1986, Ser. No. 847,539
Claims priority, application Japan, Apr. 8, 1985, 60-74036
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 14 Claims



5. A balanced differential amplifier comprising, in combination:
a first differential amplifier which includes a first differential MOS FET and a second differential MOS FET, each respectively connected to a current mirror circuit, an

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input to each of said first and said second differential MOS FETs receiving a balanced input signal in a first polarity relationship;

a second differential amplifier which includes a third differential MOS FET and a fourth differential MOS FET, each respectively connected to a current mirror circuit, an input to each of said third and said fourth differential MOS FETs receiving said balanced input signal in a reverse polarity relationship to that applied to said first differential amplifier; and

an output circuit for providing a balanced output signal between an output terminal of said second differential MS FET of said first differential amplifier and an output terminal of said fourth differential MOS FET of said second differential amplifier;

a first constant current source MOS FET connected at least to a source terminal of each of said first and said second differential MOS FETs;

a second constant current source MOS FET connected at least to a source terminal of each of said third and said fourth differential MOS FETs;

means for biasing gates of each of said first and said second constant current source MOS FETs with a voltage signal which is respectively out of phase when so applied so that the sum total of the currents respectively flowing through said first and said second constant current MOS FETs is constant irrespective of the change in said balanced input signal; and

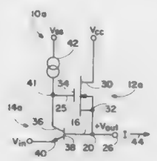
a third constant current source MOS FET connected to a source terminal of each of said first and said second constant current source MOS FETs so to provide a common source path for said sum total of currents flowing through said first and said second constant current sources.

4,728,901

POWER BUFFEE CIRCUIT

Steven H. Pepper, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 7, 1986, Ser. No. 848,520
Int. Cl.[4] H03F *1/34*; G05F *1/40*
U.S. Cl. 330—260 6 Claims



1. A power buffer circuit for providing current gain to an input signal while maintaining substantially unity voltage gain between the input and output signals, comprising:

an MOS device haivng a gate, drain, and source, the output signal appearing at the source; and

a bipolar transistor having its emitter for sensing the input voltage, its base connec[illegible]irectly to the source to sense the output voltage and its collector coupled to the gate,

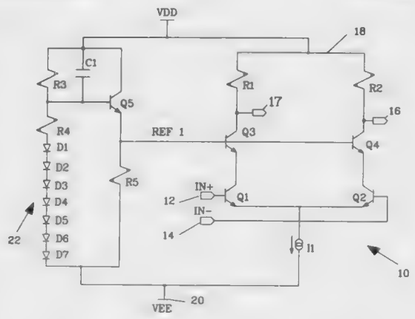
the bipolar transistor setting the voltage on the gate in response to a difference between the input and output voltages to cause the output voltage to follow the input voltage by varying the current through the MOS device.

4,728,902

STABILIZED CASCODE AMPLIFIER

Jeffrey Gleason, Minneapolis, and Richard E. Hester, Eden Prairie, both of Minn., assignors to VTC Incorporated, Bloomington, Minn.

Filed Sep. 8, 1986, Ser. No. 904,938
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 12 Claims



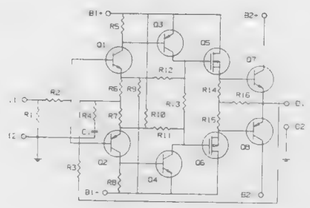
1. A bipolar integrated circuit amplifier having a cascode stage which receives a bias voltage from an emitter-follower bias circuit which includes a transistor having a base, an emitter and a collector, means for providing a base voltage to the base of the transistor, means for deriving the bias voltage from the emitter of the transistor, and stabilization capacitance means between the base and collector of the transistor for stabilizing the cascode stage of the bipolar integrated circuit amplifier.

4,728,903

CLASS A HIGH-FIDELITY AMPLIFIER

Martin G. Reiffin, 9262 Royal Palm Blud. garden Grove, Calif. 92641

Filed May 2, 1986, Ser. No. 858,664
Int. Cl.[4] H03F *3/30*
U.S. Cl. 330—264 15 Claims



10. A transistor power amplifier for driving a high-fidelity loudspeaker for the reproduction of music without audible distortion, said amplifier comprising

a complementary-symmetry push-pull output stage comprising a complementary pair of power output transistors,

a complementary-symmetry push-pull current amplification stage comprising a complementary pair of power output transistors,

said output stage transistors having greater thermal stability than said current amplification transistors,

said current amplification transistors having a higher current capability than said output stage transistors,

said output stage transistors each having an output electrode,

said current amplification transistors each having an input electrode and an output electrode,

an output terminal for connection to a high-fidelity loudspeaker system,

current-sensing impedance means extending from said output stage transistor output electrodes to said output terminal,

said impedance means having an impedance of a magnitude to permit sufficient output current to flow from said output stage transistor output electrodes through said impedance means to said output terminal and then through said loudspeaker system to drive the latter,

first conductive means connecting said current amplification transistor input electrodes to one end of said current-sensing impedance means,

second conductive means connecting said current amplification transistor output electrodes to the other end of said impedance means,

means biasing said output stage transistors to an active state with a predetermined quiescent current,

whereby at lower amplifier power output levels said loudspeaker system is driven by said output stage until the magnitude of the output current flowing through said current-sensing impedance means reaches a predetermined value to apply a signal voltage to said input electrodes of the current amplification transistors, thereby activating the current amplification stage to provide additional current to said output terminal, and

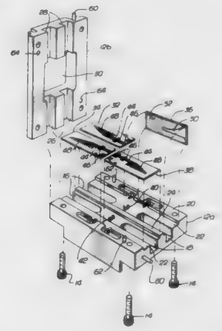
whereby there are provided the combined advantages of the thermal stability of the output stage transistors and the high current capability of the current amplification transistors.

4,728,904

EXTRA HIGH FREQUENCY (EHF) CIRCUIT MODULE

Gerald W. Swift, Rolling Hills Estates, and Patrick J. O'Sullivan, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 737,630, May 24, 1985, abandoned.
This application Jan. 27, 1987, Ser. No. 9,644
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—286 4 Claims



1. An extra-high-frequency (EHF) balanced circuit module, comprising:

two metallic blocks secured together and having channels formed in them to define a pair of waveguide input sections and a pair of waveguide output sections, and having coupling means at the input and output sections, to facilitate coupling with modules with similar coupling means;

two microstrip sections located within the module, each microstrip section being formed on first and second substrates aligned in substantially the same plane, and each substrate having a ground plane on one face and a metallized strip on the other face;

input transition means for coupling energy from the waveguide input sections to the microstrip sections;

output transition means for coupling energy from the microstrip sections to the waveguide output sections; and

two electrical devices coupled one to each of the microstrip sections, the electrical devices being positioned between the first and second substrates of the microstrip sections;

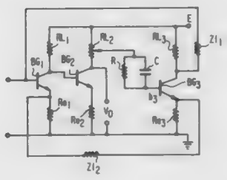
wherein the input transition means includes a fin-line section formed on the first substrate of each microstrip section, and the output transition means includes a fin-line section formed on the second substrate of each microstrip section, whereby the balnced circuit module is conveniently connectable to other circuit modules having identical coupling means.

4,728,905

HIGH FREQUENCY, WIDE BAND, SUPERLINEAR INTEGRABLE AMPLIFIER AND ITS METHOD OF FABRICATION

Yu Zhiwei, No. 1,92th Lane Yongnian Road, Luwan District Shanghai, China

Filed Mar. 31, 1986, Ser. No. 846,210
Claims priority, application China, Apr. 1, 1985, 85100523
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—293 5 Claims



1. A three stage amplifier network comprising:

a first transistor stage and a second transistor stage of said three stages having narrow bandwidth response wherein each of said first and second transistor stages have associated therewith a first resistance R_L connected to the respective collectors and a second resistance R_e connected to the respective emitters;

a third transistor amplifier stage having a bandwidth larger than said two narrow bandwidth transistor stages wherein said larger bandwidth of said third transistor stage is accomplished by at least one RC network;

wherein the wide bandwidth of said wide bandwidth amplifier stage is such that when the gain curve for said two narrow bandwidth stages passes through the −6 dB point at a first frequency then the peak point of the wide bandwidth of said wide bandwidth stage amplifier section is located at a second frequency which is greater than said first frequency and wherein said wide bandwidth stage utilizes said at least one RC network whereby the resulting curve of said three stages has an approximately flat portion below the zero gain point;

wherein said third stage is said wide band width stage and wherein the output of said network is connected to said second stage whereby the band width of said wide band width third stage is at a maximum value and wherein said third stage is a feedback attenuation stage.

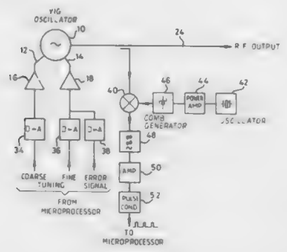
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4,728,906

TUNING AND CALIBRATION CIRCUITS FOR CW AND SWEEP FREQUENCY SIGNAL GENERATORS

Christopher B. D. Turl, Letchworth, and Geoffrey J. Hurst, Royston, both of England, assignors to Wiltron Measurements Limited, Stevenage, England

Filed Oct. 15, 1986, Ser. No. 919,191
Claims priority, application United Kingdom, Oct. 21, 1985, 8525878
Int. Cl.[4] H03L 7/12, 7/20
U.S. Cl. 331—4 16 Claims



1. A method of setting up a signal generating device to deliver an output frequency of F MHz which may lie anywhere in a range extending up to hundreds and thousands of MHz, and which includes the input of coarse and fine frequency controlling signals, wherein the fine frequency controlling signal is capable of producing linear changes in output frequency for corresponding changes in the parameter of an electric signal supplied thereto, but only over a small range of N MHz, according to which:

the output of the device is combined with a multicomponent reference signal containing at least a component having a frequency of L MHz, which is within N MHz of the desired frequency F MHz,

the frequency controlling signals supplied to the device are adjusted to yield an output signal having a frequency also within N MHz of F MHz,

the frequency of the fine frequency controlling signal is then adjusted until a correspondence signal is detected and indicates a one to one relationship of the output signal and the said component of the reference signal,

the values of the frequency controlling signals at which a correspondence signal is detected are stored,

using at least one of an algorithm and look-up table the value of a correcting signal requried for the fine frequency control to shift the frequency of the device by (F—L) MHz is determined and the desired output signal of F MHz is obtained by adding the correcting signal to the stored signals and using the combined signal as the control signal for the device.

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FREQUENCY/TEMPERATURE COMPENSATED MILLIMETER WAVE OSCILLATOR

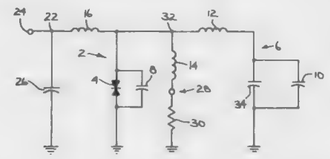
Leonard D. Cohen, Brooklyn, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 4, 1986, Ser. No. 938,045
Int. Cl.[4] H03B 7/02, 7/06, 7/12, 7/14
U.S. Cl. 331—107 R 26 Claims

1. A frequency versus temperature stabilized oscillator operational in the millimeter wave range including frequencies greater than 30 GHz, comprising:

a lumped element circuit including an active element with a negative resistance;

a lumped element circuit in parallel with first mentioned active circuit;



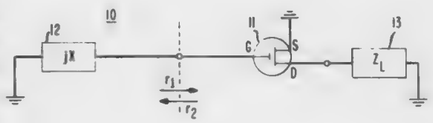
at least one of said circuits including a lumped element temperature compensating capacitor formed on material of dielectric constant less than about 15.

4,728,908

OSCILLATOR CIRCUIT UTILIZING MULTIPLE SEMICONDUCTOR DEVICES

Joseph Gonda, Moultonboro, N.H., assignor to American Telephone and Telegraph Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1987, Ser. No. 477
Int. Cl.[4] H03B 5/00
U.S. Cl. 331—108 R 4 Claims



1. An oscillator circuit having a nominal frequency, said circuit comprising

a plurality of transistor devices each having terminals, each of the terminals on one device having a corresponding terminal on the other devices, and

an interconnection path connecting a selected one of said terminals on one device to the corresponding terminal on the other devices, said path providing a delay which is an integer multiple of the inverse of said nominal frequency.

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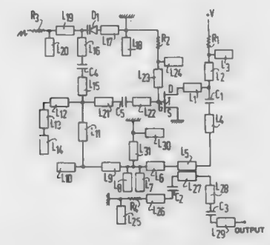
LINEARLY FREQUENCY-MODULATED HIGH-FREQUENCY OSCILLATOR WITH HIGH EXTERNAL Q FACTOR

Marie-Irène Rudelle, Aubervillers, France, assignor to U.S. Philips Corporaton, New York, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,548
Claims priority, application France, Oct. 29, 1985, 85 16043
Int. Cl.[4] H03B 5/18
U.S. Cl. 332—30 V 4 Claims

1. A high-frequency oscillator whose frequency is modulated linearly around a central frequency by means of a variable capacitance diode as a function of a control voltage applied to the terminals of this diode, said oscillator comprising a power transistor whose matching impedances on its input and output electrodes are realized by means of lines which are calculated such as to ensure a maximum gain at the central frequency, characterized in that, said transistor having a high gain and a high output power, oscillation is obtained by a stable operating mode of the transistor in a frequency range by means of a feedback network which matches its input voltage to its output voltage, said feedback being obtained at the oscillator

output via a line which is coupled to one of the lines of said feedback network so as to reinject at the input of the transistor the majority of the high power available at its output, the weak



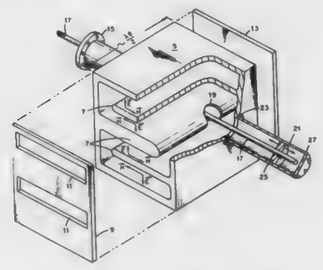
coupling thus provided and the directivity of the coupler on the one hand, and the saturation state of the transistor on the other hand ensuring that the oscillator has a high external Q-factor.

4,728,910

FOLDED WAVEGUIDE COUPLER

Thomas L. Owens, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 27, 1986, Ser. No. 923,540
Int. Cl.[4] H01P 5/00
U.S. Cl. 333—24 R 9 Claims



1. A waveguide coupler for coupling rf energy at a selected operating frequency into a magnetically confined plasma within a vacuum vessel, comprising:

an electrically conductive housing having a front opening attached to a vacuum port of said vacuum vessel, a back opening, and a plurality of vanes disposed in an interleaved spaced array from opposing walls of said housing and extending axially of said housing from said front opening to said back opening thereof to form a folded, generally rectangular resonant waveguide cavity with said plurality of vanes of said housing disposed parallel to the magnetic fields confining said plasma and having a cutoff frequency substantially below said selected operating frequency and wherein the distance between the edges of said plurality of vanes is substantially equal to the distance between adjacent ones of said plurality of vanes;

an electrically conductive polarizing plate disposed over said front opening of said housing and having a plurality of rectangular openings aligned with selected alternate folds of said housing for selective propagation therethrough of rf waves having a common polarization for selective coupling of wave energy to the fast magnetosonic wave of said plasma;

an electrically conductive shorting plate means disposed over said back opening of said housing and spaced from the front opening a distance which produces maximum power transfer of rf wave energy into said plasma for establishing a wave pattern within said cavity having a small electric field component and a large magnetic field component at the apertures of said polarizing plate attached to the front of said housing to provide substantially magnetic field coupling of wave energy propagating through said polarizing plate into said plasma located adjacent to and spaced from the front of said housing; and

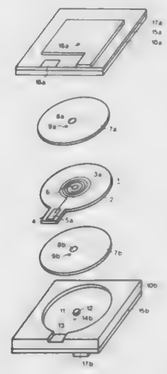
a transition connector means for introducing rf power at said operating frequency from a coaxial transmission line into said folded waveguide cavity formed by said housing at a transition junction providing an impedance match with said coaxial transmission line.

4,728,911

LOSS-IMPAIRED FILTER APPARATUS FOR SUPPRESSING RADIO FREQUENCY INTERFERENCE ON A TWO-WIRE LINE

Carl T. H. Sjögren, Växsjö, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

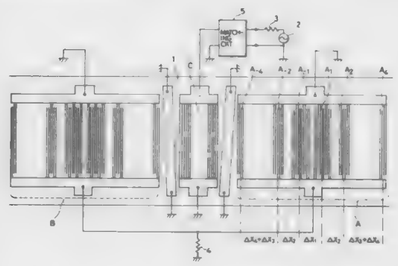
Filed Jul. 30, 1986, Ser. No. 890,564
Claims priority, application Sweden, Aug. 27, 1985, 8503988
Int. Cl.[4] H03H 7/09, 7/01
U.S. Cl. 333—167 6 Claims



1. A loss-impaired filter apparatus for suppressing radio frequency interference on a two-wire line, characterized in that the apparatus contains a coil unit (1) comprising two coils (*3a, 3b*) which are formed as printed circuits with a printed conductor going from an inner end point on either side of an insulating plate (2), each of the coil conductors being situated directly opposite the other coil conductor along its entire length, the inner end points of the coils being connected to a first terminal pair of the filter apparatus and the outer end points of the coils being connected to a second terminal pair of the filter apparatus, the apparatus also containing a ferrite casing (*10a, 10b*) surrounding the coil unit (1), and a pair of parallel-plate capacitors (*15a,* 17*a* and 15*b,* 17*b*) the plates of which are arranged substantially parallel to the insulating plate (2), one of the pair of parallel-plate capacitors being disposed on one side of the ferrite casing and the other capacitor being disposed on another side of the casing, the two sides of the ferrite casing (*10a, 10b*) facing away from each other and the coil unit (1), each of the plates (*17a,* 17*b*) on the ferrite casing disposed farthest away from the coil unit (1) being connected to its nearest inner end point of the coils (*3a, 3b*), and the other plates (*15a,* 15*b*) in the pair of capacitors being earth terminals.

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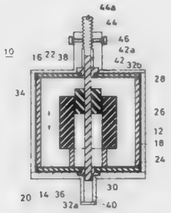
4,728,912
ELASTIC SURFACE WAVE DEVICE
Akitsuna Yuhara, Kawasaki; Jyun Sasaki; Takashi Shiba, both of Yokosuka, and Jyun Yamada, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 16, 1985, Ser. No. 809,181
Claims priority, application Japan, Dec. 14, 1984, 59-262736
Int. Cl.[4] H03H 9/64
U.S. Cl. 333—193 4 Claims



1. An elastic surface wave device comprising a piezoelectric substrate, a first transducer group disposed on said substrate and at least one second transducer group located on at least one side of said first transducer group to exchange elastic surface waves with said first transducer group, said at least one second transducer group including a plurality of pairs of transducer means which share the same elastic surface wave propagation path, said plurality of pairs of transducer means being located symmetrically about a geometrical central position of said at least one second transducer group such that respective transducer means of each pair of transducer means are located on opposite sides of said central position, each pair of said transducer means including an equal number of pairs of transducer elements, a delay time between the centers of every two adjoining transducer means, exluding the two outermost transducer means, is always constant, and a delay time between the center of each of the two outermost transducer means and that of a transducer means adjoining either of said two outermost transducer means, if the number of pairs of transducer elements included in either of said outermost transducer means is an integer, is equal to an odd-number multiple of one half of said constant delay time, and if the number of pairs of transducer [pairs] elements included in either of said outermost transducer means is not an integer, is equal to an odd-number multiple of one half of said constant delay time plus or minus a quarter wavelength time delay, and electrical outputs of said transducer elements of said at least one second transducer group being arranged in one of series and parallel.

4,728,913
DIELECTRIC RESONATOR
Youhei Ishikawa; Hidekazu Wada, and Kouichi Takehara, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Jan. 17, 1986, Ser. No. 820,194
Claims priority, application Japan, Jan. 18, 1985, 60-8201; Apr. 27, 1985, 60-92051
Int. Cl.[4] H01P 7/10
U.S. Cl. 333—235 14 Claims

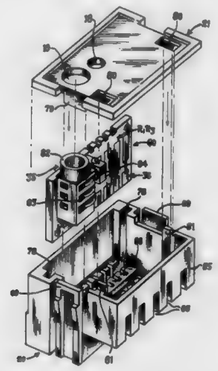
1. A dielectric resonator, comprising:
(a) a shielded casing defining a shielded space, said shielded casing comprising:
(1) a hollow case, a metallic shield electrode being formed on a surface of said case,
(2) a cover plate and a bottom plate for respectively closing top and bottom ends of said hollow case, said cover and bottom plates having metallic shield electrodes formed on surfaces thereof, said shield electrodes of said cover and bottom plates conductively contacting said shield electrode of said hollow case,
(b) a dielectric resonator element secured within said shielded space, a penetrating hole being formed in said dielectric resonator element, penetrating said dielectric resonator element in an axial direction thereof,
(c) a tuning unit comprising a dielectric material and disposed in said penetrating hole, and being displaceable in the axial direction,
(d) a supporting rod to which said tuning unit is secured, said supporting rod being held at end portions thereof by said cover plate and said bottom plate so as to penetrate said penetrating hole of said dielectric resonator for supporting said tuning unit, and



(e) displacing means for acting on said supporting rod so as to displace said tuning unit in said axial direction;
wherein said dielectric resonator element is formed as a hollow cylinder;
wherein said displacing means includes screw means mounted on said shielded casing and associated with said supporting rod for being turned to displace said tuning unit; and
wherein said screw means comprises an internal thread formed on said tuning unit, said supporting rod passing axially through said tuning unit, at least one end of said supporting rod being rotatable from the outside of said shielded casing, and said supporting rod being provided with an external thread which is screwed into said internal thread on said tuning unit.

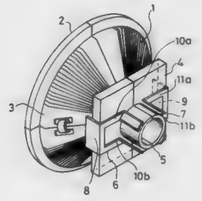
4,728,914
RATING PLUG ENCLOSURE FOR MOLDED CASE CIRCUIT BREAKERS
Robert A. Morris, Burlington; Paul T. Rajotte, Plainville, and LeeAnne Wambolt, Colchester, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed May 4, 1987, Ser. No. 45,645
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—6 16 Claims

1. A circuit interrupter comprising:
an operating mechanism connected with a pair of separable contacts arranged for separating the contacts upon occurrence of an overload condition through the contacts;
an electromagnetic actuator connected with an electronic trip circuit and arranged proximate the operating mechanism said actuator including means for articulating the operating mechanism upon receipt of an actuating signal from said electronic trip circuit;
an insulative circuit interrupter case and a removable cover surrounding said operating mechanism and said actuator, said interrupter cover including recess means formed therein;
a rating plug enclosure including a case and a removable cover housing a rating plug circuit, said circuit including at least one rating resistor, said rating plug case including electrical access means through which electrical interconnection of said rating resistor with said electronic trip circuit, said rating plug enclosure being inserted within said recess means; and a pair of detent means formed on opposing outer surfaces of said opposing sides of said



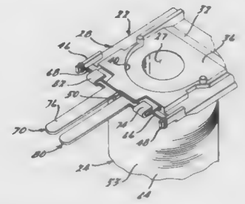
rating plug case, said detent means being captured under ledges formed within said recess, said rating plug cover includes a pair of slots aligned with and arranged over said detent means, said slots providing insertion access for a removal tool.

4,728,915
DEFLECTION YOKE FOR A COLOR CATHODE RAY TUBE
Osamu Konosu, Nagaokakyo, and Katsuyo Iwasaki, Nishinomiya, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan
Filed Mar. 17, 1987, Ser. No. 27,190
Claims priority, application Japan, Mar. 18, 1986, 61-59948; Apr. 7, 1986, 61-79757
Int. Cl.[4] H01F 3/12
U.S. Cl. 335—211 14 Claims



1. A deflection apparatus for a color cathode ray tube comprising:
(a) a pair of horizontal deflection coils for producing a horizontal magnetic field having generally pin-cushion shape distortion,
(b) a pair of vertical deflection coils for producing a vertical magnetic field having generally barrel shape distortion,
(c) an insulation bobbin having a cone shape part which is to be disposed on narrower end part of a cone part of a cathode ray tube, said cone shape part holding said horizontal deflection coils and said vertical deflection coils thereon and having a tubular part wherein a neck part of said cathode ray tube is to be disposed, and
(d) a pair of magnetic members for producing a pin-cushion-shaped auxiliary vertical deflection magnetic field by collecting leakage of vertical magnetic flux which generally has a tendency of barrel-shaped magnetic field distribution, wherein each of said pairs of magnetic members has a substantially vertical principal plane part which faces a vertical principal plane part of the other one in symmetry with each other with regard to a vertical center plane which includes the axis of said color cathode ray tube, and has an upper bar and a lower bar which are substantially horizontally projected from an upper part and a lower part, respectively, of said principal plane part to the vicinity of the vertical center plane and are bent in a vicinity of an outer face of said tubular part to extend in the axial direction toward electron gun side along the outer face.

4,728,916
SOLENOID OPERATED FLUID CONTROL VALVE
Robert P. Fontecchio, Rochester; Michael Slavin, Troy, and David B. Smith, Lapeer, all of Mich., assignors to Lectron Products, Inc., Rochester Hills, Mich.
Filed Jun. 5, 1986, Ser. No. 870,978
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—255 23 Claims



1. A solenoid assembly comprising:
coil means defining an internal bore,
a frame member having a middle portion and a first flange extending transversely from said middle portion, said first flange defining a first aperture,
a pole piece disposed and fixed in said coil means bore and within said first frame member aperture such that a first clearance is provided between said pole piece and said first flange portion such that said pole piece and said frame member do not contact each other,
an armature member disposed in said coil means bore and movable in said bore in response to energization of said coil means, and
a first ring of polymeric resin material within said first clearance thereby preventing direct contact between said frame and said pole piece.

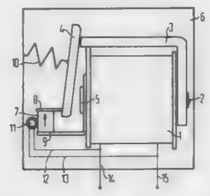
4,728,917
ELECTROMAGNETIC RELAY WHEREIN RESPONSE VOLTAGE IS RENDERED TEMPERATURE INDEPENDENT
Rolf-Dieter Kimpel, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 7, 1987, Ser. No. 1,049
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601113
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—274 6 Claims

1. In an electromagnetic relay having an excitation coil about a core and a yoke having one end coupled to an end of the core, an armature forms a working air gap with an opposite end of the core, the improvement comprising:
a permanent magnet mounted to exert a restoring force on the armature by at least one pole of said magnet, said

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permanent magnet having a negative temperature coefficient of remanence on the order of magnitude of a ferrite magnet;

a compensating spring opposing the attractive restoring force of said permanent magnet on the armature; and



means for heating being in thermally conductive contact with said permanent magnet, said heating means forming a part of an excitation circuit of the relay.

4,728,918

STORAGE COIL WITH AIR GAP IN CORE

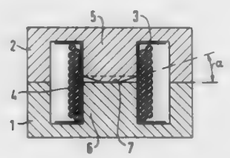
Paul Neusser, and Werner Rössler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,649

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 8428108[U]

Int. Cl.[4] H01F *17/06, 27/24*

U.S. Cl. 336—83 **5 Claims**



1. A storage coil of the type used for flux converters and low setting control elements, having a non-linear d-c bias characteristic and magnetizable core parts, in particular a shell core, E core or RM core having a signal winding on central legs thereof and including an air gap formed between adjacent end faces of the central legs of said core parts, the inductance of said coil being substantially determined by said signal winding and said core, characterized in that in a region of said core where the adjacent end faces of said central legs are oriented toward each other, one of said end faces is completely planar and the other is only partially planar so that a central area of said region has a cross-sectional area less than the total cross-sectional area of said region and has no air gap between said end faces and the remaining area corresponding to the difference between said central area and said total cross-sectional area of said region has an air gap of varying height which is symmetricaly disposed about said central area irrespective of rotational positioning of said core parts with respect to each other.

4,728,919

MOISTURE-TIGHT WOUND FERRITE TOROIDAL CORE WITH RESIN ENVELOPE

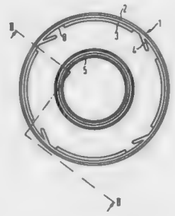
Josef Dirmeyer, Bodenwoehr, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,334

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1985, 3541626

Int. Cl.[4] H01F *27/02, 27/26*

U.S. Cl. 336—92 **10 Claims**



1. A wound ferrite toroidal core including a winding, a ferrite core member, and a resin envelope, comprising:

an annular trough member of thermoplastic material and including mutually concentric trough walls each with an end face at an open side of said trough member;

resilient tabs extending from an inside surface of at least one of said trough walls and having free edge faces, said resilient tabs being flattened angularly-projecting axially-extending flexible member's;

said ferrite core member disposed within said trough member with at least said free edge faces of said tabs disposed against said core member such that said core member is centered in said trough member; and

a cap sealed over said end faces of said trough walls to form a cover said trough member;

whereby the winding is wound around said trough member and said cap and then enveloped in resin.

4,728,920

PRESSURE TRANSDUCER

William D. McKee; John L. Evans, both of Huntsville; Joseph T. Betterton, Arab; Alfred H. Glover, Decatur, and Thomas S. McKee, Madison, all of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 29, 1987, Ser. No. 55,267

Int. Cl.[4] H01L *10/10*

U.S. Cl. 338—39 **3 Claims**

1. A pressure transducer for measuring the pressure of an engine lubricating fluid, comprising:

transducer enclosure means defining an interior space and having an apertured end portion for attachment to the engine in a manner exposing the interior space to pressurized lubricating fluid;

the enclosure means having an opposite closed end;

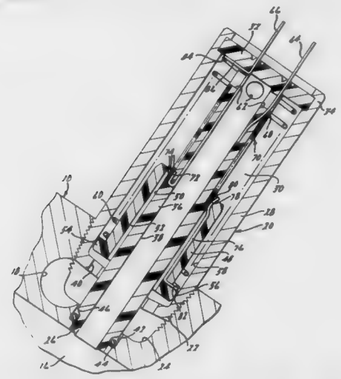
an elongated tubular guide member supported by the closed end and extending through the interior space and through the apertured end portion;

an axially extending passage formed through the guide member and communicated with the surrounding interior space adjacent the closed and to permit the flow of fluid from the interior space into the passage;

a tubular piston member supported within the enclosure means and about the guide member in a manner exposing one end to fluid from the engine and permitting axial movements thereof along the guide member in response to forces created by pressurized fluid;

electrically conductive spring means extending between the closed end of the enclosure means and the tubular piston member normally urging the piston member in opposition to forces caused by the pressurized fluid;

an electrical contact means carried by the tubular piston member;



a spirally-wound wire coil about the guide member, the contact means and the wire coil being slidably cooperative as the tubular piston member moves along the guide member to produce a variable resistance in a circuit including portions of the coil, the contact means and the conductive spring.

4,728,921

POSITION INDICATOR FOR AN ACTUATING DRIVE

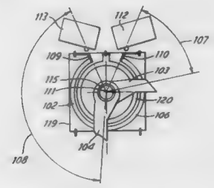
Jens N. Andresen, Sonderborg, and Kjeld Hellegaard, Bjerringbro, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 10, 1986, Ser. No. 850,006

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3513561

Int. Cl.[4] H01C *10/00*

U.S. Cl. 338—196 **3 Claims**



1. A position indicating potentionmeter, comprising, a base member, a position indicating shaft rotatably mounted on said base member, an arc shaped resistance track surrounding said shaft and having end connectors, first and second abutment means at the respective ends of said track, first and second arms connected to said shaft and being in sliding electrical contact with said track, and slip clutch means respectively between said arms and said shaft to allow said arms to be carried by said shaft and to allow respective displacement of said arms relative to said shaft when said shaft moves said arms into respective engagement with said abutment means, said shaft having an angular displacement relative to said base member depending on the adjusted position of said arms relative to said shaft.

4,728,922

VEHICLE MONITORING SYSTEM

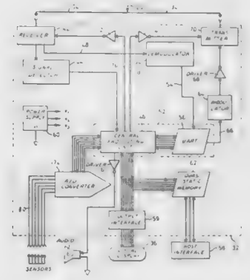
Chris R. Christen, 64 Summitcrest Drive, Weston, Ontario, Canada M9P 1H5, and Frank M. Cianfarani, 2757 Battleford Drive, Apt. 15-32, Mississauga, Ontario, Canada L5N 3A8

Filed Oct. 29, 1985, Ser. No. 792,601

Claims priority, application Canada, Mar. 21, 1985, 477195

Int. Cl.[4] B60Q *1/00;* **G01G** *19/08*

U.S. Cl. 340—52 R **17 Claims**



1. A vehicle monitoring system comprising: a vehicle monitoring station having a radio transmitter, a radio receiver, means for identifying a vehicle from a reply code transmitted to said receiver from said vehicle, means for requesting via said transmitter the transmission of stored data concerning said vehicle from said vehicle after receipt of said reply code and means for sending instructions to a driver of said vehicle via said transsmitter that said vehicle is either to stop at said station or not to stop and proceed past said station;

means for receiving a radio transmission from said transmitter located in the general vicinity of the vehicle at said vehicle monitoring station, said receiving means being adapted for installation in a vehicle and including carrier detect signal means for indicating the transmission of an interrogation signal from said transmitter and a phase detector for processing the the received radio transmission;

a central processing unit connected to said receiving means, adapted to receive and process information sent from said receiving means, capable of storing information received or produced by said unit, and producing said reply code upon receipt of said interrogation signal;

means for displaying or indicating to said driver information or instructions stored in or received by said central processing unit, including said instructions that said vehicle is either to stop or not stop and proceed;

means for sensing or measuring physical parameters of said vehicle, including the weight thereof, and converting the sensed or measured parameters to electrical signals indicative thereof;

means for conveying said electrical signals to said processing unit for storage or processing;

means for transmitting said reply code and subsequently said stored information concerning said vehicle by radio transmission from said processing unit to said vehicle monitoring station in the vicinity of said vehicle, said central processing unit permitting said transmission of the reply code only after receipt of said interrogation signal and permitting said subsequent transmision of said stored information only after receipt of a request for the transmission of same from said monitoring station; and

power supply means for said monitoring system.

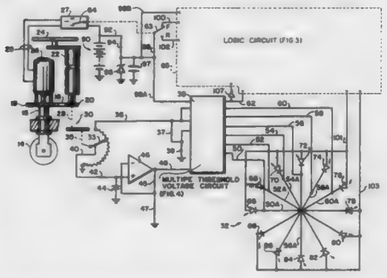
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4,728,923

STEERABLE WHEEL DIRECTION INDICATOR

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Filed Mar. 12, 1987, Ser. No. 25,182
Int. Cl.[4] B60Q *1/00, 1/42*
U.S. Cl. 340—52 R 15 Claims



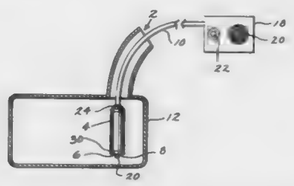
1. A wheel direction indicator for a steerable wheel which is especially useful for a vehicle such as an industrial truck of the kind which has a steerable wheel which can be turned through a steering arc of as much as one hundred eighty degrees, said direction indicator comprising a mechanical motion to voltage transducer mechanically coupled to be rotated in synchronism with the steering rotation of said steerable wheel, a multiple voltage threshold detector circuit connected to receive the variable voltage from said transducer and operable to provide one out of N discrete output signals on one out of N discrete output connections respectively in response to transducer voltages which have predetermined voltage level relationships to the respective voltage thresholds, at least N discrete indicator lamps arranged in an array for indicating steerable wheel direction, said indicator lamps being connected to receive said discrete output signals from said multiple voltage threshold detection circuit for indicating travel direction.

4,728,924

PORTABLE WATER DETECTOR FOR FUEL TANKS

Stanley E. Franklin, Reno, Nev., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed May 2, 1986, Ser. No. 858,955
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—59 8 Claims



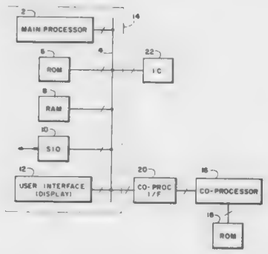
1. A portable water detector for fuel tanks comprising:
an elongated hollow tubular cartridge having top and bottom ends;
a top cap covering said top end of said cartridge and secured and sealed thereto;
an insulated electrical lead extending through said top cap and including a pair of electrically conductive wires extending downwardly within said cartridge to said bottom end;
a bottom cap covering said bottom end of said cartridge and secured and sealed thereto;
a pair of electrodes extending downwardly through said bottom cap and having lower tips for immersion in fuel in said tank when said cartridge is lowered into said tank;
sensing means for sensing reduced electrical resistance between said electrode lower tips through water in the fuel; and
extension means on said bottom cap extending downwardly beyond said electrode lower tips to prevent short-circuiting of said tips through a wall of said fuel tank.

4,728,925

DATA COMMUNICATIONS ANALYZER

William C. Randle, Bend; Dennis L. Holmbo, Redmond, and Kenneth D. Spencer, Bend, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 3, 1985, Ser. No. 752,225
Int. Cl.[4] G05B *1/00*
U.S. Cl. 340—146.2 6 Claims



1. Apparatus for comparing a stream of data characters with a predetermined string of test characters comprising:
a common bus;
an input device connected to the common bus for receiving the stream of data characters;
a first processor connected to the common bus for generating said predetermined string of test characters;
register means connected to the common bus for receiving the predetermined string of test characters from the first processor;
comparator means connected to the common bus for comparing the stream of data characters from the input device with the contents of the register means and generating a response in the event that a protion of the stream is identical to said string; and
a second processor connected to the common bus for receiving said response and sending a report to the first processor.

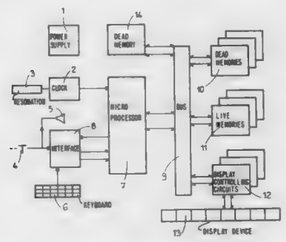
4,728,926

APPARATUS ENABLING THE IDENTIFICATION OF A PERIODIC COMPOSITE SIGNAL MADE UP OF A TRAIN OF ELEMENTARY SIGNALS

Yves Effront, rue des Granges 6, 1204 - Geneva - Canton of Geneva, Switzerland

Filed Mar. 25, 1985, Ser. No. 715,521
Claims priority, application Switzerland, Mar. 30, 1984, 1630/84
Int. Cl.[4] H03M *13/10;* G01C *21/00*
U.S. Cl. 340—146.2 7 Claims

1. An apparatus enabling the identification of a periodic composite signal made up of a train of elementary signals, the number and rhythm of which constitute a characteristic of an emitter of said composite signal, comprising:
means enabling pulses to be humanly introduced into said apparatus at a rhythm, periodicity and in a train corresponding substantially to that of said elementary signals;
a time base arranged in such a way as to measure the time intervals separating the input of said pulses;
error treatment means arranged in such a way as to recognize the periodicity of said pulses by sampling trains thereof;



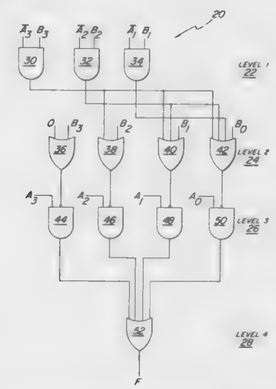
coding means for coding one of said sampled periodic trains of pulses which said error treatment means recognizes as representative;
means of comparison between the train of pulses recognized as representative and information contained in a reference stock, in order to search for an equivalence; and
display means of the recognized equivalence which provide said equivalence in a form enabling the identification of said emitter.

4,728,927

APPARATUS AND METHOD FOR PERFORMING COMPARISON OF TWO SIGNALS

James A. Aman, Box 336, Cathcart Rd., Gwynedd Valley, Pa. 19437

Filed Sep. 28, 1984, Ser. No. 656,054
Int. Cl.[4] G06F *7/04*
U.S. Cl. 340—146.2 10 Claims



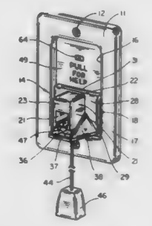
1. A comparator for comparing one digital signal A, composed of n bits, each bit being either a high or a low value and where A_i represents any particular bit whose order is defined by a value from i=0 to $i=n-1$, to another signal B, composed of n bits, each bit being either a high or a low value and where B_i represents any particular bit whose order is defined by a value from i=0 to $i=n-1$, the A_i bit for one value of i and B_i bit for the same value of i defining a bit pair A_iB_i, said comparator comprising means for examining each bit pair A_iB_i for each of the values i, with the examination of each of said pairs being in any sequence of values of i, said means for examining comprising:
(a) first means comparing bit A_i to bit B_i for each of said bit pairs A_iB_i except for the lowest order bit to provide respective first output signals for each bit pair compared, each of said first output signals being of a first predetermined logic level if and only if the value of B_i is greater than the value of A_i;
(b) second means responsive to said first means for examining all but the highest order bit of said B signal and selected bits of said first output signals, said selected bits of said B signal being provided directly to said second means, said second means for providing respective second output signals for each of said B bits examined, with each of said second outputs signals being at a second predetermined logic level for every case in which either the B bit examined is equal to said high value or if in any bit pair more significant than i there exist at least one case where the bit of signal B is of a greater value than the same order bit of signal A; and
(c) third means responsive to said second means for examining selected bits of said A signal and selected bits of said second output signals, said selected bits of said A signal being provided directly to said third means, said third means for providing respective third outputs signals for each of said A bits examined, with each of said output signals being at a third predetermined logic level if and only if bit A_i is equal to said high value and the second output signal for the bit is not at said second predetermined logic level, whereupon if any of said third output signals is at said third predetermined logic level said comparator indicates that said A signal is greater than said B signal, if not, said comparator indicates that said A signal is less than or equal to said B signal.

4,728,928

CALL SWITCH FOR WET AREAS

Robert T. Shipley, Oakland, Calif., assignor to Fisher Berkeley Corporation, Emeryville, Calif.

Filed May 8, 1986, Ser. No. 861,223
Int. Cl.[4] G08B *25/00*
U.S. Cl. 340—287 15 Claims



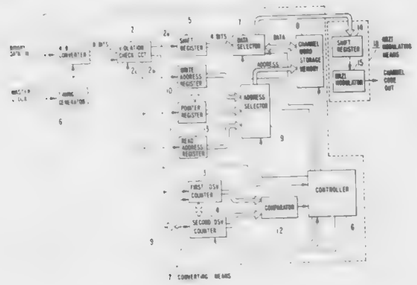
1. In a call switch for use in a wet area: a panel adapted to be mounted in the wet area with the front side of the panel exposed to the wet area and the rear side of the panel isolated from the wet area, a magnet mounted on the front side of the panel for movement between first and second positions, and means including a magnetically controlled switch mounted behind the panel for delivering an output signal when the magnet is in the second position, the panel forming a waterproof barrier between the magnet and the magnetically controlled switch.

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4,728,929
METHOD AND APPARATUS FOR ENCODING BINARY DATA

Shinichi Tanaka, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 1, 1985, Ser. No. 782,304
Claims priority, application Japan, Oct. 1, 1984, 59-205804; Oct. 18, 1984, 59-219714
Int. Cl.⁴ H03M *5/12*
U.S. Cl. 340—347 DD **11 Claims**



1. An apparatus for encoding binary data comprising: a converting means for converting binary data words each containing N data bits (wherein N is an integer larger than (1) to binary channel words each containing M data bits (wherein M is an integer larger than N); and an NRZI modulating means for modulating said channel words into NRZI coded channel codes,

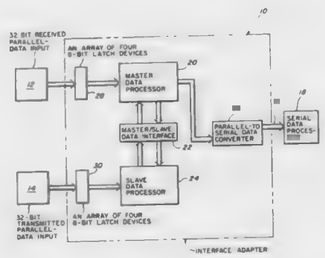
wherein said converting means holds a specific data word which satisfies at least one of a condition that the specific data word has a specific bit pattern and a condition that the specific data word has a specific relationship to adjacent data words; converts said held specific data word to an established channel word so that absolute value of digital sum variation of previously encoded binary data is reduced when another specific data word which satisfies at least one of said conditions has been inputted; and outputs said established channel word after at least a delay time required to convert said held specific data word to said established channel word, and

wherein, if a predetermined number of data words which are convertible to channel words in real time have been inputted before said another specific data word is inputted, said converting means converts said held specific data to said established channel word so that absolute value of digital sum variation of previously encoded binary data is reduced when said predetermined number of data words have been inputted.

4,728,930
PARALLEL-TO-SERIAL-DATA INTERFACE-ADAPTOR

Kevin J. Grote, and Craig A. Freed, both of Waldorf, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1987, Ser. No. 67,856
Int. Cl.⁴ H03M *9/00*
U.S. Cl. 340—347 DD **12 Claims**



1. A data interface adaptor for receiving a parallel data input and for selectively processing the received data input prior to converting the processed parallel data input into a serial data output for use by a serial data processor, said adaptor comprising:

multibit latch means for receiving a parallel data input,

flip-flop means connected to the latch means for latching a received parallel data input when the flip-flop means is actuated,

processor means,

command signal input means connected to the flip-flop means for actuating same and to the processor means for indicating when a command signal is received by the command signal input means as a parallel data input is received in the latch means,

read only memory (ROM) means,

parallel-to-serial-data converter-means,

data input/output (I/O) bus means, the bus means being interconnected to the latch means, the ROM means, and the parallel-to-serial-data converter-means, and

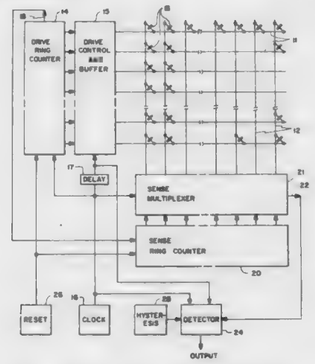
address bus means, the address bus means being interconnected to the latch means, the processor means, the ROM means, and the parallel-to-serial-data converter-means,

the processor means for addressing the ROM means via the address bus means so as to read a series of stored program signals therein and cause transfer of the stored program signals from the ROM to the processor means when a command signal is received by the command signal input means as a parallel data input is received by the latching means, the series of stored program signals when received by the processor means causing the processor means to address the latch means via the address bus means and to effect transfer of the latched-in parallel data input from the latching means to the processor means via the data I/O bus means, the processor means after receiving the parallel-data input addressing the ROM means via the address bus means so as to read a second series of stored program signals therein and cause transfer of the stored program signals from the ROM to the processor means via the data I/O bus means, the second series of stored program signals when received by the processor means causing the processor means to selectively process the stored parallel-data input prior to converting the processed/stored parallel-data input into serial format, the processor means after selectively processing the stored parallel-data input addressing the ROM means via the address bus means so as to read a third series of stored program signals therein and cause transfer of the third series of stored program signals therein from the ROM means to the processor means via the data I/O bus means, the processor means upon receiving the third series of stored program signals causing the processor means to address the parallel-to-serial-data converter-means via the address bus means while at the same time to cause transfer of the processed/stored parallel-data input from the processor means to the parallel-to-serial-data converter means via the data I/O means so as to effect conversion of the processed parallel-data input into a serial data stream output.

4,728,931
CHARGE REDISTRIBUTION CAPACITANCE DETECTION APPARATUS

William J. Linder, Minneapolis, and James D. Reinke, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 25, 1986, Ser. No. 890,215
Int. Cl.⁴ G06F *3/02*
U.S. Cl. 340—365 C **13 Claims**



1. A charge redistribution capacitance detector for determining the capacitance of a sample capacitor relative to a predetermined capacitance value, comprising:

a sense node;

a reference capacitor having first and second plates and a capacitance equal to the predetermined capacitance value, the first plate of said reference capacitor being connected to said sense node;

first connecting means adapted to connect a first plate of the sample capacitor to the sense node;

a source of reference voltage;

a comparator having an input terminal, and an output terminal at which is produced an output signal indicative of whether the voltage at the input terminal is smaller or larger than the reference voltage;

signal generating means operable to impress the reference voltage and drive voltage different from the reference voltage on the second plates of said sample and reference capacitors respectively during first time periods, and to impress the drive voltage and the reference voltage on the second plates of said sample and reference capacitors respectively during second time periods which alternate with the first time periods;

second connecting means connecting the input terminal of said comparator to said sense node; and

first switching means operable to electrically connect said sense node to said source of reference voltage during the first time periods, and to isolate said sense node from said source of reference voltage during the second time periods.

4,728,932
DETECTOR FOR CAPACITIVE SENSING DEVICES

James H. Atherton, Ringoes, N.J., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 25, 1986, Ser. No. 890,216
Int. Cl.⁴ G06F *3/02*
U.S. Cl. 340—365 C **21 Claims**

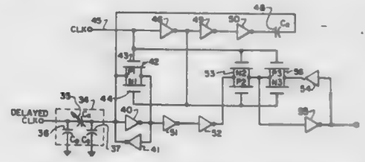
17. A method for detecting the state of a variable capacitor by means of circuitry including a reference capacitor having a capacitance between the minimum and maximum capacitance values of the variable capacitor and comparator means which changes output states at an input threshold voltage, the method comprising the steps of:

providing an inverter having input and output terminals, the input terminal being connected to first plates of the variable and reference capacitors;

during a first interval, connecting the output terminal of the inverter to its input terminal so that the first plates of the variable and reference capacitors are charged to the threshold voltage of the inverter;

during a subsequent interval, disconnecting the output terminal of the inverter from its input terminal and charging second plates of the variable and reference capacitors so that the voltages on the second plates change by equal amounts in opposite senses, whereby the voltage on the first plates of the variable and fixed capacitors is caused to be less or greater than the threshold voltage if the capacitance of the variable capacitor is smaller or greater respectively than the capacitance of the reference capacitor; and

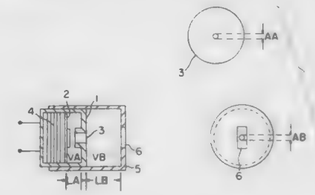
utilizing the output signal of the inverter during the subsequent interval to indicate the state of the variable capacitor.



4,728,933
MINIATURE DUAL CAVITY RINGER

Frank J. Mazza, Raleigh, N.C., assignor to U.S. Holding Company, Inc., New York, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,438
Int. Cl.⁴ G08B *3/00*
U.S. Cl. 340—388 **16 Claims**



1. A ringer, comprising:

a transducer, having a first reverberant cavity of volume VA and length LA; and

a housing, in which said transducer is mounted, having a second reverberant cavity of volume VB and length LB between a circular sound exit port of said transducer of area AA and a rectangular sound exit port of said housing of area AB, whereby sound generated by said transducer is emitted therefrom linearly through said first reverberant cavity, said circular port, said second reverberant cavity, and said rectangular port, said transducer being translatable in said housing so as to adjust said volume VB.

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4,728,934

TACTILE STIMULATION DEVICE FOR HEARING-IMPAIRED INDIVIDUALS

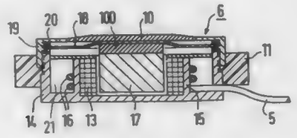
Wilhelm Pfänder, Sachsen; Friedrich Harless, Nuremburg; Horst Ruckdeschel, and Dieter Busch, both of Forchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 471,644, Mar. 3, 1983, abandoned. This application Oct. 23, 1986, Ser. No. 922,832

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208678

Int. Cl.⁴ H04R *25/00*; **G09B** *21/00*

U.S. Cl. 340—407 **5 Claims**



1. A speech information transmission device for tactile transmission via vibrations from a vibration transmitter indicative of speech information, comprising:
a wrist-watch shaped housing;
an electric coil received within the housing;
a magnetic core movably received within a central region of the electric coil and longitudinally movable in the coil;
a portion of the housing being substantially cup-shaped for receiving the coil and the core, the housing surrounding the coil providing a flux return path for flux lines passing through the core;
one end of the core being adjacent the bottom of the housing at one end of the coil and the opposite end of the core terminating at the opposite end of the coil so that the core does not project beyond either end of the coil;
a diaphragm securely connected to the core and having a peripheral edge secured to the housing; and
a vibration transmitter element independently movable with respect to the housing and supported by the diaphragm, said diaphragm retaining both the transmitter element and the magnetic core such that they are both freely oscillatable.

4,728,935

INTEGRITY SECURING MONITOR AND METHOD FOR A SECURITY INSTALLATION

Math Pantus, Brunssum, Netherlands; Rolf Beckers, Burscheid, Fed. Rep. of Germany; Jo W. Haenen, Vlodrop, and Jan H. Van Woezik, Helenaveen, both of Netherlands, assignors to ADT, Inc., Parsippany, N.J.

Filed Apr. 11, 1986, Ser. No. 850,732

Int. Cl.⁴ G08B *29/00*

U.S. Cl. 340—506 **13 Claims**



1. A self-secured security installation, comprising:
means including a sensor having an operative locale for providing a detection signal representative of detection of a predetermined event including a simulated predetermined event in the operative locale of the sensor if and so long as the sensor is functional;
a communication link;
means including an alarm remote from and coupled to the means including the sensor via said communication link for providing an alarm indication remote from the sensor in response to detection of the predetermined event if and only so long as the communication link is functional;
means coupled to the sensor for providing a sensor monitoring signal representative of whether or not the sensor is functional;
means coupled to the communication link for providing a link monitoring signal representative of whether or not the communication link is functional;
means including a memory individually responsive to the sensor monitoring signal and to the link monitoring signal for latching in the memory data representative of a possible dysfunction correspondingly in the sensor and in the communication link and for providing a possible dysfunction signal; and
means coupled to the memory and to the means including a sensor that is operative in response to said detection signal representative of said simulated predetermined event in the operative locale of the sensor for releasing the memory and thereby removing the possible dysfunction signal.

4,728,936

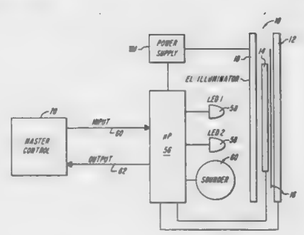
CONTROL AND DISPLAY SYSTEM

John K. Guscott, Lynnfield, and Aaron A. Galvin, Cambridge, both of Mass., assignors to ADT, Inc., Parsippany, N.J.

Filed Apr. 11, 1986, Ser. No. 850,986

Int. Cl.⁴ G08B *25/00*; **G09G** *3/02*

U.S. Cl. 340—525 **19 Claims**



1. An interactive display system comprising:
a first layer containing touchpad areas providing electrical signals representative of respectively actuated areas;
a second layer containing messages in registration with respective ones of the touchpad areas of the first layer;
a third layer containing liquid crystal areas in registration with respective ones of the message areas of the second layer;
a fourth layer containing an electroluminescent illuminator; and
means for retaining the layers in laminated disposition.

4,728,937

SECURITY MEANS FOR SUITCASE

Chi-Hsueh Hsu, 4F, No. 144, Chu Lin Rd., Yung Ho, Taipei, Taiwan

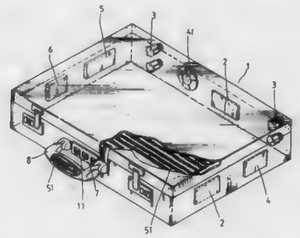
Filed Feb. 25, 1987, Ser. No. 18,696

Int. Cl.⁴ G08B *13/14*

U.S. Cl. 340—571 **2 Claims**

1. A security means for suitcase comprising
a suitcase body,
a handle provided on the front wall of said suitcase body,

a combination lock under said handle,
two levels respectively provided on one side wall and back wall of said suitcase body,
four push button switches provided on one wall of said suitcase body opposite to the wall where said combination lock is provided,
a warning system connected to said push button switches,
a delay high potential electric shock system connected to said warning system, and
a battery connected to said push button switches, each of said push button switches including a switch housing having two connecting prongs mounted on an upper wall of said switch housing, a contacting solid member partially located internal said switch housing and partially external thereof, an upper conducting plate fixedly secured to one of said connecting prongs and having a conducting horn located at a lower end thereof, a lower conducting plate fixedly secured to an upper portion of said contacting solid member and having a conducting horn at an upper end thereof, a conducting wire connecting said lower conducting plate and one of said connecting prongs, a spring chamber suspended onto said upper wall of said switch housing, and a spring inserted on one end within said spring chamber, a second end of said spring being biased against said lower conducting plate, said conducting horns of said upper and lower plates being in contact each with respect to the other.



4,728,938

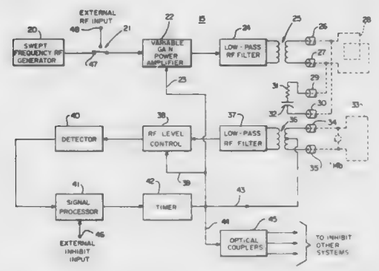
SECURITY TAG DEACTIVATION SYSTEM

George W. Kaltner, Mt. Holly, N.J., assignor to Checkpoint Systems, Inc., Thorofare, N.J.

Filed Jan. 10, 1986, Ser. No. 817,843

Int. Cl.⁴ G08B *13/24*

U.S. Cl. 340—572 **13 Claims**



1. In a system for deactivating a tag which bears a resonant circuit made of conductors on opposite sides of a dielectric substrate by applying to said circuit sufficient RF power at its resonant frequency to disable said circuit through breakdown between said conductors, the improvement which comprises:
means for detecting the presence of said tag near said system;
means for responding to said detection to initiate a tag presence signal, said initiating means including means for detecting the presence of said tag near a pad housing an RF transmit antenna and an RF receive antenna:
means for sensing the cessation of said detection due to disablement of said circuit by said RF power;
means for extending the duration of said tag presence signal by a predetermined period of time beyond said sensing of cessation of detection; and
means for responding to said detection to produce a signal capable of inhibiting the detection of the presence of a tag near another deactivating system.

4,728,939

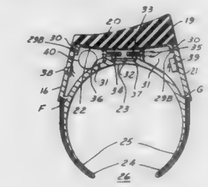
STEERING WHEEL STEERING AID

Tony U. Otani, 6124 Candor, Lakewood, Calif. 90713

Filed Jan. 29, 1987, Ser. No. 8,294

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—576 **10 Claims**



1. An aid to steering of a vehicle having directional control defined by rotation of a steering wheel, comprising:
a main body having a lower section curved for fitting over a thigh of a driver seated in said vehicle and an upper section having a pliable, frictional surface for mating with a conventional steering wheel rim of said vehicle, said main body being sized to allow said rim mating to occur as desired by said driver when said lower section is attached to said thigh; and
means for attaching said lower section to said thigh.

4,728,940

PRESSURE-LOSS OVER TEMPERATURE SENSOR

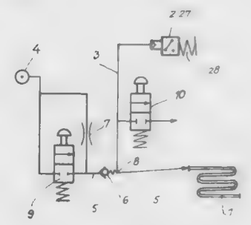
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany, and A. C. Ferf-Jentink, Maasdal 63, NL-2904 CP Capelle a/d IJssel, Netherlands

Filed Feb. 19, 1986, Ser. No. 831,150

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506152

Int. Cl.⁴ G08B *17/04*

U.S. Cl. 340—591 **20 Claims**



1. A surveillance system in the form of a pneumatic circuit designed for monitoring the temperature of an object and providing at least one signal when said object attains a critical temperature, said system comprising a detector member placed for sensing the temperature of said object, said detector mem-

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ber having a cavity therein, a pressure supply means for pressurizing this cavity of said detector member with air, said detector member being adapted to open on reaching said critical temperature to release air from it into the surroundings, a sensor connected with said cavity in said detector member and adapted to respond to a pressure drop in said cavity on the opening of said detector member and to produce a response signal, said pressure supply means being provided for pressurizing said cavity, a pressure testing valve for monitoring the internal pressure of said cavity, a duct connected with said pressure supply means and with said detector member at two respective connection points, said sensor being connected at a point between said two points, a choke placed on said duct between said sensor and said pressure supply means, at least one check valve placed between said pressure supply means and said sensor, said check valve being adapted to permit air flow towards said detector member, further comprising a prismatic aluminium carrier with at least two such sensors mounted thereon to form a modular surveillance unit adapted to be connected on the one hand with said pressure supply means and on the other hand with a number of detector members equal to the number of sensors.

4,728,941

FLUID DETECTION SYSTEM

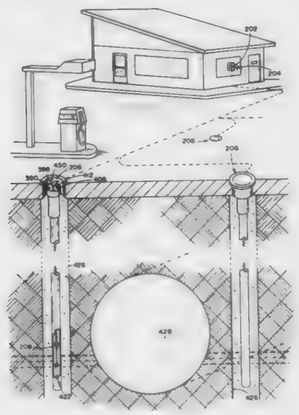
Raymond J. Andrejasich, Carmel, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Division of Ser. No. 579,431, Feb. 13, 1984, Pat. No. 4,586,033. This application Nov. 26, 1985, Ser. No. 801,918

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—620 **4 Claims**



1. An apparatus for sensing the presence of polar and non-polar fluids comprising:

a control assembly, a plurality of probe assemblies, each probe assembly located at a different location remote from said control assembly, and means for coupling each of the probe assemblies to the control assembly;

each of said probe assemblies comprising:

probe means;

polar-non-polar fluid detecting means electrically connected to said probe means for sensing the difference between a polar and non-polar fluid and for providing a fluid polar characteristic related signal;

indicating means for providing a visual or audio indication of the presence of a polar or non-polar fluid; and

manually operable test means for activating said probe indicating means to determine which probe assembly has sensed a non-polar fluid.

4,728,942

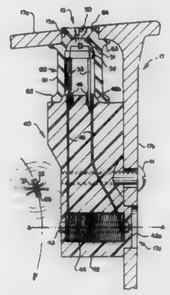
SELF-POWERED ROTATION INDICATOR

John F. L. England, North Olmsted, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 9, 1985, Ser. No. 806,699

Int. Cl.[4] G08B *21/00*; **H02H** *5/04*

U.S. Cl. 340—679 **8 Claims**



1. In a device having a rotating member contained at least partially within a housing so that the rotating member is obscured from direct view by a user when the device is in a normal operating position, a rotation indicating device comprising:

a permanent magnet mounted on the rotating member, the magnet being radially spaced from the axis of rotation of the member, the magnet revolving in a circular path about said axis, said revolving occurring in a plane perpendicular to said axis of rotation, said magnet having a north pole face and an opposed south pole face, one of said pole faces facing inwardly toward said axis of rotation, the other of said pole faces facing outwardly from said axis of rotation;

a coil having an elongated ferromagnetic core lying along a center axis coinciding with a line extending radially from said axis of rotation, said line extending in said plane, said coil including a large plurality of conductor turns wound about and along the length of said core, said coil being cylindrically shaped, one end of said cylindrically shaped coil being mounted on said housing and being positioned adjacent to the said circular path of said revolving magnet wherein magnetic flux derived from said magnet cuts the turns of said coil as the magnet moves past said one end of said cylindrically shaped coil, wherein said coil generates a cycle of alternating current voltage each time said magnet passes by said one end of the cylindrical coil; and

a light-emitting diode mounted on said housing and readily visible to said user, the light-emitting diode being electrically connected to the coil and being illuminated solely by a rectified portion of cycles of said alternating current voltage.

4,728,943

MEANS FOR DETERMINING THE STATE OF LUBRICATION IN SURFACES LUBRICATED BY A LUBRICANT AND ROLLING OR SLIDING WITH RESPECT TO ONE ANOTHER

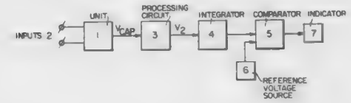
Karel N. Vermeiren, Woerden, Netherlands, assignor to SKF Industrial Trading & Development Co. B.V., Netherlands

Continuation-in-part of Ser. No. 712,965, Mar. 18, 1985. This application Jul. 2, 1986, Ser. No. 881,120

Claims priority, application Netherlands, Apr. 6, 1984, 8401112

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—682 **3 Claims**



1. Means for determining the state of lubrication in surfaces lubricated by a lubricant and rolling or sliding with respect to one another, provided with a unit for generating a signal dependent upon the capacitance between the lubricated surfaces, characterized by an operating circuit, connected to said unit, which, in response to the signal dependent upon the capacitance, emits a second signal which is dependent in accordance with a non-linear, for example, exponential, function upon the capacitance between the lubricated surfaces such as that one and the same relative variation in the thickness of the lubricant between the lubricated surfaces results in a fairly great signal variation in the event of decreasing thickness, the second signal being supplied to an integrator which integrates the second signal over an integration period displaced in time and the output signal of which indicates the state of lubrication.

4,728,944

COORDINATE POSITION DIGITIZING SYSTEM

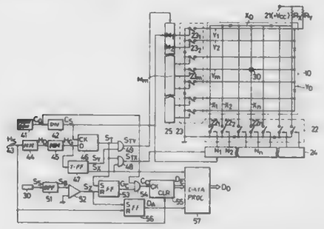
Hideshi Tamaru, Sagamihara; Kunio Shikakura, Tokyo; Kimiyoshi Yoshida, Zushi; Akio Sakano, Ibaragi, and Nobuo Kitamura, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,385

Claims priority, application Japan, Nov. 4, 1982, 57-193707

Int. Cl.[4] G08C *21/00*

U.S. Cl. 340—706 **8 Claims**



1. A coordinate position digitizing system comprising a cathode ray tube for displaying figures, beam deflecting means for causing an electron beam in said cathode ray tube to scan in synchronism with vertical and horizontal synchronizing signals, a position determining plate means juxtaposed with said cathode ray tube and having a plurality of conductors extending parallel with one another at regularly spaced intervals thereon, driving and controlling means for supplying a current selectively to the conductors of said plurality of on said position determining plate, one after another, consecutively within each horizontal scanning period of said cathode ray tube, magnetic flux detecting means juxtaposed with said position determining plate for detecting magnetic flux on said position determining plate and producing a signal in response to the detected magnetic flux, a band-pass filter means for extracting a signal component having a frequency higher than the frequency of a noise component obtained in response to the beam deflecting means of said cathode ray tube from the signal produced by said magnetic flux detecting means, and information producing means connected to said filter means for producing positional data defining a position of said magnetic flux detecting means on said position determining plate at a first instant during the operation controlled by said driving and controlling means between horizontal blanking periods and during a horizontal scanning period of said beam deflecting means and also at a second instant at which the signal component from said band-pass filter first crosses over a predetermined level in a predetermined direction in the same horizontal scanning period.

4,728,945

TABULATING SYSTEM

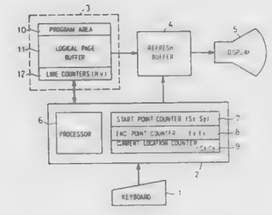
Masako Kojima, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1985, Ser. No. 736,879

Claims priority, application Japan, May 19, 1984, 59-99725

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—734 **4 Claims**



1. A tabulating system comprising: a key entry means; a display having a plurality of character boxes on a display screen; a memory means having a plurality of addressable memory locations corresponding to said character boxes, each of the locations storing flag bits for vertical and horizontal grid lines as part of attribute codes indicating display conditions of a corresponding character box; a current location counter for storing both of current horizontal and vertical locations of a cursor; means for identifying a start point, an end point and an intersection point; a start point counter for storing both of horizontal and vertical locations of the cursor at a said state point to identify one of two end points on a diagonal line of a rectangular box to be displayed on said display screen; and end point counter for storing horizontal and vertical locations of the cursor at a said end point to identify the other of said two end points;

characterized in that said tabulating system includes a control means arranged in operation to selectively set said flag bits in those of said attribute codes corresponding to character boxes identified by the contents of said current location counter, said start point counter and said end point counter including means for determining that a point identified by the contents of said current location counter is coincident with the area of said rectangular box and is specified as a said intersection point by said key entry means, said display means being responsive to said flags to show on said screen vertical and horizontal grid lines passing through said intersection point within said rectangular box.

VOL 1088 ISS 1 MR 1 1988 UMI

4,728,946

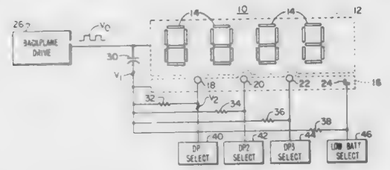
AC COUPLED LCD ANNUNCIATOR CONTROL SYSTEM

Kenneth R. Sharples, 102 Herbert Rd., Braintree, Mass. 02185

Filed Oct. 29, 1985, Ser. No. 792,451

Int. Cl.⁴ G09G *3/18*

U.S. Cl. 340—765 **6 Claims**



1. An AC coupled LCD annunciator control system comprising:

a primary backplane electrode associated with primary character segments;

a plurality of annunciator segments;

an annunciator backplane electrode associated with said annunciator segments;

a backplane drive for providing a drive signal for said primary backplane electrode;

a capacitor for coupling said drive signal to said annunciator backplane electrode;

a resistor interconnected between each said annunciator segment and said annunciator backplane electrode, and

means for selectively switching the impedance level of each said annunciator segment from a level which is above that of said resistor to a level which is below that of said resistor to provide an AC signal between the selected annunciator segment and the annunciator backplane electrode to actuate that annunciator segment.

4,728,947

ADDRESSING LIQUID CRYSTAL CELLS USING BIPOLAR DATA STROBE PULSES

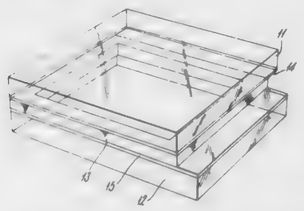
Peter J. Ayliffe, Stansted; Anthony B. Davey, Stortford, and Johannes K. Zelisse, Cambridge, all of England, assignors to STC plc, London, England

Continuation-in-part of Ser. No. 782,796, Oct. 2, 1985, and a continuation-in-part of Ser. No. 647,567, Sep. 6, 1984. This application Apr. 2, 1986, Ser. No. 847,331

Claims priority, application United Kingdom, Apr. 3, 1985, 8508713

Int. Cl.⁴ G09G *3/36;* **G06F** *3/14*

U.S. Cl. 340—805 **12 Claims**



1. A method of addressing a matrix-array type liquid crystal cell with a ferroelectric liquid crystal layer whose pixels are defined by the areas of overlap between the members of a first set of electrodes on one side of the liquid crystal layer and the members of a second set on the other side of the layer, each such pixel being capable of being switched between first and second states respectively by the co-operation of a strobe pulse with a data pulse of a first data significance and by the co-operation of a strobe pulse with a data pulse of a second data significance, in which method

(a) the cell is addressed on a line-by-line basis by applying strobe pulses serially to the members of said first set of electrodes while data pulses are applied in parallel to the members of said second set of electrodes,

(b) the waveforms of said strobe and data pulses are both balanced and bipolar, and

(c) the addressing of any given pixel includes a zero voltage portion within each said bipolar strobe pulse.

4,728,948

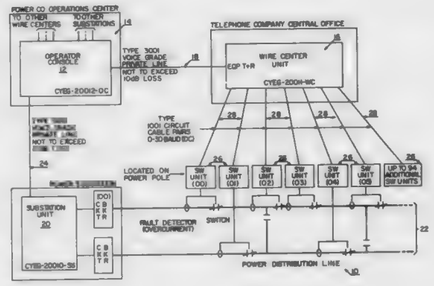
REMOTE MONITOR AND CONTROL SYSTEM

Gary C. Fields, 2347 Pelham Pl., Oakland, Calif. 94611

Filed Nov. 15, 1985, Ser. No. 798,383

Int. Cl.⁴ G05B *23/02;* **H04M** *3/22, 11/00*

U.S. Cl. 340—825.06 **8 Claims**



1. In a remote monitoring and control system of the type including an operations console at a central control point, a wire center unit located remote from the operations console at a location at which wire pairs for a geographic area are concentrated, and a plurality of monitored switching units in the area to be remotely monitored and controlled from the central control point, and wherein each switching unit includes a switchable connection arrangement and is connected to the wire center by a control wire pair comprising a tip and ring wire in predetermined connection order, the connection being provided so that the wire center may monitor and control the switching unit, and wherein a communications path extends between the wire center and the central control point, an improved wire center unit comprising a plurality of interconnected modules including:

at least one line select module for selecting a switching unit wire pair from among a plurality of pairs extending from switching units and connected to the line select module,

a line switch decoder module for sensing connection arrangement conditions present at a selected switching unit and for converting sensed conditions into a binary code, and independently for providing a control signal to the selected switching unit via the line select module to change the connection arrangement thereof,

a communications module connected to the communications path for decoding commands received from the operations console and for encoding responses from the wire center unit sent to the operations console, and

programmable digital microcomputer means for controlling all operations of the wire center unit with reference to a said switching unit in accordance with a series of instructions stored in a read only program memory associated with the digital microcomputer means and in accordance with commands received via the communications module concerning the said switching unit and connection arrangement conditions monitored at the said switching unit via the line switch decoder module and for providing responses to the operations console via the communications module.

4,728,949

REMOTE CONTROL DEVICE FOR CONTROLLING VARIOUS FUNCTIONS OF ONE OR MORE APPLIANCES

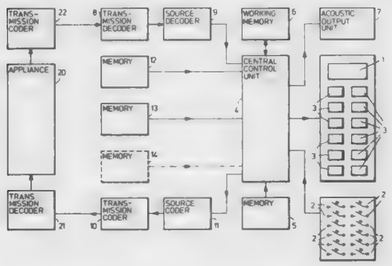
Hans-Joachim Platte, Hemmingen; Günter Oberjatzas, Hanover, and Walter Vössing, Wenningsen, all of Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,798

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310580; Sep. 14, 1983, 3333081

Int. Cl.⁴ H04Q *1/00*

U.S. Cl. 340—825.37 **11 Claims**



1. A remote control device for permitting a user thereof to control first and second appliances each having means for receiving information via a transmission channel, the first appliance additionally having a plurality of first appliance function controls which can be selectively actuated by the user to control the operation of the first appliance, with at least one of the first appliance function controls being an adjustable function control having a plurality of actuation states which can be selected to permit the user to select the manner in which the first appliance will execute the respective adjustable appliance function, the second appliance additionally having a plurality of second appliance function controls which can be selectively actuated by the user to control the operation of the second appliance, with at least one of the second appliance function controls being an adjustable function control having a plurality of actuation states which can be selected to permit the user to select the manner in which the appliance will execute the respective adjustable appliance function, said remote control device comprising:

a plurality of manually actuated keys;

a plurality of electronic display elements, each display element corresponding to a respective key;

remote control means communicating with said keys and display elements for permitting the user to select either appliance and operate the appliance function controls of the selected appliance, said remote control means including

first means for assigning the first appliance to one key and displaying indicia identifying the first appliance on the respective display element, and for assigning the second appliance to another key and displaying indicia identifying the second appliance on the respective display element,

second means for cancelling the assignment of the first means after the user has selected one of the appliances, and for thereafter assigning the appliance function controls of the selected appliance to respective keys and displaying indicia identifying these appliance function controls on the respective display elements, and

third means for cancelling the assignment of the second means if the user selects an adjustable function control, and for thereafter assigning the actuation states of the selected adjustable function control to respective keys and displaying indicia identifying these actuation states on the respective display elements; and

means operatively connected to the remote control means for generating coded signals and transmitting the signals over the transmision channel in response to manual actuation of the keys.

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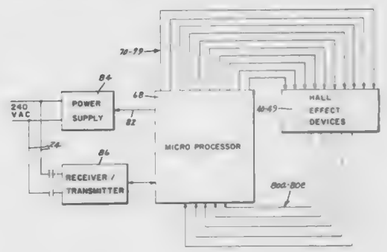
MAGNETIC SENSOR APPARATUS FOR REMOTELY MONITORING A UTILITY METER OR THE LIKE

Max S. Hendrickson, Forest Lake; Gerald M. Kackman, St. Paul, and Lawrence R. Konicek, Richfield, all of Minn., assignors to TeleMeter Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 601,053, Apr. 16, 1984, abandoned. This application Jan. 31, 1985, Ser. No. 697,000

Int. Cl.⁴ G08C *19/06*

U.S. Cl. 340—870.31 **16 Claims**



1. A magnetic sensor apparatus for sensing an angular position of a pointer member fixedly mounted on a rotatable shaft for rotational movement therewith as the shaft rotates about an axis of rotation, the apparatus comprising:

(a) a permanent magnetic member being interconnected to a free end of the pointer member for rotation with the pointer member about the axis of rotation, said permanent magnetic member having a circumferential path of travel about the axis of rotation;

(b) a circular array of spaced Hall Effect devices concentrically positioned about the axis of rotation, said Hall Effect devices being axially displaced from said permanent magnetic member of the pointer, said Hall Effect devices being in alignment with the circumferential path of travel of said permanent magnetic member;

(c) microprocessor means operatively interconnected to said Hall Effect devices for electrically driving said Hall effect devices, certain of said Hall Effect devices so driven being selectively activated by the proximate position therewith of said permanent magnetic member so as to provide an electrical output signal representative of the angular position of the pointer member;

(d) said microprocessor means being further operatively interconnected to said Hall Effect devices for monitoring said Hall Effect devices and obtaining said electrical output signals therefrom;

(e) microprocessor logic means operatively interconnected to said microprocessor means for interpreting said electrical output signals and converting said electrical output signals to a digital value, said microprocessor logic means including pointer location interpretation means for comparing a previous dial reading when two Hall Effect devices are activated so as to interpret a correct location for the pointer; and

(f) flux concentrator means for concentrating the magnetic field of the permanent magnetic member, a magnetic field of the permanent magnetic member having a steeper slope

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at its edges in the presence of the flux concentrator means than if the flux concentrator means were not present.

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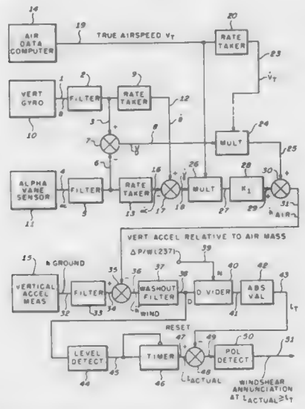
VERTICAL WINDSHEAR DETECTION FOR AIRCRAFT

David A. Johnson, and Terry L. Zweifel, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 787,879, Oct. 16, 1985, abandoned. This application Feb. 28, 1986, Ser. No. 835,446

Int. Cl.⁴ G08B *23/00*

U.S. Cl. 340—968 **10 Claims**



1. Vertical windshear detection apparatus for aircraft comprising:

(a) means for providing a signal representative of true airspeed,

(b) means for providing a signal representative of pitch angle of the aircraft,

(c) means for providing a signal representative of angle of attack of the aircraft,

(d) means for providing a signal representative of vertical acceleration of the aircraft,

(e) means for combining said pitch angle signal and said angle of attack signal to provide a signal representative of flight path angle,

(f) means for deriving a signal representative of the rate of change of airspeed from said true airspeed signal,

(g) means for deriving a signal representative of pitch angle rate from said pitch angle signal,

(h) means for deriving a signal representative of angle of attack rate from said angle of attack signal,

(i) means responsive to said airspeed rate signal and said fligh path angle rate signal for deriving a product signal thereof,

(j) means responsive to said pitch angle rate signal and said angle of attack rate signal for deriving a signal representative of the rate of change of flight path angle,

(k) means responsive to said true airspeed signal and said rate of change of flight path angle signal for deriving a further product signal,

(l) means responsive to said above mentioned product signals for providing a further combined signal representative of vertical acceleration relative to an air mass proximate to said aircraft,

(m) means for algebraically combining said further combined signal and said vertical acceleration signal to provide a signal representative of a vertical component of said windshear,

(n) means responsive to said signal representative of a vertical component of windshear for providing a first timing signal representative of an actual duration thereof,

(o) means for providing a signal representative of a predetermined value of an aircraft parameter corresponding to a power to weight ratio,

(p) means responsive to said aircraft parameter signal and said vertical component of windshear signal for generating a second timing signal representative of a quotient thereof having a value corresponding to a computed duration, and

(q) means for algebraically combining said second timing signal and said timing signal to generate an algebraic difference signal indicative of the detection of a vertical windshear condition when said difference signal is equal to or greater than a value of zero.

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RADAR ECHO DISCRIMINATING DEVICE

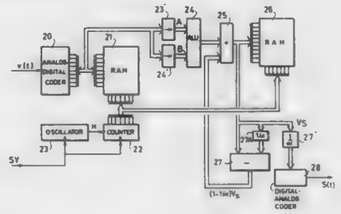
Michel Residois, Plouzane, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 21, 1984, Ser. No. 684,463

Claims priority, application France, Dec. 23, 1983, 83 20679

Int. Cl.⁴ G01S *7/30*

U.S. Cl. 342—26 **9 Claims**



1. A radar echo discriminating device for use with pulse type meteorological radar and for discriminating between the echoes generated by rain and those echoes generated by the ground comprising:

(a) fluctuation calculating means for receiving a wideband radar echo signal and for substracting an amplitude of said signal from an amplitude of a previously received radar signal and providing an output difference signal;

(b) a compensating device connected for receiving said difference signal and amplifying said difference signal with a gain which compensates for said ground echo and the rain echo, and providing a compensated amplified difference signal; and

(c) adding means having an input means to receive the wideband radar echo signal and the compensated amplified difference signal and for adding said signals, whereby a signal is provided at an output of said adding means which represents said rain echoes.

4,728,953

CLOSED LOOP CONTROL OF RECEIVER TURN-ON TO INCREASE RADAR SENSITIVITY

Carl T. Richmond, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1986, Ser. No. 914,956

Int. Cl.⁴ G01S *7/34*

U.S. Cl. 342—91 **8 Claims**

1. A radar system including in combination:

transmitter means for transmitting electromagnetic energy to be reflected by a target to provide a target signal;

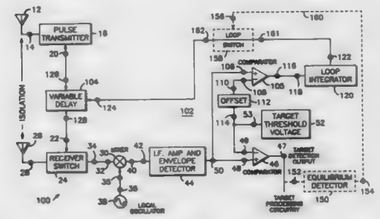
receiver means for detecting the presence of said target signal but tending to be undesirably affected by a leakage signal induced therein by said electromagnetic energy;

receiver switch means coupled to the receiver and adapted to selectively attenuate said leakage signal;

variable delay means coupled between said transmitter means and said receiver switch means for providing first control signals to said receiver switch means which selectively activate said receiver switch means in response to said leakage signal;

envelope detecting means for detecting the envelopes of said leakage signal and said target signal;

feedback means coupled between said envelope detecting means and said variable delay means, said feedback means providing second control signals for varying the timing of



said first control signals relative to the initiation of said leakage signals;

target detecting means having target comparator means for comparing the magnitude of signals applied to first and second input terminals thereof, said first input terminal of said target comparator means being coupled to said envelope detecting means; and

target threshold supply having an output terminal for providing a target reference voltage to said second input terminal of said target comparator means.

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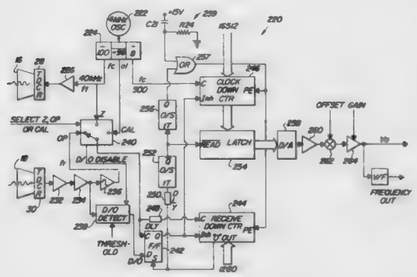
GROUND VELOCITY SENSOR WITH DROP-OUT DETECTION

James J. Phelan, Bettendorf, Iowa; Garn F. Penfold, East Moline, Ill., and Larry W. Ferguson, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 20, 1984, Ser. No. 684,217

Int. Cl.⁴ G01S *13/60*

U.S. Cl. 342—115 **26 Claims**



1. In a radar or sonic velocity sensor for sensing the velocity of an object moving relative to the sensor, the velocity sensor being of the type having a single transmitter for directing a transmit frequency signal towards the object and having a single receiver for receiving a variable magnitude unmixed signal reflected from the object, the velocity sensor having first means for determining velocity data from a velocity dependent frequency derived from the variable magnitude unmixed signal reflected from the object and from a predetermined fixed frequency signal, said first means operating without mixing the variable magnitude signal with the fixed frequency signal and having second means for limiting the effect of reflected signal degradation upon derivation of the velocity data, the improvement wherein the variable magnitude reflected signal is received by an input of the second means and the second means has an output coupled to an input of the first means.

4,728,955

METHOD FOR POSITION-FINDING AND APPARATUS HEREFOR

Bengt Hane, Johanneshov, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan I Stockholm, Stockholm, Sweden

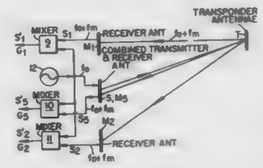
PCT No. PCT/SE85/00263, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO86/00716, PCT Pub. Date Jan. 30, 1986

PCT Filed Jun. 26, 1985, Ser. No. 847,908

Claims priority, application Sweden, Jul. 4, 1984, 8403564

Int. Cl.⁴ G01S *13/74*

U.S. Cl. 342—140 **10 Claims**



1. A method for determining a relative position between two objects, comprising transmitting a microwave signal from the first object, which comprises a transmitter receiver (S/M-unit), toward the second object, causing said second object to receive said signal and retransmit a signal which is caused to be received by the first object on at least two antennae (M_1, M_2), characterized in that the transmitter/receiver unit (S/M-unit) of the first object is caused to transmit said signal at a fixed frequency f_o from a transmitter antenna; in that the second object (T) is caused to re-transmit said signal modulated with a signal of frequency f_m; in that the two antennae (M_1, M_2) of the first object are placed symmetrically on respective sides of the transmitter antenna (S) and in an antenna plane common with the transmitter antenna (S); so that each of the two receiving antenna receives the retransmitted signal and in that an angle (Θ) between said antenna plane and said second object, at least in one dimension, namely in a first plane extending through the transmitter antenna and the two receiver antennae, is determined by a phase comparison or an amplitude comparison respectively of said received signals in dependence on whether the second object (T) is located in the so-called proximity zone of the first object or not, i.e. at a distance which is shorter than a distance of the same order of magnitude as the distance d between the two receiving antennae (M_1, M_2) or not, wherein when the second object (T) is located outside the proximity zone said angle (Θ) is determined by a phase comparison between the signal received on respective receiver antennae (M_1, M_2) subsequent to being mixed with the transmitted signal f_o, where the phase difference ($F_2 - F_1$) between the received signals is determined; and in that said angle (Θ) is determined from the equation expression

$$\theta = \arcsin\left[\frac{(F_2 - F_1)\cdot c}{2\pi \cdot f_o \cdot d}\right]$$

where F_1 is a signal corresponding to the phase difference between the transmitted signal f_o and one of the signals received by the S/M unit, F_2 is a signal corresponding to the phase difference between the transmitted signal f_o and the other of the signals received by the S/M unit, c is the speed of light and d is the distance between the two receiver antennae, by means of a computer unit (31) associated with the S/M-unit.

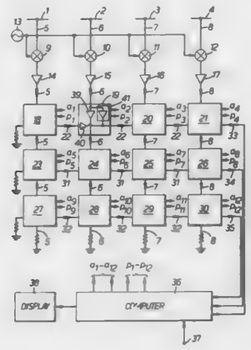
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RECEIVERS AND TRANSMITTERS

John R. Wallington, Ipswich, United Kingdom, assignor to The Marconi Company Limited, Stanmore, England

Filed Dec. 16, 1983, Ser. No. 562,285
Claims priority, application United Kingdom, Dec. 16, 1982, 8235555
Int. Cl.[4] H01Q 3/26
U.S. Cl. 342—371 28 Claims



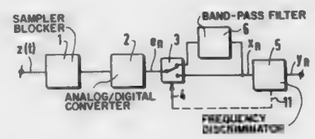
1. A receiver of radiated signals comprising:
(a) an antenna having a plurality of antenna elements;
(b) a plurality of conductors connected to respective antenna elements;
(c) a first channel having junctions with the conductors;
(d) a second channel having junctions with the conductors;
(e) first variable control means at the junctions between the first channel and the conductors for independently controlling the magnitude and phase shift of a signal passed from each conductor to the first channel, the first variable control means providing a degree of isolation, which under all conditions exceeds the maximum attenuation provided by the first variable control means by at least a factor of a hundred, between the first channel and each conductor;
(f) second variable control means at the junctions between the second channel and the conductors for independently controlling the magnitude and phase shift of a signal passed from each conductor to the second channel, the second variable control means providing a degree of isolation, which under all conditions exceeds the maximum attenuation provided by the second variable control means by a factor of at least a hundred, between the second channel and each conductor;
(g) first beam forming means arranged to control the first variable control means so that a combination of signals fed from the conductors on to the first channel represents radiation received from a first paticular direction or directions determined by the first beam forming means;
(h) second beam forming means arranged to control the second variable control means so that a combination of signals fed from the conductors on to the second channel represents radiation received from a second particular direction or directions determined by the second beam forming mean; and
(i) a unidirectional device associated with each junction and arranged to prevent reverse flow of signals along said first and second channels.

4,728,957

DIGITAL FREQUENCY DISCRIMINATOR, FOR EXTRACTING A SINUSOIDAL SIGNAL

Serge Hethuin, Meudon La Foret, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,073
Claims priority, application France, Nov. 29, 1985, 85 17684
Int. Cl.[4] G01S 3/58
U.S. Cl. 342—401 8 Claims



1. A digital frequency discriminator for extracting from a FM signal having a carrier frequency of f_o at least one low frequency sinusoidal signal of frequency F which frequency modulates the carrier with a modulating frequency excursion ΔF, the value of f_o and ΔF being known, characterized in that said discriminator comprises:
(a) means for selectively pre-filtering digital samples e_n of the FM signal to produce samples x_n modulated at a frequency $f_e=4f_o$;
(b) accumulation means for accumulating, in an interval between two successive times t_q and t_{q+1}, N successive ones of the digital samples x_n which form an analysis window, the frequency of the modulated signal being considered constant during this interval;
(c) first storage means for storing coefficients R_{01}, R_{02}, R_{11}, R_{12} and R_{22} defined by:

$$R_{01} = \sum_{n=0}^{N-1} x_n \cdot x_{n-1}$$

$$R_{02} = \sum_{n=0}^{N-1} x_n \cdot x_{n-2}$$

$$R_{11} = \sum_{n=0}^{N-1} x_{n-1}^2$$

$$R_{12} = \sum_{n=0}^{N-1} x_{n-1} \cdot x_{n-2}$$

$$R_{22} = \sum_{n=0}^{N-1} x_{n-2}^2$$

(d) computing means for determining the quantity a_1 defined by:

$$a_1 = \frac{R_{02}R_{12} - R_{01}R_{22}}{R_{11}R_{22} - R_{12}^2}$$

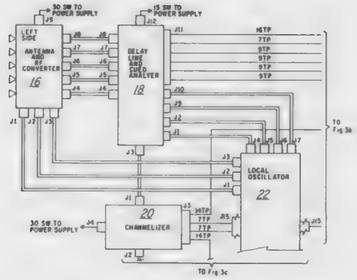
the quantity a_1 approximating the ordinate of a point on a curve representing the low frequency sinusoidal signal; and
(e) second storage means for storing the value of a_1, while the computing means determines a quantity approximating the ordinate of a subsequent point on the curve.

4,728,958

COHERENT ELECTROMAGNETIC ENERGY EMITTER LOCATOR

William C. Choate, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1986, Ser. No. 833,937
Int. Cl.[4] G01S 5/02
U.S. Cl. 342—424 6 Claims



6. An apparatus for determining the direction and range to an electromagnetic energy emitter comprising:
(a) first and second baseline interferometers including a plurality of electromagnetic energy receivers for producing a plurality of phase measurements from incoming electromagnetic energy emanating from an emitter;
(b) a third baseline interferometer operatively connected to selected receivers of the first and second baseline interferometers for producing an aliased phase measurement; and
(c) a computing means including first, second and third level processing means, the first level processing means operatively connected to the first and second baseline interferometers for restoring the total phase of the plurality of phase measurements received from the first and second baseline interferometers, estimating the angle of incidence from the total phase and performing a consistency test for determining whether phase linking errors have occurred and selectively passing the estimated incident angle to the second level processing means; the second level processing means operatively connected to the first level processing means and third baseline interferometer for receiving, respectively, the incident angle estimate and aliased phase measurement and adding to the aliased measurement and integral multiple of 360 degrees for total phase restoration, storing a sequence of restored total phase measurements, constructing a temporal phase model from the sequence of restored total phase measurements and determining therefrom any phase linking errors, determining proper phase linking and passing data representing an improved incident angle, bearing estimate means responsive to the improved incident angle data for producing and passing a bearing estimate to the level three processing means; the level three processing means operatively connected to the bearing estimate means for receiving the bearing estimates and responsive to carrier position and heading information relating the measured bearings to a fixed coordinate system, and determining the location of the emitter.

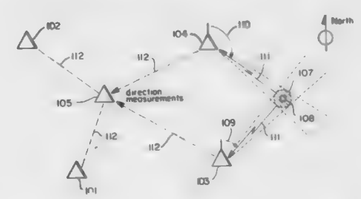
4,728,959

DIRECTION FINDING LOCALIZATION SYSTEM

John E. Maloney, Springfield, Va., and Charles N. Katz, Rancho Santa Fe, Calif., assignors to Ventana Sciences Inc., Davis, Calif.

Filed Aug. 8, 1986, Ser. No. 894,867
Int. Cl.[4] G01S 5/04
U.S. Cl. 342—457 9 Claims

1. A localization system for determining the position of a mobile radio transmitter station using a network of interconnected land stations having known locations, comprising:
an antenna array configuration at at least two land stations for receiving radio frequency (RF) signals emitted from the mobile radio transmitter station, said configuration comprising at least one pair of antenna elements, each antenna element positioned to transform the RF signal into a corresponding RF electrical signal;



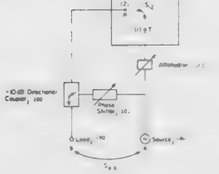
means for measuring a direction angle of the mobile radio transmitter station from at least two land stations by phase difference measurement, including means for performing a phase sensitive weighted integration of a complex conjugate product of an equivalent analytic signal wave form of the RF electrical signal in each antenna element; and
means for processing said direction angle measurements from said at least two land stations to determine a location for the mobile radio transmitter

4,728,960

MULTIFUNCTIONAL MICROSTRIP ANTENNAS

Yuen T. Lo, Urbana, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1986, Ser. No. 872,587
Int. Cl.[4] H01Q 1/38
U.S. Cl. 343—700 MS 2 Claims



1. A multifunctional microstrip antenna system capable of simultaneously transmitting an outgoing circularly polarized wave and receiving an incoming circularly polarized wave when said incoming circularly polarized wave has an opposite sense of polarization with respect to said outgoing circularly polarized wave, said multifunctional microstrip antenna system comprising:
a signal source which generates said outgoing circularly polarized wave;
a microstrip patch antenna element which transmits said outgoing circularly polarized wave while simultaneously receiving said incoming circularly polarized wave wherein said microstrip patch antenna element comprises a truncated rectangular patch element which has at least one set of opposing corners removed, said truncated rectangular patch element having an input port which receives said outgoing circularly polarized wave thereby, said truncated rectangular patch element having an output port which outputs simultaneously said outgoing circu-

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larly polarized wave as well as said incoming circularly polarized wave;

an attenuating means which is electrically connected to said signal source and said microstrip patch antenna element to conduct said outgoing circularly polarized wave from said signal source to said microstrip patch antenna element while providing an attenuation to said outgoing circularly polarized wave;

a phase shifter which is electrically connected with said signal source and produces a phase-shifted outgoing circularly polarized wave which when combined with said outgoing circularly polarized wave acts to null it, wherein said phase shifter comprises a fixed phase shifter which provides a fixed phase shift to said outgoing circularly polarized wave to produce said phase-shifted outgoing circularly polarized wave;

a directional coupler which is electrically connected with said phase shifter and said microstrip patch antenna element, said directional coupler thereby receiving said outgoing circularly polarized wave which is nulled with said phase-shifted outgoing circularly polarized wave as well as receiving conducting and outputting said incoming circularly polarized wave; and

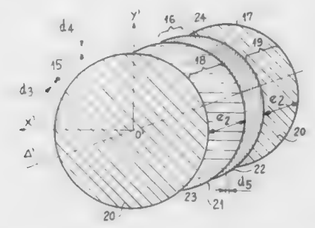
a receiver which is electrically connected to and receives said incoming circularly polarized wave from said directional coupler.

4,728,961

ELECTROMAGNETIC WAVE SPATIAL FILTER WITH CIRCULAR POLARIZATION AND A CASSEGRAIN ANTENNA COMPRISING SUCH A FILTER

Patrice Bossuet, Herblay, and Francois Gautier, Boulogne-Billancourt, both of France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 573,399, Jan. 24, 1984, Pat. No. 4,652,891. This application Sep. 29, 1986, Ser. No. 913,127
Claims priority, application France, Jan. 31, 1983, 83 01451
Int. Cl.[4] H01Q *19/00*
U.S. Cl. 343—756 **6 Claims**



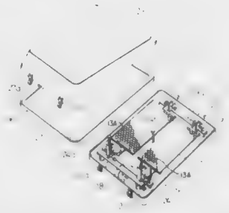
1. A spatial filter comprising first and second parallel grids (15,17) disposed on opposite sides of said filter; first and second dielectric layers (18,19) disposed between said grids; and a central network (16) between said dielectric layers participating with the said first grids and said first dielectric layer for conversion of incident circularly polarized waves into lineary polarized waves and with said second grids and said second dielectric layer for conversion of lineary polarized waves to circulatory polarized waves, said central network being totally reflecting for lineary polarized waves of a first polarization and transparent for waves of a second polarization perpendicular to said first polarization, wherein said two grids are each formed from conducting wires parallel to a same direction and having a pitch close to a quarter of the wave length λ at the central frequency of the operating band of said filter; and said central network is formed from two networks of conducting wires, the first of said two networks comprising parallel wires having a pitch close to λ/4, the second of said two networks comprising parallel wires having a closely spaced pitch less than λ/4, and with a direction perpendicular to that of the wires forming said first network, the direction of the wires of said two grids forming an angle of 45° with those of the wires of said two respective networks.

4,728,962

MICROWAVE PLANE ANTENNA

Yoshihiro Kitsuda; Toshio Abiko; Kyoji Masamoto, all of Osaka, and Katsuya Tsukamoto, Yawata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 4, 1985, Ser. No. 784,478
Claims priority, application Japan, Oct. 12, 1984, 59-153733[U]; Jan. 14, 1985, 60-4500; Feb. 25, 1985, 60-36206; Feb. 25, 1985, 60-35516; Apr. 24, 1985, 60-89344
Int. Cl.[4] H01Q *1/42, 1/38*
U.S. Cl. 343—872 **6 Claims**



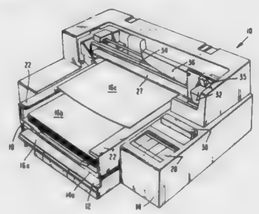
1. A microwave plane antenna comprising an antenna body including a plurality of rows of microstrip lines covered on one surface by a plastic sheet and joined on another surface with a layer of a dielectric material, a layer of a grounding conductor material joined to said layer of dielectric material, said dielectric layer restraining SHF band transmission loss for providing a high reception gain, a current feeding circuit connected to said microstrip lines, and means including a plastic cover enclosing therein said antenna body, wherein said plastic cover comprising permeable regions permeable to incident microwaves and impermeable regions impermeable to said microwaves, said permeable regions being made of a composite member comprised of a plastic sheet having a thickness less than 1 mm and a backing layer of a foamed plastic having a foaming extent of 5 to 50 times and 2 to 50 mm thick, said impermeable regions being of higher mechanical strength than said permeable regions.

4,728,963

SINGLE SHEET INK-JET PRINTER WITH PASSIVE DRYING SYSTEM

Steve O. Rasmussen; Larry A. Jackson; John D. Rhodes; David W. Pinkernell, and J. Paul Harmon, all of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 11, 1987, Ser. No. 24,278
Int. Cl.[4] G01D *9/00, 15/24;* **B65H** *31/00;* **B41F** *00/00*
U.S. Cl. 346—25 **27 Claims**



1. An ink-jet printer comprising in associative combination:

(a) a paper supply means for providing a supply of a medium to be printed;

(b) a paper collection means for collecting printed medium;

(c) means for conveying a sheet of said medium from said paper supply means to said paper collection means through a printing zone;

(d) a printhead mounted on a printhead carriage adapted to move orthogonal to movement of said medium for printing on said medium supported on a platen maintained in said printing zone;

(e) means for creating a reverse bow in said sheet of said medium for directing said sheet in a plane parallel to said printing zone just prior to entering said printing zone for maintaining flatness of said sheet;

(f) means for permitting ink on a previously-printed sheet of said medium to dry during printing of a next sheet of said medium, including a pair of opposed support rails positioned above said paper collection means and of a width sufficient to support said sheet of said medium during printing but less than that required to support said entire sheet upon completion of said printing; and

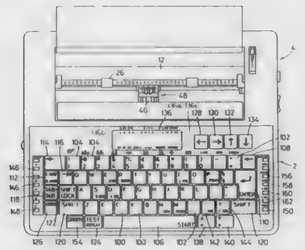
(g) means for controlling said medium-conveying and said printing operations.

4,728,964

RECORDING APPARATUS WITH AN INDICATOR FOR INDICATING CURRENT RECORDING CONDITIONS

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 10, 1986, Ser. No. 850,030
Claims priority, application Japan, Apr. 13, 1985, 60-78795
Int. Cl.[4] G01D *9/00;* **B41J** *11/44*
U.S. Cl. 346—33 R **10 Claims**



1. A recording apparatus having a function of indicating current recording conditions, comprising:

an input device including character keys corresponding to characters such as letters, numerals and symbols, and selector means for selecting one of a plurality of recording modes for each of at least two recording conditions selected from a plurality of recording conditions such as a recording direction, a size of the characters to be recorded, a color in which the characters are recorded, and a line spacing between adjacent lines of the characters;

primary indicator means, responsive to an operation of said selector means to change at least one of said at least two recording conditions from one of said recording modes to another, for displaying a single special symbol equivalent to a single character, to indicate the change of said at least one recording condition, without specifying said at least one recording condition and the newly selected recording mode of said at least one recording condition;

secondary indicator means, responsive to said operation of said selector means, for displaying a mode indication symbol to indicate said at least one recording condition which has been changed, and said newly selected recording mode of each of said at least one recording condition; and

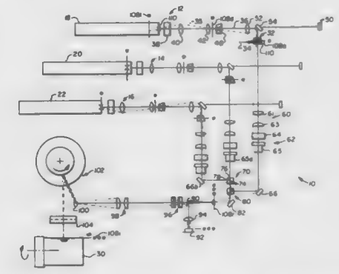
indication control means for controlling said primary and secondary indicator means based on the operation of said selector means.

4,728,965

LASER PRINTER HAVING MEANS FOR CORRECTING LASER POINTING ERRORS

David Kessler, and Edward J. Muka, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,581
Int. Cl.[4] A01D *9/42*
U.S. Cl. 346—108 **10 Claims**



1. A laser printer having a plurality of optical channels, said printer comprising:

means in each channel for projecting a beam of light of a specific wavelength along the channel;

means for combining said beams of light to form a combined beam spot at a registration plane;

means for projecting said combined beam spot onto a receiving member; and

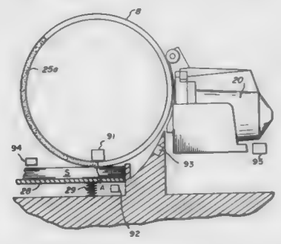
optical means for adjusting the size of the beam in each channel for optimum performance and for making said combined beam spot optically conjugate with a plane in each channel located at a predetermined point in the respective channel from which pointing errors can originate.

4,728,966

PRINTER/FEEDER HAVING INTEGRAL CONTROL SYSTEM

Michael J. Piatt, Enon; Douglas S. Maggart, Beavercreek, and Timothy P. Grayson, Dayton, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1987, Ser. No. 20,425
Int. Cl.[4] G01D *15/24, 15/34;* **G65H** *7/08;* **B41J** *11/58*
U.S. Cl. 346—134 **3 Claims**



1. In printer/feeder apparatus of the type having: (i) a feed/transport platen rotatable so that its peripheral surface moves past a sheet supply zone, a print path ingress, a print zone and

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a print path egress; (ii) frictional feed means located on a peripheral sector of said platen surface from a forward edge to a trailing end and (iii) means for selectively moving the face sheet(s) of a stack of sheet media between engaging and non-engaging conditions vis-a-vis said feed means, a detection/control system comprising:

(a) first detector means for sensing and signalling when and when not the forward edge of said feed means is at a predetermined start position, opposing said sheet stack;

(b) second detector means for sensing and signalling when and when not said moving means is in said engaging condition;

(c) third detector means for sensing and signalling when and when not a sheet is located along a predetermined portion(s) of said print path; and

(d) control means for receiving signals from said detector means and enabling a commence printing cycle condition.

4,728,967

RECORDING APPARATUS HAVING A TAPERED ROLLER PLATEN FOR EXERTING A UNIFORM PRESSING FORCE AGAINST RECORDING ELEMENTS

Hiroshi Tomita, Kyoto; Michio Kunimitsu, Yawata, and Junji Maeda, Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 20, 1985, Ser. No. 799,987

Claims priority, application Japan, Nov. 28, 1984, 59-180245[U]

Int. Cl.⁴ G01D *15/24*

U.S. Cl. 346—136 **8 Claims**



1. A recording apparatus comprising:

a non-rigid recording head over which a sheet-like recording element means is passed, said recording head having opposite ends adjacent opposite side edges of the recording element means respectively;

a roller-form platen in pressing engagement with said recording head, the recording element means passing between said roller-form platen and said recording head, said roller-form platen having an axis of rotation extending perpendicular to the direction in which the recording element means passes over the recording head, said roller-form platen having an axial length as measured along said axis of rotation that is at least as long as the recording element means is wide, and said roller-form platen having opposite ends adjacent the opposite side edges of the recording element means respectively;

biasing means connected to said recording head and/or said roller-form platen for pressing said recording head and said roller-form platen against each other by exerting respective biasing forces at said opposite ends of said recording head thereby slightly deforming said non-rigid recording head; and

said roller-form platen having an outer diameter that is largest at a median portion thereof that is between said opposite ends of the roller-form platen, said outer diameter of said roller-form platen at said median portion being larger than each of the outer diameters of the roller-form platen at said opposite ends thereof for pressing against and maintaining a uniform pressing force across the entire width of the sheet when the recording head deforms slightly when subjected to the respective biasing forces.

4,728,968

ARRANGEMENT OF DISCHARGE OPENINGS IN A PRINTHEAD OF A MULTI-COLOR INK PRINTER

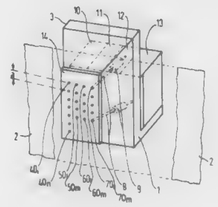
Ruediger Hillmann, Emmering; Artur Milbrandt, Munich; Hubertus Reinfeld, Penzberg, and Emmeran Vollert, Grossohchenrain, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 886,829

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3531097

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **7 Claims**



1. An arrangement of discharge openings in a printhead of a multi-color printer having the discharge openings connected by ink channels to ink reserviors and each ink channel having a piezo-transducer for ejecting discrete droplets from the discharge openings when the piezo-transducers are individually driven, the printhead being movable in line direction across a recording medium, comprising:

a plurality of first discharge openings in a first vertical row provided for ejecting black-colored ink droplets, the number and mutual spacing of said plurality of first discharge openings being such that draft quality characters are representable on a write line of the recording medium; and

a plurality of second discharge openings in further vertical rows provided for ejecting ink droplets of at least three fundamental colors, one of said further vertical rows being provided for each of said fundamental colors, the mutual spacing of said second discharge openings in said further vertical rows corresponding to the mutual spacing of said first vertical row;

said first discharge openings for ejecting black ink being greater in number than said second discharge openings for each one of said fundamental colors in said further rows;

whereby the recording medium is transported in a vertical direction after recording of one print line and for draft quality printing is transported in a vertical line height and for near-letter quality printing is transported by half the spacing of said first discharge openings in said first vertical row.

4,728,969

AIR ASSISTED INK JET HEAD WITH SINGLE COMPARTMENT INK CHAMBER

Hue P. Le, Aloha; Joy Roy; Ronald L. Adams, both of Portland; James C. Oswald, Beaverton, and Jeffery J. Anderson, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 11, 1986, Ser. No. 884,845

Int. Cl.⁴ G01D *15/18*

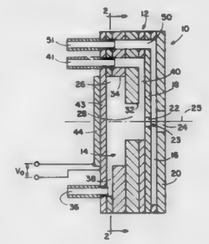
U.S. Cl. 346—140 R **17 Claims**

1. An ink jet head for generating ink drops at a predetermined maximum operating frequency, the ink jet head including an ink chamber which has an ink supply inlet for receiving ink under pressure, the ink chamber having an ink chamber wall with a valve free ink orifice passageway leading to an internal ink drop-forming orifice outlet;

an actuator means for producing pressure pulses in the ink chamber so as to cause ink to flow through the ink orifice and produce ink drops at the internal ink drop-forming orifice outlet;

an air chamber with an air chamber wall through which an external ink jet head orifice is provided in axial alignment with the internal ink drop-forming orifice outlet, the air chamber being adapted to receive pressurized air which flows inwardly from the sides of the air chamber to form a generally coaxial air stream surrounding the internal ink drop-forming orifice outlet and which air stream is directed out of the external ink jet head orifice, the air stream carrying ink drops produced at the internal ink drop-forming orifice outlet, in response to the pressure pulses, outwardly through the external ink jet head orifice and toward printing medium;

the actuator means comprising a diaphragm plate in contact



with ink in the ink chamber and a piezoelectric crystal mounted to the diaphragm plate, the actuator means having a natural resonance frequency which is greater than or equal to two and one-half times the maximum operating frequency;

the ink orifice passageway and ink chamber being sized such that ink in the ink orifice passageway has a natural resonance frequency which is greater than or equal to seventy-five percent of the maximum operating frequency but which is not from ninety to one-hundred and ten percent of the maximum operating frequency; and

the ink supply inlet having a cross-sectional area sized small enough so as to not significantly alter the magnitude, frequency and damping rate of the pressure pulses in the ink chamber and large enough to permit filling of the ink chamber as ink drops are produced.

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SUCTION RECOVERY APPARATUS OF INK-JET PRINTER

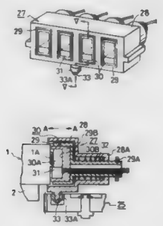
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 797,482, Nov. 13, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 909,934

Claims priority, application Japan, Nov. 14, 1984, 59-240323

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **5 Claims**



1. An apparatus for recovering by suction the discharge function of an ink-jet printer having a plurality of fluid discharge recording means for ejecting ink onto a recording medium, which apparatus comprises a plurality of cap members, each of which corresponds to one of said fluid discharge recording means, wherein each of said cap members comprises a movable portion disposed in a cap holder to be movable in a back-and-forth direction and having a rear end portion provided with a stopper member which can abut against a rear end face of said cap holder; a rubber member disposed in a front opening portion of said movable portion and having an inner portion which can be coupled to said fluid discharge recording means; and a spring member inteposed between said cap holder said movable portion and compressed when said rubber member is depressed backward.

4,728,971

IMAGE-FORMING ELEMENT FOR AN ELECTROSTATIC PRINTER WITH HELICAL SHAPED ELECTRODES

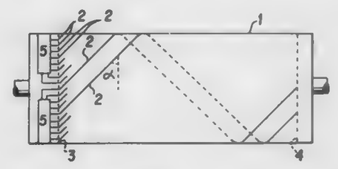
Johannes G. V. van Stiphout, Beek en Donk, and Reinder Pannekoek, Venlo, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Apr. 29, 1987, Ser. No. 43,882

Claims priority, application Netherlands, May 29, 1986, 8601377

Int. Cl.⁴ G01D *15/00*

U.S. Cl. 346—155 **8 Claims**



1. An image-forming element for an electrostatic printer comprising: an endless support with a dielectric surface layer thereon; a plurality of image-forming electrodes provided beneath the dielectric surface layer and extending paralell to one another in a zone of the image-forming element used for image formation, each electrode extending in the form of a helix, the pitch of which is at least equal to the width of the image-forming zone; and a voltage means connected to the image-forming electrodes for supplying voltage thereto, the voltage means being disposed on the endless support outside the image-forming zone.

4,728,972

MULTIPLEXING OF TRANSIENT IMAGE BAR

Joseph F. Stephany, Williamson; Virgil J. Hull, Perinton; Eugene C. Faucz, Webster, and Alain E. Perreguax, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 906,478, Sep. 12, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 62,376

Int. Cl.⁴ G01D *15/14*

U.S. Cl. 346—160 **12 Claims**

1. An improved liquid crystal image bar for use in an electrophotographic printer of the type having a moving photoconductive member, means for pre-charging the photoconductive member prior to the formation of latent electrostatic images, means for developing the latent images with toner particles, means for transferring the developed images to permanent record sheets, means for fusing the developed images to the record sheets and means for cleaning the photoconductive member before it is pre-charged, the image bar being used to form the latent images on the photoconductive member one line at a time in response to digitized data signals during the operating mode of the printer, including:

a liquid crystal material;

first and second parallel, elongated glass substrates enclosing

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the liquid crystal material, each of the glass substrates having inner and outer surfaces, the inner surfaces confronting each other and being spaced a predetermined distance from each other;

a first plurality of transparent electrodes being located on the inner surface of the first glass substrate and a predetermined, equally spaced second plurality of transparent mutually parallel electrodes being located on the inner surface of the second glass substrate, the electrodes on the second glass substrate being perpendicular to the electrode on the first glass substrate;

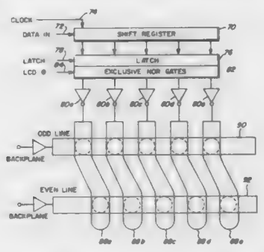
a transparent film being coated over the electrodes on each of the inner surfaces of the first and second glass substrates;

parallel polarizers being positioned on each of the outer surfaces of the glass substrates;

an illuminating means for directing light towards a one of the polarizers from a location spaced therefrom;

an alternating voltage source;

means for energizing the electrodes by connecting them to the voltage source to prevent the passage of light through the image bar during the operating mode of the printer;



means for de-energizing selected ones of the second plurality of electrodes on said one glass substrate for a predetermined time period followed by immediate energization thereof in response to receipt of digitized data signals, de-energization of each selected electrode for the predetermined time period followed by energization thereof being a cycle which causes a momentary passage of light through the image bar in the vicinity of said cycled electrode, the momentarily passed light being a burst of light which impinges on the moving photoconductive member to discharge a precharged region on the photoconductive representing a pixel thereon, thus, forming one line of a latent electrostatic image by the discharge of pixels representing the background regions of the latent image, the improvement comprising:

a shift register, one portion of said digitized data signals representing one portion of said one line being clocked into the shift register while another portion of said digitized data signals forms a latent electrostatic image of another portion of said one line.

4,728,973

CAMERA ON WHICH A FRONT CONVERTER CAN BE MOUNTED

Nobuyuki Taniguchi, Nishinomiya; Takeo Hoda, Kawachinagano; Yoshiaki Hata, Nishinomiya; Yoshinobu Kudo, Sakai; Manabu Inoue, Kobe, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1987, Ser. No. 56,688

Claims priority, application Japan, Jun. 4, 1986, 61-129510

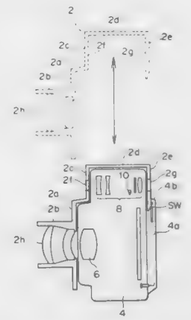
Int. Cl.⁴ G03B *29/00, 11/00*

U.S. Cl. 354—79 **2 Claims**

1. A camera on which a front converter can be mounted, comprising:

judging means for judging whether or not a front converter is mounted on said camera;

trimming designating means for designating a trimming condition in which an area smaller than a normal photograph area is printed;



encoding means operable in response to operation of said trimming designating means for encoding a trimming signal indicative of the trimming condition on a film; and

controlling means operable when said judging means judges that a front converter is mounted on said camera for operating said trimming designating means to designate the trimming condition.

4,728,974

APPARATUS FOR SUPPORTING AN IMAGING DEVICE

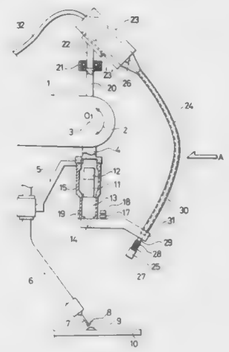
Satoru Nio, and Hajime Fujii, both of Kitakyushu, Japan, assignors to Yaskawa Electric Manufacturing Co., Ltd., Kitakyushu, Japan

Filed May 30, 1986, Ser. No. 868,752

Claims priority, application Japan, May 31, 1985, 60-116560

Int. Cl.⁴ G03B *29/00*

U.S. Cl. 354—81 **18 Claims**



1. An apparatus for supporting in which a camera supporting device having a camera therein and a fiber scope are attached to and supported the wrist of a robot having a swing axis and a twist axis, comprising:

a tube having high rigidity into which said fiber scope is inserted and which connects said camera supporting device with said robot wrist;

first identical moving means for allowing the camera supporting device to perform the same motion as said swing axis in the direction of the swing axis around the rotational center of the swing axis as the rotational center; and

second identical moving means for allowing the camera supporting device to perform the same motion as said twist axis such that the rotational center of the camera supporing device is located on the rotational center of the twist axis.

4,728,975

MOTOR DRIVEN CAMERA

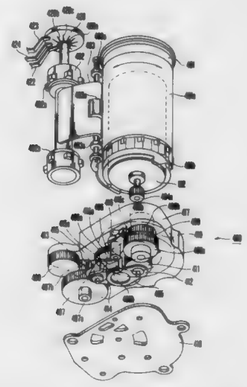
Tsunemasa Ohara, Tokyo; Hidehiko Fukahori, Kanagawa; Masayuki Suzuki, Kanagawa, and Yoshihiko Aihara, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,849

Claims priority, application Japan, Mar. 11, 1986, 61-53455; Jan. 7, 1987, 2179

Int. Cl.⁴ G03B *1/12*

U.S. Cl. 354—173.1 **10 Claims**



1. A motor driven camera having a film windup device for winding up film by an electric motor for windup as a drive source, comprising:

(a) a first windup transmission system for rotating a spool by said motor for windup as the drive source, said first windup transmission system being driven through a first planetary clutch arranged to be drivenly connected by rotation of said motor in one direction;

(b) a second windup transmission system for rotating a sprocket by said motor for windup as the drive source, said second windup transmission system being driven through a second planetary clutch arranged to be released from the connection by rotation of said motor in the other direction; and

(c) holding means for holding said second planetary clutch in the released state from said connection.

4,728,976

SYSTEM FOR CONTROLLING FILM TRANSPORT FOR CAMERA

Akira Takahashi, Kawasaki, and Shinichiro Koshiishi, Hachioji, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 9, 1986, Ser. No. 939,689

Claims priority, application Japan, Dec. 28, 1985, 60-299243

Int. Cl.⁴ G03B *1/12, 1/60*

U.S. Cl. 354—173.11 **1 Claim**

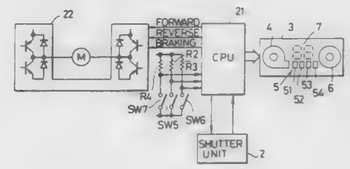
1. A system for controlling film transport in a camera, comprising:

a film transport motor for transporting a film;

an alarm;

signal generating means for intermittently generating a signal in timed relation to movement of the film; and

control means responsive to the signal supplied from said signal generating means for controlling the film transport motor to wind or rewind the film, for energizing said alarm to give a film rewinding failure warning if a predetermined number of signals are not supplied by said signal generating means within a preset period of time from the



time when the film starts being rewound, and for regarding, as a film rewinding completion time, the time when signals are no longer applied by said signal generating means for a predetermined period of time if at least a predetermined number of signals are applied by said signal generating means when the film starts to be rewound.

4,728,977

DEVICE FOR PROTECTING THE PHOTOGRAPHIC OPTICAL SYSTEM OF CAMERA

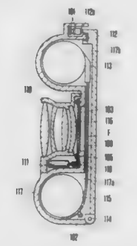
Shinya Yomogizawa, and Kiyoshi Ikuta, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 884,762, Jul. 11, 1986, abandoned. This application May 26, 1987, Ser. No. 56,261

Claims priority, application Japan, Jul. 12, 1985, 60-153751; Feb. 27, 1986, 61-42284; Feb. 27, 1986, 61-42285

Int. Cl.⁴ G03B *3/00, 17/02, 17/04*

U.S. Cl. 354—187 **36 Claims**



1. A photographic optical system protecting device for a camera comprising:

(A) a photographic optical system;

(B) protecting means for protecting a surface of a rear portion of said photographic optical system; and

(C) control means responsive to opening of a cover for the purpose of loading photographic material or not setting of the photographic material to the photographic preparation completion state for actuating said protecting means.

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4,728,978
PHOTOGRAPHIC CAMERA

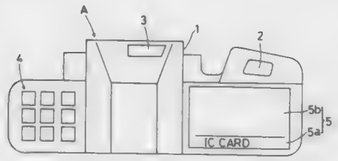
Manabu Inoue, Kobe; Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Takeo Hoda, Kawachinagano; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1987, Ser. No. 21,659

Claims priority, application Japan, Mar. 7, 1986, 61-50874; Mar. 7, 1986, 61-50871; Mar. 7, 1986, 61-50872; Mar. 7, 1986, 61-50873; Mar. 10, 1986, 61-52170

Int. Cl.[4] G03B *17/24*

U.S. Cl. 354—289.1 **9 Claims**



1. A photographic camera, comprising: an attaching portion disposed at a back lid of said camera and adapted for detachably attaching an IC card including semiconductor memory means capable of reading-out/writing-in, a circuit for communication with peripherals and a data exchange terminal for communication;

communication means disposed in a body of said camera for communicating data with said IC card; and

camera control means disposed in the body of said camera for carrying out camera operations based on data input from said IC card.

4,728,979
APPARATUS FOR EXPOSURE CONTROL/FOCUS ADJUSTMENT FOR CAMERA

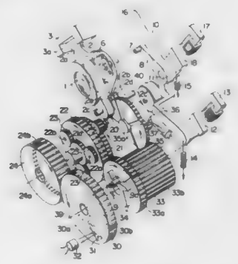
Hiroshi Akitake; Toshimasa Akagi; Gouichi Hiratsuka, all of Hachioji, and Tatsuya Suzuki, Choufu, all of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,293

Claims priority, application Japan, Nov. 2, 1985, 60-246825

Int. Cl.[4] G03B *3/00, 7/087*

U.S. Cl. 354—400 **23 Claims**



1. Apparatus for exposure control/focus adjustment for a camera comprising:

an exposure controlling mechanism for controlling the amount of incident light which passes through a taking lens for the purpose of taking a picture;

a focus adjusting mechanism for properly controlling the distance to an object being photographed;

a source of rotary drive continuously operating throughout the performance of the exposure control/focus operations for operating the exposure controlling mechanism and the focus adjusting mechanism; and

drive transmission means for transmitting the rotary drive from the source to the exposure controlling mechanism and the focus adjusting mechanism through a differential gearing and for selectively driving either one of the mechanisms responsive to changes in the load upon the exposure controlling mechanism and the focus adjusting mechanism.

4,728,980
AUTOMATIC FOCUSING DEVICE AND AUTOMATIC EXPOSURE CONTROL DEVICE

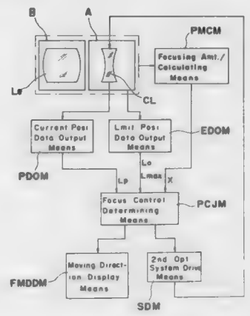
Akiyoshi Nakamura; Makoto Ando, both of Sakai; Shuji Ogino, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1986, Ser. No. 893,363

Claims priority, application Japan, Aug. 5, 1985, 60-172697; Aug. 6, 1985, 60-173747; Aug. 7, 1985, 60-173852

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **4 Claims**



1. An automatic focusing device which comprises:

a defocus amount detecting means for detecting a defocus amount attributable to a first optical system of an interchangeable lens assembly and a second optical system of an AF convertor;

a position data outputting means for outputting position data representative of the position of the second optical system;

a converting means for converting said defocus amount, taken into consideration with the position data, into data corresponding to a focusing amount of the second optical system which varies in non-linear relationship to said defocus amount; and

an optical drive means for moving the second optical system on the basis of the data representative of the focusing amount supplied from the converting means.

4,728,981
IMAGING LENS ARRAY AND OPTICAL PRINT HEAD

Kevin C. Koek; William T. Matthias, both of Rochester, and James T. Barton, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 884,944, Jul. 11, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 937,846

Int. Cl.[4] G03B *27/00*

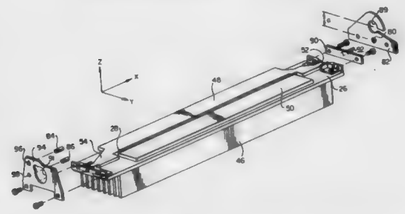
U.S. Cl. 355—1 **2 Claims**

1. In apparatus having (1) a photosensitive surface, (2) a print head having a linear array of light sources, and (3) a gradient index optical fiber imaging lens array with plural optical fibers having substantially the same total conjugate but which lens array is selectable from a group of lens arrays whose total conjugates vary from lens array to lens array within the group; the improvement comprising:

locating means for removably supporting the print head relative to the photosensitve surface such that the light source array is spaced from the photosensitive surface by the total conjugate of the selected lens array, said locating means including

A. means defining locating structure of predetermined fixed spacial relationship to the photosensitive surface, and

B. means defining reference surfaces adjustably attached to the print head and cooperatively engageable with said locating structure to support the print head relative to the photosensitive surface,



wherein the reference surfaces and the locating structure comprise pins and apertures of substantially larger size than said pins to freely receive said pins, said pins automatically resting against locatings surfaces of said apertures upon mounting of said print head to provide the support for said print head and to accurately locate said print head relative to said photosensitive surface; and

mounting means for fixatively supporting the imaging lens array to the print head such that the lens array is centered between the light source array and the photosensitive surface.

4,728,982
IMAGE FORMING APPARATUS

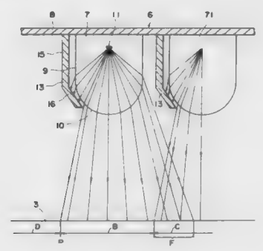
Yukio Takemura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,755

Claims priority, application Japan, Oct. 22, 1984, 59-221448

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **20 Claims**



1. An illumination device for use with an image forming apparatus including an image bearing member having an imaging area and a non-imaging area, comprising:

a plurality of light sources disposed opposed to a surface of the image bearing member for removing electric charge from the non-imaging area of the image bearing member, said light sources each having a portion exhibiting a light directivity;

a plurality of light blocking members, each disposed adjacent that side of said light source which is near the imaging area of the image bearing member, for blocking the light emitted from a marginal zone of the light directive portion of the light source but allowing the light emitted from the light directive portion away from the light blocking member to pass, each of said light blocking members having an inclined portion which extends in a direction crossing with a direction perpendicular to the image bearing member.

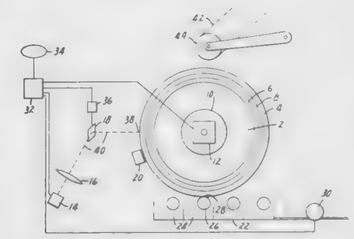
4,728,983
SINGLE BEAM FULL COLOR ELECTROPHOTOGRAPHY

Gregory L. Zwadlo, Ellsworth, Wis., and Kevin M. Kidnie, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1987, Ser. No. 38,507

Int. Cl.[4] G03G *15/01, 15/10*

U.S. Cl. 355—4 **16 Claims**



1. An electrophotographic system for producing high quality full color reproduction wherein color separation toner images are assembled in register on a photoreceptor using successive liquid toning steps, comprising

(1) a drum carrying on its outer surface a photoreceptive material,

(2) means to rotate said drum at a chosen uniform speed about its axis,

(3) means to charge said photoreceptive material in preparation for imaging,

(4) a beam of high intensity radiation of wavelength between 300 nm and 1200 nm impinging on said photoreceptive material after operation of said charging means,

(5) means for scanning said beam across the photoreceptive material parallel to said axis,

(6) means to modulate said beams in accordance with a series of temporal color image signals whereby a charge image is produced on said photoreceptive material,

(7) means to feed a first series of image signals to said modulating means to form a first charge image corresponding to a first color,

(8) means to select from a plurality of color liquid toning means a first toning means for developing said first charge image to produce a first of said color separation toner images,

(9) means to dry the first of said color separation toner images immediately following its formation,

(10) means on a later revolution of said drum to charge said photoreceptive material, to feed a second series of image signals to said modulating means to form a second charge image corresponding to a second color, said second charge image being synchronized on said photoreceptive material with said first charge image, to select from said plurality of toning means a second toning means to for developing said second charge image produce a second of said color separation toner images, and to dry said second of said color separation toner images,

(11) means to repeat said charging, said feeding of series of image signals, and said production of said toner images for a required number of said color separation toner images,

(12) means to tranfer said assembled color separation toner

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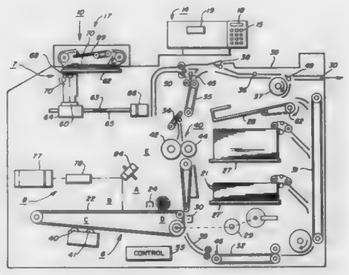
images in a single step to a receptor material to produce said high quality full color reproduction.

4,728,984

DATA HANDLING AND ARCHIVING SYSTEM

Joseph J. Daniele, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1986, Ser. No. 931,485
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—6 13 Claims



1. In a printing machine for processing documents bearing an encoded image to provide either coded or decoded print copies, comprising:

(a) at least one scanning array for scanning said documents and converting the document image to image signals;

(b) a decoder effective when actuated to decode the image signals output by said array whereby said machine produces decoded prints of said documents; and

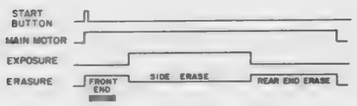
(c) operator identifying means for actuating said decoder on input of a preset operator identification code to provide said decoded prints.

4,728,985

COPIER CAPABLE OF SETTING UP AN ERASE AREA ON A PHOTOCONDUCTIVE ELEMENT

Yoshihiro Nakashima, Tokyo, and Shigeru Muramatsu, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,726
Claims priority, application Japan, Jun. 20, 1985, 60-134935; Jun. 20, 1985, 60-134936
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—7 2 Claims



1. In a copier which forms a latent image on a photoconductive element and which is responsive to various sized papers wherein the direction in which the papers are fed is assumed to be a direction x and a direction perpendicular thereto a direction y, said copier comprising:

paper size detector means for sensing a paper size (Px, Py) representative of the size of the papers;

document size detector means for sensing a document size (Ox, Oy) representative of a size of the documents being copied;

trimming area detector means for sensing a trimming area size (Tx, Ty) representative of an area size after trimming;

magnification detector means for sensing a magnification R selected; and

eraser means for erasing needless electrostatic latent images formed on the photoconductive element;

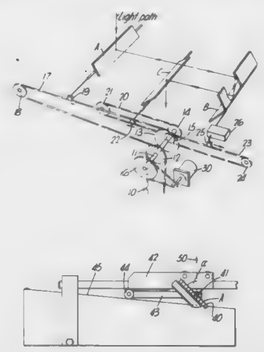
a means for determining the overlapping length of said Px, Ox X R and Tx X R selected in accordance with a length of a non-erase area in the direction x, an overlapping length of said Py, Oy X R and Ty X R selected in accordance with a length of the non-erase area in the direction y, whereby said erase means erases the latent images outside of the non-erase area.

4,728,986

OPTICAL SCANNING

Arthur C. E. Ravenshear, Harrow, United Kingdom, assignor to The Imtec Group plc, Stanmore, England

PCT No. PCT/GB86/00203, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06181, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 11, 1986, Ser. No. 5,200
Claims priority, application United Kingdom, Apr. 12, 1985, 8509416
Int. Cl.[4] G03G *15/28, 15/32;* G03B *27/70*
U.S. Cl. 355—8 9 Claims



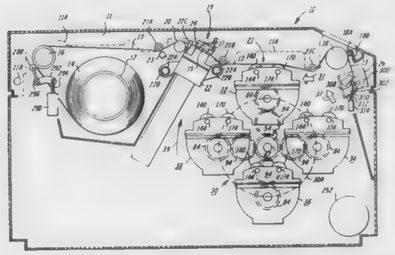
1. An optical scanning system for projecting an image onto a moving surface, comprising a scan reflecting surface (A) to deflect an incident light ray into a first direction, second and third reflecting surfaces (B) mutually at right angles which together reflect the ray from the scan reflecting surface in a direction opposite to the first direction and displaced laterally therefrom and an exit reflecting surface (C) to receive the ray reflected from the third reflecting surface and to deflect it parallel to the incident ray onto the moving surface (5), means for translating said scan and exit reflecting surfaces (A, C) in opposite directions during a full scan of said image while maintaining said scan and exit reflecting surfaces at right angles to each other, means for rocking or tipping each of the scan and exit reflecting surfaces (A, C) during their respective translations while maintaining their right angle relationship throughout, means for translating the second and third reflecting surfaces (B) together in the same direction as the scan reflecting surface (A), and the translations of the scan and exit reflecting surfaces (A, C) being effected at respective uniform rates each of which has a fixed ratio to the rate of movement of the moving surface (5).

4,728,987

CAROUSEL-MOUNTED MODULAR DEVELOPMENT UNITS FOR ELECTROGRAPHIC PRINTER

David J. Diola, Santa Cruz; Russell A. Stauffer, Nevada City; Peter A. Tapscott, Portola Valley, all of Calif., and Mark E. Martich, Seekonk, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1986, Ser. No. 880,756
Int. Cl.[4] G03G *15/01, 15/10*
U.S. Cl. 355—3 DD 14 Claims



1. A toner unit arrangement for a printer comprising:

a rotatable support for being positioned along a path followed by a medium through a printer,

at least one toner unit for holding a supply of toner to be applied to the medium, each toner unit being mountable on the support for rotating with the support into a printing position in which toner from that toner unit may be applied to the medium,

said support comprises support mounting means for holding each toner unit,

each toner unit comprising unit mounting means for engaging the support mounting means when that toner unit is mounted,

the support mounting means and the unit mounting means providing a releasable mounting permitting each toner unit to be removed from the support and replaced,

one of the support mounting means and the unit mounting means comprises a retractable element movable between an extended position and a retracted position and biased toward the extended position, the other of the support mounting means and the unit mounting means comprising a mounting opening sized to fit around the retractable element, the toner unit being mounted by holding the retractable element in the retracted position until it is positioned at the mounting opening and then permitting the retractable element to move to the extended position so that the toner unit is held in place.

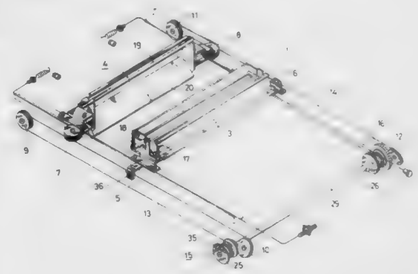
4,728,988

DRIVING APPARATUS FOR OPTICAL SYSTEMS OF PHOTOCOPIER

Eiji Tsutsui, Amagasaki, and Arihiro Tsunoda, Higashiosaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 27, 1986, Ser. No. 923,411
Claims priority, application Japan, Oct. 28, 1985, 60-166102[U]
Int. Cl.[4] G03B *27/70;* B65H *75/28*
U.S. Cl. 355—11 12 Claims

1. A driving apparatus for optical systems of a photocopier comprising 1st and 2nd optical systems for exposure of an image to an image receiving body installed in a photocopier housing and moving in a single direction at a speed ratio of 2:1 between both of the 1st and 2nd optical systems for scanning, an end for fixing a wire at each of both sides of the 1st optical system, a pair of moving pulleys mounted on both sides of the 2nd optical system, a plurality of fixed pulleys mounted each on both sides of a scanning plane for both the 1st and 2nd optical systems, a 1st wire and a 2nd wire stretched facing each other through the moving pulleys and fixed pulleys, a common wire drum over which both the 1st wire and the 2nd wire are wound and a driving means for the common wire drum, wherein



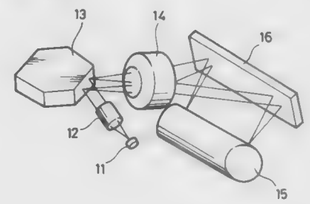
the common wire drum has two wire drum bodies which are of substantially cylindrical shape and are mounted on both sides of a common drum shaft and wind the 1st wire and the 2nd wire thereover, each of the wire drum bodies being provided with a shallow and smooth dented portion, and a means for adjustably pressing fixedly each of the wires at an approximate center of the wire against the bottom surface and/or side surface of the dented portion.

4,728,989

ELECTROSTATIC LATENT IMAGE FORMING APPARATUS USING SEMICONDUCTOR LASER

Naoto Ohmori, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 11, 1987, Ser. No. 13,483
Claims priority, application Japan, Feb. 14, 1986, 61-31580
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 14 Claims



1. An electrostatic latent image forming apparatus comprising:

a semiconductor laser,

drive means for adding bias current to switching current modulated by an image signal and applying the current obtained of the addition to said semiconductor laser, thereby to excite said semiconductor laser to emit a laser beam,

a photoreceptor having a surface on which an electrostatic latent image is to be formed by said laser beam,

a scanning optical system for scanning said surface of said photoreceptor by said laser beam emitted from said semiconductor laser and forming an image by said laser beam on said surface of said photoreceptor, and

optical means disposed in a path of transmission of said laser beam extending from said semiconductor laser to said photoreceptor for lowering intensity of said laser beam,

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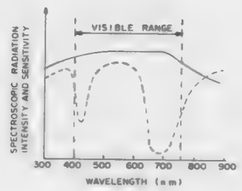
thereby to decrease a component corresponding to said bias current out of said laser beam.

4,728,990

METHOD OF CONTROLLING EXPOSURE IN ELECTROPHOTOGRAPHY

Kunio Ohashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 16, 1986, Ser. No. 920,040
Claims priority, application Japan, Oct. 30, 1985, 60-245569
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **3 Claims**



1. A method of controlling incident light on a body which is photosensitive not only within a visible range of light but also outside said visible range, said method comprising the steps of

limiting the spectroscopic radiation intensity of said incident light both in a short wavelength region and in a long wavelength region within said visible range, and

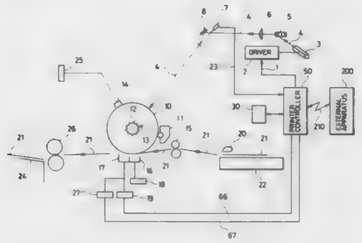
providing one or more peaks in the spectroscopic radiation intensity of said incident light with one or more peaks outside said visible range.

4,728,991

IMAGE FORMING APPARATUS

Kenzo Takayama, Tokyo, and Haruo Shimizu, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,962
Claims priority, application Japan, Sep. 19, 1984, 59-194746; Sep. 19, 1984, 59-194747; Sep. 19, 1984, 59-194748; Sep. 19, 1984, 59-194749; Sep. 19, 1984, 59-194750
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 TR **20 Claims**



1. An image forming apparatus comprising:

a recording medium;

image forming means for forming an image on said recording medium in accordance with an input image signal;

convey means for conveying a transfer material;

separating means for separating from said recording medium the transfer material which is conveyed by said convey means;

detection means for detecting a state of said input image signal; and

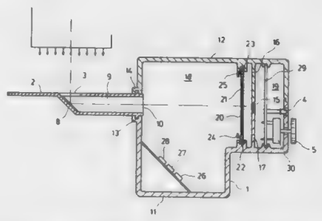
control means for controlling said separating means in accordance with an output of said detection means.

4,728,992

PROCESS AND A DEVICE FOR ADJUSTING A PHOTOGRAPHIC COLOR ENLARGING OR COPYING APPARATUS

Alex Vinatzer, Brixen/Milland, and Florian Vikoler, Brixen, both of Italy, assignors to Durst Phototechnik GmbH, Bozen, Italy

PCT No. PCT/EP85/00502, § 371 Date May 22, 1986, § 102(e) Date May 22, 1986, PCT Pub. No. WO86/02175, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 28, 1985, Ser. No. 871,435
Claims priority, application Italy, Oct. 1, 1984, 4872 A/84
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—35 **14 Claims**



1. A process for adjusting the color composition of the copying light of a photographic color enlarging or copying apparatus of the type having controls for adjusting the relative amounts of the basic colors red, green and blue in the copying light, said process comprising the steps of:

a. inserting a test original in the enlarging or copying apparatus, said test original having a gray patch of defined medium density;

b. providing an existing reference copy of the test original which reference copy represents a satisfactory reproduction of the gray patch of the test original;

c. inserting copying film in the film carrier of the enlarging or copying apparatus and exposing and subsequently developing the copying film to produce a test copy;

d. illuminating the test copy and the reference copy with the copying light of the enlarging or copying apparatus, and selectively measuring the amounts of red, green and blue light reflected by each of both the test copy and the reference copy;

e. comparing the measured red, green and blue light received from the test copy to the respective measured red, green and blue light received from the reference copy, and providing a visual indication of a deviation therebetween for each such color;

f. adjusting the color composition of the copying light for each of the three basic colors until the amounts of light in each color measured for the test copy and reference copy are in balance; and

g. repeating steps (c) through (f) above until, following step (e), there is no longer a visual indication of a deviation between the amounts of the copying light reflected by the most recent test copy in the three basic colors red, green and blue and the corresponding amounts of copying light reflected by the reference copy.

7. A measuring device for adjusting the color composition of the copying light of a photographic color enlarging or copying apparatus, said measuring device utilizing a reference copy of a test original and test copies of the test original, the reference copy of the test original representing a satisfactory reproduction thereof, and the test copies of the test original being produced by successively exposing copying film to the test original using the copying light of the enlarging or copying apparatus to be adjusted, and developing the exposed copying film to thereby produce such test copies, said measuring device including in combination:

a. a housing;

b. a light measuring chamber formed within said housing;

c. receiving means disposed in said light measuring chamber for receiving and for positioning both the reference copy of the test original and a test copy of the test original;

d. light opening means communicating with said light measuring chamber, said light opening means being adapted to be guided into the copying light path of the enlarging or copying apparatus for admitting the copying light into said light measuring chamber and directing the copying light toward the reference copy and test copy positioned by said receiving means;

e. photoelectric transducers disposed within said light measuring chamber for receiving light reflected by the reference copy and by the test copy, said photoelectric transducers generating intensity-proportional electrical signals for each of the color components red, green and blue received thereby; and

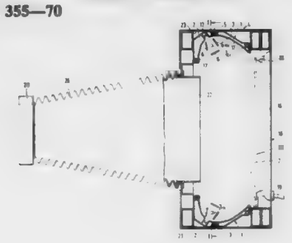
f. a measuring and indicating circuit coupled to said photoelectric transducers for providing a visual indication of deviations between the amounts of red, green and blue light reflected from the reference copy as compared with the respective amounts of red, green and blue light reflected from the test copy.

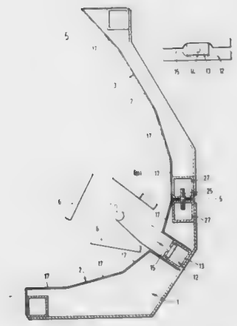
4,728,993

ILLUMINATION SYSTEM IN A PROJECTION COPIER

Horst Hilgers, Bad Schwalbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 24, 1986, Ser. No. 911,006
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1985, 3534473; Apr. 3, 1986, 3611086
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—70 **22 Claims**





1. An illumination system in a projection copier for the illumination and the projection of an original onto a light sensitive recording material comprising:

(a) platform means for receiving the original;

(b) a plurality of reflectors;

(c) radiating source means partially surrounded by said reflectors for reflecting incident radiation in the direction of the original, each of said reflectors comprising two reflector parts detachable from each other at a separating point and equipped at the separating point with a square profile, wherein the adjoining side surface of each part's square profile is connected to the other by a setting plug; and

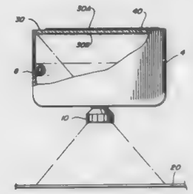
(d) a plurality of heat-protection filters partially surrounding each radiating source.

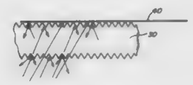
4,728,994

ILLUMINATION SYSTEM UTILIZING A DOCUMENT PLATEN WITH A DIFFUSELY REFLECTING SURFACE

Richard A. Spinelli, Rochester; Edward A. Powers, Penfield, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1986, Ser. No. 919,952
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 **3 Claims**





1. A document flash illumination system comprising, in combination:

a transparent platen positioned in an object plane for supporting a document;

illumination means positioned in a light housing located beneath said object plane for directing illumination towards said document;

said platen characterized by having at least one uniformly irregular surface for uniformly diffusing light reflected from or transmitted therethrough.

4,728,995

DEVICE FOR ADJUSTING EXPOSURE AMOUNT

Shinya Matsuda, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1987, Ser. No. 22,821
Claims priority, application Japan, Mar. 11, 1986, 61-34857[U]
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 **9 Claims**

1. A device for adjusting the amount of exposure comprising:

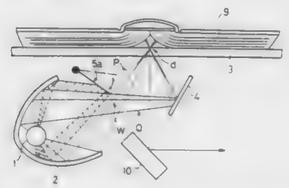
a light source,

means for causing a relative movement between the light source and a zone of illumination by the light source,

a first reflecting member having a first portion and a second portion for reflecting the light from the light source in two different directions, the first portion providing a first optical path for directing the light from the light source

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directly toward the illumination zone, the second portion providing a second optical path for directing the light from the light source toward a direction intersecting the first optical path.



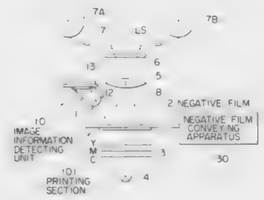
a second reflecting member for reflecting the light through the second optical path toward the illumination zone, and a light blocking member for regulating the amount of light through the first optical path and the amount of light through the second optical path by blocking the light.

4,728,996

PHOTOGRAPHIC PRINTING METHOD

Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1987, Ser. No. 51,565
Claims priority, application Japan, May 20, 1986, 61-115880
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **13 Claims**



1. A photographic printing method which automatically conveys an original film mounted on a negative film carrier by detecting frames for printing which is characterized in that number of the frames is either added or subtracted in accordance to the edge detection information for the imaged frames to obtain identification information for each of the frames so that the imaged frames of said original film are corresponded to printed sheets of photographic paper.

4,728,997

METHOD OF FABRICATING A LIGHT IMAGE DETECTOR AND A LINEAR IMAGE DETECTOR OBTAINED BY THIS METHOD

Nicolas Szydlo, Ris Orangis, and Francois Boulitrop, Sceaux, both of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 12, 1986, Ser. No. 895,812
Claims priority, application France, Aug. 14, 1985, 8512420
Int. Cl.[4] H01L *45/00, 21/306;* H01J *40/14;* B44C *1/22*
U.S. Cl. 357—2 **9 Claims**

8. A image linear detector comprising, deposited in line on a substrate, several groups of the same number of individual detectors arranged in the same way in each group, of these detectors comprising a first conducting material layer on said substrate, a first doped amorphous semiconducting layer of a first given type (p or n) on said first conducting material layer, a second undoped amorphous semiconducting layer on said first doped amorphous semiconducting layer, a third doped amorphous semiconducting layer of a second given type (n or p) on said second undoped amorphous semiconducting layer, a fourth undoped amorphous semiconducting layer on said third doped amorphous semiconducting layer, a fifth doped amorphous semiconducting layer of a first given type (p or n) on said fourth undoped amorphous semiconducting layer, said first conducting material layer and said first through fifth amorphous semiconducting layers having columns etched therein, the columns having individuals conductors etched



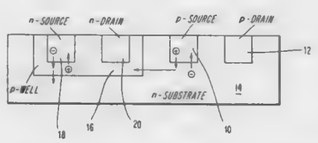
therein, the sides of the individual detectors being isolated, a second conducted material layer and electrical connections etched in the second conducting material layer, the layers closest to the substrate of the individual detectors of the same rank being interconnected by a network of conductors deposited on the substrate and the layers furthest away from the individual detectors of the same group being interconnected by a conductor.

4,728,998

CMOS CIRCUIT HAVING A REDUCED TENDENCY TO LATCH

Robert J. Strain, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Division of Ser. No. 647,743, Sep. 6, 1984, abandoned. This application Jul. 30, 1986, Ser. No. 890,459
Int. Cl.[4] H01L *29/16, 29/163, 29/78*
U.S. Cl. 357—16 **9 Claims**



1. A CMOS integrated circuit , aving a reduced tendency to latch, comprising complementary NMOS and PMOS transistors formed on a substrate to provide a p-n-p-n structure, and being a product of the process of implanting ions into the source region of each of the NMOS an PMOS transistors, said ions being of a material having an energy gap which is lower than the energy gap of the material forming the substrate.

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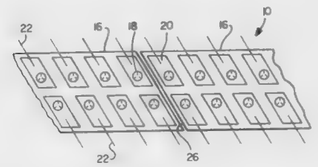
LIGHT EMITTING DIODE ASSEMBLY

Hugh St. L. Dannatt, Bethel; Donald T. Dolan, Ridgefield, and Henry Stalzer, Danbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 162,968, Jun. 25, 1980, abandoned. This application May 5, 1983, Ser. No. 491,342
Int. Cl.[4] H01L *33/00, 23/48*
U.S. Cl. 357—17 **2 Claims**

1. An assembly having a plurality of light emitting diodes, comprising: a plurality of generally longitudinally extending monoliths, means for attaching said monoliths in tandem, each of said monoliths having longitudinally opposed ends that form an angle of other than 90° relative to the longitudinal side of said monolith, said monoliths having two rows of laterally opposed LED sites extending longitudinally thereon, electrical connection means for providing selective enabling of said

LED sites, the LED sites of one row being laterally staggered relative to the LED sites of the other row, such that said



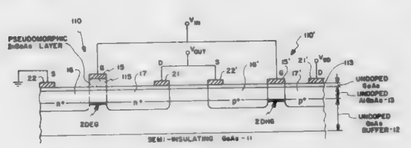
assembled monoliths define a set of contiguous centers of LED sites.

4,729,000

LOW POWER ALGAAS/GAAS COMPLEMENTARY FETS INCORPORATING INGAAS N-CHANNEL GATES

Jonathan K. Abrokwah, Rosemount, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 747,501, Jun. 21, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 891,831
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **15 Claims**



1. A lower planar complementary GaAs based heterostructure integrated circuit structure comprising:

semi-insulating GaAs substrate means having a flat major surface;

planar epitaxial grown intrinsic layers sequentially grown in order over said flat major surface comprising

a first epitaxially grown layer of intrinsic GaAs grown directly over said surface, said GaAs layer having high mobility and having a first bandgap;

a second epitaxially grown layer of intrinsic (Al,Ga)As grown directly over said first layer, which i-(Al,Ga)As has a larger bandgap than said first bandgap, and in which the energy gap difference is divided between valence and conduction bands;

a heavily doped $In_yGa_{1-y}As$ (where $0<y<0.2$) thin layer epitaxially grown on the final layer of said intrinsic layers and defining the location of a first gate electrode;

a first metal gate electrode deposited on said $In_yGa_{1-y}As$;

a second metal gate electrode deposited on the surface of the final layer of said intrinsic layers;

a n^+ source and a n^+ drain region in said structure defined by selective donor ion implantation into said structure next to said first gate electrode;

a p^+ source and a p^+ drain region in said structure defined by selective acceptor ion implantation into said structure next to said second gate electrode;

first and second n-ohmic contacts alloyed to said n-source and n-drain regions, respectively; and,

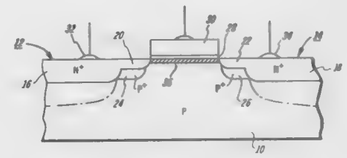
third and fourth p-ohmic contacts alloyed to said p-source and p-drain regions, respectively.

4,729,001

SHORT-CHANNEL FIELD EFFECT TRANSISTOR

Jacob D. Haskell, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 286,927, Jul. 27, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,248
Int. Cl.[4] H01L *29/78, 29/08*
U.S. Cl. 357—23.3 **5 Claims**



1. An improved short channel field effect transistor characterized by including

a semiconductor substrate of a first conductivity type,

a source region of a second conductivity type, opposite said first conductivity type and having an impurity concentration higher than that of said substrate, disposed in a first surface portion of said substrate and comprising a relatively shallow diffused tip portion laterally offset from and contiguous with a relatively deep diffused portion,

a drain region of said second conductivity type and having an impurity concentration higher than that of said substrate, disposed in a second surface portion of said substrate and comprising a relatively shallow diffused tip portion laterally offset from and contiguous with a relatively deep diffused portion, wherein said drain shallow diffused tip portion faces said source shallow diffused tip portion,

a channel region, of either said first conductivity type or said second conductivity type, disposed in a third surface portion of said substrate separating said source region from said drain region,

a gate insulation film located on the surface of said substrate between said source and drain regions, said gate insulation film overlying said channel region,

a gate electrode located upon said gate insulation film,

a source contact upon the upper surface of said source region,

a drain contact upon the upper surface of said drain region, and

plug regions, of said first conductivity type each having an impurity concentration higher than that of said substrate, and each associated with and contiguous to each source and drain region, each of said plug regions being located beneath each of said shallow diffused tip portions and between said deep diffused portions and said channel region, said plug regions being separated by said channel region by a distance no less than the shortest distance between said source and drain shallow diffused portions and said plug regions being no deeper than the greatest depth of said source and drain deep diffused portions.

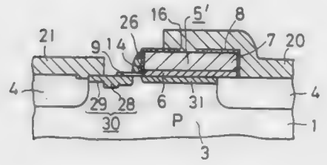
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4,729,002

SELF-ALIGNED SIDEWALL GATE IGFET

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 304,882, Sep. 23, 1981, Pat. No. 4,654,680. This application Aug. 26, 1985, Ser. No. 769,379
Claims priority, application Japan, Sep. 24, 1980, 55-132528; Sep. 24, 1980, 55-132529; Sep. 24, 1980, 55-132530
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] H01L *29/78, 27/04, 29/08*
U.S. Cl. 357—23.9 8 Claims



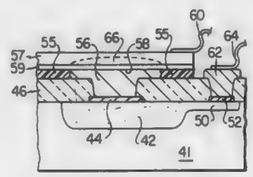
1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a layer member formed in a predetermined pattern on the major surface of the semiconductor substrate and having a first insulating side surface;
a first insulating layer formed on the major surface of the semiconductor substrate and extending from the first insulating side surface of the layer member;
a first conductive layer formed on the first insulating layer in contact with the first insulating side surface of the layer member, said first conductive layer having a marginal edge extending upwardly from said first insulating layer, and said first conductive layer having a length which extends substantially parallel to said first insulating side surface and a width which extends in a direction substantially perpendicular to said first insulating side surface, said width extending only from said marginal edge to said first insulating side surface;
a first semiconductor region of a second conductivity type reverse from the first conductivity type, formed in the semiconductor substrate from the side of its major surface and having a marginal edge extending downwardly from the major surface such that the latter marginal edge is substantially aligned with the marginal edge of the first conductive layer, the first semiconductor region extending from its marginal edge away from the first conductive layer;
a second semiconductor region of the second conductivity type formed in the semiconductor substrate from the side of its major surface to underlie the layer member in contact therewith, the second semiconductor region having a marginal edge extending downwardly from the major surface such that the marginal edge of said second semiconductor region is substantially aligned with the first insulating side surface of the layer member, the second semiconductor region extending from its marginal edge away from the first conductive layer;
wherein a first insulated gate field effect transistor is constituted using the first conductive layer as its gate electrode, that region of the first insulating layer underlying the gate electrode as its gate insulating layer, the first semiconductor region as either one of its source and drain regions, the second semiconductor region as the other of its source and drain regions.

4,729,003

CONFIGURATION OF A METAL INSULATOR SEMICONDUCTOR WITH A PROCESSOR BASED GATE

Eric F. Schulte, and Adam J. Lewis, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 646,659, Aug. 31, 1984. This application Apr. 8, 1986, Ser. No. 849,597
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 20 Claims



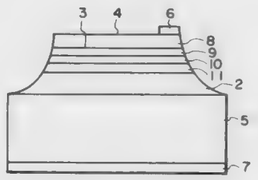
1. A metal oxide silicon semiconductor, comprising:
a substrate layer having an array of switching elements formed therein, each of the switching elements having outputs selectively connectable to a first external conducting terminal;
a plurality of deformable conductive gates formed on the upper surface of the substrate, each of said gates in conductive contact with the inputs of an associated one of said switching elements;
a layer of photosensitive semiconductor material;
a layer of semiconductor dielectric material formed on the lower surface of said semiconductor layer, said dielectric layer in contact with the surface of said conductive gates opposite said substrate;
said gates dimensioned such that the upper surface thereof is higher than the highest point on the topography of said substrate;
a layer of epoxy disposed in the spaces between said gates, the upper exposed surface of said substrate and the exposed lower surface of said dielectric layer; and
a second external conducting terminal attached to the surface of said semiconductor layer opposite said dielectric layer.

4,729,004

SEMICONDUCTOR PHOTO DEVICE

Kazuo Sakai, Tokyo; Yuichi Matsushima, Tokorozawa; Yukio Noda, Yokohama, and Takaya Yamamoto, Niza, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 573,959, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 290,084, Aug. 4, 1981, abandoned. This application Sep. 5, 1986, Ser. No. 904,775
Claims priority, application Japan, Aug. 18, 1980, 55-112672
Int. Cl.[4] H01L *29/90, 29/161, 27/14*
U.S. Cl. 357—30 6 Claims



1. A semiconductor photo detector provided with a photo detecting portion, electrodes and a substrate, in which at least

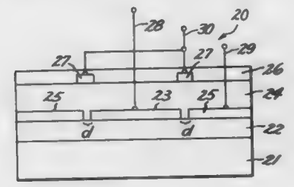
three semiconductor layers of the same conductivity type and different energy gaps are formed in the order of magnitude of the energy gap so as to be connected to one of said electrodes through said substrate, said three semiconductor layers being a first semiconductor layer (9), a second semiconductor buffer layer (10 and 11) and a third semiconductor layer (2) employed as a main light absorbing layer, and in which a fourth semiconductor layer (8) forms a p-n junction together with the first semiconductor layer and has the same composition as the semiconductor layer having the largest energy gap among the at least three semiconductor layers but is different in conductivity type from the first semiconductor layer and is in contact with the first semiconductor layer so as to be connected to the other of said electrodes, said at least three semiconductor layers and said fourth semiconductor layer defining said photo detecting portion, said second semiconductor layer having a larger energy gap than that of said third semiconductor layer for providing graded composition between said first semiconductor layer and said third semiconductor layer, said second semiconductor layer and said third semiconductor layer defining the light absorbing region, said third semiconductor layer having the largest thickness among said three semiconductor layers, said third semiconductor layer and said light absorbing region having carrier concentrations so that the end of a depletion layer can be extended to said third semiconductor layer, and said substrate having a larger forbidden bandgap energy than said main light absorbing layer.

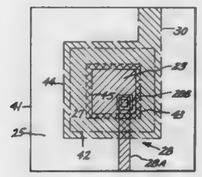
4,729,005

METHOD AND APPARATUS FOR IMPROVED METAL-INSULATOR-SEMICONDUCTOR DEVICE OPERATION

Ching-Yeu Wei, and Henry H. Woodbury, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 728,431, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 400,172, Jul. 20, 1982, abandoned. This application Jul. 31, 1986, Ser. No. 891,058
Int. Cl.[4] H01L *29/78, 27/14, 29/40, 29/34*
U.S. Cl. 357—30 41 Claims





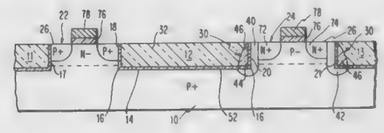
1. A method of reducing edge field enhancement at an edge of a potential well during a detection interval wherein during said detection interval said potential well receives incident radiation, said potential well being in a first portion of a semiconductor substrate lying beneath a biased gate electrode of a layered metal-insulator-semiconductor device having a radiation-transparent gate electrode formed on a first layer of the device and a buffer gate at a different layer of the device than the layer upon which the gate electrode is formed, said buffer gate positioned to partially overlap the biased gate electrode and overlie the entire peripheral edge of the potential well comprising the step of preparing the semiconductor substrate to receive radiation by biasing the buffer gate above the flat-band voltage with a non-zero bias potential only during said detection interval simultaneous with the biasing of the gate electrode so that a buffer zone is created in a second portion of the semiconductor substrate adjoining and entirely surrounding the potential well and lying beneath the buffer gate.

4,729,006

SIDEWALL SPACERS FOR CMOS CIRCUIT STRESS RELIEF/ISOLATION AND METHOD FOR MAKING

Anthony J. Dally, Pleasant Valley; Seiki Ogura, Hopewell Junction; Jacob Riseman, Poughkeepsie, and Nivo Rovedo, Poughquag, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,180
Int. Cl.[4] H01L *27/02, 29/78, 29/06, 29/34*
U.S. Cl. 357—42 15 Claims



1. Fully isolated semiconductor regions for the manufacture of integrated circuits, comprising:
a substrate of doped semiconductors of a first conductivity type;
a plurality of trenches formed in designated areas of said substrate, and said trenches having a bottom, corners, and substantially vertical sidewalls, wherein said sidewalls form the walls of mesas, said mesas having a top surface;
sidewall spacers disposed on selected sidewalls which form mesas wich have been designated as mesas wherein channel devices of the opposite conductivity type to said first conductivity type are to be formed and on a portion of said trench bottoms adjacent to said selected sidewalls, said sidewall spacers being comprised of an insulating material doped to have a low viscosity at an elevated temperature with a dopant having said first conductivity type, said spacers extending along the designated sidewalls with their greatest thickness at the trench bottoms;
an insulation material with a viscosity at said elevated temperature greater than the viscosity of said sidewall spacer doped material, said insulation material disposed to fill said trenches up to said top surface of said mesas; and
channel stops of said first conductivity type formed in said selected sidewalls of said designated mesas and formed around said trench corner and below said sidewall spacers by means of diffusion of said dopant of said first conductivity type from said sidewall spacers;
wherein said sidewall spacers reduce the occurrence of cracks in the insulator material filling said trenches by relieving internal mechanical stress therein thereby permitting deeper trenches, and allow the formation of channel stops via diffusion thereby permitting said mesa sidewalls to be substantially vertical.

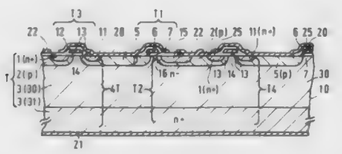
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4,729,007

MERGED BIPOLAR/FIELD-EFFECT TRANSISTORS

David J. Coe, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 17, 1985, Ser. No. 777,066
Claims priority, application United Kingdom, Sep. 19, 1984, 8423690
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—43 9 Claims



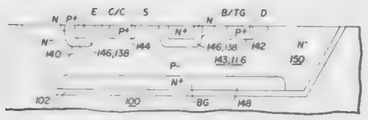
1. A semiconductor device comprising a vertical bipolar transistor having an emitter region of one conductivity type, a base region of the opposite conductivity type, and a higher resistivity body portion of the one conductivity type, the emitter region being provided in the base region and the base region being provided in the higher resistivity body portion of the one conductivity type, which body portion forms at least part of a collector region of the bipolar transistor, a first insulated-gate field-effect transistor connected to the base region, a further insulated-gate field-effect transistor which is of complementary conductivity type to that of the first field-effect transistor and which has a source region of the one conductivity type located adjacent the emitter region, the first field-effect transistor having a drain region of said opposite conductivity type in said body portion located adjacent the base region and having an insulated gate overlying a channel area in a part of said body portion between the base region and the drain region, the further field-effect transistor having an insulated gate over a channel area between the emitter and source regions to provide a gateable connection between the emitter and source regions, which channel area comprises a portion of at least the base region, and the gate of the further field-effect transistor being connected to the gate of the first field-effect transistor to permit the first field-effect transistor to be turned on during operation to extract charge from the base region when the further field-effect transistor is turned off by a signal applied to its gate.

4,729,008

HIGH VOLTAGE IC BIPOLAR TRANSISTORS OPERABLE TO BV_{CBO} AND METHOD OF FABRICATION

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 447,945, Dec. 8, 1982, abandoned. This application Jul. 7, 1986, Ser. No. 883,279
Int. Cl.[4] H01L 29/70, 29/80, 27/06
U.S. Cl. 357—43 14 Claims



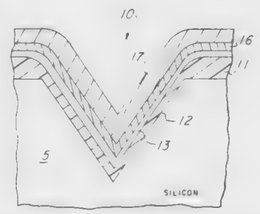
1. An integrated circuit including bipolar and junction field effect transistors comprising:
an N substrate;
a PNP bipolar transistor in said substrate having a collector, base and emitter region;
a P channel junction field effect transistor in said substrate having a channel region of the same depth and impurity concentration as said PNP collector region, source and drain regions of the same depth and impurity concentration as said PNP emitter region, a top gate region of the same depth and impurity concentration as said PNP base region and extending laterally beyond said channel region into said substrate and a buried N bottom gate region in said substrate of a high impurity concentration than said substrate and extending laterally beyond said channel region into said substrate to be connected to said top gate region by said substrate; and
means for connecting said top gate and said base regions and means for connecting said source and said collector regions.

4,729,009

GATE DIELECTRIC INCLUDING UNDOPED AMORPHOUS SILICON

Saw T. Ang, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 20, 1986, Ser. No. 832,919
Int. Cl.[4] H01L 29/78, 29/40
U.S. Cl. 357—54 11 Claims



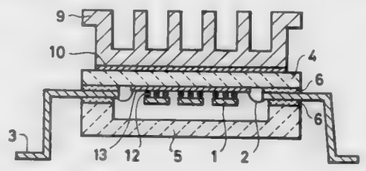
1. A dual dielectric MOSFET gate system comprising:
a monocrystalline substrate having a surface,
a silicon dioxide layer at the surface of the substrate,
and an undoped amorphous silicon layer over the silicon dioxide layer and out of direct contact with the substrate.

4,729,010

INTEGRATED CIRCUIT PACKAGE WITH LOW-THERMAL EXPANSION LEAD PIECES

Masatoshi Tsuchiya; Satoru Ogihara; Hiromi Kagohara, all of Hitachi; Kanji Otsuka, Higashi-Yamato, and Tomoji Oishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,533
Claims priority, application Japan, Aug. 5, 1985, 60-171068; Aug. 21, 1985, 60-181692
Int. Cl.[4] H01L 23/14
U.S. Cl. 357—70 18 Claims



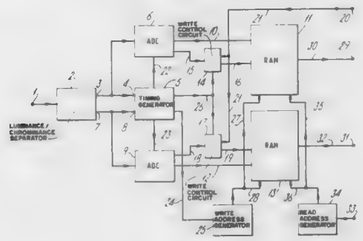
1. In an integrated circuit package in which at least one semiconductor element mounted on an insulating substrate, ends of lead pieces introduced from the outside and wires that electrically connect said at least one semiconductor element and said ends of said lead pieces are accommodated in a cell that is air-tightly defined by said substrate, a cap and a sealing glass, the improvement wherein said insulating substrate is composed of a ceramic material having a coefficient of thermal expansion of from 35 to 40×10^{-7}/°C. and a high thermal conductivity, said cap is composed of a ceramic material having a coefficient of thermal expansion of from 20 to 50×10^{-7}/°C., said sealing glass has a coefficient of thermal expansion of from 30 to 55×10^{-7}/°C., and said lead pieces are composed of an alloy having a coefficient of thermal expansion of smaller than 40×10^{-7}/°C.

4,729,011

METHOD AND APPARATUS FOR DIGITIZING TELEVISION SIGNALS

Kenneth D. McCann, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,181
Claims priority, application United Kingdom, Jun. 5, 1985, 8514152
Int. Cl.[4] H04N 17/02
U.S. Cl. 358—10 13 Claims



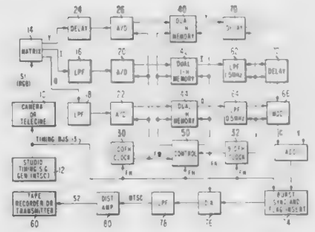
1. A television transmitter comprising a video signal input; means for modulating a carrier signal by the video signal; non-linear power amplifier means for amplifying the modulated carrier signal; a pre-corrector circuit for applying a correction to the video signal before or after modulation and before it is applied to the power amplifier means, means for measuring the distortion in the output of the power amplifying means; means for generating a control signal representative of the distortion of the output of the power amplifying means; and means for applying the control signal to a control input of the pre-corrector circuit to reduce the distortion at the output of the power amplifying means; wherein the measuring means comprises means for extracting a portion of the transmitted signal, and means for demodulating the portion to produce a demodulated television signal, wherein the measuring means further comprises means for digitizing the demodulated television signal, the digitizing means comprising means for separating said luminance and color subcarrier portions, means for applying the separated luminance portion to a first analog-to-digital converter, and means for applying the separated color subcarrier portion to a second analog-to-digital converter having a lower resolution and a higher speed of operation than said first analog-to-digital converter.

4,729,012

DUAL MODE TELEVISION RECEIVER FOR DISPLAYING WIDE SCREEN AND STANDARD ASPECT RATIO VIDEO SIGNALS

David L. Jose, Mercer County, N.J.; Spyros W. Tsokas, Montgomery County, Pa., and Robert A. Dischert, Burlington County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 30, 1985, Ser. No. 771,551
Int. Cl.[4] H04N 11/20, 7/01
U.S. Cl. 358—11 8 Claims



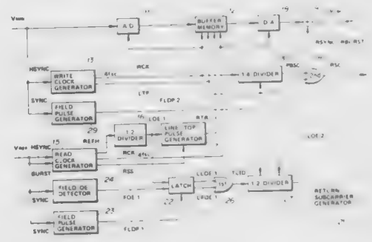
4. A video display system, comprising:
display means for producing a raster having constant width and an aspect ratio greater than 4:3;
signal source means for providing a video input signal representative of an image having an aspect ratio equal to 4:3;
signal processing means coupled to said signal source means and responsive to said video input signal for supplying a processed video output signal to said display means in which each displayed horizontal line thereof includes a horizontal synchronizing interval, a delay interval and an active video interval for causing said display means to produce an image having an aspect ratio equal to 4:3 and a horizontal position determined by said delay interval; and wherein
said signal processing means includes memory means having information stored therein for controlling said delay interval of said video output signal.

4,729,013

TIME BASE ERROR CORRECTOR

Mitsushige Tatami; Yasuo Sakura, and Yoshinori Suzuki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,422
Claims priority, application Japan, May 21, 1985, 60-109999
Int. Cl.[4] H04N 9/44
U.S. Cl. 358—19 6 Claims



1. A time base error corrector for outputting an output video signal having no time base error by means for writing an input video signal in a buffer memory in response to a synchronizing signal included in the input video signal and by means for reading the written video signal from the buffer memory in

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response to a synchronizing signal included in a reference video signal, which comprises:

means for controlling phase of a chrominance subcarrier included in the input video signal, before the input video signal is written in the buffer memory, so that the phase of a chrominance subcarrier included in the read video signal matches that of a chrominance subcarrier included in the reference video signal when the video signal written in the buffer memory is read therefrom in response to the reference video signal, wherein in the case of a National Television System Committee (NTSC) color television system, said chrominance subcarrier phase controlling means is a return subcarrier generating means for generating a first return subcarrier signal RSC when a succeeding top line identification of a succeeding field, representative of the relative phase relationship between the burst signal and the synchronizing signal at a top horizontal line of said field, is determined to be an odd number but a second return subcarrier signal RSC when the succeeding top line identification is determined to be an even number both by predicting the succeeding top line odd/even (O/E) identification on the basis of an O/E content of a preceding field identification of a preceding field, representative of an odd and even number of the field, and an O/E content of the preceding field top line identification.

4,729,014

DIGITAL CIRCUIT FOR STEEPENING COLOR-SIGNAL TRANSITIONS

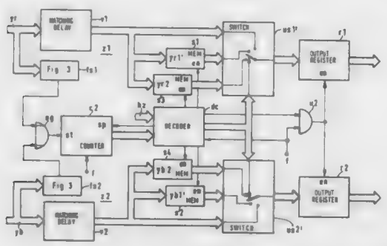
Peter M. Flamm, and Rolf Deubert, both of Freiburg, Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,479

Claims priority, application European Pat. Off., Apr. 19, 1985, 85 104 771.2

Int. Cl.⁴ H04N *9/064*

U.S. Cl. 358—37 **4 Claims**



1. A circuit arrangement for steepening color-signal transitions, comprising:

first and second circuit branches, said first branch receiving a first color difference digital signal from a first color difference channel and said second branch receiving a second color difference digital signal from a second color difference channel, each of said branches comprising:

a digital slope detector for generating a control signal at an output when the respective one of said first or second color difference digital signals has a predetermined relationship to predetermined amplitude and time thresholds;

a first delay element receiving and delaying said respective one color difference digital signal by a time equal to the delay of said digital slope detector;

at least one memory having its input connected to the output of said first delay element;

a switch having first and second inputs connected to the outputs of said delay element and said at least one memory, respectively; and

an output register having its input connected to the output of said switch;

and

a sequence controller coupled to the outputs of said digital slope detectors in said first and second circuit branches, and receiving a clock signal having a predetermined frequency relationship to a chrominance subcarrier frequency, and receiving a digital signal determining the hold time equal to the known system rise time of said first and second color difference channels, said sequence controller providing sequence control signals for controlling said at least one memory, said switch and said output register in both of said first and second circuit branches such that:

a color difference signal value occurring at an intermediate value of said hold time is read into said memory, said color difference signal value stored in said memory is read via said switch into said output rergister at the corresponding intermediate value of the steepened leading edge of said color-signal, the input of said output register being connected to the output of said delay element at all times except at said intermediate value of said steepened leading edge.

4,729,015

METHOD AND APPARATUS FOR MAKING POSITIVE COPIES FROM DIAPOSITIVES

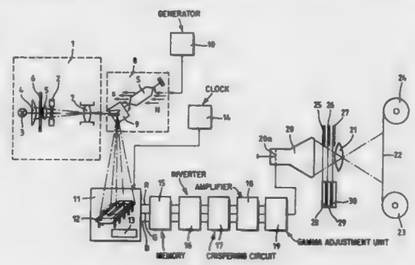
Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,624

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525807

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—76 **17 Claims**



1. A method of making a copy of an original, particularly a positive copy of a diapositive, comprising the steps of photoelectrically scanning the original, line-by-line, to obtain density signals; electronically inverting the density signals; directing a beam of radiation against a negative photosensitive material; and influencing the beam by the inverted density signals.

4,729,016

DIGITAL COLOR IMAGE PROCESSING METHOD AND APPARATUS EMPLOYING THREE COLOR REPRODUCTION FUNCTIONS FOR ADJUSTING BOTH TONE SCALE AND COLOR BALANCE

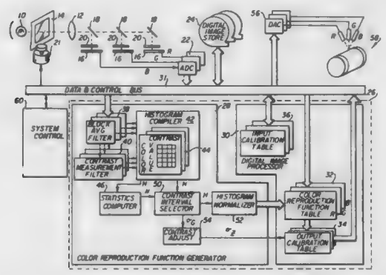
James Alkofer, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1985, Ser. No. 730,627

Int. Cl.⁴ G03F *3/08;* **H04N** *1/46;* **G03B** *27/80*

U.S. Cl. 358—80 **8 Claims**

1. A method for processing a digital color image having three color components, characterized by: separating color values from each of the three color components of the digital color image into a plurality of samples of color values corresponding to a plurality of contrast intervals, selecting one of the plurality of samples of color values from each color component corresponding to one of the plurality of contrast intervals based upon the similarity of the shapes of the distributions of the color values in the selected samples of color values,



generating a color reproduction function for each of the color components by normalizing the selected samples of color values, and processing the color components of the digital color image by applying the color reproduction functions to the respective color components of the digital color image to produce a processed digital color image.

4,729,017

STEREOSCOPIC DISPLAY METHOD AND APPARATUS THEREFOR

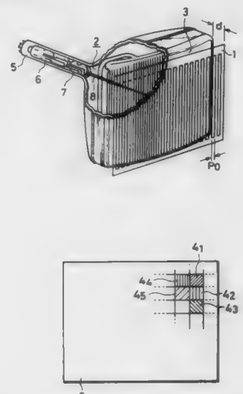
Kazuo Sayanagi, Yokohama, and Hisashi Nakatsui, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,650

Claims priority, application Japan, Feb. 28, 1985, 60-37371

Int. Cl.⁴ H04N *13/00, 13/04*

U.S. Cl. 358—88 **6 Claims**



1. A stereoscopic display apparatus comprising:

image display means for displaying an image, wherein said image display means includes output means for dividing an image to be displayed into a plurality of pixels and converting each of the pixels into fine area grids having a grid interval being variable in accordance with distance information of the pixel, and for outputting the converted pixel to the image display screen; and

a lattice plate arranged in front of and in a spaced relation from said image display screen, said lattice plate having a plurality of lattices.

4,729,018

ENDOSCOPE APPARATUS WITH ROTATING SHUTTER

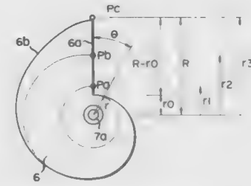
Hitoshi Watanabe, Atsugi, and Yuuichi Muranaka, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1986, Ser. No. 909,039

Claims priority, application Japan, Sep. 24, 1985, 60-208845; Sep. 27, 1985, 60-212103

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—98 **15 Claims**



1. An endoscope apparatus comprising:

a solid-state image pickup device, arranged in an insertion portion to be inserted in a body cavity for picking up an image of the body cavity;

video processing means for performing predetermined processing of a signal from said solid-state image pickup device to produce a video signal;

a light source for generating a continuous illumination light;

rotating shutter means including a shutter blade rotated in synchronism with the video signal from said video processing means and shifting means for shifting a relative distance between a rotating axis of said shutter blade and an illumination optical path, said shutter blade having a light-transmitting portion with a predetermined angle range on an edge of said shutter blade and a light-shielding portion with a remaining angle range, the predetermined angle range of said light-transmitting portion being adapted to vary according to different radii, thereby controlling the transmission time of the light from said light source;

light-transmitting means for guiding light passing through said rotating shutter means to a photographing object for said solid state image pickup device; and

display means for displaying the video signal obtained by said video processing means.

4,729,019

METHOD AND DEVICE FOR GENERATING IMAGES FROM ULTRASONIC SIGNALS OBTAINED BY ECHOGRAPHY

Bernard Rouvrais, Vezin le Coquet, France, assignor to CGR Ultrasonic, Villenoy les Meaux, France

Filed Oct. 15, 1986, Ser. No. 918,883

Claims priority, application France, Oct. 18, 1985, 85 15509

Int. Cl.⁴ H04N *5/213*

U.S. Cl. 358—112 **14 Claims**

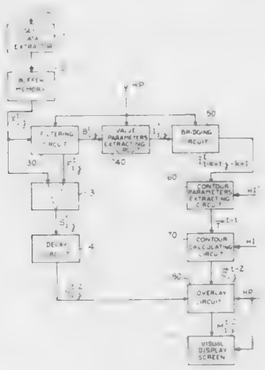
1. Method for generating images from source ultrasonic signals obtained by echography, wherein the echos signal is sampled and digitalized to form a succession of samples $x_{i,j}^{t}$ as a echographical signal with a coded digital value of luminance X at an instant t, identified in the image by the row i of the horizontal column and the row j of the vertical column to which they belong, wherein said echographical signal is automatically processed to superimpose, on the image, a contour of the analyzed organ by the following steps:

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reducing the speckle present in said echographical signal through filtration by generating a prediction divergence signal which yields useful data by taking the difference between the digitalized signal $x_{i,j}$ and a prediction signal calculated from a model of speckle, this step of reducing further providing a filtered digital signal $F_{i,j}$ and a binary signal $B_{i,j}$ deduced from the filtered signal produced by said filtration, at state 0 for the points of the filtered signal that have zero luminance and at state 1 for the other points;

processing said binary signal to extract from it the data corresponding to echos recognized as being non-characteristic of the contour, and outputting a signal $I_{i,j}$;

processing said signal $I_{i,j}$ by bridging to minimize discontinuities by eliminating isolated pixels, and outputting a bridged signal $\hat{I}_{i,j}$;



processing said bridged signal $\hat{I}_{i,j}$ to extract from it the characteristics parameters that can be used in a model of the contour of the organ examined, on the basis of a zone of maximum area, called a zero density zone, which comprises only zeros and corresponds to the interior of the organ analyzed;

calculating the pixels of the contour on the basis of said extracted characteristic parameters and the equation of the model of the organ;

replacing the digital signal, before filtration or when it is filtered, by an overlay signal for all the pixels of the contour;

displaying the result of said step of replacing the digital signal by said overlay signal.

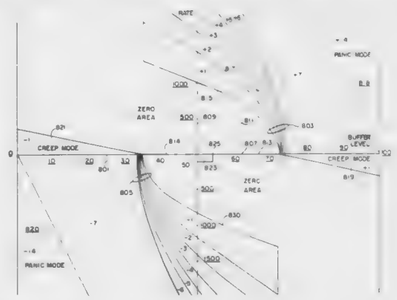
4,729,020

SYSTEM FOR FORMATTING DIGITAL SIGNALS TO BE TRANSMITTED

Richard A. Schaphorst, Jenkintown, and Neil Randall, Ft. Washington, both of Pa., assignors to Delta Information Systems, Horsham, Pa.

Filed Jun. 1, 1987, Ser. No. 56,042
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—133 **12 Claims**

1. A system for variably altering the format of image data signals to enable an encoded transmission thereof while maintaining an acceptable resolution for the output image comprising in combination: data processing means programmed to respond to the value of available empty storage space in a signal storage means and to the rate of which said empty space is lessening or increasing and formed to generate and provide control signals in response thereto; clock signal generating means to provide a plurality of different timing signals connected to said data processing means; analog to digital converter means formed to receive analog signals and convert them into digital signals, said analog to digital converter means connected to said clock signal generating means to receive timing signals therefrom; compression encoding means for compressing digital signals by selectively altering the format of digital signals received thereby, said compression encoding means connected to said analog to digital converter means to receive digital signals therefrom and connected to said data processin means to receive said control signals therefrom; signal storage means to store digital signals, said signal storage means designed to generate status signals from which the



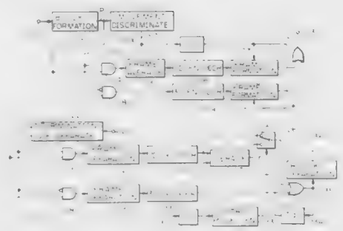
available empty storage space can be determined and from which the rate of which said empty storage space is lessening or increasing can be determined; first circuitry means connecting said signal storage means to said data processing means to transmit status signals thereto whereby said data processing means generates and transmits control signals to said compression encoding means to selectively alter the format of digital signals being transmitted through said compression encoding means.

4,729,021

HIGH EFFICIENCY TECHNIQUE FOR CODING A DIGITAL VIDEO SIGNAL

Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 925,376
Claims priority, application Japan, Nov. 5, 1985, 60-247840
Int. Cl.[4] H04W *7/12*
U.S. Cl. 358—135 **9 Claims**



1. A high efficiency coding apparatus for coding digital video data in a block format allowing compression of the video data, each block of data including digital video data representing a three dimensional group of picture elements, said coding apparatus comprising;

first detecting means for detecting a maximum value of the digital video data of said three dimensional group of picture elements in said block;

second detecting means for detecting a minimum value of the digital video data of said three dimensional group of picture elements in said block;

means for generating dynamic range information of the block from said maximum and minimum values;

means for subtracting said minimum value from each of the digital video data of said three dimensional group of picture elements in said block to generate modified digital video data;

movement discriminating means for discriminating the existence of movement in each block and generating a discriminating code;

means for encoding said modified digital data using a smaller number of bits than a corresponding number of bits of said modified digital data, said encoding means being controlled by said discriminating code; and

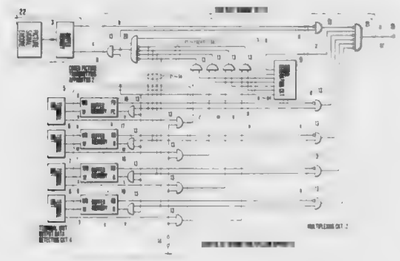
transmitting means for transmitting the output of said encoding means and an additional code for each said block formed of said discriminating code and at least two of said maximum value, said minimum value, and a signal based on said dynamic range information.

4,729,022

MULTIPLEXING SYSTEM

Toru Shibuya, and Mitsuo Nishiwaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,204
Claims priority, application Japan, Feb. 17, 1984, 59-28053
Int. Cl.[4] H04N *7/08, 7/04*
U.S. Cl. 358—146 **3 Claims**



1. A multiplexing system wherein data from a plurality of terminal units are multiplexed in time slots allocated to the terminal units and coded picture data are multiplexed at least in time slots allotted for picture data, the system comprising:

a picture signal encoding circuit operating at a clock frequency independent of a clock frequency for a transmission path;

a buffer memory circuit for storing coded picture data output from said picture signal encoding circuit;

a data detecting circuit for detecting the presence or absence of output data from said plurality of terminal units; and

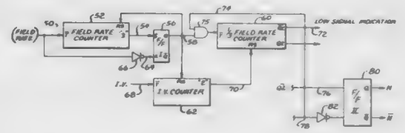
a multiplexing circuit which allocates coded picture data read out from said buffer memory circuit to a time slot or time slots of terminal units whose output data are not detected by said data detecting circuit and whenever data to be output from any one of said terminal units is detected by said data detecting circuit, inserts the detected data into the time slot allotted to said terminal units which outputted the detected data, thereby adaptively sharing coded picture data to the time slots for said terminal units.

4,729,023

MODE RECOGNITION FOR VERTICAL COUNTDOWN

Gopal K. Srivastava, Buffalo Grove, and Julian Warrick, Palatine, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 574,796, Jan. 27, 1984, abandoned. This application Oct. 9, 1986, Ser. No. 917,290
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—148 **16 Claims**



1. In a method for vertical synchronization of a television system which digitally locally develops vertical sync pulses, derives vertical sync pulses from a received television signal, and selectively applies the locally developed sync pulses or the derived sync pulses to a vertical sweep system of the television system, the improvement comprising the steps of:

defining a time window having a beginning and an end;

accumulating a count of the derived sync pulses occurring within said time window;

resetting said count of derived vertical sync pulses to a preset starting count in response to the end of said time window;

determining whether fewer than a predetermined number of said derived sync pulses occur within said time window;

said determining step including toggling a logic device in response to the beginning of said time window; and

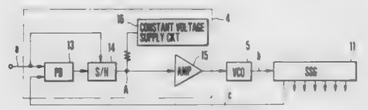
if said determining step indicates that fewer than said predetermined number of derived sync pulses occur within said time window, then triggering said logic device to generate a signal in response to the end of said time window and signaling said television system to apply said locally developed sync pulses to said vertical sweep system.

4,729,024

SYNCHRONIZING PULSE SIGNAL GENERATION DEVICE

Hisashi Kawai, Kanagawa; Makoto Masunaga; Tuguhide Sakata, both of Tokyo; Masahiro Takei, and Kenichi Nagasawa, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,942
Claims priority, application Japan, Mar. 19, 1985, 60-055150; May 27, 1985, 60-112231; May 29, 1985, 60-116217; May 29, 1985, 60-080249[U]
Int. Cl.[4] H04N *5/04, 5/06*
U.S. Cl. 358—153 **14 Claims**



1. A synchronizing pulse signal generation device, comprising:

(A) first means for forming a clock pulse signal which is phase locked relative to a first periodic signal, said first means including:

(a) a phase comparator which generates a phase error signal corresponding to a phase difference between two input signals, one of said two input signals being said first periodic signal;

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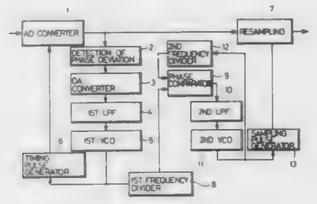
(b) a variable frequency oscillator; and
(c) means for controlling an oscillation frequency of said variable frequency oscillator by selectively using a level of said phase error signal and a predetermined level; and
(B) second means which uses said clock pulse signal together with a second periodic signal of a longer period than said first periodic signal for generating a pulse signal phase-locked relative to both said first and second periodic signals, said second means including means for generating a first pulse signal which is of the same period as said first periodic signal by using said clock pulse signal, said first pulse signal being supplied to said phase comparator as the other input signal of said phase comparator.

4,729,025

JITTER CORRECTION CIRCUIT

Shuji Yanase, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 21, 1986, Ser. No. 921,083
Claims priority, application Japan, Nov. 6, 1985, 60-171067[U]; Nov. 6, 1985, 60-171068[U]; Feb. 10, 1986, 61-27669; Feb. 12, 1986, 61-28142
Int. Cl.[4] H04N *5/95, 9/475*
U.S. Cl. 358—166 **10 Claims**



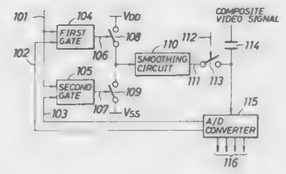
1. A jitter correction circuit comprising:
analog-to-digital converting circuit converts an input reproduced compressed video signal to a digital signal based on an input clock pulse;
a phase deviation detection circuit connected to said analog-to-digital converting circuit, said phase deviation detection circuit latches said digital signal and detects an amount of deviation of said digital signal, said phase deviation detection circuit producing a phase deviation;
digital-to-analog converting circuit converts said phase deviation to an analog signal;
a first low-pass filter connected to said digital-to-analog converting circuit, said first low-pass filter setting a cut-off frequency of said analog signal approximately equal to a horizontal synchronizing signal;
a first control oscillation circuit receives said horizontal synchronized signal from said first low-pass filter and provides a first oscillation output having a rapid frequency response characteristic based on said phase deviation of said horizontal synchronized signal contained in said reproduced compressed video signal;
a timing pulse generating circuit receives said first oscillation output from said first control oscillation circuit and produces said clock pulse input to said analog-to-digital converting circuit, wherein said analog-to-digital converting circuit samples said reproduced video signal based on said first oscillation output to provide said digital signal by analog-to-digital conversion;
a second oscillation control circuit provides a second oscillation output having a stable frequency response characteristic based on at least one of a phase deviation of said horizontal synchronized signal and a phase deviation of said first oscillation output; and
a resampling circuit resamples said digital signal from said analog-to-digital converting circuit based on said second oscillation output.

4,729,026

AUTO-PEDESTAL LEVEL CLAMP CIRCUIT

Fuminori Suzuki, Tokorozawa, and Kiyoshi Kamiya, Higashikurume, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,142
Claims priority, application Japan, May 21, 1985, 60-108524; Jun. 11, 1985, 60-126771; Jul. 19, 1985, 60-159532; Aug. 30, 1985, 60-191754
Int. Cl.[4] H04N *5/18, 5/20*
U.S. Cl. 358—168 **11 Claims**



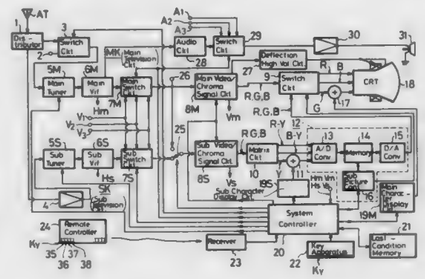
1. An auto-pedestal level clamp circuit, which clamps a pedestal level of a television signal input through a DC blocking capacitor using a pedestal level clamp switch to automatically adjust the pedestal level of the television signal, comprising:
level detecting means for detecting a luminance signal level of the clamped television signal, said level detecting means comprising an A/D converter for converting the luminance signal into a digital signal; and
judging means for judging a luminance of a frame based on the output from said level detecting means, said pedestal level clamp switch having means to adjust the pedestal level of the television signal input to said level detecting means based on an integral potential level of the output from said judging means.

4,729,027

PICTURE-IN-PICTURE TELEVISION RECEIVER

Kunio Hakamada, Tokyo, and Hideo Wakabayashi, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 469
Claims priority, application Japan, Jan. 7, 1986, 61-1125
Int. Cl.[4] H04N *5/272*
U.S. Cl. 358—183 **7 Claims**



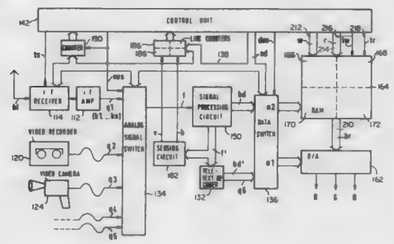
5. A picture-in-picture television receiver of the type in which a sub-picture screen is inset within a main picture screen in a picture-in-picture fashion, which is able to selectively display a television channel or an external base band video signal on the sub-picture screen, and which allows a viewer to select the channel displayed on the sub-picture screen comprising:
(a) means for determining whether or not a picture on said sub-picture screen is a television channel; and
(b) means, when said picture is not a television channel, for changing said picture on said sub-picture screen to a television channel in response to a sub-picture channel selection operation.

4,729,028

TELEVISION RECEIVER WITH MULTIPICTURE DISPLAY

Ljubomir Micic, Freiburg, and Soenke Mehrgardt, March-Neuershausen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,169
Claims priority, application European Pat. Off., Oct. 10, 1985, 85112824.9
Int. Cl.[4] H04N *5/272, 5/262*
U.S. Cl. 358—183 **7 Claims**



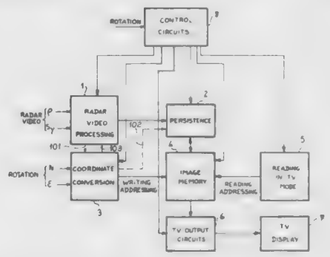
1. A television receiver in which a single video signal can be reproduced simultaneously in at least two subareas of a picture screen, or at least two different video signals can each be reproduced in different subareas, with each subarea displaying either a reduced size picture or part of the picture supplied by a video signal source, said receiver comprising:
a digital signal processing circuit for receiving signals from a plurality of video signal sources and converting said signals to picture data comprising luminance and color data for each picture element;
a random access memory for storing picture data for an entire screen;
a control unit for controlling the writing of picture data into an area of said random access memory, the area being selected depending on how many of said different video signals are to be reproduced on said picture screen and also depending upon an order by which lines of picture data are read from said random access memory, only selected lines being transferred from said video signal sources into associated areas of said random access memory;
a digital to analog converter which receives picture data read from said random access memory and which generates therefrom analog red, green and blue signals;
line counters, each having its respective count outputs coupled to said control unit, said line counters each being associated with one of said video signal sources and each being advanced between received periods such that at the beginning of a receive period it has a count corresponding to the line being received from the respective video signal source;
a sensing circuit for sensing horizontal and vertical synchronizing pulses received in receive periods of said video signal sources to synchronize said line counters; and
a signal source counter connected to said control unit that causes said control unit to periodically switch between selected ones of said video signal sources.

4,729,029

PROCESS AND APPARATUS FOR THE INSERTION OF INSETS INTO THE IMAGE SUPPLIED BY A DIGITAL SCAN CONVERTER

Jean C. Henri, Boulogne Billancourt, and Jean P. Andrieu, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 28, 1986, Ser. No. 845,317
Claims priority, application France, Apr. 2, 1985, 85 05013
Int. Cl.[4] H04N *7/01, 5/262*
U.S. Cl. 358—183 **16 Claims**



1. A process for insertion of an inset image portion into an image generated by a digital image converter including a television type image display, an image memory storing, in digital form, a basic image to displayed on the television type display, processing means including storage means for sampling and storing video information as the video information is supplied to the digital image converter, coordinate conversion means for generating Cartesian coordinates for the video information which is supplied to the digital image converter in accordance with polar coordinates, said process including the steps of:
sampling video information received by the digital image converter, including sampling video information for said basic image at a first frequency and sampling video information for said inset image portion at a second frequency, higher than said first frequency,
storing video information associated with an inset image portion in said storage means with a magnification factor k relative to said basic image, where $k>1$,
generating coordinates for an inset image portion employing parameters which are functions of a desired position for the inset image portion in the basic image and the magnification factor k for the inset image portion, and
writing said video information associated with an inset image portion from said storage means to said image memory at addresses in said image memory defined by coordinates produced in said generating step.

4,729,030

NOISE REDUCTION IN VIDEO DISPLAY APPARATUS

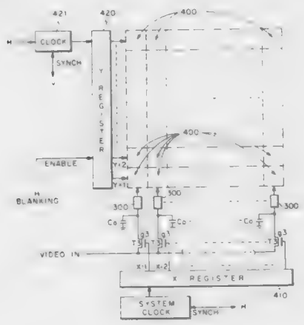
William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Continuation of Ser. No. 557,941, Dec. 5, 1983, abandoned. This application May 21, 1987, Ser. No. 53,572
Int. Cl.[4] H04N *5/74, 5/213*
U.S. Cl. 358—230 **22 Claims**

1. Apparatus for generating images represented by frames of input electronic video signals, comprising:
frame storage means, having an array of semiconductor controlled storage units, for receiving and storing frames of video information as a pattern of stored charge;
circuit means for applying the input video signals to respective storage units of said frame storage means, said circuit means having a variable time constant and being operatively to apply the input video signals to respective storage units of said frame storage means, said circuit means having a variable time constant and being operative to apply the input video signals to respective storage units with a time constant for each particular storage unit that

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depends upon the difference between the input video signal level being applied to said particular storage unit and the signal level stored at said particular storage unit; and



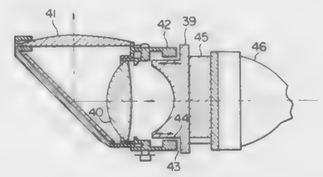
means for converting the stored charge pattern into a viewable image.

4,729,031

COUPLING SYSTEM FOR IMAGE PROJECTION

Shobe Saito; Isao Yoshizaki, both of Yokohama; Yoshiaki Iwahara, Yokosuka; Masanori Oguino, and Osamu Shugizono, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,559
Claims priority, application Japan, Jul. 28, 1983, 58-135855
Int. Cl.[4] H04N *5/74*
U.S. Cl. 358—237 **3 Claims**



1. A video projector for projecting a video picture displayed on Braun tube means through lens means onto screen means such that a plurality of independent light beams emitted from said Braun tube means are composed with each other on said screen means, wherein a space between said Braun tube means and said lens means is filled with a silicon resin having a refractive index approximately the same as that of each of a glass faceplate of said Braun tube means and the material of said lens means, said silicon resin comprising at least two liquids which is in a liquid phase just after said at least two liquids are mixed and which is cured into a gel state, and wherein said lens means is supported by lens holder means so that said lens means is movable along an optical axis within said lens holder means.

4,729,032

PICTURE RECORDING APPARATUS HAVING MEANS TO FACILITATE RASTER SCAN LINE OBSERVATION DURING VIDEO ADJUSTMENT

Mikio Nishiyama, Minami-Ashigara, and Azuchi Endo, Ashigara-Kami, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1985, Ser. No. 754,491
Claims priority, application Japan, Jul. 13, 1984, 59-145615
Int. Cl.[4] H04N *5/84, 3/223*
U.S. Cl. 358—244 **5 Claims**

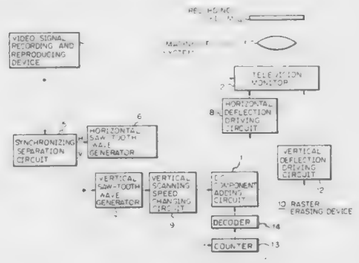
1. A picture recording apparatus having means for reproducing a video image on a display screen of a television monitor in response to image signals, and means for projecting the reproduced video signal onto a recording medium, the improvement wherein:

said means for reproducing a video image comprises:

raster scanning means for producing raster scanning signals to be applied to electron beam deflection coils of said television monitor, such that said reproduced video image is composed of a plurality of raster scan lines;

said raster scanning lines being selectable in an image reproduction mode wherein adjacent raster scan lines of said reproduced image are substantially indiscriminate from one another in a visual sense; and,

said raster scanning means also being selectable in a video adjustment mode such that a portion of said reproduced video image is displayed on said television monitor having increased spacing between adjacent raster scan lines in comparison to the spacing between adjacent raster scan lines when said raster scanning means is selected in said image reproduction mode, said increased spacing being to facilitate visual observation of discrete raster scan lines during video adjustment;



wherein said raster scanning means comprises:

amplifier means having an input terminal and an output terminal;

first feedback means comprising a first resistor connected in series between said input terminal and said output terminal; and

second feedback means comprising a second resistor and switch means connected in series between said input terminal and said output terminal, wherein said switch means, selected to a short circuit mode for a feedback path comprised of a parallel combination of said first and second resistors, represents said raster scanning means selected in an image reproduction mode, and wherein said switch means, selected to an open circuit mode for a feedback path comprised of a series connection of the first resistor only, represents said raster scanning means selected in a video adjustment mode.

4,729,033

DATA COMMUNICATION APPARATUS

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 709,422, Mar. 7, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,712
Claims priority, application Japan, Mar. 13, 1984, 59-48581
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 **12 Claims**

1. A data communication apparatus in operational relationship with a least one data communication partner apparatus, comprising:

first transmission means for transmitting an instruction signal to instruct a data communication partner apparatus to transmit data;

second transmission means for transmitting a status signal to said data communication partner apparatus, the status signal representing that said data communication partner apparatus is in a data receptible state;

detection means for detecting a data-presence signal provided by said data communication partner apparatus; and

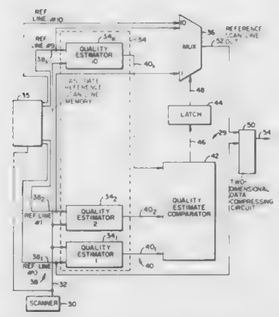
control means for initiating operation of said first transmission means when said detection means detects the data-presence signal from said data communication partner apparatus the data-presence signal representing that data to be transmitted is present in said data communication partner apparatus, and initiating operation of said second transmission means to operate when said detection means does not detect the data-presence signal within a predetermined time.

4,729,034

METHOD AND APPARATUS FOR SELECTION OF A CODING REFERENCE LINE FOR TWO-DIMENSIONAL CODING OF IMAGE DATA REPRESENTING SCREENED IMAGES

Lawrence G. Roberts, Woodside, and Alex E. Henderson, El Granada, both of Calif., assignors to Netexpress Systems, Inc., San Mateo, Calif.

Filed Jun. 27, 1985, Ser. No. 749,606
Int. Cl.[4] H04N *1/419, 1/413, 7/12*
U.S. Cl. 358—261 **16 Claims**



1. A method for processing image data for data compression, said image data comprising pixels and representing a two-dimensional screened image, said image data defining successive input scan lines, including a first scan line, a second scan line immediately preceding said first scan line, and a third scan line preceding said first scan line, said method comprising the steps of:

establishing said first scan line as a current scan line; and

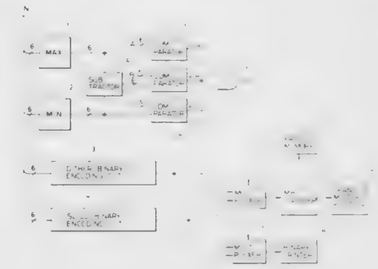
selecting a reference scan line while examining said image data on the bases of the size or frequency of occurrence of said pixels of said image data, said reference scan line being selected from among said preceding second scan line and said preceding third scan line, and said current scan line and said reference scan line being for use in connection with a two-dimensional image coding process wherein data compression is directly related to a pattern relationship between said current scan line and said reference scan line.

4,729,035

IMAGE PROCESSING APPARATUS CAPABLE OF APPRIOPRIATELY ENCODING AND PROCESSING ENTERED IMAGE SIGNALS IN ACCORDANCE WITH THE IMAGE CONTENT

Hiroshi Tanioka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,699
Claims priority, application Japan, Jun. 1, 1983, 58-97169
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—282 **23 Claims**



1. An image processing apparatus comprising:

input means for entering image signals;

detecting means for detecting the maximum and minimum values of mutually neighboring plural pixels in the entered image signals;

first comparator means for comparing said maximum value with a first reference value;

second comparator means for comparing said minimum value with a second reference value;

third comparator means for detecting the difference between said maximum and minimum values and comparing said difference with a third reference value; and

means for discriminating as to whether or not an image represented by said neighboring plural pixels is an intermediate tone of image in accordance with the results of comparisons of said first, second and third comparator means.

4,729,036

ORIGINAL READING APPARATUS AND ORIGINAL READING AND RECORDING APPARATUS USING THE SAME

Takeshi Ikeda, Yokohama, and Kazuya Ijuin, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1985, Ser. No. 804,310
Claims priority, application Japan, Dec. 4, 1984, 59-225124; Dec. 4, 1984, 59-225125; Dec. 4, 1984, 59-225126; Dec. 4, 1984, 59-225127; Dec. 4, 1984, 59-225128
Int. Cl.[4] H04N *1/21, 1/23;* **G01D** *15/10*
U.S. Cl. 358—296 **12 Claims**

12. An original reading apparatus comprising:

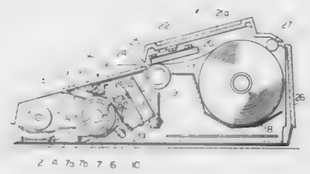
a platen roller for conveying an original to be read;

a reading assembly having a solid state image sensor for generating an electrical signal corresponding to the original;

a first arm;

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means for fixing one end of said reading assembly to said first arm;
a second arm;
means for relatively movably engaging the other end of said reading assembly with said second arm;



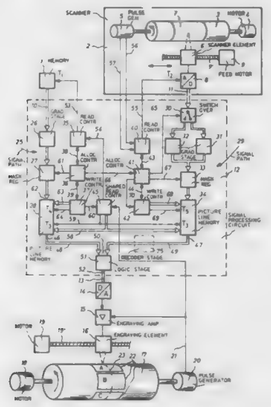
means for pivotably supporting said first and second arms; and
biasing means for resiliently biasing said reading assembly toward said platen roller.

4,729,037

METHOD FOR RECORDING PRINTING FORMS

Juergen Doelves, Heikendorf, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 44,015
Claims priority, application European Pat. Off., Apr. 30, 1986, 86105990.5
Int. Cl.[4] H04N *1/40, 1/21, 1/23*
U.S. Cl. 358—299 **33 Claims**



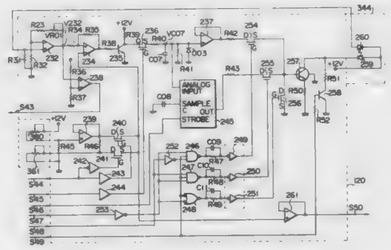
1. A method for picture-element-by-picture-element and picture-line-by-picture-line recording of a printing form, a surface of the printing form being divided into sub-areas to be recorded, comprising steps of:
acquiring at least two picture signal sequences each having picture signal values corresponding to picture elements;
for each acquired picture signal sequence, deriving a signal sequence containing picture signal values for picture elements lying within at least one sub-area, and for picture elements lying outside of the sub-area, replacing picture signal values of the respective acquired signal sequence by a mask signal value;
combining the at least two derived signal sequences to form a resulting signal sequence formed of combinations of the signal values to form signal value combinations;
allocating a recording signal value to every possible picture signal value combination that may occur in the resulting signal sequence; and
during recording, employing the picture signal value combinations of the resulting signal sequence to call in the respective allocated recording signal values to create a recording signal sequence for controlling a recording element for the printing form.

4,729,038

RECORDING APPARATUS CAPABLE OF FORMING A SHADOW PRINT IMPRESSION TO CHARACTERS

Kunihiko Miura, Hiratsuka; Goro Oda, Sagamihara, and Takefumi Nosaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 7, 1985, Ser. No. 731,381
Claims priority, application Japan, May 7, 1984, 59-91532
Int. Cl.[4] H04N *1/21, 1/23*
U.S. Cl. 358—300 **17 Claims**



1. A recording apparatus comprising:
scanning means for scanning a photosensitive member using a light beam;
light beam supply means for supplying the light beam radiated on said photosensitive member by said scanning means at one of a first level for recording, a second level which does not perform recording and a third level between the first and second levels;
input means for inputting data to be recorded;
switching means for switching the level of the light beam supplied to said scanning means to one of the first and second levels in accordance with the recording data input by said input means;
detecting means for detecting that the recording data input from said input means is character data; and
control means for controlling the level of the light beam to be the third level when said detecting means detects that the recording data input is character data.

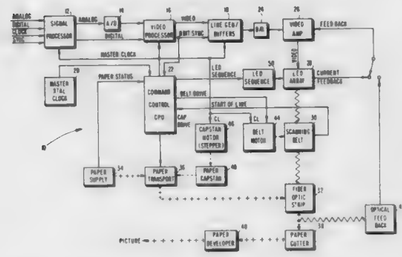
4,729,039

METHOD AND DEVICE FOR PRODUCING FULL TONE IMAGES FROM A VIDEO INPUT

Ronald L. Clark, Indianapolis, Ind., assignor to Quanta Labs, Inc., Indianapolis, Ind.

Filed Dec. 1, 1986, Ser. No. 936,227
Int. Cl.[4] G11B *7/18*
U.S. Cl. 358—302 **29 Claims**

1. A full tone image recorder comprising;
intensity modulated light source means for providing a source of light which has an intensity that is generally linearly modulated relative to modulations in a current input;
light focusing means for focusing the source of light generated by said intensity modulated light source means into a line segment of light;
flying spot generating means for generating a flying spot of light, said flying spot generating means further comprising;
a fiber optic strip arranged to be co-linearly irradiated by the line segment of light created by said light focusing means, said fiber optic strip having a transverse dimension defining a first dimensional constriction on said flying spot of light, said fiber optic strip having an optical input surface and an optical output surface;
an inextensible opaque belt with a lateral aperture disposed therein, said lateral aperture defining a second dimensional constriction on said flying spot of light;
a belt transportation means for passing said belt over said fiber optic strip so that said lateral aperture is in rectilinear relationship to said fiber optic strip;



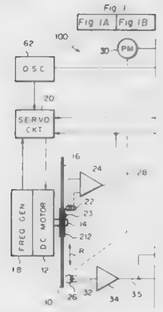
a source of photosensitive material;
material transportation means for transportation of material from said source of photosensitive material past said optical output surface of said fiber optic strip; and,
control means for controlling said intensity modulated light source means, said belt transportation means and said material transportation means to produce a latent precision image on said photosensitive material that conforms to a video input.

4,729,040

TRACKING APPARATUS FOR PLAYING BACK ROTARY MAGNETIC RECORDING MEDIUM

Izumi Miyake, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1985, Ser. No. 750,258
Claims priority, application Japan, Jul. 2, 1984, 59-135154
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—310 **5 Claims**



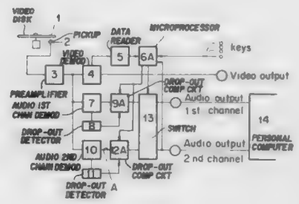
1. Apparatus for playing back a rotary magnetic recording medium comprising:
magnetic head means for detecting color video signals, provided by raster scanning, from a plurality of tracks, each of which is provided on the recording medium in a substantially closed loop;
head transport means for transporting the head means to a desired one of the tracks;
control means for performing tracking by controlling the head transport means responsive to video signals in the recording medium which are detected by the head means; and
a video signal processing circuit including a luminance signal processing circuit and a chrominance signal processing circuit for producing color video signals detected by the head means in the form of standard color television signals;
the control means normally preventing the chrominance signal processing circuit from superposing a color burst on a video signal during at least a part of a vertical blanking period in the raster scanning and allowing the chrominance signal processing circuit to superpose a color burst on a video signal during the tracking control.

4,729,041

INFORMATION REPRODUCING DEVICE WITH DYNAMIC DROP-OUT COMPENSATION INHIBITING MEANS

Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Apr. 11, 1985, Ser. No. 722,203
Claims priority, application Japan, Apr. 11, 1984, 59-052012[U]
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—336 **10 Claims**



1. An information reproducing device for reproducing modulated video band signals and modulated audio band signals recorded on a video disk, said modulated video band signals including a video signal, said modulated audio band signals including an audio signal and digital data information, said information reproducing device comprising
a video signal reproducing circuit and an audio signal reproducing circuit;
a demodulator provided in said audio signal reproducing circuit;
a drop-out detecting circuit connected to said demodulator;
a drop-out compensating circuit connected to said demodulator and said drop-out detecting circuit;
selected one of said modulated video band signals and said modulated audio band signal including a discrimination signal to recognize said digital data information; and
control means for restraining operations of said dropout compensating circuit in response to said discrimination signal.

4,729,042

CLOCK SIGNAL GENERATING CIRCUIT FOR DIGITAL SIGNAL RECORDING DEVICE

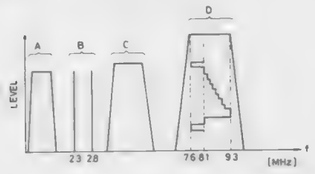
Hidehiro Ishii, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,646
Claims priority, application Japan, Aug. 29, 1984, 59-181153
Int. Cl.[4] H04N *5/94*
U.S. Cl. 358—336 **3 Claims**

1. A data reproducing device, comprising;
pick up means for reading out an RF signal recorded on a recording medium;
filter means for separating said RF signal into an FM video

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signal component, an FM audio signal component, and a digital audio pulse train signal;
first drop-out detection means for detecting drop-out in said FM video signal component to produce a first drop-out detection signal;
second drop-out detection means for detecting drop-out in said FM audio signal component to produce a second drop-out detection signal;
oscillator means for producing an oscillating output at a frequency determined in response to a first control signal, and including means for holding a current frequency in response to a second control signal;



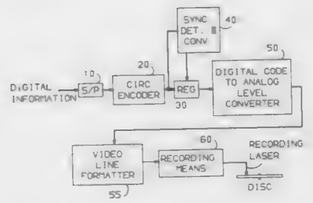
phase comparison means for comparing the phase of said oscillating output with the phase of said pulse train signal to produce said first control signal, said first control signal having a level corresponding to a phase difference between said oscillating output and said pulse train signal;
hold signal generating means coupled to at least said first and second drop-out detection means for producing said second control signal in response to at least one of said first and second drop-out detection signals; and
means for demodulating said pulse train signal using said oscillating output as a clock signal.

4,729,043

DIGITAL INFORMATION STORAGE AND RETRIEVAL USING VIDEO SIGNALS

Joseph P. Worth, Tinton Falls, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 11, 1985, Ser. No. 807,808
Int. Cl.[4] G11B *7/00;* **H04N** *5/76*
U.S. Cl. 358—342 **13 Claims**



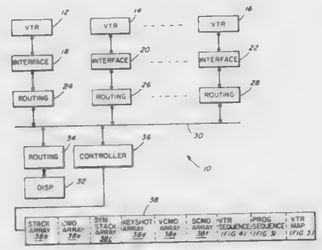
1. A video disc for storing digital information in a signal format comprising:
a plurality of concatenated video signal lines for storing a predetermined number of bits of said digital information and each beginning with a horizontal sync pulse and followed by a second plurality of analog samples;
where each of said analog samples within each of said video signal lines represents a derivable multi-bit sequence, and the concatenation of said each derivable multi-bit sequence with derivable multi-bit sequences of adjacent analog samples within each said video signal line forms a frame sequence; and
where said frame sequence comprises a first and second set of error correction codes and a plurality of message words, with said message words being related to said predetermined number of bits, said first set of error correction codes being related to said predetermined number of bits, and said second set of error correction codes being related to a rearrangement of said predetermined number of bits of a number of said video signal lines.

4,729,044

METHOD AND APPARATUS FOR PLAYING SERIALLY STORED SEGMENTS IN AN ARBITRARY SEQUENCE

Kenneth C. Kiesel, Wayland, Mass., assignor to Lex Computing & Management Corporation, Keene, N.H.

Filed Feb. 5, 1985, Ser. No. 698,911
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] H04N *5/76;* **G11B** *27/02*
U.S. Cl. 360—14.3 **9 Claims**



1. A method for playing a plurality of segments, selected from a plurality of reference segments, in a user-defined playback sequence, said reference segments being recorded on each of a plurality of serial access recording media in a known recorded reference sequence, said selected segments being played in said playback sequence in an order different than the order of said recorded sequence, each selected segment having associated therewith data representing a segment length and a staring position on each said recording medium, said method comprising the steps of
playing a first selected segment of said playback sequence from a first medium reading device,
playing each next succeeding segment of said playback sequence from a medium reading device
(a) which can reach said next succeeding segment in said contiguous playback sequence and play said succeeding segment in a desired time sequence relative to a preceding segment of said playback sequence, and
(b) which is a reading device able to reach the succeeding segment, which most recently completed play of an earlier segment, and if no such previously used reading device is available to play said next succeeding segment of the playback sequence, is a previously unused reading device,
replaying said entire playback sequence by playing each next succeeding segment of said playback sequence from a reading device
(a) which can reach said next succeeding segment in said second play of said playback sequence and play said next succeeding segment in a desired time sequence relative to a preceding segment of said playback sequence, and
(b) which is a reading device able to reach the segment, which most recently completed play of an earlier segment,
preprocessing a reading device play sequence for each of said playback sequence segments,
assigning to each selected segment a command time, a program time, and a specified reading device for playing said selected segment at said program time,

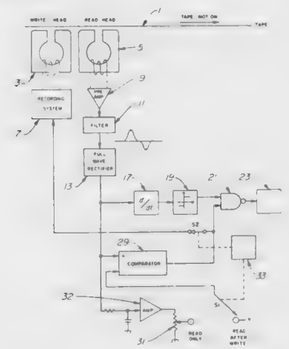
directing to a said specified reading device at each said command time, instructions required to play a said selected segment in timed sequence with other of said selected segments,
minimizing a time duration prior to which a first playback of segments in said playback sequence can take place by selecting said unused physical reading devices in accordance with a play delay minimization process,
generating a list of commands, each entry of which corresponds to the first use of a reading device to play a said segment of said playback sequence,
sorting the entries in said KEYSHOT array according to increasing time code,
sorting the available reading devices in accordance with increasing head position on the recording medium,
assigning for each successive KEYSHOT array entry, starting with the keyshot entry having the lowest time code, the physical reading device whose position is closest to the time code associated with the keyshot entry,
selecting, if that reading device is already assigned, a second reading device so that
if at least one reading device from the closest reading device to the end of the reading device list has not been previously assigned, the first unassigned reading device toward the end of the list is assigned to play the keyshot, and
if the closest reading device is already assigned and if all reading devices to the end of the list of sorted reading devices have also been previously assigned to play a keyshot, the unassigned reading device which is closest to the end of the list is identified and all reading devices from it to the next to last reading device in the list are reassigned to play the keyshot previously assigned to the reading device sequentially ahead of it, and the last reading device of the list is assigned to play the current keyshot, and
optimizing the reading device assignment by reviewing the reading device assignments.

4,729,045

APPARATUS AND METHOD FOR DIGITAL MAGNETIC RECORDING AND READING

Richard A. Baugh, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 1, 1986, Ser. No. 847,089
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—53 **6 Claims**



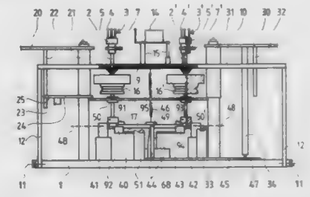
1. The method of recording and reading of a magnetic medium comprising:
a. providing a read-after-write mode of operaton for recording and reading discrete magnetic recordings in a predetermined sequence;
b. providing a fixed amplitude qualification signal level threshold at a predetermined percentage of the average dropout free amplitude;
c. detecting each magnetic recording in said predetermined sequence and rejecting any magnetic recording which produces a read signal having an amplitude which is below the level of said fixed amplitude qualification signal level threshold;
d. re-recording any rejected magnetic recording;
e. providing a read-only mode of operation including producing a read signal from each discrete magnetic recording;
f. producing a processed signal from said read signal; and
g. producing an enabling signal from said read signal for controlling transmission of said processed signal.

4,729,046

CASSETTE TAPE RECORDER

Leo Steipe, and Johannes Starke, both of Munich, Fed. Rep. of Germany, assignors to Feinwerk Electronik GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,895
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432831
Int. Cl.[4] G11B *15/18*
U.S. Cl. 360—94 **24 Claims**



1. A cassette tape recorder operable for use with a plurality of cassettes having respective different geometric dimensions and respective different spacing of cassette winding drums, comprising two winding shafts (**2, 2'**) movably disposed at variable spacing positions and each including adjustable engaging fixtures for engaging different types of winding drums of the cassettes, further comprising at least one electromagnetic sound head disposed on a carrier which is movably positionable with respect to the winding shafts, characterized in that the at last one sound head (**14, 35, 60**) is movable into either of two predetermined limit positions, in that a scanning member (**102, 103, 118–122; 139, 141, 161–166**) is provided to scan a geometric dimension of the respective cassette, and means responsive to said scanning member for moving said winding shafts' spacing positions, and for adjusting said engaging fixtures, and for movably positioning said carrier.

4,729,047

DISK DRIVING DEVICE FOR A DISK CARTRIDGE

Tetsuo Kanno, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 797,906
Claims priority, application Japan, Nov. 14, 1984, 59-171736; Nov. 20, 1984, 59-175794; Nov. 20, 1984, 59-244835; Nov. 27, 1984, 59-179776; Nov. 27, 1984, 59-249965
Int. Cl.[4] G11B *17/02, 17/04, 5/012*
U.S. Cl. 360—97 **3 Claims**

1. A disk driving device for causing information to be written into and read out of a disk cartridge when the disk cartridge is loaded in a body of the device, comprising:
a cartridge holder having a cartridge guide member made of resin and having a plurality of openings formed therein and a frame wherein first and second guide rollers are provided at each of opposite sides of said guide member

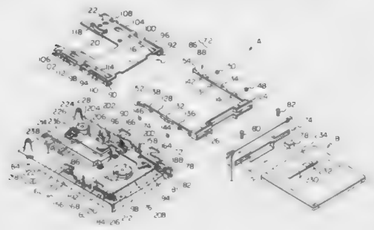
VOL 1088 ISS 1 MR 1 1988 UMI

for admitting the guide member into said frame with said guide member being fixed within the plane of said frame;

a base member of said body;

a plurality of guide pins positioned on said base member and which respectively are received in said openings of said guide member;

a slide plate mounted on said base and having means for biasing said slide plate in a direction opposite an intended direction of insertion of the disk cartridge, said slide plate having guide slots formed in said slide plate at opposite sides thereof and in which the rollers are engaged in one-to-one correspondence for supporting said frame and guide members, each of said guide slots having a first portion positioned a predetermined distance from said base member and from side portions of said cartridge



holder, a second portion positioned upstream of said first portion with respect to a direction of insertion of the disk cartridge and positioned between said first portion and said base member, and a slanted member connecting said first and second portions to each other whereby respective movement of said guide member and said slide plate permits proper registration of said guide member and said slide plate for operation upon insertion of said disk cartridge; and

a latch provided on the base member such that, upon movement of said slide base in the direction of insertion of the disk cartridge, the slide plate is latched to prevent the slide plate from return movement opposite said direction of insertion and, when the disk cartridge is inserted into the cartridge holder, the slide plate is unlatched.

4,729,048

MAGNETIC TRANSDUCER COMBINATION WITH FORMATTING, DATA, AND SERVO HEADS

Shigeyoshi Imakoshi; Hideo Suyama; Hiroaki Yada, all of Kanagawa; Toru Katakura, Miyagi; Tetsuo Sekiya, Kanagawa, and Masayuki Nakayama, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,810

Claims priority, application Japan, Mar. 8, 1985, 60-45985; Apr. 24, 1985, 60-87758; Apr. 24, 1985, 60-87757; Dec. 16, 1985, 60-282325

Int. Cl.[4] G11B *5/596, 5/012*

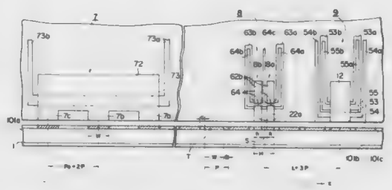
U.S. Cl. 360—103 **2 Claims**

1. A combination magnetic transducer head apparatus, comprising:

a slider disposed in an opposing relationship to a rotating magnetic recording medium and mounted for movement in a radial direction of the rotating magnetic recording medium; and

a data signal recording and playback magnetic head mounted on said slider, a pair of tracking signal playback magnetic heads mounted on said slider and having the same trace width, and an initial tracking signal recording magnetic head mounted on said slider and having three or more head sections;

whereby, where the pitch of tracks to be formed on the rotating magnetic recording medium is P, the pitch of said plurality of head sections of said initial tracking signal recording magnetic head in a direction of the arrangement of the tracks is selected to be equal to twice of the pitch P of the tracks while the distance in the direction of the arrangement of the tracks between the center of the trace



width of said data signal recording and playback magnetic head and the center between the traces of said pair of tracking signal playback magnetic heads is selected to be 3P.

4,729,049

CASSETTE TAPE RECORDING AND REPRODUCING APPARATUS WITH COMPACT ARRANGEMENT OF MAGNETIC HEADS

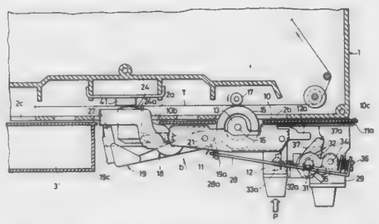
Hisaya Narita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,569

Claims priority, application Japan, Jul. 19, 1984, 59-109144[U]

Int. Cl.[4] G11B *5/54*

U.S. Cl. 360—105 **7 Claims**



1. A cassette tape recording and reproducing apparatus, comprising:

recording and reproducing head means for recording a signal on a tape and reproducing a signal from a tape,

erasing head means for erasing a signal recorded on a tape,

first movable support means for supporting said recording and reproducing head means and making a movement to take selectively an operative position for casuing said recording and reproducing head means to come into contact with a tape contained in a tape cassette loaded in the apparatus through an opening formed in a case of the tape cassette and an inoperative position for holding said recording and reproducing head means on the outside of the tape cassette,

second movable support means for supporting said erasing head means and making a movement to take selectively a first position for causing said erasing head means to come into contact with the tape contained in the tape cassette loaded in the apparatus through said opening formed in the case of the tape cassette together with said recording and reproducing head means and a second position for holding said erasing head means on the outside of the tape cassette,

first operational mode selecting means for setting a reproducing operational mode by causing said first and second movable support means to take said operative position and said second position, respectively, and

second operational mode selecting means for setting a recording operational mode by causing said first and second movable support means to take said operative position and said first position, respectively,

wherein said first movable support means comprises a main movable arm member supported at one end portion thereof to be rotatable by a stationary portion on a chassis of the apparatus and a subsidiary movable arm member mounted on said main movable arm member and provided thereon with said recording and reproducing means,

wherein said second movable support means comprises an additional movable arm member mounted to be rotatable on said main movable arm member and provided thereon with said erasing head means, and

wherein said subsidiary movable arm member and said additional movable arm member are supported to be rotatable individually about a common shaft provided on said main movable arm member.

4,729,050

THIN-FILM VERTICAL MAGNETIZATION TRANSDUCER HEAD

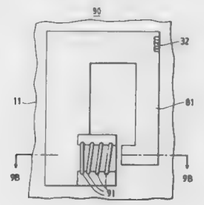
Masataka Koyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Feb. 20, 1985, Ser. No. 703,682

Claims priority, application Japan, Feb. 23, 1984, 59-33035

Int. Cl.[4] G11B *5/09, 5/127, 5/147*

U.S. Cl. 360—125 **5 Claims**



1. A vertical magnetization transducer head comprising:

a main magnetic pole member having a first thickness and a first width;

an auxiliary magnetic pole member having a second thickness larger than said first thickness and a second width greater than said first width, the pole face of the auxiliary magnetic pole being opposed to and spaced from the pole face of the main magnetic pole member to define an air gap therebetween, said main and auxiliary pole members forming a thin-film magnetic core;

a coil;

a nonmagnetic substrate; and

a thin-film nonmagnetic structure formed on said magnetic substrate for supporting said thin-film magnetic core so that said main pole member is substantially centered with respect to the thickness of said auxiliary pole member and for insulatively mounting said coil around said auxiliary magnetic pole member for generating a magnetic field across the opposed pole faces, said nonmagnetic substrate and said thin-film nonmagnetic structure having a passage extending to said air gap for allowing a magnetic recording medium to pass through said air gap in the direction of the thickness of said core.

4,729,051

SELECTIVELY INHIBITED ACTUATING MECHANISM FOR A LATCHED PUSHBUTTON

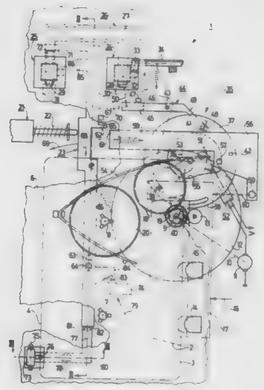
Heribert Hutterer, and Johann Veigl, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,923

Claims priority, application Austria, Jan. 18, 1984, 149/84

Int. Cl.[4] G11B *15/18, 19/02, 5/008;* **G05G** *11/00*

U.S. Cl. 360—137 **15 Claims**



1. A mechanism for actuating an apparatus part, comprising

at least one button arranged to be movable from an off-position to an on-position for selecting a mode of operation in the apparatus, and a return spring opposing movement of said button from said off-position to said on-position,

at least one apparatus part,

means for moving said part from a rest position to an operating position responsive to setting said button from its off-position to its on-position, said means for moving including an actuating device for moving said part to said on-position,

means for starting said mode of operation responsive to said part being in its operating position,

means for inhibiting said actuating device from moving said part to said on-position,

a latching member, means for moving said member between a release position and a latching position, and means for latching said button in its on-position against the force of the return spring when said member is in its latching position, and

at least one control member movable between a release position and a blocking position, in the blocking position said control member inhibiting movement of the latching member to its latching position, and causing said means for inhibiting to inhibit the transmission of actuating movement by the actuating device to said part,

characterized in that said control member engages said apparatus part directly, and the latching member is mounted to the apparatus part for movement therewith, such that movement of the latching member into its latching position is controlled by the movement of the apparatus part to its operating position.

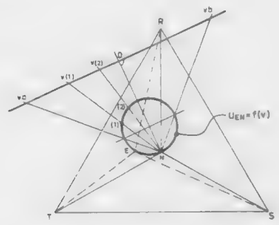
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4,729,052

SUPERVISORY SYSTEM FOR IMPEDANCE-EARTHED POWER SYSTEMS

Klaus Winter, 12, Kantelevägen, S-196 35 Kungsängen, Sweden

PCT No. PCT/SE85/00458, § 371 Date Jul. 14, 1986, § 102(e) Date Jul. 14, 1986, PCT Pub. No. WO86/03350, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 15, 1985, Ser. No. 887,110
Int. Cl.⁴ H02H *9/08*
U.S. Cl. 361—42 **3 Claims**



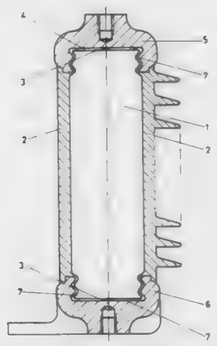
1. A device for supervision of attenuation (d), dissymmetry (k) and mismatch (v) parameters in a non-directly earthed power system, comprising:
   (a) means for continuously measuring a neutral voltage and a reference voltage in order to define the relative neutral displacement (uEN) with respect to amplitude and phase;
   (b) means for switching in regular intervals or because of a change in the value of the relative neutral displacement a reactance complement between system neutral and earth; and
   (c) means for calculating a circle diagram uEN=f(v) representing the relative neutral voltage as a function of the degree of mismatch using the values for uEN before and after switching of the reactance complement and for calculating the associated values for the d, k and v parameters from the circle diagram.

4,729,053

PROCESS FOR THE PRODUCTION OF A LIGHTNING ARRESTER AND PRODUCTS PRODUCED THEREBY

Günther Maier, Wettingen; Joseph Mosele, Biberist, and Roger Perkins, Baden-Rütihof, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 16, 1985, Ser. No. 809,339
Claims priority, application Switzerland, Feb. 7, 1985, 551/85
Int. Cl.⁴ H02H *1/04*
U.S. Cl. 361—118 **5 Claims**



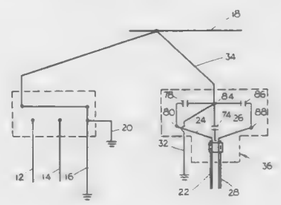
1. In a lightning arrester including an active resistor core made of a voltage-dependent resistance material based on ZnO, an insulator jacket, and terminal fittings serving as electrodes for electrical connections, the improvement comprising the active resistor core being a single, compact, monolithic workpiece having a substantially cylindrical shape with a height to diameter ratio greater than one and having a total of only two contact areas at its opposite ends, said ends each including at least one annular groove for improving adhesion with respect to adjacent electrodes.

4,729,054

LOW VOLTAGE BURIED WIRE ISOLATOR

Robert M. Freshman, Jr., 1111 Terrace, Nebraska City, Nebr. 68410

Continuation-in-part of Ser. No. 612,635, May 21, 1984, Pat. No. 4,603,369. This application Jun. 30, 1986, Ser. No. 880,277
Int. Cl.⁴ H02H *1/04*
U.S. Cl. 361—119 **2 Claims**



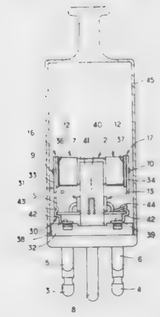
1. A protector unit for a buried cable including a metal grounding sheath surrounding at least two conductive wires, comprising,
   a housing having an electrically conductive attachment means which is electrically connected to the metal grounding sheath,
   a first voltage protector means in said housing and having an input side and a discharge side and esigned to normally prevent the flow of electrical current therethrough which is below a predetermined value,
   a ground terminal in operative electrical contact with said input side of said first protector means, said ground terminal being connected to a grounding circuit,
   the discharge side of said first voltage protector means being electrically connected to said attachment means,
   a first circuit protector means in said housing and hving an input side and a discharge side, the input side of said first circuit protector means being operatively electrically connected to one of said conductive wires and being designed to provide at least a momentary path to said ground terminal and the grounding circuit when a power surge is experienced in said one conductive wire,
   and a second circuit protector means in said housing and having an input side and a discharge side, the input side of said second circuit protector means being operatively electrically connected to the other of said conductive wires and being designed to provide at least a momentary path to said ground terminal and the grounding circuit when a power surge is experienced in said other conductive wire.

4,729,055

SURGE PROTECTION ELEMENT FOR TELEPHONE LINES, OR DATA TRANSMISSION LINES OR THE LIKE

Michel Dorival, Orsay, and Christian Macands, Issy les Moulineaux, both of France, assignors to Compagnie Industrielle de Tubes et Lampes Electriques Citel, Issy les Moulineaux, France

Filed Jun. 12, 1987, Ser. No. 61,301
Claims priority, application France, Jun. 18, 1986, 86 08786
Int. Cl.⁴ H02H *9/00*
U.S. Cl. 361—119 **17 Claims**



1. In a surge protection element for telephone lines or data transmission lines of the like, comprising:
   (a) an inert gas filled protective device having first and second electrodes connected between first and second line input terminals;
   (b) means connecting said first and second line input terminals to respective branch terminals of an installation to be protected;
   (c) initial protection means having first and second terminals adapted to be connected between said terminals of the installation to be protected; and
   (d) decoupling means connected in series between said first and second line input terminals of said gas-filled protective device and said first and second terminals of the initial protection means;
   wherein said protective device is formed by cartridge means comprising (i) an external shell adapted to be earthed, and (ii) two electrodes, said protection element further comprising a cradle mounted on a base provided with pins, said cradle comprising two lateral tongues to provide electrical connection between said first electrode of the protective device and a said pin;
   the improvement comprising:
   (e) laminar substrate means carrying said decoupling means and said initial protection means, said laminar substrate means being positioned between said lateral tongues.

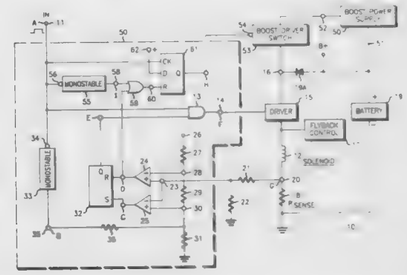
4,729,056

SOLENOID DRIVER CONTROL CIRCUIT WITH INITIAL BOOST VOLTAGE

Arthur J. Edwards, Hoffman Estates, Ill., and Randall C. Gray, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1986, Ser. No. 914,702
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—153 **21 Claims**

1. A solenoid driver control circuit comprising:
   a control signal input terminal for receiving a control signal;
   current sense means for providing a current sense signal indicative of current flowing through a solenoid;
   solenoid driver means having a first operable state such that current can flow through said solenoid from a power source terminal and a second operable state such that current effectively cannot flow from said power source terminal through said solenoid;
   threshold comparator means for comparing at least one received reference threshold input signal with said current sense signal and for providing an output signal in response thereto to control said solenoid driver means and implement at least maximum limits for said solenoid current;
   pull-in current means for responding to said control signal by initially providing, for an initial pull-in period of time, at least a predetermined maximum first reference threshold to said comparator means corresponding to a maximum current limit for said solenoid current during said pull-in period of time;
   holding current means for providing, for a hold time after said pull-in period of time, at least a predetermined maximum second reference threshold to said comparator



   means corresponding to a maximum current limit for said solenoid current during said hold time, said hold maximum current limit being lower than said pull-in maximum current limit;
   battery circuit means for connection between a battery and said power source terminal to selectively provide a nominal voltage at said power source terminal; and
   boost means coupled to said power source terminal to selectively provide a boost voltage substantially in excess of said nominal voltage at said power source terminal;
   wherein the improvement comprises boost control means coupled to said boost means and said threshold comparator means for providing said boost voltage to said power source terminal during said pull-in period until said pull-in maximum current limit occurs, said nominal voltage then being provided to said power source terminal during a remaining portion of said pull-in time.

4,729,057

STATIC CHARGE CONTROL DEVICE WITH ELECTROSTATIC FOCUSING ARRANGEMENT

Michael E. Halleck, Longmont, Colo., assignor to Westward Electronics, Inc., Aurora, Colo.

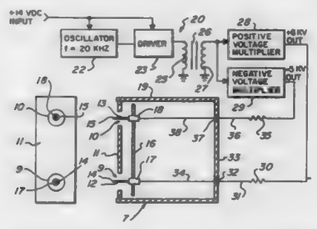
Filed Jul. 10, 1986, Ser. No. 884,011
Int. Cl.⁴ H05F *3/06*
U.S. Cl. 361—213 **19 Claims**

1. A static charge control device, comprising:
   mounting means;
   selectively chargeable electrostatic focusing means positioned forwardly of said mounting means with said electrostatic focusing means having a first opening formed by first wall means and a second opening formed by second wall means spaced form said first wall means, said first wall means being chargeable to a positive polarity and said second wall means being chargeable to a negative polarity;
   first and second electrode means mounted on said mounting means with said first and second electrodes being spaced from one another a distance such that said first electrode

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extends through and beyond said first opening in said electrostatic focusing means and said second electrode extends through and beyond said second opening in said electrostatic focusing means; and

voltage means for providing a positive voltage to said first electrode means and a negative voltage to said second electrode means so that positive ions are produced at said first electrode means and negative ions are produced at



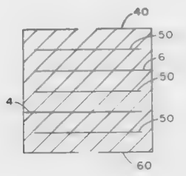
said second electrode means with said ions charging said first and second wall means of said focusing means adjacent to said electrode means to said positive and negative polarities, respectively, so that ions thereat are focused by said selectively chargeable electrostatic focusing means and separately directed away from each of said electrode means toward a neutralizing area for neutralizing of static charges thereat.

4,729,058

SELF-LIMITING CAPACITOR FORMED USING A PLURALITY OF THIN FILM SEMICONDUCTOR CERAMIC LAYERS

Tapan K. Gupta, Monroeville, and William D. Straub, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 11, 1986, Ser. No. 940,348
Int. Cl.[4] H01G *4/10, 7/00*
U.S. Cl. 361—321 **28 Claims**



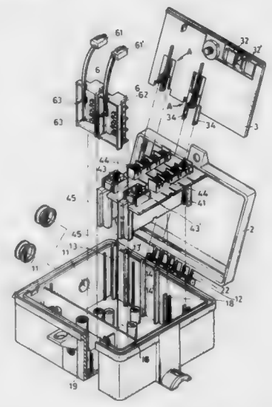
1. A self-limiting ceramic capacitor having high capacitance and transient voltage protective properties, the capacitor comprising a plurality of thin film layers of semiconducting ceramic characterized by grain boundary equivalent circuitry, the ceramic having non-linear resistance characteristics and sintered together to form a laminated stack; the thin layers having a conductive coating on at least one surface thereof, some of the conductive coatings extending to a first edge of said stack and the remainder having the conductive coating extending to a second edge; conductive material on said first edge of said laminated stack of thin film ceramic layers and in electrical communication with a portion of the conductive coating extending to said first edge to provide a first connected electrode; and conductive material on said second edge of said plurality of layers and in electrical communication with a portion of the conductive coating extending to said second edge to provide a second connected electrode, said electrode and thin layers of ceramic in combination providing said self-limiting capacitor.

4,729,059

TELEPHONE CONNECTION BOX

Chen H. Wang, 4th Fl., 66, Fu-Hsing N. Road, Taipei, Taiwan

Filed Aug. 14, 1986, Ser. No. 896,333
Int. Cl.[4] H01R *4/66*
U.S. Cl. 361—356 **3 Claims**



1. A telephone connection box comprising:

a box frame having an outer lid hingedly connected thereto, sidewalls and a bottom wall, seal means surrounding the upper edge of said frame for sealing the connection between the lid and frame when the lid is in a closed position;

an inner lid disposed within said frame and slidably and pivotally mounted at an edge thereof to the upper portion of a side wall, said inner lid adapted to pivot from a closed position about 180° to an open position;

a divider wall extending across the interior of said frame and disposed so that when the inner lid is in a closed position an edge thereof seats on the upper surface of said wall;

at least one inverted L-shaped connection based slidably mounted within said box on one side of said wall;

at least one minor connection base slidably mounted within said box on an opposite side of said wall; and

at least one surge protector mounted within said box and coupled between said L-shaped connection base and said minor connection base.

4,729,060

COOLING SYSTEM FOR ELECTRONIC CIRCUIT DEVICE

Haruhiko Yamamoto, Yokohama; Masaaki Sakai, Tokyo; Yoshiaki Udagawa, Tokyo; Kouji Katsuyama, Yokohama, and Mitsuhiko Nakata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 25, 1985, Ser. No. 695,142
Claims priority, application Japan, Jan. 26, 1984, 59-013004
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—385 **32 Claims**

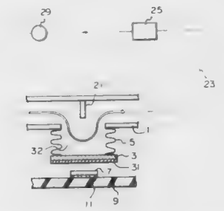
1. A cooling system used with a printed circuit board having at least one solid state electronic circuit component, said cooling system comprising:

a cooling header having a passage through which a supply of coolant flows;

a first heat transfer means operatively connected to said cooling header such that at least part of said first heat transfer means is exposed to the flow of the coolant, and

such that heat may be transferred from said first heat transfer means to the coolant;

an elastic, compliance means, disposed between said first heat transfer means and the electronic circuit component, and establishing an elastic, compliant contact between said



first heat transfer means and the electronic circuit component; and

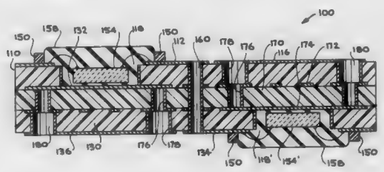
an elastic means, connected to said first heat transfer means and said cooling header, and biasing said first heat transfer means against the circuit component through said compliance means.

4,729,061

CHIP ON BOARD PACKAGE FOR INTEGRATED CIRCUIT DEVICES USING PRINTED CIRCUIT BOARDS AND MEANS FOR CONVEYING THE HEAT TO THE OPPOSITE SIDE OF THE PACKAGE FROM THE CHIP MOUNTING SIDE TO PERMIT THE HEAT TO DISSIPATE THEREFROM

Candice H. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 728,053, Apr. 29, 1985, Pat. No. 4,640,010.
This application May 23, 1986, Ser. No. 866,528
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **8 Claims**



1. An improved PC board package containing at least one integrated circuit die mounted therein comprising:

(a) a plurality of PC board laminates bonded together to form a composite;

(b) at least one cavity, having said integrated circuit die mounted therein, formed in at least a first of said plurality of PC board laminates on one surface of said package; said cavity further comprising:

(1) a metal bottom wall formed from the metal surface of a second PC board laminate adjacent said first PC board laminate and bonded to said first PC board laminate; and

(2) cavity walls plated to seal off portions of the sidewall of said first PC board laminate exposed by formation of said cavity therein to thereby prevent subsequent outgassing; and

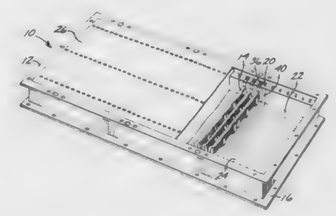
(c) heat tubes comprising metal plated holes formed in said second PC board laminate adjacent said first PC board laminate having said cavity formed therein and in thermal communication with the metallic bottom surface of said cavity to conduct from said cavity heat generated by said integrated circuit die mounted therein.

4,729,062

REWORKABLE ENCAPSULATED ELECTRONIC ASSEMBLY

Edward A. Anderson, Yorba Linda; Ernesto S. Sandi, Montebello, and Gerald H. Agnitsch, Gardena, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 16, 1986, Ser. No. 874,969
Int. Cl.[4] H05K *5/00*
U.S. Cl. 361—399 **17 Claims**



1. An electronic assembly, comprising:

a frame;

at least one electronic subassembly removably inserted into said frame;

a foam within the space defined by said frame and encapsulating said subassembly;

a release agent interposed between said subassembly and said frame; and

subassembly extraction means attached to said subassembly for extracting said subassembly.

14. A method of removing an electronic subassembly from an electronic assembly, comprising the steps of:

obtaining an electronic assembly having

a frame, at least one electronic subassembly inserted into said frame,

encapsulating means positioned between said subassembly and the frame and joining said subassembly to the frame, thus hampering the removal of the subassembly from the frame, and

a release agent interposed between the subassembly and the frame;

extracting the subassembly from the frame, whereupon the release agent allows the subassembly to be parted from and removed from the frame.

4,729,063

PLASTIC MOLDED SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH NAIL SECTION

Ryuichi Matsuo; Masahide Kaneko, and Hirokazu Harima, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,279
Claims priority, application Japan, Feb. 22, 1985, 60-34888
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 **3 Claims**

1. A plastic molded semiconductor integrated circuit device, comprising:

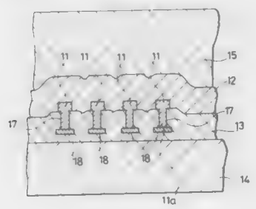
a semiconductor substrate in which circuit elements are fabricated;

metal wirings for transmitting a power supply voltage or signals of internal circuits, said metal wirings being provided on the semiconductor substrate via an insulating film;

a plurality of apertures formed at portions of the insulating film directly below said metal wirings; and

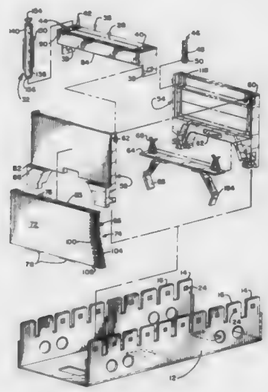
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a nail section formed integrally with said metal wiring in said plurality of apertures, wherein said nail section is electri-



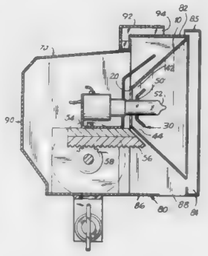
cally independent from any of the circuit elements or the other metal wirings.

4,729,064
MODULAR INTERCONNECT BLOCK WITH PROTECTOR STRUCTURE
Loren A. Singer, Jr., Minneapolis, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.
Filed Mar. 4, 1985, Ser. No. 707,610
Int. Cl.⁴ H01R *9/00*
U.S. Cl. 361—426 **23 Claims**



1. A distribution frame module, comprising:
(a) a generally rectangular module block having a front face with a plurality of first apertures and a plurality of second apertures in close proximity to each of the first apertures and a plurality of third apertures which are in open communication with said first apertures;
(b) a plurality of wire connectors mounted in recessed position in the second apertures, said connectors each having a wire terminating end and a spring contact finger end, the spring contact finger end including a spring contact finger; and
(c) an overload protector element having an external contact, the element being mounted in recessed position in one of the first apertures with said external contact extending into a recessed position in one of the third apertures to contact at least one of said spring contact fingers also extending into the recessed position in said one of the third apertures.

4,729,065
PHOTOGRAPHY LIGHT
Volker W. Bahnemann, Greenwich, Conn., and Stanislaw Loth, Nanuet, N.Y., assignors to Arriflex Corporation, Blauvelt, N.Y.
Filed Apr. 24, 1987, Ser. No. 42,307
Int. Cl.⁴ G03B *15/02*; F21V *7/00, 19/02*
U.S. Cl. 362—18 **10 Claims**

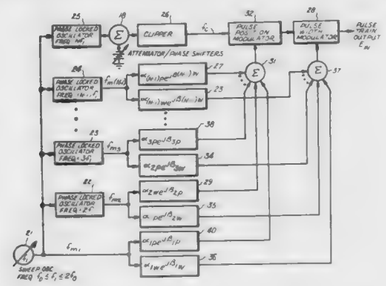


1. A photography light comprising:
(a) a main reflector having an upper surface, a lower surface, and two side surfaces, said surfaces being made reflective on an inner portion of said main reflector, said main reflector also being formed with an opening in a rear portion thereof;
(b) a secondary reflector also having an upper surface, a lower surface, and two side surfaces, said secondary reflector further having a rear surface having aperture means formed therein, said surfaces being made reflective on an inner portion of said secondary reflector, said secondary reflector being positioned within and spaced from said opening in said main reflector such that said aperture means in said secondary reflector overlies said opening and the surfaces of said secondary reflector form light compensating channels with the respective surfaces of said main reflector;
(c) illuminating means positionable within said aperture means for illuminating a photographing field, said illuminating means being elongated along an axis of said aperture means; and
(d) means for positioning said illuminating means along said axis of said aperture means in a first position, in which said illuminating means is fully inserted in said aperture means and all the illumination therefrom is available for illuminating said photographing field, and in a second position, in which said illuminating means is fully retracted from said aperture means and only a portion of the illumination therefrom passes through said aperture means and said light compensating channels, a remaining portion of said illumination being blocked by a back surface of said main and secondary reflectors.

4,729,066
METHOD AND APPARATUS FOR THE GENERATION AND TRANSMISSION OF SIGNALS FOR ECHO LOCATION AND OTHER SIGNALING PURPOSES, PARTICULARLY IN GEOPHYSICAL EXPLORATION
David E. Nelson, and David M. Berg, both of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.
Filed Dec. 24, 1984, Ser. No. 685,816
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 367—23 **22 Claims**

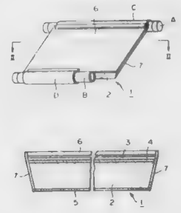
1. The method, for echo location, seismic exploration and seismic signalling, in which transmissions from a single source of seismic energy are in the form of pulses which change in amplitude from a first to a second level and which sweep in frequency, which transmissions have a spectrum extending over a frequency range greater than that of said sweep, which

method comprises the steps of generating a carrier train of pulses having spectral components which sweep in frequency



over a range ending at a frequency at least as high as the highest frequency in said spectrum, and pulse time modulating said carrier pulses to shape said spectrum.

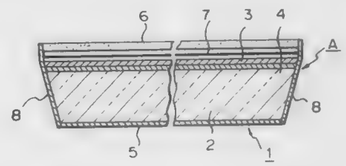
4,729,067
LIGHT DIFFUSING DEVICE
Makoto Obe, Tokyo, Japan, assignor to Mitsubishi Rayon Company Ltd., Tokyo, Japan
Filed Sep. 26, 1986, Ser. No. 912,005
Int. Cl.⁴ H02B *1/08*
U.S. Cl. 362—26 **5 Claims**

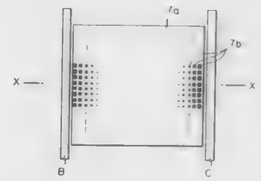


1. A light diffusing device comprising:
(A) a base plate comprising (a) a transparent light transmitting layer, (b) a light diffusing layer formed on a front surface of the transparent light transmitting layer, and (c) an intermediate layer formed between the transparent light transmitting layer and the light diffusing layer and having a light transmitting property and a light diffusing property respectively at intermediate intensities between those of the transparent light transmitting layer and the light diffusing layer, which base plate has at least one light incident edge face thereof;
(B) a light reflecting surface layer formed on a rear surface of the transparent light transmitting layer; and
(C) a light diffusing plate arranged on and in the vicinity of the light diffusing layer but not in contact with the light diffusing layer.

4,729,068
LIGHT DIFFUSING DEVICE
Makoto Obe, Tokyo, Japan, assignor to Mitsubishi Rayon Company Ltd., Tokyo, Japan
Filed Oct. 10, 1986, Ser. No. 917,533
Int. Cl.⁴ F21V *7/04*; G02B *26/02*
U.S. Cl. 362—31 **7 Claims**

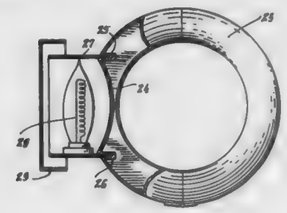
1. A light diffusing device comprising (1) a light source member and (2) a light diffusing member which comprises (A) a base plate comprising (a) a transparent light transmitting layer having at least one light incident edge face thereof facing the light source member, (b) a light diffusing layer formed on a front surface of the transparent light transmitting layer, (c) an intermediate layer formed between the transparent light transmitting layer and the light diffusing layer and (d) a light reflecting surface layer formed on a rear surface of the transparent light transmitting layer; (B) a light diffusing plate superimposed over the base plate; and (C) a light reflecting film located between the light diffusing layer in the base plate and the light





diffusion plate without being in contact therewith, and consisting of a transparent film substrate and light reflecting spots formed thereon in a pattern effective for reflecting portions of light irradiated from the light diffusing layer in such a manner that the amount of the light reflected by the light reflecting film decreases with an increase in distance from the light incident edge face, and thus the quantity of the light transmitted from the base plate to the light diffusing plate through the light reflecting film is evenly distributed.

4,729,069
LIGHT-CONDUCTIVE DEVICE FOR ILLUMINATING CENTRIPETALLY VIEWED THREE-DIMENSIONAL OBJECTS
Henry Von Kohorn, 945 Treasure Lane, Vero Beach, Fla. 37963 and David Von Kohorn, 1926 Menalto Ave., Menlo Park, Calif. 94025
Division of Ser. No. 660,906, Oct. 15, 1984, Pat. No. 4,630,177. This application Dec. 11, 1986, Ser. No. 940,587
Int. Cl.⁴ F21V *7/04*
U.S. Cl. 362—32 **5 Claims**

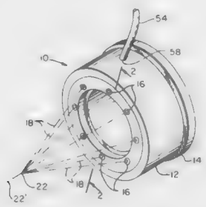


1. Illuminating device for a three-dimensional object to be centripetally viewed, comprising

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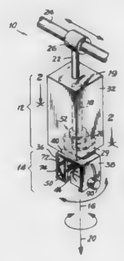
a. a structure
  i. having a light-conductive wall member adapted to substantially encircle the object to be illuminated along one axis of said object, said wall member having openings along said axis at opposite ends of said wall member and a light-emitting surface facing said object,
  ii. having light-reflective means provided on surfaces of said wall member, but not on said light-emitting surface, so as to reflect light back into said wall member,
  said structure further being characterized by
  iii. an optical interface on an outward facing surface of said wall member,
b. a light chamber
  i. comprising a housing adapted to being adhered to said structure and having an opening facing said optical interface, and
  ii. comprising an artificial light source adapted to transmit light through said opening and optical interface into said light-conductive wall member, and
c. light-shielding means adapted to prevent light in said light chamber from being directly visible, but permitting said light to issue from said light chamber through said opening and optical interface into said wall member and to issue through said light-emitting surface in the direction of the object to be illuminated.

4,729,070
ADJUSTABLE RING LIGHT
David Chiu, 33 Roslyn Ct., Port Jefferson, N.Y. 11777
Filed May 12, 1986, Ser. No. 862,320
Int. Cl.[4] F21V *13/00*
U.S. Cl. 362—33 **11 Claims**



1. Adjustable illuminating apparatus for concentrating multiple beams of light at a predetermined point comprising:
a. housing means having a plurality of annularly arranged spaced openings;
b. means within said housing means for supporting a source of a light beam at each of said openings;
c. means for biasing each of said supporting means to direct the light from each source out through said openings to converge;
d. adjusting means on said housing means to contact said supporting means and overcome said biasing means to pivot each of said supporting means thereby to alter selectively along an axis the region at which the beams of light from said sources converge; and
e. said biasing means comprising disk means having radially directed slots mounted within said housing means with each of said supporting means passing through one of said slots for limiting the direction of movement of said supporting means caused by said adjusting means so that the region of convergence of said light beams is adjustable along said axis.

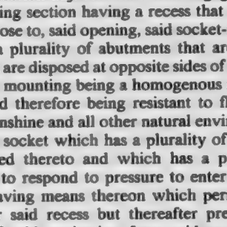
4,729,071
LOW-INERTIAL BEAM DIRECTION LIGHTING SYSTEM
Dennis Solomon, Yarmouth Port, Mass., assignor to Altman Stage Lighting Co., Yonkers, N.Y.
Filed Nov. 3, 1986, Ser. No. 926,632
Int. Cl.[4] F21V *21/30*
U.S. Cl. 362—35 **23 Claims**



1. A light display system for projecting a double-pattern light display, comprising, in combination,
a rotatably fixed first housing,
a second housing connected to and rotatable relative to said first housing about a first axis,
lamp assembly means fixedly mounted in said first housing for projecting a light beam along said first axis,
first reflector means fixedly mounted in said second housing for receiving said light beam centered along said first axis and directing said light beam in a direction away from said first axis,
first drive means connected to said first housing for rotating said second housing including said first reflector means about said first axis,
second reflector means mounted in said second housing and rotatable about a second axis transverse to said first axis, said second reflector means being for receiving said light beam from said fixed reflector means centered along said second axis and for continuously directing said light beam in a plane generally parallel to said first axis, and
second drive means connected to said second housing for rotating said rotatable reflector means about said second axis,
said second housing having a cylindrical mounting member positioned between said lamp assembly means and said fixed reflector means,
said mounting member having a cylindrical passage axially aligned with said first axis,
said lamp assembly means directing said light beam through said cylindrical passage along said first axis to said fixed reflector means,
whereby only the second housing is rotated thus minimizing inertial forces.

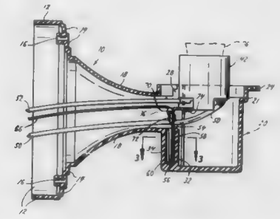
4,729,072
FRONT LIGHTING SYSTEM FOR MOTOR VEHICLE
Carlos Oroza, 10972 Granby Ct., Reston, Va. 22091
Filed Jan. 21, 1987, Ser. No. 5,870
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—80 **37 Claims**

1. In a motor vehicle, an elongate front lighting system mounted transversly across the front of the vehicle and including opposed ends generally adjacent opposed sides of the vehicle, said system comprising:
a pair of light sources mounted on said vehicle for producing light rays, means associated with said light sources for directing said light rays along generally parallel paths transverse of the motor vehicle;
mirror means mounted generally at acute angles in the paths of the generally parallel light rays for directing the light rays forwardly of the motor vehicle;
means for directing a substantial portion of the light rays downwardly forward of the motor vehicle;



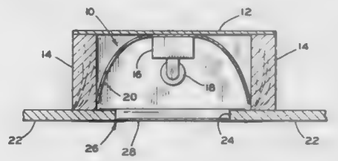
means for blocking direct transmission of the light forwardly from said light sources forwardly of the motor vehicle.

4,729,073
LAMP MOUNTING
Dale A. Klaus, St. Louis, Mo., assignor to Dal Partnership, St. Louis, Mo.
Filed Mar. 26, 1987, Ser. No. 30,342
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 **3 Claims**



1. A support for an electric lamp which comprises a mounting that has a wall-engaging section and a socket-receiving section and an opening which is between, and which communicates with, said sections, said wall-engaging section having a generally flat wall-engaging surface which is remote from said opening, said wall-engaging section being hollow and having a small cross section adjacent said opening and having a much larger cross section adjacent said wall-engaging surface, said socket-receiving section having a recess that is out of register with, but is close to, said opening, said socket-receiving section also having a plurality of abutments that are out of register with, but that are disposed at opposite sides of and close to, said opening, said mounting being a homogenous molding of polycarbonate and therefore being resistant to flame, heat, cold, water, ice, sunshine and all other natural environmental conditions, a lamp socket which has a plurality of flexible conductors connected thereto and which has a projection that is dimensioned to respond to pressure to enter said recess, said projection having means thereon which permits said projection to enter said recess but thereafter prevents accidental separation of said projection from said recess and thereby prevents accidental separation of said lamp socket from said mounting, said recess and said projection coacting to hold said lamp socket in register with said opening and to force one side of said lamp socket into engagement with said abutments, the force which holds said one side of said lamp socket in engagement with said abutments being large enough to hold said one side of said lamp socket against accidental separation from said abutments but being far too small to bend either of said abutments, said wall-engaging surface being directly engageable with a wall rather than with a metal mounting pan securable to said wall, said flexible conductors passing through said socket-receiving section and said opening and said wall-engaging section to be securable to power-supplying conductors which are largely located within said wall, and said projection and recess and abutments constituting the sole support for said lamp socket to limit the forces which can be developed between said lamp socket and said abutments to values that are far too small to cause bending of said abutments.

4,729,074
CEILING FRAME FOR A LIGHTING FIXTURE
Earl J. Steadman, P.O. Box 13, Toledo, Ohio 43692
Filed Dec. 11, 1986, Ser. No. 940,570
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—148 **20 Claims**



1. A ceiling frame for a lighting fixture, a ceiling panel being of plasterboard or the like of predetermined thickness with a rectangular opening formed therein and the lighting fixture being suitably mounted above said opening, said ceiling frame comprising two side frame members to be located along the side edges of said opening and two end frame members to be located along end edges of said openig, each of said end frame members having a first vertical flange extending substantially the length of the associated end edge of the opening and having a width about the same as the thickness of the ceiling panels, each of said end frame members further having a first wide horizontal flange at the lower edge of said vertical flange and adapted to extend out over a lower surface of the ceiling panel adjacent the associated end edge of said opening, said horizontal flange having a multiplicity of holes therein for receiving joint compound or the like for holding said horizontal flange against the lower surface of the ceiling panel, each of said side frame members having a second vertical flange extending substantially the length of the corresponding side edge of the opening and having a width about the same as the thickness of the ceiling panel, each of said side frame members further having a second wide horizontal flange structurally integral with a lower edge of said second vertical flange and adapted to extend out over the lower surface of the ceiling panel adjacent the associated side edge of said opening, said second horizontal flange having a multiplicity of holes therein for receiving joint compound or the like for holding said second horizontal flange against the lower surface of the ceiling panel, said end frame members and said side frame members having fastener openings formed therein, and fasteners extending through said fastener openings and through the ceiling panel for holding said horizontal flanges against the lower surface of the ceiling panel.

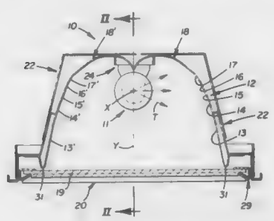
4,729,075
CONSTANT ZONE REFLECTOR FOR LUMINAIRES AND METHOD
John R. Brass, 566 Woodbine Dr., San Rafael, Calif. 94903
Filed May 29, 1985, Ser. No. 738,869
Int. Cl.[4] F21S *3/00*
U.S. Cl. 362—217 **30 Claims**

1. A luminaire of the direct lighting type for providing constant zone reflection of light comprising
light source means, having a horizontally disposed longitudinal axis, for emitting a torodial light pattern, said light

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source means being bisected by an imaginary vertical plane intersecting said axis, and

a reflector assembly including a plurality of reflector means mounted in spaced relationship from the axis of said light source means on at least one lateral side of said vertical plane and extending in parallel relationship relative to the axis of said light source means for receiving and reflecting said torodial light pattern within parallel light distribution zones, said reflector means comprising a plurality of contiguous facets each being flat and having a highly specular light reflecting surface at least generally facing said light



source means, a lowermost first facet of said facets being disposed at a first acute angle relative to said plane, a first image created by said first facet being defined by a pair of first and second rays intersecting on a backside of said first facet and being tangential to opposite sides of said first image, said first and second rays further intersecting upper and lower extremities of said first facet and the center of said first image being positioned on the backside of said facets at a distance from an extended flat plane containing said first facet that is equal to the distance from said flat plane to the axis of said light source means.

4,729,076

SIGNAL LIGHT UNIT HAVING HEAT DISSIPATING FUNCTION

Tsuzawa Masami, 14-15 Minamitsukushino 4-chome, Machida-shi, Tokyo; Tominaga Muneharu, 2-47-102, Shiohama 4-chome, Ichikawa-shi, Chiba; Uchiyama Yoshinori, 16-22 Tsurukawa, 3-chome, Machida-shi, Tokyo; Waki Osamu, 1-18, Kitano 1-chome, Mitaka-shi, Tokyo; Kato Hiroshi, 3447, Fukaya, Ayase-shi, Kanagawa, and Morikawa Tadahiro, 1184-2, Diagiri, Fujisawa-shi, Kanagawa, all of Japan

PCT No. PCT/JP84/00548, § 371 Date Sep. 15, 1986, § 102(e) Date Sep. 15, 1986, PCT Pub. No. WO86/02985, PCT Pub. Date May 22, 1986

PCT Filed Nov. 15, 1984, Ser. No. 908,702

Int. Cl.⁴ F21V *29/00*

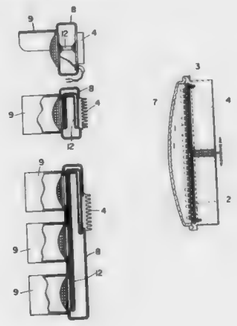
U.S. Cl. 362—235 **1 Claim**

1. A signal light box unit having a heat dissipating function which comprises

(A) a circuit board;

(B) plural LEDs arrayed upon a front face of the circuit board;

(C) a finned heat sink disposed upon an outside rear surface of the light box, said heat sink being indirectly connected to the back face of the board;



(D) a heat absorber, interposed between the said heat sink and back face of said board.

4,729,077

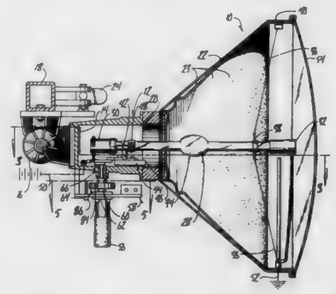
VARIABLE BEAM WIDTH LIGHTING DEVICE

Myron K. Gordin, and James L. Drost, both of Oskaloosa, Iowa, assignors to Mycro Group Co., Oskaloosa, Iowa

Filed Mar. 10, 1986, Ser. No. 837,751

Int. Cl.⁴ F21V *7/22;* **F21P** *3/00*

U.S. Cl. 362—285 **19 Claims**



1. In a luminaire assembly for high power, high intensity lighting applications, comprising a luminaire fixture to which are operatively mounted a reflector having, an innermost center portion and an outermost peripheral portion, and a high power, high intensity lamp, and to which is operatively supplied electrical power to produce a light beam, the improvement comprising:

an adjustable lamp positioning means mounted between said luminaire fixture and said lamp and being responsive to a power means to move said lamp relative to said reflector to vary the width of said light beam between a narrow beam and a wide beam according to choice; and

variable reflector surface light dispersing means associated with the reflector to present a reflecting surface which is generally specular at the innermost center portion but becomes gradually increasingly less specular and more light dispersing towards the outermost peripheral portion of the reflector to produce smooth and complete transition of the light beam when the lamp is moved relative to the reflector.

4,729,078

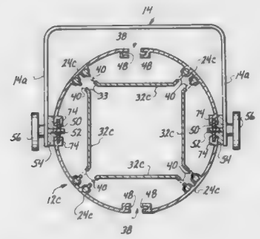
EXTRUDED LAMP HOUSINGS

Maer Skegin, 1411 N. Poinsettia Pl. #206, Los Angeles, Calif. 90046

Filed Apr. 27, 1987, Ser. No. 42,683

Int. Cl.⁴ F21V *29/00*

U.S. Cl. 362—294 **16 Claims**



10. A lamp housing comprising:

plurality of outer channel sections;

internal light baffle means arranged between said outer channel sections;

interlocking means on said outer sections and said baffle means for assembling said channel sections in mutually parallel spaced apart relationship forming a tubular structure with longitudinal ventilation slots between said channel sections; and

apertures in said baffle means defining with said ventilation slots an air flow path through said tubular structure, said apertures being offset in relation to said ventilation slots so as to contain stray light emitted by a lamp mounted to one end of said tubular structure.

4,729,079

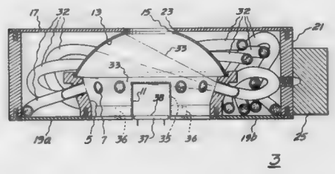
ILLUMINATOR FOR VISUAL INSPECTION OF CURVED SPECULAR SURFACES

Donald H. Maylotte, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,652

Int. Cl.⁴ F21V *7/00*

U.S. Cl. 362—350 **1 Claim**



1. An illuminator for use in visual inspection systems for providing high contrast lighting of an object having curved surfaces to be inspected, said illuminator comprising:

a spherical reflector with a light diffusing coating on the interior walls, said reflector defining an aperture situated along an axis perpendicular to the plane passing through the largest circle of the spherical reflector, the axis passing through the center of the largest circle; and

means for uniformly illuminating the interior walls of the reflector, so that the object having curved surfaces to be inspected, positioned approximately in the center of a sphere of which the reflector is a part, can be illuminated by reflected light from the reflector wall, which then can be reflected from the curved surface to be inspected through the aperture.

4,729,080

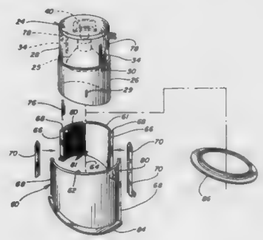
SLOPED CEILING RECESSED LIGHT FIXTURE

Robert S. Fremont, Deerfield, and Joseph B. Stauner, Crystal Lake, both of Ill., assignors to Juno Lighting, Inc., Des Plaines, Ill.

Filed Jan. 29, 1987, Ser. No. 8,270

Int. Cl.⁴ F21V *17/00*

U.S. Cl. 362—366 **24 Claims**



1. A lighting fixture for recessed mounting in a sloped ceiling which has a downwardly facing ceiling surface and which defines an opening, said fixture comprising:

lamp housing means for receiving a lamp and adapted to be supported from said ceiling, said lamp housing means defining a bottom opening;

a baffle at said lamp housing means bottom opening, said baffle including means for absorbing or blocking incident light, said baffle having a generally cylindrical internal configuration relative to a longitudinal axis of said baffle, said baffle having an upper open end and a lower open end, said lower open end being defined by a plane at an oblique angle relative to said baffle longitudinal axis to provide an elliptical aperture which may be disposed parallel to the plane of the sloped ceiling when said fixture is mounted in the sloped ceiling, said baffle lower open end extending at least to the plane of said ceiling surface about the periphery of the baffle whereby the light transmitted from said lamp is baffled at least to the plane of said ceiling surface; and

an elliptical trim ring having an elliptical inner margin around said baffle lower open end, said trim ring being positioned with its inner margin set radially outwardly of the opening in said baffle lower open end but with said trim ring extending from the periphery of said baffle over a portion of said ceiling surface around said ceiling opening for covering the portion of the ceiling opening between the baffle and the ceiling while exposing the baffle lower open end to view from beneath the ceiling and while being shielded by said baffle from direct transmission of light from said lamp to prevent reflected glare off of said trim ring.

4,729,081

POWER-FACTOR-CORRECTED AC/DC CONVERTER

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Dec. 1, 1986, Ser. No. 936,455

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—17 **23 Claims**

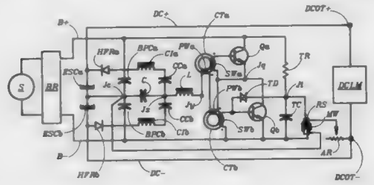
1. The combination comprising:

first means operable to connect with a relatively low frequency voltage, such as the voltage on an ordinary electric utility power line and, when so connected, conditionally operative to provide a relatively high frequency AC voltage at an AC output, the first means having control means operative, during any period when receiving a

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control action, to prevent the first means from providing the relatively high frequency AC voltage;

second means connected in circuit between the AC output and a DC output, the second means being operative to provide a unidirectional current to an energy-storing



capacitor means connected with the DC output, a DC voltage being thereby provided at this DC output; and

third means connected between the DC output and the control means and operative to provide said control action whenever the magnitude of the DC voltage exceeds a predetermined level.

4,729,082

CONTROL DEVICE FOR POWER CONVERTER

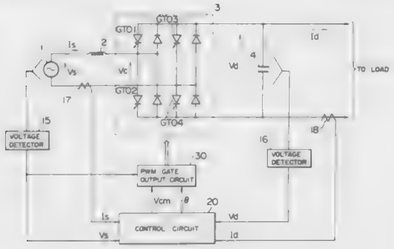
Hirokazu Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1986, Ser. No. 933,041

Claims priority, application Japan, Nov. 21, 1985, 60-262190; Nov. 21, 1985, 60-262191; Nov. 21, 1985, 60-262192

Int. Cl.[4] H02M *1/12*

U.S. Cl. 363—41 **6 Claims**



1. A control device for a power converter of the type in which an AC side thereof is connected through a reactor to an AC power supply while a DC side thereof is connected to a smoothing capacitor and a load, whereby power rectification and power inversion is carried out by pulse width modulation control in a bi-directional manner, said control device comprising: a control circuit responsive to a voltage signal of said AC power supply, a current signal flowing through said reactor, a current signal flowing through said load, a voltage signal on the DC side of said converter and a setpoint voltage signal for generating an amplitude value signal of the voltage on the AC side of said power converter and a phase difference signal for said AC power supply voltage so that the voltage across said smoothing capacitor coincides with said setpoint voltage and the current flowing through said reactor and said AC power supply voltage have a predetermined phase relationship, whereby the pulse width modulation control of said power converter is performed in response to said amplitude value signal and said phase difference signal derived from the control circuit.

4,729,083

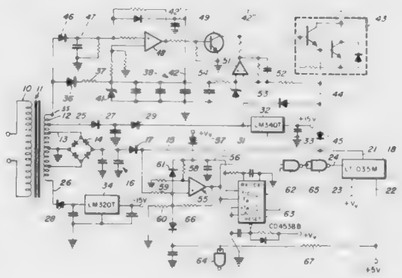
D.C. POWER SUPPLY WITH IMPROVED TRANSPARENCY TO POWER INTERRUPTS

Constantinos S. Kyriakos, Deerfield, Fla., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 17, 1986, Ser. No. 908,441

Int. Cl.[4] H02H *7/125*

U.S. Cl. 363—53 **2 Claims**



1. A d.c. power supply having improved insensitivity to brief interruptions of source power comprising

an a.c. power source;

a transformer receiving power from said a.c. source; and providing at least first and second a.c. output voltages, said second a.c. output voltage being of greater magnitude than said first a.c. output voltage;

first means for rectifying said first a.c. output voltage to provide a first d.c. voltage;

second means for rectifying said second a.c. output voltage to provide a second d.c. voltage, said second d.c. voltage being of greater magnitude than said first d.c. voltage;

regulating means having an input terminal and normally receiving said first d.c. voltage at said input terminal and providing a third regulated d.c. output voltage, said third d.c. voltage being of lesser magnitude than said first d.c. voltage;

a storage capacitor normally fully charged by said second d.c. voltage;

normally non-conductive switch means for connecting said storage capacitor as an input to said regulating means, said switch means including:

a transistor amplifier receiving input from said storage capacitor and providing output to said input terminal of said regulating means; and

sensing means for detecting an interruption of power from said a.c. source and for controlling said switch means, said sensing means causing said switch means to conduct upon detecting of interruption of power from said source to thereby provide input to said regulating means from said storage capacitor, said sensing means comprising:

means for comparing voltage from said a.c. source with voltage from said storage capacitor for providing an output bias voltage, said bias voltage being applied to said amplifier for controlling the conduction of said amplifier, said bias voltage rendering said amplifier non-conductive so long as the voltage from said a.c. source applied to said comparing means is greater than the voltage applied thereto from said storage capacitor; and

a first source of reference voltage;

means receiving said amplifier output and said reference voltage for varying said bias voltage applied to said amplifier whereby conduction of said amplifier is controlled so that said amplifier output does not exceed reference voltage.

4,729,084

INVERTER APPARATUS

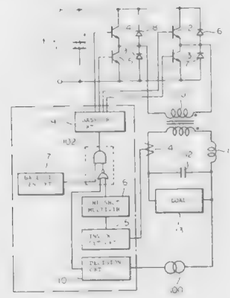
Michio Kataoka, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 13, 1987, Ser. No. 49,310

Claims priority, application Japan, May 19, 1986, 61-116356

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—56 **2 Claims**



1. In an inverter apparatus wherein an output of an inverter is fed to a load through a reactor and a capacitor for shaping a waveform, and wherein a control circuit which supplies the inverter with drive signals includes means to detect an overload of the inverter and to perform an interlock operation for interrupting delivery of the drive signals during the overload; an inverter apparatus characterized by monitoring a terminal voltage of said capacitor, and releasing the interlock operation on condition that the terminal voltage does not exceed a predetermined level.

4,729,085

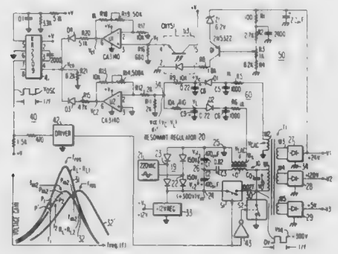
FREQUENCY LIMITED RESONANT REGULATOR USEFUL IN, FOR EXAMPLE, A HALF-BRIDGE INVERTER

Walter Truskalo, Titusville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1986, Ser. No. 946,867

Int. Cl.[4] H02M *3/315*

U.S. Cl. 363—56 **19 Claims**



1. A resonant regulator power supply, comprising:

a source of alternating input voltage, controllable in operating frequency;

a resonant circuit coupled to and excited by said source and having associated therewith a resonance frequency, said resonant circuit including an inductive element and a capacitive element;

means coupled to said resonant circuit for generating an output supply voltage;

a control circuit coupled to said source and responsive to said output supply voltage for varying said operating frequency in a negative feedback loop to regulate said output supply voltage; and

a frequency limiting circuit coupled to said resonant circuit for preventing said operating frequency from passing through said resonance frequency, including means for developing a first sense voltage representative of an inductive voltage developed by said inductive element and means for developing a second sense voltage representative of a capacitive voltage developed by said capacitive element.

4,729,086

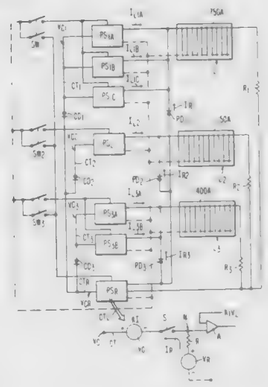
POWER SUPPLY SYSTEM WHICH SHARES CURRENT FROM A SINGLE REDUNDANT SUPPLY WITH MULTIPLE SEGMENTED LOADS

Patrice R. A. Lethellier, San Diego, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Jul. 17, 1987, Ser. No. 74,612

Int. Cl.[4] H02J *3/46*

U.S. Cl. 363—65 **11 Claims**



1. A power supply system which is comprised of:

a plurality of dedicated power supplies, each of which has a separate output terminal for furnishing output current to just one respective load;

each dedicated power supply also having a switch for turning the supply on and off independent of the remaining dedicated supplies;

a single redundant power supply which is coupled to said switches to turn on only when every dedicated supply is on;

a current output terminal on said redundant supply which is coupled in parallel through a set of unidirectional conductors to the output terminal of every dedicated power supply;

said redundant supply as well as each dedicated supply having a control circuit, with a control terminal which varies the amount of current from the output terminal of the corresponding supply in proportion to the magnitude of a control voltage on the control terminal; and

an equalizing means coupled to the control terminal of each supply for substantially equalizing the output current of just a subset of said dedicated power supplies with the output current of said redundant supply, when it is on, by equalizing their control voltage; said subset consisting of any dedicated supply which fails and those dedicated supplies whose control voltage decreases when it is equalized.

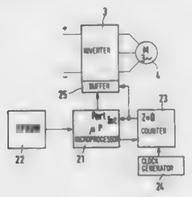
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4,729,087

INVERSION PROCESS AND APPARATUS

Walter Trümpler, Karlsruhe, and Ottokar Zimmermann, Bruchsal, both of Fed. Rep. of Germany, assignors to Sew-Eurodrive GmbH & Co., Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,235
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513584
Int. Cl.[4] H02M 5/42
U.S. Cl. 363—98 7 Claims



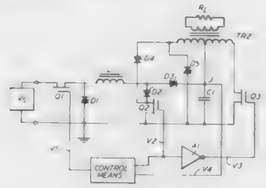
1. An inversion process, particularly as part of a frequency change in an output voltage for regulating a three-phase motor during changes in the rpm of the motor such as duration motor starting, in which square-wave voltage pulses are produced by opening and closing electronic switches, wherein repeatedly and in a desired order give combinations of switch positions and an associated number of clock intervals of unchanged switch positions are requested, the switch position combination set and the corresponding number of clock intervals is counted without changing the switch position, and wherein the duration and number of switch position combinations during a cycle of the output voltage is varied as a function of the desired rpm of the motor to change the frequency of the output voltage for said motor.

4,729,088

REGULATED HIGH FREQUENCY POWER SUPPLY

John M. Wong, Buffalo Grove, Ill., assignor to Advance Transformer Company, Chicago, Ill.

Filed May 11, 1987, Ser. No. 57,394
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—124 8 Claims



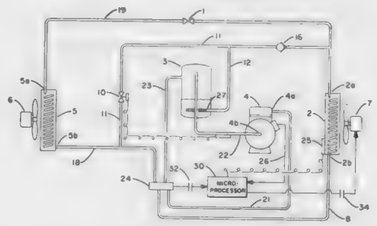
1. A power supply including an inductance and a capacitance connected in series circuit to receive current from a source thereof; a junction in said series circuit between said inductance and said capacitance; first switch means which can be turned on to enable current to flow from said source through said inductance and capacitance; second switch means which can be turned on to provide for the flow of current from said source in a path in parallel with said capacitance; control means causing said first and second switch means to be on simultaneously for predetermined periods; a transformer primary with a first and second end and a center tap, said center tap being connected to said junction; third switching means connected to provide a path for current flow from said first end of said primary when turned on; said second switching means providing a path for current flow from said second end of said primary when turned on; and said control means turning said second and third switching means on alternately.

4,729,089

TRANSIENT SUPPRESSION FOR MICROPROCESSOR CONTROLS FOR A HEAT PUMP AIR CONDITIONING SYSTEM

Ronald W. Bench, Kirkville, and Mario F. Briccetti, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,420
Int. Cl.[4] G06F 15/20; G05D 23/32
U.S. Cl. 364—184 3 Claims



1. A method for controlling the operation of a heat pump having a microprocessor control, to prevent resetting the heat pump controls to their startup condition due to transient electromagnetic noise of a switching relay which comprises the steps of:

starting power-up of the microprocessor with a program for controlling the switching relay;

loading a code into memory of the microprocessor affirming the power-up is complete;

running said program whereby the switching relay is switched whereby noise is generated and whereby said program stops and jumps to the starting power-up condition; and

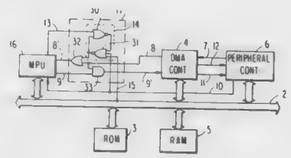
reading said code affirming the power-up was complete and having the program bypass the power-up and jump to a position at which the program was immediately before the noise causing reset.

4,729,090

DMA SYSTEM EMPLOYING PLURAL BUS REQUEST AND GRANT SIGNALS FOR IMPROVING BUS DATA TRANSFER SPEED

Eiji Baba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,787
Claims priority, application Japan, Jul. 13, 1983, 58-127209
Int. Cl.[4] G06F 13/28
U.S. Cl. 364—200 3 Claims



1. A data processing apparatus comprising:

a microprocessor for executing a program;

a program memory storing instructions, one of which is a DMA transfer instruction;

a peripheral control unit controlling a peripheral device;

a data memory;

a DMA control unit generating a first bus request signal to perform a DMA transfer between said peripheral control unit and said data memory;

a bus commonly coupled to said microprocessor, said program memory, said peripheral control unit, said data memory, and said DMA control unit; and

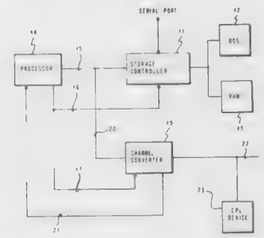
a bus control unit coupled to said microprocessor and said DMA control unit, said bus control unit containing a flag register coupled to said microprocessor and applying a second bus request signal to said microprocessor in response to a flag register setting signal applied to said flag register from said microprocessor when said DMA transfer instruction is executed by said microprocessor, said microprocessor generating a first bus grant signal regardless of a state of said first bus request signal in response to said second bus request signal, and a gate circuit having a first input coupled to said microprocessor for receiving said first bus grant signal, a second input coupled to said DMA control unit for receiving said first bus request signal, and an output coupled to said DMA control unit for applying a second bus grant signal to said DMA control unit when both said first bus request signal and said second bus grant signal are received.

4,729,091

DIRECTING STORAGE REQUESTS PRIOR TO ADDRESS COMPARATOR INITIALIZATION WITH A REFERENCE ADDRESS RANGE

Charles P. Freeman, Round Rock, and William M. Johnson, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,503
Int. Cl.[4] G06F 15/00, 12/00
U.S. Cl. 364—200 3 Claims



1. In a data processing system including a storage controller for controlling storage requests, requiring either a load or a store operation, from a processor to storage in accordance with a reference address range, said storage controller comprising:

address comparator means for directing each of said storage requests to a location in said storage identified by an address corresponding to each of said storage requests, said address comparator means becoming operative upon being initialized by being provided with said reference address range;

a first means for directing, while said address comparator means is inoperative, the first one of said storge requests to a first location in said storage if said first one requires a load operation, said means directing said first one to a second location in said storage if said first one requires a store operation; and,

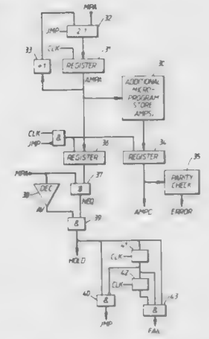
a second means for directing the remainder of said storage requests, unit address comparator means is initialized and operative, to the location in said storage to which said first one of said storage requests was directed.

4,729,092

TWO STORE DATA STORAGE APPARATUS HAVING A PREFETCH SYSTEM FOR THE SECOND STORE

John Lupton, Manchester, England, assignor to International Computers Limited, London, England

Filed May 17, 1985, Ser. No. 735,257
Claims priority, application United Kingdom, Jun. 22, 1984, 8416037
Int. Cl.[4] G06F 12/00, 9/26
U.S. Cl. 364—200 6 Claims



1. Data storage apparatus comprising:

(a) a main store having an address input and a data output,

(b) first address generating means for generating a first address signal,

(c) means for applying the first address signal to the address input of the main store thereby reading out a data item from the data output of the main store,

(d) an additional store having an address input and a data output,

(e) second address generating means responsive to a previously generated first address signal for generating a second address signal, predicting said first address signal,

(f) means for applying said second address signal to the address input of the additional store thereby reading out a data item from the data output of the additional store,

(g) selection means connected to the data outputs of the main store and the additional store and responsive to the first address signal, for selecting the data item read out from the data output of the main store when the first address is in a first predetermined range and selecting the data item read out from the data output of the additional store when the first address is in a second predetermined range,

(h) comparison means for comparing said first and second address signals and, if they are unequal, producing an inequality signal, and

(i) means connected to the second address generating means and responsive to said inequality signal, for setting the second address signal equal to the first address signal.

4,729,093

MICROCOMPUTER WHICH PRIORITIZES INSTRUCTION PREFETCH REQUESTS AND DATA OPERAND REQUESTS

David S. Mothersole; Mark W. Bluhm; Robert R. Thompson, and Douglas B. MacGregor, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 655,013, Sep. 26, 1984, abandoned. This application Mar. 4, 1987, Ser. No. 22,613
Int. Cl.[4] G06F 13/18
U.S. Cl. 364—200 2 Claims

1. A data processor comprising:

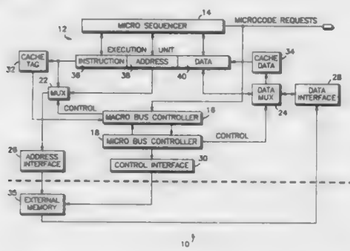
instruction execution control means for executing each of a plurality of instructions, the instruction execution control

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means requesting a transfer of a data operand if required in the execution of said instruction and, prior to completion of the execution of said instruction, requesting a transfer of a next one of said instructions, and

a bus controller, connected to the instruction execution control means and adapted to be connected to a memory external to said data processor, said memory storing a predetermined set of said instructions and said data operands, the bus controller receiving said requests from said instruction execution control means for the transfer of said instructions and said data operands and performing said requested transfers of said instructions and said data operands between said memory and said instruction execution control means in accordance with a predetermined prioritization between said instruction and data operand transfers,

characterized:



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in that the instruction execution control means selectively provides first and second control signals during the execution of a predetermined one of said instructions, said first control signal indicating that said instruction execution control means is asserting control of said bus controller with respect to the prioritization of the performance of said requested instruction and data operand transfers, and said second control signal indicating which of said transfer requests, instruction or data operand, is to have priority, and

in that the bus controller, in response to said first control signal, prioritizes the performance of said requested instruction and data operand transfers in accordance with said second control signal,

whereby the instruction execution control means selectively asserts control over, and explicitly selects, the respective priorities of the requested instruction and data operand transfers on an instruction-by-instruction basis.

4,729,094

METHOD AND APPARATUS FOR COORDINATING EXECUTION OF AN INSTRUCTION BY A COPROCESSOR

John Zolnowsky, Menlo Park, Calif.; David S. Mothersole, Austin, Tex.; Douglas B. MacGregor, Austin, Tex., and William C. Moyer, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 631,518, Jul. 18, 1984, abandoned, which is a division of Ser. No. 485,672, Apr. 18, 1983, abandoned. This application Mar. 24, 1987, Ser. No. 30,241

Int. Cl.[4] G06F *15/16, 9/30*

U.S. Cl. 364—200 **5 Claims**

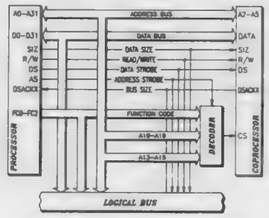
1. A method for a first data processor to coordinate, via a communication bus, execution by a second data processor of an instruction received by said first processor for execution thereby, using only standard bus cycles on said communication bus, said instruction including a type field indicative of instruction type, the method comprising the steps of:

receiving said instruction;

writing to said second processor at a unique address within the address space of said first processor, using said standard common bus cycles, at least the type field of said received instruction; immediately reading a response from said second processor at said unique address using said standard bus cycles after said second processor has received said type field on said received instruction;

examining said response;

selectively performing a predetermined task selected by said



PROCESSOR – COPROCESSOR SYSTEM BLOCK DIAGRAM

response when said response indicates that said task must be performed by said first processor in support of the execution of said instruction by said second processor; but

vectoring to a predetermined exception handler when said response selects a task other than said predetermined task must be performed by said first processor in support of the execution of said instruction by said second processor.

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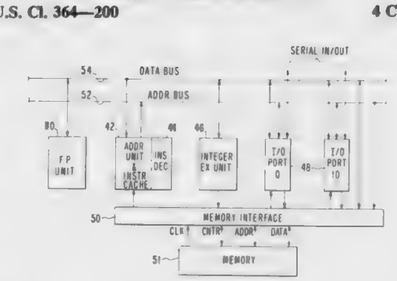
BROADCAST INSTRUCTION FOR USE IN A HIGH PERFORMANCE COMPUTER SYSTEM

Stephen R. Colley, Salinas, Calif., and Doran K. Wilde, Beaverton, Oreg., assignors to Ncube Corporation, Beaverton, Oreg.

Filed May 19, 1986, Ser. No. 864,596

Int. Cl.[4] G06F *13/00, 15/16*

U.S. Cl. 364—200 **4 Claims**



1. For use in a data processing system comprised of a plurality of processors, each one of said processors including an execution unit (**46**) and a memory (**51**), said processors being able to communicate with each other through a plurality of input and output ports (**48**), each output port including an output address pointer register (**170**) which points to locations in said memory (**51**) from which data are to be transferred, at least one of said processors including instruction decoding means (**44**) and an address unit (**42**) having access to said memory (**51**) over a memory interface (**50**), said memory (**51**) having stored therein a broadcast pointer instruction (**400**), said address unit (**42**), and said I/O ports being connected together by a common address bus (**52**) and a common data bus (**54**), said I/O ports having access to said memory (**51**) over said memory interface (**50**), a communication mechanism in said one processor comprising:

means in said instruction decoder (**44**) for decoding said broadcast pointer instruction;

said broadcast pointer instruction (**400**) including a first source operand, said first source operand being an address pointer value which is the starting address in said memory (**51**) of message data to be broadcast to a number of said processors through said ports (**48**);

said broadcast pointer instruction (**400**) including a first destination operand, said first destination operand being a first multibit mask, there being at least one bit position in said first mask for each one of said plurality of output ports in said one processor; and,

a first register (**404, 402**) for storing said first multibit mask (**404**) and said first source operand (**402**),

said address unit (**42**) including first logic (**406**) connected to said first register (**404, 402**) and to said common address and data bus (**52, 54**) for placing on said data bus (**54**) said address pointer value (**404**) in said first source operand of said broadcast pointer instruction, and for sequentially placing on said address bus (**54**) the port number of each of said output ports whose numbers correspond to bit positions in said first mask register (**402**) that are set to be one, such that each output port that is designated in said first mask (**404**) receives said starting address of the message data in said memory (**51**), means in said output port for storing said starting address in said output address pointer register and for outputting said message data in said memory (**51**) to the processors identified in said broadcast pointer instruction (**400**) via said input port of the processors identified in said broadcast pointer instruction (**400**).

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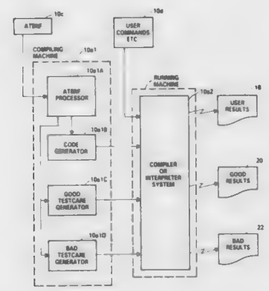
METHOD AND APPARATUS FOR GENERATING A TRANSLATOR PROGRAM FOR A COMPILER/INTERPRETER AND FOR TESTING THE RESULTING TRANSLATOR PROGRAM

Lawrence E. Larson, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,264

Int. Cl.[4] G06F *11/04*

U.S. Cl. 364—300 **8 Claims**



1. A translator writing system for developing a translator program that transforms a user's source code into object code, comprising:

means for receiving a program into said translator writing system, said program representing a summary of the pertinent characteristics associated with the user's source code; and

developing means responsive to said program for developing said translator program, said developing means including testing means for testing the developed translator program, the testing means including a data base comprising a plurality of statements, the plurality of statements being examples of all correct uses of program statements in said users source code, the testing including an interrogation of said developed translator program using each statement of said plurality of statements thereby producing results,

whereby analysis of said results reveals if errors exist within said developed translator program.

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SALES REGISTRATION APPARATUS WITH MEANS TO TRANSFER CONTROL PROGRAM AND SALES REGISTRATION DATA BETWEEN INDIVIDUAL UNITS

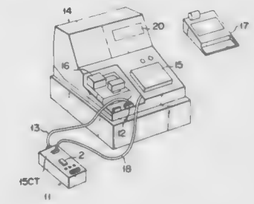
Yasushi Takaoka, and Yuji Iida, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,350

Claims priority, application Japan, May 11, 1984, 59-92904; May 11, 1984, 59-92905

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—405 **13 Claims**



1. A sales registration apparatus comprising:

first and second coupling means detachably couplable to each other;

a keyboard means, coupled to said first coupling means and including a numeral key and a department key, for supplying key-in signals through said first coupling means in accordance with a key operation in response to key-out signals supplied from the second coupling means through said first coupling means when the first and second coupling means are coupled to each other;

first memory means;

second memory means for storing key data corresponding to the control program and having substantially the form of said key-in signals;

third coupling means detachably couplable in place of said first coupling means to said second coupling means; and

data setting means, coupled to said third coupling means and including second control means for, when the second coupling means is coupled to the third coupling means, sequentially supplying key data from said second memory means through said third and second coupling means in response to key-out signals supplied through said second and third coupling means;

first control means, coupled to said second coupling means, for supplying the key-out signals through said second coupling means and for writing a control program and sales registration data in said first memory means in response to the key-in and key data signals supplied, respectively, through said second coupling means;

whereby signals input to the first control means from the keyboard means and from the second memory means can be processed alike for input to the first memory means due to the the key-in signals and the key data having substantially the same form.

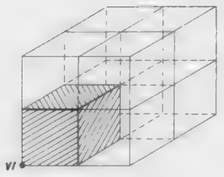
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4,729,098

SYSTEM AND METHOD EMPLOYING NONLINEAR INTERPOLATION FOR THE DISPLAY OF SURFACE STRUCTURES CONTAINED WITHIN THE INTERIOR REGION OF A SOLID BODY

Harvey E. Cline, Schenectady, and William E. Lorensen, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,391
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **16 Claims**



1. A system for displaying three dimensional surface structures comprising:

means for storing three dimensional signal patterns representing the value of at least one physical property associated with a three dimensional body at regularly spaced grid locations within said body;

means for retrieving the eight three dimensional signal pattern values associated with each set of cubically adjacent grid locations within said body;

means for comparing each set of said eight values with a predetermined threshold value to generate an eight bit binary vector each of whose elements is zero or one, based on the result of said comparison;

means for generating a set of coordinate values for each distinct binary vector, said coordinate values representing the vertices of at least one predetermined polygonal surface which approximates the intersection of surfaces determined by said threshold value with the volume defined by said eight grid points, said coordinate values also being dependent on the location of said eight grid locations within said body;

interpolation means receiving said coordinate values and producing adjusted coordinate values based on non-linear interpolation applied to at least three data values along a line joining at least three associated grid points;

display processor means for receiving said adjusted coordinate values from said interpolation means and for converting said adjusted coordinate values to a display format; and

means for displaying surfaces determined by said threshold, said display means being driven by said display processor.

4,729,099

THERAPY TREATMENT PLANNING BY RADIATION DOSE DETERMINATION

Neil A. Iverson, Mentor; Robert A. Cecil, Solon, both of Ohio, and Marc R. Sontag, Cherry Hill, N.J., assignors to Picker International, Inc., Cleveland, Ohio

Filed Jul. 19, 1985, Ser. No. 757,071
Int. Cl.[4] G01T *1/02;* **A61N** *5/10;* **G06F** *15/42*
U.S. Cl. 364—414 **15 Claims**

1. A method of determining radiation dose for therapy treatment of a patient comprising the steps of:

calculating a primary dose contribution from a radiation source to a region of said patient;

calculating a scatter dose contribution to said region for radiation scattered from other regions within said patient by a differential scatter-air ratio method where the differential scatter-air ratios for subregions within a plane of the patient are stored in a one dimensional matrix and a differential scatter-air ratio for each subregion within the plane is accessed by converting a two dimensional coordinate within the plane to a position within the one dimensional matrix;

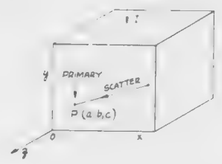
combining the primary and scatter contributions to provide a total patient dose to the region; and

mapping radiation dose over a region of the patient to aid in planning a radiation treatment.

6. A therapy planning method for radiation treatment of cancerous tissue by irradiation of the tissue with an optimum radiation dose comprising the steps of:

estimating a radiation plan to produce said optimum dose, said estimated plan defining a radiation beam geometry;

determining primary radiation dose to the patient based on the beam geometry;



calculating scatter-air ratios based upon the beam geometry to produce a radial scatter-air ratio table;

iteratively determining scatter dose to subregions within the patient by calculating radial distances from a subregion to irradiated points within the patient and attributing a scatter contribution from the radial scatter-air ratio table to each of said irradiated points for each subregion;

combining scatter and primary dose to each subregion to produce a total dose mapping for the irradiated portion of the patient;

comparing the dose mapping with the optimum dose for said tissue; and

adjusting the radiation beam geometry to match the optimum with the calculated total radiation dose.

4,729,100

CT SYSTEM WHICH CONVOLUTES PROJECTION DATA WITH A FREQUENCY VARYING FILTER FUNCTION

Osamu Tsujii, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 21, 1985, Ser. No. 767,860
Claims priority, application Japan, Aug. 28, 1984, 59-178650; Dec. 28, 1984, 59-276093; Dec. 28, 1984, 59-276232
Int. Cl.[4] G06F *15/42;* **A61B** *6/03*
U.S. Cl. 364—414 **14 Claims**

1. A computerized tomographic apparatus for reconstructing a slice of an object, comprising:

means for projecting radiation on a slice of an object to be examined along each projection direction;

means for detecting the radiation projected by said projecting means with a spatial resolution and generating radiation projection data along each projection direction; and

means for reconstructing an image by using projection data generated from said projection data generating means and producing a reconstructed image corresponding to a radiation absorption coefficient at each position of said slice,

said reconstructed image producing means comprising:

means for dividing the projection data by at least one threshold value in accordance with an amplitude of said projection data;

filter function means for storing and/or calculating different types of filter functions having frequency characteristics in accordance with the data characteristics; and

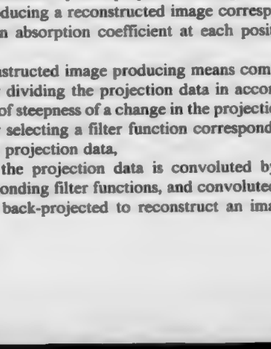
means for convoluting the divided projection data in accordance with the filter functions corresponding to the data characteristics and back-projecting convoluted projection data,

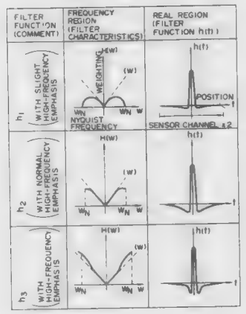
whereby the convoluted data having good high-frequency responses are obtained for the projection data having a higher degree of reliability, and are back-projected to obtain the reconstructed image.

13. A computerized tomographic apparatus for reconstructing a slice of an object comprising:

means for projecting radiation on a slice of an object to be examined along each projection direction;

means for detecting the radiation projected by said projecting means with a spatial resolution and generating radiation projection data along each projection direction; and





means for reconstructing an image by using the projection data generated by said projection data generating means and producing a reconstructed image corresponding to a radiation absorption coefficient at each position of said slice,

said reconstructed image producing means comprising:

means for dividing the projection data in accordance with degree of steepness of a change in the projection data; and

means for selecting a filter function corresponding to each divided projection data,

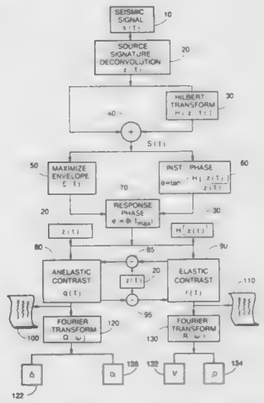
whereby the projection data is convoluted by using the corresponding filter functions, and convoluted projection data is back-projected to reconstruct an image for said slice.

4,729,101

METHOD FOR IDENTIFYING AND SEPARATING THE EFFECTS OF ELASTIC AND ANELASTIC FORMATION PROPERTIES IN SEISMIC DATA

Kenneth E. Hanson, Broken Arrow; Christopher Crowe, Tulsa; Albert L. Frisillo; Carl H. Sondergeld, both of Broken Arrow, and Leon A. Thomsen, Tulsa, all of Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed May 9, 1985, Ser. No. 732,467
Int. Cl.[4] G01V *1/30, 1/32*
U.S. Cl. 364—421 **33 Claims**



1. A method for separating the effects of absorptive and impedance properties of the earth's subterranean formations in a seismic trace signal representative of the earth's response to imparted seismic energy, comprising the steps of:

(a) deconvolving a seismic source signature from the seismic trace signal and obtaining a deconvolved signal;

(b) decomposing the deconvolved signal into a first resultant seismic trace signal representative of the absorptive contrast across reflecting boundaries in the earth's subterranean formations; and

(c) decomposing the deconvolved signal into a second resultant seismic trace signal representative of the impedance contrast across reflecting boundaries in the earth's subterranean formations.

4,729,102

AIRCRAFT DATA ACQUISITION AND RECORDING SYSTEM

Lawrence D. Miller, Jr., Redmond; Robert J. Owen, Mercer Island, and Richard M. Kiltz, Maple Valley, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Oct. 24, 1984, Ser. No. 664,157
Int. Cl.[4] G11B *5/02;* **G06F** *15/74*
U.S. Cl. 364—424 **25 Claims**

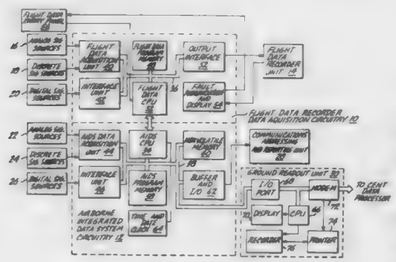
1. An aircraft data acquisition and recording system for supplying retrievable digitally encoded signals representative of a pluralty of applied parametric flight data and aircraft performance signals, said plurality of parametric flight data and aircraft performance signals including analog signals and discrete signals, said aircraft data acquisition and recording system comprising:

a data acquisition unit having a plurality of input ports, each input port being connected for receiving one of said applied parametric flight data and aircraft performance signals, said data acquisition unit including means for sequentially accessing selected ones of said applied parametric flight data and aircraft performance signals and for processing each accessed signal in response to an applied command signal, said data acquisition unit forther includ-

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ing means for supplying a digitally encoded signal representative of each accessed parametric flight data and aircraft performance signal;

a central processing unit connected for receiving each of said digitally encoded signals supplied by said data acquisition unit, said data acquisition unit being responsive to program instructions to sequentially supply said command signals to said data acquisition unit and being responsive to program instructions to detect the time at which a plurality of predetermined aircraft procedures are undertaken, said central processing unit further being responsive to program instructions to process said digitally encoded signals supplied by said data acquisition unit to supply a single set of digitally encoded signals representative of selected aircraft performance information each time a procedure of said plurality of predetermined aircraft procedures is undertaken;



program memory means for storage of said program instructions, said program memory means being connected to said central processing unit, said program memory means including programmable read only memory for storing program instructions that sequence said central processing unit for adapting said data acquisition unit to the specific parametric flight data and aircraft performance signals applied to said data acquisition unit, said program memory means further including memory for storing program instructions for sequencing said central processing unit for sequential access and processing of selected ones of said parametric flight data and aircraft performance signals; and

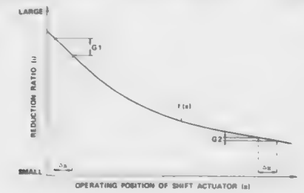
nonvolatile memory means for temporary storage of the sets of digitally encoded signals supplied by said central processing unit.

4,729,103

CONTROL DEVICE FOR CONTINUOUSLY VARIABLE TRANSMISSION

Katsunori Oshiage, and Toshio Matsumura, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 11, 1984, Ser. No. 659,699
Claims priority, application Japan, Oct. 18, 1983, 58-193539
Int. Cl.[4] B60K *41/12*; G06F *15/20*
U.S. Cl. 364—424.1 **5 Claims**



1. In a control device for a continuously variable transmission having a shift actuator which causes a reduction ratio of the transmission to vary as a predetermined non-linear function of an operating position of the shift actuator, the control device having an open loop gain which is defined as the first derivative of said predetermined non-linear function with respect to operating position of said shift actuator and effecting a feedback control of the shift actuator with a variable control gain in a manner such that a difference between an actual value variable within the reduction ratio and a target value is decreased toward zero,

means for detecting the operating position of said shift actuator and generating an operating position indicative signal; and

means responsive to said operating position indicative signal for varying said variable control gain in relation to the predetermined non-linear function of the operating position of the shift actuator as indicated by said operating position indicative signal, so that said control gain is inversely proportional to said open loop gain,

so that the feedback control is effected with a control gain that is variable in response to the predetermined non-linear function of the detected operating position of the shift actuator.

4. In a method of controlling a continuously variable transmission having a shift actuator which causes a reduction ratio of the transmission to vary as a predetermined non-linear function of an operating position of the shift actuator, the control device having an open loop gain which is defined as the first derivative of said predetermined non-linear function with respect to operating position of said shift actuator and effecting a feedback control of the shift actuator with a variable control gain in a manner such that a difference between an actual value variable within the reduction ratio and a target value is decreased toward zero,

detecting the operating position assumed by the shift actuator and generating an operating position indicative signal; and

varying responsive to said operating position indicative signal said variable control gain in relation to the predetermined non-linear function at the detected operating position of the shift actuator, so that said variable control gain is inversely proportional to said open loop gain,

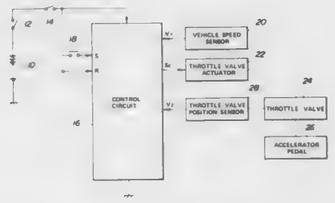
whereby the feedback control is effected with the variable control gain that varies in response to the predetermined non-linear function at the operating position detected of the shift actuator.

4,729,104

METHOD AND APPARATUS FOR VEHICLE SPEED CONTROL

Toshiaki Hara, Zama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 22, 1986, Ser. No. 865,828
Claims priority, application Japan, May 28, 1985, 60-113186
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—426 **8 Claims**



5. An apparatus for use with a vehicle having an internal combustion engine, an accelerator pedal, and a throttle valve for controlling the speed of rotation of said engine, comprising:

a first signal source for generating a first electrical signal indicative of the speed of travelling of said vehicle;

a second signal source for generating a second electrical signal indicative of the degree of opening of said throttle valve;

a control circuit responsive to said first and second electrical signals for generating a control signal, said control circuit including means for repetitively sampling said first and second electrical signals to accumulate a number of sets of actual values of vehicle travelling speed and throttle valve position, the accumulated actual values specifying a running characteristic which defines throttle valve position in relation to vehicle travelling speed, means for detecting a demand value of vehicle travelling speed, and means for determining a throttle valve position value corresponding to said control signal from said running characteristic in accordance with said detected demand value of vehicle travelling speed; and

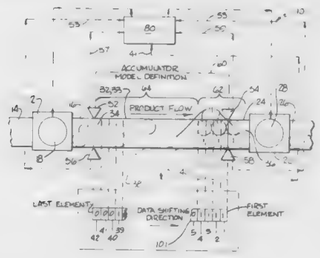
an actuator responsive to said control signal for controlling said throttle valve to maintain said vehicle at said demand travelling speed.

4,729,105

CONTINUOUS PROCESSING SYSTEM WITH ACCUMULATOR MODEL FOR PRODUCT FLOW CONTROL

Roger A. Thompson, Littleton, and Phillip W. Gold, Arvada, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Feb. 20, 1986, Ser. No. 831,416
Int. Cl.[4] G06F *15/00*; G09B *25/00*
U.S. Cl. 364—478 **24 Claims**



1. A continuous processing system for performing production operations on a plurality of unit products using at least two discrete processing machines comprising:

(a) an upstream processing machine means for performing a first operation on unit products passing therethrough, said upstream machine means having a product inlet and a product outlet;

(b) a downstream processing machine means for performing a second operation on unit products passing therethrough, said downstream machine having a product inlet and a product outlet;

(c) accumulator means for transferring said plurality of unit products between said upstream machine means and said downstream machine means and for accumulating unit products in tightly packed continuously touching relationship in a variable length area starting at a position adjacent said downstream machine product inlet and extending toward said upstream machine product outlet; the number of unit products in said tightly packed continuously touching reltaionship adjacent said downstream machine product inlet defining a continuous-fill-accumulation;

(d) count-in sensor means for sensing each unit product entering said accumulator means from said upstream machine product outlet and for generating a count-in sensor signal in response thereto;

(e) count-out sensor means for sensing each unit product exiting from said accumulator means to said downstream machine product inlet and for generating a count-out sensor signal in response thereto;

(f) accumulator modeling means for receiving said count-in and said count-out sensor signals and for continuously predicting said continuous-fill-accumulation;

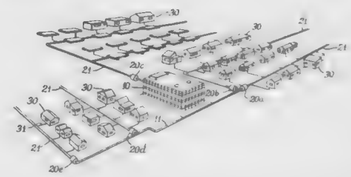
(g) machine speed control means for continuously variably controlling the speed of at least one of said upstream machine and said downstream machine based on said predicted continuous-fill-accumulation for maintaining said downstream machine speed sufficiently low relative said upstream machine speed to continuously provide a sufficiently large continuous-fill-accumulation to enable an uninterrupted flow of unit products to said downstream machine, and for maintaining said downstream machine speed sufficiently high relative said upstream machine speed to continuously prevent excessive accumulation of unit products in said accumulation means.

4,729,106

FLUID DISTRIBUTION TO MULTIPLE USERS THROUGH DISTRIBUTED INTELLIGENCE SUB-CENTERS

William F. Rush, Tinley Park, and James E. Huebler, Brookfield, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jul. 6, 1982, Ser. No. 395,315
Int. Cl.[4] G01F *1/00*
U.S. Cl. 364—510 **26 Claims**



1. A process for fluid distribution through an underground pipeline system from a principal intelligence and fluid distribution center to multiple users comprising: passing said fluid in sequence from said principal distribution center to a distributed intelligence sub-center in intelligence communication with said principal distribution center and then to an intelligence identifiable user valve and meter for each user, said user valve and meter being in intelligence communication with said sub-center, wherein said intelligence communication is conducted through said pipeline capable of conducting said fluid and said intelligence, each said user valve controlling flow of said fluid therethrough upon command from said sub-center and providing valve position intelligence to said sub-center, said user meter providing flow intelligence of said fluid flow therethrough to said sub-center upon command, and providing summary intelligence from a plurality of said intelligence subcenters to said principal center for general system control by control of fluid and intelligence to each of said intelligence sub-centers.

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4,729,107

PATTERN DATA CONVERSION PROCESSING SYSTEM

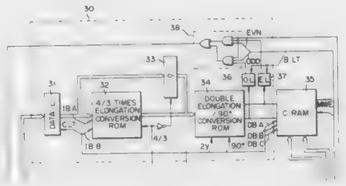
Hirokazu Hasegawa; Hideki Kudoh, and Takashi Aoki, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,946

Claims priority, application Japan, Sep. 17, 1984, 59-194391; Sep. 17, 1984, 59-194393; Sep. 17, 1984, 59-194397

Int. Cl.[4] G06F *3/14, 15/40*

U.S. Cl. 364—519 **6 Claims**



1. A pattern data conversion processing system, comprising:

first means for storing a plurality of one-character pattern data items, and for generating the one-character pattern data items according to input character codes;

second means for generating basic pattern data items obtained by dividing a one-character pattern data item generated by said first means;

third means for generating enlarged basic pattern data items in response to the basic pattern data items generated by said second means;

fourth means for storing a one-character pattern data item including the enlarged basic pattern data items generated by said third means and representing one enlarged character pattern data;

fifth means, coupled to said second, said third, and said fourth means, for controlling said second, third, and fourth means to perform the following operations:

(i) one of the basic pattern data items generated by said second means is converted to one of the enlarged basic pattern data items by said third means;

(ii) the enlarged basic pattern data item is written into said fourth means; and

(iii) said operations of (i) and (ii) are repeated until the enlarged basic pattern data items amount to one enlarged character pattern data item, and are written into said fourth means;

sixth means for storing one-page pattern data including the enlarged one-character pattern data items read from said fourth means;

seventh means connected to said fourth and said sixth means, for controlling said fourth and sixth means to perform the following operations:

(iv) each enlarged one-character pattern data item is read from said fourth means immediately after being written into said fourth means, and is then written into said sixth means; and

(v) said operation (iv) is repeated until enlarged one-character pattern data amounting to one page are written into said sixth means;

eighth means for printing one-page pattern data when read out from said sixth means; and

ninth means, coupled to said sixth and said eighth means, for controlling said sixth and eighth means so that the one-page pattern data is read out from said sixth means immediately after being written into said sixth means, to be printed.

4,729,108

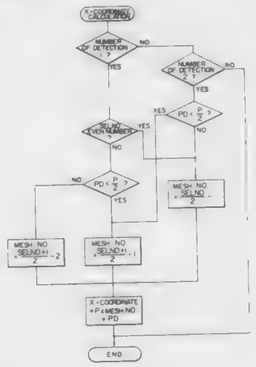
APPARATUS FOR DETERMINING A COORDINATE OF A GIVEN POINT ON A TABLET

Bunji Uchiyama, Sagamihara, Japan, assignor to Hitachi Seiko Ltd., Japan

Filed Sep. 10, 1985, Ser. No. 774,471

Int. Cl.[4] G08C *21/00;* **G06F** *15/20*

U.S. Cl. 364—520 **6 Claims**



1. A coordinate detection system capable of detecting a coordinate of a given position in a predetermined region of a tablet, comprising:

a pointer means including excitation means excited by a current of a predetermined frequency for pointing to a desired position on said tablet;

a conductor arrangement on said tablet for cooperating with said excitation means of said pointer means to determine the coordinate of a position on the tablet pointed to by said pointer means in a predetermined direction, said conductor arrangement including a first conductor arrangement having two conductors arranged to cover said predetermined region on said tablet, said two conductors being formed in rectangular wave configurations of a predetermined cycle extending in said predetermined direction, the rectangular wave configuration of a first conductor of said two conductors being displaced by half a phase cycle from the rectangular wave configuration of a second conductor of said two conductors, and a second conductor arrangement having a base line extending in said predetermined direction and a plurality of equally-spaced element wires extending from said base line at intervals equivalent to half a phase cycle of the rectangular wave configuration of at least one of said first and second conductors of said two conductors in a direction perpendicular to said base line so as to cover said predetermined region;

a detector including first detection means for detecting a phase difference between waveforms of voltages induced in said first and second conductors of said two conductors, while energizing said excitation means in said predetermined region of said tablet, and second detection means for scanning selected element wire pairs of said second conductor arrangement sequentially, and for detecting any element wire pair which produces an output voltage higher than a predetermined threshold level; and

processing means for obtaining a first data capable of identifying a space between a selected element wire pair in which the position pointed to by said pointer means should exist based on the outputs of said first and second detection means, and for calculating the coordinate of said position based on said first data and a second data relating to said phase difference detected by said first detection means.

4,729,109

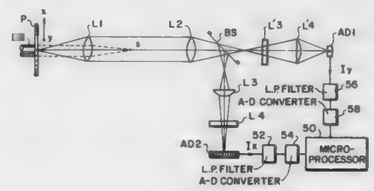
METHOD AND APPARATUS FOR MEASURING THE DISPLACEMENTS OF PARTICLE IMAGES FOR MULTIPLE EXPOSURE VELOCIMETRY

Ronald J. Adrian, Champaign, Ill., and Chung-Sheng Yao, Hacienda Heights, Calif., assignors to University of Illinois, Urbana, Ill.

Filed May 29, 1985, Ser. No. 738,775

Int. Cl.[4] G01P *5/22, 3/36;* **G01F** *1/00*

U.S. Cl. 364—560 **20 Claims**



13. A system of measuring the displacement of compact images comprising:

(a) means for periodically illuminating a record medium containing said images with a light beam;

(b) means for splitting the images into two individual images along the X and Y directions respectively;

(c) means for forming compressed images by projecting the individual images onto respective linear diode arrays;

(d) means for measuring the compressed images using integration by said linear detector arrays to yield resulting detector array output signals; and

(e) means for reading the resulting detector array output signals.

4,729,110

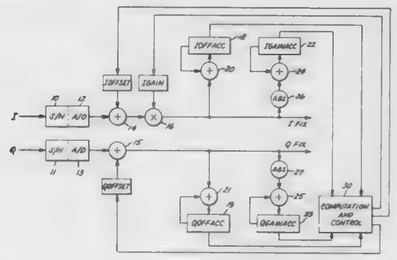
CORRECTION OF OFFSET AND GAIN ERRORS IN RF RECEIVERS

Kenneth B. Welles, II, Schenectady, and Sharbel E. Noujaim, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,351

Int. Cl.[4] G06J *1/00;* **G06F** *15/20*

U.S. Cl. 364—571 **13 Claims**



1. A method for operating a digital circuit to correct for offset errors in a sampled and digitized signal, said method comprising the steps of:

adding a signed offset correction term to each of said digitized samples;

accumulating the algebraic sum of a number N of said digitized samples ina n accumulator, during which time said offset correction term is kept constant;

determining, based on the contents of said accumulator, an updated offset correction term equal to said offset correction term minus, the contents of said accumulator divided by N;

updating said offset correction term in correspondence with said determination based on the contents of said accumulator;

resetting said accumulator to zero; and

periodically repeating the previous steps.

4,729,111

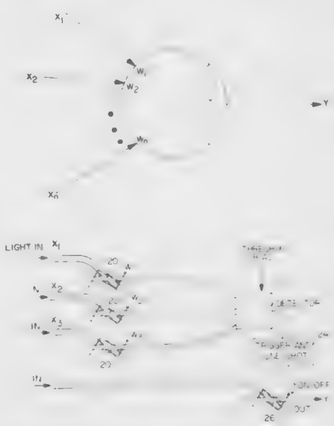
OPTICAL THRESHOLD LOGIC ELEMENTS AND CIRCUITS FOR DIGITAL COMPUTATION

Raymond Arrathoon, Rochester, and Mohammad H. Hassoun, Detroit, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Aug. 8, 1984, Ser. No. 638,984

Int. Cl.[4] G06F *7/56;* **G02B** *6/12*

U.S. Cl. 364—713 **11 Claims**



1. An integrated optical threshold logic circuit, comprising:

a light source;

a plurality of light input channels connected to said source and a single light output channel;

separate means for weighting the input in each of said input channels;

detector means coupled to the combined outputs of all said input channels;

threshold bias means connected to said detector means for presetting its light level for a zero crossing; and

triggering means connected between said detector and said output channel for sensing a change in sign and providing an output for switching said output channel on for a predetermined time.

4,729,112

DIGITAL SUB-BAND FILTERS

Paul C. Millar, Felixtowe, England, assignor to British Telecommunications, London, England

Filed Mar. 21, 1984, Ser. No. 594,888

Claims priority, application United Kingdom, Mar. 21, 1983, #307702

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **12 Claims**

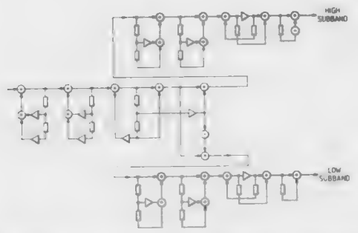
1. A digital filter including:

an input terminal connected to receive an input signal;

filter means connected to said input terminal, said input terminal applying said input signal to said filter means, said filter means having a stopband, a transition band and a passband, said filter means for filtering said input signal in accordance with an associated characteristic transfer

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function, said filter means including pole generating means for generating poles enhancing input signal frequencies in the passband, zero generating means for generating zeros attenuating input signal frequencies in the stopband, and pole generating means for generating poles enhancing input signal frequencies in the transition band, the singularities of said transfer function comprising a pole attenuating input signal frequencies in the stopband, said pole lying, in the z-plane representation, on the real axis at



unit radius, and additional singularities occurring in groups each possessing a symmetrical delay response about a relative frequency of $\pi/2$ radians, said filter means transfer function characterized in that at least one of such groups consists of a pole having z-plane coordinates r, θ within a polar coordinate system and a zero having coordinates 1/r, $(\pi-\theta)$ within said polar coordinate system, and

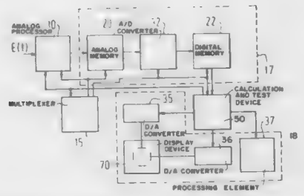
an output terminal connected to said filter means and to receive said filtered input signal.

4,729,113

METHOD AND ARRANGEMENT FOR RECOVERING AN ANALOGUE SIGNAL

Pierre-Henri Boutigny, Epinay Sous Senart, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 630,173, Jul. 12, 1984, abandoned. This application Jan. 14, 1987, Ser. No. 6,322
Claims priority, application France, Oct. 3, 1983, 83 15701
Int. Cl.[4] G06G *7/00*
U.S. Cl. 364—807 **27 Claims**



1. An arrangement for obtaining a useful recovered signal X(t) for display and/or processing comprising: an analog processor, means for applying an analog signal E(t) to the analog processor, means coupling outputs of the analog processor to a memorization and digitization element, means coupling outputs of the memorization and digitization element to a calculation and test device, which supplies:

(a) to a display device or a processing element followed by a display the useful recovered signal X(t) and signals of error function(s) for each analysis period τ as well as synchronization signals and time base signals; and

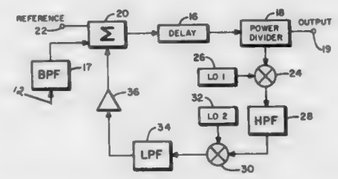
(b) to the analog processor signals for resetting to zero and to a multiplexer synchronization signals, the multiplexer supplying the operating time base signals to the analog processor, to the memorization and digitization element and to the calculation and test device.

4,729,114

SIGNAL PROCESSING CIRCUIT FOR INSTANTANEOUS FOURIER TRANSFORMATION

Samuel C. Kingston, Salt Lake City, and Randall J. Mills, Bountiful, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 24, 1986, Ser. No. 888,674
Int. Cl.[4] G06G *7/19*
U.S. Cl. 364—827 **20 Claims**



1. A signal processing circuit comprising an input means for receiving an input signal, combining means having a plurality of inputs coupled for receiving said input signal from said input means on one of its inputs and for supplying a combined signal, delay means coupled to receive said comdined signal from said combining means for delaying said combined signal for a predetermined time and for providing a delayed signal, power dividing means coupled to receive said delayed signal from said delay means and for supplying an output signal and a feedback signal, output means coupled to said power dividing means coupled for receiving said output signal, first mixing means coupled to said power dividing means for receiving said feedback signal, first local oscillator means coupled to supply a first oscillator signal to said first mixing means, said first mixing means being constructed to supply a first mixed signal comprising said feedback signal and said first oscillator signal, a first zonal filter means coupled to receive said first mixed signal and for supplying a first filtered signal, second mixing means coupled to said first zonal filter for receiving said first filtered signal, second local oscillator means coupled to supply a second oscillator signal to said second mixing means, said second mixing means being constructed to supply a second mixed signal comprising said first filtered signal and said second oscillator signal, second zonal filter means coupled to receive said second mixed signal from said second mixing means and for supplying a second filtered signal and coupling means for coupling said second mixed signal to a second input terminal of said combining means, wherein a frequency difference exists between said first and second oscillator means which is approximately equal to the inverse of the delay time between said input signal and said delayed signal.

4,729,115

NON-VOLATILE DYNAMIC RANDOM ACCESS MEMORY CELL

Bruce A. Kauffmann, Jericho, Vt., and Chung H. Lam, Troy, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1984, Ser. No. 655,134
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **19 Claims**

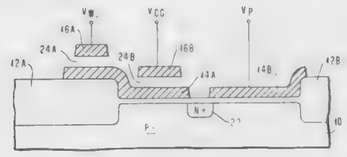
1. A non-volatile dynamic memory cell, comprising:

a semiconductor substrate of a first conductivity type having a first region which functions as a dynamic storage node for storing first and second logic states, a second region of a second conductivity type, and a third region disposed between said first and second regions;

a transfer device for selectively coupling data signals between said second region and said first region, said transfer device having a control electrode;

a floating gate electrode disposed above and insulated from said third region;

first and second charge injection means disposed on said floating gate electrode for injecting charge into and removing charge from, respectively, said floating gate electrode; and



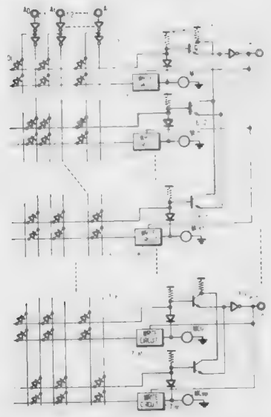
first and second control electrodes disposed on said first and second charge injection means, respectively, said first and second control electrodes receiving first and second control signals, respectively, said first and second control electrodes initiating said charge transfer by said first and second charge injection means, respectively, as a function of the voltage on said first region, said logic states being overwritten into said floating gate electrode, one of said control electrodes being connected to said control electrode of said transfer device.

4,729,116

BIPOLAR PROGRAMMABLE READ ONLY MEMORY ATTAINING HIGH SPEED DATA READ OPERATION

Hiroaki Sato, and Hiroshi Mayumi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,866
Claims priority, application Japan, Nov. 22, 1984, 59-247109
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **16 Claims**



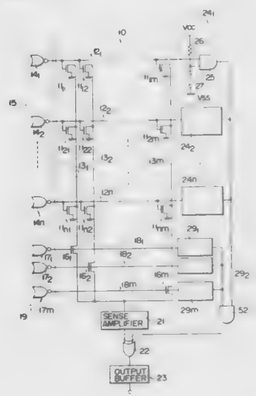
7. A semiconductor memory, comprising; at least one two-terminal memory cell having a first terminal connected directly to a reference potential and a second terminal, a data write circuit electrically coupled to said second terminal of said memory cell, a data read circuit, and a unidirectional element coupled between said data read circuit and said second terminal of said memory cell, said unidirectional element electrically isolating said data read circuit from said second terminal of said memory cell in a data write mode and electrically coupling said data read circuit to said second terminal of said memory device in a data read mode.

4,729,117

SEMICONDUCTOR MEMORY DEVICE

Yoshio Osaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 19, 1986, Ser. No. 841,249
Claims priority, application Japan, Mar. 20, 1985, 60-56513; Sep. 30, 1985, 60-216483
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—200 **2 Claims**



1. A semiconductor memory device having a memory array with a plurality of memory cells arranged in a matrix of row and column lines wherein the memory cells are addressed by selecting row and column lines and where some of the memory cells may be defective; a row decoder for selecting a row line; a column decoder for selecting a column line, and a selected memory cell being connected between selected row and column lines; detect means for detecting a defective memory cell connected between selected row and column lines; and sense means for sensing the data of a detected defective memory cell; wherein said detect means comprises:

row detect circuits connected to the output of said row decoder, said row detect circuits being programmed to detect a selected row line having a defective cell;

column detect circuits connected to the output of said column decoder, said column detect circuits being programmed to detect a selected column line having a defective cell;

means connected to said row and column detect circuits to receive the outputs thereof for detecting the selection of a defective memory cell based on the logic values of the outputs of said row and column detect circuits; and

means connected to said sense means and said detect means to receive the outputs thereof and for inverting the logic value of the data sensed by said sense means based on the logic value of the output of said detect means.

4,729,118

ON-CHIP CONVERTER TO REVERSIBLY CHANGE MEMORY ORGANIZATION USING EXTERNAL SIGNALS

Tito Gelsomini, Reiti, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1986, Ser. No. 837,631
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **7 Claims**

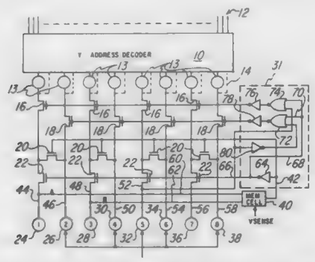
1. In a semiconductor memory device having a first output

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line and a second output line for communication of data therefrom, a circuit for selectively connecting, responsive to an external control signal, either said first or said second output line, or both, to first and second external terminals of said device, respectively, said circuit comprising:

means for storing the logic state of an external enable/disable command signal;

means, connected between said first output line and said first external terminal, for disconnecting said first output line



from said first external terminal responsive to said stored command signal being at a first logic state and for connecting said first output line thereto responsive to said stored command signal being at a second logic state; and

toggle means for selectively connecting either said first or said second output line to said second output terminal in response to a toggle input signal said toggle means enabled when said first logic state is stored by said storing means, and disabled when said second logic state is stored by said storing means.

4,729,119

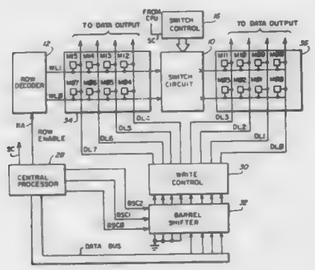
APPARATUS AND METHODS FOR PROCESSING DATA THROUGH A RANDOM ACCESS MEMORY SYSTEM

Larry R. Dennison, Norwood, and Steven E. Golson, Boston, both of Mass., assignors to General Computer Corporation, Cambridge, Mass.

Filed May 21, 1984, Ser. No. 612,565

Int. Cl.[4] G11C *8/00*

U.S. Cl. 365—230 **10 Claims**



5. An apparatus for processing a sequence of data bits through selected memory cells located at arbitrary word boundaries in a random access memory (RAM) system, the random access memory system having a plurality of rows and columns of memory cells forming a RAM array, plural word lines coupled to respective rows of memory cells, and plural data lines coupled to respective columns of memory cells, the apparatus comprising:

(a) switching means coupled to the word lines between adjacent columns of memory cells for selectively altering the word line signal paths between the adjacent columns of memory cells to allow simultaneous accessing of the portions of adjacent rows of memory cells in the RAM array corresponding to the selected memory cells, the switching means being selectively operable in a plurality of modes, at least one of the modes causing a signal along any of the word lines to access only one row of memory cells, at least a second of the modes causing a signal along an altered word line to simultaneously access selected portions of adjacent rows of memory cells;

(b) means for determining whether a word of data is to be stored to the RAM array in accordance with the second mode;

(c) barrel shifting means for aligning the individual bits of the word of data with the selected memory cells of the RAM array; and

(d) means for controlling the barrel shifting means and directing the number of shift operations required to align the word of data.

4,729,120

METHOD OF, AND CIRCUIT ARRANGEMENT FOR, FUNCTION CONTROL OF ULTRASONIC ALARM INSTALLATIONS

Peter Steiner, Jona; Rudolf Genähr, Männedorf, and David Siegwart, Meilen, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

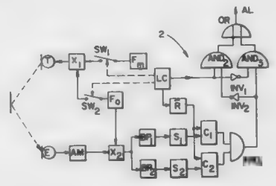
PCT No. PCT/EP85/00037, § 371 Date Sep. 23, 1985, § 102(e) Date Sep. 23, 1985, PCT Pub. No. WO85/03591, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 7, 1985, Ser. No. 782,716

Claims priority, application Switzerland, Feb. 13, 1984, 762/84

Int. Cl.[4] G08B *13/16, 29/00*

U.S. Cl. 367—94 **10 Claims**



1. A method of testing an ultrasonic alarm installation, comprising the steps of:

generating ultrasonic waves of a predetermined frequency using an ultrasonic transmitter;

emitting said ultrasonic waves generated by said ultrasonic transmitter, into a predetermined region to be monitored;

receiving ultrasonic waves originating from said monitored region by means of an ultrasonic receiver and thereby converting said received ultrasonic waves into an electrical signal;

feeding said electrical signal to an electrical evaluation circuit;

processing said electrical signal and triggering by means of said electrical evaluation circuit, an alarm signal upon a predetermined frequency deviation of said received ultrasonic waves from said emitted ultrasonic waves;

producing said predetermined frequency deviation during a test phase of the operation of the ultrasonic alarm installation;

said step of producing said predetermined frequency deviation during said test phase entailing the steps of:

producing a predetermined frequency spectrum includng said predetermined frequency deviation effective for triggering said alarm signal, using a modulation frequency generator;

modulating said frequency of said ultrasonic waves emitted by said ultrasonic transmitter by said predetermined frequency spectrum including said frequency deviation effective for triggering said alarm signal;

generating a reference signal using a reference signal generator;

switching off at least said modulation frequency generator; and

after switching off said modulation frequency generator, evaluating the time decay of a modulation-caused electrical signal by comparing said decaying modulation-caused electrical signal and triggering an alarm signal when a predetermined deviation is exceeded between said decaying modulation-caused electrical signal and said reference signal.

4,729,121

UNDERWATER DETECTION SYSTEM

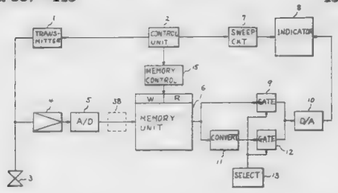
Takashi Yoshioka; Nobuo Fujita, both of Kobe, and Hiroyuki Hamato, Amagasaki, all of Japan, assignors to Furuno Electric Company Ltd., Hyogo, Japan

Filed Mar. 18, 1986, Ser. No. 840,745

Claims priority, application Japan, Jun. 7, 1985, 60-86617[U]

Int. Cl.[4] G01S *9/68*

U.S. Cl. 367—113 **13 Claims**



1. An underwater detection system for radiating ultrasonic search signals into the water, for receiving echo signals and for displaying underwater conditions based on received echo signals, comprising:

(i) an analog-to-digital converter for converting each echo signal in an analog form into a first type digital signal representative of the intensity of the converted echo signal;

(ii) a primary memory for storing said first type digital signals,

(iii) signal converting means, responsive to said digital signals recalled from said primary memory, for converting each said first type digital signal into a second type digital signal;

(iv) a digital-to-analog converter for converting said first or second type digital signals into analog signals; and

(v) indicator means for displaying the analog signals from said digital-to-analog converter on a display;

said signal converting means converting said first type digital signals representative of intermediate echo signal intensities received from small objects into second type digital signals which, when converted into analog signals by said signal converting means and displayed on said indicator means, will enhance the contrast between the representation of said small objects on said indicator and the indicator background.

4,729,122

MAGNETO-OPTICAL REPRODUCING HEAD OF A HIGH LIGHT UTILIZATION RATE

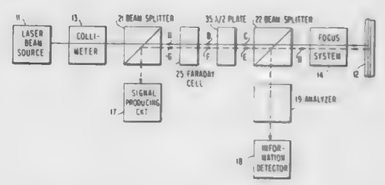
Masataka Itoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,310

Claims priority, application Japan, Oct. 22, 1984, 59-221723

Int. Cl.[4] G11B *11/00*

U.S. Cl. 369—13 **6 Claims**



1. In a magneto-optical reproducing head for use in a magneto-optical reproducing device together with a laser beam source and a magneto-optical recording medium, said head including a first and a second beam splitter along a light path and first means for causing a forward laser beam to forwardly proceed along said light path from said laser beam source to said recording medium and for causing a reversed laser beam to reversedly proceed partly along said light path from said recording medium, said reversed laser beam comprising an information and an orthogonal component having polarization planes perpendicular and parallel to a polarization plane which said forward laser beam has at said recording medium, respectively, said first beam splitter having a first transmissivity for a first p-polarized component, substantially totally reflecting a first s-polarized component, and being oriented to make said forward laser beam pass therethrough as said first p-polarized component, said second beam splitter having a second transmissivity for a second p-polarized component, substantially totally reflecting a second s-polarized component, and being oriented to reflect said information component as said second s-polarized component and to make said orthogonal component reversedly pass therethrough as said second p-polarized component, said first transmissivity being substantially equal to unity, said head further including information detecting means responsive to the information component reflected in said second beam splitter for detecting information recorded on said recording medium and second means between said first and said second beam splitters for giving a 90° difference between polarization planes of the forward laser beam incident thereon and of the orthogonal component having reversedly passed therethrough to make said forward laser beam forwardly pass through said second beam splitter as said second p-polarized component and to make said orthogonal component reversedly enter said first beam splitter as said first s-polarized component, the improvement wherein said second transmissivity is greater than 0.5 and said head comprising signal producing means responsive to the orthogonal component reflected in said first beam splitter for producing a control signal for use in servo controlling said magneto-optical reproducing device.

4,729,123

METHOD FOR ESTABLISHING AND MAINTAINING SYNCHRONIZATION BETWEEN COMMUNICATING MULTIPLEXERS USING CHECKSUM VALUES

Andrew J. T. Wheen, Finchampstead, England, assignor to General Datacomm, Inc., Middlebury, Conn.

Filed Aug. 14, 1986, Ser. No. 896,259

Int. Cl.[4] H04J *3/06*

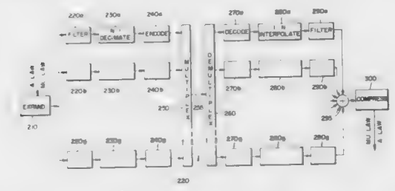
U.S. Cl. 370—100 **20 Claims**

1. A method for providing synchronization between first and second communicating multiplexers, wherein said first

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multiplexer having a frame format multiplexes at least data according to the frame format and sends the data over an aggregate channel to said second multiplexer, and wherein said second multiplexer demultiplexes according to said frame format at least said data received from said aggregate channel, the method comprising:

(a) providing said frame format with bit positions for a plurality of bits including first predetermined bit positions for a plurality of checksum bits, and second predetermined bit positions for bits other than checksum bits;



(b) calculating a checksum for the bit values of bits located at said second predetermined bit positions, and inserting bits representing the said calculated checksum into said first predetermined bit positions;

(c) sending bits including bits located at said first and second predetermined bit positions in said frame format from said first multiplexer to said second multiplexer; and

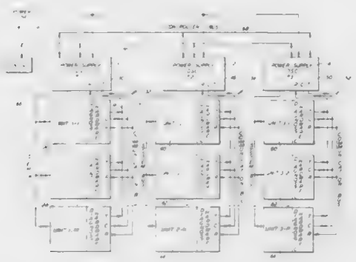
(d) establishing synchronization between said first and second communicating multiplexers by using said bits representing said calculated checksum.

4,729,124

DIAGNOSTIC SYSTEM

Allen Hansel, Sea Bright, and Kenneth Yeager, Eatontown, both of N.J., assignors to Concurrent Computer Corporation, Holmdel, N.J.

Filed Dec. 19, 1985, Ser. No. 811,061
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—18 **9 Claims**



1. A diagnostic system for detecting and indicating errors in a computer system including a plurality of replaceable logic modules, the system comprising, in combination:

a controller bus;

a plurality of communication buses;

a plurality of diagnostic system controllers each including a microprocessor, a read-only-memory, a random access memory, means to couple the microprocessor to said controller bus and means to couple said microprocessor to only one of said communication buses;

means in each of said diagnostic system controllers for establishing one of said diagnostic system controllers as the master diagnostic system controller on said controller bus, said master diagnostic system controller being operative to control communication on said controller bus;

a plurality of functional units associated with each of said communication buses and each said functional unit including diagnostic testing circuits including a microprocessor for testing the functional unit and including means to communicate on said each of said communication buses coupled thereto in response to polling signals therein; and

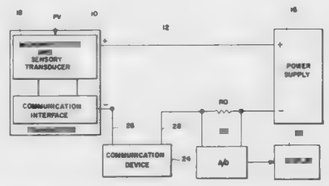
each said diagnostic system controller including means to produce polling signals on the communication bus coupled thereto.

4,729,125

ON-LINE SERIAL COMMUNICATION INTERFACE TO A TRANSMITTER FROM A CURRENT LOOP

Edward L. Sterling, Jr., Cleveland, and William L. Thompson, Montville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 12, 1985, Ser. No. 764,913
Int. Cl.[4] H04B *3/60*
U.S. Cl. 375—36 **3 Claims**



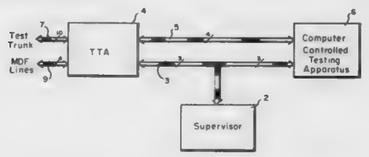
1. In a current loop arrangement having a power supply for supplying a current at various levels, a current loop connected to the power supply for carrying the current levels at a selected voltage level, a current regulating circuit connected to the current loop for driving the current levels from the power supply according to a voltage applied to an input of the current regulating circuit, a transmitter having microprocessor means with one port connected to the input of the current regulating circuit for applying a continuous voltage level to the current regulating circuit which is proportional to a process parameter measured by the transmitter, and a digital circuit for modulating the selected voltage level on the current supply by voltage pulses for carrying digital information to the current loop, the microprocressor means having a second port for receiving the serial communication voltage pulses, an on-line serial communication interface for establishing communication with the microprocessor from the current loop, comprising an amplifier having an input connected to one line of the current loop, an output of said amplifier connected directly to the second port of the microprocessor means for applying the serial communication voltage pulses while the current regulation circuit is being concurrently driven by the microprocessor means such that the current levels on the current loop are uninterrupted, and a second input of said amplifier adapted for connection to a source of fixed voltage at a selected small level whereby modulations of the selected voltage level by the digital circuit cause the formation of larger voltage pulses forming the serial communication voltage pulses of the microprocessor means.

4,729,126

METHOD AND APPARATUS FOR SUPERVISING THE ACCESSING AND TESTING OF COMMUNICATION SYSTEMS

David J. Olek, Victor, N.Y., assignor to TII Computer Systems, Inc., Copiague, N.Y.

Continuation of Ser. No. 645,478, Aug. 29, 1984, abandoned. This application Nov. 4, 1986, Ser. No. 926,871
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—22 **8 Claims**



1. An apparatus for testing and maintaining communication systems comprising:

bi-directional data channel means;

means for accessing communication lines comprising a first microprocessor for controlling said accessing and a first input/output means for sending requests and data and receiving instructions and data over said data channel means;

means for testing lines accessed by said accessing means so as to obtain values from which electrical and noise characteristics can be derived comprising a second microprocessor for controlling and testing and a second input/output means for sending requests and data and receiving instructions and data over said data channel means;

means for controlling said first and second microprocessors comprising a third microprocessor and input/output means for sending instructions and data to, and receiving responses and data from, said accessing and testing means over said data channel means;

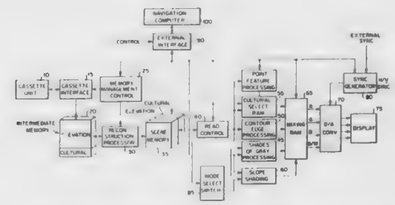
whereby line accessing, line testing and supervisory functions are distributed among cooperating testing, accessing and controlling means.

4,729,127

METHOD AND SYSTEM FOR COMPRESSION AND RECONSTRUCTION OF CULTURAL DATA FOR USE IN A DIGITAL MOVING MAP DISPLAY

Luen C. Chan, Indian Harbor Beach; Paul B. Beckwith, Indialantic, and Jeffrey B. Pearce, Melbourne, all of Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 313,327, Oct. 20, 1981, Pat. No. 4,520,506. This application Aug. 20, 1984, Ser. No. 642,481
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—56 **11 Claims**



1. A method for compressing data which is to produce a linear feature in a display comprising the steps of:

storing an address of an initial point at one end of the linear feature;

storing an initial direction code identifying the direction of the linear feature at said initial point at one end thereof; and

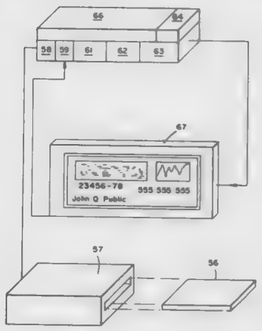
storing a plurality of delta code values which identify a further point and successive points on said linear feature with respect to the direction of said linear feature identified by said initial direction code and the direction for each successive one of the individual points thereon, said delta code values being selected from an elongated footprint pattern of points which is oriented so as to extend at each of said successive points on said linear feature away from that point in the direction of the linear feature at that point, said elongated footprint pattern including a major lobe corresponding to a single quadrant and a contiguous minor lobe at a corner of said quadrant, the orienting of said footprint pattern so as to select said delta code values at each of said successive points including positioning said pattern so that said initial point on the linear feature falls within said minor lobe and said major lobe extends away from said point in the direction of the linear feacture to that point.

4,729,128

PERSONAL IDENTIFICATION CARD SYSTEM

Marvin G. Grimes, P.O. Box 1462, Campbell, Calif. 95009-1462, and Norman E. Dixon, 7114 Road 42, Pasco, Wash. 99301

Filed Jun. 10, 1985, Ser. No. 742,942
Int. Cl.[4] G06K *7/00*
U.S. Cl. 382—58 **11 Claims**



1. A personal identification card system, including an identification card having a plurality of layers bonded together, acoustic data means on one internal surface of one of said layers for altering the propagation of an ultrasonic signal through said card in a predetermined, data encoding pattern, and card scanning means for directing an ultrasonic signal through said card and detecting the altered signal propagation through said acoustic data means and said predetermined, data encoding pattern within said card, wherein said acoustic data means includes an acoustically encoded holographic image.

4,729,129

VSWR PROTECTION CIRCUIT APPARATUS

Charles B. Koerner, Port Murray, N.J., assignor to ITT Avionics a Division of ITT Corporation, Nutley, N.J.

Filed Oct. 15, 1986, Ser. No. 919,107
Int. Cl.[4] H04B *1/04*
U.S. Cl. 455—117 **9 Claims**

1. A VSWR protection circuit for use in a transmitter which transmits a predetermined frequency to provide a gain control to a gain controlled transmitting amplifier having an output coupled to an antenna and to elements of the protection circuit, which antenna can undesirably respond to an EMI signal

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having a frequency close to the transmitted frequency comprising:

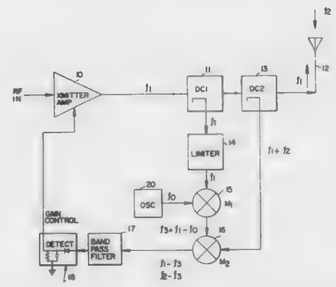
a source capable of providing an output frequency of a predetermined value,

first mixing means having one input adapted to receive said transmitted frequency and a second input coupled to said source to provide at an output a first mixed signal,

second mixing means having one input adapted to receive said EMI signal and a second input coupled to the output of said first mixing means to provide at an output a second mixed signal,

a narrow bandpass filter with an input adapted to receive said second mixed signal, said narrow bandpass filter having a center frequency centered about said output frequency of said source and having a bandwidth indicative of EMI signals close in frequency to said transmitted frequency,

detecting means having an input coupled to said bandpass filter to provide a DC voltage at an output indicative of the magnitude of said transmitted frequency and independent of said EMI signal which is applied as an input to said transmitting amplifier.



DESIGN PATENTS

GRANTED MAR. 1, 1988

ERRATA

For CLASS	See PATENT NO.
D21-011	294,505

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294,420
PRETZEL IN SHAPE OF A FIGURE
Stephen F. Austin, Kinnelon, N.J., assignor to Nabisco Brands, Parsippany, N.J.
Filed Aug. 30, 1985, Ser. No. 770,988
Term of patent 14 years
U.S. Cl. D1—108



294,421
SHOE
Tuan N. Le, Cohasett, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Oct. 22, 1986, Ser. No. 922,101
Term of patent 14 years
U.S. Cl. D2—278

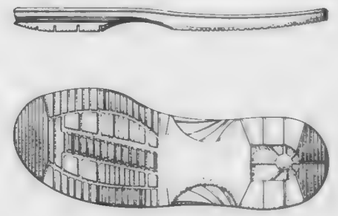




294,422
SHOE UPPER
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Apr. 5, 1985, Ser. No. 720,367
Term of patent 14 years
U.S. Cl. D2—314



294,423
SHOE SOLE
Gary Zuidema, Petaluma, Calif., and Robert L. Peterson, Taichung, Taiwan, assignors to The Donner Mountain Corporation, San Rafael, Calif.
Filed Feb. 6, 1987, Ser. No. 12,215
Term of patent 14 years
U.S. Cl. D2—320

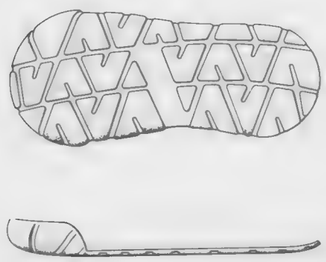


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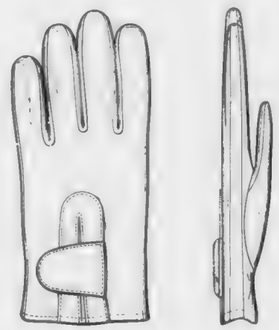
294,424
SHOE SOLE
Paul D. Brown, Hingham, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Dec. 2, 1986, Ser. No. 937,124
Term of patent 14 years
U.S. Cl. D2—320



294,425
SHOE SOLE
Tuan N. Le, Cohassett, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Dec. 8, 1986, Ser. No. 939,470
Term of patent 14 years
U.S. Cl. D2—320



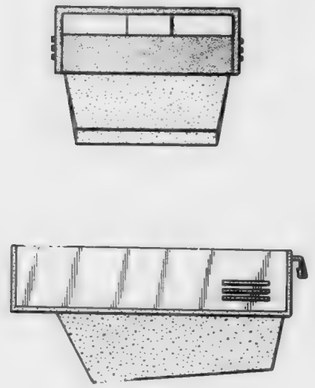
294,426
GLOVE
William Dzierson, Wyckoff, N.J., assignor to Elmer Little & Sons, Johnstown, N.Y.
Filed May 21, 1985, Ser. No. 736,568
Term of patent 14 years
U.S. Cl. D2—619



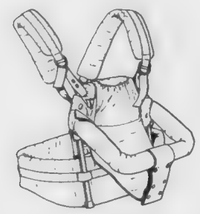
294,427
KEG CARRIER
John F. Pastorok, 509 Monterey La., San Clemente, Calif. 92672
Filed Jun. 3, 1985, Ser. No. 740,573
Term of patent 14 years
U.S. Cl. D3—30.1



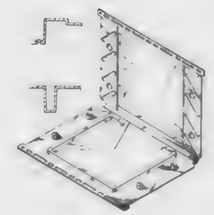
294,428
COMBINED SHOE SHINE CASE AND PAD
James H. Allen, and Barry Brinker, both of Covington, Ky., assignors to 'Totes', Incorporated, Loveland, Ohio
Filed Jun. 9, 1987, Ser. No. 59,869
Term of patent 14 years
U.S. Cl. D3—30.5



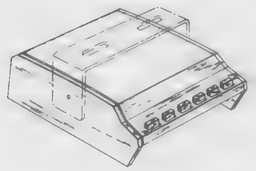
294,429
BABY CARRIER
Michael E. Vasquez, 3013 Winchester Way, Rancho Cordova, Calif. 95670
Filed Nov. 22, 1985, Ser. No. 806,239
Term of patent 14 years
U.S. Cl. D3—31

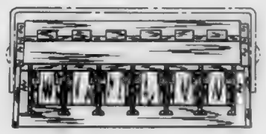


294,430
DISKETTE HOLDER
Richard B. Tell, Los Angeles, Calif., assignor to C & S Sales, Culver City, Calif.
Filed May 20, 1985, Ser. No. 735,691
Term of patent 14 years
U.S. Cl. D3—35



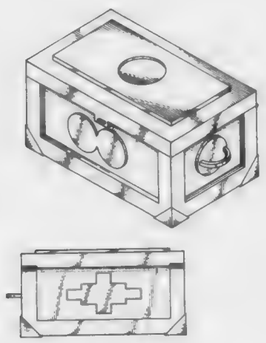
294,431
CASSETTE TAPE HOLDER
Uki Uchiyama, Tokyo, Japan, assignor to Sakai & Co., Ltd., Japan
Filed Nov. 19, 1984, Ser. No. 672,836
Claims priority, application Japan, May 18, 1984, 59-20119
Term of patent 14 years
U.S. Cl. D3—40



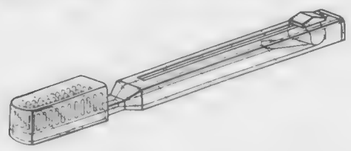


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294,432
TRAVELERS CASE FOR PORTABLE VACUUM CLEANER
Marion G. Henson, P.O. Box 281, Percy, Ill. 62272
Filed Apr. 1, 1985, Ser. No. 718,107
Term of patent 14 years
U.S. Cl. D3—74



294,433
DISPOSABLE TOOTH BRUSH
Robert A. DeMars, 7932 Maestro St., Canoga Park, Calif. 91304
Filed Aug. 16, 1985, Ser. No. 766,428
Term of patent 14 years
U.S. Cl. D4—108



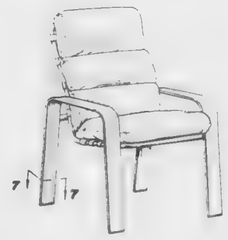
294,434
BAR STOOL
Vladimir W. Zakharov, Baldwin Park, Calif., assignor to Mikhail Darafeev, Inc., Baldwin Park, Calif.
Filed Jun. 6, 1986, Ser. No. 871,586
Term of patent 14 years
U.S. Cl. D6—360



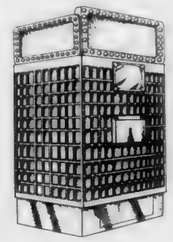
294,435
ADJUSTABLE LOUNGE CHAIR
Henry Massonnet, Nurieux-Volognat, France (01760)
Filed Oct. 22, 1985, Ser. No. 790,007
Claims priority, application France, Apr. 22, 1985, 85 1813
Term of patent 14 years
U.S. Cl. D6—368



294,436
DINING CHAIR
Donald B. Colby, Sarasota, Fla., assignor to Tropitone Furniture Company, Inc., Sarasota, Fla.
Filed Apr. 29, 1986, Ser. No. 857,533
Term of patent 14 years
U.S. Cl. D6—379



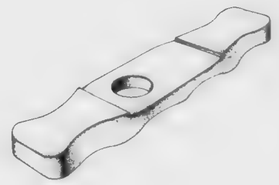
294,437
COMBINED VIEWING SCREEN AND MERCHANDISING DISPLAY FOR VIDEO TAPED MOVIES OR THE LIKE
Edward A. Tombs, Norcross, and Donald A. DaLee, Atlanta, both of Ga., assignors to Supervideo, Inc., Chestnut Hill, Mass.
Filed Jul. 26, 1985, Ser. No. 759,150
Term of patent 14 years
U.S. Cl. D6—397



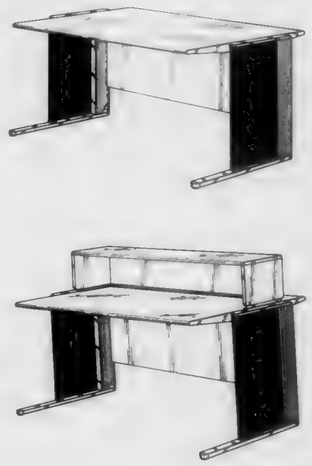
294,438
COMBINED TABLE AND PIANO
Pierre Pagé, Montreal, Canada, assignor to Pierre Page & Associates, Montreal, Canada
Filed Jul. 2, 1985, Ser. No. 751,259
Term of patent 14 years
U.S. Cl. D6—397



294,439
LAP TRAY
Michael M. Price, 2655 Abby Ridge Rd., Conyers, Ga. 30208
Filed Aug. 15, 1985, Ser. No. 765,718
Term of patent 14 years
U.S. Cl. D6—406

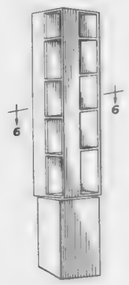


294,440
DESK
Hans H. Werner, Rosengartenstrasse 87, D-7000 Stuttgart 1, Fed. Rep. of Germany
Filed Apr. 16, 1985, Ser. No. 723,946
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, MR816
Term of patent 14 years
U.S. Cl. D6—422

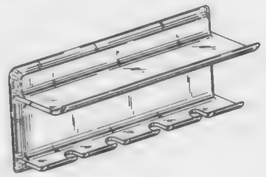


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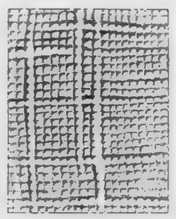
294,441
BOOK DISPLAY RACK
Harry Hoch, Chicago, Ill., assignor to Dollar Books, Inc., Chicago, Ill.
Filed Aug. 7, 1985, Ser. No. 763,276
Term of patent 14 years
U.S. Cl. D6—461



294,442
COMBINED BRUSH AND TUBE HOLDER
Jerry Bordian, P.O. Box 91253, West Vancouver, British Columbia, Canada V7V 3N9
Filed Jul. 15, 1985, Ser. No. 755,153
Term of patent 14 years
U.S. Cl. D6—528



294,443
LAMINATED PLASTIC AND PAPER TABLECLOTH OR SIMILAR ARTICLE
Glen N. Black, and Thomas L. Harold, both of Osage City, Kans., assignors to Hallmark, Cards, Incorporated, Kansas City, Mo.
Filed Jan. 3, 1984, Ser. No. 567,797
Term of patent 14 years
U.S. Cl. D6—617



294,444
ICE BUCKET
Pierre Tardif, Vieux Montreal, Canada, assignor to Genin-Trudeau & Cie Limited, Boucherville, Canada
Filed Feb. 28, 1985, Ser. No. 706,956
Claims priority, application Canada, Oct. 31, 1984, 31-10-84-6
Term of patent 14 years
U.S. Cl. D7—78



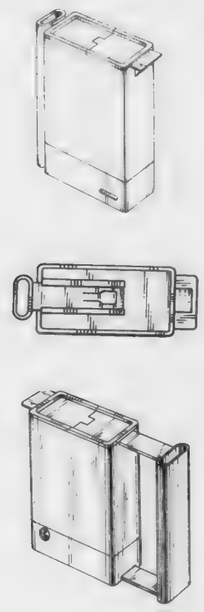
294,445
ICE BUCKET WITH LID
Carsten Jorgensen, Dattenbergrain 31, 6010 Kriens, Switzerland
Filed May 14, 1985, Ser. No. 733,859
Term of patent 14 years
U.S. Cl. D7—78



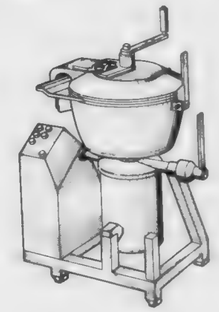
294,446
CANISTER
Pierre Tardif, Quebec, Canada, assignor to Genin-Trudeau & Cie Limited, Boucherville, Canada
Filed Feb. 28, 1985, Ser. No. 706,955
Claims priority, application Canada, Oct. 31, 1984, 31-10-84-6
Term of patent 14 years
U.S. Cl. D7—79



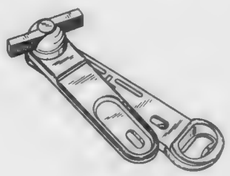
294,447
PORTABLE HOT POT
John Kao, Taipei, Taiwan, assignor to Sutton Import-Export Corp., New York, N.Y.
Filed Jul. 10, 1985, Ser. No. 753,435
Term of patent 14 years
U.S. Cl. D7—317



294,448
UNIVERSAL KITCHEN MACHINE
Friedrich Otto, Hameln, Fed. Rep. of Germany, assignor to A. Stephan U. Soehne GmbH & Co., Hameln, Fed. Rep. of Germany
Filed Jul. 26, 1985, Ser. No. 760,075
Term of patent 14 years
U.S. Cl. D7—368



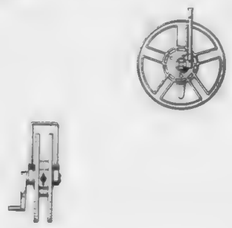
294,449
COMBINATION-OPENER, CAPSULE HOLDER AND CORK-SCREW
Jacques Kuhn, Rikon, Switzerland, assignor to Heinrich Kuhn Metallwarenfabrik Aktiengesellschaft, Switzerland
Filed May 7, 1985, Ser. No. 731,570
Claims priority, application Hague, Nov. 8, 1984, DMA/00327
Term of patent 14 years
U.S. Cl. D8—34



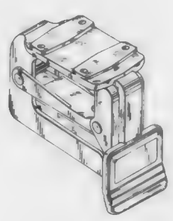


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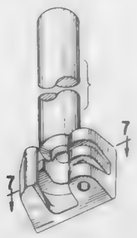
294,450
ELECTRICAL CORD REEL
Terry N. Nelson, Shoreview, Minn., assignor to Specialty Manufacturing Company, St. Paul, Minn.
Filed Jan. 7, 1985, Ser. No. 689,234
Term of patent 14 years
U.S. Cl. D8—359



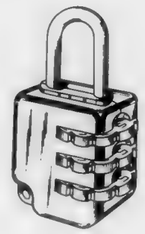
294,451
CLOTHES HANGER CLAMP FOR LUGGAGE
James S. Gregg, Aurora, and Richard E. Molesworth, Highlands Ranch, both of Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Nov. 23, 1984, Ser. No. 673,352
The portion of the term of this patent subsequent to Feb. 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—330



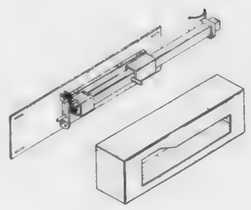
294,452
DOOR FASTENER CAM
Robert J. Bakula, Kenosha, Wis., assignor to White Welding & Mfg., Inc., Kenosha, Wis.
Filed May 29, 1984, Ser. No. 615,101
Term of patent 14 years
U.S. Cl. D8—330



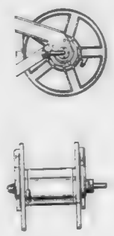
294,453
COMBINATION PADLOCK
Chong-Kuan Ling, No. 7, 3A, Lane 464, Tung-Hwa S. Road, Taipei, Taiwan
Filed Aug. 21, 1985, Ser. No. 767,906
Claims priority, application Taiwan, Jun. 8, 1985, 74302871
Term of patent 14 years
U.S. Cl. D8—334



294,454
SECURITY GATE LATCH
Larry Loudenslager, 505 McGee Dr., Sallisaw, Okla. 74955
Filed Jun. 28, 1985, Ser. No. 750,087
Term of patent 14 years
U.S. Cl. D8—341



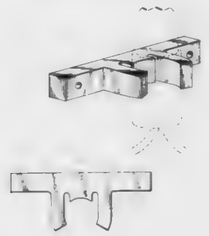
294,455
WALL MOUNT HOSE REEL
Terry N. Nelson, Shoreview, Minn., assignor to Specialty Manufacturing Company, St. Paul, Minn.
Filed Dec. 14, 1984, Ser. No. 681,917
Term of patent 14 years
U.S. Cl. D8—359



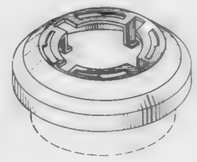
294,456
CADDY HOSE REEL
Terry N. Nelson, Shoreview, Minn., assignor to Specialty Manufacturing Company, St. Paul, Minn.
Filed Dec. 14, 1984, Ser. No. 681,941
Term of patent 14 years
U.S. Cl. D8—359



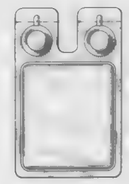
294,457
MINIATURE LIGHT WALL MOUNT BRACKET
Willard C. Doty, 3049 Bronson Dr., and Michael T. Hegland, 7604 Spring Lake Rd., both of Mounds View, Minn. 55432
Filed Oct. 30, 1985, Ser. No. 793,113
Term of patent 14 years
U.S. Cl. D8—373



294,458
COMBINED SUPPORT AND ANCHORING BASE FOR A COSMETIC PREPARATION
James M. Wilmott, Kinnelon, N.J., and Alexander P. Znaiden, Sloatsburg, N.Y., assignors to Avon Products, Inc., New York, N.Y.
Filed Mar. 5, 1985, Ser. No. 708,302
Term of patent 14 years
U.S. Cl. D9—337



294,459
PACKAGING CONTAINER
Herbert Wendel, Sarreguemines, France, assignor to Societe Internationale de Fabrication et de Diffusion de Produits Parfumes I.P.P., Sarreguemines, France
Filed Jan. 29, 1985, Ser. No. 695,968
Claims priority, application France, Aug. 2, 1984, 842736
Term of patent 14 years
U.S. Cl. D9—341



294,460
CONTAINER
William C. Rogler, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,520
Term of patent 14 years
U.S. Cl. D9—349



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294,461
CONTAINER
Michael Papa, Windsor Locks, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,571
Term of patent 14 years
U.S. Cl. D9—349



294,462
CONTAINER WALL
Akiho Ota, Funabashi, and Takao Iizuka, Matsudo, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
Filed Jul. 30, 1985, Ser. No. 760,418
Term of patent 14 years
U.S. Cl. D9—392



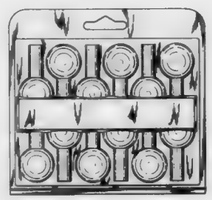
294,463
CONTAINER
William A. Lang, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,619
Term of patent 14 years
U.S. Cl. D9—392



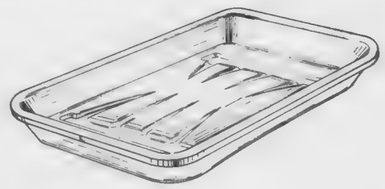
294,464
CONTAINER
William C. Rogler, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,645
Term of patent 14 years
U.S. Cl. D9—392



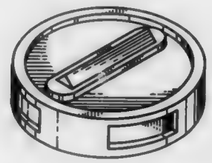
294,465
PACKAGING CONTAINER FOR BALL STEM VALVE MEMBERS
Charles P. Hill, Indianapolis, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Jul. 12, 1985, Ser. No. 754,601
Term of patent 14 years
U.S. Cl. D9—415



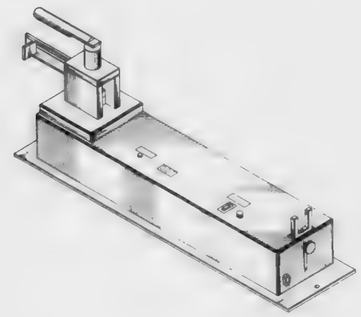
294,466
FOOD PACKAGING TRAY
Alan P. Culver, Salisbury, Md., assignor to Perdue Farms Incorporated, Salisbury, Md.
Filed May 28, 1985, Ser. No. 738,300
Term of patent 14 years
U.S. Cl. D9—425



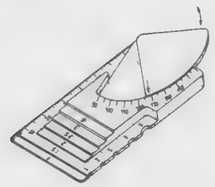
294,467
COMBINED BOTTLE CAP AND PILL DIVIDER
Dolores R. Wirkus, and Leroy A. Wirkus, both of 1619 Dogwood La., Mt. Prospect, Ill. 60056
Filed Jul. 30, 1985, Ser. No. 760,454
Term of patent 14 years
U.S. Cl. D9—436



294,468
APPARATUS FOR MEASURING THE NATURAL FREQUENCY OF ELONGATE OBJECTS
Peter M. Dragotta, Wayne, N.J., assignor to M. W. Tool Company, Elmwood Park, N.J.
Filed Mar. 11, 1985, Ser. No. 710,160
Term of patent 14 years
U.S. Cl. D10—46



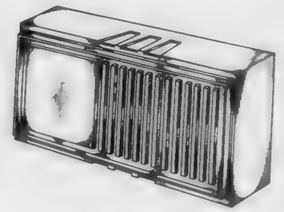
294,469
ASSEMBLING JIG FOR FURNITURE DOORS
Helmut Rupprechter, Lauterach, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Filed Aug. 2, 1985, Ser. No. 761,805
Claims priority, application Austria, Feb. 15, 1985, 27004/432/1985
Term of patent 14 years
U.S. Cl. D10—62



294,470
CLEARANCE GAUGE
David J. Jordan, 2505 W. Iola, Broken Arrow, Okla. 74012
Filed May 20, 1985, Ser. No. 735,789
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—64



294,471
CHIME HOUSING
Monte L. Levin, New York, N.Y., and John J. Daly, San Mateo, Calif., assignors to Trine Products Corporation, Bronx, N.Y.
Continuation-in-part of Ser. No. 543,726, Oct. 20, 1983, Pat. No. Des. 280,082. This application Apr. 11, 1985, Ser. No. 722,090
The portion of the term of this patent subsequent to Aug. 13, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—118



294,472
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 18, 1985, Ser. No. 724,398
Term of patent 14 years
U.S. Cl. D11—27



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294,473
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 18, 1985, Ser. No. 724,399
Term of patent 14 years
U.S. Cl. D11—41

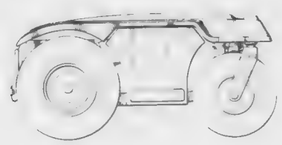


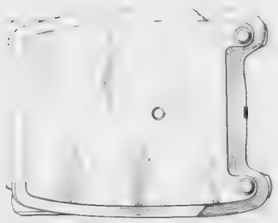


294,475
WHEELCHAIR
Sen J. Chen, No. 236, Sec. 3, Ho-Pin West Road, Taipei, Taiwan
Filed Dec. 30, 1985, Ser. No. 814,876
Term of patent 14 years
U.S. Cl. D12—131

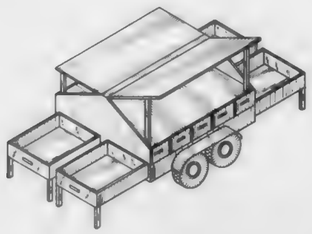


294,476
MODULAR WHEELCHAIR BASE
James J. Michel, Agoura, and Stephen H. Kaminski, Burbank, both of Calif., assignors to Everest & Jennings, Inc., Calif.
Filed Nov. 25, 1985, Ser. No. 806,202
Term of patent 14 years
U.S. Cl. D12—133

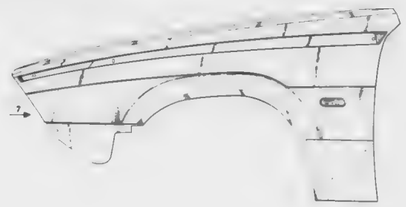




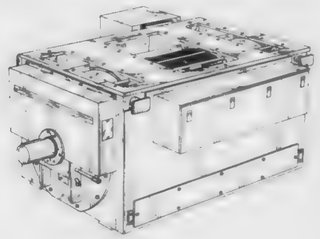
294,474
TRAILERABLE CART FOR THE VENDING OF MERCHANDISE
Charles Pellenz, 840 Dresser St., Cheboygan, Mich. 49721
Filed Apr. 22, 1985, Ser. No. 725,645
Term of patent 14 years
U.S. Cl. D12—102



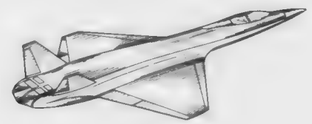
294,477
FRONT MUDGUARD FOR AN AUTOMOTIVE VEHICLE
Ermanno Cressoni, Arese, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy
Filed Apr. 30, 1985, Ser. No. 728,935
Claims priority, application Italy, Oct. 31, 1984, 23665/84[U]
Term of patent 14 years
U.S. Cl. D12—184



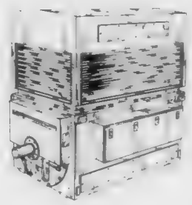
294,480
DYNAMOELECTRIC MACHINE
Charles C. Keane, Weymouth, Mass., assignor to General Electric Company, Fort Wayne, Ind.
Filed Sep. 10, 1985, Ser. No. 774,556
Term of patent 14 years
U.S. Cl. D13—3



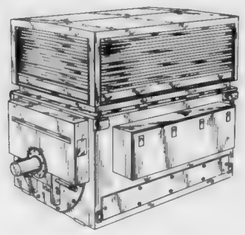
294,478
AIRCRAFT
Haig Asdurian, Fullerton; Michael G. Huben, Los Angeles; Kenneth M. Shimabukuro, Huntington Beach; David J. McNally, and Robert V. Dunkason, both of Torrance, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.
Filed Jan. 7, 1985, Ser. No. 689,267
Term of patent 14 years
U.S. Cl. D12—342



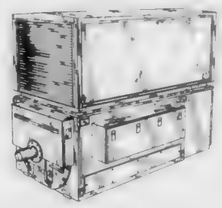
294,481
DYNAMOELECTRIC MACHINE
Charles C. Keane, Weymouth, Mass., assignor to General Electric Company, Fort Wayne, Ind.
Filed Sep. 10, 1985, Ser. No. 774,558
Term of patent 14 years
U.S. Cl. D13—3



294,479
DYNAMOELECTRIC MACHINE
Charles C. Keane, Weymouth, Mass., assignor to General Electric Company, Fort Wayne, Ind.
Filed Sep. 10, 1985, Ser. No. 774,555
Term of patent 14 years
U.S. Cl. D13—3

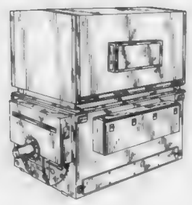


294,482
DYNAMOELECTRIC MACHINE
Charles C. Keane, Weymouth, Mass., assignor to General Electric Company, Fort Wayne, Ind.
Filed Sep. 10, 1985, Ser. No. 774,574
Term of patent 14 years
U.S. Cl. D13—3

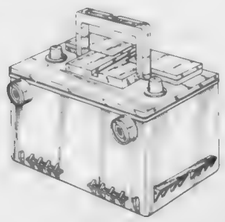


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294,483
DYNAMOELECTRIC MACHINE
Charles C. Keane, Weymouth, Mass., assignor to General Electric Company, Fort Wayne, Ind.
Filed Sep. 10, 1985, Ser. No. 774,575
Term of patent 14 years
U.S. Cl. D13—3



294,484
BATTERY HOUSING
James H. Kellett; Raymond W. Gaddis, both of Winston-Salem; Robert W. Fritts, Thomasville, all of N.C., and David L. Schoenecker, Anaheim, Calif., assignors to Douglas Battery Manufacturing, Winston-Salem, N.C.
Filed Aug. 12, 1985, Ser. No. 764,386
Term of patent 14 years
U.S. Cl. D13—8



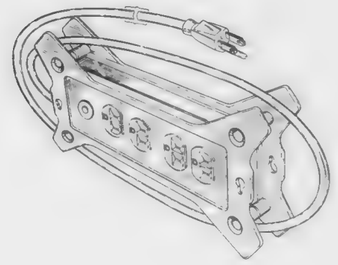
294,485
STRAP FOR MARKING AND IDENTIFICATION OF ELECTRIC CABLES
Kurt Johansson, Vallentuna, Sweden, assignor to JTR Electrical Innovation AB, Stockholm, Sweden
Filed Apr. 10, 1985, Ser. No. 721,642
Claims priority, application Sweden, Oct. 24, 1984, 84-2852
Term of patent 14 years
U.S. Cl. D13—13



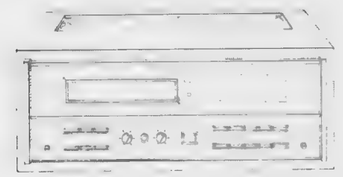
294,486
CABLE BOOT
Douglas G. Opitz, West Bend, Wis., assignor to Harley-Davidson, Inc., Milwaukee, Wis.
Filed May 20, 1985, Ser. No. 736,085
Term of patent 14 years
U.S. Cl. D13—24



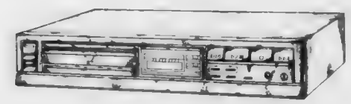
294,487
COMBINED POWERBOARD AND REEL
Francis R. Bannigan, 64 Duerdin Street, North Clayton, 3168, Victoria, Australia
Filed Dec. 28, 1984, Ser. No. 687,544
Term of patent 14 years
U.S. Cl. D13—30



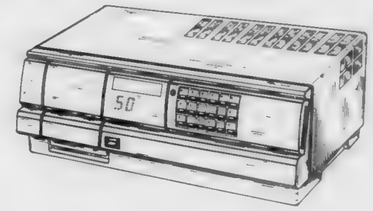
294,488
COMPACT DISC PLAYER
Thomas A. Rogers, Vestal, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.
Filed Oct. 22, 1985, Ser. No. 790,019
Term of patent 14 years
U.S. Cl. D14—1



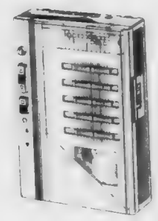
294,489
DIGITAL AUDIO COMPACT DISK PLAYER
Hiromi Okamoto, Gunma, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan
Filed Dec. 17, 1985, Ser. No. 810,277
Claims priority, application Japan, Jun. 17, 1985, 60-25476
Term of patent 14 years
U.S. Cl. D14—1



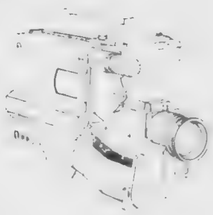
294,490
VIDEO PLAYER
Monte D. Lavine, Rochester, N.Y., assignor to Eastmen Kodak Company, Rochester, N.Y.
Filed Sep. 16, 1985, Ser. No. 776,238
Term of patent 14 years
U.S. Cl. D14—2



294,491
CASSETTE PLAYER WITH TUNER
Jun Ishii; Akihiko Konno, both of Tokyo; Koji Nakashima, Mitaka; Toshio Takada, Odawara, and Masahiko Kashiwabara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 24, 1985, Ser. No. 748,059
Claims priority, application Japan, Dec. 24, 1984, 59-52688; Apr. 18, 1985, 60-15582
Term of patent 14 years
U.S. Cl. D14—5



294,492
COMBINED VIDEO TAPE RECORDER AND CAMERA
Akira Takahashi, Sayama; Noboru Chiba, and Katsuya Hamamoto, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 27, 1985, Ser. No. 769,748
Claims priority, application Japan, Mar. 27, 1985, 60-11920
Term of patent 14 years
U.S. Cl. D14—5

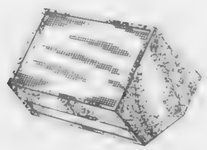


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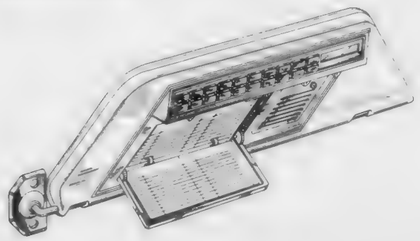
294,493
CONTROL PANEL FOR A VIDEOTAPE RECORDER
Darrell S. Staley, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Apr. 12, 1985, Ser. No. 722,979
Term of patent 14 years
U.S. Cl. D14—10



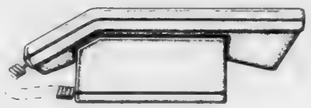
294,494
SPEAKER ENCLOSURE
John C. Kountz, 1065 Van Dyke Dr., Laguna Beach, Calif. 92651, and John M. De Bord, P.O. Box 1965, Studio City, Calif. 91604
Filed May 13, 1985, Ser. No. 733,113
Term of patent 14 years
U.S. Cl. D14—13



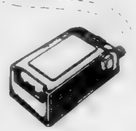
294,495
COMBINED VEHICLE SUN VISOR AND CELLULAR TELEPHONE UNIT
Harvey Nissley, Grosse Ile, Mich., assignor to Anthony P. Palett, Farmington Hills, Mich.
Filed Feb. 18, 1986, Ser. No. 833,786
Term of patent 14 years
U.S. Cl. D12—191



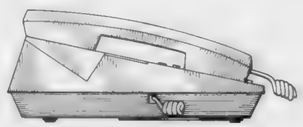
294,496
TELEPHONE SET OR SIMILAR ARTICLE
Golub Drakulovic, West Long Branch; Charles F. Liebler, Holmdel; Larry Sliker, Newton; Thomas L. Stahly, Howell; Donald E. Still, Leonardo, all of N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to American Telephone & Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.
Filed Mar. 23, 1987, Ser. No. 29,067
Term of patent 14 years
U.S. Cl. D14—53

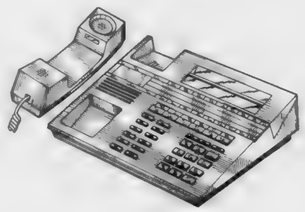




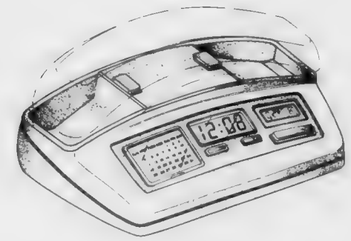


294,497
COMBINATION HANDSET AND STAND TELEPHONE INSTRUMENT
Takashi Oshima, Tokyo, and Hiroshi Satoh, Hino, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Apr. 18, 1986, Ser. No. 856,150
Term of patent 14 years
U.S. Cl. D14—58





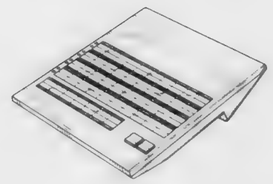
294,498
TELEPHONE INSTRUMENT BASE
George C. Sun, Suite 1300, Imperial Bank Bldg., 701 "B" St., San Diego, Calif. 92101
Filed Sep. 22, 1986, Ser. No. 910,194
Term of patent 14 years
U.S. Cl. D14—73



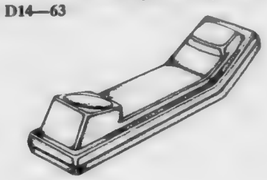


294,499
INTER-CALL DEVICE FOR TELEPHONE SETS
Hiroshi Yamagishi, Kawasaki, Japan, assignor to Nitsuko Limited, Kanagawa, Japan
Filed Jun. 24, 1986, Ser. No. 877,976
Claims priority, application Japan, Apr. 8, 1986, 61-12566
Term of patent 14 years
U.S. Cl. D14—62





294,500
TELEPHONE HANDSET
Golub Drakulovic, West Long Branch; Charles F. Liebler, Holmdel; Larry Sliker, Newton; Thomas L. Stahly, Howell; Donald E. Still, Leonardo, all of N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to American Telephone & Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.
Filed Mar. 23, 1987, Ser. No. 29,066
Term of patent 14 years
U.S. Cl. D14—63





294,501
CONTROL PANEL FOR A COPIER OR THE LIKE
W. Patrick Fricke, and Larry D. Harrison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 16, 1985, Ser. No. 712,815
Term of patent 14 years
U.S. Cl. D16—32

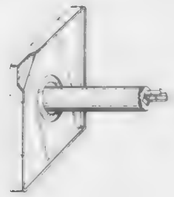


294,502
TIE BAR
James R. Espy, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 24, 1985, Ser. No. 758,528
Term of patent 14 years
U.S. Cl. D16—37



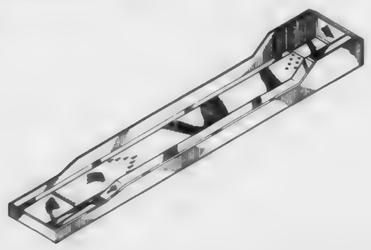
VOL 1088 ISS 1 MR 1 1988 UMI

294,503
TIE BAR/END CAP
James R. Espy, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 28, 1986, Ser. No. 838,018
Term of patent 14 years
U.S. Cl. D16—37

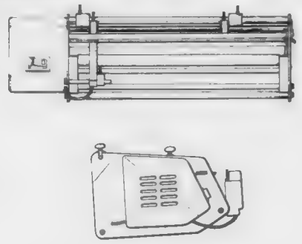


294,504
DESK-TOP ELECTRONIC CALCULATOR
Nobuo Kikuchi, and Manabu Kanazawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 23, 1985, Ser. No. 778,717
Claims priority, application Japan, Apr. 4, 1985, 60-13667
Term of patent 14 years
U.S. Cl. D18—7

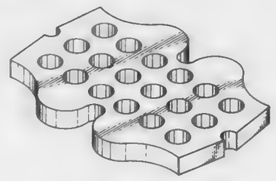
294,505
GOLFBALL BOWLING GAME ALLEY
John D. Knighten, 1650 N. Kadota Ave. #133, Casa Grande, Ariz. 85222-2749
Filed May 31, 1985, Ser. No. 739,914
Term of patent 14 years
U.S. Cl. D21—11



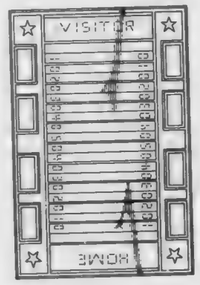
294,506
LABEL DISPENSER
Allen H. Oglander, 9 Sackston Woods, St. Louis County, Mo. 63141, and Richard E. Shannon, Lake Road Y-10, Rocky Mount, Mo. 65072
Filed Sep. 13, 1985, Ser. No. 775,807
Term of patent 14 years
U.S. Cl. D18—19



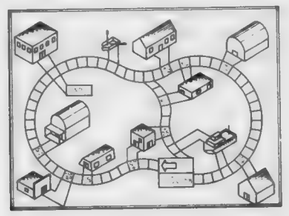
294,507
GAME BOARD
Ezra Mulugeta, 6064 E. Lovers La., #280, Dallas, Tex. 75206, and Assesaeta Shiferaw, 713 Hazeldine, S.E., Albuquerque, N. Mex. 87102
Filed Jul. 12, 1985, Ser. No. 754,079
Term of patent 14 years
U.S. Cl. D21—20



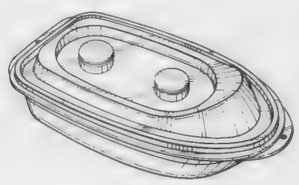
294,508
FOOTBALL GAME BOARD
Robert M. Kight, and Dianne Kight, both of Rte. 1, Box 393, Drummonds, Tenn. 38023
Filed Jul. 25, 1985, Ser. No. 758,861
Term of patent 14 years
U.S. Cl. D21—29



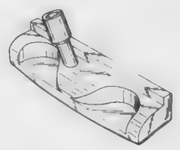
294,509
GAME BOARD
Wilton J. Hebert, Jr., and Robert P. Hebert, both of 107 Cyril St., Pierre Part, La. 70339
Filed Jul. 25, 1985, Ser. No. 758,870
Term of patent 14 years
U.S. Cl. D21—31



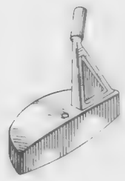
294,510
TOY BOAT OR THE LIKE
Howard W. Michaelson, Coram, and Dominick Loscalzo, Whitestone, both of N.Y., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Apr. 4, 1985, Ser. No. 719,931
Term of patent 14 years
U.S. Cl. D21—130



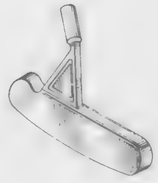
294,511
GOLF CLUB PUTTER HEAD
Michael Durket, 20701 Leonard Rd., Saratoga, Calif. 95070
Filed Apr. 29, 1985, Ser. No. 728,128
Term of patent 14 years
U.S. Cl. D21—217



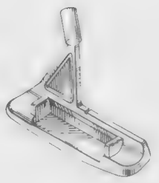
294,512
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,532
The portion of the term of this patent subsequent to Feb. 23, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217



294,513
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,713
The portion of the term of this patent subsequent to Jan. 26, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—218

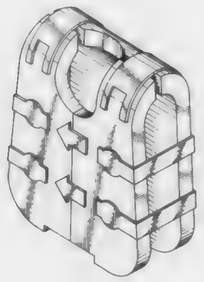


294,514
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,592
The portion of the term of this patent subsequent to Jan. 19, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—219



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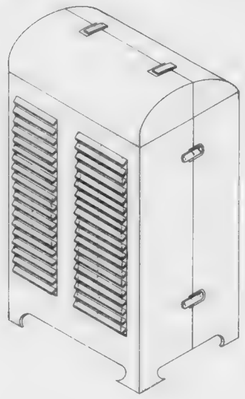
294,515
LIFE JACKET
Richard H. Gercken, 817 Park La., Liberty, Mo. 64068
Filed May 29, 1985, Ser. No. 739,087
Term of patent 14 years
U.S. Cl. D21—238



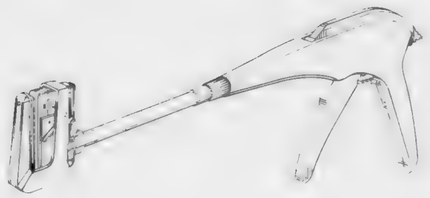
294,516
FISHING REEL
Masakazu Sakamoto, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jul. 8, 1985, Ser. No. 752,685
Claims priority, application Japan, Jan. 11, 1985, 60-672
Term of patent 14 years
U.S. Cl. D22—140



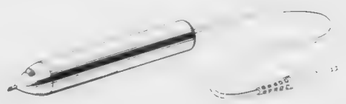
294,517
ICE CONTAINER HOUSING FOR ATTACHMENT TO BOX FANS FOR ENHANCED COOLING
Percy L. Williamson, 11261 Rivercrest Dr., Little Rock, Ark. 72212
Filed Mar. 16, 1984, Ser. No. 590,529
Term of patent 14 years
U.S. Cl. D23—411



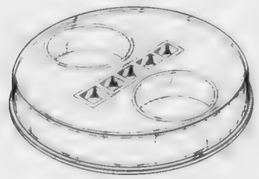
294,518
SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Sep. 19, 1985, Ser. No. 777,740
Term of patent 14 years
U.S. Cl. D24—26



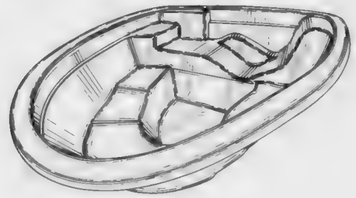
294,519
INSTRUMENT FOR TATTOOING
Arthur H. Hardy, Jr., Santa Barbara, Calif., assignor to Peter LaHaye, Medina, Wash.
Filed Jul. 29, 1985, Ser. No. 760,143
Term of patent 14 years
U.S. Cl. D24—26



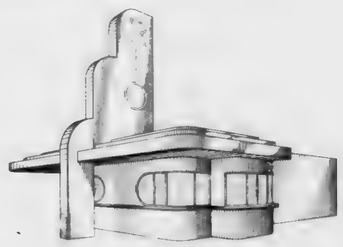
294,520
COMPARTMENTED PACKAGING CONTAINER FOR DENTAL MATERIALS OR THE LIKE
Robert D. Holewinski, Lakehurst, and Leslie Hamilton, Trenton, both of N.J., assignors to Johnson & Johnson Dental Products, Company, East Windsor, N.J.
Filed May 8, 1985, Ser. No. 731,707
Term of patent 14 years
U.S. Cl. D24—31



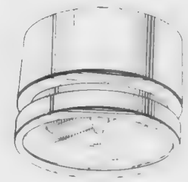
294,521
SPA
Robert V. Willich, and Robert Morrow, both of 870 Wilco Rd., Stayton, Oreg. 97383
Filed Dec. 19, 1984, Ser. No. 683,638
Term of patent 14 years
U.S. Cl. D24—38



294,522
FAST SERVICE RESTAURANT BUILDING
Larry D. Adcock, 2997-A N. Stemmons, Lewisville, Tex. 75067
Filed Apr. 8, 1985, Ser. No. 720,682
Term of patent 14 years
U.S. Cl. D25—1



294,523
AREA LIGHT
Robert L. Ewing; John W. Harvey; Richard G. Armstrong, all of Newark, Ohio, and Randall P. Crothers, Littleton, Colo., assignors to Manville Corporation, Denver, Colo.
Filed Jan. 29, 1986, Ser. No. 823,882
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—71



294,524
LIGHTER
Alvaro Garcia de la Noceda Fierro, Madrid, Spain, assignor to Fosforera Espanola, S.A., Madrid, Spain
Filed Nov. 25, 1985, Ser. No. 806,207
Term of patent 14 years
U.S. Cl. D27—42



294,525
HAIR TREATMENT SHIELD
Iris Tate, 3595 Riverside Dr., Norfolk, Va. 23502
Filed Sep. 26, 1984, Ser. No. 654,746
Term of patent 14 years
U.S. Cl. D28—10



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COMBINED CURLING BRUSH AND COVER THEREFOR
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Sep. 19, 1985, Ser. No. 777,896
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 73 MR 9378
Term of patent 14 years
U.S. Cl. D28—35



294,527
CURLING BRUSH
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Sep. 19, 1985, Ser. No. 777,905
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 73MR-9378
Term of patent 14 years
U.S. Cl. D28—35



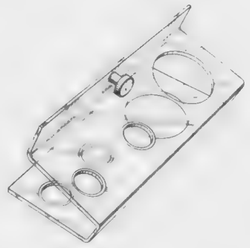
294,528
COMBINED RAZOR AND COVER THEREFOR
Michael J. Gray, 24 Hidden Acres Dr., Duxbury, Mass. 02332
Filed Jun. 25, 1985, Ser. No. 748,651
Term of patent 14 years
U.S. Cl. D28—46



294,529
DRY SHAVER
Hans T. Meelen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 11, 1985, Ser. No. 807,567
Claims priority, application Benelux, Jul. 4, 1985, 60181-00
Term of patent 14 years
U.S. Cl. D28—49



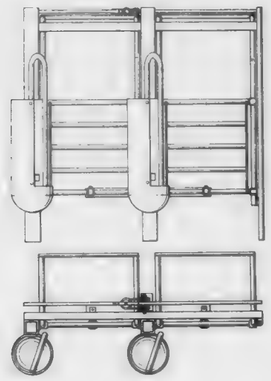
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HOLDER FOR HAIRSTYLING APPLIANCES OR THE LIKE
Ronald Carluccio, Berkeley Heights, and Frank Antonacci, Mountainside, both of N.J., assignors to Cutless Associates, Inc., New Providence, N.J.
Filed May 31, 1985, Ser. No. 739,886
Term of patent 14 years
U.S. Cl. D28—73



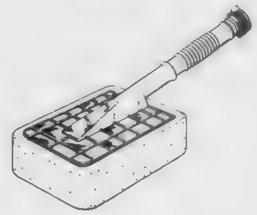
294,531
ANIMAL FEEDING BOWL
William Neunzig, 455 NE. 160th St., North Miami, Fla. 33162
Filed Feb. 12, 1987, Ser. No. 942,585
Term of patent 14 years
U.S. Cl. D30—130



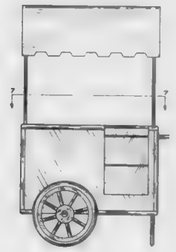
294,532
MILKING PARLOR STALL GATE UNIT
August Vandenberg, 17306 Roseton Ave.; Ben W. Vandenberg, 17224 Gard Ave., both of Artesia, Calif. 90701; Andrew W. Vandenberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706
Filed Jul. 25, 1986, Ser. No. 889,517
Term of patent 14 years
U.S. Cl. D30—119



294,533
VEHICLE WASHING BRUSH
Murray G. Spencer, 39 Warlock Crescent, Willowdale, Ontario, Canada M2K 2H8
Filed Jul. 8, 1985, Ser. No. 752,606
Claims priority, application Canada, Feb. 25, 1985, 25-02-85-13
Term of patent 14 years
U.S. Cl. D32—45



294,534
CART
David L. Hawthorn, 3903 Riverside Dr., Tulsa, Okla. 74105, and Arvil Lewis, Broken Arrow, Okla., assignors to David L. Hawthorn, Tulsa, Okla.
Filed Jul. 29, 1985, Ser. No. 760,269
Term of patent 14 years
U.S. Cl. D34—25



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Abercia, Ralph, Jr. Air and water flow system for aquarium. 4,728,420, Cl. 210-169.000.

Abiko, Toshio: *See—*
Kitsuda, Yoshihiro; Abiko, Toshio; Masamoto, Kyoji; and Tsukamoto, Katsuya, 4,728,962, Cl. 343-872.000.

Abom, Jan J. V. Process for separating substances in the evaporated state from air and/or gas mixtures. 4,728,342, Cl. 55-59.000.

Abrokwah, Jonathan K., to Honeywell Inc. Low power AlGaAs/-GaAs complementary FETs incorporating InGaAs n-channel gates. 4,729,000, Cl. 357-22.000.

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Adams, Ronald L.: *See—*
Le, Hue P.; Roy, Joy; Adams, Ronald L.; Oswald, James C.; and Anderson, Jeffery J., 4,728,969, Cl. 346-140.00R.

Adamson, Hugh P., to Adaptive Instruments Corp. Method and apparatus for improving electrochemical processes. 4,728,877, Cl. 320-21.000.

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Thompson, Roger A.; and Gold, Phillip W., 4,729,105, Cl. 364-478.000.

Adrian, Ronald J.; and Yao, Chung-Sheng, to University of Illinois. Method and apparatus for measuring the displacements of particle images for multiple exposure velocimetry. 4,729,109, Cl. 364-560.000.

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Advance Transformer Company: *See—*
Wong, John M., 4,729,088, Cl. 363-124.000.

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Brown, Candice H., 4,729,061, Cl. 361-386.000.
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Wear, Frederick C.; Bland, Hal E.; and Dada, Sadru, 4,728,522, Cl. 426-242.000.

Agfa Gevaert Aktiengesellschaft: *See—*
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Ahlberg, Carl S.: *See—*
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Ahmed, Hassan J.; and Burchill, Steven R., to Westinghouse Electric Corp. Apparatus for integrated fuel assembly inspection system. 4,728,483, Cl. 376-258.000.

Ahn, Yeon S.: *See—*
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Oba, Susumu; Kurishima, Kenji; Kusunoki, Masaharu; Odaka, Tadao; and Arai, Toshihiko, 4,728,253, Cl. 414-749.000.

Aihara, Yoshihiko: *See—*
Ohara, Tsunemasa; Fukahori, Hidehiko; Suzuki, Masayuki; and Aihara, Yoshihiko, 4,728,975, Cl. 354-173.100.

Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Torque variation absorbing device. 4,727,767, Cl. 74-574.000.

Air, Ltd.: *See—*
May, Michael G., 4,728,282, Cl. 431-9.000.

Airey, Peter J., to Schlumberger Technology Corporation. Tool for closing a production column in a well. 4,727,939, Cl. 166-332.000.

Aisin Seiki Kabushiki Kaisha: *See—*
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Aisin Warner Kabushiki Kaisha: *See—*
Ogasawara, Tsunehiko; and Sumiya, Koji, 4,727,967, Cl. 192-4.00A.
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Ajiki, Yoshio: *See—*
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Ajinomoto Co., Ltd.: *See—*
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Akademie der Wissenschaften der DDR: *See—*
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Akagi, Takao; Sakamoto, Itsuki; and Yamaguchi, Shinji, to Kuraray Co., Ltd. Sheet-like structures and process for producing the same. 4,728,564, Cl. 428-247.000.

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Alasoo, Ott F.: *See—*
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Kamelreiter, Friedrich; Landauf, Josef; Marko, Adalbert; Bormann, Helmut; Bosse, Jochen; Kirschning, Werner; Lischitzki, Dieter; and Zwetz, Detlef, 4,728,285, Cl. 431-187.000.

Zyma SA: *See*—
Ventouras, Kimon, 4,728,513, Cl. 424-461.000.

528569 Ontario Limited: *See*—
Horvath, Steven, 4,728,386, Cl. 156-361.000.

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PATENTS WERE ISSUED ON THE 1ST DAY OF MARCH, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., Re. 32,615, Cl 131-361.000.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Mercaptophenol derivatives as age resisters for polymers. Re. 32,618, Cl. 524-331.000.

Fagan, Christopher B.: *See*—
Wilson, Neill R., Re. 32,614, Cl. 81-367.000.

Gogniat, Paul, to Montres Rado S.A. Watchcase. Re. 32,617, Cl. 368-292.000.

Goodyear Tire & Rubber Company, The: *See*—
Cottman, Kirkwood S., Re. 32,618, Cl. 524-331.000.

Graham, Joe. Towel warmer and holder. Re. 32,616, Cl. 219-385.000.

Luke, John A., to Brown & Williamson Tobacco Corporation. Cigarettes. Re. 32,615, Cl. 131-361.000.

Montres Rado S.A.: *See*—
Gogniat, Paul, Re. 32,617, Cl. 368-292.000.

Wilson, Neill R., to Fagan, Christopher B. Self-adjusting locking wrench. Re. 32,614, Cl. 81-367.000.

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TO WHOM

CERTIFICATES WERE ISSUED

Bathen, Roland, to Mahle GmbH. Machine tool control system. B1 4,203,062, 3-1-88, Cl. 318-571.000.

Brunnschweiler, David; and Sedgely, Barrie, to Cosmopolitan Textile Co. Ltd. Regulating the continuous supply of material. B1 1,032,058, 3-1-88, Cl. 177-1.000.

Cosmopolitan Textile Co. Ltd.: *See*—
Brunnschweiler, David; and Sedgely, Barrie, B1 1,032,058, Cl. 177-1.000.

Mahle GmbH: *See*—
Bathen, Roland, B1 4,203,062, Cl. 318-571.000.

Sedgely, Barrie: *See*—
Brunnschweiler, David; and Sedgely, Barrie, B1 1,032,058, Cl. 177-1.000.

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A. Stephan U. Soehne GmbH & Co.: *See*—
Otto, Friedrich, 294,448, Cl. D7-368.000.

Adcock, Larry D. Fast service restaurant building. 294,522, 3-1-88, Cl. D25-1.000.

Alfa Romeo Auto S.p.A.: *See*—
Cressoni, Ermanno, 294,477, Cl. D12-184.000.

Allen, James H.; and Brinker, Barry, to 'Totes', Incorporated. Combined shoe shine case and pad. 294,428, 3-1-88, Cl. D3-30.500.

American Telephone & Telegraph Company, AT&T Information Systems Inc.: *See*—
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Drakulovic, Golub; Liebler, Charles F.; Sliker, Larry; Stahly, Thomas L.; Still, Donald E.; and Sylvester, Gordon E., 294,500, Cl. D14-63.000.

Ampex Corporation: *See*—
Staley, Darrell S., 294,493, Cl. D14-10.000.

Antonacci, Frank: *See*—
Carluccio, Ronald; and Antonacci, Frank, 294,530, Cl. D28-73.000.

Antonious, Anthony J. Golf club head. 294,512, 3-1-88, Cl. D21-217.000.

Antonious, Anthony J. Golf club head. 294,513, 3-1-88, Cl. D21-218.000.

Antonious, Anthony J. Golf club head. 294,514, 3-1-88, Cl. D21-219.000.

Armstrong, Richard G.: *See*—
Ewing, Robert L.; Harvey, John W.; Armstrong, Richard G.; and Crothers, Randall P., 294,523, Cl. D26-71.000.

Asdurian, Haig; Huben, Michael G.; Shimabukuro, Kenneth M.; McNally, David J.; and Dunkason, Robert V., to Northrop Corporation. Aircraft. 294,478, 3-1-88, Cl. D12-342.000.

Austin, Stephen F., to Nabisco Brands. Pretzel in shape of a figure. 294,420, 3-1-88, Cl. D1-108.000.

Avon Products, Inc.: *See*—
Wilmott, James M.; and Znaiden, Alexander P., 294,458, Cl. D9-337.000.

Bakula, Robert J., to White Welding & Mfg., Inc. Door fastener cam. 294,452, 3-1-88, Cl. D8-330.000.

Bannigan, Francis R. Combined powerboard and reel. 294,487, 3-1-88, Cl. D13-30.000.

Black, Glen N.; and Harold, Thomas L., to Hallmark, Cards, Incorporated. Laminated plastic and paper tablecloth or similar article. 294,443, 3-1-88, Cl. D6-617.000.

Bordian, Jerry. Combined brush and tube holder. 294,442, 3-1-88, Cl. D6-528.000.

Braun Aktiengesellschaft: *See*—
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Oberheim, Robert, 294,527, Cl. D28-35.000.

Brinker, Barry: *See*—
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Brown, Paul D.; and Diaz, Juan A., to Reebok International Ltd. Shoe sole. 294,424, 3-1-88, Cl. D2-320.000.

Bulgari, Marina, to Marina B Creation S.A. Ring. 294,472, 3-1-88, Cl. D11-27.000.

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Canon Kabushiki Kaisha: *See*—
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Carluccio, Ronald; and Antonacci, Frank, to Cutless Associates, Inc. Holder for hairstyling appliances or the like. 294,530, 3-1-88, Cl. D28-73.000.

Chen, Sen J. Wheelchair. 294,475, 3-1-88, Cl. D12-131.000.

Chiba, Noboru: *See*—
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Colby, Donald B., to Tropitone Furniture Company, Inc. Dining chair. 294,436, 3-1-88, Cl. D6-379.000.

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Culver, Alan P., to Perdue Farms Incorporated. Food packaging tray. 294,466, 3-1-88, Cl. D9-425.000.

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DaLee, Donald A.: *See*—
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Daly, John J.: *See*—
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Dart Industries Inc : *See*—
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DeMars, Robert A. Disposable tooth brush. 294,433, 3-1-88, Cl. D4-108.000.

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Dollar Books, Inc.: *See*—
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Donner Mountain Corporation, The: *See*—
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Dragotta, Peter M., to M. W. Tool Company. Apparatus for measuring the natural frequency of elongate objects. 294,468, 3-1-88, Cl. D10-46.000.

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Espy, James R., to Minnesota Mining and Manufacturing Company. Tie bar/end cap. 294,503, 3-1-88, Cl. D16-37.000.

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Oshima, Takashi; and Satoh, Hiroshi, to Iwatsu Electric Co., Ltd. Combination handset and stand telephone instrument. 294,497, 3-1-88, Cl. D14-58.000.
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Pastorok, John F. Keg carrier. 294,427, 3-1-88, Cl. D3-30.100.
Pellenz, Charles. Trailerable cart for the vending of merchandise. 294,474, 3-1-88, Cl. D12-102.000.
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Rogler, William C., to Monsanto Company. Container. 294,464, 3-1-88, Cl. D9-392.000.
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Williamson, Percy L. Ice container housing for attachment to box fans for enhanced cooling. 294,517, 3-1-88, Cl. D23-411.000.
Willich, Robert V.; and Morrow, Robert. Spa. 294,521, 3-1-88, Cl. D24-38.000.
Wilmott, James M.; and Znaiden, Alexander P., to Avon Products, Inc. Combined support and anchoring base for a cosmetic preparation. 294,458, 3-1-88, Cl. D9-337.000.
Wirkus, Dolores R.; and Wirkus, Leroy A. Combined bottle cap and pill divider. 294,467, 3-1-88, Cl. D9-436.000.
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Sprague, James W. *Prunus persica* Last Chance Peach Number One. 6,119, 3-1-88, Cl. 43.000.
Vieira, Frank A., to Huerta, Livorio C.; and Huerta, Elsie E. Plum tree, "Broken Heart". 6,118, 3-1-88, Cl. 38.000.
Welter, Gary. Syngonium plant named Magnum. 6,120, 3-1-88, Cl. 88.000.

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LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF MARCH, 1988

A. E. Staley Manufacturing Company: *See*—
Roth, Claris D.; and Moser, Kenneth B., H444, Cl. 264-45.100.

Allen, Thomas S.: *See*—
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American Telephone and Telegraph Company, AT&T Technologies, Incorporated: *See*—
Bock, Anne B.; Kurtz, Samuel E.; and Seibert, Thomas E., H445, Cl. 264-1.700.

Atkins, Ronald L.: *See*—
Fischer, John W.; and Atkins, Ronald L., H447, Cl. 544-180.000.

Bock, Anne B.; Kurtz, Samuel E.; and Seibert, Thomas E., to American Telephone and Telegraph Company, AT&T Technologies, Incorporated. Method of forming light emitting device with direct contact lens. H445, 3-1-88, Cl. 264-1.700.

Carr, Walter A.: *See*—
Farncomb, Robert E.; and Carr, Walter A., H448, Cl. 149-104.000.

Clark, Kenneth G., to United States of America, Navy. Composition and method for cleaning embedded soil from surfaces having low gloss coatings. H442, 3-1-88, Cl. 252-163.000.

Farncomb, Robert E.; and Carr, Walter A., to United States of America, Navy. Co-nitration of 1,2,4-butanetriol and glycerin. H448, 3-1-88, Cl. 149-104.000.

Fischer, John W.; and Atkins, Ronald L., to United States of America, Navy. Synthesis of 1,3,5-trinitro-1,3,5-triazacyclohexane. H447, 3-1-88, Cl. 544-180.000.

Furth, Harold P.: *See*—
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Halbach, Klaus, to United States of America, Energy. Magnetic field adjustment structure and method for a tapered wiggler. H450, 3-1-88, Cl. 330-4.000.

Kulsrud, Russell M.; Furth, Harold P.; Valeo, Ernest J.; and Goldhaber, Maurice, to United States of America, Energy. Method of controlling fusion reaction rates. H446, 3-1-88, Cl. 376-143.000.

Kurtz, Samuel E.: *See*—
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Milton, Robert W.; and Thorn, Lawrence B., to United States of America, Army. Technique and mechanism for hot spall testing under pressure. H441, 3-1-88, Cl. 374-8.000.

Moser, Kenneth B.: *See*—
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Roth, Claris D.; and Moser, Kenneth B., to A. E. Staley Manufacturing Company. Process for making molded articles with mold release agents. H444, 3-1-88, Cl. 264-45.100.

Rudesill, John A., to W. R. Grace & Co. Catalyst compositions. H449, 3-1-88, Cl. 502-67.000.

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Valeo, Ernest J.: *See*—
Kulsrud, Russell M.; Furth, Harold P.; Valeo, Ernest J.; and Goldhaber, Maurice, H446, Cl. 376-143.000.

Viksne, Janis I.; and Allen, Thomas S., to United States of America, Navy. Fluid tank sounding tube check valve. H438, 3-1-88, Cl. 137-519.500.

W. R. Grace & Co.: *See*—
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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564 4,727,847
[illegible]9 4,727,848
571 4,727,849
588 4,727,850
[illegible]1 4,727,851
627 4,727,891

CLASS 125

16 R 4,727,852

CLASS 126

41 R 4,727,853
92 B 4,727,854
242 4,727,855
437 4,727,856

CLASS 127

1 4,728,367

CLASS 128

1.3 4,727,857
[illegible] 4,727,858
4,727,859
25 R 4,727,860
80 C 4,727,861
4,727,862
80H 4,727,863
[illegible] 4,727,864
89 R 4,727,865
130 4,727,866
136 4,727,867
156 4,727,868
163 4,727,869
202.12 4,727,870
204.17 4,727,871
207.14 4,727,872
303 R 4,727,873
303.13 4,727,874
328 4,727,875
354 4,727,876
419 D 4,727,877
419 R 4,727,878
633 4,727,879
[illegible]0 4,727,880
[illegible]1 4,727,881
653 4,727,882
667 4,727,730
681 4,727,884
[illegible]5 4,727,885
725 4,727,886
748 4,727,887

CLASS 131

84.1 4,727,888
297 4,727,889
329 4,727,890
336 4,727,892
361 Re.32,615

CLASS 132

88.7 4,727,893
91 4,727,894
4,727,895

CLASS 134

1 4,728,368
184 4,727,896

CLASS 135

87 4,727,898
89 4,727,897

CLASS 136

230 4,728,369
258 4,728,370

CLASS 137

270 4,727,899
[illegible] 4,727,900
315 4,727,901
454.5 4,727,902
[illegible] 4,727,903
565 4,727,904
625.48 4,727,905
636.2 4,727,906

CLASS 138

[illegible] 4,727,907
120 4,727,908
127 4,727,909

CLASS 139

76 4,727,910
304 4,727,911

CLASS [illegible]

147 4,727,912

CLASS 141

7 4,727,913
105 4,727,914
201 4,727,915

CLASS 144

3 D 4,727,916

CLASS 148

2 4,728,372
6.15 R 4,728,373
320 4,728,374

CLASS 149

5 4,728,375
21 4,728,376

CLASS 152

209 B 4,727,917

CLASS 156

[illegible] 4,728,377
[illegible] 4,728,378
106 4,728,379
230 4,728,380
245 4,728,381
264 4,728,382
285 4,728,383
307.3 4,728,384
353 4,728,385
361 4,728,386
441 4,728,387
[illegible] 4,728,388
612 4,728,389
[illegible] 4,728,390
[illegible] 4,728,392
[illegible] 4,728,391

CLASS [illegible]

5 4,727,918
84 R 4,727,919
4,727,920
168 R 4,727,921

CLASS 162

29 4,728,393
129 4,728,394
138 4,728,395
193 4,728,396

CLASS 164

61 4,727,922
113 4,727,923
416 4,727,924
431 4,727,925
436 4,727,926
452 4,727,927
[illegible] 4,727,928
516 4,727,929

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CLASS 101
1 4,727,930
8 4,727,931
41 4,727,932
82 4,727,933
104.33 4,727,934
163 4,727,935

CLASS 156
53 4,727,936
145 4,727,937
170 4,727,938
132 4,727,939

CLASS 171
84 4,727,940

CLASS 173
29 4,727,941

CLASS 174
3 4,728,748
45 R 4,728,749
48 4,728,750
68.5 4,728,751
88 B 4,728,752
38 G 4,728,753

CLASS 175
28 4,727,942
29 4,727,943
93 4,727,944
29 4,727,945
79 4,727,946

CLASS 177
1 B1 Re.32,058
64 4,727,947

CLASS 178
2 C 4,728,754

CLASS 180
9.26 4,727,948
9.32 4,727,949
79.1 4,727,950
19 4,727,951
4,727,952
4,727,953
49 4,727,954
96 4,727,955

CLASS 181
11 4,727,956
08 4,727,957

CLASS 182
15 4,727,958
36 4,727,959
82 4,727,960
87 4,727,961

CLASS 187
9 R 4,727,962

CLASS 188
71.9 4,727,963
72.8 4,727,964

CLASS 192
0.033 4,727,966
4 A 4,727,967
6 A 4,727,965
53 F 4,727,968
58 B 4,727,969
70.13 4,727,973
70.17 4,727,970
70.27 4,727,971
84 C 4,727,974
07 C 4,727,972

CLASS 194
05 4,727,975

CLASS 198
46.1 4,727,982
60 4,727,983
03 4,727,976
50.01 4,727,977
37 4,727,978
03.3 4,727,979
12 4,727,980
41 4,727,981

CLASS 200
11 DA 4,728,755
43.08 4,728,756
50 A 4,728,758
50 AA 4,728,757
59 4,728,759

CLASS 203
80 4,728,397

CLASS 204
16 4,728,398
38.3 4,728,399
45.1 4,728,400
56.1 4,728,401
109 4,728,402
149 4,728,403
4,728,404
181.4 4,728,405
192.29 4,728,406
228 4,728,407
229 4,728,408
256 4,728,409
275 4,728,410
425 4,728,411

CLASS 206
1.5 4,727,984
221 4,727,985
229 4,727,986
293 4,727,987
610 4,727,988

CLASS 208
22 4,728,412
33 4,728,413
4,728,414
87 4,728,415
120 4,728,416
216 R 4,728,417
413 4,728,418

CLASS 209
219 4,728,419
546 4,727,989
557 4,727,990
588 4,727,991

CLASS 210
169 4,728,420
232 4,728,421
314 4,728,422
323.2 4,728,423
331 4,728,424
477 4,728,425
493.3 4,728,426
611 4,728,427
634 4,728,428
638 4,728,429
639 4,728,430
640 4,728,431
646 4,728,432
4,728,433
656 4,728,434
670 4,728,435
701 4,728,436
710 4,728,437
713 4,728,438
727 4,728,439
744 4,728,440
748 4,728,441
755 4,728,442

CLASS 211
13 4,727,992
41 4,727,993
198 4,727,994

CLASS 212
180 4,727,995
213 4,727,996

CLASS 215
100 A 4,727,997
230 4,727,998
232 4,727,999

CLASS 219
9.5 4,728,760
10.43 4,728,761
10.55 B 4,728,763
10.55 E 4,728,762
69 G 4,728,764
79 4,728,766
89 4,728,767
96 4,728,768
120 4,728,765
4,728,769
121 EF 4,728,772
121 LN 4,728,771
121 LT 4,728,773
121 LZ 4,728,770
124.22 4,728,774
202 4,728,775
301 4,728,776
348 4,728,777
385 Re.32,616
438 4,728,778
517 4,728,779
530 4,728,780
547 4,728,781

CLASS 220
71 4,728,000
90.2 4,728,001
90.4 4,728,002
319 4,728,003

CLASS 222
61 4,728,004
64 4,728,005
181 4,728,006
182 4,728,007
321 4,728,008
4,728,009
397 4,728,010
439 4,728,011
598 4,728,012
600 4,728,013
4,728,014

CLASS 223
70 4,728,015
85 4,728,016

CLASS 224
42.42 4,728,017
273 4,728,018
329 4,728,019

CLASS 227
19 4,728,020
120 4,728,021

CLASS 228
56.3 4,728,022
122 4,727,633
180.1 4,728,023

CLASS 229
3.1 4,728,024
40 4,728,025
52 B 4,728,026
69 4,728,027

CLASS 231
35 4,728,028

CLASS 235
133 R 4,728,782
456 4,728,783
462 4,728,784

CLASS 237
12.3 R 4,728,029

CLASS 238
61 4,728,030
303 4,728,031
382 4,728,032

CLASS 239
1 4,728,033
112 4,728,034
122 4,728,035
132.1 4,728,036
154 4,728,037
164 4,728,038
296 4,728,039
390 4,728,040
542 4,728,042
754 4,728,041

CLASS 241
14 4,728,043
18 4,728,044
19 4,728,045
24 4,728,046
79.1 4,728,047

CLASS 242
47 4,728,048
55 4,728,049
56 A 4,728,050
64 4,728,051
84.1 K 4,728,052
84.5 A 4,728,053
84.51 A 4,728,054
130 4,728,055
198 4,728,056

CLASS 244
3.16 4,728,057
3.28 4,728,058
119 4,728,059
159 4,728,060
164 4,728,061
170 4,728,062

CLASS 246
34 R 4,728,063

CLASS 248
74.3 4,728,064
129 4,728,065
165 4,728,066
188.7 4,728,067
220.4 4,728,068
231.7 4,728,069
303 4,728,070
316.5 4,728,071
406.1 4,728,072

CLASS 249
189 4,728,073

CLASS 250
201 4,728,785
213 VT 4,728,786
227 4,728,787
231 SE 4,728,788
236 4,728,789
305 4,728,790
327.2 4,728,791
328 4,728,792
338 4,728,793
339 4,728,794
347 4,728,795
423 P 4,728,796
484.1 4,728,798
492.2 4,728,797
4,728,799
572 4,728,800
573 4,728,801
578 4,728,802
4,728,803
4,728,804
4,728,805

CLASS 251
57 4,728,074
122 4,728,075
149.6 4,728,076
257 4,728,077

CLASS 252
8.511 4,728,444
8.514 4,728,445
8.551 4,728,446
8.552 4,728,447
8.6 4,728,443
12.2 4,728,448
49.6 4,728,450
51.5 A 4,728,451
75 4,728,452
91 4,728,453
95 4,728,454
99 4,728,455
142 4,728,456
174.15 4,728,457
299.65 4,728,458
301.5 4,728,459
511 4,728,461
513 4,728,462
609 4,728,463

CLASS 254
134.3 FT 4,728,079

CLASS 256
10 4,728,080

CLASS 260
374 4,728,464
409 4,728,465
502.4 R 4,728,466
502.5 E 4,728,460

CLASS 261
72.1 4,728,467
111 4,728,468

CLASS 264
1.4 4,728,469
1.5 4,728,470
43 4,728,471
53 4,728,472
101 4,728,473
161 4,728,474
211 4,728,475
328.18 4,728,476
509 4,728,477
514 4,728,478

CLASS 266
158 4,728,081
168 4,728,082
274 4,728,083

CLASS 267
64.11 4,728,084
122 4,728,085
140.1 4,728,086
178 4,728,087
286 4,728,088

CLASS 270
31 4,728,089

CLASS 271
7 4,728,090
97 4,728,091
100 4,728,092
103 4,728,093
119 4,728,094
124 4,728,095
166 4,728,096
268 4,728,097

CLASS 272
33 R 4,728,098
72 4,728,099
93 4,728,100
130 4,728,101
132 4,728,102
137 4,728,103

CLASS 273
86 B 4,728,104
169 4,728,105
177 R 4,728,106
273 4,728,107
296 4,728,108
410 4,728,109

CLASS 277
213 4,728,110
235 B 4,728,111

CLASS 280
47.4 4,728,112
281 R 4,728,113
425 A 4,728,114
613 4,728,115
618 4,728,116
625 4,728,117
641 4,728,118
657 4,728,119
707 4,728,120
748 4,728,121
750 4,728,122
822 4,728,123

CLASS 283
2 4,728,124
18 4,728,125
22 4,728,126
39 4,728,127
157 4,728,128
334 4,728,129
351 4,728,130

CLASS 292
7 4,728,131
329 4,728,132
336.3 4,728,133

CLASS 294
19.2 4,728,134
64.1 4,728,135
68.3 4,728,136
82.12 4,728,138
88 4,728,137
99.2 4,728,139

CLASS 296
1 S 4,728,140
37.16 4,728,141
97 G 4,728,142
153 4,728,143
168 4,728,144
213 4,728,145
216 4,728,146

CLASS 297
194 4,728,147
284 4,728,148
285 4,728,149
383 4,728,150
438 4,728,151

CLASS 299
17 4,728,152
92 4,728,153

CLASS 301
5 B 4,728,154

CLASS 303
92 4,728,156
114 4,728,155

CLASS 307
43 4,728,806
52 4,728,807
66 4,728,808
106 4,728,809
108 4,728,810
112 4,728,811
134 4,728,812
228 4,728,813
260 4,728,814
261 4,728,815
265 4,728,816
270 4,728,817
272.2 4,728,818
353 4,728,819
443 4,728,820
448 4,728,821
4,728,822
451 4,728,823
457 4,728,824
481 4,728,827
493 4,728,828
570 4,728,825
571 4,728,826
590 4,728,829

CLASS 310
12 4,728,830
13 4,728,831
41 4,728,832
68 R 4,728,833
4,728,834
71 4,728,835
80 4,728,837
91 4,728,838
112 4,728,839
113 4,728,840
114 4,728,841
217 4,728,842
325 4,728,843
327 4,728,844
358 4,728,845

CLASS 312
12 4,728,157
108 4,728,158
111 4,728,159
236 4,728,160
238 4,728,161
333 4,728,162

CLASS 313
43 4,728,847
113 4,728,848
4,728,849
278 4,728,850
309 4,728,851
348 4,728,852
406 4,728,853
407 4,728,854
435 4,728,855
451 4,728,846
467 4,728,856
642 4,728,857

CLASS 315
15 4,728,858
4,728,859
39 4,728,860
83 4,728,861
111.01 4,728,862
111.21 4,728,863
169.3 4,728,864
194 4,728,865
224 4,728,866
248 4,728,867
411 4,728,868

CLASS 318
130 4,728,871
335 4,728,869
443 4,728,870
568 4,728,872
4,728,873
571 4,728,874
B1 4,203,062
642 4,728,875

CLASS 320
2 4,728,876
21 4,728,877

CLASS 322
2 R 4,728,878
25 4,728,879

CLASS 323
267 4,728,880
353 4,728,881

CLASS 324
61 R 4,728,882
73 R 4,728,883
83 D 4,728,884
102 4,728,885
120 4,728,886
127 4,728,887
253 4,728,888
307 4,728,889
309 4,728,890
4,728,891
4,728,892
312 4,728,893
318 4,728,894
4,728,895
4,728,896
329 4,728,897
522 4,728,898

CLASS 328
150 4,728,899

CLASS 330
253 4,728,900
260 4,728,901
261 4,728,902
264 4,728,903
286 4,728,904
293 4,728,905

CLASS 331
4 4,728,906
107 R 4,728,907
108 R 4,728,908

CLASS 332
30 V 4,728,909

CLASS 333
24 R 4,728,910
167 4,728,911
193 4,728,912

235 4,728,913

CLASS 335
6 4,728,914
211 4,728,915
255 4,728,916
274 4,728,917

CLASS 336
83 4,728,918
92 4,728,919

CLASS 338
39 4,728,920
196 4,728,921

CLASS 340
52 R 4,728,922
4,728,923
59 4,728,924
146.2 4,728,925
4,728,926
4,728,927
287 4,728,928
347 DD 4,728,929
4,728,930
365 C 4,728,931
4,728,932
4,728,933
407 4,728,934
506 4,728,935
525 4,728,936
571 4,728,937
572 4,728,938
576 4,728,939
591 4,728,940
620 4,728,941
679 4,728,942
682 4,728,943
4,728,944
734 4,728,945
765 4,728,946
4,728,947
4,728,948
825.37 4,728,949
870.31 4,729,950
4,728,951

CLASS 342
26 4,728,952
91 4,728,953
115 4,728,954
146 4,728,955
371 4,728,956
4,728,957
424 4,728,958
457 4,728,959

CLASS 343
700 MS 4,728,960
756 4,728,961
872 4,728,962

CLASS 346
25 4,728,963
33 R 4,728,964
4,728,965
134 4,728,966
136 4,728,967
140 R 4,728,968
4,728,969
4,728,970
155 4,728,971
160 4,728,972

CLASS 350
96.12 4,728,166
96.13 4,728,167
96.14 4,728,168
96.15 4,728,169
4,728,170
96.20 4,728,171
332 4,728,172
4,728,173
334 4,728,174
336 4,728,175
350 S 4,728,176
357 4,728,177
364 4,728,165
377 4,728,178
465 4,728,179
626 4,728,180
632 4,728,181

CLASS 351
161 4,728,182
219 4,728,183
360 4,728,078

CLASS 353
96 4,728,184
122 4,728,185

CLASS 354
79 4,728,973
81 4,728,974
173.1 4,728,975
173.11 4,728,976
187 4,728,977
289.1 4,728,978
4,728,979
4,728,980

CLASS 355
1 4,728,981
3 DD 4,728,987
3 R 4,728,982
4 4,728,983
4,728,984
7 4,728,985
4,728,986
11 4,728,988
14 R 4,728,989
14 TR 4,728,991
35 4,728,992
70 4,728,993
71 4,728,994
4,728,995
77 4,728,990
4,728,996

CLASS 356
71 4,728,186
153 4,728,187
218 4,728,188
312 4,728,189
336 4,728,190
345 4,728,191
350 4,728,192
356 4,728,193
358 4,728,194
394 4,728,195
446 4,728,196

CLASS 357
4,728,997
16 4,728,998
17 4,728,999
22 4,729,000
23.3 4,729,001
23.9 4,729,002
4,729,003
4,729,004
4,729,005
42 4,729,006
43 4,729,007
4,729,008
54 4,729,009
70 4,729,010

CLASS 358
10 4,729,011
11 4,729,012
19 4,729,013
37 4,729,014
76 4,729,015
4,729,016
88 4,729,017
98 4,729,018
112 4,729,019
133 4,729,020
135 4,729,021
146 4,729,022
148 4,729,023
153 4,729,024
166 4,729,025
168 4,729,026
183 4,729,027
4,729,028
4,729,029
230 4,729,030
237 4,729,031
244 4,729,032
257 4,729,033
261 4,729,034
4,729,035
296 4,729,036
299 4,729,037
300 4,729,038
4,729,039
310 4,729,040
336 4,729,041
4,729,042
342 4,729,043

CLASS 360
14.3 4,729,044
53 4,729,045
4,729,046
97 4,729,047
103 4,729,048
105 4,729,049
125 4,729,050
137 4,729,051

CLASS 361
42 4,729,052
118 4,729,053
119 4,729,054
4,729,055
153 4,729,056
213 4,729,057
321 4,729,058
356 4,729,059
385 4,729,060
386 4,729,061
399 4,729,062
414 4,729,063
426 4,729,064

CLASS 362
4,729,065
26 4,729,067
31 4,729,068
32 4,729,069
33 4,729,070
35 4,729,071
80 4,729,072
147 4,729,073
184 4,729,074
217 4,729,075
235 4,729,076
243 4,729,077
294 4,729,078
350 4,729,079
366 4,729,080

CLASS 363
17 4,729,081
41 4,729,082
53 4,729,083
56 4,729,084
4,729,085
65 4,729,086
98 4,729,087
124 4,729,088

CLASS 364
184 4,729,089
200 4,729,090
4,729,091
4,729,092
4,729,093
4,729,094
4,729,095
309 4,729,096
405 4,729,097
414 4,729,098
4,729,099
4,729,100
421 4,729,101
424 4,729,102
424.1 4,729,103
426 4,729,104
478 4,729,105
510 4,729,106
519 4,729,107
520 4,729,108
560 4,729,109
571 4,729,110
713 4,729,111
724 4,729,112
807 4,729,113
827 4,729,114

CLASS 365
185 4,729,115
189 4,729,116
200 4,729,117
230 4,729,118
4,729,119

CLASS 366
219 4,728,197
279 4,728,198

CLASS 367
23 4,729,066
94 4,729,120
113 4,729,121

CLASS 368
Re.32,617

CLASS 369
13 4,729,122

CLASS 370
100 4,729,123

CLASS 371
18 4,729,124
170 4,728,199

CLASS 375
36 4,729,125

CLASS 376
203 4,728,479
209 4,728,480
216 4,728,481
249 4,728,482
258 4,728,483
272 4,728,484
307 4,728,485
4,728,486
327 4,728,487
4,728,488
439 4,728,489
4,728,490
457 4,728,491
458 4,728,492

CLASS 379
9 4,728,271
152 4,728,272
22 4,729,126
206 4,728,273

CLASS 381
56 4,729,127
83 4,729,128

CLASS 384
19 4,728,200
121 4,728,201
537 4,728,202
549 4,728,203
572 4,728,204

CLASS 400
124 4,728,205
225 4,728,206
248 4,728,207
697.1 4,728,208
4,728,209

CLASS 401
6 4,728,210
88 4,728,212
123 4,728,211
197 4,728,213
258 4,728,214

CLASS 403
118 4,728,220
231 4,728,215
282 4,728,216
290 4,728,217
319 4,728,218

CLASS 408
115 4,728,221
128 4,728,222
154 4,728,223
195 4,728,224
260 4,728,219
262 4,728,225
267 4,728,226
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	4,727,616	4,728,268	4,729,094		4,728,119	4,728,474		4,728,026
	4,727,617	4,728,283	4,729,095		4,728,123	4,728,515		4,728,129
	4,727,619	4,728,289	4,729,128		4,728,130	4,728,534		4,728,150
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	4,727,648	4,728,319	4,727,603		4,728,516	4,728,630		4,728,588
	4,727,657	4,728,322	4,727,756		4,728,660	4,728,637		4,728,744
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	4,727,816	4,728,389	4,728,407		4,729,083	4,728,838		4,727,988
	4,727,819	4,728,421	4,728,551		4,729,127	4,728,841		4,728,136
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	4,727,825	4,728,451	4,728,877		4,727,866	4,728,960		4,728,493
	4,727,856	4,728,453	4,729,057		4,727,870	4,729,023		4,728,611
	4,727,871	4,728,498	4,729,105		4,728,015	4,729,056		4,728,635
	4,727,884	4,728,526	4,727,679	09 :	4,728,025	4,729,080		4,728,882
	4,727,887	4,728,575	4,727,979		4,728,112	4,729,081		4,728,930
	4,727,907	4,728,617	4,728,020		4,728,361	4,729,088	25 :	4,727,634
	4,727,927	4,728,657	4,728,095	15 :	4,728,099	4,729,106		4,727,680
	4,727,993	4,728,669	4,728,158		4,728,812	4,729,109		4,727,705
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	4,728,060	4,728,778	4,728,433		4,727,853	4,728,691		4,728,045
	4,728,068	4,728,805	4,728,454		4,727,883	4,728,699		4,728,066
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48 : 294,522
[redacted] : 294,505
51 : 294,525
55 : 294,452
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[redacted] : 6,118
6,119
15 : 6,120

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01 : H441
06 : H439
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24 : H443
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[redacted] : H442
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51 : H431

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C. William Verity, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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UNITED STATES PATENT AND TRADEMARK OFFICE
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Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Mar. 15, 1988, and was announced in the *Official Gazette* at 1087 O.G. 24 on Feb. 16, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	
—If paid before Mar. 15, 1988	1180.00
—If paid on or after Mar. 15. 1988	1300.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Jan. 21, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks*

Status of Appeal Cases

The Date of the Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without A Hearing as of Jan. 29, 1988.

Chemical Discipline	–	January 9, 1987
Mechanical Discipline	–	December 2, 1987
Electrical Discipline	–	March 11, 1986

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Jan. 29, 1988.

Chemical	–	November 1, 1985
Electrical	–	October 4, 1985
Mechanical	–	November 4, 1985

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of January 1988.

Affirmed	187
Affirmed-in-Part	48
Reversed	152
Total Decided	387

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 5, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,502,153 through 4,503,564
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 20, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,420,843	06/367,893	12/20/83
4,420,852	06/262,202	12/20/83
4,420,860	06/379,225	12/20/83
4,420,862	06/273,042	12/20/83
4,420,863	06/282,093	12/20/83
4,420,867	06/349,258	12/20/83
4,420,884	06/329,813	12/20/83
4,420,890	06/350,718	12/20/83
4,420,893	06/320,076	12/20/83
4,420,894	06/369,653	12/20/83
4,420,899	06/298,574	12/20/83
4,420,902	06/308,553	12/20/83
4,420,903	06/371,427	12/20/83
4,420,904	06/480,511	12/20/83
4,420,906	06/314,668	12/20/83
4,420,914	06/324,342	12/20/83
4,420,918	06/312,892	12/20/83
4,420,919	06/293,168	12/20/83
4,420,922	06/217,770	12/20/83
4,420,925	06/238,352	12/20/83
4,420,955	06/287,825	12/20/83
4,420,959	06/221,568	12/20/83
4,420,960	06/260,188	12/20/83
4,420,964	06/258,420	12/20/83
4,420,967	06/234,008	12/20/83
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4,421,004	06/339,589	12/20/83
4,421,007	06/329,445	12/20/83
4,421,008	06/296,738	12/20/83
4,421,014	06/441,085	12/20/83
4,421,017	06/470,054	12/20/83
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Patent Number	Serial Number	Issue Date
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4,421,043	06/386,176	12/20/83
4,421,045	06/374,998	12/20/83
4,421,047	06/319,858	12/20/83
4,421,064	06/314,739	12/20/83
4,421,070	06/392,412	12/20/83
4,421,076	06/266,392	12/20/83
4,421,081	06/232,858	12/20/83
4,421,082	06/408,628	12/20/83
4,421,087	06/346,251	12/20/83
4,421,089	06/399,515	12/20/83
4,421,095	06/305,983	12/20/83
4,421,096	06/435,781	12/20/83
4,421,100	06/333,424	12/20/83
4,421,104	06/338,694	12/20/83
4,421,106	06/281,413	12/20/83
4,421,110	06/269,685	12/20/83
4,421,124	06/271,794	12/20/83
4,421,125	06/362,270	12/20/83
4,421,137	06/230,378	12/20/83
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4,421,147	06/312,692	12/20/83
4,421,157	06/408,729	12/20/83
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4,421,555	06/360,815	12/20/83
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4,421,617	06/421,003	12/20/83
4,421,623	06/444,049	12/20/83
4,421,625	06/378,238	12/20/83
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4,421,640	06/349,398	12/20/83
4,421,648	06/268,725	12/20/83
4,421,651	06/382,960	12/20/83
4,421,653	06/408,311	12/20/83
4,421,662	06/414,725	12/20/83
4,421,665	06/226,155	12/20/83
4,421,672	06/311,301	12/20/83
4,421,704	06/346,964	12/20/83
4,421,716	06/221,327	12/20/83
4,421,724	06/299,652	12/20/83
4,421,727	06/392,100	12/20/83
4,421,748	06/397,914	12/20/83
4,421,752	06/359,752	12/20/83
4,421,754	06/402,974	12/20/83
4,421,755	06/349,838	12/20/83
4,421,757	06/335,149	12/20/83
4,421,760	06/274,464	12/20/83
4,421,761	06/228,696	12/20/83
4,421,763	06/362,358	12/20/83
4,421,777	06/248,592	12/20/83
4,421,780	06/331,361	12/20/83
4,421,791	06/324,767	12/20/87
4,421,797	06/302,449	12/20/83
4,421,800	06/345,106	12/20/83
4,421,818	06/367,203	12/23/83
4,421,826	06/361,317	12/20/83
4,421,829	06/404,141	12/20/83
4,421,853	06/388,760	12/20/83
4,421,854	06/388,901	12/20/83
4,421,865	06/271,467	12/20/83
4,421,897	06/328,180	12/20/83
4,421,909	06/452,881	12/20/83
4,421,927	06/314,041	12/20/83
4,421,931	06/338,243	12/20/83
4,421,952	06/311,832	12/20/83
4,421,965	06/379,058	12/20/83
4,421,973	06/264,675	12/20/83
4,421,981	06/258,256	12/20/83
4,421,983	06/243,376	12/20/83
4,421,984	06/282,310	12/20/83
4,421,991	06/423,862	12/20/93
4,421,992	06/327,406	12/20/83
4,421,993	06/382,875	12/20/83
4,421,995	06/288,562	12/20/83
4,422,003	06/408,320	12/20/83
4,422,016	06/313,744	12/20/83
4,422,027	06/244,438	12/20/83
4,422,039	06/256,998	12/20/83
4,422,041	06/288,595	12/20/83
4,422,043	06/244,391	12/20/83
4,422,045	06/245,759	12/20/83
4,422,047	06/324,223	12/20/83
4,422,052	06/268,374	12/20/83
4,422,054	06/345,462	12/20/83
4,422,094	06/319,090	12/20/83

Patent Number	Serial Number	Issue Date
4,422,103	06/265,929	12/20/83
4,422,110	06/296,083	12/20/83
4,422,118	06/273,617	12/20/83
4,422,131	06/415,324	12/20/83
4,422,133	06/319,251	12/20/83
4,422,134	06/276,043	12/20/83
4,422,138	06/329,792	12/20/83
4,422,163	06/299,255	12/20/83
4,422,167	06/277,297	12/20/83
4,422,170	06/349,822	12/20/83
4,422,173	06/358,525	12/20/83
4,422,182	06/354,702	12/20/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,342,714	06/249,430	8/3/82	3/31/81	1/29/88
4,344,813	06/216,083	8/17/82	12/15/80	1/29/88
4,347,324	06/264,116	8/31/82	5/15/81	1/29/88
4,348,562	06/226,367	9/7/82	1/19/81	1/29/88
4,349,005	06/228,222	9/14/82	1/26/81	1/29/88
4,349,006	06/228,223	9/14/82	1/26/81	1/29/88
4,352,242	06/273,585	10/5/82	6/15/81	1/29/88
4,353,873	06/257,265	10/12/82	4/24/81	1/29/88
4,362,135	06/262,350	12/7/82	5/11/81	1/29/88
4,363,705	06/284,052	12/14/82	7/16/81	1/29/88
4,365,980	06/294,806	12/28/82	8/20/81	1/29/88
4,370,152	06/278,777	1/25/83	6/29/81	1/29/88
4,370,344	06/236,644	1/25/83	2/23/81	1/29/88
4,370,996	06/243,371	2/1/83	3/13/81	1/29/88
4,372,277	06/254,991	2/8/83	4/16/81	1/29/88
4,374,657	06/270,016	2/22/83	6/3/81	1/29/88
4,376,046	06/268,872	3/8/83	6/1/81	1/29/88
4,376,314	06/273,189	3/15/83	6/12/81	1/29/88
4,376,522	06/264,638	3/15/83	5/18/81	1/29/88
4,379,742	06/237,279	4/12/83	2/23/81	1/29/88
4,385,024	06/273,942	5/24/83	6/15/81	1/29/88
4,404,533	06/362,997	9/13/83	3/29/82	1/29/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,544,852, Re. S.N. 101,581, Filed Sept. 28, 1987, Cl. 307/519, CIRCUIT ARRANGEMENT FOR MONITORING THE SPEED OF A DRIVE MOTOR, Helmut Moosmann, et al., Owner of Record: *Papst-Motoren GmbH & Co KG, Black Forest, W. Germany,* Attorney or Agent: Morgan L. Fitch, Jr., Ex. Gp.: 254

4,666,028, Re. S.N. 135,442, Filed Dec. 21, 1987, Cl. 198/335, BALUSTRADE OF PASSENGER CONVEYOR, Cyuichi Saito, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Thomas E. Beall, Jr., Ex. Gp.: 317

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,730,483, Reexam. No. 90/001,421, Requested: Jan. 11, 1988, Cl. 254/371, ASSEMBLY FOR PULLING A LINE, E. Strohm, Owner of Record: *Catherine Newell, San Diego, Calif.,* Attorney or Agent: Neil F. Markva, Ex. Gp.: 240, Requester: Maxwell Marine Ltd., Takapuna, New Zealand

4,403,941, Reexam. No. 90/001,423, Requested: Jan. 7, 1988, Cl. 431/10, COMBUSTION PROCESS FOR REDUCING NITROGEN OXIDES, Kunio Okiuro, et al., Owner of Record: *Babcock-Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Thomas E. Beall, Ex. Gp.: 340, Requester: The Babcock & Wilcox Co., New Orleans, La.

4,426,860, Reexam. No. 90/001,422, Requested: Jan. 19, 1988, Cl. 70/34, LOCK AND KEY SYSTEM OF THE PLUNGER TYPE, James Swisher, Owner of Record: *Inventor, Southport, Conn.,* Attorney or Agent: Robert E. Ross, Ex. Gp.: 350, Requester: Consolidated Edison Co., of N.Y. Inc., New York, N.Y.

4,613,444, Reexam. No. 90/001,425, Jan. 28, 1988, Cl. 358/122, REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH POTASSIUM CHLORIDE, George A. Lane, et al., Owner of Record: *The Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Nils H. Juhl, Ex. Gp.: 150, Requester: Owner

Erratum

"All reference to Reexamination Certificate No. B1 4,042,890 (772nd) to Joseph S. Eckerle of La Honda, Calif. for 'HIGH EFFICIENCY ELECTRICAL POWER CONDITIONER' appearing in the Official Gazette of Oct. 20, 1987 should be deleted since no reexamination certificate has been granted."

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Erratum

In the "Trademark Registrations Issued" section of the Trademark Official Gazette of Feb. 5, 1985, the mark for Registration No. 1,318,284 was incorrectly identified as SANTINIQUE (STYLIZED).

1,318,284	TM 187	Feb. 5, 1985

The mark as corrected is SATINIQUE (STYLIZED).

PATRICIA M. DAVIS
Administrator for Trademark Operations.

Feb. 2, 1988.

Filing of Papers During Unscheduled Closings of the Patent and Trademark Office

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open.

When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Information regarding whether or not the Office is officially closed on any particular day may be obtained by calling (703) 557-INFO.

This notice supersedes the notice of Feb. 11, 1987, which appears in 1076 OG 15 and 1076 TMOG 6, and in the consolidated listing published on Jan. 5, 1988, at 1086 OG 8 and 1086 TMOG 8.

DONALD W. PETERSON
Deputy Assistant Secretary and Deputy Commissioner of Patents and Trademarks.

February 8, 1988.

Patents Available for License or Sale

4,435,995. POSITIVE DRIVE DIFFERENTIAL FOR VEHICLE INCLUDING TRACTORS, *Walter E. Welander,* c/o Law Offices of Douglas L. Tschida — Suite 115, 2819 Hamline Ave. North, St. Paul, Minn. 55113.

4,611,098. CODED TELEPHONE ACCESS SYSTEM, *Paul J. Giorgio,* 285 River Ave., Providence, R.I. 02908.

4,709,521. METHOD OF INSERTING A TUBULAR OR BAR SHAPED STRUCTURAL MEMBER TIGHTLY INTO A LOCATION HOLE IN A CONSTRUCTION ELEMENT, *James A. Oliff,* Parkhurst & Oliff, 277 S. Washington St., Alexandria, Va. 22314.

4,711,137. MECHANICAL AUTOMATIC TRANSMISSION, *Walter E. Welander,* c/o Law Offices of Douglas L. Tschida — Suite 115, 2819 Hamline Ave. North, St. Paul, Minn. 55113.

S.N. 07/137,353. SUPPORT RECEPTACLE FLOWER POT AND POT LINERS, *William Poole,* 2600 E. 79th St., Chicago, Ill. 60649.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 8, 1988

B1 3,961,877	4,650,845	4,678,174	4,692,652
Re. 32,429	4,651,666	4,678,274	4,692,941
4,355,447	4,652,471	4,679,870	4,693,590
4,367,566	4,653,208	4,680,333	4,693,844
4,415,354	4,653,427	4,680,404	4,694,854
4,496,852	4,654,484	4,682,549	4,695,401
4,508,273	4,656,171	4,682,741	4,695,422
4,521,470	4,656,491	4,682,779	4,695,824
4,525,676	4,658,534	4,682,900	4,696,004
4,526,344	4,660,271	4,683,872	4,696,440
4,538,950	4,660,469	4,683,927	4,696,457
4,556,183	4,661,537	4,684,830	4,696,835
4,560,227	4,661,794	4,684,887	4,696,864
4,600,513	4,662,005	4,685,828	4,697,813
4,610,284	4,662,972	4,686,125	4,698,422
4,621,662	4,664,275	4,686,883	4,698,707
4,624,187	4,664,393	4,687,282	4,699,026
4,625,115	4,666,627	4,687,638	4,699,204
4,626,478	4,669,502	4,687,800	4,699,260
4,626,862	4,669,757	4,687,963	4,699,441
4,630,264	4,669,805	4,688,052	4,699,668
4,632,675	4,670,423	4,688,054	4,699,764
4,634,938	4,670,553	4,688,336	4,700,187
4,637,389	4,671,834	4,688,752	4,700,361
4,638,163	4,672,309	4,688,932	4,700,362
4,640,978	4,673,804	4,689,033	4,702,172
4,641,757	4,674,066	4,689,710	4,702,875
4,642,629	4,674,719	4,689,857	4,709,511
4,646,763	4,675,309	4,691,523	
4,648,925	4,677,533	4,692,338	
4,650,514	4,677,813	4,692,423	

Disclaimers

3,614,824.—*Norbert L. Moulin,* Placentia, Calif. METHOD AND APPARATUS FOR INSERTION OF ELECTRICAL CONTACTS INTO ELECTRICAL CONNECTORS. Patent dated Oct. 26, 1971. Disclaimer filed Nov. 16, 1987, by the assignee, *Hughes Aircraft Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 11 and 15 of said patent.

4,611,664.—*M. Glenn Osterhoudt, III; Vernon L. Green,* both of Corpus Christi, Tex. TECHNIQUE FOR PLACING A LIQUID CHEMICAL IN A WELL OR BORE HOLE. Patent dated Sept. 16, 1986. Disclaimer filed Nov. 23, 1987, by the assignee, *Petro-Stix, Inc.*

Hereby enters this disclaimer to claims 1-5, 8, 10-12, 16 and 17 of said patent.

Disclaimer and Dedication

4,175,544.—*Barry N. Newton,* Lafayette, Ind. IODOARYL CARBONATES FOR USE IN METHODS IN RADIOGRAPHY. Patent dated Nov. 27, 1979. Disclaimer and Dedication filed Dec. 29, 1987, by the assignee, *Alcon Laboratories, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
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	Boston Public Library	(617) 536-5400 Ext. 265
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Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 13, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	2-18-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-18-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	4-17-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-5-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	2-18-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-87

Expiration of patents: The patents within the range of numbers indicated below expire during February 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,559,209 to 3,566,408, inclusive
Plant Patents . . . . . Numbers 3,022 to 3,029 inclusive

REEXAMINATIONS

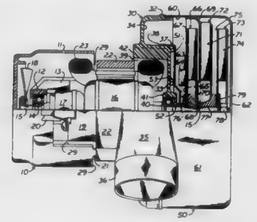
MARCH 8, 1988

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,226,575 (820th)
WET PICK-UP VACUUM UNIT

Robert L. Hyatt, Tallmadge; Norbert H. Niessner, South Euclid, and Richard D. Sumser, Louisville, all of Ohio, assignors to Ametek, Inc., Kent, Ohio

Reexamination Request No. 90/000,840, Aug. 20, 1985.
Reexamination Certificate for Patent No. 4,226,575, issued Oct. 7, 1980, Ser. No. 46,007, Jun. 6, 1979.
Int. Cl.[4] F04B *37/20*
U.S. Cl. 417—423 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** are confirmed.

Claims **12–15** are cancelled.

1. In a fan section for a wet pick-up type vacuum cleaner unit comprised of a motor section and a fan section, said motor section containing a motor and means for causing motor-cooling air to be drawn into said motor section through an entrance thereto and discharged through an exit therefrom,

said fan section having a fan chamber provided with an inlet port and containing a fan system which draws working air (by which cleaning and pick-up is performed) into said chamber through said inlet port and discharges the same through an outlet remote from an entrance or exit for the motor-cooling air of said motor section,

said fan chamber having a wall provided with support means for a main bearing in which is journaled a shaft extending into said fan chamber and on which said fan system is mounted so as to provide a space between said bearing and the most closely adjacent fan of said fan system,

said fan section having a sealing air inlet which is spaced from either a working air inlet or outlet of said fan section or a motor-cooling air entrance or exit of said motor section and which sealing air inlet leads through a sealing air passageway toward the location where said shaft extends from said bearing into said fan chamber, said passageway including a baffle portion segregating the passageway from the balance of said fan chamber and having an opening through which said shaft extends into said chamber, said opening being larger than the portion of said shaft passing therethrough to provide a substantially annular orifice through which sealing air, under normal operating conditions, may be drawn from said passageway into said fan chamber whereby liquid carried by said working air into said fan chamber and which might otherwise accumulate adjacent said bearing in the space between said bearing and the most adjacent fan is swept, by the sealing air passing through said orifice into said fan chamber, back into said fan chamber for discharge therefrom with said working air,

the improvement comprising:

check valve means preventing reverse flow of air and liquid carried thereby through said orifice, passageway, and sealing air inlet under an abnormal condition in which, but for said check valve means, resistance to discharge of said working air from said fan section outlet would exceed the resistance of reverse flow through said orifice and passageway and out of said sealing air inlet.

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REISSUES

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,619

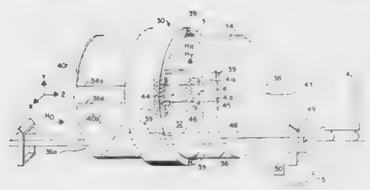
APPARATUS AND METHOD FOR NUCLEAR MAGNETIC RESONANCE SCANNING AND MAPPING

Raymond V. Damadian, 104 Plainview Rd., Woodbury, N.Y. 11797

Original No. 4,354,499, dated Oct. 19, 1982, Ser. No. 961,858, Nov. 20, 1978. Application for reissue Oct. 17, 1984, Ser. No. 661,718

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—653 **15 Claims**



1. A method of detecting selected nuclei within a specimen utilizing nuclear magnetic resonance phenomenon comprising:

(a) providing a [nonuniform] primary [static] magnetic field [space] *oriented in a direction Ho;*

(b) focusing the primary [static] magnetic field [space by a time-independent shaping of the primary static magnetic field space] to provide a *resultant magnetic field oriented in the Ho direction and having* a three dimensional resonance domain of selectable size [wherein] *within which* the field strength *in the direction Ho* is substantially uniform *and wherein there are points in the resultant magnetic field not in the resonance domain but having the same field strength in the Ho direction, all said points being in regions of non-uniform field intensity having sufficiently large gradients so as not to generate substantial resonance signals;*

(*c*) *maintaining the configuration of the resultant field within the resonance domain during generation of a nuclear magnetic resonance signal;*

[(c)] (*d*) positioning the specimen such that the resonance domain impinges on the specimen;

[(d)] (*e*) directing oscillating magnetic radiation to the resonance domain such that the magnetic field orientation of the oscillating magnetic radiation is orthogonal to the magnetic field orientation of the primary [static] magnetic field to cause a nuclear magnetic resonance signal to be generated by selected nuclei within the resonance domain;

[(e)] (*f*) receiving the nuclear magnetic resonance signal generated; and

[(f)] (*g*) processing the nuclear magnetic resonance signal to determine a nuclear magnetic resonance value directly which nuclear magnetic resonance valve represents the selected nuclei extant in the resonance domain [impringing] *impinging* on the specimen.

Re. 32,620

LUBRICATING SYSTEM FOR AN OUTBOARD ENGINE

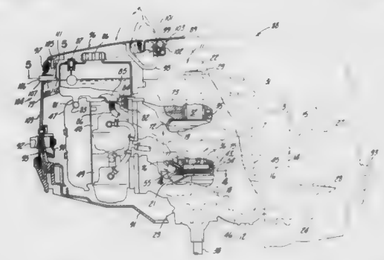
Tomio Iwai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha and Yamaha Hatsudoki Kabushiki Kaisha, both of, Japan

Original No. 4,493,661, dated Jan. 15, 1985, Ser. No. 528,996, Sep. 2, 1983. Continuation of Ser. No. 281,418, Jul. 8, 1981, abandoned. Application for reissue Sep. 11, 1985, Ser. No. 774,661

Claims priority, application Japan, Jul. 12, 1980, 55-95282

Int. Cl.[4] B63H *21/26*

U.S. Cl. 440—77 **30 Claims**



21. In a lubricating system for a two-cycle, crankcase compression internal combustion engine having a cylinder block, a cylinder head affixed to said cylinder block, a crankshaft supported for rotation about a vertically extending axis within a crankcase affixed to said cylinder block, a cylinder bore formed in said cylinder block and extending substantially perpendicularly to said vertically extending axis, a piston reciprocally supported in said cylinder bore, and connecting rod means operatively connecting said piston to said crankshaft for driving said crankshaft, the improvement comprising an oil pump positioned externally of said crankcase and said cylinder block for lubricating portions of said engine, said oil pump having a drive shaft extending perpendicularly to a plane containing said crankshaft axis and driven by said crankshaft and means for delivering oil to said engine for its lubrication.

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PLANT PATENTS

GRANTED MARCH 8, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,121

HYBRID TEA ROSE PLANT CV. AROMICLEA

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Somis, Calif.

Filed Dec. 30, 1985, Ser. No. 814,553
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. The new and distinct variety of hybrid tea rose plant cv. Aromiclea and the parts thereof, substantially as shown and described herein, the plant being particularly characterized by its large blossoms of a unique chatoyant orange coloration, essentially as described and illustrated herein; its sweet, moderately spicy to fruity fragrance, long, strong stems, urn-shaped buds, and attractive flower finish; its unusually heavy, leathery and very glossy foliage; its nearly continual bloom and well-branched habit; and its vigor, above-average hardiness, and well-above-average disease resistance.

6,122

PEACH TREE NAMED 'DELMASS'

Joseph Del Masso, 1723 Cottonwood La., Solvang, Calif. 93463

Filed Nov. 5, 1985, Ser. No. 795,106
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—42 **1 Claim**

1. A distinct and new variety of a plant as fully described in the above written specifications by this applicant and as shown from the color photographs.

6,123

MINIATURE CARNATION SANDY

Angelo J. Siri, San Francisco, Calif., assignor to Siri Bros. Nursery Inc., East Palo Alto, Calif.

Filed Aug. 17, 1984, Ser. No. 641,921
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

6,124

CHRYSANTHEMUM PLANT NAMED OMEGON

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1986, Ser. No. 833,081
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct Chrysanthemum plant named Omegon, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of incurved capitulum form; standard capitulum type; white ray floret color; diameter across face of capitulum of 125 to 150 mm. at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height when grown single stem; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

6,125

CHRYSANTHEMUM PLANT NAMED IRIDON

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1986, Ser. No. 833,091
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Iridon, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; yellow ray floret color with yellow-green inner ray florets; diameter across face of capitulum of up to 11 cm. at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height when grown as a pinched disbudded pot mum; excellent plant strength under all growing conditions; and semi-spreading branching pattern.

6,126

ST. AUGUSTINEGRASS (PS-247)

Terrance P. Riordan, Lincoln, Nebr., assignor to Pursley, Inc., Bradenton, Fla.

Filed Feb. 4, 1986, Ser. No. 828,328
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A St. Augustinegrass, substantially as herein described and illustrated, characterized by its rapid lateral spread and root length and numbers.

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PATENTS

GRANTED MAR. 8, 1988

ERRATA

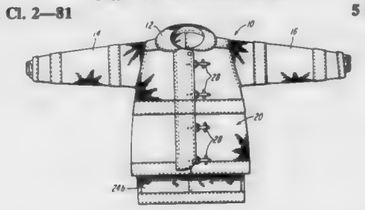
For CLASS	See PATENT NO.
126-112	4,729,207
148-033	4,729,816
424-487	4,739,904

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GENERAL AND MECHANICAL

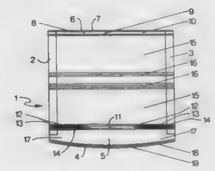
4,729,130
METHOD OF MAKING A FIREFIGHTER'S COAT
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Division of Ser. No. 936,620, Dec. 1, 1986, which is a continuation of Ser. No. 733,195, May 13, 1985, Pat. No. 4,627,112. This application May 29, 1987, Ser. No. 55,345
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 **5 Claims**

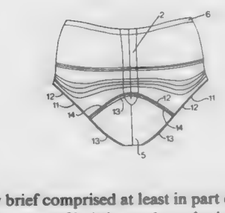


4. A method of making an improved firefighter's coat adapted for use with firefighter's pants extending downwardly from the waist of the firefighter to provide for full protection of the firefighter while also providing for less weight and improved freedom of movement and greater ventilation to reduce stress, comprising the steps of constructing a jacket of heat, flame and water resistant materials, with the jacket including a neck portion, a front portion and a rear portion, extending the front portion downwardly from the neck portion and with a lower edge of the front portion disposed below the firefighter's waist and adjacent the upper part of the firefighter's legs, extending the rear portion downwardly from the neck portion and with a lower edge of the rear portion disposed significantly below the lower edge of the front portion and generally above the knees of the firefighter to form a limited tail extension covering the lower rear part of the torso of the firefighter, thus providing the front portion with a significantly shorter vertical length than the rear portion, whereby the firefighter's legs have freedom of movement while crawling and climbing, the firefighter's torso having improved ventilation under the front portion, the lower rear part of the firefighter's torso thus being protected by the limited tail extension especially during forward bending or crawling, and the combined portions of the jacket also providing for reducing the total weight of the firefighter's coat.

5. An improved firefighter's coat adapted for use with firefighter's pants extending downwardly from the waist of the firefighter to provide for full protection of the firefighter while also providing for less weight and improved freedom of movement and ventilation to reduce stress, comprising a jacket constructed of heat, flame and water resistant materials, the jacket including a neck portion, a front portion and a rear portion, the front and rear portions being joined by opposing side portions, the front portion and side portions extending downwardly from the neck portion and having a lower edge disposed below the firefighter's waist and adjacent the upper part of the firefighter's legs, the rear portion extending between the side portions and extending downwardly from the neck portion and having a lower edge disposed significantly below the lower edge of the front portion and side portions, and the lower edge being substantially above the knees of the firefighter to form a limited tail extension covering the lower rear part of the torso of the firefighter, the front portion and side portions thus being significantly shorter than the rear portion to provide the firefighter's legs with freedom of movement while crawling and climbing, in addition to improved ventilation under the front portion and side portions, the limited tail extension of the rear portion of the jacket protecting the lower rear part of the torso of the firefighter especially during forward bending or crawling, and the combined portions of the jacket also providing for reducing the total weight of the firefighter's coat.

4,729,131
PANTY BRIEF AND A METHOD OF MAKING SAME
Eskild G. Thygesen, Ikast, Denmark, assignor to A/S Tytex, Ikast, Denmark
Filed Dec. 4, 1985, Ser. No. 805,344
Claims priority, application Denmark, Dec. 5, 1984, 5798/84
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—400 **9 Claims**





1. A panty brief comprised at least in part of elastic material, made by at least one of knitting and crocheting formed as a flat, substantially rectagular bag composed of two superposed webs which provide side pieces of said panty brief, said bag being closed along three marginal edge zones and being open in the whole extension of one longitudinal edge to form a waist opening, the bag being provided with two elongated leg openings, wherein said leg openings are located opposite one another in said two side pieces of the bag in a position between and parallel to a longitudinal marginal zone adjoining said waist opening and an opposite longitudinal marginal zone forming a crotch region of the panty brief.

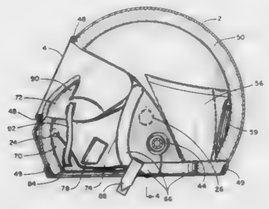
4,729,132
SPORTS HELMET
Mark F. Fierro, 4145 E. Harmon, Las Vegas, Nev. 89121
Filed Nov. 3, 1986, Ser. No. 925,989
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—414 **6 Claims**

1. A sports helmet having a rigid, impact resistant exterior shell with a downward head receiving opening, a front opening having a retractable shield for covering said front opening, and a resilient, cushioned lining interior of the shell,

at least one mounting means in a rear interior portion of the

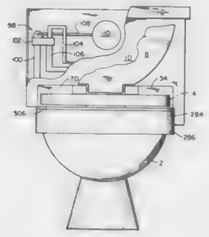
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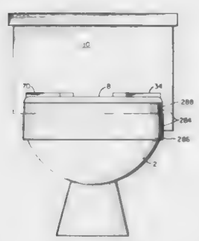
cushion lining for removably mounting an air-activated chemical heating element, and

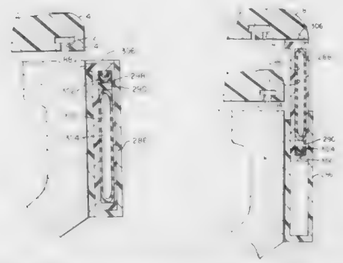


a separate mouth-covering lining member removably mounted in a forward portion of the shell.

4,729,133
TOILET APPARATUS WITH AUTOMATIC SELF-CLEANING MEANS
Ben C. Wileman, III, Oklahoma City, Okla., assignor to Wileman Industries, Inc., Oklahoma City, Okla.
Division of Ser. No. 874,667, Jun. 16, 1986. This application Apr. 20, 1987, Ser. No. 40,096
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—233 **2 Claims**

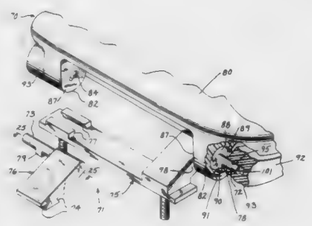






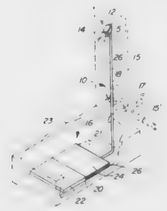
1. In a toilet apparatus having self-cleaning means including the ejection of fluid against a bowl rim surface or a seat member surface, a sealing assembly for preventing escape of said fluid from a chamber formed by said bowl, said seat member, and a cover member, said assembly comprising a housing fixed to the exterior of said bowl proximate said rim surface, and a slide member disposed in said housing, said slide member being selectively moveable to a first position in said housing in which said slide member is removed from said rim surface and to a second position extending from said housing in which an upper surface of said slide member abuts an undersurface of said cover member to effect a seal therebetween.

4,729,134
TOILET COVERING HINGE ASSEMBLY
Thomas W. Hillebrand, Janesville, and Ronald N. Grimstad, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 806,295, Dec. 6, 1985, Pat. No. 4,688,274. This application Aug. 18, 1986, Ser. No. 897,084
Int. Cl.[4] A47K *13/12*
U.S. Cl. 4—236 **5 Claims**



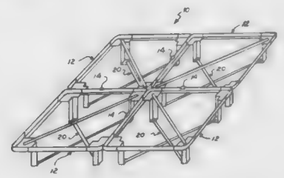
1. A toilet covering hinge assembly, comprising:
a pair of spaced apart hinge receiving elements, each said hinge receiving element having a bore which is alignable with a hinge axis;
a pair of hinge post elements, one corresponding to each hinge receiving element, each of said hinge post elements being axially insertable into the bore of the corresponding hinge receiving element;
two of said elements being suitable to be connected to the rearward portion of a toilet, and the other two of said elements being suitable to be connected to the rearward portion of a first covering member;
a carriage;
at least one of said elements being fixed to the carriage, said carriage being slidable along the hinge axis to restrain said one of said elements against rotation; and
said elements and bores being fashioned so as to permit a key-in-slot type connection between each hinge post element and the corresponding hinge receiving element to capture the first covering member on the toilet and to capture the slidable element and carriage axially by inserting the hinge post elements into the corresponding hinge receiving elements and rotating the covering member about the hinge axis, thereby locking the hinge post elements and the hinge receiving elements together;
wherein the carriage is slidable along the hinge axis to assemble or disassemble the key in slot connection associated with the carriage only when the covering member is in an assembly position in which the key and slot associated with the carriage are in angular registration with one another.

4,729,135
FOOT OPERATED FLOW CONTROL ASSEMBLY FOR A SHOWERHEAD
Patrick Titterington, 215 SW. 1st Ct., No. 2, Pompano, Fla. 33060
Filed Oct. 4, 1985, Ser. No. 784,131
Int. Cl.[4] F16K *31/12*
U.S. Cl. 4—597 **9 Claims**



1. A foot operated control assembly primarily designed to regulate flow of water through a showerhead and into a conventional receptacle such as a bathtub, said assembly comprising:
(a) a valve means for regulating water flow mounted adjacent a showerhead in water-regulating relation to a stream of water issuing therefrom,
(b) an actuating means removably positionable on the bottom of a water catching receptacle such as a bathtub for controlling said valve means,
(c) said actuation means comprising a platform assembly of sufficient dimension to support the weight of one showering by one standing thereon and having a fixed platform portion and a collapsible platform portion connected in adjacent, side-by-side relation to one another,
(d) said collapsible platform portion having a variable volume chamber capable of assuming a reduced volume position upon pressure exerted thereon by the weight of one showering,
(e) said variable volume chamber defining a contained reservoir of actuating fluid being movably disposed relative thereto when said variable volume chamber is in a reduced volume position,
(f) conduit means located in interconnecting and fluid communication between said contained reservoir and said valve means and defining a path of fluid flow therebetween,
(g) said actuating fluid at least partially maintained within said contained reservoir and said conduit means and along said path of fluid flow, said path of fluid flow including a distal end disposed adjacent said valve means and in fluid communication therewith,
(h) said valve means including a positioning element movably mounted within a positioning chamber and positionable along the length thereof, said positioning chamber defining a continuation of said conduit means and being disposed in direct fluid receiving relation to the actuation fluid passing along said path of fluid flow from said conduit means,
(i) said actuating fluid being movably disposed from said contained reservoir, along said path of fluid flow and into said positioning chamber in driving engagement with said positioning element upon said variable volume chamber assuming said reduced volume position,
(j) both said positioning chamber and said positioning element comprising a substantially semi-circular configuration, said positioning element movable in a substantially arcuate path of travel upon interacting with said actuating fluid,
(k) said valve means further including a valve element comprising a flat valve plate disposed transversely to said arcuate path of travel and connected to said positioning element in outwardly spaced relation thereto so as to be rotatable therewith about a diameter of said valve plate between a valve open and a valve closed position upon said positioning element interacting with said actuating fluid, said valve closed position and said valve open position defined respectively by said valve plate disposed transversely in blocking relation and in coplanar, non-blocking relation to the flow of water through said showerhead.

4,729,136
UNIVERSAL SLEEP SYSTEM SUPPORT
Philip J. Santo, 12 Mountin Rd., Rochester, N.Y. 14625
Filed Sep. 2, 1986, Ser. No. 902,778
Int. Cl.[4] A47C *19/04*
U.S. Cl. 5—201 **10 Claims**



1. A universal sleep system support readily collapsible for storage and transportation, and easily assembled, said support comprising:
a plurality of readily assembled modules, each of said modules including: (1) a plurality of corner pieces respectively having a planar surface and a leg structure extending substantially perpendicularly therefrom, (2) a plurality of channel units respectively having mating members in slideable association for adjusting the length of said channel units, and (3) means for receiving and holding said channel units in fixed relationship to said corner pieces; and
means for selectively locking assembled modules together into a unitary construction so that, upon adjustment of said channel members, said modules provide support for any type and common size sleep system.

4,729,137
BED CANOPY SUPPORT AND ASSEMBLY
Carmen T. Denney, 6912 Woodstream La., Seabrook, Md. 20706
Filed Aug. 21, 1986, Ser. No. 898,484
Int. Cl.[4] A47C *21/00*
U.S. Cl. 5—414 **12 Claims**

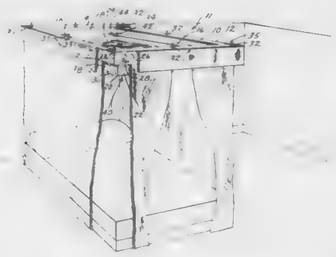
1. A bed canopy support comprising:
a channel-shaped valance support member defining upper and lower substantially parallel and opposed flanges and a connecting element extending between and at substantially right angles with said flanges;
a substantially L-shaped drapery and canopy support mem-

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ber defining a first element and a flange element integral with and projecting at a substantially right angle from said first element, said first element integral with and projecting downwardly from and at substantially a right angle with said lower flange;

first means in operative relationship with said connecting element for enabling removable attachment of a valance to said connecting element;

second means in operative relationship with said first element for enabling removable attachment of a drapery or a curtain to said first element;



third means in operative relationship with said flange element for enabling removable attachment of a canopy to said flange element;

fourth means in operative relationship with said valance support member for enabling attachment of said valance support member to a ceiling or the like; and

fifth means in operative relationship with said valance support member and with said drapery and canopy support member for enabling attachment together of additional of said canopy supports to said canopy support to form a bed canopy support assembly.

4,729,138

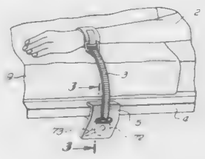
UTILITY CLAMP

Arnold M. Heyman, 2701 W. Alameda Ave., Suite 406, Burbank, Calif. 91505, and Pradip V. Choksi, 18717 Parthenia St., Unit 6, Northridge, Calif. 91324

Filed Nov. 18, 1986, Ser. No. 932,465

Int. Cl.[4] A47C *27/03;* **A44B** *21/00;* **F24N** *9/06*

U.S. Cl. 5—508 **16 Claims**



1. A utility clamp comprising:

(1) a first member having a top and a bottom and an outside and an inside, the outside being completely flush;

(2) a second member attached at the top of the first member, the second member not projecting beyond the outside of the first member;

(3) means for clamping the utility clamp to a support frame;

(4) means for attachment of straps or hooks or similar elements to the first member the attachment means not projecting beyond the outside of the first member the means for attachment of straps comprising a single slot and cam mechanism.

4,729,139

SELECTIVE INCORPORATION OF A POLYMER INTO IMPLANTABLE BIOLOGICAL TISSUE TO INHIBIT CALCIFICATION

Aws S. Nashef, Costa Mesa, Calif., assignor to Baxter Travenol, Deerfield, Ill.

Filed Nov. 5, 1985, Ser. No. 795,124

Int. Cl.[4] A61L *17/00;* **A63B** *51/02;* **D01Q** *3/00;* **D01F** *5/00*

U.S. Cl. 8—94.11 **29 Claims**

1. A process for treating animal biological tissue prior to implantation in an animal to reduce calcification of said tissue after implantation comprising the steps of:

(a) fixing said tissue under tissue-fixing conditions;

(b) contacting said fixed tissue with a first solution of one or more monomers under conditions sufficient to covalently bond said monomer(s) to the tissue;

(c) contacting said tissue with a polymerization initiator; and

(d) contacting said tissue with a second solution containing one or more monomers or oligomers under polymerization conditions in presence of a polymerization-inhibiting free-radical scavenger, such that the second monomer(s) or oligomer(s) polymerize with said covalentyl-bound first monomer(s) and the resulting polymer is concentrated in the interstices of the tissue.

4,729,140

APPARATUS FOR PULLING THE LASTING EDGES OF LASTED SHOE UPPERS OVER INSOLES

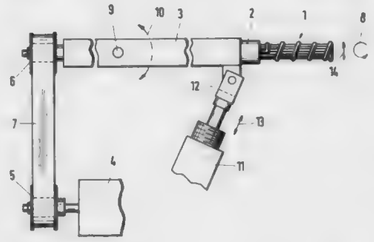
Wolfgang Emmerich, Bad Münstereifel, Fed. Rep. of Germany, assignor to Maschinenfabrik Moenus-Turner GmbH, Oberursel, Fed. Rep. of Germany

Filed Apr. 9, 1987, Ser. No. 36,441

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1986, 8610141[U]

Int. Cl.[4] A43D *25/053*

U.S. Cl. 12—8.3 **20 Claims**



1. In a lasting machine having means for pulling the lasting edges of a shoe upper over an insole while said upper is mounted on a last, the improvement comprising:

said means for pulling including at least one flexible elastic shaft having first and second end portions; means for rotating the first end portion of said shaft; and at least one substantially helical thread surrounding and rotatable with said shaft.

4,729,141

DISC BRUSH SUSPENSION FOR A FLOOR MAINTENANCE MACHINE

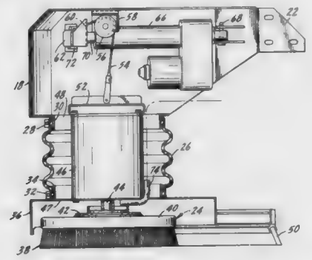
David W. Berg, and Steven V. Feeny, both of Plymouth, Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Jan. 7, 1987, Ser. No. 2,288

Int. Cl.[4] A47L *11/162*

U.S. Cl. 15—49 R **5 Claims**

1. In a disc brush structure for a scrubber, sweeper or the like, a housing, a rotatably mounted brush below the housing disposed to rotate about a generally upright axis and power means for rotating it, a flexible bellows between the housing and power means and having the general characteristics of rubber as to flexibility and distortability, the bellows serving as the primary structural connection of the power means and



brush to the housing, and means for raising and lowering the brush and power means between working and traveling positions.

4,729,142

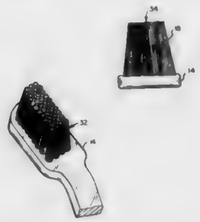
TOOTHBRUSH

Larry M. Yoshioka, Rancho Palos Verdes, Calif., assignor to Joseph C. Cox, III, Los Angeles, Calif.

Filed Mar. 31, 1986, Ser. No. 846,205

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—167.1 **11 Claims**



1. A toothbrush for improved execution of the modified Bass method of brushing teeth comprising:

a plurality of bristles in a substantially rectangular array of spaced columns on a handle, the bristles being mounted in multi-bristle tufts with substantially uniform spacings thereof in the array, the long direction of the array being parallel to the length of the handle, there being at least two substantially parallel columns of bristles disposed laterally on each side along the long direction to define at least inner and outer columns on each side, wherein the bristles terminate in a common plane to define a brushing surface and the outer and inner columns of bristles are angled inwardly at an angle of no greater than 16° from the vertical, the width of the mass of bristles at the top being substantially less than at the base, such that the toothbrush bristles are firmer when rotated about the length of the handle against the teeth of a user than when brushed lengthwise against the teeth, and sufficiently dense to provide a cooperative flexure when subjected to compression.

4,729,143

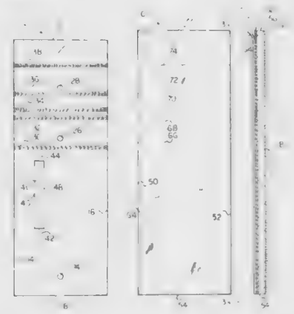
PAINT PAD REFILL DEVICE

Vernon C. Dawson, 16 Marvin Ave., Brewster, N.Y. 10509

Filed Sep. 22, 1986, Ser. No. 909,563

Int. Cl.[4] A47L *13/00;* **A47K** *7/02*

U.S. Cl. 15—210 R **10 Claims**



1. A paint pad refill device comprising a backing plate of length changeable to a final length appropriate for fitting a particular paint pad holder of any of a plurality of standard lengths, means for attaching said plate to said particular holder, after the length of said plate is changed to said final length, and a foam pad associated with said plate and of length changeable to substantially said final length of said plate, wherein said foam pad includes a sponge-like foam body portion, painting bristles protruding from one face of said body portion, a tape having adhesive material on both sides covering and adhered to the other face of said body portion, and said device further comprises a sheet of paper covering and adhered to said tape but strippable therefrom, said sheet of paper having an exposed face, and sizing lines on said exposed face, whereby said pad can be severed to said final length along an appropriate one of said sizing lines, after attachment of said plate to said holder, and said pad is thereupon adherable to said plate by stripping said sheet of paper from said pad to expose the adhesive material on said tape and pressing said pad against said plate to bring the exposed adhesive material into engagement with said plate.

4,729,144

RETRACTABLE TYPE WIPER APPARATUS

Hideshi Sahara, Toyohashi, and Takayuki Imamura, Hamamatsu, both of Japan, assignors to Asmo Co. Ltd., Shizuoka and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed Oct. 21, 1986, Ser. No. 921,154

Claims priority, application Japan, Jun. 18, 1986, 61-141868

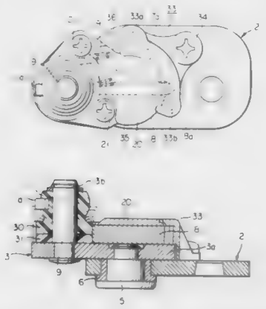
Int. Cl.[4] B60S *1/22, 1/24*

U.S. Cl. 15—250.16 **6 Claims**

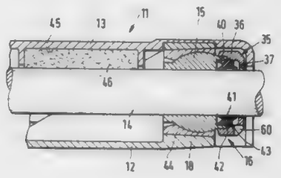
1. A retractable type wiper apparatus comprising a first crank (2) connected to an output shaft (1) of a reducer of a wiper motor; a second crank (3) rotatably secured to the first crank by means of a first pivot shaft (5) and so arranged that the second crank is kept bent at a predetermined angle relative to the first crank during the rotation of the first crank in the forward direction, and kept extended substantially straight relative to the first crank during the rotation of the first crank in the reverse direction; stop means (7, 8) provided on the first crank for defining a first locking recess (7*a*) and second locking recess (8*a*); a detent (18) longitudinally slidably mounted on the second crank; a spring means (19) urging said detent selectively into said first and second locking recesses to thereby lock the second crank in place when the second crank is positioned at the predetermined angled position and at the straight extended position, respectively relative to the first crank; means (36) for allowing the detent to be tilted in the direction of forward rotation of the second crank about an end of said

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detent adjacent said stop means; link means (12, 17) rotatably connected to the second crank by means of a second pivot shaft (9) for transmitting the motion of the second crank to a wiper blade (14); and cam means rotatably mounted over the second pivot shaft and adapted to press and lock said detent as it is urged into either said first or second recess, said cam means comprising two superposed cam members (30, 31) both engageable with said detent, one of the cam members being connected integrally with said link means and the other of the cam members being adapted to be moved together with the one cam member with a limited range of lost motion so that the two cam members are maintained at such angles relative to each other that they cooperate to press and lock said detent during the rotation of said first crank in the forward direction.

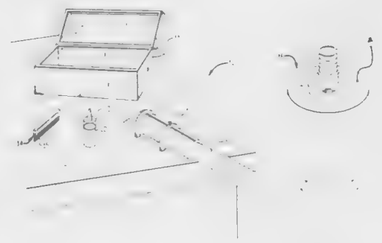


4,729,145
DEVICE, ESPECIALLY RECIPROCATING WIPER SYSTEM FOR MOTOR VEHICLES
Bruno Egner-Walter, Heilbronn; Eckhardt Schmid, Brackenheim, and Wolfgang Scholl, Gemmrigheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany
Filed Nov. 27, 1985, Ser. No. 802,695
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443750
Int. Cl.[4] B60S *1/24*; F16C *23/04, 29/02*
U.S. Cl. 15—250.21 **6 Claims**



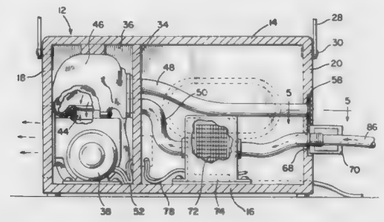
5. A reciprocating wiper system for motor vehicle comprising:
a housing;
a bearing seated in a first receptacle of said housing;
a piston linearly displaceably guided in said housing and mounted in said bearing;
a sealing ring and/or a scraping ring for said piston jointly mounted with said bearing in said housing as a single structural unit,
wherein: said bearing has an inner bearing ring and an outer bearing ring, said outer bearing ring consisting of plastics material, said outer bearing ring being seated in the housing, and wherein:
said first receptacle is cone shaped and narrows towards the interior of said housing; and said outer bearing ring has a corresponding conical form.

4,729,146
KIT FOR CLEANING PHONOGRAPH RECORDS
Jeffrey Barr, 999 Hidden Lake Dr., 8D, North Brunswick, N.J. 08902
Filed Aug. 14, 1986, Ser. No. 896,598
Int. Cl.[4] A47L *5/36*
U.S. Cl. 15—303 **16 Claims**



1. A record vacuum cleaning attachment apparatus for safely removing dirt, dust, grease, grime, chemicals and cleaning fluid on the surface of a phonograph record without damaging the playing surface of the phonograph record comprising:
(a) a tube having a first end, a second end, a hollow interior, a top surface and a bottom surface;
(b) a spindle mounting aperture means on the bottom of the first end of the tube for rotatably mounting the tube to a central spindle of a rotatable platter for phonograph records;
(c) separation means for separating the tube from the playing surface of the phonograph record including
(i) an interior separation means for separating the tube from the playing surface of the phonograph record which is attached to the bottom surface of the tube between the spindle mounting aperture means and the portion of the tube which covers the playing surface of the phonograph record and
(ii) An exterior separation means for separating the tube from the playing surface of the phonograph record which is attached to the bottom surface of said tube between said interior separation means and said second end of said tube by a slidably locking holding means for slidably adjusting and locking the exterior separation means to permit the apparatus to be adjusted for cleaning phonograph records of different size playing surface;
(d) an attachment means for attaching the record vacuum cleaning attachment apparatus to a vacuum cleaner means;
(e) an opening in said bottom surface of said tube comprising a longitudinal slot which extends over the playing surface of the phonograph record when the phonograph record is placed onto the spindle of the rotatable platter and the vacuum cleaning attachment apparatus is mounted onto the rotatable platter by the spindle aperture mounting means; and,
(f) a closure means for closing said first end of said tube between said spindle aperture mounting means and said opening.

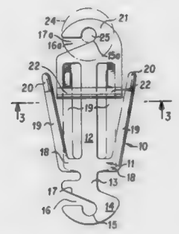
4,729,147
PET GROOMER AND FLEA ANNIHILATOR
Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064
Filed Sep. 12, 1986, Ser. No. 906,534
Int. Cl.[4] A47L *5/36*
U.S. Cl. 15—314 **11 Claims**



1. An apparatus for treating a pet by inducing a vacuum in an appliance for contact engagement with the hair or fur of a pet comprising a housing having a vacuum system incorporated therein including a disposable vacuum cleaner-type bag with the bag having an inlet communicating with vacuum tube means extending from the bag to a peripheral wall of the housing with the vacuum tube means being connected to a receptacle means exposed to the exterior of the housing, an elongated vacuum hose of flexible construction having one end insertable into the receptacle means and an appliance on the other end of the vacuum hose with said appliance including means engaging the hair and fur of a pet for inducing a vacuum in the area of engagement between the appliance and hair or fur of the pet, said vacuum tube means including a pair of vacuum tubes with one of the tubes being substantially straight and uninterrupted and the other of the tubes including a hollow grid housing incorporated therein forming part of the flow path with an electrically charged grid in the grid housing for electrocuting fleas or other insects passing therethrough,

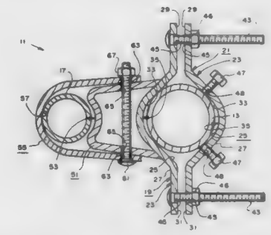
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4,729,148
CARRIER FOR FLEXIBLE CLOSURE
James F. Levy, 1010 Whaley St., Columbia, S.C. 29201
Filed Oct. 24, 1986, Ser. No. 922,995
Int. Cl.[4] E05D *15/00*
U.S. Cl. 16—87.2 **11 Claims**



8. A carrier for a flexible closure comprising a body portion having hook terminals at opposite ends thereof, a pair of divergent spring arms on the body portion between said hook terminals, keeper means on the body portion engageable with the spring arms to releasably hold them in a retracted position, wherein said spring arms are always substantially parallel when engaged by said keeper means, a dual wheel assembly including an axle portion having releasable snaplocked engagement with one of said hook terminals and being adapted to roll on a guide member.

4,729,149
GATE HINGE ASSEMBLY
B. J. Brunkan, Memphis, Tenn., assignor to Hackney Wholesale, Memphis, Tenn.
Filed Oct. 14, 1986, Ser. No. 918,844
Int. Cl.[4] E05D *5/02*
U.S. Cl. 16—252 **10 Claims**



1. A gate hinge assembly for attaching a gate to a vertical gatepost of the type being circular in cross-section, said assembly comprising:
(a) first and second complementary clamp members, each of said clamp members having an inner side with first and second ends and a midportion joining said first and second ends, said midportion of said inner side of each of said clamp members having a substantially V-shaped vertical groove therein for engaging opposite sides of said post;
(b) attachment means for attaching said first and second ends of said inner side of each of said clamp members relative to one another and for fixedly securing said clamp members to said post; and
(c) coupling means attached to one of said clamp members for pivotally coupling said gate to said one of said clamp members and for thereby pivotally coupling said gate to said post, said coupling means including a first coupling member fixedly attached only to the midportion of said first clamp member and a second coupling member removably attached to said first coupling member for swingably trapping a portion of said gate thereto.

4,729,150
FISH SKINNING, SCALING AND DRESSING DEVICE
Roddy P. Breaux, and Connie C. Breaux, both of P.O. Box 59, Gheens, La. 70355
Filed Oct. 28, 1986, Ser. No. 924,220
Int. Cl.[4] A22C *25/14*
U.S. Cl. 17—68 **18 Claims**



1. A fish skinning, scaling, and dressing device, comprising:
a. a pair of elongated arms pivotally connected intermediate the ends thereof;
b. an arcuate jaw integral with said pivotally connected end of each of said arms, said jaws matingly engaging in the closed position of said jaws;

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c. a plurality of spaced apart projections extending outwardly from the convex surface of the first one of said jaws; and

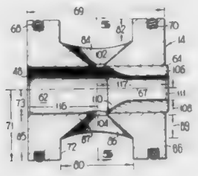
d. a cutting blade depending outwardly from and being perpendicularly disposed from the convex surface of said second jaw.

4,729,151

APPARATUS FOR ENTANGLING YARN

Robert C. Runyon, Dunwoody, and Barry J. Hopson, Jonesboro, both of Ga., assignors to RHS Industries, Inc., Atlanta, Ga.

Filed Sep. 10, 1986, Ser. No. 905,422
Int. Cl.[4] D02J *1/08*
U.S. Cl. 28—276 17 Claims



1. An air entangling jet comprising:

(a) a cylindrical body having a body length and a body diameter for insertion in a mounting block having an air feed passage.

(b) a cylindrical entangling chamber in the body having a chamber diameter a chamber length, a chamber wall having thickness, an inlet, and an outlet;

(c) an annular air feed ring around the body having a ring length that is between 50% and 90% of the body length and having a depth that is between 40% and 70% of the chamber wall thickness; and

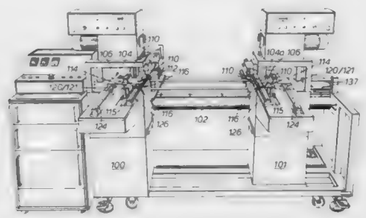
(d) diametrically opposed tapered orifices in the chamber wall for communicating between the entangling chamber and the annular feed ring, wherein the diametrically opposed tapered orifices comprise a first orifice having a cross section and aligned with the air feed passage of the mounting block and a second diametrically opposed orifice having a cross section that is smaller than the cross section of the first orifice.

4,729,152

APPARATUS AND METHOD FOR ASSEMBLING ELECTRICAL HARNESSES

Michael B. Hammond, Chestnut, and Clive Gaskell, Fleet, both of England, assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 15, 1985, Ser. No. 787,357
Claims priority, application United Kingdom, Nov. 22, 1984, 8429512
Int. Cl.[4] H01R *43/00*; B23P *19/00*
U.S. Cl. 29—33 M 14 Claims



1. An apparatus for making an electrical cable harness including a flat multiconductor ribbon cable with a plurality of spaced-apart electrical conductors having a common insulating covering forming web portions between adjacent conductors, electrically connected to an electrical connector having a plurality of insulation displacing terminals mounted in a dielectric housing, the apparatus including

a connector loading station whereat a connector is initially positioned,

a termination station spaced from said loading station whereat a connector is terminated to said cable,

means for moving said connector from said loading station to said termination station, said connector moving means comprising a shuttle table system including a plurality of coplanar tables movable in a common closed rectilinear path between said connector loading and terminating stations, at least one table having connector carrying means thereon,

means for presenting a cable end to said termination station so that the conductors are aligned with said terminals, and

a termination head at said termination station for engaging the end of the cable and mass inserting said conductors in said terminals,

the improvement comprising:

a feed member movable between a feed track and said loading station, said feed member having a plurality of engaging means for interengaging complementarily shaped engaging means formed on an outside surface of said housing to align said housing with respect to said feed member; and

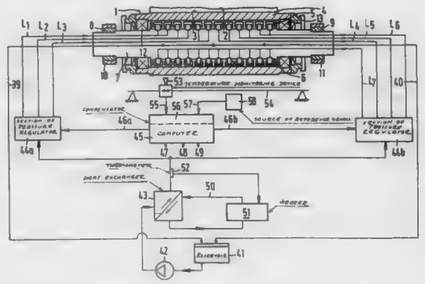
means for moving said feed member to said loading station to thereby deliver said connector to a predetermined initial position at said loading station.

4,729,153

ROLL FOR USE IN CALENDERS AND THE LIKE

Josef Pav; Richard Rauf, both of Krefeld, and Hans-Dieter Patermann, Willich, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,664
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516535
Int. Cl.[4] B21B *13/00*
U.S. Cl. 29—116 AD 19 Claims



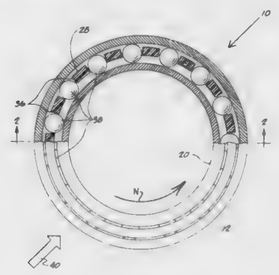
1. A pressure applying roll for use in calenders and analogous machines to define with a complementary roll a nip for the passage of running paper webs and the like, comprising a hollow flexible rotary cylindrical shell; an elongated carrier extending through and spacedly surrounded by said shell; hydrostatic bearing means interposed between said shell and said carrier and including at least one row of first fluid-operated bearing elements extending longitudinally of said carrier and arranged to apply to said shell a first substantially radial force acting in a first direction, and at least one row of second fluid-operated bearing elements extending longitudinally of said carried and arranged to apply to said shell a second substantially radial force having a component acting in a second direction counter to said first direction; a source of pressurized hydraulic fluid including means for tempering the fluid; means for conveying pressurized fluid from said source to said bearing elements including means for altering the rate of fluid flow to said bearing elements as a function of pressure changes, comprising compensator means operative to distribute said pressure changes among said first and second bearing elements so that the resulting changes of said first force match or closely approximate the resulting changes of said second force; and means for monitoring the temperatures of said shell at a plurality of locations longitudinally of the nip of the rolls and for transmitting to said compensator means first signals denoting the temperatures of the shell at said locations, said compensator means including means for comparing such first signals with second signals denoting the desired temperatures of the shell at said locations and said compensator means being arranged to alter the rate of fluid flow to bearing elements independtly of the nip pressure adjacent those locations where the monitored temperatures deviate from desired temperatures.

4,729,154

METHOD OF MAKING AND OPERATING A VERY HIGH SPEED MARGINALLY LUBRICATED BALL THRUST BEARING

Robert B. Gilbert, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 2, 1986, Ser. No. 936,853
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—149.5 R 6 Claims



1. The method of making and operating a very high speed ball bearing for operation in the range of DN numbers from 5×10^5 to 1.7×10^6 and higher while only marginally lubricated in operation by a mist of liquid jet engine fuel carried in a transport air stream, said method comprising the steps of:

providing both an annular radially inner and annular radially outer ball race member, defining on each ball race member a cooperable annular ball race groove confronting the other said ball race member, fabricating each said ball race member from bearing quality steel;

interposing radially between said ball race members a plurality of ball elements in said ball race grooves and in rolling contact with both said ball race members to provide low-friction relative rotation thereof, making said plurality of ball elements each of solid ceramic material;

interposing radially between said ball race members an annular separator member, defining in said separator member a matching plurality of circumferentially spaced apart openings radially extending therethrough, disposing in each one of said matching plurality of openings, one of said plurality of ball elements to circumferentially space apart the latter, making said separator member of inherently lubricious material;

operating said ball bearing at a speed whereat the DN number is in the range from 5×10^5 to 1.7×10^6 or higher where D is the inner diameter of said radially inner annular ball race member in millimeters and N is the relative rotational speed between said ball race members in rotations per minute;

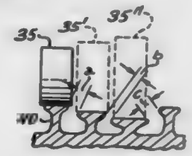
while operating said ball bearing, providing a marginally lubricating mist of liquid jet engine fuel in a transporting air stream directed upon said bearing.

4,729,155

METHOD OF MAKING HEAT TRANSFER TUBE WITH IMPROVED OUTSIDE SURFACE FOR NUCLEATE BOILING

James L. Cunningham, and Bonnie J. Campbell, both of Decatur, Ala., assignors to Wolverine Tube, Inc., Decatur, Ala.

Division of Ser. No. 744,076, Jun. 12, 1985, Pat. No. 4,660,630.
This application Sep. 16, 1986, Ser. No. 907,868
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 AH 4 Claims



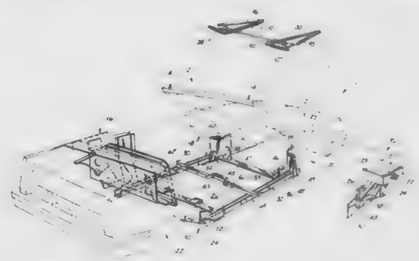
1. In a process of making a heat transfer tube with an improved outside surface for nucleate boiling comprising the steps of finning the tube to produce helical fins thereon, forming a plurality of transverse grooves around the periphery of each fin, and progressively compressing the tips of the grooved fins to cause them to become flattened and of a width in an axial direction which is slightly less than their pitch, thereby defining a narrow opening between fins which is in communication with a rather large cavity defined by the sides of adjacent fins in the region under the flattened fin tips, the improvement wherein said tips are variably compressed so that the width of the narrow openings between adjacent fins is varied so as to produce a range of opening widths which is both larger and smaller than the optimum minimum pore size for nucleate boiling of a particular fluid under a particular set of operating conditions.

4,729,156

METHOD OF CONVERTING VEHICLE BODY FROM HARDTOP TO CONVERTIBLE STRUCTURE

Frank W. Norris, Jr.; Ronald J. Benedict, both of Lima, Ohio; James G. Burgess, Burleson, Tex., and Gary L. Stewart, Lima, Ohio, assignors to Car Craft Co., Lima, Ohio

Filed Aug. 21, 1986, Ser. No. 899,032
Int. Cl.[4] B60R *27/00*
U.S. Cl. 29—401.1 9 Claims



1. A method of converting a sedan hardtop vehicle body to a soft fabric top vehicle automobile body comprising the steps of:

a. providing a sedan vehicle body to be converted that is of

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unibody construction and which includes a hardtop continuous roof panel supported by front and rear roof pillars, a forward windshield, a forward structural engine cradle and a rear transverse wheel support spaced longitudinally therefrom, and connected below by a floor pan and with forward and rear wheel wells respectively adjacent the forward engine cradle and rear transverse wheel support;

b. severing the continuous hardtop roof panel from the vehicle body by forming cuts along the front of the continuous roof panel at the vehicle windshield and along the bottom of the rear roof pillars;

c. forming a pair of longitudinal structural reinforcements to the vehicle body with beams that connect structurally between the engine cradle and the rear transverse support areas of the vehicle body by connecting the ends of the beams respectively to the front and rear wheel wells and generally along the respective left and right sides of the automobile body, and underneath the vehicle body floor pan;

d. developing a connection between each longitudinal beam and the wheel well at each end portion of each respective beam using plates that extend upwardly along and are connected to the respective wheel well so as not to interfere with operation of the wheel or wheel supports.

e. forming a transverse structural reinforcement to the vehicle unibody on the upper surface of the automobile floor pan that extends transversely between and fastens to the longitudinal reinforcements; and

f. replacing the cutaway continuous roof panel with a folding, fabric-like top.

4,729,157

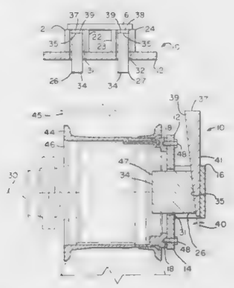
WHEEL PULLER

Alfred D. McCue, Abingdon, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 17, 1986, Ser. No. 908,168

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—426.5 **12 Claims**



6. A process for removing a wheel rim from a wheel hub comprising:

attaching a plate to the wheel rim with said plate positioned to be spaced apart from the wheel hub;

inserting two block wedges having inclined planes of a selected wedge angle between the plate and the wheel and spaced apart from each other;

inserting two driving wedges having inclined planes of the selected wedge angle between the block wedges and the plate and engaging the block wedges and the plate to provide wedging action upon insertion of the driving wedges between the block wedges and the plate; and

alternately tapping with a light hammer the two driving wedges to move the plate away from the wheel hub thereby removing the wheel rim from the wheel hub.

4,729,158

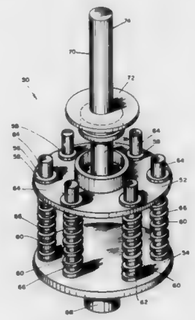
TOOL FOR AIDING THE ASSEMBLY OF DRILL STABILIZER TO THE DRILL COLLAR WHEN UP THE BOTTOM HOLE ASSEMBLY

Donald L. Williams, 202 Holstein La., Youngsville, La. 70592

Filed May 5, 1986, Ser. No. 859,394

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 29—467 **3 Claims**



1. An alignment tool for interconnecting a drill collar and a stabilizer in axial alignment, said tool comprising:

an upper plate and a lower plate held in spaced, parallel relationship to one another, said upper plate having a plurality of peripheral holes therearound;

a plurality of rods projecting between said upper and lower plates, each of said rods being mounted at a bottom end in fixed relationship to said lower plate and inserted adjacent a top end in sliding relationship through one of said peripheral holes;

a spring around each of said rods for biasing said upper plate away from said lower plate;

an attachment pin projecting downwardly from said lower plate;

a stabilizing pin projecting upwardly from said upper plate; and

a rotatable plate rotatably secured to said stabilizing pin intermediate the ends of said stabilizing pin.

2. A method of aligning and interconnecting a stabilizer and drill collar in axial alignment, said stabilizer and drill collar having cooperatively threaded ends, said method comprising:

providing a tool comprised of a rotatable plate which is spring biased towards a first direction and has a stabilizing member projecting upwardly from said rotatable plate;

attaching said tool to a surface adjacent a drill hole;

stabilizing said stabilizer on said rotatable plate with said stabilizing member;

bringing said cooperatively threaded ends of said drill collar and stabilizer into adjacent relationship with one another with the weight of said drill collar moving said rotatable plate against said spring bias; and rotating said rotatable plate to engage said cooperative threads of said stabilizer and drill collar.

4,729,159

TOOL EXCHANGE DEVICE

Hasso Henneberg, Hanover; Joachim Kuska, Wunstorf, and Wolfgang Schaefer, Langenhagen, all of Fed. Rep. of Germany, assignors to Gildemeister Aktiengesellschaft, Bielefeld, Fed. Rep. of Germany

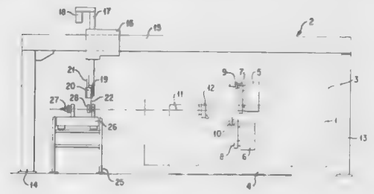
Filed Sep. 11, 1986, Ser. No. 906,922

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532924

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **5 Claims**

1. A device for interchanging tools in tool receivers of two tool turret heads arranged on two cross slides independently movable from each other in a plane inclined to the horizontal in a machine tool, said tool receivers **(42)** extending parallel to a workpiece spindle axis **(11)** of the machine tool which also includes a workpiece handling device **(2)** with a workpiece gripper movable only in a vertical plane parallel to the workpiece spindle axis, the device comprising tool grippers **(21, 22)** interchangeably insertable in the workpiece handling device **(2)**, said cross slides **(40, 41)** each including a plan carriage **(38, 39)**, at least one tool receiver of each tool turret head being movable to various operative positions in a plane of movement of said tool grippers by a respective plan carriage of a respective cross slide, means for moving tools **(27, 28)** being inter-



changed to a preparation position for said grippers **(21, 22)** which place the tools into said tool receivers to be clamped in a respective cutting position, and tool holders **(43, 44, 45)** to be clamped by said tool grippers and received in tool receivers, each tool having gripping fingers **(46, 47, 48, 49)** which have grippping surfaces, each tool holder of the tool being interchanged having two clamping faces **(51, 52; 53, 54; 55, 56)** corresponding to said gripping surfaces of each gripping finger, two said clamping faces being offset relative to each other by an angle which corresponds to a different operative angle of the tool receiver **(42)** positioned in an exchange position whereby each tool holder can be held by a respective tool gripper in two different rotation positions.

4,729,160

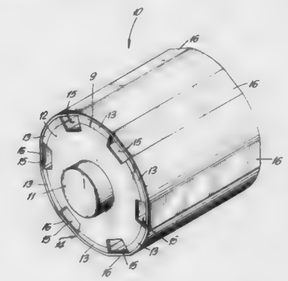
METHOD FOR MANUFACTURING A COMPOSITE SLEEVE FOR AN ELECTRIC MOTOR

Gerald W. Brown, Christiansburg, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Aug. 14, 1985, Ser. No. 765,507

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—598 **6 Claims**



1. A method for manufacturing a composite sleeve for a hollow rotor hub, having a plurality of magnets bonded thereto, for an electric motor or generator, which comprises the steps of:

winding the composite sleeve upon a mandrel having a diameter less than that of the rotor hub;

cooling the hollow rotor hub/magnet assembly until it shrinks to a diameter less than that of the sleeve;

inserting the rotor hub magnet assembly into the composite sleeve; and

heating the hollow rotor hub magnet/sleeve assembly until it expands to a diameter larger than the shaft and then inserting the shaft into the rotor hub, with an interference fit shaft to rotor hub/magnet/sleeve assembly such that there is an interference fit between the composite sleeve and the rotor hub/magnet assembly.

4,729,161

METHOD OF MANUFACTURING A MAGNETIC HEAD

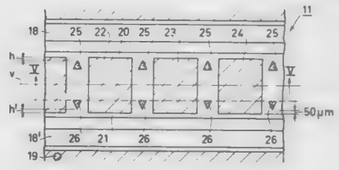
Johannes P. M. Verbunt, and Wilibrordus G. M. Van Den Hoek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 821,505, Jan. 21, 1986, which is a continuation of Ser. No. 462,272, Jan. 31, 1983, abandoned. This application Nov. 3, 1986, Ser. No. 912,453

Claims priority, application Netherlands, Feb. 12, 1982, 8200531

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **9 Claims**



1. A method of manufacturing a magnetic head of the type comprising two core parts which form a tape contact face, each core part having a gap bounding surface, said gap bounding surfaces being spaced to form a transducing gap therebetween, said method comprising the following steps:

etching a channel in the gap bounding surface of one of said core parts, said channel having a floor bounded on one side by a wall,

etching a polishing mark in said one of said core parts, said polishing mark being spaced a predetermined distance from a line colinear with said one wall of said channel,

forming a winding aperture in said channel, said winding aperture having an edge spaced from said one wall,

bonding said core parts together to form a magnetic head having a transducing gap of desired length, and

grinding the tape contact face opposite said gap from said channel using said polishing mark to control the distance between said tape contact face and said one wall defining the gap height.

4,729,162

ELECTROCHEMICAL CELL ASSSEMBLY

James H. Him, Burlington; Fred J. Berkowitz, Westford; Terrence F. Reise, Sudbury, and John D. Sillesky, Norfolk, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 11, 1986, Ser. No. 873,248

Int. Cl.[4] H07M *6/00*

U.S. Cl. 29—623.3 **4 Claims**



1. A method for making electrical contact to a foil electrode of an electrochemical cell comprising the steps of punching an array of apertures in a predetermined section of a rectangularly

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shaped conductive element; forming at least one pair of opposed teeth from the material punched from each aperture such that the teeth project from the same side of the conductive element, are longer than the thickness of the foil electrode, and are directed toward each other; pressing the conductive element into the surface of the foil electrode such that the teeth pierce through the electrode; and bending the teeth toward each other until they are flush with the opposite surface of the electrode.

4,729,163

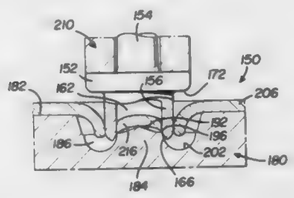
DIE SET ASSEMBLY FOR ATTACHING A FASTENER

Rudolph R. M. Muller, Frankfurt, and Jiri Babej, Lich, both of Fed. Rep. of Germany, assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274,. This application Aug. 1, 1986, Ser. No. 892,002

Int. Cl.⁴ B23P *19/00*

U.S. Cl. 29—798 **6 Claims**



1. A die set including a die member for securing a self-attaching member to a plastically deformable metal panel, said self-attaching member having a body portion and a self-piercing and riveting integral skirt portion extending from said body portion, said die member comprising:

an annular die cavity surrounding a central die portion projecting from said die cavity and a panel supporting shoulder on at least two sides of said die cavity, the free end of said projecting central die portion having a generally conical die surface and a piercing surface surrounding said central projecting die portion free end adapted to pierce a slug from the panel in cooperation with said member skirt portion, said central die portion free end telescopically receivable in the open end of said self-attaching member skirt portion, said annular die cavity including a relatively smooth concave arcuate annular die surface extending from adjacent said piercing surface through the bottom surface of said die cavity adapted to receive the free end of said member annular skirt portion and radially outwardly deform said skirt portion into an annular generally hook-shaped portion, said concave arcuate annular die surface terminating in an annular lip spaced above said bottom surface of said die cavity, said lip located below the plane of said shoulder and said die cavity including an inclined outer wall smoothly blending into said shoulder and said annular lip through relatively smooth arcuate surfaces which receive the main portion of said panel adjacent the pierced panel edge, said die cavity annular lip supporting said panel portion as said panel portion is radially inwardly into said skirt generally hook-shaped portion forming a mechanical interlock between said panel and said member skirt portion and a second member for moving said self-attaching member relative to said die member to pierce a slug from a panel supported on said die member shoulder and to deform said self-attaching member skirt portion radially outwardly by contact with said die cavity to form a mechanical interlock with a pierced edge of said panel.

5. A die set for securing a self-attaching element to a plastically deformable metal panel, comprising a female die member and a driving member, said self-attaching element having a body portion and a hollow riveting annular wall having an open free end projecting from said body portion, said die member having an annular concave die cavity surrounding a central die portion projecting from said die cavity, said central die portion adapted to be received within said self-attaching member annular wall open free end, said die member having a panel supporting shoulder surrounding said die cavity on at least two sides of said die cavity, said annular concave die cavity having a generally conical outer surface adjacent said shoulder inclined inwardly toward the axis of said central die portion and terminating in a generally radially projecting annular lip spaced above the bottom surface of said die cavity, said conical outer die surface smoothly blending into said shoulder and annular lip through relatively smooth arcuate surfaces, said die cavity bottom surface being semi-torroidal and extending from said annular lip to and including the outer surface of said central die portion, said driving member movable relative to said die member for moving said self-attaching element relative to a panel supported on said die member shoulder, the internal surface of said self-attaching element annular wall engaging said central die portion outer surface and said semi-torrodial bottom surface, deforming said annular wall radially outwardly, and said panel substantially simultaneously deformed into said die cavity against said generally conical outer surface and said annular lip, said annular lip supporting said panel radially during formation of a mechanical interlock between said self-attaching element annular wall and said panel.

4,729,164

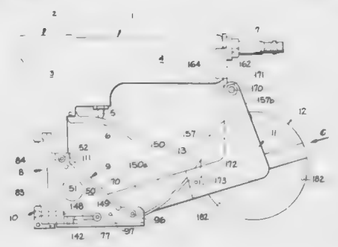
DRIVING TOOL AND MAGAZINE FOR TANDEM-TYPE PUSH-ON CLIPS

Jay M. Steeves, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 4, 1986, Ser. No. 892,863

Int. Cl.⁴ B25C *1/04;* **B21J** *15/28;* **B23Q** *7/10*

U.S. Cl. 29—809 **10 Claims**



1. A driving tool and magazine for push-on clips of the type adapted to be engaged on the post of a workpiece and arranged in tandem in a strip wherein each clip comprises an integral one-piece part of the next adjacent clip with a line of weakening therebetween, said tool comprising a body with a handle, a driver mounted in said body together with means to shift said driver between a normal retracted position and a clip applied position, said driver terminating in a tip means to engage the forwardmost clip of said strip, sever said forwardmost clip from said strip and drive said forwardmost clip on to its respective workpiece post, said driver tip having an axial bore to accommodate the post on which said forwardmost clip is to be driven, said body having a lower end, a guide body affixed to said lower end providing a drive track for said driver tip means, a clip feed means affixed to said guide body to advance said clip strip and locate the forwardmost clip of said strip in said drive track after each tool actuation, means to actuate said clip feed means, a removable magazine affixed to said tool and containing said clip strip in coil form, and a support bracket assembly for said magazine, said assembly having a first end affixed to said clip feed means and a second end affixed to said tool handle, said support bracket assembly having a pair of opposed slots in parallel-spaced relationship, said magazine having a pair of external bosses on opposite sides thereof slidably receivable in said slots to removably mount said magazine on said support bracket assembly.

4,729,165

METHOD OF APPLYING AN INTEGRATED CIRCUIT ON A SUBSTRATE HAVING AN ELECTRICALLY CONDUCTIVE RUN

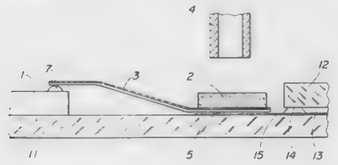
Kurt Fahrenschon, Pfaffenhofen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Sep. 23, 1986, Ser. No. 910,989

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534502

Int. Cl.⁴ H05K *3/10*

U.S. Cl. 29—846 **7 Claims**



1. Method of applying an integrated circuit onto a substrate having a plurality of electrical conductor runs, comprising suspending the IC in the opening of a frame of insulating material by means of self-supporting conductor ribbons, said integrated circuit being applied on the surface of a substrate provided with electrical conductor runs of a liquid crystal display-cell, in such a way that an electric contact is established between the conductor runs of the substrate and the conductor ribbons of the integrated circuit and including compressing the frame having the surface on which the conductor ribbons of the integrated circuit are fastened onto a support bearing a conductive adhesive layer in such a way that essentially only the regions of the conductor ribbons of the integrated circuit which are present on the surface of the frame are wetted with conductive adhesive, transferring the frame with the integrated circuit and with the conductor ribbons wetted with adhesive onto the substrate and positioning the frame so that the adhesive wetted conductor ribbons are pressed onto the correspondingly arranged conductor run parts of the substrate, and permitting the adhesive to harden so that a durable electrical connection between the conductor ribbons of the integrated circuit and the conductor runs of the substrate is established.

4,729,166

METHOD OF FABRICATING ELECTRICAL CONNECTOR FOR SURFACE MOUNTING

James Lee, Los Altos Hills; Richard Beck, Cupertino; Chune Lee, San Francisco, and Edward Hu, Sunnyvale, all of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 22, 1985, Ser. No. 757,600

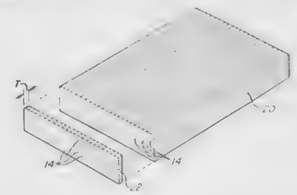
Int. Cl.⁴ H01R *13/48*

U.S. Cl. 29—877 **17 Claims**

1. A method of fabricating an anisotropic elastomeric conductor, said method comprising:

forming a stack of first and second sheets so that at least one second sheet lies between adjacent first sheets, wherein said first sheets include electrically conductive fibers running in one direction only and the second sheets are composed of electrically insulating material;

perfusing the stack with a curable elastomeric resin; and



curing the elastomeric resin to form a solid block having the electrically conductive fibers electrically isolated from one another and extending from one side of the block to the opposite side.

4,729,167

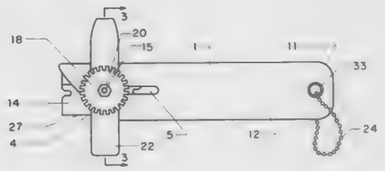
CUTTING TOOL FOR CARDBOARD BOXES

Peter De Rose, P.O. Box 5422, Albuquerque, N. Mex. 87185

Filed Oct. 24, 1986, Ser. No. 907,409

Int. Cl.⁴ B67B *7/00*

U.S. Cl. 30—2 **1 Claim**



1. A cutting tool for opening cardboard boxes and the like comprising:

handle means that includes first and second symmetrical side members, said first and second side members each having a rounded end, an arcuate half ogival end, and inner and outer flat and parallel side surfaces connected by rounded edge surfaces, said inner side surfaces having a flat surface area larger than said outer side surfaces;

said first and second side members each having a elongated adjustment opening cut therethrough in a position near the ogival ends thereof such that the adjustment openings will be aligned to provide an adjustment slot completely through said handle means when said first and second side members are secured together in an aligned position;

said first and second side members each having a rectangular adjustment groove formed in the inner side surfaces thereof adjacent said adjustment opening, said adjustment grooves extending to the arcuate ends of said first and second side members and being positioned so that when the first and second side members are aligned the adjustment grooves are aligned to provide a recess for the non-cutting edge of a single edge razor blade;

hollow fastener means pivotally connecting the rounded ends of said first and second side members together such that the inner flat surfaces thereof are juxtaposed when said first and second side members are aligned;

a single edge razor blade having a positioning hole formed therein, said blade being slidably mounted between said first and second side members so that the cutting edge of said razor blade can be exposed at the arcuate end of said handle means to enclose the cutting edge of the razor blade when the tool is not in use;

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adjustment means mounted through the adjustment slot in said handle means and engaging the razor blade for moving the razor blade to a selected position for cutting, or to a blade enclosed position, and securing said first and second side members together with sufficient force to retain the razor blade in the selected position, said adjustment means including a screw mounted through the adjustment slot in said handle means and the positioning hole in said razor blade, said screw being oriented so that the screw head is positioned adjacent to the outer flat surface of said first side member and the threaded end of the screw is adjacent to the outer flat surface of said second side member, and an adjusting washer having a threaded central opening threadably mounted on said screw and positioned adjacent to the outer flat surface of said second side member for clamping the two sides of the handle means together to retain the razor blade in a selected position and a nut threaded on said screw for pressing the adjusting washer against the handle means to retain the razor blade in its selected position; and

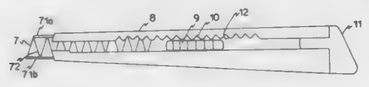
a rectangularly shaped, thin guide member having a centrally disposed mounting hole rotatably mounted on said screw and positioned between said adjusting washer and the outer flat surface of said second side member, whereby said guide member can be positioned in a guiding position or a nonguiding position, said guide member also functioning as a lid prying device, scraper, and screw driver.

4,729,168

TWO-EDGED MULTI-PURPOSE ARTISTIC TECHNICAL KNIFE

Jia-Yong Yeh, 82, Hsing Jen Road, Sec. 1, Neili Li, Chungli City, Taoyuan Hsien, Taiwan

Filed Aug. 15, 1986, Ser. No. 897,054
Int. Cl.[4] B26B *1/08, 9/00*
U.S. Cl. 30—162 **2 Claims**



1. An artistic technical knife comprising:

(a) a double-edged blade having a sharpened point at its terminus and a plurality of frangible recesses extending at oblique angles from one edge of the blade to the opposite edge of the blade to divide the blade into a plurality of triangles;

(b) a blade holder; and

(c) a push knob for extending and retracting the blade from the blade holder;

wherein the outermost triangle on the blade can be severed and removed at the outermost frangible recess to provide a new sharpened point at the terminus of the blade.

4.729,169

INNER ROTARY CUTTERS FOR ELECTRIC SHAVERS AND MANUFACTURING PROCESSES FOR THE SAME

Katsuya Asawa, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan

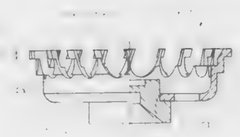
Filed Mar. 20, 1986, Ser. No. 841,641
Claims priority, application Japan, Mar. 29, 1985, 60-68176; Mar. 29, 1985, 60-68177
Int. Cl.[4] B26B *19/04*
U.S. Cl. 30—346.51 **13 Claims**

1. An inner rotary cutter for an electric shaver comprising:

a circular rotary disk;

a cylinder section extending from the peripheral portion of said circular rotary disk in an axial direction; and

a plurality of blades comprised of first sections projecting in the axial direction from said cylinder section at predetermined intervals, and second radially extending sections having front edges in the direction of rotation of the cutter, said second sections being formed into cutting sections from the front edges of said first extending sections to extend approximately in a radial direction; a space being provided between adjacent said blades that is U-shaped and inclines in the rotational direction of said circular rotary disk.

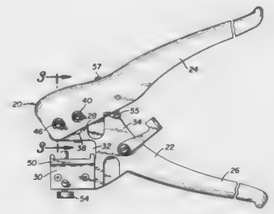


4,729,170

HAND TOOL WITH PERPENDICULAR ACTING DIES ON PIVOTED HANDLE SET

Ruben J. Hartmeister, 1034 6th St., Golden, Colo. 80401

Filed Dec. 1, 1986, Ser. No. 936,447
Int. Cl.[4] B26F *1/00*
U.S. Cl. 30—363 **9 Claims**



3. A hand tool with perpendicular acting dies and pivoted handle, comprising:

a first die housing;

a second die support member;

a neck joining said first die housing and second die support member in mutually separated position and defining a workpiece-receiving cavity therebetween;

a first die carried by the first die housing for motion on an axis that is substantially perpendicular to the second die support member, wherein said first die housing defines a pivot pin bore of predetermined diameter and following an axis disposed in a plane substantially normal to said perpendicular axis of movement of the first die;

a pivot pin received in said pivot pin bore, said pivot pin having a substantially smaller diameter than the pivot pin bore;

a resilient means for radially supporting the pivot pin in the pivot pin bore and for allowing resiliently opposed radial motion of the pivot pin within the pivot pin bore; and

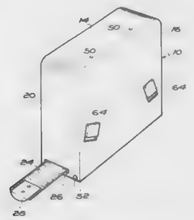
a first handle lever pivotally attached to the first die housing at said pivot pin and moveably connected to said first die for moving the first die with respect to the first die housing in response to relative pivotal motion between the handle lever and first die housing.

4,729,171

MEASURING TAPE

Ilan Samson, 62, Eshkol Street, Tel Aviv, Israel

Filed Feb. 20, 1987, Ser. No. 17,233
Claims priority, application United Kingdom, Feb. 21, 1986, 8604377
Int. Cl.[4] G01B *3/10*
U.S. Cl. 33—138 **17 Claims**



1. A tape measure comprising a case having a base, an upper surface spaced therefrom and a plurality of walls extending from said base to said upper surface with a mouth permitting passage through a said wall, proximate the injunction of said wall and said base,

a measuring tape which is coilable within the case and extensible from the case through said mouth,

an elongate marking element located within the case, with an end portion of the marking element engaged in an aperture through the case proximate said mouth and beside said tape,

an actuating element mounted within the case engaging said marking element and operable by hand to advance said marking element said actuating element comprising a pair of parts, between which the marking element extends, manual pressure on said actuating element pressing said parts thereof together so as to grip said marking element, said parts disengaging from said marking element sufficiently to permit sliding movement of said marking element between said parts when manual pressure is released from said actuating element to cause a tip thereof to project from said aperture, for marking by means of said tip,

said actuating element being exposed through an opening in a said wall of the case, intermediately between said base and said upper surface of the case,

whereby manual operation to advance the marking element is a manual movement alongside the case.

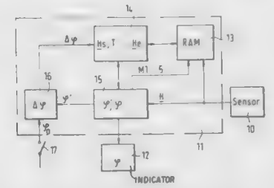
4,729,172

PROCESS FOR ESTABLISHING THE DRIVING DIRECTION OF A VEHICLE WITH AN ELECTRONIC COMPASS

Günther Alberter; Harald Bauer, both of Nürnberg, and Gerhard Hettich, Rosstal, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00122, § 371 Date Nov. 7, 1985, § 102(e) Date Nov. 7, 1985, PCT Pub. No. WO86/00128, PCT Pub. Date Jan. 3, 1986
PCT Filed Apr. 17, 1985, Ser. No. 802,011
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422491
Int. Cl.[4] G01C *17/38*
U.S. Cl. 33—356 **8 Claims**

1. Process for determining the driving direction of a motor vehicle including an electronic compass provided with a fixedly mounted magnetometer, said magnetometer having a plurality of probes arranged along mutually perpendicular axes to define a vector diagram and generating electrical signals depending on magnitude and direction of magnetic field present at said magnetometer, an evaluation circuit including a computer and storage means, said signals being applied to said evaluation circuit to determine the direction and magnitude of an interference magnetic field, the earth's magnetic field and the driving direction of the vehicle, the process comprising the steps of at least partially turning the vehicle, applying to said evaluating circuit the signals pertaining to at least five measuring points measured during the turning and storing said signals in the storing means; processing in the computer the stored signals according to an algorithm having at least five unknowns to compute the center point displacement, the shape and the turning of the local curve of the earth's magnetic field



in the vector diagram; aligning the vehicle with a predetermined cardinal direction (east) and subtracting the angle ϕ_o between the cardinal and the north directions from the angle ϕ' of the earth's magnetic field indicated by the electronic compass to produce a correction angle $\Delta\phi$;

storing the correction angle in the storage means; and

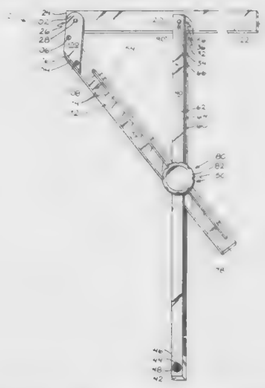
subtracting or adding in the computer said stored correction angle from or to a driving direction computed from measuring signals produced during subsequent measurements by said magnetometer.

4,729,173

ADJUSTABLE CARPENTER'S SQUARE

Dale D. Wilson, 349 Alma Ter., Cary, Ill. 60013

Filed May 6, 1987, Ser. No. 46,398
Int. Cl.[4] B43L *7/06, 13/00*
U.S. Cl. 33—451 **17 Claims**



1. An adjustable square for use by a carpenter with larger construction material, said square including a main beam, a head, and a slide, wherein:

a. said main beam, said head and said slide are each formed from a separate, long, flat bar; and interconnected to cooperate;

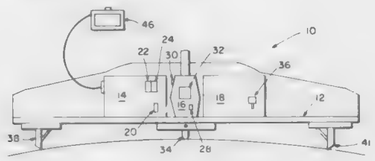
b. said main beam has a base end, and an action end oppositely disposed from said base end;

c. said slide has an angled end and a flat end oppositely disposed from said angled end;

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d. said head has a first end and a main end oppositely disposed from said first end;
e. a rotating means secures said angled end of said slide to said action end of said main beam in a partially rotatable fashion;
f. said slide has a slide slot therein; and
g. a movable means secures said main end of said head to said main beam at a joinder point in a movable relationship, with said joinder point being displaced from said action end, and closer to said action end than said base end.

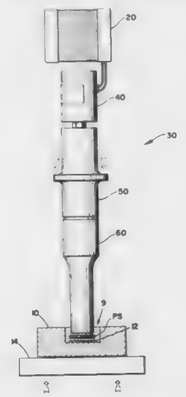
4,729,174
METHOD OF DETERMINING CIRCULARITY AND MEAN RADIUS OF CLOSED CURVED SURFACE
Paul R. Caron, Tiverton, R.I.; Gilbert Fain, Freetown, and Lee E. Estes, Mattapoisett, both of Mass., assignors to PGL Corporation, Westport, Mass.
Filed Jul. 15, 1986, Ser. No. 885,867
Int. Cl.[4] G01B *5/08*
U.S. Cl. 33—504 **19 Claims**



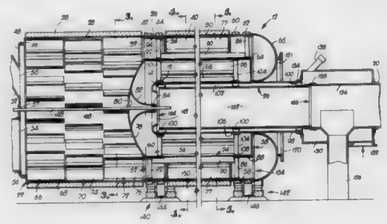
1. A method of determining the shape of a surface surrounding a reference axis which includes:
(a) establishing a reference plane which plane is perpendicular to the reference axis and which plane extends through the surface, the intersection of the plane with the surface defining a curved path;
(b) dividing the path into a plurality of contiguous segments with the junction of the adjacent segments defining stations;
(c) measuring the curvature of each station;
(d) invoking the closure property of the surface by forcing the mathematical solution to be continuous for a complete revolution as is the physical surface; and
(e) producing a deviation of each of the stations from the nominal shape of interest.

4,729,175
ULTRASONIC PRESS DRYING OF PAPERBOARD
Ralph E. Beard; Donald F. Hiscock, both of Columbus, Ohio; Kazuo Horita, Wheaton, Ill.; Joseph A. Jacomet, Galena; Nagabhusan Senapati, Dublin, both of Ohio, and Roger P. Hagan, Fernandina Beach, Fla., assignors to Container Corporation of America, Alton, Ill.
Filed Mar. 2, 1987, Ser. No. 20,539
Int. Cl.[4] F26B *20/00*
U.S. Cl. 34—1 **10 Claims**

1. An improved method of treating a continuously moving web of newly formed paperboard to remove additional moisture and further compact the fibres of the paperboard comprising the steps of:
(a) press-drying said paperboard web by simultaneously subjecting it to pressure and heat;
(b) at the same time said paperboard web is being press-dried, applying ultrasonic energy directly to said paperboard web by passing said web snugly between an ultrasonic applicator and an anvil to apply heat and pressure to both sides of said web and also to cause vibration of said paperboard fibres.

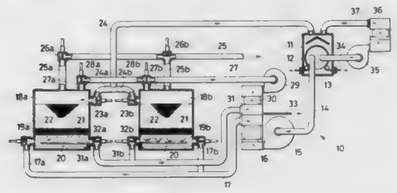


4,729,176
ROTARY DRUM DRYER AND METHOD
Donald E. Shinn, and Andrew D. Livingston, both of Independence, Kans., assignors to Productization, Inc., Independence, Mo.
Filed Apr. 1, 1987, Ser. No. 33,344
Int. Cl.[4] F26B *3/10, 11/04*
U.S. Cl. 34—33 **11 Claims**



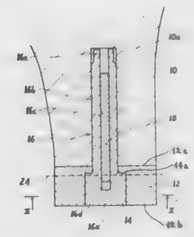
1. A multiple-pass product treating device comprising:
an elongated, normally horizontally disposed, axially rotatable body having means defining a plurality of elongated internal passageways intercommunicated to present a continuous, serpentine flow path through said body,
each of said internal passageways having a different effective cross-sectional area respectively;
means defining a product inlet oriented for initially directing product to be treated into a selected one of said passageways having a relatively large effective cross-sectional area;
means defining a product outlet in communication with another of said passageways having a relatively smaller effective cross-sectional area as compared with said one passageway,
said other passageway being disposed within and radially inboard of said one passageway; and
means for creating air currents within said body and along said flow path for conveying said product in a cocurrent fashion with said air currents along the flow path through said one passageway having said relatively large effective cross-sectional area, into and through said other passageway having said relatively small cross-sectional area, and out said product outlet.

4,729,177
EQUIPMENT FOR THE DEODORIZATION OF THE FABRIC IN MACHINERY FOR TEXTILE PROCESSING
Gino D. Vecchia, Santorso, Italy, assignor to Sperotto Rimar S.p.A., Zane , Italy
Filed Oct. 29, 1986, Ser. No. 924,607
Claims priority, application Italy, Nov. 21, 1985, 22928 A/85
Int. Cl.[4] F26B *13/08*
U.S. Cl. 34—77 **7 Claims**



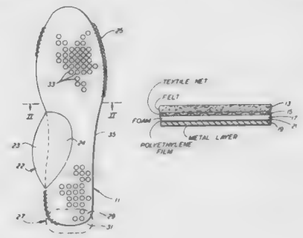
1. A textile processing apparatus for continuously deodorizing fabric and extracting and recovering solvents from fabric consisting essentially of
an air distribution element having ports to permit the entry and exit of fabric,
a main fan having its intake connected to said air distribution element and its discharge connected to at least two activated charcoal filtering elements, each activated charcoal filtering element comprising filtering materials including activated charcoal and upstream of said filtering materials a steam injection element, each activated charcoal filtering element further including at least two valved intake ports, I_a and I_b, and at least three valved discharge ports D_a, D_b, and D_c,
wherein the discharge of said main fan is connected at valved intake ports I_a, and said valved discharge ports D_a are connected to said air distribution element, forming a closed main fan circulation loop from said air distribution element through the main fan, through the at least two activated charcoal filtering elements and back to said air distribution element,
wherein said valved discharge ports D_b are connected to the intake of a secondary fan, the discharge of which is connected to the valved intake ports I_b of said at least two activated charcoal filtering elements, forming a closed secondary fan circulation loop from said secondary fan through said at least two activated charcoal filtering elements and back to said secondary fan,
wherein said valved discharge ports D_c provide a solvent recovery vent from said activated charcoal filtering elements to a solvent recovery apparatus,
which valves of said valved intake and discharge ports are independently operable so as to permit each activated charcoal filtering element to be connected, independently, to the closed main fan circulation loop, the closed secondary fan circulation loop, or the solvent recovery vent.

4,729,178
ANTIWEAR AND NONSKID PROTECTIVE ELEMENT FOR A SHOE HEEL
Manoel Bouchet, Montagny-les-Beaune, France, assignor to Ste Manoel Bouchet SA, Ladoix-Serrigny, France
Filed Jul. 15, 1986, Ser. No. 885,806
Claims priority, application France, Jul. 23, 1985, 85 11216
Int. Cl.[4] A43B *21/42, 21/00*
U.S. Cl. 36—35 A **9 Claims**



1. An antiwear and nonskid protective element for a shoe heel comprising:
a first part in which a through opening is made, the opening being smaller on a side in contact with a heel part of the shoe than on a free end opposite thereto;
a second part comprising a head, the shape and dimensions of which correspond to those of said opening, and a rod provided with a rigid inside reinforcement, the rod being capable of being driven with force into a hole made in the heel part for the fastening of the element, said rod having a bore extending longitudinally therein; and
a reinforcement inserted in said bore of said rod and being axially movable therein responsive to wearing of said free end of said first part and of said head of said second part.

4,729,179
SHOE INSOLE
Barr Quist, Jr., Locust, N.J., assignor to Kinney Shoe Corporation, New York, N.Y.
Filed Jun. 30, 1986, Ser. No. 879,978
Int. Cl.[4] A43B *13/38, 13/41*
U.S. Cl. 36—44 **23 Claims**

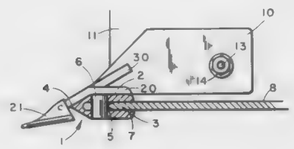


1. A shoe insole comprising:
a layer of metal foil;
a layer of felt material forming an uppermost layer in the insole, said layer of metal foil forming a lowermost layer in the insole;
a flexible layer of polyethylene foam disposed between said metal foil and said layer of felt material;
a textile net embedded in a layer of thermoplastic resin disposed between said layer of felt material and said layer of polyethylene foam; and
coupling means for connecting said layer of felt material,

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said texile net, said layer of polyethylene foam and said metal foil to one another and for maintaining same in an integral configuration.

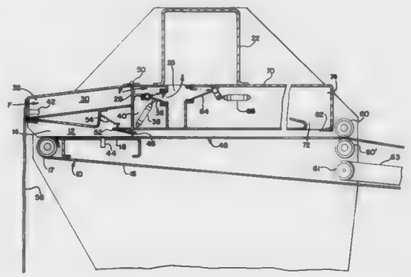
4,729,180
QUICK TEETH BUCKET ATTACHMENT
Robert G. Hendricks, 2450 Ingold Ct., Green Bay, Wis. 54303
Filed May 7, 1986, Ser. No. 860,565
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—141 T **5 Claims**



1. An improved detachable tooth bar for excavating buckets comprising;
(a) An elongate tooth carrying bar having a top plate and a bottom plate which are joined along one long edge to form a cutting edge and the plates and the cutting edge define a longitudinal recess in the bar and the recess conforms to the top and bottom surfaces of a cutting lip of an excavating bucket, and
(b) the bar has incorporated into its structure bucket lip engaging stops which project into the recess and the stops are positioned intermittently along the length of the bar so as to be engageable with a cutting lip of an excavating bucket, and
(c) the bar has mounting plates incorporated into its structure and the plates are positioned near but not at the ends of the elongate bar and project from the bar in a direction opposite the direction of the cutting edge and the mounting plates are configured so as to lie along the inside of the upright sides of an excavating bucket when the bar is engaged with the cutting lip of the excavating bucket and the mounting plates are provided with means for securing the mounting plate to the upright sides of the excavating bucket, and
(d) a tooth mounting post is positioned on the tooth bar and in contact with the mounting plate at an inside intersection of the tooth bar and the mounting plate, and a tooth mounted on the post serves to break up compacted materials into which the tooth is pushed prior to the compacted materials coming into contact with the upright sides of the bucket.

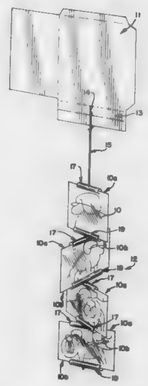
4,729,181
LAUNDRY FEEDER
Henry J. Weir, Bulwark, Chepstow, Gwent NP6 5QK, Great Britain
Continuation-in-part of Ser. No. 697,842, Feb. 3, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 893,355
Claims priority, application United Kingdom, Mar. 2, 1984, 8402909
Int. Cl.[4] D06F *67/04*
U.S. Cl. 38—143 **29 Claims**

1. A laundry feeding machine comprising a conveyor on which laundry sheet material is to be fed; a loading station at the front of the conveyor; holding means at the loading station for releasably holding the leading edge portion of sheet material with the rest thereof in a draped depending condition; an air tunnel enclosing at least the front part of the conveyor, the air tunnel being open at the front at a point adjacent and below the holding means; means for applying suction to the tunnel which thereby draws the leading edge portion of the sheet material when released from the holding means into said tunnel where it is to be deposited upon the conveyor; and valve means for controlling the air flow attendant to release of the article by



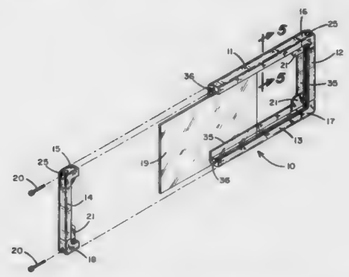
the holding means, so that the leading edge portion of the article is sucked inwardly into the tunnel to drop upon the conveyor.

4,729,182
MAILABLE MOBILE FOR PHOTOGRAPHS AND SIMILAR PLANAR OBJECTS
Eli L. Sherman, 2536 North Southport, 1st Floor, Chicago, Ill. 60614
Filed Jun. 27, 1986, Ser. No. 879,811
Int. Cl.[4] G09F *7/22*
U.S. Cl. 40—124 **7 Claims**



1. A mobile for mounting photographs and similar planar objects in combination with a mailer comprising:
an elongate flexible member;
a plurality of photograph mounts located along the flexible member in spaced apart relation, a plurality of photographs when so mounted thereby forming a mobile which can be suspended in a display configuration and can also be stacked fully assembled in a compact rectangular shaped pile in a storage configuration; and
a mailer within which the mobile is received and closed in the stacked storage configuration, the mailer having a detachable tab portion to which the flexible member is secured, the detachable tab portion being sized to provide an opening in the mailer through which the stacked mobile is removed from the mailer for immediate display when the detachable tab portion is detached, the detachable tab portion when detached also forming an end to the mobile from which the mobile can be suspended in the display configuration.

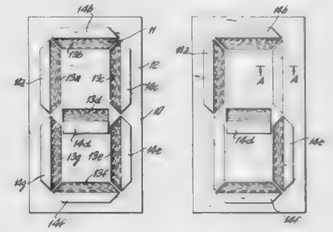
4,729,183
MODULAR FRAME STRUCTURE
Mark L. Tarter, Mesa; John A. Spencer, Phoenix, both of Ariz., and Dennis V. Baumann, Fort Collins, Colo., assignors to Kroy Inc., Scottsdale, Ariz.
Continuation of Ser. No. 652,963, Sep. 20, 1984, abandoned. This application Dec. 5, 1986, Ser. No. 938,537
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—152 **14 Claims**



1. A modular frame structure comprising:
a plurality of elongated frame side sections having retaining means for retaining an article to be displayed;
a plurality of frame corner sections each including a pair of legs for connection with adjacent frame side sections, each of said corner sections including an outside corner and an outside edge and each of said corner sections and said side sections including alignment means cooperating with one another for insuring proper alignment between said corner sections and said adjacent side sections; and
connection means for connecting each of said corner sections to said adjacent side sections including a threaded opening in each end of said side sections and a corresponding threaded member extending through a portion of said corner section and into said threaded opening for threaded engagement therewith, said threaded opening being disposed in a direction generally parallel to the longitudinal axis of said side section; each of said corner sections including a hole extending through each of said legs in alignment with a respective one of said threaded openings and in communication with the outside edge of said corner section for receiving and providing connecting access to said threaded members for connection with said threaded openings of adjacent side sections, each of said corner sections further including an access recess at said outside corner and in communication with said holes for providing access to said threaded members.

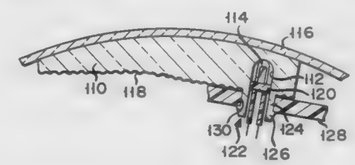
4,729,184
CHANGEABLE DIGITAL DISPLAY DEVICE
Lawrence Cihanek, Dixon Rd., Carmel, N.Y. 10512
Filed Apr. 16, 1986, Ser. No. 852,757
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—450 **7 Claims**

1. A manually alterable digital display device for displaying zero and each of the numerals 1 through 9, said device comprising:
(a) a panel having seven cut-out portions, three of said cut-out portions being parallel, horizontally aligned and evenly spaced apart; the remaining four cut-out portions being aligned vertically in two opposite pairs to form with said three horizontal cut-out portions the numeral "8" in block digital appearance;
(b) seven elongated flaps formed as part of said panel so as to form one piece with said panel, each of said flaps having a free edge and an opposite edge forming a hinge within the panel, said flap being positioned as well as having a size and configuration to cover a corresponding one of said seven cut-out portions, and



(c) an integral retaining means for retaining each of said flaps in open position when exposing each of said cut-out portions.

4,729,185
DISPLAY PANEL ILLUMINATION DEVICE
Masaharu Baba, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 28, 1986, Ser. No. 823,391
Claims priority, application Japan, Jan. 30, 1985, 60-11846[U]
Int. Cl.[4] G09F *13/18*
U.S. Cl. 40—546 **5 Claims**



1. A display apparatus comprising:
a transparent light guide plate made of a flexible and elastic material, said light guide plate having a light emitting surface, a light reflecting inner surface and a light source receiving hole having a predetermined inner diameter;
light source means fixed in said light source receiving hole, said light source means including a socket, and a lamp mounted in said socket which has an outer diameter slightly larger than the inner diameter of said hole so that said light source receiving hole expands due to the flexibility of said light guide plate when said lamp is inserted into said hole in order to fixedly receive said lamp in said hole; and
a display panel mounted on said light emitting surface of said light guide plate, said display panel being provided with display information thereo which may be illuminated by light that is emitted from said light source and is reflected from said light reflecting inner surface.

4,729,186
FIREARM WITH BARREL HOLDER FOR INTERCHANGEABLE BARRELS
Benedikt Rieger, Altenmünster-Hegnenbach, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 20, 1986, Ser. No. 876,392
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3522027
Int. Cl.[4] F41C *21/22*
U.S. Cl. 42—75.04 **24 Claims**

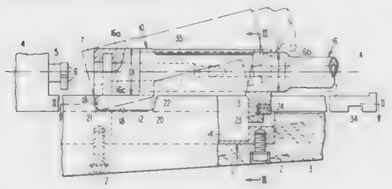
1. A firearm comprising a barrel holder means for accommodating interchangeable barrels, a breechblock housing means

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connected to a stock, said breechblock housing means including in a forward zone thereof a recess means provided with an abutment surface means for absorbing recoil forces; a tubular member fixedly joined to a rear end of an interchangeable barrel and encompassing the barrel, said tubular member including a downwardly projecting extension fitting into said recess means; and a breech bolt of a cylinder breech mechanism engages into a locking mechanism at the barrel end, and wherein:

the tubular member has a relatively large axial length and extends from the locking mechanism toward a front of the firearm to a position beyond a cartridge chamber,

the downwardly projecting extension is provided at a rear end of the tubular member,



the abutment surface means includes an undercut portion extending over the downwardly projecting extension at least partially from above,

a second downwardly projecting extension is arranged at a forward end of the tubular member and includes a locking recess means, and

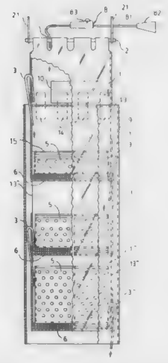
the breechblock housing means is extended up to a zone of the second downwardly projecting extension and, that location, carries a lock bolt means cooperable with the locking recess means whereby said breechblock housing means and said tubular member are detachably connectable to each other.

4,729,187
LONGLINE ASSEMBLY
John A. DiGioia, North Kingstown, R.I., assignor to Ashaway Line & Twine Mfg. Co., Ashaway, R.I.
Filed Feb. 18, 1987, Ser. No. 15,892
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—44.98 **6 Claims**



1. A longline assembly comprising a longline element, a plurality of spaced gangion lines attached to said longline element and hook means on the outer extremities of said gangion lines, said gangion lines each comprising a core element of a predetermined stiffness and an outer casing on said core element, said outer casings each comprising a plurality of individial strands which are tightly interlaced over the respective core element thereof, said strands being interlaced in a solid braid pattern wherein each strand extends alternately in substantially longitudinal and transverse directions with respect to the longitudinal extend of the casing thereof so as to reduce relative longitudinal movement between said outer casings and the respective core elements thereof.

4,729,188
AUTOMATIC SPROUTS CULTURE BAG
Ming-Kwei Cheng, 3, Lane 134, Lien Cheng Road, Chung Ho, Taipei Hsien, Taiwan
Filed Dec. 9, 1986, Ser. No. 939,928
Int. Cl.[4] A01C *1/00*
U.S. Cl. 47—14 **4 Claims**



1. An automatic sprouts culture bag comprising a plurality of longitudinally arranged culture unit bags for storing sprout seeds, each culture unit bag being in communication with an adjacent culture bag by means of a siphon, the siphons being arranged in offset between adjoining longitudinal culture unit bags for siphoning suitable amounts of water from an upper culture unit bag into a lower culture unit bag forming an S-shaped flowing path and for submerging the sprout seeds, a siphon having a lesser diameter than that of a siphon above it, the plurality of longitudinal culture unit bags being hung on a lateral rod or wall for nursing sprouts in the air in conjunction with a water-dropping device arranged above said longituinal culture units bags for feeding water in drops from a water faucet to the sprout seeds through said longitudinal culture unit bags, the sprout seeds being received in an inner perforated bag in the logitudinal culture unit bag, and having an open free end folded in a Z-shape and pressed by a water bag filled with a suitable amount of water to permit sprouts to grow upwardly and freely.

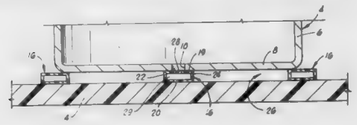
4,729,189
SUBIRRIGATION MAT
Carl E. Whitcomb, Stillwater, Okla., assignor to Lacebark Publications, Stillwater, Okla.
Filed Oct. 2, 1986, Ser. No. 914,358
Int. Cl.[4] A47G *7/00*
U.S. Cl. 47—39 **20 Claims**

1. A subirrigation mat, comprising:

a flexible substrate adapted to be rolled up into a substantially cylindrical shape and rolled out into a substantially flat shape; and

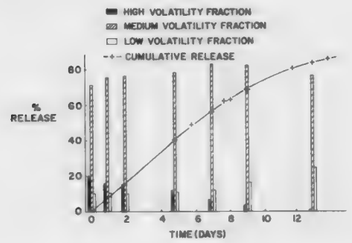
a channel non-removably attached along its length to said substrate, said channel member having a plurality of holes

defined along its length, each respective one of said holes providing a port through which irrigating fluid can be



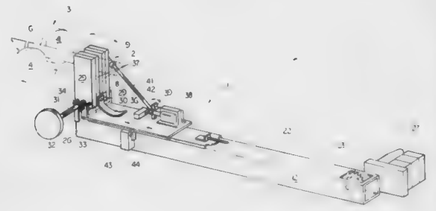
communicated to a respective container sitting atop said channel member over the respective one of said holes.

4,729,190
MEMBRANE-FORMING POLYMERIC SYSTEMS
Ping I. Lee, Valley Cottage, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 545,607, Oct. 27, 1983, abandoned, which is a continuation of Ser. No. 304,752, Sep. 23, 1981, abandoned.
This application Jul. 25, 1986, Ser. No. 890,878
Int. Cl.[4] A01C *1/06*
U.S. Cl. 47—57.6 **9 Claims**



1. Seed coated with a polymeric system comprising an association product of a polymeric carboxylic acid having free carboxyl groups on at least 10% of the monomer units thereof and an ethoxylated nonionic surfactant having at least 2 ethylene oxide units, a maximum molecular weight of 4,000 and a HLB (hydrophile-lipophile balance) value of 2 to 40.

4,729,191
CUTLERY SHARPENING APPARATUS
Dennis J. Meyer, and Richard J. Law, both of Louisville, Ky., assignors to Den-Dic, Inc., Louisville, Ky.
Filed Aug. 29, 1986, Ser. No. 901,796
Int. Cl.[4] B24B *3/54*
U.S. Cl. 51—83 BS **10 Claims**



1. Cutlery sharpening apparatus for sharpening a cutlery blade edge comprising:

an abrasive edge sharpening means, said edge sharpening means being mounted in preselected stationary position to define a rotating grinding surface;

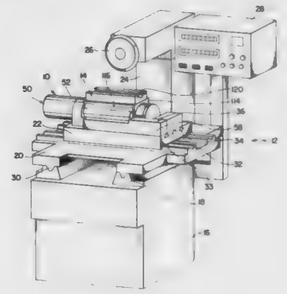
track means positioned in cooperative relation adjacent said abrasive sharpening means;

carriage means reciprocatively mounted on said track means to be selectively moved in a predetermined path relative to said abrasive edge sharpening means;

cutlery holding means pivotally mounted on said carriage means to firmly and releasably hold in cantilever fashion a gripping end portion of a cutlery blade to be sharpened so that said blade can be selectively pivoted above, into contact with and said pivoted away from said abrasive edge sharpening means; and,

power means to move said carriage means opposite directions along said track means and pivot said cutlery holding means in a preselected pattern in accordance with the position of said carriage means so that a cutlery blade whose gripping portion is firmly held by said holding means can be slidably moved above and pivoted into engagement with said preselected stationary abrasive sharpening means defining said rotating grinding surface to be sharpened thereby along its cutting length when said carriage is moved in one direction along said grinding surface and can be pivoted out of engagement with and moved with its cutting length in spaced relation above said preselected stationary abrasive sharpening means defining said rotating grinding surface when said carriage is moved in an opposite direction.

4,729,192
MACHINING APPARATUS AND WORKPIECE HOLDING ASSEMBLY THEREFOR
Waldmar J. Elsdoerfer, 235 Love La., Warwick, R.I. 02886
Filed Aug. 29, 1986, Ser. No. 902,181
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165.71 **20 Claims**



1. In a machining apparatus for performing a machining operation on a workpiece wherein the machining apparatus is of a type which includes means for holding said workpiece during said machining operation, a cutting tool which is engageable with said workpiece for performing said machining operation thereon, and first, second and third movement means for effecting relative movement between said cutting tool and said workpiece in first, second and third mutually perpendicular directions, respectively, during said machining operation, the improvement comprising said means for holding a workpiece further characterized as a workpiece holding assembly comprising a base, a gimble having a tilt axis, in one of said three directions and which is mounted on said base spaced first and second mounting means for mounting said gimble on said base so that it is rotatable about said tilt axis and so that said tilt axis extends in one of said three directions, means for securing said workpiece on said gimble, means for automatically rotating said gimble about said tilt axis, and means for sensing the rotated position of said gimble with respect to said tilt axis, said means for rotating said gimble comprising first and second

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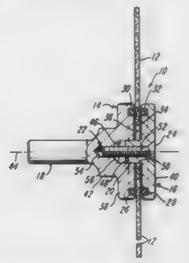
worm gears rigidly mounted in closely adjacent, substantially parallel relation on said gimble between said first and second mounting means, first and second worm shafts rotatably mounted in closely adjacent, substantially parallel relation in said workpiece holding assembly, interengaging first and second transmission gears on said first and second worm shafts, respectively, directly mechanically interconnecting said first and second worm shafts for rotation together in opposite directions, said first worm shaft interengaging said first worm gear, said second worm shaft interengaging said second worm gear, said first worm gear and said first worm shaft being of opposite rotation from said second worm gear and said second worm shaft, said first and second worm shafts engaging oppositely facing teeth of said first and second worm gears, respectively, to substantially prevent backlash movement in said gimble both during and after rotation thereof in either direction about said tilt axis.

4,729,193

CUTTING DISK MOUNTING ASSEMBLY

Eugene Gant, 4605 Merrydale Ave., Dayton, Ohio 45421, and Richard Spangler, 3924 Cloverdale Rd., Medway, Ohio 45341

Filed Dec. 22, 1986, Ser. No. 944,010
Int. Cl.⁴ B24B *41/04*
U.S. Cl. 51—168 **17 Claims**



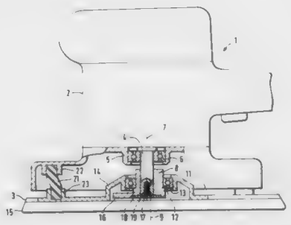
1. A cutting disk mounting assembly, comprising:
(a) a pair of first and second opposing end plates having interior surfaces facing toward one another and exterior surfaces facing away from one another;
(b) drive coupling means attached to said first plate and extending from said exterior surface thereof;
(c) first complementary means defined on said interior surfaces of said plates and being matable together to align said plates in a clamping relation with their interior surfaces located adjacent to one another, said first complementary means including
(i) a first axial bore formed in said first plate and opening at said interior surface thereof, and
(ii) an axial hub formed on said second plate protruding from said interior surface thereof and being sized to fit in said first axial bore in said first plate so as to align said plates in said clamping relation with their interior surfaces located adjacent to one another and adapted to receive a cutting disk therebetween being inserted over said protruding axial hub of said second plate;
(d) fastening means;
(e) second complementary means defined through said plates and being adapted to receive said fastening means to attach said aligned plates together in said clamping relation with respect to the cutting disk when the latter is disposed between said interior surfaces of said plates and inserted over said protruding axial hub of said second plate;
(f) a pair of resiliently-flexible endless members; and
(g) a pair of continuous grooves each defined in one of said interior surfaces of said plates and being adapted to receive and retain one of said endless members therein such that said endless members resiliently engage and grip opposite sides of the cutting disk when the disk is disposed between said plates and the latter are disposed in said clamping relation.

4,729,194

BALANCED ORBITAL SANDER/GRINDER

Peter Maier, Neidlingen, and Horst Haberhauer, Plochingen, both of Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,779
Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518984
Int. Cl.⁴ B24B *23/04*
U.S. Cl. 51—170 MT **12 Claims**



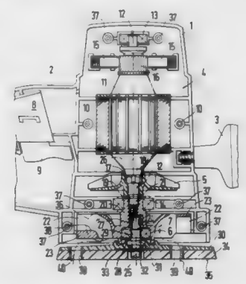
1. Operationally balanced orbital grinding or sanding machine having
a housing (**1**);
a grinding or sanding disk holder (**3**) movably retained on the housing adapted to hold a grinding or sanding disk;
a drive shaft (**4**) rotatably retained in the housing at right angles with respect to the grinding or sanding disk holder and defining a shaft axis of rotation;
an eccentric (**8**) secured to the shaft (**4**), said eccentric being rotatable about, and defining, an eccentric axis (**9**), parallel to and spaced from the shaft axis of rotation, and coupled to said grinding or sanding disk holder;
a balancing weight means (**16**) rotating in synchronism with the eccentric (**8**) and having an axis of rotation at least approximately coincident with the shaft axis of rotation to compensate eccentric unbalanced forces relative to the housing generated by the eccentric and the grinding or sanding disk holder (**3**) coupled thereto upon rotation of the drive shaft (**4**),
wherein, in order to automatically compensate for a transverse rotating force vector (**27**) arising from the cutting or grinding force effect between a grinding or sanding surface of the grinding or sanding disk secured to the disk holder (**3**), and a workpiece,
said balancing weight means (**16**) is so positioned with respect to the eccentric axis of rotation (**9**) and so dimensioned that said weight means, in operation, exerts forces to balance said cutting force vector (**27**), said weight means acting on the eccentric axis of rotation (**9**) in a direction at right angles with respect to a theoretical connecting line (**25***a*) between the shaft axis of rotation (**7**) and the eccentric axis of rotation (**9**) said weight means (**16**) having a center of gravity (**29**) being asymmetrically positioned with respect to said theoretical connecting line (**25***a*).

4,729,195

HAND GRIPPING MACHINE WITH A SUCTION DEVICE

Günther Berger, Notzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 35,905
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620136
Int. Cl.⁴ B24B *23/00*
U.S. Cl. 51—170 MT **14 Claims**



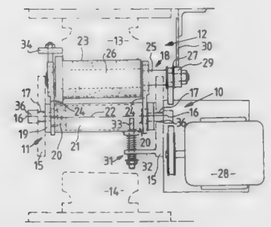
1. A hand-held grinding machine, comprising a motor with a motor shaft; a grinding sheet support; an eccentric drive for said grinding sheet support and connected to said motor shaft; and a fan wheel having an imbalance mass compensated by an imbalance of said eccentric drive, said fan wheel having a bore concentrical to said motor shaft and receiving an end of said motor shaft, and a recess eccentrical with said bore; and a pin received in said recess via bearings, said pin holding said grinding sheet support.

4,729,196

APPARATUS FOR MACHINING RAIL BEARING SURFACES

Arthur W. Chaseling, Albany Creek, Australia, assignor to Winders, Barlow and Morrison Pty., Ltd., Brisbane, Australia

Filed Sep. 15, 1986, Ser. No. 907,627
Claims priority, application Australia, Sep. 17, 1985, PH02469
Int. Cl.⁴ B24B *19/00*
U.S. Cl. 51—241 S **16 Claims**



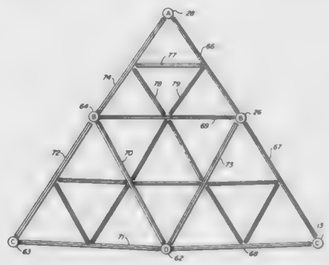
1. Machining apparatus for machining a bearing surface of a rail in a rolling element bearing assembly of the type having rolled elements caged between inner and outer side plates of a bearing cage, said machining apparatus including:
rail profile forming apparatus engageable with said bearing surface for machining said bearing surface;
a carriage assembly and connector means on said carriage assembly for connecting said carriage assembly to said bearing cage and for supporting said rail profile forming apparatus for movement with said bearing cage along said rail freely to and from said bearing surface;
biassing means for applying a selected surface cutting pressure to said rail profile forming apparatus;
profiled elongate guide means attachable to said rail adjacent to said bearing surface; and
a follower attached to said rail profile forming apparatus and engageable with said profiled elongate guide means whereby movement of said rail profile forming apparatus towards said rail is limited by engagement of said follower with said guide means to machine the longitudinal bearing surface profile to conform to said profiled elongate guide means.

4,729,197

GEODESIC DOME AND METHOD OF MAKING

Alvin E. Miller, 5605 N. Genematas Dr., Tucson, Ariz. 85704

Continuation of Ser. No. 470,533, Feb. 28, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 874,799
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—81 **25 Claims**



1. In a geodesic dome, a strut assembly comprising in combination:
(a) a first group of struts each having a first end and a second end;
(b) a plurality of first hinge connecting means, each attached to the first end of a respective one of said struts of said first group, for connecting that first end to the first end of another strut of said first group;
(c) a plurality of second hinge connecting means, each attached to the first end of a respective one of said struts of said first group, for connecting that first end to the first hinge connecting means of another strut of said first group,
each of said first hinge connecting means being connected to the second hinge connecting means of a successive one of the struts of said first group to form a first hub from which said struts of said first group outwardly extend,
wherein each of said struts of said first group has a longitudinal axis, first, second and third ones of said struts being successively adjacent, a first angle which is subtended by said first and second struts being different than a second angle which is subtended by said second and third struts, the first and second hinge connecting means of said second strut being disposed on opposite sides of the longitudinal axis of said second strut, an imaginary line extending between opposed hinge connecting points of the first and second hinge connecting means of said first strut forming a non-perpendicular offset angle with the longitudinal axis of said first strut whereby said first, second and third struts can be oriented relative to one another at said first and second angles without creating excessive stresses on any of said first and second hinge connecting means
(d) a second group of struts, each of the struts of said second group having on each end thereof first and second hinge connecting means substantially similar to said first and second hinge connecting means of said struts of said first group and interconnected to form a second hub from which the struts of said second group outwardly extend, a

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first strut which is in said first group being also included in said second group;

(e) a third group of struts, each having on each end thereof first and second hinge connecting means substantially similar to said first and second hinge connecting means of said struts of said first group and interconnected to form a third hub from which the struts of said third group outwardly extend, a second strut which is in said first group being also included in said third group;

(f) a third strut which is in said second group also being included in said third group, said first, second and third struts forming a first triangle;

(g) a first triangular panel for covering space subtended by said first triangle wherein said first triangular panel is positioned so that one of its edges lies along and against an outer surface of said first strut, said strut assembly including a plurality of panel connecting means attached to said first triangular panel and said first strut for securely attaching said first triangular panel to said first strut,

wherein each of said panel connecting means includes a strap which extends outwardly from said first strut around the outer edge of said first triangular panel and is attached to the outer surface of said first triangular panel,

wherein said first strut includes a pair of beams tightly attached side by side to each other, said straps being enclosed between said first and second beams.

4,729,198

GRAIN SILO SEALING

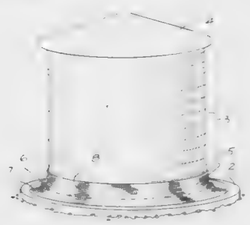
Timothy J. Nethery, Cronulla, Australia, assignor to Nethchem Pty. Ltd., New South Wales, Australia

Filed Mar. 3, 1987, Ser. No. 22,079

Claims priority, application Australia, Mar. 7, 1986, 54429/86

Int. Cl.⁴ E04H *7/22;* **E04F** *19/04*

U.S. Cl. 52—169.14 **11 Claims**



1. A grain silo having an expansion joint sealed by a bulging portion of a flexible diaphragm spaced from the joint and whose marginal edge-portions are adhesively bonded to adjoining exposed surfaces of the silo around the joint to provide continuous air-tight seals, a separating medium being located between the joint and the bulging portion of the diaphragm.

4,729,199

SNOW SLIDE KIT

Frank G. Oller, P.O. Box 107, Macks Inn, Id. 83433

Filed May 8, 1986, Ser. No. 838,695

Int. Cl.⁴ E04H *9/16;* **E01H** *5/02, 5/12*

U.S. Cl. 52—173 R **6 Claims**

1. An apparatus especially adapted to effect removal of a snow load adhering to a planar roof surface, comprising;

a. a plurality of upper and lower brackets adapted to be securely affixed to said roof surface in a spaced apart configuration thereon, each of said brackets having at least one wire-retaining slot therein, and

b. said lower brackets securely retaining a wire within said wire-retaining slot and said upper brackets releasably retaining a wire therein,

whereby, when said wire is pulled downwardly from one of said lower brackets, said wire releases from said upper brackets and sweeps downwardly across the roof surface thereby breaking the adhesion between said snow load



and said roof such that said snow load slides off of said roof.

4,729,200

SYSTEMS LIMITED

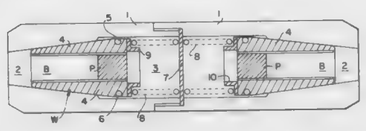
David Brearley, 81 Highfield Close, Lower Wortley, Leeds 12, West Yorkshire, England

Filed May 10, 1985, Ser. No. 733,286

Claims priority, application United Kingdom, May 11, 1984, 8412165

Int. Cl.⁴ E04C *3/10*

U.S. Cl. 52—223 L **4 Claims**



1. An anchor grip for engaging an end portion of a length of wire, rod or stranded element, the grip comprising an elongate barrel containing a wedge gripping device, the device comprising a plurality of tapered wedge elements which together define a bore to receive and grip a length of the wire wherein a plug element is present in the bore to hold the wedge elements apart to ease reception of the wire into the bore and is arranged to be displaced from the bore upon reception of the wire.

4,729,201

DOUBLE TOP CHORD

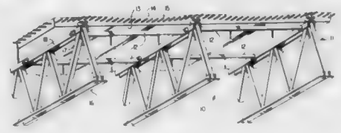
Felix F. Laurus, Nepean, and Ernest O. Butts, Ottawa, both of Canada, assignors to Hambro Structural Systems Ltd., Ottawa, Canada

Continuation of Ser. No. 522,734, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 458,365, Jan. 17, 1983, abandoned. This application Jan. 5, 1987, Ser. No. 4,202

Claims priority, application Australia, Aug. 13, 1982, PF5379; Sep. 24, 1982, PF6050

Int. Cl.⁴ E04B *5/18*

U.S. Cl. 52—334 **15 Claims**



1. In a composite action steel and concrete floor system

wherein a plurality of steel joists span horizontally and in spaced parallel relationship between spaced support members, each said steel joist including a top chord, a bottom chord and an intermediate web vertically extending between said top and bottom chords, composite action being achieved by complete embedment of each top chord in said cured concrete, and in which said joists are subject to construction loads during a non-composite state of construction of said floor system due to their own weight, construction live loads and wet concrete,

the improvement wherein each top chord of each joist comprises a pair of identical, longitudinally continuous, symmetrical, oppositely-positioned S shaped members extending in a parallel relationship for the length of the respective joist,

said S shaped members being in mirror relation to one another with the right-hand one appearing in cross section in a regular upright S form and the left-hand one in reverse S Form and being transversely spaced apart symmetrically relative to said web providing a joist having symmetry about a vertical axis passing through said web,

whereby the ability of said joists to withstand said construction loads during said non-composite steps is substantially increased.

4,729,202

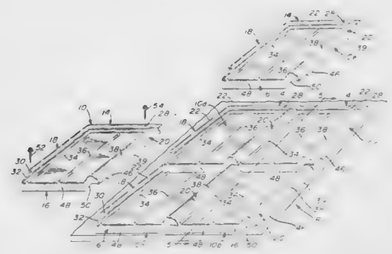
ROOFING TILE

Edouard Ferland, 25 rue Bournival, Venise, Magog, P.Q., Canada J1X 3W5

Filed Sep. 22, 1986, Ser. No. 910,380

Int. Cl.⁴ E04D *1/00*

U.S. Cl. 52—520 **6 Claims**



1. A tile roof assembly made up of lightweight roofing tiles of molded plastic material, each tile comprising a rectangular panel having first and second longitudinal edge portions adapted to extend in slope direction of a sloped roof and an upper lateral edge and a lower lateral edge adapted to run parallel to the horizontal edges of the sloped roof; the upper lateral edge and the first longitudinal edge portion having an upstanding ledge portion, the second longitudinal edge portion having a raised portion with a downwardly extending flange, the raised portion being adapted to overlap the upstanding ledge of the first longitudinal edge portion of a first adjacent tile; the bottom lateral edge portion having a downwardly extending flange adapted to overlap the upstanding ledge at the upper lateral edge portion of a further adjacent tile; a lower portion of said one longitudinal edge portion being provided with fastener access means whereby a fastener can be passed therethrough to anchor the tile to the roof, the flange of said raised portion on said second longitudinal edge portion being provided with a tab extending downwardly from the flange, slightly angled outwardly from the tile panel to tightly fit within a corresponding recess defined in the first adjacent tile at a right angle to the plane of the panel such that when a fastener anchors the lower one horizontal edge, the tab is thus interlocked within the recess of the adjacent tile.

4,729,203

BAGGING MACHINES

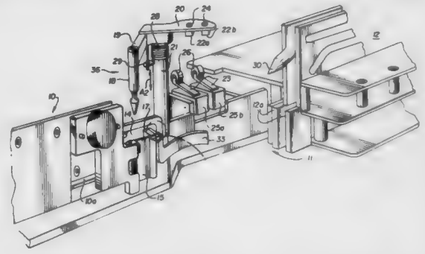
William J. Astwood, Palmerston North, and Rodney J. Lawrence, Feilding, both of New Zealand, assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 26, 1986, Ser. No. 900,461

Claims priority, application New Zealand, Aug. 29, 1985, 213300

Int. Cl.⁴ B65B *57/02*

U.S. Cl. 53—64 **1 Claim**



1. A bagging machine comprising input and output guides through which a chain of bags can be drawn, a bag filling zone between said input and output guides wherein a bag in the chain can be located for filling, means for advancing said chain of bags through said machine, movable bag engagement means adapted to engage with a bag approaching said filling zone and be moved by said bag as it moves to said filling zone, sensing means which sense the movement of said engagement means, control means which interrupt said advancement means in response to the sensing means sensing a pre-determined position of said bag in the filling zone, and means operative under control of the control means once said pre-determined position has been reached to cause the bag in the filling zone to be opened to facilitate filling thereof.

4,729,204

CONTAINER CLOSING MACHINE

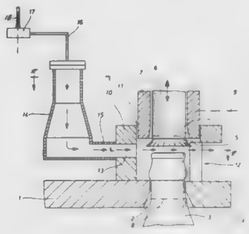
Wilhelm Weiss, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 856,014

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515334

Int. Cl.⁴ B67B *3/00;* **B65B** *7/28*

U.S. Cl. 53—88 **9 Claims**



1. A machine for closing containers such as bottles comprising:

star wheel means for being driven rotatably about a vertical axis and including upper and lower wheel members having pockets in which said bottles are held as they are transported in a circular path,

a chamber mounted to the top of said upper wheel member

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at each pocket for being occupied by the neck of a bottle and said chamber having a top opening aligned with said bottle, and bottle sealing means in said top opening movable in parallelism with said vertical axis alternately toward the mouth of said bottle to place and seal a closure element on the mouth and move away from said bottle and out of said chamber sufficiently far to acquire a closure element, said sealing means closing said top opening by said movement toward said mouth shortly after said closure element is acquired,

said chamber having a nozzle slot on one side presented toward said vertical axis for projecting a stream of gas through said chamber and having an opening presented away from said axis for admitting the neck of said bottle and for discharging said gas from said chamber, and

means for coupling said nozzle slot to a source of non-oxidizing gas.

4,729,205

METHOD OF PRODUCING FILM-WRAPPED PACKAGES OR PACKAGED UNITS, AND APPARATUS FOR CARRYING OUT SUCH METHOD

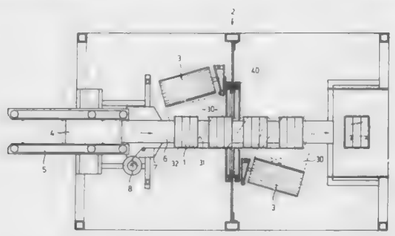
Peter Silbernagel, Weilautstrasse 18, D-4434 Ochtrup, Fed. Rep. of Germany

Division of Ser. No. 690,242, Jan. 10, 1985, Pat. No. 4,655,028. This application Jan. 8, 1987, Ser. No. 1,523

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401217; May 10, 1984, 3417341

Int. Cl.[4] B65B *13/04, 61/18*

U.S. Cl. 53—133 **6 Claims**



1. An apparatus for wrapping a package, comprising:

a wrapping device through which said package can be conveyed;

upper and lower transport means for conveying a package towards and through said wrapping device;

means for providing a tear-up thread having first and second sides, and applying the first side of said tear-up thread to a said package as said package is being conveyed through said wrapping device, said second side of said tear-up thread having an adhesive coating;

means for providing a film hose and wrapping said film hose about said package and said upper transport means as said package passes through said wrapping device, said film hose being formed by helically wrapping a stretch wrap film hose enclosing foil about said package, said film hose enclosing said tear-up thread along the length of a said package, said second side of said tear-up thread contacting said film hose and being adhesively bound thereto; and

means for severing said thread after said package passes through said wrapping device and

means for forming a material weakening line in the film hose wrapped around a package upon the passage of the wrapped package through said wrapping device, said material weakening line extending substantially the length of said tear-up thread, said film hose being maintained by said upper transport means at a spaced distance from said package while said material weakening line is being formed in said film hose.

4,729,206

METHOD AND APPARATUS FOR FILLING AND PACKAGING A FLOWABLE PRODUCT

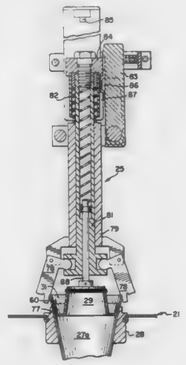
Ronald R. Francis, Hamilton Square, N.J., and Martin Mueller, Wonder Lake, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 669,545, Nov. 8, 1984, Pat. No. 4,608,809. This application Aug. 12, 1986, Ser. No. 895,774

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—297 **6 Claims**



1. In a packaging apparatus including apertured conveyor means for transporting open-ended containers along a generally horizontal path in an upright position to a plurality of processing stations for filling said containers with flowable product and closing and sealing the open-ended containers comprising:

(a) means for depositing empty, open-ended containers into container receiving apertures of a conveyor which carries the container along a generally-horizontal path in an upright position;

(b) filling means for filling each of the conveyed containers with a requisite quantity of flowable product, said filling means including a product filler valve which is connected to a product supply source and depending nozzle means, said flowable product being discharged through said nozzle means while said nozzle initially projects into the container;

(c) insertion means for seating a preshaped closure fitment within the open-end of each container on the conveyor, said fitment being inserted to a distance so as to define a lip potion of the container;

(d) crimping means for inwardly and downwardly folding the lip portion of each container over an upstanding free peripheral edge of the fitment contained within each container;

(e) means for sealing the downwardly folded lip portion of each container to the fitment which is sealed within each container in order to form a closed and sealed container; and

(f) means to discharge the filled, closed and sealed containers from the conveyor.

4,729,207

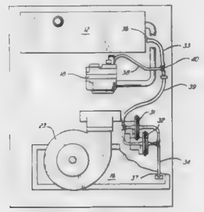
EXCESS AIR CONTROL WITH DUAL PRESSURE SWITCHES

Daniel J. Dempsey, Carmel, Ind.; Robert W. Peitz, Jr., Fayetteville, N.Y., and Kevin D. Thompson, Indianapolis, Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 17, 1986, Ser. No. 908,474

Int. Cl.[4] F24H *3/00*

U.S. Cl. 126—112 **7 Claims**



1. In a furnace of the type having a two stage gas valve, a two stage firing rate, a heat exchanger, and a variable speed inducer motor, a method of controlling excess air comprising the steps of:

providing a low pressure switch that is responsive to a selected first pressure drop level in the heat exchanger, said first pressure drop level being selected so as to be commensurate with a theoretically desired excess air level when operating the furnace in a low fire condition;

providing a high pressure switch that is responsive to a selected second pressure drop level in the heat exchanger, said second pressure drop level being selected so as to be commensurate with a theoretically desired excess air level when operating the furnace in a high fire condition;

accelerating the variable speed inducer motor until the low pressure switch closes, and sensing and recording a first motor speed at that time;

further accelerating the variable speed induce motor until the high pressure switch closes, and sensing and recording a second motor speed at that time;

computing and recording the ratio of said first and second motor speeds;

operating the system in a high fire condition with the inducer motor operating at a desired third motor speed; and

transitioning to low fire operation, with the speed of the inducer motor being reduced to a fourth speed which is calculated by multiplying said third speed by said ratio.

4,729,208

METHOD AND APPARATUS FOR PREPARING SYRINGES CONTAINING A LYOPHILE MEDICINE

Michel Galy, Le Blein St Loup, 69490 Pontchara Sur Turdine, and Alain Genet, 16, rue du Prieuré , 69130 Ecully, both of France

Continuation of Ser. No. 933,272, Nov. 20, 1986, abandoned, which is a continuation of Ser. No. 680,053, Dec. 10, 1984, abandoned. This application Jun. 25, 1987, Ser. No. 65,652

Claims priority, application France, Dec. 8, 1983, 83 19667

Int. Cl.[4] B65B *31/00*

U.S. Cl. 53—432 **5 Claims**

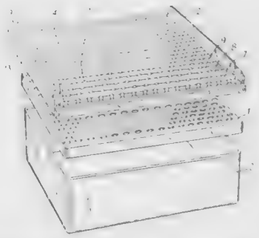
3. Apparatus for simultaneously preparing a series of auto-injectable syringes containing a lyophile medicine, the syringes being of the type having a tubular body with an open upper end, and a lower end adapted to receive an injection needle, and an elongated plunger having a piston at its lower end which is insertable through the open upper end of and frictionally slidable in the tubular body, said apparatus comprising:

a first flat rack having rows of identical holes for receiving therein the tubular bodies of the syringes and for holding the tubular bodies generally vertically, with their upper ends at the same level;

means to hold the said first rack within a lyophilizer horizontally at a predetermined distance from a horizontal support.

a second flat rack with holes formed to correspond to each hole of the first rack when the two racks are superimposed, said holes of said second rack being of a dimension to frictionally retain a piston therein, with its plunger extending upwardly therefrom;

means for supporting the second rack within a lyophilizer at



a fixed predetermined distance above the first rack with the holes of the second rack aligned with the holes of the first rack, so that said pistons enter and are forced downwardly into the tubular syringe bodies simultaneously, in response to simultaneously applying a downward force to upper ends of the plungers;

said second rack comprising a number of dismountable cross-members each having two vertical side walls and with half-holes formed in said vertical side walls and with said cross-members being mountable along side each other to extend substantially in a single plane whereby said half-holes define said holes of said second rack.

4,729,209

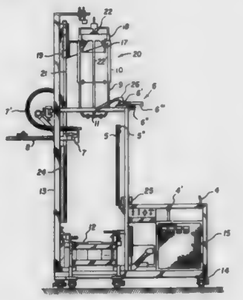
APPARATUS AND METHOD FOR INSERTING POUCHES INTO BOXES

Joseph E. Owensby, Spartanburg, and Fred A. Dobbins, Lyman, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Oct. 16, 1986, Ser. No. 919,743

Int. Cl.[4] B65B *43/18;* **B31B** *7/02*

U.S. Cl. 53—434 **6 Claims**



1. Apparatus for inserting pouches into boxes comprising:

(a) pouch supply means for supplying pouches in a flattened horizontal position; said pouch supply means comprising a stack of flattened pouches held by a wicket pin;

(b) pivotally mounted transfer arm means for transferring a pouch from the supply means to a vertical position;

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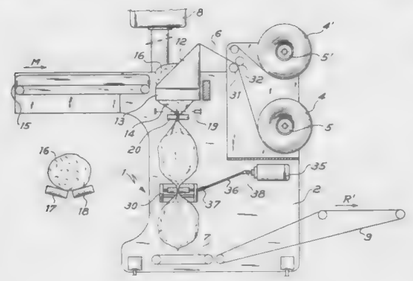
(c) gripping and opening means for removing the pouch from the transfer means and opening the pouch and holding the pouch in a vertical position; said gripping and opening means comprises two suction means for gripping each side of the pouch, one means being movable away from the other to open the pouch;
(d) box conveyor means for positioning an open box beneath the open pouch;
(e) inner mandrel means for removing the open pouch from the gripping means, said mandrel being located above the open pouch, said mandrel means being mounted for vertical reciprocal motion from a position above the open pouch to a position within said box;
(f) air blast means for fully opening said pouch as it is inserted into said box, said air blast means being associated with said inner mandrel;
(g) tucker fingers means for holding the bag as it is removed from the gripping means and for folding a portion of the bag mouth down and around a portion of the outside of the box; said finger means being located above the mandrel and disposed for vertical reciprocal motion therewith, and said tucker finger means being positioned to be partially inserted into the pouch mouth as the inner mandrel moves into the pouch and wherein the finger means include multiple fingers and means for spreading the fingers apart to hold the pouch open.

4,729,210

PROCESS AND APPARATUS FOR PACKAGING ARTICLES IN STRETCHABLE PLASTIC FILM

Mariano Galliano, Comano, Switzerland, assignor to Padeco S.A., Roveredo, Switzerland

Continuation-in-part of Ser. No. 695,046, Jan. 25, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 907,083
Claims priority, application Italy, Feb. 2, 1984, 19411 A/84
Int. Cl.[4] B65B *53/00*
U.S. Cl. 53—441 **14 Claims**



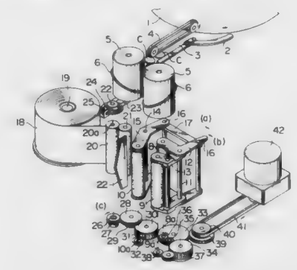
1. A process for packaging items of any shape in a stretchable plastic film, said plastic film having an extensibility of at least 40%, comprising:
forming a bag from a web of plastic film; by sealing longitudinal edges of the film and transversely sealing a lower end of the film;
inserting the item into the bag so formed;
transversely sealing an upper end of the filled bag; and severing the bag from the plastic film;
stretching the plastic film during the forming, inserting and sealing operations.

4,729,211

METHOD AND APPARATUS FOR DELIVERING AND WINDING PACKING PAPER

Tomonari Sakurai, Saitama, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 15,988
Claims priority, application Japan, Feb. 28, 1986, 61-43456
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—465 **1 Claim**



1. A method of delivering and winding packing paper in a coin stacker wherein a rod-like stack of coins is rotated between a plurality of packing rollers and at the same time a sheet of packing paper is delivered by its leading edge between said packing rollers and the stack of coins by means of feed rollers while being wound about said coin stack, said method being characterized by the steps of unwinding said packing paper sheet by said feed rollers at a low speed to deliver it between the packing rollers and the coin stack, rotating the packing rollers at said low speed to wind a part of said paper about the stack, starting to rotate the packing rollers at a speed higher than that in the delivering step and simultaneously stopping the rotation of said feed rollers to cut the paper after said part of the packing paper to be wound has been wound about the coin stack at said low speed, continuing to rotate the packing rollers at said higher speed to wrap the remainder of the packing paper about the coin stack at said higher speed.

4,729,212

PROTECTIVE COVER FOR COMBINE SKID PLATES

Thermon D. Rabitsch, P.O. Box 349, Monticello, Ga. 31064

Filed Sep. 18, 1986, Ser. No. 908,615
Int. Cl.[4] A01D *34/04, 45/02*
U.S. Cl. 56—119 **19 Claims**



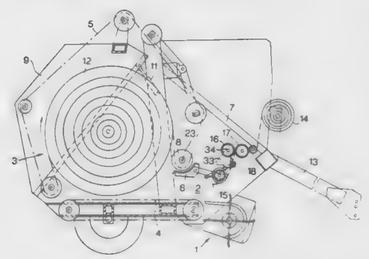
9. A cover for use on the outer surface of a skid plate of a combine grain head, and the skid plate comprising a plurality of side-by-side skid plate panels of different widths, and each skid plate panel having an outer surface, opposed leading and trailing edges, and a pair of opposed side edges, said cover comprising:
a plurality of side-by-side cover panels, each said cover panel corresponding to a specific one of the plurality of skid plate panels and each said cover panel having an outer surface, an inner surface, opposed leading and trailing edges, and a pair of opposed side edges, said inner surface of each said cover panel configured to matingly engage the outer surface of its corresponding skid plate panel, said outer surface of each said cover panel being substantially parallel to said inner surface thereof, said side edges of each said cover panel being slightly inset from the side edges of its corresponding skid plate panel, whereby each said cover panel is spaced apart from its adjacent cover panel to permit relative horizontal movement between adjacent cover panels and their corresponding skid plate panels, said cover panels being made from a material having a low coefficient of friction, whereby said cover panels will resist the adhesion of soil thereto.

4,729,213

WRAPPING APPARATUS FOR ROUND BALERS

Johan L. M. Raes, Zedelgem, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed Nov. 6, 1986, Ser. No. 927,626
Claims priority, application European Pat. Off., Nov. 12, 1985, 85/201843.1
Int. Cl.[4] A01D *59/00*; **A01F** *15/14*
U.S. Cl. 56—341 **9 Claims**



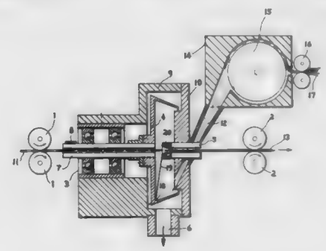
1. A round baler comprising a bale chamber in which crop material is formed into a bale, crop material pick-up means operable to deliver crop material to the bale chamber, means for wrapping a formed bale with sheet materal comprising feed means operable to feed the sheet material so that is can engage the formed bale and be wrapped therearound, and severing means operable to sever the sheet material when the formed bale has been wrapped with a predetermined length thereof, the improvement comprising material applying means disposed between the feed means and the formed bale for applying the sheet material in a predetermined width to the formed bale, the material applying means being mounted for movement between an operative position in which it is located in a throat of the bale chamber through which crop material is fed by the pick-up means and a retracted, inoperative position in which it is disposed clear of the throat.

4,729,214

COMBINED CARPET YARNS BY OPEN END ROTOR SPINNING

Paul W. Yngve, Wilmington, Del.; Peter Artzt; Gerhard Egbers, both of Reutlingen, Fed. Rep. of Germany; Ulrich Stark, Stuttgart, and Heinz Müller, Metzingen-Neuhausen, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1987, Ser. No. 4,608
Int. Cl.[4] D01H *7/882, 1/12*
U.S. Cl. 57—6 **13 Claims**



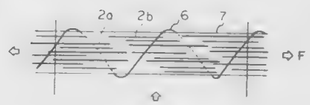
1. A method for manufacturing a combined yarn suitable for use in carpets and upholstery comprising the steps of:
(a) passing a continuous filament yarn having a denier of 20–2500 under tension through a hollow spindle of an open end spinning rotor having a consolidating groove;
(b) feeding crimped staple fibers having 6–34 dpf and 75–200 mm in length into the consolidating groove of the open end spinning rotor;
(c) twisting the staple fibers during passage of the staple fibers from the consolidating groove to a grooved navel surrounded by said rotor;
(d) combining the continuous filament yarn and the staple fibers in the navel; and
(e) adjusting the feed rate and the take-away rate to form a combined yarn having a balanced ply whereby the combined yarn has a mechanical twist of 1.5–7 tpi.

4,729,215

YARN FOR MANUFACTURING ARTIFICIAL FURS

Kenji Sato; Seiichi Yamagata, and Masaaki Sakai, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 395,010, Jul. 1, 1982, abandoned, and Ser. No. 863,591, May 15, 1986, which is a continuation of Ser. No. 395,010,. This application Oct. 28, 1986, Ser. No. 923,973
Claims priority, application Japan, Nov. 28, 1980, 55-166526; Apr. 8, 1981, 56-51655; May 26, 1981, 56-79357
Int. Cl.[4] D02G *3/04, 3/22, 3/36, 3/38*
U.S. Cl. 57—210 **31 Claims**



1. A yarn for use in manufacturing artifical fur having underfur and guard hairs comprising:
(a) a multiplicity of staple fibers having tapered ends, said fibers being of a denier and length useful to form guard hairs of the artificial fur,
(b) blended with fibers (a) a multiplicity of at least one kind of fibers selected from the group consisting of (I) a staple fiber which is shorter and of less denier than said fibers (a) and being of a denier and length useful to form underfur of

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the artificial fur, and a fiber which is of less denier than said fibers and which has the capability of being easily cut into a staple fiber which is shorter than said fibers, and which is of a denier and length useful to form underfur of the artificial fur, said fibers (a) and (b) being relatively longitudinally slidable to separate at least some of the fibers from others of the fibers, and

(c) temporary binding means connected to said fibers (a) and (b) to maintain them in continuity and resistant to longitudinal sliding separation during fabrication, whereby upon breaking or releasing the temporary binding means at least some of said fibers (a) and (b) may be longitudinally slidingly separated without being broken.

4,729,216

SERVICE DEVICE AND METHOD FOR APPLYING AN AIR BLAST TO A BROKEN YARN END IN A RING SPINNING MACHINE

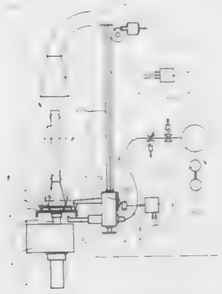
Joachim Rohner, Ebersbach/Fils, and Helmut Nickolay, Goppingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Jan. 12, 1987, Ser. No. 2,030

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600916

Int. Cl.⁴ D01H *15/00, 13/00;* **B65H** *54/22, 54/88*

U.S. Cl. 57—305 **17 Claims**



1. A service device for a ring spinning machine for traveling to individual spinning positions to apply an air blast to a broken yarn end to separate it from the previously wound yarn windings at the spinning position, said service device comprising means for detecting the extent of the winding build-up at the spinning position, means to apply an air blast, and means for setting the separating force applied by said air blast on the yarn, said detecting means acting automatically on the setting means to cause said setting means to set a lesser separating force upon detection of a greater extent of winding build-up.

15. A method for separating a broken yarn end from previously wound yarn windings at a spinning position of a ring spinning machine by means of an air blast which acts on the yarn end with a separating force, in which a service device which generates the air blast is moved to the spinning position, said method comprising detecting the extent of the winding build-up at the spinning position, applying an air blast, and automatically setting the separating force of the air blast that acts on the yarn end in response to said detecting to apply a lesser force in response to detecting of a greater extent of winding build-up.

4,729,217

COMBINED GAS/STEAM POWER STATION PLANT

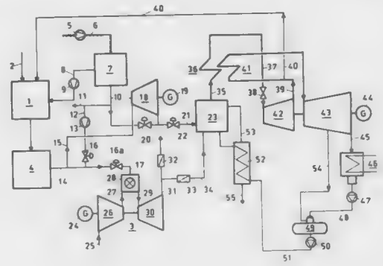
Rolf Kehlhofer, Meilen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 689,187, Jan. 7, 1985, abandoned. This application May 15, 1987, Ser. No. 51,246

Claims priority, application Switzerland, Jan. 31, 1984, 443/84

Int. Cl.⁴ F02B *43/00;* **F02C** *6/00;* **F02G** *1/00*

U.S. Cl. 60—39.02 **4 Claims**



1. A method of operating a combined gas/steam turbine power station plant having a gas turbine, a combustion chamber, a gas generator and an exhaust heat steam generator downstream of the gas turbine, the steam generator provided with a working medium and an auxiliary firing operation for increasing steam turbine power, the auxiliary firing operation and gas turbine combustion chamber operated on a fuel supplied from the gas comprising the steps of:

(a) generating an oxygen supply from an air separation plant, supplying said oxygen to the gas generator, obtaining fuel gas from the gas generator while operating the gas generator by coal gasification, dividing the fuel gas into a first portion and a second portion, and directing the first portion of the fuel gas to said gas turbine combustion chamber and directing the second portion of the fuel gas to the exhaust heat steam generator;

(b) generating a nitrogen supply in the air separation plant, conducting said nitrogen supply away from the air separation plant and dividing said nitrogen supply into a first portion and a second portion;

(c) mixing the first portion of the fuel gas and the first portion of the nitrogen in a predetermined ratio and supplying the mixture to the gas turbine combustion chamber; and

(d) mixing the second portion of the fuel gas and the second portion of the nitrogen together in a predetermined ratio and supplying the mixture to the exhaust heat steam generator.

4,729,218

GAS TURBINE ENGINE WITH GENERATOR ARRANGEMENT

Franz Haselbauer, Muenzenberg, and Thomas Weber, Oberursel, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

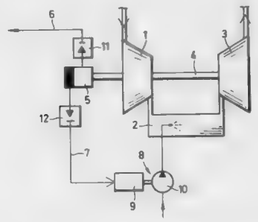
Filed Aug. 4, 1986, Ser. No. 892,932

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528519

Int. Cl.⁴ F02C *7/00*

U.S. Cl. 60—39.33 **14 Claims**

1. A gas turbine engine having a compressor, a combustion chamber, a turbine, common rotor for the compressor and the turbine and a separate electrically driven fuel pump unit supplying fuel to the combustion chamber, an electrical generator arrangement supplying electricity to drive the fuel pump unit including electric generator means mechanically and coaxially connected to and mounted on said rotor so as to be driven directly by said rotor and at least two independent electric output circuits connected to said generator means, one of said circuits being connected in electrical energy supplying relation to said electrically driven fuel pump unit and the other of said



circuits being connected to auxiliary equipment of said gas turbine engine other than said fuel pump unit, said generator means supplying electricity to said two independent cicuits at different electrical voltages, respectively, with the voltage of said one electrical circuit being significantly higher than the voltage of the other circuit.

4,729,219

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED RESPONSE CHARACTERISTICS

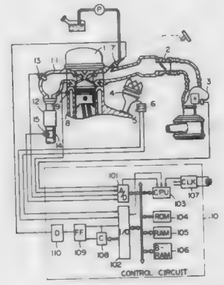
Nobuaki Kayanuma, Gotenba; Toshinari Nagai, Susono; Takatoshi Masui; Yoshiki Chujo, both of Mishima; Hironori Bessho, Susono; Yasushi Sato, Mishima; Toshiyasu Katsuno, and Toshio Tanahashi, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 31, 1986, Ser. No. 846,153

Claims priority, application Japan, Apr. 3, 1985, 60-69138; Apr. 12, 1985, 60-76614; May 20, 1985, 60-105926

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 60—274 **38 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter for detecting the concentration of a specific component in the exhaust gas, comprising the steps of:

comparing the output of said upstream-side air-fuel rato sensor with a first fixed reference voltage;

performing a delay operation upon the comparison result of the output of said upstream-side air-fuel ratio sensor with said first fixed reference voltage;

comparing the output of said downstream-side air-fuel ratio sensor with a second fixed reference voltage;

performing a delay operation upon the comparison result of the output of said downstream-side air-fuel ratio sensor with said second fixed reference voltage; and

adjusting an actual air-fuel ratio in accordance with the delayed comparison results of the outputs of said upstream-side and downstream-side air-fuel ratio sensors with said first and second fixed reference voltages, respectively.

4,729,220

AIR/FUEL RATIO CONTROL SYSTEM FOR LEAN COMBUSTION ENGINE USING THREE-WAY CATALYST

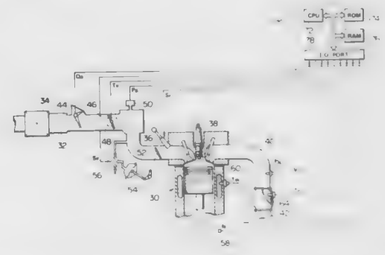
Katsunori Terasaka, Yokosuka, and Makoto Saitoh, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 12, 1987, Ser. No. 29,603

Claims priority, application Japan, Mar. 20, 1986, 61-64557

Int. Cl.⁴ F01N *3/20*

U.S. Cl. 60—285 **6 Claims**



1. A control system for feedback control of the air/fuel ratio of an air-fuel mixture supplied to an internal combution engine which uses a three-way catalyst for purifying the exhaust gas, the control system comprising:

air/fuel ratio detection means for detecting actual values of air/fuel ratio in the engine;

load detection means for detecting the load under which the engine is operating;

temperature detection means for detecting the temperature of the three-way catalyst; and

control means for performing feedback control of the feed of fuel or air to the engine based on the detected actual values of air/fuel ratio, the control means comprising target value setting means for determining a variable target value of the air/fuel ratio according to information obtained by said load detection means such that the target value becomes higher than the stoichiometric air/fuel ratio at least in a portion of a steady zone of operating conditions of the engine and modification means for varying the feed of fuel or air to the engine when the temperature of the three-way catalyst is above a predetermined temperature while the target value of feedback control of air/fuel ratio is higher than the stoichiometric ratio such that the actual air/fuel ratio decreases to a predetermined value which is optimum for the activities of the three-way catalyst or to a still lower value.

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4,729,221

PRESSURE GENERATING DEVICE WITH PRESSURE RELIEF MEANS

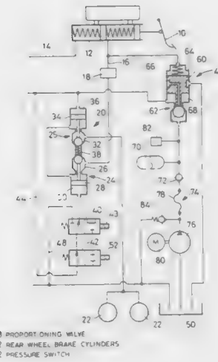
Yoshihisa Nomura, Toyota, and Masakazu Sugisawa, Takahama, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Feb. 13, 1987, Ser. No. 14,584

Claims priority, application Japan, Feb. 13, 1986, 61-29341; Feb. 13, 1986, 61-29342; Feb. 13, 1986, 61-29343

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—416 **10 Claims**



1. A pressure generating device having (a) a high-pressure accumulator for storing a fluid under a high pressure and delivering the fluid to a hydraulic component, (b) a high-pressure conduit connected at one end thereof to said high-pressure accumulator via a first check valve, (c) a high-pressure pump connected to the other end of said high-pressure conduit, to supply said high-pressure accumulator with the fluid under the high pressure, (d) a charging accumulator of a piston type including a piston and having a storage chamber connected to said high-pressure pump, for storing the fluid under a low pressure lower than that of the fluid in said high-pressure accumulator, and supplying said high-pressure pump with the fluid under the low pressure, and (e) a charging pump for supplying said charging accumulator with the fluid under the low pressure, wherein the improvement comprises:

said charging accumulator including leak means for permitting the fluid stored therein under the low pressure, to leak at a low rate;

a communication passage for communication between said high-pressure conduit and said storage chamber of said charging accumulator;

a second check valve disposed in said communication passage, and including a valve member for preventing a flow of the fluid from said high-pressure conduit toward said charging accumulator; and

one of said piston of said charging accumulator and said valve member of said second check valve having a valve actuator which is operable for holding said second check valve open while no fluid is stored in said charging accumulator.

4,729,222

BRAKE CIRCUIT APPARATUS FOR HYDRAULIC MOTOR

Hideaki Tanaka, Ibaraki; Toichi Hirata, Ushiku; Genroku Sugiyama, Ibaraki; Kuniaki Yoshida, and Shinichi Mihara, both of Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

Filed Jul. 16, 1986, Ser. No. 886,040

Claims priority, application Japan, Jul. 17, 1985, 60-155942

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—436 **14 Claims**



1. Brake circuit apparatus for a hydraulic motor in a hydraulic circuit system including at least one main hydraulic pump, a hydraulic motor driven by a hydraulic fluid supplied from said main pump and having a rotary shaft, and a directional control valve actuated by operation means for control of flow rate and flow direction of the hydraulic fluid supplied to said hydraulic motor from said main hydraulic pump, said hydraulic motor being provided with mechanical brake means having a brake release cylinder adapted to release the rotary shaft of the motor from the braking by the mechanical brake means by supply of a hydraulic fluid to the brake release chamber, wherein: said apparatus comprises an auxiliary pump, and control circuit means connected to said auxiliary pump, said brake release cylinder and a reservoir for control of fluid communication therebetween, said control circuit means having a hydraulic fluid supply line for receiving a hydraulic fluid supplied from said auxiliary hydraulic pump, a first line connected between said hydraulic fluid supply line and said brake release cylinder, and a second line connected between said hydraulic fluid supply line and said reservoir, said second line being associated with said directional control valve such that when the control valve is in a neutral position, said hydraulic fluid supply line is brought into communication with said reservoir to thereby disable a hydraulic fluid from said hydraulic fluid supply line from being supplied to said brake release cylinder through said first line, while when said directional control valve is actuated, said communication is interrupted to thereby enable the hydraulic fluid from said hydraulic fluid supply line to be supplied to said brake release cylinder through said first line.

4,729,223

FULL POWER HYDRAULIC ASSISTANCE DEVICE

Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Drancy, France

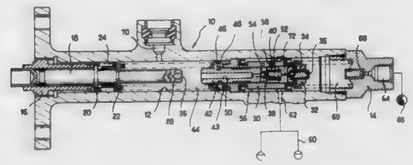
Filed Jun. 17, 1986, Ser. No. 875,039

Claims priority, application France, Jul. 3, 1985, 85 10167

Int. Cl.[4] B60T *17/00, 11/32*

U.S. Cl. 60—566 **3 Claims**

1. An hydraulic assistance device comprising a housing provided with a stepped bore inside which piston means is mounted slideably, the piston means displaceable by means of a brake pedal between a first position communicating a first chamber, connected with a brake circuit, with a low-pressure reservoir and isolating the first chamber from a high-pressure fluid source, and a second position isolating the first chamber from the low-pressure reservoir and communicating the first chamber with the high-pressure fluid source, the piston means displaceable by the brake pedal in the event of failure of the high-pressure fluid source to produce a pressure increase in a second chamber connected with the brake circuit, characterized in that the piston means comprises a bush in which is mounted slideably an actuating piston, and high-pressure valve means, the actuating piston extending from the bush and into a reduced diameter section of the stepped bore, the actuating piston displaceable by means of the brake pedal so as to open the high-pressure valve means, the actuating piston and bush



disposed within the second chamber which comprises an enlarged diameter section of the stepped bore so that in the event of the failure of the high-pressure fluid source a seal disposed about the actuating piston is displaced therewith to engage sealingly a substantially radial surface of the bush which is displaced by the actuating piston to displace a greater volume of fluid from the second chamber to the brake circuit than would be displaced through utilization of the reduced diameter section of the stepped bore, the booster further comprising a push rod connected with the brake pedal, a first spring disposed between the push rod and actuating piston and a second spring disposed between the actuating piston and bush, the seal disposed radially inwardly of the second spring.

4,729,224

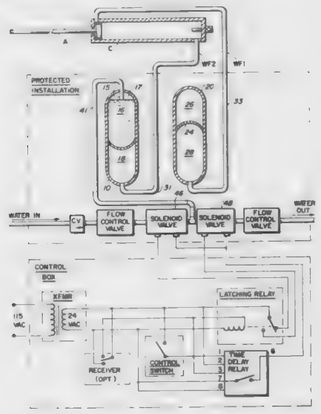
INSTALLATION, APPARATUS AND METHOD FOR ACTUATING DOORS, GATES AND THE LIKE UNDER EXTREME ENVIRONMENTAL CONDITIONS

James D. McAteer, 8406 El Prado Ave., Orlando, Fla. 32817

Continuation-in-part of Ser. No. 616,569, Jun. 4, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 884,218

Int. Cl.[4] F15B *15/18, 21/04*

U.S. Cl. 60—593 **15 Claims**



1. An installation for actuating gates, doors or the like in extreme environmental conditions from a conventional source of water under pressure, said installation comprising:

an installation which is protected from extreme environmental conditions, such as freezing temperatures or the like, including a rigid accumulator-separator vessel into a water chamber and a first working fluid chamber, a rigid accumulator vessel with means dividing said accumulator vessel into a second working fluid chamber and an air chamber;

a water supply line connected to said water source;

a supply value having an inlet port connected to said water supply line and an outlet connected to said water chamber;

a drain valve having an inlet port connected to said water chamber;

a hydraulic actuator positioned in an environment which is subject to extreme environmental conditions, such as freezing temperatures or the like, and having a first port connected to one of said working fluid chambers and a second port connected to the other of said working fluid chambers; and wherein

said working fluid chambers and said actuator are filled with a working fluid which is impervious to extreme environmental conditions.

4,729,225

TURBO-CHARGED INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS ENERGY RECUPERATION

Jakob Bucher, Bobingen, Fed. Rep. of Germany, assignor to M.A.N. - B&W Diesel GmbH, Augsburg, Fed. Rep. of Germany

Filed Aug. 28, 1986, Ser. No. 901,829

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532938

Int. Cl.[4] F02B *33/44*

U.S. Cl. 60—608 **20 Claims**



1. Supercharged internal combustion engine (ICE) (1) having an exhaust gas turbosupercharger (4), said exhaust gas turbosupercharger having a supercharger shaft (7),

a turbine (5) coupled to receive exhaust gases from the ICE (1) and a compressor part (6) providing supercharged air to the ICE, and

an energy recuperation system coupled to said supercharger shaft to provide utilizable energy output upon excess energy being supplied to the supercharger by the exhaust gases coupled thereto, and to provide auxiliary energy to the supercharger shaft when the exhaust gases from the ICE are insufficient to provide energy to rotate said supercharger shaft (7) to provide supercharged air to the ICE, wherein

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the energy recuperation and auxiliary energy supply system comprises

a hydraulic pump-motor unit (10) coupled to said supercharger shaft (7);

means (11, 26, 27, 29, 28, 12, 13) coupled to an inlet of the hydraulic pump-motor unit (10) to supply pressurized hydraulic fluid to said unit including an auxiliary hydraulic pump (27) and motor means (26) driving said pump;

a hydraulic connection line (14) hydraulically coupled to an outlet of said unit (10);

a hydraulic motor (15);

energy utilization means (8, 17, 24, 25) coupled to the hydraulic motor to accept energy therefrom;

a hydraulic fluid control valve (30) connected in said hydraulic connection line and controllably, selectively directing hydraulic fluid from said unit (10) to the hydraulic motor (15) or to a hydraulic fluid supply or sump (11); and

a control unit (21) coupled to control, selectively, operation of said motor means (26) and hence said hydraulic pump (27);

further coupled to and controlling the operation of the hydraulic pump-motor unit (10); and

further coupled to and controlling, selectively, operation of said fluid control valve (30), to control flow of hydraulic fluid to said hydraulic pump-motor unit (10) and, selectively, from said unit (10) to the hydraulic motor (15) or the supply or sump (11),

said comtrol unit receiving inputs responsive to operating parameters of the ICE comprising pressure of hydraulic fluid flowing to or from said unit (10) and at least one of:

pressure of supercharged air (P_L);

speed of the ICE (n_M);

fuel supply (F_B) to permit

under acceleration conditions of the ICE, and when the exhaust gases have insufficient energy, providing additional super-charged air to the ICE by supplying pressurized hydraulic fluid to said hydraulic pump-motor unit (10),

whereby additional rotary energy is supplied to said supercharger shaft (7) for supplying said additional supercharged air to the ICE.

4,729,226

PROCESS FOR MECHANICAL POWER GENERATION

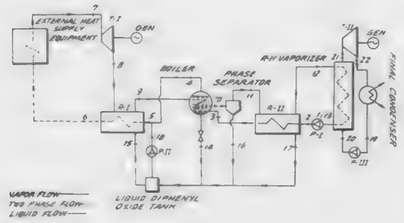
Serafin M. Rosado, Marques de Lozoya, 15, Madrid, Spain

Filed Jan. 3, 1986, Ser. No. 816,143

Claims priority, application Spain, Oct. 1, 1985, 539,465

Int. Cl.[4] F01K *25/14, 25/06, 25/08*

U.S. Cl. 60—649 **13 Claims**



1. A process of mechanical power generation using a binary cycle having a primary cycle and a secondary cycle, wherein the primary cycle employs a mixture of water and a second substance which is substantially immiscible with water and has substantially lower volatility than water, comprising in the primary cycle:

(a) dry expanding of a dry vapor mixture from a maximum working pressure and temperature to a minimum working pressure, to produce an expanded vapor mixture;

(b) cooling the expanded vapor mixture and then condensing at variable temperatures part of the substance of the higher boiling point, the heat yielded by said condensation being recovered by the primary cycle in step (e);

(c) separating the part of the substance of higher boiling point which has condensed in step (b), and pumping said condensed part to a point of equivalent temperature in step (e);

(d) total condensing the vapor mixture remaining after step (c) in a heat exchanger which transfers heat from the primary to the secondary cycle, first at variable temperatures until it reaches the eutectic composition and then at the eutectic temperature corresponding to the minimum working pressure of the primary cycle;

(e) recovering the heat ceded in step (b) for heating the mixture condensed in step (d) and for partially vaporizing it;

(f) absorbing heat by the mixture in two phases obtained from step (e), the mixture vaporizing totally until reaching the maximum working temperature of the primary cycle, to return to step (a).

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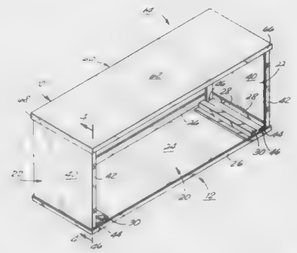
ERECTABLE SLEEVE

James H. Peden, Dayton, Tenn., assignor to Suburban Manufacturing Company, Dayton, Tenn.

Filed Feb. 17, 1987, Ser. No. 15,720

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—263 **18 Claims**



1. An erectable sleeve for receiving, to project therethrough, a unit of generally rectangular cross section comprising:

(A) a bottom member having a generally flat web section;

(B) a pair of end members, each end member having a generally flat web section and one end thereof pivotally secured to a respective end of said bottom member and being pivotable between a folded position wherein said end member web section extends generally parallel to and overlies said bottom member web section and an extended position wherein said end member web section extends generally perpendicularly to said bottom member web section; and

(C) a detachable top member having a generally flat web section and means adapted to engagingly receive the free ends of said end members for maintaining said end members in their extended position.

4,729,228

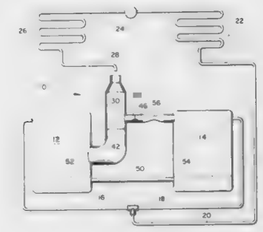
SUCTION LINE FLOW STREAM SEPARATOR FOR PARALLEL COMPRESSOR ARRANGEMENTS

Clifford N. Johnsen, La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Oct. 20, 1986, Ser. No. 920,641

Int. Cl.[4] F25B *1/10*

U.S. Cl. 62—510 **6 Claims**



1. A multiple compressor refrigeration system comprising:

a first low-side compressor having a shell which defines an oil sump;

a second low-side compressor having a shell which defines an oil sump;

an oil level equalization conduit connecting the oil sumps of said first and said second compressors for flow;

an evaporator;

suction line conduit means connected to said evaporator for conducting a suction gas flow stream from said evaporator, said flow stream being a stream comprised of vaporized refrigerant gas in which oil is entrained; and

means for unequally apportioning said gas stream to the shells of said first and second second compressors by causing said gas stream to diverge, said means for unequally apportioning having (i) a housing, connected to said suction line conduit mens, which defines both an expansion section and a separation chamber, said separation chamber having a cross-sectional area greater than the cross-sectional area of said suction line conduit menas and said expansion section being upstream of said separation chamber and causing said flow stream of diverge upstream thereof, said separation chamber being in flow communication at a downstream end with the interior of the shell of said first compressor and (ii) a takeoff conduit having a distal end, said takeoff conduit penetrating said housing and extending into said separation chamber so that said distal end is located in and spaced from the wall of said separation chamber downstream of said expansion section, said distal end facing generally into the flow stream conducted from said evaporator to said separation chamber the cross-sectional area of said distal end of said distal end of said takeoff conduit being sized so that a majority of the contents of the gas flow stream communicated from said evaporator into said separation chamber bypass the distal end of said takeoff conduit.

4,729,229

KNITTING DEVICE

James H. Whicker, Nashville, Tenn., assignor to Whicker Incorporated, Nashville, Tenn.

Filed Mar. 10, 1987, Ser. No. 24,392

Int. Cl.[4] D04B *3/00*

U.S. Cl. 66—4 **14 Claims**

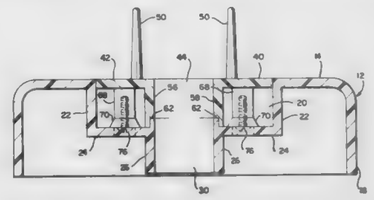
1. A manual knitting frame, comprising

a frame member having a top surface and downwardly depending side surfaces,

a slot extending through said frame member to provide a passageway from top to bottom therethrough,

a pin insert member having a slot passing therethrough to provide a passageway from its top to its bottom,

vertically extending pins disposed adjacent the slot on said insert member,



said frame member and pin insert members being constructed and arranged for the insert member to fit on said frame member with their slots in vertical registration, and

means for selectively securing said pin insert member on said frame member.

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CAM SYSTEM FOR FLAT-BED KNITTING MACHINE

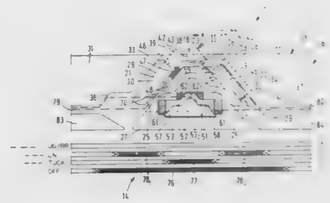
Hermann Schmodde, Albstadt, and Franz Schmid, Bodelshausen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Oct. 23, 1986, Ser. No. 922,487

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3537612

Int. Cl.[4] D04B *7/10*

U.S. Cl. 66—70 **5 Claims**



1. A cam system for a flat-bed knitting machine, having a reciprocating carriage, at least one needle bed defining a needle track, a needle supported in each needle track, said needles each having a needle jack associated therewith, a depressor apparatus having pressure jacks each with a pressure foot for acting on a needle jack, and a pressure strip unit, the cam system comprising a needle cam unit in which a knitting track and a transfer track are defined, said needle cam unit including:

a receiving cam part having a central receiving lobe;

a fixed cam part having an oblique face operative in a trailing manner; and

at least one integrated knitting/loop transfer cam, for both carriage travel and loop transferring directions, having spaced apart, adjustable, sinker elements, a transfer cam part defining a central lobe situated above the knitting track, said sinker elements including an outer flank surface and a pre-tensioning lobe situated in a leading position relative to the central lobe for pre-tensioning the loops on the sinker elements, said pre-tensioning lobe being operative in the lowered position of the sinker element, wherein:

the sinker elements are embodied such that in a leading and lowered position, they define a projection track to the transfer cam part, and in a trailing and raised position or in a sinking position, beginning at the central lobe they completely define a retractor track section of the transfer track; and

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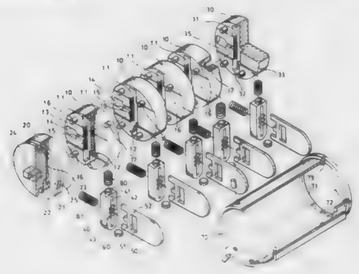
the oblique face of the fixed cam part is disposed at the same level as the central receiving lobe at a given time of the receiving cam movement and leads at the same level out of the receiving track along a substantially horizontal track, which as a result of a subsequently operative pressure strip of the pressure strip unit, extends beyond the outer flank surface of the trailing sinker element.

4,729,231

CHANGEABLE KEY TYPE LOCK BARREL

Tsay D. Wu, 2F, 33, Lane 119, Chulin Rd., Yung Ho City, Taiwan, Taiwan

Filed Dec. 29, 1986, Ser. No. 947,355
Int. Cl.⁴ E05B *27/02, 35/10*
U.S. Cl. 70—383 **5 Claims**



1. A changeable key type lock barrel comprising a plurality of rotary lock bodies, a driving lock body, a lock panel, a plurality of locking keys, a plurality of side plates, a plurality of brakes, a lock casing, a plurality of locking key springs, a plurality of side plate springs, two profile changing key and a plurality of unlocking keys, characterized by structure of its components as follows:

each rotary lock body is in the form of a disk with two key a side slot is designed perpendicular to each key slot on each side slot there is a spring seat in the form of a semi-cylindrical slot, and there is a brake seat in the form of a rectangular slot extending from an end of the spring seat, each rotary lock body has four cylindrical connection pins, each at a corner, and all located in one side, the other side of the rotary lock body has two connection holes corresponding to the said four connection pins and each of the key slots has an adapting edge on one side;

the driving lock body is in the form of a disk with a long key slot, a side slot is designed perpendicular to the key slot, another side of the driving lock body has a rectangular driving block to open or close door bolt, and on the driving lock body there are four connection holes corresponding to the connection pins;

the lock panel is in the form of a disk with a long key slot at one side and a key way in the bottom of the key slot, a side slot is designed perpendicular to the key slot, on the side slot there is a semi-circular spring seat corresponding to the spring seat on the rotary lock body, a brake seat in the form of a slot is extending from an end of the spring seat and the brake seat is corresponding to the brake seat on the rotary lock body;

the locking key is in the form of a bar with a round end and a spring brake block in the form of a short cylinder on the top, the locking key has a longitudinal side slot, on which there are three (or, two or more) rectangular brake stoppers perpendicular to the side slot;

the side plate is in the form of a thin plate with a round end and three extension plates at another end, it has a rectangular brake holder near the rear end;

the brake is a round (or square with curved edges) thin plate;

the lock casing is in the form of a cylinder with a protrusion along one side, and a flange around the inner wall of one end, the flange has a large opening on the bottom, and a small opening right above the large opening; and

each profile changing key has a thin profile on the upper side identical to the unlocking key, a small opening at the lower side, and an adapting hole at the tail; assembled in a manner that, first of all, five (or any other number) brakes are placed in five (or the other number) brake holders of different heights, and such brakes are then inserted into brake stoppers of different heights while the side plate is inserted to the side slot, a locking key spring is placed on the top of each locking key, and tail of each side plate is fixed with a side plate spring so that the locking key springs and the side plate springs are kept respectively in spring seats and top of key slots formed among the rotary lock body, the driving lock body and the lock panel and hence, the side plate is moveable in the side slot under restriction by the side plate spring, and the locking key is moveable under restriction by the locking key spring, such rotary lock bodies are connecting each other by means of the connection pins and the connection holes and then connected to the driving lock body and the lock panel, the whole assembly is then placed in the lock casing in a manner than the key way is matching with the large opening in the lock casing.

4,729,232

MACHINES FOR PRESSURE FORMING SURFACE CONFIGURATIONS ON A ROTARY WORKPIECE

Malcolm E. Hillier, Basingstoke, and John Maddaford, Belton-in-Rutland, both of England, assignors to Anderson-Cook, Inc., Fraser, Mich.

Continuation of Ser. No. 796,466, Nov. 8, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 9,637
Claims priority, application United Kingdom, Nov. 8, 1984, 8428220
Int. Cl.⁴ B21D *37/14*
U.S. Cl. 72—88 **6 Claims**



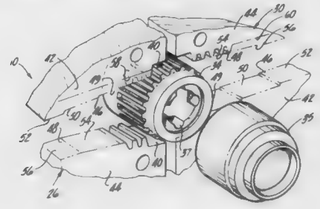
1. Apparatus for holding a tool of a machine for pressure forming surface configurations on a rotary workpiece comprising: an elongate support (3) on which a tool (4) is mountable, shifting means (5) for automatically shifting the support (3) longitudinally for adjusting the position of the tool (4), said shift means (5) including a first downwardly facing and inclined bearing surface (9) and said support (3) including an upwardly facing and angled second bearing surface (10) bearing upon said first bearing surface (9) and resilient means (12) normally urging said first bearing surface (9) away from said support (3) and hydraulic means (11) operative to urge said first bearing surface to engage said support (3); and locking means (6) for securing the support (3) in a shifted position, said locking means (6) including biasing means (20) for engaging the support (3) in a clamped condition and hydraulic means (11,21) for overcoming the force of the biasing means and releasing the support (3) for adjustment and replacement, said support (3) including at least one slot (18) therein extending along the length of said elongate support (3), said locking means (6) including a clamp (14) slideable in said slot (18) to unlock said support when said hydraulic means (21) overcomes the biasing force of said biasing means (20) for allowing longitudinal movement of said support (3) by said shifting means (5).

4,729,233

RACK ASSEMBLY FOR FORMING SPLINES IN THIN-WALL MEMBER

James T. Killop, Warren, and Carl E. Anderson, Mt. Clemens, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Filed May 12, 1986, Ser. No. 862,458
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.⁴ B21D *17/04;* **B21H** *5/00*
U.S. Cl. 72—88 **4 Claims**



1. Apparatus (10) for forming splines in a thin-walled blank (35) comprising: a pair of die means (26,30) for forming the splines, each of said die means including first (42) and second (44) die bodies independently mounted on said apparatus (10) in end-to-end coaxial relationship with each other, said first die bodies (42) including rough spline-forming surfaces (46) and said second die bodies (44) including finish-forming surfaces (48), said pair of die means (26,30) being supported with the spline-forming surfaces (46,48) of said respective die bodies (42,44) in spaced, opposed, parallel relationship to each other; and power means for sequentially moving said pair of die means (26,30) from a neutral position in which said rough spline-forming surface (46) of said first die body (42) of one of said pair of die means (26) is in opposed relationship to said finish spline-forming surface (48) of said second die body (44) of the other of said die means (30) to a rough spline-forming stroke in which said rough spline-forming surface (46) of said first die body (42) of said one die means (26) is in opposed parallel relationship to said rough spline-forming surface (46) of said first die body (42) of said other die means (30) and then back through said neutral position to a finish spline-forming stroke in which said die means (26,30) are moved in the opposite direction to a position in which said finish spline-forming surface (48) of said second die body (44) of one of said die means (26) is in opposed parallel relationship to said finish spline-forming surface (48) of said second die body (44) of said other die means (30) and then returned to said neutral position.

4,729,234

BUILT-IN LIFTING AND MANIPULATING HYDRAULIC JACKS FOR CROSSHEADS OF HEAVY HYDRAULIC PRESSES

Adam Zandel, Forest Hills, N.Y., assignor to Press Technology Corporation, White Plains, N.Y.

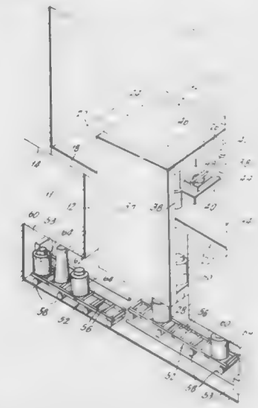
Filed Mar. 27, 1986, Ser. No. 844,898
Int. Cl.⁴ B21D *37/12*
U.S. Cl. 72—455 **7 Claims**

1. A forging press arrangement, comprising:

a foundation pit including a main chamber and alcoves along sides and a bottom region of said foundation pit;

a forging press having a horizontally extending lower crosshead portion of a press frame of said forging press, said lower crosshead being disposed in said foundation pit and generally upright tie-rod columns secured to opposite ends of said lower crosshead assembly;

a guiding frame structure disposed on a floor of said foundation pit and a plurality of support and lifting implements supported on said guiding frame structure, said guiding frame structure and said support and lifting implements being provided solely for carrying out repair and maintenance of said forging press and being independent of and constituting non-operational components of said forging press, said support and lifting implements being stored, during periods of non-use in said alcoves; and



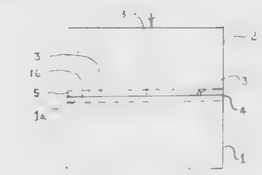
means for moving selected ones of said implements to predetermined locations under said press frame of said forging press whereby said implements are effective to assist in carrying out repair and maintenance of said forging press.

4,729,235

TEST PIECE FOR INSPECTION BY ULTRASONIC METHOD

Manfred Podlech, Hebertshausen, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen- Union München GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 802,362, Nov. 27, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 9,594
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443675
Int. Cl.⁴ G01C *25/00*
U.S. Cl. 73—1 DV **19 Claims**



1. A split powdered metallurgically manufactured test piece for ultrasonic inspection including at least one artificial flaw means therein for testing instrument quality or for calibrating high-resolution ultrasonic test units, comprising surface means in the split powdered metallurgically manufactured test piece defining a joining zone between said surface means, artificial flaw means incorporated between the surface means of the joining zone, the artificial flaw means having a particulate shape of a size smaller than 0.5 mm in its largest dimension and incorporated in the joining zone of the split provided metallurgically manufactured test piece.

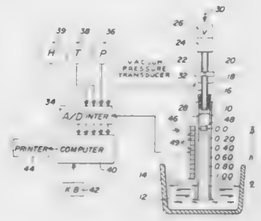
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4,729,236

AUTOMATIC ORIFICE CALIBRATOR

Andrew M. Samborsky, Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 12, 1986, Ser. No. 940,884
Int. Cl.[4] G01M *19/00*; G01F *25/00*
U.S. Cl. 73—3 6 Claims



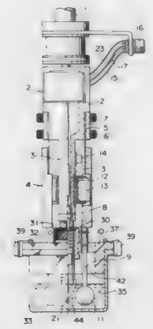
1. A method of calibrating an orifice, comprising passing a gas through the orifice into a column of liquid in a tube and measuring the time it takes for a specific volume and head pressure to occur in the tube, maintaining equality between a vacuum head and the liquid level in the tube, measuring the time for the liquid level changes in the tube, and the volumetric flow of gas into the tube, and applying regression analysis of the volumetric flow with time to form a characteristic parabolic curve, whose first derivative is the flow rate characteristic of the orifice.

4,729,237

TUNING FORK VIBRATION-TYPE VISCOSITY MEASURING APPARATUS

Osamu Suzuki, Kumagaya; Syousuke Ishiwata, Saitama, and Mitsuroh Hayashi, Kumagaya, all of Japan, assignors to Chichibu Cement Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,060
Claims priority, application Japan, Dec. 12, 1985, 60-277939
Int. Cl.[4] G01N *11/16*
U.S. Cl. 73—54 25 Claims



1. A vibration-type viscosity measuring apparatus having a measuring unit for measuring the viscosity and the temperature of a sample at the same time, said measuring unit comprising:

(a) a support block firmly fixed to a base frame and having a support column at a lower section of the support block;

(b) tuning fork vibrator means fixed to said support block and extending downward from the support block, said tuning fork vibrator means including a pair of vibrator subassemblies arranged on opposite sides of said support column, each of the vibrator subassemblies having a center line of vibration about which the vibrator subassembly vibrates and a center of gravity arranged on the center line of vibration, each vibrator subassembly including at its free end a thin flat sensor plate placeable in a sample during the measurement of the sample viscosity, each sensor plate being arranged in the same imaginary vertical plane;

(c) means for driving said pair of vibrator subassemblies at the same frequency in reverse phase relation to each other;

(d) means for detecting the vibration amplitude of said pair of vibrator subassemblies which changes due to a viscosity resistance applied to the sensor plates when placed in the sample and for converting the vibration amplitude into an electrical signal; and

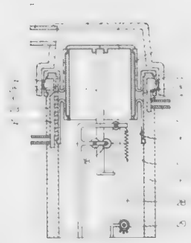
(e) a thermometer secured to the lower end of said support column, situated at an intermediate point between said sensor plates of said pair of vibrator subassemblies, and arranged in the same imaginary vertical plane where the sensor plates are arranged, the thermometer having a probe which can be immersed together with the sensor plates into the sample.

4,729,238

DEVICE FOR MEASURING THE VOLUME OF A GAS

Anthony B. Bergmans, Bilthoven, Netherlands, assignor to Gould Electronics, B.V., Bilthoven, Netherlands

Filed May 19, 1986, Ser. No. 864,794
Claims priority, application Netherlands, May 21, 1985, 8501449
Int. Cl.[4] G01F *3/14*; F15B *21/00*
U.S. Cl. 73—239 7 Claims



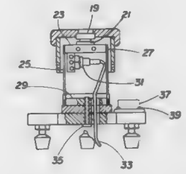
1. Device for measuring the volume of a gas, comprising a cylinder and a piston movably mounted in said cylinder, a first membrane for sealingly connecting said piston with the inner wall of said cylinder, said cylinder, said piston and said first membrane determining a measuring space, a measuring conduit for the gas to be measured, which measuring conduit debouches in said measuring space, a second membrane for sealingly connecting said piston with the cylinder inner wall, said first and second membranes determining an intermediate space, wherein a pressure lower than the pressure in said measuring space prevails in said intermediate space during operation, and wherein the axial distance between the connection places of the membranes with the piston and the cylinder inner wall, respectively, is substantially equal to half of the maximum stroke of said piston such that said membranes remain free from each other at all positions of said piston within said cylinder.

4,729,239

VIBRATION TESTER FOR BALL BEARINGS AND ASSOCIATED DEVICES

Keith M. Gordon, Munsonville, N.H., assignor to MPB Corporation, Keene, N.H.

Filed Dec. 19, 1986, Ser. No. 945,262
Int. Cl.[4] G01M *13/04*
U.S. Cl. 73—593 12 Claims



1. A device for testing ball bearings and associated devices to detect flaws therein by detecting vibrations therefrom when in operation, the device comprising:

a base;

reed support means attached to said base and extending upwardly therefrom, said reed support means for supporting upper housing tooling;

upper housing tooling mounted on said reed support means, said upper housing tooling having means for supporting a bearing thereon for rotational operation thereof and said reed support means, relative to said upper housing tooling, being flexible in a direction radial to the axis of rotation of a bearing mounted on said upper housing tooling;

drive means for rotationally driving a bearing mounted on said upper housing tooling;

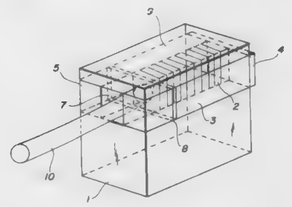
detecting means connected to said reed support means for detecting movement of said reed support means in response to a bearing on said upper housing tooling being rotated, which movement is indicative of a defect in the bearing and is radial relative to the bearing being rotated.

4,729,240

OPTICAL PRESSURE SENSOR

Takashi Sugihara, Nara, and Masaya Hijikigawa, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1986, Ser. No. 839,731
Claims priority, application Japan, Mar. 15, 1985, 60-52607
Int. Cl.[4] G01L *9/00*
U.S. Cl. 73—705 17 Claims



6. An optical pressure sensor, comprising:

a substrate;

a first composite layer, comprising,

a core layer disposed on said substrate and having a refractive index greater than a refractive index of said substrate, and

lateral cladding layers disposed on said substrate, each lateral cladding layer being at position lateral to said core layer and having refractive index less than said core layer;

an upper clad layer disposed above said core layer and said lateral cladding layers and having a refractive index substantially equal to the refractive index of said lateral cladding layers; and

an optical reflecting film disposed at a first end face of said core layer,

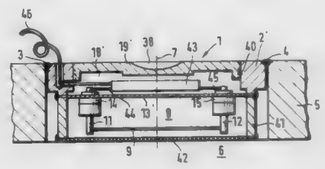
wherein at least one of the refractive indices of said core layer and said upper clad layer varies with pressure.

4,729,241

MEASURING HEAD FOR VACUUM GAUGE

Rudolf Flosbach, Thier-Wipperfürth; Günter Reich, Cologne, and Hans-Joachim Schubert, Wesseling, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 20, 1986, Ser. No. 932,493
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541178
Int. Cl.[4] G01L *21/12*
U.S. Cl. 73—755 22 Claims



1. Measuring head for a vacuum gauge, comprising:

as essentially cylindrical housing; and

a measuring cell disposed in said housing and including seal means for sealing said measuring cell in a vacuum tight manner against a surrounding atmosphere, coupling means for coupling said measuring cell with an evacuatable cavity, and a measuring filament disposed in said measuring cell for producing an electrical signal corresponding to a pressure in the measuring cell, said measuring filament being oriented approximately perpendicularly to the axial direction of said housing, wherein said coupling means comprises an opening in said measuring cell and a gas permeable cover covering said opening.

4,729,242

CONDUCTION-RESPONSIVE METER HEAD

Günter Reich, Cologne, and Rudolf Flosbach, Thier-Wipperfürth, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 866,056
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518388
Int. Cl.[4] G01L *21/12*
U.S. Cl. 73—755 7 Claims

1. A conduction-responsive meter head, comprising:

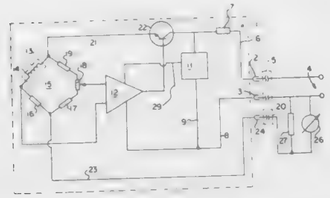
a device having electrical conduction responsive to a condition to be metered and means for communication with the condition, whereby to provide such electrical-conduction response;

a bridge electrically including the device;

power supply means comprising two terminals for providing electrical power to the bridge;

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measurement signal comprising a third terminal and a lead connecting the third terminal to the bridge for providing



a measurement signal from the bridge to the third terminal; and

a current transformer series-inserted in the lead.

4,729,243

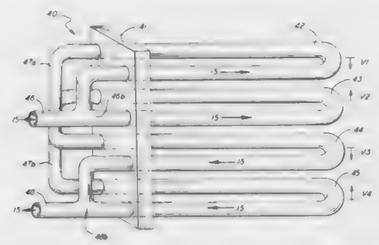
MASS-FLOW MEASURING INSTRUMENT

Bernard Friedland, West Orange; Douglas E. Williams, Bloomfield, both of N.J., and Irwin I. Sterman, Spring Valley, N.Y., assignors to The Singer Company, Stamford, Conn.

Filed May 5, 1986, Ser. No. 859,360

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **18 Claims**



1. A device to measure the mass flow rate of a fluid from the Coriolis force resulting from the flow of the fluid through the device during oscillation thereof, comprising:

(a) a base;

(b) an even-numbered plurality of spaced-apart, substantially indentical looped conduits for carrying therethrough the fluid to be measured, each conduit secured to the base at the open end thereof in a cantilevered fashion and forming a plane at the looped end which is substantially parallel to similarly-formed planes of the other conduits and arranged, as one of a pair of conduits, for forming a tuning fork configuration with an adjacent conduit;

(c) means for directing the flow of fluid through the conduits so that the flow direction in each conduit of a respective pair arranged in a tuning fork configuration is the same, the flow direction in a respective pair of conduits arranged in a tuning fork configuration is opposite to that in an adjacent pair, and the magnitude of the flow in each conduit is substantially equal;

(d) means for oscillating the conduits perpendicular to the respective planes formed by the looped ends so that the amplitude of oscillation is substantially equal for all conduits and the phases of oscillation for all conduits are synchronized so each conduit of a respective pair arranged in a tuning fork configuration is 180 degrees out of phase with the other conduit of the respective pair, the respective first conduits of the conduit pairs are in phase with one another and the respective second conduits of the conduit pairs are in phase with one another; and

(e) means for measuring the mass flow rate from the time differentials for each conduit between the crossing of one side of a respective conduit through a given reference plane and the crossing of the opposite side through the same reference plane.

4,729,244

FLOW RATE MEASURING APPARATUS

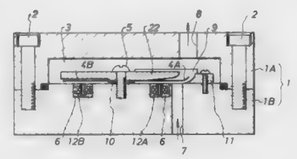
Akio Furuse, Hachioji, Japan, assignor to Cosmo Instruments Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,323

Claims priority, application Japan, Jan. 16, 1986, 61-6958

Int. Cl.[4] G01F *1/28*

U.S. Cl. 73—861.74 **16 Claims**



1. An apparatus for measuring a flow rate of a fluid, comprising:

a main body;

a flow channel disposed within said main body for receiving a fluid flow therethrough;

a cantilever-type pressure receiving plate made of a resilent member, wherein one end portion of said pressure receiving plate is inserted within said flow channel to receive a force applied by a flow of said fluid at one surface of said one end portion, and wherein another end portion of said pressure receiving plate is supported on said main body;

a wall defining a cross-sectional area for said fluid flow together with a leading end of said one end portion at a postion opposing said leading end, said wall having a shape such that said cross-sectional area for said fluid flow at said position is increased as said pressure receiving plate is deflected by said force;

a first detector for detecting a first deflection of said one end portion of said pressure receiving plate, received in a hollow portion disposed within said main body and in communication with said flow channel;

a cantilever-type gravity detection plate made of a resilient member and received in said hollow portion, wherein one end portion of said gravity detection plate is a free end supported within said main body;

a second detector for detecting a second deflection of said one end portion of said gravity detection plate due to gravity; and

a comparator for comparing said first deflection with said second deflection and for compensating said first deflection of said pressure receiving plate due to gravity.

4,729,245

METHOD AND APPARATUS FOR MONITORING LIQUID VOLUME/MASS IN TANKS

Robert J. Hansman, Jr., Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 2, 1986, Ser. No. 815,583

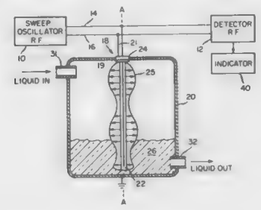
Int. Cl.[4] G01F *17/00*

U.S. Cl. 73—865 **10 Claims**

1. Apparatus for measuring the quantity of a mass of fluid material of known dielectric constant and conductivity present in a tank comprising:

(a) a transmitter means for transmitting radio frequency electromagnetic energy for exciting the tank with such electromagnetic energy: and

(b) receiver means responsive to said transmitter means for determining the ratio of the power entering the tank ver-



sus the power reflected from the tank as a function of frequency of the electromagnetic energy.

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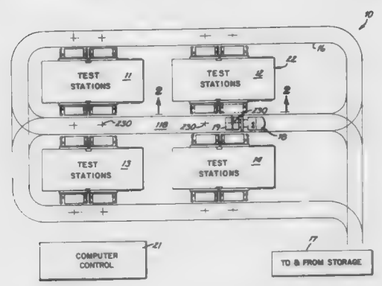
PRODUCT TESTING SYSTEM

Hans L. Melgaard, and Wendell L. Schafer, both of Minneapolis, Minn., assignors to Despatch Industries, Inc., Minneapolis, Minn.

Filed Dec. 22, 1986, Ser. No. 944,204

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—865.6 **18 Claims**



1. An apparatus for exposing products to selected environmental conditions comprising: product carrier means for holding at least one product, housing means having an internal chamber and an opening open to said chamber to receive the product carrier means to locate the product in said chamber, means for controlling the environmental conditions in said chamber, said product being subjected to said environmental conditions when located in said chamber, a vehicle for transporting the product carrier means to and from said housing means, said vehicle having a transfer assembly adapted to be connected to the carrier means, first means for moving the transfer assembly in a generally upright direction, second means for rotating the transfer assembly about an upright axis, and third means for moving the transfer assembly laterally in a generally horizontal direction to selectively move the product carrier means into and out of said opening in the housing means, guide means secured to the housing means adjacent the opening therein, and guide engagement means on the transfer assembly engageable with the guide means to guide the transfer assembly along the guide means to locate the product carrier means in alignment with the opening.

4,729,247

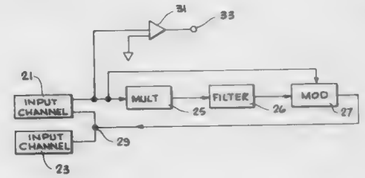
UNIVERSAL DOPPLER FLOWMETER TESTER

Alvin E. Brown, Santa Cruz, Calif., assignor to Manning Technologies, Inc., Scotts Valley, Calif.

Filed Dec. 19, 1986, Ser. No. 944,379

Int. Cl.[4] G01F *25/00, 1/66*

U.S. Cl. 73—866.4 **16 Claims**



1. A circuit simulating the electrical signal response of a flowing fluid whose velocity is to be measured by a Doppler flowmeter having an electrical-to-acoustic energy transducer acting as a signal transmitter and the same or another transducer acting as a signal receiver comprising,

input means for acquiring an electrical Doppler transmit signal from a Doppler flowmeter, said transmit signal having a transmit frequency,

circuit means, connected to said input means, for modifying said transmit frequency by a preselected amount to produce a simulated Doppler shifted signal,

modulator means communicating with said input means and said circuit means for modulating the Doppler transmit signal with the simulated Doppler shifted signal in a manner producing frequencies above and below the transmit frequency, forming a Doppler shifted return signal, and

output means for delivering the Doppler shifted return signal from said modulator means to a Doppler signal receiver.

4,729,248

LEVER ARRANGEMENT FOR TRANSMITTING LIMITED TILTING MOTIONS

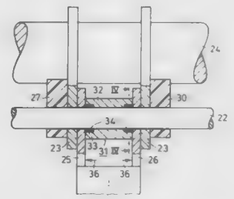
Ludvik Godesa, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,898

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544666

Int. Cl.[4] G05G *17/00*; F16N *1/00*

U.S. Cl. 74—2 **7 Claims**



1. An articulated lever arrangement for transmitting limited tilting motions with alternating direction, comprising at least one pivot pin and a lever provided with a bearing opening for the pivot pin, a supply space being provided laterally next to the bearing opening for receiving a high-viscosity lubricant which is in connection with a bearing gap between the lever and the pivot pin, the supply space comprising a sleeve which surrounds the pivot pin and is adjacent to the lever, the sleeve

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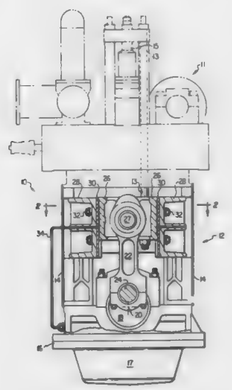
having a bore hole, a part of the bore hole being adapted to the diameter of the pivot pin and a part being enlarged relative thereto, for receiving the lubricant.

4,729,249

RECIPROCATING PLUNGER PUMP HAVING SEPARATE AND INDIVIDUALLY REMOVABLE CROSSHEAD CRADLES

Dragan Besic, West Caldwell, N.J., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1986, Ser. No. 899,702
Int. Cl.[4] F16H *21/22*; F16C *5/00*
U.S. Cl. 74—44 **13 Claims**



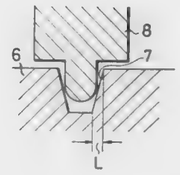
1. A reciprocating plunger pump, comprising:
a frame having two open sides;
a crankshaft mounted in said frame for rotation about a drive axis extending parallel to the sides of said frame;
a connecting rod having a first end attached to said crankshaft at a point offset from said drive axis;
a crosshead pivotally mounted on a second end of said connecting rod; and
a pair of cradles comprising crosshead guides individually and removably mounted opposite each other on said frame for covering respective sides of said frame and for confining said crosshead to linear reciprocating motion between said guides as said crankshaft is rotated about said drive axis.

4,729,250

LEAD SCREW FOR MOVING A HEAD

Yoshiaki Ikeda; Yoshio Tamura, and Hiroshi Noritake, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 619,003, Jun. 11, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 822,689
Claims priority, application Japan, Jun. 10, 1983, 58-103805
Int. Cl.[4] F16H *27/02, 29/02, 29/20*
U.S. Cl. 74—89.15 **5 Claims**



$$L \geq \frac{P}{360}\left[\cos^{-1}\left(\frac{r}{R}\sin\frac{\theta}{2}\right) - \cos^{-1}\sin\frac{\theta}{2}\right]$$

wherein
P is the pitch of the respective grooves,
R is the radius of the lead screw,
r is the radius of the lead screw between the longitudinal axis and the bottom of the grooves,
θ is the angle of division of the mold sections, and
L is the difference in width between the top and bottom of the grooves.

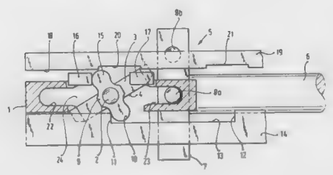
1. A lead screw formed with first and second helical grooves crossing one another within the body of the lead screw, the grooves being smaller at the bottom than at the top, the lead screw being formed from a plastic and being molded from the plastic by means of a mold comprised of a plurality of mold sections separable in the circumferential direction, the parting lines between the mold sections passing through the intersections between the grooves or midway between lines passing through the intersections, the grooves satisfying the following relationship;

4,729,251

STEPPING MECHANISM

Josef Zieringer, Salach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00203, § 371 Date Feb. 11, 1987, § 102(e) Date Feb. 11, 1987, PCT Pub. No. WO86/07424, PCT Pub. Date Dec. 18, 1986
PCT Filed May 14, 1986, Ser. No. 33,119
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3521011
Int. Cl.[4] F16H *27/02, 31/00*
U.S. Cl. 74—129 **8 Claims**



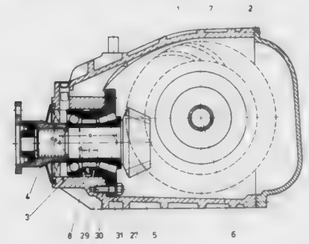
1. Stepping mechanism comprising a toothed wheel and a shifting member which engages a tooth of said wheel and shifts the toothed wheel by a tooth pitch in each shifting cycle, said shifting member being movable in a movement plane which extends at a right angle to that of said toothed wheel; and a reciprocating slide, said shifting member being formed by a two-armed shifting pawl (3) which is swivelably supported on said reciprocating slide (1) and has a tooth guiding surface (4) which is inclined with respect to a movement direction of said slide, said pawl being switchable over to opposite inclination after each shifting cycle, at least a length and an angle of inclination of said pawl being adapted to the tooth pitch of said toothed wheel (5).

4,729,252

BEARING FOR THE SHAFT OF A MACHINE ELEMENT

Wolfgang Hüber, Schweinfurt; Dietmar Frase, Dittelbrunn, and Ludwig Feuerer, Gochsheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 229,443
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004316
Int. Cl.[4] F16H *1/14, 1/20*
U.S. Cl. 74—417 **11 Claims**



1. In a rolling bearing for the shaft of a machine element, the bearing having two rows of prestressed rolling bearing elements, a radially outwardly directed flange on the outer ring thereof, said outer ring forming the outer races for said bearing elements and being positioned in the bore of a housing of a material of different thermal characteristics than said ring, the improvement wherein the rolling bearing is positioned whithin the housing with said flange abutting an inner facing surface of the housing, the rolling bearing is affixed to said housing solely by holding means for holding said flange to the facing surface of the housing, said bearing thereby being held axially and radially in the housing, said bore and ring having radially directed surfaces facing one another, one of said surfaces having a centering portion projecting slightly therefrom toward the other said surface to center said bearing, the remaining portions of the radially facing surfaces of the bore and the ring having a play fit with respect to one another.

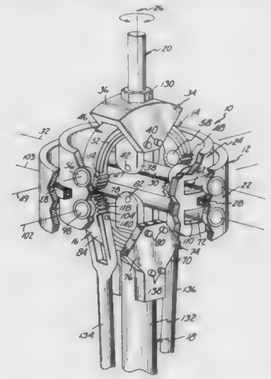
4,729,253

WRIST ACTUATOR

Mark E. Rosheim, 1565 St. Paul Ave., St. Paul, Minn. 55116

Continuation-in-part of Ser. No. 820,678, Jan. 21, 1986, Pat. No. 4,686,866. This application Aug. 20, 1986, Ser. No. 898,301
Int. Cl.[4] G05G *11/00*; B25J *17/02*; F16M *11/12*
U.S. Cl. 74—479 **19 Claims**

1. A mechanical joint comprising:
a housing structure rotatable about a first axis;
first and second gimbal assemblies pivotally attached to the housing structure and each gimbal assembly having an articulation point along the first axis when the joint is in a first position; and
first and second linkage means for transmitting selective movement from the first gimbal assembly to the second gimbal assembly such that the second gimbal assembly is movable in a selected sequence.

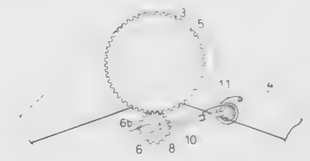


4,729,254

STEERING SYSTEM

Masateru Nogami, and Hozumi Suzuki, both of Tokyo, Japan, assignors to Isumi Corporation Industries, Inc., N.Y. and Izumi Motor Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00125, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05452, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 14, 1985, Ser. No. 939,769
Int. Cl.[4] B62D *1/10, 1/16*
U.S. Cl. 74—484 R **1 Claim**



1. A steering apparatus comprising a first external gear fixed on a column cover positioned under the spoke of a steering wheel, the steering shaft of which passes through the first external gear and is freely rotatable therein, a second external gear rotatably supported on the upper end of the steering shaft which extends over the spoke of the steering wheel, an operation panel fixed on the upper surface of said second external gear, a rotating shaft located parallel to the steering shaft, satellite gears secured to the upper and lower ends of said rotating shaft and adapted to engage said first and second external gears, a rod which is pivotably supported at its one end on the spoke of the steering wheel and has at its other end a bearing for rotatably supporting the rotating shaft of the satellite gears, a coil spring which is secured at its one end to the spoke and hooked at its other end to the rod, said coil spring being wound around the rod so that the rod is urged toward the steering shaft, whereby the rotating shaft is resiliently urged to the steering shaft.

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4,729,255

WISHBONE ADJUSTABLE HANDLE BAR STEM

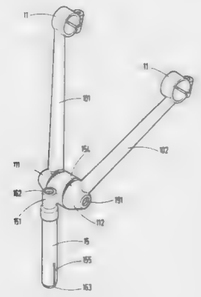
Alexander E. Moulton, Bradford-on-Avon, England, assignor to Alex Moulton Limited, Bradford-on-Avon, England

Filed Nov. 7, 1986, Ser. No. 927,945

Claims priority, application United Kingdom, Nov. 14, 1985, 8528112

Int. Cl.⁴ B62K *21/16*

U.S. Cl. 74—551.3 **4 Claims**



1. An assembly for mounting a handlebar on a steering column of a bicycle, said steering column adapted to be mounted for rotation in a head tube of a bicycle, the handlebar mounting assembly including a tubular stem mounted to the steering column for adjustment relative thereto in the direction axially of said column and stem extension means mounting the handlebar a predetermined distance from said stem, said handlebar mounting assembly including, in combination:

(a) said stem extension means comprising twin birfurcated fork arms, each arm provided with an encircling clamp at one end for mounting the handlebar and terminating at its opposite end in a boss, each boss having an inwardly facing ring of serrations;

(b) annular flange means affixed to said stem, said annular flange means having an axis at a right angle to the axis of said steering column and the stem mounted thereon, said annular flange means further including an outwardly directed ring of serrations at each of its ends;

(c) said inwardly facing rings of serrations on said bosses of said fork arms being configured to interengage with the outwardly facing rings of serrations on the ends of said annular flange means affixed to said stem;

(d) socket means in one of said bosses on the inner end of one of said fork arms, bolt means securing the bosses to said flange, said bolt including a head portion at one end thereof and an end threaded portion at the opposite end, the head of said bolt being recessed in said socket means and said end threaded portion extending axially through said flange and threadably attached to a complementary hole in said boss at the inner end of the outer fork arm;

(e) said serrated rings being clamped into interengagement by rotation of said bolt to secure said fork arms in preselected angular disposition relative to said stem whereby the handlebar may be adjusted through an arc relative to the top of the stem.

4,729,256

HANDLEBAR GRIP AND ASSEMBLING FACILITATING STRIP

Arnold A. Kelson, 811 Tara Rd., Papillion, Nebr. 68046

Division of Ser. No. 817,561, Jan. 10, 1986, Pat. No. 4,653,170.

This application Jan. 15, 1987, Ser. No. 3,616

Int. Cl.⁴ B62K *21/26*

U.S. Cl. 74—551.9 **4 Claims**



1. An intermediate product for use in applying a resilient tubular grip to a handlebar, comprising:

(1) a resilient tubular handlebar grip having inserted therewithin a loop of low friction material with two elongate strips of said low friction material attached thereto, one at each side of the loop,

(2) said strips in combination being of sufficient width to at least substantially cover the inside circumference of the grip and of sufficient length to cause the loop itself and the strips' free ends to extend outside and beyond opposite ends of the grip.

2. An intermediate product for use in applying a resilient sleeve to a shaft, comprising:

(1) a resilient sleeve and a sheet of low friction plastic material inserted within said resilient sleeve,

(2) said sheet being of sufficient width to at least substantially cover the inside circumference of the sleeve and of sufficient length to cause opposite free ends of said sheet to extend beyond the opposite ends of the sleeve.

4,729,257

BALANCED STEERABLE TRANSMISSION

Donald F. Nelson, 7560 Kentwood Ct., Gilroy, Calif. 95024

Filed Jul. 28, 1986, Ser. No. 889,774

Int. Cl.⁴ F16H *37/06, 1/40, 1/42*

U.S. Cl. 74—675 **16 Claims**

1. A balanced steerable power transmission suitable for tracked vehicles or the like comprising:

a housing;

a first input shaft extending through the housing and having a first input gear;

a first output shaft extending through the housing and having a first output gear;

a second output shaft extending through the housing coaxial with the first output gear and having a second output gear;

a first drive train between the first input gear and the first output gear for rotating the first output shaft in response to rotation of the first input gear;

a second drive train between the first input gear and the second output gear for rotating the second output shaft in response to rotation of the first input gear, the second drive train being substantially identical to the first drive train;

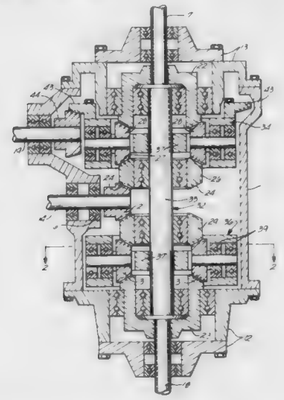
a spider mounted in the housing for pivoting as a single unit about an axis coaxial with the output shafts;

a second input shaft extending through the housing and

having a second input gear coupled directly to the spider for pivoting the spider;

the first drive train comprising first transfer gear means for rotating the first output gear in response to rotation of the first input gear;

the second drive train comprising second transfer gear means for rotating the second output gear in the opposite direction from the first output gear in response to rotation of the first input gear;



means for mounting the first transfer gear means on the spider for precessing relative to the first output gear in response to pivoting of the spider; and

means for mounting the second transfer gear means on the spider for processing relative to the second output gear in response to pivoting of the spider in the same direction as precessing of the first transfer gear means.

4,729,258

DIFFERENTIAL ACTUATOR

Naotake Mohri, Aichi; Nagao Saito, Tokyo; Kuniharu Miura, and Yoshihiko Yanai, both of Aichi, all of Japan, assignors to Naotake Mohri, Aichi and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

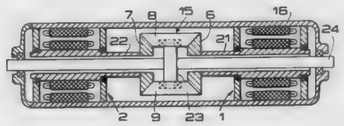
Continuation of Ser. No. 840,767, Mar. 18, 1986, abandoned.

This application Aug. 6, 1987, Ser. No. 82,959

Claims priority, application Japan, Mar. 19, 1985, 60-55069; Mar. 19, 1985, 60-55070

Int. Cl.⁴ F16H *37/08*

U.S. Cl. 74—675 **1 Claim**



1. A differential actuator comprising:

first and second motors each having a hollow rotational shaft capable of being rotated in forward and reverse directions at a desired speed;

a tubular housing which contains therein said first and second motors and which rotatably supports the hollow rotational shafts of the motors;

said hollow shafts being aligned along a common axis with each other and opposing each other at inner ends thereof at a predetermined spacing:

a differential mechanism connected to the inner ends of said hollow rotational shafts of said first and second motors and having an output shaft extending coaxially through the lumens of the hollow rotational shafts and which output shaft rotates at a speed corresponding to a relative rotating speed difference between said hollow rotational shafts;

said motors and said differential mechanism being substantially enclosed within the interior of said housing to form an integrated assembly;

said output shaft having end portions extending past outer ends of the hollow rotational shafts with the end portions of the output shaft being rotatably supported by the housing; and

at least one of said end portions of the output shaft forming a variable speed drive member.

4,729,259

INTERAXLE DIFFERENTIAL SYSTEM FOR CONNECTING TWO DRIVEN AXLES OF A MOTOR VEHICLE

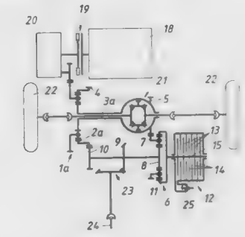
Heribert Lanzer, Gössendorf, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 9, 1987, Ser. No. 12,736

Claims priority, application Austria, Feb. 11, 1986, 330/86

Int. Cl.⁴ F16H *1/44*

U.S. Cl. 74—710.5 **6 Claims**



1. A drive system for a motor vehicle having two driven axles, comprising

an interaxle differential having two output shafts, said output shafts respectively operatively connected to said driven axles,

a planetary gear train comprising first, second, and third torque-transmitting members having parallel axes,

said first and second torque-transmitting members being respectively operatively connected to said output shafts, and

a liquid friction coupling having a first coupling half operatively connected to said third torque-transmitting member, and a second coupling half which is held against rotation.

4,729,260

TWO SPEED GEARBOX

Christopher J. Dudden, Dorset, England, assignor to Desoutter Limited, London, England

Filed Dec. 8, 1986, Ser. No. 938,905

Claims priority, application United Kingdom, Dec. 6, 1985, 8530107; Jan. 13, 1986, 8600687

Int. Cl.⁴ F16H *3/74*

U.S. Cl. 74—752 B **14 Claims**

1. A two speed gearbox comprising:

an input shaft and an output shaft;

a reduction gear mechanism drivable by said input shaft and having a high speed low torque output drive and a low speed high torque output drive;

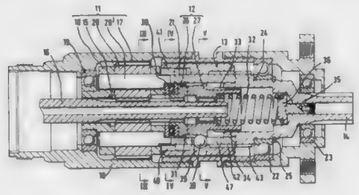
a clutch having driving and driven clutch members, one of which is axially movable relative to the other, said clutch

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connecting said high speed output drive to said output shaft when said clutch members are fully engaged;

a slidable coupling rotatable with one of the low speed output drive and the output shaft and movable between a first position in which said coupling is disconnected from the other of said low speed output drive and said output shaft and a second position in which said coupling is connected thereto for driving said output shaft;

means for urging said slidable coupling towards said second position;



means for releasably maintaining said clutch members in full engagement;

means for maintaining said slidable coupling in its first position against the force of said urging means when said clutch members are maintained in full engagement; and

means for maintaining said clutch members fully out of engagement when said slidable coupling is in its second position;

said clutch, urging means, and maintaining means, being effective in both directions of rotation of the input shaft.

4,729,261

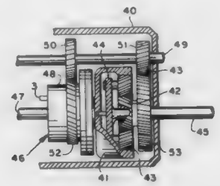
STEPLESS TRANSMISSION

Pentti J. Tervola, 3663 Lakewood Rd., Lake Worth, Fla. 33461

Filed Nov. 20, 1986, Ser. No. 932,593

Int. Cl.[4] F16H *3/44, 57/10*

U.S. Cl. 74—778 **4 Claims**



1. In combination, a fixed displacement rotary pump comprising a housing having inlet and outlet ports, and a pumping unit in said housing operative upon relative rotation of said housing and unit to pump fluid from said inlet port to said outlet port; an adjustable pressure compensated flow control valve operatively interposed between said ports to adjustably limit the rate of flow of fluid therethrough and consequently the rate of relative rotation of said housing and unit from a predetermined maximum to a predetermined minimum whereat said housing and unit are locked against relative rotation; and an epicyclic gear train including a first shaft in driving engagement with a first gear of said train and with one of said housing and pumping unit, and a second shaft in driving engagement with a second gear of said train; the other of said housing and pumping unit being in driving engagement with a third gear of said train.

4,729,262

TRANSMISSION UNIT

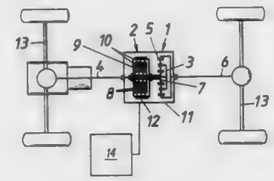
Heribert Lanzer, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Sep. 10, 1986, Ser. No. 905,929

Claims priority, application Austria, Sep. 13, 1985, 2680/85

Int. Cl.[4] F16H *3/44, 57/10*

U.S. Cl. 74—782 **18 Claims**



1. A transmission unit for a motor vehicle, comprising

a drive shaft having two ends,

first and second driven axles,

a gear unit installed between said first and second driven axles, said gear unit driving said first driven axle and controlling the relative rotational speeds of said first and second driven axles, said gear unit comprising

an epicyclic gear train having a first rotatable input member connected to and being driven by one end of said drive shaft, a second rotatable member, and a third rotatable output member connected to and driving said first driven axle,

a liquid friction clutch unit having first and second sections coupled to each other by viscous shear forces, said second rotatable member of said gear train connected to said first coupling section, and

restraining means connected to said second coupling section for holding said second coupling section and thereby said second rotatable member against rotation,

said second driven axle being connected to and being driven by said other end of said drive shaft.

4,729,263

PRESSURE REGULATING ARRANGEMENT WITH A DAMPING DEVICE FOR A CONTROL PRESSURE OF AN AUTOMATIC CHANGE-SPEED TRANSMISSION

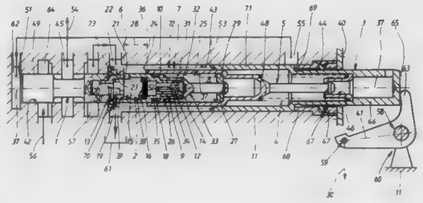
Christoph Hopff, Ditzingen, and Ludwig Bauer, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1986, Ser. No. 895,213

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528789

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—867 **28 Claims**



1. A pressure-regulating arrangement for regulating a control pressure of a shifting arrangement of an automatic change-speed transmission connected behind a driving engine in a direction of force transmission which is utilized for initiation of downshifting operations, comprising:

control slide valve means for said control pressure for adjusting a predetermined, substantially constant pressure value determined by control spring means during idling and low partial load operations of the driving engine;

adjusting sleeve means operatively connected with a control member of said driving engine for output control of said engine;

a pressure member, said control slide valve means being actuatable in response to an increase of said control pressure by said pressure member from said adjusting sleeve means by resilient means when said control member is moved beyond a predetermined position corresponding to a low partial load in a direction toward a full load position;

hydraulic damping means for delaying response of said control slide valve means with respect to said adjusting sleeve means, including two damping members of piston-cylinder-type construction which are movable relative to one another and enclose therebetween a damping chamber means containing a hydraulic damping medium, one of said damping members being rigidly supportable against a housing means and the other damping member which is movable relative to said housing means being actuatable by said pressure member and thereby displacing damping medium out of said damping chamber means against action of at least one throttle means; wherein said damping means is arranged at an end face of said control slide valve means facing said pressure member and said damping member movable relative to said housing means being immovably connected with said pressure member, and said damping chamber means being operatively connected by relief valve means with a space that is at least under atmospheric pressure.

4,729,264

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

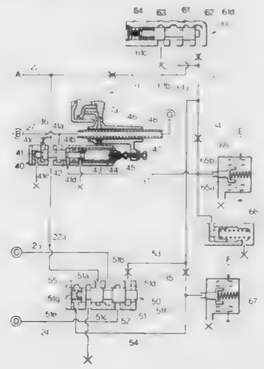
Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,663

Claims priority, application Japan, Jun. 29, 1985, 60-143468

Int. Cl.[4] B60K *41/12*

U.S. Cl. 74—868 **7 Claims**



1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the system comprising a first hydraulic circuit having a pump for supplying oil to the first and second hydraulic cylinders, a line pressure control valve having ports and a first spool and being provided in the first hydraulic circuit to control line pressure of the supplying oil by shifting of the first spool, a transmission ratio control valve having ports and a second spool and being provided in the first hydraulic circuit to control the supplying of the oil to the first hydraulic cylinder so as to control transmission ratio of the transmission, the improvement wherein:

said first hydraulic circuit is connected so as to supply a portion of the oil to an end of the first spool of the line pressure control valve;

a second hydraulic circuit for supplying the oil as control oil to the other end of the first spool of the line pressure control valve so as to shift the first spool;

control valve means provided in the second hydraulic circuit for controlling the amount of the control oil supplied to the other end of the first spool of the line pressure control valve so as to control the line pressure;

sensing means for sensing operating conditions of the engine and the transmission and for producing signals dependent on the conditions;

first means responsive to the signals from the sensing means for producing a control signal for operating the control valve means so as to control the line pressure;

said line pressure control valve has a slidably mounted spring retainer;

a spring provided between the other end of the first spool and said spring retainer; and

second means for shifting the spring retainer in accordance with the transmission ratio of the transmission so as to control the line pressure in addition to control of the line pressure by operation of the control valve means.

4,729,265

SHIFT SHOCK SUPPRESSION ARRANGEMENT FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

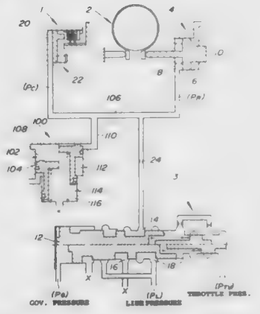
Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 3, 1986, Ser. No. 816,154

Claims priority, application Japan, Jan. 9, 1985, 60-787; Jan. 11, 1985, 60-2866

Int. Cl.[4] B60K *41/24*

U.S. Cl. 74—868 **8 Claims**



1. In a transmission for an automotive vehicle:

a first friction element, said first friction element having a first chamber which when supplied with hydraulic pressure causes said first friction element to assume an engaged condition;

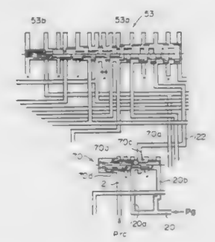
a second friction element, said second friction element having a second chamber which when supplied with hydraulic pressure induces said second friction element to assume a released condition;

said transmission being arranged so that a first speed ratio is produced when said first and second friction elements are released and engaged respectively, and a second speed

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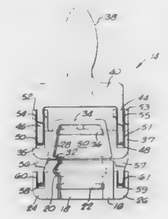
ratio is produced when said first and second friction elements are engaged and released respectively;
a shift valve, said shift valve having a valve element which establishes communication between a source of hydraulic pressure and a port when in an upshift position and communication between the port and a drain when in a downshift position;
a fluid circuit which interconnects said port and said first and second chambers;
an accumulator for reducing shift shock having a third chamber in fluid communication with said fluid circuit; and
a flow restrictor fluidly disposed in said fluid circuit between said port and said second chamber.

4,729,266
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION
Hidehiko Mishima, and Tôru Kawano, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan
Filed Aug. 8, 1986, Ser. No. 895,027
Claims priority, application Japan, Aug. 8, 1985, 60-174797
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—869 **16 Claims**



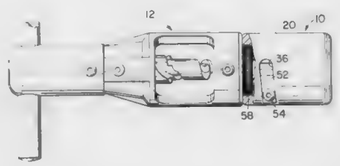
1. A hydraulic control system for an automatic transmission having a transmission gear mechanism for transmitting the engine output power by way of a plurality of power transmission paths, and friction engagement elements which are operated by a line pressure to change the power transmission path through the transmission gear mechanism, thereby effecting gear-shifting, comprising a manual shift valve means for selectably changing the driving range, a plurality of shift valves each including a means for effecting gear-shifting assigned thereto by controlling the feed of the line pressure to the friction engagement elements corresponding to the gear-shifting according to a throttle pressure and a governor pressure, the throttle pressure and the governor pressure respectively corresponding to the engine load and the output speed of the transmission gear mechanism, and a range control valve means; said range control valve means being supplied with a range control pressure and a governor pressure; said range control pressure corresponding to a position of said manual shift valve means; said range control valve means being disposed in a hydraulic line; said range control valve means including a selection means for selectively transmitting the governor pressure received by said range control valve means to one of the shift valves so as to control transmission of the governor pressure to said one of the shift valves according to the driving range determined by the manual shift valve, thereby changing the shift pattern according to the driving range.

4,729,267
CHAMPAGNE BOTTLE OPENER
Ben F. Giebeler, P.O. Box 30024, San Bernardino, Calif. 92413
Filed Aug. 26, 1985, Ser. No. 769,842
Int. Cl.[4] B67B *7/06*
U.S. Cl. 81—3.37 **12 Claims**



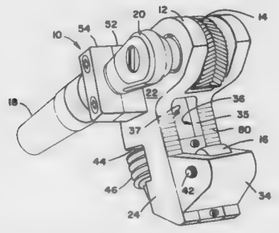
1. A device for controlled removal and reinsertion of a cork having a head from a standard champagne bottle which has an exterior circumferential rib about its neck near the spout, the device comprising:
(a) a first member having a body and a channel in said body, said channel designed and constructed to fit the neck of the bottle, said first member also having a semicircumferential groove within said channel which engages the circumferential rib on the neck of the bottle;
(b) a second member, attached to said first said member, said second member having a body and a cavity therein designed and constructed for insertion onto the cork head, said second member further having an inwardly extending semi-circular flange on the bottom of said body and a top piece designed and constructed such that when in position on the cork, said second member engages at least a portion of the top and bottom of the head of the cork, such that said second member can be used to pull the cork out of the bottle, or to push the cork back into the bottle; and
(c) linkage and handle means for attaching said first member to said second member and for causing said first member and second member to separate and return, linearly, and under leverage, a sufficient distance to pull the cork out of the bottle or to reinsert the cork back into the bottle, wherein said linkage and handle means comprises an elongate handle, one end thereof being journalled to opposing sides of said second member, and journalled at a second point to one end of a dog-leg linkage, which linkage is journalled at a second end to said first member, such that rotating said handle downward causes said first and second members to separate.

4,729,268
COAXIAL CABLE SKIVING TOOL
David L. Morrow, Chester, Conn., assignor to Ben Hughes Communication Products Co., Chester, Conn.
Filed Feb. 13, 1987, Ser. No. 14,456
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.4 **12 Claims**



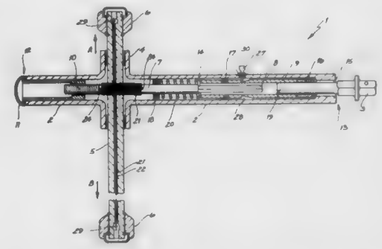
1. A skiving tool for removing insulation from a prepared end portion of an insulated coaxial cable having a central conductor, a metallic cylindrical tubular shield spaced radially outwardly from and in coaxial alignment with the central conductor, and an outer insulating jacket in coaxial surrounding engagement with the outer surface of the tubular shield, said tool comprising a tool body having a cylindrical main bore opening through the forward end thereof for receiving the end portion of the coaxial cable therein, at least a portion of said main bore having a diameter substantially equal to the outside diameter of the coaxial cable end portion, a generally cylindrical mandrel on said tool body within and in coaxial relation to said main bore, said mandrel having an outside diameter substantially equal to the inside diameter of said cylindrical tubular shield, said mandrel having a generally cylindrical coaxial central bore opening through the forward end thereof, said central bore having a diameter at least equal to the major cross sectional dimension of the central conductor, and a skiving cutter mounted in fixed position on said tool body and extending into said main bore, said skiving cutter having a cutting edge at its inner end for engaging the outer insulating jacket on said prepared end portion and separating it from said tubular shield in response to relative rotation between said tool body and the prepared end portion.

4,729,269
POWERED PIPE WRENCH
Richard H. Killian, 3053 Forbes Ave., Santa Clara, Calif. 95051
Continuation of Ser. No. 794,461, Nov. 4, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,427
Int. Cl.[4] B25B *21/00*
U.S. Cl. 81—57.11 **12 Claims**



1. A pipe wrenching tool adapted to be powered by a hand held power drive mechanism for rotating threaded pipe in clockwise or counterclockwise direction, said tool having an outside pipe engaging edge and a power drive mechanism attachment edge, said tool comprising,
(a) a two sided, unitary body frame, said frame having an open face at said outside pipe engaging edge thereof and an inside face at said drive mechanism edge thereof,
(b) a drive wheel,
(c) an idler wheel,
(d) means in said frame for rotatably supporting said drive wheel inbetween said two sides thereof in a manner to expose said drive wheel at said open face of said frame,
(e) means in said frame for rotatably supporting said idler wheel inbetween said two sides thereof in a manner to expose said idler wheel at said open face of said frame, said means including means for movably positioning said idler wheel with respect to said drive wheel,
(f) means at both sides of said frame for rotating said drive wheel in said rotatable support,
(g) supporting means for supporting a power drive mechanism on said frame with said drive mechanism in mechanical engagement with one of said means for rotating said drive wheel, said drive mechanism extending from one of said sides and away from said inside face of said frame,
(h) and each side of said frame including means for mounting said supporting means thereto such that said supporting means selectively extends from one or the other of said sides.

4,729,270
SOCKET DRIVER SPANNER
Norman L. Pritchard, 37 Surrey Street, Minto, New South Wales, Australia 2566
Filed Feb. 3, 1987, Ser. No. 10,555
Claims priority, application Australia, Feb. 4, 1986, PH4436
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—57.43 **10 Claims**



1. A socket drive spanner having a first rigid tube, a second rigid tube co-axially received within one end of said first tube and having an inner end and an outer end, a socket driver means partially received within the outer end of said second tube for rotation therewith, a spindle co-axially received within said first tube and having one inner end partially received within the inner end of said second tube, to permit sliding engagement but prevent rotation therebetween, and said one end of said first tube being slidably engageable with said socket driver means to prevent rotation therebetween, wherein said spindle, said second tube and said socket driver means are rotatable in unison relative to said first tube only when said socket driver means is slidably dis-engaged from one end of said first tube.

4,729,271
SCREWDRIVER HANDLE
Robert H. Kenigson, 811 Kains Ave. #8, Albany, Calif. 94706
Filed Nov. 20, 1986, Ser. No. 932,603
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—177.1 **3 Claims**



1. A screwdriver or the like comprising a blade, a handle fixed to said blade, said handle being formed with a plurality of helical grooves around the outside and a resilient sleeve fitting tightly around the exterior of said handle, the interior of said sleeve fitting into said grooves, all of said helical grooves curving in the same direction, whereby upon the user twisting

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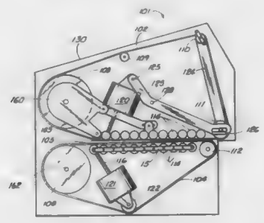
said sleeve, said sleeve is stressed and the resiliency of said sleeve augments turning action of said blades the cross-section of said grooves being of buttress-thread shape, having a slanted flank and a perpendicular flank, said perpendicular flank resisting turning of said sleeve relative to said handle where said sleeve is turned in a direction such as to cause said blade to tighten a screw with which it is engaged.

4,729,272

WIRE ROPE SALVAGING APPARATUS

Kenward J. Clement, 1230 Fig St., Morgan City, La. 70380

Continuation-in-part of Ser. No. 559,400, Dec. 8, 1983, Pat. No. 4,589,315. This application May 19, 1986, Ser. No. 864,715
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.⁴ B26D *5/20*
U.S. Cl. 83—202 **8 Claims**



1. A wire rope salvaging apparatus comprising:
a. a frame;
b. a plurality of cable engaging endless belts movably mounted on the frame;
c. cylinder means mounted on the frame and including an extensible pushrod movable between retracted and extended positions; and
d. drive means carries at least in part by the pushrod for moving one or more of the endless belts responsive to movement of the pushrod so that when the pushrod is moved between the extended and retracted positions, a length of wire rope is responsively advanced by the endless belts, and wherein the drive means comprises a pair of opposed endless chains and a corresponding pair of chain engaging means carried by the pushrods so that the rope is advanced responsive to movement of the chains; and
e. cutting means carried by the frame for cutting the length of wire rope after it has been advanced.

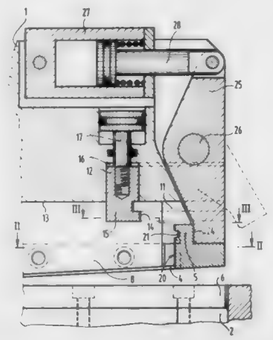
4,729,273

NOTCHING MACHINE

Harald Fazis, Weil, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 10,226
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604516
Int. Cl.⁴ B21D *28/02;* **B23D** *15/08*
U.S. Cl. 83—559 **12 Claims**

1. A notching machine having a vertically moving ram which is provided with a projecting head serving as a tool holder for an upper knife of a blade assembly which further comprises a lower knife that is attached to a machine table, the upper and the lower knives being each composed of two individual blades forming with their cutting edges a coinciding vertex angle which may be changed by turning the two blades of each knife relatively to each other around a vertical axis of rotation that extends in parallel with said ram near the noses of said upper and lower knives, comprising:
a third blade component which at least is provided for said upper knife for forming its nose portion and having a unitary cutting edge that complements the cutting edges of the two other blades of the upper knife for confining its vertex angle;



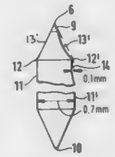
said third blade component being mounted interchangeably on said tool holder and being made available with differently sized vertex angles and/or with different contours of said unitary cutting edge.

4,729,274

STRIP-SHAPED KNIFE FOR USE IN PUNCHING MACHINES AND THE LIKE

Karl Marbach, Silcherstr. 28, D-7102 Weinsberg, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 896,120
Int. Cl.⁴ B26F *1/44*
U.S. Cl. 83—684 **16 Claims**



1. A cutting tool, particularly a punching or stamping tool, comprising a substantially strip-shaped knife having a cutting edge, a pair of lateral surfaces and a substantially concave facet between said edge and each of said lateral surfaces, said lateral surfaces being inclined with respect to the corresponding facets and each of said lateral surfaces having a concave portion adjacent the corresponding facet.

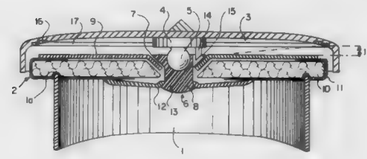
4,729,275

PAD FITTING DEVICE FOR A WIND MUSICAL INSTRUMENT KEY

Aimé Elbaz, 50, Avenue Jean-Jaurés, 75019 Paris, France

Filed Mar. 17, 1987, Ser. No. 26,753
Claims priority, application France, Apr. 2, 1986, 86 04707
Int. Cl.⁴ G10D *9/04*
U.S. Cl. 84—385 P **10 Claims**

1. A device for fitting a pad actuated by the key of a wind musical instrument so as to close a chimney of said intrument, said device including:
a cup operationally connectable to said key,
a pad, made from a compressable material such as flat, fixed to a rigid backing plate,
a rivet serving as central support for the pad, and
a hinge with male and female components connecting the center of the pad to the center of the bottom of the cup, so that the pad may assume, through a universal angular free movement, any slanted position with respect to the cup,



characterized in that it includes means provided for preventing relative rotation of the pad with respect to the cup.

4,729,276

AUXILIARY SNAP-ON KEY EXTENDERS FOR MUSICAL KEYBOARDS

Douglas A. Cutler, General Delivery, Haliburton, Canada KOM 1 S0

Filed Jan. 20, 1987, Ser. No. 4,884
Int. Cl.⁴ G10C *3/12*
U.S. Cl. 84—425 **2 Claims**

1. In a key type for musical keyboards, a set of vertically extended auxiliary snap-on keys intended for individual placement on top of corresponding host keys in conventional musical keyboards, said snap-on keys consisting of a plurality of key caps both black and white being substantially the same lateral mensuration as their intended host keys but considerably shorter than the latter, each of said key caps having fixed to its underside a support structure that provides significant vertical extension in a downward direction, each of said extending structures further being provided with at their bases means of attachment whereby they can be easily and removably secured into positions directly on top of their corresponding host keys.

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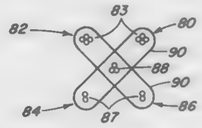
SHAPED MECHANICAL COMPRESSION PACKING

George B. Champlin, Stoneham, Mass., assignor to Seal Company of New England, Manchester, N.H.

Continuation of Ser. No. 450,517, Dec. 17, 1982, Pat. No. 4,550,639. This application Apr. 18, 1985, Ser. No. 724,475
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.
Int. Cl.⁴ D04C *1/06, 1/12*
U.S. Cl. 87—7 **2 Claims**

1. Mechanical compression packing of square or rectangular cross-section having central core yarns, a plurality of axial warp yarns, said pluality of said axial warp yarns being placed in a predetermined unsymmetrical pattern having different numbers or amounts of warp fibers at different positions and carrier yarns braided about said warp yarns, such that parallelism of opposite cross-sectional sides of said completed packing is maintained as said packing is wrapped about a cylindrical surface.

2. In the manufacture of braided mechanical compression packing of a square or rectangular cross-section having outer corners, inner corners, central core yarns, and axial warp yarns utilizing yarn carriers, the steps of arranging said axial warp yarns about said central core yarns in a predetermined non-symmetrical pattern in which warps adjacent the outer corners have more fibers than warps adjacent the inners corners, and



braiding yarns from said yarn carriers about said central core yarns and said axial warp yarns in such fashion that the cross-section of said yarns is such that any one 90 degree quadrant is a mirror image of only one of the two quadrants adjacent thereto.

4,729,278

VERTICAL ROTARY BRAIDER

Barry L. Graeff; Rudolf H. Haehnel, both of Reading, and Vincent A. Iannucci, Westlawn, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 4, 1987, Ser. No. 45,113
Int. Cl.⁴ D04C *3/42, 3/02*
U.S. Cl. 87—48 **6 Claims**

1. In a braiding machine having inner and outer bobbin arrays spaced circumferentially around inner and outer tables mounted for counter-rotation about a vertical axis, the combination comprising:
a. means defining a stationary standing rib cam located beneath the outer table;
b. strand guide means supported on the outer table for pivotal movement about pivot axes which pass through the braid point to provide a strand guide exit point that travels in an arcuate path in which all points contained in the path are equidistant from the braid point; and
c. drive means for effecting positive oscillation of said strand guide means in opposite directions about the pivot axes thereof, said drive means including:
i. operator means attached to the underside of the outer table having cam follower means depending therefrom into operative contact with each side of said standing rib cam, a portion of said operator means being positively displaced toward and away from the braiding machine vertical axis as the outer table is rotated; and
ii. push rod means operatively connected at one end to said strand guide means and at the other end to that

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portion of said operator means which is positively displaced, whereby said strand guide means is oscillated.

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DEVICE FOR TRANSPORT OF CANNON OR SUCH LIKE

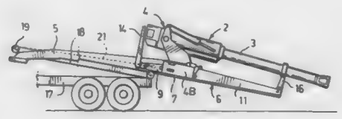
Heikki Collanus, Pirkkala; Seppo Nikula, Tampere; Ari Kanervo, Tampere, and Leo Häkkinen, Tampere, all of Finland, assignors to OY Tampella AB, Tampere, Finland

Continuation of Ser. No. 596,513, Apr. 4, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,640

Claims priority, application Finland, Apr. 8, 1983, 831189

Int. Cl.[4] F41F *23/10*

U.S. Cl. 89—40.13 **12 Claims**



1. A device for loading and unloading a heavy firearm onto and off of a vehicle, said device comprising:

a carriage having an upper portion and a lower portion, said upper and lower portions being pivotally connected;

a heavy firearm having a plurality of firing positions mounted upon said upper portion;

a pair of rails mounted under said lower portion, said rails being underneath said lower portion in each of said firing positions;

a vehicle having a tipping frame mounted thereon, said tipping frame having a first position for transporting said firearm, said first position being substantially parallel to a longitudinal dimension of said vehicle, and a second position for loading or unloading said firearm, said second position being at an angle with respect to said first position;

hoist means for raising said firearm from the ground to bring said rails into contact with a fixed point of support on said tipping frame or for lowering said firearm to the ground, said tipping frame being in said second position;

means for pivoting said tipping frame from said second to first position for transporting said firearm or from said first to said second position for loading or unloading said firearm, whereby said vehicle is available for other uses when said firearm has been unloaded.

4,729,280

RECOIL BRAKE

Josef Metz, Neuss, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 17, 1986, Ser. No. 920,057

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537322

Int. Cl.[4] F41F *19/02*

U.S. Cl. 89—43.01 **4 Claims**

1. A recoil brake for a gun having a barrel, comprising:

an outer cylinder to contain hydraulic fluid;

a hollow first piston rod mounted in said outer cylinder for sliding movement between an inserted position and an extended position, said first piston rod being operatively connected to said gun barrel and being pulled out of said outer cylinder by recoil movement of said gun barrel

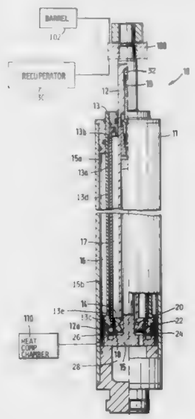
a hollow second piston rod slidably mounted in said outer cylinder and cooperating with said first piston rod, said second piston rod coaxially surrounding said first piston rod and being extended by said first piston rod after said first piston rod has been pulled out of said outer cylinder to an intermediate position that lies between said inserted and extended positions, said second piston rod being spaced apart from said outer cylinder to provide a pressure chamber between said outer cylinder and said second piston rod;

an intermediate hollow member disposed between said first and second piston rods, said intermediate hollow member being attached to said second piston rod and being spaced apart from said second piston rod, said intermediate hollow member additionally being spaced apart from said first piston rod to provide another pressure chamber between said first piston rod and said intermediate hollow member;

a first piston connected to said first piston rod to displace hydraulic fluid when said first piston rod is pulled out of said outer cylinder, said first piston surrounding said first piston rod, said first piston having an aperture therein and having a flow channel communicating with said another pressure chamber;

equalization means for equalizing hydraulic pressure between said pressure chamber and said another pressure chamber, said equalization means including at least one bore in said intermediate hollow member and at least one bore in said second piston rod;

first choke means, cooperating with said first piston and defining a narrow flow cross section, for imparting a



braking force on said gun barrel when hydraulic fluid is displaced as said first piston rod is pulled out of said outer cylinder, said first choke means including a control rod which is operatively connected to said second piston rod, said control rod extending through said aperture in said first piston and being exposed to said another pressure chamber via said flow channel in said first piston, said control rod having a cross sectional area which changes along the length thereof to control said narrow flow cross section of said first choke means;

a second piston connected to said second piston rod to displace hydraulic fluid when said second piston rod is extended, said second piston being exposed to said pressure chamber and having a piston area that is greater than the piston area of said first piston; and

second choke means, cooperating with said second piston and defining a narrow flow cross section, for imparting a braking force on said gun barrel when said hydraulic fluid is displaced as said second piston rod is extended, said second choke means including a control sleeve which is provided on said outer cylinder and which has a surface configured to control said narrow flow cross section of said second choke means.

4,729,281

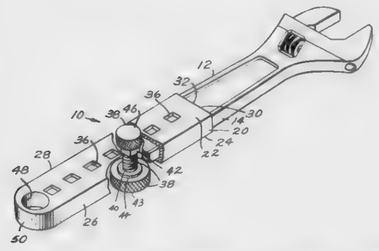
EXTENSION HANDLE APPARATUS FOR USE WITH A CONVENTIONAL WRENCH

Walter M. Holloway, Jr., 5013 Maid Marion Dr., Pascagoula, Miss. 39567

Continuation of Ser. No. 764,729, Aug. 12, 1985, abandoned. This application Aug. 7, 1986, Ser. No. 875,548

Int. Cl.[4] B25G *1/04*

U.S. Cl. 81—177.2 **8 Claims**



1. An extension handle apparatus, for use with a conventional wrench having a handle and an opening defined within and adjacent a free end of said handle, said extension handle apparatus comprising:

a tubular sleeve member having first and second opposed and substantially parallel wall elements and third and fourth wall elements connecting together said first and second wall elements, said wall elements defining an open port at a first end of said sleeve member and an interior space for receiving said wrench handle;

each of said first and second wall elements defining a plurality of aligned bolt-receiving openings therein, each of said bolt-receiving openings in said first wall element in alignment with a respective one of said bolt-receiving openings in said second wall element; and

locking means extending through predetermined and opposed one of said bolt receiving openings in said first and second opposed wall elements and through said wrench handle opening.

4,729,282

SHEET DIVERTER FOR SIGNATURE COLLATION AND METHOD THEREOF

Kurt H. Kasdorf, Sussex, Wis., assignor to Quad/Tech, Inc., Pewaukee, Wis.

Filed Jul. 22, 1986, Ser. No. 888,786

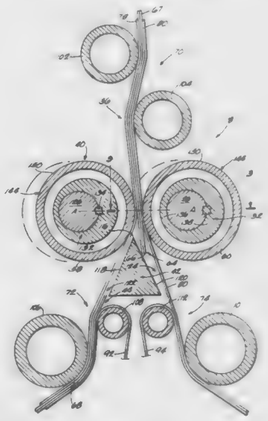
Int. Cl.[4] B26D *7/06;* **B65H** *39/10*

U.S. Cl. 83—26 **26 Claims**

1. A sheet diverter, adapted for cooperative association with a cutter in a pinless folder assembly wherein a ribbon is cut into a plurality of individual signatures destined for serially deflected parallel collation from a diverter path to a desired one of a plurality of collation paths to systematize the order of said signatures, comprising:

(a) oscillating diverter guide means for directing the lateral disposition of the leading edge of a signature relative to diverter means, wherein said diverter guide means translates over a reciprocable path in a diverter plane having a component generally normal to the diverter path of said signature; and,

(b) diverter means separating a plurality of collation paths for deflecting a signature to a selected one thereof, each of said collation paths having a throat partially bounded by



said diverter means merging to a confined course for transporting said signature along said collation path.

4,729,283

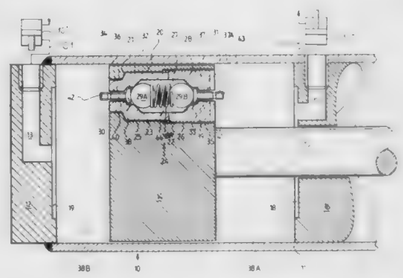
VALVE FOR USE WITH HYDRAULIC RAM ASSEMBLIES

Raymond G. Hillier, Runaway Bay, Australia, assignor to Delibes Pty. Ltd., Australia

Continuation of Ser. No. 670,287, Nov. 9, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 926,827

Int. Cl.[4] F01L *15/00*

U.S. Cl. 91—189 R **6 Claims**



1. An assembly of a plurality of hydraulic ram assemblies connected in series with a conduit interconnecting an output port of a respective ram assembly to an inlet port of an adjacent ram assembly, each said hydraulic ram assembly comprising a hydraulic cylinder, a piston located within said cylinder, and a piston rod connected to said piston,

and each of said hydraulic ram assemblies includes a valve assembly located in a mating bore in a respective said piston or piston rod, said valve assembly including:

a valve body;

a valve chamber provided in the valve body communicating with a pair of end passages constituting fluid access ports wherein each end passage is of restricted transverse dimension compared to the valve chamber and comprises a relatively narrow outer passage and an enlarged inner space;

a pair of valve members each associated with a respective

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end passage which are each substantially T-shaped having an enlarged head portion and a stem whereby in use each stem may extend outwardly from said bore and each head portion may occupy an associated inner space which functions as a valve seat for the adjacent valve member;

a pair of balls in said valve chamber separate from the valve members wherein each ball is held in abutting relationship with an adjacent head portion of a respective valve member in use; and

a biassing member interposed between each of said balls in the valve chamber and exerting a biassing force on each of said balls whereby each valve member is biassed outwardly to closed position;

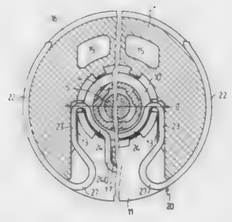
the construction and arrangement being such that each valve member may close or open a respective fluid access port to fluid flow through the valve chamber whereby in operation fluid flow into said chamber may occur only from the pressure side of the piston or piston rod accommodating said valve assembly through a proximal access port wherein a distal access port is closed whereby prior to impact of said piston or piston rod upon an internal surface of an associated hydraulic ram assembly, said distal access port is opened to permit fluid flow to occur therethrough to the non pressure side of the piston or piston rod from said valve chamber, thereby to inhibit fluid bypass or leakage of fluid between the pressure side and the non pressure side and thus provide effective sequencing of fluid flow between adjoining pistons of adjacent hydraulic ram assemblies in said plurality of hydraulic ram assemblies connected in series.

4,729,284

STOP KEY FOR THE VALVE PLUNGER OF A BRAKING ASSISTANCE SERVOMOTOR AND A SERVOMOTOR EQUIPPED WITH SUCH A KEY

Jean-Pierre Gautier, 46 ter, Avenue Louis Blanc, 93600 Aulnay-sous-Bois, France

Filed Aug. 8, 1985, Ser. No. 763,510
Claims priority, application France, Aug. 16, 1984, 84 12864
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A **1 Claim**



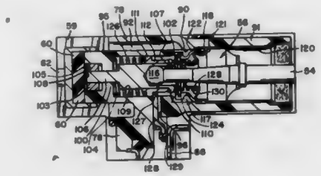
1. A braking assistance servomotor, incorporating a piston hub, a plunger of a distribution valve coupled to an input rod of the servomotor, and a stop key for the plunger, the key comprising a central portion with an end shaped essentially in the shape of a U intended to be engaged in a radial opening in the hub in cooperative engagement with the plunger and, each formed in the shape of a single piece with said central portion, a pair of arms essentially in the shape of an ark of a circle cooperatively engaged with the outer periphery of the hub, said key being made of metal wire, the central portion comprising two substantially parallel lateral mounting strand parts whose first ends are joined together by a central strand part, and each mounting strand part having a second end extended by an outer curved strand part forming the corresponding arm, said radial opening comprising a central portion having axially spaced first and second axial walls, a pair of parallel facing grooves formed in lateral walls of said central opening contiguous with said first axial wall, the axial length of said central portion being greater than the axial length of the grooves, and a projecting portion extending axially from said second axial wall adjacent to said first axial wall.

4,729,285

CONTROL VALVE FOR A VACUUM BRAKE BOOSTER

Gregory K. Harrison, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jul. 7, 1986, Ser. No. 882,985
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A **8 Claims**



1. In a brake booster having a housing with a cavity therein, a wall located in said housing for dividing said cavity into first and second chambers, said wall having a hub member with a bore therein, said hub member having a first passage connected to said first chamber and separated from a second passage connected to said second chamber by an annular seat, a control valve located in said bore and selectively positionable in a rest position with respect to said annular seat to allow vacuum present in said first chamber to be freely communicated to said second chamber by way of said first and second passages and a portion of said bore and in an operational position with said annular seat to interrupt vacuum communication through said first passage and initiate communication of air from the surrounding environment by way of said bore and second passage to said second chamber to create an operational pressure differential across said wall, said operational pressure differential acting on said wall and overcoming a return spring to produce an output force in response to an input force, the improvement in said control valve comprising:

a plunger located in said bore and having a cylindrical body with a shoulder located between a first end and a second end, and first end receiving a reaction force corresponding to said output force;

a sleeve member concentric to said cylindrical body;

a first resilient member acting on and urging said sleeve member toward said shoulder on said plunger;

a poppet member located in said bore and having a first end secured to said hub and a second end free to move within said bore;

an input member connected to said second end of said plunger;

stop means located in said second passage having a first end and a second end, said first end engaging said sleeve; and

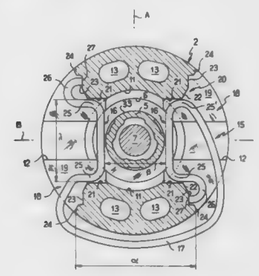
second resilient means for urging said free end of said poppet member into engagement with said second end of said plunger in said rest position and into engagement with said annular seat during said operation position and on termination of said input force, said first resilient member and said reaction force acting on said shoulder and first end of said plunger, respectively, to move said second end of said plunger into engagement with said free end of said poppet member and said free end of the poppet member away from said annular seat to define a first gap between said free end and annular seat to allow said vacuum in said first chamber to evacuate air from said second chamber, said stop means moving in said second passage and engaging said hub to limit the movement of said sleeve within said bore by said first resilient means while said reaction force continues to move said plunger to establish said first gap, said first gap being sustained by the reaction force until said operational pressure differential and reaction force terminates, said air from the environment present in said bore and vacuum present in said portion of said bore creating a static pressure differential across said poppet member, static pressure differential producing a force that acts on said poppet member and plunger to thereafter move said plunger into engagement with said sleeve and thereby define said rest position for said control valve.

4,729,286

BRAKE BOOSTER COMPRISING A VALVE PLUNGER STOP MADE OF METAL WIRE

Jean-Claude Blot, Louvres, France, assignor to Bendix France, Drancy, France

Filed Aug. 12, 1986, Ser. No. 907,432
Claims priority, application France, Sep. 19, 1985, 85 13904
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A **5 Claims**



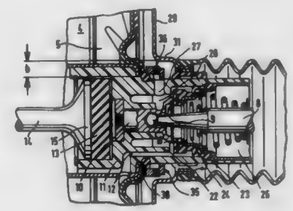
1. A brake booster, comprising a booster piston provided wit a tubular hub enclosing distribution valve means actuated by a valve plunger which is movable axially in said hub and coupled to an input rod of the booster, and a stop key for the plunger which is made from metal wire and mounted elastically on said hub with at least one stop portion of said key housed in a radial cavity of said hub so as to cooperate in engagement with said valve plunger, characterized in that the hub comprises two opposite radial cavities and said key comprises stop portions facing one another which are joined by an intermediate arch, each radial cavity comprising a central portion for housing the respective stop portion of said key and an access portion opening outwardly, a transverse distance between connecting zones located between said central portions and said access portions of said two radial cavities being greater than spacing between said stop portions facing one another of said key, each stop portion extended by an end portion which comes to bear against a bearing surface of the respective central portion, each stop portion of said key comprising a strand portion which is essentially straight and extended at each end by a bend, and the respective central portion having a height which is slightly greater than an overall distance between outer edges of said bends.

4,729,287

VACUUM-OPERATED BRAKE POWER BOOSTER HAVING DIAPHRAGM EDGE BEAD RETENTION MEMBER

Peter Boehm, Frankfurt am Main; Wilfried Wagner, Huettenberg-Weidenhausen; Gilbert Bischoff, Hattersheim, and Karl Breitwieser, Reinheim, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,727
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537237
Int. Cl.[4] F15B *9/10*; **F16J** *3/02*
U.S. Cl. 91—369 A **8 Claims**



8. A vacuum-operated brake power booster comprising, a movable wall sealed relative to a vacuum housing, said wall defined by a diaphragm plate and a rolling diaphragm on said diaphragm plate, a piston rod adapted to be coupled to a brake pedal, and operatively connected to a control valve, said control valve connecting a first chamber of the brake power booster alternately to either a vacuum or to a higher pressure differential, said control valve including a control valve piston which is axially displaceable within a control valve housing and which acts through the intermediary of an interposed reaction element on the end of a master cylinder push rod, said rolling diaphragm including an edge bead sealingly engaged around the control valve housing in a peripheral groove in the control valve housing, a retaining element arranged in an annular chamber formed by a cylindrical surface of the control valve housing and a neck portion of the vacuum housing, said retaining element including a first ring surrounding the edge bead of the rolling diaphragm and lockingly securing the edge bead in said groove against the effect of a radial force on said edge bead, said retaining element being nondisplaceably affixed on the control valve housing and including a second ring coaxially arranged at a distance from said first ring, said first ring and said second ring being interconnected by a plurality of axially extending webs forming a plurality of bleed passages aligned with a vacuum passage of said control valve for bleeding the brake booster, an air filter provided on an external peripheral portion of the retaining element between said first and second rings and coaxial to said axially extending webs for reducing noises occurring during the rapid inflow of outside air to said first chamber.

4,729,288

VACUUM SERVOMOTOR FOR ASSISTED BRAKING

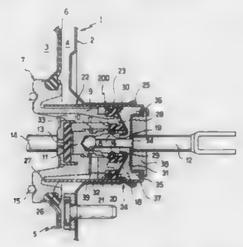
Alain Thioux, Chennevieres, France, assignor to Bendix France, Drancy, France

Filed Aug. 19, 1986, Ser. No. 897,948
Claims priority, application France, Sep. 19, 1985, 85 13905
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—376 R **7 Claims**

1. A servomotor for assisted braking, comprising, inside a housing, a piston assembly dividing the housing internally into a vacuum chamber and a working chamber and comprising a tubular piston hub enclosing distribution valve means actuable by an input rod, the tubular hub being sealingly and slidingly guided, inside a tubular structure connected fixedly with the

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housing, by an assembly comprising a guiding ring and a sliding seal which isolate the working chamber from atmosphere, characterized in that the assembly comprising the guiding ring and sliding seal is mounted on the tubular hub and the tubular structure having a first end part extending so as to project into



the working chamber, the tubular structure comprising a tubular part mounted in sealed fashion inside a central tubular portion of the housing, the tubular part and the tubular portion fixed rigidly to each other by crimping, and the assembly comprising the guiding ring and sliding seal being mounted on a free end of the tubular hub.

4,729,289

POWER BRAKE BOOSTER FOR AN AUTOMOTIVE VEHICLE

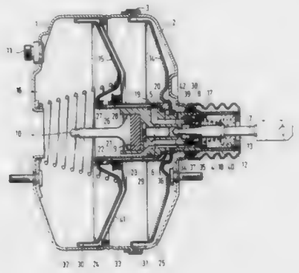
Peter Boehm, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 575,512, Jan. 31, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 906,563

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303577

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R **3 Claims**



1. A power brake booster for an automotive vehicle, said brake booster comprising:

a housing subdivided into two compartments by a partition wall, said compartments forming boosters and each compartment including one vacuum chamber and one working chamber;

a guiding tube slideably and sealingly guided in a central opening of the partition wall, and a control housing, concentrically located within said guiding tube, one end of said control housing being fixed to one end of said guiding tube and the other end thereof being coupled with the other end of said guiding tube by a rolling diaphragm bead whereby said guiding tube and said control housing are slideable in the housing in an actuating direction, the inner peripheral surface of said guiding tube being spaced from the outer peripheral surface of said control housing to provide an annular gap therebetween;

said one end of said control housing accommodating a poppet of a single booster control valve means, said poppet being operatively associated with a piston rod for operation by a brake pedal to govern the introduction of atmospheric air into both said working chambers; said other end of said control housing being operatively associated with a push rod for displacing a piston of a master cylinder, a piston between said piston rod and said push rod, said piston being fixed to said piston rod;

said annular gap communicating with the working chamber adjacent said other end of said control housing by a radial bore formed adjacent said rolling diaphragm bead, said annular gap terminating adjacent said one end of said control housing and said annular valve chamber being connected by a cross bore to the working chamber adjacent said one end of said control housing and said guiding tube;

said control housing being formed with an annular channel which connects said vacuum chambers with each other and which also connects said vacuum chambers with an annular chamber enclosing said poppet, said annular channel terminating adjacent said valve chamber and being connectible thereto by the opening of said poppet; and

said single booster control valve means including a first valve seating surface and a second valve seating surface both cooperating with said poppet for providing a vacuum connection for each said vacuum chamber and each said working chamber when said booster is unactuated and for disconnecting each said vacuum chamber from each said working chamber when said booster is partially actuated and for providing vacuum connections for said vacuum chambers and atmospheric connections for said working chambers when said booster is fully actuated.

4,729,290

FLUID PRESSURE ACTUATED SPRING BRAKE CYLINDER

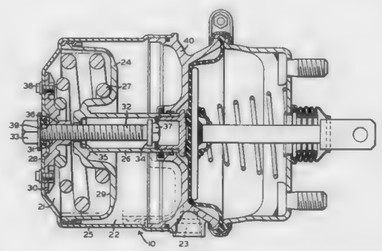
Jurgen Ewald, Laatzen; Josef Frania, and Roland Glogowschek, both of Hanover, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,590

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536766

Int. Cl.[4] F15B *1/04*

U.S. Cl. 92—130 A **8 Claims**



1. A motor vehicle spring brake cylinder which is responsive in a release position to fluid pressure, said spring brake cylinder comprising:

(a) a cylinder having a base portion;

(b) a spring brake piston disposed for reciprocal movement within said cylinder, said spring brake piston dividing said cylinder into a spring chamber located between a base of said cylinder and a first side of said spring brake piston and a pressure chamber located on an opposite side of said spring brake piston;

(c) a compression spring actuator disposed in said spring chamber, said compression spring actuator having a first end thereof adjacent said base of said cylinder and a second end engageable with said first side of said spring brake piston; and

(d) a tensioning device which mechanically acts upon said spring brake piston for facilitating adjustment of a distance between said spring brake piston and said base of said cylinder, said tensioning device including:

(i) a spring plate secured to said base of said cylinder and in engagement with an outer coil of said compression spring pointing away from said spring brake piston; and

(ii) a screw bolt threadedly engaging said spring plate and passing axially through said compression spring and said spring brake piston to adjust a distance between said spring plate and said spring brake piston.

4,729,291

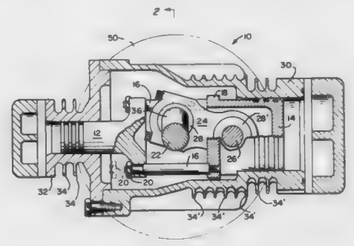
GAS COMPRESSOR

Bernard F. Miller, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 18, 1986, Ser. No. 886,647

Int. Cl.[4] F01B *9/00*

U.S. Cl. 92—138 **4 Claims**



1. A gas compressor, comprising:

a pair of opposed, in-line cylinders opening onto each other in an unobstructed confronting relationship;

a pair of opposed, in-line pistons disposed in said cylinders for reciprocation;

a crankshaft having a single crank formed therealong;

a connecting rod directly interconnecting said crank and one of said pistons; and

means fastening said pistons together into a unitized assembly, albeit with said pistons in spaced-apart disposition, for reciprocation of said assembly; wherein

said fastening means comprises four, identical rods;

each of said pistons has a head and a base, and at said base thereof, a radially extending flange or skirt;

said rods are in penetration of, and fastened to, said piston flanges or skirts to define, between said pistons, an open framework of said rods;

said crank is centralized within said framework;

said crankshaft traverses said framework; and

said rods comprise means for strengthening and stiffening said assembly.

4,729,292

AIR VENT

Lewis Marton, Randwick, Australia, assignor to Atlas Air Australia Pty. Limited, Rozelle, Australia

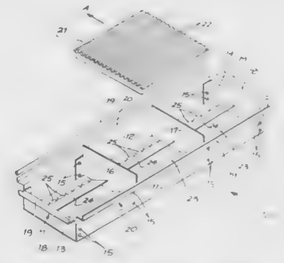
Filed Oct. 29, 1986, Ser. No. 927,005

Claims priority, application Australia, Nov. 22, 1985, PH3541

Int. Cl.[4] F24F *13/06*

U.S. Cl. 98—40.01 **8 Claims**

1. A modular air vent assembly comprising a rectangular frame having four closed sides, the frame being divided into a plurality of individual square sections by dividing plates located along the length of the assembly to separate the air flow of each section from its adjacent section and each section being provided with a separate air damper means for controlling air flow through each section independently of the other sections and a grill removably supported at the top of the respective section of the vent assembly, the vent assembly including support means adapted to rest on a supporting surface of a



raised floor assembly, and each grill including louvres angled to direct air flow therethrough to one side and the grill being locatable in one of a plurality of orientations such that air flow can be directed in any one of a plurality of directions relative to the vent assembly, each direction corresponding to a respective orientation of the grill.

4,729,293

AIR DIRECTION CONTROL APPARATUS FOR A LOUVER AT AN AIR OUTLET

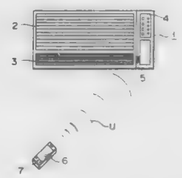
Hideo Tsunoda, Numazu, and Harunobu Nukushina, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1986, Ser. No. 844,940

Claims priority, application Japan, Mar. 29, 1985, 60-45118[U]; Jul. 24, 1985, 60-162070

Int. Cl.[4] F24F *13/10*

U.S. Cl. 98—40.24 **2 Claims**



2. A control apparatus for controlling an operation of a louver at an air outlet of an air conditioner, comprising:

a remote controller for transmitting a single remote control signal which is generated in accordance with a single operation of a push button, said remote controller including means for generating a louver operation instruction and a louver stop instruction which are successively generted in reponse to successive operation of a push button;

receiving means for receiving said remote control signal transmitted from said remote controller;

detection means for detecting the louver operation instruction and the louver stop instruction included in said receiver remote control signal;

drive signal output means for outputting a drive signal in response to said detected louver operation signal;

louver motor means driven by the drive signal;

louver means driven by said louver motor means to direct air at a direction from an air outlet of the air conditioner; and

stopping means for stoping the louver motor means thereby

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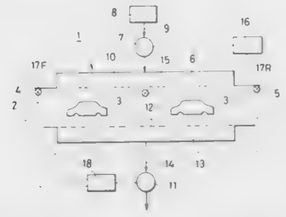
stoping the louver means in reponse to the detected louver stop instruction.

4,729,294

METHOD OF OPERATING AN AIR SUPPLIED TYPE COATING BOOTH

Michiaki Osawa, Nagoya; Hidetoshi Omori, Toyota; Hidemasa Inoue; Yoshihiro Shibata, both of Seto; Hideyuki Takata, Nagoya; Yasuo Tokushima, Toyota; Shunichi Akiyama, Toyota; Masayuki Kojima, Toyota, and Zyouzi Itou, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 29, 1986, Ser. No. 947,382
Claims priority, application Japan, Dec. 27, 1985, 60-293219
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 **2 Claims**



1. A method of operating an air-supplied type coating booth in which conditioned air supplied from an air supply blower to a plenum chamber is enforced downwardly to the inside of a tunnel-shaped coating booth and the air thus enforced in the coating booth is drawn to discharge together with coating mists, evaporated organic solvents and the likes by an exhaust blower to the beneath of a floor, wherein the method includes:

a step of ending the operation of the coating booth comprising memorizing the flow rate of air supplied from the air supply blower and the flow rate of exhaust air discharged from the exhaust blower attained just before the completion of the booth operation where the flow rate of the supplied air and the flow rate of the exhaust air have been balanced, and then stopping the operation for the air supply blower and the air exhaust blower and

a step of re-starting the operation of the coating booth comprising automatically setting the flow rate of air supplied from the supply blower and the flow rate of exhaust air discharged from the exhaust blower to the flow rate of the supplied air and to the flow rate of the exhaust air memorized respectively just before the completion of the booth operation upon re-starting the booth operation again.

4,729,295

METHOD OF OPERATING AN AIR-SUPPLIED TYPE COATING BOOTH

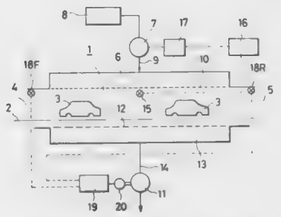
Michiaki Osawa, Nagoya; Hidetoshi Omori, Toyota; Hidemasa Inoue; Yoshihiro Shibata, both of Seto; Hideyuki Takata, Nagoya; Yasuo Tokushima, Toyota; Shunichi Akiyama, Toyota; Masayuki Kojima, Toyota, and Zyouzi Itou, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 29, 1986, Ser. No. 947,383
Claims priority, application Japan, Dec. 27, 1985, 60-293216
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 **10 Claims**

1. A method of operating an air-supplied type coating booth in which conditioned air supplied from an air supply blower to a plenum chamber is enforced through a filter to the inside of a tunnel-shaped coating booth at a predetermined flow velocity, caused to flow downwardly in the coating booth at a predetermined flow velocity and then drawn to discharge together with coating mists, evaporated organic solvents and the likes to the beneath of the floor, wherein said method comprises:

a step of detecting the flow velocity of the conditioned air flowing from said plenum chamber through said filter to the inside of said coating booth continuously by a flow velocity sensor;

a step of sampling the signals for the detected flow velocity at a predetermined sampling period and applying the primary averaging processing for the variations fluctuating at relatively shorter period caused by the external disturbances such as characteristics of the sensor;



a step of sampling the signals after applied with said primary averaging processing at a predetermined sampling period and applying the secondary averaging processing for the variations fluctuating at relatively longer period caused by external disturbances such as gradual change of states in the air conditioning device and the like;

a step of comparing the value obtained from said signals after applied with said secondary averaging processing with a predetermined flow velocity value;

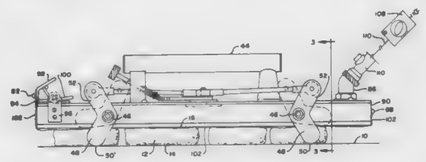
a step of variably controlling flow rate supplied from said air supply blower depending on the deviation therebetween, and thereby maintaining the flow velocity of said conditioned air flowing to the inside of said coating booth always constant.

4,729,296

PORTABLE SELF-HEATED COOKING PRESS

Philip P. Sabin, Nashville, N.C., assignor to Fast Food Merchandisers, Inc., Rocky Mount, N.C.

Filed May 28, 1986, Ser. No. 867,516
Int. Cl.[4] A47J *37/06*
U.S. Cl. 99—349 **14 Claims**



1. A portable self-heated cooking press, comprising:

a body including a generally horizontal bottom plate having an underside;

leg means mounted to said body and projecting below said underside of said bottom plate to engage an upwardly-facing generally horizontal surface for supporting said bottom plate at at least one selected height above said upwardly-facing surface;

a handle, and means securing said handle on said body for manual access from above said body so that said body is free to be moved laterally and lifted away from said upwardly-facing surface so that said legs are no longer supported on said upwardly-facing surface;

means for applying heat to said bottom plate from above said underside both while said body is supported on said upwardly-facing surface by said leg means and while said body is lifted away therefrom by use of said handle;

said body being provided as a hollow structure having a cavity of which said bottom plate provides a defining portion;

said means for applying heat to said bottom plate comprising means for adding heat to said bottom plate from within said cavity;

said means for applying heat to said bottom plate comprising at least one electrical resistance-type heating unit disposed in said cavity in a heat exchange relationship with said bottom plate;

a temperature sensor on-board said body and adapted for sensing temperature in the vicinity of said bottom plate;

an off-board electrical control unit adapted for furnishing electrical power to said at least one electrical resistance heating unit when the temperature as sensed by said temperature sensor is below a selected value;

electrical and temperature sensor signal reporting conductor means penetrating said body and operatively connecting said at least one electrical resistance-type heating unit and said temperature sensor with said off-board electrical control unit;

means for coordinately lengthening and shortening said leg means for selecting how far said underside of said bottom plate will be spaced above said upwardly-facing surface when said leg means are supported on said upwardly-facing surface;

said leg means comprising four legs pivotally secured to said body for pivotal movement about respective horizontal axes; and

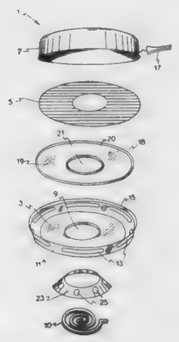
said means for coordinately lengthening and shortening said leg means comprising a rotatable cam plate means; connecting rod means connecting said cam plate means with said legs for coordinated rotation of said legs upon rotation of said cam plate means; and latch means for selectively locking said cam plate means relative to said body in each of a plurality of rotational positions.

4,729,297

COOKING GRILL

Morad Iranzadi, 10500 Rockville Pike No. 1509, Rockville, Md. 20852

Filed Nov. 7, 1986, Ser. No. 928,002
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—401 **8 Claims**



1. A device for cooking food, comprising:

a base comprising a bottom wall and at least one side wall, said bottom wall having an opening in the center thereof;

a wire grid for supporting food which rests on said base and is spaced apart therefrom;

a removable lid comprising a top wall and at least one side wall, said lid being capable of resting on said base and being spaced apart therefrom; and

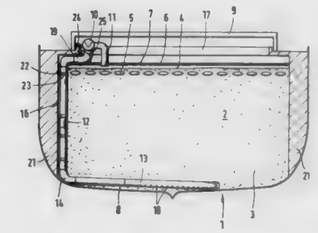
a support means which is essentially frusto-conically shaped and has a bottom rim, a top rim and a side wall, said bottom rim being capable of resting on a stove over a burner, the top rim being capable of supporting the base thereon, and the side wall of said support means having a plurality of openings therein which promote the formation of convection currents which help carry heat from the burner to the food on the wire grid.

4,729,298

SYSTEM FOR TREATING AGRICULTURAL PRODUCTS WITH PESTICIDES ON SHIPS

Manfred Dörnemann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Degesch GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 819,691
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503650
Int. Cl.[4] A23B *7/00;* **A23L** *3/34*
U.S. Cl. 99—476 **20 Claims**



1. In a ship having a hull, a loading hatch and a cargo hold which has a bottom and may contain a bulk material, such as bulk foods, animal feed or the like, and a preparation that releases a pesticide, the preparation being placed on or beneath the surface of the bulk material and the area above the bulk material being enriched with the pesticide, a device for disinfecting the bulk material comprising line sections of a total length which may be adjusted to the height of the cargo hold, said line sections being joined together and having a first end portion disposed at the bottom of the cargo hold and a second end portion disposed in the vicinity of the loading hatch, said first end portion including a plurality of gas openings; a centrifugal fan connected to the second end portion of the line sections whereby the pesticide-enriched air may be circulated through the bulk material; and means for detachably mounting the line sections to the ship.

4,729,299

CITRUS FRUIT PEELING MACHINE

Derek H. Hatch, 3939 Viewridge Place, West Vancouver, British Columbia, Canada V7V 3K7

Filed Aug. 25, 1986, Ser. No. 899,607
Int. Cl.[4] A23N *4/00, 7/00;* **B02C** *25/00*
U.S. Cl. 99—491 **17 Claims**

1. An apparatus for removing the peel, pith and membrane of citrus fruits while said fruit is travelling along the longitudinal axis of said apparatus, said fruit having two ends and a core axis, comprising:

cup means for holding said fruit such that the core axis of said fruit lies horizontal and at right angle to the longitudinal axis of said apparatus;

conveyor means for advancing said cup means along the

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longitudinal axis of said apparatus in a series of stop/start motions;

slicing means for slicing the ends off said fruit to establishing parallel planes on said fruit;

a pair of vertical plates positioned on each side and parallel to said conveyor means for guiding said fruit there between thereby preventing movement of a core axis of said fruit;

sensing means for providing a signal indicative of the diameter of said fruit;



storing means to store the diameter of said fruit;

means for carrying and rotating said fruit, said means allowing said fruit to be rotated about said core axis while being carried along said conveyor means;

means for adjusting the height of said fruit according to the stored diameter of said fruit such that said core axis is aligned with said carrying and rotating means;

rotating cutter means positioned along said path of travel for removing said peel, pith and membrane of said fruit.

4,729,300

PRESS CUSHION FOR A MECHANICAL PRESS

Theodor Klein, Burbach, Fed. Rep. of Germany, assignor to Fa. Theodor Grabener Pressensysteme GmbH & Co. KG, Netphen, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,594

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531526

Int. Cl.⁴ D30B *15/14*

U.S. Cl. 100—43 **10 Claims**



1. In a mechanical press having a platen comprising a force transmitting component including a toggle joint and an anvil comprising a force receiving component wherein the anvil is mounted on a hydraulic member in a hydraulic chamber and wherein the hydraulic chamber acts as a press cushion for said anvil and which is continuously connected with a fluid reservoir which is maintained under a gas pressure, the improvement wherein said hydraulic member has a maximum filling volume which is at most 1% of the volume of said fluid reservoir and said gas pressure in said fluid reservoir is maintained continuously at a valve enabling development of a pressing force between the anvil and platen.

4,729,301

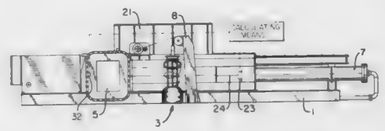
HORIZONTAL BALING APPARATUS

Richard D. Smith, Richardson, and John E. McDonough, Waco, both of Tex., assignors to Mosley Machinery Co., Inc., Waco, Tex.

Filed Nov. 27, 1985, Ser. No. 802,866

Int. Cl.⁴ B30B *15/30;* **B65B** *57/10*

U.S. Cl. 100—43 **13 Claims**



10. In a baling apparatus having a hollow body and a compression ram mounted therein for reciprocal movement for compressing a compressible material of unknown density, the improvement comprising:

means for measuring the distance travelled by the compression ram;

means for determining the density of the feed stock as a function of the length of compression ram travel during a compression; and

means for calculating an appropriate amount of additional material to be provided to the baling apparatus on successive compressions to produce a bale of a desired number of laminations.

4,729,302

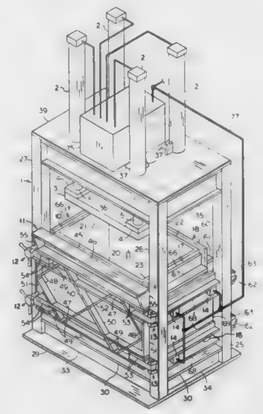
FLOATING CONTAINER CLAMP FOR A COMPACTION PRESS

Douglas E. Manning, 7300 Rule Rd., Knoxville, Tenn. 37920

Filed May 16, 1986, Ser. No. 864,295

Int. Cl.⁴ B30B *15/04*

U.S. Cl. 100—214 **3 Claims**



1. A press for compacting material in a container, said container having a bottom, a plurality of sides, and an open top, said press comprising:

a pressurized fluid means;

a vertically movable material compacting means;

a frame, said frame further allowing the bottom of said container to be supported by the base of said frame;

means for positioning said container upon the base of said frame relative to the material compacting means;

a plurality of clamps on the frame sides, each of said clamps comprising a planar member having an inner surface substantially conforming to one side of said container, each of said clamps further being of sufficient rigidity to support one side of said container during compacting;

a plurality of clamp cylinders operated by said pressurized fluid means, each of said clamp cylinders further having a cylinder rod;

means for mounting each of said clamp cylinders to said press frame; and

means for pivotally connecting a plurality of said cylinder rods to each of said clamps, allowing said clamps to be pressed against and conform to the sides of said container;

whereby the container is supported during compacting by the material compacting means by a combination of support by the base of said frame, and the inner surfaces of said clamps.

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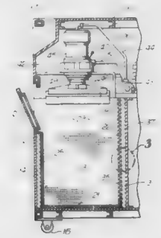
AIRCRAFT TRASH COMPACTOR WITH PENETRATION RESISTING LINER

James L. Durbin, Valencia, Calif., assignor to A.K.G.S., Las Vegas, Nev.

Filed Aug. 27, 1986, Ser. No. 900,704

Int. Cl.⁴ B30B *15/04*

U.S. Cl. 100—214 **7 Claims**



1. A lightweight high pressure trash compactor comprising:

(a) a cabinet with an internal compacting chamber defined by a floor, upstanding walls, and an upper portion thereof and being adapted to receive a trash container;

(b) a compacting platen disposed within the upper portion of the compacting chamber;

(c) extendible means to drive the compacting platen downwardly toward the floor of the compacting chamber and to withdraw the compacting platen into the upper portion of the compacting chamber; and

(d) a substantially impenetrable fabric formed of high strength, nonmetallic fiber impregnated with a thermosetting resin secured to inner surfaces of the internal compacting chamber.

4,729,304

REFUSE COMPACTOR AND TRANSFER CHAMBER

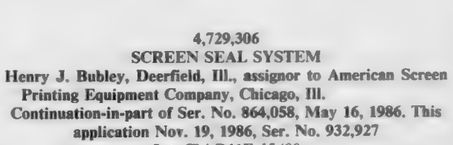
Peter Gardella, San Francisco, Calif., and Kevin L. Wood, West Linn, Oreg., assignors to Norwood Enterprises, San Francisco, Calif.

Filed Apr. 3, 1986, Ser. No. 848,031

Int. Cl.⁴ B30B *15/06, 15/32*

U.S. Cl. 100—218 **17 Claims**

1. A baling machine comprising an elongated rectangular cross-section, horizontal chamber having an open discharge end and a rearward end, said chamber having a loading aperture in its top, a retractable gate closing off said discharge end, means for retracting said gate, a platen in said chamber, a hydraulic ram fixed to said rearward end of said chamber and to said platen, transport means guiding said platen for reciprocation in said chamber between a retracted position behind said loading aperture to a projected position beyond said discharge end, whereby said platen compacts material deposited in said aperture against said gate when said gate is closed and discharges compacted material out of said chamber through said discharge end when said gate is open, all of said gate being slanted upwardly-rearwardly, said gate comprising the sole discharge end wall of said chamber against which the material compacted by said machine is forced by said platen, said gate when retracted by said means maintaining said compacted material substantially intact.



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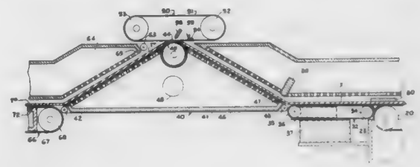
METHOD AND APPARATUS FOR MAKING PRINTED ELASTIC BANDS

Richard R. Spencer, Hot Springs, Ark., assignor to Alliance Rubber Company, Hot Springs, Ark.

Filed Jan. 10, 1986, Ser. No. 817,657

Int. Cl.⁴ B41F *17/10;* **B26D** *7/08*

U.S. Cl. 101—35 **49 Claims**



1. The method of making printed clastic bands comprising feeding an elastic tubing into a perforating apparatus, perforating the tubing, exhausting fluid from within the tubing, flattening the tubing, cleaning the tubing, drying the tubing, continuously conveying the tubing, keeping the tubing flat, aligning the tubing, printing the tubing, aligning the printed tubing, driving the tubing, drying and curing the printed image, and cutting off lengths of the printed tubing into printed elastic bands and removing the printed elastic bands.

4,729,306

SCREEN SEAL SYSTEM

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Continuation-in-part of Ser. No. 864,058, May 16, 1986. This application Nov. 19, 1986, Ser. No. 932,927

Int. Cl.⁴ B41F *15/00*

U.S. Cl. 101—114 **8 Claims**

1. In a screen printing apparatus, the combination comprising:

a printing screen,

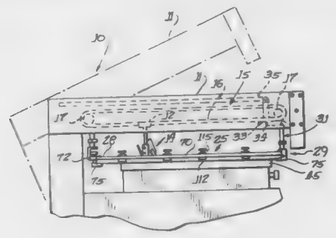
means defining a closed chamber with said printing screen,

an assemblage of a squeegee and flood bar mounted to travel across the printing screen with the flood bar being raised and the squeegee being lowered in a print stroke, and with the flood bar being lowered and the squeegee raised in a flood stroke, and

a seal means having at least a portion extending between the

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flood bar and the squeegee and movable vertically relative to said squeegee and said flood bar to seal against the loss

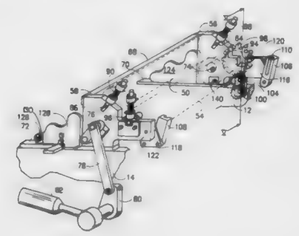


of vapors from the closed chamber at the location between the flood bar and the squeegee.

4,729,307
FORM ROLLER ATTACHMENT FOR LITHOGRAPHIC PRESS

Odis E. Harrison, 5076 College Grade Ct., San Diego, Calif. 92115, and Samuel J. Kolman, San Diego, Calif., assignors to Odis E. Harrison, San Diego, Calif.

Continuation of Ser. No. 831,469, Feb. 19, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 73,385
Int. Cl.[4] B41L *27/32;* **B41F** *7/26, 31/30*
U.S. Cl. 101—141 **5 Claims**



1. An ink roller attachment for a lithographic printing press having a main frame having a pair of spaced apart top edges, a plate cylinder, having a front and a back, for holding a lithographic printing plate, an ink system including an ink fountain and first and second form rollers engaging said plate cylinder, all said plate and rollers mounted within said main frame, said ink roller attachment comprising:

an auxiliary frame including a pair of spaced apart frame members connected together for detachable attachment to the main frame top edges of said printing press;

a pair of eccentrics rotatably mounted in coaxial alignment in said frame members for mounting a third form roller for selective engagement with said plate cylinder upon rotation of said pair of eccentrics;

an ink train comprising a plurality of ink rollers mounted in said auxiliary frame and including a third form roller mounted in said pair of eccentrics, an idler roller mounted between said frame members, a pair of plates extending outwardly from each of said frame members, and an oscillator roller mounted on arms attached to said plates, and said plurality of rollers forming an auxiliary ink train between a roller adjacent the ink fountain and the plate cylinder;

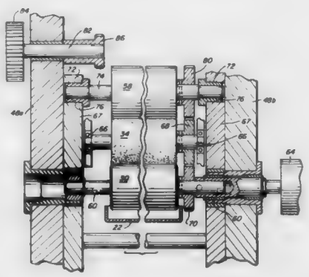
a gear train mounted on said auxiliary frame for driving said idler roller; and

linkage means mounted on said auxiliary frame for rotating said eccentrics for selectively positioning said third form roller in and out of engagement with said plate cylinder.

4,729,308
CONVERTIBLE MOISTURE/INK SYSTEM IN PRINTING OR DUPLICATING MACHINES

Stanley Witczak, Chicago, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Aug. 4, 1986, Ser. No. 892,556
Int. Cl.[4] B41F *7/26, 31/06/31/30*
U.S. Cl. 101—148 **2 Claims**



1. In a printing machine, a moisture feeding system for distributing moisture to a form roller in a rolling contact with a master cylinder, comprising:

a moisture fountain having a fountain roller rotatable in the fountain;

a pickup roller in rolling contact and driving connection with the fountain roller;

a transfer roller in rolling contact between the pickup roller and said form roller;

first drive means located at one axial end of the fountain and pickup rollers for conjointly driving the fountain and pickup rollers;

second drive means located at an axial end opposite said one end for selectively driving the transfer roller;

engaging means at one axial end of said transfer roller for operative driving connection with either said first and second drive means; and

means mounting the transfer roller so as to be invertible end-to-end for switching the operative driving connection of the transfer roller between said first and second drive means.

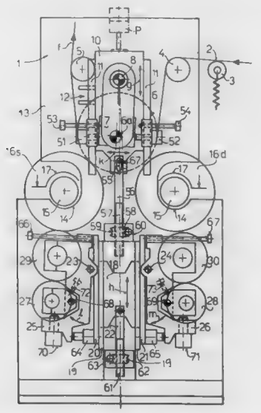
4,729,309
IMPRINTER

Mario Saterini; Gianfranco Gibellino, and Mario Forno, all of Casale Monferrato, Italy, assignors to Officine Meccaniche G. Cerutti S.p.A., Casale Monferrato, Italy

Filed Feb. 17, 1987, Ser. No. 15,393
Claims priority, application Italy, Feb. 17, 1986, 19432 A/86
Int. Cl.[4] B41F *5/18, 9/02, 13/32*
U.S. Cl. 101—152 **24 Claims**

1. Apparatus for applying printed matter to a running web of paper or the like, particularly an imprinter, comprising a frame; means defining a path for the web, including a counterpressure cylinder having coaxial first and second end portions; first and second levers rotatably supporting the respective end portions of said cylinder; pivot means for said levers, said pivot means defining an axis which is parallel to the common axis of said end portions; means for movably supporting said pivot means in said frame, including carriage means for said pivot means and guide means provided in said frame and defining for said carriage means a course extending at right angles to the axis of

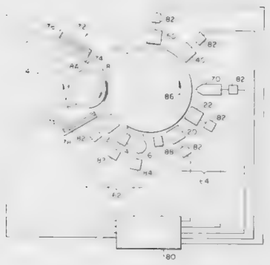
said pivot means; and first and second printing cylinders installed in said frame and flanking said counterpressure cylinder, said printing cylinders having axes which are parallel to the common axis of said end portions.



4,729,310
PRINTING METHOD

Franklin S. Love, III, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 9, 1982, Ser. No. 406,700
Int. Cl.[4] B41F *9/00*
U.S. Cl. 101—157 **16 Claims**



1. A method for preparing a gravure cylinder, having a latent image on at least one surface thereof, for use in a printing process wherein, after printing a first image, the cylinder may be re-imaged to permit printing of a second, different image, said method comprising:

(a) providing a clean hydrophilic contoured surface containing a plurality of gravure cells, said surface consisting essentially of an intrinsically substantially hydrophilic material;

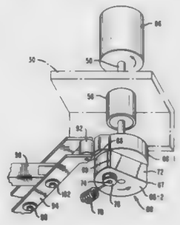
(b) applying, in direct contact with said surface, a substantially thin, hydrophobic and oleophilic layer of material, said material of said layer having an affinity for said surface and conforming to said contoured surface containing said cells without substantially changing the contour of said surface or substantially filling said cells and being capable of being removed and re-applied without substantial change to said contoured surface or substantial interruption of the printing process; and

(c) forming said latent image on said surface by removing, in an image-related configuration, a portion of said layer from said surface.

4,729,311
PRINTING APPARATUS INCLUDING A SINGLE REVOLUTION CLUTCH

Fredrik L. N. Kallin, and David G. Lant, both of Kitchener, Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1986, Ser. No. 939,502
Int. Cl.[4] B41F *13/22*
U.S. Cl. 101—232 **18 Claims**



1. A single revolution clutch comprising:

a frame;

an input shaft and an output shaft rotatably mounted in said frame;

an input member secured to said input shaft to rotate therewith;

an output member secured to said output shaft to rotate therewith and also having first and second cam sections thereon;

said first cam section having an abutment stop thereon;

actuation means mounted on said frame for movement between stopping and releasing positions relative to said output member;

said actuation means having a follower member which coacts with said abutment stop on said first cam section to stop the rotation of said output member in a stopped position when said actuation means is in said stopping position;

said second cam section having first and second control surfaces thereon, with said first control surface of said second cam section being uncoupled from said input member when said output member is in said stopped position;

resilient means for accelerating said output member from said stopped position to an engaging position where said second control surface of said second cam member engages said input member to thereby rotate said output member when said input shaft is rotated; and

moving means for moving said actuation means between said stopping and releasing positions.

4,729,312
INK DUCT FOR OFFSET OR LETTERPRESS PRINTING MACHINES

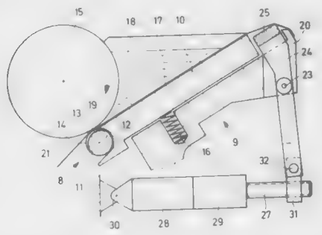
Anton Rodi, Leimen; Peter T. Blaser, Dielheim, and Walter Hofheinz, Heidelberg, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 28, 1986, Ser. No. 924,201
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1985, 3538256
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—350 **12 Claims**

1. Ink duct for offset or letterpress printing machines having an ink metering device including an ink duct roller and ink metering elements by means of which a respective ink gap is adjustable zonewise in axial direction of said ink duct roller, the ink metering device having a foil covering the metering

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elements with the metering elements pressable against the ink duct roller through the intermediary of said foil, said foil being fastened so as to be movable tangentially to the ink duct roller, comprising means for holding a location of the foil at a given distance from the ink duct roller corresponding to the width of



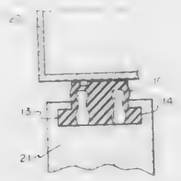
the respective ink gap, and adjusting means coupled with a motorized drive and engageable with said foil holding means for progressively moving the foil tangentially to the ink duct roller at a substantially uniform feed rate so as to dispose succeeding locations of the foil at said given distance from the ink duct roller.

4,729,313

TYPE SEGMENT FOR PRINTING ROLL

Lester R. Medlen, and James J. Nickels, both of Fort Wayne, Ind., assignors to Lincoln Logotype Company, Inc., Fort Wayne, Ind.

Filed Nov. 18, 1985, Ser. No. 799,003
Int. Cl.[4] B41B *1/02*
U.S. Cl. 101—380 **3 Claims**



1. A flexible type segment formed of elastomeric material in an initially flat condition, and adapted for mounting on the cylindrical surface of a printing roll that rolls about its axis against the surface of an object to be marked and prints indicia thereon, comprising:

an elongated base having generally flat, parallel top and bottom surfaces and being mounted on said roll with its bottom surface conforming to the cylindrical surface of the roll and extending longitudinally in a circumferential direction around the roll;

a raised print face formed on the top surface of said base and defining indicia to be inked and thereafter to apply an ink imprint to said surface of said object;

means forming a plurality of cylindrical recesses in said bottom surface of said base, said recesses extending through a major portion of the depth of said base, and being arranged in staggered rows wherein all lateral cross sections through said base parallel to the roll axis intersect at least one of said recesses, the area of the bottom surface of the base defined by the recesses being sufficient to accommodate substantial resilient flexure of the base in a direction normal to the surface of the roll;

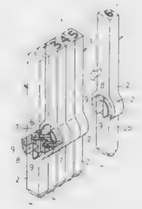
whereby, when said type segment is flexed to conform to said cylindrical surface of said roll, distortion occurs primarily in the lower portion of said base to minimize distortion in said print face and when said print face is pressed by said printing roll against the surface of said object, irregularities in surface form will produce a minimum of force variation and thus a minimum of print distortion.

4,729,314

STAMP ADAPTER FOR CONNECTION IN A SERIES

Takanobu Yamamoto, 1183-2, Asahicho, Nabarishi, Micken, Japan

Filed Feb. 11, 1987, Ser. No. 13,430
Int. Cl.[4] B41M *1/02*
U.S. Cl. 101—398 **4 Claims**



1. A stamp adapted for connection in a series, the stamp comprising:

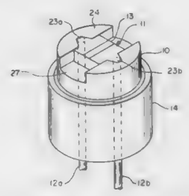
a plurality of handle means with each handle means having a rubber letter or figure overlaid to a non-porous first rubber layer and second porous rubber layer of 0.05 to 0.5 mm thickness; and with each handle means having a first tenon means and a plurality of first mortise means on one side of the handle means and a plurality of second tenon means and a second mortise means on the opposite side of the handle means, the first tenon means of one handle means being adapted to fit in the second mortise means of an adjacent handle means and the second plurality of tenon means of said one handle means being adapted to fit in the first plurality of mortise means of another adjacent handle means and wherein the mortise means is located between the plurality of second tenon means on said opposite side.

4,729,315

THIN FILM BRIDGE INITIATOR AND METHOD THEREFOR

Robert L. Proffit, Santa Clara County; Joan L. Wells; Alan L. Lause, both of San Mateo County, all of Calif., and John C. Cole, King County, Wash., assignors to Quantic Industries, Inc., San Carlos, Calif.

Filed Dec. 17, 1986, Ser. No. 943,380
Int. Cl.[4] F42B *3/12*
U.S. Cl. 102—202.9 **7 Claims**



1. A method of making a detonator utilizing an explosive containing shell having a bridge initiator for activating an adjacent primer and having a header with a pair of electrical pins comprising the following steps:

providing a header having a slot with adjacent said pins having flat ends;

fabricating a bridge initiator with a substrate carrying a pair of metallic beam-type leads connected by a thin film bridge;

placing said initiator in said slot of said header and permanently affixing said beam leads to said flat ends of said pins;

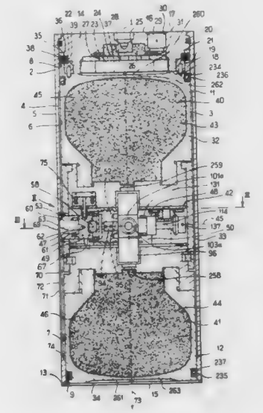
and completing fabrication of said detonator, including applying said primer to said initiator and placing said header in said explosive containing shell.

4,729,316

PROJECTILE CONTAINING A PYROTECHNIC CHARGE AND MEANS FOR DELAYED INITIATION OF THE CHARGE

Daniel R. J. Evrard, Toulouse; Hubert Calmettes, Villeneuve Tolosane, and Noel Robert, Muret, all of France, assignors to Etienne Lacroix tous Artifices S.A., Muret, France

Filed Dec. 29, 1986, Ser. No. 947,378
Claims priority, application France, Dec. 27, 1985, 85 19323
Int. Cl.[4] F42B *4/26;* **F42C** *15/34*
U.S. Cl. 102—255 **17 Claims**



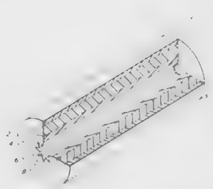
10. Projectile comprising a pyrotechnic charge, a mobile member in said projectile adapted to rotate between a safe position and an armed position, a passage in said mobile member, a pyrotechnic delay device at least part of which is accommodated in said passage and means for initiating said pyrotechnic charge via said pyrotechnic delay device, said passage being oriented so as to isolate functionally said pyrotechnic delay device from said pyrotechnic charge when said mobile member is in said safe position and to couple functionally said pyrotechnic delay device to said pyrotechnic charge when said mobile member is in said armed position, said projectile further comprising means on said mobile member and on said projectile to guide relative rotation between them about an axis fixed relative to said mobile member and relative to said projectile and mechanical arming means adapted to retain said mobile member in said safe position and against rotation about said axis relative to said projectile at least until said projectile is fired and to oblige said mobile member to move to said armed position when said projectile is fired by rotating about said axis relative to said projectile, fuse means and wherein said passage has a first branch on said axis and a second branch substantially perpendicular to said axis, said first branch is functionally coupled to said fuse means and said second branch is functionally coupled to said pyrotechnic charge in said armed position and functionally isolated from said pyrotechnic charge in said safe position.

4,729,317

CONCENTRIC LAYER RAMJET FUEL

George W. Burdette, and John P. Francis, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1986, Ser. No. 938,922
Int. Cl.[4] C06D *5/06*
U.S. Cl. 102—287 **5 Claims**



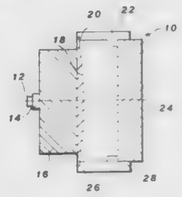
1. A solid fuel ramjet grain comprising a plurality of concentric layers of solid ramjet fuel having a perforation therethrough along the center axis of said grain, said perforation connected to a combustion after-chamber, said solid ramjet fuel layers comprising a pure hydroxyl-terminated polybutadiene hydrocarbon fuel or a mixture of a hydroxyl-terminated polybutadiene hydrocarbon fuel and from about 5 to about 60 percent by weight of an additive to increase the fuel regression rate selected from the group consisting of magnesium, boron carbide, aluminum, and zirconium such that, when burned in the operation of the ramjet, each said fuel layer produces a different level of thrust.

4,729,318

EXPLOSIVE PLANE-WAVE LENS

Stanley P. Marsh, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1987, Ser. No. 25,022
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—308 **13 Claims**



1. An explosive wave lens comprising:

a. a donor explosive;

b. detonator means for generating a detonation wave in said donor explosive;

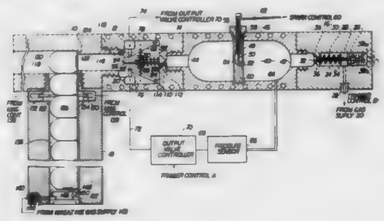
c. an acceptor explosive;

d. impactor means for receiving said detonation wave and for striking said acceptor explosive to produce a second detonation wave having a predetermined form in said acceptor explosive; and

e. spacer means for spacing said impactor means apart from said acceptor explosive.

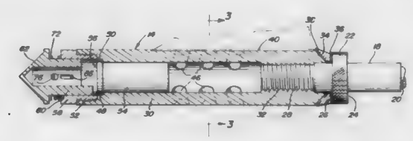
VOL 1088 ISS 2 MR 8 1988 UMI

4,729,319
CONTROLLED EXPLOSION PROJECTILE EJECTION SYSTEM
Edward Orlando, 823 Georgia St., Key West, Fla. 33040
Filed Feb. 3, 1987, Ser. No. 10,328
Int. Cl.[4] F42B *4/00*
U.S. Cl. 102—351 **20 Claims**



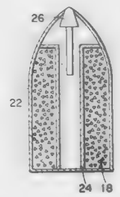
1. A controlled explosion projectile ejection system utilizing a source of combustible gas and ejecting a projectile based upon an input command signal from a generator, the system comprising:
- a combustion chamber means having a gas input port and a gas output port;
- a controllable sparking means for receiving said input command signal and producing a spark inside said chamber means;
- a one-way input valve intermediate said source of combustible gas and said gas input port controlling the amount of combustible gas passing therethrough into said chamber means;
- a barrel means, within which is disposed said projectile, attached to said chamber means at said gas output port;
- a cooling jacket about said chamber means having passages through which pass a freon gas coolant; and,
- wherein a controlled amount of said combustible gas is fed into said chamber means via said input valve, said combustible gas explodes by said spark from said sparking means based upon said input command signal and due to the expansion of said combustible gas, said projectile is ejected from said barrel means.

4,729,320
COMBUSTION EXHAUST ARROWHEAD
Robert G. Whitten, III, c/o Kenneth L. Funderburk, P.O. Box 1025, Phenix City, Ala. 36868-1025, assignor to R. Larry Phillips, Columbus, Ga.; Kenneth L. Funderburk, Phenix City, Ala. and Robert G. Whitten, II, Columbus, Ga., a part interest to each
Filed May 27, 1987, Ser. No. 54,803
Int. Cl.[4] F41B *5/04*
U.S. Cl. 102—371 **10 Claims**



1. An arrowhead for rapid kill of an animal, said arrowhead including an elongated tubular body having front and rear ends, said rear end of said body including mounting means for mounting said body on the forward end of an arrow shaft with said body substantially coaxial with the said shaft, the front end of said body including a counterbore defining a forwardly facing seat, a rearwardly facing blank cartridge telescoped into the front end of said body and including a base end equipped with a radially outwardly projecting base flange seated against said seat and a rearwardly facing ignition primer area for impact thereagainst by a firing pin, a tubular plug removably mounted from the front end of said body and engaged with said base end from forward of the latter to maintain said flange seated against said seat, elongated firing pin means lengthwise reciprocal relative to said tubular plug and disposed lengthwise relative to said body, said firing pin means including a forward target impact head portion projecting forward of said plug and comprising the forwardmost portion of said head and a rear firing pin portion aligned and disposed for impact with said ignition primer area upon rearward shifting of said firing pin means relative to said plug, said plug and firing pin means including coacting limit means establishing limits of reciprocation of said firing pin means relative to said plug, said body, rearward of said cartridge, including lateral port means formed therein opening outwardly from the interior of said body through the exterior thereof.

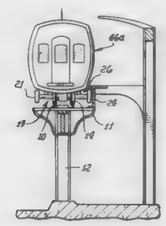
4,729,321
SHELL HAVING PYRAMID SHAPED SHOT
Gilbert A. Stafford, 2600 W. Newton, Tulsa, Okla. 74127
Division of Ser. No. 869,317, Jun. 2, 1986, Pat. No. 4,686,904. This application Jun. 24, 1987, Ser. No. 66,058
Int. Cl.[4] F42B *13/48*
U.S. Cl. 102—496 **1 Claim**



1. A shell comprising:
- a cylindrical casing;
- an explosive contained within a concentric cylindrical package of reduced external diameter within said cylindrical casing;
- means to ignite said explosive; and
- a plurality of metallic pellets positioned in the annular area between said explosive and said casing, said pellets each being in the form of a polyhedron having a polygonal base and triangular faces meeting in a common apex, the base and all faces being equally dimensioned and shaped.

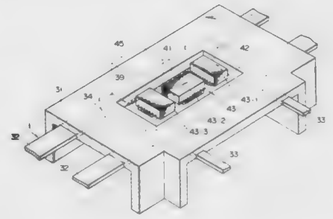
4,729,322
CANTILEVERED TRAIN SYSTEM
Russell P. Harshberger, Covina, Calif., assignor to Donald W. Harshberger, Covina, Calif.
Continuation of Ser. No. 871852, Jun. 9, 1986, abandoned. This application Jun. 1, 1987, Ser. No. 56,755
Int. Cl.[4] B61F *9/00*; **B60S** *13/02*
U.S. Cl. 104—245 **15 Claims**

1. In combination, primary rail means and apparatus adapted to travel on said primary rail means, said apparatus comprising:
- (a) a truck having primary wheel means adapted to roll on said primary rail means,
- (b) elongated auxiliary rail means, and side wheel means carried by the truck and projecting at the side thereof for car stabilizing upward engagement with said elongated auxiliary rail means, above the side wheel means, and above the level of said primary rail means,
- (c) said auxiliary rail means sidewardly offset from said primary rail means and extending above said side wheel means for engagement thereby,
- (d) and including a turntable supporting extensions of said primary rail means and of said auxiliary rail means, and structure supporting the turntable for rotation about a vertical axis,
- (e) said primary rail extensions including two rails both laterally offset from said vertical turntable axis, at one side



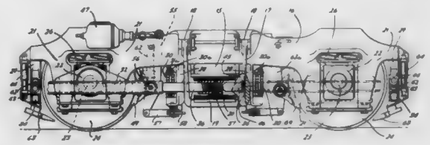
thereof, and said auxiliary rail extension is located closer to said axis than said two rails,
- (f) and a car body eccentrically mounted on the truck to exert a force couple tending to elevate said side wheel menas toward said auxiliary rail means and said extension thereof.

4,729,323
TRANSPORTATION SYSTEM OF A FLOATED-CARRIER TYPE
Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 27, 1987, Ser. No. 30,750
Claims priority, application Japan, Mar. 27, 1986, 61-69209
Int. Cl.[4] B60L *13/06*
U.S. Cl. 104—284 **12 Claims**



1. A transportation system of a floated-carrier type for transporting a cargo between predetermined positions, comprising:
- a guide rail formed of a ferromagnetic material and including at least one first rail section and at least one second rail section intersecting the first rail section;
- a coupling section connecting the first and second rail sections;
- a carrier for carrying the cargo, said carrier being capable of running along the guide rail;
- at least one magnetic unit having an electromagnet provided on the carrier so as to face the guide rail, said carrier being adapted to be suspended from the guide rail, in a non-contact manner, by means of an electromagnetic attractive force acting between the magnetic unit and the guide rail, so that a gap of a predetermined size is maintained between the magnetic unit and the guide rail;
- transfer means provided at the coupling section, and adapted so that, at the coupling section, the carrier, having sc far been running along the first rail section, is stopped, and is then transferred from the coupling section to the second rail section, all in a non-contact manner.

4,729,324
MULTIPLE AXLE SELF-STEERING POWERED LOCOMOTIVE TRUCK
Harold A. List, 38 W. University Ave., Bethlehem, Pa. 18015
Continuation of Ser. No. 422,609, Sep. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 948,878, Oct. 5, 1978, Pat. No. 4,455,946, which is a continuation-in-part of Ser. No. 608,596, Aug. 28, 1975, Pat. No. 4,131,069, which is a continuation-in-part of Ser. No. 438,334, Jan. 31, 1974, abandoned. This application Jun. 5, 1986, Ser. No. 873,291
Int. Cl.[4] B61F *5/38*
U.S. Cl. 105—168 **3 Claims**

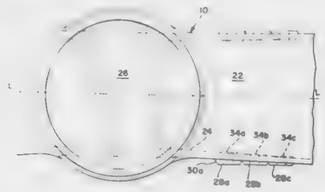


1. A powered railway truck adapted for use under the body of a locomotive, comprising:
- (a) truck framing including side frames having pairs of pedestal jaws for accommodating journal bearings of at least two axled wheelsets,
- (b) at least two axled wheelsets each comprising an axle and a pair of wheels fixed on its axle,
- (c) a pair of journal bearings for each axle, the journal bearings for each axle being received in a pair of pedestal jaws each having clearance providing freedom for yaw motion of the wheelsets with respect to the truck framing and with respect to each other,
- (d) means in the mid region of the truck framing for mounting the truck under the body of the locomotive comprising a truck swivel joint for interconnecting the truck framing with the body of the locomotive and providing freedom for swivel motion of the truck as a whole with respect to the body of the locomotiove about an upright swivel axis between the axled wheelsets,
- (e) at least one of the axled wheelsets being powered by a driving motor mounted thereon and having motor torque recation means connected to the truck framing, the motor torque reaction means being yieldable to accommodate yaw motion of the wheelset with respect to the truck framing,
- (f) a steering arm for each wheelset, each steering arm being connected with both of the journal bearings for the associated wheelset and movable therewith in yaw within the clearance provided in the associated pair of pedestal jaws, the steering arms being extended from the journal bearings into the central region between the wheelsets and between the sides of the truck,
- (g) abutment means in the region of the centerline of the truck for transmitting tractive force from the steering arm of any powered wheelset to the truck framing,
- (h) mechanism pivotally interconnecting the steering arms, including pivot means having an upright pivot axis in said central region between the wheelsets and between the sides of the truck and having means providing for relative yawing motion and means providing for relative rolling motion of the wheelsets with their respective steering arms, said pivot means being shiftably movable laterally of the vehicle independently of the vehicle body and independently of the truck framing,
- (i) and mechanism interconnecting each steering arm and the truck framing in the region between the wheelset and the adjacent end of the truck framing, each such mechanism including means providing restraint for relative movement of the steering arm and said adjacent end of the truck framing laterally of the truck, and further including means providing freedom for rolling motion of the steering arm with respect to the truck framing and for lateral shifting

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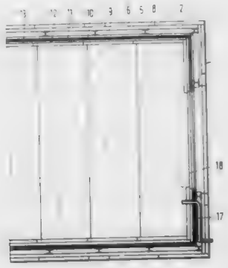
movement of the pivot means interconnecting the steering arms.

4,729,325
BOLSTER WITH IMPROVED BRAKE ASSEMBLY MOUNTING ARRANGEMENT
James A. Henkel, Park Forest, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.
Filed Apr. 7, 1986, Ser. No. 848,788
Int. Cl.⁴ B61F *1/08, 5/50*
U.S. Cl. 105—226 **4 Claims**



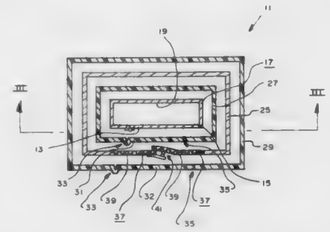
1. In a railway vehicle truck bolster including a top web, a center plate located substantially intermediate the ends thereof and walls depending from said top web, a brake assembly mounting arrangement for mounting the brake assembly on said bolster, said mounting arrangement comprising three separate circular raised bosses disposed in a triangular pattern projecting, from each of said side walls, said bosses terminating in flat exterior surfaces lying in a common plane parallel to the longitudinal axis of said bolster, and a bore formed in each of said bosses for receiving bolts of nut and bolt assemblies used to fasten said brake assembly to said bolster, said bosses having flat interior surfaces that are in planar alignment with the bosses flat outer surfaces to provide separate seats for each of said nut and bolt assemblies.

4,729,326
WALK-IN SHELTER
Klaus Richter, Berlin, Fed. Rep. of Germany, assignor to Allgemeiner Brandschutz G.u.M. Breivogel GmbH, Mainz, Fed. Rep. of Germany
Continuation of Ser. No. 759,470, Jul. 26, 1985, Pat. No. 4,628,826. This application Oct. 17, 1986, Ser. No. 920,529
Claims priority, application Switzerland, Jul. 27, 1984, 3615/84
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.⁴ E05G *3/00*
U.S. Cl. 109—1 S **19 Claims**



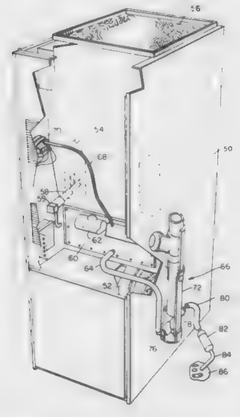
1. A walk-in shelter for protection against undesired heat, radiation, gas and water action and against mechanical stressing, particularly for data carriers, comprising walls including several different layers, outer and inner layers (**2, 13**) constructed as a closed metal envelope, a metallic supporting frame (**8**) provided between and spaced from the outer and inner layers (**2, 13**), insulating layers (**6, 10, 12**) between outer layer (**2**), supporting frame (**8**) and inner layer (**13**), with high thermal insulation and mechanical strength, and the outer and inner layers (**2, 13**), supporting frame (**8**) and insulating layers (**6, 10, 12**), set up independently of one another, are self-supporting and not mechanically interconnected.

4,729,327
SECURITY BOX PROTECTION MEANS
Betty J. Demonbreun, 2277 Union Ave., Unit 106, Memphis, Tenn. 38104
Division of Ser. No. 577,517, Feb. 6, 1984, Pat. No. 4,641,507. This application Oct. 2, 1986, Ser. No. 914,320
Int. Cl.⁴ E05G *3/00;* **G08B** *13/22*
U.S. Cl. 109—35 **4 Claims**



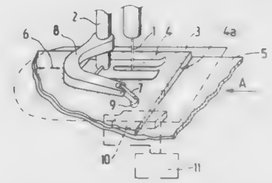
1. Protection means for preventing unauthorized entry through a door member of the type movably associated with a door jamb, said protection means comprising:
(a) electrically charged cover means for completely covering said door member and for electrically shocking anyone who attempts unauthorized entry through the door member;
(b) electrical insulator inner cover means for placement between said electrically charged cover means and the door member and for electrically insulating the door member from said electrically charged cover means;
(c) electrical insulator outer cover means for placement over said electrically charged cover means and for preventing inadvertent contact with said electrically charged cover means; said door member being part of a security box means; said inner cover means defining a box for completely enclosing said security box means; said electrically charged cover means defining a box for completely enclosing said inner cover means and said security box means; said outer cover means defining a box for completely enclosing said electrically charged cover means, said inner cover means and said security box means;
(d) an alarm signal means for producing an alarm signal;
(e) alarm switch means for activating said alarm signal means when said outer cover means is transversed;
(f) remote switch means for deactivating said electrically charged cover means and said alarm signal means; said inner cover means including a door member for allowing access to said door member of said security box means; said electrically charged cover means including a door member for allowing access to said door member of said inner cover means; said outer cover means including a door member for allowing access to said door member of said electrically charged cover means; and
(g) lock means for locking said door member of said security box means in a closed position with respect to said door jamb thereof, said lock means including a first lock means movably mounted in said door jamb for movement between a locked position in which said door member of said security box means is locked in said closed position and an unlocked position, said lock means including a second lock means movably mounted in said door jamb for movement between a locked position in which said first lock means is locked in said locked position and an unlocked position.

4,729,328
TRAP ASSEMBLY FOR A CONDENSING FOSSIL FUEL FURNACE
Timothy J. Shellenberger, Fort Smith, Ark., assignor to Rheem Manufacturing Company, New York, N.Y.
Filed Apr. 23, 1987, Ser. No. 41,838
Int. Cl.⁴ F23N *5/24*
U.S. Cl. 110—193 **3 Claims**



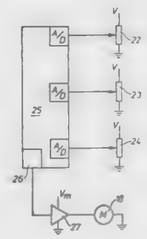
1. In a furnace of the type including a heat exchanger with a combustion chamber for combusting a fuel and air mixture;
means for introducing a fuel and air mixture to the chamber;
means for igniting the fuel and air mixture;
a combustion product plenum connected to the chamber for directing combustion products from the combustion chamber to a flue gas exhaust passage;
a fluid drain conduit for draining combustion product condensate from the combustion chamber and the plenum;
the improvement comprising in combination:
a trap assembly for the drain conduit, said assembly including trap means to collect and pass through condensate from the combustion chamber and plenum and said assembly also including means to terminate furnace operation if condensate flow from the trap means becomes blocked, said trap assembly including:
a vertical tube sealed at its lower end and having a side wall, said tube also including a condensate conduit outlet adjacent the lower end, a condensate conduit inlet above the outlet, a flue gas outlet vertically above the conduit inlet and extending through the side wall of the tube connected to the combustion chamber and plenum, a flue gas outlet at the upper end of the vertical tube above the flue gas inlet;
a condensate float in the tube, said float having a density less than the density of water, said float translatable in the vertical direction in the tube on condensate in the tube between a first lower position and a second raised position for closing the flue gas path from the flue gas inlet through the flue gas outlet, said float including a cap member conforming generally in shape with the flue gas outlet for sealing engagement with the outlet when the float is in the raised position, said cap defining means for aligning the float within the tube and for maintaining alignment of the float in the tube;
pressure sensing means connected to the plenum; and
switch means responsive to the pressure sensing means for terminating operation of the means for introducing a fuel and air mixture to the chamber of the furnace whenever the cap closes the flue gas outlet and thereby changes the pressure in the plenum.

4,729,329
MAGNETIC DETECTION DEVICE FOR SEWING MACHINE WORKPIECE
Charly Leclaire, Dourges, France, assignor to Prouvost S.A., Nord, France
Filed Jun. 3, 1986, Ser. No. 869,875
Claims priority, application France, Jun. 3, 1985, 85 08319
Int. Cl.⁴ D05B *19/00, 29/00*
U.S. Cl. 112—272 **6 Claims**



1. A device for detecting the passage of the edge (**4***a*) of a piece (**4**) of material, not parallel to the advancing direction (**A**) of the material, for a sewing machine comprising more particularly a presser foot (**2**), a needle (**1**) and a needle plate (**3**), characterized in that it comprises means (**7**) for generating a magnetic field and means (**10**) responsive to this magnetic field, one of said means being coupled to said presser foot (**2**) so that they are, on the one hand, applied to said piece of material (**4**) at a point situated at a distance and in front of said needle (**1**) of the sewing machine relatively to said advancing direction (**A**) of the material, and, on the other hand, moved with respect to said presser foot (**2**) in a direction substantially perpendicular to the plane of said needle plate (**3**), the other means being mounted opposite the first means and fixedly in the sewing machine, under said needle plate.

4,729,330
SPEED CONTROL SYSTEM FOR A SEWING MACHINE
Kenneth O. E. Skogward, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Sweden
Filed Mar. 5, 1987, Ser. No. 22,129
Claims priority, application Sweden, Mar. 11, 1986, 8601130
Int. Cl.⁴ D05B *69/18, 27/22*
U.S. Cl. 112—315 **4 Claims**



1. In a speed control arrangement for a sewing machine having a motor, a control for setting stitch length (s) and controllable means for controlling the r.p.m. of said motor, the improvement wherein the arrangement comprises separate control means for setting a feeding speed (v) of cloth on the stitch plate of the sewing machine, said controllable means comprising means responsive to the stitch length (s) and the

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feeding speed (v) for limiting the r.p.m. (r) of the motor in accordance with the formula:

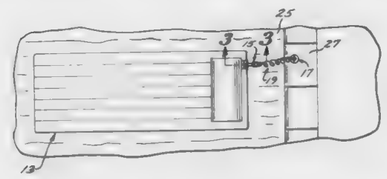
$r > v/s$

said controllable means comprising calculating means for determining a maximum current value for the r.p.m. control of said motor in accordance with said formula and means inhibiting the exceeding of said maximum current value.

4,729,331
LIGHTWEIGHT INFLATABLE SWIM RAFT ANCHOR APPARATUS

Cathy Eggleston, 5404 Oleta, Long Beach, Calif. 90815

Filed Oct. 3, 1986, Ser. No. 915,054
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 **7 Claims**



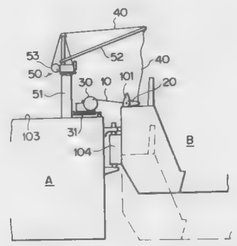
1. An anchor apparatus for attachment to a prefabricated, light weight, inflatable, swim raft for anchoring same in a swimming pool and comprising:
- a fastener device for attachment to the surface of such prefabricated swim raft and including a mounting pad formed with one side for attachment to such raft surface, such device being further formed with an eye;
- pressure sensitive adhesive bonding means on said one side of said mounting pad for rapidly bonding said mounting pad on said raft;
- a backing sheet temporarily covering said bonding means and releasable to expose said bonding means;
- a manually releasable hook for hooking into said eye;
- anchor means; and
- a tether connected between said hook and anchor means whereby said anchor apparatus may be transported to a site of use, said backing sheet removed from said mounting pad and said pad bonded to said surface of said swim raft such that said hook may be connected to said eye to enable said anchor to be deployed to anchor such swim raft in such pool during use.

4,729,332
MOORING APPARATUS

Harutaka Ohta; Kazuchiyo Miyamoto, both of Kanagawa; Arataro Terayama, Tokyo; Seiji Maruhashi, and Shigeru Gohdo, both of Kanagawa, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 756,497, filed PCT JP85/00089, Feb. 26, 1985, published as WO85/05608, Dec. 19, 1985, Pat. No. 4,708,082.
This application Jul. 1, 1987, Ser. No. 68,443
Claims priority, application Japan, Dec. 21, 1983, 58-239939; May 31, 1984, 59-79424[U]
Int. Cl.[4] B63B *21/16*
U.S. Cl. 114—230 **1 Claim**

1. A mooring arrangement comprising at least two mooring apparatus disposed a selected distance apart from each other on a deck (**103**) of a moving vessel (A) for mooring the moving vessel (A) to another vessel (B) or a quay having a bitt (**101**) or bollard at locations opposite to the mooring apparatus, each said mooring apparatus comprising
- a vertically extending post (**51**) rotatably anchored to said deck (**103**) and rotatable in a horizontal plane;
- an arm (**52**) attached to a top of said post and disposed to be horizontally rotatable with said post and independently rotatable in a vertical plane, said arm having a pulley at an end opposite to the attached end for holding a cable (**40**);
- a coiling mechanism (**53**) attached to said top of said post and holding one end of said cable (**40**) for coiling said cable (**40**);
- a bitt part (**20**) connected to the other end of said cable (**40**) and located below said pulley opposite said coiling mechanism (**53**), and comprising a geometric structure shaped to fit between or about said bitt or bollard (**101**) on said other vessel or quay;
- a bridle (**10**) having one end thereof connected to said bitt part (**21**); and
- a winch (**30**) connected to another end of said bridle for tigthening and loosening said bitt part after attachment to said bitt or bollard, said winch being disposed below said arm (**52**) and connected to said post to be simultaneously rotatable in the horizontal plane with said post and always in the same direction as said arm (**2**);
- whereby to effect mooring, the moving vessel (**A**) is brought adjacent the other vessel (B) or quay with the at least two



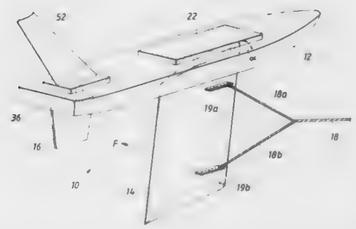
mooring apparatus positioned opposite the bitts or bollards on the other vessel or quay, then the post and winch are concurrently rotated in the horizontal plane and the arm is vertically rotated so that the end of the arm having the pulley extends slightly further into the other vessel or quay than the corresponding bit or bollard, then the coiling mechanism runs out the cable until the bitt part is about or within the bollard or bitt while concurrently the winch releases the bridle to allow sufficient length of bridle, and then the winch rolls in the bridle until the bitt part fits securely in or about the bitt or bollard; and
- whereby to effect dismooring, the winch releases the bridle to allow the bit part ot come off or out of contact with the bitt or bollard, then the coiling mechanism coils the cable and runs up the bitt part vertically to about the point of the pulley located at an end of the arm, and then the post and winch are horizontally rotated so that the arm is within the confines of the vessel;
- wherein said bitt part is a pear shaped structure which fits within a pair of bitts located on the other vessel or quay.

4,729,333
REMOTELY-CONTROLLABLE PARAVANE

Robert A. Kirby, Houston, Tex., and Jorgen E. Petersen, Horsens, Denmark, assignors to Exxon Production Research Company, Houston, Tex.

Filed Jul. 9, 1986, Ser. No. 884,135
Int. Cl.[4] B63B *21/66*
U.S. Cl. 114—244 **10 Claims**

1. A remotely-controllable paravane for use in towing an object in a body of water along a discrete pathway parallel to but laterally spaced from the pathway of the towing vessel, said paravane comprising:
- a buoyant hull having a longitudinal centerline;
- a keel attached to said buoyant hull and extending generally downwardly into said body of water, said keel having a pressure side, a reduced-pressure side, and a cambered hydrofoil shaped cross section, said cross section having a chord line, said keel being attached to said buoyant hull so that said chord line forms a positive angle of attack with said longitudinal centerline of said buoyant hull, whereby passage of said keel through said body of water generates a substantially lateral hydrodynamic force on said keel to move said paravane laterally away from said pathway of said towing vessel;

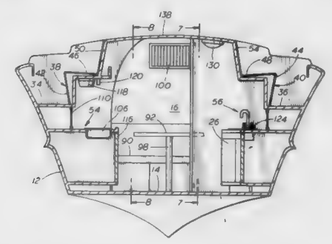


- remotely-controllable steering means attached to said buoyant hull, said steering means adapted to be remotely controlled from said towing vessel to control the course of said paravane; and
- a tow cable having a first end attached to said towing vessel and a second end attached to said paravane.

4,729,334
COMMERCIAL SPORT FISHING BOAT

Prescott L. DeJean, Jr., 3606 Third Ave. N, Texas City, Tex. 77590

Filed Oct. 16, 1986, Ser. No. 919,802
Int. Cl.[4] B63B *35/14*
U.S. Cl. 114—255 **12 Claims**

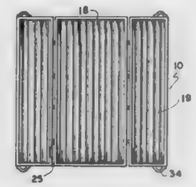


1. An upper deck for a commercial sport fishing boat having a hull defining a peripheral rail and a lower deck fixed inside the hull with a cabin supported on said lower deck, said upper deck comprising:
- a unitary member spanning said hull from rail to rail, said member defining at least one walkway extending between a portion of said rail and a like side wall of said cabin; and
- a bench seat facing outwardly toward said walkway, said bench seat having riser, seat and back portions forming a portion of said side wall of said cabin and providing head room inside said cabin.

4,729,335
FLOTATION ASSEMBLY

Gerda Vidovic, 446-3rd St., S. Kenora, Ontario, Canada P9N 1J1

Filed Jan. 20, 1987, Ser. No. 5,419
Int. Cl.[4] B63B *35/58*
U.S. Cl. 114—266 **27 Claims**

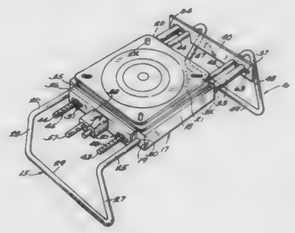


1. A flotation module for use in water comprising in combination a substantially rectangular, vertically situated frame including upper side edges and an upper surface spanning said upper side edges of said frame, and flotation means in said frame and below said upper surface, said flotation means being situated one within each side of said frame and extending longitudinally thereof, said frame being formed from synthetic plastic and including a pair of longitudinally extending sides and a pair of ends, each of said sides including an upper longitudinally extending member and a lower longitudinally extending member spaced and parallel to said member, at least one intermediate longitudinally extending member between said upper and lower members, and means to detachably retain said flotation means in said frame; said means to detachably retain said flotation means including a base panel extending inwardly from the lower edges of each of said longitudinally extending lower members, parallel to said upper surface, said flotation means engaging said side, said base member and the underside of said upper surface, said longitudinally extending side being hingedly secured along the longitudinal edges of said upper surface whereby said side and said base member can fold downwardly to an operating position and upwardly to rest on said upper surface in an inoperative and storage position, said base member also being hinged to the longitudinally extending lower member and being foldable upwardly to adjacent the inner surface of said longitudinally extending side.

4,729,336
BOAT SEAT BRACKET SECURITY DEVICE

Richard E. Rohne, 2115 S. 62nd St., West Allis, Wis. 53219

Filed Jul. 6, 1987, Ser. No. 70,308
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—363 **5 Claims**



2. A device for locking a boat seat bracket to a seat support in a boat, the bracket comprising a base having opposite sides, two clamping members each comprised of a part for gripping the seat support and a pair of parallel rods extending, respec-

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tively, in opposite directions from said parts slidably through said base, the end portions of each pair of rods having threads where they project through said base,

said device comprising:

a first lock bar means having spaced apart slotted holes for sliding over the threads on the pair of rods projecting from one side of said base,

wing nuts for being turned onto the threads of said rods with the wings of said nuts leading so when said first lock bar means is forced in a direction to cause said slots to pass onto the wing nuts turning of said nuts is prevented,

clamp bar means having holes for sliding over the threads of the other pair of rods projecting from the other side of said base and a bolt for a lock fixed on and extending from said clamp bar means,

wing nuts for being turned onto said other pair of rods with the wings of said nuts trailing for securing said clamp bar means,

a second lock bar means having slotted holes for sliding over said other threaded rods sufficiently far for the wings of said wing nuts to enter the slotted holes to prevent said nuts from being turned and said second lock bar means having holes for sliding over said lock bolt such that by engaging the body of a lock to the lock bolt the lock bar means is locked in place.

4,729,337

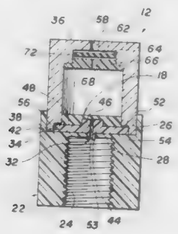
AIR PRESSURE INDICATOR

Edgar Schopp, 2210 Gratton, Riverside, Calif. 92504

Continuation-in-part of Ser. No. 885,848, Jul. 16, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 31,754

Int. Cl.⁴ B60C *23/02*

U.S. Cl. 116—34 R **2 Claims**



1. An air pressure indicator for mounting on an air inflatable tire valve comprising:

a main body housing having a threaded bore extending from one end thereof and a second bore extending from another other end thereof, said bores being coaxial and terminating at a flange formed in a plane perpendicular to the body housing axis and an aperture formed in said flange interconnecting said bores;

a valve activator plug formed of a shoulder having a pair of opposed sides and having a stem extending from one side of the shoulder along an axis perpendicular to the plane of said shoulder and being positionable in said housing aperture when one surface of said shoulder is juxtaposed with said housing flange and said shoulder is positioned in said second bore, the other side of said shoulder having a lip formed around a periphery thereof, and a fluid passage formed along an axis perpendicular to said shoulder enabling said fluid to pass from one side of said shoulder to the other side thereof, said fluid passage extending through said stem;

an inflatable balloon defined by a cup-shaped member whose free edge defines a periphery, said balloon having a flange extending along the periphery thereof for securing said balloon to said valve activator lip, said balloon being inflatable to indicate a desired condition of air inflation by fluid passing through said valve activator fluid passage, said balloon deflating when the air pressure drops below a predetermined air pressure level,

a transparent cap positioned over said balloon, said cap having an enlarged bore terminating at an outwardly facing shoulder, said cap shoulder being positioned on said balloon flange for preventing movement of said balloon flange with respect to said valve activator plug; an air passage formed in said transparent cap, said air passage enabling one surface of said balloon to be subjected to normal atmospheric air pressure, and a free floating valve positioned in a cavity formed in a platen perpendicular to said air passage, said cavity being defined by said transparent cap on one side thereof and a disc member having an air passage therethrough on the other side side thereof, said valve sealing said air passage in said cap should said inflatable balloon rupture.

4,729,338

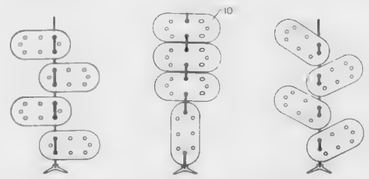
MNEMONIC IDENTIFICATION MEANS

Alfred Relzmann, Oakridge E (#61), Deerfield Beach, Fla. 33442

Filed May 18, 1987, Ser. No. 50,956

Int. Cl.⁴ B60Q *11/00;* **B61L** *15/00*

U.S. Cl. 116—209 **10 Claims**



1. A mnemonic means for identifying one object out of a multiplicity of like objects, the mnemonic means comprising:

(a) an adhesion means proportioned for placement on a substantially horizontal surface of said one object to be identified;

(b) an elongate, resilient linear member having a first end and a second end, said member secured, at said first end, to said ashesion means and placed in a substantially vertical orientation relative to said horizontal surface of said object to be identified;

(c) a plurality of resilient uniplanar elements, each of said elements having therein a plurality of holes, each of said holes proportioned to permit the slideable passage of said second end of said linear member through a selected pair of said holes after bending of said uniplanar element has occurred, said holes further proportioned to frictionally contact said linear member after said passage of said linear member therethru, thereby maintaining said uniplanar element in a resiliently deformed co-action with said linear member,

whereby the orientation of one or more of said plurality of the uni-planar on said linear member may be selectively changed through a change in said selected pair of holes within said uniplanar element through which said linear member has been passed and, further whereby, through the use of a predetermined sequence of respective orientations for each of said plurality of elements, the identification of said one object out of said multiplicity of like objects, may be achieved.

4,729,339

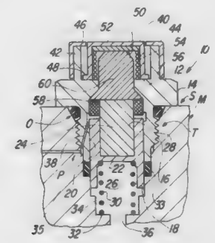
PRESSURE DIFFERENTIAL INDICATOR WITH NON-MECHANICAL THERMAL LOCKOUT

James C. Whiting, High Point, N.C., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Apr. 21, 1986, Ser. No. 854,305

Int. Cl.⁴ G01L *19/12*

U.S. Cl. 116—268 **37 Claims**



1. An indicator for use in a fluid system for indicating an excessive differential in pressure of a fluid in said system between a high pressure location in said fluid system and a low pressure location in said fluid system, said indicator comprising:

a reciprocable piston having a first end exposed to said fluid at said high pressure location in said fluid system and a second end exposed to said fluid at said low pressure location in said fluid system;

a spring resiliently biasing said piston toward said high pressure location in said fluid system, said spring resiliently biasing said piston will maintain said piston at said high pressure location when a difference in pressure between said high pressure location in said fluid system and said low pressure location in said fluid system is below a predetermined pressure differential, said spring resiliently biasing said piston further will not maintain said piston at said high pressure location in said fluid system when said difference in pressure exceeds said predetermined pressure differential, whereby said piston will move toward said low pressure location in said fluid system when said difference in pressure exceeds said predetermined pressure differential;

permanent magnet means carried by said reciprocable piston;

a magnetically permeable pole piece means having a first end positioned adjacent said permanent magnet means when said reciprocable piston is at said high pressure location in said fluid system said pole piece means having a second end opposite said first end

indicator button means having a magnetically permeable element carried thereby, said indicator button means being reciprocable between a first position at which said magnetically permeable element is adjacent said second end of said magnetically permeable pole piece and a second position in which said magnetically permeable element is spaced apart from said second end of said magnetically permeable pole piece, said permanent magnet means imposing a magnetic force transmitted at least in part by said magnetically permeable pole piece on said magnetically permeable element that attracts said indicator button means toward said first position;

a second spring resiliently biasing said indicator button means toward said second position, said second spring biasing said indicator button means thereby imposing a biasing force which is less than said magnetic force when said reciprocable piston is at said high pressure location and being greater than said magnetic force when said reciprocable piston is at said low pressure location, whereby said second spring will move said indicator button means from said first position to said second position when said reciprocable piston moves from said high pressure location in said fluid system to said low pressure location in said fluid system; and

an annular thermal ferrite element that is magnetic at temperatures below a narrow, predetermined temperature range and that is substantially less magnetic at temperatures above said narrow predetermined temperature range, said annular thermal ferrite element being located adjacent said first end of said magnetically permeable pole piece, said thermal ferrite element being positioned to surround said permanent magnet means when said reciprocable piston is at said high pressure location in said fluid system in order to impose a magnetic force on said indicator button means when said thermal ferrite element is at a temperature below said narrow, predetermined temperature range, such that said magnetic force causes said indicator button means to remain at said first position when said reciprocable piston moves to said low pressure location in said fluid system, and further, such that said magnetic force imposed by said thermal ferrite element on said indicator button means reduces when said thermal ferrite element is at a temperature above said narrow, predetermined temperature range thereby permitting said biasing force of said second spring to move said indicator button means from said first position to said second position as said reciprocable piston moves to said low pressure location in said fluid system.

4,729,340

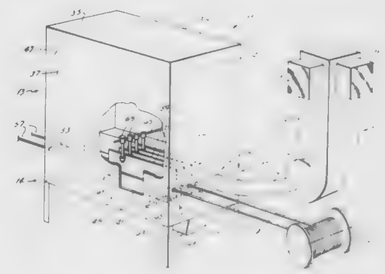
METHOD AND APPARATUS FOR POWDER COATING ELONGATED OBJECTS

James F. Zeiss, 4231 Ivanhoe Dr.; Allen Newman, 2640 Collins Dr., both of Lorain, Ohio 44053, and Gunther J. Lissy, 109 Northwood Hollow Ct., Amherst, Ohio 44001

Continuation of Ser. No. 605,292, Apr. 30, 1984, abandoned. This application Jul. 16, 1985, Ser. No. 755,957

Int. Cl.⁴ B05D *15/04, 15/00*

U.S. Cl. 118—634 **2 Claims**



1. A powder spray booth for coating elongated articles with a particulate powder material comprising:

a generally rectangular-shaped booth having opposed sides, opposed end sections, a ceiling and a floor;

a plurality of partitions each having an upper edge and a lower edge;

means for mounting said partitions within said booth, each of said partitions extending longitudinally of said booth and each being mounted in a vertical plane parallel to said sides of said booth, said partitions being mounted between said ceiling and floor of said booth with said upper edge thereof being spaced a substantial distance from said ceiling and said lower edge thereof being spaced a substantial distance from said floor, said partitions being spaced from one another to form a compartment between adjacent partitions;

electrostatic powder spraying means mounted within said

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booth and adapted to spray particulate powder material into each of said compartments between adjacent partitions;

means for moving elongated articles through said compartments within said booth, said electrostatic powder spraying means being adapted to spray particulate powder material onto the elongated articles moving within said compartments for coating thereof; and

filter/recovery means for collecting and filtering oversprayed particulate powder material dispersed from said electrostatic powder spraying means but not coating the elongated articles, the oversprayed particulate powder material being circulated beneath said partitions for collection in said filter recovery means.

4,729,341

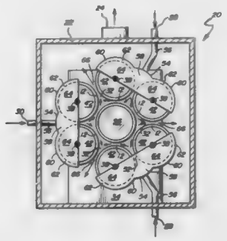
METHOD AND APPARATUS FOR MAKING ELECTROPHOTOGRAPHIC DEVICES

Eugene W. Fournier, Garden City; Erik J. Bjornard, Birmingham; Annette G. Johncock, Walled Lake, and Joachim Doehler, Union Lake, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 777,096, Sep. 18, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 934,365

Int. Cl.⁴ C23C *16/48*

U.S. Cl. 118—723 **23 Claims**



1. Apparatus for depositing a layer of material onto the outer surface of a plurality of substantially cylindrically-shaped members, said apparatus comprising:

a substantially closed deposition chamber;

a plurality of substantially cylindrically-shaped members;

said members aligned in a substantially closed loop with the longitudinal axes thereof disposed substantially parallel to one another; the outer surfaces of adjacent members closely spaced apart to form a substantially closed inner chamber;

means for introducing at least one reaction gas into the inner chamber, said at least one reaction gas including at least one element to be deposited;

means for forming a plasma from said at least one reaction gas introduced into said inner chamber to deposit a uniform layer of material containing said at least one element onto at least a portion of the outer surfaces of each of said cylindrically-shaped members; and

said plasma forming means including microwave generation means for initiating the radiation of microwaves externally of said deposition chamber and waveguide means positioned externally of said deposition chamber for directly transmitting said radiated microwaves into said inner chamber; said deposition of said uniform layer substantially limited to those portions of said outer surfaces of said members disposed within said inner chamber.

4,729,342

SELF-CLEANING PET TOILET

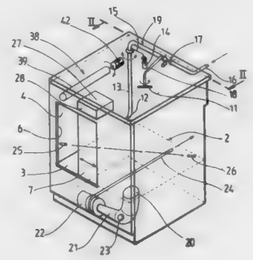
Albert Loctin, 92 rue Antoine Charial, Lyon 3 (Rhône), France

Filed Jul. 14, 1986, Ser. No. 885,086

Claims priority, application France, Jul. 12, 1985, 85 11262

Int. Cl.⁴ A01K *29/00*

U.S. Cl. 119—1 **13 Claims**



1. An automatic pet toilet comprising:

a housing defining a generally closed chamber having a top wall, a floor, and side walls, one of the side walls having an opening through which the pet can pass, the other walls and floor being substantially closed;

a door displaceable on the housing between a closed position blocking the opening and an open position clear of same;

means including a door drive motor in the housing for displacing the door between its positions;

means including a closed-door switch on the housing for indicating when the door is in its closed position;

floors and wall sprays respectively directed in the chamber at the floor and side walls of the chamber;

a valve connectable to a source of pressurized liquid, connected to the sprays, and openable to feed the liquid under pressure to the sprays;

means including a drain in the floor and a chopper connectable to a waste line for receiving material washed by the sprays from the walls and floor, comminuting the material, and feeding it to the waste line;

sensors means for generating a beam traversing the chamber for emitting an output when the pet is within the chamber; and

control means connected to the chopper, switch, sensor means, motor, and valve for normally maintaining the door in open position and for closing the door and then opening the valve and operating the chopper only after a pet has entered and left the chamber with interruption of the beam while in the chamber, and for thereafter closing the valve, stopping the chopper, and opening the door.

4,729,343

SLEEPING QUARTERS FOR PETS

Lydia Evans, 3305 Churchill Dr., Nacogdoches, Tex. 75961

Filed Dec. 22, 1986, Ser. No. 944,817

Int. Cl.⁴ A01K *1/02*

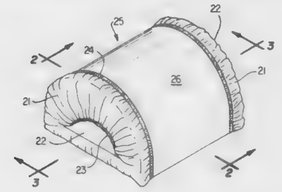
U.S. Cl. 119—19 **21 Claims**

1. A sleeping quarters structure for domestic animals comprising:

an elongated hollow frame open at at least one end to allow entrance by an animal;

a tubular fabric liner for the interior of said hollow frame having an elongated body portion and at least one open end, the diameter of said liner being greater than that of the open end of said frame to allow the end thereby to be folded back onto the outside of said frame and to provide an opening in said liner for entry by said animal, the open end of said liner having a resilient band fixed thereto to grip the outside of said frame when folded back thereon; and

at least one resilient band affixed to the outside of said tubular fabric liner and extending transversely to the longitudinal axis thereof, the fabric surface fixed to said band being arranged into gathers with the troughs of said gathers extending transversely to said band to bring the surface of



said liner adjacent said band toward the opposite side of said liner, locally reducing the inside diameter of the liner and providing snug resiliently conforming fabric surface for the animal to nestle against within the hollow frame of said structure.

4,729,344

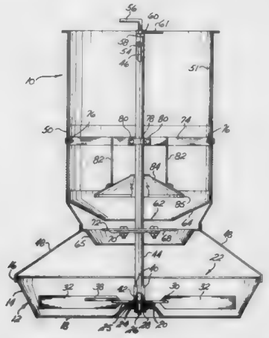
ANIMAL FEEDER

Robert M. Winkel, Niles, Mich., assignor to Vel-Agri, Inc., Niles, Mich.

Filed Feb. 21, 1985, Ser. No. 703,768

Int. Cl.⁴ A01K *5/00*

U.S. Cl. 119—53.5 **10 Claims**



1. In a feeder for dispensing feed to animals including a hopper for storing the feed to be dispensed, said hopper including a feed discharge opening, a feed receiving trough positioned beneath said hopper, a rotatable wheel positioned within said trough, the improvement comprising a generally horizontal distributor plate below said hopper discharge opening, said distributor plate positioned between said hopper discharge opening and said trough, said wheel and distributor plate connected for joint turning about a common axis, said distributor plate constituting means for centrifugally throwing said feed outwardly into said trough upon turning of said wheel, a drive member aligned with said axis connected to said distributor plate and extending to said wheel, means for raising and lowering said distributor plate and attached drive member to vary the spacing between said hopper discharge opening and the distributor plate, a slide connection between said drive member and wheel wherein turning of the wheel causes turning of the drive member and connected distributor plate.

4,729,345

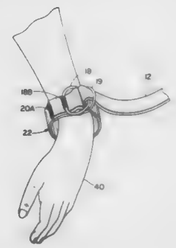
SECURITY SYSTEM

Sharon K. Anderson, 5608 N. Roosevelt, Loveland, Colo. 80537

Division of Ser. No. 735,755, May 20, 1985, Pat. No. 4,638,764. This application Jan. 5, 1987, Ser. No. 417

Int. Cl.⁴ A62B *35/00*

U.S. Cl. 119—96 **17 Claims**



12. A security system adapted to secure the wrist of a person to a second person or to an object, said security system comprising a length of flexible strap having first and second ends, wherein said first end is adapted to be detachably fastened to said second person or object, wherein said second end comprises a loop which is adapted to be detachably secured around said wrist; and wherein said second loop is adapted to maintain a fixed diameter after being placed around said wrist; wherein said second end of said strap includes first and second ring members carried thereby; wherein said first ring member is securely fastened to said second end of said strap in a manner such that said first ring member is substantially immobile relative to said strap; whereby said second ring member has more freedom of movement than said first ring member; wherein said strap is adapted to extend through said two ring members to form said second loop.

4,729,346

AIR-COOLED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

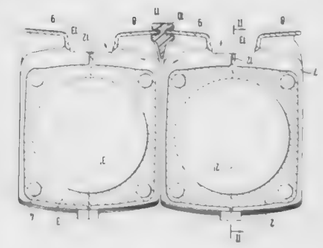
Robert Binder, Schwieberdingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 15, 1987, Ser. No. 49,828

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616635

Int. Cl.⁴ F01B *1/02*

U.S. Cl. 123—41.61 **11 Claims**



1. An air-cooled multi-cylinder internal combustion engine, comprising individually cast cylinder means arranged between associated cylinder heads and a crankcase, said cylinder means being provided externally with cooling ribs extending about the same transversely to the cylinder longitudinal axis, cooling air flowing through the cooling ribs in a transverse direction, and two guide rib means cast-on at a distance to one another at

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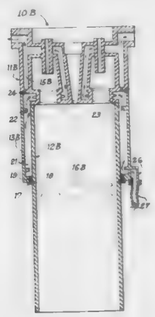
the cooling air discharge side of each cylinder, the guide rib means being constructed as thin-walled profiles which are angularly bent in mutually opposite directions.

4,729,347

INTERNAL COMBUSTION CHAMBER

Donald L. Schmitz, P.O. Box 19536, San Diego, Calif. 92119

Filed Oct. 27, 1986, Ser. No. 906,457
Int. Cl.[4] F01P *3/02*
U.S. Cl. 123—41.74 **9 Claims**



1. In combination with a high-powered reciprocating piston internal combustion engine, an internal combustion cylinder assembly comprising:

a cylinder head made of weldable material;

a cylinder liner for containing and guiding a reciprocating piston of said engine,

said cylinder liner and said cylinder head forming a welded structural unit,

a coolant jacket adapted to receive a cooling fluid, mounted on and surrounding said cylinder liner, said jacket being attached to said cylinder head and detachably supported by said cylinder liner, and forming a cooling chamber around said cylinder liner;

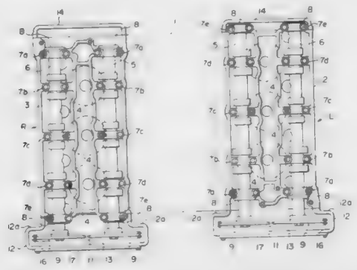
means to supply said cooling fluid to said cooling chamber and to discharge said cooling fluid therefrom.

4,729,348

CYLINDER HEAD STRUCTURE FOR V-TYPE ENGINE

Masatoshi Okada, Kariya; Koji Asanomi, Hiroshima; Masahiro Choshi, Hiroshima, and Ryoji Abe, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Japan

Filed Apr. 21, 1987, Ser. No. 40,908
Claims priority, application Japan, Apr. 23, 1986, 51-93941
Int. Cl.[4] F01L *1/12*
U.S. Cl. 123—90.31 **10 Claims**



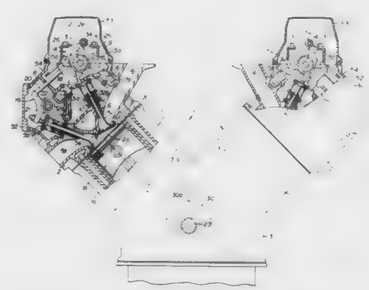
1. A cylinder head structure for a V-type engine having a pair of cylinder banks comprising a pair of cylinder head members which are the same in shape and oriented in opposite directions and which are provided in each of the front and rear end wall portions with an opening, camshafts supported for rotation in the respective cylinder head members so that the respective one ends of the camshafts project outside through the openings on the same end of the engine, a cam pulley mounted on the projecting portion of each cam shaft, a transmission belt means for transmitting the driving force of the crankshaft to the cam pulley on each camshaft, a pair of first cover members mounted on the end wall portions of the respective cylinder head members through which the camshafts project to form closed cross section spaces together with the corresponding cylinder head members for covering the transmission belt means, and second cover members mounted on the end wall portions of the respective cylinder heads opposite to the end wall portions through which the camshafts project to cover the openings therein.

4,729,349

OIL SUPPLY SYSTEM FOR A VALVE OPERATING MECHANISM IN INTERNAL COMBUSTION ENGINES

Toshinari Sonoda; Toshiaki Hiro, and Toshihiko Matsubara, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,953
Claims priority, application Japan, Aug. 21, 1985, 60-183603; Aug. 30, 1985, 60-191148; Oct. 21, 1985, 60-160880[U]; Oct. 21, 1985, 60-160878[U]
Int. Cl.[4] F01M *1/06*
U.S. Cl. 123—90.34 **13 Claims**



1. A system for supplying oil to a camshaft and hydraulic lash adjusters of a valve operating mechanism in an internal combustion engine having an engine body, comprising:

a supply passage in said engine body for supplying oil under pressure;

a distribution passage in said engine body connected to said supply passage for distributing oil from said supply passage as working oil to the hydraulic lash adjusters;

a lubricating oil passage connected said distribution passage for supplying oil from said distribution passage as lubricating oil to lubricate journals and cams of said camshaft; and

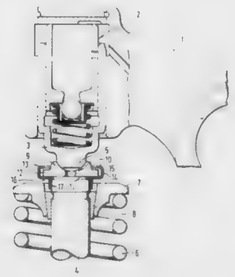
a relief passage communicating between said distribution passage and one of said journals and having a relief valve openable when the pressure of oil in said distribution passage rises beyond a predetermined level.

4,729,350

HYDRAULIC VALVE CLEARANCE COMPENSATION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Maschinen-und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,233
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614258
Int. Cl.[4] F01L *1/24*
U.S. Cl. 123—90.55 **9 Claims**



1. A hydraulic valve clearance compensation apparatus for internal combustion engines comprising a hydraulic compensation element accommodated in a bore of a rocker arm or actuating element which bore extends in prolongation of the stem of a motor valve and having a piston element guided for longitudinal displacement and provided with a crowned projection at its end facing the valve stem wherein a guide shoe is arranged between the crowned projection and the flat end face of the valve stem which, on the one hand, includes a spherical indentation engaged by the crowned projection of the piston element and, on the other hand, has a flat surface supported by the end face of the valve stem wherein the guide shoe is securely mounted to the valve stem, characterized in that a cage element **(13)** is arranged at the valve stem **(4)** or at an element **(7,8)** connected to the latter, the cage element **(13)** extending in direction to the piston element **(3)** and ends in radially inwardly directed restraining zones **(15,19,23)** which encompass the outer surface of the guide shoe **(9)** or projections **(12)** of this outer surface so that the guide shoe **(9)** is freely displaceable in the transverse direction relative to the valve stem **(4)** but is still securely mounted thereto.

4,729,351

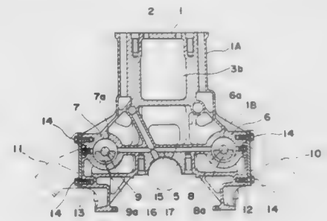
CYLINDER BLOCK CONSTRUCTION OF ENGINE

Kazuaki Nishimura; Hiroichi Takubo, both of Hiroshima, Japan, and Kuniaki Kakui, deceased, late of Hiroshima, Japan (by Kayoko Kakui, administratrix), assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 3, 1986, Ser. No. 937,240
Claims priority, application Japan, Dec. 6, 1985, 60-274663
Int. Cl.[4] F02F *7/00;* **F16F** *15/28*
U.S. Cl. 123—195 A **13 Claims**

1. In a cylinder block construction of an engine having a pair of balancer shafts provided at opposite sides thereof, said cylinder block being formed with a pair of bearing boss portions for supporting said balancer shafts, respectively, the improvement comprising:

a pair of first mounting portions for securing a pair of engine mounts to said cylinder block, respectively being, respectively, provided, in the vicinity of said bearing boss portions, at opposite side walls of said cylinder block so as to be integrally formed with said bearing boss portions.

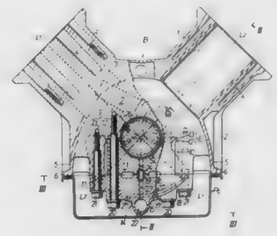


4,729,352

CRANKSHAFT SUPPORTING STRUCTURE FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Koichi Fukuo; Takao Ito, both of Saitama, and Katsumi Ichida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1985, Ser. No. 802,696
Claims priority, application Japan, Nov. 28, 1984, 59-180653[U]; Nov. 28, 1984, 59-180654[U]; Dec. 6, 1984, 59-258153
Int. Cl.[4] F02F *7/00;* **F01M** *1/00*
U.S. Cl. 123—195 R **19 Claims**

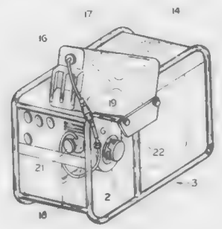


1. A crankshaft supporting structure in a multicylinder internal combustion engine, including a plurality of bearing caps secured respectively to a plurality of journal walls integral with a crankcase of a cylinder block, a crankshaft rotatably supported between said journal walls and said bearing caps, at least one counterweight on said crankshaft, and a bridge interconnecting said bearing caps, said bridge including a plurality of integral baffle plates extending between locations of the bearing caps and curved along a path of outer peripheral surfaces of each counterweight on said crankshaft,

wherein said bridge includes an oil supply gallery which extends substantially along a length of said bridge and generally parallel to the crankshaft and a plurality of branch passages are provided in said bridge and said bearing caps extending from said gallery to a bearing hole defined by each said journal wall and bearing cap.

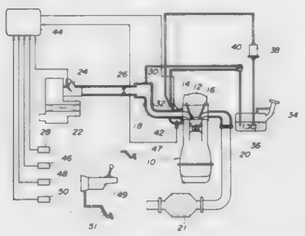
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4,729,353
FUEL CONTAINER SUPPORT SYSTEM FOR A COMBUSTION ENGINE
Roger H. Streng, St. Louis, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.
Filed Dec. 29, 1986, Ser. No. 947,279
Int. Cl.⁴ F02F *7/00*
U.S. Cl. 123—195 A **7 Claims**



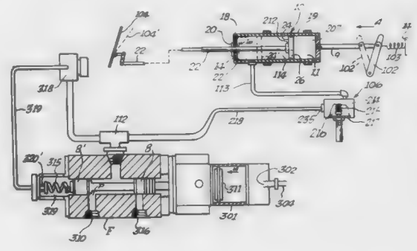
1. An improved fuel container support system for a combustion engine comprising:
a combustion engine;
frame means adjacent said combustion engine;
a shelf member supportively mounted on said frame means in a first position adjacent said combustion engine; and,
means to permit movement of said shelf member relative said frame means to a second position removed from said combustion engine to support a fuel container thereon to supply fuel to said combustion engine.

4,729,354
FUEL SUPPLY CONTROL SYSTEM FOR USE IN ENGINE
Hideki Tominaga, Higashi-Hiroshima, and Kazuya Takaki, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 2, 1987, Ser. No. 20,736
Claims priority, application Japan, Mar. 5, 1986, 61-46346
Int. Cl.⁴ F02D *41/12*
U.S. Cl. 123—320 **10 Claims**



1. A fuel supply control system for use in an engine comprising:
means for supplying fuel to the engine in an amount suitable for operating conditions of the engine;
means for detecting a decelerating state of the engine;
means for increasing a rate of fuel supply by said supply means when the decelerating state is detected by said deceleration detecting means;
means for detecting an operative state of a brake device mounted on a vehicle; and
means for limiting said increase in rate of fuel supply by said increasing means when the operative state of the brake device is detected by said brake detecting means.

4,729,355
ENGINE PROTECTION DEVICE
Richard W. Barnes, 301 N. 67th Ave., Hollywood, Fla. 33024
Filed Sep. 8, 1986, Ser. No. 905,282
Int. Cl.⁴ F02D *17/04*
U.S. Cl. 123—342 **3 Claims**

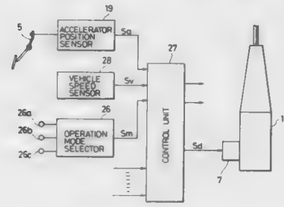


1. An engine protection device for controlling engine speed of an internal combustion engine comprising:
a throttle actuator means connectable to an engine speed regulator of an engine;
a variable link means including a piston and a piston housing, said throttle actuator means connected to one member of said variable link means and said other member connectable to the engine speed regulator, said variable link means including an inlet into said piston housing and said piston;
an oil pressure regulator including an engine oil inlet, a movable piston means in fluid communication with said oil inlet, a piston return means, a control member connected to said piston, said control member including valve means for opening and closing pressurized fluid source for access to and from said variable link means, said valve means including an inlet port connectable to a fluid pressure source, an exit port and an outlet port;
connecting means operably connected between said outlet port and inlet port and said inlet port of said variable link means;
a feedback system operably connected between said outlet port and inlet port and said return means for allowing said piston means to move and activate said throttle actuator means at one engine oil pressure and for providing a closing pressure to return said piston means by increasing total pressure of said return means after activation of said throttle actuator means.

4,729,356
CONTROL SYSTEMS FOR VEHICLE ENGINES
Tadashi Kaneko; Itaru Okuno, and Nagahisa Fujita, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan
Filed Apr. 21, 1987, Ser. No. 40,827
Claims priority, application Japan, Apr. 28, 1986, 61-98871
Int. Cl.⁴ F02D *41/10*
U.S. Cl. 123—361 **16 Claims**

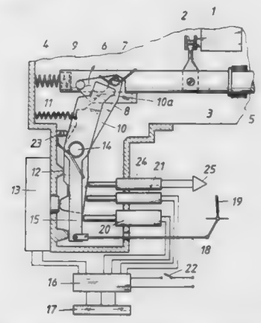
1. A control system for a vehicle engine comprising;
engine output adjusting means for controlling an output of the vehicle engine,
first detecting means for detecting a controlled variable on accelerating means accompanying with the vehicle engine,
control variable setting means for determining a fundamental control variable on said engine output adjusting means based on a detection output of said first detecting means,
driving means for actuating said engine output adjusting means in accordance with said fundamental control variable so as to cause the vehicle engine to have a predetermined normal output,
second detecting means for detecting a demand for acceleration of a vehicle employing the vehicle engine,

compensating means for revising said fundamental control variable to produce a compensated control variable on said engine output adjusting means so that said engine output adjusting means is actuated to cause the vehicle engine to have an augmented output in accordance with said compensated control variable when the demand for acceleration of the vehicle is detected by said second detecting means,
restoring means for restoring said engine output adjusting means at a predetermined restoration speed to be actuated



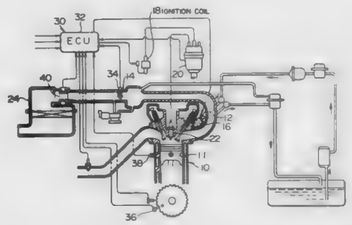
in accordance with said fundamental control variable so as to restore the vehicle engine to have the predetermined normal output after said engine output adjusting means is actuated in accordance with said compensated control variable,
third detecting means for detecting a travelling condition of the vehicle, and
restoration speed setting means for varying said predetermined restoration speed in response to the travelling condition of the vehicle detected by said third detecting means.

4,729,357
CONTROL SYSTEM FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE PROVIDED WITH AT LEAST ONE FUEL INJECTION PUMP
Otto Freudenschuss, Vienna; Leopold Rollenitz, Kirchstetten; Josef Morell, Tulbinger Kogel, and Harald Schmidt, Vienna, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria
Filed Sep. 10, 1986, Ser. No. 905,888
Claims priority, application Austria, Sep. 20, 1985, 2746/85
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—365 **15 Claims**



1. A control system for controlling an internal combustion engine which is provided with variable-delivery fuel injection pump means, comprising
an arbitrarily operable travel control lever,
a control rod, which is axially movable in a predetermined direction to increase the delivery of said pump means,
a servomotor,
a first mechanism for mechanically connecting said servomotor to said control rod, which first mechanism is operable by said servomotor to move said control rod in said predetermined direction,
first spring means opposing the movement of said control rod in said predetermined direction,
a plurality of sensors for generating output signals representing the position of said travel control lever and at least one parameter which depends on the operating condition of the engine,
a microcomputer for receiving said output signals and for controlling the operation of said servomotor in dependence on said output signals,
a second mechanism which is mechanically connected to said travel control lever and mechanically operable by said travel control lever to move said control rod in said predetermined direction, and
coupling means for initially coupling said second mechanism to said control rod and for initially uncoupling said first mechanism from said control rod, and for uncoupling said second mechanism from said control rod and for coupling said first mechanism to said control rod in response to a predetermined operation of said servomotor.

4,729,358
ENGINE CONTROLLING SYSTEM
Kiyomi Morita, Katsuta, and Junji Miyake, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 9, 1987, Ser. No. 36,476
Claims priority, application Japan, Apr. 9, 1986, 61-81648
Int. Cl.⁴ F02D *1/04, 35/00*
U.S. Cl. 123—416 **2 Claims**



1. A system for controlling an internal combustion engine having an intake manifold, a throttle valve disposed in said intake manifold for movement between an idle position and a fully opened position, a fuel injection system including at least one electrically actuated fuel injector operative to inject a fuel into an air flow through said intake manifold to form an air-fuel mixture to be sucked into the engine, and an ignition system including a spark plug for igniting charges of the air-fuel mixture in an associated engine cylinder, said controlling system including an electrical control unit electrically connected to said injector, a throttle position sensor operative to detect positions of said throttle valve and emit to said control unit an electrical throttle-position signal representing a detected throttle valve position, an engine speed sensor operative to detect an engine speed and emit to said control unit an electrical engine-speed signal representing a detected engine speed, a temperature sensor operative to detect an engine temperature and emit a temperature signal to said control unit, signal to said control unit, and a mass flow type air flow sensor for detecting a mass flow of air sucked through said intake manifold into said engine, said control unit being operative to control the rate of fuel supply through said fuel injection system into said engine in accordance with a first predetermined map of a lattice pattern showing a predetermined relationship between an engine speed and a load value determined based on an detected engine speed and a detected engine intake air flow, said first predeter-

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mined map containing a stoichiometrical air-fuel ratio zone below a predetermined load value for a detected engine speed and a power zone above said predetermined load value, the rate of fuel supply controlled in accordance with said first predetermined map being so determined that the engine is supplied with an air-fuel mixture of an air-fuel ratio richer than the stoichiometrical air-fuel ratio when the detected engine speed and load value fall within said power zone in said first predetermined map, said control unit being also electrically connected to said ignition system to control the ignition timing in accordance with a second predetermined map similar to said first predetermined map, the ignition timing controlled in accordance with said second predetermined map when the detected engine speed and the load value fall in a stoichiometrical air-fuel ratio zone in said second predetermined map being advanced than in a power zone therein,

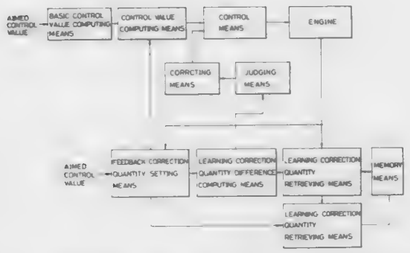
wherein the control unit includes a first judgement means operative to judge (a) as to whether the throttle valve opening is wider than a predetermined value and a second judgement means operative to judge (b) as to whether the load value and the engine speed are in the power zone in the first predetermined map, said control unit being operative to supply the fuel to the engine at an increased air-fuel ratio and simultaneously retard the ignition timing to assure that the increased air-fuel ratio and the retarded ignition timing fall within the zones of the first and second maps which correspond substantially to the degree of said throttle valve opening detected by said throttle position sensor.

4,729,359

LEARNING AND CONTROL APPARATUS FOR ELECTRONICALLY CONTROLLED INTERNAL COMBUSTION ENGINE

Naoki Tomisawa, Takasaki, and Yasunari Koshiba, Tokyo, both of Japan, assignors to Japan Electronic Control Systems Co., Ltd., Japan

Filed Jun. 25, 1986, Ser. No. 879,197
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—440 **12 Claims**



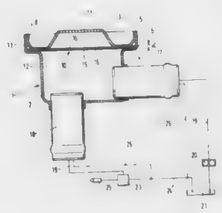
1. A learning and control apparatus for an electronically controlled internal combustion engine, which comprises means for detecting driving states of the engine, means for detecting an actual controlled value of the engine, basic control value setting means for setting a basic control value corresponding to a desired control value of an object of control in the detected driving states of the engine, memory means for storing a learning correction quantity for correcting the basic control value for every region of the driving state of the engine, learning correction quantity retrieving means for retrieving a learning correction quantity from said memory means under the same driving conditions as those of the actual controlled value detected, feedback correction quantity setting means for comparing the actual controlled value detected with the desired control value and correcting said basic control value so that the actual controlled value is brought close to the aimed control value, learning correction quantity renewal means for setting a new learning correction quantity from the feedback correction quantity and the retrieved learning correction quantity and renewing the learning correction quantity stored in the memory means under the same driving states by said new learning correction quantity, control value computing means for computing a control value from said basic control value, the retrieved learning correction quantity and the set feedback correction quantity, learning correction quantity difference computing means for computing the difference between the retrieved precedent learning correction quantity and the new learning correction quantity, judging means for judging whether or not the computed difference is larger than a predetermined value, correcting means for increasing or decreasing said control value by a predetermined quantity according to said difference when it is judged that said difference is larger than said predetermined value, and control means for controlling the engine based on the control value corrected by said correcting means when said difference is larger than said predetermined value or based on the control value of the control value computing means when said difference is smaller than said predetermined value.

4,729,360

DAMPER ELEMENT

Siegfried Fehrenbach, Markgröningen; Wolfgang Golderer, Schwieberdingen; Kurt Herbst, Burgstetten; Erwin Krimmer, Plüderhausen; Paul Schmid, Kornwestheim; Wilhelm Sorg, Markgröningen-Unterriexingen, and Eberhard Utz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 375,909, May 7, 1982, abandoned. This application Sep. 16, 1986, Ser. No. 907,178
Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119131
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 **13 Claims**



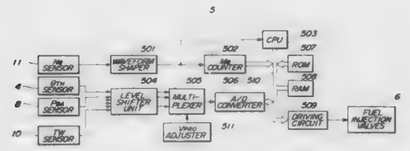
1. A damper element for damping a pulsating fluid flow particularly for smoothing out and reducing pressure fluctuations arising in a fuel supply system for internal combustion engines of motor vehicles comprising a damper housing, said housing including a base and a cap, said base and said cap having substantially coincidental circumferences which are welded together after assembly, a plastic cap in said damper housing, a plastic ring affixed to said plastic cap, a continuous elastic, nonmetallic damper diaphragm formed of polyimide clamped between said plastic cap and said plastic ring, said plastic cap including recesses therein, said plastic ring including protuberances that extend into said recesses in said plastic cap and said polyimide diaphragm further includes a notched perimeter arranged to receive said protuberances on said plastic ring whereby said polyimide diaphragm is in operative communication with fuel of said fuel supply system.

4,729,361

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES, WITH ADAPTABILITY TO VARIOUS ENGINES AND CONTROLS THEREFOR HAVING DIFFERENT OPERATING CHARACTERISTICS

Yutaka Otobe, Shiki, and Masataka Chikamatsu, Utsunomiya, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,772
Claims priority, application Japan, May 24, 1985, 60-112786
Int. Cl.[4] F02D *41/26*
U.S. Cl. 123—486 **7 Claims**



1. A method of controlling the fuel supply to an internal combustion engine, wherein a quantity of fuel for supply to said engine is determined by correcting a basic value of the quantity of fuel determined as a function of at least one operating parameter of said engine by correction values dependent upon operating conditions of said engine, and the determined quantity of fuel is supplied to said engine, the method comprising the steps of:

(1) detecting a value of at least one predetermined operating parameter of said engine;

(2) manually adjusting a single voltage creating means to set an output voltage therefrom to such a desired value as to compensate for deviation of the air/fuel ratio of a mixture supplied to said engine due to variations in operating characteristics of engines between different production lots or aging changes, a predetermined one of said correction values having a value thereof set as a function of said output voltage from said voltage creating means and dependent upon the detected value of said at least one predetermined operating parameter of said engine;

(3) determining a value of said predetermined one correction value corresponding to said set desired value of output voltage of said single voltage creating means, and then modifying the thus determined value in response to the detected value of said predetermined at least one operating parameter of said engine during engine operation; and

(4) correcting the basic value of the quantity of fuel by said value of said predetermined one correction value having the thus modified value, and the other correction values.

4,729,362

FUEL INJECTION CONTROL APPARATUS FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yasushi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

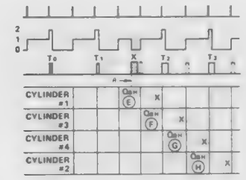
Filed Jul. 15, 1986, Ser. No. 885,686
Claims priority, application Japan, Jul. 16, 1985, 60-157336
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—492 **5 Claims**

1. An apparatus for controlling an internal combustion engine having a plurality of cylinders, a crankshaft, and fuel injectors provided for the respective cylinders, comprising:

signal sources for generating electrical signals indicative of engine operating conditions;

means for calculating a value for fuel delivery requirement, said calculating being performed using said electrical signals, said means being responsive to a demand for engine acceleration for providing a control signal; and

a control circuit coupled between said means and said fuel injectors for generating synchronous fuel injection pulses having a pulse width corresponding to said calculated value to drive said fuel injectors in synchronism with engine rotation, said control circuit being responsive to the control signal for generating an asynchronous fuel injection pulse to drive said fuel injectors, said control



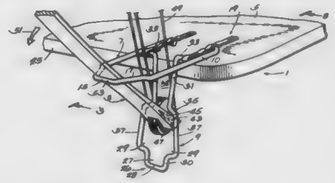
circuit retarding the timing of generation of the synchronous fuel injection pulses successive from the asynchronous fuel injection pulse whenever said control signal occurs in a predetermined range within an interval between two synchronous fuel injection pulses.

4,729,363

ARCHER'S BOW REST FOR TREE STAND

Helmut K. Skyba, Rte. 2, Box 330, Wild Rose, Wis. 54984

Filed Sep. 25, 1986, Ser. No. 911,522
Int. Cl.[4] F16M *11/00*
U.S. Cl. 124—23 R **16 Claims**



1. A bow stand comprising:

a. a generally horizontal platform having a front edge and a top surface;

b. a generally U-shaped first bracket having a loop end and a pair of leg ends pivotally mounted to the platform top surface to permit pivoting the first bracket between a folded configuration in facing contact with the platform top surface and an open configuration wherein the first bracket lies in a plane parallel to the platform and overhanging the platform front edge; and

c. a generally U-shaped second bracket having a pair of opposed generally transverse shoulders and a pair of leg ends pivotally mounted to the platform top surface for pivoting between a folded configuration in facing contact with the platform top surface and an open configuration wherein the second bracket lies in a generally vertical plane below the first bracket, the first and second brackets being configured to receive a bow inserted vertically through the brackets with the first bracket contacting a first point on the bow frame to support it against gravity and the second bracket shoulders providing reaction points for a second point on the bow frame to prevent tilting about the contact point between the bow and the first bracket,

so that the brackets cooperate to steadily hold the bow in a generally upright attitude.

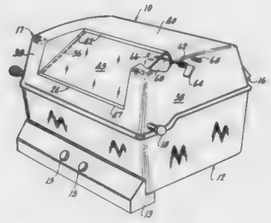
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4,729,364

GRILL WITH VIEW/VENT WINDOW

Donald E. Dailey, Evansville, Ind., assignor to Preway Industries Inc., Evansville, Ind.

Filed May 15, 1987, Ser. No. 50,035
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—39 R **14 Claims**



1. In a grill having a bottom portion for containing a heat generating source, a rim around the top thereof and a support for food products to be cooked by said heat generating source, the improvement comprising:

providing a cover for said bottom portion; sain cover having a top portion and a lower rim adapted to generally engage said rim of said bottom portion;

said cover further including an angularly disposed opening extending from the vicinity of the transverse center line of the top portion of said cover to a location above said lower rim;

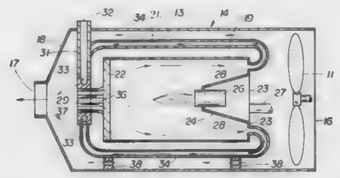
transparent panel means adapted to cover said opening and being rotatably coupled to said cover at said location rotating said panel outwardly from said cover in the vicinity of the top portion of said cover.

4,729,365

AIR HEATING APPARATUS AND METHOD

Paul A. Mutchler, University City, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Jul. 21, 1986, Ser. No. 887,229
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 B **17 Claims**



1. An improved air heating apparatus comprising:

a longitudinally extending outer casing having spaced air inlet and air outlet means;

a combustion drum disposed within said casing, said drum being closed at one end and being sized to define a longitudinally extending flow-through passage between said drum and said outer casing;

burner means dispossed within said durm;

a combustion air inlet means in said drum communicating with said burner means;

at least one combustion gas outlet in said drum;

at least one combustion gas outlet cooperating with said outer casing;

heat exchange means disposed to extend along said flow-through passage in spaced relation between and to both said drum and said outer casing, said heat exchange means including an exhaust header to connect said combustion gas outlet in said drum with said combustion gas outlet cooperating with said outer casing;

blower means cooperatively positioned with respect to said outer casing to move air from said air inlet of said outer casing through said flow-through passage between said drum and said outer casing to said air outlet of said casing to warm such moving air by said heat exchange means and the outer surface of said combustion drum; and,

support means to support said heat exchange means and said combustion drum to allow relative movement thereof in spaced relation in said outer casing.

15. A method for heating ventilating air in a heater having a casing with a combustion drum disposed therein in spaced relation therefrom to create a flow-through passage around the drum, the drum having a closed downstream end and an upstream burner with a combustion gas header downstream of the closed downstream end of the drum comprising:

directing a flame of combustion products toward the closed downstream end of said drum while evacuating said gases from the peripheral region of the drum at the upstream end of said drum to effect a reverse flow of combustion gases surrounding the flame within said drum at the upstream end of said drum;

conducting said combustion gases in separate, enclosed fluid communication passages through said flow-through passage between and in spaced relation with both said drum and said outside casing to said header from the upstream end of said combustion drum;

moving an air stream through said flow-through passage in separate surrounding heat exchange relation with said enclosed fluid combustion gases and;

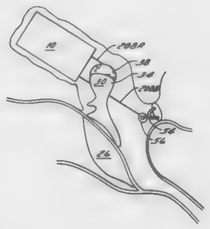
supporting said fluid communication passages to allow relative movement thereof.

4,729,366

IMPLANTABLE HEARING AID AND METHOD OF IMPROVING HEARING

Donald W. Schaefer, Belleville, Wis., assignor to Medical Devices Group, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 677,638, Dec. 4, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,156
Int. Cl.[4] H04R *25/00*
U.S. Cl. 128—1.6 **52 Claims**



1. A method for improving the hearing of a hearing-impaired subject, said subject, if anatomically normal, having a tympanic membrane intended for generating mechanical tympanic vibration in response to sound waves impinging thereon, an inner ear responsive to mechanical vibrations, and an ossicular chain intended for communicating mechanical vibrations from said tympanic membrane to said inner ear, said method comprising the steps of:

interrupting the ossicular chain to preclude transmission of mechanical vibrations between the tympanic membrane and inner ear of a subject; and,

surgically interposing an implant comprising input and output transducer means for mediating mechanical/electrical signals, having controlled amplification characteristics, within the interrupted ossicular chain to bridge the interruption therein and form an independent link between said tympanic membrane and said inner ear;

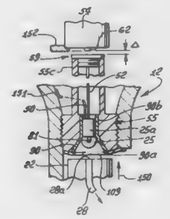
wherein said transducer means includes first transducer means operatively associated with said tympanic membrane for receiving mechanical tympanic vibrations therefrom and converting the same into electrical signals characteristic thereof, second transducer means operatively associated with said inner ear for receiving amplified electrical signals and converting the same into mechanical vibrations replicating said tympanic vibrations and transmission means for communicating between said first and second transducer means in lieu of said ossicular chain.

4,729,367

SUBMERGIBLE LARYNGOSCOPE WITH HANDLE FLUID SEALING MEANS

Jack Bauman, 16677 San Onofre, Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 830,280, Feb. 18, 1986, Pat. No. 4,669,449. This application Jan. 27, 1987, Ser. No. 3,174
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—11 **13 Claims**



1. In a fluid submersible laryngoscope including a hollow handle containing power supply means, a blade to be inserted into a patient's mouth, light transmitting means carried by the blade, and means to removably attach the blade to an end portion of the handle in a substantially L-shaped configuration, the improvement comprising:

(a) a light source with a reflector carried by the handle at said handle end portion, for movement relative to the handle and power supply means,

(b) means to place the light source in electrically energizing relation with the power supply means when the blade is attached to the handle to displace the light source relatively toward the power supply means, whereby light is directed into said light transmitting means carried by the handle,

(c) and fluid sealing means blocking access of external fluid into the hollow handle proximate the light source and reflector, whether or not the blade is attached to the handle, and whether or not the handle is submerged in fluid,

(d) said fluid sealing means extending outwardly at said end portion of the handle to be contacted by the blade when the blade is attached to the handle,

(e) said fluid sealing means including resiliently compressible material to be compressed by the blade when the light source is displaced relatively toward said power supply means.

4,729,368

APPARATUS FOR MASSAGING THE HUMAN BODY

Louis P. Guitay, 1 avenue Victor Hugo, 26000 Valence, France

Filed Nov. 12, 1986, Ser. No. 929,430
Claims priority, application France, Nov. 14, 1985, 85 17026
Int. Cl.[4] A61H *15/00*
U.S. Cl. 128—57 **15 Claims**

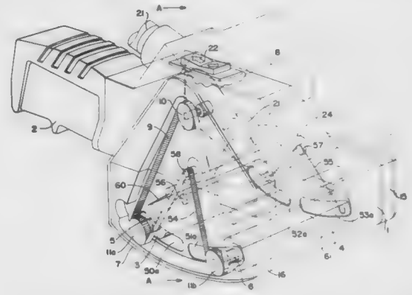
1. A massaging apparatus for massaging a human body, said apparatus comprising:

a housing;

a vacuum chamber formed in said housing;

two rollers, each roller having an outer periphery and an axis and being rotatably mounted in said housing, said axes of said two rollers being parallel;

a variable size passage communicating said vacuum chamber with the exterior of said housing, said passage being defined in part by said rollers;



return means for biassing said rollers away from one another so as to increase the size of said passage;

means associated with the roller to seal in the vacuum chamber; and

vacuum means for evacuating air from said vacuum chamber so as to create a vacuum in said vacuum chamber.

4,729,369

TOE SPLINT AND BUNION CORRECTION DEVICE

Donald E. Cook, Rte. #12, Box 19, Meridian, Miss. 39301

Filed Jun. 20, 1986, Ser. No. 876,731
Int. Cl.[4] A61F *5/00, 5/37*
U.S. Cl. 128—81 R **5 Claims**



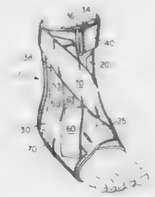
1. A toe splint and bunion correction device comprising:

(a) a thin substantially L-shaped splint member of a thermoplastic material which maintains rigidity at normal body temperature, and having an elongated base member for engaging and supporting the foot and a toe encircling member integrally formed with and substantially perpendicular to said base member for encircling one of the toes of said foot when said splint member is subjected to a predetermined temperature greater than said normal body temperature; and

(b) means for removably fastening said splint member to said foot, wherein said fastening means comprises a band removably wrappable about said foot and said splint member, and having first means attached to one side of said band, and extending the length thereof, for reciprocally mating and engaging second means attached to one end portion of the opposite side of said band when said band overlaps itself.

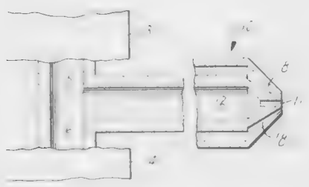
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4,729,370
ANKLE SUPPORT
Charles Kallassy, 1933 Estrada Pkwy. #328, Irving, Tex. 75061
Filed May 9, 1986, Ser. No. 861,515
Int. Cl.[4] A61F *13/06*
U.S. Cl. 128—166 **25 Claims**



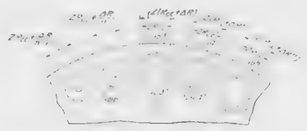
1. An ankle support comprising:
an underliner defining a main body for said support, said underliner being made of a stretchable material and fitting over a wearer's foot in the manner of a sock, and extending to a point above the wearer's ankle.
a non-stretch lateral strap secured to the exterior surface of the underliner at a point between the bottom of the foot and the ankle joint and extending upwardly and in general alignment with the fibular ligament at the side of the foot to a point above the ankle joint, said strap being inelastically secured with respect to said leg at a point above said ankle joint so that the tension thereof may be selectively adjusted; and
a non-stretch medial strap secured to the same side surface of the underliner as the lateral strap, extending under the arch of the foot and upwardly on the opposite side thereof, inelastically secured to the lateral strap and inelastically secured with respect to said leg at a point above the ankle joint so that the tension thereof may be selectively adjusted;
said medial strap being effective to support the arch of the foot and, in combination with said lateral strap, supporting the ligaments of the ankle joint, thus limiting and balancing the lateral movement of the joint.

4,729,371
RESPIRATOR COMPRISED OF BLOWN BICOMPONENT FIBERS
Dennis L. Krueger, Hudson, and James F. Dyrud, New Richmond, both of Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 704,537, Feb. 22, 1985, abandoned, which is a continuation of Ser. No. 540,543, Oct. 11, 1983, abandoned.
This application Sep. 25, 1986, Ser. No. 911,394
Int. Cl.[4] A62B *7/00*; **D02G** *3/00*
U.S. Cl. 128—206.19 **8 Claims**



1. A respirator comprising a fibrous web molded to a cup shape adapted to cover the mouth and nose of a person wearing the respirator, the fibrous web comprising a coherent entangled mass of blown bicomponent fibers which individually comprise a first polymeric material extending longitudinally along the fiber through a first portion of the cross-sectional area of the first fiber and a second polymeric material adhered to the first polymeric material and extending longitudinally along the fiber through a second portion of the cross-sectional area of the fiber, said fibers being prepared by extruding a layered molten mass of said first and second polymeric materials through a row of side-by-side orifices into a high-velocity gaseous stream, where the extruded streams are attenuated and drawn into a mass of entangled fibers having an essentially infinite aspect ratio.

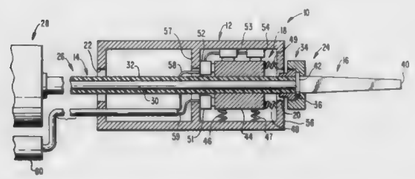
4,729,372
APPARATUS FOR PERFORMING OPHTHALMIC LASER SURGERY
Francis A. L'Esperance, Jr., Englewood, N.J., assignor to LRI L.P., New York, N.Y.
Continuation-in-part of Ser. No. 778,801, Sep. 23, 1985, abandoned, and a continuation-in-part of Ser. No. 742,225, Jun. 6, 1985, abandoned, and a continuation-in-part of Ser. No. 552,983, Nov. 17, 1983, abandoned, which is a division of Ser. No. 807,226, Dec. 10, 1985, abandoned, which is a division of Ser. No. 807,239, Dec. 10, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 891,289
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—303.1 **48 Claims**



1. Sculpture apparatus for curvature-correcting operation upon the anterior surface of the cornea of an eye, comprising laser means producing an output beam in the ultraviolet portion of the electromagnetic spectrum, controllable means for variably limiting the sectional area of said beam at impingement on the cornea, the area variation being over a range which at least includes a maximum curvature-correcting area to be ablated and being symmetrical with respect to a beam-projection axis which coincides with the optical axis of the eye, the intensity of laser-spot projection being limited per unit time to ablate but a fraction of a predetermined maximum depth of ablation into the stroma region of the cornea, and control means connected to said laser means and to said controllable means, for so correlating laser-beam impingement at the cornea with variation of the sectional area of said beam as to effect a diopter change at the cornea.

4,729,373
LASER-POWERED SURGICAL DEVICE WITH A VIBRATING CRYSTALLINE TIP
Gholam A. Peyman, 535 N. Michigan Ave., Apt. 3001, Chicago, Ill. 60611
Filed Dec. 18, 1986, Ser. No. 943,065
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **16 Claims**

1. A surgical device adapted to be connected to a laser energy generator, the combination comprising:
a hollow handle having first and second open ends;
a laser energy transmitting conduit received in said hollow handle,
said conduit having a first end extending from said handle through said first open end and adapted to engage tissue to be treated, and a second end extending from said handle through said second open end and adapted to be connected to a laser energy generator; and



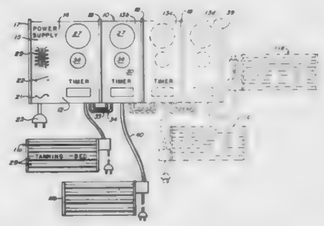
means, coupled to said handle and said conduit, for vibrating said conduit first end relative to said handle.

4,729,374
SURGICAL INSTRUMENT FOR TRANSCHOLEDOCHAL PAPILLOTOMY
Jose-Maria P. Alfranca, Santa Tereas, 29-35, escalera 1º-6º A, 50006 Zaragoza, Spain
Filed Jun. 24, 1985, Ser. No. 748,013
Claims priority, application Spain, Jun. 28, 1984, 280274
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **11 Claims**



1. A surgical instrument suitable for use in transcholedochal papillotomy for incision of duodenal papilla without duodenal incision, comprising a fixed handle; control means movably attached to said fixed handle; a transmission catheter suitable for insertion through a choledochus without duodenal incision, attached at one end to said fixed handle; guide means positioned within said transmission catheter and actuated by movement of said control means; a fixed blade attached at a second end of said transmission catheter, said fixed blade having a blunt distal end; a movable blade distally hinged to said fixed blade and closing thereon proximally and completely in a direction opposite to that of insertion, said movable blade being connected to said guide means at a point between the hinge and a cutting line of said fixed and said movable blades, said movable blade being actuated by said guide means; and means for displacing said control means back to an original position after movement therefrom, said original position corresponding to a closed position of said movable blade relative to said fixed blade, whereby movement of said control means is transmitted by said guide means to said movable blade causing movement thereof from said closed position to an open position, after which said means for displacing said control means returns said control means to said original position, thereby actuating said guide means to return said movable blade to said closed position.

4,729,375
MODULAR CONTROL FOR TANNING BEDS
Viktor J. Jegers, Bloomington and Joseph E. Supplee, Golden Valley, both of Minn., assignors to Sun Time, Inc., Plymouth, Minn.
Filed May 2, 1985, Ser. No. 729,958
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—376 **12 Claims**



1. A modular timer assembly having a power supply module and at least one timer module for controlling a plurality of tanning beds comprising,
an extendable electrical control means having a line current source and a plurality of electrical outlets, each outlet cooperatively controlling the lights of one tanning bed, each module having a modular case confining the electrical control means, each modular case having one electrical outlet for timing one tanning bed and having divider panels spanning the interspace between each modular case, each divider panel and modular case having confronting attachment faces, the attachment faces further having affixed cooperating male and female connectors so that the male connectors of the one face are retained by the adjacent female connectors removably retaining the divider panels in the interspaces between the modular cases.

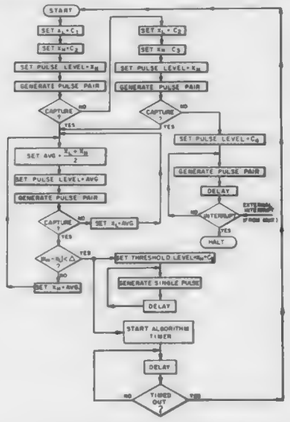
4,729,376
CARDIAC PACER AND METHOD PROVIDING MEANS FOR PERIODICALLY DETERMINING CAPTURE THRESHOLD AND ADJUSTING PULSE OUTPUT LEVEL ACCORDINGLY
Robert DeCote, Jr., Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed May 28, 1985, Ser. No. 738,606
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PT **12 Claims**

1. A cardiac pacer for stimulating contractions in a patient heart having a recurring refractory period of predetermined minimum duration, comprising:
means for establishing a pacing period within the refractory period of the heart;
pacing pulse generating means for generating a series of pacing signals for application to the heart, said generating means having a first operating mode wherein each of said pacing signals comprises a single pulse occurring during said refractory period, and a second operating mode wherein each of said signals comprises a pair of pulses occuring during said pacing period, the energy level of said pulses in said first operating mode being dependent on an applied amplitude control signal;
means defining recurring test periods;
pacer control means for conditioning said pacing pulse generating means to said second operating mode during each of said test periods;
capture thereshold detection means responsive to contractions within the heart induced by paired pulses from said generating means during said second mode of operation thereof, periodically operable during each of said recurring test periods for automatically determining the minimum pacing pulse energy required during each of said test

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periods to reliably stimulate contractions in the patient heart; and

amplitude control means responsive to said capture threshold detection means for providing following each of said



test periods an amplitude control signal to said pacing pulse generating means to cause said generating means to thereafter generate pacing pulses having an energy level related to said capture threshold.

4,729,377

GARMENT APPARATUS FOR DELIVERING OR RECEIVING ELECTRIC IMPULSES

Herman Granek, Miami Beach; Murry Granek, and John Church, both of Miami, all of Fla., assignors to Bio-Stimu Trend Corporation, Opa Locka, Fla.

Continuation-in-part of Ser. No. 499,866, Jun. 1, 1983, Pat. No. 4,580,572, and a continuation-in-part of Ser. No. 517,810, Jul. 27, 1983, Pat. No. 4,583,547. This application May 22, 1984, Ser. No. 611,731

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ A61B *5/04;* **A61N** *1/04*

U.S. Cl. 128—639 **17 Claims**



1. A garment apparatus for delivering or receiving electric impulses comprising:

a garment made of non-electrically conducting web material having small interstices;

at least one thin electrode element, said electrode element having an orifice therethrough and being secured to said garment externally thereof in a manner to overlie a portion of said garment;

at least one electrically conducting elongate pathway, one end of said pathway adapted and constructed to be in selective electrical contact with electrical impulse supplying means or electrical sensing means, the said pathway having a portion that is in electrical contact with said electrode element when said garment apparatus is in use;

the electrode element being secured to said garment permitting a space to be defined between said electrode element and that portion of the garment over which said electrode element overlies said garment;

the said orifice of said electrode element adapted and constructed to permit the introduction of electrolytic fluid-like material therethrough where by said fluid-like material may be introduced into said space;

whereby said space is provided with a wicking means for drawing said fluid-like material to the garment so that said fluid-like material will penetrate said small interstices of said garment wherein the skin of a patient is wetted by said fluid-like material when said garment is worn to thereby complete the electrical connection between said electrode element and the skin of the patient.

10. An electrode assembly for delivering or receiving electric impulses to or from the skin of a living body comprising:

a non-electrical conducting web material having small interstices;

a thin flexible electrode element, said electrode element having an orifice therethrough and being secured peripherally to said web material in confronting relationship permitting a space to be defined between said electrode element and said web material;

said orifice of said electrode element adapted and constructed to permit the introduction of electrolytic fluid-like material therethrough whereby said fluid-like material may be introduced into said space;

whereby said space is provided with a wicking means for drawing said fluid-like material to the web material so that said fluid-like material will penetrate said small interstices of said web material wherein the skin of a patient is wetted by said fluid-like material when said electrode assembly is used to thereby complete the electrical connection between said electrode element and the skin of the patient.

4,729,378

APPARATUS FOR ASCERTAINING THE PRESSURE IN A PLENUM CHAMBER

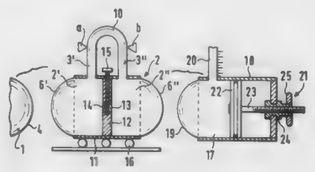
Jean Trittenbass, Dübendorf, Switzerland, assignor to Interzeag AG, Schlieren, Switzerland

Filed Nov. 25, 1986, Ser. No. 934,715

Claims priority, application Switzerland, Nov. 26, 1985, 05047/85

Int. Cl.⁴ A61B *5/10*

U.S. Cl. 128—645 **16 Claims**



1. Apparatus for ascertaining the pressure in a plenum chamber which has a flexible portion, such as a tonometer for measuring the tension of an eyeball, comprising a first testing device including a housing having an internal space and comprising first and second mobile walls **having outer sides and** inner sides, said device further including means provided in said internal space for yieldably biasing the inner sides of said walls to counteract forces which are applied to said outer sides including a force which is applied to the outer side of said first wall when said first wall is pressured against the flexible portion of a plenum chamber, and said first device also including means for indication the magnitude of forces which act upon the inner sides of said walls; and a second testing device having mobile member operable to apply pressure to the outer side of said second wall, and means for indicating the pressure which is applied to the outer side of said second wall.

4,729,379

DIGITAL SUBTRACTION-IMAGING APPARATUS UTILIZING CARDIAC-SYNCHRONIZED SUBTRACTION METHOD

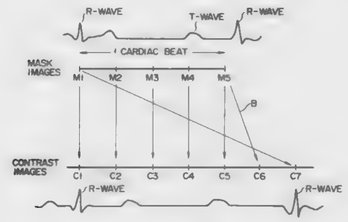
Mitsuo Ohe, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1986, Ser. No. 945,542

Claims priority, application Japan, Dec. 27, 1985, 60-294648

Int. Cl.⁴ A61B *6/00*

U.S. Cl. 128—654 **13 Claims**



1. A digital subtraction-imaging apparatus comprising:

means for providing X-ray images through an object exposed to an X-ray source;

means for injecting said object with an X-ray contrast medium;

first memory means for temporarily storing a plurality of images, as mask images, which have been acquired during at least one cardiac cycle before said X-ray contrast medium reaches a region of interest (ROI) of the object under medical examination;

second memory means for temporarily storing a plurality of images, as contrast images, which have been acquired during a plurality of cardiac cycles, succeeding said one cardiac cycle, after the X-ray contrast medium has reached the ROI of the object;

means for performing digital subtraction in synchronism with a cardiac phase of said object, between said successive mask images, read out from the first memory means, and said corresponding contrast images, read out from the second memory means; and

means for controlling said digital subtraction means in such a manner that when the number of contrast images acquired within an arbitrary single cardiac cycle defined by two successive cardiac phases is smaller than that of the mask images stored in the first memory means and acquired within said single cardiac cycle, said subtraction means performs digital subtraction between all of said contrast images and the corresponding mask images, withholding a predetermined number of said mask images which do not correspond to said contrast images, with respect to the cardiac cycles, whereas, when the number of contrast images acquired within said single cardiac cycle is greater than that of the mask images acquired within said single cardiac cycle; said digital subtraction is carried out by utilizing all of said contrast images and by repeatedly utilizing at least one of said mask images, in addition to all of the corresponding mask images, with respect to the cardiac cycles.

4,729,380

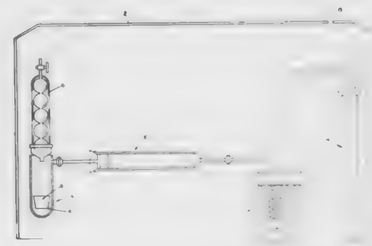
IRIDIUM 191-M GENERATOR

Salvador Treves, Newton, and Chris C. Cheng, Brookline, both of Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 290,683, Aug. 6, 1981, abandoned. This application May 6, 1983, Ser. No. 492,336

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—659 **3 Claims**



1. An apparatus for generating Iridium-191 comprising

a generator column containing a resin loaded with a solution comprising a mixture of $K_2(OsO_2(OH)_2Cl_2)$ and $K_2(OsO_2Cl_4)$,

an eluant injector, positioned upstream from said generator column,

a scavenger column connected to and positioned downstream from said generator column,

an eluate injector, including a needle for insertion into a blood vessel of a human patient, positioned downstream from said scavenger column, and

a lead container enclosing said generator and scavenger columns.

4,729,381

LIVING BODY INFORMATION RECORDER

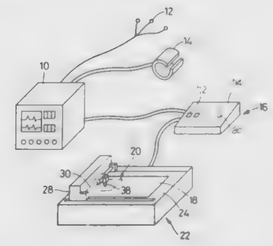
Chikao Hurada, Nagoya, and Masami Goto, Aichi, both of Japan, assignors to Nippon Colin Co., Ltd., Japan

Filed Feb. 4, 1987, Ser. No. 10,788

Claims priority, application Japan, Feb. 4, 1986, 61-22424; Feb. 4, 1986, 61-22425; Feb. 6, 1986, 61-24568; Feb. 6, 1986, 61-24569; Feb. 6, 1986, 61-24570; Feb. 6, 1986, 61-24571; Feb. 10, 1986, 61-27632; Feb. 26, 1986, 61-40983

Int. Cl.⁴ A61B *5/02, 5/04*

U.S. Cl. 128—671 **26 Claims**



1. An apparatus for effecting automatic repetitive detection of at least one item of living-subject information selected from a plurality of items of information on a living subject, and for automatically recording the detected living-subject informa-

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tion in a predetermined two-dimensional chart area provided on a recording medium, by means of recording respective indicia representative of said living-subject information, at respective recording positions in the chart area, which correspond to times of detection of the living-subject information, comprising:

a sensing device for detecting said living-subject information;

a recording device including a support means for supporting said recording medium so as to permit manual recording of auxiliary information other than said living-subject information on the recording medium, and further including recording means movable relative to said recording medium for recording said indicia in said chart area; and

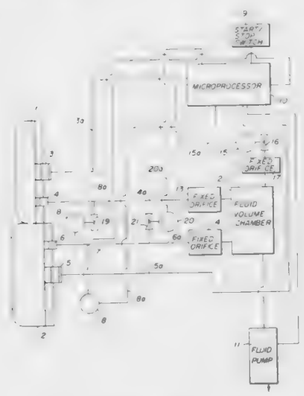
control means, responsive to said sensing device, for determining the recording positions of said indicia based on the detected living-subject information and said times of detection of said living-subject information, and for controlling said recording device so as to record said indicia at the determined recording positions in said chart area.

4,729,382

METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING PULSE RATE AND DIASTOLIC AND SYSTOLIC BLOOD PRESSURE

John D. Schaffer, 5601 Pinellas Dr., Knoxville, Tenn. 37919, and George L. McDade, Rte. 17, Fox Park Rd., Knoxville, Tenn. 37921

Filed Sep. 2, 1986, Ser. No. 902,705
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—679 **23 Claims**



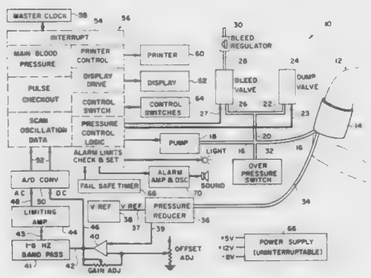
1. a device for detecting arterial pulsations in a subject's body comprising an outer rigid cylindrical shell to encircle a portion of a subject's body, a cuff including at least one substantially flat, flexible, inflatable, bladder, encircled and secured to the inside circumference of said shell to engage said body portion, a first tubular member having a first and second end, said first end of said tubular member engaging the interior of said bladder in a fluid-tight manner, said second end of said tubular member in fluid communication with a means for decreasing and increasing pressure in said bladder, a pressure control means cooperable with said means for decreasing and increasing pressure in said bladder and said interior of said bladder to control the pressure in said bladder, the improvement comprising a sensor in fluid communication with said interior of said bladder and responsive to arterially-induced pressure pulsations in said bladder for generating an electrical signal having an amplitude corresponding to said pulsations in said bladder, said sensor comprising a pressure transducer chamber and a pressure transducer, said pressure transducer having an arterial pulsation sensing end in fluid communication with the interior of said bladder in a fluid-tight manner to detect arterially-induced pressure pulsations in said bladder and to generate electrical signals having an amplitude corresponding to said pulsations, said bladder and a non-sensing end in fluid communication with the interior of the said pressure transducer chamber, a pressure equalization passageway in fluid communication with the interior of said bladder and the interior of said pressure transducer chamber, said pressure equalization passageway of sufficient size to allow equalization of pressure between said bladder and said chamber sufficiently to substantially reduce inflation pressure from impending upon said pressure transducer without interfering with detection of said arterially-induced pressure pulsations by said pressure transducer thereby eliminating any interference of inflation pressure with detecting of arterially-induced pressure pulsations in said bladder by said pressure transducer.

4,729,383

METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING BLOOD PRESSURE MEASUREMENTS

Roger E. Susi, 3061 West Albany, Broken Arrow, Okla. 74012

Filed Dec. 7, 1984, Ser. No. 679,441
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—681 **11 Claims**



1. A method for automatically determining, by noninvasive blood pressure measurements, the mean arterial pressure of a person, comprising the steps of:

(a) placing a pressure cuff around an extremity of said person's body and inflating said cuff to a selected cuff pressure;

(b) measuring and storing the amplitude of cuff pressure oscillations (PCA) with each heartbeat of said person;

(c) bleeding down the cuff pressure at a selected substantially linear rate and recording the first amplitude of oscillation (PCA 1) at a first cuff pressure;

(d) repeating step (c) for a second lower cuff pressure on the succeeding heartbeat to obtain a second amplitude of oscillation (PCA 2) at a second cuff pressure;

(e) determining the difference in amplitudes between PCA2 and PCA1, whereby as long as (PCA2) - (PCA1) is within a selected range of K where K is a predicted differential amplitude the determination is made that no amplitude artifact is present and the amplitude values are valid;

(f) continuing to bleed down the cuff pressure until a peak value of PCA is reached and the amplitude begins to decrease;

(g) continuing to monitor the PCA for a selected period and comparing the successive values of amplitude with the previously observed peak value to determine that said peak value has, in fact, been reached in that at the end of said selected period, the amplitudes have all been less than said peak values; and

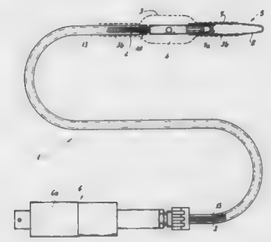
(h) determining the value of the cuff pressure at the time of said peak value of PCA and recording this value of cuff pressure as the mean arterial pressure.

4,729,384

BALLOON ASSEMBLY FOR ESOPHAGEAL PROBE

Jean-Pierre Bazenet, Corenc, France, assignor to Jacques Chevallier, Le Mesnil St. Denis, France

Filed Jul. 7, 1986, Ser. No. 882,273
Claims priority, application France, Jul. 8, 1985, 85 10768
Int. Cl.[4] A61B *5/02;* **A61M** *25/00*
U.S. Cl. 128—691 **12 Claims**



1. An intracoporal probe comprising:

a flexible and generally nontwistable element having front and rear ends;

a flexible and continuous sleeve substantially surrounding and loosely receiving the element between its ends;

a sensor unit mounted on the front end of the element past the sleeve and itself having a front end, whereby twisting of the rear end of the element will twist the sensor unit and will twist the element relative to the sleeve;

a forwardly tapered and flexible tip carried on the front sensor end; and

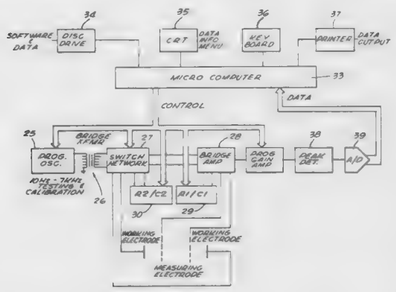
a balloon engaged around the unit between the tip and the sleeve at the front element end, the tip being mainly formed of silicone of a hardness between 50 Shore and 100 Shore, the balloon and tip being unitary, the tip having a wholly elastomeric body formed with a rearwardly open recess and being provided with a nonelastomeric plug fixed thereon and rotationally coupled to the sensor unit.

4,729,385

PROBE AND METHOD OF USE FOR DETECTING ABNORMAL TISSUES

Robert D. Juncosa, Santa Ana, and Richard J. Davies, San Diego, both of Calif., assignors to American Mediscan, Inc., Los Angeles, Calif.

Division of Ser. No. 790,491, Oct. 23, 1985. This application Jul. 11, 1986, Ser. No. 884,644
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—734 **2 Claims**



1. Method of testing selected internal epithelial tissue of a subject to determine biological condition, comprising the steps of:

locating first and second electrodes of predetermined fixed spaced apart relation within an epithelial cavity of the subject and in contact with the selected tissue;

locating third and fourth electrodes of predetermined constant spaced apart relation within a blood vessel of the subject closely adjacent the selected tissue;

establishing an A. C. voltage in the range of 10 Hz to 7 KHz between the first and fourth electrodes; and

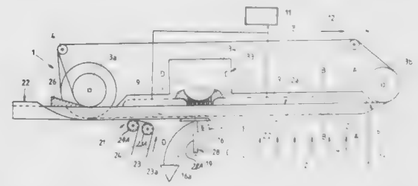
measuring the impedance of the selected tissue located between the second and third electrodes.

4,729,386

APPARATUS FOR MAKING CIGARETTES WITH DENSE ENDS

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,348
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530027
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.1 **25 Claims**



1. Apparatus for making a continuous stream from fibrous material of the tobacco processing industry, comprising an endless air-permeable conveyor defining an elongated path, said conveyor having a first side adjacent said path and a second side; means for feeding fibrous material into a first portion of said path so as to build a continuous stream which contains a surplus of fibrous material and advances along said path; means for removing the surplus from the stream in a second portion of said path downstream of said first portion; and means for pneumatically densifying spaced-apart portions fo the stream in the region of said surplus removing means, including means for establishing a variable pressure differential between said sides of said conveyor so as to attract the stream to said first side and to densify the stream in said path, said densifying means further including means for periodically varying said pressure differential so as to change the extent of densification of the stream in said region.

4,729,387

METHOD AND APPARATUS FOR MAKING CIGARETTES WITH SOFT CORES

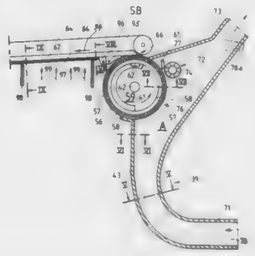
Wolfgang Steiniger, Börnsen, and Manfred Goldbach, Hamburg, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 874,039
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3521972
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.1 **45 Claims**

1. A method of producing rod-shaped articles of the tobacco processing industry from fibrous material, particularly tobacco, with a mandrel of non-smokable material, comprising the steps of forming a continuous fibrous stream having a substantially U-shaped cross-sectional outline with a longitudinally extending cavity and two legs flanking the cavity; advancing the stream along the mandrel so that the mandrel at least partially fills the cavity; showering fibrous material against the moving stream so as to confine the cavity and the mandrel and thereby transform the stream into a filler having

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a ring-shaped cross-sectional outline; separating the filler from the mandrel; draping the separated filler into a web of wrapping material; and subdividing the draped filler into rod-shaped articles of predetermined length.

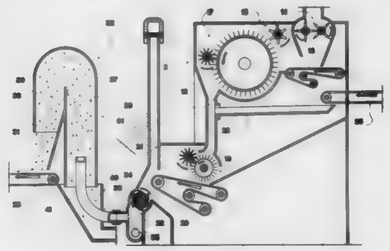


4,729,388

CIGARETTE MANUFACTURING MACHINE WITH A TOBACCO PARTICLE SEPARATOR

Riccardo Mattei, Bologna, Italy, assignor to G.D Societa' Per Azioni, Turin, Italy

Filed Mar. 14, 1986, Ser. No. 839,380
Claims priority, application Italy, Mar. 22, 1985, 3376 A/85
Int. Cl.[4] A24C *5/39*
U.S. Cl. 131—109.2 **7 Claims**



1. A cigarette manufacturing machine (**1**) with a tobacco particle separator, said machine comprising a shredded tobacco supply unit (**2**), a unit (**3**) for wrapping the said tobacco, and a conveyor belt (**7**) permeable by air and extending between the said supply unit (**2**) and the said wrapping unit (**3**), for transferring to the said wrapping unit (**3**) a continuous layer (**5**) of tobacco held by suction on to the said belt (**7**); the said supply unit (**2**) comprising a down-flow duct (**18**) for shredded tobacco, a well (**22**) communicating with the bottom end of the said down-flow duct (**18**), and an up-flow duct (**21**) for the said tobacco; the bottom end of the said up-flow duct (**21**) communicating with the said well (**22**), and the top end of the said up-flow duct (**21**) being closed by the said belt (**7**); and separating means (**32**; **42**) for separating, from the said shredded tobacco, particles of the same unsuitable for cigarette manufacture, the said separating means (**32**; **42**) comprising a duct (**36**; **43**) substantially in the shape of an upside-down U, and tubular connecting means (**33**) extending between the said U-shaped duct (**36**; **43**) and the said well (**22**); a first end of the said U-shaped duct (**36**; **43**) communicating with a dump (**41**; **64**), and a second end of the said U-shaped duct (**36**; **43**) communicating with the said down-flow duct (**18**).

4,729,389

FILTER FOR TOBACCO SMOKE

Joseph H. Anderson, 1817 South "I" St., Bedford, Ind. 47421

Continuation of Ser. No. 747,570, Dec. 6, 1976, abandoned, which is a continuation of Ser. No. 642,424, Dec. 19, 1975, abandoned, which is a continuation of Ser. No. 507,442, Sep. 19, 1974, abandoned. This application Jan. 10, 1978, Ser. No. 868,260
Int. Cl.[4] A24D *3/08, 3/16*
U.S. Cl. 131—331 **12 Claims**

1. A tobacco smoking article comprising, in combination, a body of divided tobacco to be burned and which upon the burning thereof produces moisture-laden smoke containing alkaloid and volatile materials, and a filter unit for said tobacco smoke comprising synthetic, inorganic, water-insoluble, anhydrous fibers consisting essentially of substantially homogeneous kaolin fibers having an alumina and silica content in the range of about 95 to 99.5 percent by weight and an average fiber diameter in the range of about 1 to 5 microns, said filter unit being effective in the filtration of substantial amounts of said alkaloid and volatile materials from the tobacco smoke passing therethrough and effectively reducing the temperature of said tobacco smoke, and said filter unit being effective in substantially smaller amounts than those of conventional filter materials.

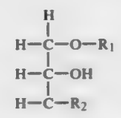
4,729,390

TOBACCO SMOKE FILTERING MATERIAL

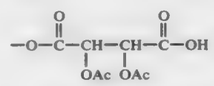
Robert C. Mumpower, II, Gray, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1985, Ser. No. 760,802
Int. Cl.[4] A24D *3/08, 3/14*
U.S. Cl. 131—331 **5 Claims**

1. A tobacco smoke filter adapted to remove certain undesirable components including tar and nicotine from tobacco smoke, said filter being comprised of a bundle of continuous filaments having a coating on the surfaces thereof comprising a compound of the formula



wherein R_1 is the residue of a straight chain fatty acid having 8–22 carbon atoms and R_2 is OH or



wherein Ac is an acetyl group, said compound having an iodine value of about 20–40, and being present in an amount of about 1–10% based on the weight of said filaments.

4,729,391

MICROPOROUS MATERIALS IN CIGARETTE FILTER CONSTRUCTION

Donna K. Woods, and Donald L. Roberts, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 14, 1985, Ser. No. 798,227
Int. Cl.[4] A24D *3/08, 3/14*
U.S. Cl. 131—332 **2 Claims**

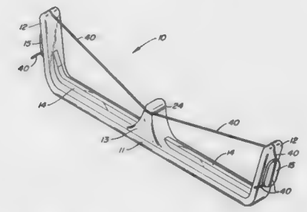
1. An improved filter cigarette comprising a tobacco rod having a filter attached thereto, wherein said filter comprises filter tow wrapped with a sheet of microporous polymer having flavorant adsorbed therein for release into the smoke stream during smoking of the cigarette.

4,729,392

DENTAL FLOSS HOLDER

Dale E. Tenny, Sunnyvale, Calif., assignor to Home Health & Safety, Sunnyvale, Calif.

Filed May 15, 1986, Ser. No. 863,301
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—91 **7 Claims**



4. A dental floss holder, for receiving a single length of commonly available dental floss and retaining said dental floss in a taut condition, without tying knots or loops, and comprising in combination:

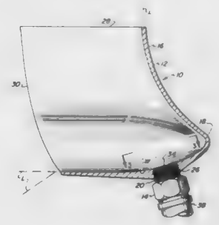
a. A comparatively inflexible elongate member supporting two flexible spaced arms at opposing ends, and supporting a circumferentially notched inflexible spaced arm lying between and extending in the same direction as said flexible spaced arms, said inflexible elongate member and said spaced arms together forming both a supporting frame for supporting two taut and usable lengths of said dental floss in tandem, as well as a means for holding, between finger and thumb, said dental floss when in use,
   (1) said supporting frame being of low bulk and having a generally elongate shape, either end of which may be inserted in the mouth and used while being held at the other end,
   (2) said supporting frame having relatively low profile at various angles while in the mouth and while going in and out of the mouth;
   (3) said supporting frame having been formed to provide a distance between the terminal end of either said flexible spaced arm and the nearest edge of the circumferential notch in said inflexible spaced arm sufficient to easily span the buccal and lingual surfaces of the largest molar, with ample space remaining for a back-and-forth sawing motion between teeth,
   (4) said supporting frame having been formed so that the range of distances perpendicularly, from a locus of points along each said taut and usable length of dental floss to the nearest surface of said supporting frame, is adequate to allow each said taut and usable length of dental floss to be manipulated in long back-and-forth sawing motions to the gumline between elongated teeth, without significant interference from said supporting frame;
b. A fastening means for each end of said dental floss, said fastening means being physically near the terminal end of each said flexible spaced arm, and consisting of at least one button around which said dental floss is wound, this in combination with said at least one button having at least one frictional securing slot to engage said dental floss,
c. A length of said dental floss strung from one of said fastening means on one of said flexible spaced arms, then around the circumferential notch of said inflexible spaced arm, thence to said fastening means on the other of said flexible spaced arms, thereby forming the two said taut and usable lengths of dental floss in tandem, one between said one of said flexible spaced arms and said inflexible spaced arm, and the second between said other of said flexible spaced arms and said inflexible spaced arm, said dental floss to have been strung tightly while applying pressure against the outside surfaces of said flexible spaced arms.

4,729,393

FLUSHING ADAPTOR AND METHOD OF MANUFACTURE

James A. Ferguson, 5215 Hidden Harbor Rd., Sarasota, Fla. 34242

Filed Apr. 4, 1986, Ser. No. 848,271
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—167 R **10 Claims**



1. A fresh water flushing adaptor for outboard and stern-driven marine engines having an external lower propulsion housing which includes a bottom forwardly pointed portion on the lower propulsion housing which further includes water intake parts only along the bottom forwardly pointed portion of the lower housing, said flushing adaptor comprising:

a molded cover adapted to substantially mateably encase the forwardly pointed portion of the lower housing including the water intake ports on the bottom thereof such that said cover is releasably retainable over the forwardly portion of the lower housing;

fitting means connected to the bottom forwardly portion of said cover for releasable attachment to a supply of water;

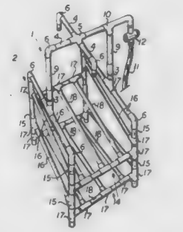
said fitting means having an internal passage in registry and fluid communication with the water intake for conveying water into said cover and into the water intake.

4,729,394

PORTABLE SCUBA EQUIPMENT FRAME

Daniel Timmes, and Christopher G. Thornton, both of 535 Seabright La., Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 806,410, Dec. 9, 1985. This application May 19, 1986, Ser. No. 864,817
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—199 **8 Claims**



1. A portable frame for maintaining, transporting and storing scuba diving equipment and the like comprising:

a self-standing rack constructed from a plurality of tubular members said rack comprising:

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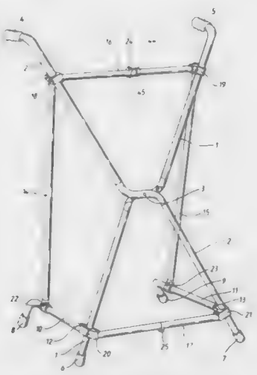
at least one pair of substantially parallel vertical sections;
each of said vertical sections including at least two vertical members, a top transverse member spanning the upper ends of said two vertical members and obliquely positioned thereto, a bottom transverse member substantially horizontal and spanning the lower ends of said two vertical members;
at least two pairs of side members spanning the vertical sections in a plane perpendicular to said vertical sections,
a plurality of first transverse members coplanar with said top transverse members and inwardly interconnecting said side members;
a plurality of second transverse members coplanar with said bottom transverse members and inwardly interconnecting said side members;
said first and second transverse members being positioned so as to form a supporting arrangement for said scuba equipment;
a spraying assembly detachably mounted over said rack, comprising a plurality of tubular members and a plurality of jets mounted thereon;
means for moving a washing fluid through the tubular sections of the spraying assembly and some tubular members of said rack.

4,729,395

WALKING AID

Alistair H. M. Adamson, 5 Park Road, Farnham, Surrey, England

Continuation of Ser. No. 696,868, Jan. 30, 1985, abandoned, which is a continuation of Ser. No. 374,304, May 3, 1982, abandoned. This application Jul. 3, 1986, Ser. No. 882,211
Claims priority, application United Kingdom, May 5, 1981, 81/3656
Int. Cl.⁴ A61H *3/04*
U.S. Cl. 135—67 **15 Claims**



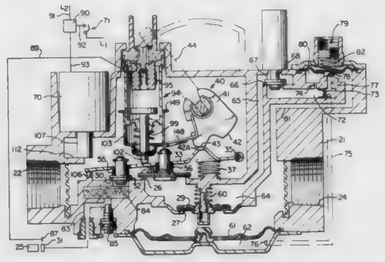
1. A collapsible walking frame for supporting a handicapped person while such person is walking and standing, comprising:
a pair of elongate front support members having upper and lower ends, said front support members being attached to each other at locations between their respective upper and lower ends by a pivot joint for allowing the members to be pivoted relative to each other in a scissor action;
a pair of upper pivotal connecting joints operatively connected to respective of said front support members in the region of upper ends of said front support member;
a pair of elongate rear support members having upper and lower ends, said rear support members, in an operative condition of the frame, being spaced apart from each other laterally of the frame and being located at an acute angle to said front support members, said upper ends of said rear support members each being coupled to a respective one of said front support members by a respective one of said pivotal connecting joints;
a pair of side bracing members on respective opposite sides of the frame and each having a front end portion pivotally connected to one of front support members below said pivot joint and a rear end portion pivotally connected on the same side of the frame to one of the rear support members at a location below and spaced from said upper pivotal connecting joints;
pivoted lockable bracing means connecting transversally between respective upper portions of said rear support members for holding the rear support members in their spaced apart relationship in said operative condition of the frame;
handle means operatively connected to respective upper ends of one of said pairs of said support members for supporting the person and for transmitting a downwardly directed load to the upper parts of said front support members and said rear members;
front ground-engaging support elements operatively connected to said front support members for receiving load forces transmitted from said handle means through said front support members; and
rear ground-engaging support elements operatively connected to said rear support members for receiving load forces transmitted from said handle means through said rear support members;
the lengths of aid support members and the relative location of said handle means and said support elements being such that an imaginary plane through said handle means and normal to an imaginary ground engagement plane containing all of said support elements intersects said ground engagement plane between said front support elements and said rear support elements; and
said front support members and said rear support members being so connected by said joints, bracing members and bracing means that their lower ends move towards each other when the frame is collapsed from its operative position until the front support members lie generally parallel to each other and adjacent the rear support members.

4,729,396

FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Samuel T. Kelly, Torrance, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 5, 1986, Ser. No. 938,621
Int. Cl.⁴ F16K *11/18*
U.S. Cl. 137—66 **21 Claims**



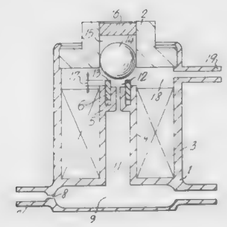
1. In a fuel control valve construction comprising a housing means having an inlet means adapted to be interconnected to a fuel source and a main outlet means adapted to be interconnected to a main burner means, said housing means having a pilot outlet means adapted to be interconnected to a pilot burner means for said main burner means, said housing means having a pilot valve seat and a main valve seat for interconnecting said inlet means respectively with said pilot outlet means and said main outlet means, said housing means having a movable pilot valve member for opening and closing said pilot valve seat and a movable main valve member for opening and closing said main valve seat, said housing means having a movable lever pivotally mounted to said housing means and carrying said pilot valve member and said main valve member, said housing means having a manually operable actuator means for controlling the operating positions of said lever, the improvement wherein said housing means has biasing means operatively interconnected to said lever to tend to pivot said lever in one direction that opens said valve members away from their respective valve seats, said actuator means having a cam means operatively associated with said lever to tend to control the pivoted position of said lever under the force of said biasing means.

4,729,397

ELECTROMAGNETIC CONTROL VALVE FOR A PRESSURE FLUID AND ASSOCIATED METHOD

Karl-Heinz Bruss, Monchen Gladbach, Fed. Rep. of Germany, assignor to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 943,642
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544527
Int. Cl.⁴ G05D *16/00*
U.S. Cl. 137—82 **3 Claims**



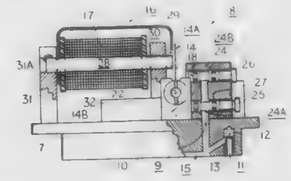
1. An electromagnetic control valve for controlling the flow of pressure from a pressure chamber in which a pressure is established and controlled as a function of an electric voltage applied to an excitation coil, said valve comprising
a valve body controlling fluid flow and movable between open and closed positions,
a magnetic circuit having an air gap and including an excitation coil energizable by a voltage to produce an electromagnetic force which acts on said valve body to urge the same to the closed position,
a pressure chamber for a pressure fluid acting on said valve body with a force to urge the same to the open position,
the electromagnetic force being variable as a function of the voltage and having a value greater than the force of the pressure fluid in the closed position of the valve, and
adjustable means for adjusting the size of said air gap to regulate the magnitude of the electromagnetic force acting on the valve body in closed position whereby to minimize the size of the valve and eliminate the need for a biassing spring,
said magnetic circuit comprising a body of magnetic material, said adjustable means comprising a non-magnetic element displaceably supported in said body and projecting therefrom by a distance forming said air gap,
said non-magnetic element facing said valve body and forming a seat therefor,
said valve body being made of a magnetic material and forming an armature in said magnetic circuit which is attracted towards said seat by said electromagnetic force,
said body of magnetic material including a spindle supporting said non-magnetic element and focussing magnetic lines of force therein,
said valve body comprising a ball, said non-magnetic element being a tubular body facing said ball,
said spindle having an annular groove in which said tubular body is displaceably inserted to a frictionally secured position.

4,729,398

CURRENT-TO-PRESSURE TRANSDUCERS

Richard A. Benson, Bedford, and Daniel E. Smith, Weston, both of Mass., assignors to Bellofram Corp., Burlington, Mass.

Filed Jan. 20, 1987, Ser. No. 5,262
Int. Cl.⁴ G05D *16/00*; **F16K** *13/02*
U.S. Cl. 137—82 **13 Claims**



1. Apparatus for governing the valved condition of a supply of fluid in accordance with electrical control signals, including a passageway communicating with said supply of fluid, and input terminals at which said control signals are impressed, comprising: an armature angularly movable about a support axis, valve means having a stationary nozzle communicating with said passageway and disposed for throttling by said armature which is variable with angular orientation of said armature about said axis, an electromagnet including stationary electrical winding means energized from said terminals and inductively associated with a stationary core of magnetic material and driving magnetic flux therethrough and across a magnetic gap between nearby ends of said core, and taut filament means supporting said armature for adjustable torsionally-restrained angular movements about said axis between spaced relatively stationary mounts, said armature having thin magnetic material thereof disposed in proximate overlapping flux-shunting relation to said ends of said core and siad gap therebetween, said thin magnetic material of said armature being substantially flat and elongated in a direction transverse to said axis and being of relatively high permeability and readily saturable by flux transversing it from said electromagnet even when currents flowing in said winding are relatively low, and surfaces of said ends of said core overlapped by said thin magnetic material of said armature being substantially flat and coplanar, whereby said armature simultaneously experiences torques about said axis caused by said taut filament means and by fluid impinging upon it from said nozzle and by forces of magnetic interaction between its said thin magnetic material and said stationary core.

4,729,399

SOLUBLE MATERIAL DISTRIBUTING DEVICE

Ray C. Wetzel, 32811 Shipside Dr., Dana Point, Calif. 92629, and Jim H. Wetzel, 24111 Leeward St., Laguna Niguel, Calif. 92677

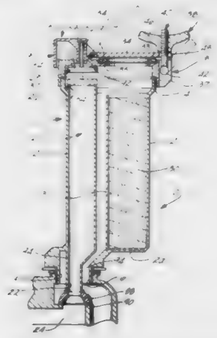
Filed Jul. 24, 1986, Ser. No. 890,066
Int. Cl.⁴ B01D *11/02*
U.S. Cl. 137—268 **8 Claims**

1. A material feeder comprising:
(a) a housing open at its top and bottom and configured to contain a material to be dissolved in a water stream which flows through the housing, the open bottom of the housing providing an outlet for the water stream;
(b) means connected to the housing for closing the top of the housing when in a first position and for opening the top of the housing when in a second position so that the material to be dissolved can be placed into the housing;
(c) a hollow conduit having an inlet for communication with

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a water supply line and an outlet, the conduit extending upwardly from its inlet through the open housing bottom with the conduit outlet being below the housing top, the only fluid connection between the water supply line and the housing outlet being through the conduit; and

(d) a check valve operatively mounted at the conduit outlet to prevent water from flowing back from within the housing through the conduit and into the water supply line wherein the check valve includes a horizontally extending



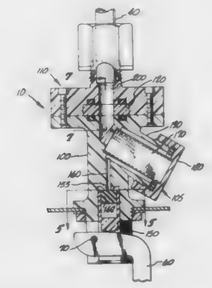
valve disk on an elongated stem which extends vertically upwardly from the disk, the housing closure means including an elongated bore extending vertically upwardly in which the check valve stem is mounted for sliding movement and an orifice in alignment with the check valve disk, the orifice being closed by the disk when the disk is in its fully raised position, and the orifice being open to the atmosphere when the disk is moved to below its fully raised position.

4,729,400

LIQUID CONTROL ASSEMBLY

Benjamin D. Mendoza, Fontana, and William L. Wright, Ontario, both of Calif., assignors to Robert Manufacturing Company, Cucamonga, Calif.

Filed Mar. 17, 1986, Ser. No. 840,381
Int. Cl.[4] F16K *43/00, 31/20*
U.S. Cl. 137—315 **12 Claims**



11. A liquid control assembly for controlling a flow of liquid from a liquid source into a reservoir for an ice-making machine, comprising,

a valve body, including an upper valve body portion and a lower valve body portion,

a passage means within said valve body, including an upper passage means for receiving the liquid from the liquid source into said valve body, and a lower passage means for controlling the flow of the liquid into the reservoir, said lower passage means having a smaller diameter than said upper passage means,

a float assembly for preventing the liquid from passing through said valve body when the reservoir is full of the liquid, comprising,

a float which floats on the surface of the liquid reservoir,

a valve closer for closing said lower passage means,

a valve lever for causing said valve closer to close said lower passage means when the liquid reaches a predetermined level in the reservoir, and

a lever rotating means,

a shut-off means for selectively preventing the liquid from passing from the liquid source through said valve body, said shut-off means being slideably activated,

a filter assembly within said valve body associated with said passage means between said float-assembly and said shut-off means, including,

a filter housing which extends downwardly from said passage means of said valve body at less than a ninety degree angle from the downstream directional axis of said passage means,

a filter within said filter housing, said filter being adapted to separate and collect particulate matter from the liquid flowing from the liquid source directly to the bottom of the filter which will then allow only particulate free liquid to said shut-off means during the liquid flow from the source and

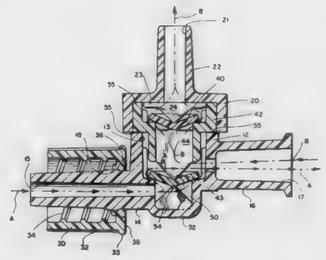
detachable means for convenient removal of said filter without removing said float assembly and said shut-off means from said valve body and any other elements of the liquid control assembly for cleaning said filter of the particulate matter and without shutting off said liquid source during such removal.

4,729,401

ASPIRATION ASSEMBLY HAVING DUAL CO-AXIAL CHECK VALVES

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Jan. 29, 1987, Ser. No. 8,364
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—512 **13 Claims**



10. A valve assembly comprising:

a main body having two passageways therein which meet at a large central cavity within said body, said cavity having a central pressure point and a valve seat;

a body cap for closing an open side of said central cavity in said main body, said cap having an outlet passageway therefrom and a central pressure point therewith;

a central support structure within said central cavity of said main body, said support structure having a valve seat and a central pressure point therewith; and

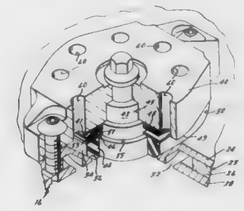
two resilient valve means mounted within said central body cavity which are maintained in cooperating co-axial relationship by said central support structure.

4,729,402

COMPRESSOR VALVE NOISE ATTENUATION

Jaroslav Blass, Sidney, and Timothy S. Quellhorst, New Bremen, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Aug. 1, 1986, Ser. No. 892,754
Int. Cl.[4] F16K *21/10*
U.S. Cl. 137—514.5 **17 Claims**



1. An improved valve assembly comprising:

a valve plate having a valve plate opening therethrough, said valve plate opening having a wall defining a valve seat;

a valve member movable between a closed position engaging said valve seat to prevent flow of a fluid through said valve plate opening and an open position spaced away from said valve seat to permit flow of the fluid through said valve plate opening; and

a retainer member fixed with respect to said valve plate and at least in part spaced therefrom to define a retainer chamber therebetween and to define a first predetermined restricted flow area therebetween, said valve member being disposed in said retainer chamber, said retainer member having a plurality of retainer openings therethrough to permit parallel flow of the fluid through said retainer openings and said first predetermined restricted flow area during opening movement of said valve member away from said valve seat toward said retainer member, said retainer openings collectively defining a flow area which is sufficiently smaller than the area of said retainer member to define a second predetermined restricted flow area tending to restrict the flow of the fluid from said retainer chamber during said opening movement of said valve member, said second restricted flow area being greater than said first restricted flow area, said restricted fluid flow tending to dampen said opening movement of said valve member and thereby minimize the force of any impact between said valve member and said retainer member during said opening movement.

4,729,403

TEST ASSEMBLY FOR WATER-FLOW ALARMS

Patrick Roche, 74 Ridge Rd., Upton, Mass. 01568

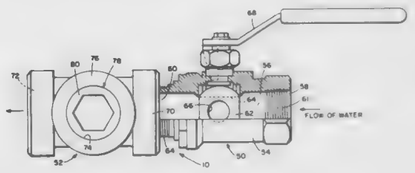
Filed Oct. 3, 1985, Ser. No. 783,867
Int. Cl.[4] F16K *37/00;* **G01M** *19/00*
U.S. Cl. 137—559 **1 Claim**

1. A test assembly for a device activated by the flow of a liquid, said device being an alarm forming part of a sprinkler system, said sprinkler system including a sprinkler having an orifice of preselected size therein, said test assembly comprising:

a. a control valve for controlling the flow of said liquid therethrough between a first preselected flow rate and a second preselected flow rate, said second preselected flow rate being equivalent to the flow rate passing through said orifice of preselected size in said sprinkler; and

b. a viewing chamber for permitting the viewing of said flow of liquid therethrough,

c. said control valve including a housing having an inlet opening and an outlet opening, said inlet opening being internally threaded for connection to an externally threaded coupling, said outlet opening being externally threaded, a rotatable element located within said housing, said rotatable element having a first orifice therein of preselected size to permit said flow of liquid therethrough in order to establish said first preselected flow rate and a second orifice therein of preselected size to permit said flow of liquid therethrough to establish said second preselected flow rate, and means for rotating said rotatable element between a first position in which said first preselected flow rate is established and a second position in which said second preselected flow rate is established, said preselected size of said second orifice of said valve means being substantially equal to said preselected size of said orifice in sprinkler,



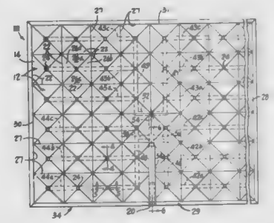
d. said viewing chamber including a housing and a transparent sight module, said housing comprising a cast iron cross, said cast iron cross having four internally threaded circular openings, said sight module comprising a molded transparent disc shaped plastic waterproof body having external threads thereon and being internally recessed from one side in a uniqued multisided configuration so that it can be screwed into and removed from an internally threaded opening using a correspondingly shaped tool, said sight module being screwed into one of said internally threaded openings in said cast iron cross, said outlet end of said control valve housing being screwed into another one of said internally threaded openings in said cast iron cross.

4,729,404

RECEPTACLE FOR COLLECTING FLUID

Patrick T. Hergenroeder, 48 W. Orange St., Chagrin Falls, Ohio 44022

Continuation of Ser. No. 869,441, May 27, 1986, Pat. No. 4,679,590, which is a continuation of Ser. No. 645,864, Aug. 31, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 23,201
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] A61M *1/00*
U.S. Cl. 137—602 **5 Claims**



1. A receptacle adapted for continuous and simultaneous

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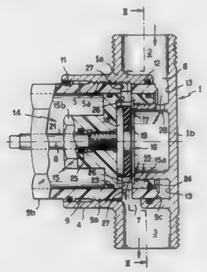
collection and disposal of impinging fluid, said receptacle comprised of a body of small thickness relative to its length and width and having a lower surface comprising fluid containment means for containing fluid beneath the lower surface and further having an upper surface comprising fluid collection means for collecting fluid on the upper surface, said upper surface in fluid-flow communication with said lower surface, and said lower surface in fluid-flow communication with a discharge port adapted to connect with a suction source for disposal of the fluid.

4,729,405

COCK WITH AN INCORPORATED STOP-VALVE

Maurice Frisquet, Meaux, France, assignor to Frisquet, Société Anonyme, France

Filed Mar. 11, 1987, Ser. No. 24,675
Claims priority, application France, Mar. 12, 1986, 86 03492
Int. Cl.⁴ F16K *11/10*
U.S. Cl. 137—614.17 **12 Claims**



1. A cock comprising a hollow body having aligned admission and discharge orifices for a fluid to be controlled and a cylindrical bore which is formed within a first lateral wall of the hollow body and opens into said hollow body between the admission and discharge orifices, and a cock head having a normally stationary member which is mounted within said bore, a valve movably mounted within said stationary member and displaceable towards and away from a valve seat in order to control the rate of flow of fluid, and a cylindrical sleeve placed within the bore of the hollow body between said body and said stationary member of the cock head and axially displaceable towards and away from an annular seat said annular seat being formed within the hollow body opposite to the inner end of the cylindrical sleeve on a second lateral wall of said body opposite to the first lateral wall in which said cylindrical bore is formed.

4,729,406

AUTOMATIC VALVE FOR USE WITH POOL CLEANING DEVICES

Herman E. Frentzel, Kentfield, Calif., assignor to Arneson Products, Inc., Corte Madera, Calif.

Division of Ser. No. 737,521, May 24, 1985, Pat. No. 4,643,217. This application Nov. 24, 1986, Ser. No. 933,974
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.⁴ G05D *11/00*
U.S. Cl. 137—624.14 **8 Claims**

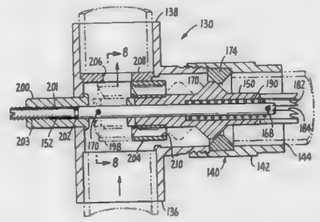
1. An automatic valve for restricting fluid flow though an orific comprising:

a central rod aligned with and passing through said orifice;

support means for maintaining the position of said central rod with respect to said orifice;

a piston journalled about said central rod and mounted for reciprocal movement between first, second and third positions along the length of said rod, said piston carrying a sealing means configured to restrict fluid flow through said orifice when the piston is in the first position and to permit fluid flow through said orifice when the piston is in the second position; and

means for providing automatic indexing of said piston between and first and second positions in response to the nonuniform flow of fluid, said means including a first cammed surface at one end of said piston and formed integrally therewith, said cammed surface including a plurality of slots, said means further including a stop pin receivable in one of said slots when the piston is in one of



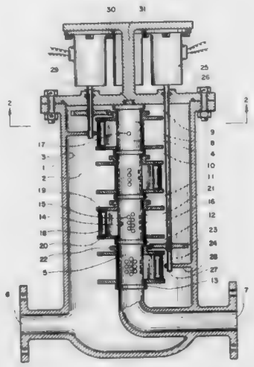
the first or second positions, with the selection of said first and second positions being governed by the length of the particular slot within which the pin is presently engaged, said means further including a biasing member for urging the piston towards said third position when the fluid flow is lessened thereby disengaging the pin from a slot, and with said cammed surface being configured such that when the fluid flow is increased and the piston moves towards said first and second postions, the pin will become engaged with the next successive slot.

4,729,407

DIGITAL CONTROL VALVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed May 13, 1987, Ser. No. 49,224
Int. Cl.⁴ F16K *31/04, 7/18*
U.S. Cl. 137—625.28 **4 Claims**



1. An apparatus for controlling fluid flow comprising in combination:

(a) a first compartment including a first port and a second compartment including a second port enclosed without a body of the apparatus, wherein said first and second compartments are separated from one another by a cylindrical wall partition;

(b) a plurality of groups of flow passage holes disposed through said cylindrical wall partition, wherein each of said groups of flow passage holes includes one or more flow passage holes disposed in an axially congregated pattern whereby two adjacent groups of flow passage holes are separated by a solid portion of the cylindrical wall partition having a sizable circumferential dimension;

(c) an idler roller disposed adjacent to said cylindrical wall partition in a parallel relationship wherein said idler roller is rotatable about its own axis and orbitable about the central axis of said cylindrical wall partition;

(d) at least one belt enveloping the combination of said cylindrical wall partition and said idler roller wherein said belt covers up all of the flow passage holes when said idler roller is orbited to a shut-off position of the apparatus or said belt covers up all of the flow passage holes except the flow passage holes belonging to one group of flow passage holes adjacent to said idler roller when said idler roller is orbited to an open position of the apparatus; and

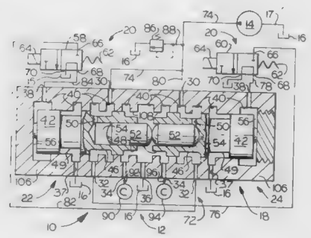
(e) means for orbiting said idler roller to and holding at shut-off or open positions.

4,729,408

CONTROL SYSTEM FOR INDEPENDENT CONTROL OF FLUID ACTUATED DEVICES

Alan R. Coutant, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 754,361, Jul. 12, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 940,233
Int. Cl.⁴ F15B *13/06*
U.S. Cl. 137—637.1 **13 Claims**



1. A fluid control system for selectively controlling actuation of a plurality of fluid actuated devices, said system including a source of pressurized fluid, a reservoir, a plurality of valve mechanisms operative to valve the fluid from said source to said fluid actuated devices, and a plurality of signal control valves each being operative to actuate a respective one of the plurality of valve mechanisms, comprising:

means for hydraulically interlocking a selected one of the plurality of signal control valves with respect to the source upon operation of a first one of the plurality of valve mechanisms so that only a first one of the plurality of fluid actuated devices may be connected with the source and a second one of the plurality of fluid actuated devices is prohibited from connection with the source; and

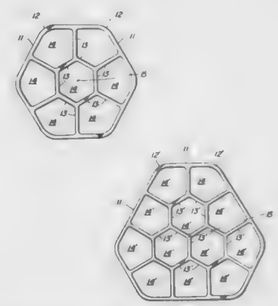
the plurality of valve mechanisms includes a second valve mechanism and each of the plurality of valve mechanisms has an inlet port, an actuator port, a drain port, and first and second outlet ports, and each valve mechanism is movable between a first position at which the inlet port is in open communication with the first outlet port and the second outlet is in open communication with the drain port and a second position at which the inlet port is blocked from the first outlet port and is in open communication with the second outlet port.

4,729,409

HEXAGONAL UNDERGROUND ELECTRICAL CONDUIT

Howard C. Paul, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 195,201, Oct. 7, 1980, abandoned. This application Aug. 6, 1982, Ser. No. 405,796
Int. Cl.⁴ F16L *9/18*
U.S. Cl. 138—115 **3 Claims**



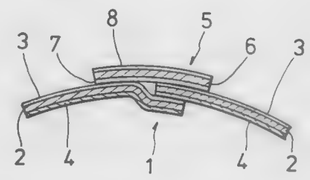
1. In a conduit for electrical cable having outer walls and a plurality of partition walls subdividing said conduit into a plurality of longitudinal ducts, the improvement wherein the outer walls of said conduit define an equiangular hexagon having arcuate vertices, the partition walls are symmetrically disposed about the longitudinal axis of said conduit to form at least seven longitudinal ducts, each of said partition walls in contact with one of said outer walls is normal thereto, and said ducts are of equal size as defined by the maximum diameter circular cable that may be inserted therein.

4,729,410

CASING FOR SAUSAGES

Hiromichi Inagaki, 1-143, Aza Maedaomote, Inuyama-shi, Aichi-ken, Japan

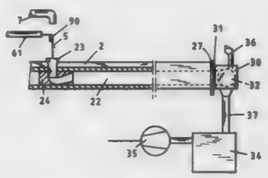
Filed Mar. 5, 1986, Ser. No. 837,091
Claims priority, application Japan, Mar. 6, 1985, 60-32055[U]
Int. Cl.⁴ F16L *11/00;* **A22C** *13/00*
U.S. Cl. 138—118.1 **2 Claims**



1. A tubular food casing for food products such as sausage, comprising a continuous multi-layer film including a heat-sealing layer on its exterior, said film being shaped into a tubular form with adjacent ends overlapping each other, a sealing tape overlapping said film exterior and extending over and beyond the adjacent tape overlapping said film exterior and extending over and beyond the adjacent overlapping ends and closing said tubular form, and a vinylidene material layer covering the interior of said film, said film having an interior layer of nylon film between said exterior heat-sealing layer and said interior vinylidene material layer.

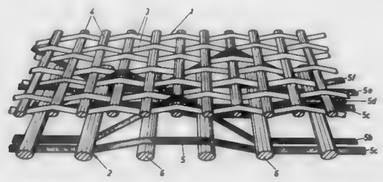
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4,729,411
AIR JET WEAVING MACHINE
Kurt Ellenberger, Wald, and Georg Senn, Ruti, both of Switzerland, assignors to Sulzer Brothers Limited, Switzerland
Filed Dec. 8, 1986, Ser. No. 939,156
Claims priority, application Switzerland, Dec. 20, 1985, 05454/85
Int. Cl.⁴ D03D *49/50*
U.S. Cl. 139—116 **4 Claims**



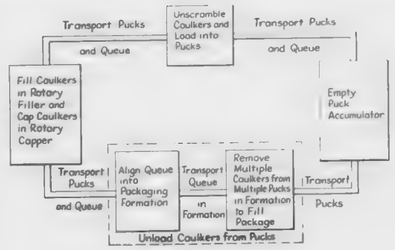
1. An air jet weaving machine having a picking nozzle outside the shed at one side of the weaving machine; and a weft yarn deflector disposed between such nozzle and the shed and operative to keep the weft yarn away from the shed in response to a machine stop signal; a sley having a conveying duct therein for conducting the deflected weft yarn to the side of the weaving machine oposite the side at which said picking nozzle is located; a receiver disposed adjacent the exit end of the conveying duct and having a suction passage entry aperture so dimensioned that the exit aperture of the conveying duct leads freely into the suction passage in all positions of the sley; and an end member disposed on the sley at the end of the conveying duct and opposite the entry aperture into the receiver, said end member being so dimensioned that, in all positions of the conveying duct relative to the receiver, it covers those zones of the entry aperture into the suction passage which are not disposed opposite the exit aperture of the conveying duct.

4,729,412
FORMING FABRIC OF DOUBLE-LAYER TYPE
Hans J. Bugge, Halmstad, Sweden, assignor to Nordiskafilt AB, Halmstad, Sweden
Continuation-in-part of Ser. No. 579,811, Feb. 13, 1984, Pat. No. 4,611,639. This application Aug. 11, 1986, Ser. No. 879,360
Claims priority, application Sweden, Feb. 23, 1983, 8300984
Int. Cl.⁴ D03D *11/00, 25/00*
U.S. Cl. 139—383 A **1 Claim**



1. An improved open mesh fabric for use in forming a fiber web in papermaking, cellulose and similar machines, said fabric comprising:
a first system of warp threads and a first system of weft threads, all warp threads of said first system of warp threads weaving with the first system of weft threads in a repeating pattern to form a first complete weave which during position of use of said fabric faces said fiber web to be formed thereon;
a second system of warp threads and a second system of weft threads, said two second systems of threads interwoven to form a second complete weave;
warp threads of said second system of warp threads being arrange in groups, each such group comprising at least two adjacent warp threads interweaving essentially in side by side relation parallel with each other and in a repeating pattern with weft threads of said second system of weft threads; and
said first complete weave and said second complete weave being joined together to form a double weave where at least one of the adjacent warp threads, interweaving essentially is side by side relation, parallel with each other, interlaces with weft threads of the first system of weft threads.

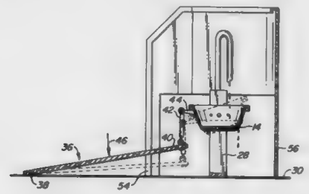
4,729,413
TRANSPORT PUCK AND METHOD TO FILL CAULKING CARTRIDGES
Walter E. Shults, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.
Filed Nov. 6, 1986, Ser. No. 927,767
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—2 **24 Claims**



11. A method for filling a caulking cartridge comprising the steps of:
(a) vertically aligning said cartridge in a transport puck, nozzle down, by means of an apparatus to unscramble and load said puck comprising
(i) a substantially solid lower portion, having a bottom face for stable contact and frictional engagement with level planar surfaces, and attached thereto, opposite said bottom face,
(ii) an upper sleeve, shaped to receive said caulking cartridge in the desired alignment,
wherein said lower portion has sufficient weight and said bottom face has sufficient breadth to maintain the center of gravity of said puck and filled caulker, below a plane passing through any single fulcral point or edge of said bottom face and extending upward through said sleeve from said level planar surface at an angle of about 60°;
(b) transporting said puck to an apparatus for filling said caulking cartridge; and
(d) filling said cartridge.

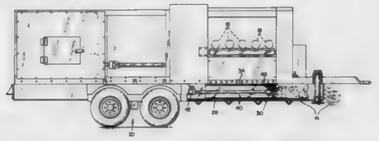
4,729,414
ANIMAL WATER DISPENSING DEVICE
Emmanuel Beber, 2308 Dolores St., Pinole, Calif. 94564
Filed Feb. 12, 1987, Ser. No. 14,230
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—250 **5 Claims**

1. A ground supported device for dispensing water from a pressure source thereof comprising:
a. a trough, said trough rotatable about an axis;
b. a faucet including a valve, said faucet being connected to the pressure source of water such that said valve is capable of controlling the flow of water therefrom, said faucet further including means for directing the flow of water into said trough, said trough being linked to said valve such that rotation of said trough actuates said valve;
c. a platform having a first end portion and a second end portion, said second end portion of said platform being positioned adjacent said trough and being linked thereto such that application of force on said platform rotates said trough from a rest position about said axis in a first direction;



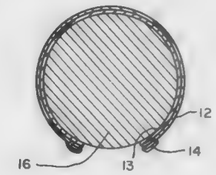
d. spring means for rotating said trough in a second direction opposite said first direction upon the renewal of force on said platform, to return said trough to said rest position; and
e. means for draining water from said trough, when said trough is in said rest position.

4,729,415
APPARATUS FOR DEBARKING TREES
Arnold N. Peterson, Eugene, and Larry A. Sprague, Dexter, both of Oreg., assignors to Peterson Pacific Corporation, Pleasant Hill, Oreg.
Filed Jul. 13, 1987, Ser. No. 72,774
Int. Cl.⁴ B27L *1/00*
U.S. Cl. 144—208 J **4 Claims**



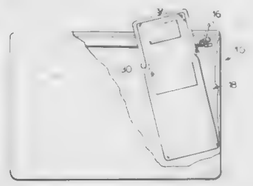
1. A debarking apparatus comprising; a debarking station wherein bark removing apparatus removes bark from tree stems passed through the station,
a channel member provided in the apparatus occupies a substantial portion of the area beneath the debarking station, said channel member extending in a direction crossway to the movement of logs through the station and extending a substantial distance in both directions beyond the debarking station, said channel member having an open top and closed sides and bottom in the area of the debarking station, and terminating at one end in a bark emitting opening that is remote from said debarking station;
a plunger slidably mounted in the channel member between a first position that is withdrawn from the area of the debarking station and at an end of the channel member opposite to the bark emitting opening, and a second position wherein the plunger resides in the debarking station, said plunger having a front face and upper surface that mates with the dimensions of the channel member, said upper surface closing the open top of the channel member when residing in said second position; and
actuating means actuating movement of said plunger between said first and second positions to thereby open the channel member to bark pieces being removed from the tree stems while the plunger member is in the first position, with movement to the second position pushing the bark material residing within the channel member toward the bark emitting opening.

4,729,416
STEERING WHEEL COVER
Derek J. Miller, 2311 Constitution Dr., San Jose, Calif. 95124
Continuation of Ser. No. 648,635, Sep. 7, 1984, abandoned. This application May 12, 1986, Ser. No. 863,818
Int. Cl.⁴ B62D *1/06;* **B65D** *65/08*
U.S. Cl. 150—52 M **4 Claims**



1. A steering wheel covered comprising:
a dual layer annular band comprising an annular layer of eel skin and an annular layer of a soft leather selected from lambskin, calfskin, pigskin, and cowhide, wherein said eel skin layer overlays said leather layer when said annular band is positioned on a steering wheel rim, and wherein said leather layer acts as a heat insulator and said eel skin layer acts as a heat repellent thereby providing a heat resistant steering wheel cover, each of said layers having outer edges rolled under and stitched to the rolled under outer edges of said other layer thereby providing double reinforced rolled edges for said annular band;
said annular band having perforations along its circumference parallel to each of said reinforced edges providing means for interlacing said reinforced edges into juxtaposition around a steering wheel rim wherein said reinforced edges, the strength and elasticity of said eel skin overlayer, and the strength of said leather underlayer prevent tearing of said perforations resulting from stress and tension on said perforations during interlacing;
said annular band having a circumference dimensioned for distension around the outer perimeter of said steering wheel rim and a width dimensioned for wrapping around said steering wheel rim juxtaposing said reinforced edges at the inner peimeter of said steering wheel rim.

4,729,417
POP UP CHANGE PURSE
Gladys Brierley, R.R. #1, Yarker, Ontario, Canada K0K 3N0
Filed Jan. 9, 1987, Ser. No. 1,855
Int. Cl.⁴ A45C *1/02, 3/02, 3/06, 13/10*
U.S. Cl. 150—116 **10 Claims**



1. In a change purse having a container for the elective insertion and removal of articles therefrom, said change purse being useable in co-operation and within a hand purse, said container having a pair of opposing sides in joined relation about the edges thereof to form the container and bounded by

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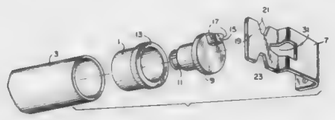
an elongated mouth joinable in closing relation therebetween, the improvement comprising suspension means attached to an edge portion of the change purse adjacent and below the mouth; said suspension means including a tilt link for attachment, in use, by one end of the link to the zipper draw of said hand purse, to locate said change purse in oriented relation within a compartment of said hand purse, beneath the zipper thereof, to enable one handed operation of said zipper in opening manipulation of said zipper draw to open said hand purse compartment; wherein said tilt link displaces said change purse in upward tilting relation relative to said zipper draw, to present said change purse oriented in stabilized, substantially level, raised relation within said hand purse compartment, for one handed access to the contents of the change purse.

4,729,418

TRUNNION AND BRACKET FOR ROLLERS

Edward T. Rude, Fairfield, Conn., assignor to General Clutch Corp., Stamford, Conn.

Filed Nov. 4, 1986, Ser. No. 926,652
Int. Cl.⁴ A47H *1/13*
U.S. Cl. 160—323.1 **6 Claims**



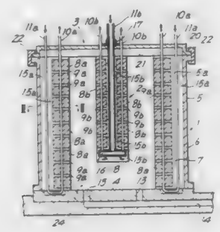
1. A bracket and trunnion means hardware pair for the trunnion end of a roller, said trunnion means being adapted for rotatable mounting into an end of said roller, a protruding lug displaced away from the centerline of said trunnion means for engaging said bracket to mount said roller, the cross-sectional shape of said lug being non-circular to impede rotation of said lug with respect to said bracket, said bracket having at least one slot for engaging said lug.

4,729,419

MOLD AND MANUFACTURING METHOD FOR HOLLOW CAST PRODUCT WITH BOTTOM

Shiro Nakamura, Ashiya; Katsuya Inoue, Aichi, both of Japan; Friedrich Werner, Krefeld, and Franz E. Schilling, Kempen, both of Fed. Rep. of Germany, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 18, 1986, Ser. No. 909,059
Claims priority, application Japan, Dec. 18, 1985, 60-286339
Int. Cl.⁴ B22D *15/04, 27/04*
U.S. Cl. 164—302 **6 Claims**



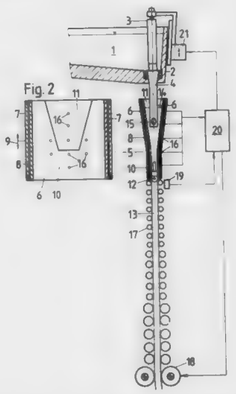
1. A static metal casting mold for large-sized hollow cast product having a bottom comprising:
- a top lid;
- an outer mold section including a lateral mold section and a lower mold section having at least one opening to serve as a sprue;
- a core to be disposed inside the outer mold section;
- the top lid attached to the core and covering the outer mold section;
- the lateral mold section of the outer mold section provided at its inner periphery with a composite cooling section to form an inner wall portion of the lateral mold section, by stacking chiller blocks and interposing therebetween refractory sands;
- the lateral mold section of the outer mold section provided at its outer wall portion with refractory sands,
- cooling pipes including plural sets of a first pipe and a second pipe,
- the first pipe extending longitudinally through the refractory sands at the outer wall portion, the second pipe extending longitudinally through the inner wall portion, the first and second pipes being connected at the respective lower portions,
- the second pipe being embedded in the chiller blocks so that the chiller block surface on the side to be contacted with a mold cavity will have enhanced cooling effect from fluid flowing in the pipes,
- each of the chiller blocks being free to expand when heated, owing to combined structure of the composite cooling section of the lateral mold section and the cooling pipes.

4,729,420

METHOD FOR CONCLUDING THE OPERATION OF THE CONTINUOUS CASTING OF STRIP METAL

Gunter Flemming, and Manfred Kolakowski, both of Erkrath, Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,623
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606289
Int. Cl.⁴ B22D *11/18, 11/20*
U.S. Cl. 164—453 **6 Claims**



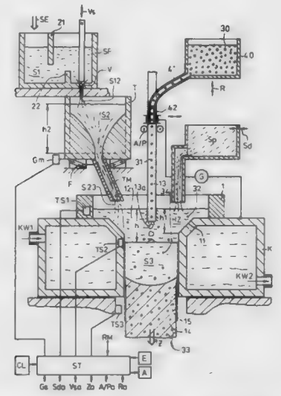
1. A method for concluding the operation of continuous casting of strip metal, comprising:
- providing continuous casting mold having a flared inlet pouring zone necking down to a distal zone in which the walls of the mold are parallel and spaced apart by substantially the desired cross-sectional shape and dimensions of the strip being cast,
- pouring liquid metal through a pouring tube having an orifice into said flared zone, and controlling the pouring rate thereof,
- continuously detecting and monitoring the instantaneous surface level of the metal bath in said mold,
- withdrawing the casting from the distal end of said mold, and controlling the rate of withdrawal,
- adjusting the pouring rate and withdrawal rate so that the level of the metal bath is at a maximum height for said mold when in normal operation,
- continuously sensing whether or not there is present downstream of said mold evidence of the distal end of the liquid core of said cast strip,
- reducing the pouring and withdrawal rates for concluding the casting to a rate at which the distal end of the liquid core of the cast strip is near to but downstream of the mold and at which the metal bath level remains constant,
- thereafter terminating said pouring while continuing said withdrawal, whereby the metal bath level descends rapidly toward the neck end of said flared zone,
- reducing the withdrawal rate when the metal bath level is close to the lower end of the flared zone to a rate at which the upper surface of the metal bath can congeal sufficiently for further processing downstream by the time it reaches the end of the distal zone, and
- thereafter withdrawing the casting.

4,729,421

METHOD AND DEVICE FOR THE PRODUCTION OF METAL BLOCKS, CASTINGS OR PROFILE MATERIAL WITH ENCLOSED HARD METAL GRAINS

Werner Schatz, Kurweg 81, 6719 Carlsberg, Fed. Rep. of Germany

Continuation of Ser. No. 666,514, Oct. 30, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 908,866
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339118; Jul. 11, 1984, 3425489
Int. Cl.⁴ B22D *27/02*
U.S. Cl. 164—457 **14 Claims**



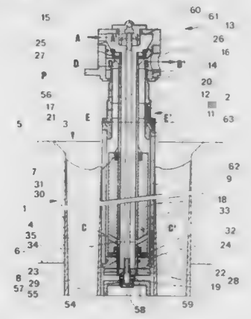
1. In a process for the manufacture of metal blocks, castings, or profile material from molten metal which is transferred in a chill from an upper heating zone into a lower cooling zone, cooled by water with such a speed theat the solidification of the molten metal proceeds, the process including continuously feeding a grain material from the upper heating zone onto the surface of the molten metal, the improvement which comprises selecting a hard material having a higher density than the molten metal, maintaining a temperature below that of the melting temperature of the hard material, maintaining the heating zone at a temperature which is higher than the melting point of the hard material grains, passing the hard material grains with a speed through the heating zone such that the grains melt on their surface to a depth of just about a micrometer before entering the molten metal, and feeding the grains in a given distribution pattern onto the surface of the molten metal.

4,729,422

PROCESS AND APPARATUS FOR THE PRODUCTION OF HOLLOW BODIES BY CONTINUOUSLY CASTING IN A MAGNETIC FIELD

Roland Ernst, Gieres; Marcel Garnier, Grenoble; Michel Giroutru, Saint-Egreve; André Gueussier, Paris; René Moreau, Voiron, and Pierre Peytavin, Neuilly-sur-Seine, all of France, assignors to Vallourec, Paris, France

Continuation of Ser. No. 457,426, Jan. 12, 1983, abandoned. This application Nov. 8, 1985, Ser. No. 797,773
Claims priority, application France, Jan. 13, 1982, 8200763
Int. Cl.⁴ B22D *11/00, 27/02, 13/02*
U.S. Cl. 164—465 **5 Claims**



1. A process for the production of hollow metal bodies by vertical continous casting comprising the steps of: (a) introducing liquid metal into an annular space defined by an outer metal mold which is cooled by circulation of a fluid, and an inner mandrel which is also cooled by the circulation of a fluid, the mold and mandrel rotating at substantially the same speed and in the same direction, the metal progressively solidifying upon contact with the walls of the mold and the mandrel to form a hollow body which can be extracted from the mold, (b) generating a sliding and rotating magnetic field within said mandrel and applying said magnetic field to the liquid in the annular region adjacent to the outer surface of the mandrel, to generate force within said liquid metal, in said annular region, having an upwardly directed vertical component to thereby entrain said liquid metal towards the free surface of the bath, wherein the common direction of rotation of the mold and the mandrel is opposite to the direction of rotation of the sliding and rotating magnetic field.

4,729,423

PROCESS AND APPARATUS FOR THE OPTICAL CHECKING OF THE SHAPE AND DIMENSIONS OF THE ENDS OF TUBES IN A STEAM GENERATOR

Alain Martin, Caluire, France, assignor to Framatome, Courbevoie, France

Filed Dec. 13, 1985, Ser. No. 808,701
Claims priority, application France, Dec. 14, 1984, 84 19210
Int. Cl.⁴ G01C *11/00;* **G03B** *35/00*
U.S. Cl. 165—1 **3 Claims**

1. Process for the stereophotogrammetric checking of the shape and dimensions of the ends of the tubes of a steam generator comprising a bundle of tubes (8) whose ends are fixed in a tubular plate (2) constituting a regular grid in which the positions of said tubes are accurately defined and lie flush with one face of said tubular plate (2), or primary face (2*a*), and a water tank (3) of hemispherical shape having at least one opening (10) in its wall, the interior space of said tank being in communication with said primary face (2*a*) of said tubular plate (2) and with the interior of said tubes (8), said process comprising the steps of

(a) placing a photographic camera (15) provided with a

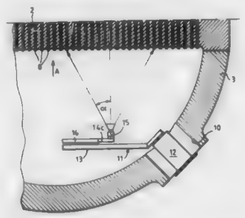
VOL 1088 ISS 2 MR 8 1988 UMI

sensitive support parallel to said tubular plate (2), inside said water tank (3), in such a manner that its optical axis remains substantially parallel to a fixed direction during the displacement;

(b) making successive exposures of the ends of said tube lying flush with said primary face (2a) of said tubular plate (2) with said camera (15) in different determined positions, each exposure corresponding to a plurality of tubes chosen so as to obtain, by the successive exposure made, at least two views at two different perspective angles of each of said tubes (8) to be checked;

(c) obtaining from said sensitive support extracted from said water tank (3) photographic images on a predetermined fixed scale of said primary face (2a) of said tubular plate (2) and of the ends of said tubes (8),

(d) determining on each image the perspective angle corresponding to each said tube to be checked by measuring the



space between said tubes in the neighborhood of the tubes to be checked and comparing said spacing to the corresponding spacing at the center of the image, each tube being identified in terms of its position in the regular grid of said plate;

(e) arranging the photographic images in pairs to give a stereophotogrammetric view of the end of each of said tubes (8) to be checked;

(f) orienting the images of each said pair with respect to each other to obtain a stereophotogrammetric image of each tube;

(g) determining the scale of the image by measuring the spacing of said tubes on the stereophotogrammetric view and comparing said spacing with the constant spacing of said grid; and

(h) observing and measuring the ends of each tube on the stereophotogrammetric view, taking the scale into account.

4,729,424

COOLING SYSTEM FOR ELECTRONIC EQUIPMENT

Tsukasa Mizuno, and Minoru Okano, both of Tokyo, Japan, assignors to NEC Corporation, Japan

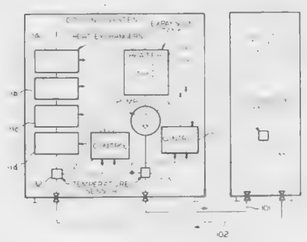
Continuation-in-part of Ser. No. 846,860, Apr. 1, 1986, abandoned. This application Apr. 30, 1987, Ser. No. 52,174

Claims priority, application Japan, Apr. 5, 1985, 60-50927[U]; Apr. 11, 1985, 60-75465

Int. Cl.⁴ G05D *23/19;* **F25B** *29/00*

U.S. Cl. 165—30 **9 Claims**

1. A cooling system for controlling the temperature of electronic equipment, said cooling system comprising a circulation system for conveying a cooling liquid into, through and out of said equipment, said cooling liquid being heated by heat of said equipment while it flows through said equipment; a plurality of heat exchangers for removing heat from said cooling liquid after it leaves said equipment, each of said heat exchangers having a capacity for removing a predetermined amount of heat from said cooling liquid; control means responsive to a differential of temperatures of the cooling liquids flowing into and out of said equipment for operating a selected number of said heat exchangers which is required to maintain a relatively wide range of temperatures within said equipment; means in said circulating system for heating the cooling liquid before it enters into said equipment; and said control means being further responsive to temperature sensing means within said equipment for controlling said heating means to maintain the



temperature of the liquid coolant to be fed to said electronic system equal to or higher than the temperature within said electronic system.

4,729,425

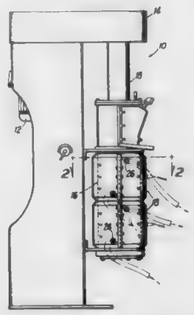
COOLING BLADDER ASSEMBLY FOR MIXING MILL

Phillip G. Mitchell, P.O. Box 612, 215 Orr Ave., Opelika, Ala. 36801

Filed Apr. 18, 1986, Ser. No. 853,671

Int. Cl.⁴ F28F *3/12, 7/00;* **B01F** *15/06*

U.S. Cl. 165—47 **7 Claims**



1. A bladder cooled chamber assembly for installation around the mixing chamber of a sandmill or the like, comprising upper and lower pairs of bladder halves, each of said bladder halves having inner and outer walls forming a chamber therebetween, a coolant fluid disposed in said chamber, inlet and outlet port means formed in said outer walls in each of said bladder halves for ingress and egress of said coolant means, a pump means operatively connected with said port means for circulating said coolant throughout said chambers, each of said bladder halves having a flange means along one vertical edge thereof and a substantially flat opposite vertical edge, said flat edges being receivable within said flange means directly opposite thereto upon installation of said bladder halves, and securing means for fastening said opposed vertical edges together, and drawing said bladder halves tightly around the sandmill, whereby essentially all of the mixing chamber of the sandmill is enveloped therebetween.

4,729,426

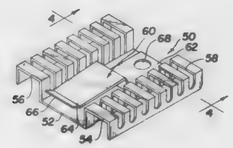
BONDED CLIP HEAT SINK

Howard G. Hinshaw, Dallas, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Filed Mar. 6, 1986, Ser. No. 836,816

Int. Cl.⁴ H02L *23/40*

U.S. Cl. 165—80.3 **11 Claims**



1. A heat sink for use in dissipating heat from an electronic device package comprising:

(a) a body constructed of heat conducting material and adapted for rapid dissipation of heat therefrom;

(b) a clip constructed of resilient material bonded to said heat sink body and adapted to grip an electronic device package to secure the electonic device package to said heat sink body and in thermal contact therewith, said clip having a first portion including an integral standoff formed thereon which is bonded to said body and spaces said first portion of said clip from said body.

4,729,427

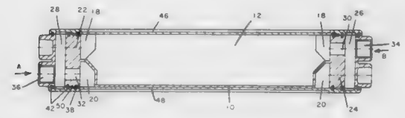
HEAT EXCHANGER

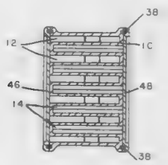
Dieter Baumann, Greven-Gimbte, Fed. Rep. of Germany, assignor to Ing. Walter Hengst GmbH & Co. KG, Münster, Fed. Rep. of Germany

Filed Apr. 23, 1987, Ser. No. 41,780

Int. Cl.⁴ F28D *7/02*

U.S. Cl. 165—165 **14 Claims**





1. A heat exchanger for two fluids, comprising:

a dividing wall of meander-like cross section for defining parallel, longitudinally running longitudinal channels alternately open at opposite longitudinal sides for a flow of two fluids in adjacent longitudinal channels, said channels having two ends;

two covers closing said open longitudinal channels at said opposite longitudinal sides;

two cross channels, situated at both ends of said longitudinal channels, which connect together the longitudinal channels of one fluid on the one hand and of another fluid on the other hand;

connecting channels leading to said cross channels;

two terminal headers of the heat exchanger in its longitudinal direction;

said covers of said longitudinal channels being prolonged to bilaterally cover said two terminal headers;

said two cross channels adjoining one another at their inner sides at the ends of said longitudinal channels and being openable at their opposite outer sides and being closable by said prolonged covers;

in each header, transversely side by side, two feed channels for the two fluids running between said covers and closable thereby;

inlet and outlet openings for said feed channels and disposed at ends of said headers;

each feed channel being connectable by one of said connecting channels to a corresponding cross channel and to a corresponding one of said inlet and outlet openings at the end of the header.

4,729,428

HEAT EXCHANGER OF PLATE FIN TYPE

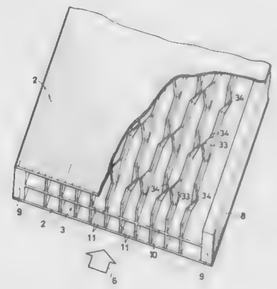
Takayuki Yasutake, and Tetsuo Shibata, both of Oyama, Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Division of Ser. No. 746,472, Jun. 19, 1985, abandoned. This application Jun. 27, 1986, Ser. No. 879,532

Claims priority, application Japan, Jun. 20, 1984, 59-128284; Jun. 20, 1984, 59-128285; Jun. 20, 1984, 59-128286; Jul. 20, 1984, 59-110413[U]

Int. Cl.⁴ F28F *3/00*

U.S. Cl. 165—166 **2 Claims**



1. A heat exchanger of the plate fin type having first fluid channels and second fluid channels arranged alternately and each separated from the adjacent channel by a flat metal plate, at least one of the first fluid channel and the second channel being formed by a pair of adjacent flat metal plates and a spacer interposed between the flat plates, the spacer comprising a pair of side walls each joined to an interconnecting a pair of opposed edges of the two flat plates at each side thereof, a connecting wall interconnecting the two side walls and spaced apart from the opposite flat plates in parallel therewith, and fins provided on the opposite surfaces of the connecting wall at a right angle therewith and joined at their forward ends to the flat plate, the fins extending in parallel with the direction of flow of fluid through the fluid channel, wherein each fin is further provided with a plurality of bent portions projecting to at least either of the right and the left at a specified spacing in the direction of flow of fluid, each bent portion having a 'V'-shape oriented transversely of the direction of fluid flow and opened toward the side at which the bent portion does not project, when cut along a plane parallel with the connecting wall, said 'V'-shape being the largest at the side of the flat plate and gradually getting smaller as it comes close to the connecting wall portion, and in a next row of passages being the largest at the side of said connecting wall and gradually getting smaller as it comes close to said flat plate, and a flat portion of

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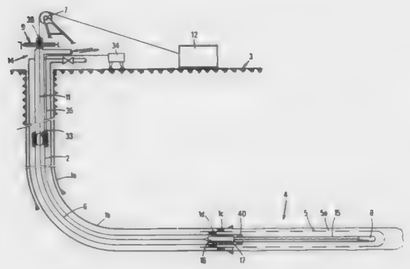
said fin provided between the bent portions adjacent to each other in the direction of flow of fluid.

4,729,429

HYDRAULIC PRESSURE PROPELLED DEVICE FOR MAKING MEASUREMENTS AND INTERVENTIONS DURING INJECTION OR PRODUCTION IN A DEFLECTED WELL

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, France

Filed Dec. 30, 1985, Ser. No. 814,755
Claims priority, application France, Dec. 28, 1984, 84 19964
Int. Cl.[4] E21B *23/10*
U.S. Cl. 166—65.1 **9 Claims**



1. A device useful for carrying out, during a fluid production or injection operation, measurements or interventions in a deflected well passing through a geological formation and being equipped with tubing, said device comprising at least one measuring or intervention instrument, an extension having an upper end provided with means for supporting sealing members allowing propulsion of the device in said tubing under the effect of a hydraulic pressure and another end fixed to the instrument, said device being connected to the surface by a flexible support line and having a propulsion position in the tubing as well as a measuring or intervention position; said support means comprising two elongate members, one of the elongate members being fixed to the upper end of said extension, extending above said sealing members and defining a flow passage which leads from at least one opening therein situated above the sealing members to at least another opening therein situated below the sealing members and the other elongate element being mobile and having at least one opening therein situated above the sealing members and being capable of being moved by sliding with respect to said upper end of said extension from a propulsion position in which the at least one opening in the fixed elongated element situated above the sealing members is closed to a measuring or intervention position in which the at least one opening in the fixed elongated element situated above the sealing members is uncovered thereby allowing a fluid to flow and to pass through said passage and through said elongated elements during injection or production of the fluid.

4,729,430

PRESSURE LIMITER FOR A DOWNHOLE PUMP AND TESTING APPARATUS

Kevin M. White, Jupiter, Fla., and Paul D. Ringgenberg, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

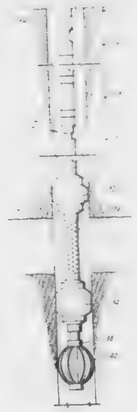
Filed Oct. 27, 1986, Ser. No. 923,800
Int. Cl.[4] F21B *47/00*
U.S. Cl. 166—106 **20 Claims**

1. A pressure limiter apparatus for use in a well testing string having a positive displacement pump including a fluid displacement element, said apparatus comprising:

enclosure means in said well testing string having a wall defining a pumping chamber adjacent said pump and in pressure transmitting communication with said fluid displacement element;

inlet valve means associated with said enclosure means for controlling flow of fluid from a well annulus into said pumping chamber;

outlet valve means associated with said enclosure means for controlling flow of fluid from said pumping chamber to a lower well testing string portion; and



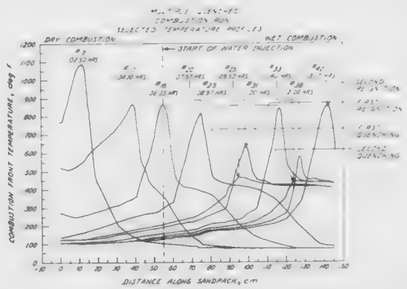
pressure limiting means in communication with said pumping chamber for increasing the volume of said pumping chamber when a positive fluid pressure differential between said pumping chamber and said well annulus exceeds a predetermined value and for preventing venting of said fluid in said pumping chamber to said well annulus when said volume is so increased.

4,729,431

OIL RECOVERY BY QUENCHED IN SITU COMBUSTION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,298
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 **14 Claims**



1. An in situ combustion method of recovery hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

igniting the formation to form a combustion front by injecting oxygen-containing gas and heat into a hydrocarbon formation through an injection well;

quenching the combustion front by injecting a sufficient amount of water into the formation through the injection well;

reigniting the combustion front at a location farther away from the injection well than the previously quenched combustion front by injecting an oxygen-containing gas into the formation through the injection well; and

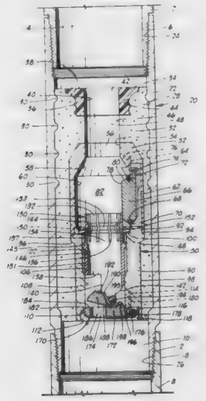
recovering hydrocarbons and other fluids at a production well.

4,729,432

ACTIVATION MECHANISM FOR DIFFERENTIAL FILL FLOATING EQUIPMENT

Lonnie C. Helms, Ducan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1987, Ser. No. 44,878
Int. Cl.[4] E21B *34/14*
U.S. Cl. 166—317 **9 Claims**



1. A differential fill valve assembly, comprising:

substantially tubular body means having upper and lower longitudinal bores therin;

back pressure flapper means secured to said body means, adapted to seat across said upper bore and including first spring biasing means;

double flapper valve assembly means having a larger and a smaller flapper, said larger flapper having an aperture therethrough, being secrued to said body means and adapted to seat across said lower bore, said smaller flapper being secured to said larger flapper and adapted to seat thereon over said aperture, and said larger flapper and said smaller flapper including second and third biasing means, respectively; and

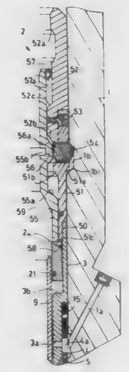
substantially tubular activiating sleeve means slidably disposed in said lower bore between said back pressure flapper means and said double flapper valve assembly means, said activating sleeve means having a top and bottom and comprising a lower tubular sleeve surmounted by a circumferential ring of upwardly extending collet fingers having inwardly radially directed shoulders extending from their inner surfaces and including elastomeric insert means extending between adjacent collet fingers and shoulders, said annular shoulders and insert means defining a ball seat means, said top protruding above said lower bore and maintaining said back pressure flapper means in an open mode in a first longitudinal position, and releasing said back pressure flapper means in a second longitudinal position spaced position wherein said bottom protrudes below said lower bore and rotates said larger flapper to an open mode against said second biasing means.

4,729,433

SAFETY VALVE FOR OIL-WELLS AND INSTALLATION TOOL FOR THE VALVE

Jean-Luc Jacob, Lescar, France, assignor to Diamant Boart France-SA-Division Petrole, Serres Castet, France

Filed Oct. 29, 1986, Ser. No. 924,438
Claims priority, application France, Jul. 29, 1986, 86 11418
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—322 **10 Claims**



1. A safety valve for insertion into an oil-well production pipe for closing or opening the pipe, said valve comprising a generally tubular valve body,

a movable shutter (**11**) located at the lower part of said valve body and biased toward a closed position,

a tubular slide (**9**) arranged to slide longitudinally inside the valve body for causing by its descending motion the opening of the shutter,

a return spring (**10**) located in an annular housing between the slide and the valve body so as to bias said slide upwardly toward an upper shutter closing position,

hydraulic means for displacing said slide downwardly and comprising a control fluid intake (*3a*, *4a*) through the valve body and a sealed volume between the slide and the body for receiving the control fluid, said slide having a differential cross-section subjected to the pressure of the fluid contained in said sealed volume so as to receive a downward force when said volume is pressurized;

an anchoring system at the upper part of the valve body for securing the valve body into a receiving sleeve (**1**) in the production pipe, said anchoring system comprising radially movable dogs (**54**) capable of entering into an anchoring groove (*1b*) of the receiving sleeve, a tubular shuttle piston (**58**) slidingly mounted in the valve body and including a surface to be subjected to the pressure of the control fluid in such a manner as to be subjected to an upward force when said control fluid is under pressure; and a lock bushing (**55**) mounted so as to receive the upward force of said shuttle piston and to be forced upwardly thereby, said lock bushing having a peripheral cam (**56**) for forcing said dogs into said anchoring groove when said cam (**56**) reaches the level of said dogs during the travel thereof to an anchoring position; upper and lower seal means (**15**, **16**) arranged around the valve body for sealing the interface between said valve body and the receiving sleeve above and below the control fluid intake;

said shuttle piston (**58**) being slidingly displaceable in said valve body so as to be freely slidable in said valve body between a lower stop position and an upper stop position, said shuttle piston being only subjected to fluid pressure

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in the absence of any mechanical blockage along its displacement,

said lock bushing (**55**) being slidingly mounted in said valve body independently of said shuttle piston in such a manner that said shuttle piston only exerts upward pressure on said lock bushing without driving said shuttle piston when said shuttle piston is in said upper stop position,

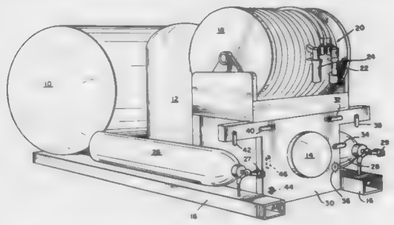
said valve body having on the peripheral surface thereof a stop shoulder (**51***a*) adapted to cooperate with said stop means (**1***bi*) of said receiving sleeve in said anchoring position, said valve body having a diameter less than the portion of said valve body below said stop shoulder so as to permit the entry of said valve body into said receiving sleeve when said stop shoulder (**51***a*) comes into contact against said stop means (**1***bi*) of said receiving sleeve.

4,729,434

PORTABLE FIRE-FIGHTING APPARATUS

Jerry T. Rohrbach, 11014 English St., Hoagland, Ind. 46745

Filed Apr. 28, 1986, Ser. No. 856,275
Int. Cl.[4] **A62C** *27/28*
U.S. Cl. 169—24 **10 Claims**



1. A fire-fighting apparatus, comprising:

a frame having two ends and two sides;

a first tank supported on a first end of the frame and containing a quantity of water;

means for selectively connecting the first tank to a first discharge nozzle;

a second tank supported on the frame and containing a quantity of chemical fire-extinguishing agent;

means for selectively connecting the second tank to a second discharge nozzle;

a third tank supported on the frame and containing a foam concentrate;

means for selectively connecting the third tank to the first discharge nozzle and for mixing a predetermined quantity of foam concentrate with water flowing from the first tank to the first discharge nozzle;

means for pressurizing the first, second and third tanks with a compressed fluid;

a hose reel supported on a second end of the frame;

a central control panel supported on the second end of the frame adjacent the hose reel, said control panel having first and second sides respectively supported by first and second sides of the frame; and

control means, mounted on the central control panel and connected to the means for connecting the first, second and third tanks to the first and second discharge nozzles, for selectively controlling the supply of water, foam concentrate and chemical fire-extinguishing agent to the first and second nozzles, respectively, and for selectively controlling the refilling of the first, second and third tanks, and for selectively controlling the purging of the means for connecting the first, second and third tanks to the first and second discharge nozzles;

wherein said control means includes a plurality of control elements mounted on the first side of the control panel for controlling the discharge, purging, metering and mixing of water and foam concentrate from the first and third tanks, and a plurality of control elements mounted on the second side of the control panel for controlling the discharge, purging, and refill of chemical fire-extinguishing agent from the second tank.

4,729,435

SUBSOIL TILLING IMPLEMENT

Oren D. Urich, Windsor, Colo., assignor to Krause Plow Corporation, Hutchinson, Kans.

Filed Oct. 27, 1986, Ser. No. 923,323
Int. Cl.[4] **E02F** *5/32*; **A01B** *13/08*
U.S. Cl. 172—196 **22 Claims**

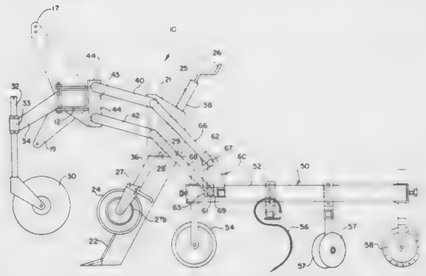
1. An agricultural tilling implement adapted to be connected to the rear of a tractor having a three-point hitch, wherein said implement comprises:

(a) an elongated tool bar including first and second attachment means adapted to connect said tool bar to said three-point hitch in a manner such that said tool bar is transverse with respect to said tractor; wherein said first and second attachment means are spaced from each other on said tool bar;

(b) a plurality of tilling units carried by said tool bar, each said tilling unit comprising:

(i) a downwardly depending ripper member;

(ii) two rotatable wheels adjacent said ripper member; said wheels being vertically adjustable; wherein said wheels are adapted to limit the depth of said ripper member in the soil;



wherein each said tilling unit is connected to said tool bar by means of a linkage which is adapted to permit said tilling unit to move vertically relative to said tool bar when said ripper member is in the soil being tilled; wherein each said tilling unit includes a bracket from which said ripper member depends; wherein said linkage connects said bracket to said tool bar; wherein said linkage comprises:

(a) a pair of upper support arms, each of which is pivotably supported at one of its ends by said tool bar and is pivotably supported at its opposite end by said bracket; and

(b) a pair of lower support arms, each of which is pivotably supported at one of its ends by said tool bar and is pivotably suppored at its opposite end by said bracket.

4,729,436

BALL AND DISC OVER-SPEED SHUT-OFF MECHANISM FOR A ROTARY PNEUMATIC TOOL

German Amador, and Paul A. Biek, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 19, 1986, Ser. No. 910,115
Int. Cl.[4] **B23Q** *5/06*
U.S. Cl. 173—12 **5 Claims**

1. A rotary pneumatic tool comprising:

a motor having a rotor mounted for rotation about an axis within a stator;

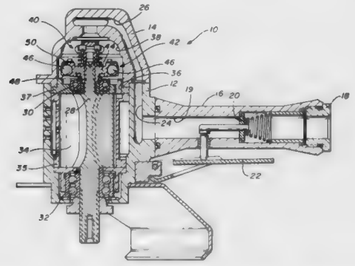
an input opening for connection of the tool to a source of compressed gas;

a plurality of walls defining passageways within the tool between the input opening and the rotor;

a frusto-conical bistable spring washer coaxially mounted with the rotor and having an outer circular edge;

the spring washer being shiftable between two stable configurations: a frusto-conical non-sealing configuration, and an inverted frusto-conical sealing configuration;

the outer circular edge of the spring washer sealingly contacting one of the walls defining the passageways when



the spring washer is in the stable sealing configuration, such that communication through the passageways between the source of compressed gas and the rotor is interrupted when the spring washer is in the stable sealing configuration;

a body coaxially mounted for rotation with the rotor; and

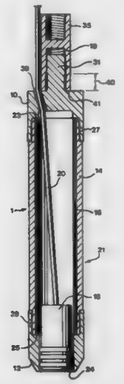
flyweight means mounted movably in the body for imparting a force upon the spring washer, said force being progressively increased with higher speeds of rotation of the rotor and upon attaining a predetermined amount forcing said washer from the stable nonsealing configuration to the stable sealing configuration for deactivating said tool.

4,729,437

SEDIMENT SAMPLER

Michael M. Zapico, #8 Krug Street, Kitchener, Ontario, M2H 2X7, Canada

Filed Apr. 21, 1986, Ser. No. 853,886
Int. Cl.[4] **E21B** *49/02, 25/00*
U.S. Cl. 175—20 **1 Claim**



1. Sediment sampler, which comprises:

an inner-sleeve (**16**), made of such material and to such dimensions that the inner-sleeve would collapse if subjected to substantial hammer blows directed axially along the length of the inner-sleeve;

an outer-sleeve (**14**), made of such material and to such dimensions that the outer-sleeve can withstand substantial hammer blows directed axially along the length of the outer-sleeve;

an upper-drive-head (**10**);

a drive-shoe (**12**);

an upper-attachment-means (**27**), by means of which the outer-sleeve may be attached to the upper-drive-head in such a manner as to transmit axially directed hammer blows from the upper-drive-head to the outer-sleeve;

a lower-attachment-means (**29**), by means of which the outer-sleeve may be attached to the drive-shoe in such a manner as to transmit axially directed hammer blows from the outer-sleeve to the drive-shoe;

where the outer-sleeve, the upper-drive-head, and the drive-shoe may be attached together and when so attached comprise a barrel-assembly (**21**);

an upper-shoulder (**23**), which is formed in the upper-drive-head;

a lower-shoulder (**25**), which is formed in the drive-shoe;

where the two shoulders face each other when the barrel-assembly is assembled, one towards each end of the barrel-assembly;

where the barrel-assembly is so dimensioned as to receive the inner-sleeve inside the barrel-assembly;

where, when the inner-sleeve is inside the barrel-assembly, the inner-sleeve is located with its axial ends between the two shoulders;

a piston (**18**) which is arranged to be a sealing, sliding fit along the length of the inner-sleeve;

a piston-holding-means (**20**) which is suitable for holding the piston against downwards movement with the barrel-assembly when the barrel-assembly is hammered down into the ground;

where the inner-sleeve may be removed from the barrel-assembly upon dis-assembly of the barrel-assembly;

and where the piston-holding-means is a cable (**20**), which is attached to the piston (**18**), and which passes out through a hole (**39**) formed through the upper-drive-head (**10**).

4,729,438

STABILIZER FOR NAVIGATIONAL DRILLING

Clyde R. Walker, Spring, Tex.; Burley Glasscock, and Haraldur Karlsson, both of Sandy, Utah, assignors to Eastman Christensen Co,, Salt Lake City, Utah

Filed Jul. 3, 1986, Ser. No. 881,951
Int. Cl.[4] **E21B** *7/08*
U.S. Cl. 175—76 **17 Claims**

1. In a stabilizer for use in a bottom hole assembly for use in navigational or controlled directional drilling in which there is a bit on the lower end of the string with a bit face oriented at an angle with respect to the axis of the drill string and wherein there is a tendency for the stabilizer to hang-up or kerf into the formation at the start of or during directional drilling, the improvement comprising:

a plurality of spaced and generally axially extending and spiraled blade elements each including a surface face of a hardened abrasion resistant material, each said surface face having a trailing and leading edge portion,

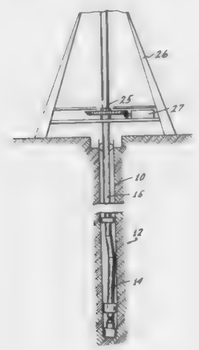
each blade having a surface face also including a generally axially tapered lead portion and a general axially tapered trailing portion and a flat non-tapered surface face portion therebetween,

each said blade also including a generally axially tapered forward lead end and a generally axially tapered trailing end;

said surface face being arcuate in shape in a radial direction,

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at least one of said edge portions being radiused a predetermined amount, and





the taper of the tapered lead portion of said surface face being greater than the taper of the trailing tapered portion of said surface face.

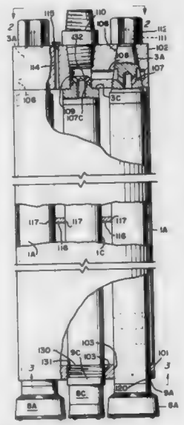
4,729,439

GANG DRILL CONSTRUCTION

Ewald H. Kurt, Roanoke, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 24, 1986, Ser. No. 922,626
Int. Cl.[4] E21B *4/16*
U.S. Cl. 175—96 **4 Claims**

1. A gang drill for rock boring and the like comprising:
an assembly of a plurality of individual percussion producing rock drills in a cylindrical drill casing having a top end connected to a drill string and a bottom end adjacent rock boring bits operatively associated with each of said drills; said casing totally enclosing said percussive producing rock drills, and being further provided with alignment means, securing means, and means for supplying pressure fluid for each of said drills of said plurality of drills, said pressure fluid entering said drills internal of said casing and exiting said drills external to said casing at its bottom end whereby said casing forms a peripheral passage for



the exiting of rock cuttings and provides protection for said drills.

4,729,440

TRANSISTION LAYER POLYCRYSTALLINE DIAMOND BEARING

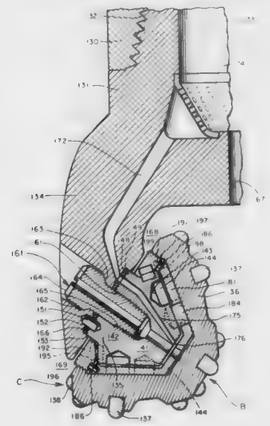
David R. Hall, Provo, Utah, assignor to Smith International, Inc., Newport Beach, Calif.

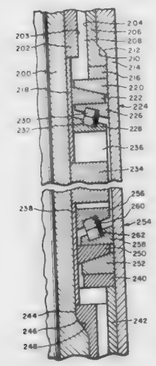
Continuation-in-part of Ser. No. 728,177, Apr. 29, 1985, Pat. No. 4,604,106, which is a continuation-in-part of Ser. No. 600,399, Apr. 16, 1984, Pat. No. 4,525,178. This application May 19, 1986, Ser. No. 864,683
The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.
Int. Cl.[4] E21B *4/02, 10/22*
U.S. Cl. 175—107 **34 Claims**

12. A rotary rock bit comprising:
a main bit body;
connecting means at one end of the bit body for connecting the bit body to a drill string;
mounting means at the opposite end of the bit body for mounting at least one roller cone on the bit body for rotation around an axis transverse to the rotational axis of the bit body; and
bearing means between the bit body and the roler cone, the bearing means comprising at least one pair of complementary friction bearing members mounted in bearing relationship, each bearing member comprising:
a polycrystalline diamond layer with a surface for slidably contacting a complementary bearing member, said polycrystalline diamond layer comprising diamond crystals pressed under sufficient heat and pressure to create polycrystalline diamond material in which adjacent diamond crystals are bonded together; and
at least one transistion layer joined at an interface with the polycrystalline diamond layer amd comprising a mixture of diamond crystals and precemented carbide pieces pressed under sufficient heat and pressure to create composite polycrystalline material in which adjacent diamond crystals are bonded together to create polycrystalline diamond material which is bonded to the precemented carbide pieces, and in which transition layer the polycrystalline diamond material and the precemented carbide pieces are interspersed in one another.

23. A fluid motor assembly comprising:
tubular housing means;

rotary shaft means supported in the housing means and adapted to support a drill bit;
motor means in the housing means actuated by flow of drilling fluid through the motor means and opearable to rotate the shaft means; and
bearing means in the housing means supporting the rotary shaft means, in which the bearing means comprises at least one pair of complementary bearing members mounted in bearing relationship, each bearing member comprising:
a polycrystalline diamond layer with a surface for slidably contacting a complementary bearing member, said polycrystalline diamond layer comprising diamond crystals pressed under sufficient heat and pressure to





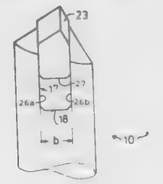
create polycrystalline diamond material in which adjacent diamond crystals are bonded together; and
at least one transition layer joined at an interface with the polycrystalline diamond layer and comprising a mixture of diamond crystals and precemented carbide pieces pressed under sufficient heat and pressure to create composite polycrystalline material in which adjacent diamond crystals are bonded together to create polycrystalline diamond material which is bonded to the precemented carbide pieces, and in which transition layer the polycrystalline diamond material and the precemented carbide pieces are interspersed in one another.

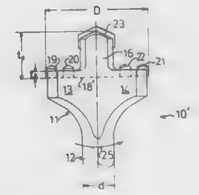
4,729,441

ROCK DRILL

Wolfgang Peetz, Blitzenreute, and Bernhard Moser, Altshausen, both of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,629
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426977
Int. Cl.[4] E21B *10/46, 10/26*
U.S. Cl. 175—385 **12 Claims**





1. A rock drill comprising:
a drill head body having a longitudinal axis and having at least one radially projecting recessed groove provided therein, which recessed groove has a pair of sidewalls and a bottom surface, which bottom surface extends from one sidewall to the other sidewall, and which recessed groove extends the entire width of the drill head body, and has a groove depth measured along said longitudinal axis; and
at least one cutting body seated in and brazed together with said at least one radially projecting recessed groove, which cutting body has a lower edge, which lower edge faces the bottom surface of the recessed groove, and a groove penetration depth measured along said longitudinal axis,
wherein said groove depth is greater than said groove penetration depth, whereby a clearance space is defined between the bottom surface of the recessed groove and the lower edge of the cutting body prior to and after brazing, such that a stress-reduced seating of said at least one cutting body is provided after brazing.

4,729,442

APPARATUS FOR THE WEIGHTED DOSING OF GRANULATED OR PULVERULENT PRODUCTS

Jean-Luc Sichet, Saint Herblain, France, assignor to Societe Chimique des Charbonnages S.A., Paris, France

PCT No. PCT/FR86/00211, § 371 Date Feb. 6, 1987, § 102(e) Date Feb. 6, 1987, PCT Pub. No. WO86/07629, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 19, 1986, Ser. No. 26,612
Claims priority, application France, Jun. 20, 1985, 85 09406
Int. Cl.[4] G01G *13/02, 11/08*; B65G *37/00*
U.S. Cl. 177—50 **7 Claims**

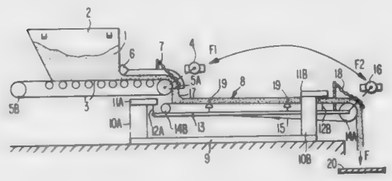
1. Apparatus making it possible to effect accurately in line and continuously the weight feeding of granulated or pulverulent products comprising two separated endless belts for extracting and dispensing, in which the endless belt of the dis-

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penser is continuously weighed as a whole and in which the speed of the extraction apparatus is controlled to the measurement of the instantaneous load of product distributed on the dispenser belt characterized in that it comprises:

a hopper (2) for storing the product to be weighed under which is arranged an endless belt (3) for extraction, of which one of the two support drums (5A, 5B) is driven at a variable speed by a motor-reduction gear (4),

a dispenser unit (8) disposed below and in line with the endless belt (3) of the extractor, this unit being constituted of a fixed T-shaped support frame (9) which is provided at its ends with three pillars (10A-10B-10C) supporting three



strain gauge type flexion weight indicators (11A, 11B, 11C) which are provided with flexible suspension cables (12A, 12B, 12C), an ultralight tubular frame (13), an endless belt (15) of which drums (14A-14B) are supported by said frame (13), one of the drums (14A) being driven at variable speed by a motor-reduction gear unit (16),

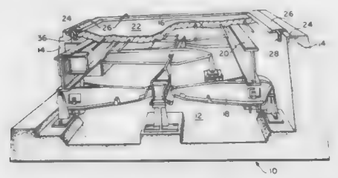
an electronic control chain F1-F2 between the motor reductor gear unit (16) driving the endless belt (15) of the dispenser and the motor gear unit (4) of the endless belt of the extractor (3), said chain being such that the speed of the endless belt of the extractor (3) is controlled in dependence to the measurement of the instantaneous load of product distributed on the dispenser belt (15).

4,729,443

WEIGHING SCALE WITH PROTECTION AND SECONDARY CHECKING SYSTEM

Joseph R. Iadarola, Hillsdale, N.J., assignor to Colt Industries Inc., New York, N.Y.

Filed Dec. 17, 1986, Ser. No. 942,640
Int. Cl.[4] G01G *19/02, 21/02*
U.S. Cl. 177—135 **15 Claims**



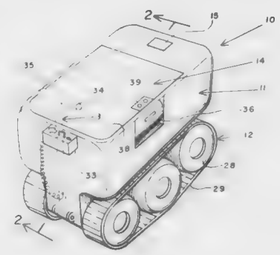
1. A weighing scale comprising a support means having spaced end surfaces extending above and away from spaced end walls, said end surfaces being joined by spaced side surfaces extending above and away from spaced side walls, said side and end surfaces extending in substantially the same plane and said side walls joining said end walls to form a platform receiving opening, a scale platform having a top surface adapted to be mounted in said platform receiving opening in spaced relation to said side walls and end walls to create an intervening space therebetween, scale linkage and mounting means secured to said support means below said scale platform and mounting said scale platform for movement into said platform opening in response to weight applied to said scale platform, said scale linkage and mounting means operating to normally mount said scale platform top surface in substantially the same plane as said side and end surfaces, and a protection and secondary checking unit supported by said scale platform top surface and said end and side surfaces, said protection and secondary checking unit including an elongate web extending into said intervening space, said web being a solid web formed of resilient material to permit said web to operate to check movement of said scale platform towards said side and end walls, and a cover and mounting section extending laterally from one end of said webs on either side thereof, said cover and mounting section resting on the top surface of said scale platform on one side of said web and on a side or end surface of said support means on the remaining side of said web, said protection and checking unit extending peripherally around said scale platform and being unattached to both said scale platform and said support means, the web and cover and mounting section being formed as a unitary, solid body of resilient material, and said cover and mounting section includes substantially flat bottom walls extending outwardly from said web, a top wall spaced above said web and said flat bottom walls to define a central portion for said cover and mounting section, and spaced tapered sections on opposite edges of said central portion, said tapered sections each being formed by an inclined surface extending from said top wall downwardly and outwardly to one of said flat bottom walls, said tapered sections being of greater flexibility than said central portion.

4,729,444

MOBILE SECURITY APPARATUS

Charles Tubman, 5024 SW. 89th Ave., Cooper City, Fla. 33328

Filed Nov. 28, 1986, Ser. No. 936,491
Int. Cl.[4] B62D *51/04, 11/04;* **B60P** *3/06*
U.S. Cl. 180—9.22 **12 Claims**



12. Mobile self-propelled security containment apparatus including an armored vehicle for housing said security containment apparatus, a ramp for on-loading and off-loading said security containment apparatus into and out of said armored vehicle, and a secured door between said secured space and the secured interior of said armored vehicle whereby valuables may be securely removed from said security containment apparatus and placed within the secured interior of said armored vehicle, said security containment apparatus comprising:

containment means for the storage of valuables therein;

secured access and retrieval means for allowing the placement of valuables in said containment means and for allowing the removal of said valuables from said containment means by authorized personnel;

propulsion means for propelling said security containment apparatus;

control means for controlling the propulsion of said security containment apparatus by authorized personnel who are located external of said security containment apparatus; and,

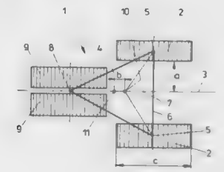
means for preventing theft of said security containment apparatus.

4,729,445

CATERPILLAR CHASSIS FOR HEAVY VEHICLES

Horst Kolleth, Zeltweg, Austria, assignor to Voest-Alpine Aktiengesellschaft, Austria

Filed Oct. 27, 1986, Ser. No. 923,644
Claims priority, application Austria, Oct. 28, 1985, 3114/85
Int. Cl.[4] B62D *55/00, 11/04*
U.S. Cl. 180—9.46 **4 Claims**



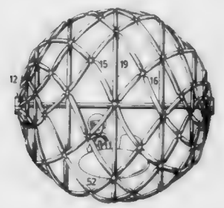
1. In an endless tread chassis for a heavy vehicle of the kind which includes a rotary table swingable about a vertical swing axis for carrying a cantilever arm, said chassis having a longitudinal axis lying in a longitudinal vertical plane and having at least four endless treads, the first and second of said treads being parallel and located on opposite sides of said longitudinal axis in a first plane which is transverse to said longitudinal axis and the third and fourth of said treads being parallel and located on opposite sides of said longitudinal axis at greater distances from said longitudinal axis than the first and second treads and in a second plane which is transverse to said longitudinal axis and which is spaced along said longitudinal axis from said first plane, said first and second treads being connected to the chassis at a common first connecting point lying in said longitudinal vertical plane and said third and fourth treads being connected to the chassis at second and third connecting points laterally spaced from said longitudinal vertical plane, said first, second and third connecting points defining the apexes of a supporting triangle and said vertical swing axis being located away from the center of gravity of said supporting triangle in a direction toward said common first connecting point.

4,729,446

MOBILE SPHERE

John S. Sefton, 280 August Crescent, Regina, Saskatchewan, Canada S4T 6N4

Filed Oct. 27, 1986, Ser. No. 923,406
Claims priority, application Canada, Oct. 31, 1985, 494298
Int. Cl.[4] A63G *29/00*
U.S. Cl. 180—21 **20 Claims**



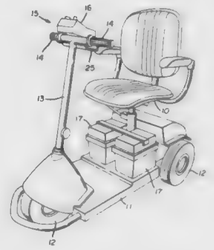
5. A hollow sphere for use as a toy, a recreational device or as a transportation vehicle comprising in combination one set of resilient members extending from one end of an axis to the other and spiralling through 360°, another set of resilient members extending from said other end of said axis to said one end thereof and spiralling through 360° in the opposite direction of said one set, each set including a plurality of resilient members secured by one end thereof to a hub at said one end of said axis and by the other ends thereof to a hub at said other end of said axis, the members of said one set being secured to the members of the other set where said members intersect thus forming a geodesic configuration, an axle extending between said hubs, a frame bearably supported upon said axle and depending therefrom, a source of power carried by said frame, including a foot pedal assembly depending below said frame means connecting said source of power to said axle for rotating same and hence rotating said sphere, and passenger supporting means attached to said frame operatively adjacent said foot pedal assembly.

4,729,447

SAFEGUARD FOR POWERED WHEELCHAIR

John F. Morse, 1699 Hines Hill Rd., Hudson, Ohio 44236

Filed Sep. 15, 1986, Ser. No. 907,851
Int. Cl.[4] B62D *61/08*
U.S. Cl. 180—65.1 **6 Claims**



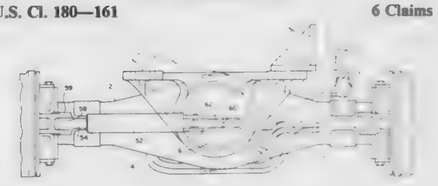
1. In combination with an electric powered wheelchair having a steering column forward of the chair seat, a handle bar mounted on the top of said column and extending substantially crosswise of the longitudinal axis of the wheelchair, a switch box mounted at the top of the steering column, and a switch control lever pivoted on the underside of said box spaced behind said handle bar and extending substantially parallel therewith, the improvement comprising a fail-safe guard mounted on said handle bar and extending rearwardly beneath said control lever to prevent accidental contact therewith by the body of the chair occupant when rising to dismount.

4,729,448

OFFSET TRUNNION BRACKET ON STEER DRIVE AXLE

James L. Sullivan, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1987, Ser. No. 8,996
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—161 **6 Claims**



1. Steer-driver axle housing apparatus for supporting a trunnion bracket comprising a differential-receiving bowl centered around a first vertical plane extending fore and aft through the bowl and a first horizontal plane extending through the bowl, first and second axle housing arms extending laterally oppositely from the differential-receiving bowl, first and second steering knuckles respectively mounted on opposite ends of the axle housing arms remote from the bowl, steering arms con-

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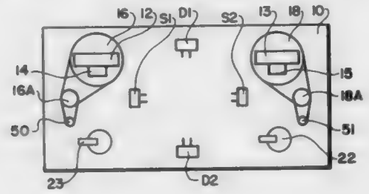
nected to the steering knuckles, first and second trunnion bearings respectively mounted fore and aft on the bowl and being centered on a trunnion axis running fore and aft through the bowl, the trunnion axis being offset from both the first and second planes, a steering bracket mounted on the bowl and extending horizontallly from a part of the bowl surrounded by one of the trunnion bearings, and said steering bracket being centered on the horizontal plane and being offset downward from the trunnion axis.

4,729,449

AUTOMATICALLY GUIDED VEHICLE HAVING STEERING MECHANISM FOR ENABLING VEHICLE TO FOLLOW GUIDANCE WIRE

Fredrik Holmquist, Charlotte, N.C., assignor to NDC Technologies, Inc., Charlotte, N.C.

Filed Dec. 6, 1985, Ser. No. 805,540
Int. Cl.[4] B60T 7/16
U.S. Cl. 180—168 7 Claims



1. A steering mechanism for enabling a vehicle to follow a guidance wire, said steering mechanism comprising:

(a) first and second cooperating steer drive antennas stationarily affixed in spaced-apart relation on said vehicle in wire sensing relation thereto;

(b) a differential drive antenna stationarily affixed on said vehicle in wire sensing relation thereto and oriented perpendicular to said first and second steer drive antennas;

(c) first drive wheel means including a first drive wheel mounted on said vehicle and having steering and driving means for propelling and steering said vehicle along a surface;

(d) second drive wheel means including a second drive wheel mounted on said vehicle in spaced-apart relation to said first drive wheel and having steering and driving means for propelling and steering said vehicle along a surface;

(e) control means operatively connecting the steering means of said first drive wheel to said first steer drive antenna and to said differential drive antenna, and, the steering means of said second drive wheel to said second steer drive antenna and said differential drive antenna; said control means further including means for;

(f) in a steer drive mode, positioning said first and second drive wheels in front-to-back, driving and steering relation for steering movement of said first drive wheel in response to lateral relative movement between said guidance wire and said first steer drive antenna and steering movement of said second drive wheel in response to lateral relative movement between said guidance wire and said second steer drive antenna; the steering movement of said first drive wheel being independent of the steering movement of the second drive wheel; and

(g) in a differential drive mode, rotating said first and second drive wheels into a position substantially perpendicular from the steer drive position and into mutual parallel relation whereby said vehicle may be moved in a direction substantially perpendicular to the direction of movement in the steer drive mode in a straight-line or sinuous path by differential speed control of said first and second drive wheels in response to lateral relative movement between said guidance wire and said second differential drive antenna;

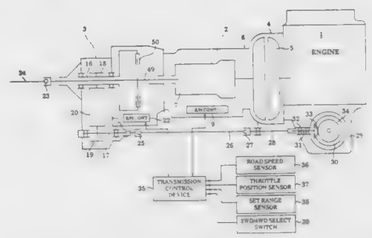
whereby said vehicle can be guided along a straight or sinuous path by said first and second drive wheels in steer drive relation and then moved perpendicularly along a straight or sinuous path by said drive wheels in differential drive position.

4,729,450

ANTI TORQUE SHOCK CONTROL DEVICE AND METHOD ENGAGING TORQUE TRANSMITTING CLUTCH BETWEEN VEHICLE WHEELS WHEN TRANSMISSION IS SHIFTED FROM NON DRIVE RANGE TO DRIVE RANGE

Kunio Morisawa; Hideki Yasue; Kagenori Fukumura; Kenichi Yoshizawa, and Yasunari Nakamura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 29, 1987, Ser. No. 8,323
Claims priority, application Japan, Jul. 25, 1986, 61-176468
Int. Cl.[4] B60K 17/34, 23/08
U.S. Cl. 180—249 6 Claims



1. For a power transmission system for a vehicle comprising a pair of front wheels and a pair of rear wheels, a transmission mechanism, a central differential device, and a selectively engagable central differential control clutch for being selectively at least partially engaged for controlling said central differential device between a mode of operation in which said central differential device provides central differential effect between said front wheels and said rear wheels and a mode of operation in which said central differential device provides no such central differential effect between said front wheels and said rear wheels:

an anti torque shock control device, comprising:

(a) a means for detecting whether or not shift range of said transmission mechanism is a vehicle non driving range or a vehicle driving range; and

(b) a means for controlling said central differential control clutch to be at least partially engaged, when shift range of said transmission mechanism, as detected by said detecting means therefor, alters from a vehicle non driving range to a vehicle driving range.

4,729,451

RECEIVER SUSPENSION AND ACOUSTIC PORTING SYSTEM

Richard Brander, Cicero, and Timothy A. Daneliuk, Chicago, both of Ill., assignors to Beltone Electronics, Corporation, Chicago, Ill.

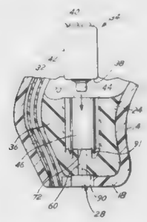
Continuation of Ser. No. 615,517, May 30, 1984, abandoned.
This application Jun. 27, 1986, Ser. No. 879,263
Int. Cl.[4] A61B 7/02; H04R 25/02
U.S. Cl. 181—130 1 Claim

1. A receiver suspension and acoustic porting system for a hearing aid, said hearing aid including a receiver having an acoustic output port, comprising, in combination:

an external shell including an inward wall, an open end, and a side wall therebetween, said inward wall defining an output port therethrough, said inward and side walls defining both an interior surface and an interior area of said shell,

pliable suspension means within said interior area, substantially affixed to said interior surface of said shell and extending inwardly therefrom, for supporting said receiver, said pliable suspension means being made of a pliant material and defining first and second voids and a plurality of pliable rib means,

said first void defining a receiver chamber for accepting said receiver,



said second void defining an elongate output passageway extending from said acoustic output port of said receiver at one end to said acoustic output port of said shell at another end, said one end of said elongate output passageway defining coupling means for grippingly engaging said acoustic output port of said receiver, whereby said acoustic output port is acoustically linked to said output passageway and said output port of said shell, and

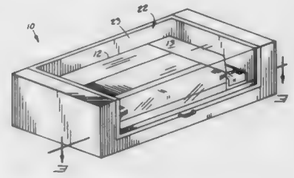
said pliable rib means extending into said receiver chamber, for supporting said receiver, whereby said receiver is cushioned by said pliable suspension means and ribs and substantially acoustically isolated from said shell.

4,729,452

PRINTER SOUND ENCLOSURE

Louis Sims, Spokane, Wash., assignor to Output Technology Corporation, Spokane, Wash.

Filed Jun. 10, 1987, Ser. No. 61,113
Int. Cl.[4] B41J 29/08
U.S. Cl. 181—201 7 Claims



1. A sound enclosure for a printer having a printer housing with a vent opening formed therein for cooling printer mechanisms within the housing, the sound enclosure comprising:

an upright perimeter wall member defining a compartment adapted to encircle the printer;

a cover member on the perimeter wall member adapted to cover the printer within the compartment;

sound reducing means on at least one of the members for absorbing sound from the printer held within the compartment; and

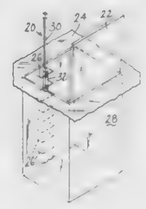
air duct means connected to one of the members and having an open outward end opening outwardly of the enclosure and an open inward end adapted to abut the printer housing about the vent opening for venting the printer to ambient atmosphere outside the sound enclosure.

4,729,453

PORTABLE SAFETY POST

Robert J. Lyons, Sr., Hamden, Conn., assignor to The Bilco Company, New Haven, Conn.

Filed Apr. 28, 1987, Ser. No. 43,334
Int. Cl.[4] E06C 5/36, 7/18
U.S. Cl. 182—106 24 Claims



1. A safety post assembly for assisting entry to or exit from the upper portion of a structure comprising:

a tubular support sleeve;

adjustable mounting means for securing said sleeve to said structure in an upstanding position;

an elongated extension rod having a tapered lower end portion for sliding insertion into said tubular sleeve and an opposite upper end portion adapted to extend above said upper portion of said structure and provide grasping means during said entry and exit;

stop means for limiting insertion of said rod lower end portion into said sleeve to a predetermined distance sufficient to support the weight of a person grasping said rod upper end portion during said entry and exit; and

means to counterbalance a portion of the weight of said extension rod when said lower end of said rod is inserted in said support sleeve while allowing said rod to be fully seated in the support sleeve by the rod's own weight;

said extension rod being entirely directly removable from said sleeve by grasping said rod and urging said rod in an upward direction.

4,729,454

SELF-BRAKING SAFETY APPARATUS FOR THE RAPID DESCENT OF PERSONS IN CASES OF EMERGENCY

Piero Barelli, Via Cantonale 46, 6963 Pregassona; Arnaldo Simoncelli, Via Pelloni 5, 6900 Lugano; Maruillo Roda, Via Crocetta 25, 6962 Viganello, and Fabrizio Guarisco, 6911 Manno, all of Switzerland

Filed May 14, 1987, Ser. No. 49,513
Claims priority, application Switzerland, May 14, 1986, 01955/86
Int. Cl.[4] A62B 1/10
U.S. Cl. 182—234 4 Claims

1. In a self-braking safety apparatus for the rapid descent of persons in cases of emergency, comprising a reelshaped rotor having a core and a rope wound on the core, one end of said rope being secured to said rotor and the other end being free and provided with an appropriate spring catch for hooking to a fixed support in the vicinity of the place from which the descent is to be made, and a coaxial fixed drum containing said rotor, the improvement comprising:

said reel-shaped rotor having end flanges projecting from said core and provided with a series of equidistant radial holes and with a series of equidistant lightening apertures between said holes, each of said radial holes containing a ball and a spring urging said ball outwardly;

brake pads arranged downstream of each of said balls and urged by said springs against an inner surface of said drum, said brake pads having the same curvature as said inner surface of said drum;

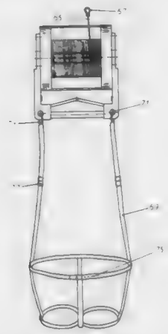
a pair of brackets arranged outwardly of said drum and

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firmly secured thereto and leading to a heat-resistant handle adapted to be gripped by the user;

a pair of pivotally connected levers firmly secured to said heat-resistant handle and to said brackets, said pair of levers being pivotally connected to each other along a longitudinal center line of said handle and at the other end to a pair of rods, one for each bracket, said rods being movable longitudinally relative to said brackets and being provided at the end remote from said handle with a pair of inclined planes, one for each rod;

a pair of brake pads adapted to be controlled by said inclined



planes on actuation of said levers to act laterally relative to the direction of movement of the drum against a lateral surface of said drum, said brake pads thus constituting a hand brake permitting the user to stop at the desired position during his descent, said brake pads provided between said rotor and said drum, when the user descends at free speed without actuating said hand brake, being urged be centrifugal force with ever increasing intensity against said drum to increase the braking action exerted by said springs and ensure that a maximum speed of descent is achieved that is absolutely safe for the user of the apparatus.

4,729,455

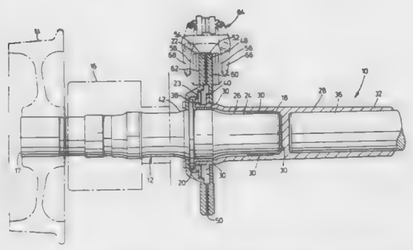
WHEEL ASSEMBLY AND BRAKE THEREFOR

Colin C. May, Kingston, Canada, assignor to Urban Transportation Development Corporation Ltd., Toronto, Canada

Filed Aug. 2, 1985, Ser. No. 761,834

Int. Cl.⁴ B61H *13/00;* **B60T** *11/00, 1/02;* **F16D** *19/00*

U.S. Cl. 188—58 **6 Claims**



1. A wheel assembly, said wheel assembly comprising an axle having two coaxial portions, said portions having wheels fixedly mounted on ends thereof for rotation therewith and said portions being rotatable relative to each other, and a brake, said brake comprising:

a first brake rotor mounted on one of said portions of said axle for rotation therewith;

a second brake rotor mounted on the other of said portions of said axle adjacent to said first braking rotor for rotation therewith, said first and second brake rotors being in face to face sliding engagement; and

a common stator disposed on either side of said first and second brake rotors and operable upon each rotor simultaneously to bring said rotors into frictional substantially non-sliding engagement to provide synchronous retardation of rotation thereof.

4,729,456

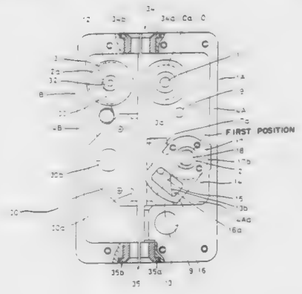
ROPE LOCKING DEVICE WITH LOCK DEVICE AND LOCK RELEASE THEREFOR

Yutaka Sugiyama, Tokyo, Japan, assignor to Nihon Biso Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,869

Int. Cl.⁴ B65H *59/16*

U.S. Cl. 188—65.1 **6 Claims**



1. A rope locking device comprising two separate cases, one of said cases containing:

a rope clamping member formed on one side thereof with a groove in which one side of a rope can be engaged;

rope clamping member drive means connected to said rope clamping member for displacing said rope clamping member between a first position in which said rope clamping member is spaced from the rope and a second position in which said rope clamping member is pressed against the rope;

an energizing member for energizing said rope clamping member drive means to displace said rope clamping member from the first position to the second position;

lock means for locking said rope clamping member drive means so as to hold said rope clamping member in the first position against the energizing force imparted by said energizing member; and

lock release means for releasing locking of said rope clamping member drive means by said lock means by detecting a relative running speed of the rope and releasing said lock means when the running speed of the rope has exceeded a predetermined speed,

and the other of said cases containing a rope support member formed with a groove in which the other side of the rope can be engaged,

said rope locking device further comprising case fixing means for fixing said two cases to each other.

4,729,457

AUTOMATICALLY ADJUSTABLE AND THERMALLY LOCKABLE STRUT FOR A DRUM BRAKE

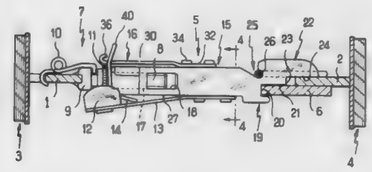
Xavier Cousin, Paris, and Jean-Claude Mery, Pavillons-sous-Bois, both of France, assignors to Bendix France, Drancy, France

Filed Sep. 3, 1986, Ser. No. 903,168

Claims priority, application France, Sep. 19, 1985, 85 13906

Int. Cl.⁴ F16D *65/66*

U.S. Cl. 188—79.5 B **6 Claims**



1. An automatically adjustable and thermally lockable strut for a drum brake, intended to be mounted in the vicinity of brake application means arranged between two first ends of two shoes lined with friction components, the strut, which bears at each end against a respective shoe, having a device which automatically extends according to wear of the friction components and which comprises a nut-and-bolt system operated by a pawl engaging with teeth of one of the members of the nut-and-bolt system, the pawl being mounted on an elastic leaf connected with the strut, the leaf elastically separated from the strut, when the brake is at rest, by means of a rocker lever mouted on the strut, the lever allowing, by tilting, the leaf to move toward the strut when the shoes are pushed apart, characterized in that the strut comprises temperature-sensitive means acting directly on the lever so as to prevent the lever from tilting and, consequently, prohibiting adjustment when the brake overheats, the temperature-sensitive means comprising a bi-metallic strip, the lever being formed by a plate mounted with diametral play on the bolt of the nut-and-bolt system and extended by an arm which forms an angle of less than 180° with the plane of the plate, a free end of the arm cooperating with the leaf carrying the pawl, the lever having an extension of the plate located opposite the arm projecting outside the strut so as to directly engage with the bimetallic strip mounted on the strut in order to lock the lever in a position where the pawl is separated from the teeth.

4,729,458

FRICTION DAMPER, IN PARTICULAR FOR WASHING MACHINES WITH SPIN CYCLE

Hans-Peter Bauer; Hans J. Bauer, and Ludwig Stadelmann, all of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer + Söhne oHG, Altdorf, Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,682

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 8508931[U]; Feb. 12, 1986, 3604286

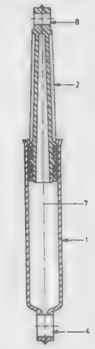
Int. Cl.⁴ F16F *7/08*

U.S. Cl. 188—129 **9 Claims**

1. A friction damper, for a washing machine with a spin cycle, consisting of a housing (1, 1') having a substantially circular cylindrical inner wall (24) with a diameter D, and tappet (2) having a hole extending therethrough, said tappet being insertable coaxially into and extending with one end out of the housing (1, 1') and provided on its other end with a friction piston (14), wherein the friction piston (14) is provided with a friction element of elastic foamed material with closed pores pressed elastically against the inner wall (24) of the housing (1, 1'), said friction piston being made in one piece with at least one pair of bracing flanges, a circular seating surface being located between the at least one pair of bracing flanges, said seating surface receiving and holding said friction element, and wherein securing elements are formed on the respective free ends of the tappet and housing, characterized in that

the housing (1, 1') is molded in one piece of plastic and has a wall thickness of 2.0–3.0 mm, said plastic being a homopolymer or a polyacetal having a heat expansion coefficient on the order of magnitude of 1.1×10^{-4}/°C.,

said plastic housing constituting friction reducing means for reducing friction between said friction element and said inner wall when the washing machine reaches a spin rpm



by generating substantial heat from vibration due to friction during passage from a wash rpm to the spin rpm, the heat so generated causing a significant increase in the diameter D of said housing,

the hole extending through said tappet comprising cooling means for cooling said friction piston by the flow of cooling air through said tappet so as to prevent heating of said friction piston and significant enlargement of the diameter of said friction piston.

4,729,459

ADJUSTABLE DAMPING FORCE TYPE SHOCK ABSORBER

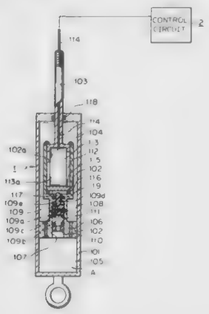
Mitsuo Inagaki; Hideaki Sasaya, both of Okazaki; Kenji Takeda, Aichi; Hiromichi Nakano, Okazaki; Sigeru Kamiya, Aichi, and Toshinobu Ishida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 30, 1985, Ser. No. 781,638

Claims priority, application Japan, Oct. 1, 1984, 59-206699; Jul. 30, 1985, 60-166669

Int. Cl.⁴ B60G *17/06*

U.S. Cl. 188—299 **17 Claims**



1. An adjustable damping force type shock absorber having first and a second oil-containing chambers on opposite sides of

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a piston slidably mounted in a cylinder, the shock absorber comprising:

a communicating path formed in the piston for communicating between the first and the second chambers;

a sliding member for changing the passage area of the communicating path by a sliding displacement thereof, one end surface of said sliding member being exposed to the oil in said second oil containing chamber and responsive to the oil pressure from said second oil chamber; and

a piezo-electric body coupled to said sliding member and responsive to the stress applied thereto by said sliding member to generate a voltage in response to the stress, said stress being a direct compressive force exerted along the direction of an axis of a rod of said piston in accordance with an oil pressure generated in said first and second chambers when said shock absorber expands or contracts, and for causing displacement of said sliding member by expansion and contraction of said piezo-electric body in response to a voltage applied thereto;

wherein said displacement of said piezo-electric body is transmitted to said sliding member via a sealed chamber comprising a casing, a plunger following said piezo-electric body in said casing, and the other end surface of said sliding member, said sealed chamber being filled with a non-compressible fluid, said displacement of said piezo-electric body being amplified by the ratio of a cross-sectional area of said plunger to that of said other end surface of said sliding member.

4,729,460

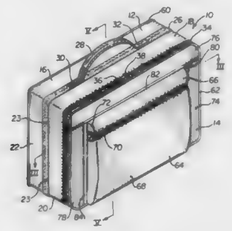
COVER FOR A CARRYING CASE

Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Feb. 5, 1987, Ser. No. 11,339

Int. Cl.[4] A45C *13/00, 3/00*

U.S. Cl. 190—109 **9 Claims**



1. A luggage case having an outer hinged cover with an external pocket, comprising:

a thickness of lining material which is substantially coextensive with said outer cover,

a thickness of trim material overlying only a part of the lining material, and having inner and outer peripheral edges,

a pocket material overlying at least that portion of the lining material which is not covered by said trim material,

said lining material being at least substantially coextensive with said pocket material,

said pocket material having outer peripheral edges being substantially in an overlapping relationship with the inner peripheral edges of said trim material, and

holding means located along the inner peripheral edges of said trim material and the outer peripheral edges of said pocket material for securing said trim material, said pocket material and said lining material together along a line in order to affix said pocket material and said trim material to said cover.

4,729,461

CONTROL METHOD FOR A DIRECT-COUPLING MECHANISM IN HYDRAULIC POWER TRANSMISSION MEANS OF AN AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLES

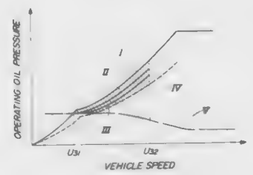
Masao Nishikawa, Nerima; Junichi Miyake, Iruma; Yoshimi Sakurai, Tanashi, and Yukihiro Fukuda, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,886

Claims priority, application Japan, Jun. 13, 1985, 60-129520; Jun. 13, 1985, 60-129521; Jun. 13, 1985, 60-129522; Mar. 3, 1986, 61-046971; Mar. 3, 1986, 61-046972

Int. Cl.[4] F16D *25/12, 43/284*

U.S. Cl. 192—3.31 **14 Claims**



1. A method of controlling a direct-coupling mechanism of hydraulic power transmission means having an input member and an output member, of an automatic transmission for an automotive vehicle, said direct-coupling mechanism being operable to mechanically engage and disengage said input member and said output member with and from each other, wherein a transmission capacity of said direct-coupling mechanism is controlled such that the value of a predetermined parameter indicative of an amount of relative slip between said input member and said output member lies within a predetermined reference range, the method comprising the steps of: (1) detecting the value of said predetermined parameter; (2) comparing the detected value of said predetermined parameter with said predetermined reference range; (3) determining a desired value of said transmission capacity and a predetermined period of time on the basis of the result of said comparison such that as the detected value of said predetermined parameter approaches said predetermined reference range, a rate of change in said transmission capacity is decreased; and (4) controlling the transmission capacity to the determined desired value thereof for the determined predetermined period of time.

4,729,462

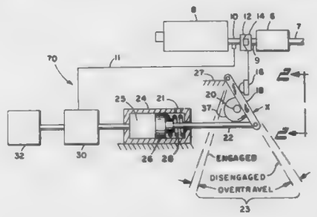
AUTOMATIC CLUTCH CONTROL SYSTEM HAVING LATCH MEMBER

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 13, 1986, Ser. No. 873,931

Int. Cl.[4] F16D *43/284;* **F15B** *15/26*

U.S. Cl. 192—0.033 **16 Claims**



1. An improved control system for an automatic clutch of the type including linkage operable to effect a condition of engagement or disengagement of the clutch by a first resilient biasing means and to correspondingly effect a condition of disengagement or engagement of the clutch by actuation of a first actuator force means operative to overcome said first biasing means, said improvement characterized by said control system including:

A moveable latch member;

second resilient biasing means operable to urge the latch member into a condition of engagement with or disengagement from the linkage;

second actuator force means operable upon actuation to overcome the second biasing means and correspondingly urge the latch member into a condition of disengagement from or engagement with the linkage; and

control means controlled by a speed signal and operative to activate the second actuator force means such that, whenever the speed signal is at a predetermined value, the second actuator force means overcomes the second biasing means and causes engagement or disengagement of the latch member from the linkage thereby either maintaining the clutch in the condition of engagement or disengagement provided by actuation of the first force actuator means or enabling the linkage to move to effect engagement or disengagement of the clutch.

4,729,463

RADIAL FRICTION COUPLING WITH SHOES

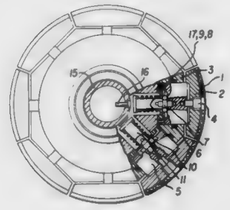
Bilen Branislav, Belgrade, and Nedeljkovic' Miloje, Novi Belgrade, both of Yugoslavia, assignors to Technical Sciences Institute of the Serbian Academy of Sciences and Art, Belgrad, Yugoslavia

Filed Dec. 1, 1986, Ser. No. 936,190

Claims priority, application Yugoslavia, Feb. 21, 1986, 264/86

Int. Cl.[4] F16D *13/16*

U.S. Cl. 192—76 **5 Claims**



1. A friction coupling, comprising:

(a) a rotatable shaft;

(b) a body keyed to said shaft and having a plurality of chordally disposed axially extending sides circumferentially disposed thereabout, each side contiguous with and disposed between two adjacent sides;

(c) a plurality of chambers disposed within said body, said chambers being equiangularly disposed apart and each chamber defining an axis transverse to said shaft and each chamber having a first end opening contiguous with said shaft and a second end opening extending through the associated side;

(d) first seal means sealing each chamber to said shaft;

(e) fluid duct means disposed in said shaft, said duct means opening into the first end portion of each chamber for supplying pressurized hydraulic fluid thereto;

(f) each chamber having a first diameter portion extending from the associated first end opening and an enlarged second diameter portion extending from the associated second end opening;

(g) a plurality of pistons, each piston slidably mounted within one of said second diameter portions and having an end portion disposed radially outwardly beyond the associated side;

(h) second seal means disposed about each of said pistons for sealing the associated chamber;

(i) first flange means disposed in each second diameter portion and overlying the associated first diameter portion;

(j) means extending radially from each piston toward said shaft and carrying second flange means radially inwardly spaced from said first flange means;

(k) spring means disposed about each radially extending means and between said first and second flange means for biasing each piston toward said shaft;

(l) a plurality of supports, each support secured to the end portion of one of said pistons and each support having a curvilinear periphery; and,

(m) a plurality of friction coverings, each friction covering secured to the periphery of one of said supports so that introduction of pressurized fluid into said chambers causes said pistons and thereby said friction coverings to move radially outwardly for engagement with a member and the absence of pressurized fluid causes said spring means to move said pistons and thereby said friction coverings radially inwardly for disengagement from the member.

4,729,464

APPARATUS FOR COMPENSATING FOR FLUCTUATIONS OF TRANSMISSION OF TORQUE BY AN INTERNAL COMBUSTION ENGINE

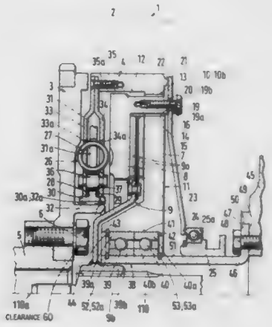
Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,016

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427163

Int. Cl.[4] F16D *3/14;* **F16F** *15/12*

U.S. Cl. 192—70.17 **16 Claims**



1. Apparatus for transmitting torque between an internal combustion engine and a transmission having a housing and a rotary input element, particularly the change-speed transmission of a motor vehicle, comprising a composite flywheel including a plurality of coaxial flywheel sections, said sections comprising a first section and a second section and said first and second sections being rotatable relative to each other, said second section comprising a first pressure plate which is held against axial movment relative to the input element of the transmission; damper means for yieldably opposing rotation of said first and second section relative to each other, said damper means comprising an input component arranged to rotate with said first section and an output component arranged to rotate with said second section, said components having registering windows and said damper means further comprising energy storing means acting in the circumferential direction of said sections and installed in said windows; means for non-rotatably

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fastening said first section to the engine; means for releasably coupling said second section to the input element of the transmission, said coupling means comprising a second pressure plate which is movable axially with reference to said first pressure plate and a clutch disc interposed between said pressure plates and non-rotatably secured to the input element of the transmission; and means for non-rotatably but substantially axially movably securing one of said components to the respective section, including mating teeth on said one component and the respective section.

4,729,465

ASSEMBLY FOR COMPENSATING FOR FLUCTUATIONS OF TORQUE WHICH IS TRANSMITTED BY AN INTERNAL COMBUSTION ENGINE

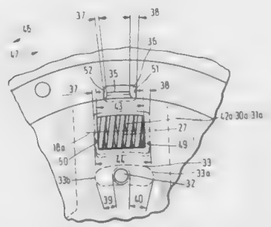
Wolfgang Reik, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 669,768, Nov. 8, 1984, abandoned. This application Jul. 15, 1986, Ser. No. 885,875

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341443; Mar. 5, 1984, 3410365

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 **34 Claims**



1. A torsion damping assembly, particularly for taking up and compensating for fluctuations in the transmission of torque between the internal combustion engine and the change-speed transmission of a motor vehicle, comprising a first rotary unit arranged to receive torque from the engine; a second rotary unit coaxial with said first unit and arranged to transmit torque to the transmission in response to rotation of said first unit, said first and second units respectively comprising first and second flywheels and being rotatable with reference to each other form a starting position; and damper means operating between said units and arranged to yieldably oppose rotation of said units with reference to each other, said damper means including a first component including energy storing resilient means acting in the circumferential direction of said units and said first component being arranged to oppose at least a part of angular movement of said units from said starting position, and a second component arranged to oppose an advance stage of said angular movement following an initial stage of said angular movement from said starting position through a predetermined angle, said second component including a friction generating device and having at least one window for a portion of said resilient means.

4,729,466

DISTRIBUTION CONVEYOR FOR PRODUCTS

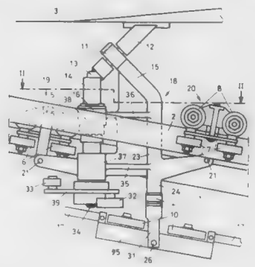
Willy Bollier, Goldau; Georg Chvojka, Reussbühl, and Heinz Wegmüller, Hinwil, all of Switzerland, assignors to Daverio AG., Zurich, Switzerland

Continuation of Ser. No. 699,648, Feb. 8, 1985, abandoned. This application May 29, 1987, Ser. No. 56,318

Claims priority, application Switzerland, Feb. 9, 1984, 624/84

Int. Cl.[4] B05G *47/46*

U.S. Cl. 198—365 **10 Claims**



1. A distributing conveyor for packages and the like, and comprising:

an endless path having inclined ascending and descending zones, and which may include spiral regions, defined by a pair of round tubular carrying rails which are placed at different heights relative to one another in each of said ascending and descending zones; and

a plurality of carriages for travelling along said endless path responsive to an endless chain acting on said carriages, and each including a carrier plate for carrying said packages and the like, and only two roller carriers hingedly connected thereto;

wherein a forwardmost one of said roller carriers is guided on one of said carrying rails and a rearwardmost one of said roller carriers is guided on the other of said carrying rails, said roller carriers being staggered in a diagonal arrangement in the direction of travel of said carriages so that the carrying rail for said rearwardmost roller carrier is arranged over the carrying rail for said forwardmost roller carrier in the ascending zones of said endless path and so that the carrying rail for said forwardmost roller carrier is arranged over the carrying rail for said rearwardmost roller carrier in the descending zones of said endless path, while maintaining said carrier plate essentially horizontally in said ascending and descending zones; and

wherein said carrier plates are tiltable at predetermined discharge points, responsive to a carriage portion which depends from between said roller carriers and which receives said endless chain, and which includes a guide roller carrier pivoted about a horizontal axis and which is guided by a pair of guide rails spaced from said carrying rails, a rotatable shaft connected to said carrier plate, and a lever operatively connected to said shaft so that said shaft is only rotated at said discharge points by control rails associated with said endless path.

4,729,467

TRANSPORT ASSEMBLY FOR USE WITH STORAGE CONVEYOR, AND COMBINATION

Leendert A. Vanderlinde, Kansas City, Mo., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed May 20, 1986, Ser. No. 865,107

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—586 **20 Claims**

1. A transport assembly for use in association with a storage conveyor having a drive wheel thereon; said transport assembly comprising:

(a) a transport mechanism for carrying an object;

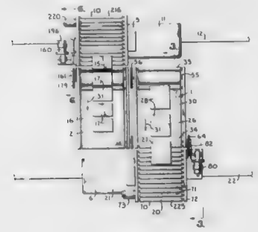
(b) means for orienting said transport assembly with said transport mechanism at selected locations for loading and unloading;

(c) a conveyor drive mechanism including a pivotably mounted arm with a powered wheel mounted thereon;

(d) actuating means for selectively rotating said powered wheel; and

(e) an arm actuator for selectively positioning said arm in an engaged position and a disengaged position;

(i) said engaged position having said arm extending outwardly for engagement with a portion of the storage conveyor drive wheel and to operably engage said



powered wheel with the conveyor drive wheel for selected rotation of the conveyor drive wheel, to operate the conveyor, as said powered wheel is actuated; and

(ii) said disengaged position having said arm and said powered wheel positioned out of possible engagement with the conveyor drive wheel;

(f) whereby said transport mechanism may be selectively oriented in an operative position relative to a storage conveyor; and

(g) whereby said conveyor drive mechanism may be selectively operated to engage said powered wheel with the conveyor drive wheel so that selective actuation of said powered wheel drives the storage conveyor, facilitating transfer of an object between the storage conveyor and the transport mechanism.

4,729,468

APPARATUS FOR MONITORING THE CONDITION OF FILAMENTARY BELTS IN CIGARETTE MAKING MACHINES AND THE LIKE

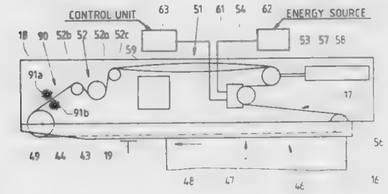
Peter Pinck, Gross-Hansdorf, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Apr. 23, 1986, Ser. No. 855,163

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515056

Int. Cl.[4] B65G *43/02*

U.S. Cl. 198—810 **17 Claims**



1. In a machine for making smokers' products, a driven foraminous belt conveyor which contains filaments and is arranged to transport fibrous matrial of the tobacco processing industry; guide means defining for the conveyor a predetermined path; and apparatus for monitoring the condition of the conveyor, comprising a monitoring unit including at least one detector having a radiation soucre arranged to emit at least one beam of radiation substantially transversely of said path and closely adjacent a portion of the conveyor so that a filament which projects from and is thus indicative of a defect of said portion of the conveyor influences said beam, and means for generating a signal in response to such influencing of the beam by the filament of the driven conveyor.

4,729,469

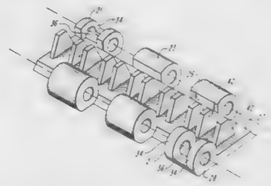
FLAT TOP CONVEYOR BELT

James M. Lapeyre, 13 Richmond Pl., New Orleans, La. 70150, and William G. Faulkner, 608 Avenue G, Marrero, La. 70072

Filed Nov. 15, 1985, Ser. No. 798,481

Int. Cl.[4] B65G *23/06, 17/06*

U.S. Cl. 198—834 **15 Claims**



1. A conveyor module comprising:

a body of plate-like configuration having said edges and front and rear edges, a flat bottom surface and a flat conveying surface;

a first plurality of spaced link ends extending from the front edge;

a second plurality of spaced link ends extending from the rear edge and laterally offset from the first plurality of spaced link ends;

each link end having a surface substantially coplanar with the conveying surface of the body, and a partially cylindrical portion extending along a pivot axis;

each plurality of link ends being spaced to mate with link ends of adjacent like modules such that adjacent modules may be pivotally connected along said pivot axis;

a plurality of sprocket engaging teeth extending from the bottom surface and spaced side by side across the width of the module each midway between the pivot axes of the first and second pluralities of link ends, at least some of the sprocket teeth arranged in plural pairs in such a way that both of the teeth of each of such pairs are cooperative with corresponding portions of an associated sprocket wheel to simultaneously engage said corresponding portions as the sprocket wheel rotates.

4,729,470

CONTINUOUS PROOFING AND BAKING APPARATUS HAVING IMPROVED CONVEYOR SYSTEM

Carlos Bacigalupe, The Colony, and Michael J. Dobie, Plano, both of Tex., assignors to Stewart Systems, Inc., Plano, Tex.

Continuation of Ser. No. 593,088, Mar. 26, 1984, abandoned. This application Jun. 27, 1986, Ser. No. 880,642

Int. Cl.[4] B65G *15/60*

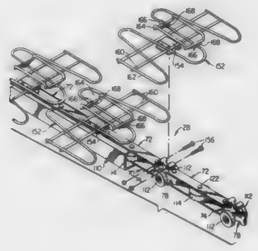
U.S. Cl. 198—838 **10 Claims**

1. A conveyor system for use in a continuous proofing and baking apparatus which comprises:

an elongate track characterized by a bottom wall, side walls extending upwardly from the bottom wall, top wall portions extending inwardly from the side walls, and a slot extending longitudinally between the top wall portions;

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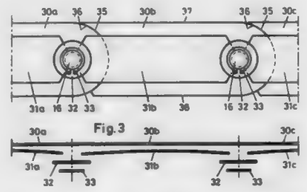
a conveyor chain for movement through the track and comprising a plurality of identical links each comprising:
connection located at one end of the link for connection with an adjacent link;
a pair of vertically spaced parallel plates extending longitudinally from the connection means;
the connection means secured between the spaced, parallel plates of adjacent links for pivotal movement with respect thereto about a vertical axis thereby facilitating horizontal flexure of the conveyor chain;
the upper spaced, parallel plate of each link of the conveyor chain being positioned on the outside of the track and overlying the longitudinally extending slot thereof for preventing debris from entering the track;
support means, attached to the connection means, for engaging the bottom wall of the track to facilitate movement of the conveyor chain therethrough;



each upper spaced, parallel plate at least partially supported by the support means to facilitate movement of the conveyor chain;
a plurality of product supporting grids each carried by the connection means of one of the links of the conveyor chains; and
a plurality of cover members each securing one of the product supporting grids to its respective link of the conveyor chain, the cover members extending between the upper plates of adjacent links of the conveyor chain for cooperation therewith in preventing debris from entering the track and wherein each product supporting grid comprises a pair of transversely extending rods secured to the cover member and a W-shaped rod supported on the transversely extending rods.

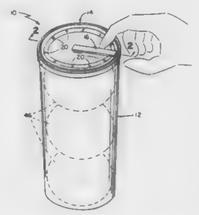
4,729,471
CHAIN CONVEYOR FOR TRANSPORTING PACKAGING CONTAINERS
Heinz-Josef Tüns, Dachsen, and Willi Altermatt, Neuhausen am Rheinfall, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed May 11, 1982, Ser. No. 377,048
Claims priority, application Switzerland, May 12, 1981, 3091/81
Int. Cl.[4] B65G *21/00*
U.S. Cl. 198—860.3 **14 Claims**

1. A chain conveyor for conveying containers comprising:
a chain extending over a closed conveyor path having straight and curved portions, said chain being composed of links and roller pins connecting said links together and extending transverse of the conveyor path;
a chain protection box enclosing said chain and provided with rails for supporting said roller pins, said box and said rails presenting a lateral slit recess extending along said conveyor path alongside said chain and providing an enclosure for said chain which is sealed against dust except for the opening presented by said slit;
connecting elements each forming part of a respective roller pin and extending out of said box through said recess for supporting holders for the containers; and
means defining a closed shielding belt formed of a succession of laminae each pivotally mounted on one respective roller pin and dimensioned and positioned such that said belt covers said slit recess over both the straight and curved portions of said conveyor path, each said lamina covering said slit over at least approximately the distance between two successive roller pins and contacting said laminae adjacent thereto in the vicinity of the associated roller pins, each lamina being substantially coextensive in length with a respective link;



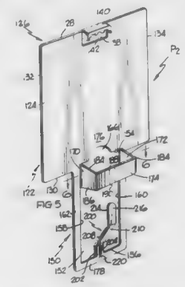
wherein said laminae are constituted by sheet metal strips each having two opposed ends, one end having a convex circular outline and the other end having a concave circular outline with a radius of curvature approximately the same as that of said convex circular outline, each said strip being pivotally mounted on a respective roller pin at said one end having a convex circular outline; and
wherein said means defining a shielding belt comprise spring elements mounted to press said laminae against portions of said chain protection box adjacent to both sides of said slit recess.

4,729,472
USE-MONITORING CLOSURE FOR TENNIS BALL CANS
Martin Lubin, 21 Lyme Rd., Hanover, N.H. 03755, and Adam Lubin, 2 McKenna Rd., Norwich, Vt. 05055
Filed Jul. 2, 1986, Ser. No. 881,198
Int. Cl.[4] B65D *85/00, 51/24*
U.S. Cl. 206—315.9 **19 Claims**



1. A use-monitoring closure for the open top of a tennis ball can comprising
a cap for releasably attaching to and closing said open top, and
a use totaller on said cap for counting, recording, and displaying the usage of tennis balls within the can.

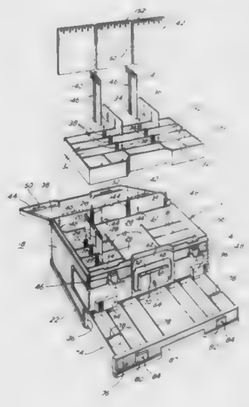
4,729,473
PACKAGE FOR USE IN DISPLAYING MERCHANDISE FOR SALE
Darrell A. Kulzer, Denver, and Martin L. Rohm, Aurora, both of Colo., assignors to B & R Plastics, Inc., Denver, Colo.
Filed Jul. 13, 1987, Ser. No. 73,073
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—477 **20 Claims**

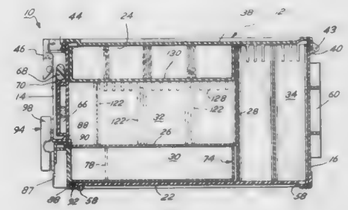


1. A package for use in displaying merchandise in condition for sale comprising:
plate means having a relatively large surface area and having generally planar front and rear surfaces;
said plate means having a top edge portion, a bottom edge portion and two side edge portions;
support means adjacent to said top edge portion so that said plate means can be hung on a hook;
a U-shaped member integral with said plate means and extending downwardly from said bottom edge portion so as to form an inner opening defined by a continuous edge comprising a top edge, a bottom edge and two side edges;
said U-shaped member having generally planar front and rear surfaces;
a pair of spaced apart projections, each of which extends outwardly from at least a portion of one of said front surfaces;
each of said projections being integral with said at least a portion;
connecting means extending between and integral with said pair of spaced apart projections and cooperating therewith and portions of said front surfaces of said plate means and said U-shaped member to form enclosure means for enclosing a portion of the merchandise;
a support prong integral with a central portion of said bottom edge and extending upwardly in a direction toward said top edge;
support means on said support prong adapted to be contacted by a portion of said merchandise to provide a support therefor when said support prong is in its supporting location; and
resilient means for permitting displacement movement of said support means from said supporting location through said opening so that a portion of said merchandise may be inserted through said enclosure means, and, after such insertion, return movement of said support means to said supporting location so that a portion of said merchandise is contacted and supported by said support means.

4,729,474
SATCHEL-STYLE TACKLE BOX
Charles A. Lanius, Prairie du Sac, and William R. Sauey, Baraboo, both of Wis., assignors to Flambeau Corporation, Baraboo, Wis.
Filed Jul. 25, 1986, Ser. No. 890,837
Int. Cl.[4] B65D *85/00;* **A01K** *97/00*
U.S. Cl. 206—315.11 **13 Claims**

1. An improved satchel-style tackle box particularly adapted for storing and transporting tackle, baits, fishing accessories, and other equipment while the box is disposed in a vertical, upright-carry position and for permitting ready and facile access to the stored tackle, baits, fishing accessories and other equipment when the box is disposed in a horizontal, in-use position, the improved satchel-style box comprising:
a one piece, molded plastic body having a generally rectangular parallelipped shape and having a front wall, a rear wall that is opposed to the front wall, a bottom wall, first and second opposed side walls, and an open, upper end that is opposed to the bottom wall;
a first, horizontally disposed interior wall integrally molded in the body, the first interior wall being positioned upwardly from the bottom wall and extending between the side walls and rearwardly from the front wall toward the rear wall;
a second, vertically disposed interior wall integrally molded in the body, the second interior wall being positioned between the front and rear walls and extending between





the side walls and upwardly from the bottom wall so that the rearwardly facing end of the first interior wall is in contact with the second interior wall between the bottom wall and the upper end of the second interior wall;
portions of the front wall, side walls, bottom wall, the first interior wall and a lower portion of the second interior wall defining a first storage compartment in the body;
other portions of the front wall and side walls, the first interior wall, and an upper portion of the second interior wall defining a second storage compartment in the body;
the side walls, second interior wall, bottom wall and rear wall defining a third storage compartment in the body;
the front wall having a front opening therein, with the front opening permitting access to the first storage compartment from the exterior of the body;
an upwardly facing drawer disposed in the front opening, the drawer being selectively slidable between a closed position wherein its interior is within the first compart-

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ment and an open position wherein the drawer extends out beyond the front wall so that access may be had to its interior from without the box;

means for selectively holding the drawer in its closed position;

lid means for selectively closing the upper end of the body;

means for connecting the lid means with the body and for permitting the lid means to be moved between a first position wherein the lid means closes the upper end of the body and a second position wherein access may be had to the second and third storage compartments through the upper open end of the body; the bottom wall of the box being capable of supporting the box horizontally when the box is its horizontally, in-use position so that the lid means is in its second position, access may be had to the second and third storage compartments through the open upper end of the box and so that access may be had to the interior of the drawer when the drawer is in its open position; and

a handle mounted on the exterior face of the front wall for permitting the box to be held in its vertical, upright-carry position, with the rear wall of the box being capable of supporting the box in a vertical position while the box is disposed in its vertical, upright-carry position.

4,729,475

SNAP-TOGETHER STORAGE CONTAINER WITH NESTING ELEMENTS

Charles V. Kurkjian, Oak Park, and Bruce E. Heggeland, Palatine, both of Ill., assignors to ACCO World Corporation, Wheeling, Ill.

Continuation-in-part of Ser. No. 881,736, Jul. 3, 1986, abandoned. This application Sep. 25, 1986, Ser. No. 911,897

Int. Cl.[4] **B65D** *85/00*

U.S. Cl. 206—425 **3 Claims**



1. A readily assembled covered container for floppy disks comprising:

a tray container having sides with an opening defined by said sides,

a cover for said opening, said cover having a top and sides depending from said top,

said tray being sized to nest within said cover when said cover and tray are unassembled,

a boss extending from each of two opposite sides of said tray, each boss having a top, an axis and a surface formed thereon that is inclined toward said top and axis,

said cover having a bore formed therein on each of two opposite sides within which a respective boss is received to attach said cover to said tray, said opposite sides of said cover each having a leading edge,

a ramp being formed in each of said opposite cover sides extending from a respective leading edge to said bore, said ramp having sidewalls sized to permit a respective boss to slide therebetween and up said ramp,

said opposite sides of said tray and cover being overlapped in assembly of the container, said cover being attached to said tray by sliding said overlapped sides relative to each other with said bosses sliding along respective ramps to seat said bosses within respective bores with said leading edges of said cover sides first contacting and then riding up said inclined surfaces to thereby flex said overlapped sides apart, with said overlapped sides then being unflexed and moving together upon seating of said bosses in said apertures, and

a lip formed along a top edge of said tray sides on said opposite tray sides and a front tray side, said cover also having a lip formed along a bottom edge of said cover sides on said opposite sides and a front cover side, said tray and cover lips being complimentarily formed to mate in an overlapping interleaved engagement when said cover is closed on said tray with said cover lip fitting within said tray lip along a portion of said tray sides and said tray lip fitting within said cover lip along another portion of said tray sides.

4,729,476

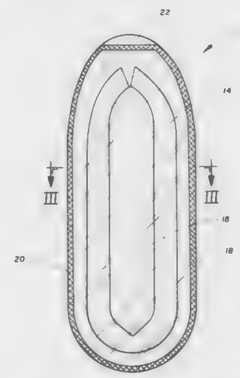
EASY OPEN SHRINKABLE LAMINATE

Cedric M. Lulham, Gray Court; George D. Wofford, Woodruff; John G. Bradfute, and Steven G. Friedrich, both of Greer, all of S.C., assignors to W.R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 703,645, Feb. 21, 1985, abandoned. This application Sep. 25, 1986, Ser. No. 912,674

Int. Cl.[4] **B65D** *37/00, 75/20*

U.S. Cl. 206—484.2 **7 Claims**



1. An easily peelable thermoplastic package comprising:

(a) a first web including a sealant layer comprising a blend of ethylene vinyl acetate copolymer and an ionomer;

(b) a second web including a sealant layer consisting of an ionomer, and which can include minor amounts of an anti-block agent; and

(c) the first and second webs adhering at their contiguous surfaces and enclosing an article.

4,729,477

FOOD SCOOP WITH SEALED PRIZE CHAMBER

Lawrence J. Growney, Pearl River, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

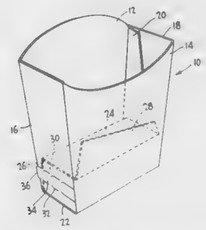
Filed Sep. 30, 1982, Ser. No. 428,783

Int. Cl.[4] **B65D** *5/41, 81/36*

U.S. Cl. 206—542 **8 Claims**

1. A scoop for fried potatoes and the like, said scoop comprising an open ended tubular member including first and second sides and a bottom, said scoop being improved by a false bottom within said tubular member above said bottom and defining an auxiliary bottom chamber within said tubular member, said auxiliary bottom chamber opening towards one of said first sides, and said one first side having opening means providing access to said auxiliary bottom chamber, said false bottom being carried by a connecting panel in turn carried by said bottom, and a securing panel carried by said false bottom and secured to one of said second sides, said connecting panel being positioned adjacent the other of said second sides and interlocked therewith.

3. A scoop for fried potatoes and the like, said scoop comprising an open ended tubular member including first and second sides and a bottom, said scoop being improved by a false bottom within said tubular member above said bottom and defining an auxiliary bottom chamber within said tubular member, said auxiliary bottom chamber opening towards one of said first sides, and said one first side having opening means providing access to said auxiliary bottom chamber, said false bottom being carried by a connecting panel in turn carried by said bottom, and a securing panel carried by said false bottom



and secured to one of said second sides, said scoop in a partially erected state may have said one second side and said bottom lying in one common plane while said connecting panel, said false bottom and said securing panel lie in a second immediately adjacent common plane.

5. A blank for forming a scoop in the form of an open ended tubular member having first and second sides, a bottom and false bottom within said tubular member above said bottom, said blank comprising a flat sheet divided by fold lines to define said first and second sides in adjacent alternating relation, said bottom being directly connected to a lower edge of one of said first sides with said false bottom being connected to said bottom by a connecting panel, and weakening lines in one of said second sides adjacent a lower edge thereof defining an opener strip.

4,729,478

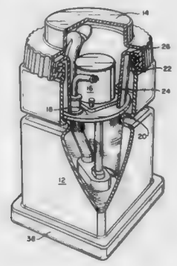
BELLOWS SHOCK ABSORBING CONTAINER

William A. Thomas, 7405 Woodley Ave., Van Nuys, Calif. 91406

Filed May 8, 1987, Ser. No. 47,787

Int. Cl.[4] **B65D** *51/26*

U.S. Cl. 206—591 **20 Claims**



15. A bellows-type shock absorbing container assembly for breakable equipment having fluids associated therewith, the container comprising:

a base portion of the container formed of resilient plastic open at the top and having an inwardly directed rib or shoulder forming a bellows-type resilient coupling between the lower section of the base portion and an upper section thereof, said base portion of the container extending upwardly to a threaded upwardly extending open end;

means for mounting the equipment to be packaged on said upper section of the base portion of said container;

a closure portion of the container including circular threaded plastic material having threads which mate with the threads on the upper end of said base portion of the container;

said closure portion forming sealing cap for the entire container assembly, and including resilient bellows means between the threads and the uppermost portion of said closure portion;

whereby said rib or shoulder forms a resilient bellows which protects the packaged equipment from shocks received on the base of the container assembly, and the bellows configuration of the closure portion of the container provides a second resilient bellows which protects the equipment from shock applied to the closure portion of the container assembly.

4,729,479

CASSETTE TAPE HOLDER

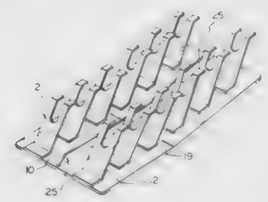
Lawrence Wallin, P.O. Box 2375, Tisdale, Saskatchewan, Canada S0E 1T0

Filed Nov. 12, 1986, Ser. No. 929,378

Claims priority, application Canada, Nov. 13, 1985, 495176

Int. Cl.[4] **A47G** *19/08*

U.S. Cl. 211—41 **11 Claims**



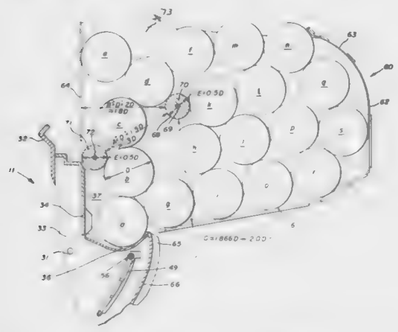
1. A device for holding a box having three parallel corner edges, said device comprising a base member having a generally planar surface; at least one arm on said base member, said arm comprising a resiliently deformable planar portion having first and second ends, said first end joining said arm to said base member, said resilient portion being disposed at an acute angle to said base member, said resilient portion and said base member forming box engaging surfaces, a lip formed at said second end of said resilient portion having a surface angled away from the plane of said resilient portion toward said base member, an elongated notch between said lip surface and said resilient portion having its major axis parallel to the plane of said base member surface and said elongated notch adapted to receive a third corner edge of said box; whereby when two corner edges of said box are placed into contact with said box engaging surfaces, and said box is pressed in a direction toward said arm, said third corner edge of said box will contact with said lip surface, continuing pressure on the box will cause said resilient portion to be deformed to allow said third corner edge of the box to slide along said surface and snap said notch.

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4,729,480
EXPANDED CAPACITY VEND BASKET FOR A VENDING MACHINE

Phillip B. Groover, Woodstock, Ga.; Gunther Baumgartner, Herrieden, and Josef Gress, Beckhofen, both of Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 18, 1986, Ser. No. 897,207
Int. Cl.[4] A47F *1/04*
U.S. Cl. 211—59.2 **16 Claims**



1. An expanded capacity and non-jamming vend basket for a vending machine dispensing rollable products, such as bottles or cans, to an opening through a cabinet wall, comprising:

front and rear walls interconnected by a pair of side walls and further including a bottom shelf or wall inclined from rear to front toward said opening for feeding said rollable products one at a time, to said opening; and

at least one roller member extending between said side walls and having a rotational axis parallel to the rotational axis of said rollable products, and being located a first predetermined distance from said front wall so that only one of said products can pass between said roller member and said front wall, and being further located a second predetermined distance from the bottom wall so that two rows of closely stacked products can fit and pass between said roller member and said bottom shelf.

4,729,481
APPARATUS FOR ADVANCING SHELVED GOODS

Rodney B. Hawkinson, Napa, and Julius A. Sarto, San Jose, both of Calif., assignors to PCR Company, Napa, Calif.

Filed Jan. 10, 1986, Ser. No. 817,567
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—59.3 **6 Claims**

1. Apparatus for advancing shelved goods comprising:

a base member adapted to be mounted at the front of a shelf;

a cylindrical roll rotatably mounted on said base member;

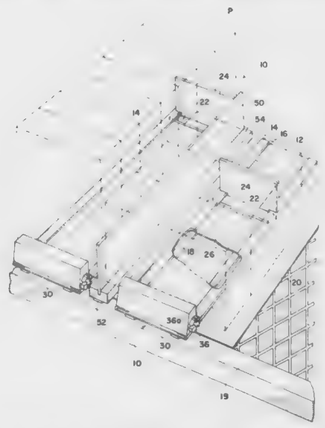
a flexible belt secured to and extending rearward from said cylindrical roll;

means biasing said cylindrical roll to reel said flexible belt thereon;

an upright pusher member carried on the end of said belt to engage behind a row of articles positioned along said belt; and

lock means, selectively operated with said pusher member in any position, to secure said roll against rotation;

said lock means being mounted on said base member for movement thereon between a locking position wherein portions thereon engage portions on said cylindrical roll

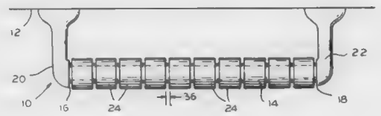


to prevent rotation of said roll and a neutral position wherein said portions are free of engagement.

4,729,482
TOWEL BARS

Robert W. Nicholson, 5217 Oak St., Oak Lawn, Ill. 60453

Filed Apr. 20, 1987, Ser. No. 39,947
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—105.2 **3 Claims**



1. A towel bar comprising

an elongated tube having two opposed ends,

a pair of brackets, one of said brackets being securable to each of said tube ends and securable to a wall to support said tube a predetermined distance from said wall, and

a plurality of rollers placed over said tube between said brackets, said rollers being adjacent to each other and operable independently of each other, each of said rollers including a support and a cylinder rotatably secured to said support, said support having an inside surface which fits over said tube and complements the shape of said tube, said cylinder being secured to the outside of said support for rotation around said support,

whereby multiple towels may be placed on said towel bar and removed separately, without creating friction between said towels and without displacing other towels on said bar.

4,729,483
DECK MEMBER FOR STORAGE RACK

Donald E. Schrader, Nashville, Tenn., assignor to Nashville Wire Products Mfg. Co., Inc., Nashville, Tenn.

Filed Jan. 9, 1984, Ser. No. 569,453
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—153 **6 Claims**

1. An automated storage and retrieval system comprising:

(a) an open storage rack having longitudinally spaced front and rear transverse support beams and a deck member spanning said support beams,

(b) a storage container comprising a bottom portion and longitudinally spaced front and rear support members having front and rear extremities, respectively, said front and rear support members having bottom support surfaces spaced below said bottom portion,

(c) an automated forklift device having tines for engaging said bottom portion of said storage container,

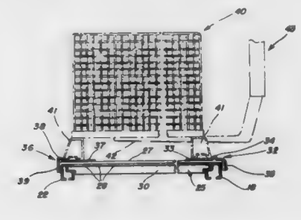
(d) said deck member comprising a shelf member having front and rear end portions and a plurality of transversely spaced, longitudinal wire rods having top surfaces extending front-to-rear and adapted to span said pair of longitudinally spaced front and rear transverse support beams,

(e) an elongated front unitary retainer sheet member having a solid front planar top surface transversely spanning said front end portion of said shelf member and fixed to the top surfaces of said wire rods,

(f) said front unitary retainer sheet member further comprising an elongated front ridge member formed integrally from said front retainer sheet member, projecting upwardly from said front planar top surface, and extending transversely of said front retainer sheet member,

(g) an elongated rear unitary retainer sheet member having a solid rear planar top surface transversely spanning at least the rear portions of some of said wire rods and fixed to the top surfaces of said wire rods,

(h) said rear retainer sheet member further comprising an elongate rear ridge member formed integrally from said rear retainer sheet member, projecting upwardly from



said rear planar top surface, and extending transversely of said rear retainer sheet member,

(i) said front and rear ridge members being spaced apart longitudinally a distance slightly greater than the front-to-rear spacing of said front and rear extremities of said front and rear support members is an operative position in which said support members are contained between said front and rear ridge members against front-to-rear movement,

(j) said front planar top surface extending rearwardly from said front ridge member and said rear planar top surface extending forwardly from said rear ridge member, sufficient distances to provide front and rear bearing surfaces for said corresponding bottom support surfaces of said corresponding front and rear support members in said operative position,

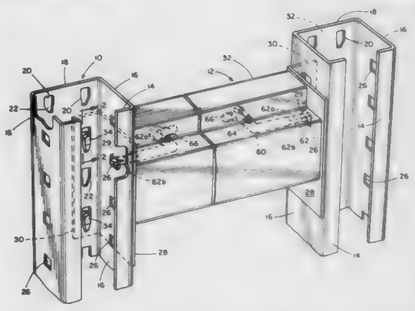
(k) each of said front and rear ridge members having a height above said corresponding planar top surface sufficient to limit the longitudinal movement of said support members on said bearing surfaces in said operative position beyond said respective ridge members, the height of said ridge members being less than the vertical distance between said planar top surfaces and the bottom portion of said container to permit the passage of said tines over said corresponding ridge member and beneath said bottom portion in said operative position,

(l) each of said front and rear ridge members having an arcuate cross-section, convex upward to define a cam surface extending upward from said planar top surface to deflect upward said tines of said forklift device engaging said cam surface.

4,729,484
PALLET RACK CONSTRUCTION

Kennedy McConnell, Flossmoor, Ill., assignor to Interlake, Corporation, Oak Brook, Ill.

Continuation of Ser. No. 541,953, Oct. 14, 1983, abandoned.
This application Feb. 12, 1986, Ser. No. 829,842
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—183 **6 Claims**



1. In a rack structure comprising a slotted upright of rectangular cross section, the walls thereof having a thickness, and a beam terminating at each end in a bracket having a first embracing face parallel to the face of said beam, and a second embracing face at right angles to the face of said beam, embracing adjoining sides of said upright, improved means for locking the beam to the upright comprising

a connector secured to the wall of said bracket adjacent said first embracing face, said connector having a hook spaced from said first embracing face, said hook being adapted to fit into a cooperating slot in said upright, said slot having at its lower end an inclined edge sloping away from said second embracing face, said connector being characterized by

an outer end,

a bearing surface spaced from said outer end facing said first embracing face,

said surface being inclined slightly toward said outer end in a direction away from said embracing face, the top of said incline being spaced from said first embracing face a distance slightly less than the thickness of said upright wall, a portion of said inclined bearing surface being compressed against a marginal portion of said upright wall surrounding said slot when said hook is inserted in said cooperating slot, thus serving to draw the beam laterally into tight engagement with said upright

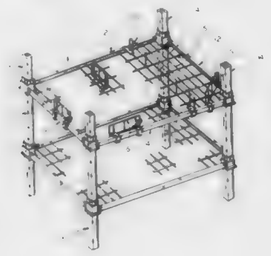
a collar surrounding said connector between said first embracing face and said inclined bearing surface, and

a groove cut into the face of said hook between said inclined surface and said collar,

said collar having a sloping perimetral surface spaced from said second embracing face a distance less than the distance from said second embracing face to the lower portion of said inclined edge of said slot, so that when said hook is inserted in said slot said sloping perimetral surface slides down said inclined edge, thus serving to draw the beam endwise into tight engagement with said upright.

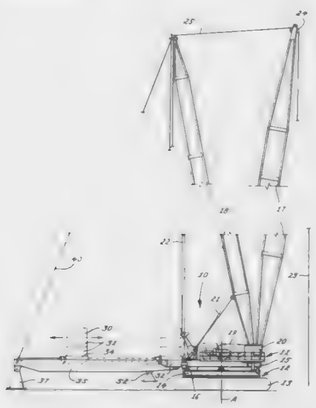
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4,729,485
FENCE OR PARTITION FOR A SHELF
Irwin Kulbersh, Skokie, Ill., assignor to Amco Corporation, Chicago, Ill.
Filed Jul. 31, 1986, Ser. No. 892,241
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—184 3 Claims



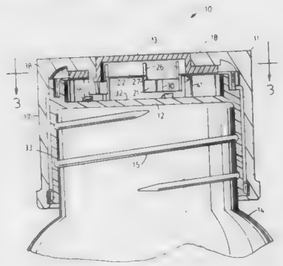
1. A fence for partitioning or enclosing a wire shelf comprising a rectangular upright member having a frame formed by an elongated rod bent into a rectangular shape and at least one post attached to and extending below said frame and oriented perpendicular to the length of the frame, at least one clip adapted to be removably secured to said wire shelf and to receive said upright member, said clip having a first upper tongue, a back wall extending downwardly from and perpendicular to said first tongue, a second lower tongue extending from said back wall below said first tongue to form with said first tongue and backwall an interior space which opens external of said clip, said space adapted to receive a portion of said shelf for placement of said clip on said shelf, and the tongues on said clip are each provided with a hole to receive said post.

4,729,486
LIFT ENHANCING BEAM ATTACHMENT WITH MOVABLE COUNTERWEIGHTS
Terry L. Petzold, Kiel, and David J. Pech, Manitowoc, both of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.
Filed Apr. 7, 1986, Ser. No. 849,165
Int. Cl.[4] B66C 23/72
U.S. Cl. 212—189 10 Claims



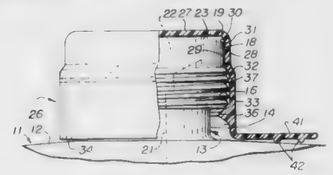
1. An attachment for increasing the lifting capacity of a crane having a mobile lower works with an upper works including a rear portion rotatably mounted on the lower works and having a pivotally mounted boom and an upwardly and rearwardly projecting mast carried on the upper works with means for lifting a load from the top of the boom and rigging means interconnecting the top of the boom and the top of the mast, comprising in combination, means interconnecting the top of the mast and the rear portion of the upper works for opposing a load lifted from the top of the boom, a counterweight support beam detachably connected to the crane upper works and extending rearwardly from the rear portion of the upper works, a counterweight assembly including a movable carrier mounted on the support beam for movement along the length thereof, means for selectively moving the counterweight carrier fore and aft along the beam, leg means for normally supporting the trailing end of the beam on the ground, and means interconnecting the trailing end of the beam and the top of the mast for raising the leg means from the ground incident to lifting a heavy load from the boom.

4,729,487
PUSH AND LOCK CHILD-RESISTANT CLOSURE
Frank S. Wright, 109 W. 7th Ave., Dayton, Tenn. 37321
Filed May 22, 1987, Ser. No. 53,019
Int. Cl.[4] B65D 55/02
U.S. Cl. 215—220 15 Claims



1. A rotationally-free child-resistant closure assembly for containers convertible to an operable position by an axially depressable member, comprising;
an inner cap member including a top portion and an annular skirt depending therefrom, the inner cap member top portion including rotational driving means formed thereon, said inner cap member top portion adapted to provide a closure for the open mouth portion of a container, the inner cap member skirt including rotational engagement means formed thereon for engagement with a container rotational engagement means by a rotational movement of the closure assembly;
an outer cap member including a top portion and an annular skirt depending therefrom, the outer cap member engaged telescopically over said inner cap member, the outer cap member top portion including an opening formed therethrough and a member depending from the lower surface of said top portion, the outer cap member skirt including a rotationally free swivel connection therewith said inner cap member skirt;
a selector member including an upstanding top portion and a perpendicular bottom portion, the selector member totp portion moveably received by said outer cap member top portion opening, the selector member bottom portion including an opening formed therethrough receiving said outer cap member top portion depending member to transmit rotational torque therebetween said outer cap and selector members, said selector member top portion including a radially flexible portion within the included rotational angle of said bottom portion opening, the radially flexible portion including a lip portion;
said outer cap member depending portion including a detent formed therein adapted to receive said selector member flexible portion lip to hold said selector member in an axial relative outward first position, the depending portion detent adapted to allow said selector member flexible portion lip to disengage said detent and allow said selector member to move axially inward therewith the application of an axially inward force applied thereto said selector member, said outer cap member depending portion adapted to receive said selector member flexible portion lip thereunder and hold said selector member in an axial relative inward second position;
said selector member bottom portion including rotational driving means formed thereon, the selector member driving means adapted to drivingly engage said inner cap rotational driving means therewith the selector in said axial relative inward second position.

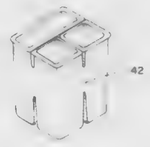
4,729,488
TAMPER-EVIDENT COVER FOR THREADED NECK
Joseph J. Bullock, III, Atherton, Calif., assignor to Bankers Trust Co., New York, N.Y.
Filed Aug. 14, 1986, Ser. No. 896,283
Int. Cl.[4] B65D 41/18
U.S. Cl. 215—256 2 Claims



1. In combination, a container having a neck formed with a top lip, a vertical cylindrical exterior below said lip, a vertical threaded portion of greater diameter than said cylindrical portion below said cylindrical portion and a vertical reduced diameter portion below said threaded portion of lesser diameter than said cylindrical portion, a shoulder below said threaded portion, and a horizontal annular ledge below said neck,
said cap comprising a top disk and a peripheral depending skirt fitting tightly around at least portions of the exterior of said neck, said skirt having an upper portion having an internal diameter to fit tightly against said cylindrical portion and a lower portion having one internal diameter to fit tightly against said threaded portion and a transition portion between said upper and lower portions, said skirt having an internal bead spaced upward from its lower edge fitting under said shoulder, said skirt being formed with tear means, said tear means comprising a horizontal first score line at a level near the top of the threaded portion of said neck, a second score line extending down to the bottom of said skirt and a tab extending beyond the bottom of said skirt adjacent said second score line whereby by pulling away said tear means the lower portion of said skirt including said internal bead may be torn off said skirt, said lower portion of said cap skirt having a length such that its lower edge fits tight against said ledge, said tab extending horizontally along said ledge.

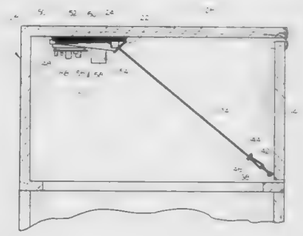
4,729,489
COMPARTMENTALIZED TRASH CONTAINER
Carl Papaianni, 800 Pine Rd., Brielle, N.J. 08730
Filed Dec. 12, 1986, Ser. No. 940,922
Int. Cl.[4] B65D 25/16, 1/24, 21/02
U.S. Cl. 220—23.8 2 Claims

1. A compartmentalized wastecan or trash container for separating trash into glass, metal, biodegradable trash or the like having in combination, a container consisting of a single piece of molded plastic, said container having semi-rigid outer sidewalls, said container being interiorly transversed by at least one separator wall, said separator wall comprising an upwardly extending V-shaped separator wall defining a segmented base and a downwardly depending V-shaped separator wall in alignment with said upwardly extending V-shaped separator wall, said V-shaped separator walls converging to



form a vertical separator wall substantially identical in height to said outer sidewalls, said downwardly depending V-shaped separator wall defining a plurality of openings, said plurality of openings having extended horizontal outwardly therefrom, an annular circumferential flange defining an upper circumferential lip about each of said plurality of openings, said upper circumferential lip for frictionally securing a plastic disposable bag in an upright open position, said compartmentalized wastecan having a removably securable lid.

4,729,490
AUTOMATIC TOUCH ACTUATED DOOR OPENER
Keith J. Ziegenbein, Rte. 2, Ashland, Nebr. 68003
Continuation-in-part of Ser. No. 793,988, Nov. 1, 1985, Pat. No. 4,609,122. This application Aug. 28, 1986, Ser. No. 901,144
Int. Cl.[4] B65D 55/00, 43/24
U.S. Cl. 220—211 10 Claims



1. An automatic touch actuated door opener adapted for opening a door mounted for movement between open and closed positions and biased to the closed position thereof, comprising
an elongated flexible tension member having one end adapted for connection to the door,
tension member take-up means operatively connected to said tension member and actuatable to take up said tension member,
means for mounting said tension member take-up means in spaced relation from a door whereby said door is moved to the open position in response to actuation of the take-up means, and
switch means in contact with said tension member and operatively connected to the take-up means, said switch means including first and second limit switches arranged relative to said tension member such that both limit switches are engaged in response to increased tension in said tension member upon operation of said tension member take-up means to take up said tension member,

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said second limit switch being arranged for release prior to said first limit switch in response to decreased tension in said tension member upon return of the door to the closed position thereof,

said tension member take-up means being deactuated in response to release of said second limit switch, and

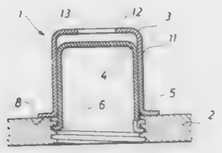
said tension member take-up means being reactuated to move the door to the open position in response to release of said first limit switch upon further decrease in tension in said tension member.

4,729,491

VENT PLUG

Niels D. Jensen, Bjerringbro, and Biarne Dissing, Hammel, both of Denmark, assignors to Grundfos International A/S, Denmark

Filed May 11, 1987, Ser. No. 48,053
Claims priority, application Denmark, May 12, 1986, 2193/86
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—288 **9 Claims**



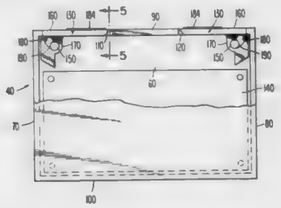
1. A plug, such as a vent plug for mounting in a hole in the wall (2, 22) of a machine element, e.g. the end wall of the rotor casing of a pump comprising a canned motor, wherein it comprises an outer cup (3, 23) provided with a support flange (5, 25) and an inner cup (4, 24) pressed into this outer cup (3, 23) and having a locking device (6, 26), preferably formed as a locking flange for interlocking the plug (1, 21) and the wall (2, 22), the distance (a) between the locking device (6, 26) and a sealing face (8, 28) of the support flange (5, 25) or of a sealing element connected to the support flange (5, 25) being smaller than the axial displacement of the plug (1, 21) in connection with the engagement of the locking device with the wall (2, 22).

4,729,492

RAM CARTRIDGE

Charles S. Brunner, Somerville, N.J., assignor to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 730,090, May 3, 1985, abandoned. This application Mar. 5, 1987, Ser. No. 23,949
Int. Cl.[4] B65D *85/00*
U.S. Cl. 220—335 **7 Claims**



1. An assembly comprising:

a tab adapted to be grasped to manipulate a device to which said tab is attached: and

means including an immovable post, said tab being pivotally seated on said post:

said tab having an aperture by means of which it is seated on said post, said aperture being generally heart-shaped, said aperture having on one side thereof a smooth arcuate wall and on the opposite side an indented wall, an inward projection formed into the aperture on said smooth arcuate wall;

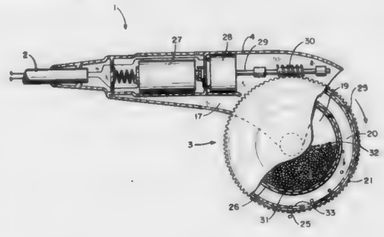
said tab assuming a closed non-graspable position wherein said post is located at one extremity of said aperture, said tab being retained in said closed position by the contact of said projection with said post, said tab being rotated in response to an external force applied thereto and thereby assuming an open graspable position, the concurrent rotation of said aperture causing said post to be relocated to the opposite extremity of said aperture.

4,729,493

POWERED SEED SPACER

John M. Cole, and Ruth E. Cole, both of 2715 So. Elmwood Ave., Sioux Falls, S. Dak. 57105

Filed Feb. 25, 1987, Ser. No. 18,441
Int. Cl.[4] A01C *7/02*
U.S. Cl. 221—185 **15 Claims**



1. A seed dispenser for discharging a volume of seeds primarily from the top of the volume thereby avoiding seed binding and causing uniform discharge thereof, comprising:

(a) an elongated handle member having upper and lower ends;

(b) a seed distributing means pivotally connected to said lower end of said handle for rotation about a generally transverse horizontal axis relative to said handle, said distributing means being comprised of a pair of opposed annular vertically disposed discs each having inner and outer sidewalls annularly arranged about the axis of said disc and extending transversely toward said opposing disc, said inner and outer sidewalls of each of said disc being constructed and arranged to engage said inner and outer sidewalls of said opposing discs, respectively, in telescoping relation;

(c) said inner and outer sidewalls of each said opposing disc defines a channel therebetween, said inner and outer sidewalls being comprised of a plurality of spaced annularly arranged arcuate flanges having leading and trailing edges and being constructed and arranged to cooperatively create adjustable openings in said inner and outer sidewalls between said flanges for seed discharge when the inner and outer sidewalls of one of said opposing discs engages said other opposing disc in telescopic relation, said seed distributing means being constructed and arranged to hold such a volume or seeds within the confines or said inner sidewalls or said discs when said discs are telescopically engaged, said cooperatively adjustable relationship between said inner and outer sidewalls constituting a means for discharging such a volume of seeds from primarily the top portion of the seeds contained within the confines of said inner sidewalls of said discs through said openings in said inner sidewalls which are adjacent to the top level of the seeds contained therein into said channel between said inner and outer sidewalls as said discs rotate, and thereafter cause the seeds thereby dispensed from the confines of said inner sidewalls to be engaged by said outer sidewalls and directed through said openings in said outer sidewalls uniformly at a point adjacent to the lowermost point of travel of said openings in said outer sidewalls; and

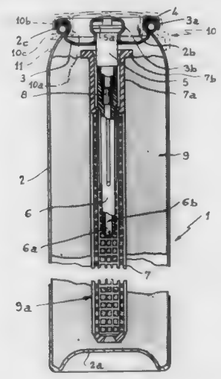
(d) powered drive means carried by said handle and constructed and arranged to engage and drive said distributing means in a rotational direction about its point of pivotal attachment to said lower end of said handle.

4,729,494

CONTAINER FOR LIQUID GAS

Jean-Pierre Peillon; Daniel Demilliere; Bruno Moglia, and Pierre Barrellon, all of Application Des Gaz Box No. 1, 69230 St Genis Laval, France

Filed Apr. 4, 1986, Ser. No. 848,688
Claims priority, application France, Apr. 12, 1985, 85 05747
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—3 **25 Claims**



1. A container for at least one fluid in both liquid and gaseous phases, the container comprising, in combination:

a hollow body extending along one dimension having an upper wall and a lower wall;

a plug of fluid-absorbing material inserted in the body and substantially filling the body;

the plug defining a central bore which extends substantially through the plug along said dimension, said bore having an open end adjacent to the upper wall of the body and another end adjacent to the lower wall of the body and said bore forming a bleeding area;

a bleeding device having an inlet and an outlet, said bleeding device at least partly extending into the hollow body and cooperating with the upper wall of the body so as to enable said bleeding device to release fluid in its gaseous phase from the bleeding area to the exterior of the body; and

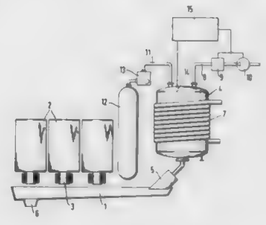
a stationary hollow feeding tube centrally positioned inside the bore in spaced relationship with the plug, said tube comprising a central canal area and two open ends, one of said ends being a free end located in the bore and the other end being tightly connected to the inlet of the bleeding device wherein upon charging of the container with fluid the absorbing material plug is saturated with liquid phase throughout a distance between one of the walls of the container and the level of liquid phase in the bore, said distance being less than or equal to the combined length of the feeding tube and the portion of the bleeding device extending into the hollow body and thereby creating a concentration gradient in liquid phase above said level which decreases away from said level so that the gaseous phase of the fluid bleeds from the plug at the bleeding area and is then fed from the bleeding area into the free end of the feeding tube and through the central canal to the bleeding device, the gaseous phase being released to the exterior of the container by the bleeding device without bleeding of the liquid phase, regardless of the position of the container.

4,729,495

CIRCUIT CONFIGURATION FOR THE CONTROLLED FILLING AND REFILLING OF CONTAINERS WITH LIQUIDS

Matthias Aschberger; Karlheinz Färber, both of Giengen, and Anton Deininger, Bachhagel, all of Fed. Rep. of Germany, assignors to The Coco-Cola Company, Atlanta, Ga. and Bosch-Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,214
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430907
Int. Cl.[4] G04C *1/12*; B67D *5/56*
U.S. Cl. 222—56 **12 Claims**



1. Apparatus for supplying water, on demand, to a carbonator tank in a dispenser system, comprising:

(a) system reset switch means for generating a first water demand signal for initiating a first filling operational mode of said tank;

(b) liquid level sensor means for sensing when the level of water falls below a predetermined level in said tank;

(c) means coupled to said sensor means for generating a second water demand signal for initiating a second filling operational mode of said tank;

(d) control circuit means including timer means generating first and second time period signals, respectively, and enabled by said first and second water demand signals, said first period signal being longer in duration than said second period signal, said timer periods being of a predetermined duration to prevent overloading and damage to system components including water supply means in the event of a malfunction, such as an interruption of supply water to said tank;

(e) water supply means for supplying water to said carbonator tank from an external source; and

(f) means responsive to said first and second time period signals for activating said water supply means for each of said first and second time periods, separately, and thereafter deactivating said supply means.

4,729,496

APPLICATOR CLAMP FOR A DISPENSING TUBE

Peter Davidson, 237 Merriweather, Grosse Pointe Farms, Mich. 48236

Filed Sep. 15, 1986, Ser. No. 907,854
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—215 **2 Claims**

1. In combination an applicator clamp and a flexible dispens-

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ing tube made of a material with a built-in memory to return to an initial shape after an end portion of the dispensing tube has been reverse-turned into a folded-over shape, the dispensing tube having an end opposite said end portion, said end having a disperser outlet, the clamp comprising:

an elongated pressure plate; and

an open-ended retainer tube into which said elongated pressure plate curvingly extends to form a unit body therewith, said unit body curvingly extending to terminate a longitudinal edge spaced from said pressure plate and defining with said pressure plate a throated opening to progressively receive a flattened end portion of the dispensing tube after the respective end portion has been



manually reverse-turned while separated from the clamp and projected through one end of said retainer tube and nested and retained between said pressure plate and said longitudinal edge, the flattened end portion projecting from the throated opening in a direction toward said dispenser outlet;

whereby manual pressure applied to said pressure plate exerts a uniform pressure across the width of said dispensing tube and its underlying contents of stored material, for continuously extruding the stored material through the dispenser outlet while said retainer tube anchors the dispensing tube against returning to the initial shape, thereby preventing the stored material from backing into said dispenser tube.

4,729,497

SLIDE UNIT AND PARTIAL PLATE MEMBER THEREOF FOR USE IN A SLIDING CLOSURE UNIT

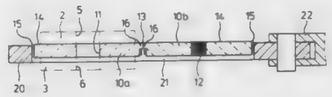
Robert Fricker, Unterägeri, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Mar. 21, 1986, Ser. No. 842,807

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512796

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 222—600 **16 Claims**



11. A partial movable refractory plate member for use in a slide unit of a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said member comprising:

a refractory partial plate having a planar sealing surface and a circumference including a rectilinear section;

a band surrounding said circumference of said partial plate;

an integral refractory shoulder extending from said partial plate, along said rectilinear section and across the thickness of said band, thereby extending said sealing surface across said band, said band having a recess through which extends said shoulder, said shoulder having a thickness no more than half the thickness of said partial plate; and

circumferential portions of said partial plate, other than said integral refractory shoulder thereof, not extending across the thickness of the band.

4,729,498

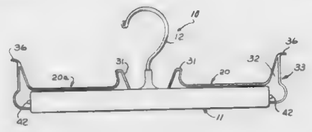
TELESCOPIC GARMENT HANGER

Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.

Filed Mar. 26, 1987, Ser. No. 28,151

Int. Cl.⁴ A47G *25/44, 25/62*

U.S. Cl. 223—95 **13 Claims**



1. A garment hanger having an elongated, hollow beam-like body member and a pair of slide elements one slidably and telescopically mounted in each end of said body member and forming the ends of said hanger, said body member having a central support hook and mounting means therefor; the upper face of said body member defining a central narrow slot extending from each end to adjacent said mounting means, said slot being defined by inwardly directed rims of said body member; said slide elements adjacent their upper edges having vertically spaced flanges defining a track for receiving said rims and guiding said slide elements as they are moved lengthwise of said body member; elastic tension members and means securing one end of each of said tension members to said body member adjacent each of the open ends of said body member, said tension members each engaging the inner end of one of said slide elements for stretching said tension members as said slide elements are moved toward the center of said hanger, interengaging means at the inner end of each of said slide elements and adjacent each of the opposite ends of said body member for limiting outward movement of said slide elements; the outer ends of each of said slide elements having an outer face shaped to engage and grip the inside surface of the waistband of a garment surrounding the hanger.

4,729,499

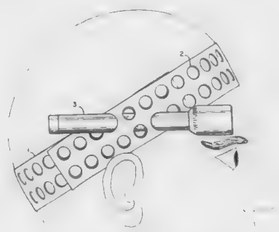
HEADBAND FOR FLASHLIGHTS

Stanley T. Martin, 106 Sterling Ave., Mt. Sterling, Ky. 40353

Filed Jan. 6, 1986, Ser. No. 816,228

Int. Cl.⁴ A42B *1/241*

U.S. Cl. 224—181 **3 Claims**



1. A headband for securing flashlights on the wearer's head, the headband consists of an elastic strip of material said elastic strip including at least two longitudinal rows of perforations such extending the entire length of said strip, said strip being of sufficient length to surround the wearer's head and including ends which overlap when said strip is worn on the head, said flashlight being inserted into two overlapped longitudinal perforations and longitudinal perforations permitting said headband to be adjustable by inserting said flashlight in a different set of overlapped perforations, said headband also allowing for adjusting the beam angle of said flashlight by inserting said flashlight into different overlapping perforations.

4,729,500

CONSTRUCTION OF A TAPE GUIDE ROLLER FOR A VIDEOCASSETTE RECORDER

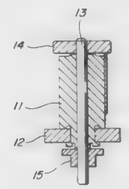
Seong T. Gwon, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 26, 1986, Ser. No. 878,646

Claims priority, application Rep. of Korea, Jun. 26, 1985, 7726/1985

Int. Cl.⁴ B65H *20/00*

U.S. Cl. 226—190 **1 Claim**



1. A tape guide roller for a video cassette recorder which comprises:

a resin roller body,

a pair of flanges disposed at ends of said roller body, said pair of flanges being adapted to hold said roller body at a predetermined position on a shaft which is mounted to a body of said videocassette recorder, and

an inertia ring made of a material generating a high inertia force, said inertia ring being secured to one end of said roller body whereby a tape utilized by the tape guide roller can stably travel causing reduction of vibration of the tape guide roller.

4,729,501

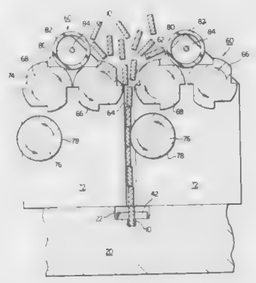
FLAT STICK AUTOMATIC FEEDER APPARATUS

Thomas F. Lowrance, 3601 Security St., Garland, Tex. 75040

Filed Apr. 10, 1987, Ser. No. 36,714

Int. Cl.⁴ B27F *7/00*

U.S. Cl. 227—117 **15 Claims**



1. Apparatus for inserting elongated flat sticks each of width greater than its thickness into articles and comprising in combination:

(a) stick source means for receiving and containing a generally random alignment of flat stick quantities supplied for insertion;

(b) feed slot means defining an ejection path from which sticks are to be ejected and inserted into an article supported beyond the outlet thereof in said ejection path;

(c) agitator means continuously receiving the flat sticks in a generally random alignment from said stick source means to effect an orientation alignment of the sticks for dispensing into said feed slot means;

(d) a dispensing slot in communication with said feed slot means from the vicinity of said agitator means and having a width dimension less than the width of sticks to be dispensed; and

(e) ejector means operable within said feed slot means to eject a stick from said feed slot means and insert the ejected stick into a recipient article supported within the ejection range of said ejection path.

4,729,502

APPARATUS FOR TREATING ENDS OF LARGE-DIAMETER WELDED PIPE

Yoshitsuga Fukukawa; Atsushi Nishida, both of Chiba; Mamoru Nishioka, Kyoto, and Akio Takemori, Nara, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Kashiwara Machine Manufacturing Co., Ltd., both of Osaka, Japan

Filed Dec. 24, 1986, Ser. No. 945,960

Claims priority, application Japan, Dec. 27, 1985, 60-296968; Dec. 27, 1985, 60-296969

Int. Cl.⁴ B23K *7/04*

U.S. Cl. 228—13 **2 Claims**



1. An apparatus for treating the ends of a large-diameter welded steel pipe, in which a pipe having a straight seam and tab plates attached to ends of the pipe as an extension of the seam is laid down along a setting line with the seam upward, said apparatus comprising:

a machine frame assembly so disposed along the setting line as to be movable longitudinally, laterally, and vertically;

a U-shaped holding member so connected to said machine frame assembly as to be rotatable about the setting line and a horizontal line perpendicular to the setting line;

a tab plate cutting unit attached to an upper jaw of said U-shaped holding member; and

a weld bead removing unit attached to a lower jaw of said U-shaped holding member;

further wherein said tab plate cutting unit comprises:

clamping means for fixing said upper jaw onto the outer surface of the pipe;

a movable block movable on said upper jaw in the direction perpendicular to the straight seam;

a lateral driving means for driving said movable block;

a vertical member attached to said movable block so as to be movable longitudinally of the pipe and to be movable toward and away from the outer surface of the pipe by the action of an urging means;

a tracing member which has two contact points on the outer surface of the pipe and arranged circumferentially thereof and which is pivotally supported on said vertical member by a shaft extending axially of the pipe;

a cutting torch mounted downwardly on said tracing member;

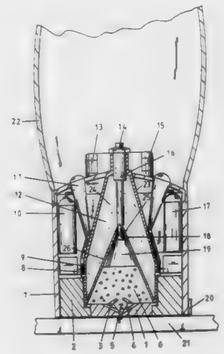
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a pair of contact pieces in resilient contact with the end of the pipe on both sides of the tab plate;
links which are connected to said contact pieces and held parallel respectively to a line connecting said contact pieces and said cutting torch, and pivotally supported so as to be bendable on a substantially horizontal plane at positions corresponding to said contact pieces and said cutting torch, with the pivotal point at a mid-point fixed to the frame which forms said upper jaw;
a second tracing member for tracing the longitudinal profile of said links, connected to said vertical member so as to be movable toward and away from said movable block; and
a driving means for driving said tracing member longitudinally of the pipe relative to a support of said tracing member.

2. An apparatus for treating the ends of a large-diameter welded steel pipe, in which a pipe having a straight seam and tab plates attached to ends of the pipe as an extension of the seam is laid down along a setting line with the seam upward, said apparatus comprising:
a machine frame assembly so disposed along the setting line as to be movable longitudinally, laterally, and vertically;
a U-shaped holding member so connected to said machine frame assembly as to be rotatable about the setting line and a horizontal line perpendicular to the setting line;
a tab plate cutting unit attached to an upper jaw of said U-shaped holding member; and
a weld bead removing unit attached to a lower jaw of said U-shaped holding member;
further wherein said weld bead removing unit comprises:
a first movable base disposed on said lower jaw for parallel movement relative to the inside weld beads;
a second movable base attached to said first movable base for movement toward and away from the inside weld beads by the action of an urging means;
an inclinable head attached to said second movable base for inclination toward and away from the direction of movement of said first movable base;
a rotary cutter attached to said inclinable head for inclination toward said inside weld beads;
a tracing roller attached to said inclinable head in proximity to said rotary cutter for adjustment of the amount by which said rotary cutter projects relative to said head; and
a clamping means attached to said lower jaw for fixing said lower jaw onto the inner surface of the pipe.

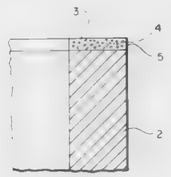
4,729,503
METHOD AND EQUIPMENT FOR UNDERWATER ATTACHMENT
Ensi K. J. Niinivaara, 45610, Koria, Finland
PCT No. PCT/FI86/00003, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1986, PCT Pub. No. WO86/04006, PCT Pub. Date Jul. 17, 1986
PCT Filed Jan. 9, 1986, Ser. No. 910,217
Claims priority, application Finland, Jan. 9, 1985, 850097
Int. Cl.[4] B23K *23/00, 20/00, 20/26*
U.S. Cl. 228—18 **23 Claims**

1. An attachment device adapted to be fused to an underwater object comprising a housing, means at an end of said housing adapted to be brought into contiguous relationship with an underwater object to which the attachment device is to be attached, means for fusing the material of the underwater object to said housing end, said fusing means including at least one passage means in said housing end for guiding molten material of the underwater object in a direction toward said housing, and said one passage means being so disposed in said



housing end as to define a discrete rigidified bridge of the molten material upon the solidification thereof.

4,729,504
METHOD OF BONDING CERAMICS AND METAL, OR BONDING SIMILAR CERAMICS AMONG THEMSELVES; OR BONDING DISSIMILAR CERAMICS
Mizuo Edamura, 10-9, Seiryodai 8-chome, Tarumi-ku, Kobe, Hyogo, Japan
Filed May 21, 1986, Ser. No. 865,395
Claims priority, application Japan, Jun. 1, 1985, 60-119299; Mar. 20, 1986, 61-63052
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—122 **24 Claims**

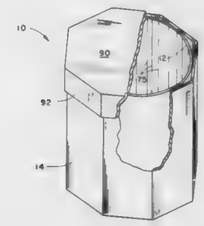


1. A method of bonding ceramics and metal, or bonding similar ceramics together, or bonding dissimilar ceramics comprising the steps of:
providing, on each bonding region, titanium particles and brazing filler metal alloyable with the titanium and having a lower melting point than the titanium; and
heating them in vacuum at a temperature which is higher than the melting point of the brazing filler metal but permits titanium to remain solid, so that some of the titanium particles are diffused into the brazing filler metal.

4,729,505
HEAVY-DUTY SHIPPING CONTAINER FOR FLOWABLE BULK MATERIALS
William J. Remaks, Anchorage, Ky., and John F. Nugent, Fresno, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Nov. 13, 1986, Ser. No. 930,813
Int. Cl.[4] B65D *5/35*
U.S. Cl. 229—23 R **31 Claims**

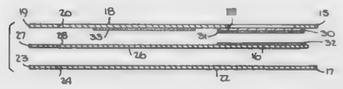
1. A heavy-duty shipping container for flowable bulk materials comprising:

an outer sleeve vertically extending between a bottom edge and a top edge, said outer sleeve having a polygonal cross-section and comprising a plurality of sidewall panels;
an inner sleeve, substantially coaxially mounted in the outer sleeve, and vertically extending between a bottom edge and a top edge, said inner sleeve having a substantially circular cross section;
the inner sleeve bearing centrally along each of the sidewall panels;
the inner sleeve and outer sleeve each comprising a multiwall corrugated fibreboard; and



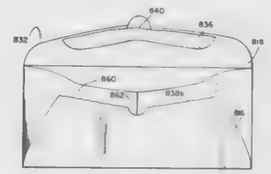
support means, mounted within the outer sleeve and underlying the bottom edge of the inner sleeve, for positioning the top edge of the inner sleeve initially higher than the top edge of the outer sleeve, said support means being deformable responsive to pressure applied to the inner sleeve so that the inner sleeve moves downwardly to a post-loading position in which the top edges of the inner and outer sleeves are in the same horizontal plane, whereby each of the inner and outer sleeves can accommodate a portion of the load of a similar container stacked thereon.

4,729,506
MAILER WITH TRANSPARENT PATCH
Frank Neubauer, Brewster, N.Y., assignor to Transkrit Corporation, Brewster, N.Y.
Filed Feb. 4, 1987, Ser. No. 11,210
Int. Cl.[4] B65D *27/04, 27/10*
U.S. Cl. 229—69 **12 Claims**



12. A continuous mailer assembly comprising a plurality of interconnected mailers, each said mailer comprising a front ply having a cut-out window, a transparent patch secured over said window, a back ply secured to said first ply to define an enclosed pocket, at least one insert ply between said front ply and said back ply, a first coating on said patch in facing relation to said insert, and a second coating on said insert in facing relation to said first coating to react with said first coating to produce an image on said insert in response to an impact force being applied on said patch for visualization through said patch.

4,729,507
EASILY OPENABLE REUSABLE ENVELOPE
Frank Y. H. Kim, 60 N. Beretania St. #2202, Honolulu, Hi. 96817
Filed Aug. 1, 1986, Ser. No. 894,467
Int. Cl.[4] B65D *27/06*
U.S. Cl. 229—73 **4 Claims**



1. In an easily openable envelope having a front wall panel, a rear wall panel, a top flap having an adhesive area for sealing to said rear wall panel, and a tear away portion defined by a tear line, the improvement wherein
said tear away portion lies at the upper end of said rear wall panel with said tear line between said tear away portion and the remainder of said rear wall panel, said tear line extending across the central portion of said envelope a distance corresponding to at least half the length of said envelope, said tear line being located so that when said envelope is sealed said tear line is hidden by said top flap and the adhesive area of said top flap overlies at least a substantial part of said tear away portion; and further comprising:
means permitting reuse of said envelope as a mailing envelope, said means comprising a second activatable adhesive on the bottom surface of said tear away portion, and a second tear away portion lying adjacent and beneath said first mentioned tear away portion.

4,729,508
HINGED LID CONTAINER AND ONE-PIECE BLANK THEREFOR
Otto Erdmann, Hamburg; Reinhard Deutsch, Geesthacht, and Harry David, Hamburg, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Jan. 7, 1987, Ser. No. 1,248
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1986, 3601470
Int. Cl.[4] B65D *43/14*
U.S. Cl. 229—146 **14 Claims**

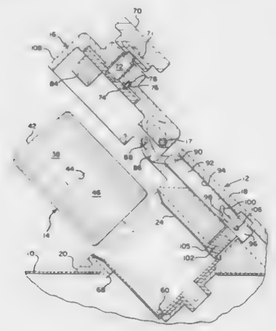


1. A hinged lid container comprising a hollow parallelpiped body having an open end and including a bottom wall, a planar rear wall, a planar front wall and two sidewalls; a collar inte-

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gral with one of said walls and disposed in part within and extending in part beyond the open end of said body, said collar having two elongated panels extending from said body beyond said sidewalls; and a lid integral with said rear wall and having two lateral walls each substantially coplanar with a different one of said sidewalls, said lid being pivotable relative to said body between a closed position in which said lateral walls abut the respective sidewalls and are outwardly adjacent the corresponding lateral panels and an open position in which said open end is accessible, each of said lateral panels having a single elongated edge remote from the respective sidewall, making an acute angle with the plane of said rear wall and making an obtuse angle with the plane of said front wall, thereby sloping upwardly from front to rear of the container.

4,729,509
COIN COLLECTING APPARATUS
Robert R. Diekhoff, Harrison, Ark., assignor to Qonaar Corporation, Rolling Meadows, Ill.
Filed Jun. 1, 1987, Ser. No. 56,047
Int. Cl.[4] G07B *15/00*
U.S. Cl. 232—16 **7 Claims**



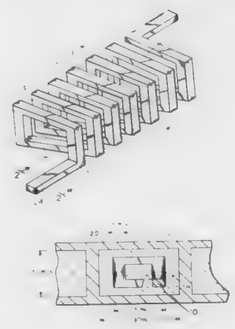
1. In a coin collection apparatus including a coin container, a receiver housing on the container, and a recess defined by the receiver housing for receiving a coin box, said coin box defining an opening whereby coins deposited in said box can be discharged into said container, a closure for said opening, said closure being opened upon movement of said box within said housing, the improvement comprising a cover for said receiver housing, means permiting placement of the cover in a position to close access to the receiver housing when a coin box is positioned within said recess, a coin box engaging head carried by said cover and movable relative to said cover, means defined by said engaging head for engaging said coin box, a handle carried by said cover, and means connecting said handle to said engaging head whereby movement of said handle results in movement of the engaging head and coin box to achieve opening of said closure and discharge of said coins into said container.

4,729,510
COAXIAL SHIELDED HELICAL DELAY LINE AND PROCESS
Richard C. Landis, Shelton, Conn., assignor to ITT Corporation, New York, N.Y.
Filed Nov. 14, 1984, Ser. No. 671,272
Int. Cl.[4] H01P *9/02*
U.S. Cl. 333—162 **4 Claims**

2. A delay line, embedded in a planar substrate formed of a plurality of superimposed parallel planar layers, said substrate having a major surface thereof lying in a plane parallel to said planar layers, comprising:

a plurality of conductive portions in said superimposed parallel planar layers;

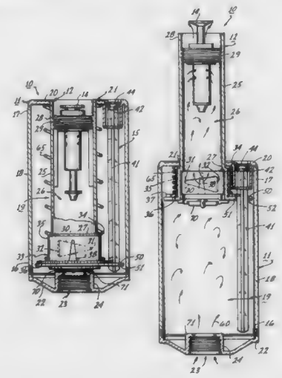
a coil having a plurality of turns embedded in said substrate and formed about an axis positioned parallel to said plane, each of said turns being formed of at least partially superimposed and electrically connected ones of said conductive portions of said plurality of superimposed parallel planar layers;



dielectric material disposed between the turns of said coil and embedding said coil; and

a conductive shield spaced from, extending along the axis of and substantially enclosing said coil, said shield being formed in said substrate by at least partially superimposed and electrically connected other ones of said conductive portions of said plurality of superimposed parallel planar layers.

4,729,511
POP-UP SPRINKLER
Manning Citron, San Marino, Calif., assignor to James Hardie Irrigation, Inc., El Cajon, Calif.
Filed Jun. 3, 1987, Ser. No. 57,792
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205 **15 Claims**



1. A sprinkler apparatus, comprising:

a housing defining a hollow interior and an inlet port through which to supply a flow of liquid to the interior;

a stem mounted on the housing to be moved between a retracted position and an extended position, the stem having a passageway and an opening through which the flow of liquid can pass from the interior of the housing to the passageway within the stem;

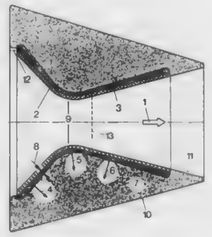
a piston mounted within the housing to respond to the flow of liquid and move the stem from the retracted position to the extended position;

a valve element mounted on the stem, which valve element is adapted to be moved relative to the stem to at least partially block the opening;

a shaft rotatably mounted on the housing; and

coupling means for coupling the shaft to the valve element so that the valve can be moved by rotation of the shaft for purposes of restricting the flow of liquid through the opening a selected amount.

4,729,512
ROCKET NOZZLES IN LAYERED CONSTRUCTION
Johannes L. N. Laing, 1253 La Jolla Rancho Rd., La Jolla, Calif. 92037
Filed Nov. 21, 1985, Ser. No. 800,547
Int. Cl.[4] B64D *33/04*
U.S. Cl. 239—265.11 **3 Claims**



1. A process to produce a rocket nozzle, whose inside surface guides a gas stream, and is formed by a liner made from a carbide material according to the following steps:

A—a powder, comprising silicon carbide crystals, carbon and a binder material is isostatically pressed into a thin walled body of rotation with the shape of a liner (2) having a converging portion, a neck portion and a diverging portion,

B—said body of rotation is converted to silicon carbide by siliconization in a reaction-sintering process, forming said liner (2),

C—a layer of highly anisotropic graphite, the surface of which is normal to the vectorial direction of the lowest ultimate compression strength of said graphite, forms a jacket (3) around the outer surface of the liner (2) permitting thermal expansion of the liner (2) during rocket operation, said layer being applied sufficiently thick in order to be able to absorb said thermal expansion,

D—a thick layer of a heat resistant material such as phenolic graphite is arranged around the outer surface of the jacket (3) forming a third layer,

E—the thin walled liner (2), with the jacket (3) and the third layer is heated in an inert atmosphere until the thick layer hardens and forms a shell (7).

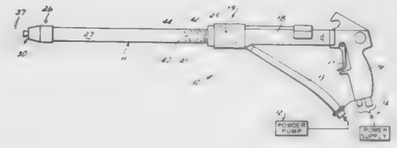
4,729,513
LANCE EXTENSION VENTURI SLEEVE
Raymond M. Fetcenko, Elyria, and Thomas E. Hollstein, Amherst, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio
Continuation of Ser. No. 638,391, Aug. 3, 1984, abandoned. This application Oct. 10, 1986, Ser. No. 918,542
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—707 **4 Claims**

1. In a powder delivery system for spraying powder entrained in an air stream wherein the system includes a powder spray controlling gun, means for conveying an air stream entraining powder from a pump to said gun, a gun barrel integral with said gun and an elongated lance extension having a rear end operatively mounted on said forward end of said gun barrel for conveying powder from said forward end of said barrel of said powder spray gun at a rearward, upstream end of the extension to a spray nozzle spaced from said gun and disposed at a forward, downstream end of the lance extension, said extension comprising an elongated tube having a length of about 6 to about 24 inches and having an inner surface comprising an elongated internal bore of substantially constant diameter defining a path for powder blown by an air stream therethrough in a downstream direction from said gun to said nozzle, and an electrode sleeve extending through said extension and defining with said extension a powder stream flow path having a cross-sectional flow area; the improvement comprising:

venturi means for homogenizing powder within said air stream in said lance extension, said venturi means including;

an elongated venturi sleeve having upstream and downstream ends and being disposed within the upstream, rearward one-third of said lance extension tube and between forward and rearward ends of said extension;

an internal bore in said venturi sleeve defining a portion of said path and terminating at a downstream end of said sleeve within said tube;



a tapered bore in said venturi sleeve coaxial with and operatively communicating with the internal bore in said sleeve, said tapered bore extending from one diameter near said internal venturi sleeve bore to a greater diameter in an upstream direction from said internal sleeve bore;

said downstream end of said venturi sleeve comprising a flat face in a radial plane, said internal bore of said venturi sleeve terminating at a port in said face radially spaced inward from said inner surface of said extension tube and opening abruptly into said tube;

said electrode sleeve extending through said internal bore and said tapered bore in said venturi sleeve and defining therewith a powder stream flow path having a cross-sectional flow area through said venturi;

said venturi means creating increased velocity and turbulence within said path in said lance extension tube when air and powder are blown therethrough, thereby homogenizing powder within said air stream and within said lance extension tube beyond said gun barrel forward end, but upstream of said spray nozzle, and whereby said turbulence is diminished in the downstream two-thirds of said extension tube to provide a homogenized uniform powder and air stream to said nozzle for discharge therefrom in a uniform pattern.

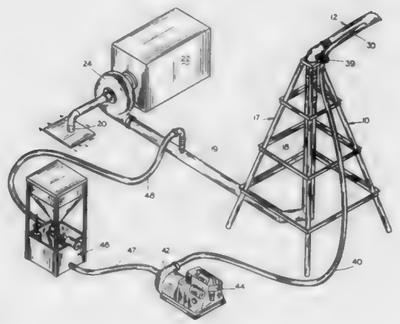
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4,729,514

MEANS FOR SEEDING THROUGH A CENTER PIVOT IRRIGATION SYSTEM

Carl R. Ostrom, Omaha, and John A. Chapman, Wahoo, both of Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Continuation-in-part of Ser. No. 745,183, Jun. 17, 1985, Pat. No. 4,660,775. This application Oct. 15, 1986, Ser. No. 919,040
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] B05B *3/18*
U.S. Cl. 239—727 20 Claims



10. In combination,

a self-propelled irrigation system comprising a primary water supply pipe supported by a plurality of spaced-apart drive towers adapted to move said primary water supply pipe over a predetermined area,

said primary water supply pipe being in operative communication with a source of water,

a plurality of spaced-apart first sprinklers on said primary water supply pipe for sprinkling water on said predetermined area as said primary water supply pipe is moved thereover,

means for pumping water through said primary water supply pipe to said first sprinklers,

an actuator means operatively connected to each of said first sprinklers,

a seed supply means adapted to supply seeds to be planted,

metering means in operative communication with said seed supply means and said primary water supply pipe for metering seeds from said seed supply means, at a predetermined rate, into the water passing through said primary water supply pipe whereby the seeds to be planted will be conveyed to said first sprinklers,

and control means operatively connected to said actuator means for selectively controlling said actuator means whereby said first sprinklers will be selectively operated to sprinkle water and seeds therefrom, as said primary water supply pipe is moved over said predetermined area, to achieve substantially uniform seed distribution on said predetermined area along the length of said primary water supply pipe.

4,729,515

MACHINE FOR CUTTING DISPOSABLE CONTAINERS

John W. Wagner, 3321 McIntyne Dr., Murrysville, Pa. 15668

Continuation of Ser. No. 646,917, Sep. 4, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,968
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—99 14 Claims

1. A machine capable of cutting into elongated pieces the thin wall material of a plurality of disposable containers such as plastic bottles and metal cans comprising:

a loading section for receiving said plurality of said disposable containers;

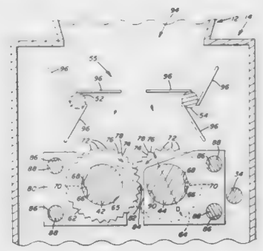
a cutting section joined to said loading section and having an entrance opening for receiving said disposable containers therefrom, said cutting section including a pair of parallel shafts mounted for rotation in opposite direction, said pair of shafts each supporting a plurality of cutting wheels keyed for rotation therewith;

each said cutting wheel being mounted for axial movement on one of said shafts and being axially separated from axially adjacent said cutting wheels thereon by one of said cutting wheels on the other of said shafts extending therebetween, each said cutting wheel having a plurality of cutting teeth thereon;

said cutting teeth of said cutting wheels having a root diameter and said pair of shafts being separated by a distance therebetween which is less than said root diameter;

said cutting section including a plurality of combers, each said comber being aligned with a corresponding said cutting wheel to provide a gap between an end thereof and said cutting teeth of said corresponding cutting wheel;

said plurality of said cutting wheels on said pair of shafts being rotated to grip said disposable containers therebe-



tween to cause said disposable containers to be directed between said pair of shafts with said thin wall material of said disposable containers being continuously cut into said elongated pieces having a width generally equal to a width of said cutting wheels with each elongated edge of each elongated piece being cut between side edges of said cutting teeth of one of said cutting wheels on said one shaft and the adjacent side edges of said cutting teeth of an adjacent said cutting wheel on said other shaft as said elongated pieces pass through said gaps between said end of said combers and said cutting teeth of said corresponding cutting wheels;

a collecting section adjoining said cutting section for receipt of said elongated pieces of said plurality of said disposable containers leaving said cutting section; and

feeding assist means in said entrance opening of said cutting section including a pair of parallel feeding shafts which are centrally disposed above said pair of said shafts and parallel therewith, said feeding shafts each including a plurality of paddles fixedly mounted thereon with each said feeding shaft and said paddles thereon rotating in the same direction as its adjacent said shaft to cause said paddles to push said disposable containers toward said cutting wheels to be gripped thereby.

4,729,516

FLUFF MILL

Robert M. Williams, Jr., Webster Groves, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

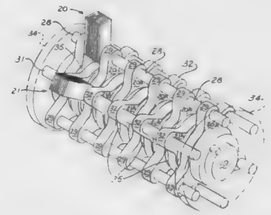
Filed Apr. 14, 1986, Ser. No. 851,957
Int. Cl.[4] B02C *13/28, 13/286*
U.S. Cl. 241—186.4 7 Claims

1. A fluff mill for converting sheet material into a fluff product, said sheet material having a predetermined thickness and width, and said fluff mill comprising:

(a) a casing defining a chamber in which the fluff product is produced;

(b) sheet material feeding means connected to said casing, said feeding means having a breaker bar formed with slots and with a sheet material supporting end presented to the interior of said casing, said breaker bar supporting the sheet material across its predetermined width, said feeding means having a sheet material guide plate spaced from said breaker bar a distance to accommodate the thickness of the sheet material and formed with slots therein;

(c) sheet material feed rolls carried by said feeding means in position to project through said slots in said breaker bar and in said guide plate for engaging and feeding the sheet material;



(d) a rotor assembly operatively mounted in said casing, said rotor assembly having hammer elements mounted thereon such that they present outer tips which define a tip circle and said hammer elements having the outer tips arranged in overlapping positions to impact the sheet material across its entire predetermined width; and

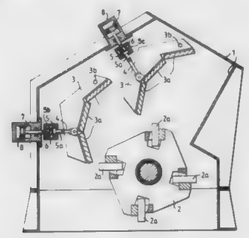
(e) breaker bar adjusting means carried by said sheet material feeding means in position to engage and adjust the position of said breaker bar end selectively relative to said hammer tip circle to obtain an operating gap spacing between the hammer tip circle and said breaker bar end to control the reduction of the sheet material into the fluff product, said breaker bar adjustment being effective by said slots therein accommodating said feed rolls.

4,729,517

REBOUND CRUSHER

Werner Krokor, Beckum-Neubeckum; Wolfgang Finken, Ennigerloh, and Bernhard König, Augsburg, all of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,644
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525101
Int. Cl.[4] B02C *13/06*
U.S. Cl. 241—189 R 12 Claims



1. A rebound crusher comprising

a crusher housing, a rebound mechanism disposed within said housing, and at least one rotor provided with hammers and being rotatably mounted in said crusher housing, said rotor cooperating with said rebound mechanism, said rebound mechanism being supported swingably against spring force within the crusher housing, the distance from said rebound mechanism to the hammers of the rotor being adjustable; and wherein

said crusher further comprises

adjustment means secured to said crusher housing, and having an adjustment piston and a setting cylinder enclosing said piston,

damping means interconnecting said adjustment means with said rebound mechanism, said adjustment means adjusting the distance between the hammers and said rebound mechanism, said damping means damping a motion of said rebound mechanism during a crushing of bodies of material placed within said housing; and wherein

said setting cylinder is secured to said housing; and

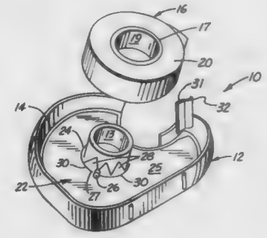
said damping means comprises a damping cylinder positioned by said adjustment piston, said damping means further comprising a damping piston enclosed within said damping cylinder and being articulated to a part of said rebound mechanism distant from a point of pivot of said rebound mechanism, said damping piston being moveable independently of a movement of said adjustment piston for operation of said damping means and said adjustment means independently of each other.

4,729,518

TAPE DISPENSER INCLUDING A BACKCARD WITH PROJECTING HUB PARKING PORTIONS

Charles A. Mathna, St. Paul, and Susan M. Butzer, Eagan, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

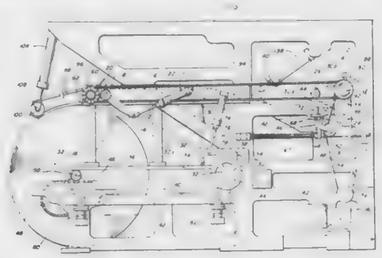
Filed Aug. 27, 1986, Ser. No. 900,701
Int. Cl.[4] B65H *19/00, 35/10*
U.S. Cl. 242—55.53 4 Claims



1. A tape dispenser comprising a housing including a hub having a cylindrical peripheral surface, a roll of tape comprising a core having a through opening defined by a cylindrical inner surface journaled on said hub and a length of pressure sensitive adhesive coated tape wound around said core with said adhesive affording low adhesion between adjacent winds of the tape so that the tape can be easily pulled from the roll; and a backcard having a through opening and disposed around one end of said hub with said hub in said opening and a main portion of the backcard adjacent one side surface of said roll of tape, said backcard further comprising a plurality of projecting portions having base edges joined to said main portion and bent at about a right angle along said base edges with said projecting portions projecting between said hub and said core to provide a friction brake therebetween that will restrict rotation of said hub to an extent that will prevent unwanted rotation of the hub and uncoiling of the tape when it is withdrawn from the dispenser.

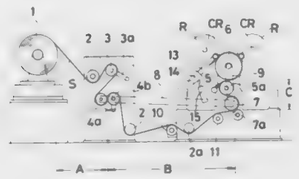
VOL 1088 ISS 2 MR 8 1988 UMI

4,729,519
WEB HANDLING APPARATUS
Leonard I. Tafel, Mount Prospect, and Leonard W. Kosoglad, Lincolnwood, both of Ill., assignors to Webquip Corporation, Wheeling, Ill.
Filed Oct. 14, 1986, Ser. No. 918,481
Int. Cl.⁴ B65H *19/18, 23/06*
U.S. Cl. 242—58.3 **27 Claims**



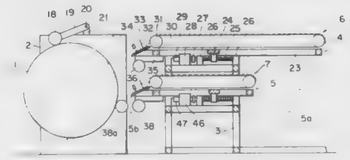
1. Apparatus for handling a web of material fed from a roll on a shaft, which comprises:
means for supporting the shaft;
means for sensing the tension of the web;
an infeed roller for feeding the web, said infeed roller having a rotational speed that varies in response to the tension sensing means;
a nipping roller for pressing the web against the infeed roller to prevent slippage;
a roll contacting belt for contacting the outer surface of the roll and aiding in rotating the roll;
means responsive to said tension sensing means for driving the belt;
brake drum means coupled to the shaft;
means for variably engaging said brake drum means for variably braking the rotation of the roll, with movement of said brake drum engaging means being responsive to said tension sensing means;
means for operating said roll contacting belt to control the rotation of the roll and thus the tension of the web when the roll is larger than a selected amount; and
means for disengaging said roll contacting belt from the roll and for operating the brake drum engaging means once the roll decreases to said selected amount.

4,729,520
METHOD AND APPARATUS FOR SUPPLYING SHEET TO WINDING UNIT
Hiroshi Katsuka, 3686 Samukawacho, Iyo-Mishima-shi, Ehime-ken, Japan
Continuation of Ser. No. 561,973, Dec. 16, 1983, abandoned. This application May 5, 1986, Ser. No. 859,232
Claims priority, application Japan, Dec. 22, 1982, 57-223665
Int. Cl.⁴ B65H *16/10, 18/08, 23/18, 35/02*
U.S. Cl. 242—56.2 **3 Claims**



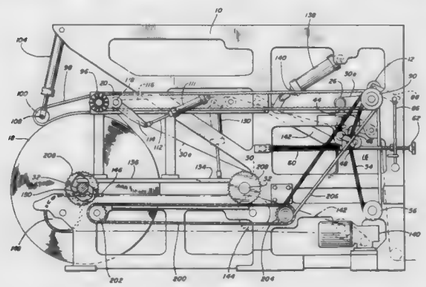
1. A sheet rewinder with slitter, comprising tension adjusting means for producing a predetermined tension in a strip-like sheet taken out from a supply roll, a feed-out roller means for feeding out said strip-like sheet under the tension, a slitter for slitting the unwound strip-like sheet into a plurality of slit sheets, a plurality of cores for winding said respective slit sheets thereon and a touch roller for guiding a slit sheet to a core and provided with center drive means, said touch roller being driven by said center drive means for providing a pressure to sheet rolls which are being formed on said plurality of cores with adjustment of the winding pressure, in contact with said sheet rolls,
said feed-out roller means comprising a first drive roller means and a second drive roller means located between said first drive roller means and said slitter;
an expander roller means disposed between said first drive roller means and second drive roller means;
a drive means for exerting a standard feed-out speed onto said second drive roller means;
a first fine speed adjustment interlock mechanism for finely adjusting the standard feed-out speed and transmitting the adjusted feed-out speed to said first drive roller means; and
a second fine speed adjustment interlock mechanism for finely adjusting the standard feed-out speed and transmitting the adjusted feed-out speed to said touch roller;
the tension in the sheet between said supply roll and said first drive roller means being adjusted by tension adjusting means, the tension in the sheet between said first and second drive roller means being adjusted through said first fine speed adjustment interlock mechanism to suppress sheet tension variations, the tension in the sheet between said second drive roller means and said touch roller being adjusted through said second fine speed adjustment interlock mechanism to produce in the sheet an optimum tension, with which the sheet is supplied to said plurality of cores, the winding tension being adjusted by driving means for driving said plurality of cores.

4,729,521
CONTROLLER FOR WINDING UNVULCANIZED RUBBER SHEET
Masayoshi Kubo; Hideaki Katayama; Kenji Tokunaga, all of Nagasaki; Megumi Yamanaka, Osaka, and Hisanobu Inada, Sennan, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Bando Chemical Industries, Inc., Hyogo, both of, Japan
Continuation of Ser. No. 724,419, Apr. 16, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,139
Int. Cl.⁴ B65H *18/10, 23/198;* **B29D** *30/30*
U.S. Cl. 242—67.2 **2 Claims**



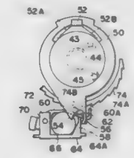
1. A controller for winding an unvulcanized rubber sheet which comprises a cylindrical drum for winding said unvulcanized rubber sheet on said cylindrical drum, a motor for rotating said drum, at least one feed conveyor for feeding said unvulcanized rubber sheet to said drum, a motor for driving said at least one feed conveyor, means for measuring an outer peripheral length of said drum before and during winding of said unvulcanized rubber sheet, a data processor for calculating the amount of winding rotation of said drum for winding said unvulcanized rubber sheet on said drum based on previous data inputted to said processor regarding certain specification data, mechanical data and designation data and said measured outer peripheral length of said drum before and during winding of said unvulcanized rubber sheet and for calculating a dividing ratio for said drum and a dividing ratio for said conveyor respectively so as to synchronize peripheral velocities of said drum and said feeding conveyor and to output said dividing ratios, said dividing ratios being defined as the ratio of the peripheral velocity of said drum and the peripheral velocity of said conveyor to the feed quantity of a rubber sheet, and a sequence control unit for controlling the sequence of operation of each of said aforesaid motors to be driven in response to operation data calculated and outputted from said data processor, including the amount of winding rotation of said drum and said dividing ratios, said sequence of operation referring to that sequence according to which each element of the controller for winding the unvulcanized rubber sheet and motors are operated, which sequence is established according to a predetermined order.

4,729,522
WEB HANDLING APPARATUS
Leonard I. Tafel, Mount Prospect, and Leonard W. Kosoglad, Lincolnwood, both of Ill., assignors to Webquip Corporation, Wheeling, Ill.
Continuation-in-part of Ser. No. 918,481, Oct. 14, 1986. This application Feb. 2, 1987, Ser. No. 10,181
Int. Cl.⁴ B65H *16/10, 19/18, 23/08*
U.S. Cl. 242—75.1 **9 Claims**



9. Apparatus for handling a web of material fed from a roll on a shaft, which comprises:
means for supporting the shaft;
means for sensing the tension of the web;
an infeed roller for feeding the web, said infeed roller having a rotational speed that varies in response to the tension sensing means;
a nipping roller for pressing the web against the infeed roller to prevent slippage;
a roll contacting belt for contacting the outer surface of the roll and aiding in rotating the roll;
means responsive to said tension sensing means for driving the belt;
rigid means coupled to and rotatable with the shaft;
rotation control means for engaging said rigid means for variably controlling the rotation of the roll, with movement of said rotation control means being responsive to said tension sensing means;
means for operating said roll contacting belt to control the rotation of the roll and thus the tension of the web when the roll is larger than a selected amount; and
means for disengaging said roll contacting belt from the roll and for operating said rotation control means in cooperation with said rigid means once the roll decreases to said selected amount.

4,729,523
LOCKING MECHANISM FOR WEBBING RETRACTOR
Tosio Saitou; Kenji Matsui; Keiichi Tamura; Shinji Mori, and Shingo Izuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan
Filed Jun. 6, 1985, Ser. No. 741,809
Claims priority, application Japan, Jun. 11, 1984, 59-086496[U]; Aug. 6, 1984, 59-120834[U]; Aug. 6, 1984, 59-120835[U]; Aug. 9, 1984, 59-122267[U]
Int. Cl.⁴ B60R *22/38, 22/40*
U.S. Cl. 242—107.4 A **14 Claims**



1. A lock mechanism for a webbing retractor which is employed in a seatbelt system for a vehicle and adapted to wind up an occupant restraining webbing onto a webbing takeup shaft by means of a biasing force, which comprises:
(a) lock means adapted to prevent the rotation of said takeup shaft in the webbing wind-off direction when a vehicle emergency occurs, said lock means including a lock ring supported on said takeup shaft;
(b) acceleration sensing means including an actuator adapted to engage with said lock ring to prevent the rotation of said takeup shaft in the webbing wind-off direction when a vehicular emergency occurs; and
(c) limiting means for preventing engagement between the lock means and the accelerator sensing means when no vehicular emergency is occurring, said limiting means having frictional contact means, canacelling means and pivoting limiting means, wherein said limiting means is pivotally movable around the takeup shaft through the frictional contact of said friction contact means, said cancelling means includes a first leg member that is moved in a first direction in response to the pivoting of said frictional contact means and adapted to prevent a locked state of said lock means when said takeup shaft rotates in the webbing wind-up direction, and said pivoting limiting means includes a second leg member that is pivotally movable around the takeup shaft in a second direction when the takeup shaft rotates in a webbing wind-out direction to limit the pivoting range of said limiting means, whereby said webbing is prevented from being gradually wound up onto takeup shaft when said vehicle is running.

4,729,524
SEAT BELT RETRACTOR WITH CINCH MECHANISM
Horst U. Befort; Keith Charlton, both of Midland, and Kevin Desrochers, Port McNicoll, all of Canada, assignors to TRW Vehicle Safety Systems Limited, Toronto, Canada
Filed Sep. 26, 1986, Ser. No. 913,214
Int. Cl.⁴ A62B *35/02;* **B65H** *75/48;* **B60R** *22/34*
U.S. Cl. 242—107.4 R **10 Claims**

4. A seat belt retractor comprising:
a spool having a seat belt webbing wound thereon;
means for supporting said spool for rotation, said spool being rotatable in a belt withdrawal direction upon withdrawal of said seat belt webbing from said spool and being rotatable in a belt retracting direction upon wind-up of said belt webbing on said spool;
means for locking said spool from rotation in the belt withdrawal direction after a predetermined amount of belt is withdrawn from said spool including a ratchet fixed to said spool and a pawl movable into engagement with said

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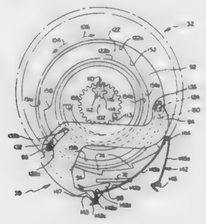
ratchet after a predetermined amount of belt withdrawal; and

means for moving said pawl into engagement with said ratchet including:

a cam member,

drive means for rotating said cam member upon rotation of said spool and for rotating said cam member multiple times during withdrawal of said belt said predetermined amount,

said cam member having a multi-loop spiral cam groove



formed on the side surface of said cam member with a radially inner cam surface, a radially outer cam surface, and an actuating surface, said inner and outer cam surfaces extending around the axis of rotation of said cam member, said actuating surface extending radially from the axis of rotation of said cam member between said inner and outer cam surfaces, and

means actuated by said actuating surface to move said pawl into locking engagement with said ratchet when said belt has been withdrawn said predetermined amount.

4,729,525

SEAT BELT RETRACTOR WITH ELECTRICALLY ACTUATABLE LOCKING MECHANISM

Robert J. Rumpf, Grosse Pointe, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 12, 1986, Ser. No. 941,091

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 B **21 Claims**



8. An apparatus comprising:

a member rotatable about an axis;

means actuated in response to slowing of the rotation of said member;

an electromagnet having opposite poles fixed against rotation and extending adjacent to the periphery of said member;

means for supporting said poles for movement relative to said member; and

means for energizing said electromagnet to create a magnetic field extending through said poles and said member to cause said poles to be attracted against said member to slow the rotation of said member.

13. A seat belt retractor comprising:

a spool rotatable in seat belt winding and unwinding directions;

a disk member rotatable with said spool at spool accelerations below a predetermined level and rotatable relative to said spool at spool accelerations above the predetermined level, said disk member being made of a material having a high magnetic permeability.

locking means for locking said spool against rotation in the unwinding direction in response to relative rotation of said disk member and said spool; and

means for restraining rotation of said disk member to effect relative rotation of said disk member and said spool comprising

an electric coil which is energized in response to a predetermined condition for creating a magnetic field through said disk member, and

at least one member disposed adjacent said disk member and movable in response to energization of said coil by the magnetic force created between the disc member at the least one member into frictional engagement with said disk member to restrain the rotation of said disk member to effect relative rotation of said disk member and said spool.

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SLEEVE TYPE LAP CREEL HAVING A CHANGEABLE AXIAL LENGTH

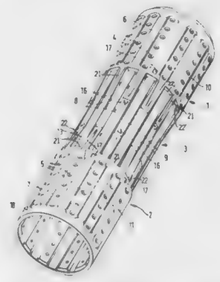
Josef Becker; Hubert Becker, and Matthias Becker, all of Niederforstbucher Str. 80-84, 5100 Aachen-Brand, Fed. Rep. of Germany

Filed Oct. 16, 1986, Ser. No. 919,796

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538861

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—118.1 **16 Claims**



1. A lap creel having a changeable axial length, comprising a first axially outer creel section with radially extending openings therein, a second axially outer creel section also with radially extending openings therein, each of said first and second axially outer creel sections forming a hollow cylinder having a given open inner diameter, said lap creel further comprising a first group of circumferentially spaced ribs extending axially from the first creel section to the second creel section and a second group of circumferentially spaced ribs extending axially from the second creel section to the first creel section whereby the ribs of one creel section fit into spacings between the ribs of the other creel section and vice versa, said first and second groups of ribs forming a rib cage having radially outer support surfaces defining an outer diameter smaller than said given open inner diameter of said first and second creel section so that said ribs can fit into the creel sections, and frangible bridging elements interconnecting said first and second creel sections through said ribs, whereby said bridging elements may be broken, when an initial axial spacing between said first and second creel sections is changed.

4,729,527

SLIDE SWITCH OF ANTI-REVERSE MECHANISM FOR FISHING REEL

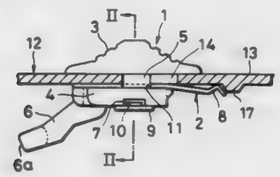
Kenji Maruyama, and Toshiaki Yorikane, both of Hiroshima, Japan, assignors to Ryobi, Ltd., Hiroshima, Japan

Filed Dec. 3, 1986, Ser. No. 937,398

Claims priority, application Japan, Dec. 5, 1985, 60-188207[U]

Int. Cl.[4] A01K *89/01*

U.S. Cl. 242—84.1 R **3 Claims**



1. A switch mechanism in a fishing reel for controlling reverse rotation of a rotor, comprising:

a casing for the fishing reel, said casing having an aperture and a projection extending along an inner surface of said casing proximate said aperture;

pawl means disposed within said casing for normally engaging the rotor to prevent reverse rotation thereof;

control means extending through said aperture and slidably aligned in first and second positions for disengaging said pawl means from said rotor in said first position and for returning said pawl means into engagement with said rotor when said control means shifted to said second position, said control means including a control knob disposed along an exterior portion of said casing, a neck portion integrally connected at a first end to said control knob and aligned within said aperture, an internal frame portion integrally connected to a second end of said neck portion and slidably positioned along said inner surface, and an operating arm extending from said internal frame portion for engagement with said pawl means;

leaf spring means for clamping said internal frame portion and for selectively holding said control means in said first and second positions, said leaf spring means including an outer plate having a cutout section for receiving said neck portion, said leaf spring means also including a clamping arm extending from said outer plate and sized to clamp said internal frame portion therebetween, said leaf spring means further including a mating arm disposed along an edge of said outer plate to urge said outer plate into frictional engagement with said inner surface of said casing along said aperture, said mating arm being aligned with a first surface of said projection nearest said aperture to hold said control means in said second position, said mating arm also being urged into alignment with a second surface of said projection opposite said first surface to hold said control means when said control means is in said first position; and

engagement means for locking said clamping arm into said internal frame portion.

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AEROELASTIC CONTROL FLAP

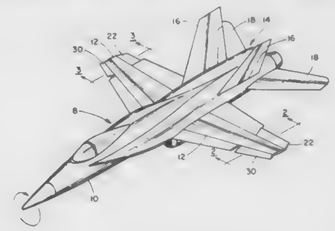
Angelo Borzachillo, San Marcos, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 28, 1983, Ser. No. 453,507

Int. Cl.[4] B64C *9/04*

U.S. Cl. 244—90 R **2 Claims**

1. A fighter airplane having a fuselage and wings supported and extending from the fuselage, said wings having leading and trailing edges, said fighter airplane designed for high dynamic pressure producing flight maneuvers, the improvement comprising, in combination, outboard ailerons mounted at the trailing edges of the wings at or near the wing tips for movement up or down with respect to the wing under the control of the pilot, control means operable by the pilot to move said ailerons, outboard aeroelastic control flaps mounted on the leading edge of the wings at or near the wing tips for movement up or down with respect to the wings, said flaps having a lateral extent approximately the same as said ailerons, and control means responsive to pilot demand to move said leading



edge control flaps up or down, said control means including control means having inputs including Mach number, angle of attack and dynamic pressure for obtaining programmed roll control to coordinate the leading edge flap movement with the movement of said ailerons to induce supplementary aerodynamic forces on the wings to counteract the effects of aeroelastic wing deformation and thereby increase the roll control effectiveness of said aircraft during high dynamic pressure flight maneuvers and counter aileron reversal.

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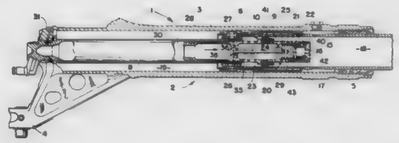
LANDING GEAR MECHANISM INCLUDING BYPASS VALVE ASSEMBLY FOR REDUCING DAMPING LOADS DURING TAXIING

Louis C. Hrusch, Chesterland, Ohio, assignor to Pneumo Corporation, Boston, Mass.

Filed Dec. 19, 1985, Ser. No. 810,578

Int. Cl.[4] B64C *25/58;* **F16F** *9/48, 5/00*

U.S. Cl. 244—104 FP **15 Claims**



1. A landing gear mechanism for high performance aircraft comprising a main cylinder, a main strut piston axially movable within said main cylinder, a restrictor member contained within said cylinder and defining with said cylinder and piston upper and lower chambers, said restrictor member having orifice means therethrough for controlling the rate of flow of hydraulic fluid from said lower chamber to said upper chamber during landing, and bypass valve means providing for increased flow of hydraulic fluid from said lower chamber to said upper chamber whenever said landing gear mechanism engages a bump during taxiing to reduce the damping loads that would otherwise occur if all of such hydraulic fluid were required to flow through said orifice means, said bypass valve means comprising bypass passage means around said orifice means, a slide member mounted for axial movement relative to said restrictor member between open and closed positions for respectively opening and closing said bypass passage means, and means for keeping said slide member in the closed position

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until after landing has taken place and the pressure in said upper chamber has risen to a predetermined level, said means for keeping said slide member in the closed position until after landing has taken place comprising a secondary piston having a first surface area which is continually acted upon by a secondary pressure source of a predetermined magnitude urging said secondary piston toward said slide member.

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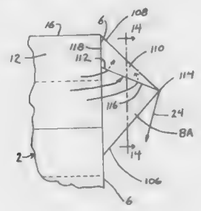
CONTROL FLAPS FOR A MULTI-CELL WING TYPE CANOPY

Domina C. Jalbert, 425 Wavecrest Ct., Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 783,024, Oct. 2, 1985, abandoned. This application May 7, 1987, Ser. No. 46,780

Int. Cl.[4] B64D *17/14*

U.S. Cl. 244—152 **10 Claims**



1. In combination, a ram air wing type flexible canopy, said canopy having a trailing edge, a rearwardly extending control flap fixed to said canopy on each side thereof having an upper and lower surface, each rearwardly extending control flap extending rearwardly of said trailing edge, means connecting a control line to each rearwardly extending control flap to place it in a desired position for proper flight, each control flap having an outer edge extending rearwardly of the canopy trailing edge, an edge pocket extending along the outer edge of each control flap, and each pocket having an inwardly facing opening to said lower surface, said opening extending along the length of each pocket, each opening being positioned to receive air flow from below the trailing edge of said canopy.

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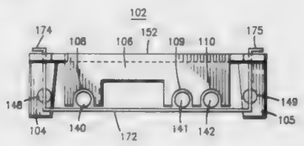
ALIGNMENT BRACKET FOR COAXIAL CABLES

Michael G. Smith, Chicago; Patrick C. Kearney, Arlington Heights, and Gary A. Egger, Elgin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 2, 1987, Ser. No. 20,413

Int. Cl.[4] F16L *3/22*

U.S. Cl. 248—68.1 **5 Claims**



1. An alignment bracket for attaching to a housing and aligning a plurality of cables extending from the housing, said bracket comprising:

a substantially flat plate having near one end protruding first and second feet for attaching to the housing, said plate having near an end opposite said one end a first protruding portion having at least first and second slots for receiving corresponding first and second cables, said plate further having near opposites sides second and third slots, and said plate further having near said one end a second protruding portion having at least fourth and fifth slots for receiving the corresponding first and second cables; and

a U-shaped spring clip having at opposite ends first and second protruding feet for inserting into the second and third slots of said plate, respectively, and retaining the first cable in the corresponding first and fourth slots and the second cable in the corresponding second and fifth slots.

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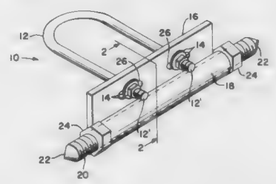
SAFETY VALVE ANCHORING DEVICE

Billy Moss, Rte. 3 Box 111A, Franklin, Tenn. 37064

Continuation of Ser. No. 714,106, Apr. 23, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 4,641

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—74.1 **4 Claims**



1. An anchoring device for securing a safety valve of the type having a flat side within a compartment having opposed side walls, the anchoring device comprising

an elongate body,

the body comprising a clamping portion and securing portion, the securing portion having a longitudinal axis and first and second ends, the clamping portion comprising an affixing section and a clamping section, the clamping portion affixing section being immovably affixed to the securing portion to form a horizontal junction in parallel alignment to the said longitudinal axis, the clamping section extending upwardly from the junction,

the clamping portion clamping section being provided with a pair of spaced openings in spaced relation above the said junction, the clamping section having a planar face adapted for clamping engagement against the flat side of the safety valve;

a clamp secured to the said clamping section for encircling the safety valve, the clamp having a U-shaped bend and first and second ends, each of the first and second ends of the clamp inserting through and being positioned within one of the said pair of spaced openings, the clamp defining a plane that is spaced from and does not intersect the said longitudinal axis of the securing portion of the body;

extending means adjustably carried in at least one of the said securing portion ends to secure the anchoring device within the compartment,

the extending means comprising a threaded stud and an affixed adjusting nut,

whereby the extending means can be threadedly extended into contact with a compartment side wall in an extremely sturdy interengagement and whereby the anchoring device can rigidly secure the safety valve within the compartment.

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SUPPORT APPARATUS

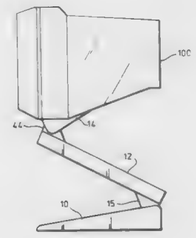
Christopher J. Hillary, Eastleigh, and John V. Pike, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1987, Ser. No. 30,514

Claims priority, application United Kingdom, Apr. 19, 1986, #609613

Int. Cl.[4] F16M *11/12*

U.S. Cl. 248—184 **47 Claims**



1. A support, intended in operation to locate an object of appreciable weight at an adjustable height relative to a reference height, the support comprising:

a mount to be located at the reference height and having a crank extending therefrom;

a boom pivotally mounted on said mount about a mount/-boom axis and extending therefrom to, and carrying, means for attaching the intended object;

a lift lever and a lift gas strut carried wholly by the boom; and

a lift rod mounted between a position on the crank remote from the mount/boom axis and the lift lever, the lift lever being pivotally mounted about a lift lever/boom axis fixed relative to the boom, and the lift rod and the lift gas strut both being connected to the lift lever but with the strut at a greater separation from the lift lever/boom axis than the rod, the lift gas strut engaging the boom and counteracting the effects of gravity when the support is loaded with the intended object.

4,729,534

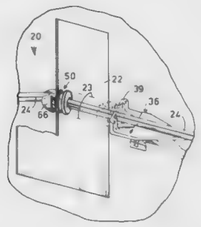
STRAIN RELIEF BUSHINGS

Royce W. Hill, Flippin, and Danny M. Nelson, Mountain Home, both of Ark., assignors to Micro Plastics, Inc., Flippin, Ark.

Filed Oct. 23, 1986, Ser. No. 922,314

Int. Cl.[4] F16L *5/00*

U.S. Cl. 248—56 **5 Claims**



1. A strain relief bushing adapted to be installed within a predefined orifice in a workpiece to nondestructively secure an electrical power cord or the like, said strain relief bushing comprising:

first and second exteriorly symmetrical, tapered segments adapted to be cooperatively folded together to deploy said bushing, such that, after folding, the composite bushing comprises:

a tapered shank portion extending between a front tip and a circular rear collar, the bushing taper being in the form of a paraboloid, ellipsoid, elliptic paraboloid, or hemisphere, said collar comprising an annular, front wall adapted to contract said workpiece;

a major circumferential groove defined concentrically within said collar adapted to be grasped and manipulated by a bushing installation tool to compress said bushing during installation;

a minor circumferential groove integrally defined in said shank adjacent said annular collar front wall for facilitating snap fitting of said bushing within said orifice;

said first segment comprising an interior cavity adapted to firmly receive at least a portion of said cord;

said second segment comprising an integral central tongue adapted to penetrate at least a portion of said cavity and urge at least a portion of said cord firmly within said cavity to restrain same when said segments are folded together;

said tongue being of a first predetermined thickness, said major groove being of a predetermined width, and the rear half of the thickness of the tongue being substantially aligned with the front half of the width of said major groove;

said cavity comprising a pair of aligned, cooperating spaced apart slots defined upon opposite internal sides therewithin for receiving said tongue when said bushing is deployed;

an integral coupling hinge extending between said segments for normally yieldably biasing them apart, said hinge adapted to foldably guide said segments into proper alignment when they are radially foldably urged together to assemble and deploy said bushing, said hinge dynamically assuming the shape of a slice of the outer surface of a hypothetical cylinder when folding occurs whereby to urge said segments into proper operative alignment when they are radially coupled together.

4,729,535

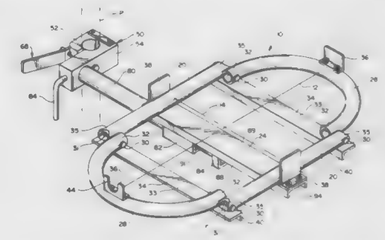
APPARATUS FOR SUPPORTING A COOKING DEVICE

Stanley J. Frazier, 1523 125th Ave., SE., Bellevue, Wash. 98005, and Blaine F. Sorenson, 18813 SE. Lakeholm Rd., Auburn, Wash. 98002

Filed Dec. 9, 1986, Ser. No. 939,550

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—230 **7 Claims**



1. Apparatus for supporting a cooking device from a structure, the cooking device having a bottom, upstanding sidewalls and upstanding endwalls which have an interior surface which form an interior chamber with a first lengthwise dimension and a second transverse dimension, said apparatus comprising:

a. means for supporting the cooking device, said supporting means including

(1) a main support platform having a first end and a second

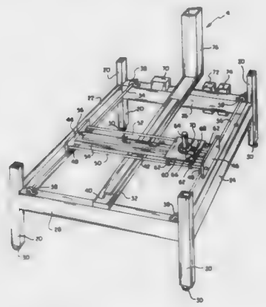
VOL 1088 ISS 2 MR 8 1988 UMI

end, said main support platform adapted to support at least a portion of the cooking device thereon,

(2) a first end platform which is pivotally connected to the first end of said main support platform, and a second end platform which is pivotally connected to the second end of said main support platform, said first and second end platforms being pivotally connected to said main support platform for movement between (i) an unfolded position in which said first and second end platforms extend horizontally outward from said first and second ends, respectively, to support additional portions of the cooking device thereon, and (ii) a folded position where said first and second end platforms extend inward of said main support platform from the first and second ends, respectively, each of said end platforms further including an engaging member which is mounted to a bottom of said end platform in a manner that said engaging member engages a bottom of said main platform when said end platform is in the unfolded position to support said end platform in the horizontal manner, and said first and second ends of said main platform further having rounded portions which permit said engaging members to pivot about said first and second ends when said first and second end platforms are rotated between the folded and unfolded positions; and

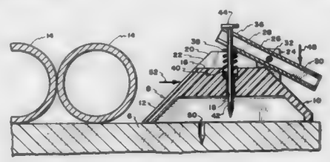
b. means for connecting said supporting means to the structure in a manner to support the cooking device in a level manner.

4,729,536
ANAGRAPHIC STAND
Harry Scala, 393 Stevens Ave., Ridgewood, N.J. 07450
Filed Nov. 4, 1986, Ser. No. 926,531
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 248—429 **20 Claims**



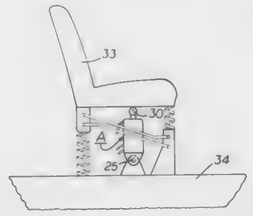
1. A graphic stand animation system comprising:
a rigid support frame;
a camera tower attached to said support frame so as to hold a camera above said support frame and positioned along a vertical line of sight;
a first drive support beam rigidly attached to said rigid support frame;
a first linear drive means mounted to said first drive support beam;
a first set of at least two horizontal support means attached to said rigid support frame and adapted to provide substantially coextensive support tracks;
a second drive support beam slidably mounted to said first set of support means and drivable by said first linear drive means, said second drive support beam being mounted transversely to said drive means;
a second linear drive means mounted to said second drive support beam;
means for attaching a stage to said second linear drive means;
and means for producing appropriate electrical drive signals to said first and second linear drive means in accordance with operator instructions.

4,729,537
PIPE-CHOCK
Jack F. Turner, 611 Shadyvale, Valinda, and Thomas E. Rand, 14402 Fairgrove Ave., La Puente, both of Calif. 91744
Filed Dec. 16, 1986, Ser. No. 942,237
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—547 **8 Claims**



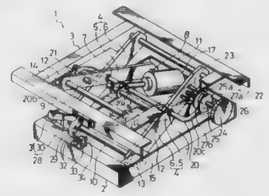
1. A pipe chock comprising a base member having a pipe engaging surface, an upper horizontal surface, an aperture extending vertically through said chock from said horizontal surface to the base of said chock;
at least one dog projecting upwardly from said horizontal surface adjacent one side thereof,
a lever member pivotally mounted to said dog for rocking movement about said pivot, said lever member having an aperture formed in one end thereof in alignment with the aperture in said chock and having the other end of said lever extending beyond said dog to a position adjacent the edge of said chock; and
a spike extending through said apertures in said lever and said shock.

4,729,538
APPARATUS FOR HYDRAULICALLY ACTUATING A VEHICLE SEAT
John W. Bergacker, 1009 NE. 104 St., Miami Shores, Fla. 33138; Thomas H. Milbauer, Rte. 2, and Donald G. Parks, P.O. Box 91, 320 Siegert St., both of, Marion, Wis. 54950
Filed Nov. 10, 1986, Ser. No. 929,098
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—550 **11 Claims**



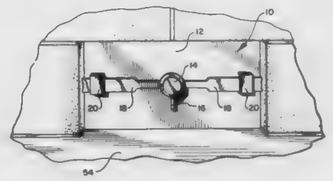
1. A hydraulic suspension system for regulating movement of a vehicular seat in response to vertical travel of the vehicular body mass, comprising:
(a) a hydraulic seat actuator comprising a first flexible coupling between the vehicular seat and the vehicular body mass, wherein the hydraulic seat actuator comprises a first piston reciprocally arranged within a first hydraulic cylinder and separating the first hydraulic cylinder into an upper portion and a lower portion, the first piston being adapted to move within the first cylinder in response to the relative movement of the vehicular body mass in relation to the vehicular seat;
(b) a hydraulic response controller comprising a second piston reciprocally arranged within a second hydraulic cylinder and separating the second hydraulic cylinder into an upper portion and a lower portion, the hydraulic response controller being adapted to control and regulate the amount of fluid to and from the first hydraulic cylinder; and
(c) a hydraulic response actuator comprising a second flexible coupling between the vehicular body mass and the vehicle suspension system, running gear, or terrain contacting apparatus, wherein the hydraulic response actuator comprises a third piston reciprocally arranged within a third hydraulic cylinder and separating the third hydraulic cylinder into an upper portion and a lower portion, the third piston being adapted to move within the third cylinder in response to the relative movement between the vehicular body mass and the vehicle suspension system, running gear or the terrain contacting apparatus; and
(d) a source of fluid under pressure, wherein the fluid is in communication with the hydraulic seat actuator, the hydraulic response controller, the hydraulic response actuator, and a fluid reservoir.

4,729,539
SEAT SUSPENSION DEVICE
Shojiro Nagata, Akishima, Japan, assignor to Tachi S Co. Ltd., Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 882,142
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—575 **7 Claims**



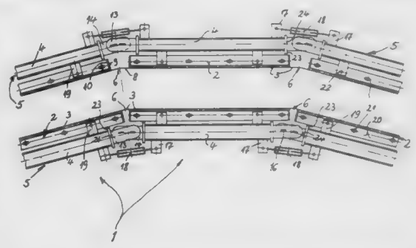
1. A seat suspension device comprising:
a lower frame to be mounted on the floor of a vehicle;
an upper frame for mounting a seat thereto;
a pair of pivotally connected, X-shaped links respectively disposed on opposite sides of, between said upper and lower frames, and supporting said upper frame in a manner such that the upper frame is moveable in a vertical direction relative to said lower frame, and
a torsion bar journaled to the point of pivotal connection connecting the link members of said X-shaped links, said torsion bar comprising a center portion having a terminal portion at each end thereof, each of said terminal portions being disposed at substantially right angles to said center portion, and being disposed in substantially opposing directions with respect to each other, wherein one of said terminal portions is engaged with a link member of one of said pair of X-shaped links, while the other said terminal portion is engaged with a link member of the other of said X-shaped links, or wherein one of said terminal portions is engaged with one side of one of said frames, while the other terminal portion is engaged with the other side of the other of said frames, said torsion bar being adapted to resiliently support said upper frame relative to said lower frame.

4,729,540
GROUT RETAINING TOOL
Donald W. Rozema, P.O. Box 913, Riverton, Utah 84065
Filed Jun. 26, 1986, Ser. No. 879,036
Int. Cl.[4] E04G *23/02*
U.S. Cl. 249—1 **24 Claims**



1. In a device capable of withstanding high levels of fluid pressure for removably covering a cleanout hole in a masonry wall during grouting comprising:
a substantially planar plate which is configured such that it is capable of being placed within a cleanout hole and of substantially covering the cleanout hole, wherein the cleanout hole is bordered on at least two sides by masonry units and wherein the cleanout hole is in communication with a grouting pour; and
a retractable engaging member secured to the front face of the plate facing outwardly from the cleanout hole, said retractable engaging member being capable of removably holding the plate in place within the cleanout hole by placing sufficient pressure on the masonry units during grouting such that, due to friction engagement between said retractable engaging member and the masonry units, the plate will not move substantially as the pour is filled with grout and the device is able to withstand the fluid pressure exerted on the plate by the grout placed behind the plate.

4,729,541
FORMWORK FOR ROUND OR POLYGONAL CONSTRUCTION
Josef Maier, Schwimmbadstrasse 3, D-7611 Steinach, Fed. Rep. of Germany
Filed Jul. 23, 1986, Ser. No. 888,884
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536816
Int. Cl.[4] E04G *11/06*
U.S. Cl. 249—18 **29 Claims**



1. A formwork for round or polygonal constructions, comprising a formwork face which is adjustable as to at least one of the parametrs including its curvature and its circumference; a series of booms including individual boom portions spaced apart from said formwork face and arranged to pivot relative to each other, at least one of said boom portions being of variable length; joints provided between neighboring boom portions and having axes disposed at least close to said form-

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work face; and means for releasably coupling the neighboring boom portions to each other, said coupling means comprising extensions provided on neighboring boom portions and movable relative to each other along arcs having centers of curvature at least close to the axes of the respective joints, and means for affixing the extensions to each other in selected positions of the respective boom portions.

4,729,542

MOLD FOR PRODUCING CONNECTING STRAPS FOR LEAD BATTERIES

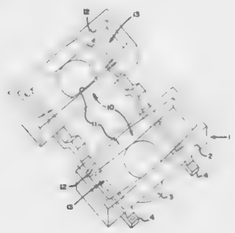
Dieter Bechtold, Frankfurt, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,940

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434901

Int. Cl.[4] B22C *9/06*

U.S. Cl. 249—96 **8 Claims**



1. In a mold for preparing connecting straps and end terminals for lead batteries by dipping the mold, which has portions corresponding to the connecting strap and to the end terminal, into molten lead to scoop up an amount of lead sufficient to fill the mold, and by bringing the content of the mold up from the bottom and together with inverted plate lugs of grouped battery plates, to fuse the plate lugs together with the content of the mold prior to solidification, the improvement comprising:

mold walls, the thickness of which vary in inverse proportion to the local accumulation of material on the connecting strap, over the length of the connecting strap; and

means for receiving a pole insert made from a material with an electrical conductivity higher than that of lead in portions of the mold which are to form the end terminal.

4,729,543

VALVE

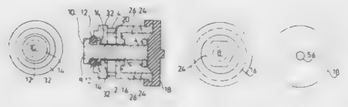
Yoel Aricha, Ashdod, Israel, assignor to Shaham Y. Aricha & Sons Limited, Ashdod, Israel

Filed Jul. 31, 1986, Ser. No. 891,340

Claims priority, application Israel, Aug. 1, 1985, 75996

Int. Cl.[4] F16K *47/00*

U.S. Cl. 251—121 **3 Claims**



1. A public drinking water fountain including a fluid supply valve for pressurized water which comprises:

a cylindrically shaped fluid chamber having first and second ends, a peripheral wall and an interior portion, said first end having formed therein a cylindrical fluid inlet passage and said peripheral wall having formed therein a fluid outlet passage;

a cylindrical housing having first and second ends and an interior portion, said first end being flanged and said second end being located adjacent said second end of said fluid chamber;

means for governing the flow of water through said fluid chamber comprising a spring wound elongated actuation member which defines a recess at one end;

an elastic disk-like seal which engages the flange of said cylindrical housing and which is configured to define a central integral cylindrical projection on its exterior face, said seal being operative to prevent flow of water from said cylindrical housing to said actuation member; and

a cylindrical plug-like body having first and second ends, and being adapted to slidably fit the inlet passage of the fluid chamber, said plug-like body traversing the interior of the fluid chamber and the interior of the cylindrical housing such that first end of the plug-like body rests against the interior face of the disk-like seal,

said recess in said actuation member being operative for engaging the central integral projection of the disk-like seal, whereby displacement of the actuation member is transmitted to the disk-like seal, which transmits the displacement to the plug like body thereby causing it to slide in a transverse fashion in the fluid chamber thereby allowing fluid to flow through the chamber and out through the fluid outlet passage.

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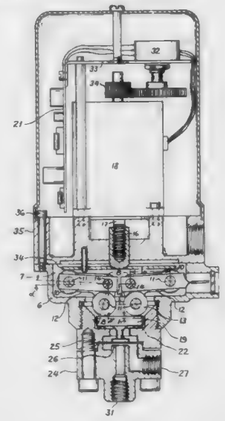
ELECTRIC-POWERED, LEVER-AMPLIFIED ACTUATING MEANS FOR VALVES AND OTHER DEVICES

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed May 7, 1987, Ser. No. 46,794

Int. Cl.[4] F16K *31/04, 7/16*

U.S. Cl. 251—129.05 **4 Claims**



1. Electric-powered, lever-amplified actuating means for valves and other devices comprising:

a. one pair of toggle elements mounted in spaced relationship within a housing having a central opening, each of said toggle elements pivotably supported by shaft means which are suitably retained within said housing;

b. each of said toggle elements comprising at least one upper bearing suitably supported essentially level to said shaft means, and at least one lower bearing suitably rotatably supported below said shaft means;

c. displacement means mounted within the lower portion of said central opening of said housing and being engaged to said lower bearings;

d. plate means mounted within the upper portion of the housing opening having a flat lower surface being subjected to rolling motion of the upper bearings and capable of engaging and displacing said upper bearings down and thereby pivoting said pair of toggle elements around said shaft means, said pivoting motion further causing said lower bearings to extend their cosinusoidal distance with respect to the supporting shaft means and thereby causing a downward motion of said displacement means;

e. electric motor means suitably mounted above said housing having threaded shaft means capable of causing a displacement of said plate means following a rotation of said shaft.

4,729,545

HIGH PRESSURE RELIEF VALVE

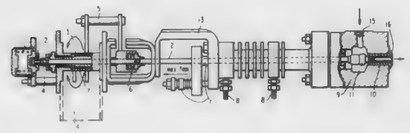
Gerhard Belhustede, Herten-Disteln, Fed. Rep. of Germany, assignor to VEBA OEL Entwicklungs-Gesellschaft mbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 930,922

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540478

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—229 **4 Claims**



1. A high pressure relief valve comprising:

(a) a valve housing (9) containing a valve seat (10);

(b) a valve poppet (11) located in said valve housing (9) and sized, shaped, and positioned to valve said valve seat (10), said valve poppet (11) having a non-actuated rest position spaced from said valve seat (10) by a throttle gap in the form of a surface gap between two broad-surfaced body;

(c) a valve stem (2) projecting from said valve poppet (11);

(d) means (1) for biasing said valve poppet (11) towards its non-actuated rest position; and

(e) a drive for adjusting the non-actuated rest position of said valve poppet (11) relative to said valve seat (10), said drive comprising:

(i) an inside screw or worm part that is solidly connected to said valve stem (2);

(ii) a stem nut (3) operatively engaging said inside screw or worm part;

(iii) a control drive (4) operatively connected to said stem not (3) to rotate said stem nut (3) relative to aid valve stem (2), thereby causing said valve stem (2) to move axially;

(iv) a rotary ratchet (6) fastened by its inside part to said valve stem (2); and

(v) a carrier mechanism (5) connecting said stem nut (3) to said rotary ratchet (6),

whereby actuation of said control drive (4) causes rotary motion of said stem nut (3), thereby causing axial motion of said valve stem (2), and rotary motion of said rotary ratchet (6), thereby simultaneously causing rotary motion of said valve stem (2) to compenstate for point wear marks on said valve seat (10) and said valve poppet (11).

4,729,546

TITANIUM ENGINE VALVE AND METHOD OF MAKING

John E. Allison, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 813,173, Dec. 24, 1985, Pat. No. 4,675,964. This application Jan. 27, 1987, Ser. No. 7,035

Int. Cl.[4] F01L *3/00*

U.S. Cl. 251—368 **2 Claims**

1. A unitary dual microstructure engine valve construction consisting of a titanium alloy body having (i) a stem portion with a fine grained, equiaxed mixture of alpha titanium regions and titanium colony microstructure regions exhibiting, at a temperature of 1400° F., a tensile strength of at least 20 ksi and a fatigue strength of at least 10 ksi; and (ii) a head portion with only a substantially uniform titanium colony microstructure region exhibiting a creep resistance, at a temperature of 1400° F., of only 1.0% strain under 4 ksi for at least 100 hours.

4,729,547

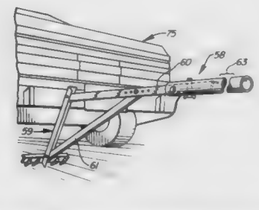
CAR MOVING LEVER ASSEMBLY

Frank P. Bleier, 536 W. Cornelia Ave., Chicago, Ill. 60657

Continuation-in-part of Ser. No. 831,931, Feb. 20, 1986, abandoned. This application Dec. 5, 1986, Ser. No. 938,541

Int. Cl.[4] B60S *9/02*

U.S. Cl. 254—35 **13 Claims**



1. A knock-down car moving lever assembly manually operable by one individual without additional assistance for moving to a safe location a disabled automotive vehicle which has lost power or traction, said assembly comprising, in combination:

(a) a drive cradle having a first detachable connecting means adjacent its upper end portion and a second detachable connecting means adjacent its lower end portion;

(b) a plurality of laterally spaced ground engaging teeth mounted in depending relation on said drive cradle;

(c) an actuating arm fixed to said first detachable connecting means at said upper end portion of said drive cradle;

(d) a tensile strut fixed at one end to said second detachable connecting means adjacent said lower end portion of said drive cradle, and detachably connected at its opposite end to an intermediate point on said actuating arm; and

(e) a tubular handle mounted on said actuating arm in an area spaced longitudinally outward from said opposite end of said tensile strut.

4,729,548

REFRACTORY COATING FOR METAL

Harry P. Sullins, Columbia, S.C., assignor to Richland Industrial, Inc., Columbia, S.C.

Filed Sep. 4, 1986, Ser. No. 903,794

Int. Cl.[4] C21B *7/16*

U.S. Cl. 266—44 **33 Claims**

1. A heat resistant composite comprising a refractory coating adhered to a metal substrate, said composite being provided by:

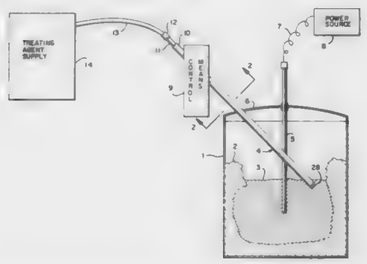
mixing a dry refractory mortar with water to provide a liquid refractory mixture;

impregnating a water absorbent web of fibrous material with said mixture;

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coating a surface of said substrate by placing at least one layer of said impregnated web on said surface as a coating; and,

drying said coating to remove said water from said web and said liquid refractory mixture and to cause said liquid refractory mixture to set and dry as a chemically bonded refractory composition adhered to said metal substrate



and having said web embedded therein, said dry refractory mortar being suitable for laying refractory brick in the lining of metal refining furnaces and for causing said liquid refractory mixture when dried to form said chemically bonded refractory composition at ambient temperature and a ceramically bonded refractory composition at a fusing temperature above said ambient temperature.

4,729,549

HANDLING DEVICE FOR A DISTRIBUTION SPOUT OF A SHAFT FURNACE

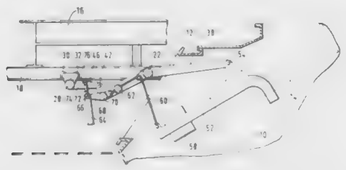
Emile Lonardi, Bascharage, Luxembourg, and Carlo Spedener, Burlington, Canada, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed May 14, 1986, Ser. No. 863,103

Claims priority, application Luxembourg, May 14, 1985, 85899

Int. Cl.[4] F27B *1/20*

U.S. Cl. 266—176 **8 Claims**



1. A handling device for the distribution spout of a shaft furnace including rails being suspended underneath a working platform which is positioned around the shaft furnace, the handling device comprising:

a front axle and a rear axle, each of said axles being mounted on roller means adapted for movement on rails suspended underneath a working platform positioned about the shaft furnace;

tilting frame means mounted on said front axle, said frame means having a front end and a rear end;

supporting cradle means for the distribution spout being suspended at the front end of said frame means and being associated with a counterweight and a supporting cable;

a pair of arm members, said arm members having front ends and rear ends, said rear end of said frame means being articulated to said front ends of said arm members, said arm members being mounted on said rear axle;

first lever means having a first end and a second end, and second lever means having a first and a second end;

jack means having a rod received in a cylinder, said first end of said first lever means being pivotably connected to said rod and said first end of said second lever means being pivotably connected to said cylinder; said second end of said first lever means being fixed to said rear axle and said second end of said second lever means being fixed to said rear end of said frame means thereby forming a pair of first articulation points between said jack means and each of said first and second lever means, said first articulation points and said articulation between said frame means and said two arm members defining a triangular configuration, said triangular configuration being deformable under the action of said jack means for causing said frame means to tilt about the axis of said front axle.

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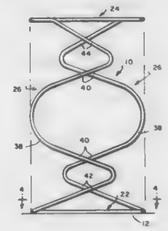
SPRING MODULE

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Jun. 2, 1986, Ser. No. 869,706

Int. Cl.[4] F16F *3/00;* **A47C** *23/02, 27/04*

U.S. Cl. 267—103 **2 Claims**



1. A spring module for disposition between a base frame and a grid frame for attachment, respectively, to the base frame and grid frame comprising an attaching element at the lower end, an attaching element at the upper end and resilient supporting elements yieldably connecting the attaching elements comprising vertically-disposed, spaced, parallel supports, each support comprising an arcuate length of wire located substantially midway between the upper and lower attaching elements, each defining a pair of diverging legs, said arcuate lengths of wire being disposed so as to face in opposite directions with respect to each other and upper and lower straight lengths of wire integrally connected at one end to the ends of the legs of the arcuate lengths of wire and at the other ends to the attaching elements, said upper and lower straight lengths of wire extending from the ends of the arcuate lengths of wire in directions opposite to the legs of the arcuate lengths of wire at acute angles thereto and being connected at their ends to the attaching element, said diverging legs of the arcuate lengths of wire being connected to the upper and lower straight lengths of wire by arcuate lengths of wire of smaller radius of curvature than the radius of curvature of the arcuate lengths of wire which connect the diverging legs and wherein said arcuate lengths of wire of smaller radius of curvature are located closer to the vertical axis of the module than are the arcuate lengths of wire of larger radius of curvature.

4,729,551

APPARATUS FOR ENGAGING A SUBSTRATE

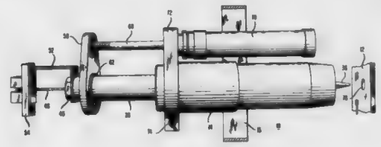
Charles W. Glessner, Jr., Upper Makefield Township, Bucks County, Pa., and Kazimierz Przydzial, Clark Township, Union County, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Division of Ser. No. 852,001, Apr. 14, 1986, Pat. No. 4,646,419.

This application Jan. 30, 1987, Ser. No. 939,335

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 269—47 **4 Claims**



1. An apparatus for engaging a substrate having an aperture therein comprising:

a pin capable of limited lateral movement about an axis perpendicular to the substrate;

means for imparting a relative motion between the pin and the substrate to insert the pin into the aperture; and

means for locking the pin against lateral movement as the pin enters the aperture so the pin engages the substrate to hold it in place.

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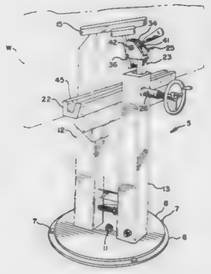
VERTICAL VISE

George Pempek, 9740 S. 81st Ct., Palos Hills, Ill. 60465

Filed Aug. 3, 1987, Ser. No. 80,818

Int. Cl.[4] B23Q *1/04*

U.S. Cl. 269—71 **10 Claims**



1. A vertical vise comprising, in combination, a first rigid upright post,

a second rigid upright post spaced from said first post, said second post being shorter than said first post, having an elongated vertically extending longitudinal cavity therein which is open at the top, and having an aperture therein which opens into said cavity from the side thereof furthest away from said first post,

a clamping head supporting and positioning arm disposed in said cavity with the lower end of said arm pivotally connected to said second post whereby said arm is swingable in said cavity toward and away from said first post, the upper end of said arm projecting above the upper end of said second post,

work piece support means mounted on said first post and having a work piece support shelf-like portion projecting from the side of said first post nearest to said second post,

a first work piece engaging jaw mounted on said first post at or adjacent its upper end on the side thereof nearest to said second post,

stationary nut means mounted on said second post with the bore of said nut in alignment with said aperture,

a screw extending through said aperture and nut means in threaded engagement therewith with the inner end of said screw being engageable with said arm, and

clamping head means including a head fitting mounted on the upper end of said arm, a second work piece engaging jaw mounted on a first lever which is pivotally mounted on said head fitting whereby said second jaw is swingable toward and away from said first jaw, a second lever pivotally mounted adjacent one end on said head fitting, a cam mounted on said pivoted end of said second lever and engaging the side of said first lever furthest away from said first post whereby on swinging said second lever said first lever may be releasably forced by said cam to swing toward said first post and said second jaw thereby releasably forced toward said first jaw and into clamping engagement with a work piece disposed between said jaws.

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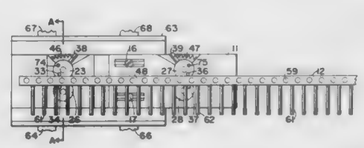
GRIPPING GUIDE BAR FOR CARRIER STRIP

Sigmund Ege, Oslo, Norway, assignor to Kloften & Kloften A/S, Oslo, Norway

Continuation of Ser. No. 742,008, Jun. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 601,950, Apr. 19, 1984, Pat. No. 4,563,563. This application Dec. 4, 1986, Ser. No. 937,814

Int. Cl.[4] B25B *1/06*

U.S. Cl. 269—225 **5 Claims**



1. A device for holding carrier strip including a ribbon having regularly spaced elements projecting therefrom, said device comprising:

(A) a guide plate comprising a groove for slidably accommodating an elongated bar member,

(B) an elongated sliding bar member comprising an upper flat surface supportingly underlying said ribbon and said elements,

(C) two pairs of circular recesses in said surface,

(D) two pairs of disks fitting in slidable rotation into said recesses, surfaces of said disks being flush with said upper flat surface,

(E) gripping means including a pin means projecting upwardly from each of said disks being grippingly disposed against opposite pages of said ribbon, at least one of said pins means being disposed in abutment with one of said spaced elements,

(F) individual gear means attached to each of said disks, said gear means being positioned on an underside of said bar member, said gear means of each of said pairs of disks intermeshing, whereby rotation of one disk causes rotation of the other disk of either pair, and spring means on said bar for rotating said disks, thereby urging together said gripping means.

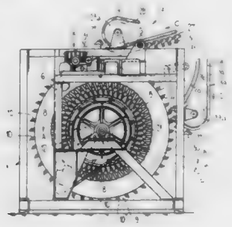
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4,729,554

METHOD AND APPARATUS FOR INSERTING AT LEAST ONE INSERT INTO PREFERABLY FOLDED PRINTED PRODUCTS

Werner Honegger, Tann Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 9, 1987, Ser. No. 12,809
Claims priority, application Switzerland, Feb. 14, 1986, 00603/86
Int. Cl.⁴ B65H *5/30*
U.S. Cl. 270—55 **24 Claims**



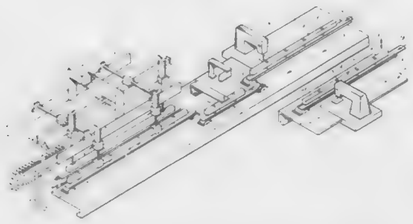
1. A method of inserting at least one insert into printed products, comprising the steps of:
conjointly moving two printed products along a processing path while maintaining two printed products at least partially in non-contacting relationship;
during the conjoint movement of said two printed products along said processing path essentially simultaneously opening said printed products; and
inserting at least one insert into each said opened printed product.

4,729,555

COMPACT HIGH SPEED STACKER

Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Sew Simple Systems, Inc., Fountain Inn, S.C.

Filed Oct. 9, 1986, Ser. No. 917,203
Int. Cl.⁴ B65H *29/54*
U.S. Cl. 271—175 **9 Claims**



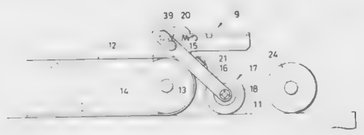
1. A method of progressively stacking elongated sheets of textile material and the like which are received in spaced series moving at a substantially constant velocity in a direction extending across their lengths from a sheet treating operation or the like, comprising the steps of:
continuing the movement of each sheet in a direction extending across its length at a speed substantially the same as the speed of the sheets moving through the sheet treating operation until the sheet has cleared the sheet treating operation;
after each sheet has cleared the sheet treating operating advancing each sheet further away from the sheet treating operation in a direction extending across the length of the sheet at a greater speed so as to increase the space between the sheet and the next oncoming sheet until the sheet reaches a stacker in-feed position;
after each sheet has reached the stacker in-feed position grasping one end portion of each sheet and pulling the one end portion of the sheet at a first speed along the length of the sheet in a lateral direction over a surface conveyor,
urging the trailing portion of the sheet toward the surface conveyor at a greater speed than said first speed while deflecting the trailing portion of the sheet downwardly until the sheet material clears the stacker in-feed position, and
releasing the one end portion of the sheet to allow the sheet to fall onto the conveyor.

4,729,556

APPARATUS FOR DETECTING THE THICKNESS OF BANK NOTE

Kiyoshi Fujii, Tokyo, and Mitsuhiro Ikeda, Warabi, both of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1986, Ser. No. 826,261
Claims priority, application Japan, Feb. 18, 1985, 60-21745[U]
Int. Cl.⁴ B65H *7/12*
U.S. Cl. 271—263 **2 Claims**



1. An apparatus for detecting the thickness of a bank note, said apparatus comprising:
a frame,
a roller having a plurality of detection portions adapted to be disposed on the surface of the bank note so that said detection portions rotate upon contacting the bank note and said detection portions being vertically movable as said detection portions rotate on the surface of the bank note,
shaft means for supporting said detection portions at intervals spaced in a direction perpendicular to the direction of movement of said bank note,
two detection arms supporting said shaft means, said detection arms being angularly movable by movement of said shaft means in response to the vertical movement of any one of said detection rollers,
a support shaft for pivotally mounting each of said two detection arms on said frame,
a potentiometer mounted coaxially with said support shafts for detecting the thickness of the bank note contacted by said rolers, and
transmission means interconnecting said two detection arms and connected to said potentiometer for sensing the angular movement of the detection arms and transmitting the angular movement of the detection arms to said potentiometer.

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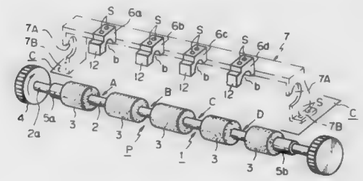
SHEET FEED DEVICE

Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,314, Nov. 15, 1985, abandoned. This application Jul. 2, 1987, Ser. No. 68,793
Claims priority, application Japan, Nov. 19, 1984, 59-244041; Nov. 19, 1984, 59-244042; Nov. 19, 1984, 59-244045
Int. Cl.⁴ B65H *5/04*
U.S. Cl. 271—272 **23 Claims**

15. A sheet feed device for a recording apparatus, comprising:

a plurality of rotatable members arranged in a spaced relation along a width of a sheet feed path for feeding a sheet in a feeding direction;
a plurality of guide members separated and disposed between said rotatable members, each said guide member having first and second guide surfaces for guiding the sheet, wherein each said first guide surface is disposed to substantially coincide with a predetermined extent of the peripheries of said rotatable members with respect to the



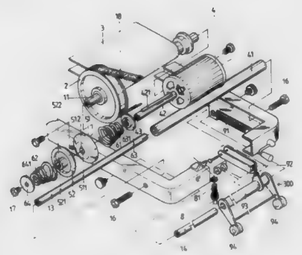
sheet feed path and each said second guide surface extends continuously from the corresponding said first guide surface downstream of said rotatable members at the position of first guide surface with respect to the sheet feeding direction to provide a recording area where the recording apparatus can record on the sheet supported by said second guide surfaces; and
support means displaceably supporting said guide members to enable adjustment of the position of said guide members with respect to said rotatable members.

4,729,558

RUNNING EXERCISER

Hai P. Kuo, 767 Jen AI Village Jen Ten Hsiang, Tainan Hsien, Taiwan

Filed Oct. 11, 1985, Ser. No. 786,636
Int. Cl.⁴ A63B *23/06*
U.S. Cl. 272—69 **1 Claim**



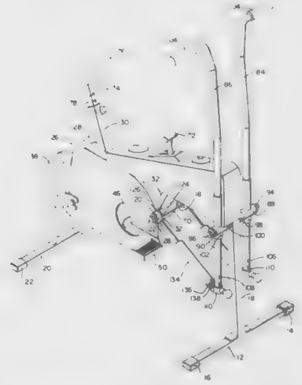
1. A running exerciser comprising:
a base frame having a first shaft mounted approximate the front part thereof, a second shaft mounted across rear part thereof, a first fixed rod mounted between the front end of the base frame and the first shaft, and a second fixed rod mounted between the front end of the base frame and the first shaft;
a pair of inverted U-shaped members each mounted at one side of said base frame;
an endless loop track wrapping around the first shaft and the second shaft;
a pulley fastened on one end of said first shaft;
a motor assembly provided with a driving shaft having a key formed integrally therewith and a tubular rod put over said second fixed rod;
a stop disc put over the driving shaft of the motor assembly;
a first spring enclosing the driving shaft of the motor assembly and bearing against the stop disc;
a pair of clutch discs each having a conical surface and a keyway adapted to the key of the driving shaft of the motor assembly, said conical clutch discs being put over said driving shaft with the conical surface thereof facing each other;
a second spring means enclosing the driving shaft of the motor assembly and forcing the conical clutch discs to move towards each other;
a stop plate fixedly connected to free end of the driving shaft of the motor assembly by a screw;
a belt connecting said pulley with said clutch discs;
a speed control mechanism mounted on one of said inverted U-shaped members, said mechanism including a housing having therein a movable block, a screw fixed in said housing and threadedly connected with said movable member, and a cable wire connected at one end with the movable block and at the other end with the motor assembly; and,
an adjustable stand mounted on a lower front end of said base frame, said adjustable stand having a screw engaged with a U-shaped element which is in turn connected with said tubular member enclosing said first fixed rod wherein said tubular member has at least one leg member projecting radially outward from said tubular member, whereby when said screw is turned into said U-shaped element, said tubular member will rotate downward causing said at least one leg member to rotate downward thereby lifting the front end of said base frame.

4,729,559

COMBINED AEROBIC AND ANAEROBIC EXERCISER

Ronald A. McNeil, P.O. Box 14165, Tallahassee, Fla. 32317

Filed Nov. 4, 1985, Ser. No. 794,736
Int. Cl.⁴ A63B *21/00*
U.S. Cl. 272—73 **10 Claims**



1. A combined aerobic and anaerobic exerciser, comprising:
(a) a ground supported frame with a forward end portion, a rearward end portion and connecting means extending between said forward and rearward end portions forming upper and lower sections of said frame;
(b) said forward end portion including a vertically disposed center post;
(c) a seat adjustably secured to said rearward portion;
(d) first shaft means secured to said center post and extending from opposite sides thereof;
(e) first and second independently operable handle bar means whereby the user of said exerciser can selectively operate one of said first and second handle bar means

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without corresponding movement from the other of said handle bar means;

(f) said handle bar means including an upper end portion adapted to be grasped by a user's hand for pivoting the handle bar means and a lower end portion disposed below said shaft means;

(g) variable first resistance means including a first and second cylinder and piston means, each having one end pivotally secured to said second shaft means on said frame and the opposite end thereof pivotally secured to one of said lower end portions of said handle bar means;

(h) a second resistance means including flywheel means rotatably mounted to said lower section of said frame;

(i) pedal means rotatably mounted to said frame and operatively engaged with said flywheel means for rotating said flywheel means;

(j) said pedal means including a pedal housing having at least one pedal rotatably received therein;

(k) said first resistance means being disposed forward of said pedal housing;

(l) said second resistance means being disposed rearward of said pedal housing; and,

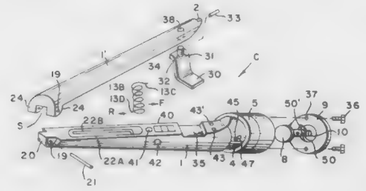
(m) said first resistance means being operable independently of said second resistance means whereby the anaerobic upper body exercises associated with said first resistance means can be performed at a rate and with a force which is independent of the lower body aerobic exercises associated with said second resistance means.

4,729,560

PIVOTAL EXERCISE HANDLES HAVING SPRING RESISTANCE

Myung H. Cho, 205-153, Cheongryang 2-Dong, Dongdaemoon-Ku, Seoul, Rep. of Korea

Division of Ser. No. 761,701, Aug. 2, 1985, which is a continuation-in-part of Ser. No. 466,983, Feb. 15, 1983, Pat. No. 4,572,503. This application Jun. 12, 1987, Ser. No. 61,418
Int. Cl.[4] A63B *5/20, 21/30*
U.S. Cl. 272—75 **5 Claims**



1. A skipping rope handle comprising:

a first handle member being substantially semicircular in cross-section and having a first end, a gripping portion, and a second end;

a second handle member being substantially semicircular in cross-section and having a first end, a gripping portion, and a second end;

a hinge structure, said hinge structure including

a hinge pin for pivotally connecting said first end of said first handle member to said first end of said second handle member,

a cylindrical helical spring having upper and lower ends positioned within longitudinally extending first and second recessed portions within facing surfaces of said first and second handle members, wherein said cylindrical helical spring is selectively laid down and hidden from view within said first and second recessed portions,

said first recessed portion has located therein a cavity deep in the side thereof for rotatably securing said upper end of said cylindrical helical spring,

said second recessed portion has located therein a stria for inserting and slidably retaining said lower end of said cylindrical helical spring,

said second recessed portion further includes means for stably positioning a lower portion of said cylindrical helical spring when said spring stands upwardly said handle members biased apart by said helical spring when in the standing position for exercise purposes;

supporting means including a ring member being mounted relative to said second end of said second handle member and a supporter being rotatably secured in a recess of said ring member for attaching a jump rope to said second handle member; and

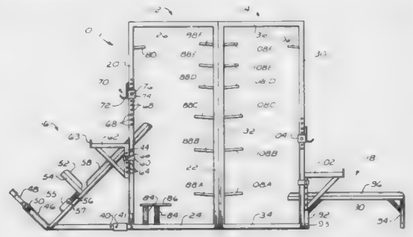
retaining means in the shape of a ring axially displaceable along said first and second handle members for selectively retaining said handle members together, said retaining means being mounted in a concavity adjcent to said second end of said second handle member wherein, upon actuation, said biased handle members are selectively retained to form said skipping rope handle of a substantially circular cross-section.

4,729,561

WEIGHTLIFTING POWER STATION

Charles J. Desjardins, 20 New Park Ave., Hartford, Conn. 06103

Filed Oct. 31, 1986, Ser. No. 925,294
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **11 Claims**



1. A station adaptable for use in weightlifting comprising:

first cage means for forming an upright cage of substantially rectilinear form comprising a base and four substantially parallel vertically extending supports defining a first open compartment;

second cage means for forming an upright cage of substantially rectilinear form comprising a base and four substantially parallel vertically extending supports defining a second open compartment, said first cage and said second cage being disposed in adjacent connected relationship at a central location with opposing pairs of said vertical extending supports being disposed at said central location and first and second pairs of vertical supports being transversely spaced from said central supports;

a plurality of vertically spaced pegs extending from said central vertical supports in fixed relationship therewith so as to form vertically spaced pairs of oppositely projecting pegs which are oriented to project upwardly at an angle on the order of 5 degrees relative to a normal line to the central vertical supports, said pegs being dimensioned and spaced so that weights may be mounted thereto;

cradle means mounted to said first vertical supports and adjustably positionable at a fixed location of said first vertical supports for suspending a weight bar between a corresponding pair of said first vertical supports;

first bench means removably mounted to one said cage base for forming a generally horizontally disposed bench projecting transversely outwardly relative to said one cage;

second bench means removably mounted to said other cage for forming an inclined bench disposed at an oblique angle with respect to said vertical supports and projecting transversely outwardly relative to said other cage, a crossbar extending between vertical supports of said other cage to support said inclined bench; and

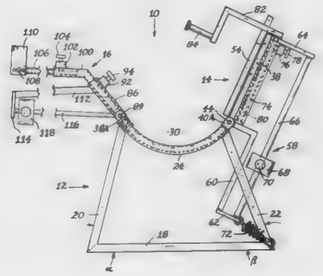
bracket means mounted to said second vertical supports and adjustably positionable at a fixed location of said second vertical supports for forming a pair of generally parallel horizontally projecting rails.

4,729,562

TOTAL ABDOMINAL WORKOUT MACHINE

George Pipasik, 954 14th St., Apt. A, Santa Monica, Calif. 90403

Filed Oct. 22, 1986, Ser. No. 921,535
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **10 Claims**



1. An exercise machine for exercising the total abdominal zone and muscles of an exercising person, comprising:

(a) a chasis consisting of base members, front members extending upwardly from said base members, rear members extending upwardly from said base members, and a downwardly arcuate seating member affixed at its front end to the upper ends of said front members and affixed at its rear end to the upper ends of said rear members for supporting an exercising person in a seated position, the front end of said arcuate seating member being elevated with respect to the rear end of said arcuate seating member;

(b) a back support consisting of a frame rotatably attached to the rear end of said arcuate seating member, a back rest slidably affixed within the central area of said frame for supporting the back of the exercising person, a pair of handles extending from the upper end of said frame and positioned for grasping engagement by the hands of the exercising person, and weight means movably affixed to the rear of said frame for adjusting the amount of lever force required to be applied by the arms and hands of the exercising person to said handles to move said frame, with said back rest and weight means, forwardly about its axis of rotatably attachment to said arcuate seating member and thereby provide abdominal workout exercise of said person; and

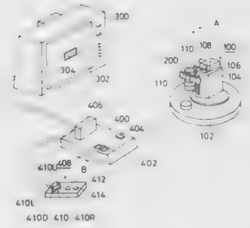
(c) leg support means consisting of an extensible tubing arrangement attached at its rearward end to the front end of said arcuate seating member, and pedal attached to the forward end of said tubing arrangement for receiving and supporting hte feet of the exercising person.

4,729,563

ROBOT-LIKE GAME APPARATUS

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Dec. 24, 1985, Ser. No. 813,257
Claims priority, application Japan, Dec. 28, 1985, 59-275475
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—1 E **17 Claims**



11. A game apparatus used with a display that is capable of displaying variable images in response to electrical signals, comprising:

a game mechanism adapted to be positioned in spaced apart relation to said display, said game mechanism having a movable portion,

image signal producing means for producing an electrical image signal to form an image on said display, including means for causing said image to change with time,

image receiving means provided on said game mechanism for receiving the image formed on said display and for outputting a signal in accordance with the change of said image, and

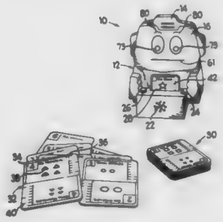
mechanism control means for controlling movement of said movable portion of said game mechanism in response to the signal output from said image receiving means.

4,729,564

CARD READING RESPONSIVE ELECTRONIC GAME

Wayne A. Kuna, River Forest, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 7, 1986, Ser. No. 827,346
Int. Cl.[4] A63F *1/00;* **G09B** *7/06*
U.S. Cl. 273—1 E **14 Claims**



1. An electronic game comprising:

cards, each bearing visual indicia of a combination of parameters;

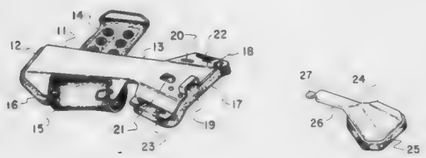
each card having a bar code indication of the combination of parameters depicted by the visual indicia;

each card having a face bearing reversely oriented portions with each portion having a different combination of the parameters;

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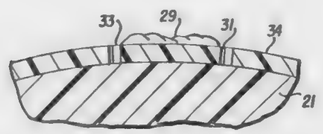
a housing having a slot into which one of the cards may be inserted;
optical sensing means within the housing for reading the bar code on the inserted card;
the housing including means for making a request and indicating a response;
means cooperating with the optical sensing means for determining whether a correct card has been inserted in the slot in answer to a request; and
means directing a response based on the determination.

4,729,565
BOWLING AID
Michael E. Lanning, 15734 Hummel Rd., Brook Park, Ohio 44142
Filed Aug. 15, 1986, Ser. No. 896,636
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—54 B **8 Claims**



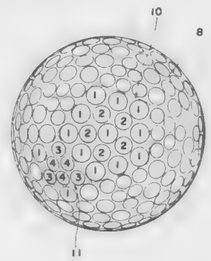
1. An improved device for supporting the wrist and hand of a bowler, comprising a main brace having a hand end and a forearm end, a forearm pad and hand pad, and a strap for securing the brace to the arm of the bowler, the hand end of the brace having at least one attachment bracket and attachment slot for the attachment of at least one auxiliary support.

4,729,566
GAME BALL
Robert P. Molitor, Niles, Mich., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Jun. 20, 1986, Ser. No. 876,506
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—60 A **1 Claim**



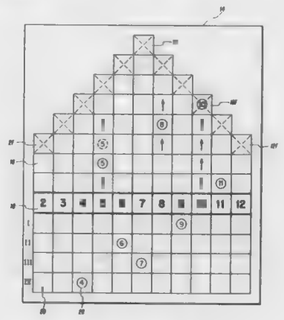
1. A playing ball comprising
a substantially solid spherical core;
a polymer cover material applied about said core;
simulated stitching having protrusions and indentations integral with and of the same material as the outer surface of said cover material; and
a multiplicity of simulated stitch holes adjacent the outer edges of said stitching, said simulated stitch holes extending through said cover material to said spherical core to simulate the depth of the stitching holes of a standard stitched leather covered ball.

4,729,567
GOLF BALL
Kengo Oka, Nishinomiya, and Kaname Yamada, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 20, 1986, Ser. No. 841,832
Claims priority, application Japan, Sep. 30, 1985, 60-218759
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—232 **8 Claims**



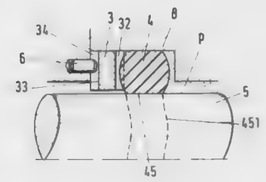
1. A golf ball of improved aerodynamic characteristics having a spherical surface impressed with dimples in the form of a 20-12 hedron, said spherical surface being divided into five-cornered divisions and three-cornered divisions by imaginary circular arcs which are reflectances of edges of the 20-12 hedron on the spherical surface, all twelve of said five-cornered divisions being generally uniformly or completely uniformly provided with said dimples therein, and all twenty of said three-cornered divisions being generally uniformly or completely uniformly provided with said dimples therein, wherein said dimples comprise four sizes having different diameters from each other, with the ratio of the diameter of the largest dimples with respect to the smallest dimples being set to be 1.25–1.50.

4,729,568
HORSE RACE BOARD GAME
Janet D. Welsh, Carrollton, Tex., assignor to Stephen D. Bailey, Mississauga, Canada, a part interest
Filed Sep. 9, 1985, Ser. No. 773,613
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—246 **1 Claim**



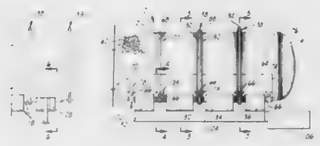
1. A race game apparatus comprising:
at least two dice cubes, each having indicia representative of the numerals one through six positioned on the six faces thereof with a different indicia on each face;
a game board having at least eleven lanes provided thereon, said lanes having successive integral numerical designations corresponding to the possible numerical totals that can be achieved by throws of said dice cubes;
a plurality of game pieces wherein there are at least as many game pieces as there are lanes and said game pieces are adapted to be moved by players along said lanes during the course of a game; and,
indicia longitudinally dispersed along said lane determining a plurality of stopping points for said game pieces, the number of indicia in substantially all of said lanes having a particular relationship to dice face value permutations, said relationship being that the number of indicia in a given lane is equal to the number of permutations of dice face values which add to equal said given lane's numerical designation plus an arbitrary constant.

4,729,569
TWIST PROOF SEAL RING ARRANGEMENT FOR SHAFTS
Heinz K. Müller, Waiblingen, and Andreas Wolf, Stuttgart, both of Fed. Rep. of Germany, assignors to Martin Merkel GmbH & Co KG, Hamburg, Fed. Rep. of Germany
Filed Jul. 11, 1985, Ser. No. 754,516
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425431; Jan. 29, 1985, 3502799
Int. Cl.[4] F16J *15/26*
U.S. Cl. 277—27 **10 Claims**



1. A shaft seal for sealing off a pressure fluid present between a cylindrical shaft and a housing part surrounding the shaft, comprising an elastic seal ring arranged between said housing part and a circumferential sliding surface portion of said shaft, said seal ring defining a high pressure end face in contact with said pressure fluid and an opposite low pressure end face, a back-up ring mounted in said housing part opposite said low pressure end face, said back-up ring being provided with a plurality of axial projections, directed against said low pressure end face of the seal ring, whereby an axial thrust exerted by said pressure fluid against said seal ring is taken up by said projections thus producing an undulating deformation on said low pressure end face.

4,729,570
FIBERGLASS TRANSPORT TRAILER
Harold E. Welch, Jr., Oklahoma City, Okla., assignor to B & K Leasing Corporation, Tulsa, Okla.
Filed May 7, 1987, Ser. No. 47,175
Int. Cl.[4] B60P *3/22*
U.S. Cl. 280—5 C **21 Claims**



1. A tank trailer comprising:
a fiberglass tank having an outer wall;
a cradle comprising:
an upper portion positionable adjacent said outer wall of said tank; and
a plurality of longitudinally spaced mounting portions extending from said upper portion, each mounting portion including first and second leg portions on opposite sides of a vertical center line of said tank;
a plurality of circumferential reinforcing ribs extending around said outer wall of said tank and said upper portion of said cradle, said ribs being longitudinally positioned between adjacent mounting portions; and
a fiberglass layer disposed around said ribs and a portion of said upper portion of said cradle between adjacent mounting portions, whereby said cradle and ribs are rigidly molded onto said tank.

4,729,571
SPINNER HITCH
Garrett R. Tienstra, Caloosa Estates Dr., LaBelle, Fla. 33935
Filed May 30, 1986, Ser. No. 868,608
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—415 A **7 Claims**



1. A quadruple trailer hitch to secure various trailers having differently sized connectors to a pulling vehicle having spaced aperture parallel bar members having locking blocks, comprising a horizontally apertured spinner hitch having quadruple angularly related plates, ball connectors having balls of different diameters secured to a plurality of said plates, and a rod to project horizontally through the apertured bar members and the horizontal spinner hitch member to secure the spinner hitch member to the parallel bar members, the locking blocks on the parallel bar members engaging two of the angularly related plates of the spinner hitch member to restrain the spinner member from rotational movement.

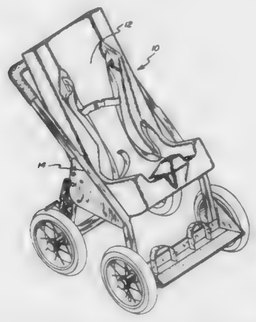
4,729,572
WHEELED SEAT CARRYING APPARATUS AND STROLLER FOR THE HANDICAPPED
Timothy J. Bergeron, R.D. 1, Box 40, Dolgeville, N.Y. 13329
Filed Mar. 30, 1987, Ser. No. 32,222
Int. Cl.[4] B62B *11/00*
U.S. Cl. 280—47.4 **29 Claims**

1. Adjustable wheeled apparatus for carrying a contoured seat for a handicapped individual, said adjustable wheeled apparatus comprising:
a first frame having two side members, said side members each having a top end and a bottom end, said bottom end

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of each side member having a wheel rotatably secured thereto, each of said side members having a pair of substantially parallel plates extending therefrom in a downward direction intermediate its ends at substantially the same height above said wheel rotatably secured to said bottom end of each side member, said parallel plate pairs each defining a receiving channel, at least two holes being aligned in at least one of said extending plates, said side members being interconnected by first support means for supporting said contoured seat;

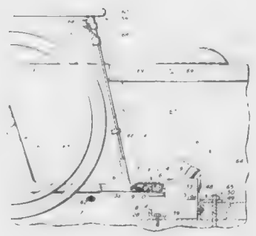
a second frame comprising a base bar and two side bars extending therefrom such that said second frame is substantially U-shaped, each of said side bars having at least one free end, one of said side bars having an externally protruding spring-biased peg near its free end, said second frame having a wheel rotatably secured thereto on each side near said base bar; and



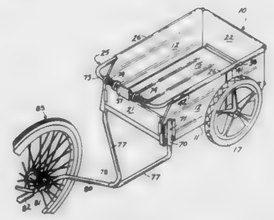
each of said second frame side bars being pivotally connected to one of said parallel plate pairs extending from said first frame side members such that a portion of each of said side bars adjacent said free end resides within one of said receiving channels, and said spring-biased peg is movable about an arc shaped path for selective engagement with said aligned holes in said one extending plate, and said second frame is locked in position relative to said first frame when said peg engages one of said holes, whereby the angle at which the axis of said second frame intersects the axis of said first frame may be selectively varied by moving said spring-biased peg such that said peg engages a different one of said aligned holes and the distance between said wheels secured to said first frame and said wheels secured to said second frame varies in relation to said angle defined by the axis of said first frame and the axis of said second frame.

4,729,573
WHEELCHAIR LATCHING DEVICE
John W. Davis, Rte. 2, Box F, Rayville, La. 71269
Filed Dec. 11, 1986, Ser. No. 940,745
Int. Cl.[4] B60N *1/02*; B60P *3/06*
U.S. Cl. 280—289 WC **17 Claims**

1. A wheelchair latching device for releasably locking a wheelchair into close proximity to a commode, said wheelchair latching device comprising axle means carried by the frame of said wheelchair and release means carried by said axle means, a housing secured in close proximity to the commode and latch tongue means pivotally carried by said housing, said axle means adapted to engage said latch tongue means in locking relationship and substantially immobilize the wheelchair with respect to the commode responsive to movement of the wheelchair in said close proximity to the commode and disengage said latch tongue means, responsive to manipulation of said release means.



4,729,574
WHEELED MATERIAL CARRIER
James M. Tipke, Spokane, Wash., assignor to Tipke Manufacturing Co., Inc., Spokane, Wash.
Filed Jan. 27, 1987, Ser. No. 6,947
Int. Cl.[4] B60D *1/14*
U.S. Cl. 280—415 R **7 Claims**



1. A wheeled material carrier convertible for use as a hand cart or as a vehicular trailer, comprising:

a frame formed symmetrically along a longitudinal center line and having longitudinally spaced front and rear ends;

a pair of wheels rotatably mounted at opposite sides of the frame about a common transverse axis;

a bottom wall extending between the front and rear ends of the frame;

a pair of side members extending between front and rear edges along opposite sides of the bottom wall;

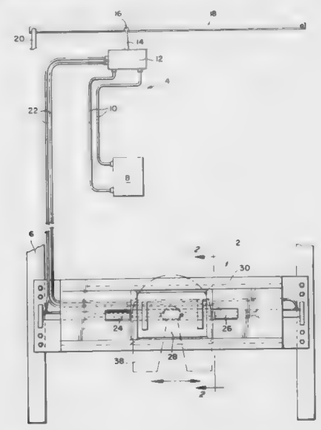
a pair of downwardly open sockets fixed to the front end of the frame in transversely spaced upright positions at opposite sides of its longitudinal center line;

a handle having a transverse section joined by spaced legs which are mounted to the respective side members for movement of the handle between an extended position with the transverse section of the handle spaced forwardly from the front end of the frame during use of the wheeled material carrier as a hand cart, and a retracted position with the transverse section of the handle located adjacent to the front end of the frame during use of the wheeled material carrier as a vehicular trailer; and

interchangeable support means releasably mounted in the respective sockets for facilitating usage of the material carrier either as a hand cart or as a vehicular trailer;

the support means comprising a pair of forwardly-extending rigid hitch members including rear ends releasably mounted in the respective sockets and front ends provided with means for attachment to a bicycle when the wheeled material carrier is being utilized a a trailer.

4,729,575
COMPENSATED TRAILER HITCH
Marvin P. Eggen, 103 12th St., Watertown, S. Dak. 57201
Filed Feb. 14, 1986, Ser. No. 829,105
Int. Cl.[4] B62D *53/06*
U.S. Cl. 280—438 R **1 Claim**



1. Apparatus for correction of jack-knifing in a tractor-trailer comprising guide frame means extending transversely between first and second longitudinal frame members of a tractor, said guide frame means having slot means for slidingly receiving anchoring table means for linear movement along said guide frame means, said anchoring table means having a fifth wheel thereon for linear movement along said guide frame means with said anchoring table means, a first hydraulic cylinder extending between a first side of said anchoring table means and said first longitudinal frame member, a second hydraulic cylinder extending between a second side of said anchoring table means and said second longitudinal frame member, said first and second sides of said anchoring table means being opposite each other and said first and second hydraulic cylinders being arranged for applying directly opposed linear forces to said anchoring table means, a hydraulic pump, hydraulic control valve means for directing a flow of hydraulic fluid under pressure to a selected one of said first and second hydraulic cylinders in response to the position of a control lever, means connecting said control lever to a steering mechanism of said tractor for bi-directional movement therewith, and flow conduit means connecting said hydraulic control valve to said first and second hydraulic cylinders, wherein movement of said steering mechanism to direct said tractor in a first direction moves said control lever to cause said hydraulic control valve to supply hydraulic fluid to a selected one of said hydraulic cylinders to cause said anchoring table to move in an opposite direction.

4,729,576
DEVICE FOR TANDEM MOVEMENT OF IV-POLE AND GURNEY
Keyton W. Roach, 812 Mark St., High Point, N.C. 27260
Filed Mar. 20, 1986, Ser. No. 841,943
Int. Cl.[4] B60D *1/04*
U.S. Cl. 280—493 **3 Claims**



1. A device for linking a small-wheeled vechicle to an object to be towed from one location to another, said tow device comprising

(a) an elongated, rigid body portion;

(b) a hooking member mounted on each end of said body portion for attaching said tow device to the vechicle and to the object being towed;

(c) locking means for removably locking said hooking members to the respective vehicle or object to which said hooking member is attached;

(d) said locking means being movable between: (1) a first position wherein said hooking member and a portion of the surface of the vehicle or towed object are engaged by said locking means, and (2) a second, retracted position wherein said locking means is out of engagement with said hooking member and the surface of the vehicle or towed object and said hooking member may be connected to or disconnected from the vehicle or object being towed;

(e) said locking means including:

(i) a first hollow, tubular member mounted in telescopic relationship over one end of said body portion, and a second hollow, tubular member mounted in telescopic relationship over the opposite end of said body portion;

(ii) a portion of each of said first and second tubular members extending beyond the respective ends of said body portion to form first and second forwardly extending skirts; each of said first and second skirts overlying a prescribed portion of one of the respective hooking members when said locking means is in said first position;

(iii) each of said first and second skirts including a means for seating on a portion of the surface of the vehicle or object to which the respective one of said hooks is attached, when said locking means is in said first position;

(f) means for biasing said locking means to said first position; whereby said locking means, when in said first position, substantially overlie said hook members and are biased against the vehicle, or object, to prevent disengagement of said hooks therefrom.

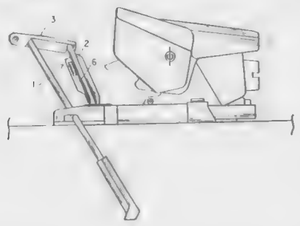
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4,729,577

LATCHING APPARATUS FOR A SKI BRAKE

Denis Gasquet, Annecy, and Pierre Desarmaux, Metz-Tessy, both of France, assignors to Salomon S.A., Annecy, France

Continuation of Ser. No. 581,726, Feb. 22, 1984, Pat. No. 4,676,520. This application Dec. 24, 1986, Ser. No. 946,012
Claims priority, application France, Feb. 23, 1983, 83 03631
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.⁴ A63C *5/00*
U.S. Cl. 280—605 **17 Claims**



1. An apparatus for a ski brake in combination with said ski brake, wherein said brake comprises: at least two elements forming a toggle, wherein said elements are adapted to be displaced with respect to each other so as to move from an inactive position to an active position in which said brake brakes a ski having edges thereon after release of a boot from a binding on the ski, and wherein said apparatus comprises:

(a) a latch adapted to be attached to said ski brake to prevent relative displacement between said at least two elements in said inactive position so as to latch said brake in the inactive position; and

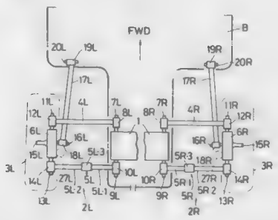
(b) means for preventing insertion of said boot in said binding, wherein said means is attached to said latch, wherein said boot passes through a zone above said ski when normally inserted into said binding and wherein said means comprises an extension element adapted to extend into said zone when attached to said brake, wherein said extension element is spaced in the longitudinal direction of the ski a distance from said binding.

4,729,578

VEHICLE SUSPENSION SYSTEM

Toshiro Kondo, Hiroshima; Tadanobu Yamamoto, Higashi-Hiroshima, and Takeshi Edahiro, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 24, 1987, Ser. No. 42,447
Claims priority, application Japan, Apr. 25, 1986, 61-94741; Apr. 25, 1986, 61-94742; Apr. 25, 1986, 61-94746
Int. Cl.⁴ B60G *3/06*
U.S. Cl. 280—690 **19 Claims**



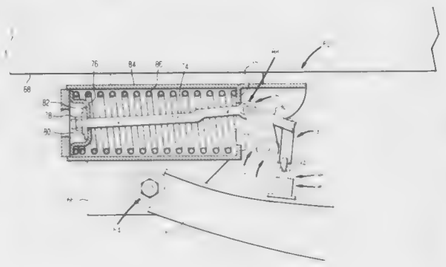
1. A vehicle suspension system including a wheel supporting means on which a wheel is rotatably mounted, a pair of lateral link means substantially transversely extending and disposed in a spaced relationship with each other in the longitudinal direction of the vehicle, the lateral link means being pivotally connected to the vehicle body at the inner end and to the wheel supporting means at the outer end thereof so that the wheel supporting means can be swingably moved in the vertical direction relative to the vehicle body, in which at least one of the lateral link means is divided into an inner and outer link members, the inner link member being connected to the outer link member by a connecting means including a precompressed resilient member constituted to be deflected in the axial direction of the lateral link means when the compressive force is applied to the resilient member beyond the precompressed force so as to reduce the length of the lateral link member.

4,729,579

AXLE LIFT MECHANISM WITH SPRING CUP WEAR PLATE

Lyle M. Hagan, North Muskegon, and William C. Pierce, Muskegon, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 627,414, Jul. 3, 1984, Pat. No. 4,634,141. This application Apr. 3, 1986, Ser. No. 847,724
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.⁴ B60G *11/56*
U.S. Cl. 280—704 **17 Claims**



1. In an axle lift mechanism for use in a vehicle having a support frame and an axle-bearing suspension means supporting the frame and movable between load-bearing and nonload-bearing relationships with the vehicle, wherein the lift mechanism comprises:

toggle linkage means adapted to be pivotably coupled to the frame and to the suspension means for movement of the axle between first and second positions corresponding to load-bearing and nonload-bearing positions, respectively;

a spring housing adapted to be mounted to the frame and having a spring retainer at one end thereof;

a spring cup having a spring-receiving means and mounted in another end of said housing;

a coil spring biasing means mounted in said housing, one end of said coil spring biasing means bearing against said housing spring retainer and another end of said coil spring biasing means being received in said spring cup spring-receiving means; and

said toggle linkage means extends in part through said coil spring biasing means and is coupled to said spring cup whereby said coil spring biasing means biases said toggle linkage means to said second position;

the improvement which comprises:

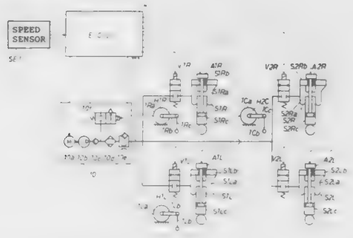
a wear plate positioned between said spring cup and said housing to avoid wear on the spring cup.

4,729,580

SUSPENSION CONTROLLER

Shuuichi Buma, Toyota; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Masami Itou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 1, 1986, Ser. No. 914,737
Claims priority, application Japan, Oct. 1, 1985, 60-219685
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.⁴ B60G *11/26*
U.S. Cl. 280—707 **10 Claims**



1. A suspension controller for a vehicle having a suspension between a body and a wheel, comprising:

vehicle height detection means for detecting a vehicle height at a front wheel and for generating a vehicle height signal according to said detected distance;

determination means having means for receiving said vehicle height signal, means for generating height data responsive to said vehicle height signal, means for determining whether the difference between a maximum and a minimum value of said height data during a predetermined period is greater than a reference value, said period being smaller than a cycle time of sprung mass vibration of said vehicle, and means for generating a suspension control signal in response to said height data; and

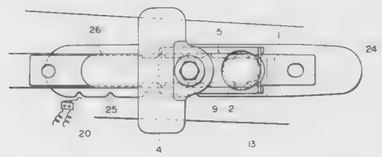
a suspension characteristic alteration means for altering at least one characteristic of the suspension in response to said suspension control signal.

4,729,581

SEAT BELT SUPPORT POSITION ADJUSTING APPARATUS

Katsuyasu Ono, Fujisawa, Japan, assignor to NSK-Warner K. K., Tokyo, Japan

Division of Ser. No. 703,471, Feb. 20, 1985, Pat. No. 4,664,415. This application Jan. 29, 1987, Ser. No. 8,319
Claims priority, application Japan, Feb. 21, 1984, 59-22415
Int. Cl.⁴ B60R *22/20*
U.S. Cl. 280—808 **7 Claims**



1. In a seat belt system, a seat belt support position adjusting apparatus comprising:

support means having a plurality of latch portions provided along a predetermined direction of said support means;

an adjustment anchor supported by said support means movably along the predetermined direction of said support means;

a belt supporting member mounted on said adjustment anchor so as to move therewith;

a latch member mounted on said adjustment anchor movably between an engaged position in which said latch member engages one of said latch portions so as to render said adjustment anchor fixed to said support means at said one of the latch portions and a non-engaged position in which said latch member is out of engagement with said latch portions so as to render said adjustment anchor movable along the predetermined direction of said support means; and

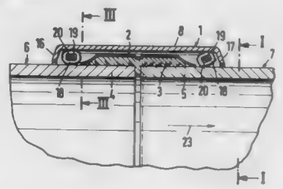
detecting means for detecting whether said adjustment anchor is fixed to said support means or movable along the predetermined direction of said support means, said detecting means comprising a first member movable together with said adjustment anchor and a second member for interacting with said first member, said second member being mounted on a side of a vehicle body.

4,729,582

PIPE COUPLING

Siegmund Zeidler, Hanau, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,072
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524621
Int. Cl.⁴ F16L *37/18*
U.S. Cl. 285—104 **19 Claims**



1. The combination with two plain end pipes having a first hardness of a coupling comprising a tubular housing surrounding the ends of the pipes and having first and second portions each adjacent the periphery of one of the pipes; and first and second sets of externally toothed blocking element provided in and contacting said housing adjacent said first and second portions, respectively, said sets of blocking elements being rotatable relative to each other axially of the respective pipes and each of said elements having a substantially oval outline and its external teeth having a second hardness at least matching said first hardness, said external teeth of each set of blocking elements engaging the periphery of the corresponding pipe and the outlines of said elements having major axes which are normally substantially parallel to the axis of said tubular housing so that the blocking elements of at least one set are compelled, as a result, of engagement of their teeth with said housing and the respective pipe, to turn in response to axial movement of at least one of the pipes relative to the other pipe whereby the teeth of the at least one set of blocking elements penetrate into the corresponding pipe.

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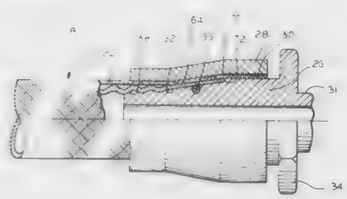
REUSABLE END FITTING FOR CONVOLUTED HOSE

James M. Lalikos, Springfield, Mass., and Norman H. Desilets, Enfield, Conn., assignors to Titeflex Corporation, Springfield, Mass.

Continuation of Ser. No. 763,757, Aug. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 743,286, Jun. 11, 1985, abandoned, Division of Ser. No. 643,067, Aug. 22, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,841

Int. Cl.[4] F16L *33/24*

U.S. Cl. 285—149 **13 Claims**



1. A reusable end fitting for a convoluted hose, said end fitting comprising coaxial inside and outside parts each of which has an inner and an outer end, said parts being joined to each other at said coaxial inner ends when said parts are attached to a hose, said inside part having an elongated section with a large and coarse screw thread at its outer end to turn into the convolutions of said hose, the contours of the large and coarse screw thread and hose convolutions approximately complementing each other, the pitch and diameter of said coarse screw threads progressively increase to progressively flatten said convolutions onto a generally smooth substantially funnel shaped ramp area near the inner end of said elongated section, the diameter of a small end of said funnel shaped ramp area beginning with the diameter of said elongated section having said coarse screw threads and progressively increasing thereafter, whereby a continual turning of said inner member into said hose stretches at least some of the convolutions at the end of the hose and gradually smooths and stretches the hose over said ramp area, valleys of said convolutions on said hose being stretched to seal around the ramp area, said outside part having an internal area with a contour which is complementary to said substantially funnel shaped ramp area, and means responsive to a joining of said inside and outside parts for compressing the end of said hose in a captured position between said parts in said funnel shaped ramp area and the contour which is complementary thereto.

4,729,584

BOAT HATCH OR WINDOW CONSTRUCTION

Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460

Filed Sep. 26, 1986, Ser. No. 911,715

Int. Cl.[4] E05C *19/00*

U.S. Cl. 292—257 **21 Claims**

1. A quick-release fastener construction, comprising in combination:

(a) two members capable of relative movement,

(b) a tie rod having external threads,

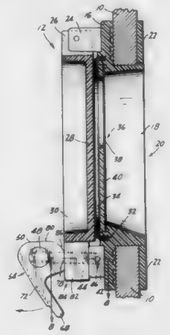
(c) means providing a first swivel joint between said tie rod and one of said members,

(d) the other of said members having an abutment shoulder, the remote end of said tie rod being capable of swiveling toward and away from said abutment shoulder,

(e) a nut having threads engaged with the external threads of the tie rod and adapted to be carried on the latter,

(f) a camming finger piece, and bearing means providing a second swivel joint between the said finger piece and said nut, whereby the nut can be turnably adjusted on the tie rod and the finger piece can swievel independently of the nut,

(g) said finger piece having an axis of rotation on said nut, and having a pair of arcuately spaced camming surfaces selectively engageable with the abutment shoulder of the said other member when the members are juxtaposed, the distances of said camming surfaces from the said axis of rotation being different, said finger piece being adjustably positionable along the length of the tie rod by turning it



about the axis thereof until one camming surface can engage the said abutment shoulder, and thereafter the finger piece being turnable about the second swivel joint so as to disengage said one camming surface from the abutment shoulder and bring the second camming surface into engagement with the said abutment shoulder, thereby to draw the members closer together by a cam action.

4,729,585

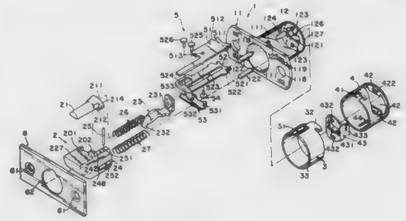
TRUMPET DOOR LOCK WITH AN ADJUSTABLE DEAD BOLT

Jui C. Lin, 297, Bor Ay Road, Kaohsiung, Taiwan, Taiwan (800)

Filed Mar. 5, 1986, Ser. No. 836,431

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—337 **5 Claims**



1. A trumpet door lock, comprising:

a base having a fixing plate; a faceplate connected to said fixing plate;

a cylinder fixed to said base such that said base is disposed about one end of said cylinder and extending generally transversely to an axis of said cylinder; said cylinder having at least one guiding projection;

a dead bolt movable into said cylinder; a guarding plate disposed within said cylinder to selectively block movement of said dead bolt into said cylinder; said guarding plate having a tip on a front end thereof; an anti-burglar bolt associated with the dead bolt and movable into the cylinder along with or separately from the dead bolt, the anti-burglar bolt having a projection disposed along a distal portion thereof for selectively positioning said front end of said guarding plate in blocking and non-blocking positions with respect to said dead bolt, the anti-burglar

bolt moving the guarding plate from the non-blocking position to the blocking position when the anti-burglar bolt is moved separately into the cylinder;

said dead bolt having an end wall; said end wall having a recess therein, said recess having an internal bounding wall which bounds the extremities of said recess; said end wall of said dead bolt abutting said tip of said guarding plate in said blocking position, and receiving said tip within said recess in said non-blocking position;

said dead bolt having a slot therein, a linking plate disposed on said slot and pivotably connected thereto; said linking plate having an end portion which is pivotably disposed within said slot in said dead bolt;

a rotating shell rotatably disposed about said cylinder, said rotating shell having an L-shaped slot therein for selectively receiving said guiding projection therein for guiding said rotating shell to move axially relative to said cylinder and to guide rotation of said rotating shell concentrically about said cylinder until said guiding projection is in a circumferentially extending limb of said L-shaped slot so as to prevent axial movement of said rotating shell relative to said cylinder; an extending shell nonrotatably disposed about said cylinder and being disposed so as to be axially movable relative to said cylinder; respective cutouts at adjacent ends of the rotating shell and the extending shell which interengage when said guiding projection is in the circumferential limb of the L-shaped slot to prevent axial movement of the extending shell on the cylinder, and which disengage when the rotating shell is rotated to bring the guiding projection into an axially extending limb of the L-shaped slot, thereby permitting movement of the extending shell from a retracted position on the cylinder to an extended position,

a plurality of moving accessories within the cylinder and which include an extending plate, a pulling plate and said linking plate;

said extending plate and pulling plate being superposed, the pulling plate being operatively connected with said dead bolt for withdrawing the dead bolt into the cylinder, the extending plate and pulling plate having respective rear end portions extending through apertures in respective back walls of the cylinder and the extending shell, said rear end portions being aligned externally of the extending shell when the extending shell is in the retracted position, said rear end portions being provided with respective slots for connecting both plates together to a door knob when the extending shell is in the retracted position, the extending plate having a lengthwise extending pin-and-slot connection with the pulling plate and side projections which engage the extending shell whereby the extending plate is extended lengthwise over the pulling plate by the extending shell when the extending shell is moved from the retracted position to the extended position and whereby in the extended position said slots at the rear end portion of the extending plate can be connected separately to the door knob for operating the pulling plate to withdraw the dead bolt.

4,729,586

CYLINDER DOOR LOCK WITH A DEAD BOLT ADJUSTABLE IN TWO SIZES

Yau C. Fang, Chiayi, Taiwan, assignor to Posse Lock Manufacturing Co. Ltd., Chiayi, Taiwan

Filed May 20, 1986, Ser. No. 865,135

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—337 **1 Claim**

1. A cylinder door lock adjustable for two sizes comprising:

a base which includes a cylinder and a fixing plate; said cylinder having a straight slot for an extending shell to slide along, integral projections on its end remote from the fixing plate, and a fixing aperture;

an extending shell received on the cylinder, the shell having a bottom wall, a large aperture in the bottom wall and two fixing apertures spaced along the length of the shell; an actuating plate in the extending shell against the bottom wall, the actuating plate having two actuating hooks exposed outside of the extending shell through the large aperture for attaching the actuating plate to an actuating device of a doorknob and stabiliizing the cylinder;

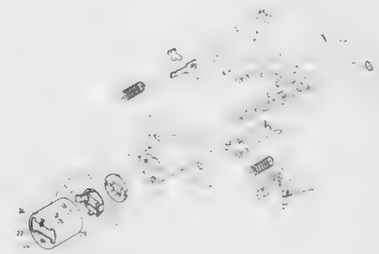
a dead bolt having a flat surface, a safety bolt associated with the dead bolt and shaped to ride and move on said surface, a locking aperture in the dead bolt;

a bolting plate having a projection fitting in said locking aperture in the dead bolt, and an elongate aperture adjacent the projection;

an extending uplocking plate above the bolting plate, the extending unlocking plate having a pair of ear hooks for connecting with the actuating device of the door knob, and a locking projection on its bottom surface fitting in the elongate aperture of the bolting plate for sliding therein;

an unlocking plate below the bolting plate, the unlocking plate having a pair of ear hooks for connecting with the actuating device, two projections to fit in the elongate aperture of the bolting plate for guiding same in a straight line, and a pair of tips extending out obliquely from the unlocking plate;

the safety bolt having a ring slot, and actuating plate formed with a trapezoidal portion and a connection with said ring



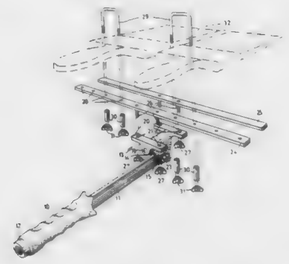
slot, a guarding plate fitting in the cylinder of the base adjacent the internal projections, a stopping plate having a connection with the guarding plate, a spring plate internally of the cylinder for pressing the stopping plate inwardly toward the actuating plate;

a fixing bolt in the cylinder extending through the fixing aperture in the cylinder for engagement selectively in one of the fixing apertures in the extending shell, and a further spring plate connected between the guarding plate and the fixing bolt;

the extending shell being movable for selectively receiving the fixing bolt in one of said two fixing apertures forming respectively short and long distances between the actuating plate and the deal bolt; in the short distance, the ear hooks of the extending locking plate and the ear hooks of the unlocking plate being connectable with the actuating device; in the long distance, the extending shell pulling out the extending unlocking plate to make the locking projection of the extending unlocking plate contact with one of the projections of the unlocking plate at one end of the elongate aperture of the bolting plate; when the ear hooks of the unlocking plate are actuated alone or with those of the extending locking plate by the actuating device, the tips of the unlocking plates push the stopping plate outwardly enabling the dead bolt to be moved.

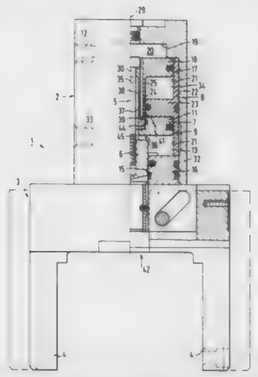
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4,729,587
PAINTER'S AID
Thomas D. M. Ward, 87 Gordon Parade, Manly, Queensland, 4178, Australia
Continuation of Ser. No. 826,738, Feb. 6, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 31,206
Int. Cl.⁴ A47F *13/06*
U.S. Cl. 294—19.1 **3 Claims**



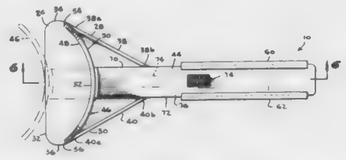
1. An improved painter's aid including in combination:
a carrier bar;
a double clamp mounted adjacent to the end of said carrier bar opposite its handle end, and paint brush mounting means for mounting one or more paint brushes, attached to said double clamp, wherein said double clamp comprises dual adjustable joints integrally combined in a single clamp structure, said double clamp permiting paint brushes mounted in said paint brush mounting means to be optionally, adjustably rotated relative to said carrier bar in a plane disposed at right angles to the longitudinal axis of said carrier bar; or adjustably tilted in a vertical plane parallel to the longitudinal axis of said carrier bar; or in both said planes, simultaneously, and wherein both the axes about which such adjustment is accomplished in each of said planes pass through said integral structure.

4,729,588
GRASPING DEVICE FOR HANDLING EQUIPMENT
Wilhelm Kratzer, Billigheim, Fed. Rep. of Germany, assignor to Fibro GmbH, Weinsberg, Fed. Rep. of Germany
Filed Oct. 28, 1986, Ser. No. 923,947
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544130
Int. Cl.⁴ B25J *15/00*
U.S. Cl. 294—88 **16 Claims**



1. Apparatus for handling equipment comprising a clamping device having at least two clamping fingers which are movable relative to one another and mounted on a housing; and a clamping finger actuating device provided in the housing and having at least first and second piston-in-cylinder units coaxially disposed behind one another, coupled together in force transmitting relationship, and simultaneously energisable with pressure fluid in the same sense.

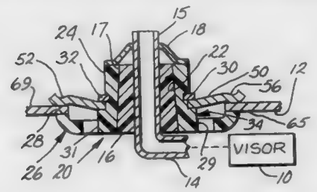
4,729,589
DEVICE FOR INSERTING FILLING INTO A TACO SHELL
Samuel Puskar, 3353 Ivanhoe Rd., Sharpsville, Pa. 16150
Filed Sep. 29, 1986, Ser. No. 913,004
Int. Cl.⁴ A47J *43/28*
U.S. Cl. 294—26.5 **3 Claims**



1. A device for inserting a filling into a taco shell, comprising:
a base portion having a lengthwise axis and comprising an elongated handle portion having a lengthwise axis and a scoop portion, said scoop portion being substantially triangular and having a truncated vertex, two sides adjacent said vertex, a base opposite said vertex, said handle portion being joined to said scoop portion at said vertex thereof and guide means mounted on said scoop portion on either side of said vertex for guiding said handle portion;
a top portion movable on said base portion along said lengthwise axis of said handle portion between a filling position and an emptied position and comprising an elongated plunger portion and an ejector portion, said ejector portion being substantially arcuate to conform to the profile of the taco shell and having a concave forward surface, a convex rearward surface, a center point, and two ends, said plunger portion being joined to said rearward surface of said ejector portion proximate said center point;
mounting means comprising keyway means mounted in said handle portion for slidably receiving the sides of said plunger portion for slidably mounting said top portion on said base portion for movement along said lengthwise axis and stop means mounted on said base portion for limiting rearward movement of said top portion; and
wherein said stop means and said guide means are defined by shoulder means projecting upwardly from each of said two sides of said scoop portion with each of said shoulder means extending from a point proximate said vertex to a point rearward of said base.

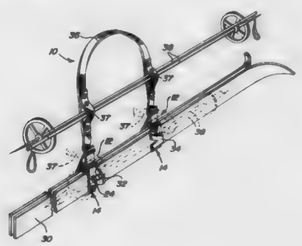
4,729,590
VISOR ROD MOUNT
Edward R. Adams, Spring Lake, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Mar. 23, 1987, Ser. No. 28,781
Int. Cl.⁴ E04G *3/00*
U.S. Cl. 296—97 K **21 Claims**

1. A visor mount for attaching a visor to a roof member of a vehicle comprising:
mounting means for mounting a visor rod and visor thereon to a vehicle roof, said mounting means including a bezel having a flange which abuts against the lower side of the roof and a generally cylindrical collar extending from said bezel and having a length sufficient to extend through a slotted aperture formed in the roof for receiving the end of the visor rod;
a clamping ring and means for mounting said ring over said collar for rotation with respect to said flange and restrained from axial movement away from said flange, said clamping ring including tang means extending outwardly



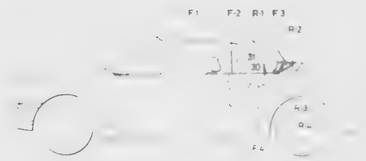
therefrom for insertion into the slotted aperture formed in the roof member of a vehicle and for engaging an upper side of the roof member when rotated after insertion; and
means for rotating said clamping ring with respect to said bezel flange to compressably clamp the roof member between said tang means and said flange for securing a visor to the vehicle.

4,729,591
COMBINATION SKI, SKI POLE AND SKI BOOT CARRYING STRAP
Ronald J. Scalise, Box 304, Pine Grove Rd., Herkimer, N.Y. 13350
Filed Jun. 18, 1986, Ser. No. 875,695
Int. Cl.⁴ A63C *11/02*
U.S. Cl. 294—141 **5 Claims**



1. A convertible carrier for skis and ski boots comprising a strap with a pair of buckles for forming adjustable size loops at opposite ends of the strap connected by a central portion of the strap forming a handle, the loops being adapted for tightening around a pair of back-to-back skis in spaced relation along the length of the skis whereby the skis are slung from the central portion of the carrier, and the carrier further including fastener means for releasably connecting the loops together for use of the carrier in carrying a pair of boots with the loops tightened around the respective boots, said fastener means comprising a clip member for releasable encircling attachment around parts of the strap defining the respective loops.

4,729,592
CONVERTIBLE VEHICLE BODY STRUCTURE
Takanori Tuchiya; Takeshi Yamamoto; Takeshi Konishi, and Iseo Hamasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Nov. 20, 1986, Ser. No. 932,793
Claims priority, application Japan, Nov. 20, 1985, 60-260839
Int. Cl.⁴ B60J *7/08*
U.S. Cl. 296—116 **10 Claims**



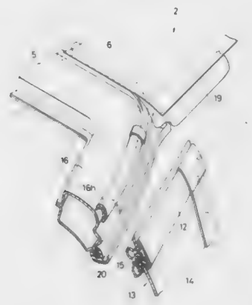
1. A convertible vehicle body structure including a front windshield structure having an upper edge, a rear body section having a pair of rear side panel structures provided at the opposite side portions of the rear body section, said rear side structure including an inner panel, said rear side panel structure having an upper edge defining a belt line of the vehicle body structure and a front edge defining a rear edge of a side door opening, a substantially U-shaped swingable pillar structure having a pair of leg portions each being of a closed cross section and pivotably mounted on said inner panel of the side panel structures so that the pillar structure is movable between an upright position wherein it stands from the side panel structures in an inverted U-shaped form and a retracted position wherein it is retracted in the rear body section, a substantially rigid front roof panel having a front edge portion adapted to be removably attached to the upper edge of the front windshield, said front panel being supported by said pillar structure so that said front roof panel is positioned in an extended position wherein the front edge portion of the front roof panel is attached to the upper edge of the front windshield when the pillar structure is in the upright position and retracted in the rear body section when the pillar structure is in the retracted position, a substantially rigid rear roof panel adapted to be positioned to extend between said front roof panel in said extended position and said rear body structure, bracket means for mounting a lower portion of said rear roof panel on said inner panel at each side of the rear body structure for movement between an extended position wherein said rear roof panel is positioned between the front roof panel and the rear body structure and a retracted position wherein said rear roof panel is retracted in the rear body structure, a transparent rear side window adapted to extend upwards from the side panel structure beyond the upper edge of the side panel structure, a side door provided in each of the door openings and having a transparent panel located at an upper portion of the side door, said rear side window being located transversely outside the leg portion of the pillar structure and being substantially flush with the transparent panel when the side door is closed with a front edge of the rear side window extending substantially along a rear edge of the transparent panel of the side door with weather strip means between said front edge of the rear side window and said rear edge of the transparent panel of the side door, said leg portions of the pillar means being spaced transversely inwardly from the weather strip means, said leg portions of the pillar structure being spaced apart transversely inwardly from the weather strip means.

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4,729,593
CONVERTIBLE VEHICLE BODY

Sadamu Nisiguchi; Kozo Odoi; Shigeki Akamatsu, and Takahiko Akamatsu, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 19, 1987, Ser. No. 16,361
Claims priority, application Japan, Feb. 19, 1986, 61-23297[U]
Int. Cl.[4] B60J *7/195, 7/12*
U.S. Cl. 296—154 **16 Claims**



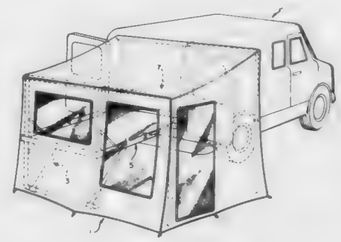
1. A convertible vehicle body including front windshield means provided at each side with front pillar means and at a top portion with front header means, roof means having a front edge portion adapted for engagement with said front header means, said roof means being removable from a closed position wherein the front edge portion is engaged with said front header means so that a top portion of the body is opened when the roof means is removed from the closed position, side door means provided at each side of the body and having a front edge portion adapted for engagement with said front pillar means, said front edge portion of the side door means being provided with first weather strip means having an upper end portion adapted to be engaged with a front corner portion of said roof means when the roof means is in the closed position, said front pillar means being provided with surface means extending in a lengthwise direction of the front pillar means for engagement with said first weather strip means on said front edge portion of the side door means, said front pillar means being provided at a portion inside the vehicle body relative to the surface means with second weather strip means extending in the lengthwise direction of the front pillar means, said second weather strip means being formed with water pocket means extending in the lengthwise direction of the front pillar means and having an upper end portion located adjacent to the upper end portion of the first weather strip means.

4,729,594
VAN CAMPER

Marie T. Hoff, 1431 Berg Dr., Dolton, Ill. 60419

Filed Dec. 16, 1985, Ser. No. 808,960
Int. Cl.[4] B60P *3/34*
U.S. Cl. 296—161 **12 Claims**

1. A collapsible and foldable tent-camper apparatus adapted for use with a rear-opening van-type vehicle having a floor, said camper apparatus comprising:
(1) a fabric covering means;
(2) a foldable platform means, having a rearward end and a forward end, and when unfolded extending rearwardly from the rearward end of said vehicle comprising
(a) a forward panel and a rearward panel abutting said forward panel, each of said panels having a forward end and a rearward end and laterally opposite sides, and each of said panels extending substantially the width of and parallel to the floor of said vehicle,
(b) means for hingeably attaching the rearward end of said forward panel to the forward end of said rearward panel, and
(c) means for attaching the forward end of said forward panel to the rearward end of said vehicle substantially adjacent the upper surface of the floor of said vehicle to support said forward end of said forward panel above the ground; and
(3) a collapsible and foldable frame means, when uncollapsed and unfolded for further supporting said platform means above the ground and for supporting said fabric covering means above and laterally of said platform means comprising
(a) a first foldable leg means permanently mounted to said rearward panel substantially adjacent the rearward end of said panel for supporting said end of said panel above the ground,
(b) a second foldable leg means mounted to said platform means intermediate of the forward and rearward ends of said platform means for supporting said platform means intermediate of said ends above the ground,
(c) a foldable rearward covering support means permanently mounted to said rearward panel substantially adjacent the rearward end of said panel for supporting said fabric covering means above said rearward end of said rearward panel, said rearward covering support means including a laterally disposed rearward cross-member having laterally opposite ends and extending substantially the width of said platform means,
(d) a telescoping rearward lateral covering support means

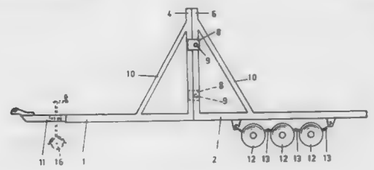


permanently mounted to and extending laterally out from said rearward covering support means for supporting said fabric covering means above the ground laterally of the rearward end of said rearward panel comprising an "L"-shaped member having a non-detachable lateral telescoping portion slidably attached to one end of said rearward cross-member, and having a substantially vertical downwardly-turned portion formed laterally of said telescoping portion, and further comprising a substantially vertically disposed non-detachable member which is slideably attached to and which telescopes from the downwardly-turned portion of said "L"-shaped member and which extends from said portion to abut the ground,
(e) a foldable forward covering support means permanently mounted to said forward panel substantially adjacent the forward end of said panel for supporting said fabric covering means above said forward end of said forward panel, said foldable forward covering support means including a laterally disposed forward cross-member having laterally opposite ends and extending substantailly the width of said platform means, and
(f) a telescoping forward lateral covering support means permanently mounted to and extending laterally out from said forward covering support means for supporting said fabric covering means above the ground laterally of the forward end of said forward panel comprising an "L"-shaped member having a non-detachable lateral telescoping portion slideably attached to one end of said forward cross-member, and having a substantially vertical downwardly-turned portion formed laterally of said telescoping portion, and further comprising a substantially vertically disposed non-detachable member which is slideably attached to and which telescopes from the downwardly-turned portion of said "L"-shape member and which extends from said portion to abut the ground.

4,729,595
MOBILE HOME

Arthur B. Barber, 111 Albert St., Strathfield, Australia N.S.W. 2135 , and John Loberg, 95 Yanderra St., Condell Park, Australia N.S.W. 2200

PCT No. PCT/AU83/00157, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/01753, PCT Pub. Date May 10, 1984
Continuation of Ser. No. 626,871, Jun. 29, 1984, abandoned.
This PCT application Oct. 27, 1983, Ser. No. 883,427
Claims priority, application Australia, Oct. 29, 1982, PF6591
Int. Cl.[4] B62D *63/06*
U.S. Cl. 296—168 **1 Claim**

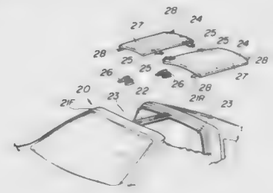


1. A mobile home having two habitable parts which when in a first configuration with the parts end to end allow the mobile home to be towed and when in a second configuration with the parts side by side provide two intercommunicating habitable areas; said mobile home comprising a first rigid rectangular perimeter frame with two parallel sides and a first end and a second end parallel to the first end, a post upstanding from and fixed to the perimeter frame where each side joins said second end, a diagonal brace from each post to the adjacent perimeter frame side, a towbar projecting from said first end of the first perimeter frame, a second rigid rectangular perimeter frame adapted to abut in end to end relationship with the first perimeter frame, the second perimeter frame having two parallel sides and a first end and a second end in parallel relationship, said second perimeter frame having a width from side to side the same as the first perimeter frame, a post upstanding from and fixed to the second perimeter frame where each of its sides join its first end adjacent the first perimeter frame, a diagonal brace extending from each of the posts on the second perimeter frame to the adjacent side of the second perimeter frame, hinge means connecting in a substantially abutting manner one of said posts of the first frame to one of said posts of the second frame to allow the frames to hinge one relative to the other about a vertical axis to allow said frames to pivot from an end-to-end relationship to a side-by-side relationship, releasable catch means connecting the other ones of said posts of the first and second perimeter frames in a substantially abutting manner when said frames are in an end-to-end relationship, wheels on the second perimeter frame, a habitable enclosure on the first perimeter frame and a habitable enclosure on the second perimeter frame, door means in the enclosures including complementing door means in the sides of the habitable enclosures adjacent the hinge means so positioned that when the two habitable enclosures are in a side-by-side relationship communication between habitable areas within the two habitable enclosures is possible by persons.

4,729,596
VEHICLE ROOF STRUCTURE HAVING LEFT AND RIGHT REMOVABLE ROOF LIDS

Ryoji Fujihara, Tokyo; Kazuaki Furuse, Atsugi; Satoshi Ishizuka; Kouichi Yagami, both of Zama, and Tsutomu Iwasaki, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1987, Ser. No. 35,420
Claims priority, application Japan, Apr. 8, 1986, 61-80481; Apr. 24, 1986, 61-93261
Int. Cl.[4] B60J *7/11, 7/19*
U.S. Cl. 296—218 **13 Claims**



1. A roof structure of a vehicle comprising: a frame having a front portion, a rear portion, a center beam extending along a longitudinal axis of the vehicle and connecting said front and rear portions, and left and right roof openings formed between said front and rear portions and separated by said center beam,
left and right removable roof lids for closing said left and right roof openings, respectively, to form a closed roof surface and concealing said center beam under the closed roof surface when said left and right lids are placed in respective left and right closed positions, and fastening means for securing said left and right lids in said left and right closed positions to said frame structure, said fastening means comprising left and right latch means fixed, respectively, to undersides of said left and right lids, and receiving means which is fixedly mounted on an upper surface of said center beam, and formed with left and right latch holes receiving said left and right latch means, respectively, when said lids are placed in said closed positions, each of said latch holes being bounded on an upper side by a downward flange, and each of said latch means being formed with an upward flange which is inserted in one of said latch holes when said lids are placed in said closed positions, wherein each of said left and right latch means comprises a first latch plate having a fixed end fixed to said underside of one of said lids and a flanged end formed with said upward flange, and wherein a guide cover is fixed to each of said latch plates in such a manner as to cover a depressed portion adjoining said upward flange and to normally prevent engagement between said upward flange and said downward flange of said receiving means.

11. A roof structure of a vehicle comprising:
a frame structure having a front portion, a rear portion, a center beam extending along a longitudinal axis of the vehicle and connecting said front and rear portions, and left and right roof openings formed between said front and rear portions and separated by said center beam,
left and right removable roof lids for closing said left and right roof openings, respectively, to form a closed roof surface and concealing said center beam under the closed roof surface when said left and right lids are placed in respective left and right closed positions, and
fastening means for securing said left and right lids in said left and right closed positions to said frame structure, said fastening means comprising left and right latch means fixed, respectively, to undersides of said left and right lids, and receiving means which is fixedly mounted on an upper surface of said center beam, and formed with left and right latch holes receiving said left and right latch means, respectively, when said lids are placed in said

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closed positions, each of said left and right latch means comprises a first latch plate having a raised portion fixed to said underside of one of said lids, and a depressed portion projecting from said raised portion and terminating at a projecting end, said depressed portion of each of said latch plates being L-shaped, and formed with a hollow corner formed by an angle of the L-shaped figure of said depressed portion, said latch plates being arranged so that said hollow corner of one of said latch plates of said left and right lids receives said projecting end of the other of said latch plates when said lids are placed in said closed positions.

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VEHICLE ROOF STRUCTURE HAVING LONGITUDINAL BEAM AND LEFT AND RIGHT REMOVABLE ROOF LIDS

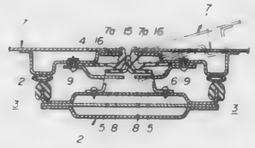
Ryoji Fujihara, Tokyo; Kazuaki Furuse, Atsugi; Satoshi Ishizaka; Kouichi Yagami, both of Zama, and Tsutomu Iwasaki, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1987, Ser. No. 35,325

Claims priority, application Japan, Apr. 9, 1986, 61-81662

Int. Cl.[4] B60J *7/11, 7/19*

U.S. Cl. 296—218 **9 Claims**



1. A roof structure of a vehicle comprising;

a frame structure having a front portion, a rear portion, a center beam extending along a longitudinal axis of the vehicle and connecting said front and rear portions, and left and right roof openings formed between said front and rear portions and separated by said center beam,

left and right removable roof lids for closing said left and right roof openings, respectively, to form a closed roof surface and concealing said center beam under the closed roof surface when said left and right lids are placed in respective left and right closed positions, and

fastening means for securing said left and right lids in said left and right closed positions to said frame structure, said fastening means comprising left and right latch means fixed, respectively, to undersides of said left and right lids, and receiving means which is fixedly mounted on an upper surface of said center beam, and formed with left and right latch holes receiving said left and right latch means, respectively, when said lids are placed in said closed positions, said receiving means having a top wall formed with a stopper projection projecting upwardly and extending along the longitudinal axis of the vehicle, said fastening means further comprising left and right slider means fixed, respectively, to inner ends of said left and right lids for limiting insertion of said latch means into said receiving means by abutting on said stopper projection.

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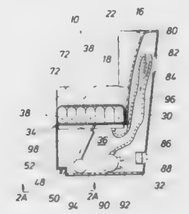
PATIENT CHAIR SYSTEM

Jack H. Hess, 15455 Ella Blvd., #75, Houston, Tex. 77090

Filed Mar. 20, 1987, Ser. No. 28,657

Int. Cl.[4] A47C *7/72*

U.S. Cl. 297—180 **18 Claims**



1. A convalescent chair for hospital and nursing home patients and the like, comprising:

(a) a chair structure forming a back rest, arm rests and shoulder and head supports for patients, said chair further forming seat support means and forming an enclosure therein and an air inlet opening for said enclosure communicating said enclosure with environmental air;

(b) a plurality of air sacs being secured in side by side relation to said seat support means and having multiple air vent holes formed in the upper surfaces thereof;

(c) means communicating pressurized air into said air sacs to inflate the same and to provide a sufficient flow of air into said air sacs to compensate for discharge of air from said multiple holes;

(d) means for exhausting air from said enclosure and stimulating air flow through said air inlet opening of said enclosure;

(e) electrically energized air blower means located within said enclosure and forming air intake and discharge openings; and

(f) an elongated heat exchanger conduit interconnecting said discharge opening of said electrically energized air blower means with said plurality of air sacs for supply of pressurized air to said air sacs, said elongated heat exchanger conduit being so located within said enclosure that air being drawn through said air inlet opening of said enclosure by said air exhausting means and said electrically energized air blower means is passed over said elongated heat exchanger conduit for cooling air being being discharged from said air blower.

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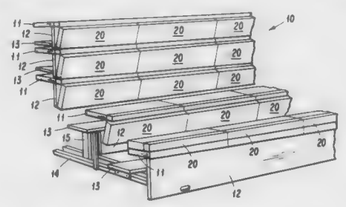
BLEACHER CUSHIONS

George P. Nissen, Cedar Rapids, Iowa, assignor to Gymnasium Protection Systems, Inc., Cedar Rapids, Iowa

Filed Jan. 27, 1987, Ser. No. 7,333

Int. Cl.[4] A47C *27/00*

U.S. Cl. 297—219 **5 Claims**



1. A cushion assembly for use on bleachers, the assembly

comprising first and second compressible members having substantially equal lengths and thicknesses and substantially rectangular in cross-section, the width of the first member being substantially greater than the width of the second member, the two cushion members abutting each other longitudinally and hinged to each other along a pair of their abutting longitudinal corners, the longitudinal corner of the second member diagonally opposite said hinge having means for hingedly securing the cushion assembly to the front face of a longitudinal extending seat member.

4,729,600

MULTI-MODE CHILD RESTRAINT SYSTEM

Arthur W. Single, II, Plymouth Township, Plymouth County, and Thomas J. Bryans, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,691

Int. Cl.[4] A47C *1/08*

U.S. Cl. 297—250 **8 Claims**



1. A child restraint system comprising

(A) a child seat comprising:

a seating unit having a seat portion, a back portion extending upwardly from said seat portion, and a pair of side walls extending forwardly from said back portion, said back portion, seat portion and side walls each being unitary with the others; and

an impact shield comprising a shield portion and a mounting arm integral with said shield portion, said mounting arm being pivotably mounted to said seating unit, said impact shield being pivotable to a forward position to present a substantially planar inclined surface spaced forwardly of said back portion of the seating unit, said impact shield also being pivotable to a rearward position behind said back portion to support the seating unit in a rearwardly reclined position;

(B) a bolster means for supporting said child seat, which bolster means is releasably engagable with said child seat; and

(C) means for propping said seating unit in a reclined position, said means comprising a prop pivotably mounted under the seating surface of said seating unit within a concavity defined by said seat portion thereof, said prop being releasably engagable in a first position substantially entirely within said concavity and releasably engagable in a second position extending below the bottom of said seat portion in such location that said propping means and the bottom rear portion of said seating unit together support said seating unit in a rearwardly reclined position, wherein said prop releasably engages the seating unit to the bolster, said prop being spring biased downwardly into such abutment with said bolster.

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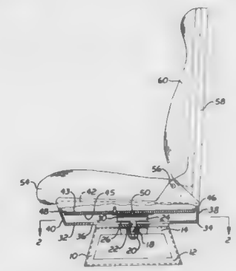
INTERLOCKING DEVICE FOR AIRCRAFT EXECUTIVE SEATS

Irwin Walle, Clearwater; Donald C. Fetterhoff, St. Petersburg, and William R. Higgins, Clearwater, all of Fla., assignors to ATR International, Inc., Clearwater, Fla.

Filed Mar. 26, 1987, Ser. No. 31,075

Int. Cl.[4] B64D *11/06*

U.S. Cl. 297—344 **14 Claims**



1. A seat adjustment and locking mechanism comprising:

(a) a seat supporting stationary pedestal having a bore through a top frame member,

(b) a seat frame mounted over the pedestal,

(c) the seat frame having a bottom wall provided with an opening over the pedestal bore, front and back walls and a top wall,

(d) a pin pad having a diameter larger than the width of the opening in the bottom wall, the pin pad juxtaposed to a shaft, the shaft protruding downwardly through the opening in the bottom wall and the pedestal bore, the shaft being affixed to the pedestal at an end distal from the pin pad,

(e) a substantially planar panel having a top and bottom surface, the panel positioned between the bottom and top seat frame walls, the panel hinged at a first end to the front wall and at a second end to the back wall of the seat frame, the panel being bendable at a midsection,

(f) a multiplicity of holes on at least one grating affixed to the bottom surface of the panel to receive corresponding pins from a top surface of the pin pad, and

(g) means for lifting the panel to retract the holes on the grating from the pins so that the seat frame is movable within the dimensions of the opening in the bottom wall.

4,729,602

SEAT BELT ANCHOR MECHANISM

Osamu Tokugawa, Kanagawa, Japan, assignor to NSK Warner K.K., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,018

Claims priority, application Japan, Jul. 31, 1985, 60-116396[U]

Int. Cl.[4] A62B *35/00*

U.S. Cl. 297—468 **8 Claims**

1. A seat belt anchor mechanism for a vehicle having a body comprising:

an anchor stay defining a plurality of interlocking teeth and means to affix the anchor stay to a side of the body of the vehicle;

a base plate displaceable as unitary member together with an associated seat of the vehicle along the anchor stay when the associated seat is slid back and forth, said base plate being fastened to an associated occupant-restraining webbing;

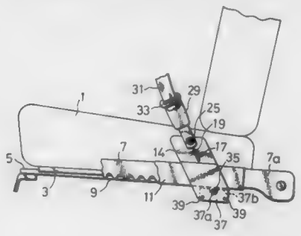
an interlocking means fixed on the base plate for engagement

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with any one of the interlocking teeth in the event of an emergency;

means for mounting the base plate on the seat in such a way that the interlocking means is displaceable in a direction which crosses the sliding direction of the seat; and

a cover member mounted on the base plate, said cover member during normal operation preventing the interlocking means from engaging said one of the interlocking teeth, said cover member having a first portion in which the



interlocking means is received during normal operation and which opens in the direction of engagement of the interlocking means with any of the interlocking teeth, and an second portion interposed between the interlocking teeth and interlocking means, wherein said cover member is displaceable from the base plate to permit engagement between the interlocking means and any one of the interlocking teeth when a load of at least a predetermined value is applied to the base plate.

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ROUND CUTTING TOOL FOR CUTTERS

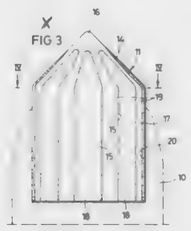
Gerd Elfgen, Theissenkreuzweg 10, D-5303 Bornheim 3, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 799,966, Nov. 20, 1985, abandoned. This application Aug. 14, 1986, Ser. No. 896,216

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442546

Int. Cl.[4] F21B *10/00*

U.S. Cl. 299—93 **6 Claims**



1. A round cutting tool for cutters comprising a metallic basic body defined by a chisel shank, said chisel shank carrying a separate chisel bit, said chisel bit being a hard metal body defined by a cylindrical body portion merging with a frusto-conical working portion which in turn merges with a terminal cone-shaped body portion; a plurality of longitudinally extending peripherally spaced recesses formed in said cylindrical body portion along generally the entire length thereof which continue into said frusto-conical body portion and terminate at said cone-shaped body portion without entering the latter; and said recesses being filled with material which is softer than the metal of said chisel bit body.

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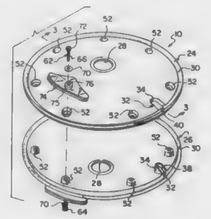
BICYCLE WHEEL SHROUD

Timothy J. Dietz, West Carrollton, Ohio, assignor to Huffy Corporation, Miamisburg, Ohio

Filed Nov. 18, 1986, Ser. No. 932,436

Int. Cl.[4] B60B *7/00*

U.S. Cl. 301—37 R **10 Claims**



1. A wheel shroud for substantially covering and enclosing the spoked portion of a bicycle wheel comprising:

a pair of identical shroud members sized to engage opposite sides of a spoked portion of a wheel, each of said members being disk-shaped and having a central aperture for receiving a wheel hub therethrough, an outer periphery sized to extend to a wheel rim, and a valve stem opening formed adjacent to said outer periphery, said opening including a U-shaped portion and a radially outward portion having a notch shaped to allow a rectilinear valve stem to extend therethrough and terminate on said opening such that access is available to said valve stem from both sides of said bicycle wheel;

a reinforcing rib extending inwardly from a periphery thereof, said ribs of said shrouds being shaped such that, when said shroud members are joined together to engage a wheel, said ribs cooperate to form a wall between said valve stem opening and an interior portion between said shroud members, whereby said wall prevents contaminants from entering an interior portion between said shroud members; and

means for joining said pair of shroud members together such that said valve stem openings are in registry and said shroud members clamp a spoked portion of a wheel therebetween.

4,729,605

MULTIPLEX SPOKE FOR WHEEL

Shoji Imao; Hitoshi Kodama, and Yozo Chiba, all of Aichi, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 744,948

Claims priority, application Japan, Jun. 18, 1984, 59-90449[U]

Int. Cl.[4] B60B *5/00*

U.S. Cl. 301—104 **11 Claims**



1. A multiplex wheel spoke for a bicycle, comprising:

a fiber reinforced plastic rod having two ends;

a first metal part non-adjustably adhesively fixed to one end of said rod,

a second metal part non-adjustably adhesively fixed to the other end of said rod,

wherein one of said first and second metal parts is provided with a first external screw thread adapted to be threaded into a rim of a wheel, whereby said spoke can be attached to a wheel hub and a wheel rim without subjecting the spoke to excessive shear stresses.

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APPARATUS FOR MOUNTING A WHEEL CAP

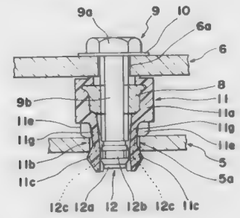
Yasuhide Narita, Nagoya; Noboru Shirai, Gamagori, and Masami Hosono, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 764,298, Aug. 9, 1985, abandoned. This application May 14, 1987, Ser. No. 50,256

Claims priority, application Japan, Aug. 10, 1984, 59-123309[U]; Jun. 18, 1985, 60-92583[U]

Int. Cl.[4] F16B *13/06*

U.S. Cl. 301—37 S **16 Claims**



1. A wheel cap mounting apparatus for mounting a wheel cap on a disk wheel having a non-circular shaped opening formed therein, said wheel cap mounting apparatus comprising:

a retainer to be mounted on said disk wheel,

said retainer comprising:

a body portion having a throughhole, a first edge and a second edge at opposite ends of the body portion, said second edge being substantially parallel to said first edge said first edge adapted for being held in contact with said wheel cap, and said second edge adapted for being in contact with said disk wheel, whereby said body portion serves as a spacer between said wheel cap and disk wheel;

a nut means provided in said body portion between said first and second edges such that a threaded hole in said nut means aligns with said throughhole in said body portion, the nut means being formed separately from the body portion and insert molded with the body portion;

a small-diametered insert section formed integrally with said body portion and adapted to be inserted into said opening in said disk wheel, said small-diametered insert section being formed with a non-circular sided cross-section and having a channel formed therethrough, said channel being aligned with said throughhole formed in said body portion; and

claw means formed integrally with said small-diametered insert section such that said claw means projects radially outwardly from one end of said small-diametered insert section remote from said body portion; and

a bolt inserted in said retainer through said wheel cap,

whereby said wheel cap is rigidly mounted on said disk wheel such that said insert section of the retainer is inserted through said opening formed in said disk wheel with said claw means being held in engagement with the peripheral edge of said opening, while said bolt screwed into said nut means has its shank being located adjacent said claw means to prevent said insert section from being pulled out from said opening.

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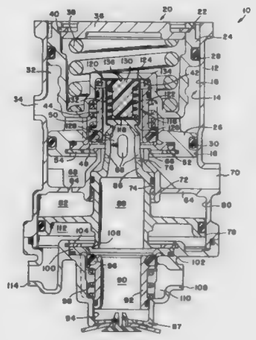
DUAL CIRCUIT BRAKE VALVE DIFFERENTIAL PRESSURE CONTROL MECHANISM

Duane R. Johnson, Wellington, Ohio, assignor to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 831,891, Feb. 24, 1986, Pat. No. 4,691,968, and Ser. No. 876,154, Jun. 19, 1986, abandoned. This application Feb. 2, 1987, Ser. No. 9,426

Int. Cl.[4] B60T *15/02*

U.S. Cl. 303—52 **6 Claims**



1. Dual circuit brake valve comprising a housing having a pair of inlet ports and a pair of outlet ports, each of said outlet ports being associated with a corresponding one of said inlet ports, a pair of valve members for controlling communication between each inlet port and its corresponding outlet port, manual valve actuating means for controlling one of said valve members, said manual valve actuating means including a control actuating member slidably mounted in said housing and movable toward and away from a position operating said one valve member to initiate communication between one of said inlet ports and its corresponding outlet port, a relay actuating member slidably mounted in said housing and movable therein relative to said control actuating member to permit the latter to move away from the relay actuating member during brake release, said relay actuating member being responsive to the pressure differential between said outlet ports for operating the other valve member in response to operation of the one valve member, said actuating members having corresponding facing ends, and reaction force transfer means carried by one of said actuating members for transferring a predetermined force to said relay actuating member upon operation of said manual valve actuating means, said reaction force transfer means including a spring retainer projecting from the facing end of said one actuating member toward the forcing end of the other actuating member, stop means carried by said spring retainer, a plunger slidably mounted in said spring retainer, and a spring yieldably urging said plunger toward engagement with said stop means and toward the facing end of the other actuating member for engagement therewith upon operation of said manual valve actuating means to effect a brake application to thereby transfer the force generated by said spring to the relay actuating member when the plunger is engaged with the forcing end of the other actuating member when a brake application is effected.

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METHOD AND CIRCUIT CONFIGURATION FOR CONTROLLING AN ANTI-LOCK BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH ALL-WHEEL DRIVE

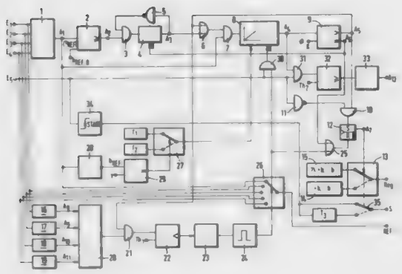
Helmut Fennel, Bad Soden; Hans Wupper, Friedrichsdorf; Gunther Buschmann, Idstein; Johannes Graeber, Frankfurt am Main, and Norbert Ehmer, Bad Soden, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 875,930

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3521960

Int. Cl.[4] B60T *8/70*; G06F *15/20*

U.S. Cl. 303—106 16 Claims



1. A method for controlling an anti-lock brake system for automotive vehicles with all-wheel drive, wherein electric signals representative of the rotational behavior of the vehicle wheels are generated, wherein after the electronic processing an logic combining of said signals braking pressure control signals are derived which, upon the occurrence of a tendency to lock, serve to reduce the braking pressure or to keep it constant and to re-increase it at a later time, and wherein wheel slip and wheel acceleration as well as deceleration are evaluated as control criteria, the individual wheel speeds being compared with a vehicle reference speed which is defined in consideration of the rotational behavior of all wheels and which serves as a reference value for the control of the braking pressure of the single wheels, said method comprising the steps of: modifying the control concept until a specific point of time in the event of a wheel rotational behavior typical of spinning or a spinning tendency; and deleting the instantaneous wheel slip as a control criterion for this time span and wherein the wheel acceleration or the wheel deceleration solely becomes decisive for the braking pressure control;

wherein the control concept is modified in the presence of a wheel rotational behavior typical in of a spinning tendency only after at least one start condition is fulfilled; and,

wherein a rise of the vehicle reference speed (V_{REF}) in excess of a predetermined limit value and continuation of this tendency during a predefined minimum period of time are chosen as start conditions.

4,729,609

SLIP-CONTROLLED BRAKE SYSTEM WITH FAST-FILL CYLINDER

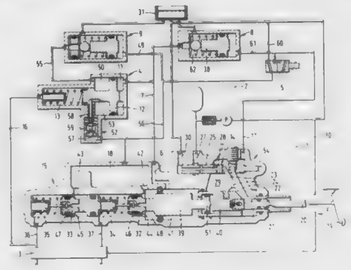
Wolfram Seibert, Pfungstadt; Norbert Ocvirk, Offenbach; Juergen Schonlau, Niedernhausen, and Guenter Trach, Offenbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 888,999

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530289

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—114 5 Claims



1. A slip-controlled brake system for automotive vehicles, said system comprising a brake pressure generator including a master cylinder and a brake power booster, the master cylinder and brake power booster being operatively connected by a plunger slideably disposed in a plunger chamber, the brake power booster having a piston slideably received in and acting on the plunger chamber, an auxiliary energy-supply system connected to a booster chamber in the brake power booster, at least two brake circuits connected to the master cylinder, a fast-fill cylinder having a stepped piston including larger and smaller stages, the smaller stage being slideably received in a smaller portion of the fast-fill cylinder, the smaller portion of the fast-fill cylinder being connected to one of the brake circuits, the larger stage being slideably received in a larger portion of the fast-fill cylinder and forming first and second fluid chambers therein, one of the first and second chambers being connected to the plunger chamber by a first fluid pressure line, the first fluid pressure line also being connected to a fluid supply reservoir, and a pressure responsive valve between said one of the first and second chambers of the fast-fill cylinder and the fluid supply reservoir, the pressure responsive valve being connected to the booster chamber in the brake power booster so that the pressure responsive valve governs the connection between said one of the first and second chambers of the fast-fill cylinder and the fluid supply reservoir as a function of the pressure in the booster chamber.

4,729,610

BRAKE SLIP CONTROL APPARATUS FED WITH AUXILIARY ENERGY FOR USE IN A VEHICULAR HYDRAULIC BRAKE SYSTEM

Wolfram Seibert, Pfungstadt; Norbert Ocvirk, Offenbach, and Juergen Schonlau, Niedernhausen, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

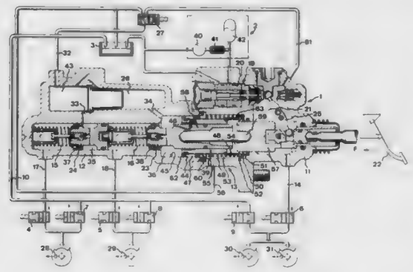
Filed Sep. 18, 1986, Ser. No. 908,626

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533255

Int. Cl.[4] B60T *8/44, 13/00*

U.S. Cl. 303—114 6 Claims

1. A brake slip control apparatus fed with auxiliary energy for use in a vehicular hydraulic brake system, comprising a master cylinder assembly (12) actuatable by the brake pedal and incorporating a master cylinder piston (23) and an assigned prechamber (36), with a supply bore (34) and with the delivery of auxiliary energy into a working chamber (16) of the master cylinder, wherein at least one positioning tube (39) which is axially slidable between stops and sealed relative to a bore (45) in the master cylinder housing (12) is arranged on a secondary side of the master cylinder piston (23), said positioning tube having a larger external diameter than the master cylinder piston (23) and being guided centrically through the master cylinder piston (23) in a sealed relationship thereto, the master cylinder piston (23) being caused to assume a defined position



on actuation of the brake pedal (22) and in the event of the secondary side of the master cylinder piston (23) being applied by auxiliary energy during slip control, wherein an elastic undular washer (59) is arranged between the pedal-side end of the positioning tube (39) and a step (51) of a braking pressure generator (1) isolating the master cylinder assembly (12) from a hydraulic brake power booster (11), wherein said positioning tube (39) is pressed against said undular washer (50) upon initiation of a slip control action to cause said undular washer (50) to cut off fluid communication between an intermediate chamber (54) provided between the master cylinder piston (23) and a booster piston (57) enclosed by the step (51).

4,729,611

VEHICULAR HYDRAULIC BRAKE SYSTEM WITH ANTI-LOCKING ARRANGEMENT

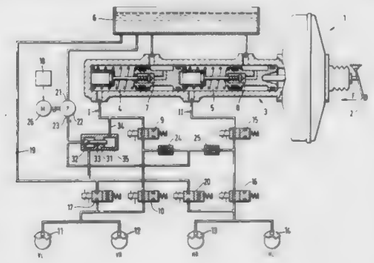
Dieter Kircher, and Horst P. Becker, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,641

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512111; Nov. 30, 1985, 3542419

Int. Cl.[4] B60T *8/32, 8/44*

U.S. Cl. 303—116 5 Claims



1. A vehicular hydraulic brake system with an anti-locking arrangement, said system comprising a master cylinder for connection to and operation by a brake pedal, brake actuating members connected to said master cylinder for receiving pressure fluid from said master cylinder, first valve means between said master cylinder and said brake actuating members, said first valve means including normally open directional control valve means for connecting or disconnecting said brake actuating members to said master cylinder and further having a normally closed directional control valve means for selectively connecting said brake actuating members to an unpressurized reservoir when said normally open directional control valve means is closed, replenishing means for assuring availability of pressure fluid at the brake actuating members, said replenishing means including shut-off valve means between said master cylinder and said normally open directional control valve means, said shut-off valve means being operative with said normally open directional control valve so that said shut-off valve means is open or closed in correspondence with said normally open directional control valve means, and an auxiliary pressure source and second valve means connected to discharge fluid pressure between said shut-off valve means and said normally open directional control valve means for providing fluid pressure for assuring the availability of a fluid pressure reserve proportional to the pressure from the master cylinder, the auxiliary pressure source comprises an electromotively drivable pressure fluid pump and a pressure control valve connected downsteam thereof, said pressure control valve includes a valve member for controlling the pressure of the pump flow and which is acted upon by the master cylinder pressure.

4,729,612

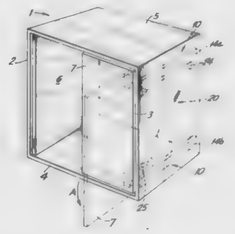
HINGE SUPPORT SYSTEM

Allen F. Stone, 4487 NE. 6th Terr., Fort Lauderdale, Fla. 33334

Filed Feb. 27, 1987, Ser. No. 19,893

Int. Cl.[4] A47B *95/00*

U.S. Cl. 312—109 4 Claims



1. In a cabinet having side walls, at least one door and means mounting the at least one door for pivotal movement between a closed position wherein the at least one door is perpendicular to one side wall and an open position wherein the at least one door is parallel to the one side walls and for sliding movement between the open position and a retracted position wherein the at least one door is disposed within the cabinet and parallel to the one side wall, the movement means including upper and lower sliding hinges, each having one hinge section fixed to the at least one door, a second hinge section pivotally connected to the first hinge section, a slide track fixed to the one side wall and a slide member slidably mounted in the slide track and to which the second hinge section is fixed, the improvement comprising means for preventing the downward skewing of the at least one door during movement between the closed position and the retracted position including a first pulley rotatably mounted about an axis and fixed to the one side wall and disposed below the slide track of the upper sliding hinge at a rearward end thereof, a second pulley rotatably mounted about an axis and fixed to the sidewall and disposed above the slide track at the lower sliding hinge at a frontward end thereof, a cable connected at one end to the slide member of the upper sliding hinge, extending in a Z-shape around the first and second pulleys and connected at the other end to the slide

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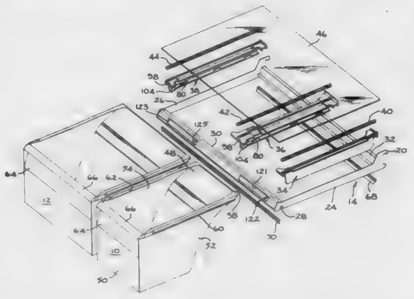
member of the lower sliding hinge, whereby the two ends of the cable are movable with the at least one door during sliding movement between the open end retracted positions.

4,729,613

HOUSEHOLD REFRIGERATOR PAN ASSEMBLY

Ralph D. Tromble, and Clarence W. Denham, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 13, 1986, Ser. No. 930,241
Int. Cl.[4] A47B *51/00*
U.S. Cl. 312—270 **8 Claims**



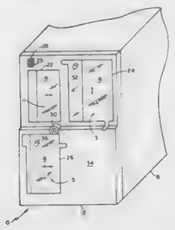
1. In a refrigerator with a fresh food compartment, a pan assembly comprising:
- a removable rigid unitary frame having two side plates secured within the fresh food compartment to support the frame, a front horizontal support member and a rear horizontal support member rigidly attached to and spanning the distance between the side plates,
- two pans of different widths, each having back, front, bottom and side walls with an open top and outwardly depending flanges along the side walls at the top thereof,
- three slide carriers with horizontal channels to receive the pan flanges and support the pans thereon, said slide carriers being supported on the rear and front support members of the frame and slidable along and removable from the support members, and
- a removable cover supported on the front and rear support members of the frame above the slide carriers.

4,729,614

ELECTRONICS CABINET SECURITY COVER

Richard Nadler, Brighton, and Joseph F. Sadlow, North Reading, both of Mass., assignors to Secure Technologies, Inc., Dedham, Mass.

Filed Sep. 2, 1986, Ser. No. 902,486
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—292 **21 Claims**



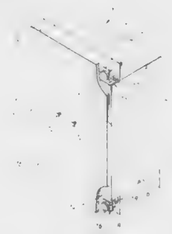
1. A cover for a cabinet said cabinet having an exposed portion to which exposed portion access is to be controlled, comprising
- a detachable panel, to be attached to said cabinet, said panel having an opening corresponding to said exposed portion,
- a movable door arranged to obstruct access to said portion when said door is in a first location, and to permit access to said portion when said door is in a second location, and
- a locking mechanism both for locking said panel to said cabinet and for locking said door in said first location.

4,729,615

WARDROBE OR OTHER CONTAINER WITH FOLDING DOORS

Kenji Ishizawa, Kyoto, and Chiyokazu Higashi, Saitama, both of Japan, assignors to Daiken Trade & Industry Co. Ltd., Toyama and Murakoshi Screw Mfg. Co. Ltd., Tokyo, both of, Japan

Filed Jul. 17, 1986, Ser. No. 886,354
Claims priority, application Japan, Jul. 19, 1985, 60-159667
Int. Cl.[4] A47B *61/00*
U.S. Cl. 312—324 **5 Claims**



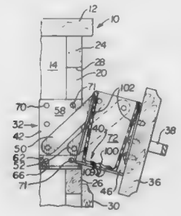
1. A container assembly comprising
- means defining a main body with a front opening, and having upper and lower portions,
- an upper rail mounted on the said upper portion,
- a lower rail mounted on the said lower portion,
- a pair of door sections arranged to close said front opening,
- hinge means connecting said door sections at adjacent vertical edges thereof,
- upper movement-enabling means mounted to each of the door sections and movable on the upper rail,
- lower movement-enabling means mounted to each of the door sections and movable on the lower rail,
- the movement-enabling means and the hinge means being so arranged that the door sections can fold so that the door sections protrude outwardly of the front opening to enable access to the container, and
- stop means provided at each end of at least one of said rails, said stop means serving releasably to retain the said movement-enabling means each said stop means comprising
  - a frame secured to the corresponding said rail,
  - a stop member,
  - means mounting the stop member on the frame for horizontal turning motion, said stop member including
    - a tapered guide portion,
    - means defining a recess contiguous with the tapered guide portion,
    - resilient means mounted on the frame of the stop means and biasing the stop member towards the corresponding rail,
- said movement-enabling means further comprising
- a shaft-like member extending substantially parallel to plane of the corresponding door section which shaft-like member can engage in the said recess after guidance along the tapered guide portion, the co-operation of the recess and the shaft-like member serving to retain the movement-enabling means on the stop means.

4,729,616

DRAWERS FOR SINK CABINETS

James B. Vogt, Ada, Mich., assignor to Vogt Industries, Inc., Kentwood, Mich.

Filed Dec. 8, 1986, Ser. No. 938,873
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—325 **7 Claims**



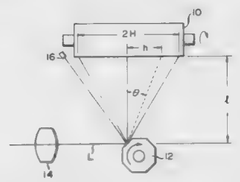
1. In combination, a storage tray of uniform cross section throughout its length and having a base wall and a pair of sidewal's upstanding from opposite sides of the base wall to define therewith opposite open ends of the tray, and a pair of hinge assemblies for supporting the tray on a sink cabinet for movement relative thereto between open and closed positions, each of the hinge assemblies comprising a cabinet hinge plate adapted to be affixed to the cabinet, a drawer hinge plate, hinge arm means supporting the drawer hinge plate on the cabinet hinge plate for movement relative thereto in a curved path, and tray support means carried by the drawer hinge plate for removably supporting the tray at a respective one of the opposite open ends thereof in a position whereby the drawer hinge plate froms an end wall closing said respective open end.

4,729,617

SCANNING CLOCK GENERATING DEVICE FOR OPTICAL SCANNER

Kazuyuki Shimada; Isamu Shibata, both of Tokyo, and Susumu Imakawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 25, 1986, Ser. No. 855,703
Claims priority, application Japan, Apr. 30, 1985, 60-92960
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **2 Claims**



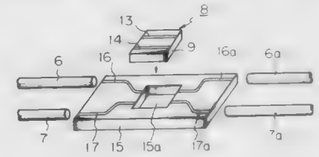
1. In an optical scanner of a type scanning a desired surface by a deflected light beam and without using an F-theta lens, a scanning clock generating device for generating an image scanning clock the frequency of which is continuously variable, comprising:
- an oscillator for oscillating a reference clock;
- a first frequency divider for dividing a frequency of the reference clock to produce a position control clock;
- an up-down counter for stepwisely varying a division ratio N which is assigned to said first frequency divider;
- a controller for, in the event of scanning a scanning range which is divided into K blocks BLi (i=1 to K), driving based on a predetermined finite series Mi (i=1, 2, . . ., K) said up-down counter responsive to every Mi pulses of the position control clock in an "i" block BLi (i=1 to K), thereby stepwisely switching over the division ratio N; and
- a phase locked loop for generating a scanning clock a frequency of which continuously varies responsive to the stepwise variation of the frequency of the position control clock.

4,729,618

INTEGRATED OPTIC CIRCUIT

Ken-ichi Yoshida, and Yoshikazu Nishiwaki, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 2, 1984, Ser. No. 576,483
Claims priority, application Japan, Feb. 4, 1983, 58-17240
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.11 **10 Claims**



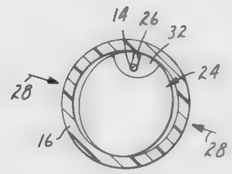
1. An integrated optic circuit comprising:
- an optical functional device comprising a first substrate made of a first material and, a plurality of first waveguides formed on said first substrate,
- a base portion comprising a second substrate made of a second material different from said first material, said second substrate having a recess for receiving said first substrate and, a plurality of second waveguides formed on said second substrate, each of said second waveguides having an inner end and a distal end, and
- a plurality of optical fibers, each of said fibers having a diameter D,
- wherein each waveguide inner end is coupled by one of said first waveguides and each waveguide distal end is coupled to an end of one of said optical fibers, said first waveguides are spaced apart a distance less than D and, said second waveguides at said distal end are spaced apart a distance greater than D.

4,729,619

OPTICAL FIBER CONNECTOR INCORPORATING MEANS FOR ISOLATING CONNECTION FROM EXTERNAL STRESSES

Jack P. Blomgren, Red Wing, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1986, Ser. No. 858,030
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **12 Claims**



1. An optical fiber connector comprising:
(A) an elongate, resiliently deformable housing with a passageway therethrough;

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(B) a first chock, secured within said passageway proximate to a first end of said housing and adapted to releasably secure at least a first optical fiber in cooperation with said housing; and

(C) a second chock, secured within said passageway proximate to a second end of said housing and adapted to releasably secure at least a second optical fiber in cooperation with said housing;

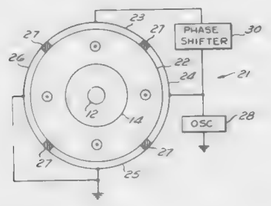
whereby a connection of said optical fibers located within said passageway is isolated and stabilized from stresses external to said housing.

4,729,620

FIBER OPTIC FREQUENCY SHIFTER

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 25, 1984, Ser. No. 613,827
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 **33 Claims**



21. A fiber optic frequency shifter for shifting an optical input signal having a frequency f_o to produce an optical output signal having frequency $f_o \pm 2f$, where f is the amount of frequency shift, comprising:

a length of optical fiber;

means for forming a rotating half-wave plate in said length of optical fiber;

means for controlling the rotation rate of said half-wave plate to control the difference between the frequency input to said half-wave plate and the frequency of the signal output from said half-wave plate; and

feedback means for processing the output signal of said half-wave plate to maintain the intensity of components in the output signal having the frequency f_o below a predetermined threshold value.

31. A method of shifting an input optical frequency of a frequency f_o to an output optical frequency $f_o \pm 2f$, comprising the steps of:

selecting a length of optical fiber;

forming a rotating half-wave plate in the length of optical fiber;

controlling the rotation rate of the half-wave plate to control the amount of the frequency shift; and

processing the output signal of the half-wave plate to maintain the intensity of components in the optical output signal having the frequency f_o below a predetermined threshold value.

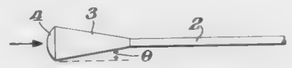
4,729,621

INTEGRAL OPTICAL FIBER COUPLER

William Edelman, Seal Beach, Calif., assignor to Shiley Inc., Irvine, Calif.

Filed Mar. 11, 1985, Ser. No. 710,196
Int. Cl.[4] A61N 5/06; G02B 6/32
U.S. Cl. 350—96.15 **14 Claims**

1. A device for transferring high energy electromagnetic radiation from an excimer laser to an optical fiber, which comprises a cone-shaped coupler having a wide proximal end and a narrow distal end, wherein the proximal end is in the form of a convex surface which acts as a focussing lens adapted to receive radiation from a laser and to transmit said radiation into and through said optical fiber and the distal end is attached to the input end of the optical fiber to form an integral assem-



bly therewith, said cone-shaped coupler being made from a material having the same refractive index as that of the optical fiber and having a taper angle θ defined by the equation

$$\theta = \sin^{-1}\left(\frac{N.A.}{\mu}\right),$$

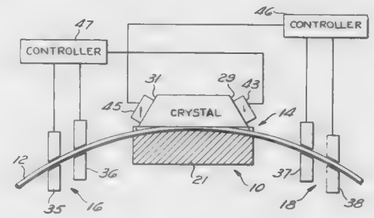
wherein N.A. is the numerical aperture of the fiber material and μ is the refractive index of the material of the coupler at the wavelength of the incident radiation.

4,729,622

FIBER OPTIC POLARIZER WITH ERROR SIGNAL FEEDBACK

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 5, 1983, Ser. No. 557,844
Int. Cl.[4] G02B 6/26, 6/09, 5/30
U.S. Cl. 350—96.15 **21 Claims**



1. A system for producing light having a selected polarization state, comprising:

a fiber optic waveguide having an interaction region;

a fiber optic polarizer for coupling light of a first polarization out of said fiber optic waveguide at the interaction region while leaving light of a second polarization within said fiber optic waveguide; and

processing means for processing light of the first polarization coupled out of said fiber optic waveguide to control the polarization of light before incidence upon said polarizer.

4,729,623

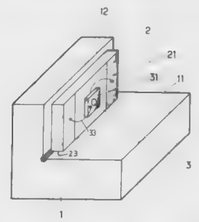
DEVICE FOR CONNECTING AN OPTICAL FIBER AND A PHOTODETECTOR AND METHOD FOR POSITIONING THE LATTER

Jean-Paul Mery, 41 rue Cantagrel, 75624 Paris Cedex 13, France

Filed Jun. 13, 1984, Ser. No. 620,030
Claims priority, application France, Jun. 14, 1983, 83 09815
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **21 Claims**

1. A device for connecting an end of an optical fiber to a photodetector, said fiber end having an endface opposite an active surface of said photodetector, said device comprising a first flat means for bearing said fiber end, a base member

shaped as a right dihedron having first and second mutually orthogonal surfaces, said first bearing means being secured on said first dihedron surface and said photodetector being se-



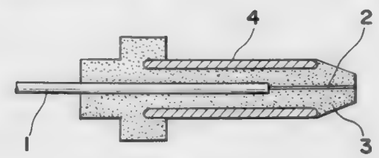
cured on said second dihedron surface, and second flat means secured to said second dihedron surface for bearing said photodetector.

4,729,624

FERRULE FOR OPTICAL CONNECTOR

Toshiaki Kakii; Koichiro Matsuno, and Shuzo Suzuki, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 11, 1985, Ser. No. 786,599
Claims priority, application Japan, Oct. 25, 1984, 59-225469
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **3 Claims**



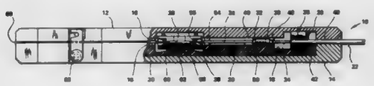
1. A ferrule for an optical connector having a flange portion, which is made of a resinous composition comprising a resin and carbon fiber as a filler, wherein at least part of the outer surface of said ferrule is surrounded by a metal tube, one end of which is embedded in the flange portion, one end of said ferrule protruding from the end of the metal tube that is not embedded in said flange portion, whereby a ferrule having increased flexural strength is provided.

4,729,625

OPTICAL FIBER SPLICE SLED

Claire E. Loscoe, Howell, N.J., and Joseph F. Larkin, Holland, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 511,423, Jul. 6, 1983, abandoned. This application Jul. 5, 1984, Ser. No. 628,091
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **13 Claims**



1. A housing for splicing optical fibers comprising:

first and second longitudinal mating integral shell portions having a pair of axial recesses at respective ends and a central recess therein for receiving optical fiber members and mounting members, and means for securing said shell portions together in a closed position to form a common enclosure surrounding said optical fiber and mounting members;

a removable alignment guide for receiving opposite ends of optical fibers to be spliced, said guide being disposed in said central recess of one of said shell portions; and

said mounting members including symmetrical first and second removable supports and retainer sleeves for holding optical fiber members, said supports having longitudinal slots for said retainer sleeves and grooves for said fibers, said supports being slidable within respective said axial recesses at opposite ends of said shell portions and central alignment guide to cause opposing optical fiber ends to enter said guide and engage to form a splice within said guide, said mating shell portions in said closed position retaining and securing said optical fiber and mounting members to maintain said splice.

4,729,626

SELF-LOCKING FIBER OPTIC SEAL

Lorin R. Stieff, Kensington, Md., assignor to The Fiber-Lock Corporation, Kensington, Md.

Filed Jul. 15, 1982, Ser. No. 398,490
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.22 **41 Claims**



1. Fiber optic seal apparatus comprising an elongated fiber optic bundle having first and second ends provided with first and second interlocking end fittings respectively, each of the end fittings being provided with fiber end light communicating openings for permitting passage of light through said fiber optic bundle, wherein the first end fitting is provided with a generally V-shaped groove having open top and bottom ends on opposite sides thereof and the second end fitting is provided with a flat longitudinally extending portion having a thickness slightly larger than the width of said open bottom end and smaller than the width of said open top end, said flat portion passing into the top end and out of the bottom end of said V-shaped groove and being held within the groove by engagement between said flat portion and said bottom end of the groove, the first end fitting being further provided with pathways on opposite sides of the V-shaped groove, a first portion of the fibers in said bundle extending through one of the pathways and the remainder of said fibers in said bundle extending through the other of said pathways.

4,729,627

OPTICAL FIBER CABLE FOR DETECTING LOW TEMPERATURE

Yasunori Saito, and Osamu Ichikawa, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

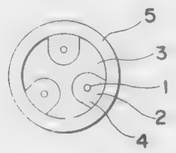
Filed Aug. 13, 1984, Ser. No. 640,093
Claims priority, application Japan, Aug. 15, 1983, 58-126253[U]; Aug. 15, 1983, 58-126254[U]
Int. Cl.[4] G02B 6/44; H01J 5/16
U.S. Cl. 350—96.23 **14 Claims**

1. An optical fiber cable for detecting a low temperature, comprising:

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a center member having a longitudinally extending groove in the outer surface thereof, said center member being made of a material having a low coefficient of linear expansion;

an optical fiber, contained in said groove, said optical fiber including a core and a cladding about said core, both said core and said cladding being made of silica glass;



a resin having a low glass transition temperature filling in the interior space of said groove not occupied by said optical fiber, said resin being in direct contact with said cladding such that changes in the physical properties of the resin due to temperature induce microbending in the optical fiber, thereby altering optical characteristics of said fiber; and

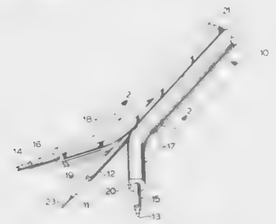
a protective covering surrounding the periphery of said center member containing said optical fiber and said resin.

4,729,628

FIBER OPTIC DROPWIRE

Heinrich A. Kraft, Roedental, Fed. Rep. of Germany, and David E. Vokey, Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Nov. 14, 1986, Ser. No. 930,669
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **11 Claims**



1. A communication cable comprising:

(a) an optical fiber having inner and outer coatings, the outer coating having a first melting point, said optical fiber disposed between two longitudinally extended strength members; and

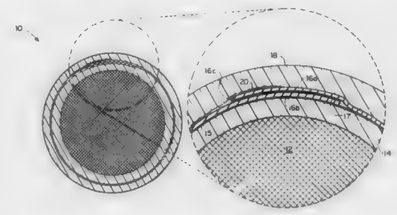
(b) an outer plastic jacket having a second melting point disposed around said coated optical fiber and said strength members, wherein the first melting point is higher than the second melting point; and said outer plastic jacket having two longitudinally extended grooves on opposite sides of the coated optical fiber in the plane containing the optical fiber and perpendicular to the plane containing the optical fiber and the two strength members.

4,729,629

BONDED SHEATH CABLE WITH LUBRICANT OVER SEAM

Yasunori Saito; Kenji Morita, both of Cary; Yves P. P. Simons, and Fred T. McDuffee, both of Raleigh, all of N.C., assignors to Sumitomo Electric Research Triangle, Inc., Research Triangle Park, N.C.

Filed Feb. 26, 1987, Ser. No. 19,071
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **23 Claims**



1. A bonded sheath cable comprising:

a cable which includes at least one conductor;

a layer of plastic material which encloses said cable;

a metallic shield which is wrapped around said layer of plastic material to form a longitudinal overlapped seam having overlying and underlying edge portions formed by overlapping adjacent longitudinal edges of said shield, said edge portions being bonded together;

a layer of viscous lubricating material which is applied along the length of said longitudinal overlapped seam; and

a jacket layer of plastic material which is bonded to substantially all of the outer surface of said shield except for the overlapped seam area to which said lubricating material has been applied;

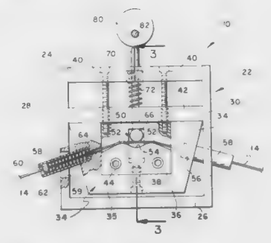
whereby said jacket layer is decoupled from said overlapped seam area of said shield in order to allow such relative movement therebetween as may be necessary to resist tearing of said jacket layer when the cable is subjected to twisting forces.

4,729,630

FIBER OPTIC TRANSDUCER

Armando S. Martinez, 515 Kelton Ave., Apt. M-9, Westwood, Calif. 90024

Filed Feb. 10, 1986, Ser. No. 827,971
Int. Cl.⁴ G02R *6/16*
U.S. Cl. 350—96.29 **15 Claims**



1. A fiber optic transducer, comprising:

an optical fiber;

a bending bridge having a pair of generally parallel convex surfaces separated by a concave surface;

means for supporting a portion of said fiber under predetermined tension to extend across said bridge in engagement with said convex surfaces. said support means including a transducer housing with said bending bridge therein and having said fiber threaded therethrough, and further including spring means associated with said fiber on opposite sides of said bending bridge for applying said predetermined tension to said fiber; and

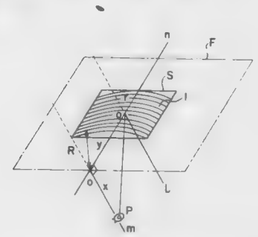
means for bending said fiber at a position generally between said convex surfaces.

4,729,631

REAR PROJECTION SCREEN

Hideo Takahashi, Yokohama; Masao Inoue, Tokyo; Shingo Suzuki, and Yasuaki Nakanishi, both of Zama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 43,025
Claims priority, application Japan, Apr. 30, 1986, 61-100452
Int. Cl.⁴ G03B *21/60*
U.S. Cl. 350—129 **13 Claims**



1. A rear projection screen having a front surface and a rear surface, in a rear projection screen apparatus which emerges light rays to be viewed to a viewing side, and which includes a light source with an optical axis along which light rays are projected onto said rear surface of said rear projection screen, said front surface of said rear projection screen confronting said viewing side, said rear surface of said rear projection screen having a principal line extending thereon and crossing the optical axis of said light source at a relatively steep angle, and being formed thereon with several prisms arranged in parallel with each other and being substantially orthogonal to the principal line at least crossing points therebetween, each of said prism having an incidence surface through which the light rays from said light source are introduced into said prism, and a reflection surface upon which the light rays introduced are reflected to be directed toward said front surface of the rear projection screen, and further said rear surface being formed in a concave cross-sectioned shape along said principal line.

4,729,632

COMMON PATH ACOUSTOPTIC ADAPTIVE LINEAR PREDICTORS

Jonathan D. Cohen, Hanover, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Ft. George G. Meade, Md.

Filed Nov. 25, 1986, Ser. No. 934,964
Int. Cl.⁴ G02B *5/18*; G06G *9/00*; G01S *13/58*
U.S. Cl. 350—162.12 **13 Claims**

1. A frequency domain optical adaptive linear predictor for predicting subsequent values of an input signal, comprising

(a) optical means for generating in a frequency plane the power spectrum of the input signal, said optical means including

(1) a source of collimated light;

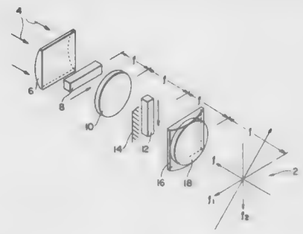
(2) first and second spaced acoustooptic modulators arranged in perpendicular orientation for diffracting light from said source of light, said acoustooptic modulators each being driven by an electrical signal including the input signal; and

(3) first lens means for transforming the light diffracted by said first and second acoustooptic modulators, the transformed light having an amplitude corresponding with the power spectrum of the input signal at the frequency plane;

(b) mask filter means arranged at a transform plane for removing components of the diffracted light; and

(c) transform-plane spatial filter means arranged beyond said mask filter means for optically processing said diffracted light to produce an output corresponding with the predicted subsequent values of the input signal, said transform-plane spatial filter means including

(1) a third acoustooptic modulator driven by an electrical signal including a residual signal comprising the difference between the input signal and the predicted signal,



said third acoustooptic modulator further diffracting the light from said mask filter means;

(2) second lens means for transforming the light from said third acoustooptic modulator; and

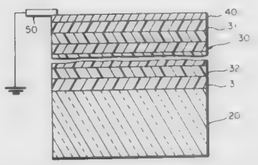
(3) an area detector for receiving the light output from said third acoustooptic modulator, said light output comprising the convolution of the diffracted light corresponding with the power spectrum of the input signal and the transform of the modulation from said third acoustooptic modulator, said detector producing an output corresponding with predicted subsequent values of the input signal.

4,729,633

DIELECTRIC MULTILAYER REFLECTOR, AND LASER SYSTEM BASED THEREON

Toshio Miyagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

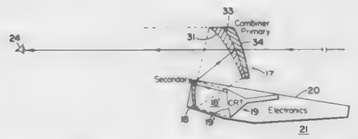
Filed Jun. 26, 1985, Ser. No. 749,096
Claims priority, application Japan, Jun. 29, 1984, 59-134301
Int. Cl.⁴ H01S *3/08*; G02B *1/10*
U.S. Cl. 350—166 **21 Claims**



1. A dielectric multilayer reflector for reflecting a laser beam at a prescribed reflectivity comprising a transparent substrate, dielectric layers formed over a surface of said transparent substrate and a conductive layer formed over a top surface of said dielectric layers wherein said conductive layer is of a thickness such that it does not adversely affect the reflectivity and transmissivity of the reflector.

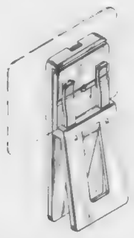
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4,729,634
REFLECTIVE HEAD-UP DISPLAY
Peter E. Raber, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Feb. 4, 1985, Ser. No. 697,677
Int. Cl.[4] G02B *27/14*
U.S. Cl. 350—174 **6 Claims**



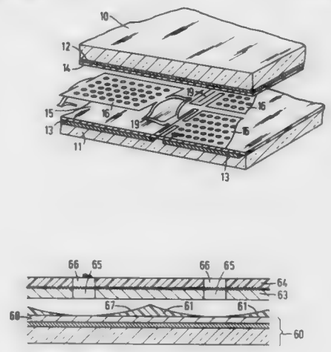
1. A head-up display arrangement for providing the image of a rearward facing display to the eye of a forward facing observer, said display being disposed in the direction of the observer, said arrangement comprising first and second converging means for reflecting the display image, characterized by said second converging means being situated closer to said display then said first converging means, facing substantially forwardly, having a concave rear surface reflector effective for reducing the separation between said display and said second converging means, and providing a reversal of image propagation direction directly onto said first converging means, and further convergence and aberration correction for said first converging means, and said first converging means facing substantially rearwardly, and being effective for combining an external image viewed by the observer with said display image, and for providing another reversal of image propagation direction for said display image.

4,729,635
HAND-HELD MICROSCOPE
Albert Saferstein; Gilbert Spector, both of Purchase, and Larry Tsuyuki, Scarsdale, all of N.Y., assignors to Innomed Inc., Purchase, N.Y.
Filed Jul. 21, 1986, Ser. No. 887,315
Int. Cl.[4] G02B *27/02*
U.S. Cl. 350—239 **6 Claims**



1. In a hand-held microscope having two articulated members movable towards and away from each other for focusing, the improvement wherein: one member has means thereon for holding a specimen to be examined and an object aperture with which the specimen is alignable during use; and the other member has a lens aperture aligned with the object aperture and means bearing at least two different lenses and rotatably mounted on the other member for bringing any one of the lens into alignment with the object aperture further comprising means biasing the two members into a rest position wherein the holding means and lenses are adjacent each other.

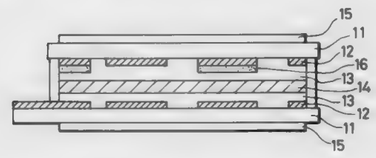
4,729,636
PASSIVE DISPLAY DEVICE HAVING MOVABLE ELECTRODES AND METHOD OF MANUFACTURING
Ties S. Te Velde, and Adriana T. A. Zegers Van Duijnhoven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 24, 1985, Ser. No. 748,243
Claims priority, application Netherlands, Jul. 12, 1984, 8402201
Int. Cl.[4] G02B *5/04, 26/02;* G09G *3/16*
U.S. Cl. 350—269 **24 Claims**



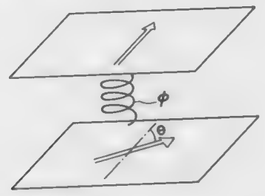
11. A method of manufacturing a passive display device, wherein said device comprises first and second supporting plates with at least one of said plates being transparent, first and second fixed electrodes on facing surfaces of said first and second supporting plates, an electrically insulating layer on each of said first and second fixed electrodes, third electrodes movable between said first and second fixed electrodes by electrostatic forces, said third movable electrodes having a pattern of apertures, and a plurality of discrete engaging points provided between at least one surface of said third movable electrodes and said electrically insulating layer, said plurality of discrete engaging points separating said third movable electrodes from said electrically insulating layer, said method comprising the steps of
providing a layer of a first material on a substrate,
providing a layer of a second material on said layer of said first material,
etching a pattern of apertures through said layer of said second material, and
removing parts of said layer of said first material to form said plurality of discrete engaging points by undercutting through said pattern of apertures in said layer of said second material, wherein at least one of said first and second material has an inhomogeneous composition through the thickness of at least one of a respective layer, said inhomogeneous composition varying etching sensitivity over said thickness.

4,729,637
LIQUID CRYSTAL DISPLAY DEVICE HAVING COLORED LAYER CONTAINING POLYAZO COMPOUND
Yasufumi Sato, Atsugi, and Yoshiyuki Nakura, Komae, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 1, 1986, Ser. No. 936,632
Claims priority, application Japan, Dec. 2, 1985, 60-272292
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 F **20 Claims**

1. A liquid crystal display device having a pair of opposing substrates, conductive films provided on said substrates, and a liquid crystal filled between the opposing substrates, comprising a colored layer containing a polyazo compound and being provided on at least one of said substrates.



4,729,638
LIQUID CRYSTAL-TYPE NONGLARE MIRROR
Yoshihiro Shirai, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 29, 1985, Ser. No. 759,824
Claims priority, application Japan, Aug. 1, 1984, 59-163271; Aug. 1, 1984, 59-163272; Oct. 12, 1984, 59-214628; Oct. 12, 1984, 59-214629
Int. Cl.[4] G02F *1/137*
U.S. Cl. 350—339 R **4 Claims**



1. A liquid crystal nonglare mirror comprising a guest-host liquid crystal between a transparent electrode base and a reflective electrode base, in which both bases of which rubbing directions are nonparallel are subjected to a treatment for homogeneous alignment and a twist angle of the liquid crystal is about 360° in order to prevent interference fringes.

4,729,639
DUAL FREQUENCY ADDRESSABLE LIQUID CRYSTALS AND METHODS OF USE
Robert L. Hubbard, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Division of Ser. No. 364,341, Mar. 29, 1982, abandoned. This application Apr. 24, 1984, Ser. No. 603,469
Int. Cl.[4] G02F *1/13;* C09K *19/30*
U.S. Cl. 350—346 **13 Claims**

1. A twisted nematic liquid crystal material suitable for use in a dual-frequency addressable liquid crystal cell, the material consisting essentially of:
(a) a base mixture consisting of at least two different base substances selected from the group of monoester compounds having the formula:

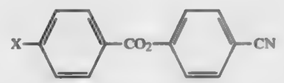
R—X—Y—CO_2—Z—R′

wherein each of R and R′, which may be the same the different, is an alkyl having 2–7 carbon atoms, and
wherein each of X, Y and Z, which may be the same or different, is a member selected from the group consisting of phenyl and trans-cyclohexyl, at least one of X, Y, and Z being cyclohexyl;
(b) up to ten weight percent of an additive component that has a strong, positive dielectric anisotropy and is suitable to lower the cross-over frequency of the base mixture; and
(c) up to twenty-five weight percent of a dopant to reduce the viscosity and melting point of the base mixture.

8. A dual-frequency addressable liquid crystal cell including
a spaced-apart pair of electrodes addressable by control means for applying an electrical signal thereto,
a body of liquid crystal material disposed between the electrodes, said material consisting essentially of
(a) a base mixture of at least two different base substances selected from the group of monoester compounds having the formula:

R—X—Y—CO_2—Z—R′

wherein R and R′ are the same or different straight chain alkyl compounds having 2–7 carbon atoms, and
wherein X, Y and Z are the same or different members of the group consisting of phenyl and trans-cyclohexyl, at least one of X, Y and Z being cyclohexyl,
(b) up to ten weight percent of at least one additive having the formula



wherein X is selected from the group consisting of

wherein R is a straight chain alkyl having 2–7 carbon atoms; and
(c) up to twenty-five weight percent of at least one dopant of the groups having the formulas



and

R—X—CO_2—Y—R′

wherein R and R′ are the same or different straight alkyl having 2–7 carbon atoms, and
wherein X and Y, which may be the same or different, each is a member selected from the group consisting of phenyl and cyclohexyl.

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LIQUID CRYSTAL LIGHT MODULATION DEVICE

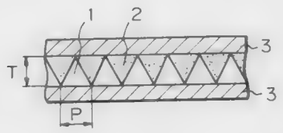
Hajime Sakata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,558

Claims priority, application Japan, Oct. 3, 1984, 59-207742; Oct. 4, 1984, 59-209256; Oct. 4, 1984, 59-209257; Oct. 4, 1984, 59-209258; Oct. 4, 1984, 59-209259; Oct. 4, 1984, 59-209260; Dec. 5, 1984, 59-256890; Dec. 7, 1984, 59-258571; Jan. 23, 1985, 60-10502; Jan. 23, 1985, 60-10503

Int. Cl.[4] G02F *1/13*; G02B *5/18*

U.S. Cl. 350—348 **36 Claims**



1. A liquid crystal liquid modulation device comprising:

a first substrate and a second substrate; said first substrate having a light-incident side for receiving incident light and a facing side facing said second substrate, said second substrate having a facing side facing said facing side of said first substrate, and said facing sides of said first and second substrates being parallel with each other and spaced a predetermined distance from each other;

an optical element having plural portions, and liquid crystals, said portions of said optical element and said liquid crystals being alternately arranged between said first and second substrates, the heights of said portions of said optical element and said liquid crystals in a direction normal to said facing sides being substantially the same, and said liquid crystals being separated from one another by the intervening portions of said optical element; and

control means for changing the refractive index of said liquid crystals, said control means causing said liquid crystals selectively to have at least two refractive indexes, one of said refractive indexes being substantially the same as that of said optical element and the other of said refractive indexes being different from that of said optical element so as to form a diffraction grating by said alternatively arranged liquid crystals and portions of said optical element.

4,729,641

FUNCTIONAL OPTICAL ELEMENT HAVING A NON-FLAT PLANAR INTERFACE WITH VARIABLE-INDEX MEDIUM

Kazuhiko Matsuoka; Kazuo Minoura; Masayuki Usui, all of Yokohama; Yukuo Nishimura, Sagamihara; Takeshi Baba, Yokohama; Atsushi Someya, Machida; Yuko Suga, and Kazuyo Matsumoto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 616,706, Jun. 4, 1984, abandoned. This application Apr. 30, 1987, Ser. No. 45,184

Claims priority, application Japan, Jun. 10, 1983, 58-103729; Oct. 7, 1983, 58-187857; Oct. 7, 1983, 58-187858

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—348 **9 Claims**

1. A functional optical element comprising:

a first optical member;

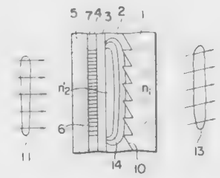
a second optical member in contact with said first optical member, said first and second optical members having configurations that provide an interface comprising a blazed-type diffraction grating; and

refractive index varying means for changing a refractive index of at least one of said first and second optical members, said refractive index varying means being capable of selectively creating a first state in which the refractive indices of said first and second optical members are equal and a second state in which the refractive indices of said first and second optical members are different.

8. An optical apparatus comprising:

a functional optical element having a first optical member and a second optical member in contact with said first optical member at an interface comprising a diffraction grating;

refractive index varying means for changing a refractive index of at least one of said first and second optical members, said refractive index varying means being capable of



selectively creating a first state in which the refractive indices of said first and second optical members are equal and a second state in which the refractive indices of said first and second optical members are different;

directive means for directing a light beam to said functional optical element;

first guiding means for guiding a light beam emitted from said functional optical element when said functional optical element is in said first state; and

second guiding means for guiding a light beam emitted from said functional optical element when said functional optical element is in said second state.

4,729,642

TIME-SHARING DRIVING METHOD FOR A CHIRAL SMECTIC LIQUID CRYSTAL SHUTTER

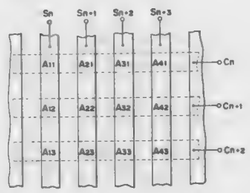
Syuzo Kaneko, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 759,138, Jul. 26, 1985, which is a division of Ser. No. 567,500, Jan. 3, 1984, Pat. No. 4,548,476. This application Apr. 2, 1987, Ser. No. 33,882

Claims priority, application Japan, Jan. 14, 1983, 58-5052

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **19 Claims**



1. A signal application method for a device comprising driving points arranged in a plurality of rows, each driving point comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal interposed therebetween having a first and a second stable orientation, comprising:

addressing said plurality of rows of driving points row by row in a time sharing manner; and

in an address period for an addressed row, (1) applying a first voltage signal, for providing a light-transmitting state based on said first stable orientation of the ferroelectric liquid crystal, at a driving point on the addressed row; said first voltage signal having first and second pulses; and (2) applying a second voltage signal, for providing a light-interrupting state based on said second stable orientation of the ferroelectric liquid crystal, at another driving point on the addressed row; said second voltage signal having third and fourth pulses; the first and fourth pulses being applied at different times, the second and third pulses being applied at different times, and the second and third pulses comprising voltages of mutually opposite polarities.

17. An apparatus for time-sharing voltage application, comprising:

a matrix electrode arrangement comprising a plurality of common electrodes and a plurality of signal electrodes intersecting with the common electrodes, and

voltage application means for (i) sequentially applying an address voltage to an addressed common electrode while applying a non-address voltage to a non-addressed common electrode, and (ii) applying signal voltages selectively to the signal electrodes in phase with the application of the address voltage; said signal voltages having mutually opposite polarities with respect to the address voltage and having the same polarity with respect to the non-address voltage.

4,729,643

TELEPHOTO ZOOM LENS SYSTEM FOR CAMERA

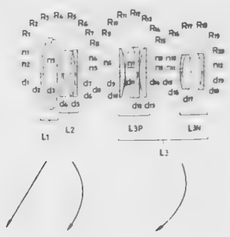
Isao Kawaguchi; Masakuni Tai, and Shin Ikeda, all of Tokyo, Japan, assignors to Tokina Optical Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 821,445

Claims priority, application Japan, Jun. 12, 1985, 60-125994

Int. Cl.[4] G02B *15/16, 9/64*

U.S. Cl. 350—427 **1 Claim**



1. A telephoto zoom lens system comprising from the objective side to the image side a first lens group having a positive refractive power, a second lens group having a negative refractive power and a third lens group having a positive refractive power, said third lens group being composed of an objective side positive lens subgroup and an image side negative lens subgroup, wherein upon zooming from the wide angle end toward the telephoto end, said first lens group moves along the optical axis from the image side toward the objective side, said second lens group first moves from the objective side toward the image side in the first half of movement and then moves from the image side toward the objective side in the latter half of movement, and said third lens group moves so as to maintain the image side focal point thereof in a fixed position of the overall lens system in conjunction with said first and second lens groups, said telephoto zoom lens satisfying the following conditions:

$$0.3 \cdot f_w \leqq f_3 \leqq 0.5 \cdot f_w \tag{1}$$

$$0.25 \cdot f_1 \leqq |f_2| \leqq 0.4 \cdot f_1 \tag{2}$$

$$f_w \leqq f_1 \leqq 2 \cdot f_w \tag{3}$$

$$1 \leqq |M_3| \leqq 2 \tag{4}$$

$$0.7 \leqq |M_2| \leqq 1.25 \tag{5}$$

$$n_N > n_p \tag{6}$$

$$\nu_{PP} > \nu_{PN} \tag{7}$$

$$\nu_{NN} \geqq \nu_{NP} \tag{8}$$

where f_1, f_2 and f_3 represent the respective focal distances of said first to third lens group; f_w the resultant focal distance of the overall lens system at the wide angle end; M_3 the magnification of the third lens group at the wide angle end; M_2 the magnification of the second lens group at the telephoto end; n_p the average value of the refractive index of the positive lens in said third lens group; n_N the average value of the refractive index of the negative lens in said third lens group; ν_{PP} the average value of the Abbe's number of the positive lens in said positive lens subgroup; ν_{PN} the average value of the Abbe's number of the negative lens subgroup; ν_{NP} the average value of the Abbe's number of the positive lens in said negative lens subgroup; and ν_{NN} the average value of the Abbe's number of the negative lens in said negative lens subgroup.

4,729,644

ZOOM LENS ASSEMBLY

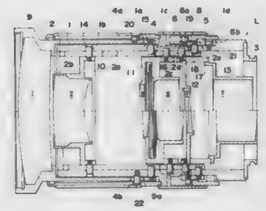
Masayuki Ueyama, Toyonaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Aug. 20, 1984, Ser. No. 642,330

Claims priority, application Japan, Aug. 19, 1983, 58-151985

Int. Cl.[4] G02B *15/00*

U.S. Cl. 350—429 **13 Claims**



1. A zoom lens assembly for a zoom lens in which a part of the zooming lens groups is commonly used for focusing, said lens assembly comprising:

a stationary barrel;

a cam ring movable relative to said stationary barrel in the direction of the optical axis of said zoom lens and also rotatable relative to said stationary barrel;

a manually operable zooming member;

a manually operable focusing member;

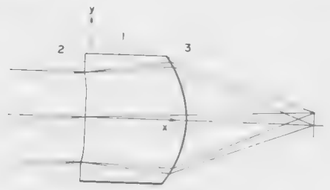
first transmission means for rotating said cam ring in response to manual operation of said zooming member;

second transmission means for moving said cam ring in the direction of said optical axis in response to manual operation of said focusing member; and

third transmission means for moving said zooming lens groups for zooming in response to the rotation of said cam ring and for moving said part of said zooming lens groups for focusing while keeping the remaining part of said zooming lens groups at rest in response to the movement of said cam ring in the direction of said optical axis.

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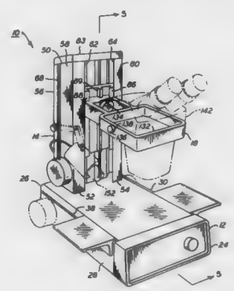
4,729,645
NON-SPHERICAL SINGLE LENS
Shigeyuki Suda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 18, 1986, Ser. No. 829,966
Claims priority, application Japan, Feb. 19, 1985, 60-31044
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 **6 Claims**

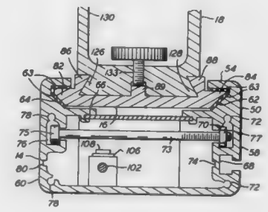


1. A non-spherical single lens comprising:
a first surface which is a non-spherical surface, said first surface being substantially zero in the curvature thereof near the optic axis and being of a non-spherical shape gradually displaced outwardly away from the optic axis; and
a second surface which is a convex spherical surface of a radius of curvature r, |r| being a value equal or approximate to d which is the thickness of said lens to such an extent that off-axis aberrations are sufficiently corrected for practical use.

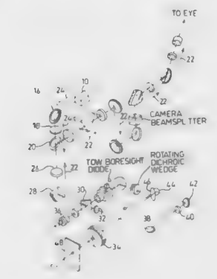
4,729,646
MULTI-USE MICROSCOPE HAVING MODULAR CONSTRUCTION OF EXTRUDED PARTS
James A. Clark, Honeoye Falls; Michael H. Dobner, Webster, and Paul A. Hoogesteger, Penfield, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed May 15, 1986, Ser. No. 863,635
Int. Cl.[4] G02B *21/24;* A47H *1/10*
U.S. Cl. 350—521 **29 Claims**

1. Modular apparatus for supporting a microscope, comprising:
an extruded column having included therein; (a) longitudinally extruded bearing ways for receiving and guiding a linearly moveable slide member having a microscope supported thereon, (b) a plurality of extruded fastener receiving apertures, and (c) means for removing play from the linearly moveable slide member including a pair of slots extruded in said column on opposite sides thereof, said slots having means disposed therein for pivoting said opposed sides about said slots toward or away from each other to thereby adjust said linearly moveable slide member.



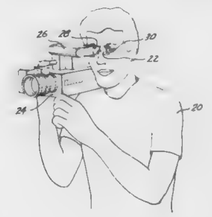


4,729,647
RETROFIT OPTICAL TURRET WITH LASER SOURCE
Menachem M. Goldmunz, Jerusalem; Michael L. Neugarten, Ramat Efal, and Yonatan Gerlitz, Herzlia, all of Israel, assignors to Israel Aircraft Industries Ltd., Lod, Israel
Filed Aug. 12, 1986, Ser. No. 895,707
Claims priority, application Israel, Sep. 9, 1985, 76343
Int. Cl.[4] G02B *23/04, 23/10, 27/64*
U.S. Cl. 350—537 **12 Claims**



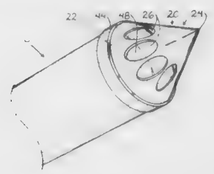
1. A retrofitted optical sight cluster system comprising:
a turret support structure defining a gimballed lower turret area and a fixed upper turret area sealed from the lower turret area;
optics mounted onto the turret support structure including
a gimbal mounted optics assembly, including narrow field of view and wide field of view optics, for providing a stabilized image of an outside scene viewed through a window; and
a relay optics assembly fixedly mounted on the turret support structure for transmitting said stabilized image in a first direction along an optical path extending through the upper turret area to an operator's eye;
a laser source mounted in said fixed upper turret area; and
means for diverting the radiation output of said laser source so as to pass along at least a portion of said optical path from the fixed upper turret area to the gimballed lower turret area in a second direction opposite to the first direction.

4,729,648
PARTIAL EYESHIELD
Jeffrey A. Armstrong, 9644 Observation Dr., Kirkland, Wash. 98033
Filed Nov. 10, 1986, Ser. No. 928,929
Int. Cl.[4] G02B *23/00;* G03B *11/00, 13/00*
U.S. Cl. 350—578 **19 Claims**



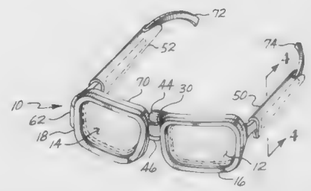
1. In combination with a camera used by a person, said person having a sighting eye and a nonsighting eye, an improvement comprising:
(a) a partial shielding means for occupying a portion of the nonsighting eye's field of view sufficient to:
(i) cause the image in the portion of the sighting eye's field of view transmitted through the camera's sighting aperture to dominate and suppress the image in the corresponding portion of the nonsighting eye's field of view, and
(ii) maintain unobstructed, usable vision in at least a portion of the nonsighting eye's medial field of view; and
(b) a supporting means for supporting the partial shielding means before the nonsighting eye.

4,729,649
FUNCTIONAL SHIELD FOR A TELESCOPE
Charles A. Thompson, P.O. Box 514, Elgin, Ill. 60121
Filed Dec. 9, 1986, Ser. No. 939,943
Int. Cl.[4] G02B *23/16;* G03B *11/04*
U.S. Cl. 350—579 **19 Claims**



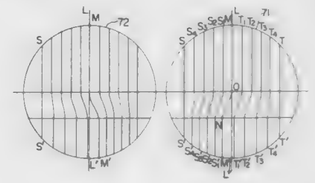
1. A unitary, combined-purpose, functional shield for a telescope, said telescope having a light receiving end, to assist with focusing of light in a telescope and protecting of said telescope from dew wherein:
a. said shield has a closed end and an open end to form a cap for a lens of said telescope to achieve protection from dew for said telescope;
b. said cap has at least two apertures between said open end and said closed end symmetrically spaced around said cap,
c. said open end is of sufficient size to cover said telescope lens; and
d. said shield protrudes from said light receiving end.

4,729,650
REMOVABLE SUNGLASSES FOR USE WITH CONVENTIONAL EYEGLASSES
Lucinda K. Jennings, 4022 Densmore Ave., Everett, Wash. 98205
Filed Apr. 15, 1987, Ser. No. 38,670
Int. Cl.[4] G02C *9/00, 7/08*
U.S. Cl. 351—47 **6 Claims**



1. A pair of removable sunglasses adapted to be attached to the front of a pair of conventional eyeglasses having a frame with a centrally located bridge and a pair of bows, said sunglasses comprising:
a pair of transparent lenses;
a center section connecting each lens and including a hinge permitting the glasses to be folded for storage and means for removably attaching the sunglasses to the bridge in front of the eyeglasses; and
a pair of side pieces, each hinged to an associated lens and including means for removably securing the sunglasses to one of the bows.

4,729,651
PROGRESSIVE POWER OPHTHALMIC LENS
Akira Kitani, Fussa, Japan, assignor to Hoya Lens Corporation, Tokyo, Japan
Filed Mar. 2, 1982, Ser. No. 354,051
Claims priority, application Japan, Jun. 19, 1981, 56-95072
Int. Cl.[4] G02C *7/06*
U.S. Cl. 351—169 **3 Claims**



1. An ophthalmic lens having two refractive surfaces, one of said refractive surfaces including an imaginary first meridian curve (M—M') called an umbilical meridian curve extending substantially in the vertical direction along said refractive surface when said refractive surface is viewed from a direction substantially orthogonal with respect thereto in the condition in which said lens stands in the same vertical direction as that mounted on a wearer, the distribution of the radius of curvature of said umbilical meridian curve (M—M') including a zone in which the radius of curvature decreases gradually from an

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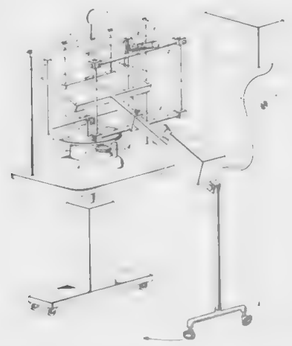
upper portion toward a lower portion of said curve according to a predetermined rule, the radii of curvature at the intersections of orthogonal curves crossing at right angles with said umbilical meridian curve (M—M′) in said refractive surface being substantially equal to the radii of curvature of said umbilical meridian curve (M—M′) at said intersections respectively so that the astigmatism along said umbilical meridian curve (M—M′) in said refractive surface is almost equal to zero, said umbilical meridian curve (M—M′) dividing said refractive surface into two lateral areas closer to the nasal side and temporal side respectively when said lens is mounted on the wearer, said two lateral areas of said refractive surface being asymmetrical with each other, said refractive surface being such that, when a second meridian curve (L—L′) extendiang in the vertical direction along said refractive surface to overlap, intersect or contact with said umbilical meridian curve (M—M′) in an upper region of said refractive surface is imagined, said umbilical meridian curve (M—M′) is displaced toward the nasal side relative to said second meridian curve (L—L′) in a lower region of said refractive surface, while it is less gradually displaced toward the nasal side relative to said second meridian curve (L—L′) in an intermediate region of said refractive surface, said intermediate and lower regions in which said umbilical meridian curve (M—M′) is displaced more or less toward the nasal side relative to said second meridian curve (L—L′) including at least one sectional curve which extends in the horizontal direction within a range of not more than 15 mm on opposite sides of said umbilical meridian curve (M—M′) and along which the distribution of astigmatism on the nasal side relative to said umbilical meridian curve (M—M′) is asymmetrical with that on the temporal side.

4,729,652

APPARATUS AND METHOD FOR DETERMINING ANGULAR ORIENTATION OF EYE

Rolf Effert, Aachen, Fed. Rep. of Germany, assignor to Eye Research Institute of Retina Foundation, Boston, Mass.

Filed Nov. 4, 1985, Ser. No. 794,752
Int. Cl.⁴ A61B *3/14*
U.S. Cl. 351—210 **14 Claims**



1. A method of determining the angular orientation of an eye of a subject fixating on a target, such method comprising the steps of:

A. illuminating an eye of the subject with a collimated beam of a light source mounted on a pivotal frame constrained for rotational motion about a frame axis said frame being aligned so that so that the frame axis is coincident with a selected central axis of the eye, said light source directing light at the subject's eye at an illumination angle offset from the eye's optic axis so that the first and fourth Purkinje images of said light reflected from said eye are distinctly separate and form a visually determinable line when viewed from a direction offset from the optic axis by said illumination angle on a side thereof opposite to the light source;

B. viewing from said direction offset from the optic axis, the first and fourth Purkinje images of the light reflected from the eye of the subject; and

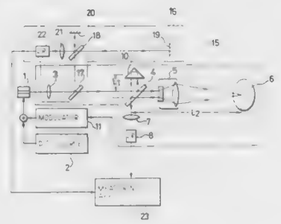
C. rotating the frame about the central axis while illuminating the eye and viewing the Purkinje images until the first and fourth Purkinje images determine a line parallel to the central axis, whereby the optical axis of the eye is determined to lie in a plane defined by the central axis and the light source, whereby said angular orientation of the frame provides a direct measure of the orientation of said optic axis.

4,729,653

METHOD AND APPARATUS FOR MEASURING DISTANCE BY LASER BEAM

Takao Kobayashi, Fukui, Japan, assignor to Shibuya Kogyo Co., Ltd., Ishikawa, Japan

Filed Feb. 20, 1986, Ser. No. 831,388
Claims priority, application Japan, Mar. 28, 1985, 60-64310; Mar. 28, 1985, 60-64311
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—4.5 **8 Claims**



1. A method of determining an unknown distance to an object by the use of a laser beam, comprising:

causing a first portion of the laser beam to travel over the unknown first distance to the object, be reflected from the object, and return over said unknown first distance as a first reflected beam;

causing a second portion of the laser beam to travel over a given second distance, be reflected from a standard reflector, and return over said given second distance as a second reflected beam;

superimposing the first and second reflected beams upon each other;

modulating the frequency of the laser beam to cause the superimposed reflected beams to produce a measuring beat wave;

causing a third portion of the laser beam to travel over a given third distance, be reflected from a first reference reflector, and return over said given third distance as a third reflected beam;

causing a fourth portion of the laser beam to travel over a given fourth distance, be reflected from a second reference reflector, and return over said given fourth distance as a fourth reflected beam;

superimposing the third and the fourth reflected beam upon each other, and thereby producing a reference beat wave due to said modulating of the frequency of the laser beam;

determining a ratio of the number of waves in the measuring beat wave to the number of waves in the reference beat wave; and

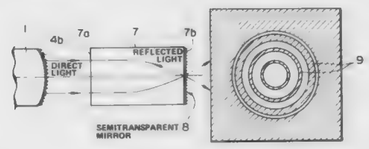
using the ratio of the numbers of waves and known distances to the reflectors to calculate said unknown first distance to the object.

4,729,654

LASER INTERFEROMETER

Tomohiko Akuta, Nagoya, and Masamitsu Naito, Tokyo, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 20,024
Claims priority, application Japan, Feb. 28, 1986, 61-043288
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—4.5 **5 Claims**



1. A laser interferometer comprising:

a laser device having a first semitransparent mirror formed at an emitting end which emits a substantially collimated beam of light;

an optical lens having an incident side and an emitting side and disposed movably relative to said laser device, said optical lens having an optical axis aligned with an optical axis of the collimated beam of light emitted form said laser device and a second semitransparent mirror formed at the emitting side thereof on which a beam of light passing through the incident side forms a focal point;

photoelectric transducer means for converting interference fringes produced at the emitting side of said optical lens to an electrical signal; and

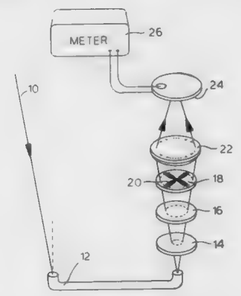
relative distance detecting means for detecting the number of the interference fringes passing through a predetermined point and the direction of movement of the interference fringes based on a detection signal of said photoelectric transducer means and for detecting the relative distance between said laser device and said optical lens.

4,729,655

DEVICE FOR SHAPING THE ANGULAR RESPONSE OF A LIGHT METER OR THE ANGULAR EMISSION OF A LIGHT SOURCE

Richard D. Boggy, Milpitas, and Eric G. Marason, Mountain View, both of Calif., assignors to Chromadyne Corporation, Sunnyvale, Calif.

Filed Oct. 28, 1986, Ser. No. 924,023
Int. Cl.⁴ G01J *1/00;* **G01B** *11/26;* **H01J** *5/16*
U.S. Cl. 356—121 **18 Claims**



1. A light modifying device capable of shaping the angular response of a radiometer or shaping the angular emission pattern of a light source comprising

(a) an optical fiber bundle, said fiber bundle having the property of spreading light ray bundles of different input angles into uniform output cones of light with cone angles equal to the respective input angles of said light ray bundles; and

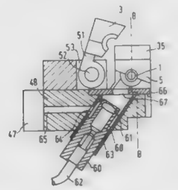
(b) a correcting element, said correcting element having light transmitting and light blocking regions such that said light blocking region block desired fractions of (1) said output cones of light in the case of the radiometer, or of (2) said light ray bundles of different input angles in the case of the light source.

4,729,656

ELECTROTHERMAL ATOMISER

John E. Churchill; Michael D. Flack, and David S. Widmer, all of Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 741,988, Jun. 6, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 28,003
Claims priority, application United Kingdom, Jun. 11, 1984, 8414815
Int. Cl.⁴ G01N *21/74*
U.S. Cl. 356—312 **7 Claims**



1. An electrothermal atomizer for atomic spectroscopy comprising

a tubular graphite body,

first electrical contact means for connecting an electrical current supply to one end of said tubular body, said first electrical contact means including a first graphite member, and

second electrical contact means for connecting an electrical current supply to the other end of said tubular body, said second electrical contact means including a second graphite member,

the improvement comprising

said first and second graphite members forming an enclosure surrounding a major portion of said tubular body to provide a containment zone for flowing protective gases over said tubular body, said first and second graphite members being slightly separated from one another to provide access to said tubular body,

each of said first and said second graphite members including first and second separable portions surrounding said tubular body, said first and said second graphite members being arranged such that said tubular body is supported by said first portions of each of said first and said second graphite members upon separating said second separable portions from said first portions, and

said first and said second separable portions being separated from one another in a direction transverse to a plane parallel the longitudinal axis of said tubular body.

4,729,657

METHOD OF CALIBRATING REFLECTANCE MEASURING DEVICES

David M. Cooper, Duluth, Ga., and Ralph S. Hernicz, Elk Grove Village, Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 23, 1986, Ser. No. 877,169
Int. Cl.⁴ G01J *3/02*
U.S. Cl. 356—319 **4 Claims**

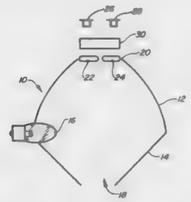
1. A method of calibrating a spectrophotometer for measur-

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ing the reflectance of a test sample, said spectrophotometer including a readhead, a broad spectrum light source mounted in said readhead, a first sample aperture, a second aperture, at least one lens in said second aperture, at least one detector for collecting reflected light whereby said detector provides an output signal proportional to the intensity of collected reflected light, a secondary reflectance standard in said readhead and a memory, the method comprising:

detecting the amount of light reflected from at least two primary reflectance standards with different known reflectances for a plurality of wavelengths of operation of said spectrophotometer;

calculating a least-squares linear regression line for said known reflectances and the output signals for said primary



reflectance standards at a plurality of wavelengths of operation;

calculating an offset reflectance for stray light for a plurality of wavelengths using the slope and intercept of said least-squares linear regression lines;

detecting for said plurality of wavelengths the amount of light reflected from a secondary reflectance standard with a known reflectance;

calculating the secondary standard reflectance for said plurality of wavelengths of spectrophotometer operation using the slope and intercept of said least-squares linear regression lines; and

storing said offset reflectance and said secondary standard reflectance for said plurality of wavelengths in said memory.

4,729,658

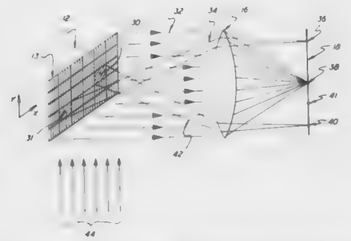
VERY WIDE SPECTRAL COVERAGE GRATING SPECTROMETER

Sherman K. Poultney, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 5, 1986, Ser. No. 871,056

Int. Cl.[4] G01J *3/18, 3/36*

U.S. Cl. 356—328 **19 Claims**



1. A very wide spectral coverage grating spectrometer which comprises:

light gathering means to gather light from a scene being viewed;

collimating means to collimate the light from a scene being viewed;

a two dimensional substantially continuous mosaic grating array, disposed in collimated space, having a plurality of grating elements in each of the two dimensions, said plurality of grating elements being comprised of at least two different grating rulings;

a plurality of substantially continuous detector arrays disposed substantially on a single focal plane; and

focusing means to focus light diffracted from said mosaic grating onto said single focal plane.

4,729,659

METHOD AND APPARATUS FOR MEASURING A LIQUID MOBILITY

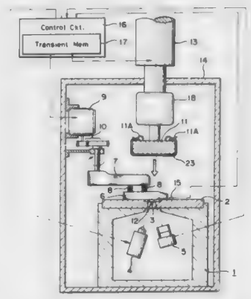
Nobuo Bessho, and Shozo Nishida, both of Tokyo, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 909,920

Claims priority, application Japan, Sep. 30, 1985, 60-214738

Int. Cl.[4] G01N *21/90, 15/04*

U.S. Cl. 356—342 **17 Claims**



1. A method of measuring a liquid mobility comprising the steps of:

disposing a specimen at least partially containing liquid in a specimen chamber having a recessed form and made at least partially of a transparent material;

pressing a liquid-absorbent material capable of absorbing said liquid against an opening of said specimen chamber to absorb said liquid;

projecting a light onto one surface of said specimen in said chamber from a light source so that the projected light is scattered from said specimen;

detecting an intensity of said scattered light coming from at least said one surface of said specimen; and

measuring mobility characteristics of said liquid in accordance with a change in the intensity of said scattered light thus detected.

4,729,660

POSITION MEASURING APPARATUS OF MOVING VEHICLE

Toshihiro Tsumura, 7-21 Abiko 3-chome, Sumiyoshi-ku, Osaka-shi, Osaka-fu, Japan 558, and Takeshi Tsumura, 8-80 Sumiyoshi 5-chome, Tokushima-shi, Tokushima-ken, Japan 770

Filed Mar. 20, 1986, Ser. No. 841,896

Claims priority, application Japan, Mar. 22, 1985, 60-59014; May 4, 1985, 60-95851

Int. Cl.[4] G01B *11/14*

U.S. Cl. 356—375 **12 Claims**

1. An apparatus for measuring the position of a moving vehicle by utilizing reflection of light, comprising

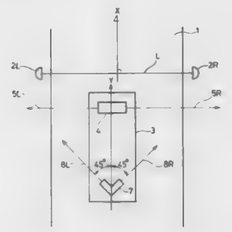
light reflecting means disposed along a course for said moving vehicle and positioned in a predetermined relationship

to a predetermined reference direction of movement for said vehicle, said light reflecting means having first and second reflectors with an optical characteristic for reflecting an incident light beam back along its path of incidence, said reflectors being disposed in spaced relationship so that said vehicle passes through the space between said reflectors while moving along said course,

light emitting means in said vehicle for emitting lights to the outside of said moving vehicle,

means in said vehicle for directing light emitted by said light emitting means laterally outward on each side of said vehicle and in such a direction that light strikes each of said reflectors as said vehicle passes proximate thereto,

photodetecting means in said vehicle for detecting light



reflected from said light reflecting means, and positioned to receive light form each of said light reflecting means, said photodetecting means producing first and second electrical signals indicating the detection of light from said first and second reflectors respectively,

moving direction measuring means in said vehicle responsive to said first and second electrical signals for measuring the angle of deviation of the direction of movement of said moving vehicle with respect to said reference direction, and

position detecting means in said vehicle for detecting a position of said moving vehicle based on the angle of deviation measured by said moving direction measuring means and said first and second electrical signals of said photodetecting means.

4,729,661

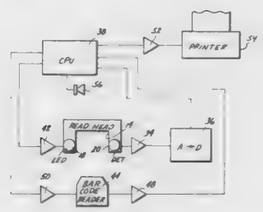
ASYNCHRONOUS SERIAL CUVETTE READER

Michael Bell, Corona, Calif., assignor to Specialty Medical Industries, Inc., Garden Grove, Calif.

Filed Jul. 29, 1985, Ser. No. 760,107

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—437 **1 Claim**



1. A method of asynchronously, optically measuring the contents of a plurality of sample cells without any timing indicia comprising the steps of:

manually moving said plurality of sample cells adjacent to a source of light and a detector of light;

quantifying the light intensity received by said detector of light at predetermined time periods;

detecting an abrupt change in said intensity of said light during one of said predetermined time periods:

determining if said abrupt change in said intensity of said light persists for a predetermined number of said time periods: and

storing a value corresponding to said intensity of said light quantified during one of said predetermined time periods when said step of determining establishes persistence of said abrupt change in said light intensity where said step of detecting said abrupt change in said intensity of said light comprises the steps of:

computing a moving average of quantified values of said light intensity as quantified during a predetermined proceeding number of said time periods;

where said step of determining includes the step of comparing a quantified value of said intensity of light to the just previously computed moving average; and

where said step of storing said value corresponding to said intensity of said light is performed only if said step of comparing indicates a difference between said quantified intensity of said light over said moving average by a predetermined amount.

4,729,662

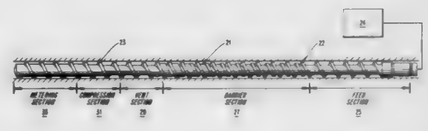
METHOD FOR EXTRUDING LIQUID CRYSTALLINE POLYMERS

Keith T. O'Brien, Edison, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 2, 1986, Ser. No. 847,387

Int. Cl.[4] B28C *1/16, 3/00;* **B29B** *1/04*

U.S. Cl. 366—89 **6 Claims**



1. A method of extruding a low melt viscosity polymer which forms an anisotropic melt phase, comprising the steps of:

feeding the polymer to a feed section of an extruder screw;

subjecting at least portions of the polymer to a gradually decreasing channel depth in a barrier section extending along a substantial portion of the length of the screw to aid melting of the polymer during passage along the screw;

venting the melted feed material in a vent section;

gradually compressing the material over a comparatively low ratio in a compression section; and

rotating the extruder screw at a high rate of speed to effect a high pressure discharge of the material leaving the compression section.

4,729,663

CYCLONE MIXER FOR THE CONTINUOUS MIXING OF PULVERULENT SUBSTANCES WITH LIQUIDS

Roland Karg, Montana, Switzerland, assignor to Ytron Dr. Karg GmbH, Affalterbach, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,841

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517879

Int. Cl.[4] B01F *7/26, 15/02*

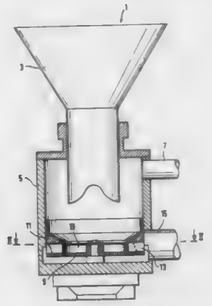
U.S. Cl. 366—165 **4 Claims**

1. A cyclone mixer for the continuous mixing of pulverulent substances with liquids, said cyclone mixer comprising:

a mixing chamber,

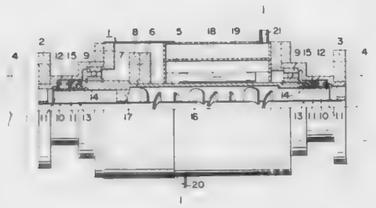
VOL 1088 ISS 2 MR 8 1988 UMI

a tangential suction tube for liquids located in an upper region of said mixing chamber,
a pump impeller located in a lower region of mixing chamber,
a charging mechanism for introducing pulverulent substances above an eye of said pump impeller,
a dispersing mechanism surrounding said pump impeller,
a lower region of a centrifugal flow produced by said pump impeller being guided through said dispersing mechanism



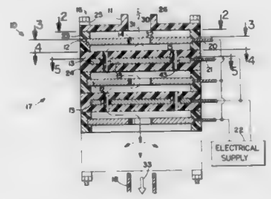
into a circular chamber and being removed from said circular chamber through an outlet arranged in said circular chamber,
said dispersing mechanism being constructed as a lamellar ring surrounding said pump impeller and which includes baffle lamellas uniformly distributed over its circumference, said baffle lamellas extending substantially radially outward sand having inner end portions located immediately adjacent to a radial outer boundary of said pump impeller.

4,729,664
IN-LINE MIXER
Mitsuo Kamiwano, Yokohama, and Yoshitaka Inoue, Tokyo, both of Japan, assignors to Inoue Seisakusho (Mfg.) Co., Ltd., Kanagawa, Japan
Filed Nov. 14, 1986, Ser. No. 931,240
Claims priority, application Japan, Nov. 18, 1985, 60-256547
Int. Cl.[4] B01F *9/00*
U.S. Cl. 366—230 **22 Claims**



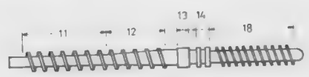
1. An in-line mixer for insertion in a pipeline to effect mixing of material flowing through the pipeline, the in-line mixer comprising: a housing having a pair of openings at opposite ends thereof and insertable in a pipeline during use of the in-line mixer so that the material flowing through the pipeline enters one opening and exits the other opening; a rotary tubular casing rotatably disposed within the housing, the tubular casing having opposite ends communicating with the housing openings so that the material which enters the one housing opening flows through the inside of the tubular casing and exits the other housing opening; mixing means disposed within the tubular casing and coacting therewith during rotation of the tubular casing to effect mixing and stirring of the material accompanied by advancement of the material through the tubular casing; and electromagnetic driving means for electromagnetically rotationally driving the tubular casing, the electromagnetic driving means comprising at least a part of the tubular casing being composed of magnetic material, and electromagnetic means disposed around and spaced from the outside of the tubular casing adjacent the magnetic material for electromagnetically generating a rotating magnetic field of sufficient strength to induce rotation of the tubular casing through the magnetic coupling of the rotating magnetic field with the magnetic material of the tubular casing.

4,729,665
FLUID MIXER/CHARGER AND METHOD
Paul R. Goudy, Jr., Milwaukee, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.
Continuation of Ser. No. 645,809, Aug. 29, 1984, Pat. No. 4,684,254. This application Dec. 22, 1986, Ser. No. 945,353
Int. Cl.[4] B01F *5/06*
U.S. Cl. 366—340 **17 Claims**



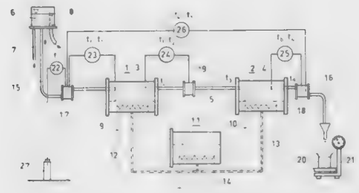
1. A fluid mixing and charging device, comprising
inlet means for receiving an input flowing fluid,
outlet means positioned to receive fluid from said inlet means for directing an output flowing fluid,
each of said inlet means and outlet means comprising a plurality of disc-like members, said disc-like members being positioned in the device along an overall flow path thereof to form a plurality of capacitors, one of said disc-like membes including opening means therethrough for dividing fluid directed thereto into a plurality of streams, and the other of said disc-like members having a single opening therethrough for recombining such streams for mixing thereof, and
charge coupling means coupled to said inlet and outlet means for coupling or removing an electrical charge wiht respect to at least one of said inlet means and outlet means to affect the charge of fluid flowing in the device.

4,729,666
SCREW FOR MOLDING THERMOPLASTIC RESIN HAVING A STRESS RELAXATION SECTION
Toyokazu Takubo, Chiba, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan
Filed Aug. 15, 1986, Ser. No. 896,902
Claims priority, application Japan, Aug. 16, 1985, 60-180846; Aug. 16, 1985, 60-180847
Int. Cl.[4] B29B *7/42*
U.S. Cl. 366—343 **17 Claims**



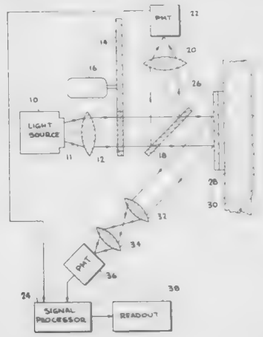
1. A screw for molding thermoplastic resin, comprising: a feed section, a compression section which is a relaxed compression section having a compression ratio in the range of 3 or less, a shearing section and a stress relaxation section being successively provided from a resin feed side to a resin extrusion side, and a mixing section being provided intermediate said shearing section and said stress relaxation section, the length of said shearing section being in the range of 0.2–2 times the diameter of said screw, the length of said stress relaxation section being in the range of 4–15 times the diameter of said screw, and a ratio L/D between the total length L and the diameter D of said screw being in the range of 15–40.

4,729,667
PROCESS AND DEVICE FOR THE DETERMINATION OF THE THERMAL RESISTANCE OF CONTAMINATED HEAT EXCHANGE ELEMENTS OF THERMODYNAMIC APPARATUSES, IN PARTICULAR OF POWER STATION CONDENSERS
Francisco Blangetti, Wettingen; Reinhard Müller, Baden, both of Switzerland, and Helmut Lang, Plainsboro, N.J., assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland
Filed Jun. 16, 1986, Ser. No. 874,644
Claims priority, application Switzerland, Jun. 17, 1985, 2553/85
Int. Cl.[4] G01N *25/20, 25/00*
U.S. Cl. 374—43 **4 Claims**



1. A method of determining the thermal resistance of a deposit layer in a tubular heat exchange element of a thermodynamic apparatus caused by cooling liquid passing through said heat exchange element comprising the steps of:
mounting a contaminated heat exchange element in a first condenser chamber, and mounting a non-contaminated heat exchange element in a second condenser chamber, said heat exchange elements being of substantially identical physical properties, except for the presence of corrosion and contamination in said contamined heat exchange element,
feeding a cooling liquid in succession through said contaminated heat exchange element and said non contaminated heat exchange element,
feeding a heating fluid in said first and second chambers around said contaminated and said non contaminated heat exchange elements, said cooling liquid feeding and said heating fluid feeding occurring under substantially the same thermodynamic and rheological conditions as exist in the thermodynamic apparatus,
measuring the cooling liquid inlet and outlet temperatures of both said heat exchange elements, the mass flow of cooling liquid, the temperatures of said fluid flowing around both said heat exchange elements, and the heat flows passing to the heat exchange elements,
determining the thermal resistances of each of said heat exchange elements,
calculating the thermal resistance of the deposit layer from the difference of the thermal resistance of said contaminated heat exchange element and of the thermal resistance of said noncontaminated heat exchange element.

4,729,668
METHOD AND APPARATUS FOR OPTICAL TEMPERATURE MEASUREMENTS
S. Michael Angel, and Tomas B. Hirschfeld, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 22, 1986, Ser. No. 854,631
Int. Cl.[4] G01K *11/20*
U.S. Cl. 374—161 **13 Claims**



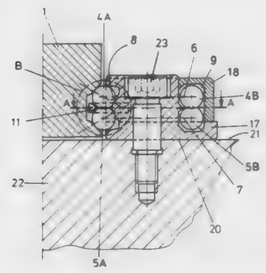
1. A method for monitoring the temperature of a substance, the method comprising the steps of:
contacting a temperature probe material with the substance, the temperature probe material having an excitation-dependent emission line whose fluorescence intensity varies directly with temperature whenever excited by light having a first wavelength, and where the excitation-dependent emission line has a fluorescence intensity that varies inversely with temperature whenever excited by light having a second wavelength, which is different from the first wavelength;
alternatively illuminating the temperature probe material with a first illumination beam comprising light of the first wavelength and a second illumination beam comprising light of the second wavelength;
measuring for successive periods of illumination by the first and second illumination beams the fluorescent intensity of the excitation-dependent emission line;
computing a ratio of successively measured intensities; and
relating the ratio of successively measured intensities to the temperature of the substance.

4,729,669
LINEAR BALL BEARING FOR CARRIAGE OF MACHINE TOOL
Lothar Walter, Schweinfurt; Uwe Mayer, Münnerstadt, and Zoltan Laszlofalvi, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Linearsysteme GmbH, Schweinfurt, Fed. Rep. of Germany
Filed Nov. 21, 1986, Ser. No. 934,172
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542478
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 **16 Claims**

1. In a linear ball bearing comprising a carriage having first and second adjacent longitudinal races, said linear ball bearing having a support with first and second guideways for receiving first and second endless rows of balls arranged to circulate in adjacent planes, whereby said first and second guideways respectively include first and second longitudinal raceways for loaded balls with open sides toward said first and second carriage races, respectively, and first and second reversal raceways for at least partly enclosing unloaded balls, said reversal

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raceways respectively connecting the ends of said first and second raceways for carrying loaded balls, and guide means fastened to said support to extend over said first and second raceways for loaded balls for guiding the loaded balls from the sides thereof away from said first and second raceways, the improvement wherein the balls of said first row and second row are arranged with the successive balls of each row later-



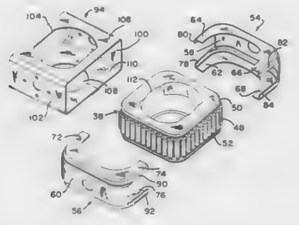
ally meshing in the interstices of the successively arranged balls of the other row and wherein said guide means comprises a longitudinally extending guiding rib arrangement having at least a first rib for laterally guiding the loaded balls, said rib being directly connected to a longitudinal retaining edge of said guide means for partly encompassing the loaded balls, said raceways for loaded balls partially surrounding said balls.

4,729,670

ROLLER BEARING

Richard F. Murphy, Torrington, Conn., and Thomas J. Daul, Green Bay, Wis., assignors to The Torrington Company, Torrington, Conn.

Filed May 18, 1987, Ser. No. 50,655
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **6 Claims**



1. In a bearing having a generally rectangular roller block having four straight raceway outer surfaces and four curved raceway outer surfaces each end of each straight raceway being connected to an end of its adjacent straight raceways by a curved raceway outer surface, and

a sufficient number of rolling members to completely occupy the straight raceways and curved raceways but loose enough to permit rolling contact with the straight raceways and curved raceways roller retaining means comprising:

a pair of roller block covers, each having a roller enclosing portion with an inside surface spaced from and enclosing a straight raceway and its adjacent curved raceways, the block covers being mounted on said roller block so that the roller enclosing portions enclose opposite straight raceways and its adjacent curved raceways thereby providing opposite straight raceways with rollers in exposed operating positions, each block cover also having four roller retention legs facing, and in contact with the legs of the other block cover, each retention leg extending from its roller enclosing portion along a side of a straight raceway with rollers in exposed operating positions, and halfway toward the other roller enclosing portion, said roller retention legs having rims covering the ends of the rollers in exposed operating positions to retain said rollers in its straight raceway and

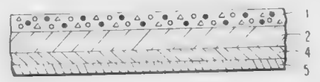
a rectangular sleeve fitted over the roller block covers to keep said roller block covers in place, said sleeve having opposite open sides, each open side being adjacent to a roller block straight raceway with rollers in exposed operating positions.

4,729,671

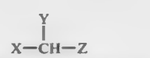
TEMPERATURE CONTROL INDICATOR UNIT

Makoto Asano, Yokohama; Iwao Chiba, and Masumi Iemura, both of Shibata, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 732,823, filed as PCT JP84/00148, Mar. 29, 1984, published as WO85/01105, Mar. 14, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 948,156
Claims priority, application Japan, Sep. 5, 1983, 58-161889
Int. Cl.[4] G01K *11/06*
U.S. Cl. 374—160 **5 Claims**



1. Temperature control indicator unit comprising a substrate having supported thereon (a) microcapsules enclosing a hydrophobic organic compound possessing an arbitrarily selected melting point, (b) a stable, solid methine dye precursor which is substantially colorless and is represented by the general formula:



wherein X, Y and Z each is an unsubstituted or substituted phenyl group, an unsubstituted or substituted naphthyl group, an unsubstituted or substituted β-styryl group, or an unsubstituted or substituted aromatic heterocyclic ring radical, the X, Y and Z radicals can be combined to form a ring, and (c) a stable solid benzoquinone derivative having at least one electron attractive substituent group, whereby, to prepare the temperature control indicator unit for usage, the outer wall of the microcapsules is breached, and whereby the indication of an abnormal temperature exceeding a predetermined temperature is based on an irreversible color-developing reaction between said methine dye precursor and said benzoquinone derivative by contacting said dye precursor and said benzoquinone derivative, said reaction being caused to occur by said hydrophobic organic compound melting and diffusing out of said microcapsules at said abnormal temperature, thereby solubilizing and placing in reactive form said methine dye precursor and said benzoquinone derivative.

4,729,672

ELECTRONIC CLINICAL THERMOMETER

Toshiaki Takagi, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,542
Claims priority, application Japan, Nov. 6, 1984, 59-232297
Int. Cl.[4] G01L *1/08*
U.S. Cl. 374—208 **15 Claims**

1. An electronic clinical thermometer, comprising:

an elongated casing formed of a relatively hard polystryrene resin material and having an extended slender tip at a distal end, the casing having a back end opposite said distal end;

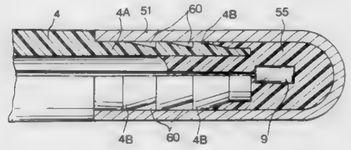
a metal cap having a smooth inner surface being press-fitted over the distal end of said tip in a direction toward the back end of said casing;

temperature sensing means arranged inside said metal cap;

electronic circuit means coupled to said temperature sensing means for detecting temperature; and

a battery housed in said elongated casing for supplying said electronic circuit means with electric power;

said distal end of said extended slender tip having an outer periphery provided with three spaced apart annular ribs,



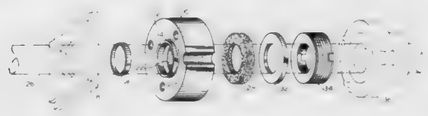
said annular ribs having portions with an outer diameter greater than the diameter of the inner surface of said metal cap, wherein the outer diameter of each rib gradually increases radially outward along the direction toward the back end of the casing and portions of said outer periphery of said distal end of said extended slender tip between said three adjacent annular ribs have an outer diameter less than the inner diameter of said metal cap, so that said annular ribs and said smooth inner surface of said metal cap define two air-filled liquid-tight chambers between said adjacent annular ribs when said metal cap is fitted onto said distal end of said extended slender tip to cover said annular ribs and said distal end.

4,729,673

ADD-ON BEARING PROTECTOR

Louis Fallova, Jr., Amsterdam, N.Y., assignor to Fallova Shredder Co., Inc., Cohoes, N.Y.

Filed May 29, 1986, Ser. No. 867,935
Int. Cl.[4] F16C *33/74;* **F16J** *15/16*
U.S. Cl. 384—139 **2 Claims**



1. An add-on bearing protector apparatus to be inserted on a rotatable shaft between a housing an a bearing assembly of a machine comprising:

an essentially cylindrical body having front and back faces and a concentric chamber therethrough, said chamber having a grooved annular flange at the front face of said body and threading at its back end, said annular flange being integral with the front surface of said body and coaxial with said chamber and adapted to receive a seal within its interior rim and a gasket about its annular base;

an interior flange within said chamber for receiving packing material there against; and

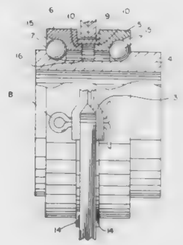
a compression plug of rigid construction for insertion into the back end of said chamber, whereby said packing material may be retained within said body completely surrounding said rotatable shaft between said interior flange and said compression plug.

4,729,674

BALL BEARING ASSEMBLY

Craig Siebert, Briarcliff Manor, N.Y., and Martin Scott, Brewster, Mass., assignors to Metallized Carbon Corporation, Ossining, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,764
Int. Cl.[4] F16C *33/60, 35/067, 43/04*
U.S. Cl. 384—505 **9 Claims**



1. A bearing comprising an inner race, a first outer race, and a second outer race, said outer races being concentric with said inner race, surrounding said inner race, and spaced axially from each other to leave a gap therebetween, a first set of ball bearings between said inner race and said first outer race, a second set of ball bearings between said inner race and said second outer race, shoulders on said outer races projecting axially toward each other, a band on said shoulders in said gap, said shoulders having a circumference, said band being longer than said circumference, thereby providing extra lengths on ends of said band, said extra lengths affixed to each other to retain said inner race, said outer races, and said sets of ball bearings in position.

4. A bearing comprising an inner race, a first outer race, and a second outer race, said outer races being concentric with said inner race, surrounding said inner race, and spaced axially from each other to leave a gap therebetween, a first set of ball bearings between said inner race and said first outer race, a second set of ball bearings between said inner race and said second outer race, shoulders on said outer races projecting axially toward each other, a band on said shoulders in said gap, said band being radially thinner than said outer races whereby said gap is not completely filled by said band, an upper frame and a lower frame, said frames being releasably secured to one another and located in said gap, one of said frames having a split fork section adapted to fit over a corresponding section of the other of said frames, at least one hole through said fork section and said corresponding section, and a cotter pin in said hole.

4,729,675

DOWNHOLE MOTOR AND BEARING ASSEMBLY

Kurt Trzeciak, and William C. Maurer, both of Houston, Tex., assignors to Magna Tools, Inc., Houston, Tex.

Continuation of Ser. No. 693,144, Jan. 22, 1985, abandoned, which is a continuation of Ser. No. 572,856, Jan. 22, 1984, abandoned. This application May 13, 1987, Ser. No. 49,672
Int. Cl.[4] E21B *4/00;* **F16C** *19/02, 19/10, 19/52*
U.S. Cl. 384—613 **32 Claims**

1. A downhole motor and bearing assembly comprising:

a tubular housing having an inlet and an outlet for flow of fluid therethrough,

a stator supported in a fixed position in said housing,

a rotor supported for rotary movement in said stator,

a shaft operatively connected to said rotor and supported for rotary movement in said housing,

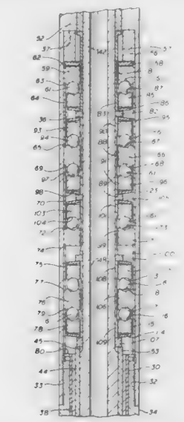
a bearing assembly comprising a first plurality of bearing members supported in said housing in fixed spaced relation therein,

a second plurality of bearing members cooperable one with

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each of said first plurality of bearing members and operatively supported on said shaft in fixed spaced relation for rotation therewith, said second bearing members being normally rotatable with said shaft, but being capable of movement relative to said shaft,

a first plurality of sleeve members positioned in said housing in spaced relation and operatively supporting said first plurlaity of bearing members in said fixed spaced relation,



a second plurality of sleeve members positioned on said shaft in spaced relation and operatively supporting said second plurality of bearing members in said fixed spaced relation, and

said sleeve members being interchangeably positioned in said housing and on said shaft to position said bearing members in selected interchangeable relations according to the need for bearings to support a load in a forward or reverse direction.

4,729,676

IMPACT PRINTING APPARATUS AND RIBBON CARTRIDGES

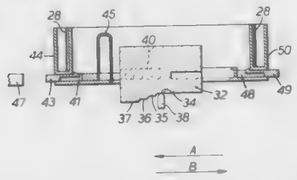
Michael J. Smith, c/o 23 Laurel Close, North Warnborough, Basingstoke, Hampshire RG25 1BH; George R. W. Sully, 80 Hermitage Road, St Johns, Woking, Surrey, and Martin Crisp, 3 Abbey Close, Harmans Water, Bracknell, Berkshire, all of England

Filed Feb. 25, 1985, Ser. No. 705,450

Claims priority, application United Kingdom, Mar. 1, 1984, 8405485

Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—196.1 **12 Claims**



10. A print ribbon cartridge comprising a cartridge body;

a print ribbon housed in said cartridge body, said ribbon having a plurality of longitudinally extending bands;

guide means on the cartridge body operative to guide the ribbon along a path extending through a printing position exterior of the cartridge;

a cam mounted for linear sliding movement in the cartridge body, said cam projecting through an aperture in the cartridge body and having a cam surface thereon exterior of the cartridge body;

spring means urging the cam in a first direction;

detent means for retaining the cam in any one of a series of positions;

a series of ratchet teeth on said cam;

a cam operator mounted for sliding movement in the cartridge body;

a pawl on said cam operator engagable with said ratchet teeth;

movement of the cam operator through a first extent being effective to engage the pawl with one of said ratchet teeth to move the cam in a second direction, opposite said first direction, against the spring means, from one to a succeeding one of said series of positions.

4,729,677

TYPEWRITER RIBBON CASSETTES WITH MULTIPLE TYPING TRACKS

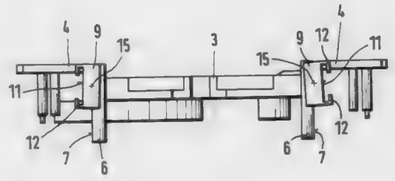
Manfred Dirla, Overath, and Markus Trabelsi, Wuppertal, both of Fed. Rep. of Germany, assignors to Regentrop & Bernard GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,118

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1985, 3529750

Int. Cl.[4] B41J *35/04*

U.S. Cl. 400—208 **4 Claims**



1. A typing ribbon cartridge for typewriting and/or printing machine comprising a housing with a housing base and two housing side-arms, and a typing ribbon with a free ribbon section outside the housing between the two housing side-arms, each housing sidearm having a guide piece lying in a plane which is parallel to the plane of the free ribbon section, the guide pieces having guide edges facing outwardly away from one another and over which the typing ribbon is passed by means of guide elements the guide elements being movable in the plane of the free ribbon section transverse to the longitudinal axis of the free ribbon section in order to move the free ribbon section to different positions for selecting one of several typing tracks, the typing ribbon cartridge being characterized by the fact that the guide edges of the guide pieces are straight and are perpendicular to the longitudinal axis of the free ribbon section throughout their entire length, and by means tiltably mounting the guide elements are mounted on the guide edges in such a way that they are tiltable relative to the guide pieces about axes which are perpendicular to the plane of the free ribbon section and which intersect the guide edges, whereby tension of the ribbon edges for different positions of the free section of the ribbon is equalized.

4,729,678

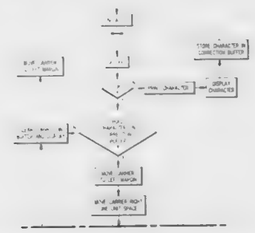
METHOD AND APPARATUS FOR PRODUCING CHARACTERS IN BOLD FORM

Douglas E. Hays, and James F. Lederer, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1987, Ser. No. 32,797

Int. Cl.[4] B41J *19/58*

U.S. Cl. 400—304 **6 Claims**



1. A method of printing characters in bold form in which a character is printed a first and a second time, with the second printing of the character occurring at a position offset from that of the first printing of the character, comprising the steps of:

printing a group of characters, such as a line of characters, substantially as the characters in the group of characters are entered through an input device;

substantially simultaneously with said printing, storing information related to said characters in the group of characters in a memory and displaying said characters in a display;

after printing the group of characters, determining from the information stored in the memory which characters, if any, in the group of characters are to be printed in bold form; and

printing each of said characters which are determined to be printed in bold form a second time at a position offset from that of the first printing of each of said characters.

4,729,679

STRUCTURE OF THE KEYBOARD BUTTON BASIC PAD

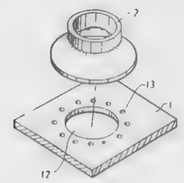
Johnny Hou, Taipei City, Taiwan, assignor to Silitek Corporation, Taipei, Taiwan

Filed Apr. 23, 1986, Ser. No. 855,115

Claims priority, application Taiwan, Dec. 17, 1985, 74210700

Int. Cl.[4] B41J *5/12*

U.S. Cl. 400—490 **5 Claims**



1. A keyboard assembly having at least one key button comprising:

a basic pad made from a non-resilient material having at least one button hole;

at least one key button made from a resilient material affixed within the button hole;

said button holes having a plurality of small passageways located at the periphery of each of the button holes; and,

said key buttons being riveted to each button hole through said small passageways located around each button hole.

4,729,680

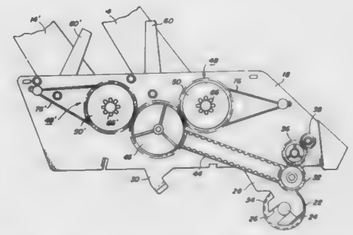
SELECTOR LATCH FOR A SHEET FEEDER

Alfred G. Osterlund, Los Gatos; James G. Hume, Mountain View, both of Calif.; John R. Leicht, Bedford, and Charles L. Bradford, Garland, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1986, Ser. No. 871,936

Int. Cl.[4] B41J *11/58, 13/10*

U.S. Cl. 400—624 **5 Claims**



1. A selector latch mechanism for a sheet feeder attachment to a printer, said printer including a motor driven platen, said mechanism receiving motive power from said platen and delivering motive power to a sheet stripper roller on said attachment, said mechanism comprising:

a rotatable drive gear for receiving motive power from said platen;

a drive pin carried by said drive gear and movable therewith in a generally circular motion, said drive pin being also movable in a generally radial direction relative to said drive gear about a pivot point on said drive gear;

biasing means carried by said drive gear for urging said drive pin radially inwardly;

a toothed driven gear connected to said sheet stripper roller for driving said roller, said driven gear being located for receiving said drive pin between its teeth when said drive pin is at its furthest radially inward position; and

a selector disc having cam means and gate means integrally formed thereon for controlling the radial movement of said pin, said cam means comprising a major formation fixed to said selector disc so as to be immovable with respect thereto, said major formation having surfaces over which said pin moves, and said cam means further includes a pair of flexible web-like formations having radially outermost surfaces over which said pin moves, each of said web-like formations having one end fixed to said selector disc so as to be immovable with respect thereto, and an opposite unconstrained end biased toward said major formation, said unconstrained ends forming said gate means which provides an escapement path for said pin.

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4,729,681

DOCUMENT PROCESSING DEVICE FOR SINGLE DOCUMENTS SEPARABLE FROM A CROSS-PERFORATED CONTINUOUS FORM WEB

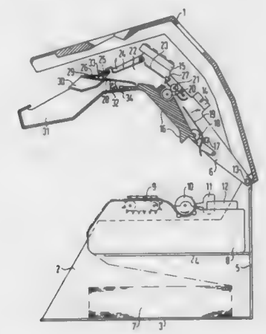
Erich Moser, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 820,804

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502529

Int. Cl.[4] B41J *11/34*

U.S. Cl. 400—613.2 8 Claims



7. A document processing device accessible from a front side for use and service comprising:

a housing enclosing said device including a front housing wall;

an upper and lower cabinet rack part enclosed within said housing;

said upper cabinet rack part and said front housing wall being pivotally attached to said lower cabinet rack part;

a paper supply space provided in said lower cabinet rack part closed by means of said pivotable housing cover and accessible from the front side of the device;

a printing mechanism including a paper feed mechanism, platen and printing head provided in said lower cabinet rack part;

a separator device for producing single documents provided in said upper cabinet rack part;

paper guidance elements being positioned upstream and downstream of said printing mechanism, said downstream guidance elements being provided in said upper rack part;

an output stacker and deposit stacker for single documents provided in said upper rack part and both being accessible from the front of the device;

said front housing wall having an opening therethrough for providing user access to said output stacker.

4,729,682

DOCUMENT FEED DEVICE WITH PIN TRACTOR ASSEMBLY

Toshiki Morita, Toyosake, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1985, Ser. No. 814,126

Claims priority, application Japan, Dec. 28, 1984, 59-199595[U]; Dec. 29, 1984, 59-199955[U]; Dec. 29, 1984, 59-199956[U]

Int. Cl.[4] B41J *11/27, 11/32*

U.S. Cl. 400—616.3 5 Claims

1. A document feed device for feeding a sheet of material having longitudinally spaced perforations, comprising:

a frame;

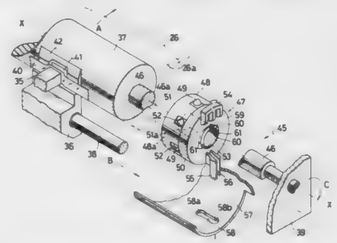
a feed shaft supported by the frame, said feed shaft defining an axis;

a platen having a cylindrical surface, said platen being rotatable around the shaft axis;

a paper guide member located under the platen in close vicinity to the platen so as to define a path between the platen and the paper guide member, through which the sheet of material is passed;

a pin tractor member rotatable with the feed shaft and slidable along the axis of the shaft, said pin tractor member having substantially the same diameter as that of the platen and including a sleeve portion which projects along the axis of the shaft;

a number of feed pins radially distributed around the axle of the shaft inside the pin tractor member and individually engaging the perforations of the sheet of material;



a body member supported by the sleeve portion of the pin tractor member for joint axial movement of the body member with the pin tractor member and rotation of the body member relative to the pin tractor member; and

axial guide means for guiding the body member together with the pin tractor member to move along the axis of the shaft, said guide means including a first portion extending radially from the body member and a second portion mounted on the paper guide member, with the first portion being slidably engaged with the second portion so as to slide along the axis of the shaft, said first portion including a projection bar which is integrally formed on the body member and defines a slit permitting the projection bar to vary its width, said second portion including a slot elongated along said axis of the shaft, whereby said projecting bar is adapted to elastically engage the slot.

4,729,683

PAPER SHEET FEEDING APPARATUS

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Ziyad Incorporated, Denville, N.J.

Filed Jan. 24, 1986, Ser. No. 822,064

Int. Cl.[4] B41J *11/58*

U.S. Cl. 400—624 21 Claims



1. A paper feeding apparatus for a printing device, said printing device including printing means for printing on a sheet of paper, and paper advancing means for advancing a sheet of paper being supplied thereto along a paper path upon rotation of said paper advancing means in a paper advancing direction, said paper feeding apparatus comprising first paper storing means for storing a plurality of individual sheets of paper, first paper feeding means for feeding individual sheets of paper from said first paper storing means upon rotation of said first paper feeding means in a paper feeding direction, first driven gear means slidable between an engaged position with said first paper feeding means to cause the rotation thereof in said paper feeding direction and a disengaged position with said first paper feeding means to interrupt the operation thereof, second paper storing means for storing a plurality of individual sheets of paper, second paper feeding means for feeding individual sheets of paper from said second paper storing means upon rotation of said second paper feeding means in a paper feeding direction, second driven gear means slidable between an engaged position with said second paper feeding means to cause the rotation thereof in said paper feeding direction and a disengaged position with said second paper feeding means to interrupt the operation thereof, and transmission means for selectively coupling said first and second driven gear means to said first and second paper feeding means in response to the rotation of said paper advancing means, said transmission means selectively arrangeing said first and second driven gear means in said engaged position upon rotation of said paper advancing means in an opposite direction to said paper advancing direction and selectively arranging said first and second driven gear means in said disengaged position upon continued rotation of said paper advancing means in said opposite direction, whereby individual sheets of paper are alternately fed from said first and second paper storing means upon selective engagement of a corresponding said first and second driven gear means and upon the rotation of said paper advancing means in said paper advancing direction.

4,729,684

MECHANICAL PENCIL

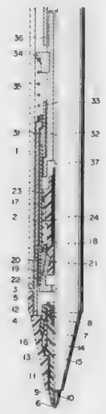
Gouji Sakaoka, Tokyo, Japan, assignor to Micro Co., Ltd., Tokyo, Japan

Filed May 7, 1986, Ser. No. 860,671

Claims priority, application Japan, Jul. 18, 1985, 60-157023

Int. Cl.[4] B43K *21/22*

U.S. Cl. 401—65 7 Claims



1. In a lead pencil: a chuck assembly for releasably gripping and advancing a lead during use of the pencil, the chuck assembly comprising a plurality of separate, complementary chuck elements positioned to define therebetween a longitudinal bore, the chuck elements being separately displaceable toward and away from one another to define respectively lead-gripping and lead-releasing positions; a lead guide tube slidably disposed in the longitudinal bore, the lead guide tube having a forward end abuttably engageable with acting portions of said chuck elements so that forward displacement of the lead guide tube sequentially effects forward displacement of the chuck assembly accompanied by advancement of the lead followed by displacement of said chuck elements to the lead-releasing position to thereby release the lead, a rearward end of said lead guide tube projecting rearwardly of the chuck elements, and the lead guide tube extending through a major lengthwise extent of the longitudinal bore and slidably receiving therein the lead for guiding the lead; means for normally urging the chuck elements to the lead-gripping position; and means for effecting manual forward displacement of said lead guide tube to sequentially effect forward displacement of the chuck assembly accompanied by advancement of the lead followed by separate displacement of the chuck elements to the lead releasing position.

4,729,685

WRITING INSTRUMENT WITH PRESS MECHANISM AND MAGNETIC CATCH

Bernhard Bruhn, Halstenbek; Jose Navarro-Ramil, and Reiner Segebarth, both of Hamburg, all of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Jul. 24, 1987, Ser. No. 77,346

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625381

Int. Cl.[4] B43K *24/02, 24/08*

U.S. Cl. 401—100 20 Claims



1. A writing instrument with a pressure mechanism for the movement against a spring pressure of a writing element (**4**, **5**, **6**, **11**, **12**, **13**) from a retracted position of rest into an advanced writing position, in which the writing element (**4**, **5**, **6**, **11**, **12**, **13**) is retained against the writing pressure and from which it can be returned into the position of rest by means of spring pressure by the displacement of a retention element (**18**, **19**, **20**) out of an engagement position with an instrument housing (**1**, **2**, **14**, **15**), wherein the retention element (**18**, **19**, **20**) has a cup section (**18**) open towards the rear, the axial length of which is greater than its inner diameter and into which has been inserted a ball (**23**) of a magnetizable material which is axially freely movable back and forth, and wherein a permanent magnet (**16**) is disposed adjacent to the opening of the cup section (**18**), the surface of which oriented towards the cup section (**18**) has a concave contact surface (**17**) disposed coaxially to the writing element for the ball (**23**), and in that the retention power exerted by the permanent magnet (**16**) on the ball (**23**) resting against it is less than the weight of the ball (**23**).

4,729,686

FLEXIBLE PEN WITH SLIDING SLEEVE

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024

Filed May 15, 1987, Ser. No. 50,617

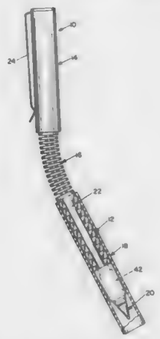
Int. Cl.[4] B43K *9/00, 7/00*

U.S. Cl. 401—117 4 Claims

1. In a pen having an elongated one-piece barrel having substantially rigid tip end and head end portions, a writing tip affixed at the distal end of the tip end portion, and a substantially rigid tubular cap member telescopically received over the tip end portion of the barrel, the barrel including an integral flexible portion intermediate the tip end and head end portions, whereby the barrel can be bent at the flexible portion, and the cap member being movable along the barrel between

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(1) a retracted position in which it overlies part of the tip end portion and substantially all of the flexible portion, thus leaving the writing tip exposed and rendering the pen substantially rigid, and (2) an extended position in which it covers the writing tip and leaves the flexible portion exposed, thus protecting the writing tip and rendering the pen flexible, and the cap member and the tip end portion of the barrel having means for releasably retaining the cap member in each of the retracted and extended positions, the improvement wherein the tip end portion of the barrel has a threaded portion extending from a juncture with the flexible portion to a terminus spaced apart from the distal end, the threaded portion having on opposite

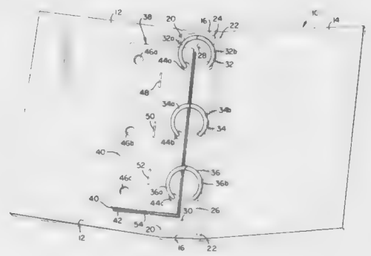


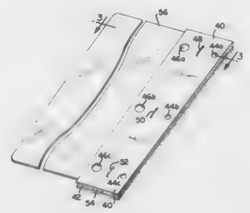
sides longitudinal rows of spaced-apart helical ribs, the external surfaces of which define a substantially circular cylindrical surface of a diameter in close sliding fit with the internal wall surface of the cap member, the ribs of the respective rows being shaped and located to define vestigial helical threads, and wherein the cap member has at generally its longitudinal center a circumferential row of equally spaced-apart protrusions extending inwardly from its internal wall, the protrusions being adapted to be received sequentially in the vestigial threads to engage and follow them and provide controlled longitudinal movement of the cap member along the threaded portion upon rotation of the cap member.

4,729,687
IMAGING DEVICE
Robert P. Arens, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 703,300, Feb. 20, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 911,735
Int. Cl.[4] B43K *23/00*
U.S. Cl. 401—198 **5 Claims**

1. An imaging device comprising in combination a reservoir incorporated in a receptacle, imaging fluid in said reservoir, and means for delivering said fluid from said reservoir to a location where marks are to be applied to a substrate, said imaging fluid being substantially free from contaminants and said receptacle, reservoir and delivery means all being substantially free of materials extractable by said imaging fluid, so that said imaging fluid as delivered consist essentially of clear, colorless, innocuous, completely volatilizable liquid having an evaporation rate on the order of from 20 to 10^{-6} (n-butyl acetate=1.00), no more than about 500 ppm of said fluid constituting a substance having an evaporation rate less than about one-half that of said liquid, whereby said device can be used repeatedly to apply indicia to the same area of substrates of the type having a base covered with a relatively light color, opaque, open cell microvoid-containing layer that is rendered translucent when the microvoids are filled with a liquid, such repeated use leaving no visible race of previously applied indica.

4,729,688
MULTI-RING LOOSE LEAF BINDER AND PORTABLE PAPER PUNCH THEREFOR
August F. Manz, 470 Whitewood Rd., Union, N.J. 07083
Filed May 20, 1987, Ser. No. 51,658
Int. Cl.[4] B42F *3/04, 13/22*
U.S. Cl. 402—1 **17 Claims**





1. In a loose leaf binder including a cover having back and side panels and a binder post assembly mounted onto the back panel for holding a stack of loose leaf paper inside said cover, said binder post assembly including a multiplicity of binder rings adapted to pass through a plurality of spaced apart, prepunched holes provided in the loose leaf paper along a longitudinal edge thereof; the combination therewith of a portable paper punch comprising:

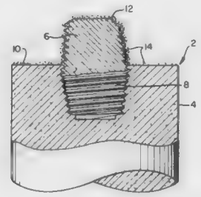
(a) a pair of substantially flat, juxtaposed members, each of said members having therein a multiplicity of holes arranged in a pattern which is identical to the pattern of holes to be formed in the loose leaf paper;

(b) means for securing said flat, juxtaposed members together in a fixed, spaced apart relation with the pattern of holes in one member registering with the pattern of holes in the opposite member, the arrangement being such that a sheet of loose leaf paper inserted in the space between said members can be punched with the same pattern of holes by forcing a sharp object through the corresponding pairs of holes in said members; and

(c) means for removably attaching said pair of flat, juxtaposed members onto said binder post assembly.

7. A portable paper punch for punching a predetermined pattern of holes in loose leaf paper comprising, in combination: a pair of substantially flat, juxtaposed members, each of said members having therein a multiplicity of holes arranged in a pattern which is identical to said predetermined pattern, and means for securing said flat, juxtaposed members together in a fixed, spaced apart relation with the pattern of holes in one member registering with the pattern of holes in the opposite member, the arrangement being such that when inserted in the space between a members, said sheet of loose leaf paper can be provided with the predetermined pattern of holes by forcing a sharp object through the corresponding pairs of holes in said members.

4,729,689
ELECTRODE MEMBER AND PROCESS FOR THE PRODUCTION THEREOF
Faramarz Nazem; Irwin C. Lewis, both of Strongsville; Leonard S. Singer, Berea, all of Ohio, and George S. Chryssomallis, Golden Valley, Minn., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Dec. 13, 1984, Ser. No. 680,995
Int. Cl.[4] H05B *7/14*
U.S. Cl. 403—267 **11 Claims**



1. In an electrode member for incorporation into an electrode joint, which electrode member comprises at least one porous electrode body having at least one electrode joint surface adapted to be disposed in a mating relationship with a second electrode member: the improvement wherein cementing pitch is adhered to and impregnated within at least a portion of said at least one electrode joint surface, wherein said cementing pitch has a carbon yield of more than about 50 percent and includes pitch particles having an average diameter of less than about 0.003 inch.

4,729,690
SELF-RIGHTING HIGHWAY MARKER SUPPORT AND METHOD FOR INSTALLING SAME
Michael R. Lavender, Chicago; Henry R. Krepel, Crystal Lake, and Sidney A. Heenan, Park Ridge, all of Ill., assignors to Amerace Corporation, Hackettstown, N.J.
Continuation-in-part of Ser. No. 727,543, Apr. 6, 1986, abandoned. This application Nov. 10, 1986, Ser. No. 928,899
Int. Cl.[4] E01F *9/00*
U.S. Cl. 404—10 **18 Claims**

1. A self-righting boundary marker for relatively permanent installation into an associated supporting surface, said marker comprising:

a tubular anchor sleeve adapted to be embedded substantially within said associated supporting surface;

a support collar having contiguous upper and lower segments, said support collar having contiguous upper and lower axially extending passageways formed therethrough;

means for firmly securing said lower collar segment within said anchor sleeve;

a hinge strut having an upper extension, a lower extension, and an annular support flange formed integrally thereon intermediate said upper and lower extensions,

said flange being sized and shaped to abut said upper collar segment when said lower strut extension is inserted into said collar via said upper passageway, said collar allowing pivotal deflection of said hinge strut from an at-rest position with respect to said collar responsive to a deflecting force applied to said hinge strut;

boundary marker means carried by said hinge strut upper extension;

means for resiliently returning said hinge strut to said at-rest position when said deflecting force terminates, said resilient return means including a connector attached to and extending from said lower hinge strut extension and passing through said lower support collar passageway; and

means for aligning said upper hinge strut extension in a preselectable direction and for causing said hinge strut to return to face in said preselected direction when said hinge is deflected and returned to said at-rest position, said aligning means substantially preventing rotational movement of said hinge strut during the deflection of said strut, said aligning means further including forming said lower collar passageway in an oval or oblong shape having a major or larger dimension and a smaller or minor dimension, and shaping and sizing said connector to pass through said lower collar passageway along said major or larger but not said minor or smaller dimension, thereby substantially precluding rotation of said hinge strut while permitting deflection thereof in any direction.

16. Method for installing a roadway marker support into a supporting surface, said support of the type having a tubular anchor sleeve of generally uniform outside diameter, a support collar having a lower mounting extension with an outside





diameter equal to or slightly greater than the inside diameter of said sleeve, and an upper extension having a uniform outside diameter equal to said outside sleeve diameter, said method comprising the steps of

(a) fashioning a pilot tool having an outside diameter substantially equal to said outside sleeve diameter;

(b) driving said pilot tool into said mounting surface to compressibly displace the material of said surface to form a generally cylindrical passage;

(c) removing said pilot tool from said passage;

(d) aligning a first end of said sleeve with said passage;

(e) aligning said pilot tool with second end of said sleeve;

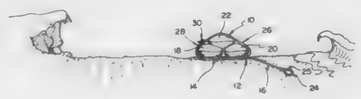
(f) impacting said pilot tool to drive said sleeve into said passage;

(g) removing said pilot tool from said sleeve; and

(h) inserting said lower mounting extension into said sleeve.

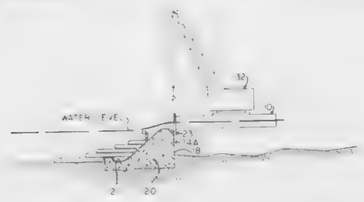
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4,729,691
BACKSHORE SILL BEACH AND DUNE EROSION CONTROL SYSTEM
Jay W. Sample, 7315 S. Indian River Dr., Fort Pierce, Fla. 33482
Filed Nov. 4, 1986, Ser. No. 926,663
Int. Cl.[4] E02B 3/06
U.S. Cl. 405—21 9 Claims



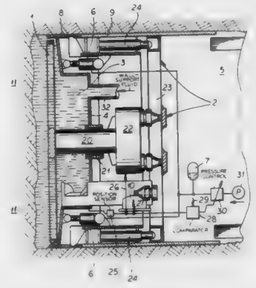
1. A backshore sill beach and dune erosion control system comprising: a supporting protective apron formed of weather and water resistant cloth, said apron including a flat base portion and an angularly sloped portion extending seaward of said base portion, a toe scour anchor tube connected to the seaward end of said apron sloped portion, and a plurality of longitudinal sand-filled geotextile containers placed upon said apron base portion each extending longitudinally shore parallel to the incoming surf, said sand-filled geotextile containers being specifically placed upon the beach in a pyramidal longitudinally extending shore parallel relation to an area being protected whereby wave action impacts upon relatively soft surfaces of said containers and is dissipated before normally impacting surfaces that would otherwise be eroded.

4,729,692
APPARATUS AND METHOD FOR QUIETING FLOWING WATERS
Terrence N. Tucker, Vincentown, N.J., assignor to Intrusion-Prepakt Incorporated, Cleveland, Ohio
Filed Dec. 11, 1986, Ser. No. 940,503
Int. Cl.[4] E02B 7/00
U.S. Cl. 405—107 18 Claims



1. An apparatus for use in moving water to quiet water in a work area comprising a float providing a work platform having water-flow-blocking means for quieting water in the work area, means mounting said water-flow-blocking means on said float to extend downwardly therefrom in a position crosswise of the water flow to substantially block the flow of water toward the work area from the position of the water blocking means, and to divert the water flow around the water-flow-blocking means, said water-flow-blocking means comprising an open ended wall to be positioned below the float crosswise of the water flowing to the work area and structural means connected to said float for supporting said wall and for engaging a fixed underwater obstruction to prevent movement of said float by the water and having a length for maintaining engagement with said obstruction as the float rises and falls with the water level.

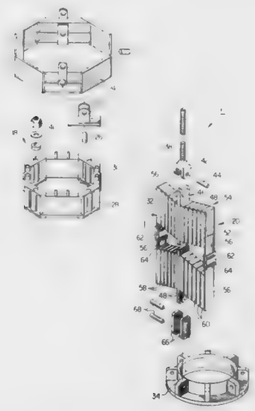
4,729,693
TUNNEL EXCAVATOR
Volker Hentschel, Dorsten, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft Vorm, Gebr. Helfmann, Essen, Fed. Rep. of Germany
Filed Sep. 18, 1986, Ser. No. 909,128
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533425
Int. Cl.[4] E21D 9/06
U.S. Cl. 405—144 9 Claims



1. In a tunnel excavator comprising a digging tool mounted on a shield support operating in a front digging chamber, which is sealed by a separating wall of said tunnel excavator across transverse cross section of said tunnel excavator from a tunnel formed behind said tunnel excavator not under an elevated pressure, said digging chamber being filled with a supporting fluid supporting a local forward wall of said digging chamber, the improvement wherein said digging chamber has a changeable volume and at least a portion of said separating wall is supported on and adjustable relative to said shield support by an adjustable spring device so as to render said portion movable back and forth longitudinally relative to said support.

4,729,694
TLP MARINE RISER TENSIONER
George W. Peppel, Arlington, Tex., assignor to Lockheed Corporation, Calabasas, Calif.
Filed Jun. 30, 1986, Ser. No. 879,923
Int. Cl.[4] B63B 35/44
U.S. Cl. 405—195 8 Claims

1. A riser tensioner for use in maintaining a tension on a marine riser from a tension leg platform, the tension leg platform moving relative to the marine riser and the marine riser having a center line, comprising:
(a) an elastomeric assembly, adjustably deformable in pad shear, for maintaining the riser in tension during vertical movement of the platform relative to the riser, said elastomeric assembly having upper and lower ends;
(b) a gimbal assembly for pivotally connecting said upper end of said elastomeric assembly to the tension leg platform to accommodate misalignment between the riser and the tension leg platform;
(c) a base ring to which said lower end of said elastomeric assembly is secured; and



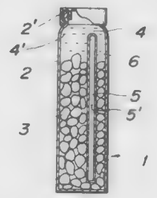
(d) a collar, securely mounted on the riser, for resting within said base ring to connect said lower end of said elastomeric assembly to the riser.

4,729,695
PROCESS FOR THE INSTALLATION OF THE ENBLOC SUPERSTRUCTURE OF AN OFFSHORE PLATFORM, AND EQUIPMENT FOR CARRYING IT PRACTICALLY
Antonio Silvestri, San Donato Milanese, Italy, assignor to Saipem, S.p.A., Milan, Italy
Filed Mar. 7, 1986, Ser. No. 837,259
Claims priority, application Italy, Jun. 19, 1985, 21211 A/85
Int. Cl.[4] E02B 17/08
U.S. Cl. 405—204 6 Claims



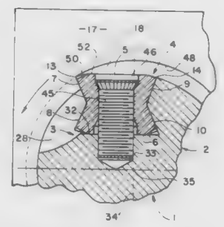
1. A process for installation of a superstructure onto a lower structure to form an offshore platform supported on a sea bottom wherein said lower structure includes a plurality of legs extending upwardly from the sea bottom and emerging from the water, the process comprising the steps of:
loading said superstructure on a vertically movable support platform having shock dampeners interposed between said platform and said superstructure provided on a semi-submersible vessel;
submerging said vessel in the vicinity of said lower structure;
raising said movable support platform such that said superstructure loaded thereon is at a height greater than said emerging ends of said legs independent from sea wave motion;
aligning said superstructure over said lower structure;
activating said shock dampeners interposed between said supporting platform and said superstructure;
contacting said superstructure to said lower structure;
transferring the weight of said superstructure from said vessel to said lower structure by contemporaneously lifting said superstructure up to a desired height relative to said legs, lowering said movable support platform and flooding ballast tanks provided on said vessel; and
affixing said superstructure to said lower structure;

4,729,696
CARTRIDGE FOR USE IN FIXING AN ANCHOR BOLT AND A METHOD
Koji Goto, and Eiichi Suzuki, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo, Osaka, Japan
Filed Jul. 26, 1984, Ser. No. 634,426
Claims priority, application Japan, Jul. 27, 1983, 58-135772
Int. Cl.[4] E21D 20/02
U.S. Cl. 405—261 23 Claims



1. A cartridge for use in fixing an anchor bolt, comprising:
(a) a casing having a fluidtight construction;
(b) partitioning means disposed in said casing for forming a first and a second chamber which are fluidtight relative to each other;
(c) a resin contained in said first chamber, said resin being substantially composed of an ester of an epoxy resin with an organic acid selected from the group consisting of acrylic acid, methacrylic acid and a mixture thereof and a reactive monomer; and
(d) a curing agent for said resin component contained in said second chamber, said curing agent comprising an organic peroxide,
said casing and said partitioning means being breakable by the action of the anchor bolt so that said resin and said curing agent are homogeneously mixed when the anchor bolt is driven into said cartridge.

4,729,697
MILLING CUTTER
Ralph W. Lacey, Grosse Pointe Parke, Mich., assignor to Dijet Inc., Harper Woods, Mich.
Filed Jun. 18, 1986, Ser. No. 875,471
Int. Cl.[4] B26D 1/00
U.S. Cl. 407—42 20 Claims



1. An end milling cutter, comprising:
an elongate cutter body having upper and lower ends, and being adapted for axial rotation with respect to a workpiece; said cutter body having at least one insert blade station disposed at the lower end of said cutter body;
at least one insert blade operably connected with said cutter body at said insert blade station; said insert blade having opposited side faces, and a plurality of peripheral edge

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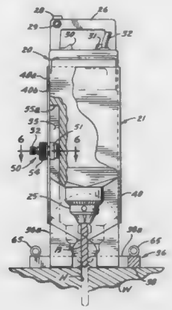
faces, with at least one rectilinear cutting edge only formed at the outermost intersection of one of said side faces and one of said edge faces that is sufficiently continuous to form non-threaded bores in the workpiece; said insert blade being oriented in said cutter body such that said one edge face defines a tooth face against which the workpiece impinges during cutting, and said one side face defines a clearance space between said insert blade and the workpiece; said tooth face having at least a portion thereof protruding axially downwardly from the lower end of said cutter body, and said one side face of said insert blade being substantially convex in shape and extending radially outwardly from said at least one cutting edge to another of said edge faces to reduce the clearance space for improved cutting efficiency and insert blade longevity, without causing undesirable contace between other portions of said insert blade and the workpiece.

4,729,698

MULTI-PURPOSE AND VERSATILE PORTABLE POWER TOOL

Jesse E. Haddon, P.O. Box 515, 4719 E. Elm St., McHenry, Ill. 60050

Filed Sep. 5, 1986, Ser. No. 904,561
Int. Cl.[4] B23B *45/14*
U.S. Cl. 408—110 **11 Claims**



1. The combination of

(a) a portable motorized power head having a driven shaft adapted to receive and hold a cutter or the like,

said power head having a predetermined cross-sectional shape in a direction transverse to the axis of said shaft,

(b) a portable sleeve having interior surfaces mating to the cross-sectional shape of said power head to receive the latter in longitudinal sliding relationship in a direction parallel to the axis of said shaft while preventing relative rotation of the head and sleeve about such axis,

said sleeve being shaped to define two parallel flat surfaces on opposite sides of its exterior, whereby the sleeve may be disposed with one of the flat surfaces resting on a flat support structure and may be clamped to the structure by clamp means engaged with the other flat surface, and said sleeve being adapted at one end to rest for support on a work surface.

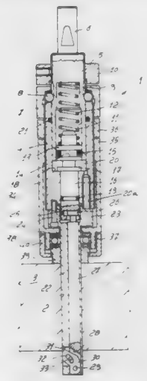
4,729,699

DEVICE FOR PERFORMING SPOT-FACINGS, IN PARTICULAR AT THE NON-ACCESSIBLE END OF THROUGH-HOLES

Luciano Frazzoli, Via Benazzi, 2 - Bologna, Italy

Filed Jan. 20, 1987, Ser. No. 5,064
Claims priority, application Italy, Jan. 28, 1986, 3322 A/86
Int. Cl.[4] B23B *51/00, 29/18*
U.S. Cl. 408—152 **10 Claims**

1. In combination, a machine tool mandrel and a device for performing spot-facings, in particular at non-accessible ends of through holes, said device comprising at least one attachment element, at least one tool, at least one shaft having an end, and at least one body having at least one longitudinal stem, said stem being adapted for insertion into a hole formed in a workpiece, said attachment element being attachable to said machine tool mandrel and slidably mounted on said body, said machine tool mandrel being adapted for rotation, said attachment element being adapted for imparting said rotation of said



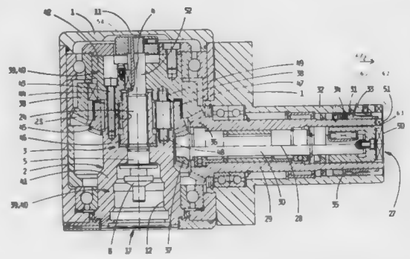
machine tool mandrel to said body, said shaft being slidably guided on said stem, said tool being articulated to said end of said shaft and rotatable between a position whereat said tool is aligned with said stem and a position whereat said tool projects radially from said stem, said shaft being coupled to said attachment element so that an axial sliding movement of said attachment element towards a workpiece actuates a sliding motion in an opposite direction of said shaft adapted for moving said tool to said position whereat said tool projects radially from said stem.

4,729,700

DRIVE UNIT FOR ROTARY TOOLS

Günther Hertel, and Karl G. Hertel, both of Nuremberg, Fed. Rep. of Germany, assignors to Hertel AG Werkzeuge & Hartstoffe, Fürth, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,547
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508231
Int. Cl.[4] B23C *5/26, 7/00*
U.S. Cl. 409—144 **14 Claims**



1. In a drive unit for a rotary tool, which unit includes: a housing having a tool receiving side and a drive power input side; a hollow drive shaft mounted in the housing for transferring rotational drive force from a first drive motor to the tool;

and clamping means disposed within the drive shaft for generating a tool clamping movement along the axis of the drive shaft, the improvement wherein:

said clamping means comprise: a pull rod having screw threads and mounted in said hollow drive shaft and coaxially positioned relative to said hollow drive shaft, said pull rod being mounted to be axially displaceable, and fixed against rotation, relative to said hollow drive shaft; a sleeve mounted in said hollow drive shaft to be axially fixed, and rotatable, relative to said hollow drive shaft, said sleeve being threaded to mate with the threads on said pull rod so that said sleeve and said pull rod form a screw and nut mechanism, with said pull rod being disposed between said sleeve and said tool receiving side of said housing; and a clamping drive shaft couplable to a clamping rotary drive and operatively associated with said sleeve for rotating said sleeve when said clamping drive shaft is rotated by the clamping rotary drive; and

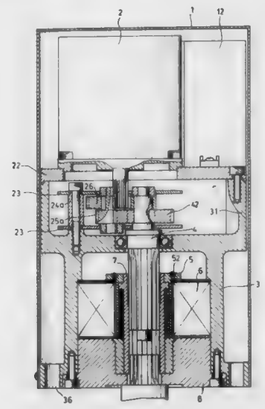
said unit further comprises blocking means operative between said hollow drive shaft and said housing to be automatically activated by connection of the first drive motor to said hollow drive shaft for permitting said hollow drive shaft to rotate relative to said housing only when said hollow drive shaft is coupled to the first drive motor, and to block rotation of said hollow drive shaft relative to said housing when said clamping drive shaft is coupled to the clamping rotary drive.

4,729,701

AUTOMATIC TOOL-REPLACING DEVICE MOUNTED ON MILLING MACHINE

Hwang Chaur-Sheng, No. 62, Fong-Jou Road, Shern-Gang Hsiang, Taichung Hsien, Taiwan

Filed Dec. 29, 1986, Ser. No. 947,353
Int. Cl.[4] B23C *5/26*
U.S. Cl. 409—233 **1 Claim**



1. An automatic tool-replacing device for a milling machine, said device comprising:

(a) a body portion being substantially a round cylinder to cover respective parts of said device, said body portion having a bottom terminus and a top terminus, with the bottom terminus of said body portion being furnished with screw holes so as to be fastened to a respective upper base of said device;

(b) an upper base, said upper base having a first, upper walled portion and a second, lower walled portion, with said upper portion being furnished with screw hole posts for mounting a respective motor base; said upper base having a central round countersunk hole, a hole for a respective motor transmission shaft, and several screw holes for mounting respective mounting discs; said upper base having holes in the lower walled portion for mounting said upper base at a respective milling machine, particularly a lathe and the like; and the lower walled portion of said upper base exteriorly being furnished with screw holes for securing said upper base to said body portion;

(c) a bearing mounted in said countersunk hole of said upper base for guiding the respective transmission shaft;

(d) a motor positioned in the upper portion of said body portion, said motor including a motor transmission shaft and a motor base; and said motor being fixedly mounted on said upper base with said motor base, and said motor transmission shaft being adapted to pass through the hole of said upper base;

(e) an electrical control case fixed to said motor base in coaxial position with said motor;

(f) two mounting discs maintained in spaced relationship from one another by a plurality of screws and sleeves, each one of said mounting discs having a plurality of through holes for mounting a respective reduction gear shaft and a transmission shaft, with one disc being operatively connected to said upper base;

(g) a reduction gear shaft operatively connected with one end at said two mounting discs;

(h) a small gear and a large gear connected to said reduction gear shaft by means of a key;

(i) a transmission shaft operatively connected with one end at said two mounting discs, said transmission shaft having a geared portion;

(j) a large transmission gear connected to said transmission shaft by means of a key; said large transmission gear being adapted to engage with said small gear; and said large gear on said reduction gear shaft being adapted to engage with said motor transmission shaft;

(k) each gear and said transmission shaft being respectively guided by bearing bushings for rotation;

(l) an attraction cylinder having two inner diameters and a top surface, said cylinder being substantially hollow and said top surface being formed with a circular groove for mounting a respective O-shaped ring therein;

(m) an O-shaped ring seated in said circular groove of said attraction cylinder to positively retard friction when in contact with said upper base;

(n) a sliding transmission cylinder having a ring-shaped flange adapted to contact tightly at the inner top portion of said attraction cylinder by means of a respective spring, and the inner surface of said sliding transmission cylinder being provided with gear tooth grooves adapted to engage with the geared portion of said transmission shaft;

(o) a spring to bias said transmission cylinder, said spring surrounding said sliding transmission cylinder;

(p) a solenoid mounted atop of a respective lower base, with said attraction cylinder being operatively disposed within said solenoid;

(q) a lower base with a central through hole for a respective bushing, said lower base being furnished with holes for positively securing said lower base to said upper base; and

(r) a bushing operatively mounted in said through hole of said lower base for slidingly receiving therein said transmission cylinder;

for actuation of

(s) a reach rod, said reach rod having a geared stud top adapted to engage the gear tooth grooves in the lower end of said sliding transmission cylinder; and the lower end of said reach rod being furnished with a thread portion adapted to engage the respective tool, and wherein the geared stud of said reach rod is mounted in the lower portion of the through hole of said lower base; such that upon forward and reverse actuation of said motor, the rotating power of said motor is respectively transmitted, through said large and small gears for reduction, to said transmission shaft that drives said sliding transmission shaft, and substantially simultaneously said solenoid being

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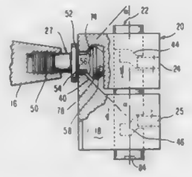
operated to attract said attraction cylinder to move downwards to cause said sliding transmission shaft to move down for engaging with the geared stud of said reach rod to rotate together for locking in place the respective tool upon said reach rod rotating forward, and to replace the tool upon said reach rod rotating reversely; and upon said motor being turned of, said solenoid being inoperative, and said spring causing said sliding transmission cylinder to contact said attraction cylinder to restore the normal separation state.

4,729,702

CLAMPING MEANS FOR TAPER TOOL SHANKS

Walter Kelm, Mt. Clemens, Mich., assignor to Carboloy Inc., Warren, Mich.

Filed Oct. 10, 1986, Ser. No. 917,907
Int. Cl.[4] B23B *31/10*; B23Q *3/12*
U.S. Cl. 409—234 **13 Claims**



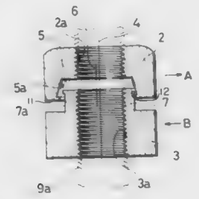
1. A clamping device for securing and locking a tool adaptor in a tool clamp device, comprising:
an upper shoe and a lower shoe adapted for engaging the tool adaptor;
a first drive means in communication with said upper shoe;
a second drive means in communication with said lower shoe; and
cam means in communication with said upper and lower shoes, having an axis and least two angular lies, and including means for engaging said drive means for advancing said shoes along the axis of said cam means at said at least two angular lies to secure and lock the tool adaptor within a tool clamp block.

4,729,703

DOUBLE NUT

Toshiyuki Sato, Daito, Japan, assignor to Kabushiki Kaisha Suiken Technology, Osaka, Japan

Filed Oct. 27, 1986, Ser. No. 923,599
Claims priority, application Japan, Nov. 29, 1985, 60-184635[U]
Int. Cl.[4] F16B *31/00*
U.S. Cl. 411—5 **6 Claims**



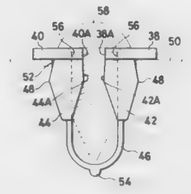
1. A double nut comprising:
a first nut body having a threaded axial bore, said first nut body being formed with a recess defined by an annular internal surface and arranged in communication with said axial bore;
a second nut body having a threaded axial bore coaxial with and corresponding in diameter to said axial bore of said first nut body to provide a common axis,
said second nut body being formed with an annular axial projection insertable into said recess and having an annular external surface;
at least one of said internal surface and said external surface being conical with a diameter decreasing progressively in a direction of insertion of said axial projection into said recess;
one of said recess and said axial projection being eccentric relative to said common axis; and
a frangible connecting web breakable at a predetermined circumferential shearing force producing a broken web portion extending in a direction intersecting said common axis to connect said external surface to said internal surface,
wherein a portion of the axial projection is axially spaced from the recess and substantially only said broken web portion engages with said conical surface for providing local wedging contact when securely locking the double nut onto a threaded bolt shank.

4,729,704

SCREW GROMMET

Naoshi Yokoyama, Nagoya, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 4, 1985, Ser. No. 772,369
Claims priority, application Japan, Sep. 7, 1984, 59-136058[U]
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—61 **4 Claims**



1. A one-piece screw grommet made of synthetic resin for use in connection with associated panels of various thicknesses and having openings of various diameters and screws having various diameters; said screw grommet comprising a pair of separated unconnected flange halves, a pair of separated tapered rigid leg halves depending one from each of said flange halves at opposite sides of a longitudinal axis of said screw grommet and a substantially narrow thin flat flexible elastic U-shaped strip of generally uniform width connecting the lower ends of said tapered leg halves, said U-shaped strip providing the sole connection between said leg halves, said tapered leg halves having outer projections; said tapered leg halves projecting at substantially right angles from the lower surface of the flange halves forming a substantially triangular pyramid; said flange halves and tapered leg halves having opposed grooves along their respective inner surfaces for receiving a screw, said U-shaped strip having sufficient initial axial extent and flexibility for enabling said flange halves and tapered leg halves to be separated from each other substantially lenearly according to the outer shape of a screw upon flexing of said U-shaped strip during insertion of the screw.

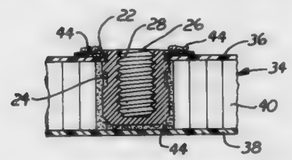
4,729,705

INSERT FASTENER IN A LIGHTWEIGHT PANEL

William R. Higgins, Clearwater, Fla., assignor to ATR International, Inc., Clearwater, Fla.

Filed Feb. 2, 1987, Ser. No. 9,966
Int. Cl.[4] F16B *39/02*
U.S. Cl. 411—82 **5 Claims**

1. An insert fastener permanently mounted within a preformed hole in a lightweight panel having a lightweight core comprising:
(a) an outer head in the form of a flat circular flange for overlapping the preformed hole;
(b) an integral cylindrical body depending from the outer head having a pair of radial flanges with serrated edges, the flanges being parallel to and spaced apart from the outer head and each other;



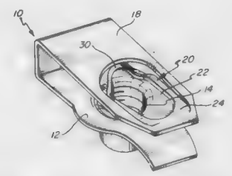
(c) a central threaded bore through the outer head and a portion of the cylindrical body; and
(d) spaced apart holes in the outer head on each side of the central bore, the diameter of the parallel radial flanges being less than the distance between an outer edge of the two holes and slightly more than the diameter of the preformed hole.

4,729,706

FASTENER CLIP

Francis C. Peterson, Woodbury, and Phillip D. Becker, Southbury, both of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

Filed Apr. 1, 1987, Ser. No. 33,175
Int. Cl.[4] F16B *37/02*
U.S. Cl. 411—175 **6 Claims**



1. In a fastener assembly of the type where a clip having two legs is adapted to be pushed onto an edge of a sheet material, said clip having a tongue formed on a first leg for frictionally engaging said sheet material and having on a second leg an internally threaded barrel, the improvement wherein said tongue comprises: a U-shaped elongated tongue formation, with an oblong aperture therein, attached to said first leg at two points at the tips of said U-shape.

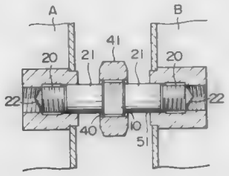
4,729,707

DOUBLE END STUD

Yoshiki Takahashi, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 26, 1985, Ser. No. 813,474
Claims priority, application Japan, Dec. 27, 1984, 59-281231
Int. Cl.[4] F16B *35/00*
U.S. Cl. 411—389 **23 Claims**

1. A double end stud for joining two structural members, each provided with guide bores, comprising a shank member having:
a central slide shank portion;
portions coaxially threaded in opposite directions on alternate sides of said central slide shank portion;
a nut member on said central slide shank portion slidable in the axial direction but not rotatable about said central slide shank portion; and



means adapted to align the stud with guide bores of structural members including guide shank portions formed on said shank portions.

4,729,708

METHOD OF AND APPARATUS FOR TURNING COVER SHEETS OF STATIONERY PRODUCTS

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Feb. 6, 1987, Ser. No. 12,007
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605239
Int. Cl.[4] B42B *5/08, 9/02*
U.S. Cl. 412—1 **29 Claims**



1. A method of turning one outermost sheet from the outer side of the neighboring sheet to the outer side of the other outermost sheet in a stack of overlapping sheets which are held together by a binder, particularly a wire binder, with freedom of pivotal movement about a predetermined axis, comprising the steps of moving a portion at least of the one outermost sheet away from the neighboring sheet so as to establish a gap therebetween; applying to the one outermost sheet a force in the gap so as to pivot the one outermost sheet relative to the remaining sheets of the stack about said axis to an intermediate position still remote from the other outermost sheet; transporting the stack along a path extending substantially at right angles to the axis; and completing the turning of the one outermost sheet against the other outermost sheet in a predetermined portion of said path.

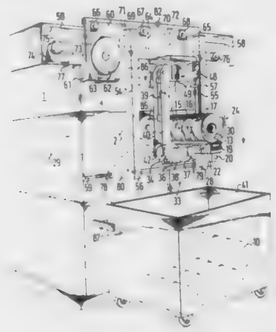
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4,729,709

DEVICE FOR TRANSFERRING CROSSWOUND COILS FROM A CROSSWOUND COIL DELIVERY LOCATION OF A TEXTILE MACHINE INTO A BOX-SHAPED CONVEYANCE

Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,630
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441778
Int. Cl.[4] B65G *67/00*
U.S. Cl. 414—399 17 Claims



1. Device for transferring crosswound coils from a crosswound-coil delivery location of a textile machine into a box-shaped conveyance, comprising a flat conveyor having means for defining a substantially flat supporting surface whereon crosswound coils are collectible in mutually adjacent rows, and grippers for unloading a plurality of said crosswound coils collected on said substantially flat supporting surface, said flat conveyor and said grippers being combined into one structural unit, said structural unit being pivotable in a vertical plane through an angle of substantially 180° and being controllably changeable in position in vertical and horizontal direction, and means comprising planetary gearing for pivoting said one structural unit in said vertical plane through said angle of substantially 180° so as to shift said one structural unit into a position wherein the crosswound coils are located under said flat conveyor, said grippers being pivotable away laterally so that the crosswound coils are releasable downwardly from the location thereof resulting from the pivoting of said one structural unit through said angle of substantially 180°.

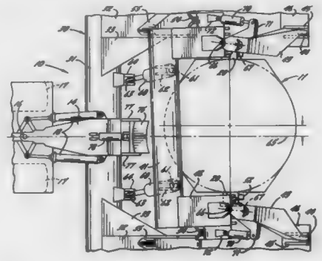
4,729,710

LADLE CARRIER WITH LATERALLY SHIFTABLE CRADLE

Edward S. Kress; Dennis R. Thomas, and William L. LaBerdia, all of Brimfield, Ill., assignors to Kress Corporation, Brimfield, Ill.

Filed Feb. 2, 1987, Ser. No. 9,688
Int. Cl.[4] B65G *65/04*
U.S. Cl. 414—421 8 Claims

1. A carrier for lifting and transporting a heavy ladle or the like having lateral trunnions, comprising in combination, a self-propelled tractor and a wheeled trailer having a longitudinal center line and a generally U-shaped frame with rearwardly projecting side members, and a forwardly projecting integral gooseneck pivotally connected to the tractor to permit turning thereof at substantially right angles, a generally rearwardly opening cradle connected by pivot means adjacent the rear ends of the trailer side members and adapted to embrace the ladle, hook means suspended from the cradle for engaging the ladle trunnions and lifting the ladle, a hydraulic lift actuator interconnected by pivot means to the forward portion of the cradle and the forward portion of the trailer frame for pivotally raising and lowering the cradle with respect to the trailer side members, said cradle including a generally U-shaped forward portion with rearwardly extending legs and a pair of rear extension members respectively connected by



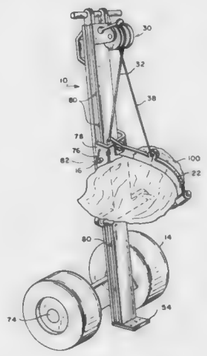
hinge means adjacent the ends of the legs, and actuator means interconnecting the legs and extension members for selectively swinging the legs and extension members about the hinge means so as to shift the cradle and hooks laterally with respect to the trailer center line.

4,729,711

HAND TRUCK

Vaino J. Holopainen, Moultonboro Neck, N.H., assignor to Charles E. Thorndike, Meredith, N.H.

Filed Sep. 16, 1986, Ser. No. 908,175
Int. Cl.[4] B65G *7/12*
U.S. Cl. 414—454 10 Claims



1. A hand truck for transporting and lifting a load comprising:

(A) an elongated frame having an upper and lower end;

(B) a wheel assembly attached to the lower end of the frame;

(C) a carriage mounted on the frame and adapted to freely travel the length of the frame, the carriage having a load bed that extends across the frame, and at least one protrusion below the load bed that extends above the surface of the load bed;

(D) a seizing arm pivotally attached at a pivot point to the carriage above the load bed, the seizing arm having a body with a securing means directed toward said load bed; and

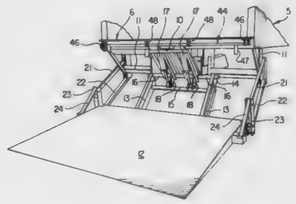
(E) a single actuator for forcing the seizing arm towards the load bed so that an object placed on the load bed is secured between the seizing arm and the carriage, and then for positioning the carriage along the frame.

4,729,712

VEHICLE LIFT GATE WITH UPRIGHT STORAGE

Quentin D. Corley, Jr., 326 S. Rock Island, Dallas, Tex. 75207

Filed Aug. 15, 1986, Ser. No. 897,052
Int. Cl.[4] B60P *1/44*
U.S. Cl. 414—557 16 Claims



1. A lift gate for attachment to a vehicle having a cargo bed comprising:

a load platform having a leading edge adapted to confront the end plane of the cargo bed and a trailing edge at the distal end of said platform from said leading edge;

an attitude control mechanism for said platform comprising a pair of platform upright members pivotally connected to opposite sides of said platform adjacent to said leading edge, and a pair of spaced apart upper and lower arms pivotally connected to each of said platform upright members and to said vehicle and cooperating with said upright members for controlling the attitude of said platform during the raising and lowering thereof between ground and bed positions;

a pair of lift arms adapted to be pivotally supported for oscillation between lower and upper positions, about a horizontal axis disposed under said vehicle bed;

longitudinally movable first pivot means mounted on said platform; the distal ends of said lift arms being pivotally connected to said movable first pivot means and operative when oscillated to effect longitudinal displacement of said first pivot means; and

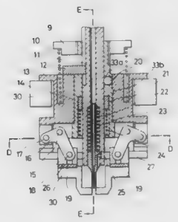
power means operative for effecting the raising of said lift arms from said lower position.

4,729,713

APPARATUS FOR HOLDING AN ELECTRONIC PART

Susumu Takaichi, Osaka; Kouji Fujiwara, Kouriyama; Masato Tanino, and Tsutomu Inukai, both of Kofu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 28, 1986, Ser. No. 867,683
Claims priority, application Japan, May 30, 1985, 60-116916
Int. Cl.[4] B65G *47/90*
U.S. Cl. 414—626 10 Claims



10. An apparatus for holding a part, comprising:

a body;

a part-absorbing nozzle mounted to the body;

a rod member connected to said part-absorbing nozzle at one end thereof, said rod member being axially movable with respect to said body;

sleeve means connected to the body and movable along the axis of said rod member in response to the movement of said rod member;

a pair of chucking jaws connected to the body for chucking the part; and

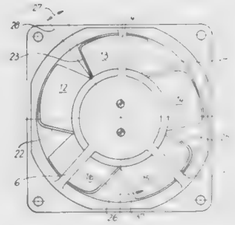
transmission means connected to the chucking jaws and sleeve means and arranged for moving said pair of chucking jaws at substantially right angles to the axis of said rod member in opposite directions to each other in response to the movement of said sleeve means, said transmission means including a pair of levers each providing a connection between each of said pair of chucking jaws and the sleeve means and further including guide means connected to the sleeve means and extending radially at generally right angles to the axis of said rod member to provide guiding movement for said chucking jaws in radial directions generally perpendicular to the axis of said rod member in response to movement of said levers and sleeve means.

4,729,714

BUILT-IN FAN

Guenter Wrobel, Villingen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

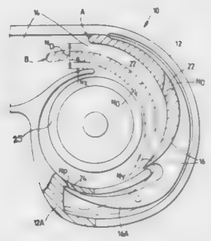
Filed May 2, 1986, Ser. No. 858,704
Claims priority, application Switzerland, May 2, 1985, 1855/85
Int. Cl.[4] F04D *29/66*
U.S. Cl. 415—119 20 Claims



1. A fan comprising fan wheel means, a housing means including a tubular member, said fan wheel means being supported substantially coaxially in said tubular member, said fan wheel means including a hub forming the rotor means of a centrally supported driving motor whose stator means is supported at the tubular member by generally radially directed spokes extending closely at one end of the fan wheel means, and fan blade means distributed over the circumference of the fan wheel means and extending in the space between the hub and tubular member to limit turbulence generated by adjacent fan blade means so that the turbulence is not in synchronism with the frequency of rotation of the fan blade means, the blade edges of adjacent fan blade means which face the spokes differing from another as regards at least one dimension of spacing, inclination, curvature, length and direction with respect to a plane substantially perpendicular to the fan axis and passing through the part of the spokes most close to the fan blade edges.

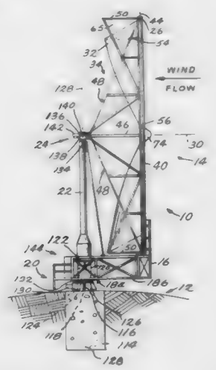
VOL 1088 ISS 2 MR 8 1988 UMI

4,729,715
VARIABLE INLET FOR A RADIAL TURBINE
Geoffrey L. Wilde, Hunter's Moon, Turnditch Derby, England
Filed Jul. 16, 1986, Ser. No. 886,221
Claims priority, application United Kingdom, Jul. 17, 1985, 8518044; Oct. 5, 1985, 8524633
Int. Cl.[4] F01D *17/18*
U.S. Cl. 415—150 **8 Claims**



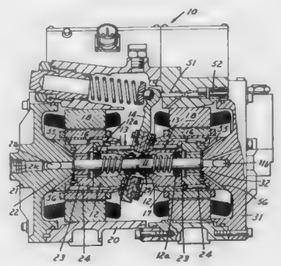
1. A turbine apparatus comprising a volute casing having an internal flow passage for receiving and passing a driving medium to a turbine rotor connected to said passage, said passage having at least one inlet and one outlet, said passage being partly defined by at least one movable wall member, the wall member being movable to vary the area of the inlet between a first position in which the inlet area is at a maximum and further positions in which the inlet area is less than the maximum to allow the driving medium to flow over both surfaces of the wall member and to flow onto the surface of a turbine rotor at, at least, two locations angularly displaced with respect to one another when the movable wall member is located at any one of said further positions, said movable wall member having at least one opening defining a fixed area nozzle to allow the passage therethrough of a portion of the driving medium.

4,729,716
WIND TURBINE
Guenter E. Schmidt, Napa, Calif., assignor to Montana Wind Turbine, Inc., Palo Alto, Calif.
Filed Feb. 25, 1986, Ser. No. 833,369
Int. Cl.[4] F03D *11/04*
U.S. Cl. 416—10 **16 Claims**



1. A wind turbine comprising:
- a turbine wheel having a rim and airfoil means depending radially inwardly from said rim for rotating said wheel when subjected to wind;
- carriage means disposed against and supporting said rim for supporting substantially the weight of said wheel;
- means for cantilevering said carriage means, including a supporting portion joined to said carriage means and an anchoring portion spaced generally horizontally from said supporting portion;
- means joined to said anchoring portion for anchoring said cantilevering means relative to the earth at a location spaced generally horizontally from said carriage means; and
- means mounted on said carriage means and coupled to said wheel for taking power from said wheel during rotation.

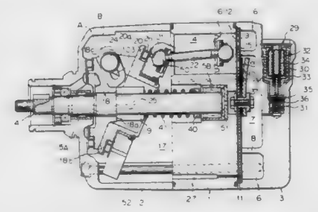
4,729,717
POWER TRANSMISSION
Umesh Gupta, Clinton, Miss., assignor to Vickers, Incorporated, Troy, Mich.
Filed Dec. 24, 1986, Ser. No. 946,322
Int. Cl.[4] F04B *41/06, 25/04*
U.S. Cl. 417—5 **8 Claims**



1. An electric motor driven inline hydraulic apparatus comprising
- a housing common to the electric motor and the hydraulic pump,
- a stationary shaft mounted in said housing,
- spaced cylinder block subassemblies that rotate around and are mounted on said shaft,
- each such subassembly including a cylinder block and a plurality of circumferentially spaced pistons,
- said cylinder block subassemblies being positioned such that the pistons of subassembly extend toward the other subassembly,
- a common yoke plate mounted in association with said pistons and between said cylinder block subassemblies,
- a hollow electric motor rotor individual to each cylinder block subassembly arranged to house and drive said cylinder block subassembly and an associated electric motor stator individual to each rotor mounted in said housing,
- each said stator, its associated rotor and its associated cylinder block subassembly being operable independently of and in direction opposite to the other.

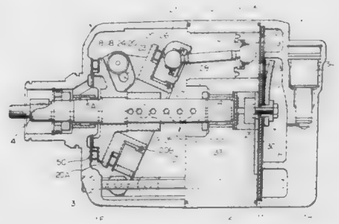
4,729,718
WOBBLE PLATE TYPE COMPRESSOR
Masaki Ohta; Shinichi Suzuki; Akihiko Hyodo, and Kenji Takenaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan
Filed Sep. 24, 1986, Ser. No. 910,944
Claims priority, application Japan, Oct. 2, 1985, 60-219808
Int. Cl.[4] F04B *1/26*
U.S. Cl. 417—222 **2 Claims**

1. A wobble plate type compressor including a rear housing having therein a suction chamber for a refrigerant to be compressed and a discharge chamber for discharging the compressed refrigerant, a cylinder block having therein a plurality of cylinder bores with associated reciprocatory pistons disposed therein to take the refrigerant from the suction chamber and to then discharge the refrigerant, after compression, to the discharge chamber, a crankcase connected to the cylinder block and receiving therein a drive shaft and an assembly of non-rotary wobble and rotary drive plates mounted on the drive shaft so as to cause a compressing motion of the reciprocatory pistons, a guide means for permitting inclination of the wobble plate from a plane perpendicular to the drive shaft while preventing any rotation of the wobble plate about the drive shaft, means for maintaining a pressure in said crankcase at a predetermined pressure level having a first passageway between said suction chamber and a crankcase interior and a second closeable passageway between said discharge chamber and said crankcase interior, and a control means for changing the inclination angle of the wobble plate so as to change a



discharge capacity within a range to be controlled in accordance with a cooling load, said control means comprising an elastic biasing means for adjusting said inclination angle of said wobble plate, to adjust said discharge capacity in order to keep the pressure in said suction chamber at a substantially constant level regardless of the change in said cooling load, in such a manner as to reduce a decrease in the amount of said inclination angle of said wobble plate caused by said pressure in said crankcase, a pressure in said suction chamber and a pressure in said discharge chamber in accordance with a change in said cooling load, a biasing force of said elastic biasing means being zero when said inclination angle of said wobble plate is at a maximum within said range to be controlled.

4,729,719
VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR WITH A WOBBLE ANGLE CONTROL UNIT
Hiroaki Kayukawa; Masaki Ohta; Akihiko Hyodo, and Kenji Takenaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan
Filed Jul. 27, 1987, Ser. No. 78,416
Claims priority, application Japan, Aug. 1, 1986, 61-119269
Int. Cl.[4] F04B *1/26*
U.S. Cl. 417—222 **8 Claims**



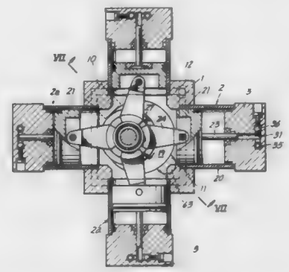
1. A variable displacement wobble plate type compressor comprising:
- a suction chamber for a refrigerant;
- a plurality of cylinder bores arranged so as to surround an axial drive shaft and having therein associated reciprocatory pistons disposed so as to draw the refrigerant from the suction chamber and to then discharge the refrigerant after compression in a discharge chamber;
- a crankcase having defined therein a chamber communicating with the cylinder bores and containing therein a drive plate mounted in such a manner that it is capable of rotating with the axial drive shaft as well as changing an inclination thereof with respect to the axial drive shaft from the minimum to the maximum inclination position thereof, and a non-rotating wobble plate held by the drive plate;
- a plurality of connecting rods connecting between the wobble plate and pistons;
- a first passageway means for communicating said chamber of said crankcase with said discharge chamber;
- a first valve means arranged in said first passageway means, for opening and closing said first passageway means;
- valve control means for controlling the operation of said first valve means in response to a change in fluid pressure in said chamber of said crankcase acting as a back-pressure applied to said pistons, with respect to a predetermined pressure level, said valve controlling means moving said first valve means to a first position opening said first passageway means when pressure in said chamber of said crankcase is less than said predetermined pressure level, and to a second position closing said first passageway means when said pressure in said chamber of said crankcase is larger than said predetermined pressure level;
- a second passageway means for providing a variable fluid communication between said chamber of said crankcase and said suction chamber, said second passageway means including a portion thereof extending axially through said drive shaft and constantly communicated with said suction chamber, and a plurality of separate vent holes axially arranged in a circumference of said drive shaft so as to separately open toward said chamber of said crankcase;
- an annular sleeve element axially slidably mounted on said drive shaft, and operatively connected to said drive plate so as to slide from a first position thereof covering first predetermined numbers of said plurality of said vent holes of said second passageway means to a second position thereof covering second predetermined numbers of said plurality of said vent holes of said second passageway means in response to a decrease in inclination of said drive and wobble plates from a predetermined inclined position whereat said wobble plate is able to provide said pistons with the maximum reciprocatory strokes, each of said first and second predetermined numbers being smaller than the total number of said plurality of said vent holes.

4,729,720
APPARATUS FOR CONTINUOUSLY GENERATING HYDRAULIC PRESSURE
Hiromu Fujita, Kyoto, Japan, assignor to Osaka Taiyu Co., Ltd., Osaka, Japan
Continuation of Ser. No. 642,218, Aug. 20, 1984, abandoned. This application Jul. 25, 1986, Ser. No. 889,597
Claims priority, application Japan, Aug. 19, 1983, 58-151881
Int. Cl.[4] F04B *1/00, 27/00*
U.S. Cl. 417—271 **2 Claims**

1. An apparatus for generating continuous pulsating free hydraulic pressure comprising a motor having a main body, said main body having a plurality of pneumatic cylinder units mounted circumferentially around the axis of said body and connected to a crankshaft, each of said cylinder units having a cylinder, hydraulic base connected directly to said cylinder and piston in said cylinder connected to said crankshaft, a plunger projecting from said piston and slidably intimately fitted in a hydraulic chamber in said hydraulic base, the pistons in said cylinder units being reciprocatingly movable, one after the other, by pneumatic pressure to drive the plungers, rotate said crankshaft and generate continuous hydraulic pressure as said pistons are reciprocated and said plungers advance inwardly into said hydraulic chambers in said bases, each of said cylinder units having a hydraulic fluid outflow line for receiv-

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ing hydraulic fluid under pressure from each said cylinder unit, an air valve case mounted on said motor main body, said air valve case having air channels communicating individually with said cylinders and opening circumferentially around said air valve case, a rotary air valve rotatably fitted in said air valve case and having in its interior an air supply chamber with a compressed air source and an air discharge chamber positioned symmetrically with said air supply chamber and communicating with the atmosphere, each of said pistons having link means connected at one end of said piston and at its opposite end to said crankshaft, said cranshaft having an eccentric portion for rotating said rotary air valve in said air valve case and for connecting said air channels, one after the other, with said individual cylinders, said air discharge chamber in said rotary air valve being open at the surface of said rotary air valve over a length longer than the opening length of said air supply chamber, a hydraulic fluid inflow line interconnecting said hydraulic chamber with a hydraulic oil supply, each of



said hydraulic bases at said hydraulic chambers having an inflow valve in said inflow line for permitting fluid flow from said inflow line into said hydraulic chamber and for preventing flow of fluid under pressure from each hydraulic chamber into said inflow line and an outflow valve in said outflow line for permitting flow of fluid under pressure from said hydraulic chamber into said outflow line and for preventing flow of fluid under pressure from said outflow line into said chamber, said opening of said air discharge chamber in said rotary air valve over a length longer than the length of said air supply chamber causing the pressured fluid from a first of said plurality of hydraulic chambers flowing into a first of said plurality of cylinders outflow line and the pressure fluid from a second of said plurality of hydraulic chambers starting to flow into a second of said plurality of cylinders outflow line when the outflow of fluid from the first hydraulic chamber is about to cease, the fluid from the first and the second hydraulic chambers being thus combined to provide pressured fluid free of pulsation.

4,729,721

VALVE ARRANGEMENT WITH AT LEAST TWO DIAPHRAGMS

Svend Hansen; Laurits B. Rasmussen, both of Sonderborg, and Jorn H. Klausen, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

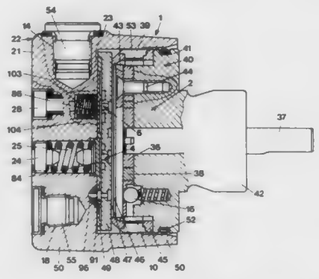
Division of Ser. No. 902,862, Sep. 2, 1986, Pat. No. 4,703,773, which is a continuation of Ser. No. 803,438, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 852,284, Sep. 25, 1984, abandoned. This application Aug. 7, 1987, Ser. No. 82,675

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335895

Int. Cl.⁴ F04B *21/02*

U.S. Cl. 417—302 **6 Claims**

1. An oil pump unit that comprises a pump housing having an end plate, pump means within said housing that has an inlet and an outlet for pressurizing oil, and inlet port, an outlet port, fluid circuit means for placing the inlet port in fluid communication with the pump means inlet and the outlet in fluid communication with the outlet port and return excess oil back to the pump inlet, a plurality of valve means in the circuit means for controlling the flow of oil through said circuit means, a cover removably mounted by the housing to in cooperation therewith define an interior chamber, and having a plate shaped portion that in part defines the interior chamber and is axially spaced from the housing end wall, said cover including said inlet and outlet ports, said valve and circuit means in part being defined by said cover, a plate shaped common component and an elastic valve plate, said valve plate and common component being located in the chamber axially between the end plate and the cover plate-shaped portion with the valve being axially between the common component and the plate-shaped portion, and means for forming a fluid seal between the end plate and said common component, said common component having a first side surface portion that has a plurality of valve seats and an annular channel surrounding each valve seat and flat surface parts surrounding said channels, an axial opposite second side surface portion that is in fluid sealing relation-



ship with the fluid sealing means and has a plurality of oil passage grooves, an axial first passage for each valve seat that opens through the respective seat and to a groove, an axial second passage opening through the first side portion and to one of the grooves and a third passage for each channel that opens to the respective channel and to a groove other than the one that the first passage in the valve seat it surrounds opens to, the valve plate abutting against the plate shaped portion and having a plurality of axial valve plate passages that respectively open to the common component second passages, a diaphragm section for each valve seat that is movable between a condition blocking oil flow between the respective first passage and the channel that surrounds it and alternately to a condition permitting such oil flow, the diaphragm unit having for each diaphragm section a raised circular bead portion of a larger diameter than the respective channel that is retained in fluid and sealing engagement with the adjacent common component flat surface part and surrounds the respective diaphragm section, said valve means including separate means for mechanically biasing the respective diaphragm section to its oil flow blocking condition.

4,729,722

NOISE SUPPRESSOR FOR TURBO-COMPRESSOR

Dennis W. Toth, Pontiac, Mich., assignor to Can-Am Engineered Products, Inc., Livonia, Mich.

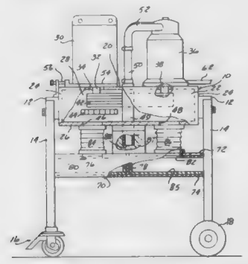
Filed Nov. 5, 1986, Ser. No. 927,081

Int. Cl.⁴ F04B *39/00, 39/16*

U.S. Cl. 417—312 **5 Claims**

1. A turbo compressor air supply system for supplying air at relatively low pressure and high volume to a paint spray system or the like, said air supply system comprising a hollow box-like base having a closed internal chamber, a drive motor mounted upon said base and having a drive shaft projecting into said chamber, a turbo compressor including a housing

mounted on said base and a drive shaft projecting from said housing into said chamber, drive train means in said chamber coupling said drive shafts to each other to enable said motor to drive said turbo compressor, said turbo compressor housing having air intake means and an air outlet means adapted to be coupled to a paint spray system, said air outlet means being in



at least restricted fluid communication with said chamber, noise suppressor means disposed beneath said base, said suppressor means having an inlet compartment having an ambient air inlet and a separate outlet compartment, first means placing said inlet compartment in fluid communication with said chamber, and second means placing said chamber in communication with said outlet compartment.

4,729,723

CASING FOR HERMETICALLY ENCAPSULATED SMALL REFRIGERATORS

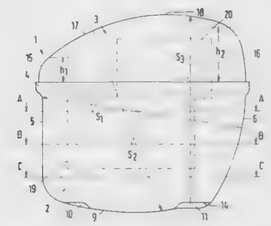
Svend E. Outzen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 27, 1987, Ser. No. 6,882

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605021

Int. Cl.⁴ F04B *21/00, 35/04*

U.S. Cl. 417—312 **9 Claims**



1. A casing for hermetically encapsulated small refrigerators, comprising, a capsule having a lower vessel and an upper cover interconnected along a welded edge, said capsule having side walls inclined relative to each other so that almost any line drawn perpendicular to any one of said walls meets the opposite one of said walls at an angle different from 90°, the angle of incidence departing at least 5° from 90°.

4,729,724

BLOWER FOR PROPELLING A CONTINUOUS GAS STREAM WITH INFLATABLE GAS SEALS

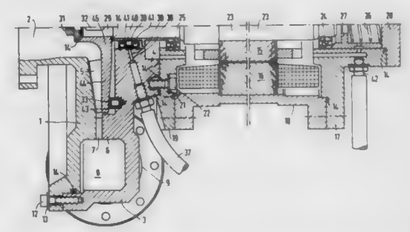
Hans-Heinrich Henning, Ennepetal; Hartmut Lelickens, Wiesenthau, and Herbert Schramm, Höchstadt, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 913,500

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534903

Int. Cl.⁴ F04B *17/00, 35/04*

U.S. Cl. 417—423 R **6 Claims**



1. Apparatus for propelling a continuous gas mixture stream of an inert carrier gas and an aggressive doping gas, comprising an electric motor having a motor housing filled with pure carrier gas and a shaft with a shaft extension, a radial blower having an impeller mounted directly on said shaft extension and a blower housing filled with the gas mixture and coupled to said motor housing, said impeller having a flange facing said motor and said blower housing having a wall facing said motor having an inner surface, a ring space, a hollow sealing ring inflated with compressed gas for sealing said blower housing from said motor housing when said blower is stopped, said hollow sealing ring being formed of soft material anchored at said inner surface of said wall of said blower housing, and said hollow sealing ring having a plurality of sealing lips lying against said flange of said impeller in the inflated state, and means for continuously feeding and maintaining a gas ring of pure carrier gas in said ring space for sealing said blower housing against said motor housing in an operating state.

4,729,725

MOUNTING SYSTEM FOR SELECTIVELY MOUNTING CEILING FANS

Herbert W. Markwardt, Fort Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.

Filed Sep. 30, 1986, Ser. No. 913,475

Int. Cl.⁴ F04B *17/00*

U.S. Cl. 417—423 R **3 Claims**

3. A ceiling fan adapted for selective mounting flush to the ceiling, or alternatively, suspended upon a down rod comprising:

a horizontally extending ceiling mounting plate having a downwardly extending flange at the outer periphery thereof, said flange defining a plurality of screw holes therethrough;

a concavo-convex canopy having screw holes therethrough and including a centrally apertured lower central plate, said lower central plate having a plurality of upper fastener holes formed therethrough in spaced array about the aperture through the center of said central plate;

a plurality of mounting screws extending through said screw holes in the canopy and into engagement with the screw holes in the downwardly extending flange of the ceiling mounting plate;

a reverse-turned hook projecting down from the ceiling mounting plate at a location within the downwardly extending flange and having a canopy suspending point thereon facilitating hanging of the canopy therefrom

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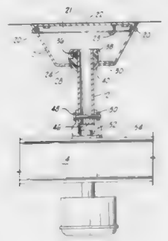
temporarily at a time when electrical connections to the fan are to be established;

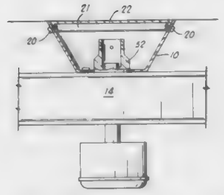
a down rod assembly movably connected to the canopy and projecting downwardly therefrom, said down rod assembly including:

an elongated tubular down rod having an upper end extending through the central aperture in said lower central plate and having a lower end;

a ball element within said canopy detachably secured to the upper end of said down rod for pivotally supporting said down rod suspended from said canopy; and

a down rod sleeve receiving the lower end of said down rod and sized to project through the central aperture in the lower central plate of said canopy when said canopy is mounted in said flush-mounting mode;





a fan motor housing having a top plate beneath, and secured to, and supporting, said down rod sleeve, said fan motor housing top plate having a plurality of lower fastener holes therethrough vertically aligned with the upper fastener holes in said central plate of said canopy; and

means for interengaging said lower central plate of said canopy in flatly abutting contact with the top plate of said fan motor housing, with said down rod sleeve projecting into said canopy through the central opening in said lower plate at a time when the down rod and ball element are removed to facilitate flush mounting of the fan, said interengaging means comprising a plurality of fasteners removably carried in said lower fastener holes through said motor housing top plate, and sized to pass through the upper fastener holes in said central plate of said canopy.

4,729,726

HOUSING STRUCTURE FOR A MULTIPLE-ROTOR TYPE ROTARY PISTON ENGINE

Noriyuki Kurio; Nobuhiro Yamamoto; Junichi Funamoto, and Yoriaki Fujimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

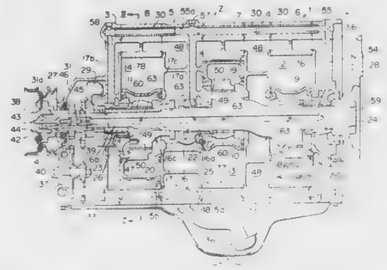
Filed Dec. 16, 1986, Ser. No. 942,283

Claims priority, application Japan, Dec. 17, 1985, 60-287464

Int. Cl.⁴ F01C *1/22, 21/10*

U.S. Cl. 418—60 **10 Claims**

1. A rotary piston engine including a casing comprised of a plurality of rotor housings each having an inner wall surface of trochoidal configuration, an intermediate housing between each adjacent pair of the rotor housings to close one side of each rotor housing, a side housing attached to an outer side surface of an axially outermost one of the rotor housings, a rotor of a polygonal configuration disposed in each of the rotor housings to rotate with apex portions in sliding contact with the inner wall surface of the rotor housing, an eccentric shaft assembly located in said casing for carrying said rotors, said eccentric shaft assembly comprising a first eccentric shaft and a second eccentric shaft which are fitted together by placing said second eccentric shaft over said first eccentric shaft at a fitting position with said fitting position and one end of the second eccentric shaft located in one of the intermediate housings, said housings being connected together only by first tightening bolts inserted through the housings at one side of the intermediate housing where said one end of the second eccentric shaft is located and connected to the same intermediate housing and second tightening bolts inserted through the housings at the other side of the same intermediate housing and connected to the same intermediate housing so that there exists no tightening bolt which extends through the same intermediate housing.



4,729,727

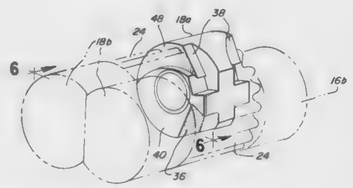
GEAR PUMP WITH GROOVE IN END WALL BEGINNING AT OUTER PERIPHERY OF PUMPING CHAMBER AND WIDENING TOWARD GEAR TEETH ROOTS

Jerome K. Aarestad, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,196

Int. Cl.⁴ F04C *18/08, 29/08*

U.S. Cl. 418—78 **6 Claims**



1. A gear pump, comprising:

a pair of intermeshing gears;

a housing defining a pumping chamber having peripheral walls surrounding and in sealing contact with the circumference of the gears between an inlet port and a discharge port;

bearing wall means adapted to engage adjacent side faces of the gears in substantially sealing relation; and

groove means in the bearing wall means for progressively admitting pressure to the gear teeth as the gear teeth move toward the discharge port, said groove means beginning at the outer periphery of the pumping chamber and widening inwardly toward the roots of the gear teeth.

4,729,728

COMPRESSOR WITH IMPROVED LUBRICATING SYSTEM

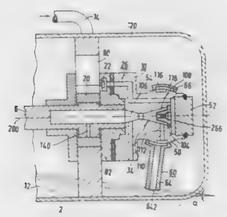
Bernd Gromoll, Baiersdorf, and Peter Gulden, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 856,616

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516593

Int. Cl.⁴ F04C *29/02;* **F01M** *1/08, 11/02*

U.S. Cl. 418—88 **6 Claims**



1. An oil-lubricated rotary piston compressor with an improved lubricating system, comprising:

an oil sump;

a compression chamber;

a piston movable within said chamber;

an axially elongated crankshaft driving said piston and having a bore through which oil from the sump is supplied to the piston;

a conduit connecting said bore with said chamber, said conduit having a constricted region intermediate said chamber and bore;

a nozzle located in said constricted region;

a diffuser located adjacent said nozzle;

an oil suction conduit having a proximal end in communication with said region and a distal end in communication with said sump, said oil suction conduit having a center of gravity; and

means for pivotally securing said oil suction conduit in a manner that it is rotatable in a plane which is perpendicular to said crankshaft and in a manner that an imaginary line passing through said distal end and center of gravity intersects said crankshaft.

4,729,729

ROTOR HOUSING FOR ROTARY PISTON ENGINES

Kouji Tarumoto, and Satoshi Nanba, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

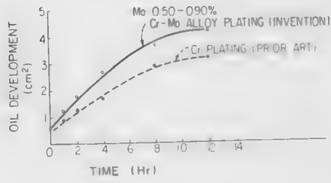
Filed Jul. 17, 1986, Ser. No. 886,380

Claims priority, application Japan, Jul. 26, 1985, 60-166391

Int. Cl.⁴ F01C *1/22, 21/00;* **B32B** *15/00;* **C25D** *5/00*

U.S. Cl. 418—178 **5 Claims**





1. A rotor housing for a rotary piston engine, including an inner wall surface of trochoidal configuration provided with a porous plating layer of a Cr-Mo alloy containing 0.50 to 0.90% in weight of Mo.

4,729,730

PRESSURE TRANSMITTING APPARATUS WITH SUPERPLASTIC ALLOY AS THE PRESSURE TRANSMITTING MEDIUM

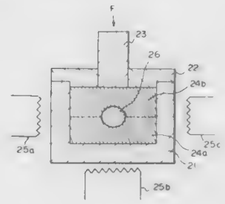
Haruaki Hatayama; Hideo Takei; Takuji Okabe, all of Higashihiroshima; Yoshiharu Waku, Ube, and Toyoaki Ueno, Yoshiki, all of Japan, assignors to Ube Industries Ltd., Yamaguchi, Japan

Filed Jan. 6, 1986, Ser. No. 816,201

Claims priority, application Japan, Jan. 9, 1985, 60-1724

Int. Cl.⁴ B30B *12/00*

U.S. Cl. 425—405.2 **3 Claims**



1. A pressure transmitting apparatus for sintering a powder body comprising (a) a container provided with a lid and a piston set in a through hole formed in the lid (b) a heater for heating the container, and (c) a superplastic alloy medium which encompasses the powder body, arranged within the container in force transmitting relation with the piston.

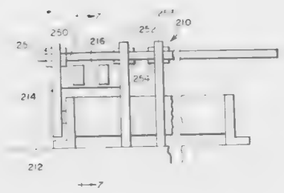
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4,729,731

LINEAR ACTUATOR FOR LABEL TRANSFER DEVICE

Siegfried C. Hasl, 80 Libert Corner, Warren, N.J. 07060, and Charles J. Lisnet, Westport, Conn., assignors to Siegfried C. Hasl, Warren, N.J.

Continuation of Ser. No. 594,883, Mar. 23, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,212
Int. Cl.[4] B28B *3/00*; B29C *33/14, 33/18*
U.S. Cl. 425—517 2 Claims



1. An in-mold label transferring apparatus comprising:

a cylinder defined by lateral sides extending from a front end to a rear end, a piston mounted in said cylinder for linear reciprocating movement along a first axis between a retracted position and an extended position, fluid supply means for selectively supplying a pressurized fluid on either side of said piston,

a piston rod connected to said piston and extending out the front end of the cylinder,

a mounting plate fixedly connected to said piston rod at a location where the piston rod extends out beyond the front end of the cylinder, said mounting plate extending in a direction transverse to said first axis,

a label transfer head connected to the mounting plate and extending as a cantilever from the mounting plate in a direction back toward the said rear end of the cylinder, extending along a second axis parallel to and spaced from the first axis,

wherein, in the extended position of the piston, the label transfer head is located forwardly beyond the said front end of the cylinder, and in the retracted position of the piston, the label transfer head is located along the lateral sides of the cylinder between transverse planes passing through the front end and the rear end of the cylinder,

the label transfer head having at least one label pickup head extendable and retractable in a direction essentially perpendicular to a reference plane passing through said first and second axis, to pickup and deliver labels from and to locations located laterally to the side of said reference plane,

said apparatus including a label pickup location located laterally to at least one side of said reference plane, between said transverse planes passing through said front and rear ends of the cylinder,

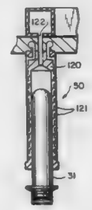
and said apparatus further including opposed mold halves which comprise said label delivery location, said delivery location located laterally to the side of said reference plane, forwardly, beyond the said front end of the cylinder.

4,729,732

CARRYING MEANS FOR HOLDING AND COOLING A PARISON

Robert D. Schad, Toronto; Herbert Rees, Orangeville; Gary Hughes, Nobleton, and John R. Murchie, Aurora, all of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Division of Ser. No. 733,969, May 14, 1985, Pat. No. 4,690,633, which is a continuation-in-part of Ser. No. 648,793, Sep. 7, 1984, Pat. No. 4,522,581. This application Mar. 30, 1987, Ser. No. 31,655
Int. Cl.[4] B29C *49/64*
U.S. Cl. 425—526 1 Claim



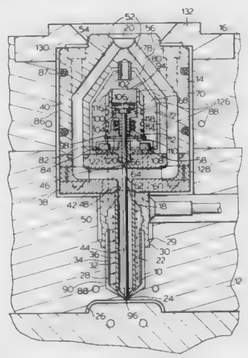
1. A carrying means for holding and cooling a heated parison therein, said carrying means having an open forward end for receiving said parison, a closed rearward end, a longitudinal wall between the forward and rearward ends with an internal surfce tapering inwardly towards the closed end, cooling means adjacent the longitudinal surface, whereby the internal surface is smaller than said heated parison, said parison also having a corresponding taper so that said cooling means is operative to shrink the parison upon cooling with the parison sliding inside the tube to fit snugly therein, said carrying means further including suction means adjacent the closed end for maintaining the cooled parison inside the tube.

4,729,733

DUAL FEED SINGLE CAVITY INJECTION MOLDING SYSTEM

Harald H. Schmidt, Georgetown, Canada, assignor to Mold-Masters Limited, Georgetown, Canada

Filed Mar. 5, 1987, Ser. No. 22,041
Claims priority, application Canada, Oct. 30, 1986, 521873
Int. Cl.[4] B29C *45/73*
U.S. Cl. 425—549 7 Claims



1. In a valve gated single cavity injection molding system having a heated nozzle seated in a cavity plate with an elongated valve pin having a driven end and a tip end mounted in a central bore in the nozzle, and a melt passage for conveying melt from a central inlet to a gate in a cavity plate leading to a cavity, the melt passage extending around the valve pin in the central bore of the nozzle which is in alignment with the central inlet and the gate, the improvement wherein,

(a) a heated hollow manifold housing is seated in a mold back plate, the manifold housing having a dome portion and a base portion, the dome portion having the central inlet therein, the base portion extending between the heated nozzle and ths dome portion and having a valve pin bore extending therethrough, the valve pin bore having a first portion and a second portion, the first portion having a substantially uniform diameter to snugly receive the valve pin therethrough, the second portion having a larger diameter than the first portion and extending in alignment from the first portion to an outlet connecting to the central bore of the nozzle, the manifold housing having a melt duct which forms a portion of the melt passage and extends from the central inlet to the join between the first and second portions of the valve pin bore, the melt duct in the manifold housing branching into at least two arms which extend to connect to the valve pin bore on opposite sides thereof, and

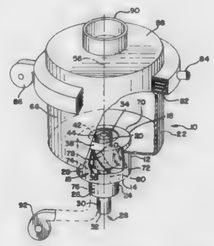
(b) hydraulic valve pin actuating mechanism is mounted inside the manifold housing, the actuating mechanism including a cylinder securely mounted inside the dome portion of the manifold housing with an insulative air space between them, a piston located in the cylinder and operatively connected to the driven end of the valve pin, and hydraulic fluid ducts connected to the cylinder on opposite sides of the piston, whereby the valve pin is reciprocated between a retracted open position and a closed position wherein the tip end of the valve pin is seated in the gate

4,729,734

DEVICE FOR IMPROVED COMBUSTION

Robert W. Polomchak, and Michael Yacko, both of Rural Rte. 1, Fair Oaks, Ind. 47943

Filed Jul. 18, 1986, Ser. No. 887,245
Int. Cl.[4] F23M *9/00*
U.S. Cl. 431—183 17 Claims



1. A device for improved combustion comprising:

a tubular housing member having a first end and a second end, said first and second ends each having a circular opening therethrough;

a combustion chamber disposed about said second end of said—tubular—housing member;

a first conduit member extending from said first end of said tubular housing member and in fluid communication with said circular opening in said first end of said tubular housing member so as to allow the passage of air therethrough;

a second conduit member axially disposed within said first conduit member and extending through said first conduit member and through said tubular housing member to said circular opening in said second end of said tubular housing member so as to allow the passage of fuel therethrough;

means for effecting turbulence in said air passing through said tubular housing member, said means including a plurality of curvilinear fins disposed in a spiral configuration within said tubular housing member, so as to effect a swirling motion to said air passing therethrough;

means for effecting turbulence in said fuel passing through said second conduit member, said means including an end member disposed on said second conduit member proximate said second end of said tubular housing member said end member having an upper end and a lower end and a plurality of curvilinear end cap fins between said upper end and said lower end; and

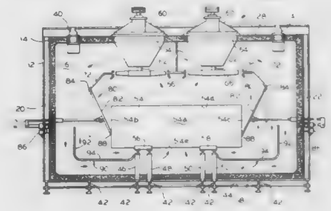
means for intermixing and emitting said turbulent air and said fuel in a mushroom shaped configuration with said turbulent air surrounding said mushroom shaped configuration so as to substantially eliminate noxious waste gases as a by-product of combustion of said air and fuel mixture.

4,729,735

VERTICAL AIR FLOW INGOT PUSHER FURNACE

Robert H. Ross, Meadville, Pa., assignor to Seco/Warwick Corporation, Meadville, Pa.

Division of Ser. No. 858,115, May 1, 1986, Pat. No. 4,676,743. This application May 21, 1987, Ser. No. 33,626
Int. Cl.[4] F27B *9/04*
U.S. Cl. 432—152 4 Claims



1. An ingot pusher furnace of the vertical air flow type comprising:

an insulating furnace enclosure formed by a bottom wall, a pair of side walls, a front wall, a rear wall and a top wall, said enclosure receiving a plurality of ingots to be heated whose length is at a minimum acceptable by the furnace;

means for heating said enclosure by heating a gaseous medium therein;

means for moving said gaseous medium within said enclosures;

a pair of vertical side baffles disposed in a parallel, spaced apart relationship to said side walls of said enclosure, each of said vertical baffles extending from the rear wall of said enclosure to the front wall, each of said vertical baffles having an upper end and a lower end;

a horizontal baffle having connecting members and extending from said rear wall to said front wall, said connecting members being pivotally attached to the respective upper ends of said vertical sides baffles;

said sides baffles being movable between a vertical position and an angled position;

a pair of L-shaped vanes surrounding the lower ends of the ingot; and

each of said L-shaped vanes including a vertical portion and a horizontal portion, the vertical portion extending vertically and substantially intermediate the respective side baffles and said side walls, the horizontal portion being joined integrally at its one end to the vertical portion and extending toward the center of the ingot, whereby said side baffles forcing said gaseous medium contained in said enclosure to flow toward the center portions of the ingots when in the angled position so as to provide uniform heating throughout the ingot.

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4,729,736
CONTOURED DENTAL POSTS
Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.
Filed Sep. 8, 1986, Ser. No. 904,205
Int. Cl.[4] A61C 5/08
U.S. Cl. 433—221 22 Claims



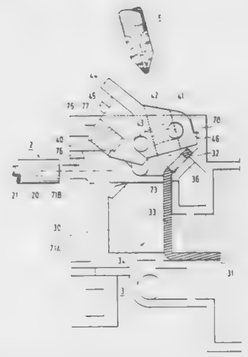
1. A dental post for securely retaining a dental restoration on a prepared tooth stub, comprising:
an elongated cylindrical pin having a longitudinal axis;
helical grooves disposed about the periphery of said pin for retaining said pin secured within a cement prepared bore in a tooth stub; and
an outer contour longitudinally formed into the periphery of the pin to define annular retaining troughs about the pin to further retain said pin secured within the bore.

4,729,737
AIRBORNE LASER/ELECTRONIC WARFARE TRAINING SYSTEM
Robert L. Reagan, and Theodore Nietzold, both of Huntsville, Ala., assignors to Teledyne Industries, Inc., Huntsville, Ala.
Filed Jun. 2, 1986, Ser. No. 869,773
Int. Cl.[4] G09B 9/08
U.S. Cl. 434—35 20 Claims



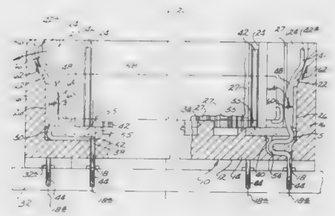
18. A system operable with the instruments of an aircraft to control the instruments for providing inflight simulation of laser/electronic warfare threats to train crews in the use of electronic warfare countermeasure equipment and tactics, said system comprising:
at least one independently operating transmitter for transmitting a radio frequency signal having line-of-sight characteristics to simulate a threat, said signal being omni-directional and having at least a unique identification code;
a receiver, carried aboard the aircraft, for receiving said signal from said transmitter;
a memory for storing data pertaining to at least the identification of said at least one threat, said threat identification data being preload into said memory;
control means responsive to said received signal for controlling the instruments of the aircraft in response thereto, said control means decoding said signal, receiving data pertaining to the position and heading of the aircraft from the aircraft instruments, and comparing said threat identification data from said memory with said aircraft position and heading data to determine whether the aircraft is within the line-of-sight, and presentation range to the threat;
and means for interfacing said control means with the aircraft instruments, said control means causing the aircraft instruments to present the threat to the crew, said control means causing the relative distance and direction of the aircraft with respect to the threat to be presented.

4,729,738
INSULATION-PIERCING CONNECTION ARRANGEMENT FOR AN ELECTRIC WIRE
Jean-Paul Heng, Lyon; André Marmonier, Bron; Noël Revollon, Decines Charpieu, and Ariel Ruiz, Villeurbanne, all of France, assignors to CGEE Alsthom, Levallois-Perret, France
Filed Apr. 22, 1987, Ser. No. 41,038
Claims priority, application France, Apr. 28, 1986, 86 06124
Int. Cl.[4] H01R 4/24
U.S. Cl. 439—395 7 Claims



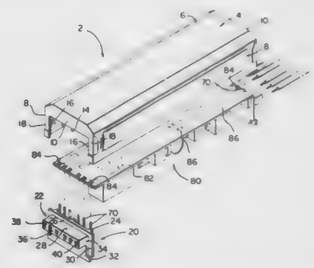
1. An insulation-piercing connection arrangement for an electric wire, the arrangement comprising:
a conductive part having a slit having parallel edges and provided with an insulation-piercing inlet;
an insulating housing in which said conductive part is received, said housing being provided with a wire-passing opening for passing a wire parallel to the insulation-piercing slit, and with a shank-passing opening for passing a removable shank forming a lever for operating the connection arrangement;
an auxiliary wire-insertion part received in said housing and operable by said removable shank to press against one end of an electric wire to be connected in the slit, in such a manner that said wire end passes through said insulation-piercing inlet into said slit in a direction transverse to said wire until it occupies a position where the core of the wire is retained between the edges of the slit in electrical connection with said conductive part;
the arrangement including the improvements whereby:
said auxiliary insertion part is provided with an operating body having a shank-passing duct passing therethrough and said housing supports a fixed hole suitable for engaging a leading end of said removable shank when received in said shank-passing duct and acting as a thrust point therefor;
said auxiliary insertion part carries a pusher for pushing against said wire; and
said housing and said auxiliary insertion part include an insertion part guide device comprising wheels disposed on said insertion part to co-operate with two complementary guide grooves in the housing in such a manner as to impart pseudocircular motion to said auxiliary insertion part under lateral pressure from said shank passing through said duct and pressing into said fixed hole;
thereby enabling said pusher to alternate, when a wire is connected by means of said arrangement, between an inclined, "admission", position in which said pusher allows an electric wire to be admitted through said opening over said insulation-piercing inlet, and an "insertion" position in which a pushing end of said pusher moves to beneath the level of said insulation-piercing inlet while pushing against said wire whose core is thus clamped between said parallel edges of said slit.

4,729,739
CONNECTOR FOR A CHIP CARRIER UNIT
James A. Coffee, Bellingham; Thomas S. Spinelli, Attleboro; Harold M. Yevak, Jr., Shrewsbury; Debra J. Provazza, Seekonk, and Peter A. Foley, Dighton, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 15, 1986, Ser. No. 907,953
Int. Cl.[4] H01R 23/72
U.S. Cl. 439—71 5 Claims



1. A connector for mounting a chip carrier unit in an electronic circuit comprising an electrically insulating body having a bottom, side walls upstanding from the bottom, and a plurality of openings spaced in the bottom around a common axis. and a plurality of resilient, electrically conductive contacts disposed in respective body openings to resiliently engage terminal means on opposite sides of a chip carrier unit inserted into the connector along the common axis, the connector body having ramp surfaces on the side walls facing the common axis and inclined relative to the common axis to face away from the bottom of the body, characterized in that the body side walls have a plurality of guide slot portions of V-shaped cross section therein in selected locations relative to respective body openings, and in that the contacts comprise wire members of substantially round cross section each having one end secured in a respective body opening to permit relatively low force cantilever spring deflection of the contacts for accommodating the chip carrier unit therebetween, each contact having a bent portion of the round wire cross section at an opposite end slidable along a narrow line of engagement with an adjacent side wall ramp surface extending along the direction of incline in the ramp surface, having a bowed portion of the round wire cross section intermediate the contact ends bowed away from the adjacent side wall ramp surface to slidably engage the terminal means on the chip carrier unit along a narrow line of engagement extending in the direction of insertion of the chip carrier unit into the connector to permit selected flattening of the bowed contact portion and said sliding of the opposite contact end on the adjacent side wall ramp surface for providing simple beam spring deflection of the contact with relatively much greater force to resiliently engage the terminal means with more precisely predetermined contact forces, and each contact having an additional portion of the round wire cross section location between the contact bowed portion and said one contact end disposed in centered engagement with the body side wall within a respective guide slot portion of V-shaped cross section to guide and facilitate pivoting of the bowed contact portion relative to said centered engagement.

4,729,740
FLUORESCENT BALLAST HAVING INTEGRAL CONNECTOR
Don H. Crowe, Clemmons, and Jessie L. Moser, High Point, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 12, 1986, Ser. No. 941,020
Int. Cl.[4] H01R 9/09; H05K 5/00
U.S. Cl. 439—76 18 Claims



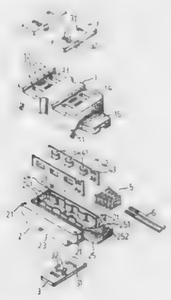
1. An electrical ballast for use with flourescent lights and the like, the ballast comprising:
an outer shell means having sidewalls and endwalls, a portion of said outer shell means having a connector locating area defined by a cutout area in at least one of the endwalls;
a printed circuit board having the ballast components mounted thereon and circuit board through holes located adjacent to the connector locating area, the printed circuit board being disposed in the shell means though an open face of said shell means; and
an electrical connector means mounted to said printed circuit board, the electrical connector means including an insulative housing having spaced plates along side edges of the housing for receipt in the cutout area of said outer shell means, the electrical connector having contact means for interconnection to stripped insulated conductors, said contact means including terminal means extending through an aperture in said housing for connection to the circuit board through holes.

4,729,741
SAFETY SOCKET
Su C. Peng, No. 101-4, Tung Ming Street, Hsinchu City, Taiwan
Filed Sep. 26, 1986, Ser. No. 911,733
Int. Cl.[4] H01R 13/44
U.S. Cl. 439—137 1 Claim

1. An improved safety socket comprising:
(A) an upper body with four securement legs on the lower corners thereof, said upper body having two slide cover tracks; each slide cover track having two conductor prong holes and two slide cover leg slots;
(B) a lower body with a plurality of leg engagement holes for receiving the four securement legs of said upper body, said lower body having a slide cover track on a bottom center surface thereof, said slide cover track in said lower body having two conductor prong holes and two slide cover leg slots, a top surface of said lower body having two retainers;
(C) three slide covers, two of which fit into said two slide

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cover tracks on said upper body and one of which fits into said slide cover track on said lower body, each of said three slide covers having engagement slots through which conductor prongs of a plug can fit, said slide covers having slide cover legs which are slidably engageable with slide cover leg slots on said upper and lower bodies, respectively; said three slide covers being slidably adjustable



so as to be alignable and disalignable with corresponding conductor prong holes;

(D) a two conductor conducting wire; and

(E) two conducting plates, said two plates being respectively retained by said retainers, each of said conducting plates being electrically connected to one of said conductors of said conducting wire.

4,729,742

ELECTRIC POWER DISTRIBUTION TRACK

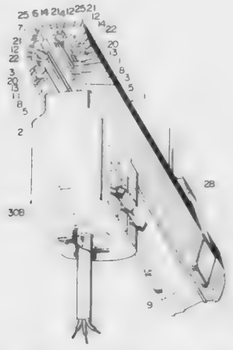
Isao Onishi, Moriguchi; Hiromi Kinoshita, Kadoma, and Masatoshi Nishizawa, Ishioka, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Continuation of Ser. No. 694,792, Jan. 25, 1985, abandoned. This application Aug. 22, 1986, Ser. No. 899,780

Claims priority, application Japan, Jan. 25, 1984, 59-12239; Jan. 25, 1984, 59-12240

Int. Cl.⁴ H02G *5/08*

U.S. Cl. 439—208 **11 Claims**



1. An electric power distribution track comprising:

an elongated duct having the cross section of a generally downwardly disposed U-shaped configuration with top wall, a pair of lateral sidwalls, and a lengthwise bottom opening, said duct including a correspondingly shaped electrically grounded metallic core channel member covered by an insulation sheath of an electrically insulative plastic material;

a plurality of spaced apart conductors extending longitudinally along the duct at positions spaced inwardly from the interior surface of the sheath with at least one of the conductors supported on the top wall and at least one of the conductors on each of the opposite sidewalls;

a corresponding number of support members integrally formed with said sheath to project inwardly of the duct for receiving said three conductors at the inward end portions of the support members;

each of the conductors being shaped as an elongated hollow member with an annular cross section, and each of the support members having at its inner end portion a rail of C-shaped cross section with an inwardly oriented slit, said conductor being snugly received within the rail and exposed to the inside of the duct through the slit with the support extending from the side diametrically opposite from the slit;

connection ribs each integrally bridging between the support member on the top wall and the support member on each of said sidewalls for integral connection therebetween, each of said connection ribs extending in a non-linear manner between the adjacent ones of the support members such that the connection ribs are capable of resiliently stretching when the track is subjected to such an external force to deformingly spread outwardly the sidewalls and the support members belonging thereto;

a pair of upwardly facing earthing surfaces in electrical contact with said core channel, one on each side of said lengthwise bottom opening and extending parallel to said conductors so that an adaptor plug inserted within said lengthwise bottom opening can be positioned to contact said earthing surfaces and said at least one conductor supported on the top wall so as to exert a downward force from said at least one conductor and thus to cause a better contact with said earthing surface.

4,729,743

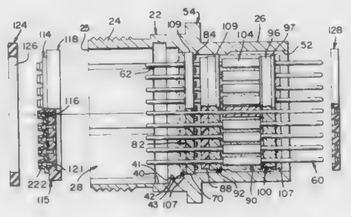
FILTERED ELECTRICAL CONNECTOR

John C. Farrar, Harrisburg; Robert J. McLean, Elizabethtown; James L. Schroeder, III, Palmyra, and Patrick F. Yeager, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 758,711, Jul. 26, 1985. This application Jun. 30, 1986, Ser. No. 880,235

Int. Cl.⁴ H01R *13/719*

U.S. Cl. 439—276 **16 Claims**



1. A transient suppression subassembly for an electrical article, comprising:

a dielectric substrate member having opposed first and second major sides each having a peripheral region and a central region, and a plurality of peripheral and central apertures extending through said peripheral and central regions of said substrate member from said first major side to said second major side for receiving therethrough respective electrical terminal members, said substrate member having disposed on said first major side a plurality of discrete conductive path means associated with respective said peripheral and central terminal receiving apertures, each said conductive path means having a first path portion adapted to be electrically connected to a respective transient suppression means and a second path portion adapted to be electrically connected to a respective terminal disposed in an associated said terminal receiving aperture;

ground conductive means comprising first and second ground conductive surfaces associated with said first and second major sides respectively and means for electrically interconnecting said first and second ground conductive surfaces, said ground conductive means being exposed to be electrically engaged by ground means of said electrical article;

said first ground conductive surface being disposed on said peripheral region of said first major side and electrically isolated from said peripheral terminal receiving apertures and said discrete conductive path means, said first ground conductive surface having first ground portions each associated with and spaced a selected small distance from a respective said first path portion associated with a said peripheral terminal receiving aperture and adapted to be electrically connected to a respective transient suppression means;

said second ground conductive surface being disposed on and substantially covering said peripheral and central regions of said second major side of said substrate member and electrically isolated from said terminal receiving apertures;

said ground conductive means including second ground portions disposed on said central region of first major side each associated with and spaced a selected small distance from a respective said first path portion associated with a central terminal receiving aperture and adapted to be electrically connected to a respective transient suppression means;

said ground conductive means further including conductive aperture means extending from said second ground portions on said first major side to said second ground conductive surface on said second major side and establishing an electrical connector therebetween; and

a plurality of transient suppression means secured to said first major side of said substrate member associated with respective said terminal receiving apertures and each electrically connected to a respective said first path portion and a respective one of a first and second ground portion associated with said respective first path portion for suppressing voltages outside a specified level as they are conductive along a respective said electrical terminal member secured in a respective said terminal receiving aperture when said ground conductive means is grounded by a said ground means, whereby an assured ground path is established between central ones of said transient suppression means and the periphery of said substrate member.

4,729,744

DEVICE FOR ASSEMBLING TOGETHER MODULAR BLOCKS OF ELECTRIC EQUIPMENT

Robert Bet, Dijon, and Henri Pierrot, Longvic, both of France, assignors to La Telemecanique Electrique, France

Filed Oct. 1, 1986, Ser. No. 914,838

Claims priority, application France, Oct. 9, 1985, 85 14917

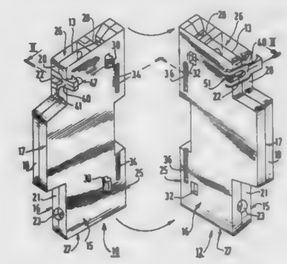
Int. Cl.⁴ H01R *9/24*

U.S. Cl. 439—717 **5 Claims**

1. An assembly of modular cases each having first and second plane and parallel side walls and front and rear walls substantially narrower than the side walls,

the first side wall of each case having upper and lower elongate bosses arranged in a first line substantially parallel to the rear wall and substantially nearer from the rear wall than from the front wall while the second side wall of each case has upper and lower elongate grooves shaped and positioned for snugly receiving the respective upper and lower bosses of an adjacent case in the assembly while allowing turning of one case with respect to an adjacent case about said line, the bosses having positioning end surfaces which cooperate with mating end surfaces of the grooves for positioning the two cases along said first line,

the first side wall of each case having upper and lower hook-shaped locking projections arranged in a second line located farther from the rear wall than said first line while the second side wall of each case forms upper and lower housings shaped and positioned for receiving and retaining the respective upper and lower locking projections of



an adjacent case in the assembly for locking the first side wall of a case with the second side wall of the adjacent case when, after turning of said second side wall about said first line, said second side wall engages said first side wall, and further means for locking together the adjacent cases when the locking projections are locked into said housings, said further locking means including a flexible tongue integral with each case transversely of the front wall thereof, said tongue having a nose projecting from the first side wall and a projection formed on the second side wall of each case and with which the nose of an adjacent case is snap-fitting.

4,729,745

QUICK RELEASE ASSEMBLY FOR ELECTRIC TROLLER MOTORS

James R. Edwards, Dubuque, Iowa, assignor to The Eska Company, Dubuque, Iowa

Filed Jul. 11, 1986, Ser. No. 884,534

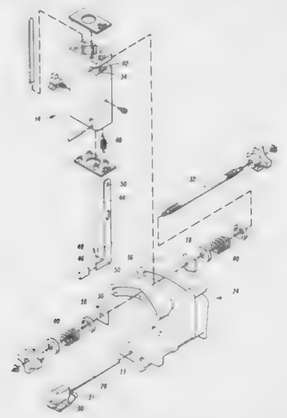
Int. Cl.⁴ B63H *5/12*

U.S. Cl. 440—6 **3 Claims**

1. A mounting structure for an outboard motor for boats comprising a mounting assembly for attaching the motor to the boat, a bracket for supporting the motor, a first connection between the bracket and the mounting assembly, said first connection including a manually removeable pivot pin interconnecting the bracket and the mounting assembly, a second connection between the bracket and mounting assembly, said second connection including a slot in the bracket open toward the mounting assembly, a thrust pin in the mounting assembly engageable in the slot, a manually releaseable latch moveable across the open end of the slot to a locked position to normally close the slot and hold the thrust pin engaged in the slot, said bracket having a vertically extending guide opening in which the latch moves, means biasing the latch to the normally closed locked position, and a cam surface on said latch that engages the thrust pin when the latch is in the normally closed locked

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position so as to seat the thrust pin tightly in the slot, said first and second connections providing for total separation of the



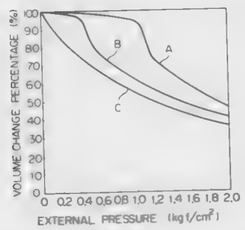
bracket from the mounting assembly by releasing the latch and removing the pivot pin.

4,729,746

BUOY HAVING EXCELLENT RESISTANCE AGAINST EXTERNAL PRESSURE

Eiji Takemae, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd. and Japan Drilling Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 802,112, Nov. 25, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 38,485
Claims priority, application Japan, Nov. 28, 1984, 59-251368
Int. Cl.[4] B63B *22/00*
U.S. Cl. 441—1 **1 Claim**



1. A buoy of the type, the volume of which varies depending upon the external pressure and which has excellent resistance against external pressure, comprising:

a high density polyethylene foam as a buoyant member and;

an outer skin covering the surface of the foam;

said polyethylene foam having an expansion ratio of 10 to 40 and made from a high density polyethylene having a specific gravity of 0.945 to 0.965 and a heat distortion temperature of 60° to 82° C.

4,729,747

HEAD-MOUNTED DOUBLE MOTOR-DRIVEN TOY

John Yeh, 6th Fl., No. 210 An-Ho Rd., Taipei, Taiwan

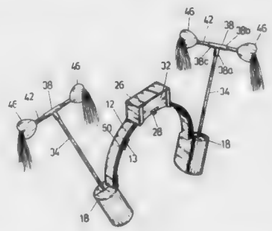
Filed Jul. 24, 1986, Ser. No. 888,981
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—27 **1 Claim**

1. A head-mounted double motor-driven toy comprising:

a head-mounting band having a central portion and two free end portions extending from said central portion;

a battery case integrally formed on the top of said central portion of said head-mounting band for accommodating batteries and a control switch;

two motor seats equipped with motors, which are secured to said free end portions of the head-mounting band, each motor having a rotation shaft extending through said motor seat perpendicularly to the central portion;



a joint secured to said rotation shaft of each said motor so as to be rotated with said rotation shaft; and

a plurality of ornaments secured to each said joint, said motors being connected to said batteries through said control switch for selectively supplying electrical power to said motors to drive the rotation shafts.

4,729,748

FLYING TOY

Gerard Van Ruymbeke, 30, boulevard Chancel, 13008 Marseille, France

Filed Apr. 25, 1986, Ser. No. 855,684
Claims priority, application France, Apr. 26, 1985, 85 06523
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—35 **19 Claims**



1. A flying toy adapted to move through the air by flapping at least one wing, said flying toy comprising:

a. a body having at least one opening;

b. at least one flexible wing connected to said body, said at least one flexible wing being adapted to flap to move said flying toy through the air;

c. power means for storing power for flapping said at least one flexible wing;

d. activation means connected between said power means and said at least one flexible wing for activating the flapping of said at least one flexible wing by said power means, said at least one flexible wing being secured to said activation means, said activation means being extended through said at least one opening;

e. wind-up means for winding said power means; and

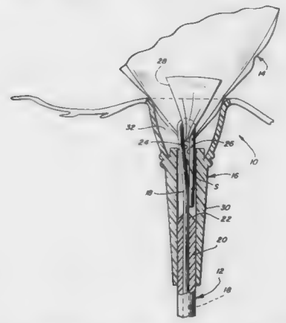
f. latching means for neutralizing said activation means before said flying toy is released to fly, said latching means comprising a manipulation shaft which extends through said at least one opening through which said activation means is extended.

4,729,749

BALLOON STEM CONNECTOR

James A. Milne, Crystal Lake, Ill., assignor to CTI Industries Corporation, Barrington, Ill.

Filed Dec. 10, 1986, Ser. No. 939,970
Int. Cl.[4] A63H *3/06*; A01N *3/00*
U.S. Cl. 446—222 **5 Claims**



1. The combination comprising a balloon having a neck and a balloon stem connector,

said connector comprising a supporting stem for the balloon,

balloon capture means securing a portion of said balloon at the end of said supporting stem, and

means affixed to said supporting stem at said end forming an elongated balloon neck receiving slot adjacent said end,

said balloon capture means including a generally tubularly shaped body fittable in sleeve-like fashion on said supporting stem to slide therealong in frictional engagement therewith from a position wherein said slot is fully exposed to a capture position wherein a portion of said body envelops a substantial portion of said slot, whereby the balloon neck is inserted into said slot when the same is exposed and captively held therein when said body is slid to said capture position,

said capture means further including balloon positioning means for orienting said balloon in a predetermined orientation when said body is at said capture position.

4,729,750

FLYING TOY CONTROLLABLE IN THREE DIMENSIONS

David Prusman, 138 Walgrove Ave., Dobbs Ferry, N.Y. 10522

Filed Feb. 18, 1986, Ser. No. 830,545
Int. Cl.[4] A63H *27/10*
U.S. Cl. 446—225 **9 Claims**

1. A flying toy controllable in three-dimensions comprising:

(a) an airborne component comprising an inflatable envelope containing a gas, said envelope having a vertical axis;

(b) a first motor secured to said envelope by a gondola suspended beneath said envelope, said first motor having a first output shaft capable of assuming a plurality of selected positions in a vertical plane and with a first propeller mounted thereon for rotation therewith, said first output shaft, when vertical, being coaxial with said vertical axis;

(c) first output shaft tilting means for selectively causing said first output shaft to achieve at least two positions in said vertical plane intersecting said vertical axis;

(d) a second motor secured to said envelope, said second motor having a second output shaft with a second propeller mounted thereon for rotation therewith, said second output shaft being tangential to an imaginery horizontal circle having a center in the line of said first output shaft, when vertical;

(e) said second motor when energized rotates said second propeller to thereby cause said envelope to rotate about said vertical axis;





(f) power supply means for energizing said first and said second motors and for activating said first output shaft tilting means; and,

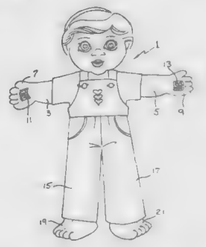
(g) control means for said power supply means.

4,729,751

DOLL WITH ATTACHMENT MEANS

Cynthia G. Schiavo, 3702 Deerford, and Carol P. Faller, 5138 Verdura Ave., both of Lakewood, Calif. 90712

Filed Aug. 11, 1986, Ser. No. 895,223
Int. Cl.[4] A63H *3/00*
U.S. Cl. 446—268 **9 Claims**



1. In a doll having a doll body including a head, a torso portion, a pair of arms with hands, a pair of legs with feet, and doll clothing, the improvement comprising:

fastening means solely of hook material attached to the palm of one hand and positioned to be easily accessible;

fastening means solely of loop material attached to the palm of the other hand and positioned to be easily accessible;

fastening means comprising a material having both hooks and loops centrally attached to the otuer surface of the clothing covering the rear upper torso portion and positioned to be easily accessible;

said hand fastening means of said doll and said torso fastening meansn of another, similar, doll cooperating for mutually engaging and capturing one another in a holding position in which an arm and hand of said one doll is held with its arm around the back of said other doll, thereby enabling a row of dolls to have alternately engaging fastening means and, consequently, every doll to have its arms held around the backs of its adjacent doll or dolls;

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said torso portion having a width W at the location of the attachment of said arms; and

said hand fastening means being attached at a location along said hand approximately the distance W from said torso fastening means.

4,729,752

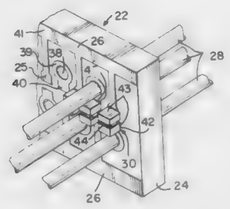
TRANSIENT SUPPRESSION DEVICE

Andrew J. Dawson, Jr., Harrisburg; James M. English, Coplay; Richard P. Hepner, Marietta, and John P. Kling, Mt. Joy, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 26, 1985, Ser. No. 758,712

Int. Cl.[4] H01R *13/66*

U.S. Cl. 439—620 **14 Claims**



1. An electrical connector comprising:

transient suppression substrate means including a planar member having at least one terminal receiving passageway extending therethrough from a first major side to a second major side, said substrate means including a corrsponding at least one conductive path means each having a first portion adjacent a respective said at least one terminal receiving passageway and adapted to be electrically connected to a respective corresponding at least one terminal extending through said at least one passageway, said substrate means further including ground conductive means at least including a corresponding at least one ground portion associated with and electrically separated from a respective second portion of said corresponding said at least one conductive path means and substantially laterally spaced from said at least one terminal receiving aperture, said ground conductive means further including a ground conductive surface area commoned with said at least one ground portion and adapted to be engaged by ground means, said substrate means further including a corresponding at least one transient suppression means each electrically connected to a said second portion of said corresponding at least one conductive path means and said at least one ground portion of said ground conductive means;

a corresponding at least one electrical terminal member secured in a respective said at least one terminal receiving passageway in electrical connection with said first conductive path portion, each said at least one terminal member including first and second contact sections extending outwardly from said first major side and said second major side respectively of said substrate means for electrical engagement with corresponding first and second contact means;

means for housing said transient suppression substrate means and said at least one electrical terminal member and adapted to permit electrical engagement of said first and second contact means with said first and second contact sections of each said at least one terminal member; and

means for grounding said ground conductive means of said transient suppression substrate means, whereby upon establishment of a ground connection with said ground conductive means, voltages outside a specific level are suppressed as they are conducted through each said at least one terminal.

4,729,753

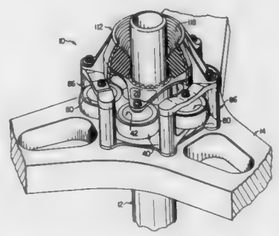
CONSTANT VELOCITY ELASTOMERIC BEARING JOINT

William D. Neathery, Fort Worth; Willem Broekhuizen, Arlington, and Ernst C. Schellhase, Forth Worth, all of Tex., assignors to Bell Helicopter Textron Inc., Forth Worth, Tex.

Filed Nov. 4, 1985, Ser. No. 794,800

Int. Cl.[4] B64C *27/35;* **F16D** *3/28, 3/30*

U.S. Cl. 464—71 **8 Claims**



1. A constant velocity joint for joining a mast of a helicopter to a yoke for joint rotation, the mast rotating about a first axis and the yoke rotating about a secod axis, the first and second axes being capable of misalignment, comprising:

a plurality of elastomeric bearing assemblies including:

(a) an inner rigid cylindrical section having a center axis;

(b) a cylindrical elastomeric bearing concentric with the inner rigid cylindrical section, the inner cylindrical surface of the cylindrical elastomeric bearing being secured to the outer cylindrical surface of the inner rigid cylindrical section;

(c) a rigid intermediate section having an inner cylindrical surface, the outer cylindrical surface of th cylindrical elastomeric bearing being secured thereto, the rigid intermediate section having an outer spherical surface;

(d) a spherical elastomeric bearing having an inner spherical surface secured to the outer spherical surface of the rigid intermediate section; and

(e) the elastomeric bearing assembly having an axial spring rate along the center axis, a radial spring rate along a radial direction perpendicular to the center axis and an angular spring rate;

a rigid carrier defining an axis of symmetry and having a plurality of apertures formed therethrough centered on axes parallel to and spaced from the axis of symmetry, the walls of the apertures defining spherical surface, each of said elastomeric bearing assemblies being positioned in an aperture with the outer spherical surface of the spherical elastomeric bearing being secured to the wall of the aperture;

a pair of spaced apart plates for securing selected ones of said elastomeric bearing assemblies to the mast, the plates securing the inner rigid cylindrical sections therebetween so that the center axes of the inner rigid cylindrical sections of said selected bearing assemblies are parallel to the first axis;

a U-shaped pillow block for securing each of the other said elastomeric bearing assemblies to the yoke, each of said pillow blocks being rigidly secured to the yoke, said pillow blocks and the yoke securing the inner rigid cylindrical sections of said other elastomeric bearing assemblies therebetween so that the center axes of the inner rigid cylindrical sections of said other bearing assemblies are parallel to the second axis;

said carrier being shaped so that it does not contact said pillow blocks and said plates during misalignment between the first and second axes; and

the elastomeric bearings deforming as the mast rotates the yoke through the constant velocity joint, permitting the carrier axis of symmetry to bisect the angle of misalignment between the first and second axes to ensure contsant velocity motion.

4,729,754

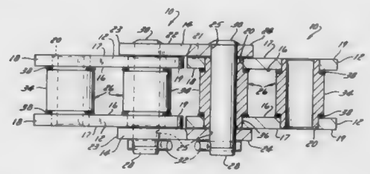
SEALED BUSHING JOINT FOR CHAIN

John H. Thuerman, West Allis, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 15, 1986, Ser. No. 918,967

Int. Cl.[4] F16G *13/06*

U.S. Cl. 474—207 **9 Claims**



1. An improvement in a chain link assembly which consists of a first pair of spaced parallel sidebars connected at least at one end by a laterally extending hollow bushing, said bushing having an axially extending bore sized and adapted to receive and articulate about a connecting pin which extends through said bushing and is connected at its opposite ends to a more outwardly spaced second pair of sidebars overlapping said first pair of sidebars, said connecting pin and second pair of sidebars comprising part of an articulatable adjacent link assembly, the improvement comprising:

said hollow bushing comprises a cylindrical central body and an integral concentric stud of smaller diameter than said central body and extending from each end of said central body and into secured engagement with one of said first sidebars, said bushing having an annular shoulder at each end of the central body and extending between outer circumference of the stud and the outer circumference of the central body; and

a pair of resilient annular seals each of which is interposed betweeen and in simultaneous contact with one shoulder of said bushing and the parallel confronting surface of the adjacent first sidebar, said seals being effective to prevent corrosive material from entering into contact with the bushing study in the space between the sidebar and bushing central body.

4,729,755

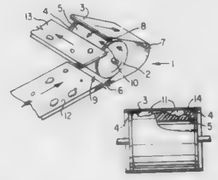
ELEVATOR FOR DELICATE ARTICLES

Gerald C. Misener, and Colin D. McLeod, both of Fredericton, Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Filed Dec. 26, 1986, Ser. No. 942,268

Int. Cl.[4] F16H *55/32;* **B65G** *15/14*

U.S. Cl. 474—166 **8 Claims**



1. An elevator for delicate articles comprising:

a rotatably mounted cylinder having a plurality of spaced rims disposed concentrically about the cylinder, defining a riding surface for an endless belt said cylinder having;

a resilient article engaging surface material disposed between the rims;

an endless belt disposed adjacent to the cylinder; and a plurality of belt guiding members having longitudinal axis parallel with a rotating axis of the cylinder, a pair of said guiding members being spaced from one another and positioned about the cylinder for supporting and guiding the belt such that a portion of the belt engages a circumferential segment of the cylinder rims and follows along with the cylinder when rotated, and wherein a region between one of the guiding members of said pair and the cylinder defines an entry region for receiving articles and a region between the other guiding member of said pair and the cylinder defines an egress region.

4,729,756

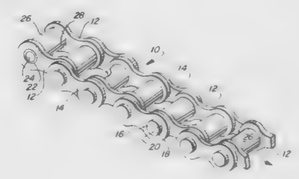
ROLLER CHAIN

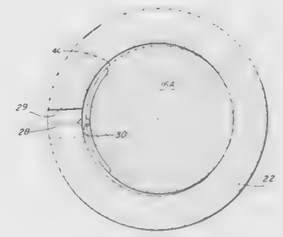
George A. Zimmer, Ithaca, N.Y., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 29, 1987, Ser. No. 8,385

Int. Cl.[4] F16G *13/06*

U.S. Cl. 474—214 **10 Claims**





1. In a roller chain adapted to have a load applied longitudinally thereto during its use comprising an assembly of apertured links, bushings which during use have a loaded side and an opposite unloaded side, rollers surrounding the bushings, pins connecting said links and passing through said bushings, said bushings being press fitted at both ends into transversely spaced pairs of alternate sets of links, and said bushings being formed from finite lengths of strip material and having a seam with the seam of being orientated to face one another, the improvement which comprises:

providing at least one longitudinal groove in each pin terminating short of the ends thereof and within the bushing, said at least one groove being orientated to face the seam of the bushing through which it passes and orientated away from the direction of the load on the chain during use.

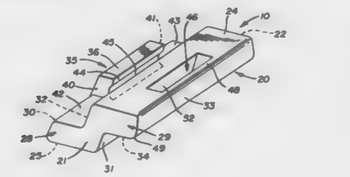
VOL 1088 ISS 2 MR 8 1988 UMI

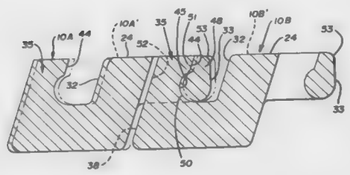
4,729,757

LINK ELEMENTS FOR FORMING A V-BELT

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1987, Ser. No. 48,557
Int. Cl.[4] F16G 5/18
U.S. Cl. 474—242 3 Claims





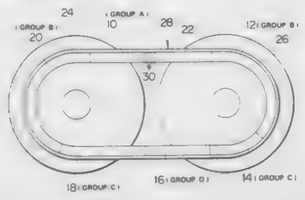
1. A V-belt formed from a successive series of link elements, each said link element comprising: a body portion definable in relation to longitudinal, lateral and vertical axes; said body portion having laterally spaced, beveled side walls; said body portion having first and second plate-like portions; each said plate-like portion having longitudinally spaced first and second ends; said second plate-like portion vertically overlying said first plate-like portion and being longitudinally disposed with respect to said first plate-like portion such that the first end of said second plate-like portion is located in closer proximity to the second end of said first plate-like portion than to the first end of said first plate-like portion; hook means extending vertically upwardly from said first plate-like portion in proximity to the first end thereof; an aperture penetrating said second plate-like portion to define a draw bar at the second end of said second plate-like portion; said hook means on one link element being selectively insertable within the aperture of a successively adjacent link element to effect an operative interconnection therebetween.

4,729,758

TRANSMISSION BELT PROVIDED WITH PUSH ELEMENTS

Keiju Abo, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 7, 1986, Ser. No. 916,096
Claims priority, application Japan, Oct. 8, 1985, 60-222740
Int. Cl.[4] F16G 5/16
U.S. Cl. 474—242 8 Claims



1. A transmission belt for transmitting a torque between two pulleys, each pulley being adapted to rotate around an axis of rotation and having a V-shaped pulley groove and walls defining the V-shaped pulley groove, comprising:

a carrier having an inner surface;

a plurality of push elements slidably arranged on said carrier in face-to-face contacting relationship to fill substantially the entire length of the transmission belt, each push element having at least one outwardly facing guide surface that is adapted to contact said inner surface of said carrier, and two inclined side faces which are adapted to cooperate with the walls defining the V-shaped pulley groove, each of said push elements being adapted to successively come into engagement with the walls defining the V-shaped pulley groove,

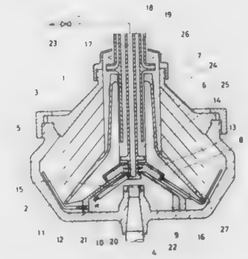
wherein each of said push elements has a predetermined dimension which is determined in reference to said side faces thereof, said predetermined dimension determining a radial distance of said guide surface of each push element from the axis of rotation of each pulley when said each push element comes into engagement with the walls defining the V-shaped pulley groove of the pulley, wherein the difference between said predetermined dimension of each push element and the predetermined dimension of any adjacent push element is not greater than a predetermined value such that said plurality of push elements are kept in contact with said inner surface of said carrier.

4,729,759

CENTRIFUGAL SEPARATOR ARRANGED FOR DISCHARGE OF A SEPARATED PRODUCT WITH A PREDETERMINED CONCENTRATION

Göran Krook, and Per Karlsson, both of Stockholm, Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

Filed Feb. 20, 1987, Ser. No. 16,740
Claims priority, application Sweden, Mar. 12, 1986, 8601153
Int. Cl.[4] B04H 11/02
U.S. Cl. 494—4 7 Claims



1. Centrifugal separator comprising a rotor which forms a separation chamber (5) with an inlet (27) for a mixture of components to be separated, with a first outlet (26) for a separated sludge impoverished component and with a second outlet (11) with flow restricting means (12) for a separated sludge enriched component means being arranged for recirculation of part of the separated sludge enriched component having flowed through said flow restricting means (12) for renewed through-flow thereof, which recirculation means form one or more recirculation passages (16) arranged for such a flow of the sludge enriched component that the recirculation decreases upon increasing viscosity and increases upon decreasing viscosity of the component, characterized by

means (9) in the rotor forming a reception chamber (10) for separated sludge enriched component, which reception chamber (10) communicates with the separation chamber (5) through the said second outlet (11) thereof,

means (21) arranged to remove separated sludge enriched component from the reception chamber (10) for maintaining a liquid level therein so low that a flow of sludge

enriched component is obtained from the separation chamber (5) to the reception chamber (10),

means (13) in the rotor forming a recirculation chamber (14) from which said recirculation passage or passages (16) start,

means (22) arranged to transfer sludge enriched component from the reception chamber (10) to the recirculation chamber (14), and

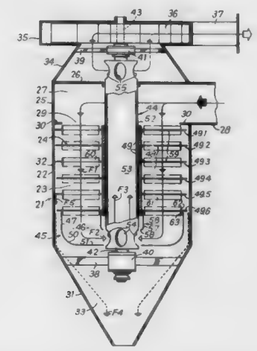
means (15) arranged to maintain a liquid surface at a predetermined level in the recirculation chamber (14) close enough to the rotor axis for the obtainment of a flow of sludge enriched component from the recirculation chamber (14) and through the recirculation passage or passages (16).

4,729,760

APPARATUS FOR THE CENTRIFUGAL SEPARATION OF A MIXTURE OF PHASES

Pierre Saget, 36, Avenue de la Grande Armée, 75017 Paris, France

Filed Jun. 20, 1986, Ser. No. 876,694
Int. Cl.[4] B04B 5/12, 15/08
U.S. Cl. 494—85 5 Claims



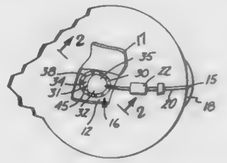
1. An apparatus for the centrifugal separation of a mixture including at least one gaseous phase comprising a fixed enclosure, a rotatable element in said closure constituted by a treatment rotor incorporating perforated discs offset angularly one from the other, upstream by a rotatable distributor and downstream by a ventilator with the possible interposition of a rotatable diffuser, whereby the mixture to be treated flows in a laminary manner through the perforations of the discs in active helicoidal streams rotating much more quickly than the rotor and separated by dead helicoidal sheets rotating substantially at the same speed as said rotor and in which the heavy phase to be separated passes between the discs as far as a fixed part of the enclosure where it is collected and evacuated, said apparatus further comprising an upstream chamber for suction of the mixture to be treated and a downstream chamber for collecting the separated gaseous phase, said treatment rotor being interposed between said chambers and comprising a coaxial hollow tubular shafting, end openings in said shafting located in said collecting chamber which communicates said downstream collecting chamber with a chamber of said ventilator, a partition in said enclosure separating said chamber of said ventilator from the upstream suction chamber, and a further partitioning in said enclosure for separating the collecting chamber, on the one hand, from the peripheral zone of the enclosure in which the separated heavy phase arrives and there is established a helicoidal leakage flow in the same axial direction as that of the principal flow of the mixture through the rotor, and on the other hand from a conical extension of the enclosure forming a cyclone and receiving the leakage flow charged with heavy phase to trap and collect the latter.

4,729,761

TISSUE-IMPLANTABLE, FLUID-DISSIPATING DEVICE

Thomas C. White, 1701 S. Minnesota Ave., Sioux Falls, S. Dak. 57105-1765

Filed Nov. 27, 1985, Ser. No. 802,574
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—8 12 Claims



1. An ocular tissue-implantable, fluid-dissipating device comprising:

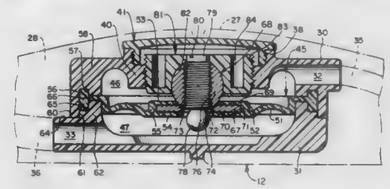
a base plate having a radius of curvature approximately equal to that of the human eye; a second plate peripherally joined to the base plate along a portion of the periphery of the base plate to form an outwardly open orifice, the second plate extending at least partially over but spaced from the base plate to form a cavity, said second plate having a radius of curvature less than that of the base plate; and tube attachment means for communicating the end of a tube with the cavity to allow fluid flow therebetween, the tube attachment means being positioned to permit an attached tube to lie generally parallel to the base plate.

4,729,762

THREE STAGE IMPLANTABLE PRESSURE RELIEF VALVE WITH ADJUSTABLE VALVE STEM MEMBERS

Demetrios Doumenis, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,780
Int. Cl.[4] A61M 27/00
U.S. Cl. 604—10 4 Claims



1. A subcutaneous implantable valve for regulating the flow of fluid from one location in the body to another location, comprising:

a housing including an upper housing portion;

a flexible diaphragm in said housing and dividing the same into first and second interior chambers;

inlet port means for establishing fluid communication between said first interior chamber and the one location;

outlet port means for establishing fluid communication between said second interior chamber and the other location;

a valve seat forming a part of said diaphragm and providing a fluid passageway opening communicating said first interior chamber with said second interior chamber;

said valve seat and diaphragm having a static position within

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said housing in the absence of a first predetermined pressure differential between said chambers;

a combination valve closure member and valve stem fluid flow restrictor mounted in said upper housing portion and projecting into said first interior chamber in coaxial alignment with said fluid passageway, said restrictor projecting from said valve closure member and at least into close association with said valve seat for control of fluid flow through said fluid passageway opening, whereby in the static condition of said diaphragm said valve seat is in engagement with said valve closure member to establish a first valving mode wherein fluid flow through said fluid passageway is prevented in the absence of said first predetermined pressure differential between said chambers, and whereby in response to a varying pressure differential between said chambers exceeding said first predetermined pressure differential said valve seat is displaceable away from said valve closure member to move along and past said restrictor to successively establish second, third and fourth valving modes wherein fluid flow between said chambers in said second valving mode is sufficient to maintain said first predetermined pressure differential, fluid flow between said chambers in said third valving mode is at a substantially constant rate, and fluid flow between said chambers in said fourth valving mode is sufficient to prevent exceeding a second predetermined pressure differential between said chambers;

said upper housing portion being provided with an opening through which said combination valve closure member and restrictor is advancable and retractable to permit variation in the parameter of at least said first predetermined pressure differential; and

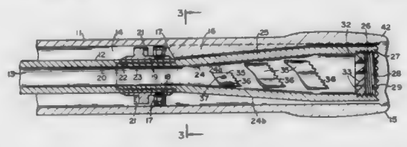
said valve closure member being provided with an opening through which said restrictor is advancable and retractable to permit variation in the parameter of at least said second predetermined pressure differential.

4,729,763

CATHETER FOR REMOVING OCCLUSIVE MATERIAL

Rodney A. Henrie, 136 E. Third St., Mount Carmel, Pa. 17851

Filed Jun. 6, 1986, Ser. No. 871,473
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 **11 Claims**



1. A catheter useful to remove occlusive material from a blood vessel and having a free end for insertion in said vessel, comprising a flexible outer tube,

a flexible rotatable inner tube having a central lumen or bore and being concentric with and spaced radially inwardly of said outer tube, thereby forming at least one axially extending channel between said tubes, hollow cutting means for said occlusive material connected to said inner tube and rotatable therewith, said cutting means being disposed within and short of said free end of the catheter,

means for rotating said inner tube and said cutting means, thereby to cut said occlusive material and to reduce the same to a subdivided form, said inner tube being immovable in an axial direction relatively to the outer tube,

means for flowing a liquid through said channel, through said free end of the catheter, and through said hollow cutting means, said liquid entraining the subdivided occlusive material, said channel and said lumen or bore being continuously open from end to end thereof thereby to permit entrained occlusive material to be removed from said blood vessel through said lumen or bore of the inner tube,

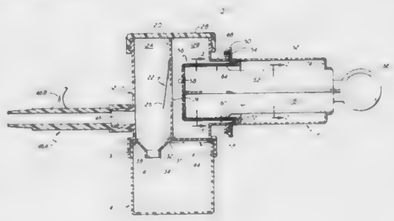
and means for applying a vacuum to said inner tube and hollow cutting means to promote removal of said subdivided occlusive material.

4,729,764

IRRIGATOR AND TISSUE SEPARATOR

Quentin E. Gualtier, 16 Winding Way, North Caldwell, N.J. 07005

Filed Jun. 5, 1986, Ser. No. 870,916
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—38 **1 Claim**



1. An irrigation device for injecting fluid into and withdrawing fluid from a body cavity and separating solids from liquid withdrawn from the body cavity, which irrigation device comprises

(a) a cylindrical housing defining first and second juxtaposed chambers each extending along the length of said housing in the axially elongated direction, said housing defining an open top and bottom end, said housing further defining a cylindrical flange extending outwardly from the cylindrical wall defining said second chamber and having an open end in direct communication with said second chamber, said flange having an axis perpendicular to the axis of said housing and defining a peripheral clamping surface at its open end extending outwardly and parallel to the axis of said housing;

(b) a cup member axially and removably attached to the open bottom end of said housing and defining a reservoir therein for receiving fluid from said housing;

(c) a cap member removably attached to the open top end of said housing for closing said top end of said housing;

(d) a one-way valve assembly provided between said first and second juxtaposed chambers for permitting the flow of fluid through said valve assembly only in the direction from said second chamber to said first chamber;

(e) a nozzle member integral with said housing for permitting inlet and outlet flow through said first chamber of said housing for fluid within said device;

(f) a removable, integral gasket and filter member between said housing and said cup member, said gasket and filter member comprising peripheral sealing means for preventing fluid from leaking from said device between said cup member and said housing, said gasket and filter member defining a downwardly tapered orifice for permitting the flow of fluid from said first chamber to said reservoir and for restricting back-flow of fluid from said cup member into said chamber, said gasket and filter member further defining a plurality of filtering apertures radially spaced from said orifice and arranged between said reservoir and said second chamber for preventing solids in the fluid within said reservoir from entering said second chamber; and

(g) a rolling diaphragm apparatus comprising a cylindrical member defining at one end thereof a radially projecting clamping flange and defining an opening at the other end, and wherein said clamping flange is connected to said peripheral clamping surface of said cylindrical flange of

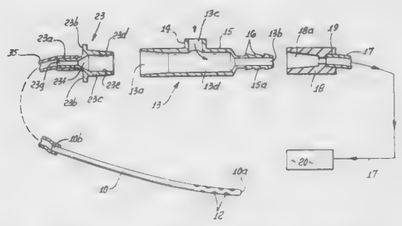
said housing, said cylindrical member being arranged coaxial with said cylindrical flange, said rolling diaphragm further comprising a piston head coaxially arranged within said cylindrical member, and a rolling diaphragm having a flat closed end attached to the side of said piston head facing said housing, said rolling diaphragm further including a radially flared skirt projecting outwardly from said flat closed end and defining a peripheral end formed as an O-ring, said peripheral O-ring end held in compression between said clamping flange of said cylindrical member and said clamping surface of said cylindrical flange of said housing, said flared skirt forming a fluid tight seal with said cylindrical flange for preventing leakage of fluid from said cylindrical housing and said cup member into said cylindrical member of said rolling diaphragm apparatus, said rolling diaphragm apparatus further comprising a piston rod connected to the other side of said piston head and coaxial therewith, said rod projecting outwardly through said open end of said cylindrical member for manually manipulating said piston rod to axially reciprocate said piston rod within said cylindrical member, and in turn, reciprocate said piston head and said rolling diaphragm within said second chamber of said housing, whereupon on the inward stroke of said piston rod, said piston head and rolling diaphragm displaces fluid from said second chamber through said one-way valve assembly into said first chamber, and in turn, further injects fluid into the body cavity through said nozzle member, and alternatively, the outward stroke of said piston rod withdraws said piston head from said second chamber, and in turn, positively draws fluid from the body cavity back through said nozzle member into said first chamber, and further through said restricted orifice into said reservoir, and then draws fluid from said reservoir through said filtering apertures into said second chamber, for further recirculation of fluid through the device and body cavity by alternately introducing at predetermined intervals said piston head in and out of said chamber.

4,729,765

METHOD OF USING MECONIUM ASPIRATOR COMPONENTS

John F. Eckels, 2762 Goldfield, Simi Valley, Calif. 93063, and Kenneth C. Cook, 27517 Arcoy Ave., Canyon Country, Calif. 91351

Filed Dec. 22, 1986, Ser. No. 944,190
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—54 **4 Claims**



1. The method of using an aspirator, an adapter and an endo-tracheal tube on an infant for meconium removal, the aspirator having an end inlet and outlet and a side inlet, that includes:

(a) providing an aspirator, an adapter and an endo-tracheal tube,

(b) inserting one end of the endo-tracheal tube into the infant's air-way, the opposite end of the tube being connected to the aspirator inlet outside the infant's air way,

(c) applying suction to the aspirator outlet to draw air into the aspirator through the side inlet, and

(d) connecting said adapter between the tube and the aspirator after the tube is inserted into the infant's airway, and while suction is applied to the aspirator, the adapter and aspirator having telescoping annular tapers, and said connection including endwise interfitting said tapers, frictionally, to establish said connection of the adapter to the aspirator,

(e) said adapter having oppositely outwardly projecting external flange means, and including urging said flange means toward the aspirator to establish said frictional interfit rapidly and to maintain the interfit during use of the aspirator, while simultaneously adjusting the suction level through said aspirator side inlet by the user's one-handed controlled manipulation of the flange means and side inlet,

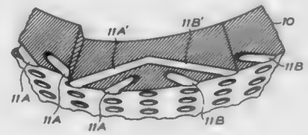
(f) and controllably closing said side inlet to increase suction application to said one end of the endo tracheal tube, thereby to controllably draw meconium fluid in said airway into the tube inlet for withdrawal through the aspirator end inlet and outlet, while also withdrawing said tube from the infant's airway.

4,729,766

VASCULAR PROSTHESIS AND METHOD IN PRODUCING IT

Sven E. Bergentz, Malmö; Kjell Bockasten, and Kurt Strid, both of Lund, all of Sweden, assignors to Astra Meditec Aktiebolag, Molndal, Sweden

Continuation of Ser. No. 583,489, Feb. 29, 1984, abandoned, which is a continuation of Ser. No. 295,362, Aug. 24, 1981, abandoned. This application Apr. 22, 1985, Ser. No. 725,153
Claims priority, application Sweden, Aug. 28, 1980, 8006024
Int. Cl.[4] A61F *2/04;* **B23K** *27/00*
U.S. Cl. 623—1 **10 Claims**



1. A method of producing a vascular prosthesis comprising

(1) mounting a tube of a biologically acceptable resinous material in relation to a laser means producing two focused beams directed to the outer surface of said tube from opposite sides thereof, whereby said tube and said laser means can move rotationally relative to each other around the longitudinal axis of said tube, and transversely relative to each other parallel to the longitudinal axis of said tube;

(2) moving said tube rotationally relative to said laser means and simultaneously moving said tube axially relative to said laser means whereby the focus of light from said laser means traces a helical pattern on the surface of said tube;

(3) focusing pulsed beams of light from said laser on the surface of said tube during said rotation; and

(4) controlling the energy of each pulse and directing the beams to form microdepressions in the surface of said tube, the depth of which are not more than about 75% of the thickness of the wall of the tube, and wherein the microdepressions formed by the two laser beams intersect within the wall of the vascular prosthesis, thereby forming an interconnected hole which extends from one position on the external surface of the tube, and concurrently controlling the frequency of said pulses relative to the rotational and axial movement of the tube in relation to the laser beams such that the pulsed beams form a regularly spaced helical array of microdepressions in the surface of said tube.

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4,729,767

AMPHOTERIC FATLIQUORING COMPOSITION

Hans-Herbert Friese, Monheim; Uwe Ploog, Haan, and Günter Uphues, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,740
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444864
Int. Cl.[4] C14C *5/00, 11/00*
U.S. Cl. 8—94.23 17 Claims

1. A method for fatliquoring leather skins during the tanning process consisting essentially of applying to said leather and skins a fatliquoring effective amount of at least one amphoteric surfactant consisting essentially of: the condensation product of at least one C_{6-22}-fatty acid or corresponding ester with at least one aminoalkyl-alkanolamine of the formula:

$$H_2N-(CH_2)_m-NH-(CH_2)_n-OH$$

wherein
m is 2–6, and
n is 2 or 3;
followed by subsequent alkylati,on reaction with at least one vinylog compound.

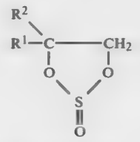
4,729,768

DELIMING OF HIDES AND USE OF CYCLIC ESTERS OF SULFUROUS ACID AS DELIMING AGENTS

Kurt Schneider, Bad Durkheim; Dietrich Lach, Friedelsheim; Rolf Streicher, Worms, and Ortwin Schaffer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 886,683
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527013
Int. Cl.[4] C14C *1/00*
U.S. Cl. 8—94.18 8 Claims

1. A process for deliming limed hides, which comprises:
deliming hides, which have been treated with lime, with a compound of formula (I):



wherein R^1 is hydrogen, saturated alkyl of 1 to 4 carbon atoms or chlorosubstituted alkyl of 1 to 4 carbon atoms, and R^2 is hydrogen or methyl.

4,729,769

GASOLINE COMPOSITIONS CONTAINING REACTION PRODUCTS OF FATTY ACID ESTERS AND AMINES AS CARBURETOR DETERGENTS

Raymond C. Schlicht, Fishkill; Mark D. Levin, Poughkeepsie; Sheldon Herbstman, New City, and Rodney L. Sung, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 8, 1986, Ser. No. 861,196
Int. Cl.[4] C10L *1/14*
U.S. Cl. 44—71 25 Claims

1. A motor fuel composition comprising
(a) a major portion of a fuel consisting essentially of a hydrocarbon boiling in the gasoline boiling range; and
(b) a minor effective amount of, as detergent additive, a reaction product of C_6–C_{20} fatty acid ester and a mono- or di-(hydroxy hydrocarbyl) amine.

4,729,770

PROCESSES AND COMPOSITIONS FOR ABRASIVE BLAST CLEANING

George L. Higgins, Windsor, England, assignor to Pyrene Chemical Services Limited, Buckinghamshire, England

Filed Apr. 6, 1987, Ser. No. 34,830
Claims priority, application United Kingdom, Apr. 11, 1986, 8608797
Int. Cl.[4] B24D *3/00*
U.S. Cl. 51—293 11 Claims

1. In a process for cleaning a ferrous surface by wet blasting using a stream of air, water and abrasive particles, the improvement comprising reducing the rusting of the cleaned surface by contacting the surface during blasting with an aqueous solution containing phosphate ions and, an imine compound.

4,729,771

ABRASIVE SHEET AND PROCESS FOR PRODUCING THE SAME

Akihiro Kunimoto, and Seiichirou Takabayashi, both of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Sep. 24, 1986, Ser. No. 910,946
Claims priority, application Japan, Sep. 27, 1985, 60-212685
Int. Cl.[4] C09K *3/14*
U.S. Cl. 51—298 16 Claims

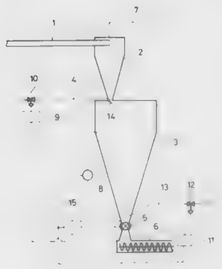
1. A thin, flexible abrasive sheet having a thickness of from 10 to 500 μm, consisting essentially of:
20 to 98% by volume of a matrix consisting essentially of an aromatic imide polymer resin which is a polymerization-imidization product of a tetracarboxylic acid component comprising, as a major acid ingredient, at least one member selected from the group consisting of biphenyltetracarboxylic acids and dianhydrides thereof with a diamine component comprising at least one aromatic diamine, and
2 to 80% by volume of abrasive particles selected from the group consisting of natural and artificial diamond, cubic boron carbide, silicon carbide, alumina, emery, spinel, garnet and flint particles having an average a size of 0.1 to 50 μm evenly dispersed in the matrix.

4,729,772

SEPARATION METHOD OF POLYMER POWDER AND CARRIER GAS

Tadashi Asanuma; Yoshiyuki Funakoshi; Kaneo Ito, and Akihiko Nakajima, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,771
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—18 4 Claims



1. In method for separating polymer powder from a carrier gas by introducing a stream of a mixture of the polymer powder and the carrier gas into a cyclone separator, drawing the polymer powder, which has been separated from the carrier gas, through a bottom part of the cyclone separator into a

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hopper, drawing the carrier gas from an upper part of the cyclone separator and feeding out the polymer by a rotary feeder from the bottom part of the hopper, the improvements wherein:

(a) the revolution speed of the rotary feeder is controlled in accordance with variations in the powder level in the hopper so as to control the amount of the polymer powder to be discharged out from the hopper, and

(b) the volume of a purge gas which is introduced into a polymer powder guide extending between the cyclone separator and the hopper for the prevention of plugging thereof is controlled in accordance with variations in the revolution speed of the rotary feeder,

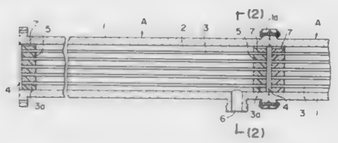
whereby the plugging of the guide between the cyclone separator and the hopper are prevented and the powder level in the hopper is maintained at a predetermined constant level.

4,729,773

UNIT FOR DEGASSING LIQUIDS

Kozo Shirato, Omiya, and Kazuyasu Kawashima, Yokohama, both of Japan, assignors to Erma Inc., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,492
Claims priority, application Japan, Mar. 4, 1986, 61-48127
Int. Cl.[4] B01D *13/00*
U.S. Cl. 55—158 **5 Claims**



1. A pipe system for conveying a liquid containing dissolved gases and for simultaneously degassing the liquid while moving through said pipe system, said pipe system comprising a plurality of interconnected pipe elements, each pipe element comprising

a pipe body which has a flange at each of its opposite ends and defines an axially extending interior chamber, each said flange being connected to the flange of an adjacent pipe body of said pipe system,

two support plates sealingly positioned in said interior chamber near the respective opposite ends of said pipe body, each of said support plates having a plurality of axial holes therethrough,

a plurality of tubes positioned in said interior chamber, each of said tubes extending sealingly within and between axial holes in said support plates, said tubes being made of a diffusion membrane material which is porous to the gases in the gas-containing liquid but not the liquid, the tubes of one pipe element being in communication with the tubes of an adjacent pipe element and

the pipe body of at least one of said pipe elements including a nipple for connection to a source of vacuum so as to evacuate the interior of the pipe body thereof around said plurality of tubes therein.

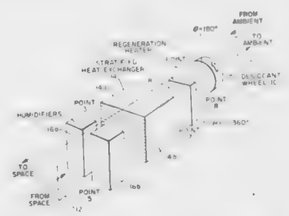
4,729,774

NONUNIFORM REGENERATION SYSTEM FOR DESICCANT BED

Barry M. Cohen, Newton Centre, Mass.; Robert K. Collier, Jr., Cove Creek, Ariz.; Andy H. Levine, Boston, and Francis A. DiBella, Roslindale, both of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 10, 1986, Ser. No. 837,941
Int. Cl.[4] B01D *53/06*
U.S. Cl. 55—181 **9 Claims**

1. In a regeneration system for a desiccant bed having at least one desiccant bed divided into a process side and a regeneration side, means for flowing process air through said process side of said bed, and means for flowing regeneration air through said regeneration side of said bed, the improvement comprising means for spatially profiling the temperature of the



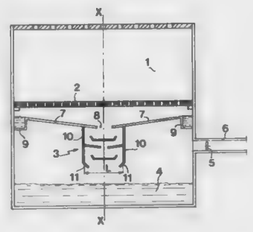
regeneration air nonuniformly over the surface area of the regeneration side of said bed, said profiling means including stationary heat exchanger means for transferring heat between corresponding zones in the process and regeneration side.

4,729,775

DEVICE FOR SCRUBBING A POLLUTED GAS

Philippe Patte, Nancy, and Andre Cordier, Clamart, both of France, assignors to Air Industrie Systems, France

Filed Mar. 2, 1987, Ser. No. 20,991
Claims priority, application France, Feb. 3, 1987, 87 01387
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—241 **9 Claims**



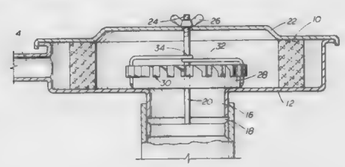
1. A scrubbing device for scrubbing a polluted gas wherein the polluted gas passes through at least one sheet of a scrubbing liquid, said device comprising trickle walls which define therebetween a first opening; means for feeding scrubbing liquid onto the trickle walls so that the scrubbing liquid trickles down the walls; means for providing circulation of the polluted gas downwardly from above; a first transverse wall disposed beneath the first opening; first and second confining walls, secured at the top ends thereof to the underside of the trickle walls and disposed on either side of the first opening in spaced relation to the edges of said opening, for defining with said transverse wall, a trickle passage surrounding the transverse wall; further walls, disposed inside the trickle passage, and beneath the transverse wall, each of said further walls being attached at one end thereof to one of the confining walls and the other ends of said further walls being spaced apart to define a second opening therebetween; and a further transverse wall disposed beneath the second opening defined between said further walls.

4,729,776

AIR SWIRLING DEVICE FOR USE IN THE ANNULAR SPACE OF AIR FILTERS ON INTERNAL COMBUSTION ENGINES

Howard E. Elliff, 14126 Carneswood, Tomball, Tex. 77375

Filed Feb. 9, 1987, Ser. No. 12,687
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—455 **1 Claim**



1. A device for use in the annular space of an air filter positioned in an air filter housing having an inlet and an outlet, said device including in combination

a circular strip frame,

a plurality of outwardly extending vanes extending from the upper portion of said frame at an angle from about 20 to 30 degrees,

a plurality of inwardly extending vanes extending from the upper portion of said frame at an angle from about 20 to 30 degrees with respect to a horizontal plane, and

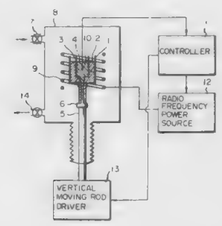
a transverse support member connected to the outer portion of said frame, said transverse support member having an opening therein.

4,729,777

METHOD AND APPARATUS FOR MANUFACTURING PREFORM FOR FLUORIDE GLASS FIBER

Yoshinori Mimura, Wako; Osamu Shinbori, Tokyo; Tetsuya Nakai, Fujisawa, and Hideharu Tokiwa, Niza, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1986, Ser. No. 897,297
Claims priority, application Japan, Aug. 22, 1985, 60-184763
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—3.13 **11 Claims**



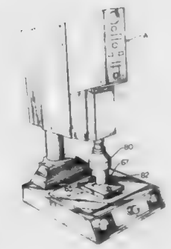
1. A method of manufacturing a fluoride glass preform for drawing therefrom a fluoride glass optical fiber comprising, containing in a first crucible fluoride glass material for use as cladding on the optical fiber and containing a different fluoride glass material in a second crucible, containing the crucibles in a sealed vessel containing a fluorine-series gas charge as an atmosphere, melting the glass in the crucibles into two glass melts by application of heat simultaneously in a same temperature range over which no marked evaporation of glass components occurs and at which the fluorine-series gas reacts with oxides and compound ions contained in the glass so that impurities are decomposed and removed, cooling the melts to a same temperature and holding it without crystallizing the glass melts effectively raising the balances of transition metals contained in the melts to a level for reducing absorption losses in the optical fiber made therefrom, further cooling the melts to a same temperature, drawing glass from the melts concentrically as a rod having a core of said core glass and a cladding made of said cladding glass about said core, and cooling the rod to solidify it into said preform.

4,729,778

METHOD OF MAKING A DISPOSABLE UNITARY CYTOLOGY CHAMBER AND FILTER CARD FOR CENTRIFUGATION OF FLUID SAMPLES

Daniel V. Griffin, Denver, Colo., assignor to Whale Scientific, Inc., Commerce City, Colo.

Division of Ser. No. 678,262, Dec. 5, 1984, Pat. No. 4,678,579.
This application Mar. 2, 1987, Ser. No. 20,233
Int. Cl.[4] C03B *23/20;* **B10D** *23/00;* **B29C** *65/08*
U.S. Cl. 65—36 **5 Claims**



1. The method of forming a unitary, disposable chamber and filter unit in which a chamber is provded with a liquid sample inlet and a discharge port which communicates between said inlet and an end flange, and a filter card is adapted to be positioned on said end flange with an opening therein aligned with said discharge port, the steps comprising:

forming energy directors in the form of protruding ribs on a flat surface of said end flange;

placing a filter card in overlying relation to said end flange with the opening in said filter card aligned with a discharge port; and

applying ultrasonic energy to said end flange whereby to weld said energy directors to said filter cards.

4,729,779

METHOD AND APPARATUS FOR MANUFACTURING GLASS ARTICLES

Bruno De Vasselot, Woodridge, and Anthony J. Massela, Chicago, both of Ill., assignors to Liquid Air Corporation, Walnut Creek, Calif.

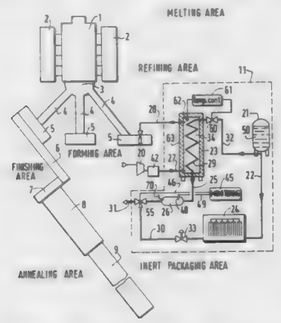
Filed Apr. 20, 1987, Ser. No. 40,075
Int. Cl.[4] C03B *9/36, 9/38*
U.S. Cl. 65—84 **17 Claims**

1. A process for the production of glass molded articles comprising the steps of forming and/or expanding a quantity of molten glass in a mold cavity to conform its wall to the contour of said mold, providing a flow of pressurized cooling gas to cool the internal and/or external walls of the formed and/or expanded glass article, said cooling gas being cooled by indirect heat exchange contact with a cryogenic liquid chosen among liquid oxygen and/or liquid nitrogen and/or liquid hydrogen, wherein it further comprises the step of vaporizing said cryogenic liquid by maintaining an appropriate indirect heat exchange contact with said cooling gas, then recovering the cryogenic gas vaporized from said cryogenic liquid and further using the vaporised cryogenic gas in at least one of other steps for the production of said glass molded articles.

15. An installation for the production of molded glass articles which are pressed and/or blown comprising means for

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forming and/or expanding a quantity of molten glass in a mold cavity to conform its wall to the contour of said mold, means for blowing cooled air about the mold and/or the glass article walls, means for compressing air, means for drying the compressed air, heat exchanging means for cooling the compressed air before delivering it to the said means for cooling the compressed air before delivering it to the said means for blowing cooled air, means for storing a cryogenic liquid chosen among



oxygen, nitrogen and/or hydrogen, means for using a gas chosen among oxygen gas and/or nitrogen gas and/or hydrogen gas, wherein said means for storing a cryogenic liquid are connected to said heat exchanging means which comprises at least one duct adapted to receive the cryogenic liquid at the inlet of the duct connected to said means for storing a cryogenic liquid and to deliver gas at the outlet of said duct which is connected to said means for using a gas.

4,729,780

CENTRIFUGAL CASTING DEVICE

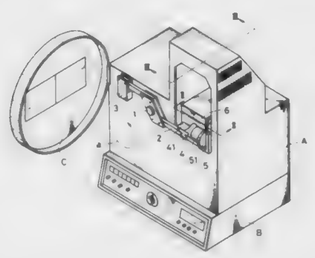
Toshio Shimizu, Kyoto, Japan, assignor to Kabushiki Kaisha Denken and Kyocera Corporation, both of Kyoto, Japan

Filed Sep. 29, 1986, Ser. No. 913,707

Claims priority, application Japan, Sep. 30, 1985, 60-218266; Sep. 30, 1985, 60-218267

Int. Cl.⁴ C03B *3/00*

U.S. Cl. 65—302 **7 Claims**



1. A centrifugal casting device comprising a rotary driving shaft, a rotary arm mounted at an end of said shaft and turning around an axis of the shaft by driving force of the shaft, a balance weight adjustably mounted at a first end side of the arm along an axial direction thereof, means for holding a crucible disposed at a second end of the arm for holding a casting crucible adapted to receive a melted material for casting therein, means for holding a mold connected to a centrifugal side of said means for holding a crucible, and means for melting casting material movably mounted so as to permit pouring of said melted material from said means for melting casting material into said casting crucible when said rotary arm is in an initial position and withdrawing of said means for melting casting material to a second position so as to lie outside a path of rotation of the arm at least when the rotary arm is rotated.

4,729,781

3,6-DICHLORO-2-METHOXYBENZOHYDROXAMIC ACID DERIVATIVES AND USE AS HERBICIDAL AGENTS

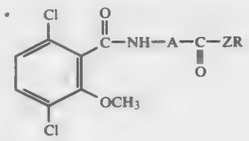
John W. Williams, Lake Bluff, Ill., assignor to Sandoz Ltd., Basel, Switzerland

Filed Aug. 4, 1986, Ser. No. 892,987

Int. Cl.⁴ A01N *43/00, 37/00, 37/44;* **C07C** *101/30*

U.S. Cl. 71—88 **36 Claims**

1. A compound of the formula:



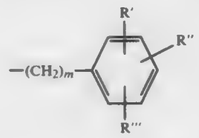
I

wherein

A is O-alkylene of 1 to 5 carbon atoms, O-alkenylene of 3 to 6 carbon atoms in which the unsaturation is non-adjacent the oxygen atom thereof or NH-alkylene in which the alkylene is 1 to 5 carbon atoms, the O— and NH— thereof being attached to the NH which is adjacent to A,

Z is oxygen or sulfur,

R is H, C_1–C_{12}alkyl, C_3–C_8alkenyl, C_3–C_8alkynyl, C_2–C_{10}haloalkyl containing 1 to 6 halogens of atomic weight of 18 to 80, C_2–C_{10}alkoxyalkyl, cycloalkyl or cycloalkenyl of 3 to 8 ring carbon atoms optionally substituted by 1 or 2 halogens of atom weight of 18 to 80 or C_1–C_2alkyl groups, cycloalkylalkyl or cycloalkenylalkyl of 4 to 10 carbon atoms in the alkyl portion is of 1 to 3 carbon atoms and the cycloalkyl or cycloalkenyl ring is of 3 to 8 carbon atoms and is optionally mono- or di-ring substituted by halo of atom weight of 18 to 80 or C_1–C_2alkyl groups or



m is 0 to 3,

R′ and R″ are independently H, C_1–C_4alkyl, C_1–$_4$alkoxy, C_1–C_4alkylthio, CF_3, halo of atomic weight of from 18 to 80 or NO_2,

R‴ is H, C_1–C_3alkyl or halo of atomic weight of 18 to 80, or

two of R′, R″ and R‴ together form C_1–C_2alkylenedioxy with the other being H, in non-salt or in salt form.

29. A method of combatting weeds in a locus comprising applying to said locus a herbicidally effective amount of a compound of claim **1**.

4,729,782

POLLEN SUPPRESSANT COMPRISING A FUSED PYRIDAZINONE

Jeffrey N. Labovitz, Palo Alto, and Lawrence Fang, Foster City, both of Calif., assignors to Lafarge Coppee, Paris, France

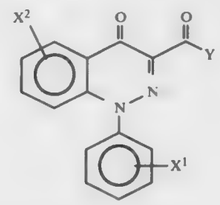
Continuation-in-part of Ser. No. 532,020, Sep. 14, 1983, Pat. No. 4,604,134. This application Mar. 29, 1985, Ser. No. 717,666

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ A01N *43/58;* **C07D** *237/28*

U.S. Cl. 71—92 **41 Claims**

1. A pollen suppressant of the formula



wherein

X^1 represents hydrogen or one or two substituents independently selected from fluorine, chlorine, bromine, iodine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, and trihalomethyl;

X^2 represents fluorine or chlorine; and

Y is OR^3 wherein R^3 is hydrogen, C_1–C_4 alkyl, C–C_4 alkenyl, or C–C_4 alkynyl, and

agronomically acceptable salts thereof.

4,729,783

HALOGENATED TRIAZOLYLVINYL KETO AND CARBINOL COMPOUNDS AND PLANT GROWTH REGULANT AND FUNGICIDAL COMPOSITIONS

Erik Regel, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Berg.-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

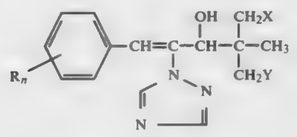
Continuation of Ser. No. 542,909, Oct. 18, 1983, abandoned, which is a continuation of Ser. No. 276,842, Jun. 24, 1981, abandoned. This application Mar. 22, 1985, Ser. No. 715,574

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025242; Mar. 20, 1981, 3111012

Int. Cl.⁴ A01N *43/653;* **A61K** *31/41;* **C07D** *249/08*

U.S. Cl. 71—92 **20 Claims**

1. Halogenated triazolylvinyl carbinol compound of the formula



wherein

X is hydrogen, and

Y is fluorine or chlorine; or X and Y are identical and are fluorine or chlorine;

R_n is 4-chloro, 2,4-dichloro, 4-tert.-butyl, 4-methoxy or 4-trifluoromethoxy, or

a physiologically acceptable acid addition salt thereof with 1,5-naphthalenedisulphonic acid.

4,729,784

1-(1,4-BENZOXAZIN-3-ON-6-YL)-DIALKYLMALEIMIDES AND USE AS HERBICIDES

Toyohiko Kume; Toshio Goto; Atsumi Kamochi; Naoko Yamaguchi; Akihiko Yanagi, all of Tokyo; Hidenori Hayakawa, Kanagawa, and Shigeki Yagi, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

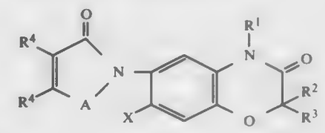
Filed Jun. 23, 1987, Ser. No. 65,443

Claims priority, application Japan, Jul. 7, 1986, 61-157890

Int. Cl.⁴ A01N *43/84;* **C07D** *413/04*

U.S. Cl. 71—95 **11 Claims**

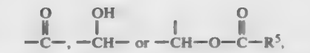
1. A dialkylmaleimide of the formula



(I)

wherein

A is



R^1 is a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an alkoxyalkyl group, a cyanoalkyl group, a trialkylsilylalkyl group, an alkylthioalkyl group or the group



R^2 is a hydrogen atom or an alkyl, aryl or aralkyl group,

R^3 is a hydrogen atom or an alkyl group,

R^4 is an alkyl group,

R^5 is an alkyl or aryl group,

R^6 is a hydrogen atoms or an alkyl group

R^7 is an alkoxy, cycloalkoxy, haloalkoxy, alkylamino, dialkylamino, N-alkyl-N-arylamino or trialkylsilylalkoxy group, and

X is a hydrogen atom, a halogen atom or an alkyl group.

10. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim **1**.

4,729,785

PREPARATION OF ACICULAR FERROMAGNETIC METAL PARTICLES CONSISTING ESSENTIALLY OF IRON

Ekkehard Schwab, Neustadt; Werner Steck, Ludwigshafen; Peter Rudolf, Maxdorf; Guenter Vaeth, Limburgerhof; Helmut Jakusch, Frankenthal, and Jenoe Kovacs, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 29, 1986, Ser. No. 856,972

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516884

Int. Cl.⁴ C22C *1/04*

U.S. Cl. 75—0.5 AA **1 Claim**

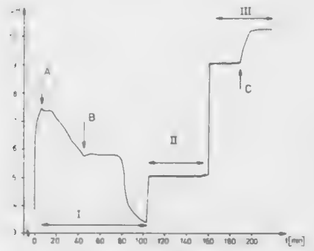
1. A process for preparing acicular ferromagnetic metal particles consisting essentially of iron which comprises:

adding from 0.5 to 1.5% by weight, based on the amount of γ-FeOOH end product, of phosphate ions in the form of orthophosphoric acid or primary, secondary or tertiary alkali metal or ammonium salts of orthophosphoric acid to

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an iron (II) salt solution while simultaneously passing air into the solution, whereby γ-FeOOH nuclei are precipitated from the solution;

adjusting the pH of the suspension of γ-FeOOH nuclei to from 4.0–5.5 whereby the nuclei are allowed to grow;



adding silicon dioxide, tin dioxide or a mixture thereof of the suspension to coat the surface of the γ-FeOOH particles;

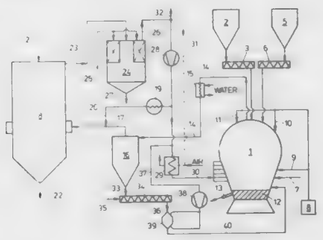
isolating the coated particles; dehydrating the particles at 350°–600° C. to form α-iron (III) oxide; and thereafter reducing the particles to the metal state in the presence of a reducing gas.

4,729,786

PROCESS FOR THE DIRECT REDUCTION OF IRON-OXIDE-CONTAINING MATERIALS

Hermann Schneider, Leonding; Konstantin Milionis, Graz, and Hermann Pusch, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria

Filed Jul. 31, 1985, Ser. No. 760,943
Claims priority, application Austria, Aug. 16, 1984, 2633/84
Int. Cl.⁴ C21B *13/02*
U.S. Cl. 75—35 **14 Claims**



1. A process for the direct reduction of iron oxide-containing materials comprising:

(a) separately introducing into a gasifier having walls, a top portion and a bottom portion, feed materials comprising (i) coal, (ii) oxygen or oxygen admixed with steam, and (iii) a sulfur acceptor material, and reacting said feed materials in a fluidized bed maintained at a temperature of at least 1150° C., whereby a reducing gas containing CO and H_2 is produced and any ash portions of said coal and sulfur compounds formed from said sulfur acceptor materials are converted into liquid slag, said liquid slag forming a liquid bath;

(b) withdrawing said reducing gas with entrained solid particles carried therein from said gasifier, separating said entrained solid particles from said reducing gas, and introducing said reducing gas into a shaft furnace;

(c) introducing iron oxide-containing materials into said shaft furnace, said iron oxide being reduced by said reducing gas with the production of a reduced iron product and a top gas containing 15–30% CO_2, said top gas having dust carried therein;

(d) withdrawing said reduced iron product from said shaft furnace;

(e) withdrawing said top gas from said shaft furnace, separating said top gas from said dust carried therein and introducing at least a portion of said top gas at a temperature of 80°–800° C. into said gasifier laterally through a wall thereof into said fluidized bed;

(f) admixing said solid particles separated from said reducing gas with dust coal having a grain size of up to 3 mm. and introducing the resultant mixture into the bottom region of said gasifier above the surface of said slag bath; and

(g) tapping said bath in the vicinity of the bottom of said gasifier.

4,729,787

METHOD OF PRODUCING AN IRON; COBALT AND NICKEL BASE ALLOY HAVING LOW CONTENTS OF SULPHUR, OXYGEN AND NITROGEN

Tohei Ototani, Tokyo; Toru Degawa, Kurashiki; Kenichi Kusumoto, Inagi, and Makoto Ebata, Tokyo, all of Japan, assignors to Mitsui Engineering and Ship Building Co., Ltd. and Metal Research Corporation, both of, Japan

Continuation-in-part of Ser. No. 799,382, Nov. 18, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 937,426
Claims priority, application Japan, Apr. 26, 1985, 60-90571; Oct. 7, 1985, 60-223288
Int. Cl.⁴ C21C *7/02*
U.S. Cl. 75—58 **16 Claims**

1. A method of producing an iron-, nickel-, and cobalt-base alloy having an oxygen content of less than 0.002%, a sulphur content of less than 0.002%, and a nitrogen content of less than 0.03%, comprising the steps of:

(a) holding a molten alloy in a container selected from the group consisting of a lime crucible, a lime crucible furnace, a converter and a ladle lined with a basic refractory consisting of 15–85% of calcium oxide (CaO) and 15–75% of magnesium oxide (MgO), wherein said alloy consists essentially of at least one major ingredient selected from the group consisting of iron (Fe), nickel (Ni), and cobalt (Co);

(b) adding at least one additive into said molten alloy in an atmosphere selected from the group consisting of a non-oxidizing atmosphere and a vacuum, wherein said additive is selected from the group consisting of aluminum (Al) and aluminum alloys;

(c) desulphurizing, deoxidizing and denitrifying said molten alloy in the presence of aluminum, calcium and magnesium under an atmosphere selected from the group consisting of a non-oxidizing atmosphere and a vacuum, whereby the molten alloy contains 0.005 to 7.0% of residual aluminum, 0.0001 to 0.02% of residual calcium, and 0.0005 to 0.03% of residual magnesium; and

(d) casting said molten alloy into a mold.

4,729,788

THERMOPHILIC MICROBIAL TREATMENT OF PRECIOUS METAL ORES

Stephen R. Hutchins; Michael S. Davidson, both of Golden; James A. Brierley, and Corale L. Brierley, both of Wheat Ridge, all of Colo., assignors to Advanced Mineral Technologies, Inc., Golden, Colo.

Filed Jan. 23, 1987, Ser. No. 6,487
Int. Cl.⁴ C22B *11/04*
U.S. Cl. 75—118 R **19 Claims**

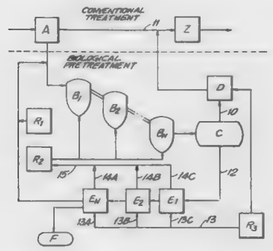
1. A method for recovering precious metals from particulate refractory mineral sulfides in which at least one precious metal is occluded within the sulfide particulate which impedes the recovery of precious metals therefrom by direct leaching which comprises: bioleaching a mineral sulfide containing said occluded precious metal with an aqueous solution containing at least one facultative or obligate thermophile capable of promoting the oxidation of said mineral sulfide,

said bioleaching being carried out at a temperature of at least about 45° C. but not exceeding that temperature above which the thermophile is degraded,

said bioleaching being carried out in the presence of nutrients specific to the growth of said thermophile for a time at least sufficient to oxidize said sulfide mineral and liberate said precious metal and provide a residue containing said liberated precious metal in recoverable form,

separating said precious-metal-containing residue from said bioleach solution,

washing said residue, and then leaching said precious-metal-containing residue with an aqueous leach solution selective to the dissolution of said liberated precious metal and provide a residue impoverished in said precious metal.



4,729,789

PROCESS OF MANUFACTURING AN EXTRUDER SCREW FOR INJECTION MOLDING MACHINES OR EXTRUSION MACHINES AND PRODUCT THEREOF

Tsuneyuki Ide; Kazunori Nakano; Masaru Inoue, and Yoshikazu Kondo, all of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed May 21, 1987, Ser. No. 53,363
Claims priority, application Japan, Dec. 26, 1986, 61-308920
Int. Cl.⁴ C22C *29/14*
U.S. Cl. 75—244 **20 Claims**



1. A process of making a composite of a sintered layer on a metal core member comprising:

charging a green compact sintering powder material into a space between an inner surface of a compressible mold and an outer surface of a mold core disposed in said compressible mold;

sealing said compressible mold with said green compact material and said mold core therein;

isostatic pressing said sealed compressible mold with said green compact material and said mold core therein;

removing said mold core from said isostatically pressed green compact thus forming a cavity therein after said step of isostatic pressing of said sealed compressible mold;

inserting a metal core in said cavity in said isostatically pressed green compact, said metal core having a smaller transverse cross-section than said previously removed mold core;

shrinking and bonding said isostatically pressed green compact onto said metal core by heating said isostatically pressed green compact and said metal core to a temperature at which said isostatically pressed green compact is sintered resulting in shrinkage thereof and bonding of said sintered material onto said metal core.

4,729,790

RAPIDLY SOLIDIFIED ALUMINUM BASED ALLOYS CONTAINING SILICON FOR ELEVATED TEMPERATURE APPLICATIONS

David J. Skinner, Long Valley, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 30, 1987, Ser. No. 31,495
Int. Cl.⁴ B22F *3/00*
U.S. Cl. 75—249 **12 Claims**



1. A rapidly solidified aluminum-base alloy consisting essentially of the formula $Al_{bal}Fe_aSi_bX_c$, wherein X is at least one element selected from the group consisting of Mn, V, Cr, Mo, W, Nb, Ta, "a" ranges from 1.5 to 7.5 at %, "b" ranges from 0.75 to 9.0 at %, "c" ranges from 0.25 to 4.5 at % and the balance is aluminum plus incidental impurities, with the proviso that the ratio [Fe+X]:Si ranges from about 2.01:1 to 1.0:1.

4,729,791

CORROSION-INHIBITING COATING COMPOSITIONS FOR METALS

Paul E. Laura, Southport, Conn.; Paul W. Niemczura; Harold H. Christhilf, both of Trainer, Pa., and Paul E. Morrison, New York, N.Y., assignors to Witco Corporation, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,148
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.⁴ C04B *9/02;* **C08L** *91/00*
U.S. Cl. 106—14.23 **23 Claims**

1. A corrosion-inhibiting composition including, as essential ingredients, (a) an inorganic-organic complex in the form of a thixotropic overbased alkaline earth metal organic sulfonate complex with an alkaline earth metal carbonate colloidally dispersed in a carrier selected from the group of volatile organic solvents, mineral oils, and mixtures of said volatile organic solvents and mineral oils, (b) a drying oil, and (c) a drier, said thixotropic overbased alkaline earth metal organic sulfonate complex with an alkaline earth metal carbonate constituting from about 10 to about 40 wt. % of said corrosion-inhibiting composition, and said drying oil constituting from about 15 to about 50 wt. % of said corrosion-inhibiting composition, said corrosion-inhibiting composition, after application in the form of a thin film on a metal surface and drying, forming a hard essentially non-oily coating.

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4,729,792
MICROCAPSULES, PRINTING INKS AND THEIR PRODUCTION

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 796,196, Nov. 8, 1985, abandoned. This application May 22, 1986, Ser. No. 866,224
Int. Cl.[4] B01J 13/02; C09D 11/00
U.S. Cl. 106—21 18 Claims

12. A process for making a printing ink comprising:
mixing a printing ink vehicle with a wetting agent, and
adding a filter cake of microcapsules prepared by the process of
dispersing an oily solution including a crosslinking agent into an aqueous solution;
forming a polysalt in said aqueous solution, said polysalt including a high molecular weight polyanion and a polycationic polyamine having a functionality of at least three, whereby a hard thick layer is formed around the droplets of oily solution and microcapsules are produced.
adding a sufficient amount of a lipophilizing agent to cause the outer surface of said microcapsules to become substantially non-polar, and
filtering said microcapsules from said aqueous solution to obtain the filter cake of microcapsules.

4,729,793
COMPOSITION FOR MANUFACTURING WALL OF DISPENSING DEVICE

James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 764,143, Aug. 9, 1985, Pat. No. 4,624,945, which is a continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Sep. 2, 1986, Ser. No. 902,916
Int. Cl.[4] C08L 1/08, 1/12
U.S. Cl. 106—169 2 Claims



1. A composition for forming a wall of a dispensing device, said composition comprising cellulose acetate butyrate, cellulose acetate, tributyl citrate and triethyl citrate.

4,729,794
SKI WAX COMPOSITION AND PROCESS OF APPLICATION

Ira Rosenberg, Norwalk, Conn., assignor to Edge Line Products, Inc., Trumbull, Conn.

Filed Jun. 6, 1985, Ser. No. 741,944
Int. Cl.[4] C08L 1/08, 91/06; C08K 5/24
U.S. Cl. 106—191 7 Claims

1. A solid composition useful for waxing the base of skis to improve their performance, comprising:
(a) a wax component in an amount between about 40% and about 80% by weight of the total composition;
(b) a solvent component in an amount between about 5% and about 30% by weight of the total composition; and,
(c) a polymer of a siloxane selected from the group consisting of dimethyl siloxane and cyclo siloxane and having a molecular weight between about 100 and about 2,000 and a vapor pressure at 20° C. between about 1.5 and about 100 mm of Hg, said polymer comprising between about 5% and about 30% by weight of the total composition.

4,729,795
STABLE SLURRIES COMPRISING POWDERED ACTIVATED CARBON

Bruce K. Fillipo, Dublin, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 761,641, Aug. 1, 1985, abandoned. This application Jul. 25, 1986, Ser. No. 890,687
Int. Cl.[4] C08L 1/26; C04B 14/36
U.S. Cl. 106—193 R 2 Claims

1. Slurry composition comprising powdered activated carbon prepared by the destructive distillation of a wood precursor, sodium carboxymethylcellulose, and hectorite clay, wherein, based on the total weight of said slurry, said powdered activated carbon being present in an amount of from about 1% to about 50 wt %, said sodium carboxymethylcellulose being present in an amount of from about 0.25% to about 5 wt %, and said hectorite clay being present in an amount of from about 0.25% to about 5 wt %.

4,729,796
PROCESS FOR PREPARING PIGMENT GRANULES FROM AQUEOUS SUSPENSION OF PIGMENT AND ALKALINE SOLUTION OF RESIN

Reinhold Deubel, Bad Soden am Taunus; Christa Uhde née Schilling, Kriftel, and Werner Marx, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,253
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039642
Int. Cl.[4] C09B 67/08, 67/20, 67/22, 67/54
U.S. Cl. 106—309 7 Claims

1. A process for preparing pigment granules, which comprises adding to the aqueous suspension of a finely divided pigment an alkaline solution of from 25 to 90 weight %, based on the weight of the granules obtained, of colophony or a colophony derivative, acidifying the mixture, subjecting it to a flush process while stirring and heating to a temperature, above the softening point of the resin, up to 100° C. and isolating the granules obtained.

4,729,797
PROCESS FOR REMOVAL OF CURED EPOXY

Harold G. Linde; Elizabeth T. Murphy, and Denis J. Poley, all of Richmond, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1986, Ser. No. 948,259
Int. Cl.[4] C09D 9/00, 9/04
U.S. Cl. 134—38 6 Claims

1. A method for removing cured epoxy from a substrate which comprises contacting the cured epoxy with a mixture comprising:
(a) one or more compounds of formula (I)



(I)

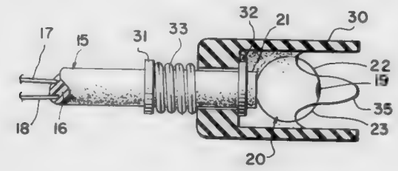
wherein R and R′ are each selected independently from straight and branched alkyl having from 1 to 3 carbon atoms, and phenyl, which may optionally be substituted with one or more hydroxyl, or R and R′ together are alkane of 3 to 6 carbon atoms; and

(b) one or more compounds selected from the group consisting of pyridine and substituted pyridines.

4,729,798
LONG LIFE RIGHT ANGLE THERMOCOUPLE WITH CONSTANT CONTACT PRESSURE

Jacob Nanigian, 622 S. L-St., Lake Worth, Fla. 33460

Filed Dec. 30, 1986, Ser. No. 947,860
Int. Cl.[4] H01L 35/28
U.S. Cl. 136—221 7 Claims



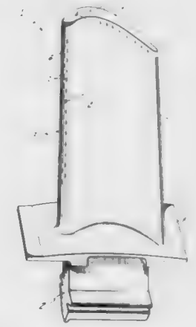
1. An improved thermocouple assembly comprising in combination, a shaped thermocouple wire junction temperature sensing member mounted on a mounting structure means to extend a sensing tip beyond the mounting structure means, the sensing member defined by a juntion comprising pair of flattened strips of dissimilar metal joined together at a sensing tip to form a resilient sensing member for biasing the sensing tip against the surface whose temperature is to be monitored, and an open ended protective shield member carried by the mounting structure means and surrounding the sensing member, spring biasing means carried on said mounting structure means to bias the shield member toward an outer position in which the shield member surrounds the sensing tip and to permit movement of the shield member to an inner position at which an open end of the shield member is moved away from a position at which the shield member surrounds the junction to expose the junction at the open end for contact with a surface whose temperature is to be monitored, the movement of the shield member occurring as a result of pressure overcoming the spring bias and applied to the shield member by pressing the shield member against the surface being monitored with the open end of the shield member in contact with the surface whose temperature is being monitored, whereby the sensing member is protected by the shield member from physical contact with other surfaces and possible damage therefrom when the shield member is in its outer position.

4,729,799
STRESS RELIEF OF SINGLE CRYSTAL SUPERALLOY ARTICLES

Robert J. Henricks, Farmington; John J. Marcin, Hartford, and Jacqueline B. Wahl, Willington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 30, 1986, Ser. No. 880,603
Int. Cl.[4] C22F 1/10
U.S. Cl. 148—13 12 Claims

1. A method for preventing the cracking, upon exposure to a corrosive media, of a single crystal nickel base superalloy article which has accumulated residual strains, said method characterized by prior to said exposure subjecting said article to a stress relieving heat treatment, such that the residual

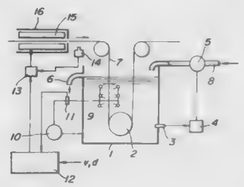


strains are reduced to a level below which cracking will not occur.

4,729,800
METHOD FOR COOLING STEEL STRIP

Sachihiro Iida, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 20, 1986, Ser. No. 842,137
Claims priority, application Japan, Mar. 22, 1985, 60-56094
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] C21D 11/00
U.S. Cl. 148—128 2 Claims



1. A method of cooling a steel strip which has been cooled through a final cooling zone in a continuous heat treating line comprising steps of:
immersing the steel strip in cooling water within a cooling tank, passing the steel strip around one or more sink-rolls immersed in the cooling water and injecting cooling water jets to at least one of opposite surfaces of the immersed strip from a plurality of injection nozzles arranged along the immersed strip until the immersed strip reaches the first one of the sink rolls so as to cool the strip to such a low temperature that a water film interposed between the surface of the first sink-roll and the surface of the strip passing around the first sink-roll does not evaporate.

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4,729,801

PROCESS FOR PRODUCING SUPERCONDUCTING COMPOUND TAPE OR WIRE MATERIAL BY ELECTRON BEAM IRRADIATION

Kazumasa Togano; Hiroaki Kumakura, both of Sakura; Hirosada Irie; Susumu Tsukamoto, both of Yokohama, and Kyoji Tachikawa, Tokyo, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,655
Claims priority, application Japan, Jul. 30, 1985, 60-166786; Oct. 21, 1985, 60-233468
Int. Cl.[4] H01L *39/00*; C22C *27/02*
U.S. Cl. 148—133 11 Claims

1. A process for producing a superconductiong compound tape or wire material, which comprises irradiating electron beams at an acceleratiop voltage of 5 to 150 KV on a starting tape or wire material consisting essentially of constituent elements of a superconducting compound, a compound between the constituent elements, an alloy between the constituent elements or a mixture of at least two of said elements, said compound between the constituent elements and said alloy at a power density, determined on the starting tape or wire material, of 1×10^3 to 1×10^7 w/cm^2 while the starting material is moved at a rate of 1 cm to 10 cm/sec relative to the electron beams.

4,729,802

OPENER-DISK HEAT-TREATING PROCESS AND PRODUCT

John A. Matalis, Lombard, and Thomas Watmough, Flossmoor, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 16, 1986, Ser. No. 819,369
Int. Cl.[4] C21D *9/00*
U.S. Cl. 148—145 15 Claims



1. A process for increasing surface hardness of a planar heat-hardenable steel disk, comprising:

selecting a first position on the disk surface spaced radially annularly intermediate the circumferential edge and the central portions of the disk;

rapidly heating at the first position a minor portion of the annularly intermediate disk surface in relation to the remainder of the disk so as to cause the minor portion to increase in temperature from an initial temperature to an elevated temperature ranging from about 1400 to about 1600 degrees Fahrenheit in a time period of from about 0.3 to about 0.7 seconds, and in a manner such that substantially no heat diffuses from the thus-heated portion of the disk to the remainder of the disk;

terminating the heating step in a manner so as to allow the remainder of the steel disk to serve as a heat sink thereby to rapidly cool the thus-heated portion of the disk from the elevated temperature to a temperature of less than about 1000 degrees Fahrenheit in a time period of less than about 0.75 seconds, and in a manner such that warpage of the steel disk is held to within 0.030 inches;

selecting a second position spaced from the first position on the annularly intermediate disk surface portion, and repeating the rapid-heat and heat-termination steps; and

repeating the position-selection through heat-termination steps until a major portion of the annularly intermediate disk surface portion is increased in hardness to the greater value.

4,729,803

METHOD OF FILLING A CABLE WITH A FLOODING COMPOUND

Thomas D. Hindman; Thomas J. Roessing, both of Parker, and Joseph D. Burkhard, Petrolin, all of Pa., assignors to Witco Corp., New York, N.Y.

Division of Ser. No. 734,676, May 16, 1985, Pat. No. 4,716,191.
This application Jan. 23, 1987, Ser. No. 6,079
Int. Cl.[4] H01B *13/14*
U.S. Cl. 156—48 6 Claims

1. A method of filling a cable with a flooding compound comprising;

(a) dissolving a wax soluble rubber in a microcrystalline wax at an elevated temperature between 220° F. to 260° F., said rubber comprising an ethylene-propylene copolymer;

(b) dissolving polyethylene in the mixture of step (a), and said wax being present in at least 90% by weight;

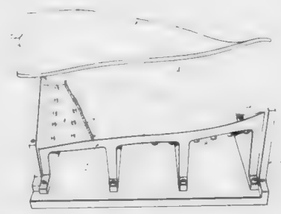
(c) extruding the mixture of step (b) at about said elevated temperature, between a metal sheath and a plastic cable covering of said cable, and wherein the extruded mixture has the jacket slip characteristics of atactic polypropylene as defined by the R.E.A. 15 lb. minimum test standard.

4,729,804

METHOD FOR SECURING A WORKPIECE TO A WORKHOLDER

James R. Dillner, Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 829,050, Feb. 13, 1986, Pat. No. 4,685,660.
This application Dec. 24, 1986, Ser. No. 946,474
Int. Cl.[4] B32B *31/06*, *7/04*
U.S. Cl. 156—91 2 Claims



1. A method for fixing a workpiece to a workholder, utilizing a curable resinous material, said method comprising the steps of:

(1) providing a workholder which comprises a body having a contoured bonding surface essentially matching a surface of said workpiece and having means disposed about said body for releasably engaging said resinous curable material, said means configured for engagement with said material and comprising a plurality of removable members disposed within a plurality of holes located about the contoured bonding surface of said body, said members having an engaging end extendable into said resinous material, said resinous material flowable around said end and, after curing, forming corresponding holes in said cured resinous material, said ends engaging said resinous material, fixably positioning said resinous material, and thus said workpiece, relative to said workholder;

(2) applying a release agent to said contoured bonding surface and said engaging means;

(3) positioning said workpiece relative to said contoured surface;

(4) contacting said workpiece, said contoured bonding surface and said engaging means with said resinous material, sandwiching said material between said workpiece and said workholder; and

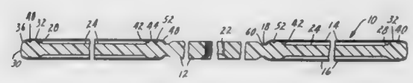
(5) curing said resinous material, such that said workpiece is bonded to said resinous material, with said engaging means fixably positioning said resinous material, and thus said workpiece, relative to said workholder, said workpiece releasably fixed to said workholder.

4,729,805

RECORDING MEDIUM ANNEALING PROCESS

Jerry L. Alexander; Sankar B. Narayan; Sten R. Gerfast, and Charles E. Nelson, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 711,825, Mar. 14, 1985, Pat. No. 4,623,570.
This application Aug. 11, 1986, Ser. No. 895,322
Int. Cl.[4] G11B *5/85*, *5/84*
U.S. Cl. 156—160 8 Claims



1. A process for annealing a stretched surface recording disk comprising a rigid annular support, having at least two concentric raised annular reference surfaces and an annular polymeric film, having a recording layer, attached to the support and stretched between and supported by the raised annular reference surfaces, said process comprising:

A. annealing a polymeric film which has been fixed in radial tension, at a temperature above its glass transition temperature for a time sufficient to obtain a substantial absence of anisotropic stress distribution in the film;

B. bonding the annealed film from step A to the annular support at or near the inside and outside diameters of the support; and

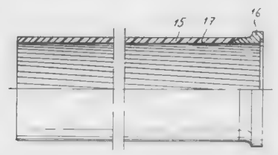
C. annealing the product of step B, at a temperature above the glass transition temperature of the polymeric film but below the temperature which would cause warping of the annular support, for a time sufficient to obtain a substantial absence of anisotropic stress distribution in the polymeric film.

4,729,806

METHOD FOR MAKING TUBES HAVING LOW WEIGHT

Bengt Stein, Bynasvagen 18F, Sweden, assignor to Affarsverket FFV, Eskilstuna, Sweden

Filed Aug. 12, 1986, Ser. No. 895,887
Claims priority, application Sweden, Aug. 13, 1985, 8503790
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—172 8 Claims



1. A method for manufacturing a tubular device and the like of a composed material, said method comprising the steps of:

forming a tube blank having a substantially even wall thickness and made of a first material, said wall having a predetermined cross sectional shape;

mounting said tube blank in cooperating position with a press tool and a mandrel having the desired shape and profilings of the tubular device to be formed;

descending said press tool and said tube blank in an isostatic pressing bath;

isostatically pressing said tube blank against said mandrel to produce a liner, and

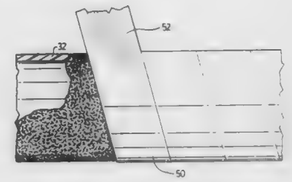
covering said liner with a second material to form a solid, integral composite tubular device, said second material being a high strength fiber material and being bound to said liner by a binder.

4,729,807

METHOD OF FABRICATING COMPOSITE PRODUCTS

Hans Hede; Gunnar Blomqvist, and Jarl-Erik Jofs, all of Vaasa, Finland, assignors to Oy Wiik & Hoglund AB, Vaasa, Finland

Filed Feb. 28, 1985, Ser. No. 706,785
Claims priority, application Canada, Jun. 22, 1984, 457308
Int. Cl.[4] B65H *81/00*; B29C *47/06*, *59/00*, *67/12*
U.S. Cl. 156—172 7 Claims



1. A method of fabricating bonded composite products composed of a plurality of materials with a low affinity for mutual bonding, comprising the steps of:

extruding a first stream of a first plastic through a die to form a profile, coextruding a second stream of plastic through said die which is fusible with said first stream as a surface layer on said profile, said second stream being blended with an additive capable of interrupting the homogeneous structure of said plastic;

allowing said surface layer to rupture upon emergence from the die, as a result of pressure drop and shear stresses due to friction at the surface of the die, so as to form a rough surface comprising a pattern of irregular projections and cavities;

applying a flowable coating of a second plastic material, with a low bonding affinity for said first plastic, on to said rough surface to surround said projections and invade said cavities;

hardening said coating material.

5. A method as claimed in claim 1 in which said profile is a cylindrical tube of polyethylene and said coating is a helical wrapping of glassfibre reinforced polyester.

4,729,808

INK RESERVOIR HAVING CONTINUOUS RANDOM SLIVER WITH STRETCH YARN

Richard M. Berger, Midlothiam, Va., assignor to American Filtrona Corporation, Richmond, Va.

Filed Apr. 15, 1986, Ser. No. 852,241
Int. Cl.[4] D04H *1/54*
U.S. Cl. 156—180 8 Claims

1. A method of making a fibrous body for use in an ink reservoir, comprising the steps of:

supplying a plurality of fibers of false twist stretch yarn;

gathering said fibers in an unprocessed bundle;

supplying a chamber for passage of said bundle of fibers therethrough;

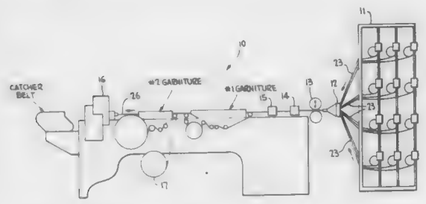
supplying a means for heating said bundle of fibers;

said means for heating supplying heat to said chamber during passage therethrough of said bundle of fibers;

heating said bundle of fibers by said means for heating;

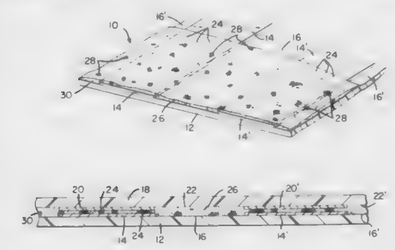
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permitting tangling of said bundle of fibers in said chamber due to application of heat thereto by said means for heating;
drawing said tangled bundle of fibers from said chamber;



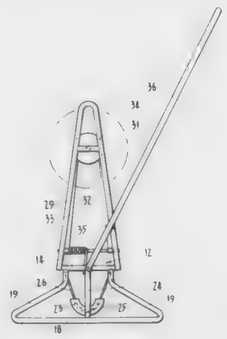
cooling said tangled bundle of fibers;
said tangled gathered bundle of fibers upon cooling forming a relatively strong fibrous body.

4,729,809
ANISOTROPICALLY CONDUCTIVE ADHESIVE COMPOSITION
Ronald A. Dery; Warren C. Jones, both of Winston-Salem, N.C.; William J. Lynn, Groveland, Mass., and John R. Rowlette, Clemmons, N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 710,361, Mar. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 601,836, Apr. 19, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 16,496
Int. Cl.[4] B29C *65/02, 65/54;* **B32B** *5/16, 7/12*
U.S. Cl. 156—306.6 **22 Claims**



1. An anisotropically conductive adhesive composition for use in electrically connecting at least one conductive area on one substrate with at least one conductive area on a second substrate, each substrate having conductive and insulating areas on at least one surface thereof, the adhesive composition being characterized in that:
the composition is comprised of a nonhomogenous mixture of conductive particles in a nonconductive adhesive binder;
the conductive particles, not requiring a specific shape, are dispersed randomly throughout the mixture in noncontiguous, self-evidently discrete, and nonaligned conductive units, each unit being comprised of a plurality of individual particles, the units being sufficiently spaced apart to preclude electrical conductivity between adjacent conductive areas on the same substrate,
whereby upon applying a layer of the adhesive composition over the conductive and insulating areas on the first substrate and positioning in a conducting relationship and adhering said at least one conductive area on the second substrate with said at least one conductive area on the first substrate, the units establish electrical connection between the adhered conductive areas on the two substrates.

4,729,810
CARPET TAPE DISPENSER
Ronald H. Brooks, 293 Nepean Highway, Edithvale, Victoria 3196, Australia
PCT No. PCT/AU86/00029, § 371 Date Oct. 7, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/04568, PCT Pub. Date Aug. 14, 1986
PCT Filed Feb. 7, 1986, Ser. No. 930,284
Claims priority, application Australia, Feb. 8, 1985, PG9208
Int. Cl.[4] B29C *65/50;* **B32B** *35/00*
U.S. Cl. 156—391 **15 Claims**

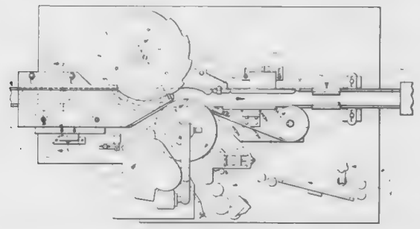


1. A carpet seaming tape dispenser, comprising:
(a) a main frame;
(b) a pair of support legs diverging downwardly and away from said main frame;
(c) a tape roll support fixed to said main frame and extending upwardly from one side of said main frame;
(d) said tape roll support including a stub axle for carrying a roll of tape;
(e) a holding frame pivotally connected to said tape roll support;
(f) said holding frame including a retaining lever means and spring means, said spring means permits an operator to pivot said retaining lever means for allowing removal of a roll of tape;
(g) a pair of carpet edge separating arms secured to opposed sides of said main frame and extending downwardly and outwardly therefrom;
(h) a tape guide member secured to said main frame and having at least a portion thereof extending below said main frame;
(i) at least a portion of said pair of carpet edge separating arms extending substantially parallel to at least a portion of a corresponding support leg means; and
(j) said tape dispenser being substantially symmetrical about a vertical plane transverse to the direction of movement of the tape dispenser for permitting an operator to dispense tape in two opposite directions.

4,729,811
INFEED GUIDE AND ROLL-ON BELT FOR BOTTLE LABELING MACHINE
Frank J. DiFrank, Toledo, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio
Filed Apr. 28, 1986, Ser. No. 856,243
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—449 **4 Claims**

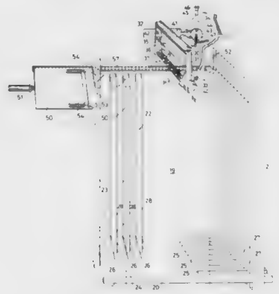
1. In apparatus for applying wrap-around labels to cylindrical glass containers where the side wall of the container is guided into engagement with the leading edge of a label that is being transported on the surface of a rotating cylindrical vacuum drum with the leading edge of the label becoming adhered

to the container wall and the container is held against the drum surface by a resilient, curved, primary backup pad so the label will be rolled around the container until its trailing edge overlaps the leading edge and becomes adhered thereto and the container is rolled along the vertical of a horizontal secondary backup pad by being held thereagainst by a linearly moving belt, the improvement in the system comprising a vertical axle for supporting a vertical series of rollers thereon, each roller being free to rotate relative to each other and said axle, a wide endless belt extending about said rollers, a driving roll mounted on a vertical shaft, said shaft being spaced from said



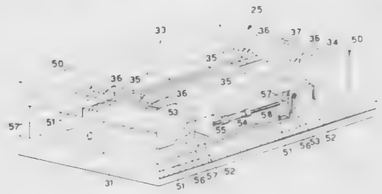
axle, said belt extending about said drive roll, means connected to said shaft for rotating said shaft to move said endless belt between said drive roll and said vertical series of rollers, a stationary vertical surface extending between said drive roll and rollers against which the surface of said belt is moved, said vertical surface being parallel to said secondary rollup pad whereby containers will be biased between said moving belt and backup pad to assure that the overlap of the label will produce a complete, secure seam in the label, said rollers being a fairly small diameter so that the gap between the vacuum drum and the driven belt is held to a minimum.

4,729,812
SERVICE APPARATUS FOR MACHINES USING CONTINUOUS STRIPS OF PAPER FORMS OR SHEETS
Luciano Meschi, Corso Amedeo 73, 57100 Livorno, Italy
Filed Feb. 5, 1986, Ser. No. 826,287
Claims priority, application Italy, Feb. 6, 1985, 19041 A/85
Int. Cl.[4] B31F *5/04, 1/00*
U.S. Cl. 156—459 **20 Claims**



1. Service apparatus for machines using sheets or forms joined in continuous strips and folded accordion-wise in packs, each of said packs having a first sheet and a last sheet, the first sheet being the initial sheet of each said pack fed to a printer, and the last sheet of an immediately preceeding pack being splicable with the first sheet of the next succeeding immediately following pack fed to the printer, comprising:
a splicing unit for splicing the last sheet of the immediately preceeding pack being fed to the printer with the first sheet of the next succeeding immediately following pack;
an outlet unit for receiving and piling sheets or forms treated in the printer, said outlet unit being arranged adjacent to said splicing unit and being positioned transversely to said splicing unit;
a receptacle below said outlet unit;
outlet unit means for receiving and piling the forms leaving the printer for guiding the strip and piling thereof into said receptacle;
said receptacle having a bottom panel which is movable between a lowered or receiving position and a raised or compressing position, a first set of two oppositely disposed vertical walls, one of which is fixed and the other of which is movable in an adjustable manner toward or away from said fixed wall, and a second set of two oppositely disposed vertical walls substantially orthogonal to said first set of two vertical walls, both of which are movable and one of said walls of said second set of walls moves parallel to the fixed wall of said first set of walls to allow size adjustment of said receptacle and said other movable wall of said second set slides transversely of said fixed wall of said first set to allow access to said receptacle.

4,729,813
SPLICING HEAD FOR SHEET MATERIAL
Luciano Meschi, Corso Amedeo 73, 57100 Livorno, Italy
Filed Jan. 27, 1986, Ser. No. 822,904
Claims priority, application Italy, Feb. 6, 1985, 20716/85[U]
Int. Cl.[4] B31F *5/00;* **B65H** *69/06*
U.S. Cl. 156—502 **7 Claims**



1. A sheet material splicing head for splicing apparatuses of the type for splicing two sheets together, comprising:
a splicing plane formed of two semiplanes movable between a lowered or working position in which they are coplanar and a position slightly inclined upwardly for positioning and adjustment of the two sheets to be spliced;
positioning pins on each of said two semiplanes for positioning and retaining the sheets to be spliced;
movable sidewalls along two outer opposite edges of said splicing plane parallel to a splicing line, said sidewalls being movable in a controlled manner between a rest or lowered position in which they are flush with said splicing plane and an operating or raised position in which they protrude a predetermined distance above said splicing plane; and
means for driving said sidewalls between said two positions so that they raise the two spliced sheets from the splicing plane, disengaging them from the positioning pins;
said drive means including:
at least one block for each said sidewall and associated therewith,
each said block sliding parallel to the lie plane of its said associated sidewall and each said block having a slot arranged in an inclined position along a diagonal,
a sidewall pin rigidly integral with a said sidewall for each said block and housed in the related slots, and
a cylinder assembly associated with each said sidewall with two opposing pistons, the stems of which are rigidly integral with said blocks so that operation of said cylinder

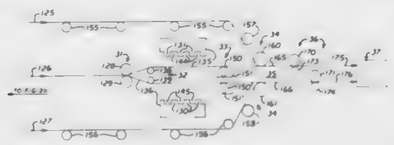
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assemblies and opposing pistons brings about sliding of said blocks and sliding of said sidewall pins in their respective slots, forcing the corresponding sidewalls to descend and rise depending on the direction of sliding of the blocks.

4,729,814
APPARATUS FOR MAKING AN OFFSET LAMINATED ROOFING SHINGLE

Robert E. Jennus, Brandon, Fla., and Dale P. Major, Camden, Ark., assignors to The Celotex Corporation, Tampa, Fla.

Filed Aug. 14, 1986, Ser. No. 895,988
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—512 3 Claims

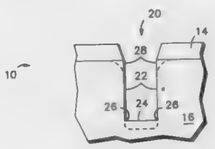


1. An apparatus for making a roofing shingle from a glass mat comprising means for longitudinally slitting said glass mat into two sheets each having a respective centerline and two sides, means for laterally shifting one of said last mentioned sheets so that the respective centerlines are coincident, means for applying an adhesive to one side of one of said latter mentioned sheets, means for laminating said latter mentioned sheets in overlapping relation to form a laminated sheet, means for cutting narrow strips from opposite edges of said laminated sheet, cutting means for severing said laminated sheet into individual strips, said individual strips having alternating tabs and cut-out portions, means for separating said individual strips, means for adhering said narrow strips to said tabs along one edge of each of said individual strips and cutting means for cutting said individual strips into preselected lengths, whereby a tri-level laminated roofing shingle is made.

4,729,815
MULTIPLE STEP TRENCH ETCHING PROCESS

Howard K. H. Leung, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 21, 1986, Ser. No. 887,597
Int. Cl.[4] B44C *1/22;* H01L *21/308*
U.S. Cl. 156—643 15 Claims

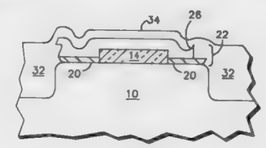


1. A process for etching trenches with rounded corners in a semiconductor substrate comprising the sequence of steps of:
performing a first etch using NF_3 and CHF_3 etch species at a first DC etch bias, to form a preliminary trench having sharp top corners and sharp bottom corners;
performing a second etch using NF_3 and CHF_3 as etch species at a second DC etch bias higher than said first DC etch bias, to etch the sharp corners of the trench into rounded top corners; and
performing a third etch using only NF_3 as etch species, to further extend the depth of the trench while forming rounded bottom corners.

4,729,816
ISOLATION FORMATION PROCESS WITH ACTIVE AREA PROTECTION

Bich Y. Nguyen; Howard K. H. Leung, both of Austin, Tex., and Bridgette A. Bergami, Gilbert, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 2, 1987, Ser. No. 271
Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 148—33.3 15 Claims

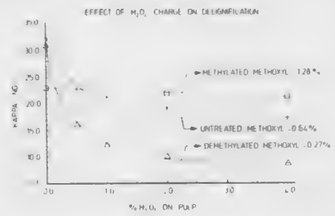


1. A protected active region formed on a surface of a semiconductor substrate, for future device formation, surrounded by an isolation region, made by the process comprising the steps of:
forming a protective material over the protected region of the surface of the semiconductor substrate;
forming a thermal silicon nitride rings in the semiconductor substrate immediately surrounding the protected region;
forming a masking cover over the protected region and the surrounding silicon nitride ring;
forming an isolation region in the semiconductor substrate surrounding the ring; and
removing the masking cover, the ring and the protective material to expose the protected region.

4,729,817
PROCESS FOR THE OXIDATIVE DELIGNIFICATION OF DEMETHYLATED CHEMICAL PULP

Raymond C. Francis, Don Mills, and Douglas W. Reeve, Toronto, both of Canada, assignors to Tenneco Canada Inc. (ERCO division), Islington, Canada

Continuation-in-part of Ser. No. 638,013, Aug. 6, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 810,590
Claims priority, application Canada, Aug. 1, 1984, 460161
Int. Cl.[4] D21C *9/00, 9/14, 9/147, 9/16*
U.S. Cl. 162—65 5 Claims



1. A process for the oxidative delignification of chemical pulp, which comprises:
forming a chemical pulp containing about 2 to about 6 wt. % of lignin from wood by a kraft process, a soda process or a sulphite process,
chemically demethylating the lignin content of said chemical pulp with an electron-deficient compound selected from the group consisting of aluminum chloride, boron tribromide and trimethylsilyl iodide or a nucleophile selected from the group consisting of organic and inorganic sulfides, reagents containing thiosulfate, sulfite, iodide, bromide or chloride ions, and phosphides, without effecting any substantial delignification of said chemical pulp during said chemical demethylation of the lignin so as to provide lignin in said chemical pulp with a degree of demethylation of at least about 30%, and thereafter subjecting said demethylated pulp to oxidative delignification by contact with an oxidative delignification agent.

4,729,818
DEHYDRATION OF ACETIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Minn. 59715

Filed Apr. 16, 1987, Ser. No. 38,966
Int. Cl.[4] B01D *3/40;* C07C *51/44, 53/08*
U.S. Cl. 203—16 1 Claim

1. A method for recovering acetic acid from a mixture of acetic acid and water which comprises distilling a mixture of acetic acid and water in a rectification column in the presence of about one to two parts of extractive agent per part of acetic acid—water mixture, recovering water as overhead product and obtaining the acetic acid and the extractive agent from the stillpot, the extractive agent comprises cinnamic acid and at least one material from the group consisting of acetophenone, adiponitrile, methyl salicylate and benzophenone.

4,729,819
METHOD FOR RESTORING THE CURRENT EFFICIENCY

Manabu Suhara; Kohji Suzuki, and Isamu Takeshita, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 2, 1986, Ser. No. 815,469
Claims priority, application Japan, Jan. 18, 1985, 60-5773
Int. Cl.[4] C25B *1/14*
U.S. Cl. 204—98 12 Claims

1. In the electrolysis of sodium chloride by means of a perfluoro cation exchange membrane having carboxylic acid groups as ion exchange groups on the side facing the cathode, for the production of sodium hydroxide having a concentration of from 32 to 40% by weight, a method for restoring the current efficiency of the membrane which has dropped due to a decrease of the electrolytic temperature to a level of at most 80° C. or an increase of the sodium hydroxide concentration to a level of at least 40% during the electrolysis, which comprises suspending the electrolysis when the current efficiency of the perfluoro cation exchange membrane has dropped to a predetermined level, and maintaining the catholyte concentration at a level of not higher than 30% by weight.

4,729,820
MULTIELECTROLYTE SHEAR TREATMENT OF CARBON FIBERS

Stuart Mitchell, North Ridgeville, Ohio, assignor to Amoco Corporation, Chicago, Ill.

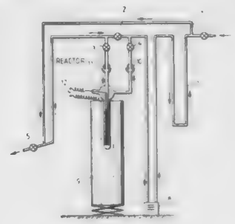
Continuation-in-part of Ser. No. 868,737, May 30, 1986, abandoned. This application Feb. 11, 1987, Ser. No. 13,683
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—130 9 Claims

1. A method of surface-treating carbon fibers comprising the steps of:
(a) moving the carbon fiber, as anode, through a first electrolytic bath comprising an aqueous solution of an oxidizer; then
(b) moving said carbon fiber, as anode, through a second electrolytic bath comprising an aqueous solution of an ammonium compound, said bath having a pH of at least about 8.

4,729,821
IN SITU ACTIVATION OF CATALYSTS BY APPLIED ELECTRICAL POTENTIALS

Richard B. Timmons, Arlington, Tex., and Sandor Kristyàn, Budapest, Hungary, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Nov. 3, 1986, Ser. No. 926,643
Int. Cl.[4] C07C *17/00, 3/24*
U.S. Cl. 204—164 18 Claims

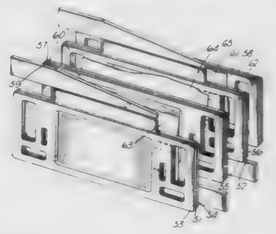


1. A process for increasing the rate of a catalyzed gas phase reaction wherein a gas phase reactant is reacted in the presence of an electrically conductive catalyst to form a desired product which comprises applying a negative electrical potential to the catalyst composition in the presence of the reactant at a potential difference and for a time sufficient to increase the rate of the product forming reaction and to maintain an increased rate of product formation after the potential difference is removed.

4,729,822
ELECTROLYTIC CELL

Stephen R. James, Macclesfield, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 7, 1986, Ser. No. 916,101
Claims priority, application United Kingdom, Oct. 22, 1985, 8526054
Int. Cl.[4] C25B *9/00, 15/08, 13/00*
U.S. Cl. 204—255 16 Claims



1. An electrolytic cell of the filter press type which comprises a plurality of plate-like anodes, cathodes, and gaskets of an electrically-insulating material, and an ion-exchange membrane positioned between each anode and adjacent cathode to form in the cell a plurality of anode compartments and cathode compartments, in the electrolytic cell at least the gaskets each containing a plurality of apertures therein which in the electrolytic cell form compartments lengthwise of the cell which serve as headers from which electrolyte may be charged to the anode compartments of the cell and from which liquors may be charged to the cathode compartments of the cell, and to which products of electrolysis may be removed from the anode compartments and cathode compartments of the cell, the cell being provided with means of communication between the said headers and the anode and cathode compartments, in which at

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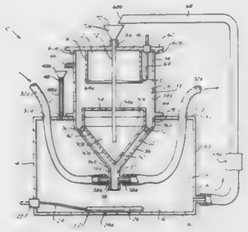
least the gaskets each comprise an aperture therein which together form a compartment lengthwise of the cell which is in communication only with the anode compartments of the cell, or which is in communication only with the cathode compartments of the cell, and which serves as a balancing header.

4,729,823

APPARATUS AND METHODS FOR ELECTROPHORESIS

Juan G. Guevara, Jr., Houston, Tex., assignor to Guevara-Kelley Scientific Products, Inc., Houston, Tex.

Filed Aug. 8, 1986, Ser. No. 894,886
Int. Cl.⁴ G01N *27/26*
U.S. Cl. 204—299 R **4 Claims**



1. An apparatus for separating individual components from a mixture of said components by electrophoresis, comprising:
a first buffer reservoir for holding a buffer solution;
a positive electrode within said first buffer reservoir in electrical contact with said buffer solution therein;
a second buffer reservoir for holding said buffer solution;
a negative electrode within said second buffer reservoir in electrical contact with said buffer solution therein;
means for separating said components from said mixture, wherein said means for separating is interposed between said first and second reservoirs, and wherein said means for separating comprises:
a hollow out frustum,
an inner member spaced apart from an interior surface of said hollow frustum to form a column therebetween, and
a separation medium within said column,
wherein said components are separated from said mixture as said components migrate through said separation medium from a first end of said column toward a second end thereof, wherein said column is constructed so that said components are concentrated as they migrate through said separation medium, and wherein said inner member provides additional heat exchange surface to remove heat from said separation medium, and
recycle means for recycling said buffer solution in a path between said first reservoir and said second reservoir without a formation of an electrical circuit across said path.

4,729,824

GAS SENSOR AND METHOD OF USING SAME

Jose D. Giner, Brookline, Mass., assignor to Giner, Inc., Waltham, Mass.

Continuation of Ser. No. 697,898, Feb. 4, 1985, abandoned, which is a division of Ser. No. 430,688, Sep. 30, 1982, Pat. No. 4,508,598, which is a continuation-in-part of Ser. No. 377,143, May 11, 1982, abandoned. This application Oct. 14, 1986, Ser. No. 918,652
Int. Cl.⁴ G01N *27/26*
U.S. Cl. 204—415 **19 Claims**

1. A system for determining the concentration of carbon dioxide in a subject fluid comprising a sensor comprising at least a working electrode which will reductively adsorb carbon dioxide, a counter electrode, and means whereby said subject fluid containing carbon dioxide contacts said working electrode, said electrodes of said sensor being connected to a current or potential controlling device which, in turn, is connected to a current integrator, whereby carbon dioxide reductively adsorbed on said working electrode of said sensor is measured.

4,729,825

METHOD AND APPARATUS FOR CONTACTING FEED MATERIALS WITH FLUIDIZED SOLIDS

Richard H. Nielsen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 720,203, Apr. 4, 1985, abandoned. This application May 30, 1986, Ser. No. 871,162
Int. Cl.⁴ C10G *9/32, 11/00*
U.S. Cl. 208—154 **15 Claims**

1. A method of feeding a mixture of fluidized solids and a fluid feed material into a contacting zone to contact, said fluid feed material with said fluidized solids under cracking conditions, which comprises:
(a) introducing a purging fluid consisting essentially of steam at a purging fluid flow rate through atomization nozzle means upwardly into said contacting zone while maintaining a fluid pressure upstream of said atomization nozzle means to force fluid through the said atomization nozzle means;
(b) introducing a first fluidizing medium into a lower portion of a feeding zone, located below and in communication with said contacting zone, at a flow rate sufficient to fluidize solids in said feeding zone, to increase the velocity level of fluidized solids in said feeding zone and to move said fluidized solids to an upper portion of said feeding zone;
(c) introducing a second fluidizing medium into said upper portion of said feeding zone at a flow rate sufficient to further increase the velocity level of fluidized solids in said feeding zone and to move said fluidized solids from said feeding zone into said contacting zone;
(d) introducing solids into said feeding zone, intermediate said upper and lower portions thereof, whereby said solids are fluidized and moved from said feeding zone as fluidized solids into said contacting zone by said first fluidizing medium and said second fluidizing medium; and
(e) upon the achievement of desired operating conditions in said contacting zone, introducing said fluid feed material through said atomization nozzle means upwardly into said contacting zone at an increasing fluid feed material flow rate while simultaneously reducing said purging fluid flow rate and controlling said fluid pressure upstream of said atomization nozzle means until the achievement of 0% flow of said purging fluid and 100% flow of said fluid feed material through said atomization nozzle means into said contacting zone to contact said fluidized solids.

4,729,826

TEMPERATURE CONTROLLED CATALYTIC DEMETALLIZATION OF HYDROCARBONS

David A. Lindsay, Orange; Michael C. Smith, Costa Mesa; Walter Albertson, Brea, and Marvin J. Schwedock, Costa Mesa, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 28, 1986, Ser. No. 834,783
Int. Cl.⁴ C10G *45/02, 45/00*
U.S. Cl. 208—211 **43 Claims**

1. A catalytic process for removing contaminant metals from a petroleum hydrocarbon oil containing contaminant metals, said catalytic process comprising the following steps:
(1) contacting an upstream portion of a catalyst bed containing a particulate hydrometallization catalyst having a known metals-accumulating capacity under hydrodemetallizing conditions with said hydrocarbon oil to produce a product hydrocarbon oil containing less contaminant metals than said hydrocarbon oil, and
(2) subsequently contacting a downstream portion of said catalyst bed under said hydrodemetallizing conditions of step (1), including a weighted average catalyst bed temperature controlled at least 5° F. higher than the weighted average catalyst bed temperature in step (1), with said product hydrocarbon obtained in step (1) to produce a second product hydrocarbon oil containing less contaminant metals than said product hydrocarbon oil obtained in step (1), and wherein said weighted average catalyst bed temperatures in step (1) and step (2) are sufficient to cause deposition of a weight percent of contaminant metals on said upstream portion of said catalyst bed, as calculated on a fresh catalyst basis, in a ratio less than 2 to 1 as compared to the weight percent of contaminant metals on a portion of said downstream portion of said catalyst bed equivalent to said upstream portion of said catalyst bed.

28. A multi-reaction zone process for hydrodemetallizing and hydrodesulfurizing a petroleum hydrocarbon oil containing sulfur and contaminant metals, said process comprising the following steps:
(1) contacting a first portion of a hydrodemetallization catalyst under hydrodemetallization conditions with said hydrocarbon oil in a first reaction zone to produce a product hydrocarbon oil containing less contaminant metals than said hydrocarbon oil, said hydrodemetallization catalyst comprising at least one Group VIB metal hydrogenation component and at least one Group VIII metal hydrogenation component on a porous refractory oxide support containing alumina;
(2) contacting a second portion of said hydrodemetallization catalyst in a second reaction zone with the product hydrocarbon obtained from step (1) under said hydrodemetallization conditions of step (1) except at a weighted average catalyst bed temperature controlled at least 5° F. higher than the weighted average catalyst bed temperature in said first reaction zone to produce a second product hydrocarbon oil containing less contaminant metals than said product hydrocarbon oil obtained in step (1) and wherein said weighted average catalyst bed temperatures in said first and said second reaction zones are sufficient to cause deposition of a weight percent of contaminant metals on said catalyst in said first reaction zone, as calculated on a fresh catalyst basis, in a ratio less than 2 to 1 as compared to the weight percent of contaminant metals on a portion of said catalyst in said second reaction zone equivalent to said portion of said demetallization catalyst in said first reaction zone; and
(3) contacting a hydrodesulfurization catalyst under hydrodesulfurization conditions with the product hydrocarbon obtained from step (2) in a third reaction zone, said hydrodesulfurization catalyst comprising at least one Group VIB metal hydrogenation component and at least one Group VIII metal hydrogenation component on a porous refractory oxide support containing alumina, said hydrodesulfurization catalyst having an average pore diameter of at least 30 angstroms less than the average pore diameter of said hydrodemetallization catalyst.

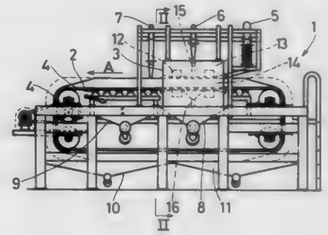
4,729,827

MAGNETIC SEPARATOR

Ian J. Corrans, and Jan Svoboda, both of Randburg, South Africa, assignors to Council for Mineral Technology, Randburg, South Africa

Continuation of Ser. No. 608,593, May 9, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 871,147
Claims priority, application South Africa, May 10, 1983, 83/3323
Int. Cl.⁴ B03C *1/02*
U.S. Cl. 209—223.1 **8 Claims**

1. A magnetic separator comprising:
a conveyor assembly arranged for conveying a matrix of magnetic elements through at least one magnetic field set up by magnetic field generating means associated with said separator;
a feed inlet for supplying feed material to be subjected to separation in a first region of said conveyor assembly which is present at any time in said magnetic field, said first region of said conveyor assembly being at least roughly horizontal;
means for conducting said feed material away from said matrix in the region of the magnetic field; and
means for removing magnetic particles retained by said matrix at a second region of said conveyor assembly which is outside of the magnetic field,
the separator being characterized in that:
the magnetic field generating means comprises at least one pair of solenoid coils located opposite each other with the



axes thereof being substantially upright and substantially at right angles to said first region of said conveyor assembly with one coil located above and the other one below said conveyor assembly and wherein the coils of a pair are joined to each other by cladding so that each pair of solenoid coils is embodied in a single unit having openings for permitting said conveyor assembly to pass therethrough between said coils, whereby the capacity of said separator can be increased by increasing the width of said conveyor assembly as respects said first region and commensurately increasing the corresponding width of said coils while maintaining the same vertical spacing therebetween to thereby maintain the same flux intensity in said first region without a substantial increase in power consumption.

4,729,828

MODULAR ROTATING BIOLOGICAL CONTACTOR SYSTEM

Gary Miller, 4931 E. 300 North, Lafayette, Ind. 47905

Continuation-in-part of Ser. No. 946,923, Dec. 29, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,008
Int. Cl.⁴ C02F *3/08*
U.S. Cl. 210—150 **13 Claims**

1. An improved modular rotating biological contactor apparatus comprising in combination:
(A) at least two hemicylindrical trough sections, all said trough sections having inside walls with generally similar diametrical and circumferential dimensions, and all being oriented relative to one another so as generally to have a common longitudinal axis, and each said trough section being generally in a proximate relationship relative to longitudinally adjacent others thereof,
(B) a bulkhead means located between each adjacent pair of said trough sections, said bulkhead means including mounting means for engaging said bulkhead means with said adjacent pair of said trough sections in a generally fluid tight engagement and further including aperture means defined in each said bulkhead means for achieving fluid passage therethrough,
(C) a pair of endplate means each one disposed across a different opposed end of the terminal pair of said trough

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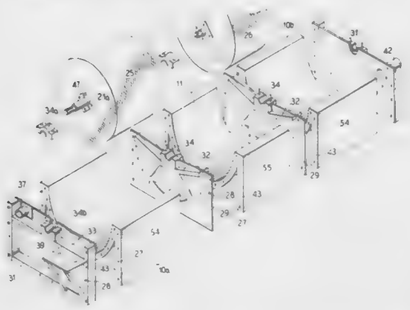
sections, each said endplate means including mounting means for engaging said endplate means with a different one of said opposed ends in a generally fluid tight engagement, and further including aperture means defined therein for achieving fluid passage therethrough,

(D) fluid conduit means associated with the respective said aperture means of each one of said pair of endplate means for inputting fluid into a first chamber of a series of sequential chambers defined by the resulting assembly of said trough sections, said bulkhead means and said endplate means, and for removing fluid from a final chamber of said series,

(E) rotatable contactor means suspended in each one of said chambers in adjacent but diametrically spaced relationship to said inside walls, all said contactor means including an associated shaft means mounting said contactor means, and bearing means for so suspending said shaft means, supported by said bulkhead means and said endplate means, said shaft means being generally coaxial with said axis,

(F) drive means for rotatably driving said shaft means, whereby said contactor means is rotatable, and

(G) support means associated with at least one of said hemicylindrical trough sections, said bulkhead means, and said endplate means for independently supporting said rotating biological contactor apparatus relative to an underlying ground surface in an orientation such that said axis is generally horizontal.



13. A coacting combination of components which are assemblable in a plurality of ways to provide a tankage assembly for a rotating biological contactor apparatus, said tankage assembly being characterized by having at least two generally coaxial chambers in longitudinally adjacent relationship to one another, each said chamber having generally hemicylindrical side walls with generally similar diametrical and circumferential dimensions, and further having generally flat end walls which are generally in spaced, parallel relationship to one another, said tankage assembly being comprised of:

(A) at least two hemicylindrical trough sections, all said trough sections having inside walls with generally similar diametrical and circumferential dimensions, and all being oriented relative to one another so as generally to have a common longitudinal axis, and each said trough section being generally in a proximate relationship relative to longitudinally adjacent others thereof,

(B) a bulkhead means located adjacently between each adjacent pair of said trough sections, said bulkhead means including mounting means for engaging said bulkhead means with said adjacent pair of said trough sections in a generally fluid tight engagement and further including aperture means defined in each said bulkhead means for achieving fluid passage therethrough,

(C) a pair of endplate means each one disposed adjacently across a different opposed end of the terminal pair of said trough sections, each said endplate means including mounting means for engaging said endplate means with a different one of said opposed ends in a generally fluid tight engagement, and further including aperture means defined therein for achieving fluid passage therethrough,

(D) support means integrally associated with at least one of said hemicylindrical trough sections, said bulkhead means, and said endplate means for independently supporting said tankage assembly relative to an underlying ground surface in an orientation such that said axis is generally horizontal.

4,729,829

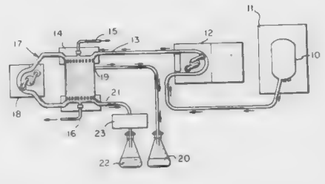
HOLLOW FIBER PLASMAPHERESIS MODULE

Ray B. Duggins, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 690,092, Jan. 9, 1985, abandoned, which is a division of Ser. No. 450,221, Dec. 16, 1982, Pat. No. 4,668,399, which is a continuation-in-part of Ser. No. 349,371, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 287,116, Jul. 22, 1981, abandoned. This application Nov. 13, 1986, Ser. No. 930,093

Int. Cl.⁴ B01D *13/01*

U.S. Cl. 210—195.2 **7 Claims**



1. Apparatus including:

A. an improved microfiltration module for separating whole blood into a cellular-enriched fraction and a plasma-enriched fraction, the module comprising in combination a bundle consisting of a plurality of blood wettable porous membrane hollow fibers all of which are in parallel bundle alignment and have pores of substantially uniform diameter and capable of passing plasma but not cellular components, each of the fibers having a pore diameter within the range 0.1 to 1.0 μm and a lumen diameter (D) no greater than 0.050 cm, the fibers being of substantially equal lengths and terminating in first open ends and second open ends; a liquid tight housing to contain the fibers; liquid tight sealing means cooperating with the housing and the first open ends of the fibers; liquid tight sealing means cooperating with the housing and the second open ends of the fibers, the two sealing means dividing the housing into two end chambers and one central chamber, the end chambers being in liquid transfer relationship with each other through the hollow fibers; blood inlet means for introducing whole blood into one chamber; blood outlet means for removing a cellular-enriched blood fraction from the other end chamber; and plasma outlet means for removing a plasma-enriched blood fraction from the central chamber, the improvement characterized in that the effective length (L), that is, the portion of each fiber, between the ends, through which plasma passes, to lumen diameter (D) ratio (L/D) is not greater than 16,400 cm^{-1} D (L and D being in centimeters); and

B. means, operably associated with the microfiltration module, for conducting blood through the fibers in reciprocatory pulsatile flow.

4,729,830

THREE-PHASE SEPARATION DEVICE USING DOUBLY-CANTED DECANTER

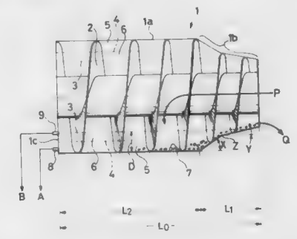
Souroku Suzuki, Mobara, Japan, assignor to Kotobuki Iron Works, Ltd., Japan

Filed Dec. 17, 1986, Ser. No. 943,653

Claims priority, application Japan, Dec. 27, 1985, 60-293191

Int. Cl.⁴ B01D *17/038*

U.S. Cl. 210—380.3 **1 Claim**



1. A three phase separation device for fluids, comprising means for enabling practicable three-phase separation of a fluid comprising heavy and light liquids and solids, including, a bowl for the fluid including a hollow cylindrical section having first and second ends, a canted section connected to said first end of said cylindrical section and having first and second portions of different tapering angles including a first portion adjacent said cylindrical section which is of a larger tapering angle than said second portion which is remote from said cylindrical section, a screw rotatably mounted in said bowl and extending through said cylindrical section and said canted section and having a screw thread conforming to the configuration of each section, a heavy liquid exit port on said second portion of said cylindrical section adjacent its exterior side, and a light exit port on said cylindrical section spaced radially inwardly of said heavy liquid exit port and near the surface of the fluid.

4,729,831

METHOD FOR PREVENTING THE BULKING OF ACTIVATED SLUDGE

Kiyoharu Fujino, Yokkaichi, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,375

Int. Cl.⁴ C02F *3/12*

U.S. Cl. 210—631 **4 Claims**

1. A method for preventing the bulking of activated sludge, which comprises adding to the activated sludge a water-soluble cationic polymer having a intrinsic viscosity of at least 0.05 as measured in a 2M KBr aqueous solution obtained by the reaction of a dialkylamine with epichlorohydrin, in an amout of from 0.1 to 25 parts by weight relative to 100 parts by weight of the dried solid content of the activated sludge.

4,729,832

METHOD FOR REMOVAL OF COAL TAR BASED CONTAMINANTS FROM WASTE WATERS

Robert E. Leonard, and Darrell W. Clinton, both of Oklahoma City, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Apr. 21, 1986, Ser. No. 854,423

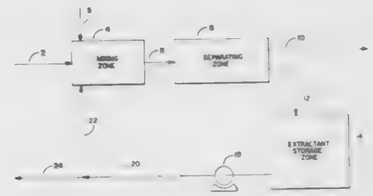
Int. Cl.⁴ C02F *1/26*

U.S. Cl. 210—639 **5 Claims**

1. A method for substantially reducing concentrations of phenol and naphthalene contaminants in a waste water stream recovered from a wood product drying process employing a coal tar based wood preservative as a heat transfer medium and for providing a treated waste water stream containing an equilibrium concentration of the phenol and naphthalene contaminants and a substantially reduced biological oxygen demand, said method consisting essentially of:

forming an intimate mixture comprising the waste water stream, at least one cationic organic polyelectrolyte demulsifying agent selected from the group consisting of polyamines and polyamides and at least one coal tar based extractant selected from the group consisting of creosote-coal tar solutions and creosotepetroleum oil solutions;

subjecting the intimate mixture to an extraction temperature ranging from about 10° C. to about 95° C. for an extraction period of time sufficient to effect a transfer of the contaminants from the stream and into the extractant and thereby



reduce the concentration of the contaminants in the stream to the equilibrium concentration for the contaminants at the extraction temperature employed;

separating and recovering from the intimate mixture, a treated waste water stream characterized by a substantially reduced and constant concentration of the contaminants and a substantially reduced biological oxygen demand and a contaminant containing coal tar based extractant phase; and

conveying the contaminant containing coal tar based extractant phase to a wood preserving process wherein the extractant is employed to impregnate wood products.

4,729,833

METHOD OF CONCENTRATING AQUEOUS SOLUTION CONTAINING VOLATILE SUBSTANCE

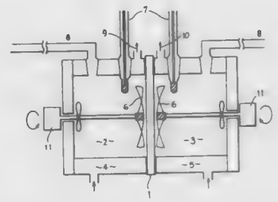
Zenjiro Honda, and Hajime Komada, both of Himeji, Japan, assignors to General Director of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,190

Claims priority, application Japan, Jul. 8, 1983, 58-123474

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—644 **6 Claims**



1. A liquid permeation method for treating a starting aqueous solution containing a volatile substance dissolved therein to obtain a product aqueous solution containing a higher concentration of said volatile substance, which comprises the steps of: dividing said starting aqueous solution into first and second portions and placing said portions in a vessel on opposite sides of and in contact with an inert, hydrophobic, porous membrane having a pore size of from 0.05 to 150 microns so that said volatile substance can permeate through said membrane, and maintaining the temperature of said first portion lower

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than the temperature of said second portion so that the temperature difference between said first and second portions is effective as a driving force for selectively transporting said volatile substance present in said second portion through said membrane and thence into said first portion whereby the concentration of said volatile substance in said first portion of said aqueous solution is increased while simultaneously the concentration of said volatile substance in said second portion is decreased.

4,729,834

METHOD FOR ADSORBING AND DESORBING

Hiroshi Itoh, Yokohama; Toshimi Nakagawa, Fujisawa; Atsuhiko Nitta, Yokohama; Tomio Tanaka, Tokyo; Hideo Kamio, Odawara, and Katsutoshi Nagai, Yonezawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 728,211, Apr. 29, 1985, abandoned, and Ser. No. 728,027, Apr. 29, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 878,647

Claims priority, application Japan, May 7, 1984, 59-89386; May 7, 1984, 59-89315; May 28, 1984, 59-106466

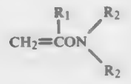
Int. Cl.[4] B01D *15/00*

U.S. Cl. 210—670 **20 Claims**

1. An absorption-desorption method for the separation of water soluble organic compounds from the aqueous solution containing the same wherein the water soluble organic compounds are selected from the group consisting of (a) compounds containing active hydrogen atoms wherein said active hydrogen atoms are present in the form of (1) one or more hydroxyl groups substituted to an aromatic ring or an aliphatic hydrocarbon radical or (2) one or more carboxyl groups substituted to an aromatic hydrocarbon radical or an aliphatic hydrocarbon radical; and (b) compounds containing a hydrophobic group consisting of (a) surfactants, (b) proteins, (c) physiologically-active substances or (d) colorants from an aqueous solution which comprises the steps of:

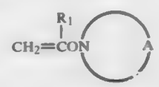
(a) providing a water insolubilized polymeric adsorbent material selected from the group consisting of:

(1) a homopolymer of at least one monomer selected from N-alkyl- or N-alkylene- substituted (meth)acrylamides represented by the following general formula (I) or (II):



(I)

wherein R_1 is a hydrogen atom or methyl group and R_2 is a methyl or ethyl group, or



(II)

wherein R_1 is a hydrogen atom or methyl group and A is member selected from the group consisting of $-(CH_2)_n-$ or $-(CH_2)-O-(CH_2)_2-$ wherein n is an integer of from 4 to 6;

(2) a first copolymer of two or more monomers selected from said (meth)acrylamides, and

(3) a second copolymer of at least one monomer selected from said (meth)acrylamides and one or more monomers other than said (meth)acrylamides and copolymerizable therewith;

(b) bringing said aqueous solution containing said water soluble organic compounds into contact with said polymeric absorbent material at a first adsorbing temperature for a time sufficient to allow said water soluble organic compounds to be adsorbed from said aqueous solution onto said polymeric adsorbent material;

(c) separating said aqueous solution from said polymeric adsorbent material containing said absorbed water soluble organic compounds; and

(d) desorbing said water soluble organic compounds from said polymeric absorbent material by contacting said polymeric absorbent material with a desorbing aqueous solution at a second desorbing temperature which is lower than the first absorbing temperature.

4,729,835

PROCESS FOR WASTE TREATMENT

Alastair McNeillie, Runcorn, and David B. Mobbs, Handforth, both of England, assignors to Interox Chemicals Limited, London, England

Filed Sep. 24, 1986, Ser. No. 910,969

Claims priority, application United Kingdom, Oct. 10, 1985, 8525047

Int. Cl.[4] C02F *1/72*

U.S. Cl. 210—759 **17 Claims**

1. In a process for the treatment of waste effluent in which an aqueous liquor containing organic sulphide compounds is contacted with hydrogen peroxide in the presence of a catalyst, the improvement wherein

the pH of the liquor is adjusted to about 8.5 to 11.5, and

the liquor is contacted with at least two moles of hydrogen peroxide or adduct per mole of organic sulphide in the presence of a catalytic amount of a water-soluble oxotungsten compound, whereby the organic sulphides are oxidised to substantially odor-free compounds.

4,729,836

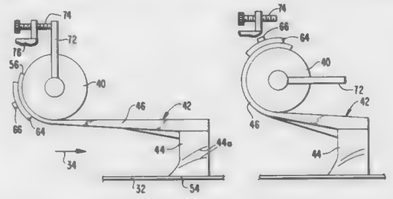
FLEXIBLE CHICANE SYSTEM FOR LIQUID-SOLID SEPARATION EQUIPMENT

Georg Ickinger, Graz, Austria, and Siegfried Hausegger, Arlington, Tex., assignors to Arus Andritz-Ruthner, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1986, Ser. No. 936,306

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—783 **39 Claims**



1. A chicane system for a belt filter, comprising:

a gravity drainage zone having a movable filter conveyor belt, inlet means for distributing a suspension on said filter belt and outlet means for discharging separated liquid and solid components of the suspension;

a support rod mounted over said filter belt and having a longitudinal axis generally perpendicular to filter belt movement; and

a plurality of flow turners depending from said support rod and engaging said filter belt to prevent clogging of said filter belt by solid components of the suspension, each of said flow turners including a plow portion to extend into the suspension engaging said filter belt and a leaf spring portion fixed at a first end to said support rod and at an opposite second end to said plow portion, each said leaf spring portion including coupling means for stressing each said leaf spring portion and for biasing and forcing the respective plow portion against said filter belt during operation.

38. A method of cleaning a chicane system for a filter belt during operation, comprising the steps of:

rotating a support rod mounted over a filter belt in a first direction to wind flexible leaf spring portions of flow turners about the support rod and to move plow portions of the flow turners depending from free ends of the leaf spring portions in an upstream direction toward the support rod in opposition to slurry flow, while maintaining contact between the plow portions and the filter belt; and

rotating the support rod in a second direction, opposite to the first direction, to partially unwind the leaf spring portions from about the support rod and to move the plow portions back downstream with slurry flow, while maintaining contact between the plow portions and the filter belt.

4,729,837

METHOD AND APPARATUS FOR THICKENING A SUSPENSION

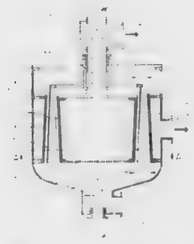
Kaj O. Henricson, Kotka, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed May 5, 1986, Ser. No. 859,818

Claims priority, application Finland, May 20, 1985, 851998

Int. Cl.[4] F01D *33/10*

U.S. Cl. 210—784 **17 Claims**



1. A method for thickening a suspension, in particular a pulp containing fibres, comprising thickening the pulp while it flows through a space between two screen surfaces by maintaining a pressure difference, which is required by the thickening, over the screen surfaces causing filtrate to flow through the screen surfaces, and intermittently preventing the pulp from thickening on alternate screen surfaces including by removing pulp thickened on each such alternate screen surface when no filtrate flows through such alternate screen surface.

5. Apparatus for thickening a suspension, in particular a pulp containing fibers, the apparatus comprising a closed pressure-proof vessel provided with a pulp inlet, an outlet for the thickened pulp, and at least two filtrate outlets equipped with closing devices; and at least two opposite screen surfaces disposed inside the vessel the space between which constitutes a pulp thickening zone and on the other side of which filtrate spaces are formed; said filtrate spaces lying in communication with waid filtrate outlets, respectively, and being at lower pressure when said closing devices are open to create a pressure difference across the screen to enable filtrate to flow through the screens; wherein at least one of the screen surfaces is stationary and the opposite screen surface rotates around a shaft; and means for intermittently preventing the pulp from thickening on alternate screen surfaces including at least one vane disposed in the thickening zone between the stationary and the rotating screen surfaces at a short distance from the screen surfaces for alternate relative movement in relation to the stationary and to the rotating screen surfaces; and means enabling the closing devices disposed in the filtrate outlets to be intermittently closed to prevent flow of filtrate through the associated screen surface sufficient for pulp thickened on such surface to be removed by relative movement of said one vane and such surface.

4,729,838

PROCESS FOR THE PREPARATION OF CRYSTALLINE CALCIUM SODIUM METAPHOSPHATE

Edward J. Griffith, Manchester; John R. Jany, Ellisville; Vaidy R. Nathan, St. Louis, and Toan M. Ngo, Eureka, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 8, 1986, Ser. No. 938,940

Int. Cl.[4] C01B *25/30*

U.S. Cl. 252—1 **14 Claims**

1. A process for the preparation of crystalline calcium sodium metaphosphate, which process comprises:

(a) bringing together in aqueous media source materials for CaO, Na_2O, and P_2O_5 in proportions sufficient to provide a $CaO/Na_2O/P_2O_5$ mol percent ratio on a dry basis of about 24.0–34.0/12.0–18.0/50.0–60.0, with the proviso that the CaO/Na_2O mol ratio is from about 1.60 to about 2.00, and form a wet mix slurry containing a solid phase and an aqueous liquid phase; and

(b) dispersing the wet mix slurry onto substrate calcium sodium metaphosphate crystals in a crystal formation and growth zone under conditions sufficient to remove the aqueous liquid phase and deposit the solid phase onto the substrate crystals and cause identically oriented continuous crystal formation and growth between the solid phase deposit and the substrate crystals to thereby form product crystals of calcium sodium metaphosphate.

4,729,839

WATER SOLUBLE LUBRICATING ADDITIVES

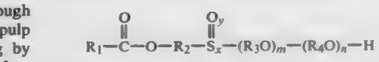
Alexander Schuettenberg; Howard F. Efner; Merlin R. Lindstrom; Rex L. Bobsein; Benedict R. Bonazza, and Melvin D. Herd, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1986, Ser. No. 868,922

Int. Cl.[4] C10M *135/00, 173/00*

U.S. Cl. 252—48.6 **44 Claims**

1. A method for improving the lubricating properties of a water-based fluid used in metalworking operations comprising the step of adding to said water-based fluid a lubricating additive having the generic structural formula:



wherein R_1 is an alkyl, cycloalkyl, aryl, alkaryl or aralkyl group having from 1 to 34 carbon atoms; R_2, R_3 and R_4 are independent alkylene groups having from 2 to 30 carbon atoms; x is either 1 or 2; y is either 0 or 1 when x=1 and is 0 when x=2; m is either 0 or 1 and n=2 to 30, wherein a sufficient amount of said lubricating additive is added to said water-based fluid to result in a concentration of said lubricating additive in said water-based fluid in the range of about 0.01 weight-% to about 10 weight-% based upon the combined weight of said lubricating additive and said water-based fluid.

4,729,840

LUBRICANT AND FUEL ADDITIVES DERIVED FROM O,O-DIALKYLDITHIOPHOSPHORIC ACID AND A NORBORNYL REACTANT

Richard M. Lange, Euclid; William C. Tritt, South Euclid, and Stephen A. DiBiase, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jul. 11, 1986, Ser. No. 884,685

Int. Cl.[4] C10M *137/10*

U.S. Cl. 252—46.7 **13 Claims**

1. A lubricating composition comprising a major amount of

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an oil of lubricating viscosity and minor amount of a compound of the formula:



wherein R is, independently, alkyl or aryl and X and Y are independently selected from the group consisting of hydrogen, hydrocarbyl carboxy, N-substituted carboxamide, thio- or dithiocarbamate, thioamide, thio acid or ester, a hydrocarbyl phosphorus containing radical, together are imide or N-hydrocarbyl substituted imide, provided that when X is alkyl carboxy, Y is not alkyl carboxy, or hydrogen and X and Y are not both hydrogen.

4,729,841

ALKENYLSUCCINIC ACID HALF-AMIDES AS ANTICORROSION AGENTS

Werner Ritschel, Hofheim am Taunus, and Horst Lorke, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

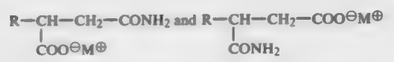
Division of Ser. No. 614,452, May 25, 1984, Pat. No. 4,609,531. This application Jul. 9, 1986, Ser. No. 883,635

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319183

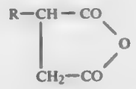
Int. Cl.⁴ C10M *193/02, 133/16*

U.S. Cl. 252—49.3 **1 Claim**

1. Aqueous cooling lubricants containing 0.1 to 10% by weight of an alkenylsuccinic acid half amide of the formula



in which R denotes C_6–C_{12}-alkenyl and M denotes a proton or an ammonium ion of the formula $NHR_1R_2R_3$ and R_1, R_2 and R_3 are identical or different and denote hydrogen, C_1–C_{12}-alkyl, 2-hydroxyethyl or 2-hydroxypropyl said half amide obtained by reacting 1 mole of an alkenylsuccinic anhydride of the formula



with at least two moles of ammonia at a temperature of from 0° to 5° C. and converting the ammonium salt thus obtained into different salts under the meaning of $M^{\oplus}$ if $M^{\oplus}$ does not represent an ammonium ion and at a pH of a 1 percent solution in distilled water.

4,729,842

CARBONATE TREATED DISPERSANTS

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 673,963, Nov. 21, 1984, Pat. No. 4,585,566. This application Feb. 28, 1986, Ser. No. 834,972

Int. Cl.⁴ C10M *133/16*

U.S. Cl. 252—51.5 A **20 Claims**

1. A product prepared by the process which comprises reacting at a temperature sufficient to cause reaction a Mannich base dispersant having at least one primary or secondary amine group with a cyclic carbonate and wherein the molar charge of cyclic carbonate to the basic nitrogens of the Mannich base dispersant is from about 0.2:1 to about 10:1.

4,729,843

MIXTURES OF ALKYL XANTHOGEN FORMATES AND DIALKYL THIONOCARBAMATES AS COLLECTORS IN FROTH FLOTATION

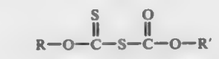
Kim N. Unger, Tucson, Ariz., assignor to Essex Industrial Chemicals, Inc., Clifton, N.J.

Filed Mar. 4, 1986, Ser. No. 835,982

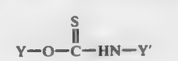
Int. Cl.⁴ C09K *3/00;* **C07C** *155/02, 161/00*

U.S. Cl. 252—61 **8 Claims**

1. A collector for use in froth flotation comprising a mixture of alkyl xanthogen alkyl formates having the general formula:



in a concentration in the range of about 60 to 80% by weight, wherein R is a branched or straight chain alkyl substituent having 1 to 6 carbon atoms and R′ is an alkyl substituent selected from the class consisting of methyl and ethyl; and dialkyl thionocarbamate having the general formula:



in a concentration in the range of about 20 to 40% by weight, wherein Y is a branched or straight chain alkyl substituent having 1 to 6 carbon atoms and Y′ is an alkyl substituent selected from the class consisting of methyl and ethyl.

4,729,844

SOLID ELECTROLYTIC CAPACITOR

Sohji Tsuchiya, Kanagawa; Yasuo Kudoh, Yokohama; Toshikuni Kojima, Kawasaki, and Susumu Yoshimura, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Filed Oct. 17, 1986, Ser. No. 919,999

Claims priority, application Japan, Oct. 18, 1985, 60-233642

Int. Cl.⁴ H01G *1/00*

U.S. Cl. 252—62.2 **5 Claims**

1. Solid electrolytic capacitor comprising
a first electrode made of valve metal having an anode film on its surface,
a second electrode provided opposing to said first electrode, and
a solid electrolyte comprising an ion radical complex salt formed essentially of N-isoamylisoquinolinium as cation and 7.7.8.8-tetracyanoquinodimethane as anion, said solid electrolyte being disposed between said first electrode and said second electrode.

4,729,845

DETERGENTS FOR DISHWASHING MACHINES IN THE FORM OF FUSED BLOCKS CONTAINING ALKALI HYDROXIDES AND ACTIVE CHLORINE AND A PROCESS FOR THEIR PRODUCTION

Theodor Altenschoepfer, Duesseldorf; Jochen Jacobs, Wuppertal; Peter Jeschke, Neuss, and Klaus Schumann, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,821

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519355

Int. Cl.⁴ C11D *7/18, 17/00*

U.S. Cl. 252—99 **12 Claims**

1. Storage stable detergent composition for dishwashing machines in the form of homogeneous fused blocks comprising from about 2 to about 70% by weight of alkali metal hydroxide, from about 2 to about 60% by weight of alkali metal silicate, from about 10 to about 40% by weight of water, and from about 0.2 to about 4% by weight of an active chlorine donor having a hydrolysis constant of about 3×10^{-4} or below, all weights being based on the weight of said composition.

4,729,846

METHOD FOR MANUFACTURING LEPIDOCROCITE

Yasushi Matsui, Yokohama; Norio Koike, Tokyo; Kunio Takahashi, Yokohama, and Hiroshi Matsue, Hiratsuka, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,943

Claims priority, application Japan, Jan. 17, 1986, 61-7309

Int. Cl.⁴ C01G *49/02*

U.S. Cl. 252—62.56 **5 Claims**

1. A method for manufacturing lepidocrocite, comprising the steps of:
preparing an aqueous suspension of ferrous hydroxide at a pH of 6.5 to 7.5 by mixing a ferrous salt and an alkali in an amount of 0.4 to 0.7 times the theoretical amount for converting all of the ferrous salt to ferrous hydroxide, wherein the Si concentration of the suspension is controlled to be within a range of 5 to 30 ppm;
blowing an oxygen-containing gas into the suspension to form a seed crystal of γ-FeOOH; and
completing a generation reaction of γ-FeOOH by blowing an oxygen-containing gas into the suspension while adding an alkali solution and keeping the pH of the suspension within a range of 3 to 5, wherein the Si concentration of the suspension during the generation reaction is controlled to be within a range of 5 to 30 ppm.

4,729,847

OPTICALLY ACTIVE LIQUID CRYSTAL COMPOUND HAVING METHYLENEOXY GROUP AND COMPOSITION CONTAINING SAME

Kazutoshi Miyazawa; Hiromichi Inoue; Takashi Inukai, and Kanetsugu Terashima, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

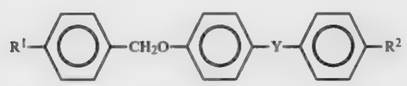
Filed Jul. 10, 1986, Ser. No. 889,093

Claims priority, application Japan, Jul. 26, 1985, 60-165564

Int. Cl.⁴ G02F *1/13;* **C09K** *19/20;* **C07C** *69/76*

U.S. Cl. 252—299.64 **10 Claims**

1. An optically active liquid crystal compound expressed by the formula



wherein Y represents —COO— or —OCO—; and either one of R^1 or R^2 represents an optically active 1-methylheptyloxy group, 1-methylheptyloxycarbonyl group or 2-methylbutyloxy group, and the other represents a non-optically active alkyl group or alkoxy group each of 5 to 12 carbon atoms.

4,729,848

METAL SALTS OF ALKYL CATECHOL DITHIOPHOSPHORIC ACIDS AND OIL COMPOSITIONS CONTAINING THE SALTS

Elaine S. Yamaguchi, El Cerrito, and Thomas V. Liston, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

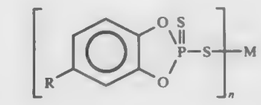
Continuation of Ser. No. 537,628, Sep. 30, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 904,992

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.⁴ C07F *3/06;* **C10M** *105/08, 107/22*

U.S. Cl. 252—32.7 E **9 Claims**

1. A compound of the formula:



wherein R is alkyl containing 10 to 18 carbon atoms or mixtures thereof, M is an alkali or alkaline earth metal or transition metal, and n corresponds to the valence of M.

9. An oil concentrate comprising 10 to 90 weight percent of an oil of lubricating viscosity and from 90 to 10 weight percent of a compound according to claim 1.

4,729,849

FLUORINE-CONTAINING SURFACE ACTIVE COMPOSITIONS

Iwao Hisamoto, Osaka; Chiaki Maeda, Kyoto, and Mitsuhiro Nishiwaki, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 594,734, Mar. 29, 1984, Pat. No. 4,609,489, which is a continuation of Ser. No. 277,685, Jun. 26, 1981, Pat. No. 4,459,221. This application Jul. 14, 1986, Ser. No. 885,134

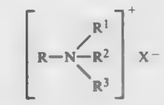
Claims priority, application Japan, Jun. 27, 1980, 55-88345

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ B01F *17/18, 17/26*

U.S. Cl. 252—355 **2 Claims**

1. A fluorine-containing surface active composition consisting essentially of from 10 to 90 parts by weight of a nonionic surfactant selected from at least one member of the group consisting of:
$C_7F_{15}CONHC_3H_6N(CH_3)_2{\rightarrow}O$
$C_9F_{19}SO_2N(C_2H_5)(C_2H_4O)_{16}H$,
$C_8F_{17}CH_2O(C_2H_4O)_{10}H$,
$C_9F_{19}COO(C_2H_4O)_5CH_3$,
$C_9F_{19}COO(C_2H_4O)_5C_{12}H_{25}$, and
$C_9F_{17}O(C_2H_4O)_{20}C_9F_{17}$;
and
from 90 to 10 parts by weight of at least one surfactant of the formula:



wherein R is a substituted or unsubstituted aliphatic group of 4 to 20 carbon atoms or a substituted or unsubstituted aromatic hydrocarbon group of 6 to 20 carbon atoms, R^1, R^2 and R^3 are each a hydrogen atom, a substituted or unsubstituted aliphatic group of 4 to 20 carbon atoms, a substituted or unsubstituted aromatic hydrocarbon group of 6 to 20 carbon atoms or a fluorine-containing group comprising not more than 5 carbon atoms, of which each carbon atom bears at least one fluorine atom, and X^- is an anion, provided that at least one of R^1, R^2,

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and R^3 is a fluorine-containing group or, when none of R^1, R^2 and R^3 is the fluorine-containing group, X^- is a fluorine-containing anion corresponding to the fluorine-containing group.

4,729,850

POLYOXYALKYLENE/UNSATURATED DIESTER REACTION PRODUCT FOR CELLULAR FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 722,248, Apr. 11, 1985, Pat. No. 4,555,442, which is a division of Ser. No. 663,627, Oct. 22, 1984, Pat. No. 4,520,140, which is a division of Ser. No. 544,301, Oct. 21, 1983, Pat. No. 4,481,307, which is a division of Ser. No. 426,581, Sep. 29, 1982, Pat. No. 4,418,158, which is a division of Ser. No. 282,322, Jul. 10, 1981, Pat. No. 4,365,024. This application Sep. 30, 1985, Ser. No. 781,555

Int. Cl.[4] **B01F** *17/30;* **C08G** *18/14;* **B32B** *3/26*

U.S. Cl. 252—356 **38 Claims**

1. A composition which is the reaction product of a mixture of reactants consisting essentially of

(a) a polyoxyalkylene adduct having the formula

$$\text{H—polyoxyalkylene chain }\rangle_t R,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, and

(b) an esterified unsaturated dibasic acid having the formula

$$T^1O_2C—C_uH_{2u-2}—CO_2T^2$$

wherein u is 2 or 3 and T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain of 8 to 18 carbon atoms in the presence of an effective amount of a free-radical initiator.

4,729,851

POLYMERS WITH CONJUGATED DOUBLE BONDS

Hermann Bräunling, and Reinhard Jira, both Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,932

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531600

Int. Cl.[4] **H01B** *1/00, 1/02*

U.S. Cl. 252—500 **19 Claims**

1. A polymer compound with conjugated double bonds, comprising heterocyclic and/or carbocyclic rings or ring systems in which said rings or ring systems are linked with one another in pairs via a carbon atom acting as a bridge member, said polymer compound having, at least, five of said rings or ring systems.

4,729,852

OXIDE SEMICONDUCTOR FOR THERMISTOR

Takuoki Hata, Neysgawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00364, § 371 Date Mar. 12, 1985, § 102(e) Date Mar. 12, 1985, PCT Pub. No. WO85/00690, PCT Pub. Date Feb. 14, 1985

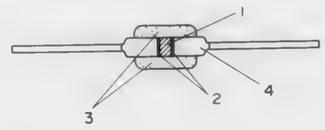
Continuation-in-part of Ser. No. 713,396, Mar. 12, 1985, abandoned. This PCT application Jul. 16, 1984, Ser. No. 946,175

Claims priority, application Japan, Jul. 18, 1983, 58-131265

Int. Cl.[4] **H01B** *1/06*

U.S. Cl. 252—518 **4 Claims**

1. An oxide semiconductor for a thermistor to be used as a temperature sensor in the range 300°–700° C., characterized by containing the following four metal elements: Mn, Ni, Cr and Zr in amounts of 67.0–83.6 atom %, 0.1–3.0 atom %, 0.3–5.0



atom % and 0.05–16.0 atom %, respectively, the total amount of said four metal elements being 100 atom %.

4,729,853

FLAME-RETARDING SEALING COMPOUNDS

Wulf von Bonin, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 699,900, Feb. 8, 1985, abandoned. This application Jul. 11, 1986, Ser. No. 884,445

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407037

Int. Cl.[4] **C09K** *21/00;* **C09D** *5/16, 5/18;* **C04B** *7/02*

U.S. Cl. 252—601 **5 Claims**

1. A flame-retarding sealing compound consisting essentially of

(a) 10 to 50 weight % of a hydraulic binder selected from the group consisting of alpha-gypsum, beta-gypsum, plaster of Paris, plastering gypsum and anhydrite,

(b) 20 to 60 weight % of a dehydratable filler selected from the group consisting of aluminium hydroxides, aluminium hydrated oxides and hydrated aluminas,

(c) 10 to 60 weight % of a melamine selected form the group consisting of 2,4,6-triamino-s-triazine and salts of 2,4,6-triamino-s-triazine, said melamine being such that upon thermal decomposition said melamine simultaneously gives off basic gases which are capable of bonding hydrogen halides, said melamine being such that said melamine consumes energy during thermal decomposition and said melamine being capable of melting, subliming and decomposing under thermal decomposition,

(d) 3 to 30% by weight of a polymer dispersion having a film forming temperature between −15° C. and +40° C. and

(e) optionally a pigment or an inorganic phosphorous-containing compound as a phosphoric acid donor in an amount of 5 to 35% by weight.

4,729,854

FIRE-RETARDANT RESIN COMPOSITION

Shigeo Miyata, and Takeshi Imahashi, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 620,100, Jun. 13, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,033

Claims priority, application Japan, Jun. 17, 1983, 58-107841

Int. Cl.[4] **C09K** *21/00;* **C08F** *6/00;* **C08K** *3/20, 3/22*

U.S. Cl. 252—609 **20 Claims**

1. A fire-retardant resin composition comprising

(A) 100 parts by weight of a member selected from the group consisting of the thermoplastic resins and the thermosetting resins,

(B) about 5 to about 30 parts by weight of a halogen-containing organic fire retardant,

(C) about 0.1 to about 5 parts by weight of a hydrotalcite having a BET specific surface area not exceeding about 30 square meters per gram, as a stabilizer, and represented by the formula (1)

$$Mg_{1-x}Al_x(OH)_2A_{x/n}{}^{n-}.mH_2O \quad (1)$$

wherein A^{n-} is an anion of n value, and x and m each represent a number shown by the following formulas

$$0<x<0.5 \text{ and } 0<m<1, \text{ and}$$

(D) 0 to about 20 parts by weight of a fire-retarding assistant other than the fire retardant of (B), above,

said halogen-containing organic fire retardant (B) is selected from the group consisting of chlorinated polyethylene, chlorinated paraffin, brominated polyphenyl, chlorinated polyphenyl, perchloropentacyclodecane, tetrabromoethane, tetrabromobutane, decabromo diphenyloxide, 1,2-dibromo-3-chloropropane, 1,2,3-tribromopropane, hexabromocyclodecane, tetrabromobenzene and chlorinated diphenyl.

4,729,855

METHOD OF DECONTAMINATING RADIOACTIVE METAL SURFACES

Alexander P. Murray, Murrysville, and Clifton G. Slater, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

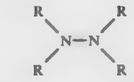
Filed Nov. 29, 1985, Ser. No. 803,024

Int. Cl.[4] **G21F** *9/00*

U.S. Cl. 252—626 **17 Claims**

1. A method of decontaminating metal surfaces contaminated with a radioactive deposit, comprising circulating between said deposit and a cationic ion exchange column an aqueous solution of a water soluble condensation reaction product of

(1) a hydrazine compound having the general formula



where each R is independently selected from hydrogen and alkyl to C_4; and

(2) a water-soluble aliphatic polycarboxylic acid selected from the group consisting of oxalic acid, tartaric acid, citric acid, succinic acid, and mixtures thereof.

4,729,856

PROCESS FOR THE PREPARATION OF 2-PERFLUOROPROPOXY-PERFLUOROPROPIONYL FLUORIDE

Giorgio Bornengo, Novara; Filippo M. Carlini, Vicenza; Michele Pontevivo, Novara, and Giorgio Guglielmo, Gallarate, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

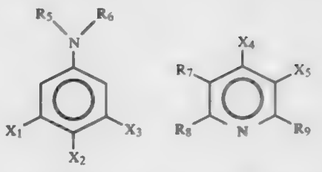
Filed May 20, 1986, Ser. No. 864,841

Claims priority, application Italy, May 28, 1985, 20914 A/85

Int. Cl.[4] **C07C** *51/58*

U.S. Cl. 260—544 F **5 Claims**

1. Process for the preparation of 2-perfluoropropoxyperfluoropropionyl fluoride by dimerization of perfluoropropene epoxide in an aprotic polar solvent selected from the group consisting of ethers, nitriles and dimethylformamide, at temperatures comprised within the range of from −50° C. to +50° C., in the presence of a catalyst comprising an N,N,N′,N′-tetrasubstituted diaminodifluoromethane and a co-catalyst comprised within the following formulae:



wherein R_5, R_6, R_7, R_8, and R_9, equal to or different from each other, are a hydrocarbon radical containing from 1 to 8 carbon atoms, which can either contain or not contain a substituent group inert towards the reactants under the reaction conditons; R_7 can be also H; R_7 and R_8 can furthermore be linked to each other to form a second ring of 5 or 6 carbon atoms and which can either aliphatic or aromatic; X_1, X_2, X_3, X_4, and X_5, equal to or different from each other, can be H, halogen or a hydrocarbon radical of from 1 to 8 carbon atoms, which can either contain or not contain a substituent group inert towards the reactants under the reaction conditions, said co-catalyst being used in amounts comprised within the range of from 0.001 to 10 mol/perfluoropropene epoxide mol.

4,729,857

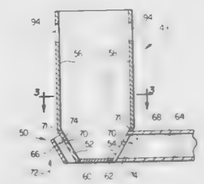
LIQUID DISTRIBUTOR FOR PACKED TOWER

Adam T. Lee, Richardson, and Layton Kitterman, Gainseville, both of Tex., assignors to Glitsch, Inc., Dallas, Tex.

Filed Apr. 27, 1987, Ser. No. 42,759

Int. Cl.[4] **B01F** *3/04*

U.S. Cl. 261—97 **20 Claims**



1. An improved liquid flow distributor for a process column of the type wherein said distributor is positioned above a packing section for the distribution of liquid downwardly therethrough, said improvement comprising:

a plurality of troughs disposed in generally parallel spaced relationship;

said troughs each being formed with a downwardly tapering lower body section terminating in a bottom region, said lower body section having holes formed therein for spewing liquid outwardly therefrom;

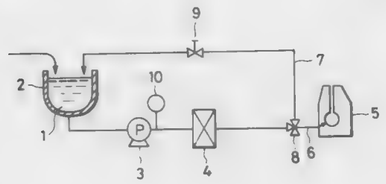
first and second baffles disposed outwardly of said lower tapering body section of said troughs for receiving the spew of liquid therefrom, said baffles each being disposed in generally parallel spaced relationship with said adjacent tapering body section of said troughs;

a plurality of flow equalization pipes interconnecting said troughs one to the other; and

said equalization pipes being coupled to said troughs through the side wall thereof in flow communication with the lower region therein facilitating flow equalization therebetween.

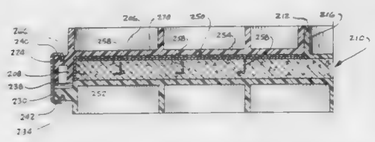
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4,729,858
MAGNETIC LIQUID APPLICATION METHOD AND APPARATUS
Naoyoshi Chino; Yasunori Tanaka; Kenichi Fukumura, and Yasuhito Hiraki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 22, 1986, Ser. No. 899,357
Claims priority, application Japan, Oct. 18, 1985, 60-231089
Int. Cl.[4] B05D *5/12;* **B29C** *47/06, 47/74;* **B32B** *31/30*
U.S. Cl. 264—37 **2 Claims**



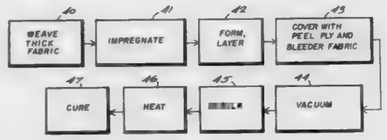
1. A method for applying a magnetic liquid to a moving web by an apparatus having an extruder head for ejecting the magnetic liquid onto the web, a feed source for holding a supply of the magnetic liquid, and a feeder line connecting the extruder head with the feed source, comprising: providing a by-pass line that connects with the feeder line immediately upstream of the extruder head and with the feed source for returning liquid to the feed source, providing a changeover valve at the juncture of the feeder line and by-pass line to control the flow of liquid so that liquid flows either to the feeder line or to the by-pass line, positioning the changeover valve so that liquid flows to the extruder head before the first starting of the application of liquid to the web; supplying said liquid to said by-pass line through said changeover valve after said extruder head is filled with said liquid before the first starting of the application of the liquid to the web or before the resumption thereof; and switching the position of said valve at the time of the first starting of the application or the resumption thereof so as to supply said liquid to said head to perform said application.

4,729,859
METHOD FOR CASTING CONCRETE PANELS
R. Jack Munsey, Caledonia; Leroy D. DeJong, Spring Lake, and Charles P. Keip, Grandville, all of Mich., assignors to C-Tec, Inc., Grand Rapids, Mich.
Division of Ser. No. 743,987, Jun. 12, 1985, Pat. No. 4,639,204. This application Sep. 29, 1986, Ser. No. 912,805
Int. Cl.[4] B28B *1/08, 1/20*
U.S. Cl. 264—71 **4 Claims**



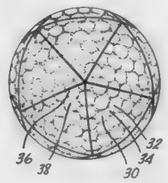
1. A method of making concrete access floor panels adapted to be supported on pedestals, said method comprising the steps of:
forming a metal pan having a planar bottom defining openings and peripheral sidewalls;
inserting the metal pan into a two-part mold, said mold including a part defining a thin mold cavity having a cavity bottom and cavity sidewalls dimensioned to receive the metal pan in a slip fit fashion and said mold including another part defining a flat surface facing said mold cavity;
placing a smooth magnetic sheet within said mold cavity against said cavity bottom and between said cavity bottom and said planar bottom of said metal pan, said sheet dimensioned and disposed to engage the planar bottom of the metal pan to prevent seepage of a concrete mixture through the openings in the planar bottom during casting;
filling the pan within the mold with the concrete mixture;
clamping the mold parts together;
rotating the mold about an axis; and
vibrating the mold while it is being rotated to evenly distribute the concrete mixture within the pan.

4,729,860
MULTIPLE, THICK GRAPHITE FABRIC PRODUCTION
Jack Leach, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Dec. 17, 1985, Ser. No. 809,795
Int. Cl.[4] B29D *28/00*
U.S. Cl. 264—103 **9 Claims**



1. A method of producing a resin impregnated graphite structure having a curved portion thereof, and having high strength and rigidity, comprising the steps of:
(a) weaving a fabric having a thickness in the range of about 0.25–1.0 inches and comprising primarily graphite fiber;
(b) impregnating one or more layers of the fabric with resin;
(c) forming the fabric into a desired shape by bending the fabric to form a curved portion without wrinkling, folding, creasing, crinkling or pleating of the fabric; and
(d) further treating the impregnated fabric to produce a final resin impregnated graphite structure having a curved portion and high strength and rigidity.

4,729,861
METHOD OF MAKING GOLF BALLS
Francis deS. Lynch, Mattapoisett; John W. Jepson, Marion, and Robert A. Brown, Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.
Division of Ser. No. 213,056, Dec. 4, 1980, which is a continuation of Ser. No. 91,087, Nov. 5, 1979, abandoned, which is a continuation of Ser. No. 920,396, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 816,882, Jul. 18, 1977, abandoned, which is a continuation of Ser. No. 716,100, Aug. 20, 1976, abandoned, which is a continuation of Ser. No. 363,353, May 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 236,318, Mar. 20, 1972, abandoned. This application Mar. 18, 1985, Ser. No. 713,298
Int. Cl.[4] A63B *37/14*
U.S. Cl. 264—219 **24 Claims**



1. A method of manufacturing a golf ball having dimples in the outer periphery thereof comprising the steps of:
(A) selecting a golf ball structure onto the surface of which dimples can be molded;
(B) determining the dimple number, dimple diameter and dimple depth by:
(a) selecting the number of dimples to be used, the said number of dimples being between 182 and 392;
(b) selecting a dimple diameter and dimple depth that satisfy the following relationship:

$$S=\left[\frac{831.5(d-x)-55.56(D-y)}{a}\right]^2+\left[\frac{83.15(D-y)+555.6(d-x)}{b}\right]^2$$

in which:
S=a value of 0 to 1.0
d=average depth of all dimples in inches
D=average diameter of all dimples in inches
and wherein:
a value N is obtained by dividing the exact number of dimples by 100, and x, y, a and b are defined by the following relations as functions of N:
when the number of dimples is between 182 and 332:

$y=0.323-0.0896N+0.0122N^2$

$x=0.0186-0.00406N+0.000550N^2$

$a=6.30-3.30N+0.693N^2$

$b=3.11-1.03N+0.155N^2$

and when the number of dimples is between 333 and 392:

$y=0.287-0.0383N$

$x=0.0162-0.00150N$

$a=4.66-0.500N$

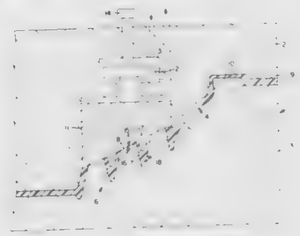
$b=5.00-1.08N$

(C) making golf ball molds by positioning the selected dimples on the golf ball mold so that the surface of the golf ball made therefrom will have at least 80% of the distances between the closest points of the edges of adjacent dimples less than about 0.065 inches, and at least 55% of the distances between the closest points of the edges of adjacent dimples greater than 0.001 inches the edge of the dimples being defined as the point of intersection of the periphery of the golf ball or its continuation and a tangent to the sidewall of the dimples at a point 0.003 inches below the periphery of the golf ball or its continuation;
(D) forming the dimples on the surface of the golf ball by molding a golf ball in the mold;
(E) removing the formed golf ball from the mold; and
(F) finishing the golf ball.

4,729,862
NYLON COMPOSITION FOR USE IN ROTATIONAL MOLDING
Peter P. Salatiello, Morris Plains; Frank Petrucelli, Boonton, and Paul W. Flood, Lake Hopatcong, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Continuation of Ser. No. 684,327, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 464,836, Feb. 8, 1983, Pat. No. 4,508,675, which is a division of Ser. No. 256,887, Apr. 24, 1981, abandoned. This application May 20, 1986, Ser. No. 867,903
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.[4] B29C *5/04*
U.S. Cl. 264—310 **12 Claims**

1. A method of rotationally molding a polyamide article in a rotationally molding mold comprising rotationally molding a polyamide composition in the presence of oxygen wherein the composition comprises a polyamide having from 60 percent to 90 percent of the polyamide chain ends terminated with acid groups, and from about 0.001 percent to about 0.5 percent, by weight of the polyamide, of a copper compound.

4,729,863
PROCESS AND MOLDING TOOL FOR THE MANUFACTURE OF MOLDED PARTS HAVING AREAS IN THE FORM OF GRIDS, GRILLS OR GRATINGS, SUCH AS MOTOR VEHICLE SOFT-FACES, SPOILERS, BUMPERS FROM A FLUID MASS
Heinz Müller; Klaus Schulte, both of Leverkusen, and Lothar Klier, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany
Filed May 16, 1985, Ser. No. 734,711
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419824
Int. Cl.[4] B29C *45/56, 67/22;* **C08G** *18/08, 18/14*
U.S. Cl. 264—318 **5 Claims**



1. A process for the manufacture of molded parts having apertures in the form of grids, grills or gratings comprising (i) introducing a fluid mass selected from the group consisting of thermoplastics and polyurethane reaction mixtures into the mold cavity of a molding tool conforming to the molded part, said mold cavity being characterized in having zones conforming to said apertures, (ii) filling the mold cavity with said fluid mass including flooding said zones and (iii) displacing said fluid mass from said zones.

4,729,864
IN-MOLD LABELING OF PLASTIC CONTAINERS
Long F. Chang, Sylvania, and Thomas C. Sanderson, Perrysburg, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Jan. 28, 1987, Ser. No. 7,857
Int. Cl.[4] B29C *49/24, 65/02, 65/70*
U.S. Cl. 264—509 **3 Claims**

3. In an in-molding method of forming a plastic container wherein a paper label is placed inside the blow mold and then

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a parison is blown outwardly into the mold so that heat from the parison and pressure generated by the blow medium binds the label on the blown container side wall, the step of controlling the moisture content of the paper label prior to placement in the mold such that the moisture content of the paper label ranges between 6–8% and side wall deformation of the plastic contamer is substantially eliminated.

4,729,865

NUCLEAR FUSION REACTOR

Merrill P. Busch, 5541 NE. 72nd, #6, Portland, Oreg. 97218

Continuation of Ser. No. 810,577, Dec. 19, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,326

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—107 **4 Claims**



1. A magnetic fusion reactor comprising,

a hollow metallic wave guide, closed upon itself, having a rectangular cross section and containing an electromagnetically resonating, pulsating, self-bombarding plasma in a vacuum,

a plurality of equally spaced probes extending to the inner surface of said wave guide and producing a type of transverse electromagnetic coupling with said resonating plasma, with said plasma acting as an internal coaxial cable,

said wave guide being vertically positioned between two extended opposite-hand electromagnets which are closed upon themselves and having horseshoe-type cross sections with horizontally oriented bases, and with their internal openings having tear-shaped cross sections containing longitudinal superconducting winding means and coming to a central point such that oppositely-directed magnetic fields are produced vertically in close proximity throughout the entire extent of said wave guide, upwardly directed through one side of said wave guide and downwardly directed through the opposite side,

a plurality of equally spaced, ferromagnetic by-pass vanes extending from the vertically oriented surfaces on each side of said opposite-hand electromagnetics, said vanes sloping outward and upward or downward respectively and being spaced to pass equidistantly between opposite-hand components, said vanes curving inward past the vertical midpoint of said wave guide and terminating with their end surfaces parallel to the vertical surfaces of said wave guide, and thus producing narrow, concentrated, curving magnetic fields interspaced with much wider, weaker thicknesses of said oppositely-directed vertical magnetic fields across each corner of the cross section of said rectangular wave guide throughout its entire extent.

4,729,866

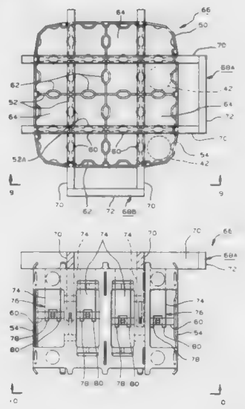
HIGH FLUENCE NEUTRON DOSIMETRY METHOD

Francis H. Ruddy, and Ezra P. Lippincott, both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 7, 1986, Ser. No. 928,150

Int. Cl.⁴ G01T *3/00*

U.S. Cl. 376—153 **4 Claims**



1. A high fluence neutron dosimetry method, comprising the steps of:

(a) exposing a dosimeter containing an alpha-emitting target isotope to neutron irradiation to form an alpha-emitting product isotope;

(b) determining the alpha decay rates of the target nucleus and the product nucleus; and

(c) using known alpha decay constants for the target nucleus and the product nucleus and the determined alpha decay rates of the target nucleus and the product nucleus to determine the neutron capture rate of the target nucleus.

4,729,867

SPRING RETAINER APPARATUS AND METHOD FOR FACILITATING LOADING OF FUEL RODS INTO A FUEL ASSEMBLY GRID

Edmund E. De Mario, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 3, 1986, Ser. No. 881,996

Int. Cl.⁴ G21C *19/00*

U.S. Cl. 376—261 **13 Claims**

1. For use with a fuel assembly having at least one grid formed of interleaved straps defining a plurality of hollow cells for respectively receiving a plurality of fuel rods, at least some of said straps being disposed in pairs thereof so as to form springs in pairs thereof being positioned in back-to-back relationships between adjacent ones of said cells, said springs in each pair thereof being configured to normally assume expanded positions in which they are displaced away from one another to engage fuel rods received in said respective cells and being deflectible to retracted positions in which they are displaced toward one another to allow loading of the fuel rods in said respective cells without engaging said springs, a spring retainer apparatus for facilitating the loading of said fuel rods into said cells of said fuel assembly grid, comprising:

(a) a plurality of elongated holder bars, each holder bar being alignable with one of said pairs of said straps of said grid which defines said pairs of springs and extendible along, and in spaced relation from, said one strap pair and between and spaced from positions occupied by fuel rods when received in said cells of said grid; and

(b) a plurality of members supported by each of said holder bars corresponding to said pairs of springs defined by said pair of straps aligned with said holder bar;

(c) each of said members having a terminal end configured to engage and retain said springs of one of said pairs thereof in their retracted positions when said respective holder bar supporting said member is aligned with and moved toward said pair of straps aligned with said holder bar;

(d) each of said members being an elongated post with said terminal end of said member being a bifurcated end on said post defining at least one pair of spaced apart fingers adapted to receive said pair of springs therebetween for retaining said springs in their retracted positions.

4,729,868

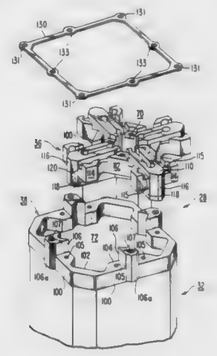
VIBRATION ARRESTOR FOR ROD GUIDE SUPPORT STRUCTURE OF THE INNER BARREL ASSEMBLY OF A PRESSURIZED WATER REACTOR

James E. Gillett, Hempfield Township, Westmoreland County, and Daniel C. Garner, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1986, Ser. No. 817,362

Int. Cl.⁴ G21C *1/01*

U.S. Cl. 376—285 **16 Claims**



1. In a pressure vessel of a pressurized water reactor system, the vessel having a support plate having a generally planar surface and a plurality of generally cylindrical, rigid extensions protruding from the planar surface thereof in a predetermined array of regularly spaced positions, and a plurality of further plates supported in a substantially common plane, parallel to and spaced from the support plate, each further plate having a central aperture therein received over a corresponding said cylindrical extension, a vibration arrester comprising:

a central hub having a central aperture therein for being received over a corresponding extension and engaging the generally planar surface of the support plate;

at least a pair of spring arms integral with said central hub and extending in aligned, oppositely oriented directions from said central hub and depending at corresponding angles away from said central hub, said spring arms being of a common length sufficient to engage the corresponding extremities thereof on the respective further plates received on the extensions of the predetermined array thereof aligned with said spring arms and positioned next adjacent said corresponding extension on which said central hub is received and to exert a compressive force thereon, within a predetermined range, for resiliently opposing any reduction of the parallel spacing and reacting lateral loads tending to displace the further plates in a direction parallel to the common plane;

a stiffening ring having a periphery generally corersponding to the periphery of said central hub; and

means for connecting said stiffening ring to said support plate with said central hub of said arrestor therebetween.

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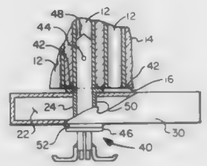
MODULAR RADIATION SHIELDING SYSTEM

Glen E. Schukei, So. Windsor, and Francis X. McDonald, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 4, 1986, Ser. No. 892,543

Int. Cl.⁴ G21F *3/00*

U.S. Cl. 376—287 **6 Claims**



1. A modular radiation shielding system for use on the lower side of a nuclear steam generator tubesheet to protect inspection and repair workers in the primary head of the generator from radiation of the tubesheet and plurality of tubes it secures, said system comprising:

a plurality of modular panels of lead shielding of like geometric shape, each having a transverse opening for alignment with a tube and being symmetrical about one axis and asymmetrical about a second axis perpendicular thereto so that if a previously plugged tube is encountered, a quick 180° rotation aligns the transverse opening in register with another tube;

means for protecting said modular panels of lead shielding of like geometric shape from damage by external forces and from producing unwanted lead deposits in the steam generator;

said means for protecting said modular panels defining for each such panel, a sheath of material harder than lead having at least one opening transverse to the panel and in register with the transverse opening of the panel at a location at which the distance from the centers of the transverse openings in register and aligned with a tube in the tubesheet to the edge of the geometric shape places the edge in register with tubesheet material between a plurality of tubes; and,

means extending through the transverse openings in register and aligned with a tube in the tubesheet for releasably fastening said modular panel to said tubesheet.

4,729,870

FUEL ELEMENT FOR A NUCLEAR REACTOR

Claude Mercier, and Marcel Mabboux, both of Manosque, France, assignors to Commissariat a l'Energie Atomique, Paris, France

PCT No. PCT/FR86/00021, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/04728, PCT Pub. Date Aug. 14, 1986

PCT Filed Jan. 23, 1986, Ser. No. 923,155

Claims priority, application France, Feb. 12, 1985, 85 01950

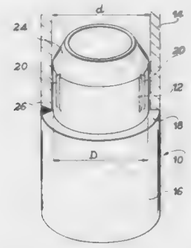
Int. Cl.⁴ G21C *3/10*

U.S. Cl. 376—451 **2 Claims**

1. A nuclear fuel element comprising a tubular can having an internal diameter between a maximum diameter and a minimum diameter, which is sealed at at least one end by a plug having a cylindrical portion force fitted into said can, wherein the cylindrical portion has a diameter equal to the minimum diameter of the can and has at least three serrations oriented in accordance with the generatrixes of said cylindrical portion

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and which are regularly spaced, said serrations forming overhanging beads with respect to said cylindrical portion over a



thickness equal to half the difference between the maximum diameter and the minimum diameter of the can.

4,729,871

PROCESS FOR PREPARING POROUS METAL PLATE

Toru Morimoto, Chiba, Japan, assignor to Hiroshi Kawaguchi, Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 833,375

Claims priority, application Japan, Jun. 21, 1985, 60-134241; Jun. 21, 1985, 60-134243; Jul. 24, 1985, 60-162053; Oct. 9, 1985, 60-225672

Int. Cl.[4] B22F *7/00*

U.S. Cl. 419—2 **21 Claims**



1. A process for preparing a porous metal plate comprising the steps of:

applying adhesive onto at least one surface of a substrate;

embedding short metal fibers by the action of at least one of an electrostatic field and a magnetic field, in said adhesive on said surface of said substrate with predetermined bulk densisty to form a composite;

applying pressure to said composite to push over said short metal fibers; and

sintering said composite.

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ISOTROPIC TOOL STEEL

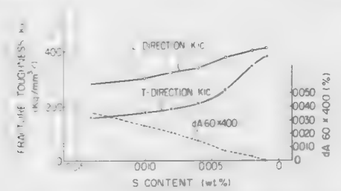
Tamiya Kishida; Mitsuru Suzuki, both of Yonago; Toshio Okuno, Yasugi, and Atsusuke Nakao, Yanago, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Sep. 10, 1986, Ser. No. 906,031

Claims priority, application Japan, Sep. 18, 1985, 60-205858

Int. Cl.[4] C22C *38/22*

U.S. Cl. 420—105 **9 Claims**



6. Isotropic tool steel consisting essentially, by weight, of 0.30–0.45% of C, 2.00% or less of Si, 2.0% less of Mn, 7.00% or less of Cr, 0.20–12.0% of W and/or Mo alone or in combination (½W+Mo), 3.00% or less of V, less than 0.005% or S and less than 30 ppm of O, the balance being substantially Fe, the cleanliness of said tool steel with respect to non-metallic inclusions determined by JIS G 0555 being dA60×400≦0.010% and d(B+C)60×400≦0.020%, and a ratio of transverse directoin toughness to longitudinal direction toughness, wherein said longitudinal direction means a direction of elongation by forging and said transverse direction means a direction perpendicular to said longitudinal direction, being more than 0.70.

4,729,873

PROCESS AND APPARATUS FOR PRODUCING STEEL

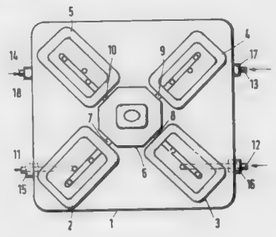
Jorge U. Shulz, Santiage de Chile, Chile, assignor to Compania de Acero del Pacifico S.A. de

Filed May 20, 1986, Ser. No. 865,019

Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518023

Int. Cl.[4] C21C *33/00*

U.S. Cl. 420—129 **24 Claims**



1. A process for producing steel by joining different components, comprising:

providing a liquid melt consisting essentially of at least one grade of steel;

feeding at least one solid state material into said liquid melt; and

solidifying the material produced;

wherein said solid state material is adapted to melt on a near-surface but not open melt at a predetermined temperature just above the temperature of liquidus of said liquid melt.

4,729,874

METHOD OF USING RAPIDLY DISSOLVING ADDITIVES FOR METAL MELTS

Hartmut Meyer-Grünow, Garching, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,195

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530275

Int. Cl.[4] C22C *1/00*

U.S. Cl. 420—129 **18 Claims**

1. A process for the introduction of alloying metals into melts of aluminum, aluminium alloys, magnesium or magnesium alloys, said process comprising adding to the melt a composition comprising from 2 to 50% by weight of a powdered component A, consisting of magnesium and/or a magnesium-containing alloy, and 50 to 98% by weight of a powdered component B, consisting of one or more alloying metals, the components A and B being intimately mixed and being in pressed or compacted form.

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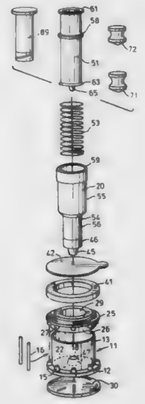
DEVICE FOR PERFORMING IMMUNOCHEMICAL ASSAYS

Howard M. Chandler, Orton, Canada, assignor to Allelix Inc., Mississauga, Canada

Filed Jun. 26, 1986, Ser. No. 880,948

Int. Cl.[4] G01N *31/22;* **B01L** *3/02;* **C12M** *1/24*

U.S. Cl. 422—58 **11 Claims**



1. A device for performing immunochemical chemical assays, comprising:

at least two transparent tubes, each having an internal surface, said tubes being disposed side by side and connected in series, thereby defining a first end and a second end for the connected tubes, at least one of the tubes having an antigen, hapten or antibody attached to the internal suface thereof;

a syringe having a fluid passageway defined at one end thereof, and having a tubular body defining a chamber capable of receiving a fluid test sample;

means for connecting the syringe to the first end of said connected tubes, so that the syringe chamber may be in fluid communication with said connected tubes through said fluid passageway;

and a hollow plulnger insertable into the syringe for forcing liquid therefrom into the connected tubes, the plunger having an inner wall and an exit structure which is insertable into the fluid passageway of the syringe, the hollow plunger having first and second pistons positioned within it, a first plunger chamber being defined between the first piston and said exit structure, and a second plunger chamber being defined between the first and second pistons, the first piston having first and second spaced circumferential surfaces for engaging the inner wall of the plunger thereby defining an annular space between the first piston and the inner wall of the plunger, the inner wall of the plunger having first and second means for coacting with the first and second circumferential surfaces of the first piston when said first piston has been moved near the exit structure, said first and second means, said first piston and said inner wall of the plunger defining a fluid pathway including said annular space from the second plunger chamber to the exit structure;

means for depressing the first and second pistons of the hollow plunger; and

a waste reservoir connected to the second end of the connected tubes, the connection providing access for the tubes to fluid deposited therein so that said fluid may be back flowed through the tubes by means of suction from the syringe, the waste reservoir comprising a base member, an upright side wall and a top member; the base and top members having portions extending outwardly from the sidewall and having openings therein for receiving each of the at least two tubes, the base member having openings in flow communication with the reservoir for receiving the end of the syringe and for depositing fluid into the reservoir; conduit means in the base member connecting said openings to the first and second ends of said connected tubes, and conduit means in the base and top members for connecting the tubes in series; and the top member defining an opening therein for receiving the syringe.

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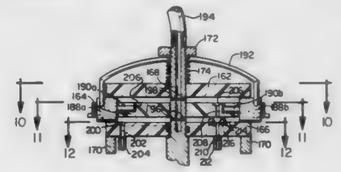
BLOOD ANALYSIS SYSTEM

James W. Hennessy, Trumbull; Henry R. Angel, Fairfield; William J. Casey, Jr., Milford, and Samuel P. Baron, Fairfield, all of Conn., assignors to Nova Celltrak, Inc., Trumbull, Conn.

Continuation of Ser. No. 675,378, Nov. 27, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 931,894

Int. Cl.[4] B01L *11/00*

U.S. Cl. 422—103 **7 Claims**



1. A valve comprising spindle means defining a centrally disposed flow through passageway with outwardly disposed ports, three stacked members centrally disposed on the spindle means and whose mating surfaces are rotatably slidable relative to one another, a middle one of which stacked members is movable relative to the other two, the middle member having at least two positions of operation wherein at least one port through the middle member is aligned with aligned ports in the outer two members, retaining means on each side of the stacked members fixed to the spindle means on opposite sides of the stacked members for confining the stacked members in the direction of stacking between the respective retaining means, means between at least one of the retaining means and the stacked members urging the stacked members together, and means acting to separate the stacked members from one another and position them such that the outwardly disposed ports will direct cleaning liquid flow between each pair of the separated members.

4,729,877

APPARATUS FOR THE SOLID-BED POLYMERIZATION OF MONOMERS

Karl Hennig, Hessheim; Karlheinz Messmer, Weisenheim; Guenter Hoerdt, Grossniedesheim; Gerhard Kleinpeter, Lambsheim; Werner Hoffmann, Beindersheim, and Hans-Juergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 852,569

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514367

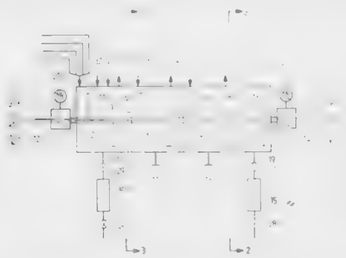
Int. Cl.[4] B01F *3/08, 9/02;* **B01J** *14/00*

U.S. Cl. 422—134 **3 Claims**

1. A horizontal solid-bed polymerization reactor which is divided into a plurality of zones, comprising a reaction zone, an after-reaction zone, a heating zone and a product discharge zone and said reactor further having inlet and outlet openings for feeding substances into the zones and/or removing substances from the zones, the zones being separated from one

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another over a part of the reactor cross-section by means of weirs having variable free cross-sections, wherein drive shafts



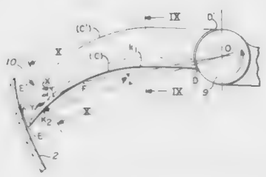
which are independent of one another and possess mixing elements located in the middle of the solid-bed polymerization reactor.

4,729,878

VERTICAL AUTOCLAVE

Yves Pommier, Lyons, and Yves Legrand, Saint-Priest, both of France, assignors to Atochem, France

Filed Apr. 10, 1986, Ser. No. 850,286
Claims priority, application France, Apr. 11, 1985, 85 05429
Int. Cl.[4] B01F *3/08, 3/14;* **B01J** *14/00*
U.S. Cl. 422—135 **20 Claims**



1. A vertical autoclave for carrying out operations involving a medium having a liquid phase and/or a solid phase, comprising:

a. a concave shaped autoclave bottom;

b. a shaft along a vertical axis of said autoclave, said shaft passing through said bottom of said autoclave; and

c. at least one stirrer arm attached to said vertical shaft for driving said medium with a centripetal motion about said concave autoclave bottom said stirrer arm having a shape matching the shape of said concave bottom of said autoclave and being attached so that said arm is adjacent said concave bottom.

4,729,879

PRODUCTION OF NITROGEN AND CARBON DIOXIDE

Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404

Continuation of Ser. No. 484,934, Apr. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 289,714, Aug. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 154,423, May 23, 1980, Pat. No. 4,313,399. This application Nov. 21, 1986, Ser. No. 934,207
Int. Cl.[4] F01N *3/12;* **C01B** *21/00, 31/20*
U.S. Cl. 422—189 **3 Claims**

1. Apparatus for use in the separation of at least one gaseous component from the combustion products of a hydrocarbon fuel and air comprising:

(a) a diesel engine in which a mixture of the fuel and air is subjected to a first stage of combustion yielding primary products of combustion containing at least 6% by volume of free oxygen,

(b) a secondary combustion unit comprising an elongated tubular element defining an elongated secondary combustion chamber having an inlet end and an outlet end,

(c) an end closure wall at the inlet end of the secondary combustion chamber,

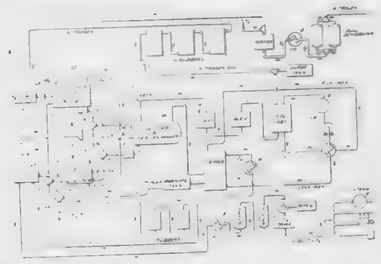
(d) means for introducing primary combustion products and secondary combustion fuel through said end closure wall into the inlet end of the secondary combustion chamber,

(e) a discharge connection for delivering secondary combustion products from the outlet end of the secondary combustion chamber,

(f) a cylindrical heat shield in the inlet end portion of said elongated secondary combustion chamber, the cylindrical heat shield comprising a cylindrical wall spaced inwardly from said tubular element defining the secondary combustion chamber and providing an annular heat shield space between the heat shield wall and said tubular element, the cylindrical wall of the heat shield having an inlet end connnected with said closure wall at the inlet end of the secondary combustion chamber and having an outlet end opening presented toward and communicating with the outlet end portion of the secondary combustion chamber,

(g) a cyllindrical shell forming a housing for the secondary combustion chamber, said shell surrounding the tubular element in spaced relation to provide an annular chamber between the shell and said tubular element,

(h) means for separating at least one gaseous component from the secondary products of combustion, including a gas absorber containing an absorber liquid in which carbon dioxide is selectively absorbed, the secondary products of combustion being delivered from said discharge connection of the secondary combustion unit into the gas absorber,



(i) a stripper for separating the absorbed carbon dioxide from the absorber liquid and including indirect heat exchange means carrying a heat exchange fluid for heating the absorber liquid,

(j) and an indirect heat exchange system for absorbing heat from the tubular element of the secondary combustion chamber and being connected to the indirect heat exchange means for heating the absorber liquid in the stripper, said indirect heat exchange system including

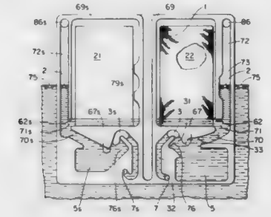
circulating means in said annular chamber between the tubular element defining the secondary combustion chamber and the surrounding cylindrical housing shell and having an inlet and an outlet providing for circulating said indirect heat exchange fluid in heat exchange relation to said tubular element defining the secondary combustion chamber in the region of said annular heat shield space and also in the region of the tubular element of the secondary combustion chamber downstream of said heat shield space, and thereby transfer heat from the secondary combustion chamber to the indirect heat exchange fluid, and said indirect heat exchange system further including means for delivering indirect heat exchange fluid from the circulating means in said annular chamber into the indirect heat exchange means of said stripper, and thereby heat the absorber liquid in the stripper.

4,729,880

ARTICLE FOR MAINTAINING MORE EVEN CONCENTRATIONS OF BLEACH IN A PASSIVE DOSING DISPENSER

Robert S. Dirksing, Cincinnati; Bruce Brown, Fairfield; Ray D. Lotts, Cincinnati, and Louis F. Wong, Mason, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 452,543, Dec. 23, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 727,611
Int. Cl.[4] F03D *9/03*
U.S. Cl. 422—264 **1 Claim**



1. An article of manufacture comprising a bottom feed dosing dispenser comprising: a solid cake (22) of water-soluble calcium hypochlorite, a cake compartment (69), an inlet/outlet exit port (7), a first inlet-outlet passageway (32), a second inlet/outlet passageway (31), a reservoir (5), dose volume baffle (67), incline (33), passageway (70), said dispenser containing said solid cake (22) within said cake compartment (69), said dispenser is designed for allowing a dose volume of aqueous liquid to be routed through said inlet/outlet exit port (7), said first inlet/outlet passageway (32), said second inlet/outlet passageway (31), said reservoir (5), said dose volume baffle (67), said incline (33), said passageway (70) and into said compartment with each dispensing cycle, said dispenser including a lower most edge means (62) for initially immersing only a lowermost portion of said cake (22) to a predetermined depth in the aqueous liquid to facilitate dissolving a portion of said cake (22) for dispensing at a later time; said cake (22) comprising a substantially completely water-soluble solid weighing from 45 gms to 120 gms and having a density of from 1.5 to 2.3 gms/cc; said cake compartment containing sufficient free space to allow the cake (22) to swell and gravity feed freely by dissolution into the aqueous liquid; said dispenser is designed to receive and contain a total of from 7 to 16 mls of aqueous liquid and to form a bubble (3) between said first inlet/outlet passageway (32) and said dose volume baffle (67); and said incline 33 and passageway 70 are designed to cooperate:

(a) to limit the size of the bubble which acts as a lock to isolate toilet tank water (75) from the aqueous liquid inside the dispenser reservoir (5),

(b) to maintain in said reservoir (5) a constant minimum volume of the aqueous liquid of from about 6 mls to 12 mls, and

(c) to fully dispense a small 1 ml to about 4 mls dose of the aqueous liquid;

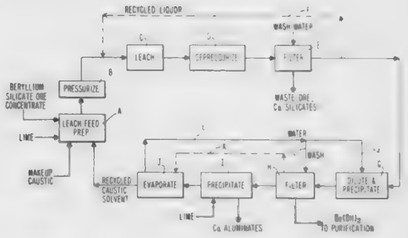
wherein the volumes of the reservoir liquid (b) and said dose (c) have a volumetric ratio of from 3:1 to 6:1, and wherein the reservoir liquid has an average concentration of from about 9% to about 15% of said hypochlorite, and wherein said dosing dispenser provides a substantially uniform concentration of hypochlorite solution for each dispensing cycle for the life of the cake.

4,729,881

HYDROMETALLURGICAL PROCESS FOR THE PRODUCTION OF BERYLLIUM

William C. Copenhafer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 16, 1986, Ser. No. 942,474
Int. Cl.[4] C01F *3/02*
U.S. Cl. 423—123 **18 Claims**



1. A hydrometallurgical process for producing solid beryllium hydroxide from an ore containing a beryllium silicate mineral, which comprises:

(a) leaching the ore by simultaneously contacting with effective amounts of a concentrated caustic solution and lime or lime hydrate, with agitation in a closed reactor at elevated temperature and autogenous pressure, until a slurry is formed containing dissolved beryllium hydroxide and by-product solids comprising waste gangue and calcium-sodium silicates;

(b) reducing the pressure to about one atmosphere and maintaining the temperature below the boiling point of the caustic solution;

(c) separating the by-product solids from the slurry to leave a pregnant leach liquor;

(d) diluting and heating the pregnant leach liquor to precipitate the beryllium hydroxide and to leave a mother liquor containing caustic; and

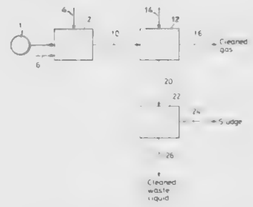
(e) separating the beryllium hydroxide.

4,729,882

PROCESS FOR CLEANING MERCURY-CONTAINING GASEOUS EMISSIONS

Akira Ide, Kanagawa; Tsutomu Shigenaka, Chiba; Masayuki Kokado, Chiba, and Shigeru Kondo, Kanagawa, all of Japan, assignors to Tokyo Metropolitan Environmental Service Corporation, Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,236
Claims priority, application Japan, Mar. 28, 1985, 60-64589
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—210 **6 Claims**



1. A process for cleaning gaseous emmissions congaining mercury which are produced by a municipal refuse incinerator comprises the steps of:

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(a) heating mercury-containing waste in a vessel thereby transforming the mercury into a gaseous phase;
(b) adding a chlorine-containing material to said vessel;
(c) heating said material with said gaseous phase in said vessel, whereby a water-soluble mercuric chloride ($HgCl_2$) is formed in a vessel effluent;
(d) scrubbing said vessel effluent having the water-soluble mercuric chloride with a wash water containing a liquid chelate and a metal salt, thereby forming a chlorocomplex ion ($HgCl_4^{-2}$) in said wash water; and
(e) sedimentation coagulating said wash water containing said chloromcomplex ion, thereby fixing and insolubilizing the mercury in a resulting sludge.

4,729,883

ACID GAS REMOVAL PROCESS

Chi W. Lam, Weybridge; Terence J. Ritter, and Peter Small, both of Fulham, all of England, assignors to British Gas Corporation, London, England

Filed Sep. 5, 1986, Ser. No. 903,963
Claims priority, application United Kingdom, Sep. 12, 1985, 8522575; Oct. 24, 1985, 8526293
Int. Cl.[4] C01B *17/16, 31/20*
U.S. Cl. 423—228 **7 Claims**

1. A process for the removal of carbon dioxides from gaseous mixtures wherein said mixture is contacted with an aqueous alkaline solution comprising a compound of an alkali metal or ammonia and an alkanolamine-based promoter characterised in that the promoter is a mixture of at least one secondary alkanolamine and at least one N-alkyl-2-aminoethanol, said alkyl radical containing up to 3 carbon atoms.

4,729,884

PROCESS FOR THE PREPARATION OF A GRAPHITE INTERCALATION COMPOUND

Tsutomu Sugiura; Maki Sato, and Kenichi Fujimoto, all of Kawasaki, Japan, assignors to Nippon Steel Corp. and Nippon Steel Chemical Co., Ltd., both of, Japan

Filed Aug. 5, 1986, Ser. No. 893,259
Claims priority, application Japan, Aug. 17, 1985, 60-180046
Int. Cl.[4] H01B *1/06*
U.S. Cl. 423—448 **1 Claim**

1. A process for preparing a graphite intercalation compound having a first metal chloride as an intercalant thereof, said process comprising:
reacting graphite and said first metal chloride in the presence of a second metal chloride and in the absence of chlorine gas, said first metal chloride being selected from the group consisting of cupric chloride, aluminum chloride, nickel chloride, cobalt chloride, manganese chloride and chromium chloride, and said second metal chloride being selected from the group consisting of ferric chloride, aluminum chloride, cupric chloride, and cobalt chloride, wherein said second metal chloride is different from said first metal chloride and is present in an amount of 0.1% to 2.0% by weight based on said first metal chloride.

4,729,885

HIGH MIXING REACTOR PROCESS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Dec. 10, 1986, Ser. No. 828,418
Int. Cl.[4] C01B *31/02;* **C09C** *1/48*
U.S. Cl. 423—450 **14 Claims**

1. A process for producing high surface area carbon black in which fluids comprising at least one stream of carbon black feedstock and at least one stream comprising combustion gases are injected into a precombustion zone of a carbon black reactor, said process comprising:
(a) injecting one of said fluids in axial flow through a first pipe nozzle concentric with the center line of said reactor and the remainder of said fluids through the annuli formed by a plurality of pipe nozzles concentric with and surrounding said first pipe nozzle, and
(b) controlling the velocity of fluid flow through said first pipe nozzle and said annuli to provide radially adjacent axially flowing streams with each stream having a flow velocity within a range of about 50 ft/sec to about 1700 ft/sec that is sufficiently dissimilar from each adjacent stream to create turbulence and sufficiently rapid mixing of the streams to form high surface area carbon black on being subjected to combustion conditions.

4,729,886

METHOD OF PREPARING REPRODUCIBLY STABLE AQUEOUS SUSPENSIONS OF SODIUM DITHIONITE FOR WOODPULP BLEACHING

Edwin D. Little, Cranford, N.J., and Karsten R. Minzghor, Porstmough, Va., assignors to Virginia Chemicals, Inc., Portsmouth, Va.

Filed May 20, 1986, Ser. No. 865,092
Int. Cl.[4] C01B *17/66;* **D21C** *3/04*
U.S. Cl. 423—515 **9 Claims**

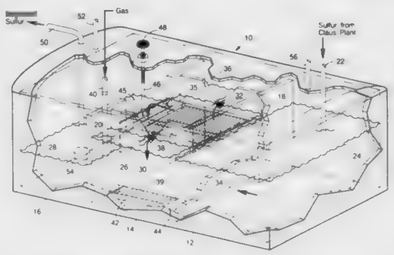
1. A method for reproducibly preparing a storable and pumpable aqueous dithionite suspension which contains sodium dithionite and is useful for woodpulp bleaching, said method comprising the following steps, based on weight percentages of said suspension:
A. preparing a dilute hydrosol containing about 0.144–0.180% of xanthan gum;
B. sequentially adding 5.48–6.32% of 50% sodium hydroxide and 0.24–0.28% of a chelate to said dilute hydrosol;
C. cooling said hydrosol to below 45° F. to form a cold dilute hydrosol;
D. adding 31.20–36.00% sodium dithionite, containing 88–90% $Na_2S_2O_4$, to said cold dilute hydrosol at such a rate as to maintain its temperature below 45° F. to form a suspension; and
E. adding 1.85–2.00% of sodium tripolyphosphate to said suspension to form said storable and pumpable aqueous dithionite suspension.

4,729,887

PROCESS AND APPARATUS FOR DEGASSING SULFUR

Paul T. Pendergraft, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Aug. 16, 1985, Ser. No. 766,609
Int. Cl.[4] C01B *17/16;* **B01J** *8/02*
U.S. Cl. 423—564 **19 Claims**



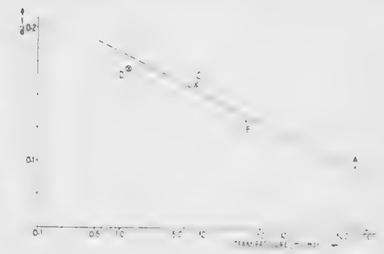
1. A process for converting hydrogen polysulfide to hydrogen sulfide in liquid sulfur and for removing hydrogen sulfide from liquid sulfur, said process comprising:
passing liquid sulfur containing hydrogen polysulfide and hydrogen sulfide to a first zone of a three zone treating system comprising adjacent first, second, and third zones with fluid communication means between adjacent zones;
continuously passing said liquid sulfur from said first zone to a lower portion of the adjacent second zone, said second zone being provided with a catalyst containing zone, said catalyst being effective for converting hydrogen polysulfide to hydrogen sulfide and for oxidizing hydrogen sulfide to sulfur;
recirculating liquid sulfur passed through said catalyst containing zone into the lower portion of said second zone by recirculation means responsive to sulfur level, with increasing amounts of liquid sulfur being recirculated as the depth of liquid sulfur increases in said second zone;
introducing a sparging gas into the lower portion of said second zone and circulating liquid sulfur from the lower portion of said second zone through said catalyst containing zone;
continuously passing liquid sulfur with a reduced hydrogen polysulfide and hydrogen sulfide content from the second zone over an adjustable weir of variable height to the adjacent third zone, the depth of liquid sulfur in said second zone being controlled by the height of said adjustable weir and increasing as the height of said adjustable weir is increased; and
removing liquid sulfur from said third zone and removing hydrogen sulfide from said treating system.

4,729,890

POROUS ALUMINAS AND THEIR PREPARATION

Martyn H. Stacey, Cuddington, and Stephen J. Wilson, Duxford, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 236,628, Feb. 20, 1981, abandoned. This application Mar. 26, 1984, Ser. No. 593,171
Claims priority, application United Kingdom, Feb. 26, 1980, 8006409
Int. Cl.[4] C01F *7/02*
U.S. Cl. 423—628 **8 Claims**



1. A porous transition phase alumina obtained by the controlled dehydration of a particulate boehmite or gibbsite hydrous alumina and comprising particles which are aggregates or agglomerates of porous primary particles in which the internal porosity within the primary particles is provided by micropores of controlled average width within the range 4 to 20 Angstroms and wherein the pore width over the majority of the pores is within 1 Angstrom of the averaage pore width.

4,729,888

PROCESS OF RECOVERY OF SULPHUR FROM MINERALS CONTAINING PYRITES

Didier Anglerot, Pau, France, assignor to Societe Nationale Elf Aquitaine, France

Filed Apr. 15, 1987, Ser. No. 38,620
Claims priority, application France, Apr. 17, 1986, 86 05500
Int. Cl.[4] B01D *11/02;* **C01B** *17/033, 17/06;* **C01G** *49/00*
U.S. Cl. 423—578 A **20 Claims**

1. Process of production of elementary sulphur from an iron sulphide mineral, which comprises the oxidizing acid lixiviation of the pulverized mineral for extraction of the sulphur, characterized in treating the pulp obtained from the lixiviation with an organic solvent for sulphur, the solvent having a density greater than 1, to separate the pulp into an aqueous phase containing in solution the non-ferrous metals, the sulphates of which are water soluble, and a suspension of the solid of the pulp in an organic phase comprising a solution of the sulphur in the solvent, separating the solid in suspension from the organic phase, and recovering the sulphur by crystallization after cooling the organic phase.

4,729,889

HIGH TEMPERATURE REGENERATIVE H_2S SORBENTS

Maria Flytani-Stephanopoulos, Pasadena; George R. Gavalas, Altadena, both of Calif., and Satish S. Tamhankar, Scotch Plains, N.J., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 29, 1985, Ser. No. 717,333
Int. Cl.[4] C01F *7/02;* **C01G** *49/02*
U.S. Cl. 423—593 **10 Claims**

1. A composition of matter in the form of porous particles consisting essentially of a refractory metal oxide support containing a layer of a binary metal oxide mixture of a first Group VB or VIB metal oxide and a second Group IB, IIB or VIII metal oxide, said oxides being present in the mixture such that the ratio of the metal oxide of the first group to the metal oxide of the second group is within ±5 percent of the atomic ratio of the metal oxide of the first group to the metal oxide of the second group at the eutectic point and said layer being molten at a temperature from 400° C. to 750° C.

4,729,891

HYDROGEN GENERATING METHOD

Prabhakar Kulkarni, 12027 Circle Dr. East, Houston, Tex. 77071

Filed Aug. 16, 1984, Ser. No. 641,576
Int. Cl.[4] C01B *13/00*
U.S. Cl. 423—650 **14 Claims**



1. A method of extracting elemental hydrogen comprising the steps of:
(a) heating in a retort coal and steam free of air to convert the coal and steam into a gaseous outflow including oxides of carbon, trace impurities and methane;
(b) directing the gaseous outflow through gas separation apparatus for removing the oxides and trace impurities from the gaseous outflow resulting in an outflow of methane;
(c) heating the outflow of methane from the prior step in a chamber at an elevated temperature in the range of 900° F. to 2000° F. and at a reduced pressure in the range of 50 to 10^{-5} torr forming a vacuum within said chamber to disas-

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sociate methane, the methane forming elemental hydrogen flowing from said chamber; and
(d) collecting the hydrogen from said chamber.

4,729,892

USE OF CROSS-LINKED HYDROGEL MATERIALS AS IMAGE CONTRAST AGENTS IN PROTON NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY AND TISSUE PHANTOM KITS CONTAINING SUCH MATERIALS

Paula T. Beall, Ardsley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,337
Int. Cl.[4] A61K *49/00*; A61B *5/05, 6/00*
U.S. Cl. 424—9 10 Claims

1. A method of contrasting a proton NMR tomograph of the gastro-intestinal tract, or a portion thereof, by administering enterally to a mammal an effective image contrasting amount of a physiologically tolerable, synthetic, substantially non-degradable cross-linked hydrogel having, in the aqueous swollen state, spin-lattice or spin-spin relaxation values substantially shorter than the surrounding gastro-intestinal tissue environment; and subjecting said mammal to said proton NMR tomography.

4,729,893

ENTERIC ENCAPSULATION OF ANCROD FOR ORAL ADMINISTRATION

Robert L. Letcher, 95 Horatio St., New York, N.Y. 10014, and Jeffrey W. Williams, New York, N.Y., assignors to Robert L. Letcher, New York, N.Y.

Continuation-in-part of Ser. No. 686,232, Dec. 26, 1984, Pat. No. 4,585,653, which is a continuation of Ser. No. 584,102, Feb. 27, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 856,955
The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.
Int. Cl.[4] A61K *35/58*
U.S. Cl. 424—98 20 Claims

1. A method of treating vascular disease in a mammal in need of such treatment which comprises:
orally administering to said mammal an effective amount of enterically coated ancrod.

20. A method of lysing fibrinogen comprising:
lysing said fibrinogen with a biologically effective amount of ancrod administered enterically coated orally, to lyse said fibrinogen.

4,729,894

POULTRY DRINKING WATER ADDITIVE

Robert G. Teeter, Stillwater, Okla., assignor to Oklahoma State University, Stillwater, Okla.

Continuation-in-part of Ser. No. 567,507, Jan. 3, 1984, Pat. No. 4,608,257. This application Apr. 11, 1985, Ser. No. 722,001
Int. Cl.[4] A61K *33/14*
U.S. Cl. 424—153 11 Claims

1. A method of treating heat stress in poultry comprising the step of supplementing the diet of said poultry with poultry drinking water containing from about 0.05 weight percent to about 1.0 weight percent dissolved potassium ion.

9. A poultry drinking water additive comprising for every 100 parts by weight of the additive:
(a) from about 40 to about 99 parts by weight of a water soluble, non-toxic, potassium salt;
(b) up to about 15 parts by weight NH_4Cl;
(c) up to about 18 parts by weight NH_4HCO_3; and
(d) the balance, ascorbic acid.

4,729,895

COMPOSITION FOR SOLID PHARMACEUTICAL PREPARATIONS OF ACTIVE VITAMINS D_3 AND PROCESS FOR PREPARATION THEREOF

Yuji Makino, and Yoshiki Suzuki, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 554,669, Nov. 23, 1983, abandoned. This application Mar. 16, 1987, Ser. No. 27,082
Claims priority, application Japan, Feb. 22, 1983, 58-26898
Int. Cl.[4] A61K *9/20, 9/26*
U.S. Cl. 424—465 4 Claims

1. A solid pharmaceutical, composition of active vitamins D_3 having improved stability comprising:
(a) an outer layer comprising an active vitamin D_3 and an excipient which is readily soluble in an organic solvent and containing from 500 to 100,000 parts by weight of said excipient per 1 weight part of active vitamin D_3, said excipient which is readily soluble in an organic solvent being selected from the group consisting of polyvinyl pyrrolidone, methyl cellulose, ethyl cellulose hydroxypropyl cellulose, hydroxypropylmethyl celluose, and mixtures thereof and
(b) a core material comprising an excipient which is slightly soluble in an organic solvent, said excipient which is slightly soluble in an organic solvent being selected from the group consisting of crystalline cellulose, lactose, and mixtures thereof; said core material containing from 1 to 100 parts by weight of said excipient which is slightly soluble in an organic solvent per 1 weight part of said excipient in the outer layer which is readily soluble in an organic solvent.

4,729,896

BUFFERED ANIMAL FEED SUPPLEMENT BLOCK

J. Wallace Sawhill, Canoga Park, Calif., assignor to Pacific Kenyon Corp., Long Beach, Calif.

Filed Jun. 23, 1986, Ser. No. 877,214
Int. Cl.[4] A23K *1/04, 1/22*
U.S. Cl. 426—2 20 Claims

1. A method of feeding ruminants which comprises:
(a) preparing a solid feed supplement in block form having a total water content from 10 to 35 weight percent and consisting essentially of from 30 to 95 weight percent of a feed solution containing 40 to 95 percent solids of sugar, protein, or mixtures thereof and, solidifying and buffering ingredients consisting essentially of sodium carbonate, sodium bicarbonate, and mixtures thereof in an amount from 8 to 25 weight percent of said supplement, and from 2 to 5 weight percent magnesium oxide of said supplement;
(b) feeding said solid feed supplement to the ruminant for free choice consumption; and
(c) controlling the free choice consumption of the feed supplement at a level from 1 to about 4 pounds per day by maintaining the quantities of said solidifying and buffering ingredients at the amounts sufficient to impart a preselected hardness to said solid feed supplement.

4,729,897

GELATIN PRODUCT HAVING HIGHLY IMPROVED PROPERTIES OF WETTABILITY AND DISPERSIBILITY, AND A METHOD OF MAKING THE SAME

Jan Poppe, Lovendegem, Belgium; Claude Ridoux, Isle-sur-Sorgue, France; Bernard Grouber, Boissy-St. Leger, France, and Michel Schoentjes, Versailles, France, assignors to Compagnie Rousselot, S.A., Paris, France

Filed Aug. 1, 1986, Ser. No. 893,167
Claims priority, application France, Aug. 7, 1985, 85 12090
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—96 17 Claims

1. A gelatin product having improved wettability and dispersibility properties, comprising particles of a basic gelatin coated with a film of a hydrolyzed gelatin.

4,729,898

HASHED WHITE MEAT BASED FOOD PRODUCT

Joseph Brulé, Le Bourg, 44150 Couffe Ancenis, France

Filed Jan. 29, 1986, Ser. No. 823,760
Claims priority, application France, Jan. 31, 1985, 85 01359; Nov. 14, 1985, 85 16843
Int. Cl.[4] A22C *21/00*
U.S. Cl. 426—241 2 Claims

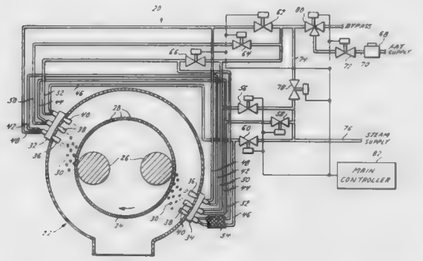
1. In a method for making a food product comprising lean white meat, fat and alcoholic liquid, the improvement consisting essentially of the steps of:
hashing lean white meat and at least one member selected from the group consisting of veal fat and pork fat, to form a fine emulsion;
adding aqueous alcoholic liquid to said fine emulsion and mixing said emulsion to incorporate said alcoholic liquid therein; and
shaping said emulsion to form a food product, said product comprising, by weight:
50–70% lean white meat
18–30% of said fat
5–15% of said alcoholic liquid.

4,729,899

METHOD FOR CONTROLLED FAT INJECTION WITH STEAM IN A PELLET MILL

Joseph A. Volk, Jr., Florissant, and Mark R. Kniepmann, St. Louis, both of Mo., assignors to Beta Raven Inc., St. Louis, Mo.

Division of Ser. No. 755,082, Jul. 15, 1985, Pat. No. 4,678,424. This application May 4, 1987, Ser. No. 45,547
Int. Cl.[4] A23P *1/02, 1/08*
U.S. Cl. 426—307 6 Claims



1. A method for applying a coating of fat to pellets immediately as they are formed in a pellet mill, the pellet mill comprising a rotating die, the die having a plurality of holes through which the material to be pelleted is forced to form the pellets, said method comprising the steps of mixing the fat with steam and spraying the steam/fat mixture onto the pellets immediately as they emerge through the holes in the die.

4,729,900

FOAM-STABILIZED MALT BEVERAGE

Kenneth Clare, Vista; Margaret A. Lawson, and Walter Bryden, both of San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 22, 1986, Ser. No. 855,052
Int. Cl.[4] C12C *5/02*
U.S. Cl. 426—329 18 Claims

1. A process for improving the foam properties of a fermented malt beverage comprising adding to said beverage xanthan gum and a cold-water soluble protein in a weight ratio in the range of about 4:1 to 1:4, in a combined amount of about 5–400 ppm by weight of said beverage.

4,729,901

PROCESS FOR CANNING DRY BEANS AND OTHER LEGUMES

Louis B. Rockland, Moraga, and Thomas M. Radke, Santa Ana, both of Calif., assignors to Chapman College, Orange, Calif.

Filed Sep. 15, 1986, Ser. No. 907,397
Int. Cl.[4] A23B *9/00*
U.S. Cl. 426—634 26 Claims

1. A process for preparing canned legumes, comprising the steps of:
providing an aqueous hydrating medium capable of imparting quick cooking properties to said legumes, said medium containing about 1–3% by weight sodium chloride and a mixed carbonate/bicarbonate buffer to maintain the medium at a pH of about 8 to 9.5;
soaking dry legumes in said aqueous hydrating medium for a time of about ½ hour to 4 hours that is equal to between about 7% and about 30% of the time in said medium that would be necessary to render said legumes fully quick-cooking, wherein a fully quick cooking legume is a legume that may be cooked for the table in boiling water 20 minutes or less;
hermetically sealing the soaked legumes in a container with a liquid different from said hydrating medium; and
thermally processing the container of legumes in a still retort until said legumes are cooked and commercially sterilized.

4,729,902

ANIMAL AND FOWL FEED SUPPLEMENT AND PROCESS OF MANUFACTURE

Robert J. Urman; Robert L. Patton, both of Phoenix, Ariz., and Joseph B. Michaelson, North Hollywood, Calif., assignors to Control Feeds, Inc., Phoenix, Ariz.

Filed Aug. 11, 1983, Ser. No. 521,971
Int. Cl.[4] A23K *1/04*
U.S. Cl. 426—647 17 Claims

1. A method of converting a moist blood concentrate into an animal and fowl food supplement comprising the steps of:
dewatering a predetermined quantity of raw mammal blood to approximately 40 to 50 percent of its volume forming a moist blood concentrate and then drying the resulting moist blood concentrate to a predetermined moisture content,
blending the moist blood concentrate in a mixer,
treating the moist blood concentrate in the mixer with an acid solution to control its pH rating, thereby forming an acidified product,
said acidified product comprising a given solid particle content and a liquid blood serum, and
mixing together with the acidified product diatomaceous earth comprising diatoms in a substantially one-to-one ratio by weight with the acidified product until the diatomaceous earth encapsulates the particles of said concentrate and the blood serum is at least partially absorbed into the diatoms with the pH value of the resulting food supplement approximately 2.

4,729,903

PROCESS FOR DEPOSITING I-125 ONTO A SUBSTRATE USED TO MANUFACTURE I-125 SOURCES

James J. McGovern, Monroe, and Joseph M. Olynyk, Warwick, both of N.Y., assignors to Midi-Physics, Inc., Emeryville, Calif.

Filed Jun. 10, 1986, Ser. No. 872,721
Int. Cl.[4] B05D *5/00*
U.S. Cl. 427—5 11 Claims

1. A process for depositing I-125 on a substrate, which comprises

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(a) suspending a substrate of predetermined surface area in a pressure vessel,
(b) contacting the substrate with Xe-125 gas, whereby Xe-125 decays to I-125 gas, and
(c) depositing at least about 1 microcurie of I-125 gas as a solid on the surface of the substrate.

4,729,904

INERT CROSS-LINKED COPOLYMER SUPPORT, ITS PREPARATION PROCESS AND ITS USE FOR PRODUCING DELAYED ACTION MEDICAMENTS

Jeanne Berthet, Velizy Villacoublay; Marie-Francoise Blin, Versailles, and Gilbert Gaussens, Meudon, all of France, assignors to Compagnie ORIS Industrie S.A., Gif sur Yvette, France

Division of Ser. No. 525,404, Aug. 22, 1983, Pat. No. 4,590,068. This application Aug. 7, 1985, Ser. No. 763,253
Claims priority, application France, Jun. 30, 1980, 80 14529
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] A61K *9/22, 31/78*
U.S. Cl. 424—487 **11 Claims**

1. A process for slow release of a pharmaceutically active substance soluble in aqueous or alcoholic solutions which comprises:

absorbing the active substance in a powder comprising a cross-linked copolymer comprising 30–80% by weight of a monounsaturated alkyl acrylate and/or alkyl methacrylate wherein the alkyl acrylate is selected from the group consisting of butyl, hexyl and heptylacrylates and the methacrylate is selected from the group consisting of methyl, ethyl, butyl, hexyl and heptylmethacrylates, 5–68% by weight of acrylic and/or methacrylic acid and 12–15% by weight of bifunctional or trifunctional acrylate and/or methacrylate selected from the group consisting of polyethylene glycol diacrylate, trimethylol propane triacrylate and trimethylol propane triacrylate, and thereafter administering said powder to a patient whereby said active substance will slowly be released.

4,729,905

METHOD FOR PRODUCTION OF CUTTING TOOLS

Viktor P. Zhed, Moscow; Alexei G. Gavrilov, Domodedovo; Elena I. Kurbatova, Moscow; Andrei K. Sinelschikov, Moscow; Albert M. Boyarunas, Kharkov, and Vitaly M. Smirnov, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Instrumenta, Moscow, U.S.S.R.

Filed Jan. 9, 1987, Ser. No. 2,310
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—37 **1 Claim**

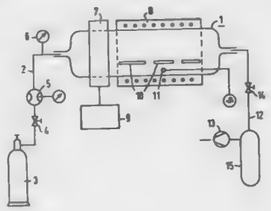
1. A method for production of cutting tools from an iron-based alloy, provided with a wear-resistant coating based on interstitial phases, comprising the steps:
(a) placing the cutting tool in a vacuum chamber provided with a cathode;
(b) applying a bias voltage to said cutting tool;
(c) striking an arc discharge in said vacuum chamber to evaporate the material of said cathode, wherein said cathode is comprised of at least one material selected from the group consisting of titanium and a titanium alloy;
(d) preheating and cleaning said cutting tool by bombarding it with the ions of said evaporable material of said cathode;
(e) reducing said bias voltage to that at which said wear-resistant coating is formed;
(f) feeding a reactant gas into said vacuum chamber;
(g) establishing said wear-resistant coating on the surface of said cutting tool by interaction of said ions of said evaporable cathode material with said reactant gas fed into said vacuum chamber;
(h) increasing said bias voltage to the value of said bias voltage effect for preheating and cleaning said cutting tool;
(i) feeding an oxygen-containing redox gas into said vacuum chamber;
(j) heating said cutting tool to the temperature of the eutectoid decomposition in the pseudobinary 'iron-titanium' system;
(k) annealing said cutting tool at the temperature of the martensitic transformation in said pseudobinary 'iron-titanium' system in an atmosphere of an oxygen-containing redox gas for 10 to 40 minutes.

4,729,906

METHOD FOR PRODUCING GLOW POLYMERISATE LAYERS

Wolfgang Kleeberg, Erlangen; Johann Kammermaier, Unterhaching; Gerhard Rittmayer, and Rolf-Winfried Schulte, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 630,717, Jul. 13, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,937
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 33263779
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—41 **6 Claims**



1. A process for the formation of polymer layers on a substrate comprising glow discharging fluorocarbon monomers at a high frequency and a low pressure wherein said glow discharging is conducted by means of a hollow wave conductor and in the absence of a carrier gas in the microwave range of between 0.5 and 1,000 GHz and wherein the substrate is disposed outside of the hollow wave conductor and wherein the amplitude E_0 of the effective field strength in the vicinity of said substrate is no greater than 850 V/cm.

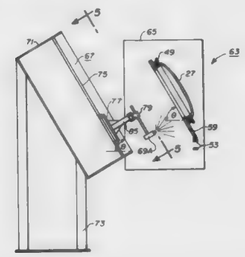
4,729,907

METHOD OF MAKING A VIEWING SCREEN STRUCTURE FOR A CATHODE-RAY TUBE

Samuel B. Deal, and Richard A. Lambert, both of Manheim Township, Lancaster County, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 24, 1987, Ser. No. 17,726
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—64 **5 Claims**

1. In a method of making a viewing screen structure for a cathode-ray tube having a faceplate panel, a viewing screen on a portion thereof and a metal layer on said viewing screen, the steps subsequent to producing said metal layer comprising
(A) preheating said panel in a preheat oven,
(B) conveying said heated panel to a tilt station by means of a transport device.
(C) tilting said panel to a 60°±10° angle relative to a horizontal plane.
(D) loading said tilted panel onto a carrier.
(E) advancing said carrier and said guns being perpendicular to said panel by means of said transport device in a first direction through a spray assembly including a spray booth and a plurality of spray guns mounted on a reciprocating device which is parallel to said carrier, said reciprocating device moving said spray guns in a second and a third direction, said second and third direction being different from said first direction,
(F) activating and deactivating one of said spray guns to deposit on said metal layer a barrier coating of a volatilizable film-forming material.



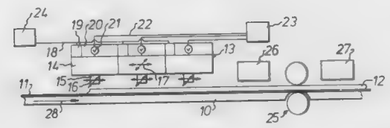
(G) and sequentially activating and deactivating the remaining spray guns to deposit on the barrier-coated metal layer multiple coatings of a heat absorptive overcoating.

4,729,908

METHOD FOR MAKING DECORATIVE PLASTIC WEBS OR SHEETS, DEVICE FOR CARRYING OUT THE METHOD, AND DECORATIVE PLASTIC WEB OR SHEET

Heinz Mahrle, Ronneby, Sweden, assignor to Tarkett AB, Sweden

Filed Feb. 11, 1986, Ser. No. 828,639
Claims priority, application Sweden, Feb. 14, 1985, 8500676
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—286 **9 Claims**



1. Method for making decorative plastic webs having pattern forming areas extending throughout at least a substantial part of the thickness of the web, wherein plastic materials of sprayable type and of different appearance are sprayed in a predetermined amount by means of nozzles onto a carrier web in different areas at predetermined time intervals during which said nozzles and said carrier web are displaced in relation to each other, said nozzles being moved independently of each other throughout the entire width of the web whereupon said plastic materials are cured.

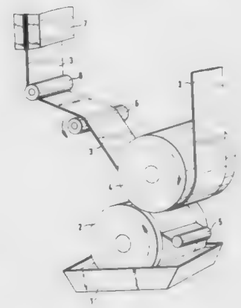
4,729,909

PROCESS FOR PRODUCTION OF METAL-COATED PAPER

Wolfgang Noack, Velden, Fed. Rep. of Germany, assignor to Eckart-Werke Standard Bronzepulver-Werke Carl Eckart, Furth

Continuation of Ser. No. 629,805, Jul. 11, 1984, abandoned. This application Nov. 18, 1986, Ser. No. 931,967
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326457
Int. Cl.[4] B41M *1/10, 1/22*
U.S. Cl. 427—288 **36 Claims**

1. A process for producing metal-coated paper by applying a printing ink to a paper carrier material, the process comprising the steps of:
(a) preparing a printing ink with a coating material made by first forming a metal pigment paste containing a solvent which has an evaporation index of below 25 and metal particles having a flake structure and of a non-leafing grade, and then fully wetting the metal particles thereabout of the pigment paste by a resin binding agent; and



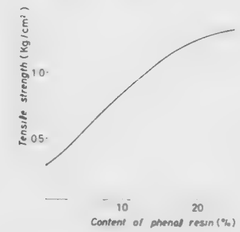
(b) applying the printing ink to the paper carrier material by an intaglio printing process in a thickness corresponding to a coating weight of from 0.5 to 10 g/m^2, wherein the proportion of metal in the coating is from 5 to 90% by weight with respect to the total weight of the coating.

4,729,910

REINFORCED FLEXIBLE GRAPHITE SHEET

Hiroyuki Fukuda; Masatomo Shigeta; Hisatsugu Kaji, all of Iwaki, and Kuniyuki Saitoh, Abiko, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,562
Claims priority, application Japan, Apr. 10, 1984, 59-71659
Int. Cl.[4] B05D *3/02, 3/12*
U.S. Cl. 427—294 **7 Claims**



1. A process for preparing a reinforced flexible graphite sheet which comprises:
(a) subjecting a flexible graphite sheet and a solution of phenolic resin adhesive to preliminary de-aeration treatment in a pressure reduction device;
(b) immersing the flexible graphite sheet subjected to the preliminary de-aeration treatment into the solution of phenolic resin adhesive subjected to the preliminary de-aeration treatment;
(c) subjecting the immersed sheet and the adhesive solution to a pressure reducing treatment comprising (i) disposing the graphite sheet impregnated with the adhesive solution together with the vessel containing the adhesive solution in the pressure reduction device, and (ii) subjecting the sheet and solution to subsequent de-aeration treatment;
(d) taking the graphite sheet out of the pressure reduction device;

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(e) removing adhesive deposited on the surfaces of the sheet; and
(f) hardening the adhesive using a hot press.

4,729,911

WOOD GOLF CLUB HEADS, PROCESS OF TREATING THEM, AND APPARATUS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Jun. 27, 1986, Ser. No. 879,415
Int. Cl.[4] B05D *1/18, 3/00;* C23C *14/00*
U.S. Cl. 427—297 5 Claims

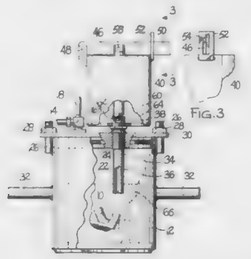


FIG. 3

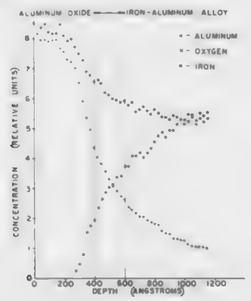
1. The process of treating driver and fairway type wood golf club heads comprising the steps of:
first subjecting the heads to a vacuum source of at least 20 inches mercury and holding such vacuum for a selected time to withdraw entrained air and to stabilize the wood,
providing a single immersion of the heads in a solution of impregnating material while under the vacuum condition,
shutting off the vacuum source while the heads are still immersed,
subjected the heads while immersed to an elevated pressure of at least 100 psi,
removing the pressure condition, and drying the heads.

4,729,912

OXIDATION RESISTANT FERROUS BASE FOIL AND METHOD THEREFOR

Farrell M. Kilbane, Centerville, and F. Curtiss Dunbar, West Chester, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Division of Ser. No. 741,282, Jun. 4, 1985, Pat. No. 4,686,155.
This application May 8, 1987, Ser. No. 48,011
Int. Cl.[4] C23C *2/12*
U.S. Cl. 427—376.8 6 Claims



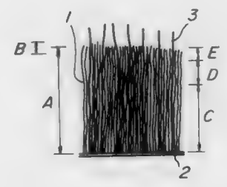
1. A method of making an aluminum coated ferrous base metal foil having improved oxidation resistance at elevated temperatures, improved wet corrosion resistance, and surfaces adapted to bond securely to a ceramic, heat resistant catalyst support material, comprising the steps of:
hot dip coating a ferritic base metal strip in a bath of molten aluminum, said strip having a thickness of at least 0.25 mm and containing from 10% to about 35% chromium, up to 3% aluminum, up to 1% silicon, and balance essentially iron;
finishing the molten aluminum coating to provide a coating thickness ranging from 0.013 to 0.13 mm on each side and a total aluminum content of at least 4% by weight;
cold reducing the aluminum coated strip to a foil having a thickness not greater than 0.13 mm without intermediate annealing wherein the ratio of total aluminum coating thickness to base metal thickness is at least 1:10; and
heating said foil in an oxidizing atmosphere within the range of about 600° to about 1200° C. with a time at temperature ranging from about 1 second to about 1 hour in accordance with the relationship:
1210>temperature (°C.)+1/6×time (seconds)>600,
whereby to produce a porous surface having a matte gray appearance.

4,729,913

CHINCHILLA-LIKE ARTIFICIAL FUR

Masao Matsui, Takatsuki; Kazuo Okamoto, Osaka; Tsutomu Naruse, and Taro Murata, both of Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 915,298
Claims priority, application Japan, Oct. 11, 1985, 60-227460; Dec. 9, 1985, 60-277257
Int. Cl.[4] A41D *5/00*
U.S. Cl. 428—15 14 Claims



1. A chinchilla-like artificial fur comprising a substrate fabric and pile fibers secured to at least one side of said fabric and projecting therefrom, in which
(a) said pile fibers comprise underhairs having a fineness in the range of from 0.5 to less than 4.0 deniers, an average length in the range of from 10 to 35 mm, a hair density in the range of from 8,000 to 30,000 hairs/cm^2 and a crimp ratio of 20% or less,
(b) said pile fibers have a minimum frictional coefficient (M_1) of 1.6 or less and (M_1) is measured in a first direction in which said pile fibers are inclined, and
(c) the ratio (M_2/M_1) is the range of from 1.0 to 1.4, wherein M_2 is the frictional coefficient in a second direction which lies at an angle of 180° to said first direction.

4,729,914

HYDROPHILIC COATING AND SUBSTRATE COATED THEREWITH

Charles K. Kliment, Princeton, and George E. Seems, Pennington, both of N.J., assignors to Tyndale Plains-Hunter Ltd., Princeton, N.J.

Continuation of Ser. No. 814,906, Dec. 30, 1985, abandoned.
This application May 22, 1987, Ser. No. 56,338
Int. Cl.[4] B32B *7/04, 27/40, 31/06*
U.S. Cl. 428—36 15 Claims

1. An article having thereon a coating which swells in the presence of aqueous media with concomitant reduction in the coefficient of friction, the said article being produced by:
applying to a substrate, an adherent coating having free isocyanate groups;
applying to the so-coated substrate a second coating of a vinyl copolymer having a major polymeric component derived from N-vinylpyrrolidone and a minor polymeric component derived from an ethylenically unsaturated monomer containing reactive hydrogens, and
heating the coated substrate to curing temperatures to effect reaction between the active hydrogens and isocyanate groups thereby chemically binding the copolymer coating to the adherent isocyanate coating.
14. The article according to claim 1 wherein the substrate is a gastroenteric feed tube.

4,729,915

ELECTRICAL INSULATING MATERIAL

Seiji Sakamoto, Machida, and Yoshinori Sato, Yokohama, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 930,116
Claims priority, application Japan, Nov. 13, 1985, 60-254315
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—141 12 Claims

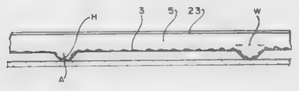
1. An electrical insulating material, which comprises: a biaxially oriented polyethylene naphthalate film having a center line average roughness of 0.008 to 0.08 μm as measured on the surface thereof and a volume resistivity of 5×10^7 to 5×10^{10} Ω-cm as measured in the molten state.

4,729,916

THERMAL PROTECTIVE SYSTEM

Rubin Feldman, St. Louis County, Mo., assignor to Thermal Science, Inc., St. Louis, Mo.

Division of Ser. No. 410,454, Aug. 23, 1982, Pat. No. 4,493,945.
This application Nov. 29, 1984, Ser. No. 676,418
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—182 24 Claims



24. A fire wall comprising a core of relatively heavy sheet mesh, a continuous layer of an active thermal protective material on each side of said mesh core, a relatively light mesh applied to the exterior of said active thermal protective material on at least one side of said core, and a relatively light mesh support structure having a plurality of spacers formed integrally therein, said spacers being in contact with said core and holding said thermal protective material, through a major part of its extent, spaced from said core.

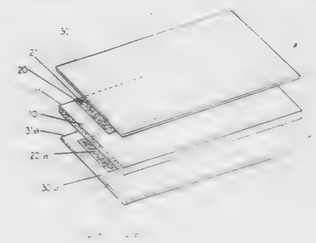
4,729,917

METHOD AND LAMINATE FOR THERMOFORMING AUTOMOBILE HEADLINERS AND LIKE THREE DIMENSIONAL OBJECTS

Andrew J. Symdra, Grand Rapids, Mich., and Harry J. Rozek, Athens, Ga., assignors to Sackner Products Inc., Grand Rapids, Mich.

Filed Oct. 24, 1986, Ser. No. 922,697
Int. Cl.[4] B32B *3/00, 31/00*
U.S. Cl. 428—190 58 Claims

30. A thermoformable laminate comprising:
a relatively stiff, thermoformable foam core, a porous, nonextendable material laminated thereto and a fabric laminated to and covering said porous, nonextendable layer, wherein said porous, nonextendable layer is arranged so as to be subject to two dimensional contouring in a thermoforming process, and is arranged so as not to extend into areas of the laminate which will be subject to severe three dimensional contour formation, and is sufficiently porous to have better sound absorbing properties than a polymeric film material or a material such as kraft paper.



4,729,918

METHOD OF USING POWDERS TO CURE SOLVENT FREE INKS

William B. Neuberg, Perrineville, and John J. Aclin, Bricktown, both of N.J., assignors to Shamrock Chemical Corporation, Newark, N.J.

Division of Ser. No. 640,326, Aug. 13, 1984, Pat. No. 4,615,911.
This application Oct. 6, 1986, Ser. No. 915,812
Int. Cl.[4] B05D *5/02*
U.S. Cl. 428—207 11 Claims



1. A half-tone printed surface cured according to a process for curing solvent free ink, wherein resin powder is applied to a printed surface on a web and cured, the inmprovement wherein a caulstock laminate having a release agent is applied to said powdered, printed surface of said web, wherein said web and said caulstock are heated, wherein said web and said caulstock are pressed together, wherein said web and said caulstock are cooled, and wherein said caulstock is peeled from said web.

4,729,919

PROTECTIVE BARRIER COATING FOR STYROFOAM USING AN UNSATURATED THERMOSETTABLE RESIN COMPOSITION

James C. Uroda, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 4, 1987, Ser. No. 81,417
Int. Cl.[4] B32B *3/26, 5/16, 7/04*
U.S. Cl. 428—215 10 Claims

5. A plastic product having a protective external surface comprising:
(a) a bottom layer having a surface to be protected, the bottom layer being a foamed vinyl aromatic polymer;
(b) a latex aggregate layer over the bottom layer, the latex aggregate layer being a copolymer system of butadiene

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and styrene or vinylidene chloride or styrene-vinylidene chloride;
(c) a top layer over the latex and aggregate layer made of
(1) a fine particulate solid or aggregate with
(2) a thermosetting resin mixture of ethylenically unsaturate monomers, and or more of:
(a) unsaturated polyester or polyesteramide resins,
(b) norborynyl modified unsaturated polyester or polyesteramide resins,
(c) hydrocarbon modified unsaturated polyester or polyesteramide resins,
(d) vinyl ester resins, or
(e) mixtures of the foregoing resins.

8. The product of claim 5 wherein:
(a) the bottom layer is a closed cell foam of any thickness;
(b) the latex layer has a thickness that expands to cover the bottom layer to a depth of up to about 20 mils;
(c) top layer incorporates said particulate solid or aggregate homogeneously distributed throughout and over the expanse of the bottom layer and has a thickness of 50 to about 250 mils.

4,729,920

CURABLE FABRIC

Robert H. McLoughlin, Swindon; Kenneth B. Pithouse, South Marston, and David J. Barker, Faringdon, all of England, assignors to Raychem Limited, United Kingdom

Continuation of Ser. No. 583,458, Feb. 24, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,849
Claims priority, application United Kingdom, Feb. 25, 1983, 8305313
Int. Cl.[4] B32B 27/02, 27/08; D03D 15/04
U.S. Cl. 428—229 18 Claims

1. A fabric comprising dimensionally-recoverable fiber, filament, or yarn fabric members, which fabric carries first and second components of a heat curable composition which can be cured by reaction together of the first and second components when the fabric is heated to a curing temperature, at least the first component being in the form of fiber, filament, or yarn fabric members separate from the dimensionally recoverable fabric members.

4,729,921

HIGH DENSITY PARA-ARAMID PAPERS

Edward W. Tokarsky, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 662,938, Oct. 19, 1984, abandoned. This application Sep. 17, 1985, Ser. No. 775,577
Int. Cl.[4] P04H 1/58; D21H 5/12
U.S. Cl. 428—288 15 Claims

1. High density para-aramid paper for use in an electrical circuit board laminates having low coefficient of thermal expansion comprising 5 to 15 percent, by weight, based on the total solids content of the paper, of a polymeric binder of aramid fibrids and short para-aramid fibers made up of 0–50 volume percent para-aramid pump and 50–100 volume percent para-aramid floc having lengths of 0.8 to 12.7 mm, the fibers being compacted at a nip pressure of 1500 to 5000 lbs/inch (268 to 894 kg/cm) to provide a volume percent para-aramid fiber in the paper of at least 53 minus 0.13 times the volume percent para-aramid floc in the fibers.

4,729,922

MAGNETIC RECORDING MEDIUM

Kiyomi Ejiri; Hideaki Koshu, and Akihiro Matsufuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 12, 1986, Ser. No. 929,316
Claims priority, application Japan, Nov. 11, 1985, 60-250839; Nov. 11, 1985, 60-250840
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—328 6 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer containing magnetic particles dispersed in a binder, wherein said magnetic layer contains acicular Cr_2O_3 having an average length in the long axis of 1.0 μm or less, an average length in the short axis of 0.1 μm or less and an acicular ratio (long axis/short axis) of from 5/1 to 20/1 in an amount of from 1 to 20 wt % based on the total weight of the magnetic particles, and wherein the binder contains at least one material selected from the group consisting of a polyurethane having a glass transition temperature (Tg) of from 0° to 95° C. or containing a metal sulfonate group, or a vinyl chloride resin containing a metal sulfonate group.

4,729,923

NYLON CONTAINING METAL SALTS

William T. Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1986, Ser. No. 860,251
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—372 1 Claim

1. A polyamide fiber consisting essentially of 1–6% nylon, 6, 94–99% nylon 66 and 0.001–2% of an inorganic metal salt, wherein said inorganic metal salt is calcium acetate and characterized by a cold dye rate of greater than 1000 after steam heatsetting at 132° C. and a spherulite rating of 1.

4,729,924

METALLIC THIN FILM MAGNETIC RECORDING MEDIUM HAVING A HARD PROTECTIVE LAYER

Joseph Skorjanec, White Bear Lake, and Carmen D. Moe, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1984, Ser. No. 684,735
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—422 2 Claims

1. A ferromagnetic recording medium comprising:
(A) a non-magnetic substrate;
(B) a magnetic layer on said substrate comprising a cobalt/-chromium alloy having an atomic ratio of cobalt to chromium between about 75/25 and 90/10, the cobalt of which is all metallic cobalt;
(C) a bonding layer, between about 40 and 300 Angstroms thick, on the magnetic layer of part (B) comprising reaction products of cobalt and chromium selected from the group consisting of oxides, nitrides and carbides of cobalt and chromium and combinations of such oxides, nitrides and carbides, said bonding layer providing a surface which is completely oxidized, nitrides and or carburized and having a substantial absence of metallic cobalt and chronium; and
(D) a lubricant layer on the bonding layer of part (C), said lubricant comprising a primer layer and a perfluoropolyether having the formula

$$Q(R_f)_kC_aF_{2a}—Z$$

wherein Q comprises a polymerizable terminally unsaturated group attached to R_f, which represents a plurality of randomly distributed perfluoroalkylene oxide repeating units which may be branched or straight chain structures represented by the formula $—C_aF_{2a}O—$ in which a of each unit is independently an integer of 1 to 4, k is the number of such units having a value of from 1 to 300 such that the segment R_f has a number average molecular weight of 500 to 20,000 and Z is selected from $—OC_aF_{2a+1}$ and Q, there being no layer in between the bonding layer and the lubricant layer.

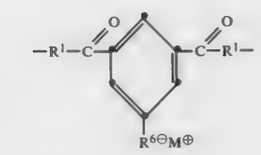
4,729,925

POLYURETHANE ELASTOMERS COMPRISING A CHARGE-CONTROL AGENT AND SHAPED ELEMENTS THEREFROM

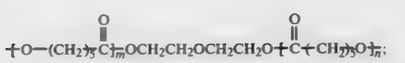
Tsang J. Chen, Rochester; Donald A. Upson, Webster, and Paul D. Yacobucci, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,127
Int. Cl.[4] C08G 18/30
U.S. Cl. 428—425.8 7 Claims

1. A polyurethane elastomer formed from a composition comprising in approximately stoichiometric amounts:
(a) a polyisocyanate prepolymer which is the reaction product of:
(i) an aliphatic polyisocyanate, and
(ii) an amine-based polyol; and
(b) a hardening mixture comprising:
(i) a polyol selected from the group consisting of amine-based polyols, polyether polyols and mixtures thereof, and
(ii) from 1 to 8 weight percent based on the total weight of
(b) of a charge-control agent having the formula:



R^1 represents



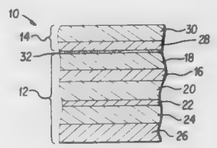
R^6 represents sulfonate, oxyphenylene sulfonate, oxycyclohexylene sulfonate or p-toluenesulfonamidosulfonyl;
m and n are integers which together are of sufficient value to achieve an R^1 molecular weight of 300 to 30,000;
M represents hydrogen, an alkali metal, ammonium or $P^+(C_6H_5)_3CH_3$.

4,729,926

PACKAGING MATERIAL FOR LONG-TERM STORAGE OF SHELF STABLE FOOD PRODUCTS AND METHOD OF MAKING SAME

Randal M. Koteles, Gray Court, and John G. Bradfute, Greer, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 864,170, May 16, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 936,997
Int. Cl.[4] B32B 27/08, 27/30, 27/32, 27/34
U.S. Cl. 428—474.7 16 Claims



8. A thermoplastic laminate comprising:
(a) a first substrate comprising a layer of an ethylene vinyl alcohol copolymer and a layer of a polyamide;
(b) a second substrate comprising a vinylidene chloride copolymer; and
(c) a third substrate disposed between and bonded by a lamination adhesive to the first and second substrates and comprising a polyamide.

4,729,927

POLYESTER PACKAGING MATERIAL

Masahiko Hirose; Takatoshi Kuratsuji, and Toshihiro Santa, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 21, 1985, Ser. No. 800,454
Claims priority, application Japan, Nov. 22, 1984, 59-245885; Feb. 5, 1985, 60-19241
Int. Cl.[4] B32B 27/08, 27/36; C08L 67/02, 67/04
U.S. Cl. 428—480 9 Claims

1. A polyester packaging material having excellent resistance to the permeation of gases, said material comprised of a polyethylene terephthalate component and a component of polyethylene isophthalate copolymerized with 5 to 60 mole% of an aliphatic hydroxycarboxylic acid having up to 8 carbon atoms and wherein the copolymerized polyethylene isophthalate component is present in such an amount that the content of the units of the aliphatic hydroxycarboxylic acid is 3 to 25 mole% based on the total polyester.

4,729,928

DURABLE HIGH GLOSS WATER-BASED COATING COMPOSITION

Attilio V. Schiappa, 7808 NW. 79th Pl., Kansas City, Mo. 64152, and Wilson M. Ferrell, 928 Sunset Ave., Petersburg, Va. 23805

Filed Apr. 10, 1987, Ser. No. 36,634
Int. Cl.[4] B05D 3/02; C08K 5/34; B32B 23/08
U.S. Cl. 428—514 23 Claims

1. A coating composition comprising ethylene acrylic acid (EAA) and N-methylpyrrolidone (NMP).

8. A durable high gloss article of manufacture comprising a printed substrate and the composition of claim 1 as a coating thereon.

9. The article of claim 8 wherein the substrate is paper.

4,729,929

HIGHLY CORROSION RESISTANT ALUMINIZED STEEL SHEET FOR THE MANUFACTURE OF PARTS OF EXHAUST GAS SYSTEM

Ken-ichi Shinoda, and Shohei Fujita, both of Hiroshima, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

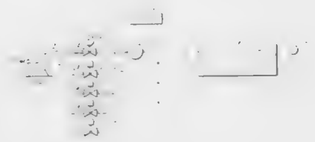
PCT No. PCT/JP86/00012, § 371 Date Aug. 27, 1986, § 102(e) Date Aug. 27, 1986, PCT Pub. No. WO86/04361, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 14, 1986, Ser. No. 905,916
Claims priority, application Japan, Jan. 17, 1985, 60-6294
Int. Cl.[4] B32B 15/18
U.S. Cl. 428—653 5 Claims



1. A highly corrosion resistant aluminized steel sheet suitable for use in the manufacture of parts of an exhaust gas system, comprising a steel substrate consisting essentially of, in % by weight, up to 0.08% of C, from 0.10 to 1.50% of Si, up to 0.50% of Mn, and from 0.10 to 0.50% of Cu, the balance being Fe and unavoidable impurities, having on its surfaces hot dip coated aluminum layers.

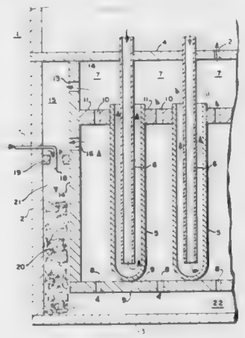
VOL 1088 ISS 2 MR 8 1988 UMI

4,729,930
AUGMENTED AIR SUPPLY FOR FUEL CELL POWER PLANT DURING TRANSIENT LOAD INCREASES
Daniel W. Beal, East Hartford, and Glenn W. Scheffler, Tolland, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.
Filed May 29, 1987, Ser. No. 55,570
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—13 **6 Claims**



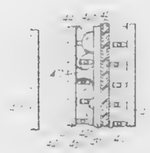
1. In a fuel cell power plant, a system for supplying air to an oxygen side of the cells in the plant, said system comprising:
(a) conduit means for feeding air to said oxygen side of said plant;
(b) a constant speed blower connected to said conduit means for blowing an air stream into said conduit means at a constant velocity;
(c) a motorized control valve in said conduit means between said blower and said oxygen side, said control valve being adjustable to vary the amount of air flowing to said oxygen side;
(d) branch conduit means opening into said conduit means for providing an air flow path from said blower to said oxygen side which bypasses said control valve;
(e) fast acting valve means in said branch conduit means, said fast acting valve means being relatively instantly transformable from a closed condition to an open condition and return, and said fast acting valve means being normally in said closed condition;
(f) flow meter means in said conduit means for measuring amounts of oxygen flowing from said control valve and said fast acting valve means to said oxygen side;
(g) current monitoring means connected to a loaf line from the power plant for monitoring load changes imposed upon the cells in the power plant; and
(h) microprocessor means for controlling operation of said system, said microprocessor means being operably connected to said current monitoring means, to said flow meter means, to said fast acting valve means, and to said control valve, said microprocessor means being operable to:
(i) receive load and oxygen flow data from said monitoring and sensor means respectively;
(ii) continually determine if said control valve is capable of providing sufficient oxygen to satisfy existing load demands;
(iii) open said control valve incrementally when said control valve can independently provide increased oxygen in a timely manner responsive to increased load demand; and
(iv) open said fast acting valve means and simultaneously open said control valve in continued fashion, when said control valve cannot independently provide increased oxygen in a timely manner responsive to increased load demand, whereby the power plant will not suffer from oxygen starvation during transient increases in load demand.

4,729,931
REFORMING OF FUEL INSIDE FUEL CELL GENERATOR
Ralph E. Grimble, Finleyville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 3, 1986, Ser. No. 926,300
Int. Cl.[4] H01M *8/06, 8/18, 8/22*
U.S. Cl. 429—17 **13 Claims**



1. In a solid oxide fuel cell generator having a plurality of individual fuel cells in a refractory container, where said fuel cells generate a partially spent fuel stream and a partially spent oxidant stream, an improved method of reforming a gaseous reformable fuel within said container comprising
(A) dividing said partially spent fuel stream into two streams, spent fuel steam I and spent fuel stream II;
(B) burning spent fuel stream I with said partially spent oxidant stream inside said refractory container to produce an exhaust stream;
(C) dividing said exhaust stream into two streams, exhaust stream I and exhaust stream II;
(D) venting exhaust stream I;
(E) mixing exhaust stream II with spent fuel stream II for form a recycle stream;
(F) mixing said recycle stream with said gaseous reformable fuel within said refractory container to form a fuel stream; and
(G) supplying said fuel stream to said fuel cells.

4,729,932
FUEL CELL WITH INTEGRATED COOLING WATER/STATIC WATER REMOVAL MEANS
James F. McElroy, Suffield, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Oct. 8, 1986, Ser. No. 916,584
Int. Cl.[4] H01M *8/04, 8/06*
U.S. Cl. 429—34 **6 Claims**

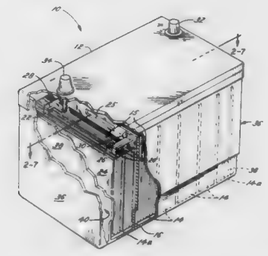


1. A fuel cell comprising at least one individual fuel cell, each individual fuel cell comprising:
(a) a barrier plate bounding one side of the individual fuel cell,
(b) an anode chamber,

(c) a solid polymer electrolyte membrane having two opposite surfaces separating the anode chamber from a cathode chamber,
(d) an anode within the anode chamber in intimate contact with one surface of the solid polymer electrolyte membrane,
(e) a cathode in intimate contact with the other surface of the solid polymer electrolyte membrane,
(f) a structure of a hydrophobic porous material in intimate contact with the cathode,
(g) a cathode chamber,
(h) a gas/water separator associated with the cathode and bounding the other side of the individual fuel cell wherein the gas/water separator includes a porous, hydrophilic structure which is permeable to liquid but impermeable to gas flow at gas pressures below the "bubble pressure P" of the porous hydrophilic structure wherein the "bubble pressure P" is related to the pore size of the structure by the relationship

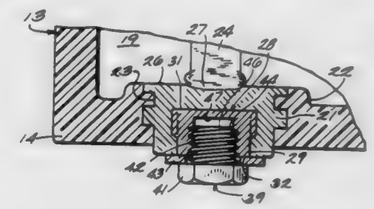
$$P = \frac{2\ (\text{surface tension})}{(\text{pore radius for nominally circular pores})}.$$

4,729,933
SEALED ABSORBED ELECTROLYTE BATTERY WITH BULGE COMPENSATING END CELLS
Thomas L. Oswald, Roseville, Minn., assignor to GNB Incorporated, Mendota Heights, Minn.
Filed Feb. 11, 1987, Ser. No. 17,282
Int. Cl.[4] H01M *2/02*
U.S. Cl. 429—59 **9 Claims**



1. A sealed absorbed electrolyte battery comprising, in combination:
a sealed container divided into a plurality of working cells by internal partition walls;
each working cell containing an electrode stack comprising a plurality of positive and negative plates and a plurality of substantially porous separators intimately contacting and separating said positive and negative plates;
an electrolyte substantially completely absorbed in said plates and separators;
the working cells being dimensioned to hold the plates and separators within the working cell in contact with each other; and
bulge compensating auxiliary cells for accommodating gas pressure changes within the battery without substantially deforming the working cells.

4,729,934
BATTERY SIDE TERMINAL
Henry J. Krystaszek, 893 Cypress Lake Cir., Fort Myers, Fla. 33907
Filed Nov. 25, 1986, Ser. No. 934,679
Int. Cl.[4] H01M *2/30*
U.S. Cl. 429—179 **12 Claims**



1. A side terminal battery comprising:
a casing having a side wall made from a moldable material; and
a plug formed of relatively deformable, electrically conductive, corrosion resistant material molded into said side wall to form a seal between the interior and exterior of said casing and including a battery terminal insert embedded therein so as to be exposed at the exterior of said casing and isolated, by said plug, from the interior of said casing, said battery terminal insert comprising:
an elongate one-piece corrosion resistant member formed of electrically conductive, relatively non-deformable material and including an exterior having a generally circular cross section and an interior cavity having an open end for receiving a threaded battery connector fastener and a closed end for isolating said interior cavity from said plug, and further including a plurality of circumferentially spaced, axially extending serrations in said exterior for securing said insert within said relatively deformable material to resist rotation of said insert relative to said plug when less than a predetermined maximum torque is applied on said insert and to permit rotation of said insert relative to said plug when said predetermined maximum torque is exceeded so as to maintain the seal between said plug and said side wall despite overtightening of the threaded battery connector fastener within said cavity.

4,729,935
PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES UTILIZING A NEGATIVE WORKING DIAZO CONTACT FILM
John E. Walls, Hampton, and Major S. Dhillon, Belle Mead, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Continuation-in-part of Ser. No. 359,460, Mar. 18, 1982, Pat. No. 4,448,873, and a continuation-in-part of Ser. No. 565,667, Dec. 27, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 789,236
Int. Cl.[4] G03F *1/00, 7/08;* **G03C** *1/78*
U.S. Cl. 430—5 **14 Claims**

1. A process for the production of a processed photographic element capable of functioning as a photomask which comprises coating a transparent support with a photosensitive composition and drying, then imagewise exposing said coating to a patter of actinic radiation and subsequently developing said exposed coating with a developer, said coating comprising in admixture a light sensitive negative working diazonium composition having a light absorbency of about 45% of less, when exposed to an energy source in the range of from about 350 to about 390 nanometers, said percentage light absorbency being determined using a spectrophotometer by comparing the absorbency of 0.001 grams of said diazonium composition dissolved in 100 milliliters of a solvent to the absorbency of 100

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milliliters of said solvent, and a colorant composition comprising a mixture of dyes, said coating having a light transmission of not more than about 0.1% in the 350 to 390 nanometer range, and is capable of being rendered substantially insoluble upon exposure to ultraviolet radiation at an energy level of from at least about 15 mJ/cm^2 and wherein the non-radiation-exposed areas are substantially removable upon treatment with a developer.

4,729,936

IMAGE FORMING PROCESS INCLUDING A HEATING STEP

Hiroshi Kitaguchi; Kozo Sato, and Masatoshi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 27, 1986, Ser. No. 867,176

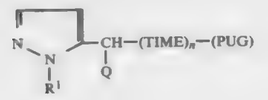
Claims priority, application Japan, May 24, 1985, 60-111596

Int. Cl.^{4} G03C *5/26, 5/34, 5/54, 1/00*

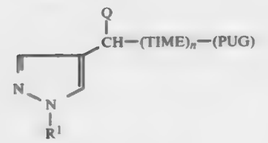
U.S. Cl. 430—151 **8 Claims**

1. An image forming process including heating a diazo or silver halide photographic material, which process comprises conducting said heating step in the presence of at least one compound represented by formula (I), (II), or (III)

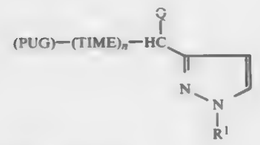
(I)



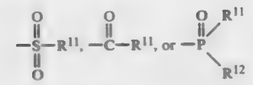
(II)



(III)



wherein R^1 represents



wherein R^{11} and R^{12} each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted alkyloxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group or a substituted or unsubstituted amino group, or R^{11} and R^{12} together form a 5-membered or 6-membered ring; Q represents a hydrogen atom or a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group or a substituted or unsubstituted aryl group, or Q represents a group linked to the pyrazole ring, TIME, or PUG either directly or through another atom to form a ring; TIME represents a timing group; PUG represents a photographically useful group; and n represents 0 or a positive integer.

4,729,937

LAYERED AMORPHOUS SILICON ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISES BN SURFACE LAYER AND BN BARRIER LAYER

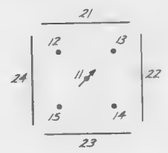
Mutsuki Yamazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1986, Ser. No. 943,190

Claims priority, application Japan, Dec. 26, 1985, 60-291866; Feb. 24, 1986, 61-38792

Int. Cl.^{4} G03G *5/14*

U.S. Cl. 430—65 **18 Claims**



1. An electrophotographic photosensitive member comprising:

a substrate;

a photoconductive layer comprising boron-containing amophous silicon;

a barrier layer, provided between said substrate and said photoconductive layer, for substantially inhibiting injection of carriers from said substrate to said photoconductive layer and;

a covering layer provided on said photoconductive layer, said barrier layer and said covering layer consisting essentially of boron nitride.

4,729,938

OPTICAL DISC BASE PLATE HAVING A PRIMER LAYER FORMED OF AN ULTRAVIOLET-CURED RESIN COMPOSITION

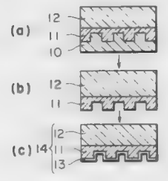
Tetsuo Tajima; Hiroaki Miwa, both of Fujisawa, and Ryoichi Sudo, Yokosuka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Maxell Ltd., both of, Japan

Filed Nov. 8, 1985, Ser. No. 798,244

Claims priority, application Japan, Nov. 13, 1984, 59-237418

Int. Cl.^{4} G03C *1/80, 1/72;* **B03C** *3/02;* **G01D** *9/00*

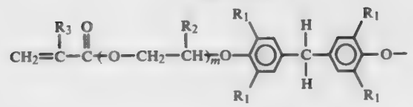
U.S. Cl. 430—272 **16 Claims**

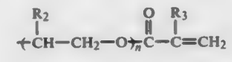


1. An optical disc base plate comprising a transparent substrate, a primer layer formed on the substrate and having depressions and protuberances for carrying information signals, and a recording film formed on the primer layer, said primer layer being obtained by curing with ultraviolet light irradiation an ultraviolet-curable resin composition comprising at least one compound selected from the compounds of the formulae:

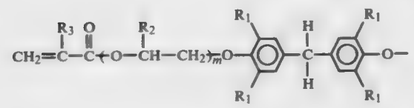
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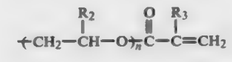
(1)



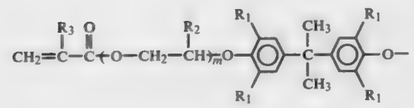


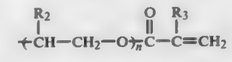
(2)





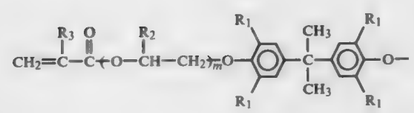
(3)

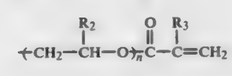




and

(4)





wherein R_1 is hydrogen or a halogen; R_2 is an alkyl group having 1 to 12 carbon atoms; R_3 is hydrogen or a methyl group; m and n are independently an integer of 1 to 4, and a photopolymerization initiator.

2. An optical disc base plate according to claim 1, wherein the photopolymerization initiator is used in an amount of 0.01 to 5 parts by weight based on 100 parts by weight of the compounds of the formulae (1) to (4).

4,729,939

ALUMINUM ALLOY SUPPORT FOR LITHOGRAPHIC PRINTING PLATES

Yasuhisa Nishikawa; Tadayuki Katoh; Misako Kawasaki, all of Ihara, and Kazushige Takizawa, Haibara, all of Japan, assignors to Nippon Light Metal Company Limited, Tokyo and Fuji Photo Film Co. Ltd., Minamiashigara, both of, Japan

Filed Jul. 23, 1986, Ser. No. 888,255

Claims priority, application Japan, Jul. 25, 1985, 60-162871; Sep. 30, 1985, 60-214630

Int. Cl.^{4} G03C *1/94*

U.S. Cl. 430—278 **7 Claims**

1. A photosensitive lithographic printing plate comprising an aluminum alloy support plate and a photosensitive layer thereon, said plate having been produced by cold rolling into plate form an aluminum alloy consisting essentially of Mg 0.05 to 3 wt %, Si 0.05 to 0.7 wt %, Zr 0.01 to 0.25 wt %, and Fe 0.05 to 0.4 wt %, with the balance being Al and impurities, the plate surface having been subjected to a graining treatment.

4,729,940

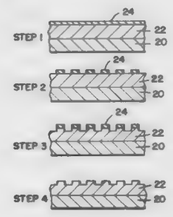
METHOD OF MANUFACTURING MASTER FOR OPTICAL INFORMATION CARRIER

Hanphire H. Nee, and Vasil D. Tasi, both of Stamford, Conn., assignors to CBS Inc., New York, N.Y.

Filed May 16, 1986, Ser. No. 863,905

Int. Cl.^{4} G03C *5/00*

U.S. Cl. 430—323 **14 Claims**



1. Method of manufacturing a disc-shaped information carrier provided with a substantially spiral track of information pits of predetermined depth, comprising the steps of:

coating a metallic disc-shaped substrate with a layer of fine-grained copper to a thickness at least as great as the predetermined depth of the information pits,

coating the surface of the copper layer with a photoresist,

exposing the photoresist to radiation in a sequence of spaced areas which correspond to the information arranged in a spiral track,

developing the photoresist,

electrolytically etching the exposed portions of the copper layer to said predetermined depth in an electrolyte comprising a water solution of compounds selected from the group consisting of tetra-potassium pyrophosphate and tetra-sodium pyrophosphate in which the concentration of the pyrophosphate is in the range from about 1.0% to about 7.0% and the pH of the solution is in the range from about 7 to about 10, and

stripping the photoresist from the etched copper surface.

4,729,941

PHOTORESIST PROCESSING SOLUTION WITH QUATERNARY AMMONIUM HYDROXIDE

Kunio Itoh, Tokyo; Kimio Watabe, Mie, and Masahiro Shiozaki, Kanagawa, all of Japan, assignors to Hoechst Japan Kabushiki Kaisha and Nisso Petrochemical Industries Co., Ltd., both of Tokyo, Japan

Filed Oct. 8, 1985, Ser. No. 785,518

Claims priority, application Japan, Oct. 9, 1984, 59-211742; Feb. 12, 1985, 60-24975; Feb. 12, 1985, 60-24976; Jun. 20, 1985, 60-135030

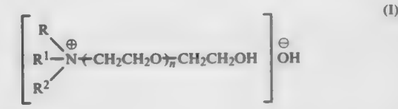
Int. Cl.^{4} G03C *5/00, 5/24, 5/34*

U.S. Cl. 430—331 **4 Claims**

1. A photoresist processing solution consisting essentially of:

(a) a quaternary ammonium hydroxide of the formula I represented by the formula

(I)



wherein

R, R^1 and R^2 are the same and each is a methyl group; and n is a positive number of 1; and

(b) a solvent in which compound (a) is dissolved in a concentration of from about 0.05 to 30 wt. %, such that said

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solution is suitable for developing or stripping a radiation-imaged photoresist coating, wherein said solvent is selected from the group consisting of water, a water-miscible organic solvent, and mixtures thereof.

4,729,942

METHOD FOR FORMING AN IMAGE

Osamu Takahashi, and Kiyoshi Morimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 19, 1986, Ser. No. 897,899
Claims priority, application Japan, Aug. 19, 1985, 60-181419
Int. Cl.⁴ G03C *5/54, 1/40*
U.S. Cl. 430—351 **10 Claims**

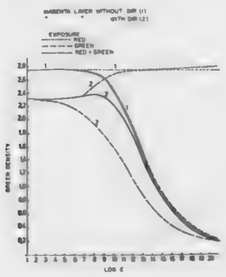
1. A method for forming an image comprising heating a light-sensitive material comprising a support having provided thereon at least a light-sensitive silver halide and a dye developer, said dye developer not releasing or forming a dye but developing silver halide to thereby render the dye developer non-diffusible, said heating being in the presence of a base and/or a base precursor after or simultaneously with image exposure to imagewise distribute a mobile non-oxidation type dye developer, wherein the dye developer is a compound having a dye moiety having a ballast group, which ballast group is split off upon heating in the presence of the base and/or base precursor, said dye developer also containing a developer moiety for the silver halide in its molecule, said dye developer being immobilized in said light-sensitive material by developing the silver halide, whereafter said ballast group splits off.

4,729,943

COLOR IMAGE-FORMING PHOTOGRAPHIC REVERSAL ELEMENT WITH IMPROVED INTERIMAGE EFFECTS

Maurice Pfaff, Le Perreux-sur-Marne, and Régis Thomas, Chalon-sur-Saone, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,442
Claims priority, application France, Dec. 9, 1985, 8518297
Int. Cl.⁴ G03C *7/00, 1/46*
U.S. Cl. 430—362 **14 Claims**



1. A color image-forming silver halide reversal photographic element comprising at least two dye image-forming units, each unit containing at least one photosensitive silver halide layer and a dye image-former, wherein at least one of the dye image-forming units comprises

(1) a first silver halide emulsion layer spectrally sensitized to a given region of the spectrum with which is associated a dye-forming coupler and

(2) a second halide emulsion layer spectrally sensitized to a different region of the spectrum than the first and containing an interimage effect-forming means comprising a development inhibitor-releasing compound or coupler which, upon color development, forms either a colorless compound or a dye which does not substantially take part in the formation of the image, said second silver halide emulsion layer not having a dye-forming coupler which substantially takes part in the formation of the image.

12. A process for producing a reversal image comprising exposing the photographic element of claim 1, developing said element in a black-and-white developer, washing said element, and then developing said element in a color developer wherein said interimage effect-forming means is released in the color development step.

4,729,944

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keiji Mihayashi; Shunji Takada; Keiichi Adachi; Seiji Ichijima, and Hidetoshi Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 599,868, Apr. 13, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 802,603
Claims priority, application Japan, Apr. 14, 1983, 58-66006
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.⁴ G03C *7/26, 7/32*
U.S. Cl. 430—376 **19 Claims**

19. A method of forming a color image comprising developing an imagewise exposed silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, wherein the photographic light-sensitive material has a layer containing both a non-diffusible coupler which forms a properly smearing diffusible dye upon reaction with an oxidation product of a color developing agent and a silver halide emulsion in which a diameter corresponding to the projected area of grains that takes 40% or more of the projected area of whole silver halide grains is 1.5 μm or more with an aqueous alkaline solution containing a color developing agent, wherein the non-diffusible coupler which forms a properly smearing diffusible dye is a coupler represented by the following general formula (A):

$$(Cp)_aX \qquad (A)$$

wherein Cp represents a diffusible coupler component which forms a proper smearing of dye images and improves graininess; X represents a component which is bonded to the coupling position of the coupler component, which is released upon the reaction with the oxidation product of the color developing agent and which contains a ballast group having from 8 to 32 carbon atoms; and a represents 1 or 2.

4,729,945

MULTILAYER PHOTOGRAPHIC SUPPORT MATERIAL

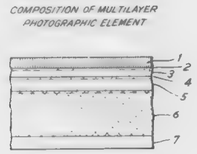
Reiner Anthonsen, Bramsche, and Wieland Sack, Bissendorf, both of Fed. Rep. of Germany, assignors to Felix Schoeller, Jr., Fed. Rep. of Germany

Continuation of Ser. No. 522,817, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 315,034, Oct. 26, 1981, abandoned. This application Sep. 23, 1986, Ser. No. 910,786
Int. Cl.⁴ G03C *1/76*
U.S. Cl. 430—538 **16 Claims**

1. A method for preparing a multilayer photographic support material using at least one coating mixture and accelerated electron radiation to provide a smooth unmottled surface, wherein harmful reactive products that remain after exposure to the accelerated electron radiation are rendered inert to a photographic silver halide emulsion subsequently applied onto said surface, comprising in combination:

applying to at least one surface of a photographic base paper a liquid acrylic coating mixture consisting essentially of liquid acrylic acid esters containing two or more C=C double bonds and characterized by molecular weights of about 1000 or less, hardenable by electron radiation; and containing a pigment,

hardening said liquid acrylic coating mixture in a polymerization reaction by irradiation with accelerated electrons at substantially room temperature in an inert gas atmosphere or covered with an inert solid material to polymerize a layer of acrylic polymer onto said surface, said layer of acrylic polymer including harmful reactive products that remain after the exposure to electron radiation, and said acrylic layer further including a hardening surface,



subjecting said hardened surface to oxidizing treatment selected from the group consisting of corona, flame, ozone, ultraviolet radiation or wet oxidizing chemical treatment to facilitate adhesion to a subsequent coating,

melt extrusion coating onto said treated hardened surface a film of pigmented polyolefin resin; and

applying onto the polyolefin resin a coating that includes a silver-halide photographic emulsion.

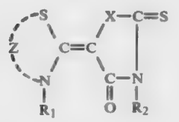
4,729,946

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuo Kasama, and Kiyohiko Yamamuro, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 697,198, Feb. 1, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 933,311
Claims priority, application Japan, Feb. 1, 1984, 59-16280
Int. Cl.⁴ G03C *1/36, 1/10, 1/34*
U.S. Cl. 430—567 **18 Claims**

1. A silver halide photographic light-sensitive material, comprising a monodisperse silver halide emulsion of 0.30 μm or less in average silver halide grain size containing at least 75 mol%, silver chloride and 2 mol% or less silver iodide, and having incorporated in said emulsion a dye represented by formula (I)



(I)

wherein

Z represents atoms forming a thiazoline nucleus, a thiazole nucleus, or a benzothiazole nucleus,

X represents an oxygen atom or a sulfur atom, and

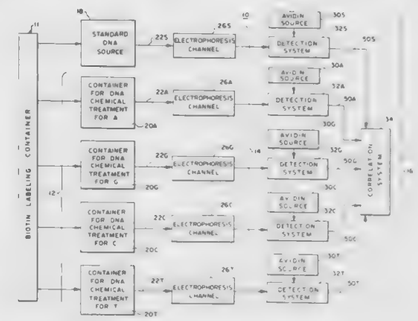
R_1 and R_2 each represents an unsubstituted or substituted aliphatic group or an unsubstituted or substituted aromatic group.

4,729,947

DNA SEQUENCING

Lyle R. Middendorf, and John A. Brumbaugh, both of Lincoln, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Mar. 29, 1984, Ser. No. 594,676
Int. Cl.⁴ C12Q *1/68;* **G01N** *27/26, 21/64*
U.S. Cl. 435—6 **18 Claims**



1. A method for sequencing DNA comprising the steps of:

preparing a multiplicity of identical DNA strands;

marking the DNA strands on one end with biotin;

dividing the DNA strands into at least four batches;

preparing at least one additional batch of DNA strands with known lengths to be electrophoresed as a time base;

randomly cleaving at least some of the DNA strands in a first batch at adenine bases by a chemical treatment to form an adenine-strand batch;

randomly cleaving at least some of the DNA strands in a second batch at guanine bases by a chemical treatment to form a guanine-strand batch;

randomly cleaving at least some of the DNA strands in a third batch at cytosine bases by a chemical treatment to form a cytosine-strand batch;

randomly cleaving at least some of the DNA strands in a fourth batch at thymine bases by a chemical treatment to form a thymine-strand batch;

applying samples from each of the four batches after cleaving at their respective bases to four identical channels of gel electrophoresis apparatus;

applying at least one time base source of DNA of known length strands to at least one additional channel positioned among the aforementioned four channels whereby a reference time of electrophoresing may be obtained from said channel;

electrophoresing the DNA strands through a gel slab so that bands of more mobile strands, each of which has substantially uniform length strands, are fully resolved while the less mobile strands to be later formed into bands are unresolved in a continuous process such that at least ten percent of the bands are fully resolved and electrophoresed through the gel while the less mobile strands are yet unresolved into bands in the gel; whereby a plurality of adenine-strand bands is formed in a first channel in an order corresponding to the length of the strands; a plurality of guanine-strand bands is formed in a second channel in an order corresponding to the length of the strands; a plurality of cytosine-strand bands is formed in a third channel in an order corresponding to the length of the strands; and a plurality of thymine-strand bands is formed in a fourth channel in an order corresponding to the length of the strands;

attaching fluorescent markers to avidin whereby the fluorescently labeled avidin is combined with the biotin markers at the end of the DNA strands;

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moving the fluorescently-marked bands in sequence through a medium;
scanning said bands with laser having a narrow bandwidth substantially comforming to the optimum absorption spectrum of the fluorescent markers;
pulsing the laser light with pulses of shorter duration than three nanoseconds during a first period of time;
detecting the fluorescent emission from the markers across a narrow selective band of wavelengths conforming substantially to the optimum emission spectrum of the markers during a second period of time;
said second period of time beginning at least fifty nanoseconds from the start of its corresponding pulse of laser light and terminating at a time no greater than one hundred fifty nanoseconds from the start of the pulse of the laser light; and
identifying and recording the sequence of the bands in each of the channels so as to indicate the DNA sequence.

4,729,948

DRY ANALYTICAL ELEMENT FOR α-AMYLASE

Masakuni Saruhashi; Isao Haga; Morio Kobayashi, and Kazumi Arai, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,679
Claims priority, application Japan, Sep. 12, 1983, 58-166530
Int. Cl.⁴ C12Q *1/40*
U.S. Cl. 435—22 **21 Claims**

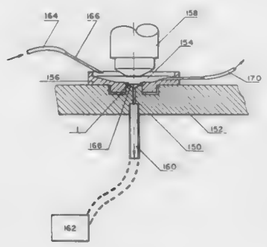
1. A dry analytical element for α-amylase in a fluid sample comprising a starch capable of forming a complex with iodine, and iodine compound and an oxidizing agent, wherein said oxidizing agent is capable of reacting with said iodine compound to generate iodine and said iodine compound and said oxidizing agent are disposed in said element so that iodine may be liberated therefrom when said fluid sample is brought into contact with said analytical element.

4,729,949

SYSTEM AND METHODS FOR CELL SELECTION

Arye Weinreb, Jerusalem, and Mordechai Deutsch, Petah-Tikvah, both of Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

Continuation-in-part of Ser. No. 489,605, May 2, 1983, abandoned. This application Nov. 8, 1983, Ser. No. 550,233
Claims priority, application Switzerland, May 10, 1982, 2897/82
Int. Cl.⁴ C12Q *1/24, 1/04;* C12M *1/34, 1/12*
U.S. Cl. 435—30 **47 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 21 Pages)



1. A method for performing on a cell-by-cell basis one or more of the operations of (i) observing or measuring a property of a living cell, (ii) moving a living cell, or (iii) killing a living cell, comprising the steps of:
(a) providing a carrier defining first and second outer surfaces and comprising an ordered array of holes therethrough, the positions on the carrier of the holes being identifiable and the holes being sized to contain individual living cells therewithin in that the holes have (i) a first cross section at the first outer surface of the carrier of such dimensions that the living cell can pass through the first cross section without suffering substantial damage, (ii) a second cross section at a level spaced from the first outer surface of such dimensions that the living cell cannot pass through the second cross section, and (iii) a height between the first outer surface and the level of the second cross section such that either the entire living cell or substantially the entire living cell is contained within the hole so that the living cell is not washed out of the hole by the passage of a fluid across the first outer surface of the carrier;
(b) applying a fluid containing living cells to the first outer surface of the carrier;
(c) applying a force to the living cells to move the living cells into the holes;
(d) performing on an individual, first living cell located at a first hole having a first position on the carrier one or more of the operations of (i) observing or measuring a property of the first living cell, (ii) moving the first living cell, or (iii) killing the first living cell; and
(e) performing on an individual, second living cell located at a second hole having a second position on the carrier one or more of the operations of (i) observing or measuring a property of the second living cell, (ii) moving the second living cell, or (iii) killing the second living cell.

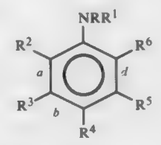
4,729,950

ENHANCED LUMINESCENT OR LUMINOMETRIC ASSAY

Larry J. Kricka, Birmingham; Angela M. O'Toole, Wolverhampton; Gary H. G. H. Thorpe, Birmingham, and Thomas P. Whitehead, Leamington Spa, all of England, assignors to National Research Development Corporation, London, England

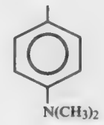
Filed Jul. 29, 1985, Ser. No. 760,036
Claims priority, application United Kingdom, Aug. 7, 1984, 8420053
Int. Cl.⁴ C12Q *1/28;* G01N *53/00, 21/52*
U.S. Cl. 435—28 **10 Claims**

1. In a luminescent or luminometric assay which comprises carrying out a chemiluminescent reaction between a peroxidase, an oxidant, and a chemiluminescent 2,3-dihydro-1,4-phthalazinedione and measuring or detecting the chemiluminescence thereby produced, the improvement wherein the reaction is carried out in the presence of an aromatic amine of the general formula

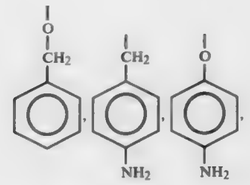


(1)

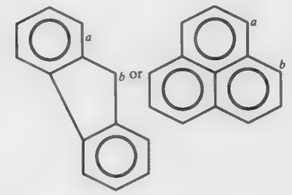
wherein the R symbols, namely R, R^1, R^2, R^3, R^4, R^5 and R^6, have any of the meanings (a) to (j) given below, all other R symbols in each meaning are hydrogen atoms and the fused rings are to be read in the same configurational sense as formula 1, whereby sides "a", "b" and "d" in formula (1) are fused to sides "a", "b" and "d" respectively in the formulae below:
(a) $R=R^1=CH_3$; $R^4=$



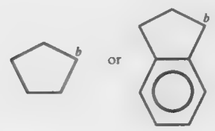
(b) $R^4=$



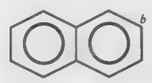
cyclohexyl, or alkyl or alkoxy having 1 to 4 carbon atoms
(c) R^2, R^3 and R^4 together represent the polycyclic fused ring system:



(d) R^3 and R^4 together represent the fused ring or ring system



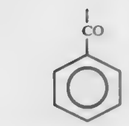
(e) R^3 and R^4 together represent the fused ring system



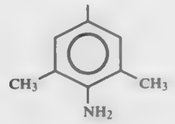
and R^5 and R^6 together represent the fused ring



(f) $R^2=NH_2$ and $R^4=$



(g) $R^2=R^6=CH_3$ and $R^4=$



(h) $R^3=C_2H_5$
(i) $R^2=R^4=CH_3$ and
(j) $R^3=R^4=CH_3$.

4,729,951

PROCESS FOR THE IMPROVEMENT OF ANTIBIOTIC PRODUCTION BY IN VIVO GENETIC RECOMBINATION

Lajos Ferenczy; Antal Mai, both of Szeged; István Ott, Budapest; Gábor Ambrus, Budapest, and Tibor Láng, Budapest, all of Hungary, assignors to Biogal Gyogyszergyar, Debrecen, Hungary

Filed May 16, 1984, Ser. No. 610,774
Claims priority, application Hungary, May 16, 1983, 1678/83
Int. Cl.⁴ C12P *19/48;* C12N *15/00, 1/20;* C12R *1/465*
U.S. Cl. 435—80 **14 Claims**

1. A process for the production of fermentation broths containing aminoglycoside antibiotics from Streptomycetes modified in antibiotic-producing ability by in vivo genetic recombination which comprises preparing a cultivation medium consisting essentially of sucrose and calcium and magnesium salts;
cultivating genetically marked aminoglycoside antibiotic-producing Streptomycetes in said cultivation medium;
separately cultivating prototrophic or unmarked aminoglycoside antibiotic-producing Streptomycetes;
preparing protoplasts of said cultivated genetically marked Streptomycetes and of said cultivated prototrophic or unmarked Streptomycetes;
chemically or physically inactivating said prototrophic or unmarked Streptomycetes protoplasts to make them nonviable;
fusing said protoplasts of genetically marked Streptomycetes with said inactivated protoplasts of prototrophic or unmarked Streptomycetes;
regenerating the fused protoplasts;
assaying the resulting strains for antibiotic-producing capacity;
selecting the strains with enhanced antibiotic-producing ability; and
carrying out aerated, submerged fermentations with the novel strains so obtained in a medium containing organic carbon and nitrogen sources, inorganic salts, trace elements, and oils or fats or mixtures thereof.

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4,729,952
PROCESS FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Kiyoji Hattori; Yukinobu Kotani, and Kuniki Kino, all of Hofu, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,883
Claims priority, application Japan, Feb. 25, 1983, 58-30480; Sep. 22, 1983, 58-174319
Int. Cl.[4] C12P *13/14;* C12N *1/20;* C12R *1/13, 1/15*
U.S. Cl. 435—110 6 Claims

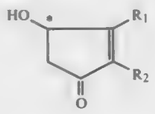
1. A process for producing L-glutamic acid, which comprises culturing a microorganism belonging to the genus Corynebacterium or Brevibacterium which has both an ability to produce L-glutamic acid and a resistance to 100 μg/ml α-naphthoquinoline, 100 μg/ml oligomycin, or 2 mg/ml p-hydroxycinnamate in a nutrient medium until L-glutamic acid is accumulated in the culture liquor, and thereafter recovering the L-glutamic acid therefrom.

4,729,953
OPTICALLY ACTIVE 4-HYDROXY-2-CYCLOPENTENONES, AND THEIR PRODUCTION

Masayoshi Minai, Moriyama, and Tadashi Katsura, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

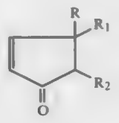
Continuation-in-part of Ser. No. 575,588, Jan. 31, 1984, abandoned. This application Dec. 11, 1984, Ser. No. 680,533
Claims priority, application Japan, Feb. 3, 1983, 58-17054; Aug. 10, 1983, 58-147155
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] C12P *7/38, 41/00;* C12R *1/38*
U.S. Cl. 435—149 27 Claims

1. A process for preparing an optically active 4-hydroxy-2-cyclopentenone of the formula:



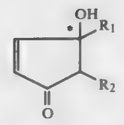
(I)

wherein R_1 is a hydrogen atom or a methyl group, R_2 is an alkyl group of not more than 12 carbon atoms, an alkenyl group of not more than 12 carbon atoms or an alkenyl group of not more than 12 carbon atoms and the asterisk (*) indicates an asymmetric configuration, which comprises subjecting a racemic or optically active 4-cyclopentenone ester of the formula:



(III)

wherein R_1 and R_2 are each as defined above, R is a lower alkanoyloxy group and the substitutents R_1 and R_2 take a cis-configuration to asymmetric hydrolysis with an enzyme or microorganism capable of hydrolyzing the same, and treating the resultant optically active 4-cyclopentenone-alcohol of the formula:



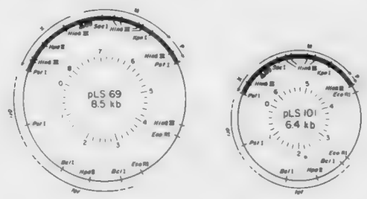
(II)

wherein R_1 and R_2 are each as defined above, the asterisk (*) indicates an asymmetric configuration and the substituents R_1 and R_2 take a cis-configuration with a catalyst selected from the group consisting of organic tertiary amines, metal oxides, inorganic bases and basic buffers at a temperature of −20° to 130° C., whereby the optically active 4-cyclopentenone-alcohol (II) is rearranged to the optically active 4-hydroxy-2-cyclopentenone (I) while maintaining the original steric configuration.

4,729,954
PLS010 PLASMID VECTOR

Sanford A. Lacks, Brookhaven, and Tanjore S. Balganesh, Upton, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 19, 1985, Ser. No. 702,766
Int. Cl.[4] C12N *15/00, 1/00*
U.S. Cl. 435—172.3 3 Claims



1. Recombinant plasmid pLS101, deposited in the American Type Culture Collection under deposit #39938, which is characterized as a Mal$^+$ transformant and consists essentially of a 2.0 Kb MalM gene fragment ligated to a 4.4 Kb Tc^r DNA fragment and inserted in a suitable Gram-positive bacteria.

4,729,955
METHOD OF PRODUCING REVERSE TRANSCRIPTASE

Michi Kodama; Kiichi Sekiguchi, both of Ibaraki, and Masanori Kubo, Kagoshima, all of Japan, assignors to Director of The National Institute of Animal Health, Ibaraki, Japan

Filed Dec. 8, 1983, Ser. No. 559,383
Claims priority, application Japan, Dec. 23, 1982, 57-224947
Int. Cl.[4] C12N *9/00, 5/00;* C12R *1/91*
U.S. Cl. 435—183 14 Claims

1. A method of producing reverse transcriptase, which comprises isolating a fraction containing retrovirus from a tissue culture fluid supernatant of retrovirus producing cells, said retrovirus producing cells being Shimozuma cells IFO 50136; said retrovirus producing cells being grown and propagated in vitro, treating said fraction at least once by sucrose density gradient centrifugation to thereby obtain a purified retrovirus, and extracting and isolating reverse transcriptase from said purified retrovirus.

4,729,956
STABILIZED ALCOHOL OXIDASE COMPOSITIONS AND METHOD FOR PRODUCING SAME

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1986, Ser. No. 857,862
Int. Cl.[4] C12N *9/96, 9/04;* C12Q *1/26*
U.S. Cl. 435—188 16 Claims

1. An enzyme composition consisting essentially of
(a) alcohol oxidase, and
(b) a stabilizing amount of at least one stabilizing agent selected from the group consisting of:
peroxidase, catalase, hemoglobin, cytochrome c and myoglobin.

4,729,957
PROCESS FOR MANUFACTURE OF L-ASPARAGINASE FROM ERWINIA CHRYSANTHEMI

Shwu-Maan Lee, Frederick; John T. Ross, Myersville, and Marie H. Wroble, Mt. Airy, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 808,729, Dec. 13, 1984, abandoned. This application Oct. 8, 1986, Ser. No. 916,796
Int. Cl.[4] C12N *9/82;* C12R *1/18*
U.S. Cl. 435—229 7 Claims

1. A process for purifying L-asparaginase from Erwina comprising the steps of:
(1). Harvesting cells from both;
(2). Permealizing the Erwina by mixing with acetone and passing acetone/cell
mixture through a filter press at least once;
(3). Rinsing the acetone/cell cake with buffer in the neutral pH range
(pH 6.5–7.5) to remove acetone;
(4). Rinsing cells with buffer in alkaline range;
(5). Pass cells from step 4 through a cell press to extract the enzyme;
(6). Clarify the enzyme containing fluid obtained in step 5 by in-line passage
through filter bag loaded with Cell Debris Remover;
(7). Purifying the enzyme on an affinity chromatography column.

4,729,958
METHOD FOR IMPROVING THE FILTERABILITY OF A MICROBIAL BROTH

Jan W. Drozd, and Andrew J. Rye, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1985, Ser. No. 807,940
Claims priority, application United Kingdom, Dec. 14, 1984, 8431653
Int. Cl.[4] C12N *1/08*
U.S. Cl. 435—270 9 Claims

1. A method of preparing an aqueous microbial polysaccharide-containing broth of improved filterability which comprises: (a) fermenting microorganisms selected from the group consisting of xanthan-producing species of Xanthomonas, Pseudomonas and Agrobacterium to obtain an aqueous microbial broth comprising polysaccharide polymers produced by said microorganisms and microbial cell matter; (b) subjecting said broth to a treating step which results in the breaking down of said microbial cell matter; and (c) contacting said broth with one or more enzymes having nuclease activity for a time and under conditions sufficient to increase the filterability of said broth.

4,729,959
GLUCOSE REFERENCE CONTROL FOR GLUCOSE TEST STRIPS

Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.

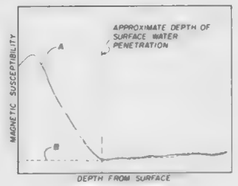
Filed Feb. 24, 1986, Ser. No. 832,068
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—14 12 Claims

1. A glucose reference control for glucose test strips consisting essentially of an aqueous suspension of:
(i) about 40 to 500 mg/dL of glucose, and
(ii) about 0.1 to 0.3×10^{12}/dL red blood cells fixed with a fixing agent to render said red blood cells incapable of metabolizing glucose, the number of said fixed red blood cells being sufficient to provide a glucose reference control for glucose test strips in which the true value of glucose and the measured value is approximately the same.

4,729,960
METHOD OF PROSPECTING FOR HYDROCARBON DEPOSITS

Robert S. Foote, 1328 Etain, Irving, Tex. 75060

Continuation-in-part of Ser. No. 743,391, Jun. 11, 1985, abandoned. This application Dec. 11, 1985, Ser. No. 807,495
Int. Cl.[4] G01N *33/24*
U.S. Cl. 436—31 37 Claims



1. The method of prospecting for conditions indicative of subterranean deposits of hydrocarbon comprising the steps of:
(a) determining the approximate maximum depth of diagenetically-formed magnetic materials in a substantially vertical column of earth;
(b) taking earth samples from said substantially vertical column of earth at pre-selected depths from the earth's surface to approximately said maximum depth of diagenetically-formed magnetic materials;
(c) determining the magnetic susceptibility of said earth samples;
(d) correlating the magnetic susceptibility data of said samples to form a curve representative of the distribution of magnetic susceptibility as a function of depth;
(e) comparing the magnetic susceptibility distribution curve to the approximate maximum depth of diagenetically-formed magnetic materials; and
(f) determining if a discontinuity occurs in the magnetic susceptibility distribution curve above the depth representative of the approximate maximum depth of diagenetically-formed magnetic materials in said vertical column of earth.

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4,729,961

PROCESS FOR THE DETECTION AND ASSAY BY ERYTHROADSORPTION

Stratis Avrameas, La Celle Saint Cloud, and Jean-Luc Guesdon, Paris, both of France, assignors to Institut Pasteur, Paris, France

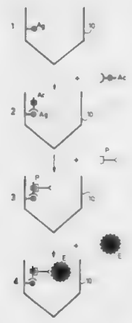
Continuation of Ser. No. 355,744, Feb. 1, 1982, abandoned. This application Dec. 11, 1985, Ser. No. 807,773

Claims priority, application France, Jul. 9, 1980, 80 15293

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ G01N *33/566, 33/555*

U.S. Cl. 436—501 **12 Claims**



1. A process for the detection and assay of a biological substance by erythroadsorption, comprising:

(1) immobilizing a compound which specifically binds the biological substance to be assayed;

(2) incubating the immobilized compound with a liquid medium containing the biological substance to be assayed in order to fix said biological substance to the immobilized compound;

(3) incubating the fixed biological substance with a soluble coupling product comprising: (a) a specific ligand, which binds to the fixed biological substance through (b) a coupling agent chosen from the group consisting of benzoquinone and glutaraldehyde, to (c) a second ligand which binds with erythrocytes;

(4) eliminating excessive coupling product which is not bound to the fixed biological substance;

(5) adding erythrocytes; and

(6) determining the amount of erythrocytes bound to said coupling product.

4,729,962

SEMICONDUCTOR JUNCTION FORMATION BY DIRECTED HEAT

Robert B. Campbell, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 24, 1986, Ser. No. 843,486

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—2 **1 Claim**

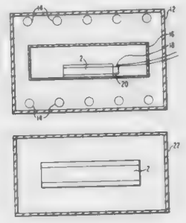
1. The method of forming semiconductor junctions in a dendritic silicon web of either P- or N-type, comprising:

applying a single coating of a liquid precursor solvent containing a dopant of a type opposite that of the web to one face of said web;

applying a single coating of a liquid precursor solvent containing a dopant of a type the same as that of the web to the opposite face of said web;

then baking the web in an oven at approximately 200° C. for approximately 20 minutes to remove excessive solvent;

then heating the web rapidly with a high intensity light for a period in the range of 15 seconds to attain temperatures in a range from about 950° C. to 1200° C. to simultaneously form junctions in both faces of said web; and then annealing said web in air following said rapid heating, at a temperature generally in the range of 750° C. to 850° C. for a period of 10 to 60 minutes to take out defects in



the web frozen therein by the rapid cooling of the web when this high intensity light is shut off and thereby produce a highly efficient solar cell.

4,729,963

FABRICATION METHOD FOR MODIFIED PLANAR SEMICONDUCTOR STRUCTURES

Nader Tabatabaie, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 21, 1986, Ser. No. 933,148

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 437—5 **12 Claims**



1. A process for fabricating a semiconductor device comprising the steps of:

providing a semiconductor substrate having a first major surface on which active semiconductor devices are to be formed, and a second major surface;

providing an epitaxially grown etch stop first layer on said first major surface;

epitaxially depositing a second layer composed of semiconductor material on said etch stop layer;

depositing a third layer composed of semiconductor material on said second layer of semiconductor material

selectively removing portions of said semiconductor substrate to provide a pattern of apertures in said substrate extending to said etch stop layer; and

providing a dopant species through said second surface to form active regions in said second layer of semiconductor material.

4,729,964

METHOD OF FORMING TWIN DOPED REGIONS OF THE SAME DEPTH BY HIGH ENERGY IMPLANT

Nobuyoshi Natsuaki, Higashiyamato; Masao Tamura, Tokorozawa; Yasuo Wada, Tokyo; Kiyonori Ohyu, Hachioji; Tadashi Suzuki; Hidekazu Okuhira, both of Kokubunji; Akira Shintani, Machida, and Shoji Syukuri, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

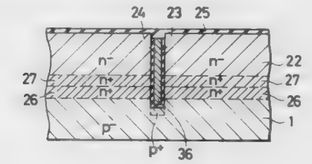
Filed Apr. 15, 1986, Ser. No. 852,184

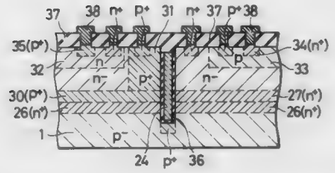
Claims priority, application Japan, Apr. 15, 1985, 60-78349

Int. Cl.⁴ H01L *21/265, 21/22*

U.S. Cl. 437—29 **19 Claims**

1. A process for producing a semiconductor device comprising the steps of: implanting first conductivity type impurity ions at a predetermined depth all over a region of a workpiece where impurity ions are to be implanted; forming a mask having an edge forming an opening on said workpiece; implanting impurity ions of second conductivity type opposite to said first conductivity type in a dose about twice as large as that of said first conductivity type impurity ions at substantially the same





depth as in the step of ion implantation of said first conductivity type impurity ions through said opening so as to make said first and second conductivity type impurity concentrations in a portion just beneath the edge of said mask offset each other and be substantially zero; and annealing the resulting workpiece to form first and second conductivity type regions in a region covered with said mask and a region corresponding to said opening, respectively.

4,729,965

METHOD OF FORMING EXTRINSIC BASE BY DIFFUSION FROM POLYSILICON/SILICIDE SOURCE AND EMITTER BY LITHOGRAPHY

Yoichi Tamaki, Kokubunji; Kazuhiko Sagara, Tokyo; Norio Hasegawa, Nishitama; Shinji Okazaki, Urawa; Toshihiko Takakura, Koganei, and Hirotaka Nishizawa, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

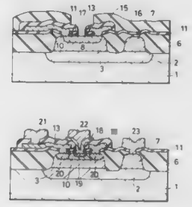
PCT No. PCT/JP85/00432, § 371 Date Apr. 9, 1986, § 102(e) Date Apr. 9, 1986, PCT Pub. No. WO86/01338, PCT Pub. Date Feb. 27, 1986

PCT Filed Jul. 31, 1985, Ser. No. 855,616

Claims priority, application Japan, Aug. 10, 1984, 59-166355

Int. Cl.⁴ H01L *27/12, 21/265*

U.S. Cl. 437—31 **24 Claims**



1. A method of producing a semiconductor device comprising the following steps:

(a) forming a mask having a hole at a position at which a base is to be formed, on the surface of a semiconductor substrate;

(b) doping an impurity having a first conductivity type into the surface region of said semiconductor substrate through said hole of said mask to form said base;

(c) forming an insulating film having a hole at a position at which an external base is to be formed, said insulating film being formed on at least said base;

(d) forming at least a polycrystalline silicon film into which an impurity having said first conductivity type is doped, or forming a metal silicide film, on the entire surface, including on said insulating film on at least said base;

(e) forming a resist film on the entire surface of said polycrystalline silicon or metal silicide film, and selectively changing the solubility or a desired portion of said resist film;

(f) removing the portion of said resist film having a high solubility by development, and removing the exposed portion of said polycrystalline silicon or metal silicide film, thereby exposing a portion of the insulating film;

(g) oxidizing the surface of said polycrystalline silicon or metal silicide film, leaving at least a remaining portion of the polycrystalline silicon film or metal silicide film as polycrystalline silicon or metal silicide, respectively; and

(h) removing the exposed portion of said insulating film to form a hole, and doping an impurity having a second conductivity type opposite to said first conductivity type into a desired portion of the surface region of said base to form an emitter.

4,729,966

PROCESS FOR MANUFACTURING A SCHOTTKY FET DEVICE USING METAL SIDEWALLS AS GATES

Yutaka Koshino, Yokosuka; Tatsuo Akiyama, Tokyo, and Shunichi Hiraki, Hyogo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 643,395, Aug. 23, 1984, abandoned. This application Mar. 26, 1986, Ser. No. 843,833

Claims priority, application Japan, Aug. 24, 1983, 58-153166

Int. Cl.⁴ H01L *21/225, 29/80, 29/72*

U.S. Cl. 437—39 **6 Claims**

1. A process for manufacturing a Schottky FET device, comprising:

a first step of forming an island-shaped insulative film portion on a surface of a Schottky-junction semiconductor substrate, which has a low-concentration impurity layer on the surface, with the periphery of the insulative film substantially vertical to the substrate surface;

a second step of forming a gate electrode metal film in a loop shape and with a predetermined thickness on the outer periphery of said island-shaped insulative film portion;

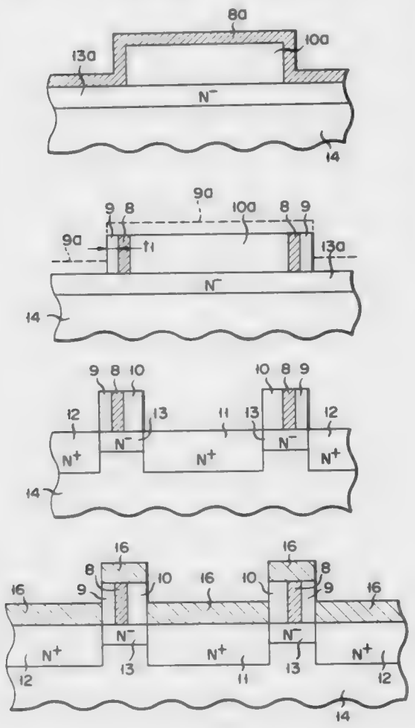
a third step of forming a first insulative film in a loop shape and with a predetermined thickness on the periphery of said loop-shaped gate electrode metal film;

a fourth step of forming a second insulative film in a loop shape and with a predetermined thickness of the inner peripheral surface of said loop-shaped gate electrode metal film by removing the center portion of said island-shaped insulation film portion; and

a fifth step of forming source and drain regions, which consist of high-concentration impurity layers, inside said substrate on the outside of said first insulative film and on the inside of said second insulative film by driving a high-concentration of impurities into the surface of said substrate other than on said loop-shaped gate electrode metal

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film and said first and second insulative films, and at the same time forming a channel of the remainder of said



low-concentration impurity layer inside said substrate between said source and drain regions.

4,729,967

METHOD OF FABRICATING A JUNCTION FIELD EFFECT TRANSISTOR

Craig A. Armiento, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 9, 1987, Ser. No. 36,411
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—40 **13 Claims**

1. The method of fabricating a junction field effect transistor comprising

providing a body of semiconductor material including a substrate of semiconductor material of one conductivity type of relatively low resistivity and a layer of semiconductor material of the one conductivity type of relatively high resistivity contiguous said substrate, said layer having a surface at a surface of the body;

introducing conductivity type imparting material of the one conductivity type into a plurality of spaced-apart source regions in said layer at said surface;

forming a first undercut mask on said surface having a plurality of openings, each opening exposing a portion of said surface intermediate between two adjacent source regions, said first undercut mask being undercut at each opening so that the opening is wider at said surface than at a distance from the surface;

introducing conductivity type imparting material of the opposite conductivity type into a plurality of gate regions in said layer at said surface defined by the plurality of openings in said first undercut mask;

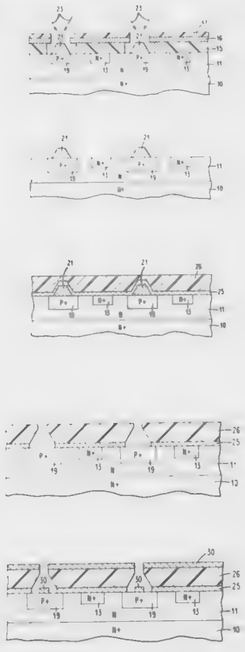
depositing dielectric material onto said surface through the openings in said first undercut mask so as to form a plurality of temporary gate members, each being wider at its base contiguous with said surface than at its uppermost portion spaced from said surface;

removing said first undercut mask to expose said surface except the portions thereof occupied by the temporary gate members;

depositing a layer of adherent, nonconductive, protective material on the exposed surface and on the temporary gate members;

depositing masking material on said layer of adherent, nonconductive, protective material;

removing masking material to expose the portions of the layer of adherent, nonconductive, protective material overlying the uppermost portions of the temporary gate members;



removing said temporary gate members and portions of the layer of adherent, nonconductive, protective material adjacent thereto so that the remaining masking material forms a second undercut mask having a plurality of openings, each opening exposing a portion of the surface of one of said gate regions, said second undercut mask being undercut at each opening so that the opening is wider at said surface than at a distance from the surface;

depositing a conductive material for making ohmic contact to semiconductor material of the opposite conductivity type onto a portion of the exposed surface of each of said gate regions defined by the openings in the second undercut mask to form a plurality of gate contact members;

removing the second undercut mask;

forming a plurality of openings in said layer of adherent, nonconductive, protective material, each opening exposing an area of the surface of a source region;

depositing a conductive material for making ohmic contact to said semiconductor material of the one conductivity type onto a portion of the exposed surface area of each of said source regions to form a plurality of source contact members; and

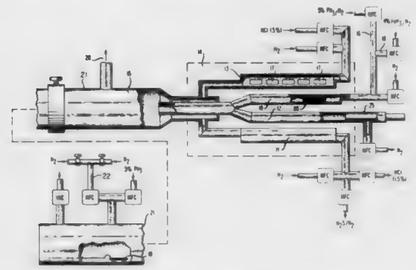
applying conductive material to form a source interconnection in contact with said source contact members and to form a gate interconnection in contact with said gate contact members.

4,729,968

HYDRIDE DEPOSITION OF PHOSPORUS-CONTAINING SEMICONDUCTOR MATERIALS AVOIDING HILLOCK FORMATION

Robert F. Karlicek, Jr., South Plainfield, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 776,791, Sep. 16, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 37,078
Int. Cl.⁴ H01L *7/36, 21/203*
U.S. Cl. 437—81 **8 Claims**



1. A process for forming a device comprising the steps of subjecting a substrate in a hydride epitaxy process to a phosphorus-containing vapor, inducing deposition of a phosphorus-containing composition on said substrate through interaction with said vapor, and completing said device characterized in that

said phosphorus is introduced from a phosphine source wherein at least 93 mole percent of said phosphorus interacting at said substrate is in a form other than phosphine.

4,729,969

METHOD FOR FORMING SILICIDE ELECTRODE IN SEMICONDUCTOR DEVICE

Kakutaro Suda, and Tadashi Hirao, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1986, Ser. No. 903,900
Claims priority, application Japan, Sep. 5, 1985, 60-198217
Int. Cl.⁴ H01L *21/283*
U.S. Cl. 437—200 **2 Claims**

1. A method for forming a metal silicide electrode in contact with a doped region of a silicon substrate through a contact hole which is opened through an insulator film over said substrate, comprising the steps of:

covering said contact hole area and said insulator film with a metal film;

injecting silicon ions into the area of said metal film covering said insulator film portion adjacent said contact hole area;

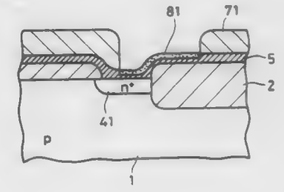
forming a continuous metal silicide film by annealing only said metal film covering said hole area and said ion-injected metal film area;

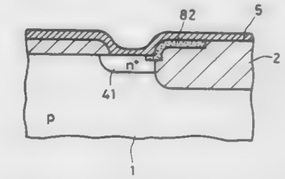
removing the remaining non-silicide metal film to leave said metal silicide film as an electrode which extends laterally to cover said hole area and said adjacent portion of said insulator film.

2. A method for forming a metal silicide electrode in contact with a doped region of a silicon substrate through a contact hole which is opened through an insulator film over said substrate, comprising the steps of:

injecting silicon ions into the area of said insulator film adjacent said contact hole area;

covering said contact hole area and said insulator film with a metal film;





forming a continuous metal silicide film by annealing said metal film covering said hole area and said ion-injected area;

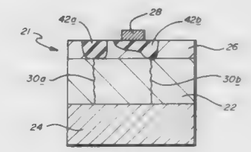
removing the remaining non-silicide metal film to leave said metal silicide film as an electrode which extends laterally to cover said hole area and said adjacent area of said insulator film.

4,729,970

CONVERSION PROCESS FOR PASSIVATING SHORT CIRCUIT CURRENT PATHS IN SEMICONDUCTOR DEVICES

Prem Nath, Rochester, and Craig Vogeli, New Baltimore, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 15, 1986, Ser. No. 907,425
Int. Cl.⁴ H01L *21/306, 31/18*
U.S. Cl. 437—225 **17 Claims**



1. A method of passivating short circuit defects in an electronic device of the type including a thin film body having a superposed electrode comprised of a layer of transparent, electrically conductive oxide material, said method including the steps of:

providing a conversion reagent in contact with at least those portions of the electrode proximate said defects, said reagent adapted to convert the electrically conductive

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electrode material to a material of higher electrical resistivity; and

activating said conversion reagent proximate said defects so as to alter the stoichiometry of the transparent conductive oxide material to the higher resistivity form, whereby said defect regions are substantially electrically isolated from the remainder of said electrode.

4,729,971

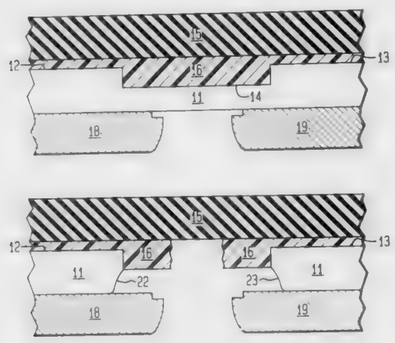
SEMICONDUCTOR WAFER DICING TECHNIQUES

Basil Coleman, Branchburg, N.J., assignor to Microwave Semiconductor Corporation, Somerset, N.J.

Filed Mar. 31, 1987, Ser. No. 38,132

Int. Cl.[4] H01L *21/461, 21/463, 21/467*

U.S. Cl. 437—226 **12 Claims**



1. A method for separating a wafer of III-V compound semiconductor material into dice wherein the wafer has at least some repetitious device geometries embedded into a first of two major surfaces corresponding to dice areas, the method comprising the steps of:

defining a first patterned mask on the first major surface, the first patterned mask having open areas in the form of lanes generally intersecting conforming to regions between dice geometries and closed areas conforming to the regions occupied by the dice areas;

etching the lanes to a depth below the plane of the first major surface;

removing the first patterned mask from the first major surface;

mounting the wafer on the first major surface so that the second of the two major surfaces is exposed;

defining a metallized pattern on the second major surface aligned with the dice areas on the first major surface;

removing semiconductor material from the lanes on the second major surface to form dice from the wafer; and

etching exposed semiconductor material remaining in the lanes to remove semiconductor material immediately adjacent to the previously removed material.

4,729,972

HIGH TOUGHNESS CERAMICS AND PROCESS FOR THE PREPARATION THEREOF

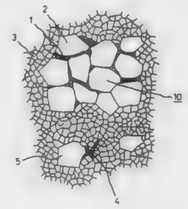
Hironori Kodama; Akihiro Gotoo; Tadahiko Miyoshi; Hiroshi Sakamoto, all of Hitachi, and Takaaki Suzuki, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,303

Claims priority, application Japan, Jan. 11, 1985, 60-2013; Jun. 7, 1985, 60-122474

Int. Cl.[4] C04B *35/56, 35/16*

U.S. Cl. 501—91 **23 Claims**



1. A high toughness ceramic consisting essentially of 0.05 to 10 volume % of a phase (a) of at least one of a silicate or an oxide of at least one element selected from the group consisting of aluminum, scandium, yttrium and a rare earth element, 5 to 40 volume % of a particle phase (b) of at least one metal carbide other than silicon carbide, 5 to 30 volume % of a composite particle phase (c) of a portion of said phase (a) and said particle phase (b) surrounding said portion of the phase (a) and a balance of a silicon carbide matrix (d) in which the above phases (a), (b) and (c) are dispersed.

4,729,973

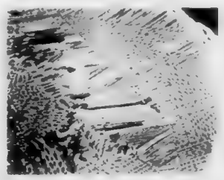
PROCESS FOR PRODUCING CERAMIC COMPOSITES FROM MICROCOMPOSITE PARTICLES HAVING DISPERSED FIBROUS MICROSTRUCTURES AND THE PRODUCT THEREOF

Marion Brockway, Columbus; Beebhas Mutsuddy, Lancaster, and Roger Wills, Solon, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 7, 1987, Ser. No. 35,568

Int. Cl.[4] C04B *35/060, 35/062, 35/064*

U.S. Cl. 501—95 **16 Claims**



1. A process for producing a toughened ceramic composite comprising:

a. providing a ceramic precursor material;

b. forming microcomposite particles from the ceramic precursor material in a manner adapted to produce fibrous microstructures that impart enhanced toughness to the particles; and

c. consolidating the microcomposite particles at a pressure, a temperature and for a time adapted to form bulk ceramic components that exhibit the general microstructure and toughness of the microcomposite particles, wherein the temperature is maintained above that where particle consolidation occurs but below the eutectic or melting temperature of the matrix.

4,729,974

MAGNESIA AND SPINEL REFRACTORY BRICK

Morteza Nazirizadeh, and Herbert Naefe, both of Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 809,074

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445482

Int. Cl.[4] C04B *35/02*

U.S. Cl. 501—120 **5 Claims**

1. An improved cement kiln refractory shape for lining cement kilns, said refractory shape comprising sintered magnesium oxide and $MgO.Al_2O_3$ spinel, said refractory shape having high resistance to temperature changes and good pressure flexibility;

said refractory shape consisting essentially of:

between about 82 to about 90 percent by weight of magnesium oxide;

between about 10 to about 18 percent by weight Al_2O_3; and

a content of up to about 3 percent by weight impurities; said impurities comprising CaO, Fe_2O_3 and SiO_2;

said refractory shape being fired at a temperature of between about 1450° C. and about 1600° C.;

said refractory shape when fired having a refractoriness under load of more than 1740° C. and a change of dimension under compression at a load of 0.2 N/mm^2 of about −3 to about −5 percent at 1400° C. after 24 hours;

said refractory shape being manufactured from the following starting materials:

a magnesium oxide sinter; and

an $MgO.Al_2O_3$ spinel; wherein about 35 to about 42 percent by weight of said starting materials is magnesium oxide sinter having a grain size of less than about 0.09 mm;

said starting magnesium oxide sinter having a CaO content between about 1.5 and about 3.5 percent by weight;

said starting magnesium oxide sinter having a CaO/SiO_2 ratio by weight of more than about 2.5.

4,729,975

METHOD FOR REGENERATING A DENITRATION CATALYST FOR EXHAUST GASES FROM COAL-BURNING APPARATUS

Norihisa Kobayashi, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

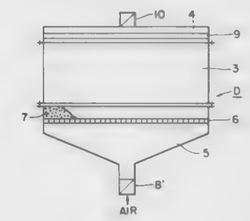
Filed May 13, 1986, Ser. No. 862,652

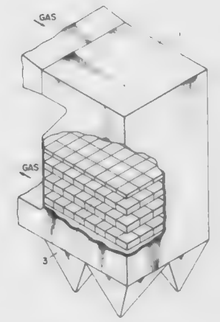
Claims priority, application Japan, May 17, 1985, 60-103995

Int. Cl.[4] B01J *38/00, 38/72;* **B01D** *53/36*

U.S. Cl. 502—20 **5 Claims**

1. A method for regenerating a denitration catalyst for exhaust gases from a coal-burning apparatus which comprises arranging in a closed system a grating on which catalyst pack is disposed, putting abrasive particles inside said grating, feeding air so as to fluidize said abrasive particles in said closed system and then contacting the catalyst, whose denitration performance has lowered, with said fluidized abrasive particles to remove poisons deposited on the surface on the catalyst to regenerate the catalyst.





4,729,976

POLYMER OF DICYCLOPENTADIENE AND A PROCESS FOR PREPARATION

Willem Sjardijn, and Arris H. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1986, Ser. No. 923,549

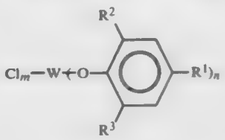
Claims priority, application United Kingdom, Oct. 28, 1985, 8526539

Int. Cl.[4] C08F *4/62*

U.S. Cl. 502—102 **8 Claims**

1. A catalyst composition for the preparation of a polymer of dicyclopentadiene which comprises

(a) a tungsten compound having the formula



wherein R^2 is a bulky alkyl group having at least 3 carbon atoms and R^3 is selected from the group consisting of an hydrogen atom and a bulky alkyl group having at least 3 carbon atoms, R^1 is selected from the group consisting of an hydrogen atom and an alkyl group of 1 to 10 carbon atoms, (m+n) is equal to 6 and n is 1 or 2, and

(b) a tin compound having the formula

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wherein R^4 is selected from the group consisting of a phenyl group, and an alkyl group having 1 to 10 carbon atoms.

4,729,977

SUPPORTED CATALYST, PROCESS FOR ITS PREPARATION AND ITS USE FOR THE PREPARATION OF HYDROXYDIPHENYL

Otto Immel; Oskar Weissel, and Hans-Helmut Schwarz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1986, Ser. No. 872,796

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523205

Int. Cl.[4] B01J *31/04, 31/02, 27/55, 23/26*

U.S. Cl. 502—170 17 Claims

1. A supported catalyst comprising rhodium, hydroxides or oxides of chromium and manganese and oxides, hydroxides and/or alcoholates, carbonates, bicarbonates and/or salts of lower carboxylic acids of alkali metals, disposed on a catalyst support, wherein the rhodium is contained in an amount of 0.1 to 5% by weight, the chromium and manganese together are contained in an amount of 0.05 to 8% by weight, and the alkali metal is contained in an amount of 0.05 to 15% by weight, based on the catalyst support weight, and wherein the weight ratio of chromium to magnesium is 5:1 to 1:5.

4,729,978

CATALYST FOR DEHYDRATION OF LACTIC ACID TO ACRYLIC ACID

Robert A. Sawicki, Stormville, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 4, 1987, Ser. No. 45,633

Int. Cl.[4] B01J *27/20, 27/18, 27/182;* C07C *57/04*

U.S. Cl. 502—174 12 Claims

1. A process for preparing an acidic dehydration catalyst to convert lactic acid to acrylic acid, said process comprising the steps of:

(a) impregnating an inert metal oxide carrier with a phosphate salt;

(b) buffering said impregnated carrier with a base to a pH ranging from about 5.2 to about 6.6; and

(c) recovering the catalyst.

4,729,979

COPPER ALUMINUM BORATE

Alex Zletz, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 11, 1985, Ser. No. 709,790

Int. Cl.[4] B01J *21/02, 23/70;* C01C *15/12*

U.S. Cl. 502—202 23 Claims

1. Crystalline copper aluminum borate having the significant x-ray diffraction lines set forth in Table A, a surface area of at least 5 square meters per gram and a pore volume of at least 0.04 cc per gram which is at least partially reducible with hydrogen under Temperature Programmed Reduction at a temperature no more than 350° C. to a composition comprising zero valent copper and $Al_4B_2O_9$.

4,729,980

CATALYST FOR THE SIMULTANEOUS HYDRODEMETALLIZATION AND HYDROCONVERSION OF HEAVY HYDROCARBON FEEDSTOCKS AND PROCESS FOR PREPARING THE CATALYST

M. M. Ramirez de Agudelo, and C. E. Galarraga, both of Los Teques, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Apr. 27, 1987, Ser. No. 42,812

Int. Cl.[4] B01J *23/85, 27/049*

U.S. Cl. 502—221 10 Claims

1. A catalyst for use in the hydrodemetallization and hydroconversion of heavy hydrocarbon feedstocks comprising a refractory support having a first demetallization phase and a second hydrogenation phase supported thereon, said first demetallization phase being selected from the group consisting of iron oxide, iron sulphide and mixtures thereof and said second hydrogenation phase being selected from the group consisting of iron-Group VIB metal oxides, iron-Group VIB metal sulphides and mixtures thereof wherein said weight ratio of said first phase to said second phase as measured by mossbauer spectrum is from about 0.1 to 8.0; said iron is present in an amount of from about 4 to 20 wt.% and said Group VIB metal is present in an amount of from about 0.1 to 8 wt.% wherein the atomic ratio of iron to Group VIB metal is from about 0.3 to 20.

4,729,981

ROR-ACTIVATED CATALYST FOR SYNTHESIS GAS CONVERSION

Thaddeus P. Kobylinski, Vero Beach, Fla.; Charles L. Kibby, Gibsonia, Pa.; Richard B. Pannell, Allison Park, Pa., and Elizabeth L. Eddy, Gibsonia, Pa., assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Division of Ser. No. 734,189, May 15, 1985, Pat. No. 4,605,676, which is a continuation-in-part of Ser. No. 635,911, Jul. 30, 1984, Pat. No. 4,585,798, which is a continuation-in-part of Ser. No. 310,969, Oct. 13, 1981, abandoned, and a continuation-in-part of Ser. No. 540,662, Oct. 11, 1983, Pat. No. 4,493,905, which is a division of Ser. No. 310,977, Oct. 13, 1981, Pat. No. 4,413,064.

This application Jun. 2, 1986, Ser. No. 869,705

Int. Cl.[4] B01J *23/70*

U.S. Cl. 502—259 38 Claims

1. A process for the preparation of a catalyst useful for conversion of synthesis gas to a product containing liquid hydrocarbons, said process comprising:

(A) depositing cobalt or nickel precursor on a refractory metal oxide support by impregnation or precipitation to distribute cobalt or nickel as crystallites on said support to form a supported catalyst, and

(B) activating said supported catalyst by subjecting said supported catalyst to the steps, in sequence, of

(i) reduction in hydrogen gas, (ii) oxidation in an oxygen-containing gas and (iii) reduction in hydrogen gas, steps (i), (ii) and (iii) being conducted at a temperature of from about 100° to about 450° C. to form an, activated, supported catalyst more active for conversion of synthesis gas after said step (iii) than after step (i).

4,729,982

BED PACKING MATERIAL

Terence Thistlethwaite, Middlesbrough; Johan H. H. T. Maat, Stockton-on-Tees, and Peter J. Davidson, Darlington, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 28, 1986, Ser. No. 924,037

Claims priority, application United Kingdom, Nov. 8, 1985, 8527663; Jun. 12, 1986, 8614297

Int. Cl.[4] B01J *23/74, 35/04*

U.S. Cl. 502—338 10 Claims

1. A bed packing material in the form of units, each unit having

(a) a multiplicity of passages of substantially uniform cross section extending lengthwise through the unit, said passages having an effective diameter of 0.03 to 1 mm, where the effective diameter is four times the cross-sectional area of the passage divided by the perimeter of the passage cross section, and there being at least 20 passages per cm^2 of the unit cross section area;

(b) a substantially uniform cross section;

(c) a ratio of the length, L, to the notional cross section diameter, D, of at least 0.5, said notional cross section diameter being the diameter of the circle of area equal to the cross-sectional area the unit would have if there were no passages therethrough, the minimum of said length and notional cross section diameter being at least 3 mm;

the number of said passages, and their size relative to said length, L, and notional cross section diameter, D, being such that each unit has

(i) a geometric voidage, GV, of not more then 0.40;

(ii) a ratio of the geometric surface area, GSA, to the volume, V, of the cylinder of length L and diameter D, of at least 10 cm^{-1}; and

(iii) a ratio of GSA to the product of GV and A of at least 15, where A is the surface area of the cylinder of length L and diameter D.

4,729,983

HEAT-SENSITIVE RECORDING MATERIAL

Toshimi Satake; Tomoaki Nagai, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

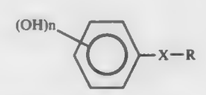
Filed Jun. 9, 1986, Ser. No. 872,233

Claims priority, application Japan, Jul. 10, 1985, 60-150090

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—211 7 Claims

1. A heat-sensitive recording material comprising a support and having thereon a color-developing layer, wherein said color-developing layer comprises both a saturated higher fatty acid iron salt having 16–35 carbon atoms and a polyvalent phenolic derivative represented by the following general formula (I):



(I)

where R represents an alkyl group having 18–35 carbon atoms, n represents an integer from 2 to 3, and —X— represents $—CH_2—$, —O—, —CONH—,



(R′ is an alkyl group having 5–10 carbon atoms), $—SO_2—$, $—SO_3—$, or $—SO_2NH—$.

4,729,984

HEAT SENSITIVE RECORDING SHEETS CONTAINING SULFONE DERIVATIVES

Fumio Hama, Osaka; Masayuki Omatsu, Hyogo, and Mitsuru Kondo, Tokyo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

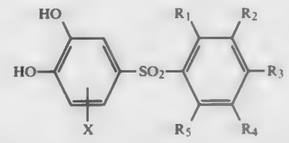
Filed Aug. 4, 1986, Ser. No. 894,498

Claims priority, application Japan, Aug. 9, 1985, 60-176319

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—216 3 Claims

1. In a heat sensitive recording sheet which comprises a base support and a heat sensitive recording layer formed over the base support and which contains a colorless or pale colored basis chromogenic material and an electron accepting color developing material capable of forming a color when contacted with the chromogenic material, the recording layer contains as the color developing material at least a compound selected from the group consisting of 3,4-dihydroxydiphenyl sulfone derivatives being represented by the structural formula:



[I]

wherein X is hydrogen atom, halogen atom, alkyl group or alkoxy group, and R_1, R_2, R_3, R_4 and R_5 are respectively hydrogen atom, halogen atom, hydroxyl group, alkyl group, cycloalkyl group, aralkyl group, aryl group, alkoxy group, aralkyloxy group, aryloxy group, alkylthio group, aralkylthio group or arylthio group, or, both R_1 and R_2 or both R_2 and R_3 may form a naphthalene ring, a tetrahydronaphthalene ring or an indane ring together with their adjacent benzene ring.

4,729,985

RENIN INHIBITORS CONTAINING 5-AMINO-2,5-DISUBSTITUTED-4-HYDROXYPENTANOIC ACID RESIDUES

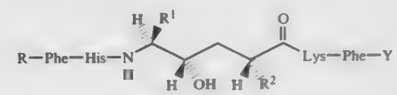
Edward F. Kleinman, Groton; Robert L. Rosati, Stonington, and Jasjit S. Bindra, Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 764,168, Aug. 9, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 858,324

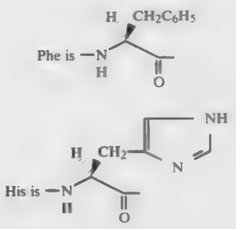
Int. Cl.[4] A61K *37/43;* C07K *7/06, 7/02*

U.S. Cl. 514—17 15 Claims

1. A polypeptide derivative of the formula

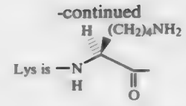


or a pharmaceutically acceptable salt thereof, wherein



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R is hydrogen or an amino protecting acyl group having a molecular weight of less than 500;

R^1 and R^2 are each independently hydrogen, (C_1–C_6)alkyl, (C_1–C_6)alkenyl, phenyl, naphthyl, (C_4–C_7)cycloalkyl, (C_4–C_7)cycloalkenyl, (C_7–C_9)phenylalkyl, (C_{11}–C_{13}) naphthylalkyl or (C_5–C_{10}) (cycloalkyl)alkyl; and

Y is OR^9 or NR^9R^{10}; where R^9 and R^{10} are each independently hydrogen, (C_1–C_5)alkyl, (C_4–C_7)cycloalkyl or benzyl.

4,729,986

FUNGICIDAL TRIAZOLES AND IMIDAZOLES

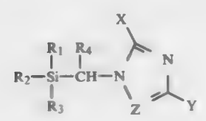
Richard E. Olson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 855,297, Apr. 24, 1986, abandoned. This application Mar. 18, 1987, Ser. No. 23,747

Int. Cl.[4] A01N *55/00;* **C07F** *7/18*

U.S. Cl. 514—63 **24 Claims**

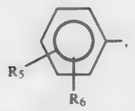
1. A compound of the general formula:



I

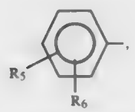
wherein

R_1 is



naphthyl, $—CR_7=CHR_8$, or $—C\equiv CR_7$:

R_2 and R_3 are independently C_1–C_6 alkyl, vinyl, $CH_2CR_9=CR_{10}R_{11}$,

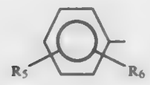


or OR_{12} provided that both R_2 and R_3 may not be OR_{12}:

R_4 is H or CH_3:

R_5 and R_6 are independently H, F, Cl, Br, OCH_3, SCH_3, OCF_2H, OCF_3, C_1–C_4 alkyl, C_1–C_4 haloalkyl, phenyl, or halophenyl:

R_7 and R_8 are independently H, C_1–C_4 alkyl, or



R_9, R_{10} and R_{11} are independently H or CH_3;

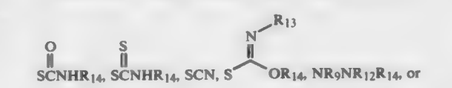
Z is N or CH;

when Z is N,

X is H, C_2–C_4 alkenyl, ethynyl, F, Cl, Br, I, NO_2, SH and its corresponding disulfide, SeH and its corresponding diselenide,









SSR_{17}, CO_2CH_3, CHO, or SH and its corresponding disulfide;

m is 0 or 1;

n is 0, 1, or 2;

R_{12} is H or C_1–C_4 alkyl;

R_{13} is H, C_1–C_4 alkyl, allyl, benzyl, C_1–C_4 alkylcarbonyl, C_1–C_4 haloalkylcarbonyl;

R_{14} and R_{15} are independently H, C_1–C_4 alkyl, allyl, benzyl, or phenyl optionally substituted with 1–3 substituents independently selected from halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, NO_2 or SCH_3;

R_{16} is H, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_2–C_8 alkenyl, C_4–C_8 cycloalkenyl, alpha-pinenyl, aralkyl, aralkenyl, or phenyl optionally substituted with 1–3 substituents independently selected from halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, NO_2 or SCH_3;

R_{17} is C_1–C_4 alkyl, C_1–C_4 haloalkyl, allyl, benzyl or phenyl optionally substituted with 1–3 substituents independently selected from halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, NO_2 or SCH_3;

R_{18} is C_1–C_5 alkyl, C_1–C_4 haloalkyl, CH_2SCN, C_2–C_4 alkenyl, $CHR_9(CHR_{10})_mCN$, $CH_2CO_2R_{14}$, C_3–C_4 alkynyl, CH_2NO_2, benzyl, CH_2OCH_3,



CH_2CCH_3, $CH_2CCH_2COCH_3$ or $CH_2CCH_2COCH_2CH_3$;

R_{19} is CH_3, phenyl, or benzyl;

R_{20} is C_1–C_4 alkyl, CH_2CN, CH_2SCN, or allyl;

provided that either X or Y must be H but both X and Y cannot be H simultaneously;

when Z is CH, Y is H and X is $S(O)_nR_{21}$, SO_2OH, I or SH and its corresponding disulfide;

R_{21} is C_2–C_4 alkyl, CH_2CN or CH_2SCN.

17. A method for controlling fungus disease which comprises applying to the locus of infestation to be protected an effective amount of a compound of claim **1**.

4,729,987

INSECTICIDAL O,O-DIETHYL-O-(2-(1,1-DIMETHYLETHYL)-5-PYRIMIDINYL)-PHOSPHOROTHIOATE

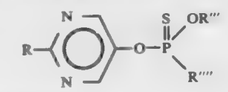
Walter Reifschneider, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 688,774, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 521,516, Aug. 9, 1983, abandoned, which is a continuation of Ser. No. 300,422, Sep. 9, 1981, abandoned, which is a continuation of Ser. No. 928,665, Jul. 28, 1978, Pat. No. 4,429,125. This application Oct. 21, 1986, Ser. No. 921,300

Int. Cl.[4] A01N *57/16;* **C07F** *9/65*

U.S. Cl. 514—86 **6 Claims**

1. A compound of the formula



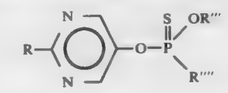
wherein

R is 1,1-dimethylethyl;

R''' is ethyl; and

R'''' is ethoxy.

3. A method which comprises applying to crop land soil an insecticidal amount but less than a phytotoxic amount of a pyrimidinyl phosphate having the formula



wherein

R is 1,1-dimethylethyl;

R''' is ethyl; and

R'''' is ethoxy.

4,729,988

Patent Not Issued For This Number

4,729,989

ENHANCEMENT OF ABSORPTION OF DRUGS FROM GASTROINTESTINAL TRACT USING CHOLINE ESTER SALTS

Jose Alexander, and Joseph A. Fix, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 28, 1985, Ser. No. 749,696

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/43, 31/545*

U.S. Cl. 514—192 **3 Claims**

1. A method of enhancing the rate of gastrointestinal absorption of an orally or rectally administred drug, comprising administering a dosage form capable of being orally or rectally absorbed, said dosage form comprising a therapeutically effective dosage amount of a poorly absorbed β-lactam antibiotic drug selected from the group consisting of cefoxitin, N-formamidinyltheinamycin, ampicillin, azlocillin, bacampicillin, carbenicillin, cefaclor, cefadroxil, cefamandole, cefatrizine, cefazoline, cefonicid, cefaperazone, ceforanide, cefotaxime, cefotiam, cefroxadine, cefsulodin, ceftazidime, ceftriaxone, ceftizoxime, cephalexin, cephaloglycin, cephaloridine, cephradine, cyclacillin, cloxacillin, dicloxacillin, floxacillin, hetacillin, methicillin, nafcillin, oxacillin, sarmoxacillin, sarpicillin, talampicillin, ticaricillin, penicillin G., penicillin V., pivampicillin. piperacillin, pirbenicillin and a choline ester absorption enhancing agent of the formula :

$$[(CH_3)_3N^+CH_2CH_2OR]X^-$$

wherein R is saturated acyl (C_2–C_{20}), acyl(C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl(C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl(C_4–C_{20}), unsaturated hydroxycacyl(C_5–C_{20}) or carbalkoxyacyl(C_5–C_{20}), or carboxy acyl(C_4–C_{20}) and X- is a pharmaceutically acceptable counterion.

4,729,990

SUBSTITUTED PENEM DERIVATIVES

Marco Alpegiani; Angelo Bedeschi; Maurizio Foglio; Giovanni Francheschi, and Ettore Perrone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

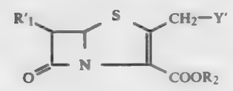
Division of Ser. No. 481,924, Apr. 4, 1983, Pat. No. 4,577,016. This application Dec. 11, 1985, Ser. No. 807,688

Claims priority, application United Kingdom, Apr. 8, 1982, 8210410

Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **9 Claims**

1. A compound of the following formula (Ia):



(Ia)

wherein

R'_1 is a C_1–C_6 alkyl group substituted by hydroxy;

R_2 is hydrogen;

Y' is a group —S-Het' wherein Het' represents:

(a) 5-oxo-6-hydroxy-2,5-dihydro-1,2,4-triazinyl or 5-oxo-6-hydroxy-4,5-dihydro-1,2,4-triazinyl, both optionally substituted by a C_1–C_3 alkyl group; or

(b) tetrazolo-pyridazinyl optionally substituted by a group



wherein each of R' and R'' is independently hydrogen or C_1–C_3 alkyl group; and the pharmaceutically acceptable salts thereof.

4,729,991

CEPHEM COMPOUNDS

Ikuo Ueda, Toyonaka; Masakazu Kobayashi, Ikeda, and Tadashi Kitaguchi, Kukuchinishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 72,990, Sep. 6, 1979. This application Sep. 24, 1982, Ser. No. 423,183

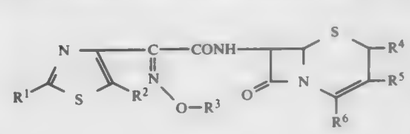
Claims priority, application United Kingdom, Sep. 8, 1978, 36131/78

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/545;* **C07D** *501/36*

U.S. Cl. 514—202 **12 Claims**

1. A compound of the syn isomer of the formula:



wherein

R^1 is amino,

R^2 is halogen,

R^3 is lower alkyl,

R^4 is hydrogen,

R^5 is tetrazolylthiomethyl, thiadiazolylthiomethyl, tetrazolylthiomethyl having a lower alkyl substituent on the

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tetrazolyl, or thiadiazolylthiomethyl having a lower alkyl substituent on the thiadiazolyl, and

R^6 is carboxy, and its pharmaceutically acceptable salt thereof.

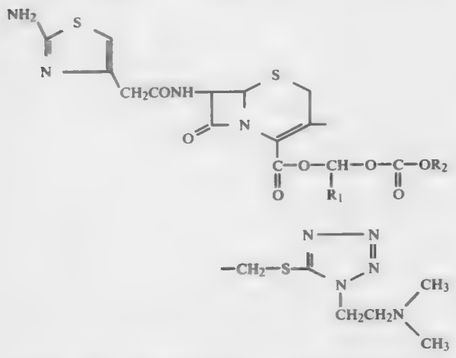
4,729,992

CEPHALOSPORIN ESTERS, THEIR PRODUCTION AND USE

Tatsuo Nishimura; Yoshinobu Yoshimura, and Mitsuo Numata, all of Osaka, Japan, assignors to Tatsuo Chemical Ind., Ltd., Japan

Filed Apr. 19, 1985, Ser. No. 724,927
Claims priority, application Japan, Apr. 20, 1984, 59-80744
Int. Cl.⁴ A61K *31/545;* **C07D** *501/36*
U.S. Cl. 514—206 **5 Claims**

1. A compound of the formula:



wherein R_1 is a cycloalkyl having 5-7 carbon atoms group; and R_2 is a cycloalkyl having 5-7 carbon atoms, or a pharmaceutically acceptable salt thereof.

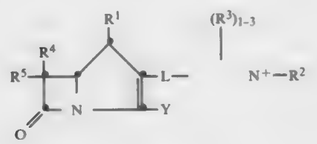
4,729,993

CARBAPENEMS AND 1-METHYLCARBAPENEMS HAVING AN EXTERNALLY ALKYLATED MONO- OR BICYCLIC 2-QUATERNARY HETEROARYLALKYL SUBSTITUENT

Burton G. Christensen, Cliffside; Ronald W. Ratcliffe, Matawan; James V. Heck, Fanwood; Thomas N. Salzmann, North Plainfield, and David H. Shih, Manalapan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 13, 1984, Ser. No. 681,179
Int. Cl.⁴ C07D *499/00;* **A61K** *31/425*
U.S. Cl. 514—210 **21 Claims**

1. A compound having the formula:



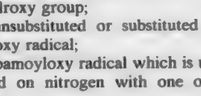
(I.)

wherein:

R^1 is hydrogen or methyl;

R^4 and R^5 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, FCH_2—, F_2CH—, F_3C—, $CH_3CH(F)$—, $(CH_3)_2C(F)$—; CH_3CF_2—, or

L is a bridging group comprising substituted or unsubstituted C_1–C_4 straight, C_2–C_6 branched or C_3–C_7 cycloalkyl groups wherein the substituents are selected from C_1–C_6 alkyl, O-C_1–C_6 alkyl, S-C_1–C_6 alkyl, CF_3, $N(C_1$–C_6 alkyl)$_2$;



is a mono- or bicyclic heteroarylium group containing from 5–11 ring atoms of which up to 5 are heteroatoms in addition to the quaternary nitrogen;

wherein:

R^2 is

(1) an unsubstituted or substituted C_1–C_6 alkyl radical;
(2) an unsubstituted or substituted C_2–C_6 alkenyl radical;
(3) an unsubstituted or substituted C_2–C_6 alkynyl radical;
(4) a C_3–C_7 cycloalkyl radical in which the ring is substituted or unsubstituted and one or more atoms may be replaced by a heteroatom;
(5) a C_3–C_7 cycloalkyl methyl radical in which the ring may be substituted and one or more atoms may be replaced by a heteroatom;
(6) an unsubstituted or substituted C_5–C_7 cycloalkenyl radical;
(7) an unsubstituted or substituted bivalent C_2–C_6 alkylidene radical, optionally interrupted by a heteroatom, and joined to the heteroarylium group to form a ring which is carbocyclic or in which one or more atoms is replaced by a heteroatom and wherein the new ring may contain one or more double bonds;
(8) an unsubstituted or substituted phenyl or heteroaryl radical;
(9) an unsubstituted or substituted phenyl (C_1–C_4 alkyl) or heteroaryl (C_1–C_4 alkyl) radical;
(10) a cyano (C_1–C_4 alkyl) radical;
(11) a carboxy (C_1–C_4 alkyl) radical;
(12) a sulfo (C_1–C_4 alkyl) radical;
(13) a carbamoyl (C_1–C_4 alkyl) radical;
(14) a phosphonyl (C_1–C_4 alkyl) radical;
(15) a hydroxy (C_1–C_4 alkyl) radical; or
(16) an amino (C_1–C_4 alkyl) radical in which the nitrogen atom is unsubstituted or substituted with one to three C_1–C_4 alkyl groups;

wherein the substituents in the above definitions of R^2 are independently selected from the group consisting of:

(a) a trifluoromethyl group;
(b) a halogen atom;
(c) an unsubstituted or substituted C_1–C_4 alkoxyl radical;
(d) a hydroxy group;
(e) an unsubstituted or substituted (C_1–C_6 alkyl) carbonyloxy radical;
(f) a carbamoyloxy radical which is unsubstituted or substituted on nitrogen with one or two C_1–C_4 alkyl groups;
(g) a C_1–C_6 alkylthio radical, C_1–C_6 alkylsulfinyl radical or C_1–C_6 alkylsulfonyl radical, each of which is unsubstituted or substituted on the alkyl group;
(h) a sulfo group;
(i) a sulfamoyl group which is unsubstituted or substituted on nitrogen by one or two C_1–C_4 alkyl groups;
(j) a formylamino group;
(k) an unsubstituted or substituted (C_1–C_6 alkyl)carbonylamino radical;
(l) a (C_1–C_4 alkoxyl) carbonylamino radical;
(m) a ureido group in which the terminal nitrogen is unsubstituted or substituted with one or two C_1–C_4 alkyl groups;
(n) an arylsulfonamido or a (C_1–C_6 alkyl)sulfonamido group;
(o) a cyano group;
(p) a formyl or acetalized formyl radical;

(q) an unsubstituted or substituted (C_1–C_6 alkyl)carbonyl radical wherein the carbonyl is free or acetalized;
(r) an unsubstituted or substituted phenylcarbonyl or heteroarylcarbonyl radical;
(s) a carboxyl group;
(t) a (C_1–C_6 alkoxy)carbonyl radical;
(u) a carbamoyl radical which is unsubstituted or substituted on nitrogen by one or two C_1–C_4 alkyl groups;
(v) an N-hydroxycarbamoyl or $N(C_1$–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group;
(w) a thiocarbamoyl group;
(x) a 5-(1H)-tetrazolyl group;
(y) a phosphonate group—P(O) (OH)OR′ where R′ is C_1–C_3alkyl;
(z) an alkyl phosphonate group $—(CH_2)_nP(O)(OH)(OR')$ where n=1 to 3 and R′ is C_1–C_3alkyl;
(aa) hydrogen;
(ab) an unsubstituted or substituted C_1–C_6 alkyl radical;
(ac) an unsubstituted or substituted C_2–C_6 alkenyl radical;
(ad) an unsubstituted or substituted C_2–C_6 alkynyl radical;
(ae) a C_3–C_7 cycloalkyl radical in which the ring is substituted or unsubstituted and one or more atoms may be replaced by a heteroatom;
(af) a C_3–C_7 cycloalkyl methyl radical in which the ring may be substituted and one or more atoms may be replaced by a heteroatom;
(ag) an unsubstituted or substituted C_5–C_7 cycloalkenyl radical;
(ah) an unsubstituted or substituted phenyl or heteroaryl radical; and
(ai) an unsubstituted or substituted phenyl (C_1–C_4 alkyl) or heteroaryl (C_1–C_4 alkyl) radical; and

R^3 is

(a) hydrogen;
(b) an unsubstituted or substituted C_1–C_6 alkyl radical;
(c) an unsubstituted or substituted C_2–C_6 alkenyl radical;
(d) an unsubstituted or substituted C_2–C_6 alkynyl radical;
(e) a C_3–C_7 cycloalkyl radical in which the ring is substituted or unsubstituted and one or more atoms may be replaced by a heteroatom;
(f) a C_3–C_7 cycloalkyl methyl radical in which the ring may be substituted and one or more atoms may be replaced by a heteroatom;
(g) an unsubstituted or substituted C_5–C_7 cycloalkenyl radical;
(h) an unsubstituted or substituted phenyl or heteroaryl radical;
(i) an unsubstituted or substituted phenyl (C_1–C_4 alkyl) or heteroaryl (C_1–C_4 alkyl) radical; and
(j) a trifluoromethyl group;
(k) a halogen atom;
(l) an unsubstituted or substituted C_1–C_4 alkoxyl radical;
(m) a C_1–C_6 alkylthio radical, C_1–C_6 alkylsulfinyl radical or C_1–C_6 alkylsulfonyl radical, each of which is unsubstituted or substituted on the alkyl group;
(n) a mono (C_1–C_4 alkyl) amino or di(C_1–C_4 alkyl)amino group, each of which is unsubstituted or substituted on the alkyl group; or
(o) a cyano group; and

Y is

(i) COOH or a pharmaceutically acceptable ester or salt thereof,
(ii) COOR wherein R is a removable carboxy protecting group,
(iii) COOM wherein M is an alkali metal, or
(iv) COO^-; provided that when Y is other than (iv) a counterion Z^- is provided.

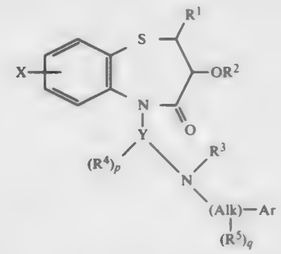
4,729,994

BENZOTHIAZEPINE VASODILATORS HAVING ARALKYL SUBSTITUTION

John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 898,298, Aug. 20, 1986, abandoned. This application Mar. 16, 1987, Ser. No. 26,430
Int. Cl.⁴ A61K *31/38;* **C07D** *285/36*
U.S. Cl. 514—211 **18 Claims**

1. A benzothiazepine of the following formula (I):



(I)

wherein

X is a hydrogen atom or a halogen atom;

R^1 is a phenyl ring which is unsubstituted or independently substituted by 1 to 3 of lower alkyl, lower alkoxy or halogen;

R^2 is a hydrogen atom or a lower alkanoyl group;

Y is a straight chain alkylene group of about 2 or 3 carbons;

R^3 is lower alkyl;

R^4 is independently lower alkyl;

p is the integer 0, 1, 2 or 3;

Alk is a straight chain alkylene of about 2 to 4 carbons;

R^5 is independently hydroxy, alkyl or phenyl;

q is 0, 1 or 2 or 3 if Alk is alkylene of about 2 to 4 carbons; and

Ar is a phenyl, phenoxy, thiophenoxy, naphthyl or a 5- or 6-membered heterocyclic aromatic ring which rings may be substituted independently by one or more of alkyl, alkoxy, alkylthio, hydroxy, halogen, fluoroalkyl, nitro, amino or dialkylamino or by methylenedioxy at adjacent ring carbon, and the pharmaceutically acceptable acid addition salts and quaternary ammonium compounds thereof.

13. A pharmaceutical composition comprising a benzothiazepine of claim 1 in combination with a pharmaceutically acceptable diluent or carrier.

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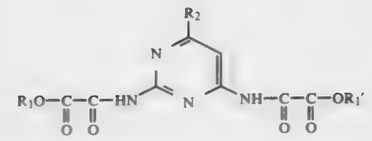
PYRIMIDINE 2,4-DIOXAMATE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Hiroaki Taguchi, Ibaraki; Takeo Katsushima, Kyoto; Masakazu Ban, Mukoh; Shoichi Aoki, Hino, and Akihiko Watanabe, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1987, Ser. No. 33,734
Claims priority, application Japan, Apr. 21, 1986, 60-91482; Nov. 22, 1986, 60-279040
Int. Cl.⁴ A61K *31/505, 31/535;* **C07D** *239/48, 413/04*
U.S. Cl. 514—212 **6 Claims**

1. A pyrimidine compound of the formula:

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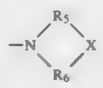


(I)

wherein R_1 and R_1' are the same or different and are each hydrogen atom, a lower alkyl, benzyl, an alkali metal, or amonium; R_2 is hydrogen atom, a halogen atom, a lower alkyl, a lower alkoxy, an aryl, a group of the formula:



wherein R_3 and R_4 are the same or different and are each hydrogen atom, a lower alkyl, or an aryl, or a group of the formula:



wherein R_5 and R_6 are the same or different and are each an alkylene having 1 to 3 carbon atoms, and X is oxygen atom, methylene, or a group of the formula: >N-Y wherein Y is hydrogen atom, a lower alkyl, benzyl, or an aryl, or a hydrate thereof.

4. A pharmaceutical composition for the prophylaxis and treatment of various allergic diseases, which comprises as an active ingredient a prophylactically or therapeutically effective amount of the pyrimidine compound as set forth in claim **1** in admixture with a conventional pharmaceutically acceptable carrier or diluent.

9. A method for inhibiting tumors in a host comprising contacting a tumor with an effective antitumor amount of one or more compounds of claim **1**.

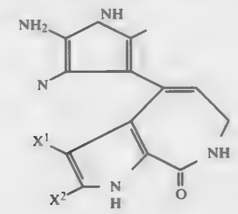
4,729,996

ANTITUMOR COMPOSITIONS AND THEIR METHODS OF USE

Amy E. Wright, Ft. Pierce, and Winnie C. Thompson, Vero Beach, both of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed May 29, 1986, Ser. No. 868,795
Int. Cl.[4] C07D *521/00;* **A61K** *31/55*
U.S. Cl. 514—215 **20 Claims**

1. A compound according to the formula:



wherein X^1 and X^2 are the same or different and are a halogen or hydrogen with the proviso and that X^1 and X^2 are not both bromine.

4,729,997

NOVEL METHOD OF ADMINISTERING MECLIZINE TYPE PHARMACEUTICAL AGENTS AND NOVEL DOSAGE FORMS CONTAINING SAME

Jeffrey Wenig, Dix Hills, N.Y., assignor to Nastech Pharmaceutical Co., Inc., N.Y.

Division of Ser. No. 787,617, Nov. 15, 1985, Pat. No. 4,624,965, which is a continuation-in-part of Ser. No. 671,694, Nov. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,891, Oct. 23, 1984, abandoned. This application Aug. 19, 1986, Ser. No. 897,863
Int. Cl.[4] A61K *31/44, 31/47, 31/54*
U.S. Cl. 514—225 **9 Claims**

1. A method of eliciting a systemic, therapeutic, antihistaminic, antinausea or antiemetic response in a mammal which comprises nasal administration to said mammal of a systemically, therapeutically effective antihistaminic antinausea or antiemetic amount of a therapeutic agent selected from the group consisting of cyclizine, chlorcyclizine, meclizine, buclizine, trimethobenzamide and benzquinamide or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable nasal carrier therefor.

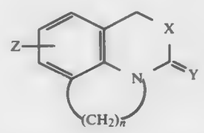
4,729,998

CYCLIC CARBAMATES AND FUNGICIDAL USE

Yoshio Kurahashi, Tokyo; Shinzo Kagabu, Gifu; Noboru Matsumoto, Tokyo; Takayo Yamada, Tokyo, and Katsuaki Wada, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 31,349
Claims priority, application Japan, Apr. 4, 1986, 61-76625
Int. Cl.[4] A01N *43/86;* **C07D** *491/06, 498/06*
U.S. Cl. 514—226 **10 Claims**

1. A cyclic carbamate of the formula



in which
X and Y each represent oxygen or sulfur,
Z represents hydrogen, halogen, alkyl or nitro, and
n is 2 or 3.

9. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim **1**.

4,729,999

ANTIESTROGEN THERAPY FOR SYMPTOMS OF ESTROGEN DEFICIENCY

Ronald L. Young, Houston, Tex., assignor to BCM Technologies, The Woodlands, Tex.

Filed Oct. 12, 1984, Ser. No. 660,510
Int. Cl.[4] A61K *31/535, 31/445, 31/40, 31/19*
U.S. Cl. 514—227 **29 Claims**

1. A method of treating menopausal symptoms comprising administering a true antiestrogen to a postmenopausal or an oophorectomized woman in a dose effective to prevent the manifestation of said menopausal symptoms, without any estrogen administration.

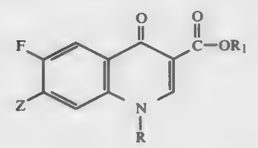
4,730,000

QUINOLINE ANTIBACTERIAL COMPOUNDS

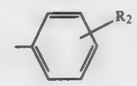
Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 597,854, Apr. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 574,227, Jan. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 514,716, Jul. 18, 1983, abandoned. This application Oct. 7, 1985, Ser. No. 784,421
Int. Cl.[4] A61K *31/495;* **C07D** *401/04*
U.S. Cl. 514—254 **25 Claims**

1. A compound having the formula:



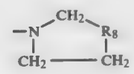
wherein R_1 is hydrogen or a carboxy protecting group; R is selected from the group consisting of (1) an aromatic heterocyclic ring having 5 to 6 atoms therein, with 1 to 2 hetero atoms being selected from the group consisting of S, O and N and the remaining atoms in the ring being carbon atoms and substituted derivatives of said aromatic heterocyclic ring wherein the aromatic heterocyclic ring is mono-substituted with C_1 to C_6 alkyl; and (2) a phenyl group having the formula:



wherein R_2 is one, two or three substituents independently selected from the group consisting of hydrogen, halogen, cyano, C_1 to C_6 alkyl, halo-substituted C_1 to C_6 alkyl, a group having the formula:

$$—Y—R_3$$

wherein —Y— is —O— or —S— or R_3 is hydrogen or C_1 to C_6 alkyl, and NH_2; and Z is selected from the group consisting of (1) an aliphatic heterocyclic ring having the structure:



wherein R_8 is CH_2, $(CH_2)_2$ or a group of the formula $—(CH_2)_n—R_9—$ wherein R_9 is —N—, —O—, or —S— and n is 0, 1 or 2, and substituted derivatives thereof wherein the aliphatic heterocyclic ring is substituted with one, two or three substituents independently selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_3 alkylamino-substituted C_1 to C_6 alkyl, amino-substituted C_1 to C_6 alkyl, hydroxy, alkanoyl having 1 to 6 carbon atoms, alkanoylamido having 1 to 6 carbon atoms, halogen, an amine of the formula:



wherein R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and C_1 to C_6 alkyl; and (2) an amino group of the formula:



wherein R_6 is hydrogen or C_1 to C_6 alkyl, and R_7 is selected from the group consisting of C_1 to C_6 alkyl, NH_2, a mono-(C_1 to C_4) alkylamino group and a di-(C_1 to C_4) alkylamino group, and pharmaceutically acceptable salts thereof.

24. A method of treating a bacterial infection in a patient comprising administering to a patient in need a therapeutically effective amount of a compound as defined in claim **1**.

VOL 1088 ISS 2 MR 8 1988 UMI

4,730,001

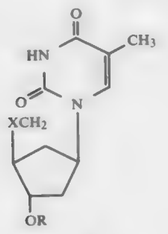
CARBOCYCLIC ANALOGUES OF AMINO AND AZIDO THYMIDINES

Y. Fulmer Shealy, and C. Allen O'Dell, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

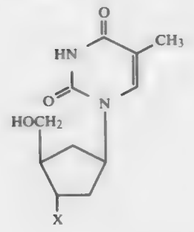
Filed Jan. 22, 1986, Ser. No. 820,790
Int. Cl.[4] C07D *239/26;* **A61K** *31/505*
U.S. Cl. 514—274 **14 Claims**

1. A compound having one of the following formulas:

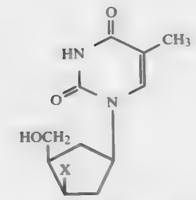
Formula I



Formula II



Formula III



wherein X is an azido group or an amino group and R is hydrogen or an acyl group having from 2–7 carbon atoms.

4,730,002
Patent Not Issued For This Number

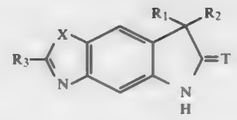
4,730,003

TRICYCLIC COMPOUNDS FOR TREATING HEART AND CIRCULATORY DISEASES

Wolfgang von der Saal, Weinheim; Alfred Mertens, Schriesheim; Herbert Berger, Mannheim, and Bernd Müller-Beckmann, Grünstadt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 904,094
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531678
Int. Cl.[4] A61K *31/415;* **C07D** *487/04, 498/04, 513/04*
U.S. Cl. 514—387 **22 Claims**

1. A compound of the formula:



(I)

wherein

R_1 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl or C_3–C_7 cycloalkyl;

R_2 is hydrogen, cyano, C_1–C_6 alkyl, C_2–C_6 alkenyl, or a carbonyl group substituted by hydroxyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, amino, C_1–C_6 alkylamino, C_2–C_{12} dialkylamino or hydrazino, or

R_2 and R_1 together with the carbon to which they are attached form a C_3–C_7 cycloalkyl ring, or R_1 and R_2 together form C_3–C_7 alkylidene or C_3–C_7 cycloalkylidene,

T is oxlygen or sulphur or an NR_4 group wherein R_4 is hydrogen or a C_1–C_6 alkyl;

R_3 is hydrogen, C_1–C_6 alkyl, hydroxyl, amino or mercapto, C_1–C_6 alkylthio, pyridylcarbonylamino, C_1–C_6 alkylcarbonylamino, C_3–C_7 cycloalkyl, C_2–C_6 alkenyl, C_3–C_7 cycloalkenyl, C_2–C_6 alkynyl, C_1–C_6 haloalkyl, C_1–C_6-alkoxy-C_1–C_6-alkyl, carboxy-C_1–C_6-alkyl or C_1–C_6-alkoxycarbonyl-C_1–C_6-alkyl and

X is an oxygen or sulphur atom or an NR_5 group, wherein R_5 is hydrogen or an C_1–C_6 alkyl;

a tautomer thereof

or a physiologically acceptable salt thereof with an inorganic or organic acid.

20. A method of treating heart or circulatory diseases in a mammal comprising administering at least one of the compounds of claim **1** in an amount sufficient to exhibit at least one physiological effect selected from the group of a positive inotropic effect to increase the power of the heart, a blood pressure-lowering action, an influence on thrombocyte aggregation and an improvement of the micro-circulation.

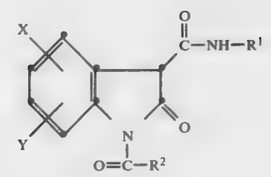
4,730,004

ANALGESIC AND ANTI-INFLAMMATORY 1-ACYL-2-OXINDOLE-3-CARBOXAMIDES

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 821,296, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 753,200, Jul. 9, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 14,120
Int. Cl.[4] A61K *31/40;* **C07D** *209/34*
U.S. Cl. 514—418 **34 Claims**

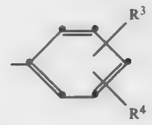
23. A method of treating an inflammatory disease in a mammalian subject, which comprises administering to said mammalian subject an inflammatory disease treating amount of a 1-acyl-2-oxindole-3-carboxamide compound of the formula



or a pharmaceutically-acceptable base salt thereof; wherein

X and Y are each selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl and alkyl having 1 to 4 carbons;

R^1 is selected from the group consisting of alkyl having from 1 to 6 carbons, cycloalkyl having from 3 to 7 carbons, and groups of the formula



wherein R^3 and R^4 are each selected from the group consisting of hydrogen, fluoro, chloro, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl;

and R^2 is alkyl having 1 to 6 carbons.

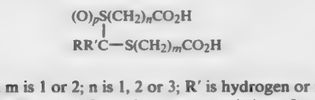
4,730,005

LEUKOTRIENE ANTAGONIST

John G. Gleason, Delran, N.J., and Carl D. Perchonock, Philadelphia, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

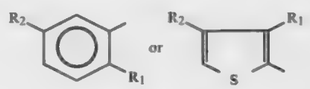
Continuation of Ser. No. 716,320, Mar. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 689,114, Jan. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 630,500, Jul. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 572,021, Jan. 19, 1984, abandoned. This application May 16, 1986, Ser. No. 864,562
Int. Cl.[4] A61K *31/38;* **C07D** *333/36, 333/32, 333/24*
U.S. Cl. 514—438 **22 Claims**

1. A compound represented by the following structural formula (I):

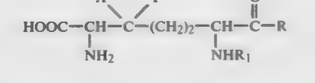


(I)

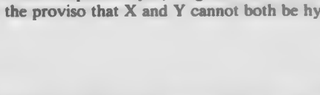
wherein m is 1 or 2; n is 1, 2 or 3; R′ is hydrogen or methyl; R is a radical selected from the group consisting of:



wherein R_1 is C_8 to C_{13} alkyl, C_7 to C_{12} alkoxy, C_7 to C_{12} thioalkyl, C_{10} to C_{12} 1-alkynyl, 11-dodecynyl, 1-trans-dodecenyl, 5-(4-acetyl-3-hydroxy-2-propylphenoxy)pentoxy, 2(Z),5(Z)-undecadienyloxy, phenyl-C_4 to C_{10} alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, methoxy, methylthio or trifluoromethylthio, phenylthio-C_3 to C_9 alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, methoxy, methylthio or trifluoromethylthio, phenyl-CH=CH—$(CH_2)_{2-8}$, phenyl-C_3 to C_9 alkoxy, trifluoromethyl-C_7 to C_{12} alkyl, cyclohexyl-C_4 to C_{10} alkyl or



wherein each q is 0, 1, 2 or 3 but the sum of both q's does not exceed 3, and R_2 is hydrogen, bromo, chloro, methyl, trifluoromethyl, methoxy or nitro; or R_1 is hydrogen and R_2 is C_8 to C_{13} alkyl, C_7 to C_{12} alkoxy, C_7 to C_{12} thioalkyl, C_{10} to C_{12} 1-alkynyl, 11-dodecynyl, 1-trans-dodecenyl, 5-(4-acetyl-3-hydroxy-2-propylphenoxy)pentoxy, 2(Z),5(Z)-undecadienyloxy, phenyl-C_4 to C_{10} alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, methoxy, methylthio or trifluoromethylthio, phenylthio-C_3 to C_9 alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, methoxy, methylthio or trifluoromethylthio, phenyl —CH=CH—$(CH_2)_{2-8}$, phenyl-C_3 to C_9 alkoxy, trifluoromethyl-C_7 to C_{12} alkyl, cyclohexyl-C_4 to C_{10} alkyl, or



wherein each q is 0, 1, 2 or 3 but the sum of both q's does not exceed 3, and p is 0 or 1, with the proviso that R is not a thiophene radical and any of R_1 and R_2 above are not thioalkyl or phenylthioalkyl when p is 1; or a pharmaceutically acceptable salt thereof.

4,730,006

DERIVATIVES OF 2,6-DIAMINO-3-HALOHEPTANEDIOIC ACID

Ekkehard H. Bohme, Cincinnati, Ohio; Fritz Gerhart, Kehl Leutesheim, Fed. Rep. of Germany, and William Higgins, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 27, 1986, Ser. No. 822,436
Int. Cl.[4] A61K *31/195, 31/24;* **C07C** *101/26;* **C07K** *5/06, 5/08, 5/10*
U.S. Cl. 514—538 **16 Claims**

1. A 2,6-diamino-3-haloheptanedioic acid derivative having the formula

wherein

R is hydroxy, (C_1–C_4)alkoxy or an amino acid, dipeptide or tripeptide residue said amino acid, dipeptide or tripeptide residue being composed of the amino acid selected from the group consisting of glycine and the L-isomers of alanine, methionine, valine, leucine and isoleucine;

R_1 is hydrogen or an amino acid, dipeptide or tripeptide residue dipeptide or tripeptide residue being composed of the amino acid selected from the group consisting of glycine and the L-isomers of alanine, methionine, valine, leucine and isolencine, and there simple amides, with the proviso that when R_1 is an amino acid, dipeptide or tripeptide residue, then R must be hydroxy, and with the further proviso that when R is an amino acid, dipeptide or tripeptide residue, then R_1 must be hydrogen;

X and Y are independently hydrogen, fluorine or chlorine, with the proviso that X and Y cannot both be hydrogen;

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and the pharmaceutically acceptable salts or optical isomers thereof.

4,730,007

NOVEL ANALGESIC COMPOSITIONS

Seymour Ehrenpreis, 4339 Birchwood Ave., Skokie, Ill. 60076

Filed Sep. 4, 1985, Ser. No. 772,551

Int. Cl.[4] A61U *31/16, 31/195*

U.S. Cl. 514—561 **8 Claims**

1. An analgesic composition comprising an effective amount of an analgesic, anti-inflammatory agent selected from the group consisting of D-phenylalanine, DL-phenylalanine, D-leucine and DL-leucine and a synergistically effective amount of acetominophen.

4,730,008

AMINOPHENOL DERIVATIVES

Ian F. Skidmore, Welwyn; Harry Finch, Hitchin; Alan Naylor, Royston; Lawrence H. C. Lunts, Broxbourne, and Ian B. Campbell, Ware, all of England, assignors to Glaxo Group Limited, London, England

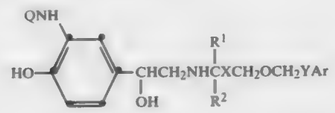
Continuation-in-part of Ser. No. 788,120, Oct. 16, 1985, abandoned. This application Jan. 10, 1986, Ser. No. 817,676

Claims priority, application United Kingdom, Oct. 17, 1984, 8426200

Int. Cl.[4] C07C *143/74;* **A61K** *31/18*

U.S. Cl. 514—605 **16 Claims**

1. A compound of formula (I)



(I)

wherein

Ar represents a phenyl group optionally substituted by one or more substituents selected from halogen atoms, or the groups C_{1-6} alkyl, C_{1-6} alkoxy, nitro, $-(CH_2)_qR$, $-(CH_2)_rR^{10}$ or $-O(CH_2)_tR^{11}$, or Ar is a phenyl group substituted by an alkylenedioxy group of formula $-O(CH_2)_pO-$;

where R is hydroxy, $-NR^3R^4$, $-NR^5COR^6$, $-NR^5SO_2R^7$, $-COR^8$, $-SR^9$, $-SOR^9$, SO_2R^9 or $-CN$;

R^1 and R^2 each represent a hydrogen atom or a C_{1-3} alkyl group with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4;

R^3 and R^4 each represents a hydrogen atom or a C_{1-4} alkyl group or $-NR^3R^4$ forms a saturated heterocyclic amino group which has 5–7 ring members and optionally contains in the ring one or more atoms selected from —O— or —S— or a group —NH— or $-N(CH_3)-$;

R^5 represents a hydrogen atom or a C_{1-4} alkyl group;

R^6 represents a hydrogen atom or a C_{1-4} alkyl, C_{1-4} alkoxy, phenyl or $-NR^3R^4$ group;

R^7 represents a C_{1-4} alkyl, phenyl or $-NR^3R^4$ group;

R^8 represents hydroxy, C_{1-4} alkoxy or $-NR^3R^4$;

R^9 is a hydrogen atom or a C_{1-4} alkyl or phenyl group;

R^{10} is a C_{1-4} alkoxy group;

R^{11} represents a hydroxy or C_{1-4} alkoxy group;

p represents 1 or 2;

q represents an integer from 0 to 3;

r represents an integer from 1 to 3;

t is 2 or 3;

X represents a C_{1-7} alkylene, C_{2-7} alkenylene or C_{2-7} alkynylene chain;

Y represents a bond, or a C_{1-6} alkylene, C_{2-6} alkenylene or C_{2-6} alkynylene chain with the proviso that the sum total of carbon atoms in X and Y is 2 to 10;

Q represents a group $R^{12}CO-$, $R^{12}NHCO$, $R^{12}R^{13}NSO_2-$, or $R^{14}SO_2$

where R^{12} and R^{13} each represent a hydrogen atom or a C_{1-3} alkyl group, and R^{14} represents a C_{1-4} alkyl group; with the proviso that when X represents C_{1-7} alkylene, and Y represents a bond or C_{1-6} alkylene, then the group Ar does not represent an unsubstituted phenyl group or a phenyl group substituted by one or more substituents selected solely from halogen atoms or C_{1-6} alkyl or C_{1-6} alkoxy groups or an alkylenedioxy group $-O(CH_2)_pO-$; or a physiologically acceptable salt or solvate thereof.

4,730,009

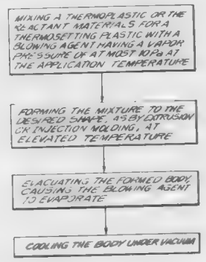
PLASTIC FOAMS AND METHOD OF MAKING SAME

Sven G. Soredal, Birger Jarlsgatan 42, S 114 29, Stockholm, Sweden

Filed Mar. 21, 1984, Ser. No. 591,845

Int. Cl.[4] C08J *9/26, 9/28;* **B29C** *45/00, 47/00*

U.S. Cl. 521—87 **8 Claims**



1. A plastic foam having a maximum permissible application temperature of about 50°–180° C., said foam having closed cells, and the vapor of a physical blowing agent contained in said cells, said vapor having an absolute pressure of less than 10 Pa at said application temperature, said blowing agent being one which does not react with the plastic material of the foam.

4,730,010

QUARTERNARY AMMONIUM GROUP-CONTAINING RESINS FOR USE IN CATHODIC ELECTRODEPOSITION COATING SYSTEMS

Yasuyuki Tsuchiya, Hirakata; Koji Ito, Ibaraki; Koichi Hagihara; Hiroyuki Sakamoto, both of Nishinomiya, and Yutaka Otsuki, Yokohama, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka and Nippon Oil Company, Ltd., Tokyo, both of, Japan

Filed Mar. 27, 1986, Ser. No. 844,643

Claims priority, application Japan, Apr. 1, 1985, 60-69635

Int. Cl.[4] C08K *3/20*

U.S. Cl. 523—403 **8 Claims**

1. A cathodic electrodeposition coating composition which comprises:

(A) 100 parts by weight of a tertiary amino group-containing film-forming polymer derived from partially epoxidized homopolymer or copolymer of butandiene having a molecular weight of 500 to 5,000 and an aliphatic amine, optionally followed by reacting with an ethylenically unsaturated polymerizable carboxylic acid;

(B) 20 to 100 parts by weight of a reaction product of a polyphenol polyglycidyl ether with an ethylenically unsaturated polymerizable carboxylica acid;

(C) 0.005 to 1. 0 parts as elementary metal by weight of an oxide or organic acid salt of manganese, cobalt or copper;

(D) 5 to 100 parts by weight of a cationic water-dispersible resin having quaternary ammonium groups, said cathionic water-disperible resin being a product produced by reacting (a) an acid-addition salt of a polymeric tertiary amine derived from a partially epoxidized homopolymer or copolymer of butadiene having a molecular weight of 500 to 5,000 and an aliphatic secondary amine, and (b) a monoepoxide compound; said components (A) to (D) being dissolved or dispersed in an aqueous medium containing an amount of an organic acid sufficient to neutralize said component (A).

4,730,011

SYNTHETIC RESIN CONTAINING QUATERNARY AMMONIUM GROUPS, ITS PREPARATION, AND PIGMENT PASTE PRODUCED USING THIS RESIN

Werner Loch, Erpolzheim; Rolf Osterloh, Gruenstadt; Eberhard Schupp, Schwetzingen, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,495

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431532

Int. Cl.[4] C08L *63/00*

U.S. Cl. 523—414 **6 Claims**

1. A water-dilutable synthetic resin containing quaternary ammonium groups, which furthermore contains one or more basic secondary or tertiary amino groups or secondary and tertiary amino groups per quaternary ammonium group, and is an adduct of

(A) a quaternary ammonium salt having a molecular weight of about 175–1200, which is prepared by reacting

(a) an organic compound possessing two or more basic amino groups per molecule, one of which is a primary group and is protected as a ketimine by prior reaction with a ketone, and the remaining basic amino groups are tertiary groups with

(b) from 15 to 100 mol %, based on the nitrogen atoms of component (a), of an organic or inorganic acid and

(c) from 15 to 100 mol %, based on the nitrogen atoms of component (a), of one or more monoepoxide compounds, and, if required, eliminating the protective group hydrolytically, and

(B) a resin which has a mean molecular weight $\overline{M}_w$ of from 300 to 6000 and contains on average from 1.5 to 3.0 epoxide groups per molecule, and, if necessary,

(C) one or more monofunctional organic compounds whose functional group is capable of undergoing an addition reaction with an epoxide, with the exception of tertiary amines and their salts.

4,730,012

BUILDING MATERIAL COMPOSITION

Arthur J. Espeland, P.O. Box 477, Jewell, Iowa 50130, and Theodore R. Stekhuizen, 11253-66th St. N., Pinelass Park, Fla. 33565

Continuation of Ser. No. 785,613, Oct. 9, 1985, abandoned. This application Sep. 4, 1986, Ser. No. 904,545

Int. Cl.[4] C08K *13/02, 7/14*

U.S. Cl. 523—505 **3 Claims**

1. A building material composition made according to the method comprising:

mixing a styrenated unsaturated polyester with hydrated alumina and dry clean sand at a ratio of 1:1:1, respectively, by volume;

adding methyl ethyl ketone peroxide as a catalyst to said mixture of polyester, alumina and sand, said methyl ethyl ketone being approximately 1% by weight with respect to said polyester when the temperature of said mixture is approximately 75 degrees Fahrenheit; embedding bamboo within said mixture; said bamboo being filled with glass fibers;

permitting said mixture to cure and harden after the addition of said catalyst, whereby said cured mixture will exhibit the following properties:

compressive strength of approximately 19,400 psi,

tensile strength of approximately 1,900 psi,

shear strength of approximately 5,936 psi,

flexural strength of approximately 2,475 psi,

modulus of elasticity of approximately 78,475.

4,730,013

BIOSOLUBLE OCULAR INSERT

Joseph V. Bondi, Collegeville, and Richard J. Harwood, Bensalem, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 679,411, Dec. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 491,114, May 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 309,852, Oct. 8, 1981, abandoned. This application Mar. 2, 1987, Ser. No. 20,616

Int. Cl.[4] A61K *9/22;* **C08L** *1/26*

U.S. Cl. 524—42 **2 Claims**

1. A non-vision blurring ocular insert comprising 75–100% of a matrix comprising, in percentage parts by weight:

(i) 15% polyvinyl alcohol (m.w. 2000–3000);

(ii) 10% glycerin; and

(iii) 75% hydroxypropylmethylcellulose phthalate, and 0–25% of a pharmacologically active agent.

4,730,014

USE OF PYRIDOQUINOLONE DERIVATIVES AS PIGMENTS

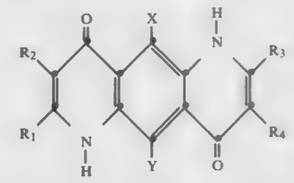
Alain C. Rochat, Fribourg; Abul Iqbal, Ettingen, both of Switzerland, and Edward E. Jaffe, Wilmington, Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1986, Ser. No. 920,624

Int. Cl.[4] C08K *5/45*

U.S. Cl. 524—84 **5 Claims**

1. A process for mass-colouring high molecular weight organic material, which comprises incorporating into said organic material a compound of the formula I



in which one of R_1 and R_2 and one of R_3 and R_4 are independently of each other hydrogen, C_1–C_{12}-alkyl or benzyl and the other two radicals are independently of each other unsubstituted phenyl, phenyl which is substituted by halogen, trifluoromethyl, cyano, C_1–C_{12}-alkyl, phenyl or by the groups $-OR_5$, SR_5, $-COR_6$ or $-SO_2R_6$, or a 5- or 6-membered aromatic heterocyclic ring containing one or more identical or different hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur without or with one or two fused-on benzene rings, R_5 is hydrogen or C_1–C_{12}-alkyl, R_6 is C_1–C_{12}-alkyl, and X and Y are independently of each other hydrogen, halogen or cyano.

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4,730,015

WEATHER RESISTANT POLYACETAL RESIN COMPOSITION

Yukio Ikenaga; Masami Yamawaki, and Kunio Suzuki, all of Fuji, Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Jul. 22, 1985, Ser. No. 757,595
Claims priority, application Japan, Jul. 27, 1984, 59-156563
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—91 **7 Claims**

1. A polyacetal resin composition of improved crack resistance which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a stabilizer selected from a benzotriazole compound and (B) 0.01 to 2.0 percent by weight of a hindered amine compound which is a piperidine derivative having stereohindered groups; the combination of (A) and (B) having a synergistic effect in stabilizing said polyacetal resin against weathering yet having little effect on physical/mechanical properties and heat stability of said polyacetal.

4,730,016

POLYOLEFIN-BASE RESIN COMPOSITION CONTAINING A VOLATILE RUST PREVENTIVE AMINE SALT USED FOR METAL-PRODUCT WRAPPING MATERIAL

Akira Fujii; Yasuhisa Isobe, and Kenichi Hashiudo, all of Toyohashi, Japan, assignors to Aicerro Chemical Company Limited, Toyohashi, Japan

Filed Apr. 14, 1986, Ser. No. 851,162
Claims priority, application Japan, Apr. 19, 1985, 60-82288
Int. Cl.[4] C08K *5/35, 5/52, 5/17*
U.S. Cl. 524—96 **8 Claims**

1. A rust preventive resin composition suitable for use in wrapping material, comprising:

an olefin-base resin obtained by partially neutralizing a free carboxyl group in a random copolymer of an α-olefin and an α,β-ethylenically-unsaturated monocarboxylic or dicarboxylic acid, the latter being contained in an amount of 1.0–2.0 mole %, with ions of an alkali metal or alkaline earth metal having a normal electrode potential lower than aluminum to a level in a range of 5–90 mole% based on the original content of the free carboxyl group; and

a votive rust preventive selected from one or more amine salt compounds in an amount of at least 0.5 parts by weight per 100 parts by weight of the olefin-base resin.

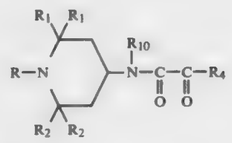
4,730,017

2,2,6,6-TETRAALKYL-PIPERIDINE COMPOUNDS USEFUL AS LIGHT STABILIZERS

Lajos Ávár, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Filed Sep. 12, 1986, Ser. No. 907,359
Claims priority, application United Kingdom, Sep. 13, 1985, 8522666; Fed. Rep. of Germany, Dec. 4, 1985, 3542858; United Kingdom, Feb. 5, 1986, 8602834
Int. Cl.[4] C07D *401/12;* **C08K** *5/34*
U.S. Cl. 524—103 **27 Claims**

1. A method of stabilizing a lacquer composition based on a member selected from the group consisting of acrylic resins, alkyd resins, polyester resins and acrylic resins, alkyd resins and polyester resins crosslinked with melamine/formaldehyde resins, epoxide resins or polyisocyanates, which comprises incorporating into the resin a light-stabilizing-effective amount of at least one 4-oxalamido-2,2,6,6-tetraalkylpiperidine compound of formula I



(I)

in which

R is hydrogen, oxygen, C_{1-8}alkyl or —CO—R_5; each R_1, independently, is $—CH_3$ or $—CH_2(C_{1-4}alkyl)$ or both groups R_1 form a group $—CH_2)_5$; each R_2, independently, is $—CH_3$ or $—CH_2(C_{1-4}alkyl)$ or both groups R_2 form a group $—CH_2)_5$;

R_4 is an amide-forming group;

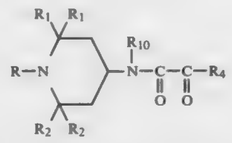
R_5 is $—C(R_{10})═CH_2$, C_{1-6}alkyl, phenyl, —CO—O—C_{1-4}alkyl or $—NR_7R_8$;

R_7 is hydrogen, C_{1-2}alkyl, C_{5-6} cycloalkyl, phenyl, phenyl C_{1-4}alkyl or C_{1-12}alkylphenyl;

R_8 is C_{1-12}alkyl or hydrogen; and

R_{10} is hydrogen or C_{1-4}alkyl.

17. A compound of formula I



(I)

in which R is hydrogen, oxygen, C_{1-8}alkyl or —CO—R_5, where R_5 is $—C(R_{10})═CH_2$, C_{1-6}alkyl, phenyl —CO—O—C_{1-4}alkyl or $—NR_7R_8$ and where R_7 is hydrogen, C_{1-12}alkyl, C_{5-6}cycloalkyl, phenyl, phenyl C_{1-4}alkyl or C_{1-12}alkylphenyl and R_8 is C_{1-12}alkyl or hydrogen;

each R_1, independently, is $—CH_3$ or $—CH_2(C_{1-4}alkyl)$ or both groups R_1 form a group $—(CH_2)_5—$;

each R_2, independently, is $—CH_3$ or $—CH_2(C_{1-4}alkyl)$ or both groups R_2 form a group $—(CH_2)_5—$;

R_{10} is hydrogen or C_{1-4}alkyl; and

R_4 is an amide-forming group

with the proviso that when R is hydrogen, then R_4 is not

(i) N unsubstituted 2,2,6,6-tetraalkylpiperidine 4-amino; or

(ii) unsubstituted phenylamino.

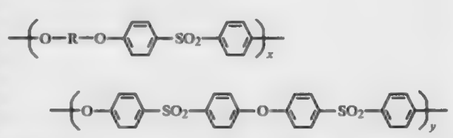
4,730,018

SOLUTIONS OF POLY(ARYL ETHER SULFONES) IN CYCLOHEXANONE

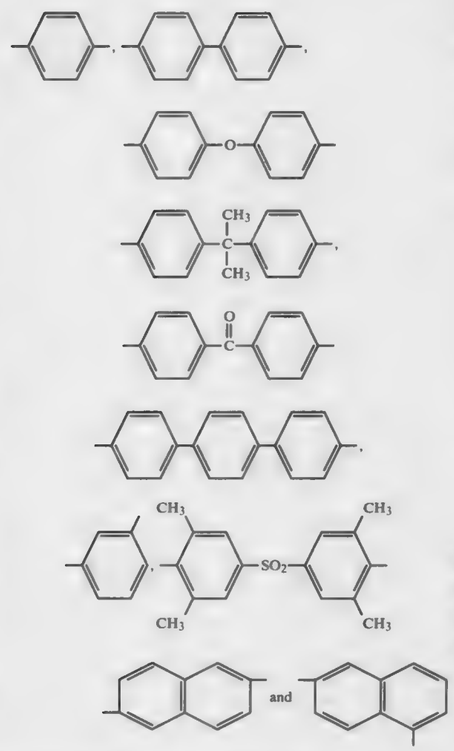
Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 4, 1985, Ser. No. 794,564
Int. Cl.[4] C08G *51/34, 51/44, 51/46*
U.S. Cl. 524—360 **8 Claims**

1. A solution comprising at least one poly(aryl ether sulfone) dissolved in a cyclohexanone solvent alone or cyclohexanone solvent with up to about 5 to 10 wt. percent of another solvent, wherein the poly(aryl ether sulfone) is represented by the following formula:



wherein R is selected from the following:



wherein the ratio of x to y is 10:90 to 60:40.

4,730,019

PROCESS FOR PREPARING AN AQUEOUS CUT OF A LIGAND-FREE MONOMER/MALEIC ANHYDRIDE POLYMER AND PRODUCT

Frederick C. Hansen, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 711,895, Mar. 14, 1985, Pat. No. 4,623,692.
This application May 12, 1986, Ser. No. 862,084
Int. Cl.[4] C08L *37/00*
U.S. Cl. 524—549 **8 Claims**

1. A coating composition having improved heat resistance, the coating composition comprising a ligand-free monomer maleic anhydride polymer that is able to be solubilized in an aqueous medium, and an effective amount of a metal ion-containing fugitive ligand complex to solubilize the polymer in the aqueous medium, said aqueous medium having a pH of from 7 to 9, wherein the ligand-free monomer is a polymerizable, ethylenically unsaturated monomer selected from the group consisting of alpha-olefin, aromatic alkenyl monomer, acrylate monomer, methacrylate monomer, and combinations thereof, wherein the metal ion of the metal ion-containing fugitive ligand complex is a zinc or zirconium ion, and wherein the fugitive ligand is ammonia.

4,730,020

WATER-DILUTABLE COATING COMPOSITIONS FOR BASE COATS FOR WET-ON-WET APPLICATION OF CLEAR COAT ON BASE COAT

Werner Wilfinger; Herbert Zima, both of Graz, and Herbert Stanin, Feldkirchen, all of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Feb. 27, 1986, Ser. No. 833,162
Claims priority, application Austria, Feb. 27, 1985, A571/85
Int. Cl.[4] C08F *20/58*
U.S. Cl. 524—555 **11 Claims**

1. Water-dilutable coating compositions for use in a base coat for wet-on-wet application of finishes comprising

(A) 10–40% b.w. of at least one copolymer with a glass transition temperature of between −55° C. and +25° C. and containing

(Aa) 40–60% b.w. of vinyl and vinylidene compounds free of functional groups other than the α,β-ethylenically unsaturated group,

(Ab) 30–40% b.w. of hydroxyalkyl esters of (meth)acrylic acid, maleic acid or fumaric acid, and/or

(Ac) 30–40% b.w. of N-methylol(meth)acrylic acid amide,

(Ad) 2–17% b.w. of (meth)acrylic acid amide,

(Ae) 0–8% b.w. of C_1–C_4-alkoxymethylated N-methylol (meth)acrylic acid amide,

(Af) 2–8% b.w. of α,β-ethylenically unsaturated monocarboxylic acids, and

(Ag) 0–0.8% b.w. of a multiple α,β-ethylenically unsaturated compound,

with the condition that a 60% solution of the copolymer in ethanol, after neutralization of the carboxy groups with ammonia to a pH-value of 7.2 to 7.5, measured as a 20% solution in water, can be diluted with water to provide a clear solution, or with a slight turbidity only, to a solids content of 20% and that the solution, on dilution with water, to a solids content of from 25–40% has a maximum viscosity of over 5 Pa.s,

(B) 5–40% b.w. of a mixture of

(Ba) 20–80% b.w. of one or more solvents with an evaporation number according to DIN 53 170 of below 30, and

(Bb) 20–80% b.w. of one or more solvents with an evaporation number according to DIN 53 170 of over 60, is completely miscible with water at ambient temperature, and not miscible with benzine hydrocarbon solvents having a boiling range of from 80° to 110° C. and a content of aromatic hydrocarbons of maximum 5%,

(C) 1–30% b.w. of one or more coloring and/or optical effect imparting components,

(D) 0–20% b.w. of one or more dispersions stable in the paint composition, based on vinyl polymers, polycondensates or polyaddition resins, and

(E) 0–20% b.w. of one or more partially or totally etherified amine-formaldehyde condensates.

4,730,021

PROCESS FOR PREPARING AQUEOUS DISPERSIONS OF ACRYLIC-URETHANE GRAFT COPOLYMERS

Walter M. W. Zom, Kaatsheuvel; Hendricus C. Goos, Dorst, and Johan Stijntjes, Alkmaar, all of Netherlands, assignors to Polyvinyl Chemie Holland B.V.

Continuation of Ser. No. 733,528, May 13, 1985, abandoned.
This application Jan. 5, 1987, Ser. No. 4,230
Claims priority, application Netherlands, Jun. 4, 1984, 8401785
Int. Cl.[4] C08C *39/00*
U.S. Cl. 524—457 **29 Claims**

1. A process for preparing aqueous dispersions of urethane-acrylate graft copolymers, characterized in that

a. a monoacrylated adduct is prepared by reaction of a polymerizable acrylate, containing at least one active hydrogen atom with a diisocyanate to produce an essentially monoacrylated diisocyanate adduct in the presence of

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excess diisocyanate, the NCO/OH equivalent ratio to produce the adduct is from about 2:1 to about 30:1,

b. the thus obtained adduct together with other polyisocyanates is reacted with an organic compound, containing at least one active hydrogen atom and an organic compound containing at least one active hydrogen atom and a group which is capable of forming a salt group, said organic compounds having an average isocyanate-reactive functionality of 2,

c. the thus obtained prepolymer is neutralized and is dispersed in water, immediately followed by the addition of a chain extender thereby obtaining a chain-extended acrylated urethane polymer dispersion, and

d. the thus obtained dispersion is used in an emulsion polymerisation thereby obtaining a stable aqueous dispersion of urethane-acrylate graft copolymer.

4,730,022

POLYMER COMPOSITIONS AND ALKALINE ZINC ELECTROPLATING BATHS

William J. Willis, North Royalton, Ohio, assignor to McGean-Rohco, Inc., Cleveland, Ohio

Filed Mar. 6, 1987, Ser. No. 22,390
Int. Cl.⁴ C08L *79/04; C08G 73/06*
U.S. Cl. 524—800 **29 Claims**

1. A polymeric composition prepared by the process which comprises the steps of

(A) preparing an intermediate by reacting

(A-1) at least one nitrogen-containing heterocyclic compound with

(A-2) an epihalohydrin, glycerolhalohydrin or mixtures thereof, and

(B) reacting said intermediate with at least one amidine compound to form the desired polymeric composition.

4,730,023

IMPACT RESISTANT METHACRYLIC RESIN COMPOSITION

Fumio Sato, and Masamitsu Tateyama, both of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 913,213
Claims priority, application Japan, Nov. 29, 1985, 60-267407
Int. Cl.⁴ C08L *39/04, 51/06*
U.S. Cl. 525—73 **8 Claims**

1. An impact resistant methacrylic resin composition comprising a multi-layer graft copolymer (II) and a methyl methacrylate polymer (III);

said multi-layer graft copolymer (II) being obtained by polymerizing 30 to 900 parts by weight of a monomer mixture (C) comprising 80 to 100% by weight of at least one alkyl methacrylate having an alkyl group with 1 to 4 carbon atoms, 0 to 20% by weight of at least one alkyl acrylate having an alkyl group with 1 to 8 carbon atoms, 0 to 10% by weight of at least one copolymerizable monomer selected from the group consisting of other vinyl monomers and vinylidene monomers and 0 to 3% by weight of at least one polyfunctional monomer having at least two functional groups selected from acryloyloxy groups and methacryloyloxy groups in one molecule thereof in at least one step in the presence of 100 parts by weight of a double-layer elastic copolymer (I);

said double-layer elastic copolymer (I) being prepared in two steps wherein in the first step 5 to 50 parts by weight of a monomer mixture (A) comprising 57 to 43% by weight of at least one alkyl methacrylate having an alkyl group with 1 to 4 carbon atoms, 7 to 12% by weight of styrene or a styrene derivative, 35 to 45% by weight of at least one alkyl acrylate having an alkyl group with 1 to 8 carbon atoms, and 0.1 to 10% by weight of at least one polyfunctional monomer having at least two functional groups selected from the group consisting of acryloyloxy groups and methacryloyloxy groups in one molecule thereof is polymerized, and in the second step 95 to 50 parts by weight of a monomer mixture (B) comprising 69 to 89% by weight of at least one alkyl acrylate having an alkyl group with 1 to 8 caron atoms, 10 to 30% by weight of styrene or a styrene derivative, 0.1 to 5% by weight of a graft-linking monomer and 0 to 5% by weight of at least one polyfunctional monomer having at least two functional groups selected from the group consisting of acryloyloxy groups and methacryloyloxy groups in one molecule thereof is polymerized in the presence of the copolymer obtained through said first step; and

said methyl methacrylate polyer (III) comprising 80 to 100% by weight of methyl methacrylate units and 0 to 20% by weight of units of at least one copolymerizable monomer selected from the group consisting of other vinyl monomers and vinylidene monomers.

2. A composition as defined in claim 1, wherein the graft-linking monomer is selected from the group consisting of triallyl isocyanurate and allyl cinnamate.

4,730,024

LUBRICANT FOR THERMOPLASTIC RESINS AND THERMOPLASTIC RESIN COMPOSITION COMPRISING SAID LUBRICANT

Kazuo Kishida, Hiroshima; Kazuo Ueda, Kawasaki, and Masahiro Kaneda, Ootake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 6, 1986, Ser. No. 860,256
Claims priority, application Japan, May 10, 1985, 60-99355
Int. Cl.⁴ C08F *265/04, 265/06, 255/00;* **C08L** *51/06*
U.S. Cl. 525—80 **8 Claims**

1. A lubricant for thermoplastic resins, which is prepared by (A) polymerizing 60 to 100% by weight of an aromatic vinyl monomer and 0 to 40% by weight of other vinyl monomer or monomers copolymerizable therewith to form a polymer, (B) polymerizing 30 to 70 parts by weight of a monomer or monomer mixture comprising 50 to 100% by weight of an acrylic acid ester and 0 to 50% by weight of other vinyl monomer or monomers copolymerizable therewith in the presence of 10 to 60 parts by weight of said polymer wherein when said monomer or monomer mixture is singly polymerized alone, the reduced viscosity $\eta sp/C$ of the resulting polymer is lower than 1.0 as measured at 25° C. with respect to a solution of 0.1 g of the polymer in 100 ml of chloroform, to obtain a polymer, and (C) polymerizing 5 to 30 parts by weight of a methacrylic acid ester in the presence of the two-stage polymer obtained at the stage (A) and (B) so that the total amount of the components (A), (B) and (C) is 100 parts by weight.

2. A thermoplastic resin composition comprising 100 parts by weight of a thermoplastic resin and 0.05 to 10 parts by weight of a lubricant as set forth in claim 1.

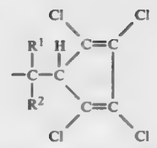
4,730,025

HEXACHLOROCYCLOPENTADIENE END GROUP POLYMERS

Anthony J. Bell, Stow; Adel F. Halasa, Bath; Kenneth F. Castner, Uniontown, and George F. Balogh, N. Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 22, 1986, Ser. No. 910,035
Int. Cl.⁴ C08C *19/18*
U.S. Cl. 525—332.3 **20 Claims**

2. An endbindable polydiene having chlorinated cyclopentadienyl end groups which is comprised of polymer chains which are comprised of repeat units which are derived from at least one conjugated diolefin monomer wherein said polymer chains are terminated with chlorinated cyclopentadienyl groups having the structural formula:



wherein R^1 represents a member selected from the group consisting of hydrogen atoms, alkyl groups, aryl groups, and carboalkoxy groups and wherein R^2 represents a member selected from the group consisting of alkyl groups, aryl groups and carboalkoxy groups.

4,730,026

CROSS-LINKED ORGANOSILAZANE POLYMERS

John D. Bolt, Landenberg, Pa., and Frederick N. Tebbe, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1986, Ser. No. 913,405
Int. Cl.⁴ C08F *283/00*
U.S. Cl. 525—475 **26 Claims**

1. A polymer comprising a plurality of precursor residues comprising repeat units of the formula



said precursor residues being linked together by at least one bridge of the formula $—MR'_n—$; said bridge or bridges being attached to nitrogen atoms of the repeat units wherein the formulas

R is independently selected from the group consisting of hydrogen, alkyl groups having from 1 to 6 carbon atoms, substituted and unsubstituted phenyl groups, substituted and unsubstituted napthyl groups, substituted and unsubstituted biphenyl groups, substituted and unsubstituted allyl groups, substituted and unsubstituted alkylaryl groups having from 7 to 18 carbon atoms, and substituted and unsubstituted vinyl groups;

R′ is independently selected from the group consisting of hydrogen, lower alkyl groups having from 1 to about 6 carbon atoms provided that the alkyl group has no β-hydrogen atoms when M is Ti, Zr, or Hf, and mono- and di- aryl- or alkylamino, alkylphenyl, and alkylaryl groups;

M is a metal independently selected from Groups IIIA, IIB, IVB and IIA of the Periodic Table, provided that M is not Hg;

n is an integer less than or equal to the valence of M; and

a is an integer greater than 1.

4,730,027

METHOD OF MAKING STYRENE-TYPE POLYMER COMPRISING SUSPENSION POLYMERIZATION CONDUCTED IN AQUEOUS MEDIUM CONTAINING COMBINATION OF POLYVINYL ALCOHOL AND SULFONATED POLYSTYRENE OR SULFONATED STYRENE-MALEIC ANHYDRIDE COPOLYMER

James E. Millington, Lunenburg, and Stephen V. Slovenkai, Leominster, both of Mass., assignors to Huntsman Chemical Corporation, Salt Lake City, Utah

Filed Jun. 28, 1982, Ser. No. 393,220
Int. Cl.⁴ C08F *2/20*
U.S. Cl. 526—201 **3 Claims**

1. A method of making a styrene-type poloymer composition which comprises a step of suspension polymerizing a styrene-type monomer composition in an aqueous medium comprising water, polyvinyl alcohol and a water-soluble sulfonated styrene-maleic anhydride copolymer.

4,730,028

PROCESS FOR PREPARING HYDROPHOBICALLY ASSOCIATING TERPOLYMERS CONTAINING SULFONATE FUNCTIONALITY

Jan Bock, Bridgewater, and Paul L. Valint, Asbury, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

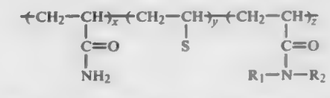
Filed Mar. 28, 1986, Ser. No. 845,195
Int. Cl.⁴ C08F *2/26, 2/30*
U.S. Cl. 526—225 **6 Claims**

1. A homogeneous micellar free radical polymerization process for the formation of a water soluble terpolymer of acrylamide, an alkylacrylamide and an ethylenically unsaturated sulfonate-containing monomer which consisting of the steps of:

(a) forming a homogeneous solution in deoxygenated water of acrylamide, an alkylacrylamide and an ethylenically unsaturated sulfonate containing monomer using a suitable anionic surfactant under an atmosphere of nitrogen, said surfactant being water soluble and selected from the group consisting of salts of alkyl sulfates, salts of alkyl sulfonates, salts of alkyl carboxylates, salts of alkyl arene sulfates, salts of alkyl arene sulfonates and salts of alkyl arene carboxylates;

(b) adding free radical initiator to said homogeneous reaction mixture to initiate polymerization of said monomers;

(c) copolymerizing said monomer mixture at a temperature of about 10° C. to 90° C. for a sufficient period of time to form said terpolymer without the formation of substantial amounts of particulates or phase separation occurring, wherein said water soluble terpolymer has the formula:



wherein S is SO_3M, phenyl SO_3M or $CONHC(CH_3)_2CH_3SO_3$; R_1 is a C_6 to C_{22} alkyl or cycloalkyl group; R_2 is the same or different alkyl group as R_1 or hydrogen; M is an alkali metal or ammonium cation x is about 5.0 to about 98.0 mole percent; y is about 10.0 to about 80 mole percent; and z is about 0.1 to about 10 mole percent.

4,730,029

FLAME-RETARDANT RESIN

Hiroshi Wachi, Ebina; Tohru Kawasaki; Atsushi Funaki, both of Yokohama, and Gen Kojima, Machida, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,857
Claims priority, application Japan, Dec. 18, 1985, 60-282774; Jun. 27, 1986, 61-149688
Int. Cl.⁴ C08F *12/20*
U.S. Cl. 526—249 **13 Claims**

1. A flame-retardant resin having excellent moldability and composed of a fluorine-containing polymer obtained by the copolymerization of tetrafluoroethylene, chlorotrifluoroethylene and ethylene, wherein the polymer consists essentially of from 10 to 16 molar % tetrafluoroethylene, from 20 to 60 molar % chlorotrifluoroethylene, and from 20 to 40 molar % ethylene, and has a thermal decomposition temperature of at least 325° C.

4,730,030

ARYLCYCLOBUTANE/DIENOPHILE COPOLYMER

Stephen F. Hahn, and Robert A. Kirchhoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1986, Ser. No. 890,671
Int. Cl.⁴ C08F *12/32, 32/00*
U.S. Cl. 526—262 **7 Claims**

1. A copolymer composition comprising, in polymerized

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form, a comonomer containing at least two polymerizable arylcyclobutane moieties, and a comonomer containing at least two polymerizable dienophilic moieties.

4,730,031

POLYMERS OF SUBSTITUTED 1,3-BUTADIENE COMPOUNDS HAVING REACTIVE SILYL GROUPS AND PROCESS FOR THEIR PREPARATION

Fumie Sato, Fujisawa; Seiichi Nakahama, Yokohama; Akira Hirao, Kawasaki; Misao Miyamoto; Kenichi Osawa, both of Ichihara, and Toshihiro Ishii, Tokyo, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

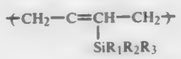
Filed Jan. 23, 1986, Ser. No. 824,581

Claims priority, application Japan, Jan. 23, 1985, 60-10307; Jan. 23, 1985, 60-10308; May 24, 1985, 60-111937

Int. Cl.[4] C08F *130/08, 230/08, 4/46*

U.S. Cl. 526—279 **6 Claims**

1. A 1,4-addition polymer of a silane 1,3-butadiene, having units of the formula:



wherein each of R_1, R_2, and R_3 is lower alkyl or lower alkoxy, provided that R_1, R_2 and R_3 are not lower alkyl at the same time, wherein at least 70% of the units are of cis-form.

4,730,032

PHENYLACETYLENE-SUBSTITUTED SCHIFF'S BASE MONOMERS AND ELECTROCONDUCTIVE POLYMERS

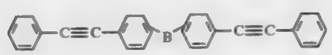
Robert D. Rossi, Levittown, Pa., and Steven P. Fenelli, Hillsborough, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 26, 1987, Ser. No. 19,467

Int. Cl.[4] C08F *38/00*

U.S. Cl. 526—285 **18 Claims**

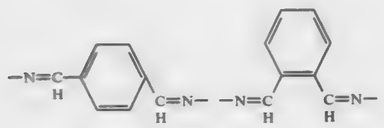
1. A polymerizable phenylacetylene substituted Schiff's base monomer whose formula is:

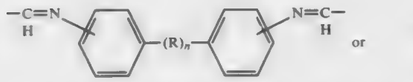


(I)

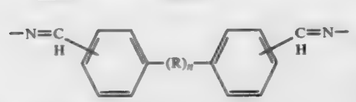
where B is







or

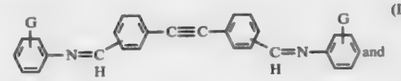


and R is CH_2, $C(CH_3)_2$, CHOH,

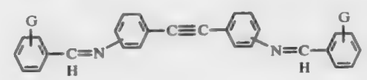
$C(CF_3)_2$, SO_2, S, CH_2CH_2, HC=CH, O,



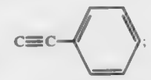
n=0 or 1; and



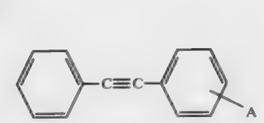
(II)



where G is C≡CH, H,

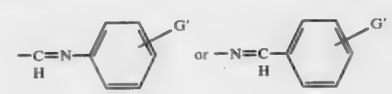


and

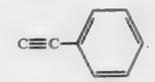


(III)

where A is



where G' is C≡CH, H, and



4,730,033

COATING COMPOSITIONS

Susan M. Horley, High Wycombe; Auguste L. L. Palluel, Windsor, and Philip L. Taylor, Slough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 790,987, Oct. 24, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 941,506

Claims priority, application United Kingdom, Nov. 5, 1984, 8427942; Jun. 12, 1985, 8514904

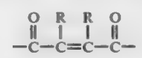
Int. Cl.[4] C08G *63/44, 69/44*

U.S. Cl. 528—288 **8 Claims**

1. A curable coating composition which comprises:

(i) a condensation polymer in which the polymer backbone

of each molecule on average contains at least one active unsaturated grouping of the formula



where R is hydrogen, a halogen or an alkyl or aryl group, and

(ii) a compound carrying at least three primary amino groups, one or more of which may be in the form of a derivative which is capable of reverting to a primary amino group under the curing conditions to which the composition is exposed.

4,730,034

RECOVERING POLY(ARYLENE SULFIDE) OLIGOMERS FROM A POLY(ARYLENE SULFIDE) REACTION MIXTURE

Afif M. Nesheiwat, Bartlesville, Okla.; Guy Senatore, Borger, Tex., and Fred T. Sherk, Tokyo, Japan, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1987, Ser. No. 6,410

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—388 **24 Claims**

1. A method for recovering poly(arylene sulfide) oligomers comprising the steps:

(a) dehydrating an aqueous admixture of alkali metal hydroxide and alkali metal bisulfide in a polar organic solvent wherein the molar ratio of alkali metal hydroxide to alkali metal bisulfide is about 0.90:1 to about 1.05:1 thereby forming a dehydrated admixture wherein said molar ratio is 0.99:1 to about 1.05:1;

(b) admixing at least one polyhalo-substituted aromatic compound with said dehydrated admixture to form a polymerization reactant mixture;

(c) subjecting said reactant mixture to polymerization conditions effective to produce a polymerization reaction mixture comprising poly(arylene sulfide);

(d) admixing said polymerization reaction mixture at a temperature above that at which said poly(arylene sulfide) is in a molten phase with a sufficient amount of a separation agent characterized as substantially soluble in said polar organic solvent and a non-solvent for said poly(arylene sulfide) to effect a phase separation of said molten poly(arylene sulfide) from said polar organic solvent;

(e) cooling said polymerization reaction mixture from step (d) to produce a slurry comprising particulate poly(arylene sulfide) and poly(arylene sulfide) oligomers in said polar organic solvent;

(f) treating said slurry to recover particulate poly(arylene sulfide) therefrom and produce a dispersion of poly(arylene sulfide) oligomers in said polar organic solvent; and

(g) filtering said dispersion of poly(arylene sulfide) oligomers from step (f) to recover said oligomers therefrom.

4,730,035

DRYING AND REMOVING RESIDUAL ACID FROM HALOGENATED POLYMER RESINS

Frank E. Mark, Schaferstieg, Fed. Rep. of Germany; Charles B. Carpenter, Sunshine, and James B. Akers, Jr., Baton Rouge, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 4, 1986, Ser. No. 903,635

Int. Cl.[4] C08F *6/00*

U.S. Cl. 528—502 **30 Claims**

1. A process for drying, and stripping residual acid from, a moist halogenated resin separated from an aqueous acid suspension of said the suspension consisting essentially of water, acid and halogenated resin, halogenated resin consisting essentially of the resin, an amount of water an amount of residual acid, the amount of water being from about 60 to about 15 weight percent, based upon combined weight of water and resin the acid content being from about 80,000 to about 1,000 parts by weight of acid per million parts by weight of halogenated resin, based upon dry weight of halogenated resin, the process comprising passing a heated inert drying gas through the moist resin (a) at a fluidization velocity sufficient to establish and maintain the admixture of resin and inert drying gas as a fluidized bed and (b) for a period of time sufficient to produce a dried polymer resin which is white in color with no visually detectable areas of discoloration and which has a water content of from about 0.05 to about 4 weight percent, based upon combined weight of water and resin, and a residual acid loading of from about 5,000 200 parts by weight of acid per million parts by weight of halogenated resin upon dry weight of halogenated resin.

4,730,036

PURIFICATIONS OF B-CELL INDUCING FACTOR (BIF) AND B-CELL GROWTH FACTOR (BGF)

Peter Ralph, Purdys, and Karl Welte, New York, both of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,562

Int. Cl.[4] C07K *3/20;* **C12P** *21/00;* **C12N** *5/00*

U.S. Cl. 530—351 **15 Claims**

1. Method for the purification of B-cell inducing factor (BIF) which comprises:

(a) antigen-stimulation of human immunoregulatory cells to produce BIF;

(b) recovery of BIF from culture medium;

(c) contacting the recovered BIF with an ion exchanger;

(d) size-fractionation of BIF active fractions from ion-exchange; and

(e) agarose chromatography of BIF active fractions derived from gel chromatography.

5. Purified human BIF.

14. Method for the purification of B-cell growth factor (BGF) which comprises:

(a) antigen-stimulation of human immunoregulatory cells to produce BGF;

(b) recovery of BGF from culture medium;

(c) contacting the recovered BGF with an ion exchanger;

(d) size-fractionation of BGF active fractions from ion-exchange; and

(e) agarose chromatography of BGF active fractions derived from gel chromatography.

4,730,037

PROCESS FOR THE APPLICATION OF IR SPECTROSCOPY FOR MODULATION AND MONITORING OF DIAZONIUM ION CONCENTRATION

Ferenc Rakoczi, Zurich, Switzerland, and Rüdiger Oxenius, Rheinfelden, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,149

Claims priority, application Switzerland, Aug. 22, 1985, 3604/85

Int. Cl.[4] C07C *113/04;* **C09D** *29/00;* **G01N** *21/34;* **G05B** *11/00*

U.S. Cl. 534—565 **7 Claims**

1. A method of determining and controlling the diazonium ion concentration in diazotisation solutions or in azo coupling reactions, which comprises determining said diazonium ion concentration by means of IR spectroscopy from the intensity of the N=N stretching frequency.

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4,730,038

WATER-SOLUBLE DISAZO COMPOUNDS OF 1-AMINO-8-NAPHTHAL-3,6- OR 4,6-DISULFONIC ACID AS BIVALENT COUPLING COMPONENT, CONTAINING FIBER-REACTIVE GROUPS SUITABLE AS DYESTUFFS

Fritz Meininger; Ernst Hoyer, both of Frankfurt am Main, and Rudolf Fass, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

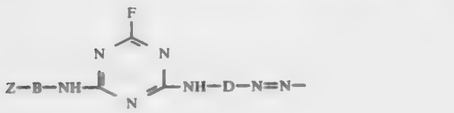
Continuation of Ser. No. 713,566, Mar. 18, 1985, abandoned, which is a continuation of Ser. No. 549,638, Nov. 7, 1983, abandoned, which is a continuation of Ser. No. 379,934, May 19, 1982, abandoned. This application Dec. 16, 1985, Ser. No. 811,303

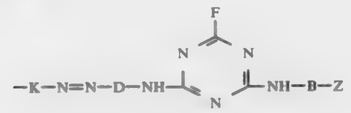
Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120187

Int. Cl.[4] C09B *62/09, 62/513;* D06P *1/382, 1/384*

U.S. Cl. 534—637 9 Claims

1. A water-soluble disazo compound of the formula





in which

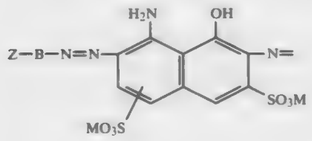
B is phenylene unsubstituted or substituted by 1 sulfo group or by 1 methyl group or 1 methoxy group or 1 chlorine atom or 2 methoxy groups or 1 methoxy group and 1 methyl group, and the two formula moieties B are identical to or different from one another,

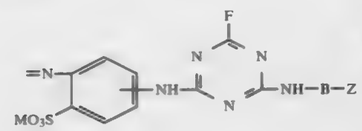
D is phenylene unsubstituted or substituted by 1 or 2 sulfo groups and the two formula moieties D are identical to or different from one another,

K represents, as the bivalent radical of a coupling component, the bivalent radical of 1-amino-8-naphthol-4,6-disulfonic acid, and

Z is β-phosphatoethylsulfonyl, β-sulfatoethylsulfonyl or vinylsulfonyl, or an alkali metal salt thereof.

4. A water-soluble disazo compound of the formula





in which

B is phenylene unsubstituted or substituted by 1 sulfo group or by 1 methyl group or 1 methoxy group or 1 chlorine atom or 2 methoxy groups or 1 methoxy group and 1 methyl group, and the two formula moieties B are identical to or different from one another,

Z is β-phosphatoethylsulfonyl, β-sulfatoethylsulfonyl or vinylsulfonyl,

M is hydrogen or an alkalimetal, and

the free amino group is bonded to the benzene ring in the meta- or para-position relative to the azo group.

4,730,039

LEUCANICIDIN

Akinori Suzuki; Akira Isogai, both of Chiba; Shogo Matsumoto; Shohei Sakuta, both of Tokyo; Mitsuo Ogura, Kamakura; Haruo Seto, Hachioji, and Kazuo Furihata, Tokyo, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

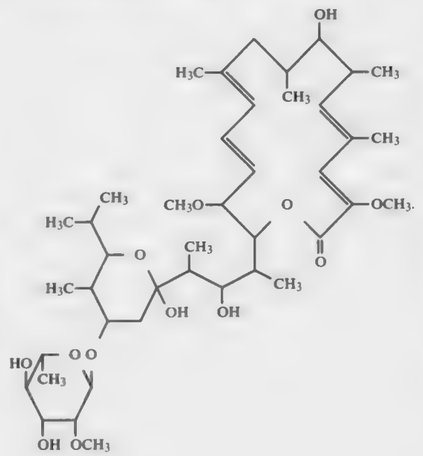
Filed Jan. 24, 1985, Ser. No. 694,263

Claims priority, application Japan, Mar. 9, 1984, 59-43815

Int. Cl.[4] C07H *17/08*

U.S. Cl. 536—7.1 1 Claim

1. Leucanicidin of the formula:



4,730,040

PREPARATION OF CAPROLACTAM

Uwe Vagt, Speyer; Rolf Fischer, Heidelberg; Franz Merger, Frankenthal, and Hans-Martin Hutmacher, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,788

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602377

Int. Cl.[4] C07D *201/08*

U.S. Cl. 540—538 9 Claims

1. A process for the preparation of ε-caprolactam, wherein

(a) a 5-formylvalerate is reacted with water in the presence of an acidic agent at from 30° to 200° C.,

(b) the 5-formylvaleric acid thus obtained is reacted with excess ammonia and hydrogen in the presence of a hydrogenation catalyst and of a solvent which is inert under the reaction conditions, at from 50° to 150° C. under superatmospheric pressure, and

(c) after the ammonia has been separated off, the resulting solution of 6-aminocaproic acid is heated to 150°–370° C. and the caprolactam formed is isolated.

4,730,041

PREPARATION OF ε-CAPROLACTAMS

Hans-Martin Hutmacher, Ludwigshafen; Franz Merger, Frankenthal; Franz J. Broecker, Ludwigshafen; Rolf Fischer, Heidelberg; Uwe Vagt, Speyer; Wolfgang Harder, Weinheim; Claus-Ulrich Priester, Meckenheim; Heinz-Walter Schneider, Ludwigshafen, and Wolfgang Richter, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,789

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602376

Int. Cl.[4] C07D *201/08*

U.S. Cl. 540—538 9 Claims

1. A process for the preparation of ε-caprolactam, wherein

(a) a C_1–C_4-alkyl 5-formylvalerate is reacted with excess ammonia and hydrogen in the presence of an alkanol as a solvent and in the presence of a hydrogenation catalyst under superatmospheric pressure in the liquid phase at from 40° to 130° C.,

(b) excess ammonia and hydrogen are separated off from the reaction mixture and

(c) the reaction mixture thus obtained is heated to 150°–250° C. and ε-caprolactam is obtained.

4,730,042

COMPOUNDS 1 OR 3-HYDROXY-4-BENZYL-6-METHYL-7-(4-ISOPROPYLAMINO-BUTOXY)-1,3-DIHYDRO[3,4-C]PYRIDINE AND 2-METHYL-3-(4-ISOPROPYL-AMINOBUTOXY)-4-(1'-MORPHILINOMETHYL)-5-HYDROXYMETHYL-6-BENZYL PYRIDINE, USEFUL FOR TREATING CARDIAC ARRHYTHMIAS

Hans-Guenther Hege, Neustadt; Gerhard Eisen, Schifferstadt; Horst Koenig, Ludwigshafen, and Gerda von Philipsborn, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,699

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519693

Int. Cl.[4] C07D *491/048, 413/12*

U.S. Cl. 544—124 3 Claims

1. 2-Methyl-3-(4-isopropylaminobutoxy)-4-(1'-morpholinomethyl)-5-hydroxymethyl-6-benzylpyridine.

3. 3-Hydroxy-4-benzyl-6-methyl-7-(4-isopropylaminobutoxy)-1,3-dihydrofuro[3,4-C]pyridine.

4,730,043

PROCESS FOR PREPARING PYRIMIDINE

Roland E. van der Stoel, Buchten, Netherlands, assignor to Stamicarbon B.V. Licensing Subsidary of DSM, Geleen, Netherlands

Continuation-in-part of Ser. No. 652,472, Sep. 20, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 812,812

Claims priority, application Netherlands, Oct. 7, 1983, 8303449

Int. Cl.[4] C07D *239/26*

U.S. Cl. 544—242 7 Claims

1. Process for preparing pyrimidine, which comprises contacting an alkyl pyrimidine, having an alkyl substituent, of from 1 to 4 carbon atoms, at the 2 and/or 4 (6) position, in the gas phase at a temperature of 300°–450° C. with an oxidation catalyst containing one or more oxides of at least one of the elements of the group consisting of Bi, Mo and V and in the presence of water and of a gas containing molecular oxygen and recovering pyrimidine from the resulting reaction mixture.

4,730,044

SPARSOMYCIN DERIVATIVES

Douglas W. Beight, Cincinnati, and Gary A. Flynn, Madeira, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 840,631, Mar. 17, 1986, abandoned, which is a division of Ser. No. 632,133, Jul. 18, 1984, Pat. No. 4,595,687. This application Feb. 24, 1987, Ser. No. 18,765

Int. Cl.[4] C07D *239/10*

U.S. Cl. 544—311 2 Claims

1. The compound N-[1-(Hydroxymethyl)-2-[[4-(hydroxy)-phenyl]sulfinyl]ethyl]-3-(6-methyluracil)-2-propenamide or a pharmaceutically acceptable salt thereof.

2. The compound D-N-[1-(Hydroxymethyl)-2-[[4-(hydroxy)phenyl]sulfinyl]ethyl]-3-(6-methyluracil)-2-propenamide or a pharmaceutically acceptable salt thereof.

4,730,045

METHOD FOR MAKING PYRIMIDIN-2-ONE AND IMIDAZOL-2-ONE COPOLYMERIZABLE MONOMER DERIVATIVES

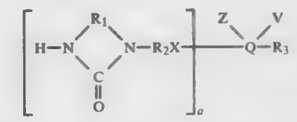
Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 448,254, Dec. 9, 1982, Pat. No. 4,617,364. This application Jun. 18, 1986, Ser. No. 875,692

Int. Cl.[4] C07D *233/30, 239/02*

U.S. Cl. 544—318 5 Claims

1. The method of producing a monoethylenically unsaturated copolymerizable monomer having the formula



in which

R_1 is alkylene having 2 or 3 carbon atoms;

R_2 is alkylene having 2 to 10 carbon atoms;

X is a radical selected from NH-, S-, and O- which initially carried Z;

Z is an isocyanate-reactive hydrogen atom initially carried by R_2X;

a is an integer from 1 to 5 to consume all the isocyanate groups on the polyisocyanate noted hereinafter other than the one consumed by R_3;

Q is an organic aliphatic or aromatic polyisocyanate carrying a+1 isocyanate groups;

V is an isocyanate-reactive hydrogen atom initially carried by R_3;

R_3 is the residue of a monohydroxy C_1–C_{12} alkyl maleate or fumarate which is connected to Q via its hydroxy group; and

X and R_3 are connected to Q via the isocyanate groups therein and Z and V are carried by the nitrogen atoms in said isocyanate groups which comprises,

adding one mole of said polyisocyanate slowly to a mixture of one equivalent of said maleate or fumarate and enough of an alkyl alkylene urea supplying said X radical to consume the isocyanate functionality in excess of one equivalent, said polyisocyanate including one isocyanate group which is less reactive than the others and said hydroxy group carried by said maleate or fumarate being less reactive with the isocyanate group than said X radical carried by said alkyl alkylene urea, first reacting the more reactive isocyanate group of said polyisocyanate with the X radical of said alkyl alkylene urea by maintaining conditions adequate for that reaction, but inadequate for reaction with the hydroxy group carried by said maleate or fumarate, and then raising the temperature to cause the less reactive isocyanate group of said polyisocyanate to

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react with the hydroxy group carried by said maleate or fumarate.

4,730,046

PREPARATION OF ARYL HALIDES

Andrea Leone-Bay; Elliott Bay, both of Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 14, 1986, Ser. No. 851,625

Int. Cl.[4] C07C *17/22, 41/22;* **C07D** *213/61, 239/30*

U.S. Cl. 544—334 **11 Claims**

1. A process for selectively substituting an aromatic nitro group with a halogen which comprises contacting a compound containing an aromatic nitro group with a phosphorushalide of formula: R_nPX_{5-n} wherein n is selected from 0, 1, 2 and 3; R is selected from the group consisting of C-6 to C-10 aryl and substituted aryl wherein the substituents are selected from the group consisting of: straight and branched chain alkyl, alkoxy, and haloalkyl; halogen, sulfonate and mixtures thereof; and X is a halogen, in the presence of an arylphosphorusoxydihalide solvent and in an amount effective to selectively denitrohalogenate said compound.

4,730,047

BENZENESULPHONAMIDE DERIVATIVES

John T. A. Boyle, Cookham, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 782,258, Sep. 30, 1985, Pat. No. 4,684,657. This application May 11, 1987, Ser. No. 48,186

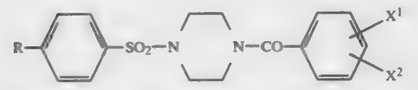
Claims priority, application United Kingdom, Oct. 3, 1984, 8424979

Int. Cl.[4] C07D *241/04*

U.S. Cl. 544—383 **1 Claim**

1. A compound selected from these having the formula I

(I)



and, in the case where R is amino, their acid addition salts, wherein R is selected from amino and nitro and X_1 and X_2 are independently selected from hydrogen, halogen, trifluoromethyl, lower alkyl and lower alkoxy.

4,730,048

GUT-SELECTIVE OPIATES

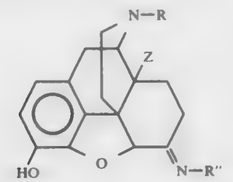
Philip S. Portoghese, Falcon Heights, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Dec. 12, 1985, Ser. No. 809,051

Int. Cl.[4] C07D *489/06, 489/00;* **A61K** *31/485*

U.S. Cl. 546—45 **4 Claims**

1. A composition of matter of the formula:



wherein R is (C_1–C_5) alkyl, C_3–C_6(cycloalkyl)alkyl, aryl, aralkyl or trans-(C_2–C_5) alkenyl, Z is H or OH and R″ is NH-A(B)(C) or guanidino, wherein A is selected from the group consisting of (C_1–C_5) alkyl, (C_2–C_5) alkenyl and (C_2–C_5) alkoxy (alkyl); B is selected from the group consisting of H and a (C_1–C_5)alkyl group optionally substituted with CO_2H, OH or phenyl and C is CO_2H, SO_3H, amino or guanidino; and the pharmaceutically-acceptable salts thereof.

4,730,049

PROCESS FOR PREPARING 5-(2-CHLOROBENZYL)-4,5,6,7-TETRAHYDROTHIENO (3,2-C)PYRIDINE

Toshio Suguro, Kamifukuoka, Japan, assignor to Nisshin Flour Milling Co., Ltd. and Nisshin Chemicals Co., Ltd., both of, Japan

Filed Oct. 1, 1985, Ser. No. 782,409

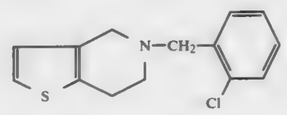
Claims priority, application Japan, Oct. 3, 1984, 59-206280

Int. Cl.[4] C07D *495/04*

U.S. Cl. 546—114 **8 Claims**

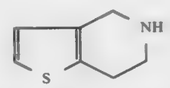
1. A process for preparing 5-(2chlorobenzyl)-4,5,6,7-tetrahydrothieno[3,2-c]pyridine of the formula (I)

(I)



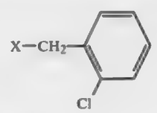
and acid addition salts thereof, which comprises reacting a compound of the formula (II)

(II)



with a compound of the formula (III)

(III)



wherein X represents Cl, Br or I, in the presence of a phase transfer catalyst and a base.

4,730,050

NOVEL ENZYME DERIVATIVES

Richard A. G. Smith, Reigate Surrey, England, assignor to Beecham Group p.l.c., England

Continuation of Ser. No. 785,012, Oct. 7, 1985, abandoned, which is a division of Ser. No. 684,359, Dec. 21, 1984, Pat. No. 4,600,580. This application Apr. 3, 1987, Ser. No. 34,784

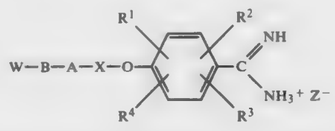
Claims priority, application United Kingdom, Dec. 24, 1983, 8334499

Int. Cl.[4] A61K *37/48;* **C07C** *103/52;* **C07G** *7/00;* **C12N** *9/70*

U.S. Cl. 546—290 **9 Claims**

1. A compound of the formula (II):

(II)



wherein B is a hydrophilic linking group; A is a bridging group comprising one or two heteroatoms independently selected from the group consisting of oxygen, sulphur and nitrogen, in which the nitrogen is unsubstituted or substituted by alkyl of 1

to 6 carbon atoms; X is an optionally substituted benzoyl group further substituted at the 2- or 4-position by the moiety A, and optionally substituted acryloyl group joined to A at the 2- or 3-position or a naphthoyl group; and W is a group capable of reacting directly with the amino acid side chain of a protein or with a protein attachment group to produce a covalent bond between B and said side chain or attachment group; Z is a counter anion; and R^1, R^2, R^3 and R^4 are ach hydrogen or an electron withdrawing moiety which increases the reactivity of an amidinophenyl ester.

4,730,051

4-(SUBSTITUTED-OXY)-3-PYRIDINECARBOXAMIDES USEFUL AS PLANT GROWTH INHIBITORY AGENTS

Yoichiro Ueda; Yukihisa Goto; Kazuhisa Masamoto, all of Himeji; Yoshiyuki Hirako, Otake; Hiroshi Yagihara, Himeji; Yasuo Morishima, Kobe, and Hirokazu Osabe, Himeji, all of Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Jan. 15, 1986, Ser. No. 819,144

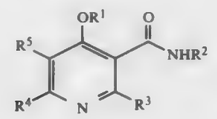
Claims priority, application Japan, Jan. 18, 1985, 60-7665; Aug. 2, 1985, 60-171673; Sep. 25, 1985, 60-211821

Int. Cl.[4] C07D *213/56;* **A01N** *43/40*

U.S. Cl. 546—291 **4 Claims**

1. A compound of the formula:

(I)



wherein

R^1 is C_1–C_8 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, aralkyl selected from the group consisting of benzyl, 2-phenylethyl, 3-phenylpropyl and 4-phenylbutyl, haloalkyl, C_1–C_6 alkoxy-C_1–C_6 alkyl, C_1–C_6 alkylthio-C_1–C_6 alkyl or C_1–C_6 alkoxycarbonyl-C_1–C_6 alkyl;

R^2 is unsubstituted or substituted phenyl or naphthyl, wherein the substituents are selected from the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxycarbonyl, trifluoromethyl, cyano or nitro;

R_3 and R_4 are selected from the group consisting of C_1–C_6 alkyl, aralkyl selected from the group consisting of benzyl, 2-phenylethyl, 3-phenylpropyl and 4-phenylbutyl, haloalkyl, C_3–C_6 cycloalkyl, unsubstituted phenyl or naphthyl, and substituted phenyl or naphthyl, wherein the substituents are selected form the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano or nitro;

R^5 is hydrogen, halogen, C_1–C_6 alkyl, or unsubstituted or substituted phenyl or aralkyl selected from the group consisting of benzyl, 2-phenylethyl, 3-phenylpropyl and 4-phenylbutyl, wherein the substituents are selected from the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano or nitro;

R^4 and R^5 or a 1-oxide or an acid addition salt thereof.

4,730,052

METHOD FOR PREPARING UNSYMMETRICAL 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID DIESTERS

Yoshimoto Nakashima; Toshihisa Ogawa, both of Ageo; Atsuro Nakazato; Yukinari Kumazawa, both of Ohmiya, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,162

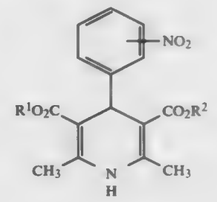
Claims priority, application Japan, Jul. 13, 1984, 59-145597; Jul. 13, 1984, 59-145598; Jul. 13, 1984, 59-145599

Int. Cl.[4] C07D *211/90*

U.S. Cl. 546—321 **3 Claims**

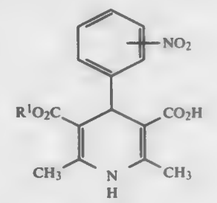
1. A method for preparing an unsymmetrical 1,4-dihydropyridine-3,5-dicarboxylic acid diester represented by the general formula

(I)



wherein R^1 and R^2 are different and represent each a nitratoalkyl group having 2 or 3 carbon atoms, which comprises reacting a 1,4-dihydropyridine-3,5-dicarboxylic acid monoester represented by the general formula

(II)



wherein R^1 is as defined above, with an activating reagent of the carboxylic acid which activating reagent is an organic acid anhydride in the pressure of a catalyst of an inorganic base, a mixture of the inorganic base and an inorganic salt, an organic base, molecular sieves 3A, molecular sieves 4A, molecular sieves 5A, molecular sieves 13X, anhydrous sodium sulfate or anhydrous magnesium sulfate, and reacting the resulting reactive derivative of the compound of formula II with an alcohol represented by the general formula

R^2OH (III)

wherein R^2 is as defined above.

4,730,053

S-[2-PHENYL (ALKYL) CARBAMOYL]-PHENYLSELENYLMERCAPTO DERIVATIVES

Norbert Dereu, Frechen-Bachem; Albrecht Wendel, Tübingen; Helmut Sies, Düsseldorf; Sigurd Leyck, Pulheim; Axel Römer, Hürth-Gleuel, and Erich Graf, Kerpen-Horrem, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 25, 1985, Ser. No. 801,561

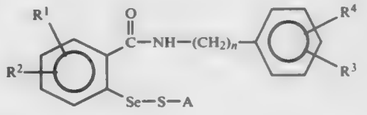
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443467

Int. Cl.[4] C07C *163/00;* **A61K** *31/44, 31/165*

U.S. Cl. 546—337 **4 Claims**

1. A compound of formula (I)

(I)



wherein

R^1, R^2,

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R^3 and R^4 are identical or different from each other and represent members selected from the group consisting of hydrogen, halogen, C_{1-4}-alkyl, C_{1-3}-alkoxy, trifluoromethyl, nitro, cyano, hydroxy, carboxy, C_{1-2}-alkoxycarbonyl, carboxy-C_{1-4}-alkyl and C_{1-2}-alkoxycarbonyl-C_{1-4}-alkyl and

A represents a member selected from the group consisting of the straight and branched alkyl groups having 1 to 4 carbon atoms and said alkyl groups substituted by 1 to 3 members selected from the group consisting of the carboxy, C_{1-3}-alkoxycarbonyl, hydroxy, mercapto, carboxy-C_{1-4}-alkylcarbamoyl, C_{1-3}-alkoxycarbonyl C_{1-4}-alkylcarbamoyl, phenyl, carboxyphenyl, C_{1-3}-alkoxycarbonylphenyl, pyridyl and pyridyl-C_{1-4}-alkyl groups, and

n is zero or one.

4,730,054

IMIDAZOLE THIENO-BENZOTHIEPINS

Jan Leiner; Vladislava Holá; Miroslav Rajsner, and Iva Matunová, all of Prague, Czechoslovakia, assignors to SPOFA, Spojene Podniky Pro Zdravotnickou Vyrobu, Prague, Czechoslovakia

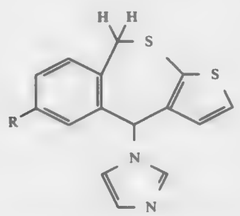
Filed Dec. 1, 1986, Ser. No. 936,540

Claims priority, application Czechoslovakia, Nov. 29, 1985, 8664-85

Int. Cl.⁴ C07D *495/04*

U.S. Cl. 548—336 **5 Claims**

1. An imidazolyl thieno-benzothiepin derivative of the formula



wherein R is selected from the group consisting of a hydrogen and a chlorine atom.

4,730,055

METHOD FOR SILYLATING AROMATIC IMIDES AND SILYLIMIDES MADE THEREFROM

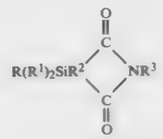
Jonathan D. Rich, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 647,301, Aug. 30, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,813

Int. Cl.⁴ C07F *7/10, 7/16, 7/18*

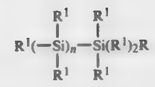
U.S. Cl. 548—406 **13 Claims**

1. A method for making silyl aromatic imides of the formula

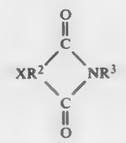


which comprises

(A) effecting reaction between a polysilane of the formula



and a haloaromatic imide of the formula,

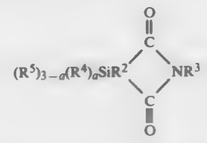


in the presence of an effective amount of a transition metal catalyst, and

(B) recovering the resulting silyl aromatic imide from the mixture of (A),

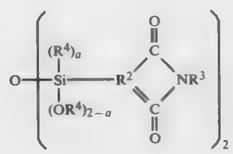
where X is halogen, R is a monovalent group selected from the class of X, hydrogen, $C_{(1-8)}$ alkoxy, $C_{(1-13)}$ hydrocarbon groups and $C_{(1-13)}$ hydrocarbon groups substituted with radicals neutral during silylation, R^1 is selected from R, —O— and —S—, and when R^1 is —O— or —S— or a mixture thereof. R^1 can form ≡SiOSi≡ or ≡SiSSi≡, connecting groups, R^2 is a trivalent $C_{(6-13)}$ aromatic organic group, R^3 is selected from $C_{(1-13)}$ monovalent hydrocarbon groups and monovalent hydrocarbon groups substituted with radicals neutral during silylation, and n is an integer having a value of from 1 to 50 inclusive.

5. Silyl aromatic imides of the formula,



where R^2 is a trivalent $C_{(6-13)}$ aromatic organic group, R^3 is selected from $C_{(1-13)}$ monovalent hydrocarbon groups and $C_{(1-13)}$ monovalent hydrocarbon groups substituted with radicals neutral during silylation, R^4 is $C_{(1-14)}$ monovalent hydrocarbon group, or a $C_{(1-14)}$ monovalent hydrocarbon group substituted with radicals neutral during silylation, R^5 is a monovalent group selected from halogen or —OR^4, and a is a whole number having a value of 0 to 2 inclusive.

7. Imide disiloxanes having the formula



where R^2 is a trivalent $C_{(6-13)}$ aromatic organic group, R^3 is selected from $C_{(1-13)}$ monovalent hydrocarbon groups and $C_{(1-13)}$ monovalent hydrocarbon groups substituted with radicals neutral during silylation, R^4 is $C_{(1-14)}$ monovalent hydrocarbon group or a $C_{(1-14)}$ monovalent hydrocarbon group substituted with radicals neutral during silylation, and a is a whole number having a value of 0 to 2 inclusive.

4,730,056

PROCESS FOR (1H)-ISOINDOLIN-1-ONE-3-CARBOXYLIC ACID

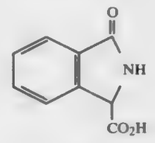
John A. Lowe, III, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 29, 1986, Ser. No. 902,344

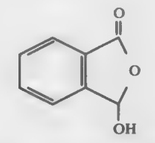
Int. Cl.⁴ C07D *209/46*

U.S. Cl. 548—472 **2 Claims**

1. A process for preparing a compound of the formula



which comprises the steps of (a) treating a solution of a compound of the formula



in an alkanol having one to three carbon atoms with ammonia, (b) contacting the resulting solution with an aqueous solution containing an equimolar amount of an alkali metal cyanide, (c) removing the alkanol, (d) adjusting the pH to about 1.0, (e) heating the resulting reaction mixture until the formation of the product is substantially complete and isolating the product.

4,730,057

PHTHALIDE DERIVATIVES USEFUL AS COLORLESS CHROMOGENIC MATERIAL

Nobuo Kanda, Osaka; Naoki Yonese, and Mitsuru Kondo, both of Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

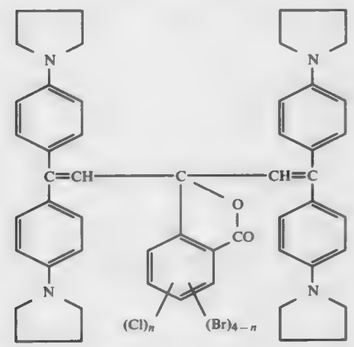
Filed Jan. 10, 1986, Ser. No. 817,564

Claims priority, application Japan, Jan. 17, 1985, 60-7074; Jan. 17, 1985, 60-7075

Int. Cl.⁴ C07D *295/06*

U.S. Cl. 548—524 **1 Claim**

1. A phthalide derivative having the following formula:



wherein n is an integer of 1 to 3.

4,730,058

SIALOSYLCERAMIDES AND PRODUCTION METHOD THEREOF

Tomoya Ogawa, Tokyo; Mamoru Sugimoto; Masaaki Numata, both of Saitama; Yoshiyasu Shitori, and Masayoshi Ito, both of Tokyo, all of Japan, assignors to Mect Corporation, Tokyo, Japan

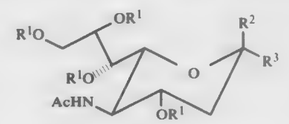
Filed Apr. 9, 1987, Ser. No. 36,445

Claims priority, application Japan, Apr. 11, 1986, 61-83396

Int. Cl.⁴ C07D *309/00, 309/02*

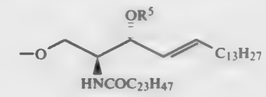
U.S. Cl. 549—214 **14 Claims**

1. A compound expressed by the following formula (1):

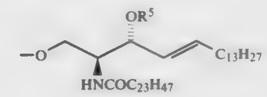


(1)

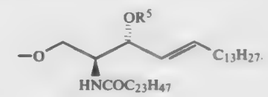
wherein R^1 denotes a hydrogen atom or CH_3CO—, R^2 denotes —$COOR^4$ (R^4 denotes Na or a methyl group) or



(R^5 denotes a hydrogen atom, —COC_6H_5 or —$Si(C_6H_5)_2C(CH_3)_3$) and R^3 denotes



(R^5 denotes a hydrogen atom, —COC_6H_5 or —$Si(C_6H_5)_2C(CH_3)_3$) when R^2 is —$COOR^4$ (R^4 denotes Na or a methyl group) or denotes —$COOR^4$ when R^2 is



4,730,059

6'-THIOMETHYLSUBSTITUTED SPECTINOMYCINS

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

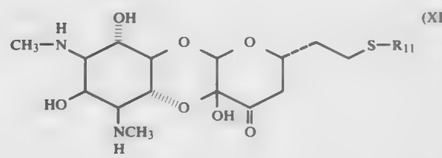
Filed Mar. 10, 1986, Ser. No. 838,317

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.⁴ C07D *323/04, 493/00*

U.S. Cl. 549—361 **9 Claims**

1. A 6'-thiomethyl-substituted spectinomycin of the formula

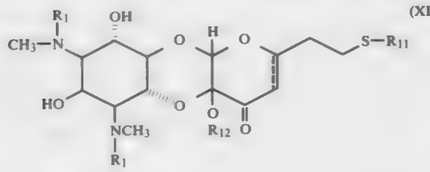


(XII)

VOL 1088 ISS 2 MR 8 1988 UMI

where R_{11} is C_1–C_5 alkyl, —CH_2—(C_2–C_4 alkenyl), C_5–C_8 cycloalkyl, phenyl or phenyl substituted with 1 through 5 —F, —Cl, —Br, or —I and pharmaceutically acceptable salts thereof.

4. A 6'-thiomethyl-substituted compound of the formula



(XIV)

where

R_1 is —COO—(t-butyl), —COO—CH_2CH_2—$Si(CH_3)_3$ or —COO—CH_2CH_2Cl;

R_3 is C_1–C_8 alkyl;

R_{11} is C_1–C_3 alkyl, C_5–C_8 cycloalkyl or phenyl;

R_{12} is —H or R_3—CO—;

is a single or double bond with the proviso that

(1) when is a double bond, R_{12} is R_3—CO— and

(2) when is a single bond, R_{12} is a hydrogen atom.

4,730,060

CARBACYCLIN DERIVATIVES, METHOD OF MANUFACTURING THE SAME AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Tsuyoshi Tomiyama, Sakaki; Akira Tomiyama, Togura; Takashi Yanagisawa, Koushoku, and Masayuki Yokota, Sakaki, all of Japan, assignors to Kotobuki Seiyaku Co. Ltd., Nagano, Japan

Filed Jun. 1, 1987, Ser. No. 57,359

Claims priority, application Japan, Jul. 8, 1986, 61-161445; Dec. 9, 1986, 61-291467

Int. Cl.[4] C07C *177/00*

U.S. Cl. 549—362 **14 Claims**

1. A compound of formula:



Wherein:

A is —CH=CH— or —C≡C— group; B is substituted or unsubstituted indanyl group, substituted or unsubstituted benzodioxanyl group, substituted or unsubstituted benzodioxolanyl group or 2,3,5,6,7,8-hexahydrobenzodioxanyl group, D is —CH_2— or —O— atom; ~OH is α or β-configuration of OH group,



or pharmaceutically acceptable alkali addition salts thereof.

4,730,061

PYRONE-3-CARBOXAMIDE COMPOUNDS

Yoichiro Ueda; Yukihisa Goto; Kazuhisa Masamoto, all of Himeji; Yoshiyuki Hirako, Otake; Hiroshi Yagihara, Himeji; Yasuo Morishima, Kobe, and Hirokazu Osabe, Himeji, all of Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

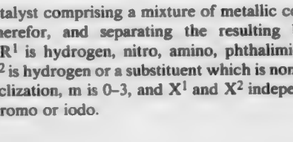
Filed Dec. 31, 1985, Ser. No. 815,229

Claims priority, application Japan, Dec. 29, 1984, 59-278974

Int. Cl.[4] C07D *309/22*

U.S. Cl. 549—419 **5 Claims**

1. A pyrone-3-carboxamide compound of the formula:



wherein R1 is an alkyl group; and one of R3 and R4 is an alkyl group or a halogen atom and the other is a hydrogen atom.

4,730,062

PROCESS OF PREPARATION OF TETRAFLUORO 2,3-DIHYDROBENZOFURANS

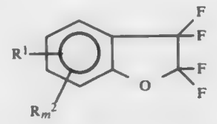
David E. Seelye, Newtown, and Ernest L. Plummer, Yardley, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 19, 1985, Ser. No. 725,193

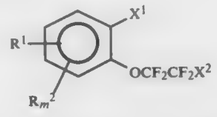
Int. Cl.[4] C07D *307/82*

U.S. Cl. 549—462 **11 Claims**

1. A cyclization process for preparing benzofurans of the formula:



which comprises contacting, at elevated temperature in an aprotic solvent, an ether of the formula:



with a catalyst comprising a mixture of metallic copper and a ligand therefor, and separating the resulting benzofuran, wherein R^1 is hydrogen, nitro, amino, phthalimido or acetamido, R^2 is hydrogen or a substituent which is non-interfering in the cyclization, m is 0–3, and X^1 and X^2 independently are chloro, bromo or iodo.

4,730,063

ALKALI METAL 2,5-DIHYDRO-3-ETHOXYCARBONYL-2-[(SUBSTITUTED PHENYL)AMINO]-4-FURANYLOXIDES

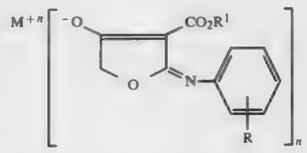
Vassil S. Georgiev, Rochester; Clyde R. Kinsolving, Fairport, and Robert A. Mack, Rochester, all of N.Y., assignors to Pennwalt Corportion, Philadelphia, Pa.

Filed Dec. 5, 1986, Ser. No. 938,199

Int. Cl.[4] C07D *307/68*

U.S. Cl. 549—479 **7 Claims**

1. A compound having the formula:



where;

n=1 or 2, M is an alkali or alkaline earth metal, R is hydrogen, lower alkyl, lower alkoxy, nitro, halogen or acetyl, and R^1 is lower alkyl.

4,730,064

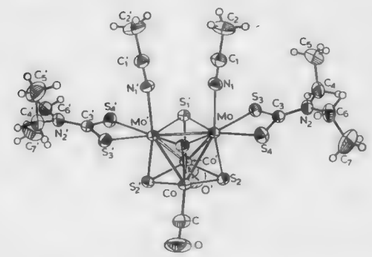
HETEROMETALLIC THIOCUBANES (C-2044)

Thomas R. Halbert, Annandale, N.J.; Steven A. Cohen, Naperville, Ill., and Edward I. Stiefel, Bridgewater, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 711,601, Mar. 14, 1985, abandoned. This application Jun. 2, 1986, Ser. No. 870,772

Int. Cl.[4] C07F *15/00, 15/02, 15/04, 15/06*

U.S. Cl. 556—15 **27 Claims**



1. A composition of matter containing a heterometallic thiocubane cluster selected from compositions having the formula

$(M_2^1M_2^2S_4)L_2^1L_2^2L_2^3$,

and

$(M_2^1M_2^2S_4)L_2^1L_2^3$

wherein:

M^1 is Re, V, Mo or W,

M^2 is Co, Cr, Cu, Ni or Fe,

L^1 is a bidentate sulfur and/or nitrogen bearing ligand, and

L^2 is a monodentate S, N, P or O donor ligand,

L^3 is CO, a monodentate anion ligand selected from halide, mercaptide or alkoxide anion ligands, or O, N, P or S containing monodentate donor ligand, and

wherein $(M_2^1M_2^2S_4)$ forms said heterometallic thiocubane cluster.

4,730,065

15-DEOXY-16-HYDROXY-16-SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

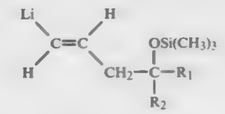
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Fort Lee, N.J.; Charles V. Grudzinskas, Upper Nyack, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 931,896, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 680,208, Dec. 10, 1984, abandoned, which is a division of Ser. No. 337,425, Jan. 6, 1982, Pat. No. 4,504,417, which is a division of Ser. No. 305,901, Sep. 25, 1981, Pat. No. 4,429,148, which is a division of Ser. No. 79,126, Sep. 26, 1979, Pat. No. 4,328,358, which is a division of Ser. No. 835,614, Sep. 22, 1977, Pat. No. 4,192,950, which is a division of Ser. No. 706,343, Jul. 19, 1986, Pat. No. 4,061,670. This application Jul. 24, 1987, Ser. No. 77,042

Int. Cl.[4] C07C *177/00*

U.S. Cl. 556—21 **14 Claims**

1. A compound of the formula:



wherein R_1 is an alkyl or alkenylmethyl group having 3 to 7 carbon atoms or said alkyl or alkenylmethyl group is substituted with one or two alkyl groups having one to three carbon atoms and wherein R_2 is a substituent selected from the group consisting of vinyl and cyclopropyl.

4,730,066

COMPLEX FOR ENHANCING MAGNETIC RESONANCE IMAGING

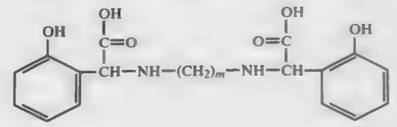
David H. White, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 6, 1986, Ser. No. 860,064

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—50 **1 Claim**

1. A complex for use in enhancing magnetic resonance images of body organs and tissues, said complex comprising a central metal ion selected from the group consisting of manganese(II), manganese(III), gadolinium(III) and chromium(III) and a compound of the formula:



wherein m=2, 3, 4 or 5.

4,730,067

PROCESS FOR THE PREPARATION OF ZIRCONIUM CARBOXYLATE

Lawrence A. Filachek, Englishtown, N.J.; Stanley E. Whitehead, deceased, late of New Brunswick, N.J., and by James M. Whitehead, executor, Anchorage, Ak., assignors to Akzo America Incorporated, New York, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,975

Int. Cl.[4] C07F *7/00;* **C11C** *1/00*

U.S. Cl. 556—55 **15 Claims**

1. A process for the production of zirconium carboxylate comprising: combining within a basic environment of a basic aqueous solution having a pH less than 13, a zirconium salt and a carboxylate in an amount sufficient to give a mole ratio of carboxylate to zirconium in the range of from 1:1 to about

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1.4:1, said basic environment being provided by a basic salt in an amount sufficient to leave a minimum excess of about 0.11 equivalents of base relative to said zirconium salt after the combination of the zirconium salt and the carboxylate, whereupon sad zirconium salt reacts with said carboxylate within the basic environment to form zirconium carboxylate.

4,730,068

TUMOR RETARDING (1,2-DIPHENYL-ETHYLENEDIAMINE)-PLATINUM(II)-COMPLEXES

Helmut Schonenberger, Pentling; Erwin von Angerer, Grablfing; Johann Karl, Sunching; Margaretha Jennerwein, Regensburg, and Jurgen Engel, Alzenau, all of Fed. Rep. of Germany, assignors to Asta-Werke Aktiengesellschaft, Bielefeld, Fed. Rep. of Germany

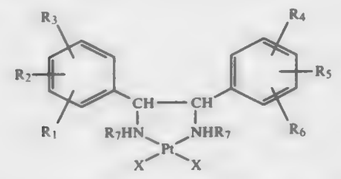
Filed Feb. 21, 1986, Ser. No. 831,913

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506507

Int. Cl.⁴ C07F *15/00*

U.S. Cl. 556—137 **14 Claims**

1. A (1,2-diphenyl-ethylenediamine)-platinum(II) complex of the formula



I

wherein R_7 is hydrogen or C_1–C_6-alkyl and R_2 is either (1) a halogen atom and the groups R_1, R_3, R_4, R_5, and R_6 are the same or different and are hydrogen, halogen, trihalomethyl, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, a C_2–C_6-alkanoyloxy or a halo or C_1–C_4-alkanesulfonyloxy substituted C_2–C_6-alkanoyloxy group or R_2 is in the 4-position and is (2) a hydroxy group, a C_1–C_6-alkoxy group, a C_2–C_6-alkanoyloxy group or a halo or C_1–C_4-alkanesulfonyloxy substituted C_2–C_6-alkanoyloxy group and if R_2 is (2) then the groups R_1 and R_3 which are the same or different are in the 2 and 6 positions of the phenyl group and are halogen, trihalomethyl, C_1–C_6-alkyl, hydroxy, a C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy group or a halo or C_1–C_4-alkanesulfonyloxy substituted C_2–C_6-alkanoyloxy group with the proviso that R_1 can also be hydrogen* and the groups R_4, R_5, and R_6 are the same or different and are hydrogen, halogen, trihalomethyl, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, a C_2–C_6-alkanoyloxy group or a halo or C_1–C_4-alkanesulfonyloxy substituted C_2–C_6-alkanoyloxy group and X is the equivalent of a physiologically compatible anion.

if R_3 is halogen, trihalomethyl or C_1–C_6-alkyl

4,730,069

CIS-PLATINUM COMPLEXES WITH A PENTAERYTHRITOL DERIVATIVE AS THE LIGAND, A PROCESS FOR THEIR PREPARATION AND A PHARMACEUTICAL AGENT CONTAINING THESE COMPOUNDS

Cenek Kolar; Hans P. Kraemer, both of Marburg, and Konrad Dehmel, Marburg-Michelbach, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

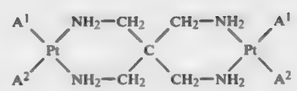
Filed Aug. 30, 1985, Ser. No. 770,996

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432320

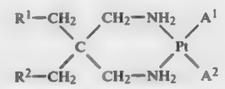
Int. Cl.⁴ C07F *15/00*

U.S. Cl. 556—137 **1 Claim**

1. A compound of the formula I or II

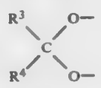


Formula I



Formula II

in which R^1 and R^2 independently of one another represent $H—(CH_2)_a—(O—CH_2)_b)_c—O$, where a=0 to 4, b=1 to 4 and c=1 to 7, an alkoxy or arylalkoxy group with 1 to 20 carbon atoms, an alkane- or aralkanesulfonyloxy group with 1 to 7 carbon atoms or a tetrahydropyranyloxy radical, or R^1 and R^2 together represent an oxygen atom bonded in an ether-like manner or an acetal or ketal radical



where R^3 and R^4 independently or one another represent a hydrogen atom, an alkyl group with 1 to 20 carbon atoms or a phenyl group, A^1 and A^2 are identical and represent a hydroxyl group, chloride, bromide, iodide, nitrate, acetate, trifluoroacetate, trifluorosulfonate or perchlorate, or A^1 represents sulfate or carbonate and A^2 represents H_2O, or A^1 or A^2 together represent the diamion or an organic acid selected from the group consisting of oxalic, malonic, hydroxymalonic, ethylmalonic, succinic, maleic, aconitic, 3,6,9-trioxaundecanedioic, 1- or 1,2-cyclobutanedicarboxylic, phthalic, 3- or 4- carboxyphthalic and 3,4-dicarboxyphthalic acid, or A^1 and A^2 together represent a recurring anionic unit of a polymeric compound selected from the group consisting of dextran sulfate, chondroitin sulfate, galactan sulfate, polyglutamic acid or polyitaconic acid.

4,730,070

STABILIZATION OF AMINE ALANES

Everett M. Marlett; Frederick W. Frey; Steven W. Johnston, all of Baton Rouge, La., and Herbert D. Kaesz, Los Angeles, Calif., assignors to Ethyl Corporation, Richmond, Va.

Filed May 20, 1987, Ser. No. 51,720

Int. Cl.⁴ C07F *5/06*

U.S. Cl. 556—171 **11 Claims**

1. Process for reducing the rate of amine alane decomposition catalyzed by titanium, said process comprising treating titanium that is in contact with an amine alane with a passivating amount of a passivating agent selected from the class consisting of O_2, CO, nitrogen oxides, and alkyl nitrites.

4,730,071

PROCESS FOR PREPARING ALUMINOXANES

Galeon W. Schoenthal, Houston, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 15, 1986, Ser. No. 896,689

Int. Cl.⁴ C07F *5/06*

U.S. Cl. 556—179 **7 Claims**

1. A process for preparing aluminoxanes which comprises mixing a first solution of a trialkyl aluminum compound in a liquid, dry, inert hydrocarbon solvent with a second solution of a liquid, inert, hydrocarbon solvent having water ultrasonically dispersed therein wherein the trialkyl aluminum compound and the water react to produce an aluminoxane.

4,730,072

PROCESS FOR PREPARING ALUMINOXANES

Galeon W. Schoenthal, Houston, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 15, 1986, Ser. No. 896,701

Int. Cl.⁴ C07F *5/06*

U.S. Cl. 556—179 **7 Claims**

1. A process for preparing aluminoxanes which comprises mixing a first solution of a trialkyl aluminum compound in a liquid, dry, inert hydrocarbon solvent with a second solution of a liquid, inert, hydrocarbon solvent having water dispersed therein by using a high speed, high shear-inducing impeller wherein the trialkyl aluminum compound and the water react to produce an aluminoxane.

4,730,073

NOVEL ORGANOSILICON COMPOUND AND METHOD FOR THE PREPARATION THEREOF

Toshio Takago, Annaka; Yasushi Yamamoto, Takasaki; Goichi Yamaguchi, Urawa, and Akira Kurashima, Aizuwakamatsu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,469

Claims priority, application Japan, Jul. 18, 1986, 61-169548

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—414 **7 Claims**

1. An organosilicon compound represented by the general formula

$$(CH_2{=}CCH_3{-}O)_n(CH_3)_{3-n}Si(CH_2)_3NCO,$$

in which n is 1 or 2.

4,730,074

VAPOR PHASE ALCOHOLYSIS OF AMINOSILANES AND CARBAMATOSILANES

Kenrick M. Lewis, Rego Park, N.Y.; Frank D. Mendicino, Marietta, Ohio, and Nan S. Chu, Hartsdale, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 31, 1986, Ser. No. 948,036

Int. Cl.⁴ C07F *7/18*

U.S. Cl. 556—470 **26 Claims**

1. A vapor phase process for the synthesis of alkoxysilanes of the general formula $HSi(OR''')_x(R'')_{3-x}$ wherein R'', R''' and X are as defined below, which comprises reacting

(a) an aminosilane of the general formula

$$HSi(NRR')_x(R'')_{3-x}$$

wherein R and R' are individually hydrogen or a substituted or unsubstituted aryl, alkenyl or alkyl group, each having from one to eight carbon atoms inclusive, and where R'' is R' or an alkoxy or carbamato group and where x has a value of from one to three; with

(b) an alcohol of the general formula

$$R'''OH$$

wherein R''' is a substituted or unsubstituted aryl, alkenyl group or alkyl group, each having from one to twenty carbon atoms inclusive, said reaction taking place in the presence of

(c) a catalyst in which both the aminosilane and the alcohol are present in gaseous form in a stoichiometric ratio of 0.4 to 1.05 moles of alcohol per mole of silicon-nitrogen bonds in the aminosilane and where said catalyst is present in an amount from 0.01 to 10 mole percent of the silicon-nitrogen bonds of the aminosilane.

4,730,075

CHEMICAL PROCESS INVOLVING ETHERS AND AMINES

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited

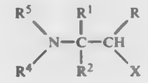
Division of Ser. No. 647,235, Sep. 4, 1984. This application Jun. 20, 1986, Ser. No. 876,768

Claims priority, application United Kingdom, Sep. 7, 1983, 8323961

Int. Cl.⁴ C07C *85/18, 102/00, 120/00, 101/00*

U.S. Cl. 558—394 **7 Claims**

1. A process for the production of a second amine, said second amine having the formula



where

R^1, R^2, and R are hydrogen, X or hydrocarbyl radicals, R^4 and R^5 are hydrocarbyl radicals or hydrogen, and

X is an electron withdrawing group,

which process comprises reacting an activated olefin with a first amine,

said activated olefin being one which can undergo the Michael Reaction, and said first amine being selected from the group consisting of methylamine, ethylamine, propylamine, dimethylamine, diethylamine and ammonia, in the presence of an effective amount of a catalyst, characterised in that the catalyst is

(a) an amidine, or

(b) a Lewis base and epoxide.

4,730,076

PROCESS FOR PRODUCING α-ASPARTYL-PHENYLALANINE ESTER

Tadashi Fujii, Iwatsuki; Hiroshi Yagiuchi; Akikazu Mitsunobu, both of Tokyo; Shigeru Aoki, Matsudo, and Makoto Tsuda, Saitama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

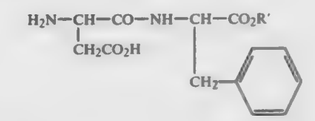
Filed Dec. 16, 1986, Ser. No. 942,146

Claims priority, application Japan, Dec. 18, 1985, 60-283048; Jan. 14, 1986, 61-4251

Int. Cl.⁴ C07C *101/02*

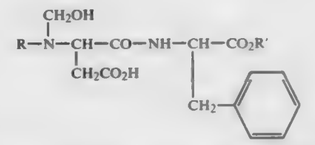
U.S. Cl. 560—41 **11 Claims**

1. A process for producing α-aspartyl-phenylalanine ester represented by the general formula (I)



(I)

wherein R' represents an alkyl group having 1 to 4 carbon atoms, which comprises reducing an N-protected-N-hydroxymethyl-α-aspartyl-phenylalanine ester represented by the general formula (IV)



(IV)

wherein R represents an organic moiety which can be substi-

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tuted by hydrogen reductively, and R′ is as defined above, with hydrogen gas or formic acid in the presence of a reduction catalyst and an aromatic primary amine.

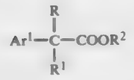
4,730,077

METHOD OF PREPARING α-ARYLALKANOIC ESTERS

Robert C. Chapman, Manchester, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jul. 12, 1986, Ser. No. 888,538
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—105 25 Claims

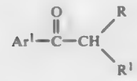
1. A method for preparing an α-arylalkanoic ester represented by the general formula



wherein Ar^1 is an aromatic hydrocarbon, R is an alkyl group or a hydrogen atom, R^1 is an alkyl group or a hydrogen atom, and R^2 is an alkyl group, which comprises reacting, under α-arylalkanoic ester-producing conditions, a trivalent iodine compound represented by the general formula



wherein Ar is an aromatic hydrocarbon and X and Y each represents a group which can be elimiated as an anion, with a carbonyl compound represented by the general formula



wherein Ar^1, R and R^1 are as defined above, in the presence of an orthocarboxylic ester represented by the general formula

$ZC(OR^2)_3$

wherein Z is an alkyl group or a hydrogen atom and R^2 is as defined above, via an improved method wherein the reaction between iodine and carbonyl compounds is effected in a substantially anhydrous mixture.

4,730,078

ALLENIC PROSTACYCLINS

Stevan W. Djuric, Glenview, and Masateru Miyano, Northbrook, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 13, 1987, Ser. No. 50,257
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—119 6 Claims

1. A compound having the formula:

wherein:
n is 0, 1, 2
R^1 is hydrogen, lower alkyl, lower hydroxyalkyl, or a pharmaceutically acceptable cation;
R^2 is hydrogen, lower alkyl, cycloalkyl, heteroalkyl, halogen, aryl, alkylthio, phenylthio, alkylsulfinyl, phenylsulfonyl, or trifluoromethyl;
R^3 is a lower alkyl, a cycloalkyl, phenyl, benzyl, a cycloheteroalkyl, a lower alkyl having one or more fluorines or containing 1 or 2 unsaturated bonds; and carbon 15 may be in the R or the S configuration, or a mixture of R and S with the proviso that when R^1 is a lower alkyl or lower hydroxyalkyl that carbon 15 is not in the R configuration.

4,730,079

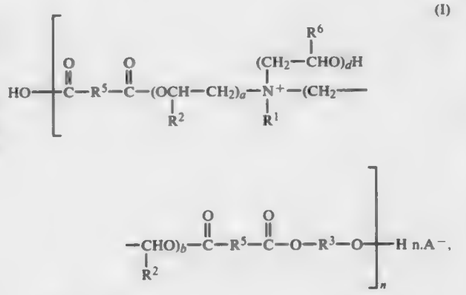
QUATERNARY OXALKYLATED POLYCONDENSATES

Manfred Hofinger; Willibald Böse, both of Burgkirchen; Martin Hille, Liederbach, and Roland Böhm, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

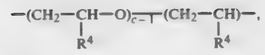
Filed Jul. 23, 1986, Ser. No. 889,334
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526600
Int. Cl.[4] C07C *69/34, 69/80*
U.S. Cl. 560—196 7 Claims

1. A quaternary oxalkylated polycondensate of the formula

(I)



in which
R^1 is an alkyl radical or alkenyl radical having 8 to 23 carbon atoms,
R^2 is H or CH_3 and, arranged in blocks within the chain of the polyoxalkylene radical, can also assume both meanings,
R^3 denotes an alkylene radical of formula $-(CH_2)_x-$ in which x is an integer from 1 to 6 or denotes a polyoxalkylene radical of the formula



in which R^4 is H or CH_3 and, arranged statistically or in blocks within the chain, can also assume both meanings, and c is an integer or fractional number from 2 to 80,
R^5 is an alkylene radical of the formula $-(CH_2)_y-$ in which y denotes an integer from 1 to 8, it being possible for this alkylene radical optionally to carry 1 to 2 OH groups, or R^5 is a vinylene radical or a p-phenylene radical,
R^6 is H or CH_3,
A^- denotes the anion of a carboxylic acid having 2 to 6 carbon atoms or of a hydroxycarboxylic acid having 2 to 6 carbon atoms and 1 to 3 OH groups or denotes the anion of benzoic acid, salicylic acid or phosphoric acid,
a and b are identical or different and are an integer or fractional number from 1 to 15,
d is an integer or fractional number from 1 to 2 and
n is an integer of from 2 to 50.

4,730,080

PROCESS FOR THE PREPARATION OF DIESTERS OF ALKANEDIOIC ACIDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1986, Ser. No. 879,669
Claims priority, application United Kingdom, Aug. 29, 1985, 8521492
Int. Cl.[4] C07C *67/38*
U.S. Cl. 560—204 10 Claims

1. A process for the preparation of diesters of alkanedioc acids, which process comprises reacting at a temperature in the range of from 20° C. to 200° C. and a pressure in the range of 5 to 200 bar a dihydrocarbyl peroxide with carbon monoxide and with an alpha-alkene having 2 to 10 carbon atoms per molecule in the presence of a solvent and a catalyst system formed by combining (a) a noble metal or a compound thereof of Group VIII of the Periodic Table of the Elements and (b) a cupric salt.

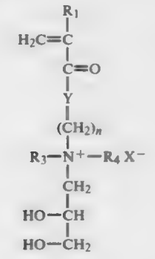
4,730,081

VICINAL DIOL CONTAINING MONOMERS AND METHODS OF PREPARING

Marlin Holtmyer; David Hanlon; Mike Conway, and Charles Hunt, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 819,166, Jan. 14, 1986, abandoned. This application Jan. 28, 1987, Ser. No. 9,018
Int. Cl.[4] C07C *69/54, 103/70*
U.S. Cl. 560—222 4 Claims

1. A water soluble vinyl monomer containing a vicinal diol group of the formula:



R_1 is hydrogen or methyl;
R_3 and R_4 are independently methyl or ethyl;
Y is oxygen or NH;
X^- is a halogen, sulfate, $CH_3SO_4^-$, $C_2H_3SO_4^-$ or CH_3COO^-; and
n is 2 or 3.

4,730,082

PROCESS FOR THE PREPARATION OF METHYLTRIFLUOROACETATE

Louis Amiet, Lyons, France, assignor to Rhone-Poulenc Specialties Chimiques, France

Filed Jun. 12, 1986, Ser. No. 873,510
Claims priority, application France, Jun. 14, 1985, 85 09024
Int. Cl.[4] C07C *69/63;* B01D *3/34*
U.S. Cl. 560—227 14 Claims

1. A process for the preparation of methyltrifluoroacetate comprising the steps of:
(a) containing trifluoroacetic acid with an excess of methanol;
(b) distilling the trifluoroacetic acid and methanol to form a methyltrifluoroacetate/methanol azeotrope;
(c) contacting the azeotrope with trifluoroacetic acid in the presence of a catalytic quantity of a strong acid to form a mixture; and
(d) distilling the mixture to obtain methyltrifluoroacetate and a residue.

4,730,083

PROCESS FOR THE PREPARATION OF 3,5-DIALKYL-4-HYDROXY BENZOIC ACID

Stephen D. Pastor, Yonkers; John D. Spivack, Spring Valley, both of N.Y., and Paul Odorisio, Palisades Park, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 685,369, Dec. 24, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 898,794
Int. Cl.[4] C07C *51/15*
U.S. Cl. 562—423 5 Claims

1. A process for preparing 3,5-dialkyl-4-hydroxybenzoic acid which consists essentially of converting 2,6-dialkylphenol to the corresponding phenolate in the presence of an alkali or alkaline-earth metal hydroxide, hydride or amide and a mono- or polyalkylene glycol ether selected from the group consisting of ethylene glycol dimethyl ether and tetraethylene glycol dimethyl ether, reacting the resulting phenolate with carbon dioxide at a temperature of from about 30°–60° C. and isolating the 3,5-dialkyl-4-hydroxybenzoic acid.

4,730,084

PROCESS FOR THE PREPARATION OF DODECAMETHYLENEBISMELAMINE AND THE USE THEREOF

Peter Werle, Gelnhausen; Holger Focke, Bruchkoebel, and Alwin Boes, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 833,693, Feb. 27, 1986, Pat. No. 4,683,307. This application May 19, 1987, Ser. No. 51,347
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509056
Int. Cl.[4] C07C *47/058*
U.S. Cl. 568—422 2 Claims

1. A process for the stabilization of aqueous formaldehyde solutions comprising introducing into said formaldehyde solutions a sufficient amount of dodecamethylenebismelamine in the form of a 15 to 25 weight percent solution, based on the total amount, wherein methoxymethanol (methyl hemiformal) is used as a solvent in form of a methanolic solution with a methoxymethanol content of 70–85%.

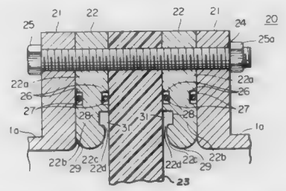
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4,730,085

GAS INSULATED ELECTRICAL APPARATUS WITH PARTICLE TRAPS

Hiroyuki Hama, and Hiroshi Yamamoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 6, 1987, Ser. No. 11,756
Claims priority, application Japan, Feb. 7, 1986, 61-23994
Int. Cl.[4] H02G *5/06*
U.S. Cl. 174—14 R **7 Claims**



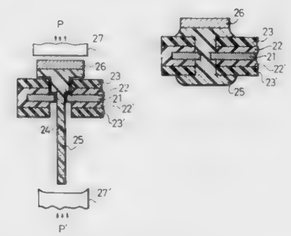
1. A gas insulated electrical apparatus comprising:
a hermetic sheath having a plurality of electrically conductive sheath sections each including flanged ends;
a high voltage conductor disposed within said sheath;
an electrically insulating spacer for electrically insulatably supporting said conductor relative to said sheath, said spacer having an outer circular periphery of a diameter which is substantially the same as the diameter of said flanged ends of said sheath sections;
a pair of electrically conductive trap rings interposed between adjacent flanged ends of said sheath sections and said outer periphery of said spacer, each said trap ring defining, between each said trap ring and said spacer, a low electric field particle trap in which electrically conductive particles can be retained;
through hole fastening means for fastening said flanged ends of said sheath sections, a portion of each of said trap rings and said outer periphery of said spacer thereof;
an electrically insulating gas disposed within said sheath; and
an inner periphery of each of said trap rings having a substantially rounded cross-section to moderate the concentration of the electric field.

4,730,086

FILM-COVERED TERMINAL

Yoshimi Kamijo; Yoshinori Kato, and Masami Ikarashi, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Division of Ser. No. 756,328, Jul. 18, 1985, Pat. No. 4,653,186.
This application Oct. 22, 1986, Ser. No. 923,174
Claims priority, application Japan, Jul. 19, 1984, 59-150082
Int. Cl.[4] H01R *11/16*
U.S. Cl. 174—74 R **3 Claims**



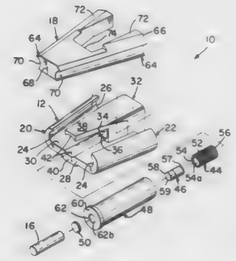
1. A film-covered terminal comprising:
an electric terminal having opposite surfaces thereof covered with sealing films applied through bonding layers, respectively;
a rivet of an electrically conductive plastic material inserted into a through hole formed through said electric terminal, said bonding layers, and said sealing films;
the opposite ends of said rivet being thermally press-bonded such that the electrically conductive material thereof is thermally melted and securely bonded physically and electrically together with said bonding layers, said sealing films, and said electric terminal; and
a soldering member secured to one of said press-bonded ends of said rivet.

4,730,087

EXPLOSIVELY-OPERATED ELECTRICAL CONNECTOR

Walter M. Werner, Downingtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 19, 1986, Ser. No. 944,473
Int. Cl.[4] H01R *4/08*
U.S. Cl. 174—94 S **7 Claims**



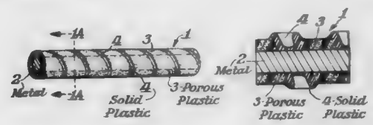
1. An explosively operated electrical connector for mechanically gripping and electrically interconnecting a pair of cables, comprising:
an elongated, conductive, C-member having spaced apart, inwardly facing channels joined by a connecting portion, said channels converging from a first end towards a second end of said C-member;
a housing positioned on said connecting portion at said first end of said C-member;
a ram movably disposed in said housing;
conductive wedge means having converging sides and adapted for being slidably positioned on said connecting portion between said converging channels and adjacent said ram; and
explosive means disposed in said housing for being ignited to push on said ram to drive said wedge means into wedging engagement with cables which may be positioned along respective channels in said C-member.

4,730,088

TRANSMISSION LINE

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Co., Ltd., Japan

Filed Oct. 27, 1986, Ser. No. 923,820
Claims priority, application Japan, Nov. 15, 1985, 60-256231
Int. Cl.[4] H01B *11/00, 7/08*
U.S. Cl. 174—102 R **9 Claims**



1. An electrical transmission line comprising a signal conductor, a porous polymeric insulating material surrounding

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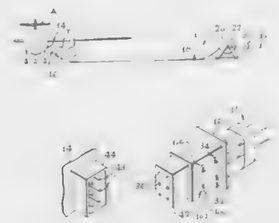
said conductor, said insulating material having at least one opening therein having a wall, the polymeric material at and near said wall being solid, fused polymeric material, whereby said opening provides compressive strength for the otherwise highly compressible, porous material.

4,730,089

REMOTELY CONTROLLABLE CABLE ASSEMBLY

Donald F. Pepper, San Gabrial, Calif., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Sep. 2, 1983, Ser. No. 528,960
Int. Cl.[4] H01H *9/00;* **H02G** *11/02*
U.S. Cl. 191—12.4 **3 Claims**



1. Apparatus for safely connecting an electrical power source such as an electrical outlet at an airport, to a remote power consuming device such as an aircraft, in an environment where a spark is dangerous such as where there may be a flammable substance, comprising:

an electrical cable assembly with inner and outer end portions, including a plurality of power conductors having inner and outer end portions, and an outer connector at the outer end portion of the cable assembly for connecting said power conductors to said power consuming device;

said cable assembly including a manually operable switch located at said outer end portion of the cable; and

relay means coupled to the inner end of at least one of said conductors, and responsive to operation of said switch for connecting at least one of said power conductors to said power source.

4,730,090

ELECTRICAL SWITCH HAVING OPPOSITELY FACING CONTACTOR

Andrew F. Raab, Morton Grove, and Albert R. Cobb, III, Glenview, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 800,558, Nov. 21, 1985, Pat. No. 4,679,588. This application Feb. 25, 1987, Ser. No. 18,523
Int. Cl.[4] H01H *19/58*
U.S. Cl. 200—11 J **2 Claims**

1. A rotary electrical switch, comprising an electrically insulating casing,

a rotary carriage having a shaft rotatably in the casing,

the carriage being made of an electrically insulating material,

the casing having a bearing for rotatably supporting the shaft along a rotary axis,

the rotary carriage having first and second opposite sides facing in opposite directions which are generally parallel with the rotary axis,

first and second electrically conductive contactors mounted on the first and second sides of the rotary carriage and facing in the opposite directions,

first electrically conductive contact means confronting the first contactor and slidably engageable by the first contactor for selectively establishing electrical connections between the first contactor and the first contact means,

second electrically conductive contact means confronting the second contactor and slidably engageable by the second contactor for selectively establishing electrical connections between the second contactor and the second contact means,

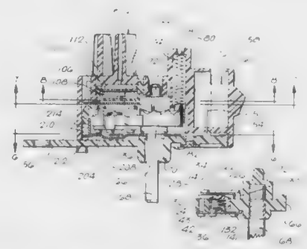
the casing comprising front and rear electrically insulating components and connecting means for connecting the front and rear components together,

the first contact means being mounted on one of the components,

the second contact means being mounted on the other of the components,

the carriage having a cylindrical opening therein disposed between the first and second contactors,

and electrically insulating spring means mounted in the cylindrical opening and acting between the first and second contactors for biasing the first contactor toward the first contact means while biasing the second contactor toward the second contact means,



the electrically insulating spring means including a cup-shaped insulator having a cylindrical portion slidably mounted in the cylindrical opening,

the insulator having an end wall portion engaging the first contactor,

the cup-shaped insulator having a cup-shaped spring nest therein,

and a coil spring having first and second opposite ends,

the first end of the coil spring being received and located in the spring nest in the insulator,

the second end of the coil spring engaging the second contactor,

whereby the cup-shaped insulator presses the first contactor toward the first contact means while the second end of the coil spring presses the second contactor toward the second contact means,

the cup-shaped insulator guiding and locating the coil spring while obviating any electrical connection between the first and second contactors.

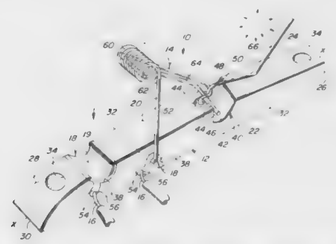
4,730,091

ALARM SWITCH

Glenn Hiller, 231 Westwood Ave., Staten Island, N.Y. 10314

Filed Apr. 16, 1986, Ser. No. 852,767
Int. Cl.[4] H01H *21/40*
U.S. Cl. 200—74 **1 Claim**

1. An alarm switch, comprising, a non-conductive base, a pair of conductive inserts received on said base, trip means received on said base, a conductive spring means received on said base and coacting with said trip means and said inserts, latch means received on said base which coacts with said trip means, each of said conductive inserts being disposed for connection to a conductive member, and said trip means, said latch means and said spring means coacting such that a pre-determined movement of said trip means operates said latch means and causes said spring means to electrically connect said inserts one to another, and said spring means is in a form of a coil spring with a first L-shaped contact leg proximate a first end of said coil spring which coacts with a first insert of said conductive inserts, and a second L-shaped leg proximate a second end of said coil spring which coacts with said latch means, and said coil spring coacts with a second insert of said conductive



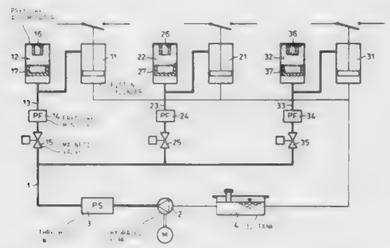
inserts when said trip means is activated, thereby establishing electrical contact between said first insert and said second insert.

4,730,092

HYDRAULIC DRIVING DEVICE FOR AN ELECTRIC PRESSURIZED-GAS SWITCH

Horst Eggert, and Wolfgang Jacobsen, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,845
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545782
Int. Cl.[4] H01H *35/38, 33/88*
U.S. Cl. 200—82 B **12 Claims**



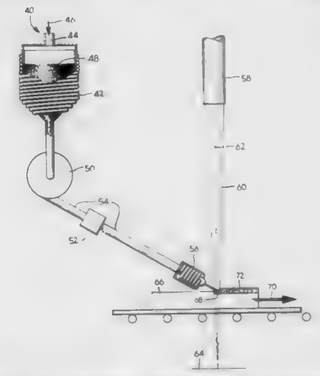
1. An hydraulic driving device for an electric pressurized-gas switch having a piston-cylinder system comprising a plurality of piston-cylinders for operating respective switch contacts, each piston-cylinder being respective to a respective hydropneumatic pressure accumulator supplied by an hydraulic pump which feeds a plurality of said pressure accumulators, a respective pressure monitor being associated with each accumulator which monitors the pressure in a feedline to the respective accumulator, and further comprising a gas monitoring device for the pressure accumulators, said gas monitoring device comprising a threshold switch for measuring an output pressure of the hydraulic pump, said hydraulic pump being responsive to each of said pressure monitors on an individual basis to supply hydraulic fluid to a selected one of said accumulators associated with a particular one of said pressure monitors indicating a low pressure in the feedline supplying the respective accumulator, said hydraulic pump also being responsive to said threshold switch in the event the fluid pressure to a respective accumulator increases beyond a predetermined threshold if the gas pressure in an accumulator falls below a predetermined limit value.

4,730,093

METHOD AND APPARATUS FOR REPAIRING METAL IN AN ARTICLE

Paul P. Mehta, Fairfield; Robert R. Otten, and Ernest B. Cooper, Jr., both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 655,775, Oct. 1, 1984. This application Feb. 17, 1987, Ser. No. 15,412
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **3 Claims**



1. Apparatus for delivering a consistent, continuous flow of powder comprising, in combination:

an enclosed powder reservoir;

means to introduce a gas under pressure into the reservoir;

a mechanical, volumetric powder feed means to move powder from the reservoir into a powder conduit;

a conduit vibrating means to vibrate the powder conduit and the powder therein; and

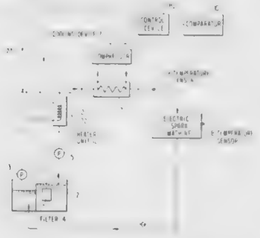
a fluid-cooled powder delivery nozzle connected with the powder conduit to receive powder from the conduit for delivery from the nozzle.

4,730,094

ELECTRIC SPARK MACHINING APPARATUS

Jun Aramaki, and Toshiaki Tanaka, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,757
Claims priority, application Japan, Dec. 18, 1985, 60-285016
Int. Cl.[4] B23H *7/36*
U.S. Cl. 219—69 D **5 Claims**



1. An electric spark machining apparatus, comprising: an electric spark machine (**1**), a pump (**5**) for supplying machining liquid (**21**) to a machining portion of said electric spark machine, a cooling device (**7**) disposed in series and downstream of said pump in a liquid supply path (**6**) extending from said pump to said electric spark machine, means (**9**) for sensing the temperature of pumped machining liquid flowing out from said cooling device, and means (**110**) responsive to an output signal from said sensing means for controlling the cooling capacity of said cooling device and attendantly the temperature of said machining liquid.

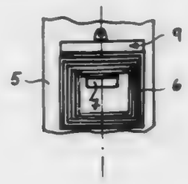
VOL 1088 ISS 2 MR 8 1988 UMI

4,730,095

METHOD OF PRODUCING PLANAR ELECTRICAL CIRCUITS

Poul Richter-Jörgensen, Almunecar, Spain, assignor to Durgo AG, Switzerland

Filed Jul. 25, 1986, Ser. No. 889,365
Claims priority, application Switzerland, Jul. 25, 1985, 3230/85
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LM 5 Claims



1. A method of producing a plurality of equal printed circuits on a common, planar insulating carrier of which at least one side is provided with an electrically conducting layer for producing oscillating circuits of which every one comprises an electrical circuit closed in itself and including spirally arranged conduit tracts forming at least one induction coil and including at least one capacitor, comprising the steps of:

(a) applying by means of laser rays a plurality of reference perforations on at least one of a sheet and web-shaped composite body formed of an insulating carrier and at least on one side thereof an applied conducting layer, each individual one of said perforations being allocated to one respective oscillating circuit to be produced and the mutual distances of which depending from the dimensions of the circuits to be produced, which perforations serve as reference points for the application of apparatus for the performance of further working steps;

(b) thereafter extricating the rough contours of the oscillating circuits and of the intended capacitor surfaces at the at least one electrically conductive covering layers;

(c) thereafter bringing the surfaces serving for the forming of the capacitors to the final dimensions and extricating, by means of at least one of a program and computer controlled laser rays, the circuit tracts forming the oscillating circuit; and

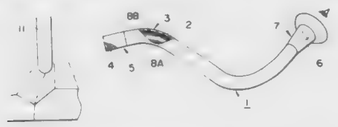
(d) to finally produce the oscillating circuits determining the actual electrical values and comparing such with the design values to carry out corresponding adjustments by an additional working by laser rays.

4,730,096

WELDING MONITORING APPARATUS

Morihide Mizumoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,333
Claims priority, application Japan, Mar. 19, 1986, 61-062686
Int. Cl.[4] B23K *9/32*
U.S. Cl. 219—130.01 21 Claims



1. A welding monitoring apparatus for monitoring a welding state or the like luminous at a high luminance comprising:

an objective forming the image of an object position;

an image guide formed of an optical fiber bundle arranged on one end surface in the focal plane of said objective and transmitting an optical image to the other end surface;

an eyepiece for magnifying and observing the optical image transmitted by said image guide; and

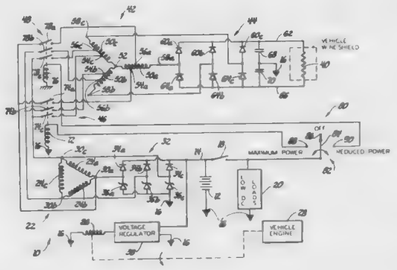
a light attenuating means provided near at least one end surface of said image guide and dimming a part of the image.

4,730,097

DUAL MODE WINDSHIELD HEATER CONTROL

Robert W. Campbell, and Donald O. Ruff, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 896,816, Aug. 15, 1986, abandoned. This application May 15, 1987, Ser. No. 50,582
Int. Cl.[4] H05B *1/02*; B60L *1/02*
U.S. Cl. 219—203 10 Claims



1. A dual mode method of operating a windshield heater element in an automotive vehicle, the method comprising the steps of:

initiating a deice mode of operation in which the heater element is energized with maximum voltage to develop maximum heat effective to remove ice and frost from the exterior surface of the windshield in response to an operator actuated deice input;

terminating the deice mode of operation in response to the first to occur of (a) expiration of a predetermined time period after initiation, or (b) an operator actuated off input;

initiating a defog mode of operation in which the heater element is energized with reduced voltage to develop reduce heat effective to remove condensation from the interior surface of the windshield or to help prevent the formation of ice and frost on the exterior surface of the windshield in response to (a) an operator actuated defog input, or (b) termination of a preceding deice mode of operation provided that such termination was not in response to an operator actuated off input; and

terminating the defog mode of operation in response to the first to occur of (a) the expiration of a predetermined time period after initiation provided that such initiation was not in response to an operator actuated defog input, or (b) an operator actuated off input.

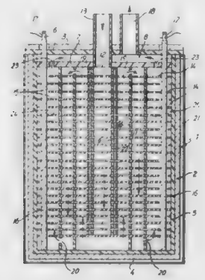
4,730,098

ELECTRIC ELECTRODE-TYPE WATER HEATER

Norman M. Cave, 355 Mottram Road, Stalybridge, Cheshire, England

Filed Jul. 30, 1985, Ser. No. 760,660
Claims priority, application United Kingdom, Aug. 1, 1984, 8419977
Int. Cl.[4] H05B *3/60*; F24H *1/10*; F22B *1/30*
U.S. Cl. 219—291 5 Claims

1. A heating device for heating an electrically conductive fluid comprising a vessel having a bottom wall, side walls and a top with a fluid inlet and a fluid outlet through a lid closing the top of the vessel, a plurality of closely-spaced electrode plates extending substantially parallel to each other substantially horizontally across the vessel between said bottom wall and said lid, said plates having holes therein, a plurality of spaced wall structures within said vessel between each pair of plates, means including said plurality of wall structures, the side walls and bottom wall of said vessel, said lid and the holes in said plates defining a plurality of separate fluid passages which extend alongside each other transversely through the plates from said lid to said bottom wall, said passages being interconnected in series to each other to form a continuous path, the opposite ends of said flow path being connected to the said inlet and outlet so that fluid introduced into said inlet is constrained to flow along said passages backwards and forwards in opposite directions through said plates to said outlet, and electrical terminals for connection to a source of electric power, alternate said electrodes being connected to different said terminals.

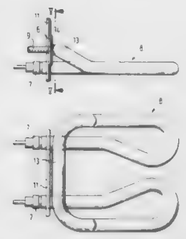


4,730,099

ELECTRICAL LIQUID HEATING APPARATUS

Ingo Bleckman, Ignaz-Rieder-Kai 11, A-5020 Salzberg, Austria

Filed Aug. 25, 1986, Ser. No. 900,339
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 8525950[U]; Dec. 3, 1985, 8534008[U]
Int. Cl.[4] H05B *1/02, 3/82*; A47J *27/21*
U.S. Cl. 219—328 24 Claims



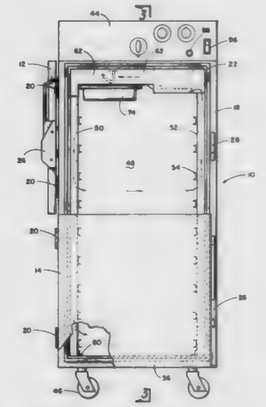
1. An electrical liquid-heating apparatus, comprising a vessel having a peripheral side wall and a bottom, for receiving a liquid to be heated therein; openings in said side wall in the vicinity of the bottom of said vessel; a tubular heater member disposed in said vessel and having connection end portions mutually spaced apart and extending through respective ones of said openings, said tubular heater member being of a double loop configuration such as to provide a central section disposed in the vicinity of said connection end portions, said central section including an at least substantially straight portion which is disposed above and bridges over the space between said connection end portions; a mounting plate of poor thermal conductivity connected to said tubular heater member and fastened against said side wall of said vessel, said at least substantially straight portion of said central section being joined along its length by a fusion-type join to said plate, to provide a thermal bridge between said central section and said plate; sealing means interposed between said side wall of the vessel and said plate to seal said openings; clamping screw means passing through respective ones of said openings in said side wall of said vessel thereby to fix said plate in position thereon; and a thermally operable switch disposed outside said vessel and in contact with said plate and operable in response to a given temperature being exceeded to switch off said tubular heater member.

4,730,100

FOOD COOKING AND HEATING APPARATUS

John R. Pingelton, Broken Arrow, Okla., assignor to Jero Manufacturing, Inc., Tulsa, Okla.

Filed Nov. 26, 1986, Ser. No. 935,227
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—400 7 Claims



1. A food cooking and heating apparatus which comprises: a food holding oven having at least one front door movable between open and closed positions for access to the interior thereof; an air heating chamber having an inlet and an outlet; air heating means within said heating chamber; an intake passageway to conduct heated air from the outlet of said air heating chamber to an inlet of said food holding oven; an exhaust passageway to conduct air from said food holding oven to said air heating chamber; air temperature sensing means within said air heating chamber; a closed air convection system including blower means in said heating chamber for circulating air past said heating means, through said intake passageway, through said food holding oven, through said exhaust passageway and back to said air heating chamber; variable air volume means to vary the volume of air passing through said closed air convection system; means for selecting a desired temperature to be maintained within said oven and located outside of said closed air convection system; and a circuit for comparing said sensed temperature to said selected temperature, causing said air heating means to operate and said variable air volume means to increase when a difference in temperature exists and causing said air heating means to cease and the said variable air volume means to decrease said air volume to a minimum greater than zero when said selected temperature is reached.

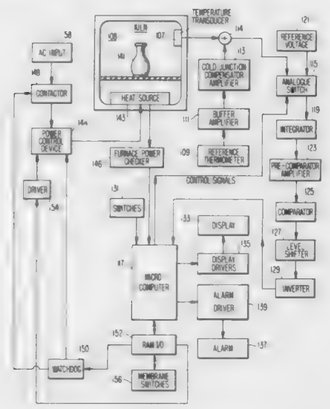
VOL 1088 ISS 2 MR 8 1988 UMI

4,730,101

APPARATUS AND METHOD FOR CONTROLLING THE TEMPERATURE OF A FURNACE

Kenneth Mahon, Columbus; Gary S. Sheffield, Westerville; Gary L. Snider, Columbus, and Milan Vukovich, Jr., Galena, all of Ohio, assignors to Edward Orton, Jr. Ceramic Foundation, Westerville, Ohio

Filed Apr. 22, 1986, Ser. No. 854,487
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—508 **15 Claims**



1. A method for controlling the temperature of a furnace comprising the steps of:

(a) supplying a predetermined quantum of energy for heating the furnace;

(b) monitoring the heating rate at which the temperature of the furnace changes and the temperature of the furnace at each monitored heating rate until a maximum heating rate is observed and recording the maximum heating rate was well as the temperature at which the maximum heating rate is observed;

(c) determining the heating characteristics of the furnace including at least the heat lag defined as the difference between the time required for the furnace to reach the temperature at which the maximum heating rate is observed and the time necessary for a linearly heated furnace, having a heating rate equal to the observed maximum rate, to reach this same temperature from the observed rate of temperature change; and

(d) modulating the quantum of energy supplied to the furnace in response to the determined heating characteristics to thereby control the temperature of the furnace.

4,730,102

ELECTROCERAMIC HEATING DEVICES

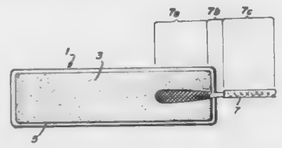
Lionel J. Melanson, Casco, Me., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,876
Int. Cl.[4] H05B *3/08;* **H01C** *1/44*
U.S. Cl. 219—541 **12 Claims**

1. An electroceramic heater comprising:

a body of electroceramic material, said body having an outer edge and two sides, each of the sides having an interior face, said body having an electrode disposed on each of said faces, said body further being capable of producing heat upon application of current to said electrodes, said electrodes being formed of metallic coatings selected from the group consisting of aluminum, copper and nickel, said electrodes further having rough external surfaces and being electrically insulated from each other, the average thickness of said electrodes being between about 8 and 20 mils;

a lead wire extending outwardly from each of the metallic electrodes, said lead wire being selected from the group consisting of aluminum, copper and nickel, each of said



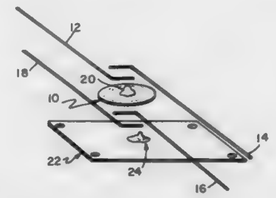
lead wires being ultrasonically welded to said electrodes, said lead wires each being swaged such that the width of the ends of the wires is greater nearer the interior faces of the heater than at the outer edge, the metal of said lead wires being mechanically mixed with the metal of said electrodes at said welds.

4,730,103

COMPACT PTC RESISTANCE HEATER

Donald R. Hawkins, Cornish, Me., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 28, 1986, Ser. No. 935,884
Int. Cl.[4] H05B *3/08*
U.S. Cl. 219—541 **4 Claims**



1. A compact resistor heater device having a particular operating temperature comprising:

a resistor body of ceramic material having a positive temperature coefficient of resistance;

electrically conductive means disposed upon said resistor body for conducting current from opposite sides of a power supply to opposite sides of said resistor body;

a thermally conductive member formed of a sheet of metal disposed in thermally conductive relationship to said resistor body; and

a coating of thermally conductive material substantially free of voids entirely covering said resistor body and thermally conductive member.

4,730,104

PERIPHERAL VISION GUIDANCE DISPLAY

James G. Rogers, Crestline, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

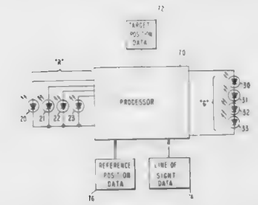
Continuation of Ser. No. 673,257, Nov. 20, 1984, abandoned.
This application May 7, 1987, Ser. No. 51,255
Int. Cl.[4] G06F *15/58;* **G02B** *27/34;* **F41G** *3/00*
U.S. Cl. 235—412 **27 Claims**

24. A display system responsive to target deviation signals indicative of the direction and magnitude of the deviation of the target from a reference position, and responsive to a target range signal for displaying the target position and range to a viewer, comprising:

at least four light sources of a first color arranged such that they are equally spaced around a circle, the center of which corresponds to the reference position, and having a diameter such that the at least four light sources are within the peripheral vision of the viewer positioned at a predetermined distance from the circle;

at least four light sources of a second color arranged such that they are equally spaced around the circle and interspaced with the at least four light sources of the first color; and

processing means responsive to the target deviation signals for illuminating all of the at least four light sources of the first color when the magnitude of deviation of the target



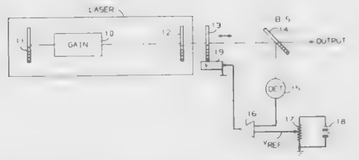
from the reference position is less than a predetermined amount, and for flashing a light source of the first color which is located in a direction from the center of the circle corresponding to the direction of deviation of the target from the reference position, and for flashing two adjacent light sources of the first color when the direction of deviation of the target from the reference position corresponds to a direction from the center of the circle between the two adjacent light sources, the flash rate increasing as the magnitude of deviation increases, and also responsive to the target range signal for illuminating the at least four light sources of the second color upon the target attaining a predetermined range.

4,730,105

APPARATUS FOR THE STABILIZATION OF THE OUTPUT INTENSITY OF A LASER USING A FABRY-PEROT CAVITY

Fedor M. Mitschke, Red Bank, and Linn F. Mollenauer, Colts Neck, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 25, 1986, Ser. No. 889,252
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **3 Claims**



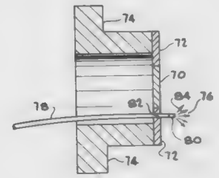
1. Apparatus for stabilizing the output intensity of a laser having an output mirror, said apparatus comprising a mirror positioned relative to said output mirror so as to form a Fabry-Perot cavity with said output mirror, means for comparing the intensity of light coupled out of said Fabry-Perot cavity with a reference value so as to develop an error signal, and means coupled to said mirror and responsive to said error signal for adjusting the transmission characteristics of said Fabry-Perot cavity.

4,730,106

OPTICAL FIDUCIAL TIMING SYSTEM FOR X-RAY STREAK CAMERAS WITH ALUMINUM COATED OPTICAL FIBER ENDS

David G. Nilson, Oakland; E. Michael Campbell, Pleasanton; Brian J. MacGowan, and Hector Medecki, both of Livermore, all of Calif., assignors to United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1986, Ser. No. 937,792
Int. Cl.[4] H01J *31/50, 40/14*
U.S. Cl. 250—213 VT **12 Claims**



1. For use with an X-ray streak camera that comprises an X-ray photocathode and a data recording medium, and is of a type wherein during operation an X-ray beam impinges on the X-ray photocathode and thereby ejects a quantity of photoelectrons that are formed into a photoelectron pulse that records an X-ray data record onto the data recording medium, with the X-ray data record being related to the X-ray beam, a method for recording an optical data record onto the data recording medium, with the optical data record being related to an optical signal, with the optical data record being recorded on the data recording medium both as the optical signal arrives at the X-ray streak camera, and at the location on the recording medium where the X-ray data record is then being recorded, the method comprising the steps of:

coating a first end of an optical fiber with a layer of aluminum;

positioning said aluminum coated fiber end into a spatial region within the X-ray streak camera where said quantity of photoelectrons begin to be formed into said photoelectron pulse; and

introducing, during operation of the X-ray streak camera, said optical signal into a second end of the optical fiber, so that the optical signal travels along the optical fiber to the first end of the optical fiber, strikes the aluminum layer and thereby ejects a quantity of electrons, from the aluminum layer, that are formed into an electron pulse that records said optical data record, that is related to said optical signal, onto said recording medium.

4,730,107

PANEL TYPE RADIATION IMAGE INTENSIFIER

Richard S. Enck, Jr., San Jose, and F. Dan Meadows, Los Altos, both of Calif., assignors to Picker International, Inc., Cleveland, Ohio

Filed Mar. 10, 1986, Ser. No. 838,100
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT **28 Claims**

23. An image intensifier tube comprising:

a. a tube envelope;

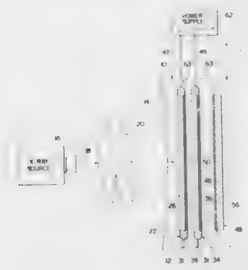
b. an input window mounted to one end of the tube envelope, said input window being transmissive to incident radiation;

c. an output window mounted to an other end of the tube envelope, said output window being transmissive to visible light; and

d. a conversion means mounted between said input window

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and said output window for converting incident radiation to visible light, said conversion means comprising a cellu-



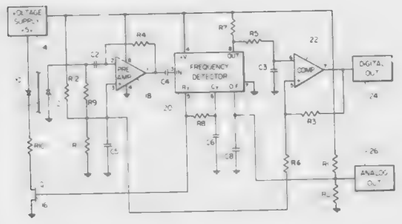
lar substrate material having a thickness greater than the cell width.

4,730,108

AMBIENT LIGHT INSENSITIVE CIRCUIT WITH FREQUENCY MATCHING

David R. Rodal, Palo Alto, and Nathan W. Osborn, Menlo Park, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1986, Ser. No. 851,000
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **11 Claims**



1. An optical sensing circuit for detecting the end of a non-transparent moving body comprising:
- a source of light radiation;
- means for modulating said light radiation at a predetermined frequency;
- photosensor means spaced from said light source for generating an output signal having the predetermined modulation frequency when the space between said source and said photosensor is unobstructed; and
- a frequency detector coupled to said photosensor means for supplying a valid signal indicative of the end of tape only when the frequency of the modulated signal from said light source substantially matches the frequency of the output signal from said photosensor means.

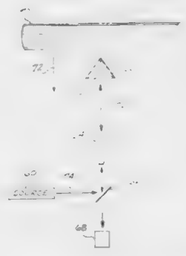
4,730,109

APPARATUS AND METHOD FOR MEASURING ELECTRIC FIELD BY ELECTROREFLECTANCE

Martin A. Afromowitz, Seattle, Wash., assignor to Puget Sound Power & Light Company, Bellevue, Wash.

Filed Jun. 30, 1986, Ser. No. 880,306
Int. Cl.[4] G01J *3/50*
U.S. Cl. 250—226 **21 Claims**

1. A device for measuring an electric field at a point, comprising:
- a probe positionable at said point, the probe comprising a layer of an electroreflective material, said layer including first and second surfaces and having a substantially uniform thickness along a direction normal to said surfaces; and
- sensor means including source means for generating an optical source signal at a selected wavelength, means for directing the source signal onto the probe such that the first and second surfaces produce an optical output signal,



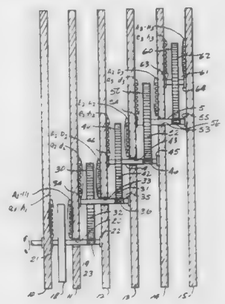
and detector means for determining the intensity of the output signal,
- the selected wavelength being selected such that the electroreflective material exhibits the electroreflective effect at the selected wavelength, and such that the reflectance of said layer of electroreflective material at the selected wavelength changes as the index of refraction of the electroreflective material changes.

4,730,110

SHAFT POSITION ENCODER

Carl P. Spaulding, Duarte, Calif., assignor to Spaulding Instruments, Duarte, Calif.

Continuation-in-part of Ser. No. 634,880, Jul. 27, 1984, abandoned. This application Sep. 11, 1986, Ser. No. 906,421
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **25 Claims**



1. A shaft position encoder comprising:
- an input shaft;
- a high-speed disc coupled to the input shaft;
- at least one group of n concentric tracks on the high-speed disc, n being greater than one, each track comprising slotted openings that form alternating transparent and opaque sectors;
- n+1 pairs of light sources and light sensors associated with each group of tracks, the light sources and light sensors being disposed on opposite sides of the high-speed disc in alignment with respective tracks such that two pairs are aligned with one of the tracks;

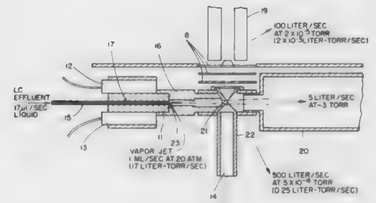
- a low-speed disc means coupled to the input shaft with a speed reduction of 1:2^n relative to the high-speed disc;
- a group of n concentric tracks on the low-speed disc means, each track comprising slotted openings that form alternating transparent and opaque sectors; and
- n+1 pairs of light sources and light sensors associated with the group of tracks on the low-speed disc means, the sources and sensors being disposed on opposite sides of the low-speed disc means in alignment with the respective tracks such that two pairs are aligned with one of the tracks thereon.

4,730,111

ION VAPOR SOURCE FOR MASS SPECTROMETRY OF LIQUIDS

Marvin L. Vestal, and Calvin R. Blakley, both of Houston, Tex., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 527,751, Aug. 30, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 832,743
Int. Cl.[4] H01J *49/28*
U.S. Cl. 250—288 **61 Claims**



1. An ion vapor soruce for obtaining an ion vapor from a liquid sample, said sample having ions of interset therein, the source comprising:
- (a) a capillary tube means for receiving a liquid sample containing ions of interest, said tube means defining a nozzle on one end thereof,
- (b) a temperature sensing means for detecting a temperture at a preselected location within the ion vapor source,
- (c) a first heating means for heating a predetermined length of the capillary tube to partially vaporize the liquid sample passing therethrough,
- (d) a first automatic control means, said control means responsive to said temperature sensing means within the ion vapor source for controlling the temperature of the sample within the capillary to maintain a predetermined fraction of the sample in liquid form as it is ejected from the nozzle as a thermospray of minute particles entrained in an intense vapor jet such that ions of interest are vaporized from the particles as a consequence of an electrical charge on the particles and the internal enthalpy of the particles,
- (e) a downstream means for confining the thermospray and adding heat thereto to control adiabatic expansion of the vapor jet.

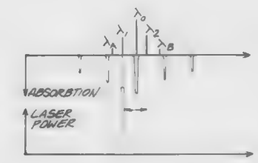
4,730,112

OXYGEN MEASUREMENT USING VISIBLE RADIATION

Jacob Y. Wong, Santa Barbara, Calif., assignor to Hibshman Corporation, San Luis Obispo, Calif.

Continuation-in-part of Ser. No. 837,605, Mar. 7, 1986, abandoned. This application May 15, 1986, Ser. No. 863,315
Int. Cl.[4] G01N *21/61*
U.S. Cl. 250—343 **8 Claims**

1. Apparatus for use in an instrument that measures the absorption of a sample by passing radiation through the sample, the sample having more than one absorption line including an absorption line at wavelength λ_o, said apparatus serving to positively identify the absorption line being measured as the absorption line at wavelength λ_o, said apparatus comprising:
- source means including a diode laser responsive to an applied electric current to produce radiation and emitting a part of that radiation in a first direction toward the sample, and emitting another part of that radiation in a second direction;
- a first detector positioned to receive radiation that was emitted in the first direction after it has passed through the sample, and generating a first electrical signal related to the intensity of the radiation received by said first detector;
- a filter positioned to intercept the radiation emitted in said direction and having a narrow rejection band centered at



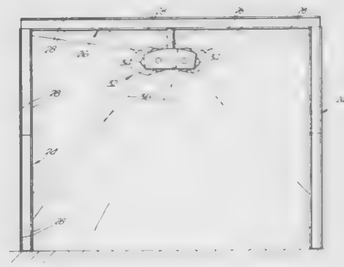
wavelength λ_o and substantially transmitting radiation of wavelengths outside the narrow rejection bank;
- a second detector positioned to receive radiation that has passed through said filter, and generating a second electrical signal related to the intensity of the radiation received by said second detector;
- first means connected to said diode laser for scanning the wavelength of the radiation emitted through a wavelength interval in a continuous manner; and,
- second means, connected to said first means and to said second detector, and responsive to the second electrical signal generated by said second detector to determine at what instant in the scanning the wavelength of the radiation emitted by said diode laser equals λ_o.

4,730,113

SAFETY SYSTEM FOR A LASER-UTILITY FACILITY

Stanley A. Edwards, Wallesey; Robert Hunt, Orpington, and Daniel R. Lobb, Chislehurst, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 7, 1986, Ser. No. 827,098
Claims priority, application United Kingdom, Feb. 19, 1985, 8504168; Mar. 22, 1985, 8507505; Nov. 21, 1985, 8528719; Jan. 30, 1986, 8602224
Int. Cl.[4] G01J *5/08; G08B 21/00*
U.S. Cl. 250—347 **27 Claims**



1. A safety system for a laser beam-utilizing facility, comprising an enclosure housing said facility, radiation-sensitive sensor means for receiving the radiation emitted by at least one sur-

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face or wall forming, or located within, said enclosure, on which wall(s) or surface(s) the laser beam is only incident in the event of a malfunction of said facility, said sensor means producing an output signal dependent upon the radiation received thereby, and means responsive to the sensor means for modifying operation of the laser beam-utilizing facility in response to levels of emitted radiation, or changes thereof, in excess of a threshold value or values.

21. Apparatus for monitoring infrared emissions comprising:

(a) sensor means responsive to infrared radiation for producing an electrical output related to the intensity of infrared radiation incident thereon;

(b) scanning means for effecting a cyclical scan to provide the sensor means, in use of the apparatus, repeatedly with an overall field of view encompassing an area under surveillance, said scanning means comprising a support, a scanning head mounted on the support for rotation about a predetermined axis, drive means for effecting continuous rotation of the scanning head about said predetermined axis, an anamorphic lens mounted by the scanning head at a location spaced radially outwardly from said predetermined axis and so that its wide angle of view extends in a plane which contains or is parallel to said predetermined axis of rotation, and beam focussing and deflecting optical components for effecting focussing of the infrared radiation refracted radially inwardly from said lens and deflecting the same along said predetermined axis for reception by said sensor means;

(c) means for analyzing the outputs of the sensor means with reference to a predetermined threshold value or values to detect within said overall field of view arising sources of infrared radiation representing potentially hazardous conditions; and

(d) means for generating an actuating signal in the event of detection of such sources.

4,730,114

CIRCUIT ARRANGEMENT FOR ELECTRONICALLY GENERATING A RESISTOR SETTING AND AUDIO SYSTEM BASED THEREON

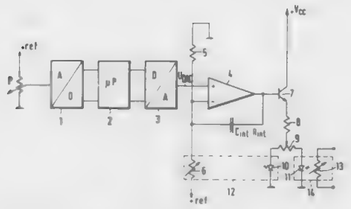
Juerg Portmann, Basel, Switzerland, assignor to Audio System DB AG, Basel, Switzerland

Filed Feb. 4, 1986, Ser. No. 825,936

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505983

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 250—551 **17 Claims**



1. A circuit arrangement comprising:

means for generating a first control voltage;

means for generating a second control voltage, and for varying said second control voltage in accordance with the resistance of an included first element whose resistance varies in accordance with an intensity of light incident upon said first element;

first light generating means for illuminating said first element with light so that the resistance of said first element varies in accordance with the intensity of the light generated by said first light generating means;

control output generating means, responsively connected to said means for generating said first control voltage and said means for generating and varying said second control voltage, for generating a control output in accordace with a difference between said first and second control voltages, said control output controlling said first light generating means so as to vary the resistance of the first element to such an amount that the difference between said first and second control voltages becomes zero;

second light generating means, responsive to said control output, for generating light whose intensity varies with the magnitude of said control output; and

a second element, arranged to be illuminated by said second light generating means, whose resistance varies in accordance with the intensity of light incident upon said second element, and so on the intensity of light generated by said second light generating means.

4,730,115

TRANSFORMER SYSTEM AND DIRECT CURRENT POWER SUPPLY

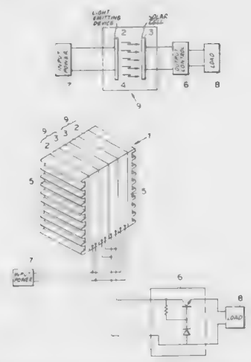
Kozo Abe, Saitama, Japan, assignor to Logical Co., Ltd., Japan

Filed Feb. 12, 1986, Ser. No. 828,546

Claims priority, application Japan, Feb. 12, 1985, 60-24635; Feb. 3, 1986, 61-21644; Feb. 3, 1986, 61-21645

Int. Cl.⁴ H01L *31/16*

U.S. Cl. 250—551 **7 Claims**



1. An electrical transformer system comprising:

a plurality of transformers each comprising a primary and secondary and said transformers being connectable, selectively, in series, parallel, and series-parallel, with a primary of at least one of said transformers connectable to an input power supply and with a secondary of at least one of said transformers connectable to a load;

each said secondary comprising a solar cell unit generative of a certain amount of electricity in response to a rated quantity of light received and according to a particular rating for said solar cell unit;

each said primary comprising a light emitting device situated to provide at least said rated quantity of light to said solar cell unit upon energization by said input power supply; and

said light emitting device comprising a heat radiating means for dissipating heat therefrom.

4,730,116

SHEET THICKNESS MEASURING APPARATUS BY OPTICAL SCANNING

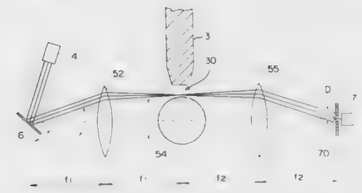
Yoshiaki Ida, and Toshishige Nagao, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,782

Claims priority, application Japan, Aug. 6, 1985, 60-174609; Aug. 9, 1985, 60-176781; Sep. 20, 1985, 60-209436

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 250—560 **27 Claims**



1. A sheet thickness measuring apparatus comprising:

a light beam source,

a shaft for supporting a sheet which is partly wound around said shaft and whose thickness is to be measured,

a light shading plate positioned on a plane including the central axis of said shaft and passing through the contact area between the surface of said shaft and the sheet to be measured, and forming a slit of a predetermined width between the surface of said shaft and a side edge of the plate,

a scanning apparatus including a scanner for scanning at a constant speed, a light beam irradiated from said light beam source toward said slit on a plane which crosses, within said slit, the sheet supported by said shaft and to be measured, and a photoelectric conversion device which receives the light beam through said slit, converts it into electric signals and outputs them,

a timer for measuring the signal outputting duration of said photoelectric conversion device, and

an arithmetic means which detects the clearance between the surface of the sheet supported by said shaft and to be measured, and the side edge of said light shading plate, on the basis of the measuring result by said timer and the scanning speed of the light beam by said scanning apparatus, and determines the sheet thickness by subtracting the detected result from said slit width.

4,730,117

CASH BOX IDENTIFICATION SYSTEM

Larry E. Zack, Cary, Ill., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 3, 1986, Ser. No. 915,192

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 250—568 **6 Claims**

1. An identification system for guaranteeing that a cash box adapted to receive money from an associated fare box is delivered to an authorized location comprising:

a fare box and apparatus on which said fare box is mounted;

a cash box and a compartment in said apparatus for receiving said cash box so as to place it in proximity to said fare box for receiving money from the fare box;

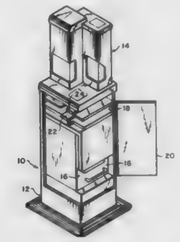
a transmitter included as part of said cash box for generating and transmitting a coded series of electronic pulses uniquely identifying said cash box;

a first receiver included as part of said fare box for receiving said coded series of pulses;

a microcomputer connected to the output of said receiver for reading and decoding said coded series of pulses to yield the identification number for said cash box, and for storing said number in memory;

means for transmitting said identification number to a central station computer;

further comprising a vault at said authorized location where said money is collected from a multiplicity of cash boxes;



a second receiver built into said vault for receiving said coded series of pulses, thereby to enable checking on proper delivery of cash boxes to said authorized location, including means for transmitting said received and coded series of pulses to said central computer so as to verify that a particular identified cash box has been delivered to said vault.

4,730,118

OIL FIELD INDUCTION GENERATOR SYSTEM

Malcolm H. Quaries, Houston, and William D. Bolin, Katy, both of Tex., assignors to James D. Barnes, Shreveport, La.

Continuation of Ser. No. 014,110, Feb. 3, 1987, abandoned, which is a continuation of Ser. No. 881,517, Jun. 30, 1986, abandoned, which is a continuation of Ser. No. 803,513, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 477,215, Mar. 21, 1983, abandoned. This application Aug. 11, 1987, Ser. No. 85,257

Int. Cl.⁴ H02P *9/04*

U.S. Cl. 290—40 R **22 Claims**



12. An induction generator system for powering an electric load at a location where fuel is available to power a prime mover and at a location having an existing electrical power distribution system, said generator system comprising:

an electrical motor coupled to an existing electrical power distribution system and designed to rotate at a selected synchronous speed in response to application of said electrical power;

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a prime mover fueled by said fuel and mechanically coupled to drive said electric motor at a speed in excess of said selected synchronous speed whereby said electric motor will generate electrical energy into said electric load; and,

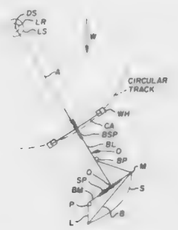
control means for coupling said existing electrical power distribution system to said electrical load in the absence of sufficient fuel to drive said prime mover at a speed sufficient to rotate said electric motor above its synchronous speed and for coupling the electrical energy generated by said electric motor to said existing electrical power distribution system when sufficient fuel is available to drive said prime mover at a speed sufficient to rotate said electric motor above its synchronous speed, said control means includes a speed sensor adapted to monitor the rotational speed of said electric motor and means to couple said electrical power distribution system to said electric load and means to couple said electric motor to said electrical power distribution system responsive to the speed of rotation of said electric motor which is sensed by said speed sensor.

4,730,119

SAIL-DRIVEN WIND MOTOR

Lloyd I. Biscomb, 4452 Burlington Pl., N.W., Washington, D.C. 20016

Filed Sep. 24, 1986, Ser. No. 911,095
Int. Cl.[4] H02P *9/04;* **F03B** *13/00*
U.S. Cl. 290—55 **13 Claims**



1. A sail-driven wind motor, comprising:

a stator adapted to be supported on a foundation, a rotor associated with said stator and journalled for rotation with respect thereto, a rotary drive means operatively associated with said rotor for imparting rotary motion to said rotor upon rotation thereof, and an arm means operatively connected at a point thereon with said rotary drive means in cranking relation thereto so that as said arm means is reversingly rotated in a generally horizontal plane about said point said rotary drive means is correspondingly reversingly rotated, said arm means having at least one portion which extends radially outwardly from said point, each such arm portion having a radially outer end located distally of said point;

at least one sail assembly including at least one sail fore and aft rigged to a respective subassembly of an erect mast and generally horizontal beam;

means mounting each said mast and beam subassembly to a respective said arm portion, distally of said point, for rotation about a generally vertical axis, with each beam being disposed athwart the respective arm portion; and

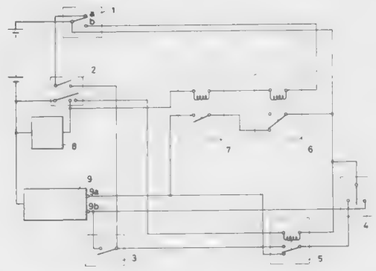
rigging means operatively associated between each said mast and beam subassembly and the respective said arm for automatically reversingly, oscillatingly tacking said sail with respect to a wind heading direction upon clockwise and counter-clockwise extremes of rotation of said arm means caused by wind-induced lift on said at least one sail and thereby reversingly rotating the respective said arm throughout a circular arc of less than 360.

4,730,120

AUTOMATIC LOCKING DEVICE FOR AUTOMOBILE DOOR

Takao Okada, 2-57, Ningyo, 1-chome, Kounosu-shi, Saitama-ken, Japan

Filed Sep. 3, 1986, Ser. No. 903,248
Claims priority, application Japan, Sep. 3, 1985, 60-194379
Int. Cl.[4] B60R *25/04*
U.S. Cl. 307—10 AT **5 Claims**



1. An automatic locking device for an automobile door comprising:

an ignition key switch for detecting a presence and absence of a key;

an actuator operative to lock the automobile door when electrically energized;

a door switch operated to a first state at times when the door is open and operated to a second state at times when the door is closed;

first and second relay means;

first circuit means responsive to the operation of the door switch to said first state at times when said key switch detects the absence of the key for operating said first and second relay means to a first state and responsive to the operation of said door switch to said second state for operating said first and second relay means to a second state;

said first relay means being operative from said first to said second state during a time period greater than the time period for the operation of said second relay means from said first to said second state upon operation of said door switch for momentarily placing said first and second relay means in a different one of said first and second states; and

second circuit means operative to electrically energize said actuator to lock said door at times when said second relay means is in said first state and said second relay means is in said second state.

4,730,121

POWER CONTROLLER FOR CIRCUITS WITH BATTERY BACKUP

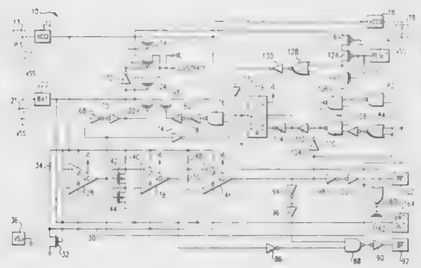
Robert D. Lee, Denton, and Donald R. Dias, Carrollton, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Mar. 11, 1987, Ser. No. 24,687
Int. Cl.[4] H02J *9/02*
U.S. Cl. 307—66 **6 Claims**

1. A power controller for providing electrical coupling between a primary power source, a backup battery, and an electrical circuit comprising:

(a) first means for coupling electrical power from said primary source to said electrical circuit if a power supply voltage of said primary source rises above a first predetermined voltage and if said power controller is not in an isolation condition;

(b) second means for coupling electrical power from said backup battery to said electrical circuit if said power supply voltage of said primary source falls below said first predetermined voltage and if said power controller is not in said isolation condition; and



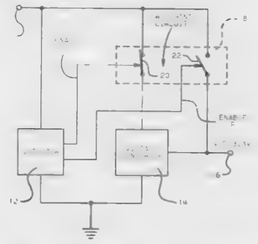
(c) means for placing said power controller in said isolation condition in response to an external signal such that said primary power source and said backup battery are simultaneously and continuously isolated from said electrical circuit.

4,730,122

POWER SUPPLY ADAPTER SYSTEMS

Jeffrey H. Dreibelbis, Williston; Roy C. Flaker, Essex Junction, and Erik L. Hedberg, Essex Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 18, 1986, Ser. No. 908,846
Int. Cl.[4] H02J *3/04*
U.S. Cl. 307—75 **25 Claims**



1. A power supply adapter system comprising

a voltage supply terminal,

an output terminal,

switching means including first and second switches, said first switch being disposed between said voltage supply terminal and said output terminal,

voltage conversion means serially connected with said second switch and disposed between said voltage supply terminal and a point of reference potential, said voltage conversion means having an output coupled to said output terminal and,

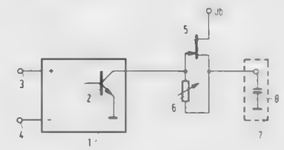
means for detecting first and second ranges of voltages at said voltage supply terminal and for producing first and second control signals, respectively, indicative of said first and second ranges of voltages, said first control signal being applied to said first switch and said second signal being applied to said second switch.

4,730,123

CIRCUIT FOR DRIVING A CAPACITIVE LOAD WHICH PROVIDES LOW CURRENT CONSUMPTION

Fritz A. Wegener, and Manfred Albach, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,549
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538552
Int. Cl.[4] H03K *17/08, 17/687, 17/284, 17/16*
U.S. Cl. 307—200 B **6 Claims**



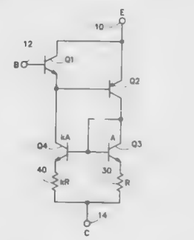
1. A circuit arrangement for operation of a capacitive load comprising: a control circuit including an output transistor having a collector connected to an output of the control circuit, a terminal for a source of supply voltage for the circuit arrangement, a junction field effect transistor having a drain, source and a gate, means coupling said output of the control circuit to said capacitive load via the gate-source path of said field effect transistor, a resistor connected in parallel with said gate-source path of the field effect transistor, means connecting the drain of the field effect transistor to said supply voltage terminal, and wherein the collector-emitter path of the output transistor is in parallel with the load so that the capacitive load will be discharged via said resistor and said output transistor when the output transistor is made to conduct.

4,730,124

HIGH TRANSCONDUCTANCE COMPOSITE PNP TRANSISTOR

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 11, 1987, Ser. No. 13,494
Int. Cl.[4] H03K *17/60, 3/01;* **G05F** *3/16;* **H03F** *3/04*
U.S. Cl. 307—255 **4 Claims**



1. A composite PNP transistor, comprising:

a collector terminal, a base terminal, and an emitter terminal;

a first transistor of PNP conductivity type having an emitter coupled to said emitter terminal;

a second transistor of NPN conductivity type having a collector coupled to said emitter terminal, a base coupled to said base terminal, and an emitter coupled to a base of said first transistor; and

third and fourth transistors of NPN conductivity type, each having a collector, a base, and an emitter, wherein the emitters of said third and fourth transistors are coupled

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together to said collector terminal, the bases of said third and fourth transistors are coupled together to the collector of said third transistor, and the collectors of said third and fourth transistors are coupled respectively to a collector of said second transistor and said emitter of said first transistor.

4,730,125

ARRANGEMENT FOR SYNCHRONIZING THE PULSE-WIDTH-MODULATED CLOCK SIGNALS OF SEVERAL CLOCKED DIRECT VOLTAGE CONVERTERS

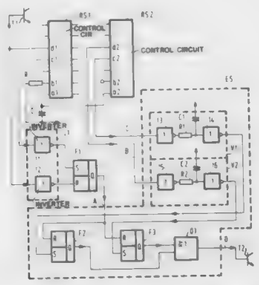
Walter Lösel, Fürth, and Gerd Kohler, Nuremberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,752

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524768

Int. Cl.[4] H03K *5/13, 1/17*

U.S. Cl. 307—269 **9 Claims**



1. An arrangement for synchronizing PWM clock signals of several clocked direct voltage converters each of which comprises a control circuit having an individual oscillator, each control circuit having a first connection for a capacitor and a second connection for a resistor for defining the frequency of the control circuit oscillator, the PWM clock signal for driving a switching transistor in a clocked converter being derived at a third connection of the control circuit and a pulse shifted in phase by 180° with respect to the PWM clock signal being derived at a fourth connection of the control circuit, said arrangement comprising, means coupling the first connections of the control circuits of all the direct voltage converters to a common capacitor and the second connections to individual resistors, means coupling the PWM clock signal and the pulse shifted in phase by 180° of a first control circuit to an input means of a logic circuit, a first flipflop responsive to an output of the logic circuit for deriving a signal having a duty cycle of 50%, wherein for each further control circuit there is a decision circuit having three inputs and an output, means connecting an output of the first flipflop to a first input and the third and fourth connections of the further control circuit to second and third inputs of the associated decision circuit, and wherein the decision circuit passes that pulse from the third or fourth connection of the further control circuit to its output, in which the transient times for the associated switching transistor fall within a predetermined half cycle of the switching clock of the first control circuit.

4,730,126

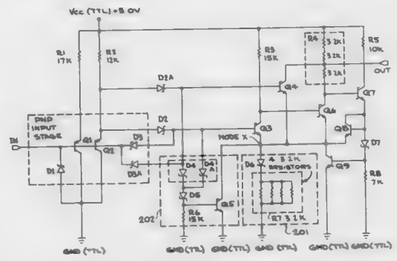
TEMPERATURE COMPENSATED HIGH PERFORMANCE HYSTERESIS BUFFER

Martin Chen, Foster City, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 27, 1986, Ser. No. 900,965

Int. Cl.[4] H03K *17/14, 17/30*

U.S. Cl. 307—290 **20 Claims**



1. A temperature compensated hysteresis buffer comprising:

(a) means for receiving an input signal inherently representing data;

(b) means for outputting data inherently represented by said input signal;

(c) first signal path means coupled to said means for receiving an input signal, including a hysteresis feedback loop, for setting hysteresis reference levels as a function of said input signal, wherein said hysteresis feedback loop further includes threshold adjustments means for performing output data level independent current switching to set said hysteresis reference levels and further wherein said threshold adjustment means includes a series temperature compensation circuit, combined with means for performing current switching as a function of said input signal, for keeping a first voltage drop across said series circuit relatively constant independent of temperature; and

(d) second signal path means, separated from said first signal path means, coupled to said means for recieving an input signal end to said means for outputting data, for protagating said data to said means for outputting.

4,730,127

METHOD OF MATCHING CURRENTS FROM SPLIT COLLECTOR LATERAL PNP TRANSISTORS

David M. Susak, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1986, Ser. No. 944,047

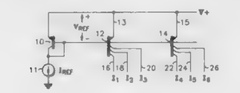
Int. Cl.[4] H03K *19/091, 19/003, 17/12, 17/16*

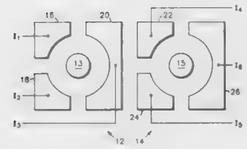
U.S. Cl. 307—299.3 **5 Claims**

1. A method of generating at least first and second matched currents, comprising:

providing a first transistor having a base region, a first emitter region, and at least a first collector region for generating said first matched current; and

providing a second transistor having a first emitter region electrically coupled to the first emitter region of said first transistor, and at least a first collector region for generating said second matched current, said first collector region of said first transistor having a location with respect to the first emitter region of said first transistor which corresponds to the location of the first collector region of said second transistor with respect to the first emitter region of said second transistor.





4,730,128

BIAS CIRCUIT FOR AN AVALANCHE PHOTODIODE

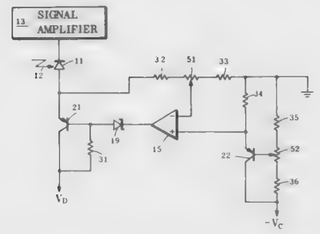
Yoshihito Seki, Musashino, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,274

Claims priority, application Japan, Oct. 1, 1985, 60-218896

Int. Cl.[4] H03K *3/26, 3/42;* **H01L** *32/14*

U.S. Cl. 307—310 **4 Claims**



1. A bias circuit of an avalanche photodiode comprising:

temperature coefficient voltage means including an emitter follower with a constant voltage applied to a base for obtaining a temperature coefficient voltage at an emitter to compensate a temperature coefficient of variation of an optical multiplication factor in an avalanche photodiode;

voltage dividing means for obtaining a voltage divided from a biasing voltage at a terminal of said avalanche photodiode of which another terminal is connected to an input of a signal amplifier;

a transistor of which emitter is connected to said terminal of said avalanche photodiode for bypassing current of said avalanche photodiode and of which collector is connected to a voltage source; and

comparing means for receiving and comparing said divided voltage obtained from said voltage dividing means with said temperature coefficient voltage generated in said temperature coefficient voltage means and received by said comparing means to obtain an amplified error voltage which is applied to a base of said transistor.

4,730,129

INTEGRATED CIRCUIT HAVING FUSE CIRCUIT

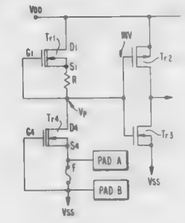
Tadayoshi Kunitoki, Yokohama, and Kunihiko Gotoh, Kunitachi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

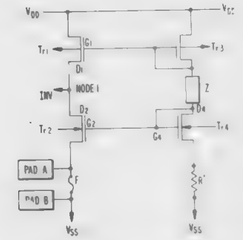
Filed Feb. 21, 1985, Ser. No. 703,987

Claims priority, application Japan, Feb. 29, 1984, 59-037927

Int. Cl.[4] H03K *5/20, 19/40*

U.S. Cl. 307—362 **12 Claims**





6. A detection circuit for an integrated circuit having a fuse which has first and second terminals and said detection circuit detects whether or not said fuse has blown, said detection circuit comprising:

a first voltage source supplying a first voltage;

a second voltage source, coupled to the first terminal of the fuse, supplying a second voltage lower than the first voltage;

a first circuit comprising a first transistor, having a source coupled to the second terminal of the fuse; and

a second circuit comprising a second transistor, having a source and a gate;

a mirror circuit comprising a third transistor, a fourth transistor, and an impedance element, said third and said fourth transistors each having a gate, a source, and a drain, the sources of said third and said fourth transistors being connected to said first voltage source, the gates of said third and said fourth transistors being coupled to each other, the gate of said fourth transistor being further connected to the drain of said fourth transistor, said impedance element being connected between the drain of said fourth transistor and said second circuit, said first circuit being connected between the drain of said third transistor and said second voltage source, said second circuit being connected between said impedance element and said second voltage source, the gates of said first and said second transistors being connected to each other, and said first and said second circuits being coupled in parallel with each other and coupled to said mirror circuit, a detection signal indicating a blown condition of said fuse being generated at the drain of said third transistor.

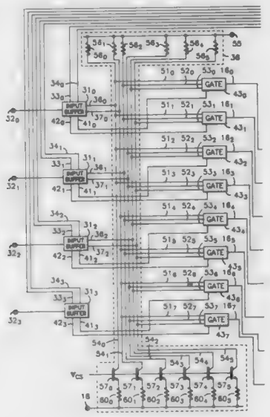
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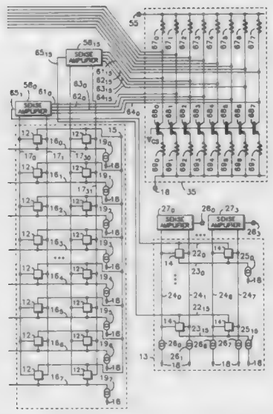
4,730,130

WRITABLE ARRAY LOGIC

Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1987, Ser. No. 492
Int. Cl.⁴ H03K *19/177*
U.S. Cl. 307—466 **18 Claims**





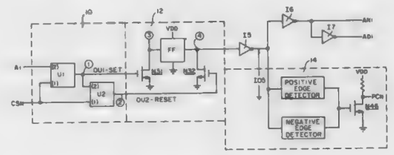
1. A bipolar writable array logic device providing a device output representing a logical AND function and a logical OR function in response to a plurality of input signals, said device comprising:
first means for receiving said plurality of input signals;
second means coupled to said first means for decoding said input signals;
third means coupled to said first means for decoding said input signals;
fourth means coupled to said second and third means for providing said logical AND function; and
fifth means coupled to said fourth means for providing said logical OR function and providing said output, wherein said logical AND and logical OR function may be reprogrammed by said input signals.

4,730,131

INPUT SIGNAL CONDITIONING CIRCUIT

Donald J. Sauer, Allentown, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,297
Int. Cl.⁴ H03K *17/16, 3/29, 5/01, 5/26*
U.S. Cl. 307—443 **10 Claims**



1. The combination comprising:
a signal input terminal;
first and second asymmetrically responsive logic gates, each logic gate having a signal input node and a signal output node;
means connecting the signal input node of said first logic gate to said signal input terminal and the output node of said first logic gate to the input node of said second logic gate;
said first and second logic gates being asymmetrically responsive in that they respond faster to signals at their signal input nodes making a transition from a first level-to-a-second level than to signal making a transition from the second level-to-the-first level;
a set/reset flip flop having a set input and a reset input and exhibiting hysteresis;
means connecting said set input to the signal output node of said first and second logic gates; and
means connecting the reset input to the signal output node of the other one of said first and second logic gates for combining the asymmetric response of said first and second logic gates with the hysteresis response of said set/reset flip-flop and digitally filtering "noise" pulses present at said signal input terminal and preventing said set/reset flip-flop from changing state in response to said "noise" pulses.

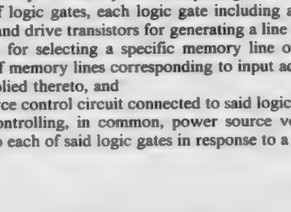
4,730,132

SEMICONDUCTOR DEVICE HAVING BIPOLAR TRANSISTOR AND INSULATED GATE FIELD EFFECT TRANSISTOR WITH TWO POTENTIAL POWER SOURCE

Takao Watanabe, Kokubunji; Goro Kitukawa; Ryoichi Hori, both of Tokyo; Kiyoo Itoh, Higashikurume; Yoshiki Kawajiri, Hachioji, and Takayuki Kawahara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,816
Claims priority, application Japan, Jul. 22, 1985, 60-161467; Jan. 31, 1986, 61-17929; Feb. 17, 1986, 61-30846
Int. Cl.⁴ H03K *19/01*
U.S. Cl. 307—446 **12 Claims**

1. A semiconductor device comprising:
a preceding circuit which delivers an output signal of first amplitude in correspondence with an input signal;
a power source which has a first potential to be fed to said preceding circuit;
a succeeding circuit which includes at least one bipolar transistor and at least one insulated-gate field effect transistor and to which the output signal of said preceding circuit is applied, said succeeding circuit delivering an output signal of a second amplitude larger than the first amplitude in correspondence with the output signal of said preceding circuit and being supplied with a voltage of a second potential from a power source higher than the first potential;
said preceding circuit being constructed of a first p-channel MOSFET and a first n-channel MOSFET, gate electrodes of both said MOSFETs being electrically connected to form an input node to which the input signal is applied;
a source or drain electrode of said first p-channel MOSFET being connected to said power source which has the first potential;
the drain or source electrode of said first p-channel MOSFET being connected to a source or drain electrode of said first n-channel MOSFET, to form an output node;
the drain or source electrode of said first n-channel MOSFET being connected to a reference potential;
said succeeding circuit including a second p-channel MOSFET, a second n-channel MOSFET, a switching means and a first bipolar transistor;
a gate electrode of said second p-channel MOSFET, a gate electrode of said second n-channel MOSFET and a first electrode of said switching means being electrically connected to form an input node of said succeeding circuit to which the output signal of said preceding circuit is applied;



a source or drain electrode of said second p-channel MOSFET connected to a power source which has a third potential lower than the second potential;
a collector electrode of said first bipolar transistor being electrically connected to the power source having the second potential;
the drain or source electrode of said second p-channel MOSFET, a source or drain electrode of said second n-channel MOSFET and a base electrode of said first bipolar transistor being electrically connected;
the drain or source electrode of said second n-channel MOSFET being connected to the reference potential;
an emitter electrode of said first bipolar transistor and a second electrode of said switching means being electrically connected to form an output node which delivers the signal having the second amplitude; and
the third electrode of said switching means being connected to the reference potential.

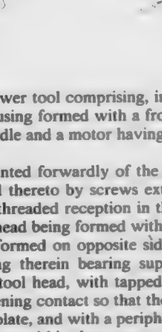
4,730,133

DECODER CIRCUIT OF A SEMICONDUCTOR MEMORY DEVICE

Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 19, 1986, Ser. No. 864,243
Claims priority, application Japan, May 20, 1985, 60-107826
Int. Cl.⁴ H03K *19/094, 19/096, 19/082*
U.S. Cl. 307—449 **4 Claims**

1. A decoder circuit of a semiconductor memory device including a plurality of memory lines comprising;
a plurality of logic gates, each logic gate including a load transistor and drive transistors for generating a line selection signal for selecting a specific memory line of said plurality of memory lines corresponding to input address signals applied thereto, and
a power source control circuit connected to said logic gates and for controlling, in common, power source voltage supplied to each of said logic gates in response to a mode designation signal, said mode designation signal being a normal mode signal and an all selection mode signal,



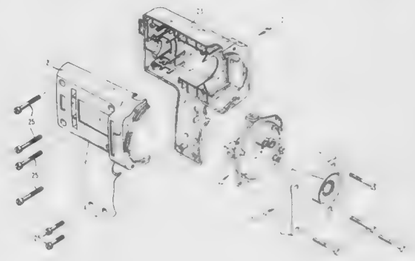
wherein when said all selection mode signal is input to said power source control circuit, an all selection mode state of said decoder circuit is obtained by pulling down said power source voltage supplied to each of said logic gates.

4,730,134

PORTABLE POWER TOOL WITH COMBINATION BEARING PLATE, NUT PLATE AND AUXILIARY HANDLE MOUNT

James R. Sistare, Pickens, S.C., assignor to The Singer Company, Stamford, Conn.

Filed May 28, 1987, Ser. No. 54,921
Int. Cl.⁴ H02K *5/16*
U.S. Cl. 310—50 **11 Claims**



1. A portable power tool comprising, in combination:
a power unit housing formed with a front edge surface and a gripping handle and a motor having a shaft journaled in the housing;
a tool head mounted forwardly of the power unit housing and connected thereto by screws extending through the tool head for threaded reception in the power unit housing, said tool head being formed with a rear edge surface;
a bearing plate formed on opposite sides thereof with surfaces providing therein bearing support for the motor shaft and the tool head, with tapped holes receiving the screws in fastening contact so that the bearing plate functions as a nut plate, and with a peripheral edge to position the bearing plate within the power unit housing enabling the front edge surface of the power unit housing and the rear edge surface of the tool head to contact each other without forming an external seam with said bearing plate;
said power unit housing including first and second housing element, and means for securing the housing elements together with the motor shaft projecting forwardly of the power unit housing through the bearing plate;

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a plurality of auxiliary handle mounts integrally formed at a peripheral portion of the bearing plate, each in the form of a cylindrical tapped bore having a longitudinal axis generally perpendicular to the longitudinal axis of the portable power tool, one of said auxiliary mounts being formed in an uppermost surface of the bearing plate, and another of said auxiliary mounts projecting from a lateral generally vertical edge of the bearing plate;

a plurality of vents formed in the power unit housing walls, said vents being disposed rearwardly adjacent the auxiliary handle mounts to provide cooling air for bearings; and

alignment projections formed to project inwardly from and disposed adjacent said front edge surfaces of the power unit housing to define a clamping flange disposed between the bearing plate and tool head against which flange the tool head is clamped.

4,730,135

VEHICULAR-TYPE ALTERNATOR WITH CONTAMINATION-PROTECTED SLIP RINGS

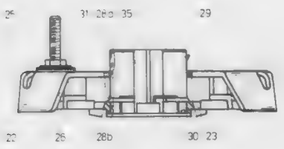
Peter Dolderer, Oberstenfeld; Werner Lemke, Bietigheim-Bissingen; Stefan Renner, Weissach; Rüdiger Sohnle, Stuttgart; Kurt Flasche, deceased, late of Esslingen (by Irma Flasche, heiress), and by Peter Flasche, heir, Ostfildern, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1986, Ser. No. 901,761

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533115

Int. Cl.⁴ H02K *5/136, 5/14*

U.S. Cl. 310—68 D **8 Claims**



1. Vehicular-type alternator (**10**) with contamination-protected slip rings (**20***a*, **20***b*),

said alternator having a stator (**14**, **15**, **16**),

a rectifier system (**24**) secured to the stator,

a rotor and a rotor shaft (**11**),

bearings (**18**) secured to the stator for rotatably retaining the rotor shaft,

said slip rings (**20***a*, **20***b*) being secured to the rotor shaft,

a rectifier support plate (**22**) secured in the stator;

a connection support plate (**23**) secured in the stator, axially spaced from said rectifier support plate,

said support plates extending transversely to the shaft and being formed with openings (**28***a*, **28***b*) to permit passage of the shaft (**11**) therethrough, said support plates supporting at least part of the rectifier system; and

a brush holder (**21**) secured within the alternator and brushes located in the brush holder, in position for engagement with said slip rings,

said alternator comprising, in accordance with the invention,

a protective sleeve (**29**) formed with an axial gap (**35**) surrounding the slip rings (**20***a*, **20***b*) and adjacent portions of the shaft (**11**), the axial gap (**35**) being located facing the brushes to permit passage of the brushes in the brush holder (**21**) past and through said sleeve for engagement with the slip rings, thereby obviating alteration of said brush holder,

said protective sleeve being axially and radially secured in at least one of the openings (**28***b*) of at least one of the support plates (**22**, **23**) and being circumferentially fitted in the support plate; and

wherein the sleeve (**29**) is formed with a groove extending at least in part circumferentially around the sleeve, said groove being engaged, in the portion of the support plate defining said opening, by a snap-in connection.

4,730,136

TWO-PULSE PERMANENT MAGNET BRUSHLESS D-C MOTOR

Rolf Müller, Black Forest, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. Kg, St. Georgen, Fed. Rep. of Germany

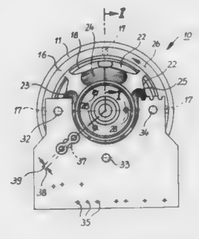
Continuation of Ser. No. 605,997, May 3, 1984, abandoned, which is a continuation of Ser. No. 335,484, Dec. 29, 1981, abandoned. This application Sep. 23, 1985, Ser. No. 778,772

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 304949

The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 R **14 Claims**



1. A two-pulse brushless direct current motor having an approximately cylindrical air gap and including a permanent magnet rotor with approximately trapezoidal magnetization and narrow gaps between its poles, a stator including a winding and a plurality of stator poles, each of said poles having a slot at each of its ends opening toward the air gap, a rotation position detector fixedly mounted with respect to the stator and responsive to the position of the rotor, said detector controlling the current to said winding so as to generate an alternating magnetic field in the air gap which reacts with the permanent magnet rotor to thereby produce an electromagnetic torque with small interruptions, the stator poles being constructed so as to provide a magnetically effective air gap, between the stator and the oppositely located circumference of the rotor for producing a reluctance torque varying over the rotation angle, wherein the improvement comprises, said effective air gap on either side circumferentially of one of said slots including a first sector having a circumferential length greater than the circumferential length of said one of said slots and having a small magnetically effective air gap extending in the direction of rotation substantially to the leading edge of said one of said slots, a second sector having a substantial increase in the magnetically effective air gap from the leading edge to the trailing edge of said one of said slots, a third sector following said second sector in the direction of rotation having a circumferential length about the same as the circumferential length of the said one of said slots and having a substantial increase to a maximum dimension in the magnetically effective air gap from its leading end to its trailing end, and a fourth sector following said third sector in the direction of rotation and including the main portion of a stator pole, the magnetically effective air gap in said fourth sector decreasing over the circumference of the main portion of the stator pole in the direction of rotation from said maximum dimension to said small magnetically effective air gap of said first sector.

4,730,137

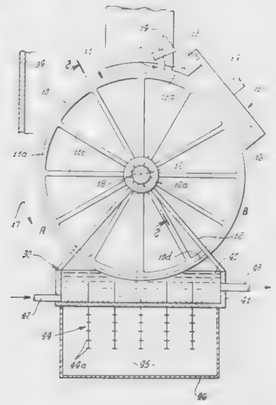
ENERGY CONVERSION SYSTEM

Gary L. Vollers, 11471 Tampa Ave., Unit 149, Northridge, Calif. 91326

Filed Nov. 3, 1986, Ser. No. 926,229

Int. Cl.⁴ H02N *7/00*

U.S. Cl. 310—306 **15 Claims**



1. In a motion generator, the combination comprising

(a) first and second structures which are relatively rotatable,

(b) a strip of magnetic material associated with one of said structures and characterized as having a first magnetic state at a high temperature and a second magnetic state at a low temperature, said magnetic material strip extending annularly on said one structure which is a heat insulative rotor,

(c) a magnet associated with the other of said structures and having a pole to produce flux that intercepts said material as said structures relatively rotate,

(d) first means to transfer heat to cause said material to vary in temperature between said high and low temperatures so that magnetic force is exerted on the rotating structure as said material relatively passes in proximity to said magnet, thereby producing torque causing the rotating structures to rotate, and

(e) other means to transfer heat from the magnetic material to fluid media, said other means comprising a liquid bath below the rotor, and into which only the lowermost extents of the rotor and magnetic material dipsduring rotor rotation, transferring heat from the magnetic material to the bath liquid, and heat transfer means contacting the bath liquid to transfer useful heat therefrom.

4,730,138

COAXIAL MOUNTING METHOD

Wladimir Wladimiroff, Kyrkbacken 27, S-17150 Solna, Sweden

Filed Jan. 18, 1985, Ser. No. 692,742

Int. Cl.⁴ H01J *5/12;* **H01S** *3/03*

U.S. Cl. 313—312 **6 Claims**

1. Apparatus for securing a fragile cylindrical tube within a cylindrical envelope comprising at least two spaced apart mounting means disposed along the length of said tube and between said tube and said envelope, each of said mounting means comprising:

(a) a ring-shaped holder having an inner diameter greater than the outer diameter of said tube, and an outer diameter smaller than the inner diameter of said envelope, said ring-shaped holder further being provided with three radially-oriented cylindrical through-holes, and



(b) an elastic sphere disposed in each of said cylindrical through-holes for pressing against an outer portion of said tube and an inside portion of said envelope;

whereby said tube is fixedly secured within said envelope.

4,730,139

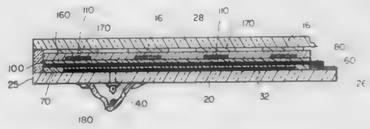
GAS DISPLAY PANEL WITH INTERNAL HEATER

Edgar L. Harvey, Jamesburg, N.J., assignor to Telegenix, Inc., Cherry Hill, N.J.

Filed Jul. 30, 1986, Ser. No. 890,507

Int. Cl.⁴ H01J *17/26*

U.S. Cl. 313—15 **7 Claims**



1. A display panel comprising

an envelope made up of a base plate and a glass face plate heremetically sealed together and filled with an ionizable gas of the type which can support cathode glow,

an array of cathode electrodes adjacent to said base plate and anode means adjacent to said face plate,

a source of mercury adjacent to said base plate, and

heater means provided in said envelope in operative relations with substantially the entire area of said base plate and the seal between said base plate and said face plate and said source of mercury,

said heater means including a portion which encircles a portion of the area of said base plate which said source of mercury is adjacent to,

so that no gobules of mercury appear in said panel which might cause electrical shorts.

4,730,140

METHOD OF DRIVING DIODE TYPE DISPLAY UNIT

Sadao Masubuchi, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 676,950, Nov. 30, 1984, abandoned. This application Dec. 11, 1986, Ser. No. 941,521

Claims priority, application Japan, Dec. 2, 1983, 58-228240

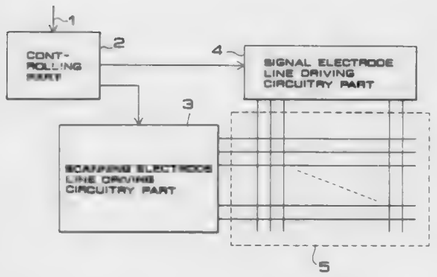
Int. Cl.⁴ G09G *3/10, 3/00*

U.S. Cl. 315—169.3 **2 Claims**

1. A method for driving a liquid crystal panel using diode elements wherein a two-terminal element having bidirectional nonlinear current-voltage characteristics is provided two-dimensionally on a substrate, an electrooptical element capable of controlling the optical quality by means of applied voltage is disposed in response to said two terminal element, charge is injected into said electrooptical element by utilizing the current-voltage nonlinearity in said two-terminal element for a

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writing period, the sign of the charge being reversed whenever the charge is injected during the writing period, and the charge injected is held by utilizing the current-voltage nonlinearity in said two-terminal element for a holding period thereby effecting display, the improvement comprising providing a charge regulating period immediately before said writing period functioning to regulate the amount of charge in said two-terminal



element, aaplying a charge regulating voltage thereto which is large enough to enable the dependence of charge amount immediately after said writing period upon the charge amount prior to said writing period to be ignored, and reversing the sign of the charge injected for regulating the amount of the charge whenever the charge to be regulated is injected into said two-terminal element.

4,730,141

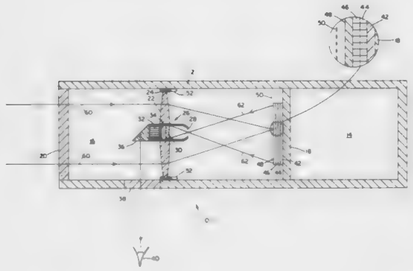
IMAGING TUBE HAVING A REFLECTIVE PHOTOCATHODE AND INTERNAL OPTICAL MEANS

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Mar. 21, 1986, Ser. No. 842,298

Int. Cl.⁴ H01J *29/45, 31/48, 31/49, 43/18*

U.S. Cl. 313—366 **13 Claims**



1. An imaging tube for imaging light energy comprising

a housing,

a first window,

a second window,

a reflective photocathode emitting electrons in response to light energy,

a conversion element for converting electrons to light energy, and

an optical element,

said first window and said second window being mounted in said housing to define therewith a vacuum-tight zone and to transmit therethrough respectively a first set and a second set of rays of light energy, said first set being said light energy to be imaged,

said first window being arranged to transmit said first set along a first axis,

said second window being arranged to transmit said second set along a second axis,

said first axis intersecting said second axis at an angle of less than 180°,

said conversion element being mounted to receive said electrons and to provide said second set,

said optical element being mounted in said housing and including a centrally discontinuous portion,

said optical element being oriented with respect to said first window and said photocathode so that said first set is directed by said optical element onto said photocathode, and at least one of said electrons and said second set is directed through said centrally discontinuous portion.

4,730,142

COLOR PICTURE TUBE

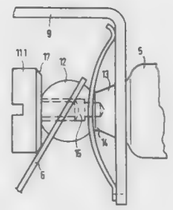
Otto Brunn, Wernau, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz A.G., Stuttgart, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,315

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533564

Int. Cl.⁴ H01J *29/07*

U.S. Cl. 313—402 **8 Claims**



1. A color tube, comprising:

a faceplate;

a funnel having a neck, said funnel being attached to said faceplate;

studs having one end attached in the corners of said faceplate and a free end

a shadow mask;

hold members connected to said shadow mask and engaging said studs; and

screw fasteners screwed into the free ends of said studs so as to hold said hold members to said studs.

4,730,143

IMPROVED COLOR CATHODE RAY TUBE HAVING A FACEPLATE-MOUNTED SUPPORT STRUCTURE WITH A WELDED-ON HIGH-TENSION FOIL SHADOW MASK

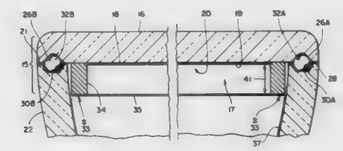
James R. Fendley, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 21, 1986, Ser. No. 832,493

Int. Cl.⁴ H01J *29/07*

U.S. Cl. 313—407 **9 Claims**

1. A front assembly for a cathode ray tube including a substantially flat faceplate having on its inner surface a centrally disposed phosphor target surrounded by a peripheral sealing area adapted to mate with a funnel, and a stiff faceplate-mounted support structure composed of a weldable metal and secured to said inner surface between said sealing area and said target for supporting a welded-on high-tension foil shadow



mask at a predetermined distance from said inner surface of said faceplate, said mask having a central apertured area and a peripheral area which is welded to said support structure, the bond between said support structure and said faceplate being of such area and strength as to resist substantially all of the tensile forces exerted by said foil mask.

4,730,144

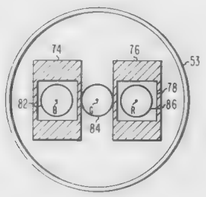
COLOR PICTURE TUBE HAVING INLINE ELECTRON GUN WITH COMA CORRECTION MEMBERS

Arthur J. Ingle, East Hempfield Township, Lancaster County, Pa., and Roger C. Alig, Princeton Junction, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1986, Ser. No. 900,971

Int. Cl.⁴ H01J *29/51, 29/76*

U.S. Cl. 313—413 **2 Claims**



1. In a cathode-ray tube having an inline electron gun therein for generating three inline electron beams and directing same beams along paths through magnetic deflection fields toward a cathodoluminescent screen of said tube, a first of the fields causing deflection of the beams in a first direction perpendicular to the inline direction of the electron beams, a second of the fields causing deflection of the beams in a second direction parallel to the inline direction of the beams, said gun including means for at least one of said beams, said shunting means comprising at least one magnetically permeable shunt, said shunt being a flat plate having a centered aperture therein, said shunt completely surrounding one of the electron beam paths, the improvement comprising

said shunt being longer in the first direction than in the second direction and being symmetric about a central axis of the shunt that parallels the first direction and symmetric about another central axis of the shunt that parallels the second direction, wherein the exterior peripheral shape of said shunt is rectangular, and wherein the aperture in said shunt is rectangular in shape with the sides of the aperture paralleling the external peripheral sides of said shunt.

4,730,145

DEFLECTION UNIT HAVING A THIN-WALLED YOKE RING FOR CATHODE-RAY TUBES

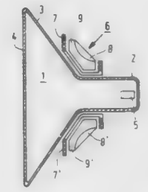
Aant B. D. van der Meer, and Theodorus G. W. Stijntjes, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1986, Ser. No. 890,765

Claims priority, application Netherlands, Jul. 30, 1985, 8502155; Feb. 27, 1986, 8600489

Int. Cl.⁴ H01J *29/70;* **H01F** *3/00*

U.S. Cl. 313—440 **16 Claims**



1. A deflection unit for a cathode-ray tube, comprising a first and a second system of deflection coils and a coil yoke in the form of an annular core of a sintered, oxidic, ferromagnetic material, characterized in that the annular core is less than 6 mm thick and the oxygen content thereof at or adjacent its surface is substantially the same as the oxygen content within the remainder of the annular core; whereby the annular core is substantially stress-free.

4,730,146

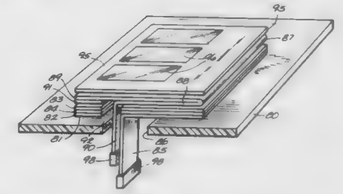
FOLDED ELECTROLUMINESCENT LAMP ASSEMBLY

Thomas L. Maser, Mequon, and Kelly R. Davis, Milwaukee, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 21, 1986, Ser. No. 921,714

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 313—511 **4 Claims**



1. In combination with an electroluminescent lamp panel haivng a base electrode, a transparent electrode spaced from the base electrode, a conductive lead electrically connected to the base electrode, and one or more conductive leads electrically connected to the transparent electrode to define one or more electroluminescent lamps,

the improvement comprising:

a circuit panel of flexible plastic film joined to the electroluminesce lamp panel;

a tail of flexible plastic film extending from a marginal portion of the circuit panel;

conductive tracks extending across the circuit panel and across the tail to a free end thereof, the conductive tracks being electrically connected to the aforesaid conductive leads to the base and transparent electrodes of the electroluminescent lamp panel;

the circuit panel overlying and adhered to the electroluminescent lamp panel along a surface of the lamp panel adjacent the base electrode to define a folded assembly including the conductive tracks along an interior surface of the circuit panel; and

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the tail extending from the folded assembly for connection to an electrical power source for activation of each lamp of the electroluminescent lamp panel.

4,730,147

METHOD AND ARRANGEMENT FOR THE OPERATION OF A GAS DISCHARGE LAMP

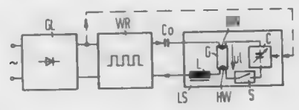
Armin Kroening, Nussdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,187

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628013

Int. Cl.⁴ H05B *39/04*

U.S. Cl. 315—100 **11 Claims**



1. A method for the operation of a gas discharge lamp provided with heater coils, particularly a fluorescent lamp, whereby a high-frequency ac voltage for operating the lamp is generated with an inverter from a dc voltage which is derived from a line ac voltage by rectification, said lamp being thereby arranged parallel to an effective capacitance of a series-resonant circuit formed of an effective capacitor and of an inductor and which includes the heater coils of the lamp, and whereby, during the heating-up operation of the heater coils (starting interval phase) between the turn-on of the power supply and the ignition of the lamp, the voltage adjacent thereto is limited to a value below the lamp's ignition voltage, said method comprising the steps of:

following the ignition of the lamp, suppressing the series-resonant circuit by interrupting a current branch having the effective capacitance and lying parallel to the lamp, said interruption affected by means of an isolating switch; and

suppressing the series-resonant circuit as long as the lamp is in operation.

4,730,148

VERTICAL DEFLECTION CIRCUIT

Katsumi Nakata, Ohtsu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,449, Jul. 3, 1985. This application Jun. 4, 1987, Ser. No. 58,613

Claims priority, application Japan, Jul. 5, 1984, 59-140808

Int. Cl.⁴ H01J *29/70, 29/76*

U.S. Cl. 315—397 **10 Claims**



1. A vertical deflection circuit, which comprises:

a vertical deflection coil;

vertical deflection current means for supplying a vertical deflection current to the vertical deflection coil; and

current source means for selectively imposing a predetermined current upon the vertical deflection current thereby increasing the current flowing through the vertical deflection coil in either an even field or an odd field of a television signal;

wherein the raster of the even field and the raster of the odd field coincide with each other by the selective imposition of the predetermined current.

4,730,149

CIRCUIT ARRANGEMENT FOR REGULATING THE RPM OF A SERIES MOTOR

Heinrich Zeitvogel, Gaimersheim, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

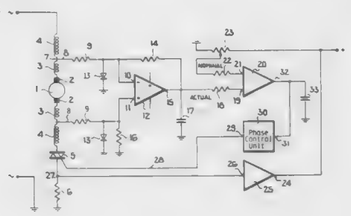
PCT No. PCT/EP85/00737, § 371 Date Sep. 18, 1986, § 102(e) Date Sep. 18, 1986, PCT Pub. No. WO86/04468, PCT Pub. Date Jul. 31, 1986

PCT Filed Dec. 21, 1985, Ser. No. 924,839

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501727

Int. Cl.⁴ H02K *23/08;* **H02P** *7/62*

U.S. Cl. 318—246 **9 Claims**



1. A circuit arrangement for controlling the rpm of an electric motor having series-connected field and armature windings to which a controllable rectifier is connected in series, said rectifier being controlled by a phase control unit as a function of a control signal obtained at the armature winding and conducted through an operational amplifier, characterized in that one terminal (**2, 7**) of the armature winding (**1**) is connected to the inverting input (**10**) of the operational amplifier (**12**), and the other terminal (**2, 7**) is connected to the non-inverting input (**11**) of said operational amplifier so that the voltage between the inverting and non-inverting inputs of said operational amplifier is proportional to the voltage across the armature winding, the output (**15**) of the operational amplifier (**12**) is connected to one input (**19**) of a comparator (**20**) whose second input (**21**) is connected to a desired value generator (**23**), and the output (**32**) of the comparator (**20**) is connected to the phase control input (**31**) of the phase control unit (**30**).

4,730,150

D.C. MULTI-PHASE BI-POLAR BRUSHLESS MOTOR

I S. Lee, Seoul, and Jung S. Lee, Kyung Ki-Do, both of Rep. of Korea, assignors to Woo Y. Choi, San Diego, Calif.

Filed Jun. 6, 1986, Ser. No. 843,273

Claims priority, application Rep. of Korea, Aug. 20, 1985, 85-6014

Int. Cl.⁴ H02K *29/08*

U.S. Cl. 318—254 **5 Claims**

1. A bi-polar brushless d.c. motor comprising:

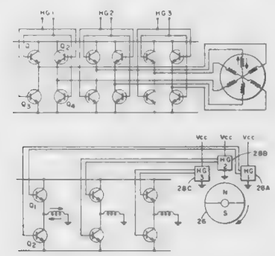
a stator having M phase windings;

an N pole rotor rotatably coupled to said stator;

a circular permanent magnet mounted at one end of said rotor, said magnet having N poles;

M sets of paired Hall effect devices, each Hall effect device in each set of paired Hall effect devices positioned adjacent one another and each set of paired Hall effect devices positioned, with respect to radial and angular distance, adjacent the periphery of said magnet and each Hall effect device in each set of paired Hall effect devices alternately generating spaced apart control signals in response to the angular position of said magnet;

circuit means coupled to said stator M phase windings and



said M sets of paired Hall effect devices for receiving input d.c. power and responsive to said control signals for selectively coupling d.c. power to a predetermined one of said M phase windings.

4,730,151

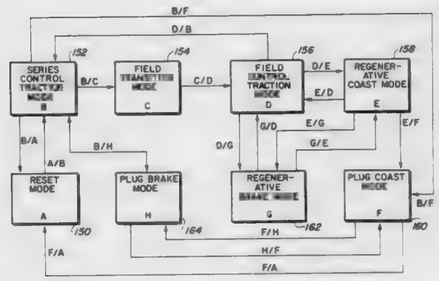
CONTINUOUS FIELD CONTROL OF SERIES WOUND MOTORS

Bernard I. Florey, and Joe C. Lambert, both of Charlottesville, Va., assignors to General Electric Company, Charlottesville, Va.

Filed Jan. 15, 1986, Ser. No. 819,071

Int. Cl.⁴ H02P *3/14*

U.S. Cl. 318—376 **30 Claims**



1. An operating method for use in a control system for an electrically driven vehicle for implementing operation in a propulsion mode, a coast mode and an electrical brake mode, said coast mode being distinct from a plug braking mode and simulating the retarding effects of an internal combustion engine driven vehicle, the vehicle being powered by a direct current electric traction motor having an armature and a field winding and including: a power source; a variable mark-space ratio power regulator responsive to a motor current command signal for connecting the power source to the motor in a manner to regulate motor current in the armature and field winding and wherein the current command signal is developed in response to the position of an accelerator; a direction selection means for providing signals indicative of a desired direction of motion of the vehicle; and signal processing means responsive to said selection means signal and to the accelerator position and mark-space ratio for establishing the mode of operation of the motor; said method comprising the steps of:

(a) receiving data indicative of movement of the accelerator from a rest position and a selected direction of motion of the vehicle;

(b) establishing a mark-space ratio for the regulator responsive to accelerator position for establishing operation in the propulsion mode;

(c) sensing data representative of return of the accelerator to a rest position; and

(d) transitioning the motor operation to the coast mode in response to return of the accelerator to the rest position.

18. A method for braking an operator controlled electric traction motor propelled vehicle of the type including, a power source, a time-ratio power regulator which is controlled to be conducting and non-conducting for connecting and disconnecting the motor to a direct-current power source in response to the relative position of an accelerator, a direction positioning means for controlling the direction of the vehicle, a signal processing means for controlling switching means, the switching means controlling the operation of the motor, a sensing means for providing signals representative of currents within field and armature windings of the motor, a braking means for providing signals representative of a brake position, said method comprising the steps of:

(a) receiving data, the data including the position of the accelerator, the direction of motion of the vehicle, and the conducting and nonconducting time ratio interval;

(b) setting the switching means in response to the position of the accelerator and the selected direction of motion of the vehicle; and

(c) changing the switching means in response to release of the accelerator for implementing a first relatively low level of electrical braking of the vehicle distinct from a plug braking mode.

23. In a control system for a direct current traction motor having armature and field windings, the control system being of the type including a variable mark-space ratio power regulator, an accelerator and signal processing means responsive to accelerator position for supplying current command signals to the regulator, switching means for establishing connection of the motor in one of a series propulsion mode and a separately excited propulsion mode, the switching means being operated by the signal processing means in response to predetermined desired operating characteristics of the motor, and a power source, a method for switching between the series mode and separately excited mode comprising the steps of:

(a) sensing the mark-space ratio of the regulator;

(b) transitioning from a series mode to a separately excited mode when the mark-space ratio exceeds a predetermined value;

(c) determining the magnitude of motor current just prior to transitioning; and

(d) increasing the magnitude of field current above the determined magnitude of motor current immediately after transitioning whereby the magnitude of armature current is prevented from increasing above a determined magnitude at the time of transitioning.

4,730,152

VEHICLE POWER ANTENNA CONTROL WITH DRIVE STRESS LIMITING

Jeff A. Foust, Farmersville; Donald E. Graham, Dayton; Richard E. Wainwright, Kettering, and Gary R. Denton, Vandalia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 931,060

Int. Cl.⁴ G05B *19/29;* **H01Q** *1/10*

U.S. Cl. 318—603 **6 Claims**

1. A power antenna control for a motor vehicle having antenna drive means effective to extend and retract the antenna relative to the vehicle, the antenna drive means including a DC

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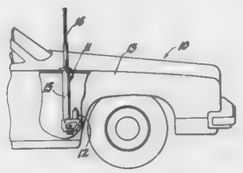
motor having an armature, the control comprising, in combination:

pulse signal means responsive to movement of the antenna drive means to generate pulses for equal predetermined increments of antenna travel;

a first counter responsive to the pulse signal means while the antenna is extending to change its count in a first direction and while the antenna is retracting to change its count in the opposite direction to thereby maintain a count indicative of antenna position;

a second counter responsive to the pulse signal to count in a first direction;

means responsive to the first counter during antenna extension to deactivate the antenna drive means when the count of the first counter indicates a predetermined extended antenna position;



means effective to periodically monitor the count of the second counter and reset the count to an initial value and, when said monitored count is less than a predetermined count indicating motor stall, to generate a stall signal;

means responsive to the stall signal during antenna retraction to deactivate the antenna drive means and, if the count of the first counter is within a predetermined count of full retraction, to reset the count of the first counter to the count indicating full retraction;

means activatable to limit the current in the motor armature to a predetermined maximum value; and

means responsive to the first counter to activate the current limiting means only when the count of the first counter is within a range corresponding to a predetermined range of antenna position close to full retraction.

4,730,153

PROCESS OF CHARGING AN ELECTROCHEMICAL GENERATOR HAVING ZINC NEGATIVE ELECTRODES AND AN ELECTROCHEMICAL GENERATOR FOR PUTTING THE PROCESS INTO PRACTICE

Olivier Breting, Cormeilles-en-Parisis; Bernard Bugnet, Champ sur Marne, and Guy Bronoël, Versailles, all of France, assignors to Seregie, Rueil-Malmaison, France

Filed Jan. 30, 1986, Ser. No. 824,216
Claims priority, application France, Jan. 30, 1985, 85 01338
Int. Cl.⁴ H01M *10/44, 8/18*
U.S. Cl. 320—14 **9 Claims**



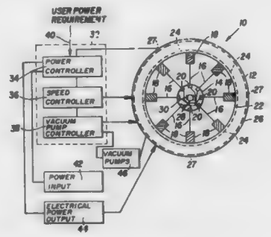
1. Process for charging a reversible electrochemical generator including of a plurality of cells which are electrically in series, each of said cells comprising a zinc negative electrode and a positive electrode between which circulates a basic electrolyte containing solubilized zinc, said process comprising the steps of: causing the electrolyte in the cells to circulate successively from one cell to the next, applying to said electrodes a charging current forming a succession of approximately rectangular charging pulses, and periodically reversing the direction of circulation of the electrolyte during said charging step.

4,730,154

VARIABLE INERTIA ENERGY STORAGE SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 31, 1986, Ser. No. 890,928
Int. Cl.⁴ H02K *7/02;* **H02P** *9/04*
U.S. Cl. 322—4 **5 Claims**



1. A variable inertia energy storage system for mounting on land or on a vehicle, the storage system comprising:

an enclosed housing having an inner periphery;

a central hub mounted in the center of the housing and rotatably mounted therein;

a plurality of spokes extending outwardly toward the periphery of the housing;

a plurality of solid movable masses mounted on the spokes for moving inwardly and outwardly from the central hub, said movable masses for storing inertial energy;

drive motors attached to one end of the spokes for moving the masses along the length of the spokes; and

a hoop disposed around and adjacent said inner periphery of the housing and attached to the ends of the spokes, the hoop having electrical motor/generator elements mounted thereon, and complementary motor/generator elements disposed on said inner housing periphery adjacent said motor generator elements for generating electricity or rotative force as the movable masses, said hoop, and said motor/generator elements are rotated past said complementary elements.

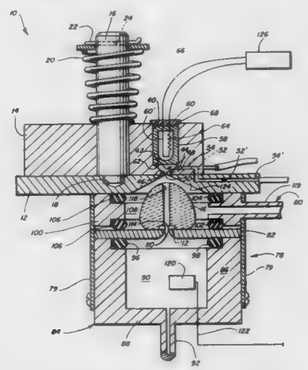
4,730,155

SAMPLING VALVE INCLUDING SAMPLE EJECTION MEANS

Walter R. Hogg, deceased, late of Miami, Fla. by Shirley J. Hogg, legal representative, assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed May 12, 1986, Ser. No. 861,837
Int. Cl.⁴ G01N *27/07*
U.S. Cl. 324—71.1 **24 Claims**

1. In a sample metering device for use in a particle study device wherein particulate matter is passed through a sensing zone including in combination, an input for receiving a sample of particulate matter, a drain for expelling the sample, an ejection port, means for trapping a volume of said particulate matter, ejecting means for ejecting a predetermined amount of said trapped volume through said ejection port and means for sealing off the trapping means, ejecting means and ejection port from the sensing zone and drain during trapping of said volume.

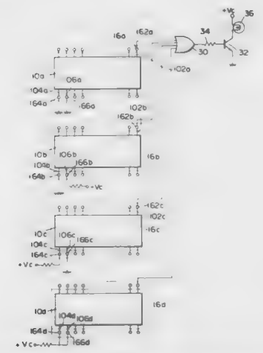


4,730,156

SELF-MONITOR SYSTEM FOR MICROPROCESSOR FOR DETECTING ERRONEOUS CONNECTION OF TERMINALS

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 14, 1984, Ser. No. 610,002
Claims priority, application Japan, Jun. 6, 1983, 58-99464
Int. Cl.⁴ G01R *31/02;* **G08B** *21/00*
U.S. Cl. 324—73 R **10 Claims**



1. A self-monitor system for indicating an improper connection of an IC package having pins to be connected to a printed circuit board by means of an IC socket having terminals, said IC package including a microprocessor and said system comprising:

a first means for applying a signal with a predetermined level to a preselected terminal of the IC socket into which a preselected connector pin of the IC package is to be inserted, said preselected terminal and connector pin being utilized only for indicating improper connection of said IC package to said IC socket of said printed circuit board, said predetermined level of said signal being a fixed level;

a second means, including said microprocessor and responsive to an onset of power, for comparing the signal level at said preselected connector pin with a reference value corresponding to said predetermined level, said second means producing an error signal when the signal level at said preselected connector pin is inconsistent with said reference value thereby indicating an improper connection of said IC package to said IC socket; and

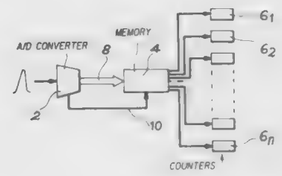
an error indicator means responsive to said error indicative signal for generating an alarm.

4,730,157

CIRCUIT FOR THE REAL TIME ANALYSIS OF THE ENERGY DISTRIBUTION OF PULSES OF A PULSE SIGNAL

Jean L. Lepetit, Chevigny St. Sauveur; Jean P. Lepagnot, St. Seine L'Abbaye, and Emile Poussier, Is/Tille, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 12, 1986, Ser. No. 838,951
Claims priority, application France, Mar. 25, 1985, 85 04403
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 A **4 Claims**



1. A circuit for the real time analysis of the amplitude of the pulses of a pulse signal, said analysis comprising counting the pulses appearing in each of a plurality of windows of energy, said circuit comprising:

an analog-digital converter means receiving said pulse signal and supplying for each pulse a digital signal which is a function of the amplitude of said pulse,

a memory means having locations, said memory means being addressed by said digital signal, each location containing a code indicating the window of energy corresponding to the amplitude of the pulse signal which corresponds to said location, said memory means supplying the code memorized in the location addressed by said digital signal,

a decoder means having an input and a plurality of outputs, said decoder means receiving on said input said code from said memory means and supplying a signal on one of said outputs as a function of said code,

a plurality of counting means, each counting means being connected to one output of said decoder means, and having means for storing the number of signals received from said decoder means.

4,730.158

ELECTRON-BEAM PROBING OF PHOTODIODES

Ichiro Kasai, Santa Barbara; Roderic L. Osgood, Goleta; Charley B. Burgett, Santa Barbara; Richard J. Joyce, Thousand Oaks, and Michael D. Warfield, Oxnard, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 6, 1986, Ser. No. 871.231
Int. Cl.⁴ G01R *31/26, 31/28*
U.S. Cl. 324—158 R **20 Claims**

1. Photodiode testing apparatus comprising:

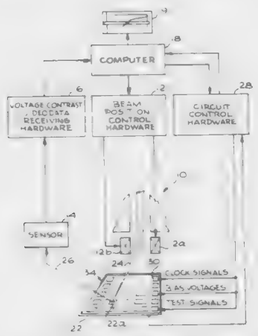
electron beam control means for charging the parallel resistance and capacitance of a photodiode during a selected time interval;

secondary emission electron means for measuring the voltage of the photodiode at predetermined times within said interval;

means for measuring photodiode current at said times;

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means for correlating the corresponding measurements of photodiode voltage and current to derive a plurality of data points relating thereto; and



means for determining a current-voltage curve for the photodiode from the derived data points.

4,730,159

PROGRAMMABLE BED-OF-NAILS TEST ACCESS JIGS

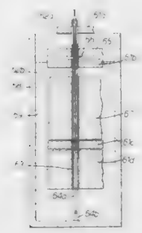
Roderick J. W. Collins, Maldon, England, assignor to The General Electric Company P.L.C., London, England

Filed Jun. 12, 1985, Ser. No. 744,461

Claims priority, application United Kingdom, Jun. 21, 1984, 8415874

Int. Cl.[4] G01R *1/073*

U.S. Cl. 324—158 F **19 Claims**



1. A bed-of-nails assmebly for use in a programmable bed-of-nails test access jig, and including

a framework,

a multiplicity of pins carried by the framework and positioned on a suitable grid, each pin being mounted for longitudinal movement between a first, in contact, position and a second, out of contact, position,

pin displacement means associated with each pin, for urging the pin to move between the two positions, and

displacement control means associated with each pin, for controlling the pin's movement when urged by the displacement means,

wherein:

each pin has its own, individual, displacement control means, functionally separate from the control means of any other pin;

each individual pin displacement control means utilizes the electro rheological effect available from an electro rheological fluid to regulate pin movement; and

wherein the displacement control means comprises a clutch including an inner push rod longitudinally movable within a hollow cylinder, the push rod being integral with a respective one of the pins, and wherein a gap is formed between the cylinder internal wall and the rod, which gap is filled with an electro rheological fluid.

4,730,160

PROGRAMMABLE THERMAL EMULATOR TEST DIE

Michael D. Cusack, Monument, and Christopher A. Freymuth, Colorado Springs, both of Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 20, 1986, Ser. No. 841,975

Int. Cl.[4] G01N *25/18*

U.S. Cl. 324—158 R **9 Claims**



1. A programmable die for simulating the thermal characteristics of a given product die, comprising:

a die having a plurality of bond pads arrayed along the perimeter thereof;

a plurality of heating resistor groups, each group including one or more linear resistive elements, said plurality of resistor groups being disposed in a lesser plurality of generally concentric rings on a major surface of said die;

a plurality of sense diodes formed in said die surface at a plurality of locations in proximity to said heating resistor groups;

a plurality of hot spot resistors formed in said die surface at another plurality of locations in proximity to said heating resistor groups and said sense diodes; and

interconnection array, having a plurality of electrical signal conductors disposed on said die major surface, each connected between a related one of said bond pads and, alternately, to one of said heating resistor groups, said sense diodes, and said hot spot resistors, whereby said array conducts electrical signals applied to said bond pads to individual ones of said heating resistor groups, said sense diodes, and said hot spot resistors, whereby said heating resistors and said hot spot resistors provide, when excited, an actual surface temperature value for said die, and wherein said sense diodes each provide a signal indicative of said actual surface temperature.

4,730,161

DUAL FREQUENCY WELL LOGGING SYSTEM FOR DETERMINING THE WATER RESISTIVITY AND WATER SATURATION OF AN EARTH FORMATION

Percy T. Cox; Jackie C. Sims, and Richard S. Simpson, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 22, 1986, Ser. No. 910,043

Int. Cl.[4] G01V *3/18, 3/30*

U.S. Cl. 324—338 **5 Claims**

5. A well logging system for determining the water resistivity and the water saturation in an earth formation traversed by a borehole, a well logging sonde including:

first transmitter means for transmitting electromagnetic energy at a first frequency, lying within the range of frequencies from 10 MHz to 200 MHz into the earth formation,

second transmitter means for transmitting electromagnetic energy at a second frequency, lying within the range of frequencies from 10 MHz to 200 MHz into the earth formation,

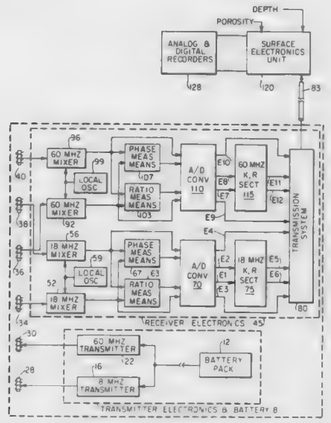
a first pair of receiver means spatially related to the first transmitter means for receiving electromagnetic energy from the earth formation and providing signals representative thereof,

a second pair of receiver means spaced a predetermined distance apart and spatially related to the second transmitter means for providing signals representative of electromagnetic energy received from the earth formation,

first signal means for providing signals relating to the electromagnetic energy transmitted by the first transmitter means and received by the first pair of receiver means,

first parameter means connected to the first signal means for providing signals corresponding to the phase difference between the signals provided by the pair of receiver means and for providing a first ratio signal corresponding to the ratio of the amplitudes of the signals provided by the first pair of receiver means,

second signal means connected to the second pair of receiver means for providing signals representative of the electromagnetic energies received by the second pair of receiving means,



second parameter signal means connected to the second signal means for providing a second phase difference signal corresponding to the phase difference between the signals provided by the second signal means and providing a ratio signal corresponding to the ratio of the amplitudes of the signals provided by the second signal means,

first means connected to the first parameter signal means for deriving a dielectric constant and a resistivity in accordance with the phase difference signal and a the ratio signal from the first parameter signal means,

second means connected to the second parameter signal means for deriving a dielectric constant and a resistivity in accordance with the phase difference signal and the ratio signal from the second parameter signal means;

means for transmitting the dielectric constant signals and the resistivity signals to the surface; and

surface signal processing means including:

means for providing a signal corresponding to porosity, and

means connected to the porosity signal means and to the transmission means for deriving the water saturation and the resistivity of the water in the earth formation in accordance with both phase difference signals and both dielectric constant signals and the porosity signal.

4,730,162

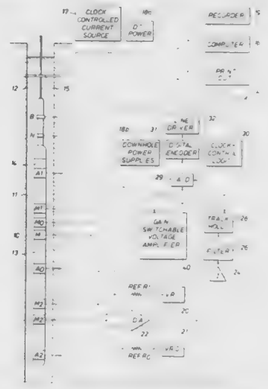
TIME-DOMAIN INDUCED POLARIZATION LOGGING METHOD AND APPARATUS WITH GATED AMPLIFICATION LEVEL

Harold J. Vinegar, and Monroe H. Waxman, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1985, Ser. No. 815,322

Int. Cl.[4] G01V *3/20*

U.S. Cl. 324—362 **30 Claims**



1. A time-domain induced polarization logging apparatus for measuring parameters of an earth formation, comprising:

(a) current source means for alternately applying a substantially constant electrical stimulus signal to the earth formation and then removing said stimulus signal to induce a time-domain polarization response therein,

(b) amplifying measuring means for measuring the amplitudes and phases of the time-domain voltages induced in the formation by said current source means,

(c) amplification control means coupled to said current source means and said measuring means for temporally gating the amplification level of said measuring means between predetermined gain levels substantially with the cycling of said current source means, and

(d) means coupled to said measuring means for generating a log as a predetermined function of said measurements.

4,730,163

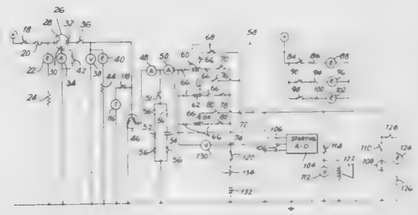
DEVICE FOR TESTING HIGH-PRESSURE LAMPS AND COMPONENTS USED THEREWITH

Luis S. Santos, 42nd Street, E-38, Colinas Montecarlo, Rio Piedras, P.R. 00924

Filed Mar. 13, 1985, Ser. No. 711,474

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—414 **2 Claims**



1. A portable test device for use in dynamic testing of circuit components of a high-pressure ionized vapor luminaire, such as a sodium vapor lamp, said circuit components including a

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photoelectronic switch, a tank circuit, a ballast, a voltage multiplier starter circuit, and a said high-pressure ionized vapor luminaire, said test device including:

a first test section incorporating a selectively replaceable photoelectronic switch, said photoelectronic switch being substitutable by said photoelectronic switch of said circuit components, said first test section including means for indicating the extent of operability of a said photoelectronic switch inserted into said first test section;

a second test section connected in parallel with said first test section and incorporating a selectively replaceable tank circuit device, said selectively replaceable tank circuit device being substitutable by said tank circuit device of said circuit components, and, said second test section including means for indicating the extent of operability of a said tank circuit device inserted into said second test section;

a third test section connected in series relation with said second test section, said third test section incorporating one of a plurality of selectively replaceable ballast circuits, said ballast of said circuit components being substitutable for said one selectively replaceable ballast circuit, and, means for indicating the extent of operability of said selected ballast circuit inserted into said third test section;

a fourth test section connected in parallel with said third test section and incorporating a selectively replaceable voltage multiplier starter circuit, said voltage multiplier starter circuit being replaceable by said voltage multiplier starter circuit of said circuit components, and, means for indicating the extent of operability of the selected voltage multiplier starter circuit inserted into said fourth test section;

a fifth test section connected in parallel with said fourth test section, and incorporating a selectively replaceable high-pressure ionized vapor luminaire, said luminaire being replaceable by said luminaire of said circuit components, said fifth test section including a device connected in parallel with said voltage multiplier starter circuit, for giving an audible warning of excessive voltage developed by said voltage multiplier starter circuit.

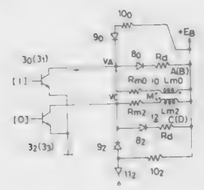
whereby, any one of said circuit components of said luminaire can be selectively inserted into said test device in combination with any other component of said luminaire in order to prove out the respective circuit components of said luminaire, each said circuit component being replaceable in said test device by a standard component of determined characteristics and known operability.

4,730,164

DEVICE FOR DETECTING ABNORMAL CONDITIONS IN A STEPPING MOTOR

Toshihiko Daido, Osaka, and Yoshikazu Ikegi, Nara, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 26, 1985, Ser. No. 813,561
Claims priority, application Japan, Dec. 26, 1984, 59-273137
Int. Cl.[4] G01R *31/34, 31/02*
U.S. Cl. 324—545 **7 Claims**



1. Solid state apparatus of a motor for detecting an abnormal condition in a first phase coil of the motor, comprising:

a second phase coil of the motor disposed such that mutual induction exists between said second phase coil and the first phase coil, the first phase coil and said second phase coil each having a first end connected to a supply voltage of predetermined value;

voltage applying means, comprising a semiconductor device, for selectively applying a first phase coil voltage to a second end of the first phase coil to produce a second phase coil voltage at a second end of said second phase coil which is greater than said predetermined supply voltage when the first phase coil is in an abnormal condition; and

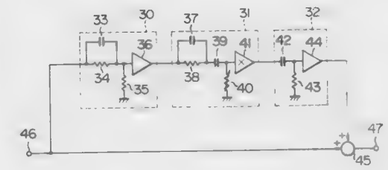
sensing means for sensing whether said second phase coil voltage is greater than said predetermined supply voltage at a time after said first phase coil voltage has been applied to determine whether the first phase coil is in said abnormal condition.

4,730,165

NON-LINEAR SIGNAL PROCESSING APPARATUS

Masakazu Nishino, Fujiidera, and Kiyokazu Hashimoto, Matsubara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 9, 1985, Ser. No. 773,673
Claims priority, application Japan, Sep. 12, 1984, 59-191018; Dec. 24, 1984, 59-277106
Int. Cl.[4] G06G *7/12;* **H03G** *7/00;* **H04B** *1/00*
U.S. Cl. 328—142 **41 Claims**



1. A non-linear signal processing apparatus comprising:

a first signal processing circuit for processing an apparatus input signal in a predetermined manner to provide an output signal;

a non-linear signal processing network including a differential circuit for generating an output signal by extracting a variation in a predetermined time period from the output signal of said first signal processing circuit, a non-linear circuit for receiving an input signal and for generating in response thereto an output signal having an amplitude that is non-linearly compressed in accordance with the amplitude of the input signal to the non-linear circuit, a delay circuit for generating an output signal by delaying the output signal of said non-linear circuit by a predetermined time period, an adder circuit for combining the output signal of said delay circuit and the output signal of said differential circuit and supplying the combined signal to said non-linear circuit as the input signal received by the non-linear circuit, and a multiplier circuit for multiplying the output signal of said non-linear circuit by a predetermined factor to provide an output signal of said non-linear signal processing network, wherein said non-linear circuit has a multiplication factor that is non-linear, said output signal of said non-linear circuit being not only outputted through said multiplier circuit to exhibit a first compression effect, but also being fed back through said delay circuit to increase a second compression effect;

a second signal processing circuit for processing the output signal of said non-linear signal processing network in a predetermined manner to provide an output signal; and

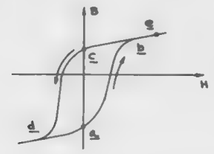
an arithmetic operation circuit for arithmetically combining the output signal of said second signal processing circuit and said apparatus input signal.

4,730,166

ELECTRON BEAM ACCELERATOR WITH MAGNETIC PULSE COMPRESSION AND ACCELERATOR SWITCHING

Daniel L. Birx, Brentwood, and Louis L. Reginato, Orinda, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 592,302, Mar. 22, 1984, Pat. No. 4,646,027. This application May 27, 1986, Ser. No. 867,126
Int. Cl.[4] H05H *5/08*
U.S. Cl. 328—233 **13 Claims**



1. A pulse-forming network for generating an initial voltage pulse of duration substantially one microsecond or greater and for reforming the pulse as a voltage pulse with a time duration of no more than 100 nanoseconds and pulse rise time and pulse fall time of at most 20 nanoseconds each and delivering tne pulse to a predetermined electrical load, the network comprising:

a voltage pulse source having an output terminal and capable of producing a sequence of one or more output pulses of current at least 20 kamps, voltage at least 20 kV and pulse duration substantially one μsec or greater;

a first capacitor having two terminals, with one terminal thereof being grounded and with a second terminal being operatively associated with the output terminal of the voltage pulse source;

a first saturable inductor having two terminals and with inductances satisfying $L^{(unsat)}/L^{(sat)} \geqq 100$, with a first terminal thereof operatively associated with the second terminal of the first capacitor;

a pulse transmission line having an associated impedance of substantially two ohms, with a first terminal thereof operatively associated with a second terminal of the first saturable inductor;

a second saturable inductor having two terminals and with inductances satisfying $L^{(unsat)}/L^{(sat)} \geqq 100$, with a first terminal thereof operatively associated with a second terminal of the pulse transmission line and with a second terminal thereof electrically connected to a load; and

a grounded, electrically conducting tube substantially surrounding the electrical connection between the second saturable inductor and the load.

4,730,167

POWER SUPPLY ARRANGEMENT

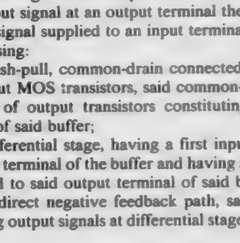
Horst Beeken, and Hans-Heinrich Vitters, both of Berlin, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 889,035
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526548; Oct. 1, 1985, 3534979
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 **12 Claims**

1. A power supply arrangement for amplifying a modulated voltage signal comprising:

a power transformer composed of a primary winding, and a plurality of individual power supply units each having a secondary winding arranged in operative relationship with said primary winding, and including means connected to said secondary winding for generating a direct voltage from a voltage induced across said secondary winding in response to an alternating voltage impressed across said primary winding, each individual power supply unit further including a controllable switch for switching said individual power supply unit on and off independently of the other individual power supply units so that the direct voltage from selected individual power supply units can be additively combined to form an amplified modulated voltage signal; and

switch control means coupled to the modulated voltage signal and having a plurality of outputs each connected to a respective one of said controllable switches, said switch control means including a permanently programmed control means which stores a program comprising a switching schedule for selectively controlling the controllable switches in dependence of the momentary value of the amplitude of the modulated voltage signal and in a manner



which combines said individual power supply units into an annular arrangement to form a switching ring in which adjacent individual power supply units are combined solely in dependence of their electrical characteristics so that, during switching of identically sized sectors in the switching ring, voltage jumps are produced which are essentially of the same magnitude and said individual power supply units have essentially the same internal resistances, said switching schedule causing additional individual power supply units to be switched in consecutively at the beginning of a sector in response to an increase in the momentary value of magnitude of the modulated voltage signal and causing individual power supply units to be consecutively switched off at the end of a sector in response to a reduction in the momentary value of the magnitude of the modulated voltage signal.

4,730,168

CMOS OUTPUT STAGE WITH LARGE VOLTAGE SWING AND WITH STABILIZATION OF THE QUIESCENT CURRENT

Daniel Senderowicz, Berkeley, Calif., and Germano Nicollini, Piacenza, Italy, assignors to Sgs Microelettronica SpA, Agrate Brianza, Italy

Filed Aug. 14, 1986, Ser. No. 896,205
Claims priority, application Italy, Sep. 18, 1985, 22181 A/85
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **2 Claims**

1. A large swing CMOS output buffer, for producing an amplified output signal at an output terminal thereof in accordance with a signal supplied to an input terminal thereof, said buffer comprising:

a pair of push-pull, common-drain connected, complementary output MOS transistors, said common-drain node of said pair of output transistors constituting said output terminal of said buffer;

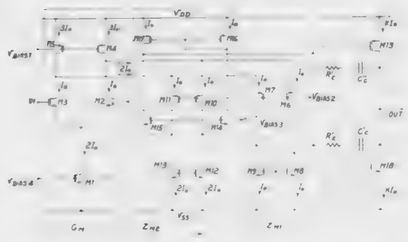
an input differential stage, having a first input constituting said input terminal of the buffer and having a second input connected to said output terminal of said buffer for providing a direct negative feedback path, said input stage producing output signals at differential stage output termi-

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nals in accordance with said signal supplied to said input terminal;

two parallel gain stages, each having two differential input terminals respectively coupled to said differential stage output terminals for producing an output signal at a respective gain stage output terminal in accordance with said output signals of said input differential stage;

said output terminals of said two parallel gain stages being connected, respectively, to the gate of one of said two



complementary output MOS transistors forming said push-pull pair and, through a local compensation network comprising a resistor and a capacitor connected in series, to said output terminal of said buffer;

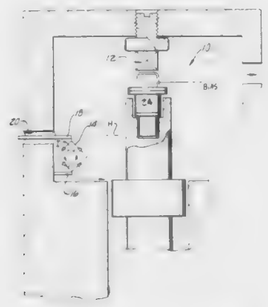
said input differential stage, said two parallel gain stages and said direct connection of said buffer's output terminal to said second input of said input differential stage constituting two parallel feedback loops each providing a direct negative feedback for driving one of said two complementary output transistors.

4,730,169

INJECTION LOCKING AND TUNING CIRCUIT FOR MICROWAVE DIODE OSCILLATOR

Hsiu Y. Li, Sepulveda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1986, Ser. No. 895,982
Int. Cl.[4] H03B 9/14; H03L 7/24
U.S. Cl. 331—36 C **20 Claims**



1. A microwave oscillator comprising:

a cavity;

an oscillator diode coupled to said cavity for producing microwave oscillations in said cavity;

a four-diode bridge positioned in said cavity for injecting signals into said cavity; and

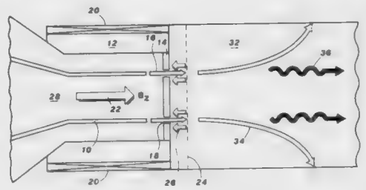
a means for applying a predetermined injection signal to said diode bridge for injection into said cavity, said injection signal cooperating with said oscillations in said cavity to control the frequency of said oscillations.

4,730,170

VIRTUAL CATHODE MICROWAVE GENERATOR HAVING ANNULAR ANODE SLIT

Thomas J. T. Kwan, and Charles M. Snell, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 31, 1987, Ser. No. 32,262
Int. Cl.[4] H03B 9/01; H01J 25/74
U.S. Cl. 331—79 **5 Claims**



1. A microwave generator using an oscillating virtual cathode, comprising:

a cathode for emitting electrons;

an anode for accelerating emitted electrons from said cathode, said anode having an annular slit therethrough effective for forming said virtual cathode and having at least one range thickness relative to electrons reflected from said virtual cathode; and

magnet means for producing a magnetic field having a field strength effective to form an annular beam from said emitted electrons in substantial alignment with said annular anode slit and to enable said electrons reflected from said virtual cathode to axially diverge from said annular beam;

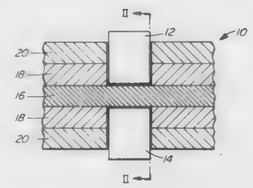
wherein said reflected electrons returning toward said cathode diverge from said annular beam and are absorbed by said anode to substantially eliminate electrons reflexing between said cathode and said virtual cathode.

4,730,171

OPTICAL SIGNAL MODULATORS

Vincent C. So; Paul J. Vella, and Richard P. Hughes, all of Edmonton, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 28, 1986, Ser. No. 856,887
Int. Cl.[4] G02F 1/34; G02B 5/14
U.S. Cl. 332—7.51 **11 Claims**



1. An optical signal modulator comprising:

an optical fiber, comprising a core and a cladding, for carrying an optical signal to be modulated;

an interruption in said cladding, the core being continuous at said interruption;

an electro-optic crystal of a tetragonal phosphate material disposed at said interruption; and

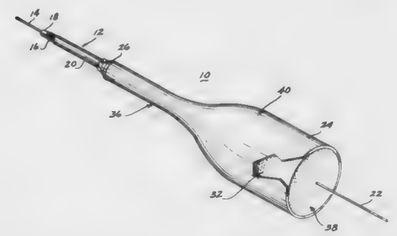
means for applying a modulating electric field to the electro-optic crystal to vary the refractive index thereof, thereby to modulate the optical signal.

4,730,172

LAUNCHER FOR SURFACE WAVE TRANSMISSION LINES

Greg A. Bengeult, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1986, Ser. No. 913,774
Int. Cl.[4] H01P 5/10, 3/10
U.S. Cl. 333—26 **6 Claims**



1. A signal launcher for coupling signals between a coaxial cable and a surface wave transmission line, said coaxial cable including a substantially cylindrical outer conductor and a concentrically contained inner conductor with one end of said inner conductor being electrically connected to a first end of said surface wave transmission line, said signal launcher being of horn-shaped geometry of substantially circular cross section and being formed of electrically conductive material, said launcher having a first end of predetermined diameter that is adapted for electrical connection to said coaxial cable outer conductor at the interface between said coaxial cable and said surface wave transmission line with said surface wave transmission line extending axially through said signal launcher in substantial coincidence with the axial centerline of said signal launcher, the diameter of said launcher increasing with axial distance away from said first end of said launcher to establish a relationship between the impedance of said signal launcher and axial distance along said signal launcher that corresponds to a Chebyshev impedance taper.

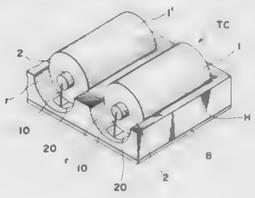
4,730,173

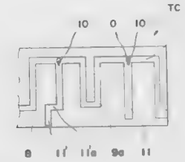
ASYMMETRICAL TRAP COMPRISING COAXIAL RESONATORS, REACTANCE ELEMENTS, AND TRANSMISSION LINE ELEMENTS

Kikuo Tsunoda, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Continuation of Ser. No. 623,763, Jun. 20, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 871,173
Claims priority, application Japan, Jun. 23, 1983, 58-113892
Int. Cl.[4] H01P 1/202
U.S. Cl. 333—206 **3 Claims**

1. An asymmetrical trap which comprises a plurality of dielectric material coaxial resonators, each of said resonators including a solid dielectric member provided between inner and outer conductors, at least one reactance element inserted between the inner conductor of a respective one of said plurality of coaxial resonators and an ungrounded conductor of a first signal transmission line, said first signal transmission line having said ungrounded conductor and another conductor, said outer conductor of said respective one of said plurality of coaxial resonators and said another conductor of said first signal transmission line being grounded so as to thereby produce a series resonance at a first frequency through the combination of said respective reactance element and said respective one of said plurality of coaxial resonators, and a second transmission line having one ungrounded conductor and having another conductor which is grounded, said second transmission line having one end of said ungrounded conductor connected to the connection junction between said ungrounded conductor of said first signal transmission line and said respective reactance element, said second transmission line having a selected length and having another end of said ungrounded conductor terminated such that anti-resonance is produced at a second frequency through the combination of said respective reactance element, said respective one of said plurality of coaxial resonators and said second transmission line;





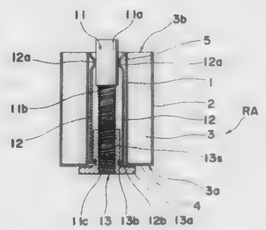
wherein said first transmission line comprises a connection strip having a portion folded into a U-shaped and wherein said ungrounded conductor of said first transmission line has a portion folded into an L-shape of a predetermined length and wherein said second tranmission line is connected to said respective one of said plurality of coaxial resonators.

4,730,174

DIELECTRIC MATERIAL COAXIAL RESONATOR WITH IMPROVED RESONANCE FREQUENCY ADJUSTING MECHANISM

Toshio Nishikawa, Nagaokakyo; Koji Saito, and Toshiro Hiratsuka, both of Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Continuation of Ser. No. 608,082, May 8, 1984, abandoned. This application Dec. 18, 1986, Ser. No. 942,057
Claims priority, application Japan, May 10, 1983, 58-70014
Int. Cl.[4] H01P 7/04
U.S. Cl. 333—224 **7 Claims**



1. A frequency adjustable dielectric material coaxial resonator comprising:

an elongated dielectric material member having an outer wall surface and opposite end faces and a central longitudinal axis extending in the direction between said opposite end faces and an axial bore extending through said member along said axis;

an inner electric conductor formed on the inner wall surface

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of said bore and terminating at end faces of said dielectric material member;

an outer electrical conductor formed on the outer wall surface of said dielectric material member and terminating at said one end face and a conductive layer on the other end face electrically connecting said inner and outer conductors, said dielectric material member and said electric conductors defining a resonant system; and

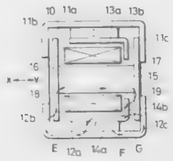
a resonance frequency adjusting mechanism insertable as a unit into said bore within said inner conductor and having a displacing mechanism located adjacent said other end face of said dielectric material member, said displacing mechanism having a fixed member fixed relative to said inner conductor and a movable member movable therein, a resonance frequency adjusting member having an elongated shape with an outer peripheral surface and mounted on said movable member and fitted loosely within said bore and projecting out of the end of said bore at the one end face of said dielectric material, said movable member being adjustable for axially moving said adjusting member for moving the end which is toward said one end of said dielectric member out of said resonant system thereby altering the resonance frequency of said resonator, and springs of electrically conductive material mounted on said fixed member of said displacing mechanism and extending along the inner surface of said inner electrical conductor and firmly electrically contacting said inner surface of said inner electrical conductor at at least one point therealong and having free ends contacting the outer peripheral surface of said resonance frequency adjusting member under pressure at at least one point in the vicinity of the one end face of said dielectric material member for providing an electric contact therebetween and firmly supporting said resonance frequency adjusting member substantially axially with respect to said bore, said resonance frequency adjusting member being slidable along said free ends when moved by said movable member.

4,730,175

POLARIZED ELECTROMAGNET DEVICE

Haruo Ichikawa, and Takato Hirota, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 6, 1987, Ser. No. 46,451
Claims priority, application Japan, Jun. 2, 1986, 61-127655
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—230 **5 Claims**



1. A polarized electromagnet device comprising

first and second outer magnetic yoke means;

first and second inner magnetic yoke means;

a first permanent magnet disposed in an abutting relationship between said first outer and inner yoke means;

a second permanent magnet disposed in an abutting relationship between said second outer and inner yoke means;

a magnetic coil disposed between said first and second inner yoke means, said coil having a first end and a second end and being adapted to receive a voltage selectively applied thereto;

a first non-magnetic plate adjacent to said first and second outer yokes and proximate said first end of said magnetic coil;

a second non-magnetic plate adjacent to said first and second outer yokes and proximate said second end of said magnetic coil, each of said first and second inner magnetic yoke means including a corresponding portion extending between said second end of said magnetic coil and said second non-magnetic plate; and

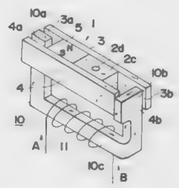
magnetic block means having a body passing through said magnetic coil, a first end, and a second end, said block means operative between a first state wherein said second end of said block means is in a contacting relationship with said second plate when no voltage is applied to said magnetic coil and a second state wherein said first end of said block means is in a contacting relationship with said first plate when voltage is applied to said magnetic coil, said first and second inner magnetic yoke means in said first state establishing a first magnetic circuit where the magnetic flux flows from said permanent magnets in one direction to said outer yoke means to said block means to said inner yoke means back to said permanent magnets and a second magnetic circuit where the magnetic flux flows from said permanent magnets in the other direction to said outer yoke means to said inner yoke means back to said permanent magnets.

4,730,176

ELECTROMAGNET HAVING A PIVOTED POLARIZED ARMATURE

Kenichi Matsuo; Muneo Nakata; Kazuhiro Oota; Mitukazu Hori; Tooru Oohara, and Makoto Yazawa, all of Iida, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 10, 1987, Ser. No. 13,296
Claims priority, application Japan, Feb. 10, 1986, 61-27436; Mar. 17, 1986, 61-39408[U]
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—230 **3 Claims**



1. An electromagnet device comprising:

a movable assembly supported swingably and having two magnetic plates which are arranged so as to face each other with a predetermined interval and a permanent magnet arranged between said two magnetic plates, each of said magnetic plates having operating portions in which magnetic poles appear at both end portions of said magnetic plate; and

a core having two end portions and around which a coil is wound, both of said end portions being arranged so as to respectively face said operating portions of said magnetic plates,

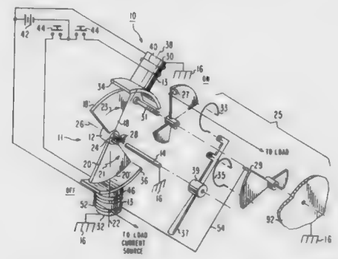
wherein at least one of the operating portions which faces at least one of said end portions of said core is formed at the edge surface of the magnetic plate.

4,730,177

SHOCK AND VIBRATION RESISTANT MAGNETICALLY OPERATED ACTUATOR

Joseph F. McSparran, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 16, 1986, Ser. No. 874,455
Int. Cl.[4] H01F *7/08, 7/14*
U.S. Cl. 335—272 **13 Claims**



1. A shock and vibration resistant magnetically operated actuator comprising:

a pair of nonmagnetized magnetically responsive elements secured to each other in fixed spaced relation for rotation about an axis passing through the combined mass center of gravity of the elements, sid elements being angularly spaced relative to each other about said axis;

a pair of coil means fixed in angular spaced relation about said axis, each coil means corresponding to and adjacent to a different element, each coil means for creating a magnetic field adjacent thereto in response to an applied current, each coil means being spaced from its corresponding element so that it is always magnetically coupled to that element when energized, the angular spacing of the coil means being different than the angular spacing of the elements to each other about said axis so that one coil means and its element are magnetically aligned and the other coil means and its element are magnetically misaligned, the misalignment being such that when the misaligned coil means is energized, its element, in response to that coil means's field, tends to rotate into alignment with that coil means and the other element tneds to rotate into misalignment with its coil means; and

circuit means for receiving a magnetic field inducing current and for selectively applying said received current to each said coil means.

4,730,178

BOBBINS COILS WITH TERMINAL HOUSING

William F. Gunnels, Hendersonville; Candler A. Willis, and Mitchell M. Osteen, both of Zirconia, all of N.C., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 912,676, Sep. 25, 1986, which is a continuation of Ser. No. 652,233, Sep. 19, 1984, abandoned. This application Aug. 31, 1987, Ser. No. 91,562
Int. Cl.[4] H01F *15/10*
U.S. Cl. 336—192 **5 Claims**

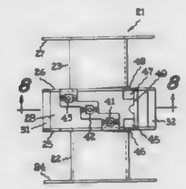
1. A multiple bobbin of insulating material supporting electrical coils wound thereon comprising:

physically spaced apart drum-like coil support portions surrounding a winding axis each with side flanges extending radially outward relative to said axis,

bridging sections extending between the inner flanges of said coil support portions,

a terminal housing on a bridging section having walls projecting outwardly beyond the rims of the flanges and a slot located in the flange's rim at a position which leads into the first layer of the wound electrical coil on said support portion, said slot having a bottom in said flange and an outwardly extending side which is continuously curved into an end wall which is perpendicular to said flange, said terminal housing having spaced apart inner walls which are downwardly sloped toward each other to define an inwardly extending terminal-receiving cavity,

a wire having a section constituting the initial portion of said first layer of the wound coil disposed in said cavity and



coiled about said support portion, the sloped walls of said cavity disposing said initial portion of said wire in a substantially circumferential direction about said axis and said initial portion of said wire being an excursion beyond said flange in a manner corresponding generally to a turn of coiling in the support portions, and

a pressure-applying terminal accommodated by said cavity in coupling relationship to said wire.

4,730,179

VOLTAGE NON-LINEAR RESISTOR AND ITS MANUFACTURE

Masami Nakata, Aichi, and Osamu Imai, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 028,394, Mar. 20, 1987. This application Jul. 31, 1987, Ser. No. 80,006
Claims priority, application Japan, Nov. 28, 1986, 61-282139
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—20 **6 Claims**

1. A voltage non-linear resistor comprising a disc-like voltage non-linear resistance element and a thin insulating covering layer integrally provided on a peripheral side surface of said disc-like element, wherein said element comprises zinc oxides as a main ingredient, 0.1–2.0 mol. % bismuth oxides calculated as Bi_2O_3, 0.1–2.0 mol. % cobalt oxides calculated as Co_2O_3, 0.1–2.0 mol. % manganese oxides calculated as MnO_2, 0.1–2.0 mol. % antimony oxides calculated as Sb_2O_3, 0.1–2.0 mol. % chromium oxides calculated as Cr_2O_3, 0.1–2.0 mol. % nickel oxides calculated as NiO, 0.001–0.05 mol. % aluminum oxides calculated as Al_2O_3, 0.005–0.1 mol. % boron oxides calculated as B_2O_3, 0.001–0.05 mol. % silver oxides calculated as Ag_2O and 7–11 mol. % silicon oxides calculated as SiO_2, and said layer comprises 45–60 mol. % silicon oxides calculated as SiO_2, 30–50 mol. % zinc oxides calculated as ZnO, 1–5 mol. % bismuth oxides calculated as Bi_2O_3 and antimony oxides for the remainder.

4,730,180

HOSE PAYOUT ALARM SYSTEM

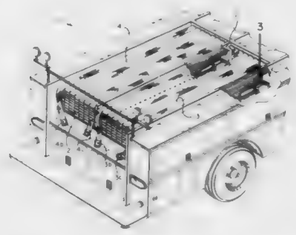
Gary L. Riddell, 825 Drake St., P.O. Box 370040; Rolf W. Loeffler, P.O. Box 524, 498 Eighth St., both of Montara, Calif. 94037, and Gary R. Kennedy, 2145 Carlos St., Moss Beach, Calif. 94038

Filed Apr. 7, 1986, Ser. No. 848,793
Int. Cl.[4] B60Q *1/00;* **G08B** *21/00*
U.S. Cl. 340—52 R **4 Claims**

1. A hose laying vehicle, said vehicle having a hose bed, a length of fire hose folded in loops and lying in said hose bed in a manner disposing both ends of said hose at a common end of said bed, a hose payout alarm system carried by said vehicle for use in alerting the vehicle operator of the imminent discharge of the end of hose being paid out, said system comprising an

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electrically operated warning device disposed near the operator, means forming an electric circuit for operating said warning device, switch means in said circuit, said switch means having a removable element of insulating material normally disposed in a manner to provide an interruption in said circuit with said element installed and to complete the circuit via said



switch means when said element is removed from said switch means, means coupling said element to a given one of said loops of hose near the bitter end thereof, said given one of said loops serving to tug on said coupling so as to withdraw said element when said given one of said loops of hose is paid out, withdrawal of said element serving to permit said switch means to complete said circuit to activate said warning device.

4,730,181
EARLY WARNING SIGNAL SYSTEM
Oscar L. Perkins, R. 1, Box 779, Hereford, Ariz. 85615
Filed Feb. 4, 1987, Ser. No. 10,773
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—71 **7 Claims**



1. A deceleration signal system for an automotive vehicle adapted for cooperative association with an accelerator rod extending between a proximal extremity engaging an accelerator pedal and a distal extremity joined to a carburator linkage, said system comprising

A. switch means comprised of first and second electrical contacts:

(1) said first contact being fixedly associated with said accelerator rod and having the ability to move therewith in its reciprocal movement as the driver of said vehicle periodically depresses and releases the accelerator pedal which motivates the accelerator rod,

(2) said second electrical contact being comprised of a bolt having a contact extremity and an adjusting extremity, said bolt being threaded through a rigid, stationary electrically conductive bracket having a straight arm which disposes said bolt in a parallel relationship to said accelerator rod while directing the contact extremity toward said first contact, said bracket being mounted directly to the engine of said vehicle,

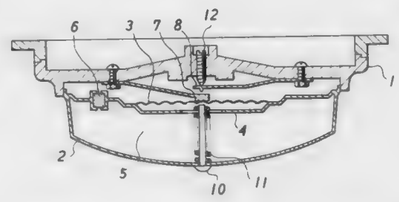
B. a third electrical contact comprised of a strip of flat spring steel having an upper extremity disposed within the path of travel of the carburator linkage, and a lower extremity mounted upon the engine but electrically insulated therefrom, whereby an acceleration of said vehicle causes the carburator linkage to make electrical ground contact with the upper extremity of said spring,

C. a warning light facing rearward in said vehicle, said light having a negative terminal which is connected to said first electrical contact via an insulated conductive wire, such that an electrical circuit is completed and the light illuminates when the distal extremity of said accelerator rod returns to its forward position by virtue of the driver's lifting of his foot from said accelerator pedal,

D. a buzzer operable on 12 volt direct electrical current and having a negative terminal connected to said third electrical contact via an insulated conductive wire in a manner such that a circuit is completed, and

E. a DPST switch positioned adjacent the driver, said switch controlling a flow of direct current from said vehicle's electrical supply to either said light or said buzzer, depending upon switch position.

4,730,182
COMBINATION HEAT-SENSING FIRE DETECTOR
Seiji Tsubouchi, Tokyo, Japan, assignor to Nittan Company, Tokyo, Japan
Filed Apr. 8, 1986, Ser. No. 849,567
Claims priority, application Japan, Apr. 11, 1985, 60-52867[U]
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—593 **2 Claims**



1. A combination heat-sensing fire detector comprising an air chamber composed of a cup-shaped heat-sensing plate, a diaphragm support frame covering the opening of the cup-shaped heat-sensing plate and a diaphragm which is secured to the central opening of the diaphragm support frame, said air chamber is secured to a base plate of a non-conductive material which can be secured to a ceiling or wall by conventional securing means, wherein the diaphragm support frame is provided with a leak hole which is a pinhole or a small opening packed with a porous material, an electric contact point is provided at the center of the diaphragm so that the contact point is closed when the diaphragm is deformed and displaced outward, a pin made of a material having high thermal conductivity is secured at the center of the heat-sensing plate so as to project toward the center of the diaphragm and a coil made of a shape memory effect alloy the inside diameter of which corresponds to the diameter of the pin and the length of which is at least more than half of the length of the pin is mounted on and surrounding the pin.

4,730,183
MULTIPLE-MODE DATA ACQUISITION SYSTEM
Wayne D. Crowe, Houston, Tex., assignor to Ferranti Subsea Systems, Ltd., London, England
Filed Dec. 10, 1984, Ser. No. 680,402
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—870.16 **15 Claims**

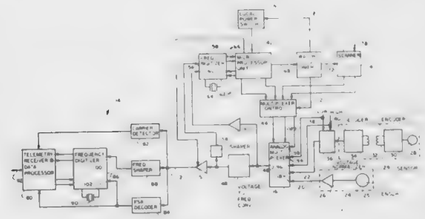
1. A multiple-mode system for acquisition and processing of data over a plurality of channels from a plurality of sources comprising:

switching means having a plurality of addressable input ports and an output port, for connecting input signals occurring at selectively addressed ones of said input ports to said output port, a first plurality of said input ports being connectable to receive input signals exhibiting a first signal format and having a voltage amplitude indicative of acquired data, and a second plurality of said input ports being connectable to receive input signals exhibiting a second signal format within a first frequency band and having a frequency indicative of acquired data;

first converter means for changing said input signals exhibiting said first signal format from said output port into a first plurality of variable signals within a second frequency band when said output port is connected to said input ports, said variable signals exhibiting frequencies proportional to the voltage amplitudes of said input signals occurring at said input ports;

second converter means receptively coupled to said first converter means and said switching means for selectively changing said first plurality of variable signals within said second frequency band and said input signals exhibiting said second signal format within said first frequency band into digital signals;

first processing means connected between said second converter means and said switching means for sequentially



addressing said input ports to selectively couple said input ports to said output port, for controlling operation of said second converter means, for storing and processing said digital signals, and for encoding said digital signals as a second plurality of variable signals within said second frequency band by alternately addressing selected ones of said input ports;

transmitter means periodically enabled by said first processing means and receptively coupled to said first plurality of variable signals from said first converter means for transmitting said second plurality of variable signals within said second frequency band while enabled;

detection means remotely located from and responsively coupled to said transmitter means for generating an indication signal in response to reception of a transmitted signal within said second frequency band;

decoding means remotely located from and operatively coupled to said transmitter means for providing digital data in response to reception of said second plurality of transmitted variable signals within said second frequency band; and

second processing means remotely located from said first processing means and responsively coupled to said detection and decoding means for processing said digital data.

4,730,184
NEIGHBORHOOD AUDIO-VISUAL ALARM SYSTEM
Arthur Bach, 829 N. 10th Ave., Phoenix, Ariz. 85007
Filed Nov. 25, 1985, Ser. No. 801,192
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—691 **15 Claims**

1. An alarm system for protecting a dwelling comprising:

a source of electrical energy;

means for generating an audible alarm signal;

means for generating a visual alarm signal;

means for supplying said electrical energy to said signal-generating means;

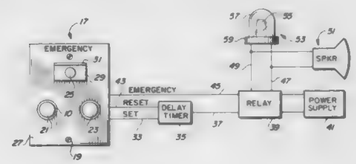
manually-operable means located within a dwelling to be protected for generating a trigger signal;

relay means operatively coupling said source of electrical energy to said alarm signal-generating means, said relay means being normally open to disconnect said source of electrical energy from said alarm signal-generating means and being responsive to the generation of said trigger signal for closing to connect said source of electrical energy to said alarm signal-generating means for turning on both said audio and visual alarm signals;

said manually-operable means including a manually-operable switch panel operatively disposed on an interior surface of the dwelling;

said switch panel including a first manually-operable switching means for initiating a predetermined time delay;

means responsive to the expiration of said predetermined time delay for generating said trigger signal;



reset switch means for resetting said first switch means to its initial condition and resetting said predetermined time delay period to zero; and

an emergency switch means for immediately generating said trigger signal without waiting for said predetermined time delay to elapse;

said alarm signal-generating means including:

a means for operatively engaging an electrical receptacle;

means for supplying electrical energy thereto;

means for generating an audible signal, said audible signal-generating means including a housing being integral with said means for engaging an electrical receptacle; said housing including an electrical light receptacle; and

illumination means adapted to be operatively received within said electric light receptacle of said housing for supplying said electrical energy to said illumination means, said illumination means further including a protective covering for operatively shielding said illumination means from breakage.

4,730,185
GRAPHICS DISPLAY METHOD AND APPARATUS FOR COLOR DITHERING
Richard A. Springer; Pavel Houda, both of Tualatin, and Rodney B. Belshee, Tigard, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Jul. 6, 1984, Ser. No. 628,693
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—701 **12 Claims**

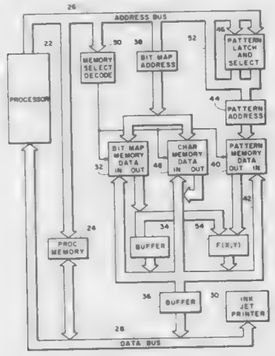
1. A graphics display apparatus including means for portraying pixels of a display on a viewable surface, and bit map memory means for storing configurations of said pixels for display, said graphics display apparatus further comprising:

means for addressing locations in said bit map memory means in accordance with a configuration the display of which is desired,

pattern memory means also responsive to said means for addressing, said pattern memory means storing plural repeatable patterns each descriptive only of color com-

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prising a plurality of pixels substantially smaller than a display,



and means for coupling pixel information data from said pattern memory means to said bit map memory means at corresponding addresses.

4,730,186

INPUT INTEGRATED FLAT PANEL DISPLAY SYSTEM

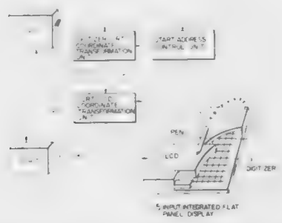
Kazuyoshi Koga; Yasushi Fukunaga, both of Hitachi; Soshiro Kuzunuki, Katsuta, and Ryo Fujita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 724,925

Claims priority, application Japan, Apr. 20, 1984, 59-78507; Aug. 15, 1984, 59-169353

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—708 **12 Claims**



1. An input integrated flat panel display system comprising:
an input integrated flat panel display device having an integrated structure, including input means for inputting handwritten data in the form of characters, graphics, and points and a flat display panel integrally combined with said input means for displaying display point data corresponding to handwritten data input through said input means;
processing means for recognizing whether the display point data relates to characters or graphics and for providing the display point data to the flat display panel for display;
large screen frame memory means coupled between said display device and said processing means for storing display point data for display on a large screen having a larger display area than that of said flat display panel;
register means responsive to said input means for storing a start address indicative of a portion of said display point data for the large screen which is to be displayed on said flat panel display;
transformation control means connected to said register means for transforming said input handwritten data into display point data for display on a large screen and for transferring said display point data to said processing device based upon the start address from said register means; and
display control means responsive to said start address from said register means, for extracting a portion of said display point data from said large screen frame memory means for display on said flat display panel and for transforming said portion of data into display point data for said flat display panel.

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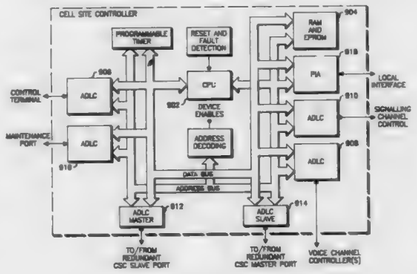
INTERFACE METHOD AND APPARATUS FOR A CELLULAR SYSTEM SITE CONTROLLER

Barry J. Menich, Chicago; Daniel E. Wood, Algonquin; Daniel R. Tayloe, Rolling Meadows; Jeff D. Bonta, Arlington Heights, and Valy Lev, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 18, 1986, Ser. No. 830,390

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.5 **13 Claims**



1. A method for message and control interface between a cell site controller and a plurality of peripheral devices having a message data port and a control data port, comprising the steps of:
enabling one of the plurality of peripheral devices via an independent enable line;
muting said message data port at said enabled one of the plurality of peripheral devices in response to said enabling;
transmitting a control data message to said enabled one of the plurality of peripheral devices via the control data port;
receiving a copy of said control data message transponded from said enabled one of the plurality of peripheral devices via the control data port; and
disenabling said one of the plurality of peripheral devices thereby unmuting said message data port.

4,730,188

IDENTIFICATION SYSTEM

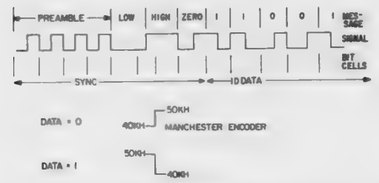
Thomas A. Milheiser, Littleton, Colo., assignor to Identification Devices, Inc., Boulder, Colo.

Continuation of Ser. No. 580,401, Feb. 15, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,492

Int. Cl.⁴ H04Q *1/00*

U.S. Cl. 340—825.0 **39 Claims**

1. An object identification system, comprising:
an interrogator comprising means for sending a continuous interrogation signal and means for detecting a responsive identification signal, and
a transponder comprising means for detecting said interrogation signal and for transmitting an identification signal in response to said detection,
wherein said identification signal extends over a plurality of bit cells of equal length in time, and comprises a preamble portion having a specified number of bit cells and an identification portion having a specified number of bit cells, and a further encoded portion having a specified number of bit cells having a predetermined signal content interposed between said preamble portion and said identification portion; and



wherein said preamble and identification portions of said identification signal are transmitted according to a first format in which a signal transmission parameter is varied between first and second values during each of said bit cells, and wherein said further encoded portion is transmitted according to a second format in which said identification signal is transmitted without variation in said transmission parameter for a period at least equal to one bit cell.

4,730,189

PULSE DOPPLER RADAR WITH VARIABLE PULSE REPETITION FREQUENCY

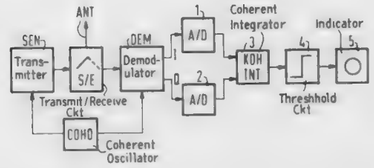
Harald Siegel, Gauting, and Rudolf Hauptmann, Dachau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,261

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321264

Int. Cl.⁴ G01S *13/52*

U.S. Cl. 342—104 **6 Claims**



1. A pulse Doppler radar system with variable pulse repetition frequency comprising:
means for staggering the periods of pairs of successive received reflected pulses according to the dimensioning $n\cdot(\overline{PRT}+(-1)^n\cdot\Delta T)$ wherein n is the number of a particular pulse in a transmission sequence, $\overline{PRT}$ is the mean value for the periods of the pulses, and ΔT is a selected constant fraction of said mean value for the periods of the pulses;
means for undertaking modified coherent integration of said received reflected pulses by vectorial addition thereof, said means for taking modified coherent integration including means for forming a mean value of the frequencies of said pairs of pulse repetition frequencies, which mean value is constant, and means for generating an indicator reference for the reflected pulses which is a constant value such that the phase condition for undertaking said coherent integration is satisfied after every second pulse repetition frequency.

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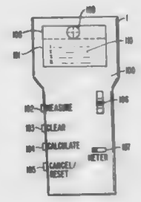
HAND-HELD MEASURING DEVICE

Leslie A. Win, San Francisco, Calif., and Wai Chi Wilkie Lam, Causeway Bay, Hong Kong, assignors to Winlam Company, San Francisco, Calif.

Filed Oct. 29, 1986, Ser. No. 924,390

Int. Cl.⁴ G01S *13/08*

U.S. Cl. 342—118 **9 Claims**



1. A portable, hand-held measurement device, comprising:
transmitter means to transmit a signal at a target object;
receiver means to receive a reflection of the signal reflected from the target object;
processor means operably coupled to the transmitter and receiver means to obtain a measurement value, the processor means having storage means for storing pluralities of the measurement values and calculation means for calculating areas and volumes from the stored pluralities of measurements;
display means coupled to the processor means for selectively displaying the measurement values and calculated areas and volumes; and
viewfinder means for aiming the device at a target, the viewfinder means being disposed so as to project the target image onto the display means.

4,730,191

RADAR SIMULATION

Harald Groebke, Salem, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,511

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408404

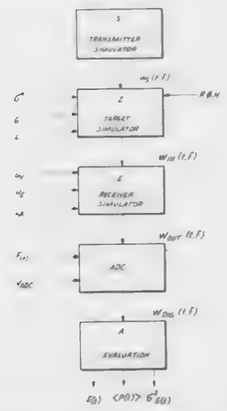
Int. Cl.⁴ G01S *7/40*

U.S. Cl. 342—169 **6 Claims**

1. Method for computer aided simulation of complete radar systems under evaluation of the instantaneous power and frequency information of such systems, comprising the steps of:
using a simulator signal representing the instantaneous time and frequency variable power spectrum of the transmitter of a radar system to be simulated;
modifying said simulator signal in accordance with an expected propagation and spreading path, said path also to be simulated, and, in addition modifying said simulator signal in accordance with expected preselected target properties to be simulated accordingly;
modifying the previously modified signal in accordance with particular properties characteristical of the receiver of the radar system to be simulated;
modifying the signal as modified in accordance with the preceeding receiver simulating step, including digitization and under utilization of the characteristics of signal pro-

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cessing components connected to the receiver and to be simulated accordingly; and



calculating statistical moments of the first and second order of the resulting signal and indicating the same.

4,730,192

MONITOR FOR AN ELECTRONIC TACAN BEACON

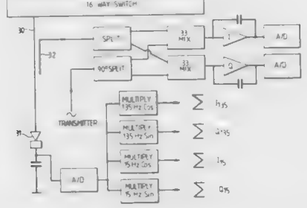
Francis G. Overbury, Cuffley, England, assignor to International Standard Electric, New York, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,237

Claims priority, application United Kingdom, Mar. 23, 1984, 8407605

Int. Cl.⁴ G01S *1/30*

U.S. Cl. 342—399 **16 Claims**



1. A monitoring apparatus for an electronic Tacan beacon transmitter operating at a given transmitted frequency in which the rotating field patterns are produced by electronic commutation of a static antenna array comprising a plurality of individual antenna elements in a circular array which array generates a far field pattern by having selected groups of said elements in said plurality radiating simultaneously, said monitoring apparatus operative to monitor each antenna element in said array to determine a proper far field pattern comprising:

commutating switch means having a plurality of identical selectable switching paths each separate one associated with one antenna element, with each path coupled to a common output lead and means for selecting any one of said paths to provide an antenna element signal on said common output lead indicative of the radiated field from said associated antenna element;

correlation means coupled to said output lead to provide an I & Q signal according to said transmitted frequency to provide an output indicative of the phase of said transmitted signal over a given period as provided by each of said antenna elements with said output indicative of said far field pattern and whereby a non-operative element can be determined according to said transmitted phase.

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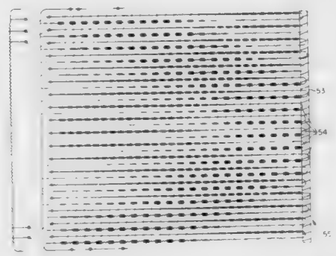
MICROSTRIP ANTENNA BULK LOAD

Leonard Schwartz, Montville; James B. Mead, Brookside, both of N.J., and Emile J. Deveau, Pleasantville, N.Y., assignors to The Singer Company, Montvale, N.J.

Filed Mar. 6, 1986, Ser. No. 836,897

Int. Cl.⁴ H01Q *1/38*

U.S. Cl. 343—700 MS **14 Claims**



1. A microstrip antenna including first and second antenna apertures for reducing image beams to an acceptable level, the antenna comprising:

a plurality of parallel first arrays, corresponding to the first antenna aperture, located in spaced coplanar relation;

a corresponding plurality of parallel second arrays, corresponding to the second antenna aperture, positioned in coplanar interleaved relation with the first arrays; each of the second arrays being connected, at a first end, to a first end of a corresponding adjacent first array;

first feed means connected to respective second ends of the first arrays for delivering power thereto;

second feed means connected to respective second ends of the second arrays for delivering power thereto; and

an absorber means placed in intimate contact with the connected first ends of the first and second arrays, thereby signficantly reducing reflected residual power in the arrays.

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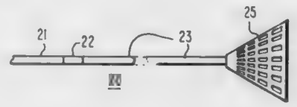
AIRBORNE TRANSMITTING ANTENNA AND METHOD FOR DEPLOYING SAME

Nelson B. Tharp, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1985, Ser. No. 746,893

Int. Cl.⁴ H01Q *1/30*

U.S. Cl. 343—707 **6 Claims**



1. In combination with an aircraft means of predetermined flight pattern capabilities and which is operable to transmit vertically polarized electromagnetic signal energy said energy having a predetermined frequency; said aircraft means including a transmitting means for said electromagnetic energy, and an elongated one piece cable-antenna means, said cable-antenna means having a free end, and predetermined length, weight, density and electrical characteristics; a reel means fixed within said aircraft upon said reel means, said cable-antenna means is adapted to be dispensed; and a drogue means affixed to said free end of said cable-antenna means;

wherein when said aircraft is in an orbiting flight pattern and said cable-antenna means is dispensed by said reel means, the majority of said cable-antenna means will hang vertically from said aircraft;

wherein the improved cable-antenna means is operable to transmit vertically polarized electromagnetic energy having a predetermined frequency greater than 30 kHz to be transmitted from said aircraft;

wherein said cable-antenna means is formed of separate joined, non-jointed sections, further said cable-antenna means has a uniform unbroken, uninterrupted, unsegmented exterior diameter from the entire length of said cable-antenna means at least one of said cable-antenna means sections positioned furthest from said aircraft means when said cable-antenna means is dispensed by said reel means, said cable-anntena means section furthest from said aircraft means comprising a non-radiating portion, and the other of said cable-antenna means sections comprising an electromagnetic energy signal radiating portion, further said reel means operable to dispense a predetermined length of said cable-antenna means including a predetermined length of said radiating portion of said cable antenna means, and the dispensed portion of said signal radiating portion of said cable-antenna means having a length which approximates one-half wavelength of said predetermined frequency desired to be transmitted.

4,730,195

SHORTENED WIDEBAND DECOUPLED SLEEVE DIPOLE ANTENNA

James P. Phillips, Lake in the Hills, and Henry L. Kazecki, DesPlaines, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,633

Int. Cl.⁴ H01Q *9/18*

U.S. Cl. 343—792 **14 Claims**

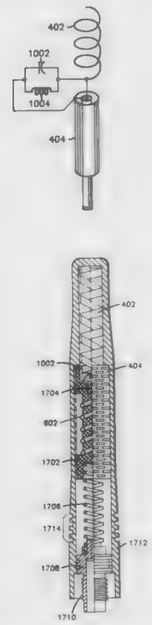
1. A wideband shortened decoupled sleeve dipole antenna comprising:

a helically wound first radiating element tuned to a center resonant frequency and having first and second opposing ends and a central axis;

a cylindrical second radiating element tuned to said center resonant frequency and having first and second opposing ends and a central axis, said first end of said second radiating element disposed adjacent to said first end of said first radiating element and said second radiating element central axis essentially collinear with said first radiating element central axis;

a coaxial transmission line of a predetermined impedance disposed within said second radiating element, said transmission line helically wound about said second radiating element axis, and having first and second opposing ends, the outer conductor of said coaxial transmission line at said first end coupled to said first end of said first radiating element and the inner conductor of said coaxial transmission line at said first end coupled to said first end of said first radiating element, and said second end of said coaxial transmission line, adapted to couple to an antenna utilization means, emanating from said second end of said second radiating element; and

a matching network, coupled to said coaxial transmission line at said first end, tuned to said center resonant frequency, and having reactive impedance components at frequencies above and below said center resonant frequency, to substantially impedance match said coaxial transmission line impedance to the impedance of said first and second radiating elements at said center resonant frequency and at frequencies a predetermined amount above and below said center resonant frequency.



4,730,196

INK-JET PRINTER

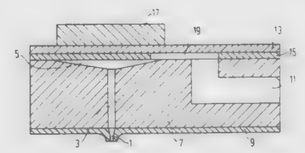
Johannes van Esdonk, Eindhoven, Netherlands; Michael Döring, Hamburg, and Jan Roulaux, Kirchen-Frensburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 880,400, Jun. 30, 1986, abandoned. This application Mar. 26, 1987, Ser. No. 31,220

Claims priority, application Netherlands, Jul. 1, 1985, 8501881

Int. Cl.⁴ G01D *15/18*; B41J *3/04*

U.S. Cl. 346—140 R **1 Claim**



1. An ink-jet printer including at least one ink-jet nozzle, a body with a pressure chamber recessed therein, an ink drain channel connecting said nozzle to said pressure chamber, an ink feed channel, a narrow passage connecting said pressure chamber to said ink feed channel, a diaphragm covering said pressure chamber and a driving element fitted over said diaphragm wherein said diaphragm comprises two plates one

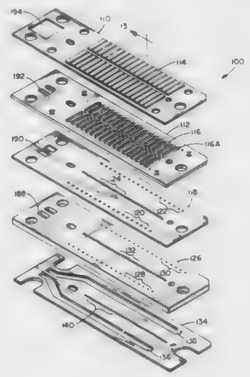
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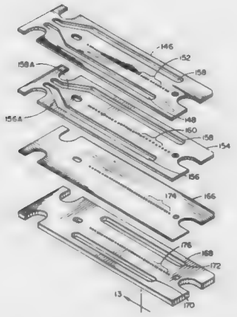
above the other, namely an outer plate on which the driving element is fitted, and an inner plate provided with an oblong opening which extends between the pressure chamber and the ink feed channel, said opening forming the narrow passage.

4,730,197
IMPULSE INK JET SYSTEM

Gopalan Raman, Bethel, and Robert A. Cordery, Danbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 795,584, Nov. 6, 1985, Pat. No. 4,680,595. This application Jun. 1, 1987, Ser. No. 55,979
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **31 Claims**



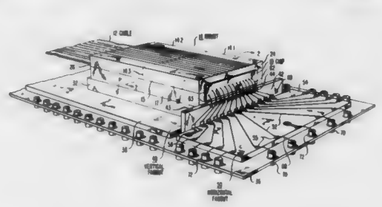


1. An impulse ink jet print head comprising:
a plurality of operating plates held together in a superposed relationship including at least:
a first plate including at least a pair of nozzles therein for ejecting droplets of ink therethrough, each said nozzle having a diameter in the range of 50 to 85 micrometers and a length to diameter ratio in the range of approximately 1.0 to 2.0;
a second plate defining a pair of generally coplanar and rectangular ink chambers having dimensions lying in the range of 2 mm to 20 mm for length, 1.0 mm to 1.5 mm for width, and at least 0.15 mm for depth, said chambers being axially aligned along their major axes and proximately opposed to one another at their said end walls, each of said chambers connected to an ink supply and having an outlet for directing ink toward an associated one of said nozzles in said first plate;
each of said nozzles having a central axis extending transversely of the planes of said plates and intersecting said second plates at proximate extremities of each of said chambers;
said plates having passage means connecting each of said nozzles with an associated one of said outlets;
a third plate contiguous with said second plate including piezoelectric transducer means mounted thereon so as to overlie said pressure chambers and adapted, upon application of a voltage thereto, for displacing ink in each of said pressure chambers thereby causing the ejection of ink droplets from each of said nozzles, said transducer means being substantially coextensive with its associated said pressure chamber, said third plate with said transducer means thereon having a compliance in the range of 2 to 10×10^{-18} m^3/Pa; and
a fourth plate contiguous with said second plate having at least a pair of restrictors therein, each of said restrictors positioned intermediate the ink supply and an associated one of said chambers;
wherein ejection of droplets having a diameter of at least 80 micrometers occurs at frequencies up to 7 KHz without substantial variation in droplet diameter and speed.

4,730,198
ALIGNING ARRAYS OF OPTOELECTRONIC DEVICES TO ARRAYS OF OPTICAL FIBERS

Michael G. Brown, Berkeley Heights; Stephen R. Forrest, Chatham; Daniel R. Kaplan, Springfield; Paul A. Kohl, Chatham; Yusuke Ota, Mountain Lakes, and Harvey S. Trop, South Plainfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 26, 1984, Ser. No. 674,681
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **11 Claims**

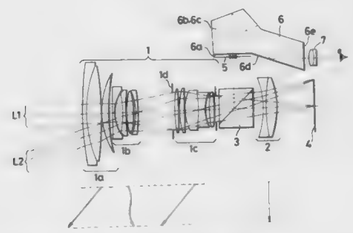


1. An optoelectronic assembly comprising
a mount including first and second submounts each having a pair of essentially parallel end faces,
a plurality of optical fiber segments embedded in said first submount with at least one set of fiber ends being essentially flush with one of said end faces and extending to said other end face, thereby forming a uniformly spaced, linear array of said set of fiber ends, and
an elongated optoelectronic chip affixed to said one end face of said first submount, said chip including a linear array of optoelectronic devices which have essentially the same spacing as said set of fiber ends and being positioned so that each device is aligned and optically coupled to a separate open of said fiber ends, and
a fiber ribbon cable abutting said other end face, the cable fibers being optically coupled to the fiber segments in said first submount,
end portions of the cable fibers being embedded in said second submount so that the ends of said portions are essentially flush with one end face thereof, said one end face of said second submount being abutted against said other end face of said first submount so that the ends of the cable fibers and the ends of the segments are aligned with one another.

4,730,199
PHOTOGRAPHIC APPARATUS

Keiji Ikemori, Kanagawa; Ichiro Ohnuki, and Masaharu Eguchi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Nov. 6, 1985, Ser. No. 795,619
Claims priority, application Japan, Nov. 9, 1984, 59-236322
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—152 **13 Claims**

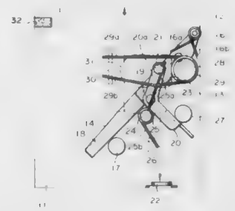


1. A photographic apparatus comprising:
an objective including a front lens unit for forming a first object image at a position of finite distance, and a rear lens unit cooperating with said front lens unit to form a second object image of different magnification from that of said first object image, said rear lens unit having a negative refractive power;
dividing means arranged between said front lens unit and said rear lens unit, for dividing a first light path of said objective into second and third light paths;
observation means, arranged on said second light path, for observing said first object image; and
image receiving means, arranged on said third light path, for receiving said second object image.

4,730,200
MIRROR-DRIVING MECHANISM FOR SINGLE-LENS REFLEX CAMERAS

Toshiyuki Kitazawa, Shiki, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 944,521
Claims priority, application Japan, Jan. 24, 1986, 61-8598[U]
Int. Cl.[4] G03B *19/12, 7/099*
U.S. Cl. 354—152 **17 Claims**

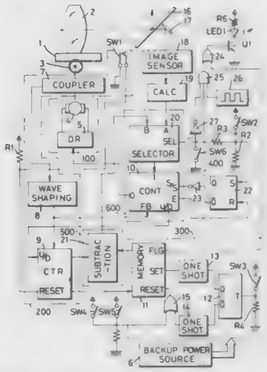


1. A mirror-driving mechanism adapted for use with a single-lens reflex camera comprising a first mirror holding frame adapted to be pivotably mounted on a mirror box of said single-lens reflex camera, said first mirror holding frame having a back surface and being positioned within a photographing optical path during a camera observation period in order to guide light from an object to a finder optical system during said period, a second mirror holding frame pivotably mounted on said first mirror holding frame in order to guide light having passed through a first mirror to a light receiving element, a second mirror urging spring which urges, during said observation period, said second mirror holding frame in a direction away from said first mirror holding frame, said second mirror urging spring urging said second mirror holding frame into resilient contact with the back surface of the first mirror holding frame when the first mirror holding frame rotatably moves upwardly during photographing, and a second mirror restricting member which engages, during upward and downward movement of said first mirror holding frame, an actuating pin provided on said second mirror holding frame so as to thereby restrict the movement of said second mirror holding frame, said restricting member and said pin comprising at least a part of means for imparting to said second mirror urging spring a snap action to change the urging direction of the second mirror urging spring, said second mirror restricting member comprising a resilient member capable of undergoing resilient deformation when said actuating pin impinges on said resilient member.

4,730,201
AUTOMATIC FOCUS ADJUSTMENT APPARATUS

Nobuaki Sasagaki, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,530
Claims priority, application Japan, Jul. 16, 1986, 61-166989
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—402 **20 Claims**



1. A photographic camera having drive means for driving its photographing lens in response to a signal supplied from focus detecting means, the barrel of said photographing lens being detachably mounted on the body of said photographic camera, comprising:
memory means;
means for storing in said memory means data corresponding to a given position of said photographing lens;
control means for controlling said drive means in accordance with said data stored in said memory means irrespective of said focus detecting means;
detect means for outputting a detection signal by detecting the fact that said barrel of said photographing lens is removed from said body of said photographic camera; and
reset means for resetting the contents of said memory means in response to said detection signal.

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4,730,202
CAMERA

Koji Watanabe; Michio Yagi; Seiichi Isoguchi; Satoshi Harada, and Masami Fujita, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 697,073, Jan. 31, 1985. This application Aug. 7, 1986, Ser. No. 894,385
Claims priority, application Japan, Feb. 6, 1984, 59-20409; Feb. 6, 1984, 59-20410; Oct. 9, 1984, 59-213464
Int. Cl.⁴ G03B *7/08*
U.S. Cl. 354—435 **14 Claims**

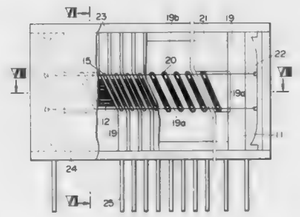


1. A camera comprising:
a photometry means that measures the brightness of a subject and produces the measurement results as a subject brightness information;
a film speed-setting means that produces the speed information of a film to be set on the camera;
a diaphragm-shutter device the aperture of which gradually opens from the closed-shutter condition to the full-open condition and then changes to the closing operation with a shutter-closing signal; and
an exposure control means that receives at least aforesaid subject brightness information and film speed information and controls for operation of aforesaid shutter device based on aforesaid information;
wherein, aforesaid exposure control means has a memory means wherein the classification of subject brightness and timing information for the shutter-closing instruction for each class of subject brightness both for prescribed ISO speed are stored as a form of a basic table and said exposure control means converts aforesaid subject brightness information corresponding to the inputted film speed information into the information corresponding to aforesaid ISO speed and selects the timing information for the shutter-closing instruction from aforesaid basic table based on said converted information, for the exposure; and
wherein aforesaid photometry means has a photometry circuit comprising a light-responsive element or a light-responsive element unit that changes the output in connection with the quantity of light from a subject, a series system of a capacitor and a comparator that compares the output of the capacitor with a standard voltage and wherein aforesaid series system of a capacitor is discharged or charged through the light-responsive element or the light-responsive element unit and the time period from the start of discharging or charging to the operation of aforesaid comparator is produced as a subject brightness information.

4,730,203
WRITE HEAD FOR AN OPTICAL PRINTER

Hiroshi Watanabe, and Yukihiko Shimizu, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Aug. 6, 1986, Ser. No. 893,618
Claims priority, application Japan, Aug. 10, 1985, 60-174997; Nov. 20, 1985, 60-260671
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**

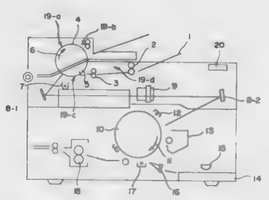


1. A write head for an optical printer in the form of a vacuum fluorescent tube comprising: a substrate; a plurality of strip-like anode conductors arranged in parallel on the substrate; phosphor layers deposited on the anode conductors; control electrodes arranged above the anode conductors; and cathodes stretched above the control electrodes; the control electrodes comprising a plurality of second control electrodes formed with slits which cross the anode conductors obliquely, and a first control electrode arranged above the second control electrode, at positions the first control electrode being formed with slits at positions corresponding to the slits of the second control electrodes.

4,730,204
COPYING MACHINE WITH AUTOMATIC ORIGINAL FEEDING DEVICE

Fumio Satoh, Habikino, and Kazuo Takahashi, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1986, Ser. No. 850,014
Claims priority, application Japan, Apr. 11, 1985, 60-54660[U]; Apr. 16, 1985, 60-82966
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 SH **3 Claims**

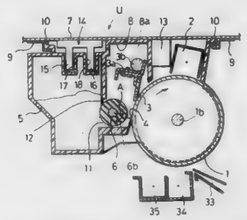


1. A copying machine comprising:
means for detecting a jammed original in an original paper conveying path; and
means for first discharging copy paper utilized in an image transference process from the copying machine upon detection of said jammed original and for subsequently causing the value of a copied-paper counter to return to the value displayed before the paper jammed.

4,730,205
TONER COLLECTING APPARATUS

Tadakazu Ogiri, Osaka; Yoshiaki Yanagida, Hirakata; Yasuyuki Ishiguro, Osaka; Hirofumi Ozaki, Sakai; Takashi Maekawa, Osaka; Tetsuya Matsushita, Osaka; Kiyoshi Shibata, Osaka, and Kiyoshi Morimoto, Osaka, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Sep. 3, 1986, Ser. No. 903,348
Claims priority, application Japan, Sep. 5, 1985, 60-196338
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—15 **8 Claims**

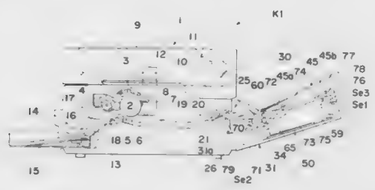


1. Toner collecting apparatus comprising a photosensitive drum for forming a latent electrostatic image, a cleaning blade for removing toner remaining on the surface of said photosensitive drum, a seal blade for guiding toner removed by said cleaning blade, a toner collecting container having a toner receiving port formed at a predetermined position in a lower side of said container for collecting removed toner therein through said port, a toner feeding member being constructed of a porous material and being located adjacent said toner receiving port for feeding collected toner, said toner feeding member being in continuous pressure contact with an upper edge of said toner receiving port and located adjacent a lower edge of said port and being rotatingly driven in a direction from said lower edge of said toner receiving port to said upper edge thereof, and an optical detector disposed on said toner collecting container, said container having portions made of light-permeable material located in opposition to said optical detector.

4,730,206
COPYING APPARATUS HAVING A SHEET REFEEDING DEVICE

Shigeru Sawada; Masaru Komura, both of Toyokawa; Masazumi Ito, Toyohashi, and Masaaki Oyabu, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1987, Ser. No. 7,794
Claims priority, application Japan, Jan. 19, 1986, 61-18515; Jan. 29, 1986, 61-18501; Jan. 29, 1986, 61-18502; Jan. 29, 1986, 61-18503
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 SH **27 Claims**

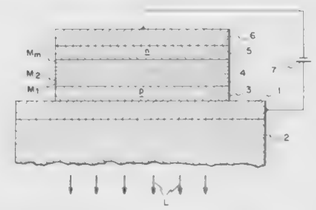


1. A copying apparatus comprising:
a recording module which forms an image on copy paper sheets fed from a sheet feeding portion and discharges the copy paper sheets to a sheet ejecting portion; and
a sheet processing module which is detachably mounted on said sheet ejecting portion; said sheet processing module comprising:
a sheet cassette for accommodating the copy paper sheets, which is detachably mounted on said sheet processing module and said sheet feeding portion;
a copy receiving tray; and
a changeover means for changing over a passage of the copy paper sheets discharged from said sheet ejecting portion so as to guide the sheet to said sheet cassette or to said copy receiving tray.

4,730,207
NON-SINGLE-CRYSTAL SEMICONDUCTOR LIGHT EMITTING DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 645,773, Aug. 30, 1984. This application Mar. 24, 1986, Ser. No. 842,950
Claims priority, application Japan, Aug. 30, 1983, 58-160026
Int. Cl.⁴ H01L *27/12*
U.S. Cl. 357—4 **2 Claims**

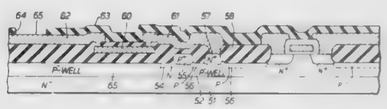


1. A non-single-crystal semiconductor light emitting device comprising:
a non-single-crystal semiconductor region formed by a non-single-crystal semiconductor laminate member made of a plurality m (where $m => 3$) of non-single-crystal semiconductor layers M_1, M_2, . . . and M_m sequentially laminated in this order, wherein the energy gaps Eg_1, Eg_2 . . . and Eg_m of said non-single-crystal semiconductor layers bear such relationships as $Eg_1 > Eg_2 < Eg_3$, $Eg_3 > Eg_4 < Eg_5$, . . . $Eg_{(m-2)} > Eg_{(m-1)} < Eg_m$, and wherein the energy gaps Eg_2, Eg_4, . . . and $Eg_{(m-1)}$ are different from one another.

4,730,208
SEMICONDUCTOR DEVICE

Eitaro Sugino, Yokohama, and Akira Morikuri, Kawaguchi, both of Japan, assignors to Tokyo Sahbaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 519,720, Aug. 2, 1983, abandoned. This application Nov. 21, 1986, Ser. No. 933,327
Claims priority, application Japan, Aug. 9, 1982, 57-138210
Int. Cl.⁴ H01L *29/78, 27/02, 29/04*
U.S. Cl. 357—23.8 **8 Claims**



1. A semiconductor device with MOS FET circuits, comprising:
a semiconductor substrate having one conductivity type;

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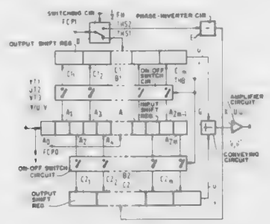
an insulation layer formed on said substrate;
an active portion formed in said substrate and coupled to the MOS FET circuits;
an input protection resistor, having one end coupled to said active portion, formed on said insulation layer;
a bonding pad, connected to another end of said input protection resistor, formed on said insulation layer;
an impurity diffusion region having an opposite conductivity type relative to said one conductivity type formed underlying said insulation layer, said impurity diffusion region positioned at least under said input protection resistor and electrically maintained at floating potential level; and
a channel stopper region having said one conductivity type and a higher impurity concentration than that of said substrate, formed underlying said insulation layer, said channel stopper region positioned at the surface portion of said semiconductor substrate except for the portion where said impurity diffusion region is formed;
wherein said insulation layer overlying said impurity diffusion region is not thicker than that of said insulation layer overlying said channel stopper region and when a voltage of a predetermined polarity is applied across the bonding pad, the insulating layer and the substrate, a depletion layer is formed between said impurity diffusion region and the substrate such that the applied voltage is divided by the insulating layer and the depletion layer thereby to reduce the voltage existing across the insulating layer.

4,730,209

CIRCUIT FOR CONVERTING A COLOUR TELEVISION TIME DIVISION MULTIPLEX SIGNAL INTO SIMULTANEOUS SIGNALS

Leendert J. Van De Polder, and Leonard J. M. Esser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,632
Claims priority, application Netherlands, Mar. 19, 1985, 8500787
Int. Cl.[4] H04N *11/12*
U.S. Cl. 358—11 **10 Claims**



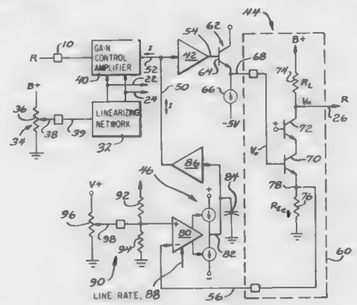
1. A color television receiver having a converter circuit for converting a time division multiplex television signal into simultaneous signals, said time division multiplex signal having an interrupted sequence of a first information component relating to luminance information occurring in first periods, the first information components being separated by a further sequence of a second and a third information component relating to chrominance information occurring in second and third periods, respectively, said simultaneous signals corresponding to the first, second and third information components and repeated third and second information components, respectively, said second and third information components, either repeated or not, being expanded in time so that they occur in the simultaneous signals during the same first period or a fourth period, respectively, as the first information components when said first or fourth periods correspond to television line scan periods, the converter circuit including signal sampling, expansion and repetition means disposed between a circuit input and a circuit output for the second and third information components relating to chrominance information, said means being formed with shift registers having different write and read rates under the control of clock pulses of different clock pulse frequencies, characterized in that for the signal sampling, expansion and repetition means the said circuit input of the converter circuit is coupled to a signal input of at least one input shift register of the series-in, parallel-out type and that the said circuit output of the converter circuit with the expanded second and third information components relating to chrominance, repeated or not, is coupled to respective signal outputs of first and second output shift registers of the parallel-in, series-out type, parallel outputs of the input shift register being coupled through an on-off switch circuit to respective parallel inputs of the first and second output shift registers, said switch circuit being periodically conducting prior to the occurrence of the first and fourth periods during television line blanking periods and being non-conducting during the first or fourth television line scan periods, corresponding to the first and second output shift registers alternately applying per respective line scan period the second and third information components, and the repeated second and third information components, respectively, to the respective circuit output.

4,730,210

WIDEBAND ANALOG RGB VIDEO PROCESSOR WITH NEGATIVE FEEDBACK CAPABILITY AND BLACK LEVEL CONTROL

Roman W. Leshko, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 14, 1985, Ser. No. 765,888
Int. Cl.[4] H04N *9/72*
U.S. Cl. 358—34 **16 Claims**



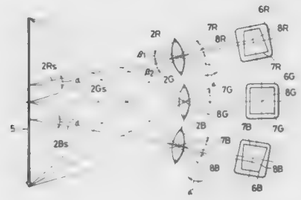
1. A wideband analog RGB video processor comprising:
gain control means including voltage-to-current conversion means for converting recieving color video voltage component signals to color video current component signals and amplifier means for adjustably amplifying said color video current component signals;
current-to-voltage conversion means for converting said amplified color video current component signals to color video voltage component signals for use with driving color video display means, said conversion means including combining means for combining said amplified video current component signals with correction current signals;
video output circuit means for amplifying said color video voltage component signals and outputting said amplified signals to drive color video display means and having at least one node at which a relatively low voltage level signal typically is present; and
feedback means coupled to receive said voltage level signal and a reference signal to process said signals and to provide said correction current signals, and adapted to receive a periodic gating signal corresponding to the scan retrace intervals during which video is not present to control the operation of said feedback means.

4,730,211

PROJECTION-TYPE COLOR TELEVISION RECEIVER WHEREIN THE CENTER LINES OF RIGHT AND LEFT PROJECTION LENSES INTERSECT A DISPLAY SCREEN AT POINTS WHICH ARE OFFSET FROM A POINT AT WHICH THE CENTER LINE OF A CENTER PROJECTION LENS INTERSECTS THE DISPLAY SCREEN

Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,855
Claims priority, application Japan, Aug. 6, 1985, 60-172654
Int. Cl.[4] H04N *9/31, 9/16*
U.S. Cl. 358—60 **4 Claims**



1. A projection-type color television receiver comprising:
projection tube means including right, left and center projection tubes each having a face, each of said projection tubes being capable of forming an image on its corresponding face, the image formed on the face of each of said right and left projection tubes being in registry with the center of its corresponding face;
a transmissive screen for receiving the images from said projection tubes and for displaying a composite picture of said images; and
lens means, including right, left and center lenses corresponding to said right, left and center projection tubes, for focusing the images from said projection tubes onto said transmissive screen to form said composite picture;
wherein each of said right, left and center lenses has an associated center line, wherein the point of intersection of the center line of each of said right and left lenses with said transmissive screen is offset by a fixed amount toward the corresponding lens from the point of intersection of the center line of said center lens with said transmissive screen, and wherein the center line of each of said right and left lenses intersects said transmissive screen at an angle of inclination α other than 0°.

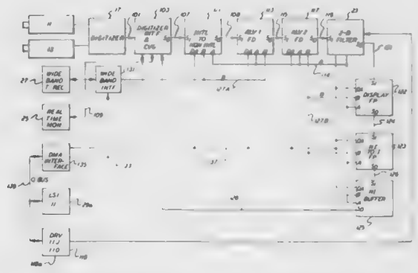
4,730,212

REALTIME DIGITAL DIAGNOSTIC IMAGE PROCESSING SYSTEM

David R. Wojcik, Woburn; Richard J. Jones, Winchester, and James M. Aufiero, Reading, all of Mass., assignors to ITEK Corporation, Lexington, Mass.

Division of Ser. No. 568,013, Jan. 4, 1984, Pat. No. 4,680,628.
This application Jan. 16, 1987, Ser. No. 4,340
Int. Cl.[4] H04N *7/18, 5/32*
U.S. Cl. 358—83 **1 Claim**

1. Apparatus for processing a fluoroscopic image comprising:
a. a television camera operating at a frame rate of at least 30 frames per second providing an analog video output;
b. means to digitize said analog video output to provide digital information representative of the analog signal;
c. means for processing said digital image including a plurality of frame processors coupled in series for carrying out arithmetical and logical operations on said digital image information and operable at the frame rate of said television camera coupled to receive the output of said digitizer;
d. means to convert digital image information processed in said means for processing back into an analog signal;
e. a wide-band tape recorder, having an input and an output;
f. means for coupling said digital image information, before processing, to the input of said wide-band tape recorder at the same time that processed information is being provided to a television display;



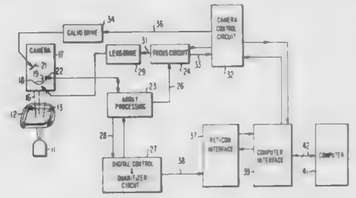
g. means for coupling the output from said wide-band tape recorder to said means for processing, such that unprocessed digitized information will be recorded on said wide-band tape recorder and may later be played back through said system and processed therein in non-real time.

4,730,213

METHOD MEASURING TRANSPARENT ELEMENTS AND AN OPAQUE MEDIUM

Daniel T. Kelly, 3rd, Ephrata; Evo Andreatti, Jr., Rheems, and Frank S. Krufka, Mount Joy, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 25, 1986, Ser. No. 856,008
Int. Cl.[4] H04N *7/18, 17/00*
U.S. Cl. 358—107 **11 Claims**

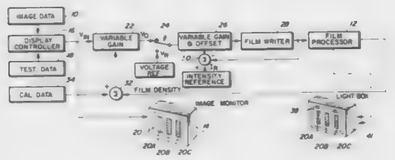


1. A method of measuring the dimensions of, and spaces between, transparent elements arranged in pattern in an opaque medium including the steps of:
(a) placing said medium between an energy source and an array of pixels responsive to said energy and illuminating said medium with said energy;
(b) scanning said energy across said array in a plurality of scan lines whereby pixels receiving energy passing through said transparent elements charge to a first charge level and pixels shaded by said medium charge to a second charge level;
(c) detecting said charge levels and producing an analog signal having amplitude levels indicative of said charge levels and pulse widths indicative of a dimension of said transparent elements and of said spaces between said elements;
(d) converting said analog signal to a digital signal having first and second pulse levels in accordance with said amplitude levels, whereby said dimensions are represented by pixel counts;

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(e) transferring said pixel counts for a selected number of said transparent elements, and for an equal number of spaces between said elements, to a storage means, and transferring zeros to said storage means where the number of transparent elements is less than said selected number;
(f) storing said pixel counts in a matrix wherein the pixel counts for each of said scan lines form a row and the pixel counts of said transparent elements and each of said spaces are aligned as columns, one of said columns having a succession of zeros when the number of transparent elements is less than said selected number; and
(g) successively investigating said one column for zeros and rejecting rows having one of said zeros is said one column, and accepting rows having a pixel count in said one column.

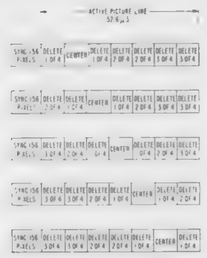
4,730,214
METHOD AND APPARATUS FOR CORRELATING VIDEO AND FILM IMAGES PRODUCED FROM ELECTRONIC DATA
Thomas W. Lambert, Dousman; Walter L. Robb, Brookfield, and Barry F. Belanger, Milwaukee, all of Wis., assignors to General Electric Company, Milwaukee, Wis.
Filed Sep. 15, 1986, Ser. No. 907,454
Int. Cl.[4] H04N *17/00, 5/84*
U.S. Cl. 358—139 **10 Claims**



1. In an imaging system for transferring electronic image data to video and film images including an electronic monitor for providing a video image and a film writing system for transferring the electronic image data to film, a method for providing uniformity between the video image and the displayed film image comprising the steps of:
providing a set of intensity values on the monitor;
measuring the intensity of the values on the monitor;
converting the measured intensity values to electronic signals;
storing the electronic signals;
writing the intensity values on film;
summing the intensity values written on the film with the stored measured intensity values represented by the electronic signals; and
adjusting the writing intensity such that the film image intensity values correspond to the measured monitor intensity values.

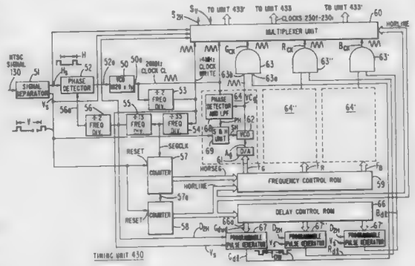
4,730,215
COMPATIBLE WIDE SCREEN TELEVISION SYSTEM WITH VARIABLE IMAGE COMPRESSION/EXPANSION
David L. Jose, Hamilton Township, Mercer County, and Robert A. Dischert, Burlington County, both of N.J., assignors to RCA Corporation, Princeton, N.J.
Filed May 30, 1986, Ser. No. 869,174
Int. Cl.[4] H04N *7/01, 11/20*
U.S. Cl. 358—140 **13 Claims**

1. Video image compression apparatus, comprising:
signal source means for providing a video input signal representative of a wide screen image and for providing a compression control signal;
video compression means coupled to said source means for compression left and right edge regions of said wide screen image and for varying relative widths and relative degrees of compression of the left and right compressed edge regions as a function of said control signal to provide



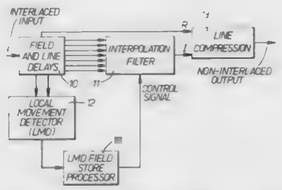
a processed video output signal representative of a wide screen image having a central region bordered on left and right sides thereof by compressed edge regions having variable relative and variable relative degrees of compression; and
combining means for combining said processed video output signal with said compression control signal for transmission to a utilization means.

4,730,216
RASTER DISTORTION CORRECTION CIRCUIT
Robert F. Casey, Oradell, and Werner F. Wedam, Lawrenceville, both of N.J., assignors to RCA Corporation, Princeton, N.J.
Filed Jul. 3, 1986, Ser. No. 881,710
Int. Cl.[4] H04N *11/20, 7/01*
U.S. Cl. 358—140 **24 Claims**



1. A video display apparatus responsive to an incoming interlaced video signal containing picture information for generating therefrom a noninterlaced video signal that contains in a given video line signal thereof a plurality of pixel signals derived from said interlaced video signal for display in a corresponding plurality of pixel locations of a corresponding display line of said video display apparatus, said video display apparatus being subject to a distortion that, if left uncompensated, results in erroneous pixel locations during noninterlaced display of said pixel signals, said apparatus comprising:
a memory coupled to said interlaced video signal for storing said picture information of said interlaced video signal in said memory;
first means coupled to said memory responsive to a varying clock signal for generating said plurality of pixel signals contained in said noninterlaced video signal from the picture information stored in said memory;
second means for generating a correction signal that varies in accordance with said distortion; and
third means responsive to said correction signal for generating said varying clock signal that varies in accordance with said correction signal wherein said first means generates said plurality of pixel signals in a manner that varies in accordance with said varying clock signal so as to compensate for said erroneous pixel locations.

4,730,217
MOVEMENT DETECTOR FOR USE IN TELEVISION SIGNAL PROCESSING
Gary J. Tonge, and Barry A. Flannigan, both of Winchester, United Kingdom, assignors to Independent Broadcasting Authority, England
PCT No. PCT/GB84/00360, § 371 Date Jun. 12, 1985, § 102(e) Date Jun. 12, 1985, PCT Pub. No. WO85/02080, PCT Pub. Date May 9, 1985
PCT Filed Oct. 24, 1984, Ser. No. 743,993
Claims priority, application United Kingdom, Oct. 24, 1983, 8328362
Int. Cl.[4] H04N *5/14, 5/21, 7/01*
U.S. Cl. 358—160 **6 Claims**



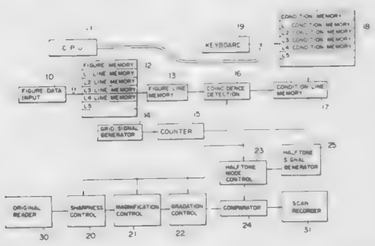
1. Television signal processing apparatus comprising delay circuitry for receiving a series of input signals and including means for producing a series of output signals representing input signals delayed by a plurality of lines and a plurality of fields, movement detection means responsive to said series of output signals for producing from signals which are a frame apart a series of movement detection signals, first processing circuitry responsive to the detection signals from the movement detection means for modifying a present detection signal by a further signal which is a function of a previous detection signal for producing a control signal, and further processing means responsive to the control signal and connected to the delay circuitry to receive outputs therefrom for producing a processed television signal in the presence of movement as determined by said control signal.

4,730,218
UNDER-HAND PROJECTOR
Dennis L. Goodrich, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Oct. 2, 1986, Ser. No. 914,720
Int. Cl.[4] H04N *5/247, 5/253*
U.S. Cl. 358—185 **8 Claims**

1. A projection system for projecting an image from a lecturer to an audience for viewing by the lecturer and by the audience who normally face one another, comprising:
a lecturn having a top surface, at least a part of which is translucent;
said image being operatively positioned on the translucent part of the top surface of said lecturn from above or below the top surface; and
a video camera operatively connected to a video monitor facing the audience,
a mirror beneath said translucent surface so as to maintain an open and clear area above said top surface of said lecturn, said mirror providing for operatively focusing of said camera on the image such that said image is recieved by said video camera and conveyed to said video monitor whereby the audience views the image on the video monitor and the lecturer views the image on the translucent part of the lecturn while remaining in a face-to-face orientation with the audience.



4,730,219
IMAGE SCANNING AND RECORDING METHOD
Yuji Oshikoshi, Tokyo, and Toshitaka Agano, Minamiashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Continuation of Ser. No. 397,444, Jul. 12, 1982, Pat. No. 4,476,497. This application Aug. 22, 1984, Ser. No. 643,145
Claims priority, application Japan, Jul. 17, 1981, 56-112029
Int. Cl.[4] H04M *1/40*
U.S. Cl. 358—280 **6 Claims**



1. An image scanning and recording method for recording an image by scanning a photosensitive recording medium with a light beam, which comprises:
designating at least one image region on an image to be recorded;
processing said electric scanned image signals for each designated image region under different processing conditions; and
recording each of the processed electric scanned image signals for each designated image region on a photosensitive recording medium.

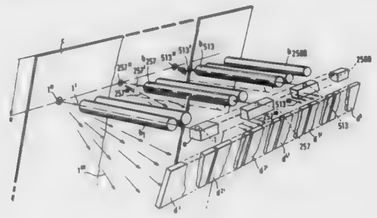
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4,730,220

DEVICE FOR ELECTRONIC RECORDING OF IMAGES WITH AN OPTICAL RADIATION-EMITTING SYSTEM AND A DETECTOR SYSTEM FOR DETECTING THE RECEIVED IMAGE INFORMATION

Elmar Wagner, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jun. 11, 1986, Ser. No. 873,793
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521157
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—280 5 Claims



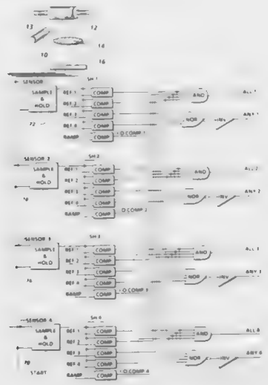
1. A device for electronic recording of images with an optical, radiation-emitting exposure device and a detector system for detecting the image information recieved, wherein a sequentially triggered system of radiation-emitting elements is provided for exposure and the image to be recorded is optically scanned using the sequentially triggered radiation-emitting elements, wherein several radiation emitting elements are triggered at once during sequential triggering of the radiation-emitting elements, but with only those elements being triggered simultaneously that are far enough apart for the reflected beams not to interfere.

4,730,221

SCREENING TECHNIQUES BY IDENTIFICATION OF CONSTANT GREY COMPONENTS

Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 16, 1986, Ser. No. 919,521
Int. Cl.[4] H04N *1/40, 1/22*
U.S. Cl. 358—298 3 Claims



1. A method for creating on a light sensitive recording medium a halftone reproduction of an original image comprising the steps of:

(a) providing an electronic signal representing the average grey scale of said original image over a halftone dot period;

(b) providing a plurality of electronic signals representing details of said original image over said halftone dot period;

(c) providing a halftone screen function in electronic form;

(d) combining said halftone screen signals of (c) with said original image signals of (b) to provide a plurality of sum functions;

(e) finding the; maximum and minimum grey scale values over said halftone dot period;

(f) generating black or white template dots correspond to the maximum and minimum grey scale values;

(g) placing any generated white dots in the halftone dot period;

(h) decreasing from the allowable areas where white dots can be placed; and

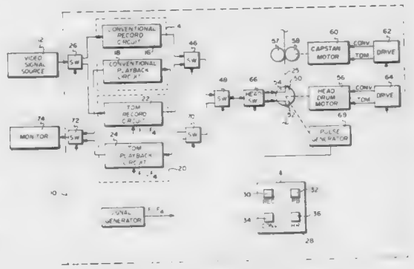
(i) locating the rest of the dots in the remainder of the halftone dot period space.

4,730,222

VIDEO RECORDING APPARATUS HAVING LOW AND HIGH RESOLUTION OPERATIONAL MODES

Carl N. Schauffele, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,873
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—310 10 Claims



1. Video reproduction apparatus comprising:

circuit means for selectively processing video signals either of a first conventional format of reduced bandwidth or of a second high resolution format of greater bandwidth than that of said first format;

tape moving means for moving magnetic tape along a path at a first speed and at a second speed greater than said first speed;

magnetic transducer means, coupled to said circuit means and located along said tape path for recording and/or playing back video signals in parallel tracks on said magnetic tape;

means for rotating said magnetic transducer means at a first rotational speed and at a second rotational speed greater than said first rotational speed; and

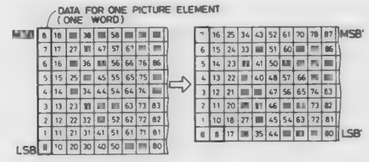
means for controlling said circuit means, said tape moving means and said magnetic transducer rotating means to operate (1) in a first mode in which said circuit means processes video signals of said first format, said tape moving means moves said tape at said first speed and said magnetic transducer rotating means rotates said magnetic transducer means at said first rotational speed to record and/or playback said video signals of said first format on said magnetic tape and (2) in a second mode in which said circuit means processes video signals of said second format, said tape moving means moves said tape at said second speed and said magnetic transducer rotating means rotates said magnetic transducer means at said second rotational speed to record and/or playback said video signals of said second format on said magnetic tape.

4,730,223

METHOD OF CONVERTING A DIGITAL DATA SIGNAL HAVING A FIRST LENGTH INTO A DIGITAL DATA SIGNAL HAVING A SECOND LENGTH

Shigeyuki Ikeda, Tokyo; Morishi Izumita, Inagi, and Seiichi Mita, Kanagawa, all of Japan, assignors to Hitachi, Ltd and Hitachi Medical Corp., both of, Japan

Filed Jun. 7, 1985, Ser. No. 742,446
Claims priority, application Japan, Jun. 8, 1984, 59-116422
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 15 Claims



1. A signal conversion method wherein a digital video signal which includes first words each including N_1 bits representing a value of one sample in a video image is converted into a digital video signal which includes second words each including N_2 bits (N_1 and N_2 being integers and $N_2 < N_1$) representing a value of one sample, comprising the steps of:

separating each of said first words corresponding to each of a plurality of scanning lines into a first portion which includes said N_2 bits including a most significant bit and a second portion which includes the remaining (N_1–N_2) bits including a least significant bit;

storing said first portions of said first words in a first memory means;

composing third words, each of which includes N_2 bits, by sequentially arranging at least one of said second portions of said first words;

storing said third words in a second memory means;

composing a first group of words by sequentially arranging said first portions of said first words stored in said first memory means;

composing a second group of words by sequentially arranging said third words; and

composing a converted digital video signal corresponding to one scanning line by sequentially arranging said second group of words before said first group of words.

4,730,224

ROTARY COUPLER

Yasutoshi Komatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

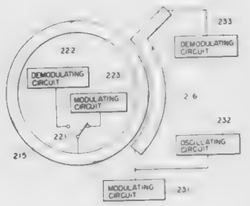
Filed Oct. 30, 1985, Ser. No. 793,128
Claims priority, application Japan, Oct. 30, 1984, 59-228259
Int. Cl.[4] G11B *15/14*
U.S. Cl. 360—64 2 Claims

1. A rotary coupler for transferring signals between signal processing circuits provided on a rotor and a stator, comprising:

first and second microstrip lines formed on facing surfaces of said rotor and stator and facing each other, said first and second microstrip lines respectively having signal input-/output terminals, at least one of said first and second microstrip lines being substantially in the form of a ring-shaped microstrip line,

an oscillator circuit for generating a high frequency signal at a resonant frequency of a resonant circuit formed of such first and second microstrip lines,

and a variable impedance circuit connected to said oscillator circuit for varying said resonant frequency in response to said signal, said high frequency signal being modulated by said variable impedance circuit and transferred between the rotor side microstrip line and the stator side microstrip line.



4,730,225

TAPE LOADING APPARATUS HAVING A TAPE PREVENTIVE MEMBER FOR PREVENTING MAGNETIC TAPE FROM BEING INSERTED BETWEEN A TAPE DRAWING MEMBER AND A TAPE GUIDE MEMBER THEREOF

Yoshinobu Kishimoto, Takarazuka; Toshikazu Ura, Neyagawa, and Hidetaka Sasaki, Okayama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 22, 1986, Ser. No. 821,548
Claims priority, application Japan, Jan. 24, 1985, 59-11241
Int. Cl.[4] G11B *15/665*
U.S. Cl. 360—85 8 Claims

1. A tape loading apparatus for drawing magnetic tape in a tape drawing direction out of a tape cassette which is inserted and lowered to a set position therein and for urging a portion of the tape around a tape guide cylinder, said apparatus comprising:

first and second tape drawing means movable in said tape drawing direction between a first unloading position adjacent the magnetic tape when the cassette is at said set position and a second loading position at which the portion of the magnetic tape is drawn out from the cassette and urged around the tape guide cylinder,

said first and said second tape drawing means each including a tape drawing member and a tape guide member which are mounted on a movable base and extend therefrom to respective top ends thereof, said movable base slidable between said unloading position and said loading position, and at least said tape drawing member of said first tape drawing means having a height adjusting means for adjusting the height thereof relative to the tape guide member of the first tape drawing means and to the movable base from which it extends; and

a tape protective member mounted on the top end of the tape

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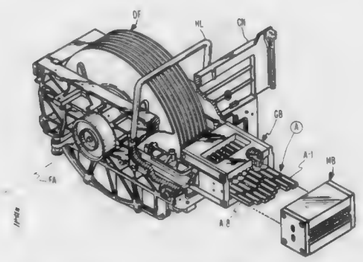
guide member of said first tape drawing means and extending over only a portion of the top end of the tape drawing member of said first tape drawing means for preventing the magnetic tape from being inserted between the tape guide member and the tape drawing member of said first tape drawing means when the tape cassette is lowered to the set position and for allowing said height adjusting means to be accessed and adjusted.

4,730,226

ACTUATOR CARRIAGE WITH "SPLAYED-BEARING" ARRAY

Arkady K. Shatkin, San Jose, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Jan. 6, 1986, Ser. No. 816,606
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 21 Claims



19. Carriage means for a magnetic disk drive, this carriage means including a body on a prescribed pair of roll assemblies, this body being part of an actuator body adapted to translate read/write transducer means across various tracks of one or several disk faces, each assembly adapted for rolling engagement on associated rail means, each rail means disposed along a respective side of the body and including guide face means;

each roll assembly comprising a pair of spaced roller sets disposed along a respective side of the body, each set comprising a first and second bearing means, each bearing means being adapted and disposed to be engaged guidingly, and roll-ingly, with a respective guide face means;

one such roll assembly being "flexible" with one of its roller sets having both bearing means compliantly deflectable upon urging of its respective rail means thereagainst and also with the other of its roller sets having one bearing means so compliantly deflectable, whereby to better assure "full-line contact" of all the bearing means with respective guide face means;

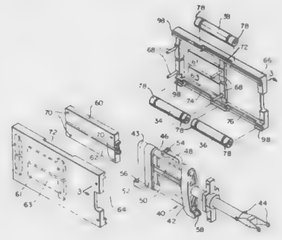
each bearing means comprising a like cylindrical roller mounted for rotation on a shaft; and wherein the so-deflectable bearing means have their bearing shafts constructed to be bendable and mounted on the actuator body to be presented in oblique non-parallel relation with a respective guide face means, but, when so urged thereby to be deflected and pivoted into substantial parallelism and full-line contact therewith.

4,730,227

DISK FILE ACTUATOR WITH COMBINED CARRIAGE RAIL AND ISOLATOR MOUNT FOR DRIVE MAGNET

Darryl G. Chong, San Jose; Burford J. Furman, Palo Alto; Edward L. Mathurin, Los Gatos, and Thomas J. Rajac, Gilroy, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 683,752, Dec. 19, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,075
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 12 Claims



1. An actuator for moving a read or write head to selected tracks on a disk in a data recording disk file of the type having a frame supporting the actuator, the actuator comprising:

a movable carriage for supporting and moving the head;

an electrically conductive coil mounted on the carriage;

at least two carriage guide rails generally rigidly secured to the frame;

means attached to the carriage for supporting the carriage on the guide rails during movement;

at least two magnets for generating a magnetic field;

means secured to the magnets for positioning the magnets for electromagnetic interaction with the coil to cause the carriage to move along the guide rails upon electrical actuation of the coil; and

means resiliently connecting the magnet positioning means to the carriage guide rails for attenuating reaction forces acting on the magnets in a direction opposite the direction of movement of the carriage when the coil is electrically actuated, said resiliently connecting means substantially supporting said magnet positioning means, whereby the carriage guide rails and the disk file frame to which they are generally rigidly secured are substantially isolated by said resiliently connecting means from the effect of the reaction forces on the magnets.

4,730,228

OVERTEMPERATURE DETECTION OF POWER SEMICONDUCTOR COMPONENTS

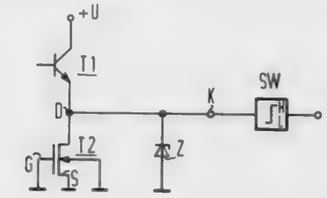
Josef Einzinger, Unterschleissheim; Christine Fellinger, Unterhaching; Ludwig Leipold, Munich; Jenoe Tihanyi, Munich, and Roland Weber, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,577
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609713
Int. Cl.[4] H02H *5/04*
U.S. Cl. 361—103 11 Claims

1. In a circuit arrangement for the generation of a signal when a critical temperature in a power semiconductor component is exceeded, said circuit arrangement using semiconductor components with temperature-dependent current/voltage characteristics, the improvement comprising:

a bipolar transistor (T 1) in thermal contact with the power semiconductor component and having a temperature dependent leakage current flowing therethrough;

a current source connected in series with said bipolar transistor, said current source having a current demand which is greater than said leakage current of said bipolar transistor at a given temperature which is less than said critical temperature; and



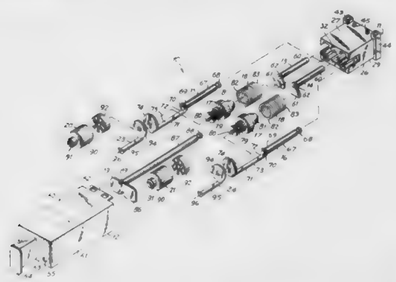
a threshold element having an input connected to the emitter electrode of said bipolar transistor and an output which provides said signal when said critical temperature is exceeded.

4,730,229

MALE BASE SUBSCRIBER CIRCUIT PROTECTOR MODULE

Paul V. De Luca, Plandome Manor; Michael Belle-Oudry, Centereach; Helmuth Neuwirth, Garden City, all of N.Y., and Paul Shaskan, Stamford, Conn., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 13, 1986, Ser. No. 874,117
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—119 4 Claims



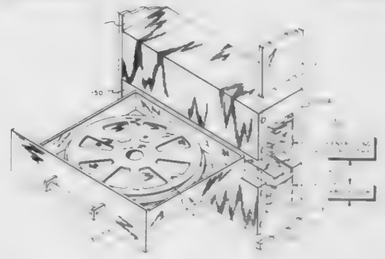
1. An improved protector module comprising: an axially elongated molded base element and a housing element selectively engageable upon said base element; said base element having an inner transverse surface and an outer transverse surface and a plurality of bores extending in mutually parallel relation from said outer surface to a point medially positioned relative to said inner and outer surfaces; a corresponding plurality of counterbores extending from said inner surface to a point medially positioned relative to said inner and outer surfaces in parallel alignment relative to said plurality of bores; a plurality of contact pin assemblies, one said assembly positioned within each of said plurality of bores, each of said asemblies including an elongated contact pin having inner and outer ends, and a laterally extending enlargement on said inner end positioned within a respective counterbore; said base element having a single through bore extending between said inner and outer surfaces, a ground pin assembly including a ground pin extending through said single bore; said base element having another bore of non-circular cross sectional configuration extending from said inner surface to a plane medially disposed relative to said inner and outer surfaces; a pair of heat coil assemblies positioned in mutually parallel relation within said another bore, said heat coil assemblies including a resilient component electrically communicating with said ground pin, and momentary excess current surge protection means positioned between said ground pin assembly and some of said contact pin assemblies.

4,730,230

APPARATUS AND METHOD FOR DEGAUSSING MAGNETIC STORAGE MEDIA

Albert Helfrick, Boonton, N.J., assignor to Dowty RFL Industries, Inc., Boonton, N.J.

Filed Mar. 31, 1987, Ser. No. 32,782
Int. Cl.[4] H01F *7/20, 13/00*
U.S. Cl. 361—151 20 Claims



8. Apparatus for degaussing magnetic storage media, comprising:

a pair of spaced apart magnetic field generating means;

means for inserting a magnetic storage medium into the region between said field generating means;

means for rotating the magnetic storage medium; and

means for energizing both of said field generating means to produce a magnetic field substantially along one direction through the magnetic storage medium and for subsequently energizing both of said field generating means to electrically shift the direction of the produced magnetic field to be substantially along another direction through the magnetic storage medium, said another direction being perpendicular to said one direction; and.

4,730,231

GAS INSULATED METAL-CLAD HIGH VOLTAGE EQUIPMENT WITH INSULATING BUSHING

Shuzo Tanigaki, Tokyo, and Masashi Tokushige, Kunitachi, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,376
Claims priority, application Japan, Mar. 4, 1985, 60-30707[U]; Mar. 4, 1985, 60-30708[U]; Dec. 19, 1985, 60-286199
Int. Cl.[4] H02B *11/14*
U.S. Cl. 361—336 8 Claims

1. A gas insulted metal-clad electrical power equipment, comprising:

(a) a compartment containing an electrical power device and filled with an insulating gas;

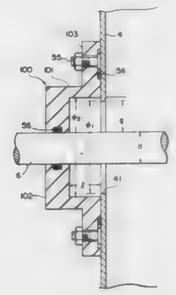
(b) a grounded metal wall arrangement comprising a metal plate part formed with a through hole having an electrically conductive edge surface;

(c) a cylindrical insulating bushing having an inner cylindrical space extending on the center axis thereof and having a transverse wall blocking the inner cylindrical space, said insulating bushing having an open edge hermetically fixed to a surface of the plate part of said metal wall arrangement about the through hole so that the cylindrical space is communicated with the interior of said compartment and filled with the insulating gas, the cylindrical space being disposed coaxially with the through hole and having a diameter ϕ_2 greater than a diameter ϕ_1 of the through hole;

(d) an electrically conductive rod having an electrically conductive circumferential surface and passing centrally

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through the through hole, the cylindrical space and the transverse wall and hermetically supported by the transverse wall, said conductive rod being capable of connecting the electrical power device within said compartment to an electrical power device outside said compartment; and



(e) wherein the circumferential surface of said conductive rod directly faces the edge surface of the through hole and is separated therefrom by a distance g; and

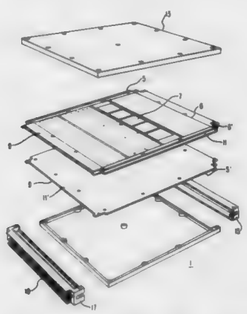
(f) wherein the axial length l of the cylindrical space is equal to or longer than a quarter of the distance g.

4,730,232

HIGH DENSITY MICROELECTRONIC PACKAGING MODULE FOR HIGH SPEED CHIPS

Frank A. Lindberg, Relay, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 25, 1986, Ser. No. 878,102
Int. Cl.⁴ H02B *1/00*; H05K *7/20*
U.S. Cl. 361—381 **5 Claims**



1. A multi-chip, high density, lightweight module having fully demountable covers, producing low capacitance and low power dissipation, said module operable to function at high clock speeds, comprising:

at least one multi-layer printed circuit board, said multi-layer circuit board having a first and a second planar lateral surface, and a first and second end, said printed circuit board further comprising;

a multiplicity of fully enclosed individually hermetically sealed, microelectronic chip packages mounted upon said first lateral surface of said printed circuit board, said microelectronic chip packages further comprising, a single layer of insulating material having a region sufficient to receive and retain a microelectronic chip, a multiplicity of electrically conductive chip lead lines in fanout configuration, said electrically conductive chip lead lines configured with a predetermined spacing, further said electrically conductive chip lead lines wirebonded to circuit board bonding pads upon said printed circuit board by individual wirebonds,

a multiplicity of electrically conductive connecting means layered within and upon said multi-layer printed circuit board, said electrically conductive connecting means operable to interconnect via said circuit board bonding pads and said wire bonds, said individual microelectronic chip packages thereby forming electrical circuits upon said first lateral face of said printed circuit board,

a multiplicity of input and output electrically conductive circuit board lead lines positioned at said first end of said printed circuit board, said circuit board lead lines operable to input electrical signals into said electrical circuits layered within and upon said first lateral surface of said printed circuit board and said circuit board lead lines further operable to output electrical signals from said electrical circuits within and upon said first lateral surface of said printed circuit board,

a heat sink means layered upon said second lateral surface of said printed circuit board, said heat sink means comprising a heat conducting material operable to transfer heat generated by said microelectronic chip packages during said module operation, said heat sink means extending the full surface area of said printed circuit board, and said heat sink means extending beyond the two surfaces of said printed circuit board, connectable to said heat sink means;

a first and a second demountable cover means of a lightweight material operable to be interconnected via a plurality of threaded means, said first cover means operable to be placed upon said first planar lateral surface of said printed circuit board, and said second cover means operable to be placed upon said heat sink means upon said second planar lateral surface of said printed circuit board, said first and said second demountable cover means operable to be fully removed to facilitate said module repair,

a first end connector means comprising a protective end cap means, said protective end cap means operable to interconnect said first and said second demountable cover means encovering said printed circuit board, and

a second end connector means comprising a protective end cap means having integral electrical interconnections within said second end connector means said second end connector means further comprising a multiplicity of input/output pins external to said protective end cap means, said second end connector operable to be positioned and interconnected with said lead lines of said printed circuit board, said second end connector means further operable to input and output power supply voltages and electrical signals to said electrical circuits within and upon said printed circuit board during said module function.

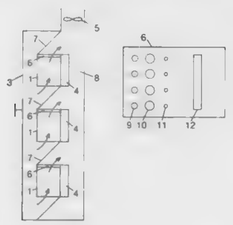
4,730,233

ARRANGEMENT IN COOLING CIRCUIT BOARDS

Karl F. Osterman, Sundbyberg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE85/00465, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986, PCT Pub. No. WO86/03648, PCT Pub. Date Jun. 19, 1986
PCT Filed Nov. 18, 1985, Ser. No. 882,928
Claims priority, application Sweden, Dec. 7, 1984, 8406220
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—383 **2 Claims**

1. Apparatus comprising a cabinet, a plurality of magazines supported in said cabinet in vertically spaced relation one above the other, a plurality of circuit boards supported in each magazine in spaced horizontal relation adjacent to one another such that air flow through the magazines between adjacent boards, and a plate supported in said cabinet above each magazine and through which the air flows after traversing the respective magazine, each plate being provided with rows of aperture means, each row constituted by a plurality of orifices or a slot, said rows extending parallel to said circuit boards and having a spacing corresponding to the spacing of said boards such that each row is disposed above a respective board in opposition thereto, each board generating a respective amount



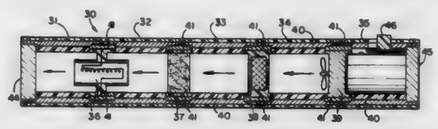
of heat which may differ from that of the other boards, said aperture means in each row being of a size related to the respective amount of heat generated by each board such that the sizes of the aperture means in the different rows may differ from one another to cause the air flow through the rows at the aperture means in each plate to be adjusted to the heat generation in each board.

4,730,234

PIPE ASSEMBLY MODULE WITH INTERNAL ELECTRICAL CIRCUITRY

Michael A. Monico, Jr., 1300 Sonnet La., West Chester, Pa. 19380

Filed May 29, 1986, Ser. No. 868,011
Int. Cl.⁴ F16L *39/00*; H02B *1/04*
U.S. Cl. 361—384 **5 Claims**



1. A system of interengageable pipe modules, adapted for use with one another and with a functional unit, comprising:

at least two lengths of pipe of electrically insulating material and having an internal circular cross-section, each forming an outer module;

at least two electrically conductive strips on the inner surface of each of the at least two pipes and a functional electrically operative unit making contact therewith, running the entire lengths thereof;

a precisely threaded coupling formed on at least one end of each of the at least two pipes and a functional electrically operative unit, one of the at least two pipes and a functional electrically operative unit having a male coupling and the other having a female coupling, each of the couplings having a single starting point and being an engagement with another outer module and each of the at least two conductive strips in each of the at least two modules and a functional electrically operative unit spatial relationship to one another and to the single starting point, the at least two conductive strips of coupled outer modules and a functional operative unit being automatically aligned respectively with one another and in surface contact across the interengaged threaded couplings;

each of the at least two conductive strips being sufficiently thick and forming an inner contact surface on female couplings and an outer contact surface on male couplings, and a contact surface on said functional electrically operative unit;

at least one inner module adapted to fit and slide snugly within any number of interengaged outer modules, the at least one inner module having interengaged outer modules therearound, the at least two conductive strips, respective contacts of the at least one inner module being in electrical contact with the at least two conductive strips irrespective of the specific and relative positions of the inner module within any number of interengaged outer modules, and

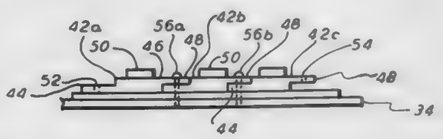
wherein the at least one inner module comprises electrical battery means and has axial fluid flow passages therethrough, another one of the inner modules comprises an electrically operative functional unit which is an electrically driven fan means, each of the electrically conductive strips forming a power bus between the electrical battery means and the electrically driven fan means, and yet another of the inner modules comprises air filtering means, whereby air may be driven through an assembly of interengaged outer modules, and filtered during through an assembly of interengaged outer modules, and filtered during passage therethrough, irrespective of the relative positions of the inner modules.

4,730,235

CASCADABLE CARRIER FOR HIGH POWER SEMICONDUCTORS OR OTHER ELECTRONIC COMPONENTS

Charles M. Newton, Budd Lake, N.J., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 16, 1987, Ser. No. 3,748
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—388 **8 Claims**



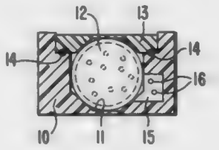
1. In an electronic circuit having two or more electronic components which generate heat as a byproduct of their operation, the electronic circuit being mounted to a retaining means, at least two carriers for mounting said electronic components to said retaining means, each of said carriers permitting heat generated during the operation of each of said electronic components to be conducted away from said electronic components, each of said carriers having a body portion to which a one of said electronic components may be mounted and a first stepped end at a first end of said body portion and a second stepped end at a second end of said body portion, said first stepped end and said second stepped end being constructed so that the second stepped end of a one of said carriers overlies and contacts the first stepped end of another one of said carriers when two of said carriers are mounted in contact with each other on said retaining means, said carriers being retained to said retaining means by at least a fastener common to both of said carriers.

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4,730,236
PROCESS FOR ENCAPSULATING A SENSITIVE COMPONENT IN A PROTECTIVE HOUSING AND ARTICLE

Friedrich Heinemeyer, Siegburg; Gert Kamp; Winfried Nass, both of Troisdorf; Frank Runge-Eschen; Gottfried Senkowski, both of Troisdorf, and Joachim Sturm, Lohmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,598
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529884
Int. Cl.⁴ H05K *7/00*
U.S. Cl. 361—392 **10 Claims**

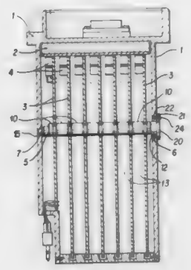


7. An assembly of a protective housing and a sensitive component, which comprises a member formed of a synthetic resin surrounding the sensitive component under force-locking fixation, said member comprising a housing body having an opening for allowing insertion of said component and a seat formed therein encompassing the component from at least opposite sides, said housing body exhibiting on at least one of these sides a deformation zone which is plastically defomed in a direction towards the component in order to clamp the component in place and an elastically deformable lid means for sealing the opening in said housing body, said lid means pressing against the component and urging the component against the seat within the housing body.

4,730,237
CAM-LOCK CIRCUIT BOARD SPACER

John C. Locker, 8061 Round Moon Cir., Jessup, Md. 20794

Filed Sep. 30, 1986, Ser. No. 913,299
Int. Cl.⁴ H05K *1/14*
U.S. Cl. 361—395 **5 Claims**



1. A device for maintaining the proper spacing for circuit boards comprising:

a housing for mounting electronic circuit boards;

a chassis circuit board mounted onto said housing;

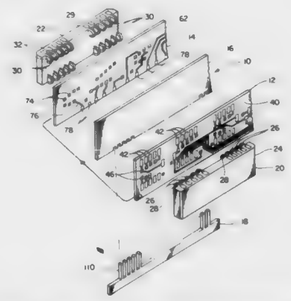
a plurality of circuit boards having one end secured to said chassis circuit board at a right angle, and having apertures centrally located within said circuit boards; and

a cam-lock shaft mounted onto said housing wherein adjacent lobes of said cam-lock shaft are positioned to engage the edges of said apertures of said circuit boards, thereby securing said circuit boards in proper spaced alignment with adjacent circuit boards.

4,730,238
DOUBLE SIDED MOUNTING MODULE FOR SURFACE MOUNT INTEGRATED CIRCUITS

Carl R. Cook, Coral Springs, Fla., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 1, 1986, Ser. No. 914,094
Int. Cl.⁴ H05K *1/11*
U.S. Cl. 361—414 **2 Claims**



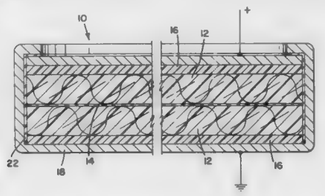
1. A mounting module for electrically connecting a surface mount integrated circuit to a printed circuit board, comprising: an insulating body having a exposed first and second face, said insulating body having a first and second outer insulating layers and an intermediate insulating layer, said intermediate insulating layer having an edge portion defining a plurality of slots; a first plurality of exposed conductors mounted upon said first exposed face; a second plurality of exposed conductors mounted upon said second exposed face; a first plurality of feed-through holes electrically connected to said first plurality of exposed conductors and extending interiorly of said first exposed face; a second plurality of feed-through holes electrically connected to said second plurality of exposed conductors and extending interiorly of said second exposed face; a first plurality of connection pads mounted interiorly of said insulating body and being electrically connected to said first plurality of feed-through holes; a second plurality of connection pads mounted interiorly of said insulating body and being electrically connected to said second plurality of feed-through holes; and a plurality of conductive legs extending into respective ones of said plurality of slots in an interior portion of said insulating body, each said conductive leg of said plurality contacting a respective connection pad of said first and second pluralities in good electrical connection therewith.

4,730,239
DOUBLE LAYER CAPACITORS WITH POLYMERIC ELECTROLYTE

John C. Currie, Novelty; Linda F. DiFranco, Mayfield Heights, both of Ohio, and Phillip D. Bennett, Gainesville, Fla., assignors to Stemcor Corporation, Cleveland, Ohio

Filed Oct. 29, 1986, Ser. No. 924,525
Int. Cl.⁴ H01G *9/00*
U.S. Cl. 361—433 **24 Claims**

1. A double layer capacitor comprising a pair of high surface area electrodes each having an electronically conductive surface on one side thereof, said electrodes comprising carbon in particulate, fiber or cloth form, the high surface area electrodes being impregnated with a multiphasic polymeric electrolyte, said multiphasic electrolyte comprising polymer material doped with a soluble salt to confer ionic conductivity and



electronically non-conductive means separating said electrodes to prevent short-circuiting therebetween.

4,730,240
REFLECTOR

Franciscus A. M. M. van Meel; Leonard C. H. Eijkelenboom, and Egbertus J. P. Maassen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,070
Claims priority, application Netherlands, Dec. 9, 1981, 8105535
Int. Cl.⁴ F21V *7/00*
U.S. Cl. 362—346 **2 Claims**



1. A reflector in which an opening is present to accommodate a light source which reflector is formed as a portion of a solid of revolution, the generatrix of the solid of revolution being formed from a plurality of staggered parabolic segments, characterized in that the parabola axis associated with each parabolic segment P_i makes a respective angle χ_i (i=1, 2, 3 etc.) with the axis of revolution of the reflector, there being present at least between each pair of adjacent parabolic segments a respective transitional portion which smoothly changes into the adjoining parabolic segment(s), the generatrix of the reflector being of such a shape that

$$\chi_i \leqq \psi - 0.5\alpha_{min}$$

$$\beta \leqq 0.75\psi,$$

and

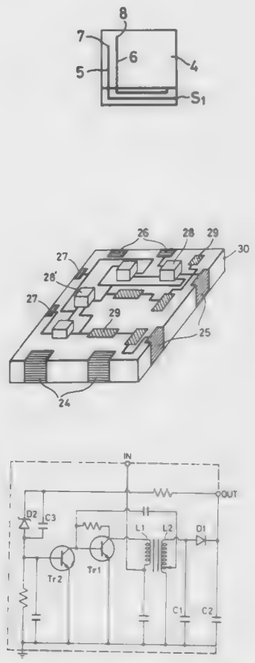
$$0.25\alpha_{max} \leqq \psi \leqq 2\alpha_{max}$$

wherein α is the angle within which the ends of the light-emitting portion of the light source, when accommodated in the reflector, are seen from a point on the reflecting surface, and ψ is the half-value width of the light beam (in degrees) emerging from the reflector, β is the total change of inclination angle in the reflector, over that parabolic segment and adjoining transitional portion which provides the largest total change.

4,730,241
LAMINATED HYBRID INTEGRATED DC-DC CONVERTER

Minoru Takaya, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 760,017, Jul. 29, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 40,688
Claims priority, application Japan, Jul. 27, 1984, 59-113453[U]
Int. Cl.⁴ H02M *3/338*
U.S. Cl. 363—19 **3 Claims**



1. A DC-DC converter of a laminated hybrid integrated type comprised of a DC-DC converter including a transistor with the input connected to a DC input terminal and a transformer with its primary winding connected to the output of said transistor and its secondary winding to the input of said transistor to form an oscillator, an AC-DC converter operatively associated with said DC-AC converter and including a diode and capacitor network for rectifying and smoothing the output of the secondary winding, characterized in that said transformer consists of a sintered laminate formed by alternately laminating a plurality of insulator layers and two sets of conductor insulated from each other, said conductor layers being connected at ends so as to constitute said primary and secondary windings each spiralling upward in an interlayer formation from above one insulator layer to another, both ends of said windings being led to terminals on periphery of said sintered laminate, said transistor and said diode and capacitor network being mounted on the surface of said sintered laminate, the output and input of said transistor being connected to said terminals for the primary and second windings respectively, and the input of said diode and capacitor network being connected to the terminal for the output of said secondary winding.

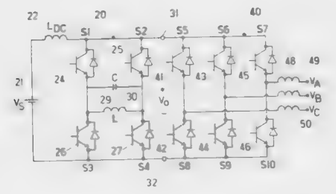
VOL 1088 ISS 2 MR 8 1988 UMI

4,730,242

STATIC POWER CONVERSION AND APPARATUS HAVING ESSENTIALLY ZERO SWITCHING LOSSES

Deepakraj M. Divan, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 25, 1986, Ser. No. 912,080
Int. Cl.⁴ H02M *5/458, 7/162, 7/5387*
U.S. Cl. 363—37 **25 Claims**



1. A power converter for converting DC power to AC power comprising:

(a) a resonant circuit having an inductor adapted to receive a DC power input, a capacitor connected to the inductor, and a DC bus providing the output voltage from the resonant circuit;

(b) means for causing the resonant circuit to oscillate stably at or below its resonant frequency and for the voltage across the DC bus to be maintained at an average DC level and to go to zero voltage at least once during each cycle of oscillation of the resonant circuit; and

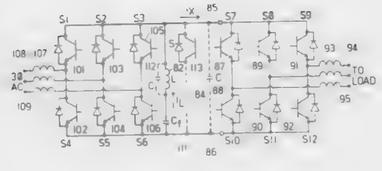
(c) an inverter connected to receive the voltage on the DC bus and having gated switching devices which are switched on and off only when the voltage on the DC bus is substantially zero.

4,730,243

EMI REDUCTION CIRCUIT

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,746
Int. Cl.⁴ H02M *1/14*
U.S. Cl. 363—44 **25 Claims**

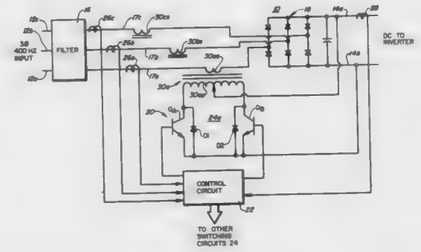


10. An electromagnetic interference (EMI) reduction circuit for reducing harmonics in AC power carried on a power line caused by rectification of the AC power by a rectifier circuit, comprising:

first means for developing a current signal representing the current carried by the AC power line;

second means coupled to the first developing means for developing an error signal from the current signal;

means coupled to the second developing means for deriving compensating current from the error signal; and



means coupled to the deriving means and to the power line for combining the compensating current with the AC current to reduce the harmonics therein.

11. The EMI reduction circuit of claim **10**, wherein the combining means comprises a transformer having a primary winding which receives the compensating current and a secondary winding coupled to the power line.

4,730,244

POWER SUPPLY

Alan W. Zimmerman, Hanover Park, Ill., assignor to Wells-Gardner Electronics Corporation, Chicago, Ill.

Filed Jan. 16, 1987, Ser. No. 4,114
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—49 **21 Claims**

1. A regulated power supply having an output voltage, which comprises:

means for coupling the power supply to a source of alternating current;

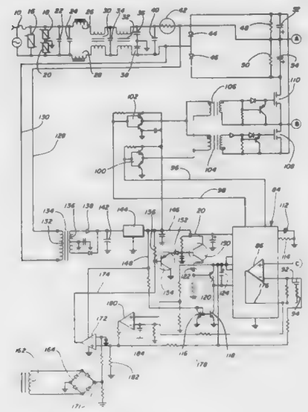
means for rectifying and filtering the alternating current;

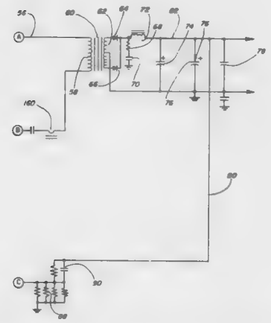
means for sensing the output voltage;

an error amplifier for providing a first error signal and a second error signal responsive to the output voltage;

means for sensing the current level;

means for providing a first current level set point for said current level sensing means in response to the first error signal and for providing a second current level set point for said current level sensing means in response to the second error signal; and





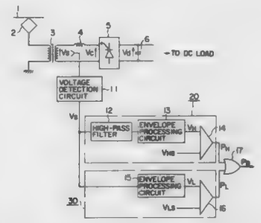
means for providing an output signal is response to sensed current level.

4,730,245

POWER CUT DETECTION APPARATUS FOR POWER CONVERTER

Hirokazu Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 22, 1986, Ser. No. 909,724
Claims priority, application Japan, Sep. 27, 1985, 60-213816
Int. Cl.⁴ H02H *7/125*
U.S. Cl. 363—54 **8 Claims**



1. A power converter having an ac side connected through a reactor to an ac power source and a dc side connected to a smoothing capacitor and a load, said converter being capable of converting and inverting electric power in accordance with pulse width modulation control, comprising:

(a) a voltage detection circuit for detecting a voltage on the side of the ac power source when viewed from said reactor;

(b) a first judgement section for detecting that an amplitude of a voltage component on the ac side of said power converter, which is included in the ac power source voltage, is above a predetermined value based on an output signal from said voltage detection circuit to produce an output signal indicative of a first judgement result;

(c) a second judgement section for detecting that the amplitude of the ac power source voltage is below the predetermined value to produce an output signal indicative of a second judgement result; and

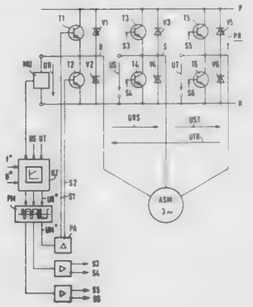
(d) a gate circuit for performing a logical sum of the output signals from the first and second judgement sections to produce an output signal from said gate circuit indicative of a power interruption of said ac power source.

4,730,246

METHOD AND APPARATUS FOR OPERATING A PULSE FREQUENCY CONVERTER WITH COMPENSATION OF FAULT VOLTAGE-TIME AREAS CAUSED BY CARRIER STORAGE EFFECTS

Günter Schwesig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1986, Ser. No. 915,082
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541227
Int. Cl.⁴ H02H *7/122*
U.S. Cl. 363—56 **14 Claims**



1. A method for operating a pulse frequency converter, in particular a pulse frequency converter having transistor or gate turn-off thyristor switches, comprising forming, from a control voltage for two frequency converter switches coupling a common AC output terminal of the converter alternatingly to one of two DC input connections to the converter, two pulse width modulated control pulses for the alternating drive of respective ones of said two switches, interlocking the switches jointly briefly between the two pulse width-modulated control pulses during a latch period, generating a voltage-time area by integration during the latch periods from a measured signal corresponding to a switch voltage and controlling the width of the control pulses with a correction quantity derived from the generated voltage-time area as an interference quantity.

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4,730,247

DIGITAL INDICATION TYPE MEASURING APPARATUS AND MEASURED DATA STORAGE APPARATUS THEREFOR

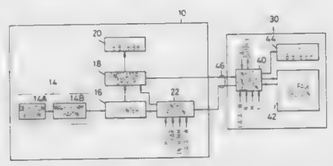
Noboru Takahara, Tokyo, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,979

Claims priority, application Japan, Sep. 5, 1983, 58-162952; Sep. 5, 1983, 58-162953

Int. Cl.⁴ G01B *7/12*

U.S. Cl. 364—560 **7 Claims**



1. Digital indication type article measuring appartus comprising: an encoder connected to a measuring element, for detecting a displacement of said measuring element; a counter for counting output signals from said encoder; and a digital indicator for indicating a value counted by said counter as a measured value and for producing a measured value output; wherein the improvement comprises:

computer readable portable data storage means responsive to said measured value output for directly storing measured values relating to a plurality of measured articles, said data storage means being connected to a main body of said measuring apparatus so as to be operable and transporable with said measuring apparatus for measuring the articles and separable from said measuring apparatus for reading of the stored contents of said storage means by an external computer without interfering with the operation of said digital indicator;

data switch means for controlling input of said measured values to said data storage means; and

data identifying means responsive to said data switch means for automatically generating and storing in said data storage means predetermined identifying data associated with each inputted measured value signifying the article to which each measured value corresponds.

4,730,248

SUBROUTINE LINK CONTROL SYSTEM AND APPARATUS THEREFOR IN A DATA PROCESSING APPARATUS

Hiroshi Watanabe, and Takeshi Kato, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,673

Claims priority, application Japan, Sep. 2, 1983, 58-160454

Int. Cl.⁴ G06F *9/30, 12/00*

U.S. Cl. 364—200 **8 Claims**

1. For operation of a data processing apparatus in the running of successive routines, including a plurality of general registers each for storing data necessary for operation of a routine, memory means for storing data received from said general registers, and means for transferring data from a general register to said memory means when the operation of the data processing apparatus is shifted from one routine into another routine and for retrieving from said memory means and restoring previously stored data to a general register when the one routine is resumed after execution of said other routine, a routine link control method comprising the steps of:

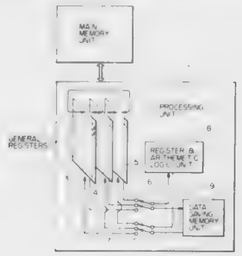
storing the data necessary to the operation of one routine in a first general register;

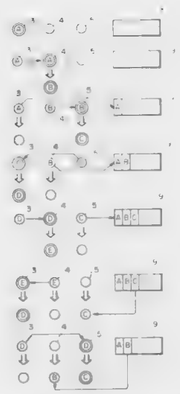
running said one routine on the basis of the data stored in said first general register;

copying the data in said first general register into a second general register when the operation of the data processing apparatus is shifted from said one routine to a second routine;

running said second routine on the basis of the data stored in said second general register;

copying the data in said second register into a third general





register and storing the data from said first general register into said memory means when the operation of the data processing apparatus is shifted from said second routine to a third routine; and

running said third routine on the basis of the data stored in said third general register.

4,730,249

METHOD TO OPERATE ON LARGE SEGMENTS OF DATA IN A VIRTUAL MEMORY DATA PROCESSING SYSTEM

John T. O'Quin, II, Austin, Tex., and John C. O'Quin, III, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 16, 1986, Ser. No. 819,457

Int. Cl.⁴ G06F *15/00, 12/08*

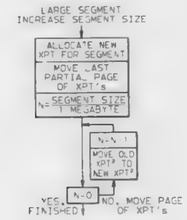
U.S. Cl. 364—200 **10 Claims**

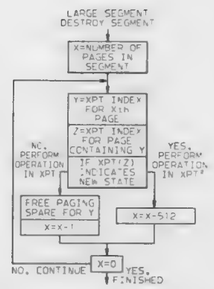
1. A method used in a data processing system having a virtual memory for performing selected operations on entire large segments including a "create segment" operation, each said segment that is created having a unique address range and a plurality of virtual pages each having a virtual address within said unique address range, each said virtual page having a plurality of different states including a first state where said page is free and unreferenced and a second state where said page is committed, said committed virtual pages being demand paged into said system and stored at a physical location having a real address of a first storage device and paged into another

storage location of a second storage device by a page faulting mechanism when required by said system, said system further including a plurality of pageable external page tables (XPTs), each XPT having at least one page of XPT entries, each said page of XPT entries having a virtual address and including k entries, each having n bytes, where k times n is equal to the byte capacity of a virtual page in said system, each said XPT entry having a first field for storing said real address of one of said virtual pages and a second field for storing an indication of said state of said one said virtual page, said "create segment" operation comprising the combination of the following steps,

(A) establishing one virtual segment having pages with virtual page addresses that correspond to real page addresses,

(B) storing said one virtual segment in said second storage device so that said one virtual segment in not pageable,





(C) providing a non-pageable data structure XPT^2 having k' entries, each having n' bytes where k' times n' equals said byte capacity, each of said k' XPT^2 entries having a first field for storing the virtual address of one said page of XPT entries and a second field for storing an indication that all of said pages represented by said XPT entries in said one page of XPT entries are either in said first state or said second state,

(D) establishing a sub-set of real addresses for said one virtual segment for storing a plurality of said XPT^2 data structures, and

(E) changing said indication from said first state to said second state in at least one of said k' XPT^2 entries corresponding to said address range of said newly created segment whereby a new segment is created having at least k virtual pages by changing only one said indication in one XPT^2 entry for each said k pages created.

4,730,250

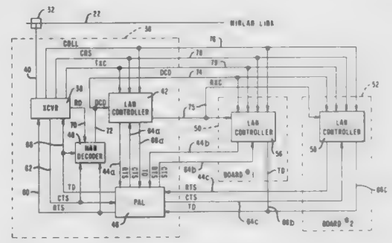
LOCAL AREA NETWORK PROCESSING SYSTEM

Donald J. Girard, and Frank Hines, both Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 3, 1985, Ser. No. 772,226

Int. Cl.⁴ G06F *15/16;* **H04Q** *9/00;* **H04J** *3/02*

U.S. Cl. 364—200 **9 Claims**



1. A data processing system for transmitting data between a first processing device and a plurality of remote processing devices including:

a communication channel coupled to said first processing device;

means coupled to said communication channel over a first communication line;

priority resolving means coupled over a second communication line to said transmitting means for transmitting data to said transmitting means and coupled over a plurality of third communication lines to each of said remote processing devices for outputting a first control signal over one of said third communication lines to one of said remote processing devices enabling said remote processing device to transmit data to said priority resolving means over another of said third communication lines whereby said priority resolving means will transmit the received data over said second communication line to said transmitting means; and

means coupled between each of said remote processing devices and each of said third communication lines for selectively connecting said one of said third communication lines to its associated remote processing device enabling said associated remote processing device to receive said first control signal from said priority resolving means and connecting said another of said third communication lines to its associated remote processing device enabling the remote processing device to transmit data to the priority resolving means whereby the priority resolving means will transmit the data over said second communication line to said transmitting means.

4,730,251

AUTOMATIC I/O ADDRESS ASSIGNMENT

David E. Aakre, Kasson; Douglas J. Abrahamson, Rochester; Neil C. Berglund, Kasson; Vincent A. Bettermann, Rochester; Lloyd S. Heim, Oronoco, all of Minn., and Kenneth A. Moe, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,884

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—200 **2 Claims**

1. A method of assigning addresses to units attached by a bus having multiple lines, to a controller, wherein each unit has a unique identifier comprising a string of bits, comprising the steps of:

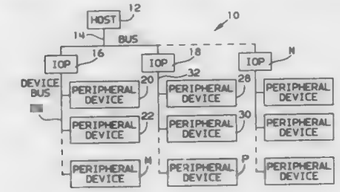
(a) raising a first line of the bus if at least one unit does not have an address already assigned;

(b) sending a status poll to the units if the first line of the bus is raised;

(c) detecting address unique bus lines raised by units in

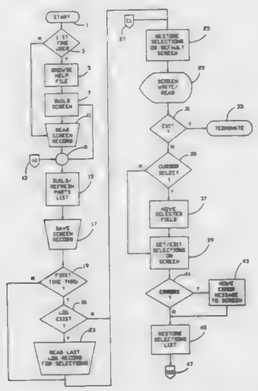
VOL 1088 ISS 2 MR 8 1988 UMI

response to the status poll indicating which addresses are already assigned;
(d) sending a command to each unit to respond to address assignment signals if such units do not already have an address assigned;
(e) sending a bit of identification data to each unit responding to address assignment signals;
(f) causing each unit to respond to said bit of identification data if it matches a corresponding bit of unique identifier in a unit which is still responding address assignment signals;



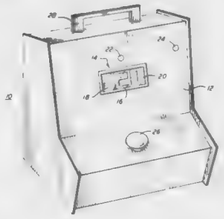
(g) causing each unit to stop responding to address assignment signals if said bit of identification data does not match a corresponding bit of unique identifier for said each unit;
(h) changing the value of the bit of identification data if no unit responded in step f;
(i) repeating steps e through h for a predetermined number of bits equal at least in length to the longest unique identifier;
(j) assigning an address not previously assigned to the single unit still responding to address assignment signals; and
(k) repeating steps b through j until all units have addresses assigned.

4,730,252
DOCUMENT COMPOSITION FROM PARTS INVENTORY
Kenneth A. Bradshaw, Bedford, Tex., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Sep. 24, 1985, Ser. No. 779,535
Int. Cl.[4] G06F *3/12, 15/21*
U.S. Cl. 364—403 **21 Claims**



1. A program for use in a word processing system including an operator display and operator input means, said program being selectively operable to effect the process of:
displaying an inventory screen which includes a plurality of generic parts indicia corresponding to predetermined standard parts of a document, each of said standard parts having associated therewith a plurality of screen areas for including short identifiers for a plurality of specific files which may be associated with said standard parts;
receiving selectively generated operator input for assigning specified short identifiers to said plurality of screen areas;
selectively displaying file screens for prompting operator input to define a content of said specific files;
receiving operator input for defining the content of said specific files;
receiving operator input for designating selected specific files to be included in a document; and
assembling a document from said designated specific files.

4,730,253
TESTER FOR MEASURING IMPULSIVITY, VIGILANCE, AND DISTRACTIBILITY
Michael Gordon, 301 Ambergate Rd., Dewitt, N.Y. 13214, assignor to Michael Gordon, Dewitt, N.Y.
Continuation-in-part of Ser. No. 508,813, Jun., 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,511
Int. Cl.[4] G06F *15/42;* **G09B** *5/00*
U.S. Cl. 364—415 **17 Claims**



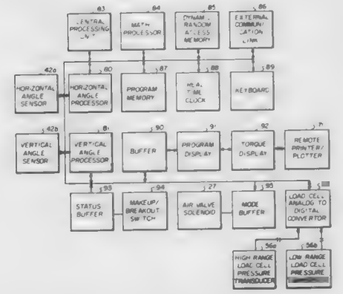
1. A method of diagnosing hyperactivity in a child by measuring the child's attentiveness and impulsivity using a diagnostic device, comprising
(1) administering a Delay Task including
(i) setting the device into a Delay Task mode;
(ii) selecting a delay interval corresponding to a minimum time between successive actuations of a response key on the machine for which to record a reward event for the task;
(iii) suitably instructing the child to depress the responsive device, wait for a time, and again depress the response key to obtain a reward,
(iv) starting the child on the Delay Task operation and recording the number of times the key has been actuated and the number of reward events achieved by the child over a prescribed period of time, and
(v) comparing the number of reward events thus recorded with a standard table of normative data; and
(b) administering a Vigilance Task including
(i) setting the device into a Vigilance Task mode,
(ii) suitably instructing the child to depress said response key when a predetermined symbol is presented, under certain prescribed condition or conditions, on a display, and only to depress the key when the symbol is so presented under said condition or conditions, wherein said prescribed condition or conditions is that the predetermined symbol is followed immediately by a second predetermined symbol such that a correct response is constituted by depressing the response key when the second symbol is presented but only when immediately after presentation of the first-mentioned symbol,
(iii) generating a series of different symbols, including several occurrences of said predetermined symbols, in a random or pseudorandom order and presenting said series on said display,

(iv) recording as correct responses the number of depressions of said response key when said predetermined symbols are presented under the prescribed condition or conditions, as errors of commission the number of depressions of said key other than when said predetermined symbols are presented under said prescribed condition or conditions, and as errors of omission the number of failures of the child to depress said key when said symbols are presented under said condition or conditions, and
(v) comparing the recorded errors of omission, the recorded errors of commission, and the recorded correct responses of said child with standard tables of normative data.

8. Apparatus for objectively testing a subject's ability to sustain attention and control impulsivity under controlled conditions requiring a positive response comprising
a housing,
response key means on said housing to be manually actuated by said subject,
switch means for switching between a Delay Task mode and a Vigilance Task mode,
symbol generating means for presenting to the subject a series of different symbols in which a known symbol is presented for recognition at least several times when the apparatus is in the Vigilance Task mode,
delay means for comparing the time between successive actuations of said response key with a predetermined delay time when said apparatus is in the Delay Task mode and producing a reward indication when the subject has waited at least said delay time after one actuation of the response key before again actuating the same, and
means for automatically recording the number of reward indications in said Delay Task mode for said subject for a predetermined period of time, as correct responses the number of times in said Vigilance Task mode said key is depressed when said known symbol is presented under a prescribed condition, wherein the prescribed condition of the known symbol is that a set of plural characters including said symbol are presented in a predetermined sequence, as errors of commission the number of times in said Vigilance Task mode said key is actuated other than when said known symbol is presented under said condition, and as errors of omission the number of times in said Vigilance Task mode that said key fails to be actuated when the known symbol is presented under said prescribed condition.

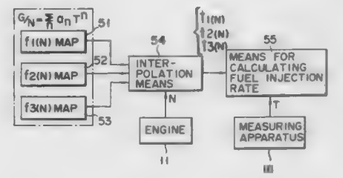
4,730,254
DRILL STRING MAKE-UP AND BREAKOUT TORQUE CONTROL SYSTEM AND APPARATUS
Gerre S. Voden, Jr., Evanston, Wyo., assignor to Torque Systems, Inc., DeQuincy, La.
Filed Feb. 3, 1986, Ser. No. 825,450
Int. Cl.[4] G01L *5/24;* **E21B** *19/00;* **B25B** *23/00*
U.S. Cl. 364—422 **11 Claims**

1. A drill string make-up and breakout torque control system and apparatus for use with a cat head system, including clutch operated drum and chain or cable for force generation, and a tong for torque application comprising:
(a) means for measuring the instantaneous force generated by the cat head system and applied to the tong:
(b) means for measuring the instantaneous vertical and horizontal angles between the direction of the force applied by the cat head system to the tong and the longitudinal axis of the tong;
(c) means for connecting the force measuring means and the angle measuring means to the tong and the cat head chain or cable;
(d) means for computing the torque applied to the drill string by the tong, utilizing the length of the tong to the point of the force application, the force applied to the tong as measured by the force measuring means, and the vertical and horizontal angles between the direction of the applied force and the longitudinal axis of the tong as measured by the vertical and horizontal angle measuring means;
(e) means for computing a shutdown time interval in advance of achievement of a pre-selected make-up torque at which shutdown of the cat head must be initiated to achieve, within an allowed tolerance, the pre-selected make-up torque at the instant shutdown of the cat head system is complete;



(f) means for automatically disengaging the clutch of the cat head, when the shut down time interval is reached during make-up of the drill string; and
(g) means for displaying, printing and plotting applied force, horizontal and vertical angles between the direction of the applied force and the longitudinal axis of the tong, actual make-up torque, and date and time at cat head shutdown or breakout.

4,730,255
ENGINE CONTROL APPARATUS
Susumu Akiyama, Kariya; Ito Katsunori; Yuzi Hirabayashi, both of Aichi; Masumi Kinugawa, Okazaki, and Norio Omori, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed May 23, 1985, Ser. No. 737,088
Claims priority, application Japan, May 28, 1984, 59-107783
Int. Cl.[4] G01F *1/68;* **F02D** *5/00*
U.S. Cl. 364—431.05 **6 Claims**



1. An engine control apparatus comprising:
an intake condition measuring device which is formed by means supplying a heating current to a temperature sensing element in accordance with a start pulse signal synchronous with the engine rotation, automatically stopping the supply of the heating current when the temperature of the element rises to a predetermined value, and generating an output pulse signal having a width T corresponding to the period during which the heating current has been supplied to the element;
means for detecting a number of engine rotations;
a plurality of map memory means for storing, in the form of a one-dimensional map, a plurality of functions $f_n(N)$,

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respectively, determined based on the number of engine rotations;

interpolation calculation means which, by using said plurality of map memory means, performs interpolation calculation of the numerical values of functions $f_n(N)$, based on the number of engine rotations detected by said engine rotation number detecting means, for determining a plurality of coefficients a_n in a polynomial approximation of

$$G/N = \sum_n a_n \cdot T^n,$$

which expresses an intake air flow rate per engine rotation G/N by means of width T of the output pulse signal of the intake condition measuring device;

fuel injection quantity calculation means for calculating the intake air flow rate per engine rotation G/N, on the basis of the numerical values of functions $f_n(N)$, calculated by the interpolation calculation means for determining the coefficients a_n, and the width T of the output pulse signal of the intake condition measuring device, and by using the polynomial approximation

$$G/N = \sum_n a_n \cdot T^n,$$

and for calculating a fuel injection quantity on the basis of the calculated intake air flow rate per engine rotation G/N; and

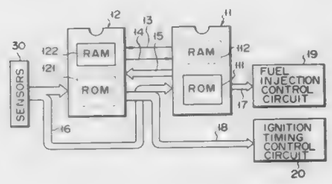
fuel injection means for supplying an engine with a quantity of fuel corresponding to the fuel injection quantity calculated by the fuel injection quantity calculation means.

4,730,256

ELECTRONIC CONTROL APPARATUS INCLUDING MICROCOMPUTERS FOR CONTROLLING SOME OF THE SYSTEMS FOUND IN A VEHICLE

Yukihide Niimi, Aichi; Takashi Harada, Hekinan; Akio Kobayashi, Kariya; Ryosuke Tachi, Aichi, and Takeshi Matsui, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 28, 1985, Ser. No. 749,902
Claims priority, application Japan, Jul. 4, 1984, 59-138765
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 364—431.12 **12 Claims**



1. An electronic control apparautus, including microcomputers, for controlling the system found in a vehicle, comprising:

a first one-chip microcomputer having at least one ROM, at least one RAM, and at least one input/output port and adapted to calculate a control value for controlling one of the devices provided in the system;

a second one-chip microcomputer having at least one ROM, at least one RAM, and at least one input/output port and adapted to calculate a control value for controlling other of the devices provided in the system;

data transmission means connected between said first and second microcomputers for supplying data from, at least, said first microcomputer to said second microcomputer;

initialization means for transferring an operational map stored in the ROM of said first microcomputer to the RAM of said second microcomputer;

data sensing means for supplying items of data, representing the conditions of the system, to said first and second microcomputers; and

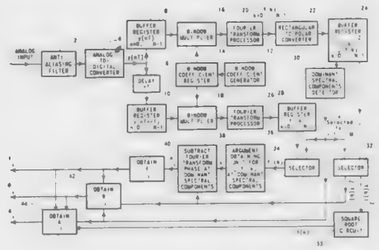
output means for controlling said first and second microcomputers, which calculate control values from the items of data in accordance with the programs stored in the ROMs and the operational maps stored in the RAMs.

4,730,257

APPARATUS FOR ANALYZING SIGNALS, TO OBTAIN PARAMETERS OF CONSTITUENTS

Lai-wan M. Szeto, 57 Axsmith Cres., Willowdale, Ontario, M2J 3K2, Canada

Filed Jan. 25, 1985, Ser. No. 695,017
Int. Cl.⁴ G01R *23/00*
U.S. Cl. 364—484 **24 Claims**



1. An apparatus, for use in analysing a signal, the apparatus comprising:

(i) delay means, for applying a delay to an original signal, to create a shifted signal and having an output;

(ii) first transform means for applying a Fourier Transform to an original signal, to create a plurality of first frequency components, and having an output;

(iii) second transform means connected to the output of the delay means, for applying a Fourier Transform to the shifted signal to create a plurality of second frequency components, the second transform means having an output for the second frequency components:

(iv) argument obtaining means connected to the outputs of the first and second transform means for obtaining the arguments of the corresponding first and second frequency components and having an output for said arguments;

(v) phase difference obtaining means, connected to the output of the argument obtaining means and having an output; and

(vi) frequency obtaining means, connected to the output of the phase difference obtaining means, for obtaining the frequencies of the constituents of the original signal from said phase differences.

4,730,258

METHOD OF AND APPARATUS FOR CONTROLLING AUTOMATED DEVICES

Kenji Takeda, Kamakura; Shunji Mohri; Kichie Matsuzaki, both of Yokohama; Seiji Hata, Fujisawa, and Kenji Suzuki, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,229
Claims priority, application Japan, Nov. 2, 1984, 59-230172
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—513 **10 Claims**

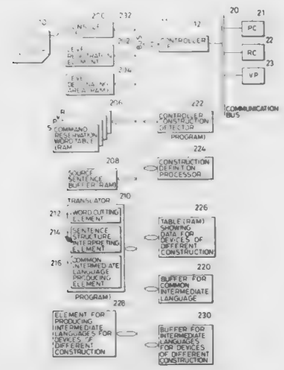
1. A method of controlling automated devices connected in an automated system in which a plurality of automated program-controlled devices are connected to one another and

have operations cooperatively controlled, comprising the steps:

inputting a program written in a unified language which has a unified format for all connected automated devices;

translating said inputted program into a corresponding program for each of the connected automated devices in accordance with a combination of said connected automated devices; and

practicing the controlling of said automated devices on the basis of said corresponding program for each of the connected automated devices.

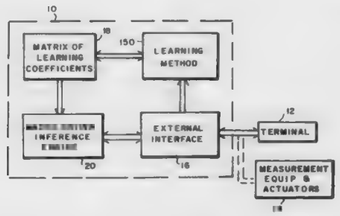


4,730,259

MATRIX CONTROLLED EXPERT SYSTEM PRODUCIBLE FROM EXAMPLES

Stephen I. Gallant, 14 Porter Rd., Cambridge, Mass. 02140

Filed Mar. 1, 1985, Ser. No. 707,458
Int. Cl.⁴ G06F *15/18*
U.S. Cl. 364—513 **36 Claims**



1. An expert system for providing responses, actions or inquires in response to a set of conditions comprising:

a set of goal variables representative of said responses and said actions;

a set of variables representative of said conditions;

a matrix of learning coefficients providing a matrix value for each combination of one from a set of resultant variables and one from a set of primary variables, said set of resultant variables at least including a set of goal variables representative of said responses and said actions and said set of primary variables at least including a set of varaibles representative of said conditions;

an external interface for receiving said conditions to establish known primary variables and outputting said responses, actions or inquiries; and

an inference engine including:

means for computing likely values of said resultant variables from known primary variables in accordance with said matrix of learning coefficients,

means for determining whether said likely value is a final determination, said likely value being a final determination when said likely value would be unchanged regardless of the value of the primary variables whose values are not known;

means for determining a useful condition which will contribute to making a final determination of a resultant variable whose value has not been finally determined; and

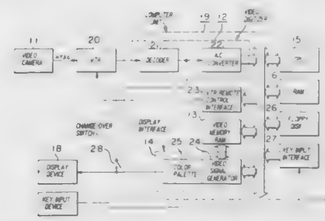
means for causing said external interface to output responses or actions in accordance with the finally determine values of said goal variables and to output an inquiry making for said useful condition.

4,730,260

METHOD FOR EYEWEAR SIMULATION AND A DEVICE FOR ITS PRACTICE

Masaru Mori, Ichikawa; Tetsuo Miyake, Yokohama, and Kazuaki Shimizu, Urayasu, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 779,115
Claims priority, application Japan, Sep. 28, 1984, 59-201817
Int. Cl.⁴ G06F *15/62;* **H04N** *7/18*
U.S. Cl. 364—518 **14 Claims**



1. A method for eyewear simulation, wherein a spectacles frame is matched with a person, said method comprising:

projecting a reference area on a display device;

aligning an image of a person who has taken off his/her spectacles taken with a video camera on said display device with said reference area;

converting analog signals from said camera to digital signals representing the aligned image of the person by an A/D-conversion,

storing into a video memory device the converted digital signals;

thereafter displaying the aligned image which is produced by synthesizing data for the image of the person and data for the spectacles frame as stored in the video memory device; and

finally displaying the person with the spectacles frame superimposed on his/her face on a display device to thereby match the spectacles with the person.

4,730,261

SOLIDS MODELLING GENERATOR

David M. Smith, Saratoga, Calif., assignor to Ramtek Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 545,366, Oct. 23, 1983, Pat. No. 4,667,306, which is a continuation-in-part of Ser. No. 515,946, Jul. 20, 1983, abandoned. This application Apr. 6, 1987, Ser. No. 35,630
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 364—521 **8 Claims**

1. A graphics display apparatus for generating visual images of visible surfaces of geometric solids, wherein said geometric solids are defined by line segments which meet at vertices, and further wherein said vertices are defined in at least a three-di-

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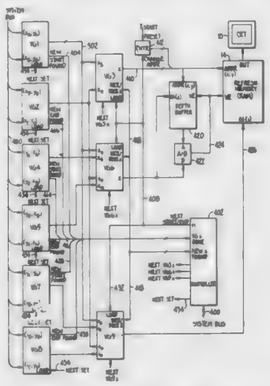
mensional coordinate system and by an intensity coordinate, comprising

visual display means for displaying an array of pixels;

refresh memory means coupled to the visual display means for storing the array of pixels, wherein each pixel of the array of pixels is stored at a designated address;

a first plurality of vector generator means, coupled to address the refresh memory means and responsive to a first set of coordinate values from selected ones of said vertices which define line segments of the geometric solids that oppose one another, for determining start, end, and intermediate points of parallel line segments which extend between the opposing line segments and which are parallel to a first dimensional axis of the three-dimensional coordinate system, wherein the first set of coordinate values correspond to a first set of specified coordinate dimensions of the three-dimensional coordinate system, and the start, end, and intermediate points are expressed in the first set of specified coordinate dimensions;

a second plurality of vector generator means, responsive to a second set of coordinate values from said selected ones of said vertices and to the start, end, and intermediate points of the parallel line segments, for determining coordinates values of the start, end, and intermediate points of said parallel line segments for the dimensional coordinates



of the multi-dimensional coordinate system which were not included in the first set of dimensional coordinates, wherein the second set of coordinate values include coordinates which correspond to a second set of coordinate dimensions of the three-dimensional coordinate system, at least one coordinate dimension of which is different from that in the first set of specified coordinate dimensions;

means coupled to the first and second plurality of vector generator means, to the refresh memory means, and to the control means, for enabling the refresh memory means when points on visible surfaces are being identified by the first and second vector generator means;

a third plurality of vector generator means, coupled to the refresh memory means and to the determining means and responsive to the intensity and dimensional coordinate values from the selected ones of said vertices, for determining start, end, and intermediate intensity values of the parallel line segments and for supplying said intensity values to the refresh memory means; and

control means for coordinating the operation of the first, second, and third plurality of vector generator means and for addressing the refresh memory means and the determining means so that intensity values of the visible surface of the geometric solid are stored at the appropriate designated address of the refresh memory means.

4,730,262

METHOD OF DISPLAYING THE SCANNING SCHEDULE IN A COMPUTER TOMOGRAPHIC APPARATUS

Yoshihiko Watanabe; Yoshikazu Ogawa, and Akimoto Nakase, all of Musashino, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

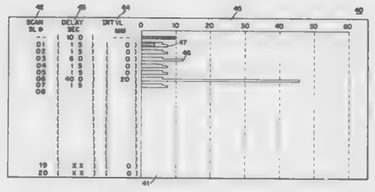
PCT No. PCT/JP85/00023, § 371 Date Sep. 24, 1985, § 102(e) Date Sep. 24, 1985, PCT Pub. No. WO85/03856, PCT Pub. Date Sep. 12, 1985

PCT Filed Jan. 22, 1985, Ser. No. 789,307

Claims priority, application Japan, Feb. 29, 1984, 59-29829[U]

Int. Cl.⁴ G01N *23/04;* A61B *6/03*

U.S. Cl. 364—521 **4 Claims**



1. A method of displaying the scanning schedule for computer tomographic apparatus comprising a scanner for scanning an object to be examined; a setting device for setting the scanning schedule including a margin time setting value between a previous scanning step and the next scanning step for each of a series of a plurality of scanning steps to be effected by said scanner; a visual display for concurrently displaying a schedule of scannings as numbers, delay times as numbers, intervals as numbers and graphic figures representing the scanning schedule; and a controller for causing said scanner to conduct scanning for the object according to the schedule for a series of a plurality of scanning steps set by the setting device, and displaying as graphic figures the set scanning schedule and proceeding state of the scanning schedule on said display; said method comprising the steps of

displaying the individual scanning steps in the visual display as a first bar representing the length of the scanning time and a second bar having a different configuration from said first bar and added as an extension of the first bar for indicating the length of time of said margin time, with the first and second bars being disposed on said visual display opposite the corresponding step of the scanning schedule, delay time and interval; and

changing in real time the composition of the first bar as the scanning proceeds until the scanning in that step is completed and then subsequently changing in real time the composition of the second bar as the margin time proceeds, whereby an operator can determine instantaneously from the number of the scanning schedule, the number of the delay, and from the number of the interval, and the composition of the first and second bars in the visual display, the steps already executed, the exact part of the exact step of the scanning schedule being executed, and the steps still to be executed.

4,730,263

METHOD AND DEVICE FOR MEASURING GAMMA RADIATION

Gary L. Mathis, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Mar. 4, 1985, Ser. No. 708,041

Int. Cl.⁴ G01C *25/00;* G06F *15/74*

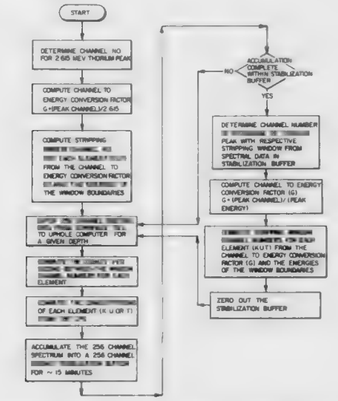
U.S. Cl. 364—571 **18 Claims**

1. A method of measuring gamma radiation comprising:

(a) determining a minimum and a maximum number of counts within a preselected multiple channel energy spectrum measurement range having a lower boundary channel corresponding to a selected minimum energy value and an upper boundary channel corresponding to a selected maximum energy value;

(b) determining a channel having approximately one-half of the maximum number of counts;

(c) determining a channel representing Compton background energy;



(d) computing a peak energy centroid channel from the relationship between the channel having one-half of the maximum number of counts and the channel representing the Compton background energy;

(e) computing a channel to energy conversion factor; and

(f) computing calibrated lower and upper boundary channels, respectively, by multiplying the channel to energy conversion factor by the selected minimum energy value and the selected maximum energy value

4,730,264

ARRANGEMENT FOR DETECTING MEASURING DATA IN MOTOR VEHICLES

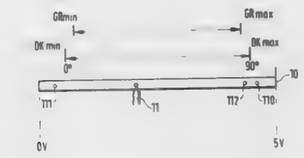
Rolf Kohler, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,109

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428879

Int. Cl.⁴ G01D *3/02*

U.S. Cl. 364—571 **6 Claims**



1. An arrangement for detecting measuring data in motor vehicles especially in combination with apparatus for controlling the internal combustion engine, the arrangement comprising:

a potentiometer having a potentiometer track and a slider movable along said track detecting data between boundary values (DKmin and DKmax) of a measuring range disposed along a portion of said track, said boundary values together with said measuring range being shiftable in a first direction along said track or in a second direction therealong opposite to said first direction because of an external influence such as drift caused by component aging, inaccuracies introduced by repair work or the like;

means for electrically shifting at least one of said boundary values (DKmax, DKmin) is one of said directions so as to coincide with a measured value (DKmeas) thereof detected by said slider; and,

means for causing the electrical shift of said boundary value to occur at first and second speeds in dependence upon in which of said two directions the boundary value (DKmax, DKmin) is shifted, said first speed being greater than said second speed.

4,730,265

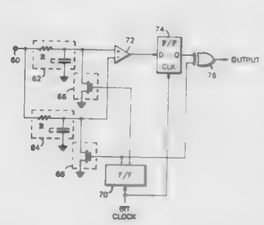
SPLIT-PHASE MATCHED FILTER USING SINGLE COMPARATOR

John E. Bjornholt, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1986, Ser. No. 892,963

Int. Cl.⁴ G06J *1/00*

U.S. Cl. 364—602 **8 Claims**



1. A split-phase matched filter comprising a pair of parallel connected integrate-and-dump circuits having outputs connected to inputs of a single comparator and said integrate-and-dump circuits further connected to alternately integrate and alternately dump.

4,730,266

LOGIC FULL ADDER CIRCUIT

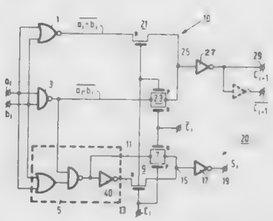
Jozef L. van Meerbergen; Hendrikus J. M. Veendrick; Franciscus P. J. M. Welten, and Franciscus J. A. van Wijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,055

Claims priority, application Netherlands, Feb. 9, 1984, 8400408

Int. Cl.⁴ G05F *7/50;* H01L *27/02*

U.S. Cl. 364—787 **8 Claims**



1. A logic full adder for adding two binary numbers a and b having n bits each, where n is equal to or greater than 2 including a plurality of single bit adders, each comprising:

an inverting AND gate and inverting OR gate for receiving a pair of like bit numbers a_i and b_i and producing an in-

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verted OR signal $\overline{a_i+b_i}$ and an inverted AND signal $\overline{a_ib_i}$ for each of said pairs of bit numbers;

a summing circuit for producing a sum signal from each pair of said like bit numbers a_i and b_i comprising a logic gate which receives said like bit numbers a_i, b_i and said inverted AND signal $\overline{a_ib_i}$, and forms on first and second outputs a first signal $a_ib_i(\overline{a_i+b_i})$, and a second signal $a_ib_i(a_i+b_i)$, respectively;

a pair of electronic switches connected to receive said first and second signals, and operated in response to a carry signal c_i, to supply either said first signal or said second signal to a first junction; and

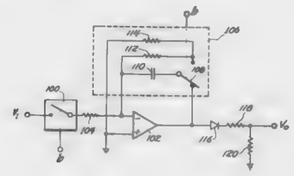
a carry look-ahead circuit for generating a carry look-ahead signal from said inverted OR signals $\overline{a_i+b_i}$ and said inverted AND signals $\overline{a_ib_i}$ produced by each of said pairs of bit numbers.

4,730,267

COMBINATION INTEGRATE AND DUMP FILTER AND LEVEL DETECTOR

William C. Hughes, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,584
Int. Cl.[4] H03D *3/02*
U.S. Cl. 364—839 **9 Claims**



1. Apparatus for integrating an input signal in response to a baud signal, comprising:

means for amplifying said input signal, said amplifying means having an input and an output;

coupling means, coupled to receive said baud signal and said input signal, for coupling said input signal to said amplifying means input in response to a first state of said baud signal, said coupling means being responsive to a second state of said baud signal for decoupling said input signal from said amplifying means input; and

selective circuit configuration (SCC) means, coupled between said amplifying means input and output and further coupled to receive said baud signal, responsive to said first state of said baud signal for providing reactive feedback between said amplifying means input and said amplifying means output such that electrical voltage representing a time integral of said input signal is stored by said SCC means, said SCC means being responsive to said second state of said baud signal for discontinuing said reactive feedback and for coupling said stored voltage to said amplifying means input such that said stored voltage is amplfied by said amplifying means and, therefore, said amplifying means output is indicative of the time integral of said input signal.

4,730,268

DISTRIBUTED BUS ARBITRATION FOR A MULTIPROCESSOR SYSTEM

James S. Marin, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1985, Ser. No. 728,955
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **8 Claims**

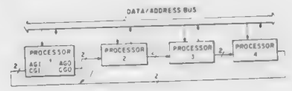
1. A system for providing bus arbitration for at least two processors having a common clock signal, comprising:

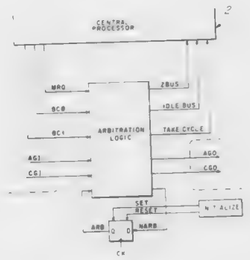
an asynchronous arbitration signal line connecting the processors into a ring;

an asychronous cycle grant signal line connecting the processors into a ring;

arbitration control means located in each processor and coupled to said arbitration signal line for determining which processor will control arbitration for bus access on a following clock cycle, wherein said control means includes

means for selecting an arbitration state of said control means;





means for storing a bit indicating whether the processor has arbitration mastership; and

logic means coupled to said asynchronous signal line, to said arbitration state selecting means, and to said bit storing means, for determining whether the processor will take arbitration mastership during the next cycle;

cycle grant control means in each processor and coupled to said cycle grant signal line for determining which processor will have bus access on the following clock cycle.

4,730,269

METHOD AND APPARATUS FOR GENERATING WORD SKELETONS UTILIZING ALPHA SET REPLACEMENT AND OMISSION

Henry Kucera, Providence, R.I., assignor to Houghton Mifflin Company, Boston, Mass.

Continuation of Ser. No. 467,834, Feb. 18, 1983, Pat. No. 4,580,241. This application Mar. 31, 1986, Ser. No. 846,555
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] G06F *5/00, 11/00, 15/00*
U.S. Cl. 364—900 **18 Claims**

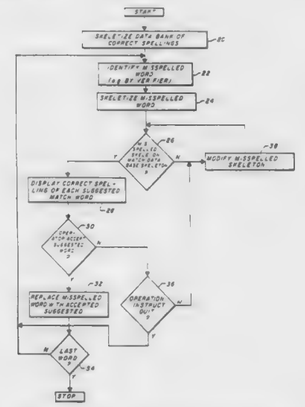
1. A process for generating a digital signal representative of a word skeleton, said process comprising the steps of

A. accepting a digital signal representative of a designated word in conventional graphic representation,

B. generating from said designated word a linguistically salient word skeleton, said generating step comprising the steps of

(i) omitting from the linguistically salient word skeleton produced thereby a selected alpha set, if any, of the designated word which lacks isomorphy with a phonetic representation of that selected set, and

(ii) replacing with a different linguistic symbol another selected alpha set, if any, of the designated word which lacks isomorphy with a phonetic representation of that other selected set,



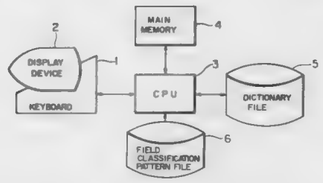
C. producing an output digital signal representative of said linguistically salient word skeleton.

4,730,270

INTERACTIVE FOREIGN LANGUAGE TRANSLATING METHOD AND APPARATUS

Atsushi Okajima, Yokohama; Fumiyuki Yamano, Kawasaki, and Eri Okamoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,708
Claims priority, application Japan, Jul. 31, 1984, 59-162448
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—900 **10 Claims**



1. An interactive foreign language translating method performed by a machine translation apparatus which includes a central processing unit for performing translation processing, input means coupled to said central processing unit, output means coupled to said central processing unit and said input means, a main memory coupled to said central processing unit, a dictionary file coupled to said central processing unit, and a field classified pattern file coupled to said central processing unit, said method comprising the steps:

asking a user, by said central processing unit, a series of questions in a first language read out from said field classified pattern file;

collecting, by said central processing unit, in said main memory, source sentence information answers by the user from said input means to said questions in the first language;

parsing, by said central processing unit, the source sentence information collected in said main memory; and

making, by said central processing unit, a composition in a second language on a basis of results of the parsing by utilizing said dictionary file.

4,730,271

MAGNETIC FIELD CONFIRMING CASE WITH INCLINED PORTIONS FOR MAGNETIC BUBBLE MEMORY MODULE

Yutaka Akiba, Fujisawa; Kazuo Hirota, Chigasaki; Nobuo Kishiro, Mobara; Toshio Futami, Mobara, and Tatsuo Hamamoto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,392
Claims priority, application Japan, Apr. 26, 1985, 60-88593; Apr. 26, 1985, 60-88689; Apr. 26, 1985, 60-88687
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—2 **3 Claims**



1. A magnetic bubble memory module comprising:

(a) a rectangular annular core having two pairs of opposite sides wound by a pair of wires, respectively;

(b) a magnetic bubble memory chip disposed at a position surrounded by said core;

(c) a flexible substrate loading said magnetic bubble memory chip and electrically connecting the same for leading input and output signals to said chip out of a case for confining a revolving magnetic field, said revolving-magnetic-field confining case accommodating said core, said chip and said flexible substrate;

(d) a pair of magnetic bodies mounted on upper and lower surfaces of said revolving-magnetic-field confining case; and

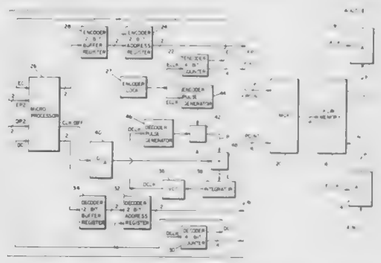
(e) inclined portions formed on said revolving-magnetic-field confining case at positions at which said pair of magnetic bodies are mounted, said inclined portions causing said pair of magnetic bodies to be inclined at a predetermined angle to said chip in said case, said inclined portions of said case being provided by a varying plate thickness of said case.

4,730,272

AUDIO DELAY SYSTEM

Daniel T. Sullivan, Bolton, Mass., assignor to Analog and Digital Systems, Inc., Wilmington, Mass.

Filed Sep. 24, 1985, Ser. No. 779,787
Int. Cl.[4] G11C *27/00;* **G06K** *15/00*
U.S. Cl. 365—45 **11 Claims**



1. A system for variably delaying an audio signal, said apparatus comprising

memory means for storing a sequence of numbers comprising digital represention of consecutive portions of said audio signal,

addressing means for generating encoding and decoding pointers for accessing said memory means,

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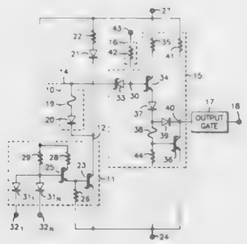
memory writing means for writing said numbers at sequential memory locations prescribed by said encoding pointer,
memory reading means for reading numbers from said memory at sequential locations prescribed by said decoding pointer,
clock means for generating encoding and decoding clock signals,
said addressing means including means for incrementing said encoding pointer in response to said encoding clock and for incrementing said decoding pointer in response to said decoding clock, and for shifting said encoding and decoding pointers to a predetermined low address in said memory (e.g., the zero address) after a predetermined higher address (e.g., the highest address) is reached,
means for varying the frequency of said decoding clock relative to said encoding clock, thereby to vary address separation between said encoding and decoding pointers and the amount of delay of said audio signal.

4,730,273

ON-CHIP PROGRAMMABILITY VERIFICATION CIRCUIT FOR PROGRAMMABLE READ ONLY MEMORY HAVING LATERAL FUSES

Gene T. Sluss, Chippewa Falls, Wis., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1986, Ser. No. 847,974
Int. Cl.[4] G11C *17/00, 29/00*
U.S. Cl. 365—96 **9 Claims**



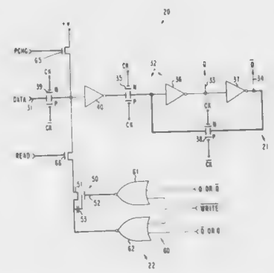
1. A programmable memory circuit comprising:
a plurality of word lines;
a plurality of bit lines;
a plurality of fuses, each of said fuses uniquely coupled between one of said word lines and one of said bit lines;
first means coupled to said plurality of bit lines for selecting one of said bit lines;
a first diode having a cathode coupled to one of said word lines and an anode;
second means coupled to said anode of said first diode for selecting one of said word lines;
an output terminal;
a first supply voltage terminal;
a second supply voltage terminal;
third means coupled to said first and second supply voltage terminal and coupled between said anode of said first diode and said output terminal for sensing the voltage on one of said word lines and translating said voltage to one of said output terminals as an output signal;
a first resistor;
a second resistor;
a test voltage terminal coupled for receiving a test voltage;
a second diode having an anode coupled to said test voltage terminal and a cathode; and
a transistor having a base coupled to said first supply voltage terminal by said first resistor and to said second means, an emitter coupled to said anode of said first diode, and a collector coupled to said anode of said second diode by said second resistor.

4,730,274

NON-VOLATILE MEMORY WITH PREDICTABLE FAILURE MODES AND METHOD OF DATA STORAGE AND RETRIEVAL

Colin W. Edwards, Chalfont St. Peter, England, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 24, 1986, Ser. No. 832,112
Claims priority, application United Kingdom, Feb. 27, 1985, 8505081
Int. Cl.[4] G11C *11/00*
U.S. Cl. 365—156 **18 Claims**



1. A method of data storage and retrieval comprising the steps of:
applying a data signal to an input of a volatile memory cell;
storing the data signal and its complement in said volatile memory cell;
applying said data signal and its complement to inputs of a non-volatile memory cell comprising a FATMOS transistor and control circuitry coupled thereto, said FATMOS transistor having drain, source and floating gate electrodes said drain electrode being coupled to said volatile memory cell, said source and floating gate electrodes being coupled to said control circuitry;
selectively storing one of said data and complement signals in said non-volatile memory cell: and
selectively applying the signal stored in said non-volatile memory cell to said volatile memory cell for storage therein.

4,730,275

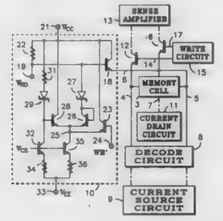
CIRCUIT FOR REDUCING THE ROW SELECT VOLTAGE SWING IN A MEMORY ARRAY

Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 22, 1985, Ser. No. 800,875
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—174 **1 Claim**

1. A memory circuit having a read mode and a write mode, including a first voltage terminal and a second voltage terminal, said circuit comprising:
a word line;
a current drain line;
a first bit line;
a second bit line;
a memory cell coupled between said word line and said current drain line and coupled between said first and second bit lines;
first means coupled between said current drain line and said second voltage terminal for sinking current from said current drain line;
second means coupled to said first and second bit lines for sensing current in said first and second bit lines;

third means coupled between said second voltage terminal and both said first and second bit lines for sinking a current through said first and second bit lines;
fourth means coupled between both said first and second bit lines and said fourth means for enabling current through said first and second bit lines;
a first transistor coupled between said first voltage terminal and said word line and having a control electrode;
a first resistor;
a multi-emitter transistor having a first emitter, and one or more other emitters coupled as said inputs, a base and a collector coupled to said control electrode of said first transistor and coupled to said first voltage terminal by said first resistor;
a first current source;
a second current source;
a second resistor;



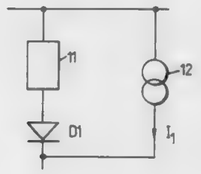
a second transistor having a collector coupled to said first voltage terminal, a base coupled to said first voltage terminal by said second resistor, and an emitter coupled to said first emitter of said multi-emitter transistor;
a first pair of differentially connected transistors having their emitters coupled to said second voltage terminal by said first current source, their collectors coupled to said first voltage terminal and said emitter of said second transistor, respectively, and their bases coupled to receive a reference voltage and an enable signal, respectively; and
a second pair of differentially connected transistors having their emitters coupled to said second voltage terminal by said second current source, their collectors coupled to said first voltage terminal and said first voltage terminal by said second resistor, respectively, and their bases coupled to said reference voltage and said enable signal, respectively.

4,730,276

SEMICONDUCTOR MEMORIES

David L. Waller, Swanley, Great Britain, assignor to STC PLC, London, England

Filed Jun. 12, 1986, Ser. No. 873,388
Claims priority, application United Kingdom, Jun. 12, 1985, 8514924
Int. Cl.[4] G11C *11/36, 13/00*
U.S. Cl. 365—189 **5 Claims**



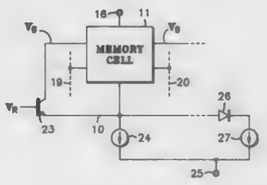
1. A static random access memory, including an array of memory cells, and a plurality of bit-lines whereby the cells are accessed to effect reading and writing of data, wherein each bit-line is provided with a load comprising a diode or diode equivalent, current limiting means in series with the diode, and a current source in parallel with the diode and limiting means.

4,730,277

CIRCUIT FOR BIASING ROW OF MEMORY CELLS

James J. Stipanuk, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1985, Ser. No. 809,617
Int. Cl.[4] G11C *7/00, 8/00, 11/34*
U.S. Cl. 365—189 **6 Claims**



1. A circuit for selecting a row of memory cells in an array of memory cells, said memory cells having a write mode for writing information into one of said selected memory cells, a low current mode for storing said information, and a read mode for reading said information in one of said selected memory cells, said array of memory cells including a first voltage terminal, a second voltage terminal, a plurality of word lines, a plurality of bit lines, wherein said memory cells are arranged in a matrix of rows and columns, each of said memory cells in a row coupled between said first voltage terminal and one of said word lines, each of said memory cells in a column coupled between a pair of said bit lines, each of said memory cells including a pair of load transistors and a transistor means, each load transistor having a base and coupled between said first voltage terminal and said transistor means, said transistor means being further coupled to said one of said word lines and said pair of bit lines for storing said information in response to a signal on said bit lines, a plurality of first means, each of said first means coupled between said one of said word lines of each of said rows and said second voltage terminal for sinking current from said one of said word lines during said write mode and said read mode, said circuit comprising:
a plurality of second means, each of said second means coupled between said one of said word lines of each of said rows and said second voltage terminal for sinking additional current from said one of said word lines during said write mode, said low current mode, and said read mode; and
a plurality of third means, each of said third means coupled between a base of both of said pair of load transistors and said one of said word lines of each of said rows for selectively applying voltage to one of said word lines for selecting one of said word lines during said write modes and said read modes.

4,730,278

CIRCUIT FOR CHARGING AND DISCHARGING A ROW OF MEMORY CELLS

Daniel N. Koury, Jr., Scottsdale, and Walter C. Seelbach, Fountain Hills, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1986, Ser. No. 914,957
Int. Cl.[4] G11C *11/36, 7/00;* **H03K** *3/01*
U.S. Cl. 365—203 **1 Claim**

1. A circuit for quickly discharging a memory cell in a row of memory cells, said circuit comprising:

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an input terminal coupled for receiving a digital input signal having a high state and a low state;

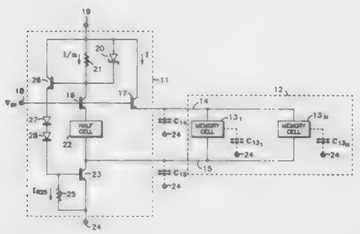
first means coupled to said input terminal and coupled between a first voltage source and said memory cells for selectively supplying current to said memory cell in response to said input signal;

a first transistor having its collector-emitter path coupled between said memory cells and a second voltage source having a base;

second means coupled to said first voltage source for providing a voltage level below that of said first voltage source;

third means coupled to a first node between said collector-emitter path of said first transistor and said memory cells for providing a load similar in resistance to said memory cell;

a second transistor having its collector-emitter path coupled



between said second and third means, and a base coupled to said input terminal;

fourth means coupled to said base of said first transistor for setting the voltage level at said base of said first transistor; and

a third transistor having its collector-emitter path coupled between said first voltage source and said fourth means and a base coupled to a second node between said second means and said collector-emitter path of said second transistor, wherein said second transistor becomes more conductive when said input signal is in said high state, causing said third and first transistors to become less conductive and causing said first means to charge said memory cell, and said second transistor becomes less conductive when said input signal is in said low state, causing said third and first transistor to become more conductive, thereby causing said memory cells to discharge.

4,730,279

STATIC SEMICONDUCTOR MEMORY DEVICE

Takayuki Ohtani, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1986, Ser. No. 842,441

Claims priority, application Japan, Mar. 30, 1985, 60-66901; Sep. 6, 1985, 60-197129

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—203 **11 Claims**

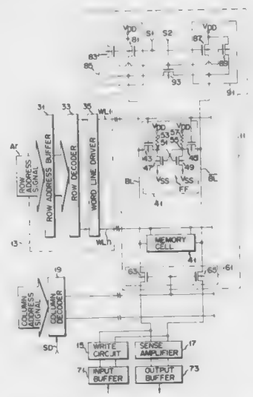
1. A semiconductor memory device comprising:

a memory cell array including memory cells arranged in a matrix of rows and columns, said array having a plurality of sections, each section including memory cells belonging to at least one column;

a plurality of bit lines for writing data to and reading data from said memory cells, a pair of said bit lines being provided for each column and connected to memory cells in the corresponding column;

word lines connected to corresponding memory cells to select memory cells in the row direction; and

precharge means connected to said bit lines, for receiving and for detecting the contents of an address signal, said precharge means being responsive to said address signal to charge, during a predetermined period, said bit lines in at least one selected section which includes at least one



memory cell designated by said address signal, and to charge said bit lines in at least one nonselected section.

4,730,280

SEMICONDUCTOR MEMORY DEVICE HAVING SENSE AMPLIFIERS WITH DIFFERENT DRIVING ABILITIES

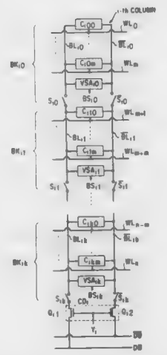
Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 18, 1985, Ser. No. 798,783

Claims priority, application Japan, Nov. 20, 1984, 59-245801; Nov. 20, 1984, 59-245803

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—205 **2 Claims**



1. A semiconductor memory device having a plurality of memory cells arranged in a matrix formed by word lines and bit lines, one end of said bit lines being connected to a data bus, said semiconductor memory device comprising:

a plurality of blocks provided by dividing each bit line, the plurality of blocks for each bit line comprising a first block which is the farthest block from the data bus, additional blocks being nearer to said data bus one by one, the last block being the nearest block to the data bus, each block containing a plurality of memory cells and being designated as a selected block when one of its associated memory cells is selected for being accessed;

a plurality of sense amplifiers each placed in an associated block and having a different driving ability respectively,

the sense amplifier in a first block having the most driving ability, each sense amplifier in additional blocks located between said first and last blocks having less driving ability the closer it is located to said data bus, the sense amplifier in said last block having the least driving ability, and the sense amplifier in said selected block being the only one initially activated; and

a switching element inserted into a bit line in each block, the switching element in each block being selectively controlled so as to be ON or OFF after the sense amplifier in the selected block is activated, switching elements in all blocks being turned ON when the first block is designated as the selected block, switching elements in the selected block and blocks nearer to the data bus than said selected block being turned ON and at the same time blocks farther from said data bus than said selected block being OFF when said selected block is located between the first and last blocks, only one switching element in said last block being turned ON when the last block is designated as the selected block.

4,730,281

DATA PROCESSING FILTERING METHOD AND APPARATUS

Paul F. Rodney, Spring, and Richard A. Kester, Magnolia, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,556

Int. Cl.⁴ G01V *1/28*

U.S. Cl. 367—44 **10 Claims**



1. Apparatus for processing a signal, including a filter comprising:

a. input means whereby a signal may be introduced to said filter, and output means whereby such an output signal so introduced to said filter and processed thereby may be output from said filter;

b. signal delay means for providing a time delay to a signal;

c. difference means in communication with said input means and with the output of said signal delay means, whereby the output of said signal delay means may be compared with such input signal and the difference of said two signals provided at said filter output means as the output from said filter;

d. a feedback loop also in communication with the output of said signal delay means and including a first multiplicative scaler featuring a first scaler parameter for scaling said output of said signal delay means;

e. summing means for receiving said input signal and combining said input signal with said output of said signal delay means as scaled by said scaler to provide a combined signal as output of said summing means;

f. a second multiplicative scaler, featuring a second scaler parameter, for scaling said combined signal from said summing means and communicating said scaled signal to said signal delay means; and

g. means for digitally sampling such a signal to be filtered and communicated as said input signal to said input means of said filter, wherein said sampling means effects sampling periodically, and wherein said periodic sampling is synchronized to begin at the start of noise structure of said signal being sampled.

4,730,282

LOCATING SIGNAL SOURCES UNDER SUPPRESSION OF NOISE

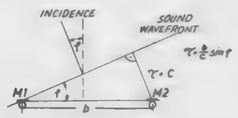
Reinhard Jaeger, Delmenhorst, and Peter von Volckamer, Bremen, both of Fed. Rep. of Germany, assignors to MBB GmbH, Bremen, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,404

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406343

Int. Cl.⁴ G01S *3/80*

U.S. Cl. 367—124 **4 Claims**



1. Method for locating signal sources under utilization of several, spacially separated sensors which are responsive to signals from said sources and produce output signals to be related to each other in accordance with the principle of cross power density, for acquiring information on the direction of such signal sources, comprising the steps of:

first, acquiring, as a preparatory step, and through the plurality of sensors, transit time differences resulting from oblique angles of incidence of noise signals originating from a parasitic noise source other than a signal source to be located;

establishing a normalizing, noise suppressing signal under consideration of transit time differences and amplitude differences for particular sensors;

second, acquiring signals by means of said sensors, said latter signals include as components, noise signals from the parasitic source and signals from said signal source; and

subsequently subtracting said normalizing signal from an unnormalized signal, respectively being the signals as acquired by the second acquiring to thereby eliminate from the second acquired signal component signals originating in parasitic noise sources.

4,730,283

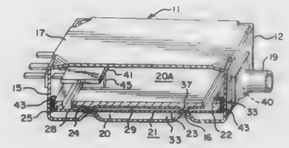
ACOUSTIC TRANSDUCER WITH IMPROVED ELECTRODE SPACING

Elmer V. Carlson, Prospect Heights, and Peter L. Madaffari, Elgin, both of Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Filed Sep. 15, 1986, Ser. No. 907,498

Int. Cl.⁴ H04R *19/00*

U.S. Cl. 367—181 **6 Claims**



1. An acoustical transducer, comprising in combination, a case having a top, bottom and side walls; and electret assembly including a diaphragm having peripheral portions and a central vibratable plate portion forming a movable electrode, a diaphragm support ring having an opening thereon mounted in

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said case, the peripheral portions of said diaphragm being mountable to said support ring, a backplate mounted within the opening of said support ring to form a spacing between the backplate and the support ring, said backplate having a surface comprising a fixed electrode and cooperating with the diaphragm movable electrode to develop a signal, an acoustical chamber formed between the electret assembly and the bottom of said case, a second chamber formed between said assembly and the top of said case, said spacing between the backplate and the support ring lowering the capacitance between said electrodes, and said spacing enabling air movement between said chambers.

4,730,284

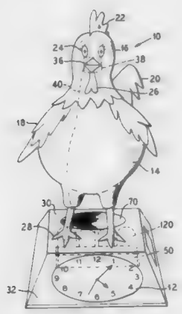
ALARM CLOCK

Michael E. Adams, 5 Revere Dr., Suite 200, Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 939,630, Dec. 8, 1986, abandoned. This application Jun. 25, 1987, Ser. No. 66,631

Int. Cl.⁴ G04B *21/02*; G04C *21/00*

U.S. Cl. 368—72 **13 Claims**



1. An alarm clock for broadcasting an alarm signal at a predetermined time, comprising:

a housing;

a first portion of said housing having the shape of a type of animal, a second portion of said housing providing a base for said animal shape;

said animal having a characteristic sound, said first portion including an anatomical feature reflective of a source for said characteristic sound in animals of that type;

a clock mechanism and clock display mounted within said housing;

a manually operatable switch associated with said anatomical feature;

a sound generating circuit connected to said clock mechanism and to said switch and effective to generate said characteristic sound at a predetermined time as determined by said clock mechanism;

said switch effective to disable said characteristic sound; and

said anatomical feature having portions thereof movable with respect to other portions of said housing to activate said switch.

4,730,285

INDIVIDUAL PARKING METER

Jon Lie, P.O. Box 54, N-2391 Moelv, Norway

PCT No. PCT/NO85/00058, § 371 Date Jul. 17, 1986, § 102(e) Date Jul. 17, 1986, PCT Pub. No. WO86/01922, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 20, 1985, Ser. No. 876,892

Claims priority, application Norway, Sep. 21, 1984, 843805

Int. Cl.⁴ G04F *1/00, 8/00*

U.S. Cl. 368—90 **6 Claims**

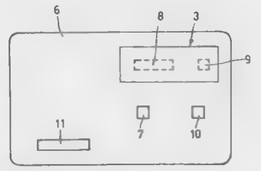
1. An individual parking meter intended to be fitted in a vehicle so as to be visible for inspection from the outside, and comprising

a parking time storage for storing of a prepaid parking time, and being of a disposable type which cannot be renewed and reused after purchase of the parking meter when the prepaid parking time has been consumed,

a timing means connected to said parking time storage,

a display means connected to said parking time storage and said timing means, for displaying parking information in dependence on signals from said means,

a parking zone selector connected to said time storage, timing means and display means and arranged to cause said parking time storage to count down the parking time stored therein at a rate dependent on a set parking zone,



a source of electric power, and

a switch means for connection and disconnection of electric power to the components of the parking meter,

the parking meter being shaped as a sealed, card-shaped casing wherein the components of the parking meter are embedded,

the parking zone selector being arranged to be operated by a single operating button on the front of said card, for selecting the appropriate one from a number of parking zones, and

the switch means being operable by an on/off button on said card.

4,730,286

CIRCUIT AND METHOD FOR CORRECTING THE RATE OF AN ELECTRONIC TIMEPIECE

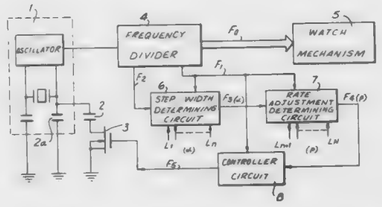
Hitomi Aizawa, and Hiroshi Yabe, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,803

Claims priority, application Japan, Jul. 6, 1984, 59-140017; Feb. 18, 1985, 60-29837

Int. Cl.⁴ G04B *17/20*

U.S. Cl. 368—202 **17 Claims**



1. A circuit for use in correcting the rate of an electronic timepiece, the rate adjustment circuit comprising:

quartz crystal oscillator means having a standard frequency signal for a timepiece as an output;

reactance means adapted to be coupled to the oscillator means for changing the frequency of the output signal;

switch means responsive to a control signal for coupling the reactance means to the oscillator means to effect a change in rate of the electronic timepiece;

divider means having the output of the quartz crystal oscillator means as an input and having a minimum rate adjustment unit signal as an output;

means having the minimum rate adjustment signal as an input and responsive to the input of a first predetermined number for providing a rate adjustment step width signal comprising a first predetermined number of minimum rate adjustment unit signals;

means having the rate adjustment step width signal as an input and responsive to the input of a second predetermined number for providing a rate adjustment signal comprising a second predetermined number of rate adjustment step width signals; and

controller means responsive to the rate adjustment signal to provide the control signal for coupling and decoupling the reactance means to the oscillator means, whereby the rate adjustment is effected by the operation of the switch means.

4,730,287

POWER SUPPLY FOR ELECTRONIC TIMPIECE

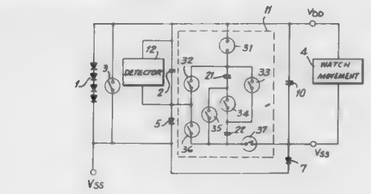
Masahito Yoshino, and Yoshitsugu Nishiwaki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

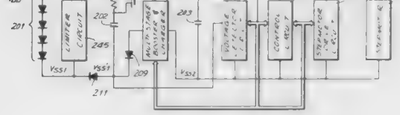
Continuation-in-part of Ser. No. 716,891, Mar. 28, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 849,932

Claims priority, application Japan, Apr. 10, 1985, 60-76007

Int. Cl.⁴ G04C *3/00*

U.S. Cl. 368—205 **38 Claims**





1. An electronic timepiece comprising:

a primary source of electric power;

a secondary power source which is charged by the primary source and whih has an output voltage which changes with use of power stored therein;

a timepiece movement; and

a supply circuit which delivers power from the secondary power source to the timepiece movement, the supply circuit comprising:

detector means responsive to the level of the output voltage of the secondary power source to provide a control signal when the output voltage has fallen to a predetermined voltage level;

booster means in the supply circuit, the booster means being responsive to the control signal for transforming voltage from the secondary power source to a higher level for delivery to the timepiece movement;

an auxiliary power source which is charged by the booster means above the predetermined voltage level and which delivers the charge to the timepiece movement; and

whereby the level of voltage supplied to the timepiece movement from the secondary power source is maintained above the predetermined level.

4,730,288

EXTERIOR ELEMENT FOR A WRIST WATCH

Eric Loth, Bienne, Switzerland, assignor to Montres Rado S.A., Lengnau, Switzerland

Continuation of Ser. No. 752,682, Jul. 8, 1985, abandoned. This application Jan. 8, 1987, Ser. No. 4,788

Claims priority, application Switzerland, Jul. 12, 1984, 3382/84

Int. Cl.⁴ G04B *37/00*; B23P *13/00*

U.S. Cl. 368—280 **8 Claims**

1. An exterior element for a wrist watch, said element being at least partially formed from a composite material, said material comprising an organic binder and macroscopic particles of mineral substances enrobed in said binder and disposed flush with at least a portion of a visible surface of said element, and covering 60%–95% of said portion, wherein said particles have a diameter greater than or equal to 0.1 mm.

4,730,289

MAGNETIC-OPTICAL DISC MEMORY SYSTEM AND APPARATUS FOR SWITCHING HEADER AND DATA INFORMATION

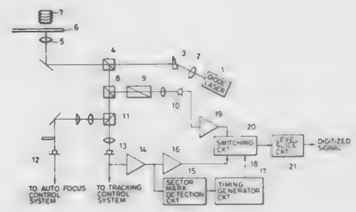
Atsushi Saitoh, Ichikawa, and Toshimitsu Kaku, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,684

Claims priority, application Japan, Jan. 23, 1985, 60-8980

Int. Cl.⁴ G11B *11/00, 15/087*

U.S. Cl. 369—13 **4 Claims**



1. A magnetic-optical disc memory system wherein header information items including sector marks indicative of initial positions of sectors, track numbers and sector numbers are written at predetermined areas on a magnetic-optical disc in the form of embossed pits and wherein data information items are written in the form of magnetic signals in areas other than the predetermined areas on the magnetic-optical disc for the header information items; said system comprising:

means to detect the header information;

means to detect the date information;

means to detect sector marks from an output of the header information detection means; and

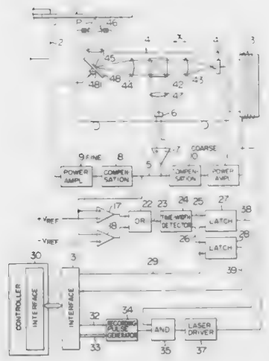
a switching circuit for selecting one of the header information and the data information based on a sector mark detection signal generated from the secotr mark detection means.

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4,730,290
DEFECT DETECTING OPTICAL APPARATUS ENABLING RECORDING IN AN ALTERNATE SECTOR OR TRACK

Masahiro Takasago, Odawara, and Osami Kushizaki, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,663
Claims priority, application Japan, Mar. 20, 1985, 60-57023
Int. Cl.[4] G11B *21/08, 27/36*
U.S. Cl. 369—32 **10 Claims**



7. A method of optically recording information comprising the steps of:

passing a light beam to a desired one of a plurality of tracks formed on a disc-shaped recording medium, each of said tracks being divided into a plurality of sectors for recording information;

detecting light reflected from said recording medium;

generating a tracking error signal indicating an amount of digression of the light beam from a track where information is recorded and reproduced on the basis of the result of light detection;

comparing the tracking error signal with a predetermined level;

preventing projection of a recording light beam onto the recording medium so as to interrupt a recording operation when a time during which the level of the tracking error signal exceeds the predetermined level exceeds a first predetermined time shorter than a time necessary for off-track of the light beam;

preventing projection of a recording light beam onto the recording medium to interrupt a recording operation when a time during which the level of the tracking error signal exceeds the predetermined level exceeds a second predetermined time longer than the first predetermined time and sufficient to cause off-track;

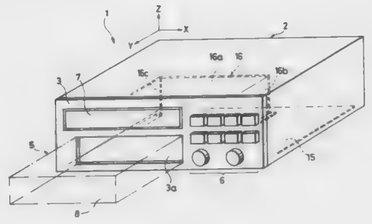
enabling information, the recording of which has been interrupted when the first predetermined time is exceeded, to be recorded on another sector of the same track; and

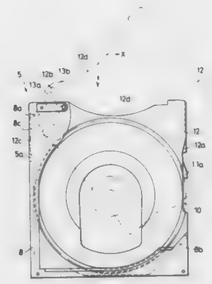
enabling information, the recording of which has been interrupted when the second predetermined time is exceeded, to be recorded on another track of the recording medium.

4,730,291
MULTI-DISK PLAYER SYSTEM

Yuji Ikedo; Takahiro Okajima; Masahiko Miyake, and Tsutomu Miyakawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,121
Claims priority, application Japan, Mar. 8, 1985, 60-46208; Mar. 8, 1985, 60-46209; Mar. 8, 1985, 60-46211; May 15, 1985, 60-104301
Int. Cl.[4] G11B *17/28, 5/48*
U.S. Cl. 369—36 **7 Claims**





1. A mechanism for limiting movement to one of several movable components, said mechanism comprising a plurality of movable components and a holder for holding said movable components, said holder being provided with partitions that separate the movable components at predetermined spacings, said partitions each being provided with a hole penetrating said partition in a direction perpendicular thereto, said holes being filled with a predetermined number of movable sliders such that the sliders are in contact with each other, each of said sliders being of a size equal to the distance between adjacent partitions, and means for applying a resilient force to said sliders to cause them to press against each otehr when part of said one moveable component is thrust between adjacent sliders.

4,730,292
DEVICE FOR SEQUENTIALLY FEEDING A PLURALITY OF DISK-SHAPED RECORDING MEDIA

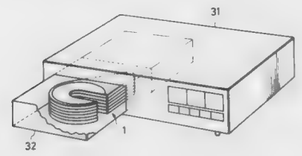
Kazuo Hasegawa, and Osamu Fujiwara, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,400
Claims priority, application Japan, Aug. 7, 1984, 59-165408
Int. Cl.[4] G11B *17/22, 19/10, 33/04*
U.S. Cl. 369—39 **13 Claims**

1. A device for sequentially feeding a plurality of disk-shaped recording media in an apparatus for performing a data recording or reproducing operation on a rotating disk-shaped recording medium, comprising:

loading means for holding a plurality of disk-shaped recording media, said loading means being insertable into and removable from apparatus including a plurality of loading members rotatable about a common axis, each of said loading members being capable of holding one of the disk-shaped recording media, each of said loading members having a geared portion extending therefrom, said geared portions of said loading members being rotatable about the common axis;

feeding means for feeding a selected one of the plurality of disk-shaped recording media from a stored position to a feeding position, said feeding means including means for rotating a selected one of said loading members, corresponding to the selected disk-shaped recording medium, about the common axis through a predetermined angle to the feeding position, said means for rotating the selected one of said loading members including:



a drive gear for engaging the geared portion of the selected one of said loading members when said loading means is inserted in the apparatus said drive gear being movable in the direction of the common axis;

means for moving said drive gear in the direction of the common axis; and

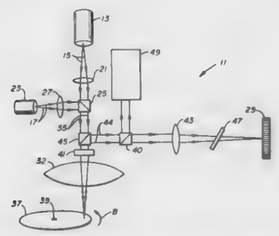
means for driving said drive gear to rotate said geared portion of the selected one of said loading members, so that the selected one of said loading members is moved to the feeding position; and

lifting means for lifting the selected disk-shaped recording medium from the feeding position into a position at which the data recording or reproducing operation can be performed.

4,730,293
DUAL BEAM OPTICAL DATA SYSTEM

Gerald A. Pierce, Redwood City; Louis F. Schaefer, Palo Alto; Norman A. Peppers, Belmont, and William F. Mullen, San Bruno, all of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Filed Sep. 15, 1986, Ser. No. 907,956
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **22 Claims**



1. An optical data reading and writing system comprising,

a first light source comprising a laser capable of emitting a modulated laser beam,

a second light source emitting a second beam,

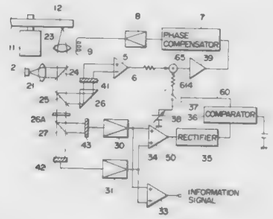
means for directing said laser beam and said wide beam onto an optical data storage medium, said medium having pre-recorded information thereon, said laser beam recording data spots of a uniform size, said size less than about ten micrometers, said second beam having a width illuminating a substantially larger area of said medium than said laser beam, and

means for reading said prerecorded information and said recorded data spots from said area of said medium illuminated by said second beam.

4,730,294
OPTICAL INFORMATION-RECORDING/REPRODUCING APPARATUS WITH CANCELLATION FOR OFFSET CONTAINED IN ERROR SIGNAL

Saburo Funada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 910,955
Claims priority, application Japan, Oct. 1, 1985, 60-218862
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—46 **5 Claims**



1. An optical information-recording/reproducing apparatus with cancellation for an offset contained in an error signal, said apparatus comprising:

beam-irradiation means for irradiating a beam to an optical information-recording medium having a pre-format portion containing an address signal and a data portion including an area in which information signals are to be recorded;

reflected-beam detection means for producing an electric signal corresponding to a reflected beam from the optical-information recording medium irradiated by said beam-irradiation means;

error-signal detection means for detecting an error signal for tracking control and/or focussing control of the beam, based on the electric signal from said reflected-beam detection means;

information-signal detection means for detecting the information signal to be recorded in the data part of the optical information-recording medium, based on the electric signal from said reflected-beam detection means;

pre-format portion detection means for detecting the pre-format portion of the optical information-recording medium, based on the electric signal from said reflected-beam detection means;

offset-cancellation means for overlapping the error signal from the error-signal detection means and a compensation signal corresponding to the substantial difference of DC offset components between the data portion and the pre-format portion, detected by said pre-format detection means; and

control means for controlling tracking and/or a focussing of the beam, based on a signal which is generated when the DC offset components contained in the error signal are compensated by said offset cancellation means.

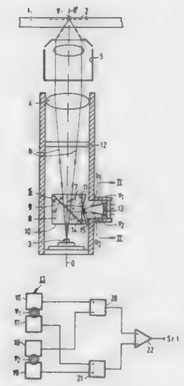
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4,730,295

APPARATUS FOR READING AND/OR RECORDING A TRACKWISE ARRANGED OPTICAL INFORMATION STRUCTURE

Andreas J. M. Bressers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,247
Claims priority, application Netherlands, Oct. 14, 1985, 8502802
Int. Cl.[4] G11B *7/095*
U.S. Cl. 369—46 4 Claims



1. An apparatus for reading and/or recording a trackwise arranged optical information structure in a record carrier, which information structure comprises information areas alternating with intermediate areas in the track direction, which apparatus comprises radiation source, an objective system for focussing a beam produced by the radiation source to form a radiation spot on the information structure, and a tracking error detection system for generating a tracking signal containing information on the magnitude and the direction of a deviation between the centre of the radiation spot and the central axis of a track, which detection system comprises a beam-splitting element which is arranged in the path of the beam from the record carrier to form two sub-beams, and four radiation-sensitive detectors arranged along a line transverse to the effective track direction, of which the first detector and the second detector cooperate with a first sub-beam and of which the third detector and the fourth detector cooperate with the second sub-beam, and an electronic circuit for processing the detector signals to form the tracking signal, characterized in that the electronic processing circuit comprises elements for forming a tracking signal which is defined by:

$$S_{r.1}=(S_1-S_2)+(S_3-S_4)$$

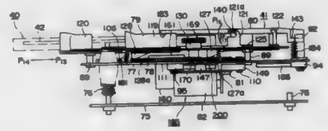
where S_1, S_2, S_3 and S_4 are the output signals of the first, the second, the third and the fourth detector respectively.

4,730,296

LOADING DEVICE IN A DISC PLAYBACK DEVICE

Kazuo Urata; Takuya Tamaru, both of Hamakita; Yasuhiko Kamoshita, and Mikio Ogusu, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamtsu, Japan

Filed Sep. 30, 1985, Ser. No. 781,768
Claims priority, application Japan, Oct. 3, 1984, 59-207608
Int. Cl.[4] G11B *25/04, 17/04*
U.S. Cl. 369—75.2 10 Claims



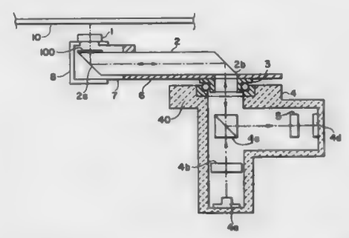
1. A disc loading device in a disc playback device comprising:
- a turntable for rotating a disc thereon;
- a holder provided above said turntable for holding a disc or a case housing a disc and movable upwardly or downwardly with respect to said turntable;
- a carrier movable horizontally with respect to said holder for loading said disc or said case housing the disc into said holder or ejecting the same from said holder; and
- cam means, operative between said holder and said carrier, for moving said holder downwardly toward the turntable in the loading of said disc or said case housing the disc and moving said holder upwardly away from the turntable in the ejection of said disc or said case housing the disc as the carrier moves horizontally.

4,730,297

RETARDATION COMPENSATING LIGHT BEAM GUIDING SYSTEM IN AN OPTICAL STORAGE MEDIUM DRIVE APPARATUS

Hiromichi Ishibashi, Toyonaka, and Masaharu Imura, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 4, 1985, Ser. No. 772,749
Claims priority, application Japan, Sep. 4, 1984, 59-185505; Oct. 12, 1984, 59-214542
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—110 14 Claims



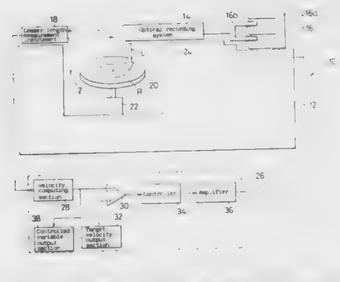
1. In an optical storage medium drive apparatus having a light beam source for providing a light beam for writing information on a storage medium and reading information recorded on said storage medium, a light beam guiding system comprising:
- an optical head in which the light beam source is provided for emitting a polarized light beam, said optical head having a light detector for converting a reflected light beam from the storage medium into an electric signal;
- an optical system provided between said optical head and said storage medium for forming an optical path along which said light beam emitted from the light source is guided from said optical head to said storage medium and said reflected light beam from said storage medium is guided to said optical head and in which optical system retardation of the light beam occurs; and
- optical phase compensation means disposed at a specific position in said optical path for shifting the phase of said light beam guided along said optical path so as to compensate for the retardation of said light beam.

4,730,298

MOVING DEVICE FOR AN OPTICAL RECORDING SYSTEM IN A HIGH DENSITY SPIRAL TRACK-FORMING APPARATUS

Yoshihiko Takahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1984, Ser. No. 654,232
Claims priority, application Japan, Sep. 27, 1983, 58-176885
Int. Cl.[4] G11B *7/00, 21/08*
U.S. Cl. 369—111 1 Claim



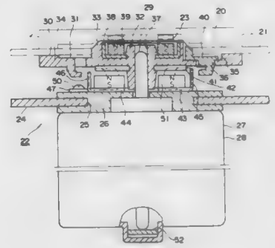
1. In a high density spiral track-forming apparatus which forms a spiral-shaped recording track on a disk-shaped substrate disk by focusing the recording beam on the surface of the disk-shape substrate disk while moving the optical recording system in the radial direction of the rotating disk-shape substrate disk, an optical recording system transferring device, comprising:
- (i) means for transferring the optical recording system in the radial direction of the substrate disk;
- (ii) means for detecting the travel velocity of the optical recording system, said travel velocity detecting means having,
  - (a) length measuring means for measuring the distance traveled of the optical recording system in the radial direction of the substrate disk and for generating a traveled distance equal corresponding thereto, and
  - (b) velocity computing means for computing the travel velocity of the optical recording system according to the optical recording system traveled distance signal from the length measuring means and the time elapsed during said distance traveled, and for generating a travel velocity signal corresponding to said computed travel velocity;
- (iii) means for setting a target velocity value for the optical recording system and for generating a target velocity signal corresponding thereto;
- (iv) means for comparing the travel velocity signal from said travel velocity detecting means with the target velocity signal from said target velocity setting means;
- (v) means for controlling said optical recording system transferring means so that the travel velocity of the optical recording system becomes equivalent to the target velocity;
- (vi) where said length measuring means comprises a laser length measuring device; and
- (vii) said velocity computing device comprises a trigger circuit for outputting sampling signals with a fixed sampling period, a gate circuit for inputting a positional signal from the optical recording system from the laser length measuring device in accordance with the sampling signal from the trigger circuit, a delaying device for delaying the positional signal from the gate circuit by a time equal to one sampling period, a first memory device for registering the delayed positional signal from the delaying device, a second memory device for registering a subsequent positional signal from the gate circuit, a comparator for comparing the positional signal from the first memory device and the subsequent positional signal from the second memory device to compute their difference, and a multiplier for outputting the result of multiplication obtained by multiplying the signal for the distance traveled sent from the comparator by the inverse of the sampling time.

4,730,299

DEVICE FOR PREVENTING VIBRATION OF A DISC MOTOR SHAFT IN A DISC PLAYBACK DEVICE

Yasuhiko Kamoshita; Kazuo Urata, and Mikio Ogusu, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 3, 1986, Ser. No. 870,094
Claims priority, application Japan, Jun. 5, 1985, 60-84818[U]; Jun. 6, 1985, 60-85579[U]
Int. Cl.[4] G11B *3/60*
U.S. Cl. 369—264 14 Claims



1. A device for preventing vibration of a disc motor shaft in a disc playback device comprising:
- a disc motor having a rotatable disc motor shaft;
- a turntable fixedly connected to said disc motor shaft for placing a disc thereon; and
- magnetic biasing means for generating a magnetic force biasing said disc motor shaft in a predetermined direction other than rotational to prevent vibration of the disc motor shaft with respect to the disc motor.

4,730,300

DISC CENTERING DEVICE FOR A DISC PLAYBACK DEVICE

Yasuhiko Kamoshita; Kazuo Urata, and Mikio Ogusu, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 3, 1986, Ser. No. 870,318
Claims priority, application Japan, Jun. 5, 1985, 60-84817[U]
Int. Cl.[4] G11B *25/04*
U.S. Cl. 369—270 3 Claims

1. A disc centering device for a disc playback device comprising:
- a turntable having a disc mounting portion and at least three recesses provided thereon substantially concentric to the center of the turntable;
- a disc motor shaft connected to said turntable;
- at least three disc centering members provided in the respective recesses of said turntable substantially concentrically

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with said disc motor shaft and each having a surface facing radially outwardly and vertically with respect to the turntable and each slidably disposed in each of the recesses of the turntable, wherein the centering members are separately slidable in the radial direction of said turnta-



ble to engage a central opening of a disc with the vertical surface of each centering member pushing in a normal direction against the periphery of the central opening of the disc; and

urging means provided in said turntable for urging said centering members radially outwardly of said turntable.

4,730,301

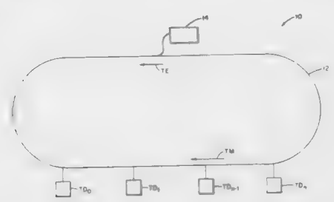
WAVELENGTH MULTIPLEXED OPTICAL COMMUNICATIONS SYSTEM AND METHOD

Donald H. McMahon, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1985, Ser. No. 811,775

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—2 **22 Claims**



1. An optical communications system comprising:

an optical pathway for propagating light energy, said optical pathway preferentially supporting light propagated in first and second characteristic states, wherein said first and second characteristic states correspond, respectively, to first and second polarization states;

means for introducing light energy in the first characteristic state onto said optical pathway for propagation thereof; and

means coupled to said optical pathway for removing optical energy propagated in the first characteristic state, for modulating and shifting the removed light to the second characteristic state, and for returning the modulated and state shifted light at a frequency different from the light introduced in the first characteristic state to said optical pathway for propagation thereon.

4,730,302

MONITORING MEANS FOR DIGITAL SIGNAL MULTIPLEX EQUIPMENT

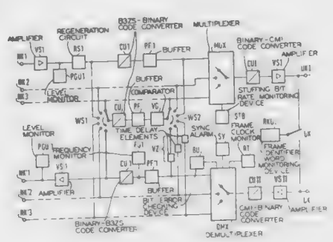
Franz Fuerlinger, Vienna; Albrecht Grabner, Ybbsitz; Werner Pokorny, Vienna; Walter Steiner, Poelten, all of Austria, and Wilhelm Volejnik, Sauerlach, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 17, 1986, Ser. No. 920,190

Claims priority, application Austria, Oct. 17, 1985, 3004/85

Int. Cl.⁴ H04J *3/14*

U.S. Cl. 370—13 **4 Claims**



1. Monitoring apparatus for a switching system apparatus in which a plurality of transmission signals are time-division multiplexed to form a common multiplexed transmission signal, and a common time-division multiplexed received signal is demultiplexed into a plurality of received signals, each of the pulsed messages including a frame identifier word, said apparatus comprising:

a multiplexer and a plurality of incoming transmission channels connected to said multiplexer;

a demultiplexer and a plurality of outgoing receiving channels connected to said demultiplexer;

a common outgoing transmission output connected to said multiplexer and a common incoming receiving input connected to said demultiplexer;

a plurality of first level monitoring devices each connected to a respective incoming transmission channel for monitoring the signal level of the respective channel;

a plurality of regeneration circuits each connected in a respective incoming transmission channel as a respective one's density monitor;

a plurality of first code converters each connected in a respective incoming transmission channel for converting signals of a first code into signals of a second code;

a stuffing bit rate monitor connected to said multiplexer and operable to insert stuffing bits;

a plurality of second code converters each connected in a respective outgoing receiving channel for converting signals of the second code into signals of the first code;

frame identifier word recognition means including clock recovery means connectable to said common outgoing transmission channel and to said common incoming receiving channel;

a second level monitoring device connected to said clock recovery means for monitoring the level of signals received on said common incoming receiving channel;

a frame clock monitor connected to said demultiplexer;

a synchronism monitor connected to said demultiplexer;

a bit error monitor connected to said demultiplexer;

a plurality of frequency monitors each connected to a respective outgoing receiving channel; and

a plurality of third level monitors each connected to a respective outgoing receiving channel.

4,730,303

DIGITAL SWITCHING SYSTEM WITH HOST AND REMOTE DUPLICATED TRANSMISSION CONTROLLERS

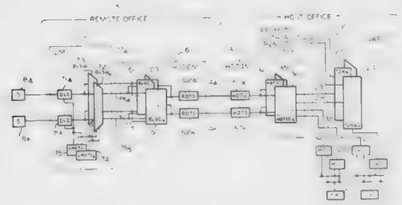
Yoshihiko Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 23, 1986, Ser. No. 877,246

Claims priority, application Japan, Jun. 24, 1985, 60-137441

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58 **1 Claim**



1. A digital switching system with host and remote duplicated transmission controllers, comprising:

a host office having duplicated first and second transmission controllers, each of said first and second transmission controllers being in one of active and standby operation modes alternatively; and

a remote office having duplicated third and fourth transmission controllers which are connected with said first and second transmission controllers via at least two of time division multiplexed digital transmission lines, each of said third and fourth transmission controllers being in one of active and standby operation modes alternatively;

wherein said first transmission controller and said second transmission controller are connected with cross-communication lines to transmit/receive control information, said third transmission controller and said fourth transmission controller are connected with cross-communication lines to transmit/receive control information, said first and third transmission controllers and said second and fourth transmission controllers transmit/receive said control information in accordance with respective high level data link control protocols via different channels of one of said transmission lines, and said controllers which are currently in active operation mode supply respectively their own time division multiplexed paths to said controllers which are currently in standby operation mode.

4,730,304

DATA BASE CREATION IN STORED PROGRAM CONTROLLED SWITCHING SYSTEMS

Susan A. Mezera, Naperville, and Merle K. Pieper, Wheaton, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 2, 1985, Ser. No. 783,126

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58 **9 Claims**

1. In an arrangement comprising a switching network, a first controller for establishing and maintaining connections through said switching network and a second controller, a method comprising the following steps:

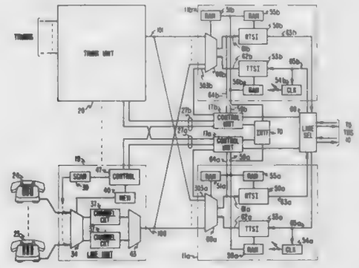
inhibiting said first controller from establishing and maintaining connections through said switching network;

reading hardware controlling data from said switching network;

generating from said hardware controlling data a data structure in a format acceptable to said second controller,

storing said data structure in said second controller; and

establishing and maintaining connections through said switching network by said second controller operating in



accordance with the data structure stored in said storing step.

4,730,305

FAST ASSIGNMENT TECHNIQUE FOR USE IN A SWITCHING ARRANGEMENT

Anthony Acampora, Freehold, and Kai Y. Eng, Red Bank, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 11, 1986, Ser. No. 850,778

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **10 Claims**

1. A switching arrangement comprising:

a plurality of M input ports (20_1–20_M) for receiving M separate input signals, each input signal comprising a plurality of C separate packets of information formatted in a first arrangement of C channels received during a predetermined period of time;

a plurality of M output ports (27_1–27_M);

a memory comprising a first and a second section (23_{iA} and 23_{iB}), each section including a plurality of C-by-M memory locations;

a distribution arrangement (**18,21,22,24–26**, FIG. **1**; **18,26,40–42,43–44**, FIG. 7) for directing the C separate packets of information received at each input during sequential ones of the predetermined periods of time alternately into the first section and then the second section of the memory, while concurrently directing the C-by-M separate packets of information stored in the first or second memory section during an immediately prior predetermined time period to the M output ports in a predetermined sequence of M concurrent packets for formatting each of the M output signals in a second arrangement of C channels, the M concurrent packets being capable of including more than one packet of information from a

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particular input port for transmission to separate ones of the M output ports;

a plurality of M receivers (12), each receiver including an output terminal connected to a separate one of the M input ports and an input terminal; and

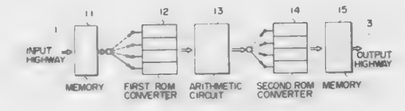
an N-by-M switching means for directing N input signals concurrently received during each predetermined time period to the input terminals of the plurality of M receivers, each input signal comprising C packets of information, and the N-by-M switching means comprises a plurality of separate P-by-Q switches (14) with each P-by-Q switch receiving a separate group of P of the N input signals and directing the packets of information received in the associated P input signals to the input terminals of a separate group of Q receivers forming part of the plurality of M separate receivers, where N>P and Q is dependent on the number of C packets of information included in the group of associated P input signals during the predetermined period of time and is equal to or less than P.

4,730,306

CONFERENCE SYSTEM

Seiya Uchida, Akishima, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,777
Claims priority, application Japan, Oct. 11, 1984, 59-211446
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—62 **1 Claim**



1. A conference system in which PCM codes input from a plurality of communication lines on a time-division basis are converted to linear codes, conference-operated, reconverted to PCM codes and then output to the communication lines on the time-division basis, comprising:

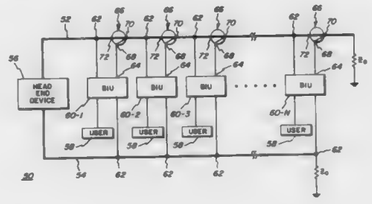
a plurality of first ROM converters, each provided for a predetermined amplification or attenuation degree, for amplifying or attenuating the sound volumes of the input PCM codes in connection with their voice signal levels and for converting them to linear codes; a plurality of second ROM converters, each provided for a predetermined amplification or attenuation degree, for amplifying or attenuating the sound volumes of the linear codes in connection with their voice signal levels and converting them to PCM codes; and storage means for storing the kind of one of the first ROM converters and the kind of one of the second ROM converters specified each conference-operated communication line; wherein the PCM codes input from the plurality of communication lines are each applied to one of the first ROM converters determined by the storage means for each communication line and subjected to a conference operation and the operation results are provided on the plurality of communication lines via the second ROM converters, each determined by the storage means for each communication line, thereby correcting the attenuation of the sound volume for each communication line to obtain an appropriate sound volume for conference.

4,730,307

METHOD AND APPARATUS FOR LOCAL AREA NETWORKS

William C. Hughes, Scotia, and Charles R. Stein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,283
Int. Cl.[4] H04J *3/02, 3/24*
U.S. Cl. 370—85 **36 Claims**



1. A communication network, comprising:

a transmit bus;

a receive bus;

means for directing signals leaving said transmit bus onto said receive bus;

a plurality of bus interface units (BIU) respectively coupled between said transmit and receive buses at locations spaced therealong, said BIUs communicating with one another by transmitting and receiving signals on said transmit and receive buses respectively, each said BIU being coupled to a user device for which it both transmits and receives information packets;

each said BIU including:

means for detecting signals on said transmit bus originating from an upstream direction away from said directing means;

means for detecting signals on said receive bus; and

means for measuring the respective durations of a first, a second, and a third time period;

each said BIU having an information packet to transmit being in an active state and initiating measurement of said first time period upon detecting the absence of receive bus signals, said BIU in said active state ceasing the first time period measurement upon subsequently detecting receive bus signals and reinitiating the first time period measurement only when the receive bus signals cease;

said BIU transitioning from said active state to a wait state upon successfully completing the first time period measurement and then initiating measurement of said second time period;

said BIU ceasing the second time period measurement upon detecting said upstream signals and transitioning from said wait state to said preempted state;

said BIU in said wait state upon successfully completing the second time period measurement transitioning to a transmit state in which it commences transmission of its information packet;

said BIU ceasing transmission upon detecting said upstream signals and transitioning from said transmit state to said preempted state;

said BIU in said preempted state initiating measurement of said third time period upon detecting cessation of said upstream signals, said BIU ceasing the third time period measurement upon detecting said upstream signals and reinitiating the third time period measurement only upon the subsequent cessation of said upstream signals;

said BIU in said preempted state transitioning to said transmit state upon successfully completing the third time period measurement; and

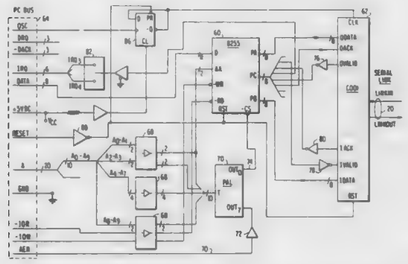
said BIU in said transmit state reverting to said active state upon successfully completing transmission of its information packet.

4,730,308

INTERFACE BETWEEN A COMPUTER BUS AND A SERIAL PACKET LINK

Lee G. Friedman, Cronton-on-Hudson, and Brent T. Hailpern, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,441
Int. Cl.[4] H04J *3/02, 3/24*
U.S. Cl. 370—85 **8 Claims**



1. A communication interface between a first communication system which reads and writes blocks of data to a port over a parallel data bus, said bus and said port being controlled by a processor, and a second communication system which sends and receives blocks of data over a full duplex link, said second communication system requiring an acknowledgement of receipt of a block of data previously sent before said second communication system will send a subsequent block of data, said interface comprising:

first means connected to said parallel data bus for having blocks of data being read from and being written to by said processor;

second means connected to said full duplex link for receiving and sending blocks of data to and from said second communication system; and

control means connected between said first and second means for transferring data therebetween under a full handshaking protocol, wherein when either said first or second communications system tries to send data to the other, said control means notifies said first or second communication system if said corresponding first or second means is able to receive said data, said control means converts said data according to the protocol of the receiving communication system, transfers the data between said first and second means, sends said data to the receiving communication system, and receives an acknowledgement of receipt of said data from said receiving communication system.

4,730,309

DATA TRANSMISSION STATION

Paul S. Chang, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 25, 1986, Ser. No. 899,681
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—86 **26 Claims**

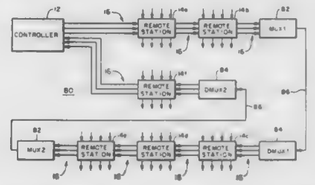
1. A data transmission station for use in a data transmission system that comprise a clock channel adapted to carry a periodic clock signal, a flag channel adapted to carry a flag signal, and a data channel adapted to carry a plurality of data signals between the data transmission station and at least one additional station, said data transmission station comprising:

a plurality of data terminals;

means, responsive to the clock channel, for receiving the clock signal;

means, responsive to the flag channel, for receiving the flag signal;

means, responsive to the flag signal receiving means, for storing the flag signal for only a selected interval comprising a first predetermined number of clock signal periods;



means, responsive to the clock signal and the flag signal, for gating a plurality of data signals between the data channel and the data terminals during a gating interval which starts a second predetermined number of clock signal periods after the flag signal is received by the flag signal receiving means and lasts for a third predetermined number of clock signal periods; and

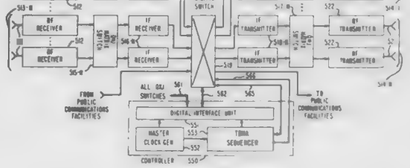
means for placing the flag signal on the flag channel after said selected interval.

4,730,310

TERRESTRIAL COMMUNICATIONS SYSTEM

Anthony Acampora, Freehold; Ta-Shing Chu, Lincroft; Corrado Dragone, Little Silver, and Michael J. Gans, Monmouth Beach, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 729,915, May 3, 1985, abandoned. This application Mar. 26, 1986, Ser. No. 843,842
Int. Cl.[4] H04J *3/16;* **H01J** *5/18*
U.S. Cl. 370—95 **15 Claims**



1. A base station for a terrestrial communications system, said base station comprising

a plurality of signal receiving ports, each receiving port being disposed at a terrestrial location to receive energy at a predetermined receiving frequency from only a respective one of a plurality of regions forming a system service region, said predetermined receiving frequency being the same for more than one of said plurality of signal receiving ports,

a plurality of signal transmitting ports, each transmitting port being disposed at said terrestrial location to transmit energy at a predetermined transmitting frequency to only an associated one of said plurality of regions forming said system service region, said predetermined transmitting frequency being the same for more than one of said plurality of signal transmitting ports,

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each region in said system service region being defined by a directional antenna pattern emanating from said base station, the totality of directional antenna patterns defining said system service region,

at least one transmitter,

at least one receiver, and

means for respectively interconnecting said transmitter and receiver to a selected one of said signal transmitting and signal receiving ports during a time slot in a sequence of time slots forming a time division multiplexed frame.

4,730,311

REMOTE MULTIPLEXER FOR DIGITAL TELEPHONE SYSTEM

Gregg D. Carse, Mountain View, and Bernard N. Daines, Union City, both of Calif., assignors to Pacific Bell, San Francisco, Calif.

Continuation-in-part of Ser. No. 711,083, Mar. 12, 1985, abandoned. This application Oct. 25, 1985, Ser. No. 791,304

Int. Cl.⁴ H04J *3/12*

U.S. Cl. 370—110.1 **7 Claims**



1. A multiplexer unit for installation at or near a telephone system subscriber premise for interfacing between equipment located at the subscriber premise and a central office, said multiplexer unit comprising,

voice interfacing means for converting between voice encoded digital signals and analog signals for operatively connecting to at least one subscriber analog voice communication equipment,

data interfacing means for routing data encoded digital signals to at least one subscriber data communication equipment,

frame processing means connected to each of said voice interfacing means and said data interfacing means for assembling and disassembling digital frames each comprised of voice encoded digital signals, data encoded digital signals, and control and status encoded digital signals,

transceiver means connected to said frame processing means for transmitting to and receiving from a central office via a single subscriber loop serial full duplex frames of voice encoded, data encoded, and control and status encoded digital signals,

and utility processing means connected to said voice interfacing means, said data interfacing means, said frame processing means, and said transceiver means for controlling same in accordance with said control and status encoded digital signals received by said transceiver from the central office, and for producing control and status encoded digital signals for transmission by said transceiver to the central office.

4,730,312

VOICE, DATA OR BOTH OVER ONE TELEPHONE LINE A T-1 CARRIER SYSTEM

Robert D. Johnson, Newport Beach; George A. Merritt, Jr., Irvine, and Terry L. Dawson, Laguna Beach, all of Calif., assignors to San/Bar Corporation, Irvine, Calif.

Filed Feb. 21, 1986, Ser. No. 832,451

Int. Cl.⁴ H04J *3/12*

U.S. Cl. 370—110.1 **22 Claims**



1. A user-selectable system for communicating over a standard T-1 span connected over digital switches in a patch between users, wherein the T-1 format comprises a superframe having a plurality of sequential frames with each frame comprising a synchronizing pulse followed by a predetermined number of sequential time slots, with each time slot having a fixed number of bit positions from a most to least-significant bit position and further wherein the least significant bit positions in selected frames of every superframe is reserved without regard to received frame identity for T-1 signalling bits inserted by T-1 equipment free of any control by said user, said system comprising:

encoding means for digitizing voice samples to an encoded number equal to said fixed number of bit positions;

a source of synchronized data at said user's location and under his control;

means available to a user at a user's station for commanding that the user's digitized encoded voice from said encoding means and synchronized data from said user's data source be simultaneously transmitted over one part of said T-1 span;

means responsive to said user's command regarding voice and data for discarding the least significant bit position of said encoded voice sample from a user's location and moving the next-to-least significant bit position of said encoded voice sample into said bit position of said frames reserved for said T-1 signalling bits whereby said bit position previously occupied by said next-to-least significant bit position of said encoded voice sample is unoccupied;

means also responsive to said user's command regarding voice and data for inserting data in said unoccupied bit position of said encoded voice sample; and

means for interleaving said user's data, voice samples and allowing the telephone companies' T-1 signalling bits to be placed in the proper location during the time slots of the selected frames in each superframe free of any user's control.

4,730,313

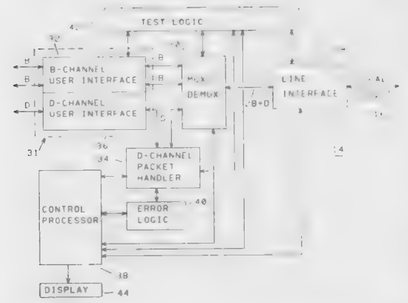
ACCESS CIRCUIT DIAGNOSTICS FOR INTEGRATED SERVICES DIGITAL NETWORK

Jack E. Stephenson, Davie; Jay P. Jayapalan, Hollywood; Ming-Luh Kao, Miami; Charles R. Baugh, Plantation, and Jerry A. Miller, Sunrise, all of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Aug. 18, 1986, Ser. No. 897,556

Int. Cl.⁴ G06F *11/20*

U.S. Cl. 371—5 **23 Claims**



1. A method of providing diagnostic information in an ISDN having a B channel and a D channel, comprising the steps of:

monitoring error performance of said ISDN D channel;

establishing a representation of said error performance in a format suitable for comparison with a predetermined error performance criterion; and

comparing said ISDN D channel error performance with said predetermined error performance criterion as an indication of said ISDN B channel's error performance.

4,730,314

LOGIC ANALYZER

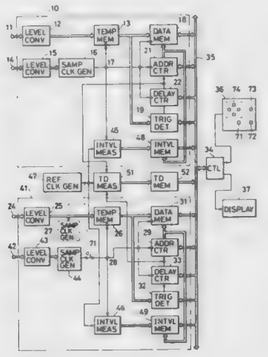
Kazuo Noguchi, Kumagaya, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 797,205

Claims priority, application Japan, Nov. 12, 1984, 59-238994

Int. Cl.⁴ G09G *1/08*

U.S. Cl. 371—16 **23 Claims**



1. A logic analyzer, comprising:

first and second data paths;

a first data memory, coupled to said first data path, for loading first input data for each change in state of said first data memory;

a first trigger detector, coupled to said first data path, for detecting that the first input data has reached a first preset value;

first delay means, coupled to said first trigger detector, for delaying the detected output if the first trigger detector, for a time period equal to a time required for performing a predetermined number of data loadings into said first data memory, to provide a delayed output for stopping the data loading into the first data memory;

a second data memory, coupled to said second data path, for loading second input data;

a second trigger detector, coupled to said second data path, for detecting that the second input data has reached a second preset value;

second delay means, coupled to said second trigger detector, for delaying the detected output of the second trigger detector, for a time period equal to a time required for performing a predetermined number of data loadings into said second data memory, to provide a delayed output for stopping the data loading into the second data memory;

a first data loading interval measuring circuit, coupled to said first data memory, for measuring intervals of loading the first input data into the first data memory;

a first data loading interval memory, coupled to said first data loading interval measuring circuit, for storing the data loading intervals measured by the first data loading interval measuring circuit;

a time difference measuring circuit, coupled to said first and second delay means, for measuring the time difference between the points of generation of the delayed outputs from the first and second delay means;

a time difference memory, coupled to said time difference measuring circuit, for storing the time difference measured by the time difference measuring circuit;

data specifying means for specifying a desired one of the data stored in one of the first and second data memories; and

corresponding data detecting means, connected to said first data loading interval memory, said time difference memory and said data specifying means, for determining data in the one of said first and said second data memories corresponding to the loading point of the specified data utilizing the time difference stored in the time difference memory and the data loading intervals stored in the first data loading interval memory.

4,730,315

DIAGRAMMATIC METHOD OF TESTING PROGRAM

Kazumasa Saito, Kawasaki, and Hiroyuki Maezawa, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,386

Claims priority, application Japan, Oct. 17, 1984, 59-216146

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—19 **10 Claims**



1. A program testing method performed in a data processing

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system having processing means, memory means, inputting means and outputting means, comprising the steps of:

storing in said memory means data representing diagrammatic specifications of a program and a corresponding series of program statements having correspondence information associated therewith which indicates the correspondence of said program statements to respective portions of said diagrammatic specifications;

starting execution of said series of program statements;

identifying during said execution a portion of said diagrammatic specifications corresponding to a program statement in a path of said execution by referring to said correspondence information; and

outputting during said execution at least part of said data representing diagrammatic specifications with said identified portion expressed distinctively, thereby showing the execution state of said series of program statements on said diagrammatic specifications.

4,730,316

DIGITAL INTEGRATED CIRCUITS

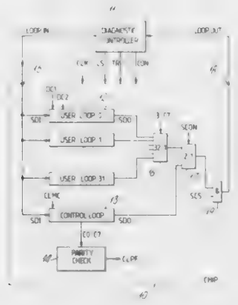
Peter L. L. Desyllas, Wilmslow, and Finbar Naven, Cheadle Hulme, both of Great Britain, assignors to International Computers Limited, London, England

Filed Jul. 7, 1986, Ser. No. 882,949

Claims priority, application United Kingdom, Jul. 25, 1985, 8518859

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—25 **9 Claims**



1. A digital integrated circuit comprising:

(a) a plurality of shift register latches connected together to form a plurality of serial shift paths in parallel between a serial data input terminal and a serial data output terminal, each path having a plurality of modes of operation,

(b) a control shift register connected to the serial data input terminal to allow commands to be shifted serially into the control shift register,

(c) a command register,

(d) means for transferring a command in parallel from the control shift register into the command register, and

(e) means for utilizing the contents of the command register to control the modes of operation of the shift paths.

4,730,317

DIGITAL INTEGRATED CIRCUITS

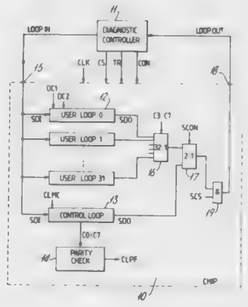
Peter L. L. Desyllas, Wilmslow, and Finbar Naven, Cheadle Hulme, both of Great Britain, assignors to International Computers Limited, London, England

Filed Jul. 7, 1986, Ser. No. 882,947

Claims priority, application United Kingdom, Jul. 25, 1985, 8518860

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—25 **7 Claims**



1. A digital integrated circuit comprising

(a) at least one group of latches,

(b) a serial input terminal and a serial output terminal connected to the latches,

(c) means for producing a clock signal,

(d) means for operating the group of latches in a user mode in which the group acts as at least one register with parallel inputs and outputs,

(e) means for operating the group of latches in a hold mode in which the contents of all the latches in the group are preserved,

(f) means for operating the groups of latches in a shift mode in which the latches are coupled together to form a serial shift path extending between the serial input terminal and the serial output terminal and data is stepped through this path by means of the clock signal,

(g) a control input terminal for receiving a series of transfer pulses, and

(h) a control circuit connected to the control input terminal and operable to put the group of latches into its hold mode and then, in response to each of the transfer pulses, to switch the group from the hold mode into the shift mode and then back into the hold mode.

4,730,318

MODULAR ORGANIZED STORAGE TESTER

Richard Bogholtz, Jr., Mahopac, and Louis J. Bosch, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,046

Int. Cl.⁴ G01R *31/28*; G06F *11/00*

U.S. Cl. 371—27 **8 Claims**

1. Apparatus comprising;

first and second memory means for addressably storing and supplying stored test data signals,

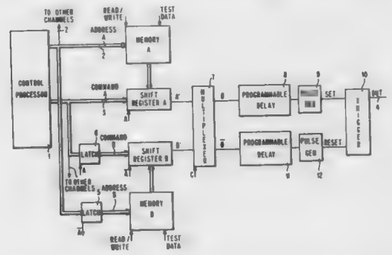
first and second shift registers connected to receive said stored data signals from said first and second memory means, respectively,

said registers serially shifting said received stored data signals onto first and second output lines in response to first and second clock pulses, respectively,

said second clock pulses being delayed with respect to said first clock pulses,

means for applying address signals to said first and second memory means and for applying command signals to said first and second shift registers, and

a multiplexer connected to receive said data signals on said first and second output lines and operative to provide recurrent groups of interleaved data signals, each group



comprising a serial succession of data signals from said first register followed by data signals from said second register in response to third clock pulses,

said third clock pulses occurring between said first and second clock pulses.

4,730,319

DEVICE FOR TRANSFORMING THE OCCURRENCE PROBABILITY OF LOGIC VECTORS AND FOR THE GENERATION OF VECTOR SEQUENCES WITH TIME VARIABLE PROBABILITIES

René David, Saint-Egreve, and Xavier Fedi, St-Martin d'Hères, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

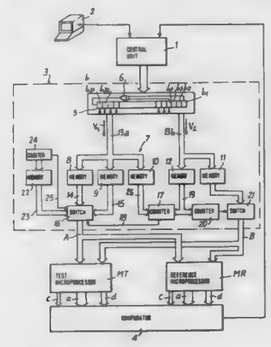
PCT No. PCT/FR84/00229, § 371 Date Jun. 7, 1985, § 102(e) Date Jun. 7, 1985, PCT Pub. No. WO85/01813, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 12, 1984, Ser. No. 744,013

Claims priority, application France, Oct. 13, 1983, 83 16285

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—27 **14 Claims**



1. A random testing device for logic circuits, particularly microprocessors, comprising:

a central unit (1) having an input and an output;

a reference microprocessor (MR) and a test microprocessor (MT) to be tested, each said microprocessor having a data (d), an address (a) and a monitoring output (c);

a random sequence generator (3) for generating random sequences of instructions and orders, each applied in parallel to both said reference microprocessor and to said test microprocessor; and

a comparator (4) having first and second inputs, each of which is connected to one of said data, address and monitoring outputs of each said microprocessor, and an output connected to the input of said central unit;

said random sequence generator (3) comprising:

(1) a shift register (5) looped as a sequence generator of maximum period by an exclusive OR circuit (6) having inputs, the cells of said shift register corresponding to certain bits defined by a known mathematical property and being connected to said inputs of said exclusive OR circuit (6);

(2) a vector sequence generator having an input connected with an output of said shift register for receiving therefrom equiprobable vectors of twenty-eight (28) bits issuing from said shift register, said vector sequence generator comprising for instructions:

(a) a first memory (8) for storing data,

(b) a second memory (9) for storing operation codes, and

(c) a third memory (10) for storing the number of cycles corresponding to the various operation codes; and

said vector sequence generator comprising for orders:

(d) a fourth memory (11) for storing the types of orders, and

(e) a fifth memory (12) for storing the number of cycles corresponding to the various respective orders,

means including said shift register (5) for allowing a pseudo-random generation of equiprobable vectors for application to said vector sequence generator;

said means including said first memory (8) for storing data, said second memory (9) for storing operation codes, and said third memory (10) for storing the number of cycles corresponding to the various operation codes, to provide instructions;

first and second switches (16, 21) for transferring data supplied thereto to said two microprocessors, and first and second busses (14, 15) for connecting the outputs of said first and second memories (8, 9) respectively to said first switch (16);

a first bus (A) for data to connect both said reference microprocessor (MR) and said test microprocessor (MT) in parallel and with the outputs of said first switch (16), and a second or order bus (B) for orders connecting both said reference microprocessor (MR) and said test microprocessor (MT) in parallel and with the outputs of said second switch (21);

first and second counters (17,20), and a third bus (19) having its input connected with said fifth memory (12) containing the number of cycles corresponding to the respective orders and the output connecting said first and second counters (17, 20) in parallel, a fourth bus (26) connecting said third memory (10) with said first counter (17), and a link (18) connecting said first counter (17) and said first switch (16) for controlling said first switch (16); and

a fifth bus connecting said second switch (21) to the output of said fourth memory (11), the output of which is connected to said second or order bus (B);

the output of said second counter (20) and said fifth memory (12) being connected to said first counter (17) and through said second counter (20) to said second switch (21) for controlling said second switch (21) to maintain an order for a period of time sufficient for correct execution thereof, and the linking to said first counter makes it possible to send an operation code at the moment when said microprocessors are expecting it after execution of an order;

said memories (8, 9, 10, 11, 12) being loaded by subdividing the total field of each said memory into a certain number of areas of different ranges, depending on the probabilities that it is desired to obtain at the output.

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4,730,320
SEMICONDUCTOR MEMORY DEVICE

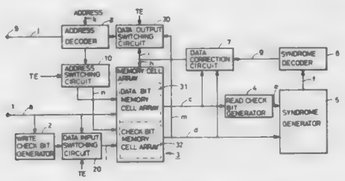
Hideto Hidaka; Kazuyasu Fujishima; Masaki Kumanoya; Hideshi Miyatake; Katsumi Dosaka, and Tsutomu Yoshihara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,869

Claims priority, application Japan, Feb. 7, 1985, 60-23182; Feb. 20, 1985, 60-33731; Feb. 20, 1985, 60-33732; Sep. 26, 1985, 60-215472

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **22 Claims**



1. A semiconductor memory device comprising:

a data bit memory cell array (**31**), a check bit memory cell aray (**32**) for outputting write check bits for an on-chip error correcting function,

switch means (**10**, **20**, **30**) for making said check bit memory cell array directly externally accessible, and

said switch means including input address switching means (**10**) responsive to external test signals for switching external address signals to one of said data bit and check bit memory cell arrays.

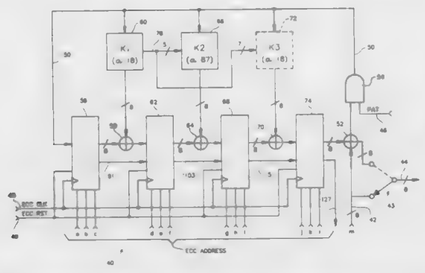
4,730,321
DISK DRIVE WITH IMPROVED ERROR CORRECTION CODE

Michael G. Machado, San Jose, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed May 30, 1986, Ser. No. 869,005

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **28 Claims**



1. In Reed-Solomon error correction code apparatus for a computing system storage device including a programmed digital microcontroller for controlling operations of the device in accordance with prestored program routines and in which useful data written on the surface of a rotating disk in finite blocks is read by a transducing mechanism and in which each finite block of data so recorded includes finite field error correction coding syndrome information appended at the end thereof for enabling detection and correction of errors within the block, an error correction code syndrome generator/decoder of minimized logic elements for calculating error correction coding syndrome information in accordance with a predetermined Galois field and syndrome generator polynomial, the generator/decoder for testing the calculated information with the appended information to signal any discrepancies indicative of an error within the data block, the generator/decoder comprising:

an input/output summing junction for receiving each incoming data block as a clocked data stream of serial bytes,

an error correction code feedback path leading from the summing junction and carrying feedback values,

multiplier apparatus for multiplying the feedback values by a first predetermined constant to yield first product values, for multiplying the feedback values by a second predetermined constant to yield second product values, and for multiplying the feedback values by a third predetermined constant to yield third product values,

a first clocked latch stage for latching the feedback values present on the feedback path,

a first summing junction for summing the latched feedback values from the first latch stage with the first product values to yield first sum values,

a second clocked latch stage for latching the first sum values,

a second summing junction for summing the first sum values and the second product values to yield second sum values,

a third clocked latch stage for latching the second sum values,

a third summing junction for summing the second sum values and the third product values to yield third sum values,

a fourth clocked latch stage for latching the third sum values,

the input-output summing junction for summing the third sum values with the incoming clocked stream of serial bytes to generate the feedback values,

the first, second, third and fourth latch stages being clocked in synchronism with the incoming data stream of serial bytes,

testing means for testing the values held in the first, second, third and fourth latch stages at the end of processing of each block thereby to determine if an error has occurred, and

the first, second, third and fourth latch stages including at least one addressable, enablable bus driver for enabling syndrome byte values contained therein at the end of processing of a data block to be obtained and analyzed by the programmed digital microcontroller in accordance with Read Solomon error correction routines executed thereby for locating and correcting at least one data byte determined to be in error.

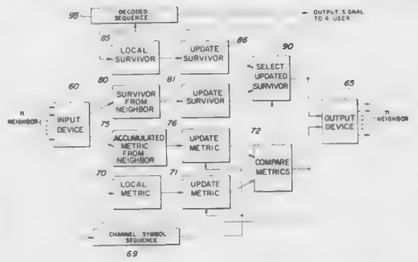
4,730,322
METHOD AND APPARATUS FOR IMPLEMENTING A MAXIMUM-LIKELIHOOD DECODER IN A HYPERCUBE NETWORK

Fabrizio Pollara-Bozzola, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 27, 1985, Ser. No. 781,224

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—43 **11 Claims**



1. A method for maximum-likelihood decoding of convolutional codes for a received code sequence having 2^m states (where m is a whole integer) by a plurality of interconnected processors each of which is normally in communication with all the other processors of said plurality and each provided with a decoding algorithm means for deriving/interchanging decoding parameters including branch metrics, accumulated metrics and survivors in an m-state trellis with each processor fixedly assigned to one state of said trellis, the improvement comprising:

connecting each one of a plurality of 2^m processors, equipped with said decoding algorithm means, in an n-cube configuration having bidirectional communication links along the edges only of said cube and certain processors thereof not having a direct communication link between other processors of said n-cube configuration;

mapping an equivalent trellis for said n-cube configuration wherein processors represent more than one state and thus have direct communication links between other processors of said n-cube configuration on said equivalent trellis; and

deriving/interchanging the branch and accumulated metrics between the processors which represent all of the states in said equivalent trellis in order to select, by said decoding algorithm means, the maximum likelihood path from said equivalent trellis.

4,730,323
LASER FREQUENCY DRIFT CONTROL DEVICE AND METHOD

Norman T. Seaton, 2821 9th St., Berkeley, Calif. 94710

Filed Feb. 7, 1986, Ser. No. 827,234

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—32 **14 Claims**



1. A laser frequency drift control device for an electrically powered, gas laser tube, said laser tube having an integral electrode and end reflector with a reflector portion, and said laser tube being operable by a discharge current, said drift control device comprising:

electrically powered heater means including electrical connection means for electrically coupling of said heater means to said integral electrode and end reflector for powering of said heater means solely by said discharge current passing therethrough, said heater means sensing the temperature of said integral electrode and end reflector and controlling the generation of heat based upon the temperature sensed, and said heater means having thermal connection means for thermal coupling said heater means to said reflector portion of said integral electrode and end reflector for heating thereof.

4,730,324
METHOD AND APPARATUS FOR COMPENSATING FOR WAVE FRONT DISTORTION IN A SLAB LASER

Farzin H. Azad, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1986, Ser. No. 914,431

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—33 **22 Claims**

12. Apparatus, comprising:

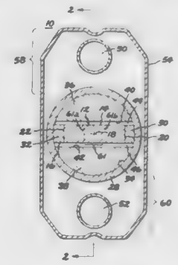
a solid-state lasing medium having a longitudinally extending lasing axis;

pumping means adjacent said lasing medium for impinging electromagnetic radiation upon said lasing medium;

cooling means for flowing a fluid coolant across at least a portion of said lasing medium;

said lasing medium exhibiting a negative focal power lens effect in lateral edge portions thereof;

means for introducing a positive focal power lens effect approximately equal in magnitude to said negative focal power lens effect to a central portion of said lasing medium between said lasing medium lateral edge portions, said introducing means creating a thermal lens effect in



said central portion exhibiting said positive focal power; and

means for passing a beam of coherent light having a wavefront including multiple rays at least twice through said lasing medium in a direction generally along said lasing axis such that said rays in said wavefront traverse alternate regions of positive and negative focal powers of approximately equal magnitudes.

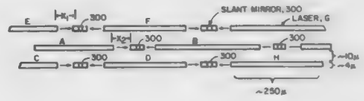
4,730,325
TWO-DIMENSIONAL PHASE LOCKED SEMICONDUCTOR LASER ARRAY

Weng W. Chow, Cedar Crest, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 17, 1986, Ser. No. 840,620

Int. Cl.[4] H01S *3/19, 3/08*

U.S. Cl. 372—44 **4 Claims**



1. A phase locked two-dimensional semiconductor laser array comprising:

a heat sink;

a common electrode placed on said heat sink;

a common substrate placed on said common electrode;

a plurality of individual lasers forming a column arrangement fixed on said common substrate in i columns such that each of said columns has more than one laser in it, and where i equals an integer enumerating any column in said array, each of said individual lasers in a column emitting light towards the lasers next to it in the same column, and wherein each of said lasers in an ith column is offset with adjacent lasers in columns numbered ($i \pm 1$); and

a plurality of slant mirrors fixed on said common substrate so that every one of said individual lasers has one of said plurality of slant mirrors between it and the lasers next to it in the same column, each of said slant mirrors reflecting out of the laser array the light it receives from the individual lasers beside it so that phase locking is accomplished as a result of the column arrangement of said plurality of individual lasers by evanescent wave coupling from offsetting adjacent lasers in said column arrangement, and a wavefront emanates from said plurality of slant mirrors.

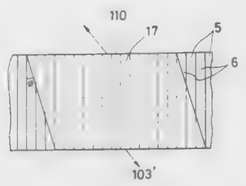
VOL 1088 ISS 2 MR 8 1988 UMI

4. A phase locked two-dimensional semiconductor laser array comprising:
a heat sink;
a common electrode placed on said heat sink;
a common substrate placed on said common electrode;
a plurality of individual lasers forming a column arragement fixed on said common substrate in i columns such that each of said columns has more then one laser in it, and where i equals on integer, each of said individual lasers in a column emitting light towards the lasers next to it in the same column; and
a plurality of slant mirrors fixed on said common substrate so that every one of said individual lasers has one of said plurality of slant mirrors between it and the lasers next to it in the same column, each of said slant mirrors reflecting out of the laser array the light it receives from the individual lasers beside it in a wavefront by coupling evanescent waves of adjacent individual lasers, which is accomplished as a result of the column arrangement of said plurality of individual lasers, and wherein each of said slant mirrors in an ith column of said array forms an optical path length of x_i with the individual lasers adjacent to it so that an optical path length of column number i+1 is x_{i+1} which is given by:

$$x_i = x_{i+1} \pm n(\lambda/2)$$

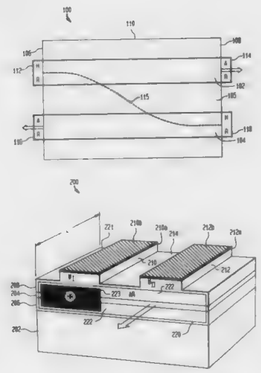
where:
i equals an integer enumerating any column in said array; λ equals a measure of wavelength of the light transmitted out of the array; and n equals an odd integer.

4,730,326
SEMICONDUCTOR LASER ARRAY DEVICE
Mototaka Taneya; Sadayoshi Matsui; Mitsuhiro Matsumoto, all of Tenri; Saburo Yamamoto, Nara, and Seiki Yano, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 9, 1985, Ser. No. 773,966
Claims priority, application Japan, Sep. 12, 1984, 59-191189; Sep. 12, 1984, 59-191191
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 7 Claims



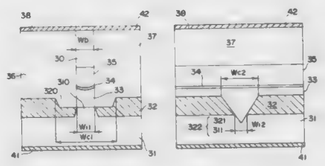
1. A semiconductor laser array comprising:
a substrate having a plurality of grown layers thereon including an active layer, said active layer having a plurality of parallel index-guided lasing filaments formed therein; and
an electrical current injection portion formed on an upper face of said grown layers, said electrical current injection portion having an asymmetrical shape with respect to any line which is parallel to the lasing filaments.

4,730,327
DUAL CHANNEL FABRY-PEROT LASER
Eugene I. Gordon, Convent Station, N.J., assignor to Lytel Incorporated, Somerville, N.J.
Filed Dec. 16, 1985, Ser. No. 809,577
Int. Cl.[4] H01S *3/19, 3/08*
U.S. Cl. 372—45 10 Claims



1. A semiconductor diode laser comprising:
a substrate,
a plurality of layers fabricated on said substrate, said layers including an active layer capable of emitting radiation when a pumping current is applied thereto,
a first active waveguide defined in said active layer,
a second active waveguide defined in said active layer,
electrode means connected to said layers for applying said pumping current,
a coupling region defined in said active layer between said first and second active waveguides so that said waveguides are optically coupled, and
means for providing feedback for radiation emitted in said first or second active waveguides so that laser oscillations may be supported therein, said means providing a feedback path including a portion of said first active waveguide, said coupling region and a portion of said second active waveguide.

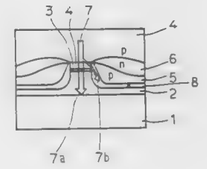
4,730,328
WINDOW STRUCTURE SEMICONDUCTOR LASER
Nobuyuki Miyauchi; Shigeki Maei, both of Tenri; Osamu Yamamoto; Taiji Morimoto, both of Nara; Hiroshi Hayashi, Soraku, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 15, 1985, Ser. No. 787,760
Claims priority, application Japan, Oct. 16, 1984, 59-217782
Int. Cl.[4] H07S *3/19*
U.S. Cl. 372—46 9 Claims

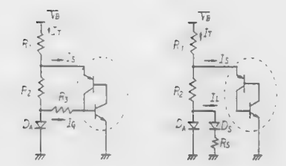


1. A semiconductor laser comprising:
a substrate,
a current blocking layer formed on said substrate,

a striped channel portion formed in said current blocking layer on said substrate so as to form a current injection region, said striped channel portion having a middle channel section and end channel sections disposed at both ends of said middle channel section, said middle channel section being wider than said end channel sections; and
an active layer operatively associated with said striped channel portion and said substrate, said active layer having planar portions formed at positions corresponding to said end channel sections to form window regions and said active layer having a concave-shaped portion formed at a position which corresponds to said middle channel section to form a laser operation area;
wherein said active layer is incorporated into a mesa-shaped operation portion, said mesa-shaped operation portion is surrounded by burying layers to cut off current leakage from said laser operation area, and the width of said mesa-shaped operation portion is not less than the width of said current injection region formed within said striped channel portion.

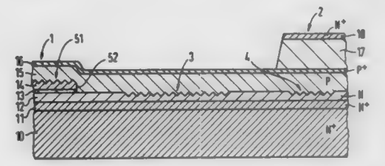
4,730,329
SEMICONDUCTOR LASER DEVICE
Toshihiko Yoshida, Tenri; Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara, and Sadayoshi Matsui, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 2, 1986, Ser. No. 869,596
Claims priority, application Japan, Jun. 10, 1985, 60-126954
Int. Cl.[4] H01S *3/18*
U.S. Cl. 372—46 2 Claims





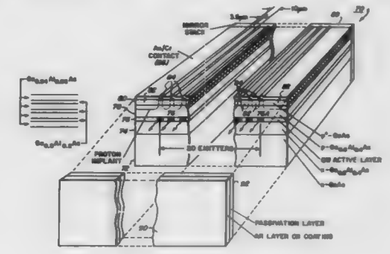
1. A semiconductor laser device comprising:
a semiconductor substrate of a first conductivity type;
a first electrode formed under said semiconductor substrate;
a mesa-striped structure formed on said semiconductor substrate and successively having an active layer with a refractive index higher than that of said semiconductor substrate and with an energy gap smaller than that of said semiconductor substrate, and a cladding layer of a second conductivity type;
a multi-layered burying crystal successively having, at the sides of said mesa-striped structure, a first burying layer of the first conductivity type, a second burying layer of the second conductivity type, and a third burying layer of the first conductivity type, said second burying layer being thicker than said first burying layer;
a cap layer of the second conductivity type, covering the upper face of said mesa-striped structure and an upper face of said third burying layer; and
a second electrode formed on said cap layer,
whereby injected current flowing into a thyristor composed of said cap layer, said third burying layer, said second burying layer and said first burying layer can be suppressed.

4,730,330
INTEGRATED STRUCTURE FOR BI-DIRECTIONAL OPTICAL FIBER TRANSMISSION
Manfred Plihal; Heinrich Schlötterer, and Reiner Trommer, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 23, 1985, Ser. No. 812,468
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1985, 3500327; European Pat. Off., Sep. 9, 1985, 85 111 386.0
Int. Cl.[4] H01S *3/19;* H01L *31/12;* G02B *6/26*
U.S. Cl. 372—50 23 Claims



1. In an integrated structure, the combination comprising:
a substrate;
a laser diode integrated on said substrate;
a photodetector integrated on said substrate;
a bi-directional optical waveguide integrated on said substrate disposed for guiding radiation from said laser diode out of said structure and for directing incoming radiation of a different wavelength through said structure to said photodetector; and
a passive optical device coupled in said integrated structure with said waveguide for substantially isolating said incoming radiation propagated in one direction in said waveguide from said laser diode and substantially isolating radiation emitted by said laser diode propagated in an opposite direction in said waveguide from said photodetector.

4,730,331
SUPERLUMINESCENT LED SOURCE
Robert D. Burnham, Palo Alto; Thomas L. Paoli, Los Altos, and Robert L.Thornton, East Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Coan.
Division of Ser. No. 719,595, Apr. 3, 1985, Pat. No. 4,638,334.
This application Jun. 16, 1986, Ser. No. 874,982
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 15 Claims



1. In a light source comprising a semiconductor laser comprising a plurality of deposited semiconductor layers, an active

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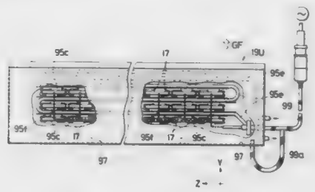
region in said source and comprising a plurality of layers forming at least two quantum wells in said active region, a p-n junction is proximity to said active region, the layers immediately adjacent to said active region providing confinement for light generated in at least one optical cavity established in said active region and propagating between end facets of said source, means to convert said semiconductor laser into a superluminescent LED source, means to broaden the wavelength spectral emission from said source by rendering the energy levels present in said quantum wells to be at different levels between or among said quantum wells thereby producing an output beam having high output intensity and a uniform far field pattern without intensity variation along the beam width.

4,730,332

LASER OSCILLATING APPARATUS

Ethan D. Hoag, Boston, Mass., assignor to Laser Corporation of America, Stamford, Conn.

Filed Mar. 20, 1986, Ser. No. 841,769
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **4 Claims**



1. A laser oscillating apparatus of type having a hollow cylindrical housing, gas flow generating means for generating a circulatory gas flow within the housing, paired discharge electrode assemblies opposedly disposed in spaced relationship to define a lasing region therebetween traversed by the circulatory gas flow for carrying out a predetermined discharge within the gas flow traversing the lasing region thereby generating a ray of radiation, and optical resonator means disposed within the housing for resonating the ray of radiation generated in the discharge, characterized in that each of said paired discharge electrode assemblies comprises:

a. an insulated substrate having a molded base portion and an insulated ceramic surface portion disposed adjacent the molded base portion;

b. a plurality of pin-shaped electrodes, each pin-shaped electrode having a first part that is buried in the molded base portion of said insulated substrate and a second part extending from said first part through the ceramic surface portion of said insulated substrate into the lasing region defined between said paired discharge electrode assemblies;

c. a ballast capacitor disposed within the molded base portion of said insulated substrate, said ballast capacitor comprising a plurality of capacitor units aligned in parallel, spaced rows, each capacitor unit interconnected in electrical communication between a power source and at least one pin-shaped electrode;

d. cooling tube means disposed within the molded base portion of the insulated substrate so as to pass between each pair of adjacent rows of the capacitor units forming said ballast capacitor; and

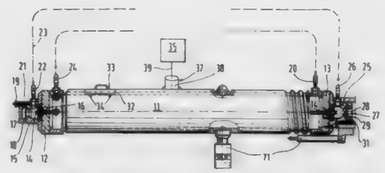
e. at least one heat absorbing plate disposed between each pair of adjacent rows of capacitor units forming said ballast capacitor in contact with said cooling tube means passing therebetween.

4,730,333

GAS LASER WITH HIGH-FREQUENCY EXCITATION

Dieter Butenuth, Dettingen, Fed. Rep. of Germany, assignor to Elcede GmbH, Kirchheim, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 39,211
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614471
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **22 Claims**



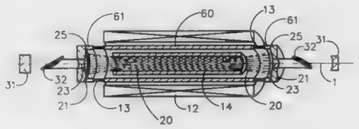
1. A gas laser comprising an elongate laser tube with first and second electrode means for high-frequency excitation thereof, an elongate conductive tubular housing with an inner wall and a longitudinal axis and end closures supporting the ends of said laser tube in radially spaced relation to said inner wall within said tubular housing, gas-flow supply means for supplying gas to said laser tube, said gas supply means including an inlet connection at one end and an outlet connection at the other end of said laser tube, a grounding connection for a first one of said electrode means to said housing, and means including a high-frequency lead-through connection via said housing for excitation of said second electrode means, said lead-through connection comprising a movable capacitor-electrode element and an electrically insulating means for radially supporting and adjusting said movable capacitor-electrode element within said housing for offset with respect to said inner wall of said housing, whereby the housing comprises another capacitor element.

4,730,334

ULTRAVIOLET METAL ION LASER

George J. Collins, 807 W. Oak St., Fort Collins, Colo. 80521; John R. McNeil, 13423 Desert Hills NE., Albuquerque, N. Mex. 87111, and Zeng-qi Yu, North Aggie Village, Apt. 7C, C.S.U., Ft. Collins, Colo. 80523

Filed Jan. 5, 1987, Ser. No. 475
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—88 **50 Claims**



1. A metal ion laser comprising:

a cylindrical vacuum enclosure having a longitudinal axis that is coincident with an unobstructed longitudinal optical axis defined by a resonant optical cavity comprising two mirrors, one at each end thereof, one or both of which mirrors are employed to extract power from the laser;

a cylindrical magnetron sputtering source positioned coaxially with an adjacent to said cylindrical vacuum enclosure, the cylindrical magnetron sputtering source including a cylindrical metal cathode tube positioned coaxially with and enclosed within said cylindrical vacuum enclosure, the cylindrical magnetron sputtering source further including magnetic means positioned outside said cylindrical vacuum enclosure for providing a longitudinal magnetic field parallel to the longitudinal optical axis and within said cylindrical metal cathode tube and for additionally providing fringe magnetic fields at the ends of said cylindrical metal cathode tube, the cylindrical magnetron sputtering source further including two cylindrical anodes each having a diameter substantially equal to the diameter of said cylindrical vacuum enclosure, one of the cylindrical anodes being positioned coaxially with the cylindrical vacuum enclosure at one end thereof, and the other one of the cylindrical anodes being positioned coaxially with the cylindrical vacuum enclosure at the other end thereof;

two annular shaped cold cathodes each having diameter substantially equal to the diameter of the cylindrical vacuum enclosure and the two cylindrical anodes, each of said annular shaped cold cathodes having a central aperture therein and having a concave inner surface, said two annular shaped cold cathodes being positioned coaxially with and outside of the two cylindrical anodes such that the concave inner surface of one of the annular shaped cold cathodes faces the concave inner surface of the other annular shaped cold cathode and such that the aperture in each of the annular shaped cold cathodes is in substantial alignment with said longitudinal optical axis, said two annular shaped cold cathodes being operative for emitting counter propagating electron beams focused into said cylindrical metal cathode tube by said concave inner surface of each of said annular shaped cold cathodes and by said fringe magnetic fields and being confined within said cylindrical metal cathode tube by said longitudinal magnetic field; and

power supply means electrically connected to said metal ion laser for causing the cylindrical magnetron sputtering source to sputter metal vapor from the cylindrical metal cathode tube and for creating rare gas ions.

4,730,335

SOLID STATE LASER AND METHOD OF MAKING

John H. Clark, Wheaton, and Dennis L. Werth, Indian Head Park, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 26, 1986, Ser. No. 879,149
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—98 **25 Claims**



1. An optically pumped laser comprising:

(a) solid state component means for generating laser light, said solid state component means comprising a plurality of solid state components which include a solid lasant material and solid state optical pumping means for optically pumping said lasant material; and

(b) fitting means for arranging the components with respect to one another along an optical path within predetermined tolerances, said fitting means comprising a plurality of complementary configured fittings which are interlockingly coupled to each other and positioned on said components.

4,730,336

OXY-FUEL BURNER SYSTEM

Edward L. Herneisen, and Robert G. Gist, Jr., both of Gilbertsville, Pa., assignors to G & H Oxy-Fuel, Inc., Boyertown, Pa.

Filed Jun. 16, 1986, Ser. No. 874,573
Int. Cl.[4] H05B *11/00*
U.S. Cl. 373—2 **23 Claims**

1. A method of modifying an electric arc furnace to include a plurality of oxy-fuel burners which assist in the melting of scrap metal, said furnace including a bottom wall extending to a generally cylindrical side wall, and centrally located electrode means, comprising the steps of:

(a) providing a plurality of gas burners operable to emit hot combustion gases for melting scrap metal, each of said burners having a firing rate in the range of from about 175,000 to about 350,000 BTU/hr. per ton of furnace capacity;

(b) securing mounting means to said furnace to adjustably mount each of said burners to said furnace to flow combustion gases into the furnace along a firing direction extending downwardly at an angle of about 45 degrees and across an associated furnace cold spot, said mounting means being adjustable to laterally vary the firing direction of each of said burners toward and away from the center of said furnace and to vertically vary the firing direction of each of said burners upwardly and downwardly;

(c) selecting a burner firing rate for each of said burners within said firing rate range and operating each of said burners for a firing time of sufficient duration to provide a total heat energy output of from about 250,000 to about 350,000 BTU per ton of furnace capacity;

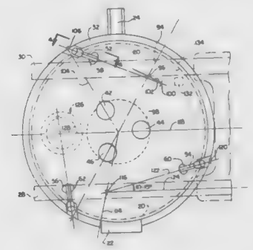
(d) operating said furnace to determine the occurrence of any side wall wear locations and unmelted scrap metal locations and the burner primarily affecting such location;

(e) adjusting said mounting means to laterally vary the firing direction of said burner primarily affecting the location of side wall wear radially inwardly and to laterally vary the firing direction of said burner primarily affecting the location of any unmelted scrap metal toward such scrap metal;

(f) operating said furnace to determine the continued occurrence of said side wall wear and unmelted scrap locations determined in step (d);

(g) adjusting said mounting means to vertically vary downwardly the firing direction of the next adjacent upstream burner to the location of side wall wear determined in step (f) and to vertically vary upwardly the firing direction of the next adjacent upstream burner to the location of unmelted scrap metal determined in step (f); and

thereby mounting said burners to the furnace and aligning their firing directions to provide a circular flow of combustion gases within said furnace and a melt trench within said scrap metal to effect melting of the scrap metal substantially free of side wall wear and unmelted scrap locations.



4,730,337

METHOD AND APPARATUS FOR OPERATING A DIRECT-CURRENT ARC FURNACE

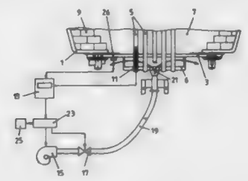
Manfred Schubert, Oberhausen, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshütte GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 854,317
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1985, 3515438
Int. Cl.[4] H05B *7/02, 7/20*
U.S. Cl. 373—72 **8 Claims**

7. A device for operating a direct-current arc furnace to maintain an electrode at a selective temperature, comprising a cooling unit mounted below the arc furnace providing a flow of a cooling medium over the electrodes, and a control device

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connected to said cooling unit regulating the flow of the medium, and means for sensing the temperature in the vicinity of



the electrodes and regulating the control device in accordance with the sensed temperature.

4,730,338

COUPLING CONSTRUCTION FOR AN ELECTRIC FURNACE

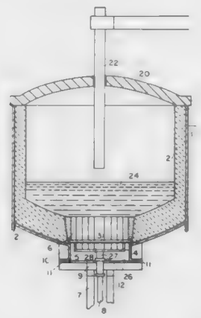
Heinz Guido, Duisburg, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshütte GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,398

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535690

Int. Cl.⁴ H05B *7/02, 7/20*

U.S. Cl. 373—72 **9 Claims**



5. A contact electrode arrangement for a direct current melting furnace comprising: a vessel with a bottom opening; an exchangeable contact electrode assembly positioned within the opening including a support plate, positioned within the opening, a base plate, connected to said support plate and positioned at a base location therefrom, at least one metal contact rod fastened to said base plate, with refractory tamping around said at least one rod, said exchangeable contact electrode assembly being supported by said vessel, within said opening, so as to be removable therefrom in an upward direction, a terminal assembly having attachment means thereon; a plurality of electrical and coolant cables connected to said attachment means of said terminal; and, coupling assembly means for connecting the terminal assembly for providing electrical connection to said base plate and a fluid passage for cooling medium provided by said coolant cable, said coupling assembly means defining a point of separation between said exchangeable contact electrode assembly and said terminal assembly.

4,730,339

METHOD OF CALCINING CARBONACEOUS BODIES, IN PARTICULAR ELECTRODES, IN EITHER CONTINUOUS OR INTERMITTENT FURNACES, AND A CONTAINMENT STRUCTURE FOR THE IMPLEMENTATION THEREOF

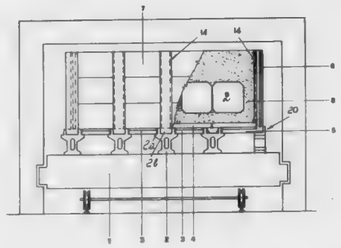
Renzo Corato, Mestre; Giulio Ganapini, Genoa; Hans-Anton Meier, Milan; Mauro Poggi, Genoa; Antonio Rosso, Venice, and Sergio Sanchioni, Mestre, all of Italy, assignors to Alusuisse Italia S.p.A., Milan; Italimpianti Società Italiana Impianti p.A., Genoa and Sirma S.p.A., Malcontenta, all of, Italy

Filed Sep. 23, 1985, Ser. No. 778,645

Claims priority, application Italy, Sep. 28, 1984, 22918 A/84

Int. Cl.⁴ H05B *3/60*

U.S. Cl. 373—120 **15 Claims**



10. A containment structure for containing therein carbonaceous bodies and for introducing the containment structure with the carbonaceous bodies therein into a furnace for the calcination of the carbonaceous bodies, the containment structure comprising, base supports horizontally spaced at regular distances from each other, a rest grid defining horizontal bottom beams with opposite end portions, said base supports having central seat formations and lateral stepped groove formations for receiving therein said opposite end portions of said beams, horizontal loading plates supported on said grid, pillars supported in said central seats and extending upwards therefrom, said pillars having longitudinal flutes, the flutes of opposite pillars facing each other, wall defining plates having edge portions seated in said flutes, said wall defining plates including side wall defining plates, said pillars including side wall plates supporting pillars arranged in outwardly yieldable relationship with respect to said bottom plate means.

4,730,340

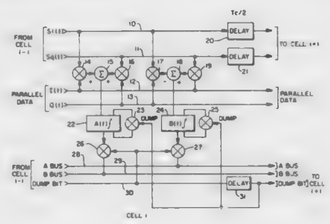
PROGRAMMABLE TIME INVARIANT COHERENT SPREAD SYMBOL CORRELATOR

William R. Frazier, Jr., Indialantic, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Oct. 31, 1980, Ser. No. 202,649

Int. Cl.⁴ H04K *1/00*

U.S. Cl. 375—1 **20 Claims**



15. A communication system comprising:

at a transmitting station;

first means for receiving information signals and encoding said information signals into respective coherent groups of intermediate signals which have maximized and equalized energy distance with respect to each other;

second means, coupled to said first means, for generating for each of said groups of intermediate signals a plurality of symbols in the form of respective spreading sequences and including means for controllably varying the spreading sequences by way of which the respective symbols are formed, so that for successive prescribed time intervals each symbol is formed of a respectively difference sequence; and

third means, coupled to said second means, for modulating an output carrier by the spreading sequences of said symbols and causing said carrier to be transmitted to a receiving station;

at a receiving station;

fourth means, for demodulating a received signal to obtain said respective spreading sequences;

fifth means, coupled to said fourth means, for correlating said obtained spreading sequences with respective ones of a set of reference spreading sequences defining the symbols capable of being transmitted; and

sixth means, coupled to said fifth means, for deriving, from the correlated outputs of said fifth means, respective coherent groups of said intermediate signals and recovering therefrom said information signals.

4,730,341

EQUALIZER AND EQUALIZING CIRCUIT USING THE SAME

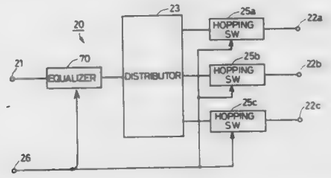
Kazuo Saito, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 19, 1986, Ser. No. 897,979

Claims priority, application Japan, Aug. 20, 1985, 60-184402; Aug. 20, 1985, 60-184403; Aug. 20, 1985, 60-184404

Int. Cl.⁴ H03H *7/30*

U.S. Cl. 375—11 **20 Claims**



1. An equalizing circuit (20) interposed in a signal transmission line for changing the characteristics of a transmitted signal to desired characteristics, comprising:

equalizing means (70, 90) for changing a plurality of serially input burst signals by providing thereto plural predetermined characteristics in a time division manner,

signal distributing means (23) for distributing said signals changed by said equalizing means (70, 90) to a desired number of paths, and

switching means (25*a*, 25*b*, 25*c*) coupled to respective output terminals of said signal distributing means (23) for turning on and off in synchronism with the operation of said equalizing means (70, 90),

said equalizing means and said switching means responsive to a hopping control signal to provide to said burst signals different equalizing characteristics for different switched connections.

4,730,342

EQUALIZER CIRCUIT FOR USE IN COMMUNICATION UNIT

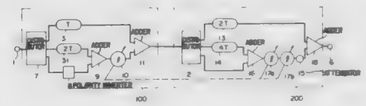
Kazuo Saito, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,729

Claims priority, application Japan, Feb. 25, 1983, 58-31223; Jun. 14, 1983, 58-108179; Jun. 14, 1983, 58-108180

Int. Cl.⁴ H03H *11/06*

U.S. Cl. 375—12 **25 Claims**



1. A variable group delay equalizer comprising:

a signal inputting means;

a delay means receiving an input signal from said signal inputting means for controlling a group delay frequency response characteristic of the input signal and for providing a controlled signal, the controlled signal from said delay means having an amplitude distortion which is caused during the control thereof; and

an amplitude correcting means receiving said controlled signal from said delay means for correcting said amplitude distortion included therein, said amplitude correcting means including correcting means for varying an amplitude of said controlled signal in an opposite sense to amplitude variation included in said amplitude distortion caused by said delay means,

wherein said amplitude correcting means is further operable for providing a flat characteristic to the group delay equalizer and free of any amplitude distortion by said delay means.

4,730,343

DECISION FEEDBACK EQUALIZER WITH A PATTERN DETECTOR

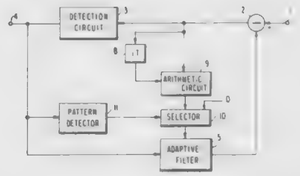
Akira Kanemasa, and Akihiko Sugiyama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,211

Claims priority, application Japan, Aug. 28, 1985, 60-190726; Aug. 28, 1985, 60-190727; Sep. 2, 1985, 60-194329; Apr. 18, 1986, 61-90745

Int. Cl.⁴ H04B *3/04*

U.S. Cl. 375—14 **7 Claims**



1. A decision feedback equalizer comprising:

adaptive filter means (5) responsive to a demodulated data sequence and a residual intersymbol interference (ISI) signal for estimating an intersymbol interference signal which occurs during pulse transmission of a period of T seconds and producing a first estimated intersymbol interference signal;

subtraction means (2) for subtracting the first estimated intersymbol interference signal from a received signal which includes the intersymbol interference signal to produce a residual signal;

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means (**9**) for extracting the residual intersymbol interference signal from the residual signal and a delayed residual signal which is produced by delaying the residual signal;

demodulating means (**3**) for producing the demodulated data sequence from the residual signal and applying the data sequence to said filter means;

pattern detector means (**11**) for detecting a particular consecutive pattern out of the demodulated data sequence; and

means (**10**) for applying the residual intersymbol interference signal to said filter means in response to an output of said pattern detector means.

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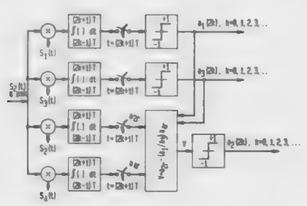
QUADRATURE-QUADRATURE PHASE SHIFT KEYING WITH CONSTANT ENVELOPE

Debabrata Saha, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 640,057, Aug. 13, 1984, Pat. No. 4,680,777. This application Mar. 19, 1987, Ser. No. 28,179

Int. Cl.[4] **H04L** *27/10;* **H04J** *11/00;* **H03C** *3/00*

U.S. Cl. 375—53 **2 Claims**



1. A modulation method for modulating simultaneously four streams of data pulses, the modulation method comprising the steps of:

coding each of the four streams of data pulses into a respectively associated stream of data words, each such data word being formed of a predetermined number of the data pulses from the associated one of the data pulse streams, and a parity check bit, said parity check bit having a value responsive to a mathematical operation performed using said predetermined number of the data pulses;

combining a pulse-shaping signal with respective ones of first and second carrier signal components, each of said first and second carrier signal components having the same frequency as the other and a quadrature phase relationship with respect to the other, to produce first and second composite modulation signals, each having first and second frequency components;

combining subtractively said first and second frequency components associated with each of said first and second composite modulation signals, to produce first and third modulation signals;

combining additively said second and first frequency components associated with each of said first and second composite modulation signals, to produce second and fourth modulation signals; and

combining said first, second, third, and fourth modulation signals with respective ones of said four streams of said data words, to produce respectively corresponding first, second, third, and fourth modulated streams of pulses having predetermined pulse shapes and quadrature pulse phase relationships with respect to one another, combining said first, second, third, and fourth modulated streams of pulses, whereby a transmission signal formed of the combination of said first, second, third, and fourth modulated streams of pulses has a constant envelope.

4,730,345

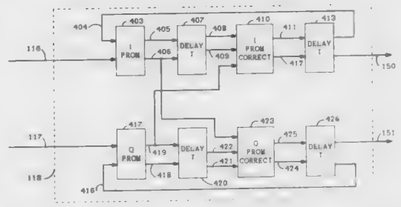
VESTIGIAL SIDEBAND SIGNAL DECODER

Howard C. Reeve, III, Methuen, Mass., assignor to American Telephone and Telegraph Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1986, Ser. No. 848,254

Int. Cl.[4] **H03D** *1/24*

U.S. Cl. 375—77 **15 Claims**



1. A method of recovering first and second data signals from modulated quadrature-related carrier signals after said carrier signals are transformed into a vestigial sideband signal, said method comprising the steps of

demodulating said vestigial sideband signal into first and second received signals,

forming said first data signal at prescribed times, said first data signal at one prescribed time being in response to said second data signal at an associated prescribed time which precedes said one prescribed time and to said first received signal, and

forming said second data signal at said prescribed times, said second data signal at said one prescribed time being in response to said first data signal at said associated prescribed time and to said second received signal.

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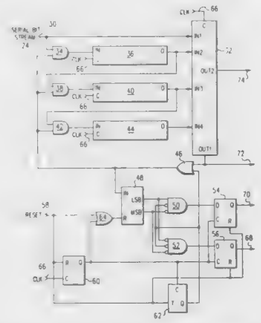
METHOD AND APPARATUS FOR EXTRACTING A PREDETERMINED BIT PATTERN FROM A SERIAL BIT STREAM

Ching-Lin Jiang, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Feb. 12, 1987, Ser. No. 13,911

Int. Cl.[4] **H04L** *7/08*

U.S. Cl. 375—116 **4 Claims**



3. Apparatus for locating the position of a bit framing pattern in a serial bit stream wherein each of said framing bits is separated by P−1 bits of data comprising:

(a) a serial data input terminal for receiving said serial bit stream;

(b) K logic-storage means, each having an input terminal and an output terminal where said input terminal of said first logic-storage means is coupled to said serial data input terminal, said input terminal of said second logic-storage means is coupled to said output terminal of said first logic-storage means, and said rest of said remaining K logic-storage means are similarly connected to form a series circuit in which said Kth logic-storage means is the last circuit of said series circuit, each of said K logic-storage means including means for receiving a logic signal at said input terminal and either setting said logic signal to a first or second logic state or leaving said logic signal unaltered in response to a comparator output signal, for storing said altered or unaltered logic signal sequentially in P storage locations in synchronization with the rate of arrival of said serial bit stream at said serial data input terminal, and for providing at said output terminal the Pth prior altered or unaltered logic signal;

(c) comparison means coupled to said serial data input terminal and to said output terminals of said K logic-storage means for determining if the bit of said serial bit stream present at said input terminal in combination with said altered or unaltered logic signals at said output terminals of said first, second, . . . Kth logic-storage means respectively match any (K+1)-bit sequences of the pattern formed by concatenating two of said framing bit patterns and for providing said comparison output signal at an output terminal indicating if a match has occurred or not, said K logic-storage means responding to said comparison output signal by setting each of said logic signals to said first or second logic state such that the combination of a logic bit X, where logic bit X can be either a logical 1 or a logical 0, and said altered logic signals of said first, second, . . . and Kth logic-storage means respectively would not match any sequence of the bit pattern formed by concatenating two of said framing patterns if a match occurs, and if a match does not occur, leaving unaffected said logic signals of said K logic-storage means; and

(d) counting means for counting the number of matches which occur during successive blocks of said serial bit stream which arrive at said data input terminal, each of said blocks being P bits in length.

4,730,347

METHOD AND APPARATUS FOR REDUCING JITTER IN A SYNCHRONOUS DIGITAL TRAIN FOR THE PURPOSE OF RECOVERING ITS BIT RATE

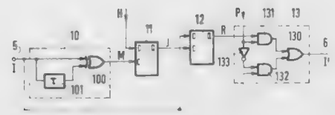
Philippe Paul, Ploubezre, France, assignor to Alcatel, Paris, France

Filed Jun. 10, 1986, Ser. No. 872,723

Claims priority, application France, Jun. 10, 1985, 85 08742

Int. Cl.[4] **H04L** *25/36;* **H03K** *17/26*

U.S. Cl. 375—118 **8 Claims**



1. In a method of reducing the jitter in a synchronous digital train for the purpose of recovering the bit rate signal defining a succession of periods in said train, said bit rate signal being generated by a bit rate recovery circuit operating on a version of the digital train at baseband and suffering from jitter which spreads its transitions over a time range referred to as the jitter range, which range extends between two consecutive periods of the digital trains, the improvement comprising using a recovered bit rate signal to determine a time window which overlaps the beginning, but not the end, of the jitter range, and in causing those transitions in the digital train applied to the bit rate recovery circuit which occur during the time window to be delayed by a fixed delay time less than the maximum peak-to-peak time period of the jitter.

4,730,348

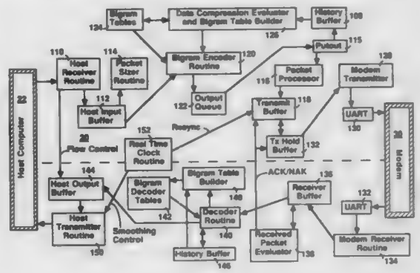
ADAPTIVE DATA COMPRESSION SYSTEM

John E. MacCrisken, Palo Alto, Calif., assignor to Adaptive Computer Technologies, Santa Clara, Calif.

Filed Sep. 19, 1986, Ser. No. 909,281

Int. Cl.[4] **H04L** *23/00*

U.S. Cl. 375—122 **17 Claims**



8. A data compression system, comprising:

encoding means for encoding input data received from a first data processing system in accordance with a selected character by character data compression encoding scheme;

modem transmission means for transmitting an encoded representation of said input data over a communication channel;

history buffer means for storing at least a portion of said input data which has been encoded by said encoding means;

character substitution encoding means for finding the longest string of data in said history buffer which matches said input data, and, if said longest string meets a predefined length requirement, representing said input data with a string substitution code including a pointer to the portion of said history buffer with said matching string, and a length indicator of the length of said matching string;

whereby

some of said transmitted data is encoded on a character by character basis and some of said transmitted data is encoded with a string substitution code; and

a receiver of said transmitted data can decode said transmitted data by maintaining a history buffer identical in content to said history buffer means in said data compression system, and by separately decoding said transmitted data in accordance with whether said data is encoded on a character by character basis or by a character substitution code.

4,730,349

WIDEBAND FREQUENCY DIVIDER

Wilhelm Wilhelm, and Zafer Incecik, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 733,513, May 13, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 6,298

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418206

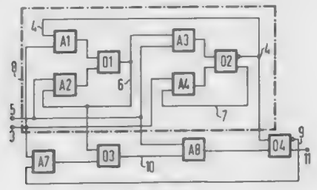
Int. Cl.[4] **H03L** *7/00;* **H03K** *21/00*

U.S. Cl. 377—47 **2 Claims**

1. Bipolar clock-controlled bistable mutlivibrator comprising a static D-master-slave flip-flop and a dynamic master-slave delay circuit having a first and second AND-gate, each

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having a first and second input, said AND-gates forming respective dynamic master and slave delay circuits, the static slave flip-flop connected to the master flip-flop output and having an inverting and a non-inverting output; both said master and slave flop-flops connected to first and second clock signals inverted with respect to each other; synchronizing means forming part of said dynamic master-slave delay circuits including a first OR-gate and a second OR-gate having an inverting and non-inverting output, each OR-gate having a first and a second input; the static master flip-flop having first and second input means, each input means having first and second input leads, the first input means being controlled by said first clock connected to the first input lead thereof and by an output from the static master flip-flop connected to the second input lead thereof for interim storage of signals therein; the second input means of the master flip-flop being controlled by said inverted clock connected to the first input lead thereof



and by an inverting output of the static slave flip-flop connected to the second input lead thereof; the non-inverting output of the static slave flip-flop being connected with an input means thereof for interim storage of signals therein; the inverting output of the second OR-gate being connected with the second input of the first AND-gate, the first AND-gate also being connected at its first input to said inverted clock; the first OR-gate being connected at its second input to the output of the first AND-gate, and at its first input to the output of the static master flip-flop; said first and second AND-gates having propagation delays serving for interim storage of signals therein; the second OR-gate having its first input connected to the inverting output of said static slave flip-flop, and the second input to the output of the second AND-gate; said second OR-gate having a non-inverting output for providing a divided clock output from said static master-slave flip-flop at low clock frequencies and a divided clock output from said master-slave circuit at high clock frequencies.

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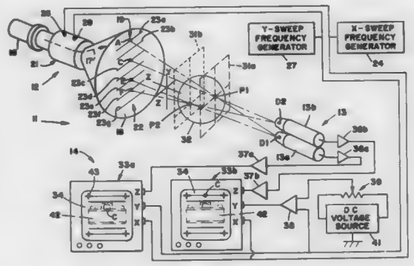
METHOD AND APPARATUS FOR SCANNING X-RAY TOMOGRAPHY

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Filed Apr. 21, 1986, Ser. No. 854,083
Int. Cl.⁴ G01N *23/08*
U.S. Cl. 378—10 **27 Claims**

1. In a method of producing a tomographic image of a subject that includes the steps of generating X-rays at a moving origin point by directing a charged particle beam to a target surface, deflecting said charged particle beam to travel said origin point through a predetermined raster scan at said surface, detecting variations of X-ray intensity during the course of said raster scan at a plurality of spaced apart detection points situated at the opposite side of said subject from said origin point, generating a first sequence of data values that is indicative of variations of X-ray intensity at a first of said detection points at successive times during the course of said raster scan and generating at least a second sequence of data values that is indicative of variations of X-ray intensity at a second of said detection points at successive times during the course of the same raster scan, the improvement comprising:

combining successive individual data values of said first sequence that are generated by X-rays from successive particular locations in said raster scan with at least individual data values of said second sequence that are generated by X-rays from predetermined successive different locations in the same raster scan in order to produce a composite sequence of data values, and



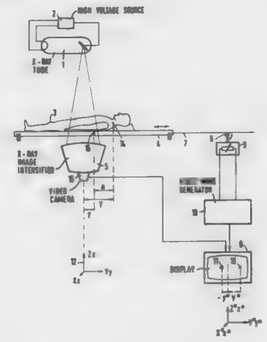
producing an image corresponding to at least a portion of said raster scan which depicts variations of the magnitude of successive data values of said composite sequence.

4,730,351

X-RAY DIAGNOSTICS INSTALLATION

Reiner Heumann, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 865,628
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 3520926
Int. Cl.⁴ H05G *1/64*
U.S. Cl. 378—99 **3 Claims**



1. An x-ray diagnostics installation for obtaining an x-ray image of an examination subject comprising:

a bed on which said patient is disposed movable along at least one axis;

means for irradiating said patient on said bed with x-radiation;

an x-ray image intensifier video chain including a display means with a screen for visually displaying said x-ray image;

a mechanical/electrical transducer means mechanically coupled to said bed for generating an electrical signal corresponding to the position of said bed along said axis; and

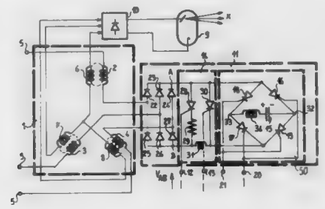
a video mark generator connected to said means for generating an electrical signal and to said display means for generating a video mark on said screen at a location corresponding to the position of said bed along said axis.

4,730,352

SUPPLY CIRCUIT FOR AN X-RAY EMITTER USABLE IN RADIOLOGY

Roberto Rovacchi, Monza Italie, Italy, assignor to Thomson-CGR, Paris, France

Filed Sep. 11, 1985, Ser. No. 774,722
Claims priority, application France, Sep. 14, 1984, 84 14153
Int. Cl.⁴ H05G *1/10, 1/56*
U.S. Cl. 378—101 **8 Claims**



1. A supply circuit for an X-ray emitter for use in radiology, comprising:

a transformer having a primary circuit connected to a three-phase power supply, a secondary circuit connected to the emitter and controlled switch means for placing said primary circuit in and out of operation, said switch means having a set of closing thyristor means for closing said primary circuit and consequently putting into operation the supply circuit said switch means also having a correctly charged capacitor connectable to said primary circuit for reversing the flow direction of the current into the set of closing thyristors, in order to open the switch means and consequently stop the supply, said set of closing thyristors comprising at least one thyristor; and

a circuit for reversing the polarity of the charge which said capacitor supplies to said switch means.

4,730,353

X-RAY TUBE APPARATUS

Katsuhiro Ono, Kawasaki; Tatsuya Sakuma, Yokohama, and Hiroshi Takahashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 739,098, May 30, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 31,207
Claims priority, application Japan, May 31, 1984, 59-111905
Int. Cl.⁴ H01J *35/00*
U.S. Cl. 378—138 **12 Claims**

1. An X-ray tube apparatus comprising:

an X-ray tube including a vacuum envelope having a tube axis, an anode target and a cathode assembly means which are disposed within said vacuum envelope in a manner to oppose each other, said cathode assembly means including:

a flat plate-like filament for generating an electron beam;

beam shaping electrode means formed with a rectangular beam limiting aperture and with a focusing dimple having a shape substantially similar to said beam limiting aperture, said beam shaping electrode means being insulated from said filament, when Sy, Sx, Dy, Dn are assumed to represent the longitudinal length of said focusing dimple, the lateral length of said focusing dimple, the longitudinal length of said beam limiting aperture, and the lateral length of said beam limiting aperture, respectively, and P and Q are assumed to represent the value of the ratio Sy/Dy and the ratio Sx/Dx, respectively, the value of the ratio (P/Q) of P to Q satisfies the inequality:

$$0.4 < P/Q < 2.0;$$

a concave electrostatic lens for diverging the electron beam from said filament to the beam shaping electrode means, which is formed between said beam shaping electrode means and said filament; and,

a convex electrostatic lens for converging the diverged electron beam passing through the beam limiting electrode means to a focal point defined by the concave and convex electrostatic lenses, which is formed within the dimple of said beam shaping electrode;

said anode target having a target surface which is disposed between the beam shaping electrode means and the focal point of the lenses and on which the converged electron beam is impinged to form an electron beam spot which has longitudinal length ly and lateral length lx, X-rays being irradiated from the electron beam spot in an X-ray irradiation direction,

when d2 and d3 are assumed to represent a depth of said focusing dimple and a distance between said beam shaping electrode and said target surface, respectively, the value of the ratio of d2 and d3 satisfies the equality or inequality:

$$1.0 \leqq d3/d2 \leqq 4.0,$$

when θ is assumed to represent an anode angle defined between the target surface of said anode target and the X-ray irradiation direction, the relationship between said anode angle θ and the value of the ratio Sy/Sx of said longitudinal length Sy to the lateral length Sx satisfies the inequality:

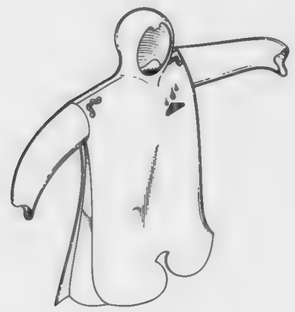
$$1 < Sy/Sx < 2/\sin\theta$$

and

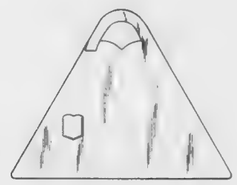
power source means including a first power source for applying first voltage across said anode target and said filament, a second power source for applying an electric current to said filament so as to heat the same, and a third power source for applying a bias voltage to said beam shaping electrode means, said bias voltage being positive against said filament and the focal point being shifted away from said target as the bias voltage is increased, whereby the size of the beam spot is increased in such a manner that the ratio of ly/lx is maintained within the range of 1.4.

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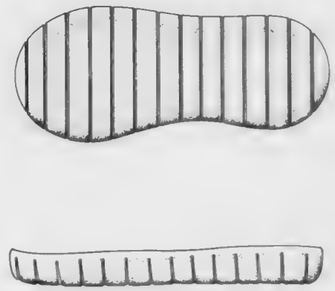
294,535
DISPOSABLE RAINCOAT
Gerald K. Stricklin, 316 Fairfax Ave., Bessemer, Ala. 35020
Filed Oct. 24, 1985, Ser. No. 791,091
Term of patent 14 years
U.S. Cl. D2—185



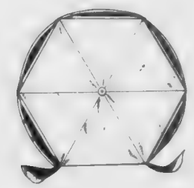
294,536
NURSING IIIB
Susan E. Welsh, 511 Sellers Rd., Duson, La. 70529
Continuation of Ser. No. 397,426, Jul. 12, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,927
Term of patent 14 years
U.S. Cl. D2—225

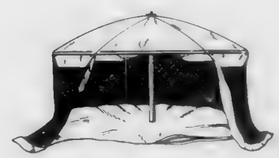


294,537
SHOE SOLE
Tuan N. Le, Cohasset, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Dec. 8, 1986, Ser. No. 939,452
Term of patent 14 years
U.S. Cl. D2—320



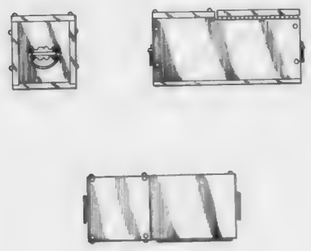
294,538
UMBRELLA
Catherine F. De Marr, 925 S. 22nd St., Arlington, Va. 22202
Filed Mar. 5, 1985, Ser. No. 708,392
Term of patent 14 years
U.S. Cl. D3—5





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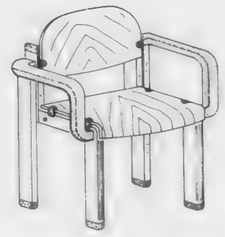
294,539
BENCH SEAT BIN FOR A PICKUP TRUCK OR THE LIKE
Sidney L. Coggins, 5590 Lehigh Ave., Denver, Colo. 80237
Filed Jan. 14, 1985, Ser. No. 690,874
Term of patent 14 years
U.S. Cl. D3—40



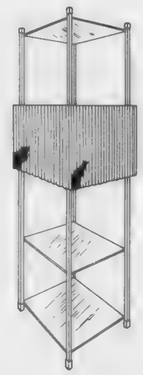
294,540
BELT MOUNTED UMBRELLA HOLDER
Jack G. Richardson, and Dorothy L. Richardson, both of 5842 Candlewood St., Lakewood, Calif. 90713
Filed Jun. 17, 1985, Ser. No. 745,074
The portion of the term of this patent subsequent to Nov. 12, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—106



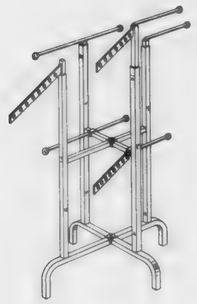
294,541
CHAIR
Friedrich Schlapp, Bahnhofstrasse 2, D-6390 Usingen, Fed. Rep. of Germany
Filed Jul. 3, 1985, Ser. No. 752,392
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1985, MR 75
Term of patent 14 years
U.S. Cl. D6—379



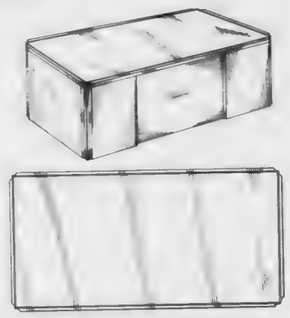
294,542
COMBINED TABLE AND FLOOR LAMP
D. James Hill, Harrisburg, Pa., assignor to Vanguard-Hill, Inc., Wilmington, Del.
Filed Dec. 14, 1984, Ser. No. 682,015
Term of patent 14 years
U.S. Cl. D6—399



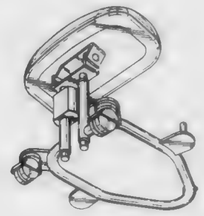
294,543
CLOTHING DISPLAY RACK
John A. Rekow, 23755 Anderson Lane, Newberg, Oreg. 97132
Filed Jun. 14, 1985, Ser. No. 744,640
Term of patent 14 years
U.S. Cl. D6—411



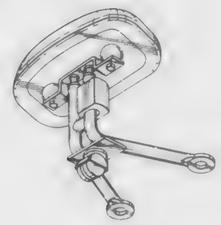
294,544
DESK
Gordon Kyle, Moosup, Conn., assignor to Helikon Furniture Company, Inc., Taftville, Conn.
Filed Jun. 28, 1985, Ser. No. 750,036
Term of patent 14 years
U.S. Cl. D6—428



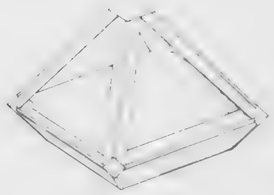
294,545
SEAT CUSHION AND SUPPORT UNIT FOR A COMBINED SEAT AND KNEELER
Peter Opsvik, Högtunvn. 12, 137o Asker, Norway
Filed Aug. 7, 1985, Ser. No. 763,354
Claims priority, application Norway, Feb. 18, 1985, 65999
Term of patent 14 years
U.S. Cl. D6—500



294,546
SHIN CUSHION AND SUPPORT UNIT FOR A COMBINED SEAT AND KNEELER
Peter Opsvik, Högtunvn. 12, 137o Asker, Norway
Filed Aug. 7, 1985, Ser. No. 763,353
Claims priority, application Norway, Feb. 18, 1985, 65996
Term of patent 14 years
U.S. Cl. D6—500

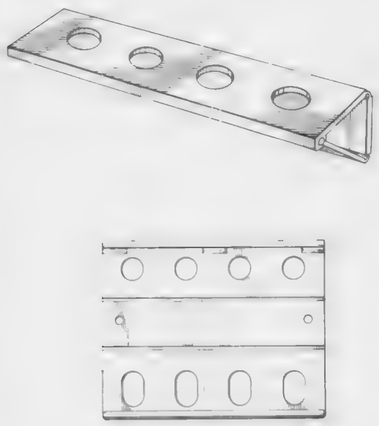


294,547
BED FRAME
John C. Saxer, 2200 W. Memorial St., Janesville, Wis. 53545
Filed Aug. 8, 1985, Ser. No. 763,907
Term of patent 14 years
U.S. Cl. D6—503



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294,548
STORAGE RACK FOR SCREWDRIVERS OR THE LIKE
Clyde R. Wallace, Cheraw, S.C., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 17, 1985, Ser. No. 745,660
Term of patent 14 years
U.S. Cl. D6—567



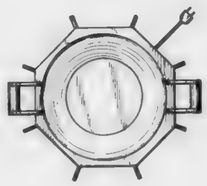
294,549
WINDOW SHADE PULL OR SIMILAR ARTICLE
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533
Division of Ser. No. 685,158, Dec. 21, 1984, Pat. No. D. 291,954. This application Jul. 2, 1987, Ser. No. 69,276
Term of patent 14 years
U.S. Cl. D6—581



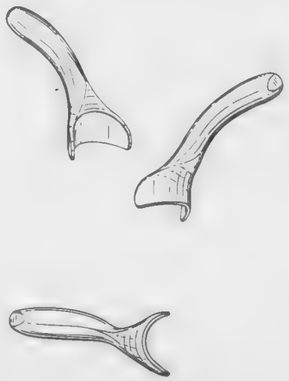
294,550
WINDOW SHADE PULL OR SIMILAR ARTICLE
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533
Division of Ser. No. 685,158, Dec. 21, 1984, Pat. No. Des. 291,954. This application Jul. 2, 1987, Ser. No. 69,278
Term of patent 14 years
U.S. Cl. D6—581



294,551
ELECTRICALLY COOLED PUNCH BOWL
Rosanna K. Donnelly, 307 Locknere La., San Antonio, Tex. 78213
Filed Feb. 11, 1985, Ser. No. 700,089
Term of patent 14 years
U.S. Cl. D7—21



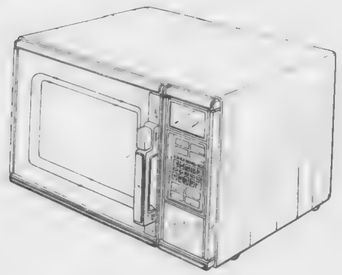
294,552
EATING IMPLEMENT FOOD PUSHER FOR AN INFANT
Vivienne D. Jagger, Ardingly, England, assignor to Little People Ltd., Hong Kong
Filed Jun. 4, 1985, Ser. No. 741,316
Claims priority, application United Kingdom, Dec. 4, 1984, 8410236 94
Term of patent 14 years
U.S. Cl. D7—141

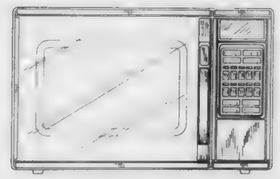


294,553
EATING IMPLEMENT SCOOP SPOON FOR AN INFANT
Vivienne D. Jagger, Ardingly, England, assignor to Little People Ltd., Hong Kong
Filed Jun. 4, 1985, Ser. No. 741,311
Claims priority, application United Kingdom, Dec. 4, 1984, 8410236 95
Term of patent 14 years
U.S. Cl. D7—141

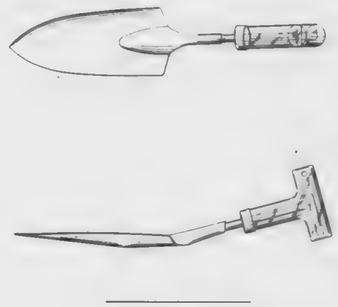


294,554
MICROWAVE OVEN
Bong H. Song, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jan. 14, 1985, Ser. No. 692,012
Term of patent 14 years
U.S. Cl. D7—351

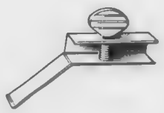




294,555
HAND TROWEL
David K. Tremaine, 2504 30th Street, San Diego, Calif. 92104
Filed Dec. 30, 1985, Ser. No. 814,871
Term of patent 14 years
U.S. Cl. D8—10



294,556
SLIDING CLAMP FOR EASELS
Jens H. Christiansen, 5339 Agana Dr., Santa Barbara, Calif. 93111
Filed Jul. 1, 1985, Ser. No. 750,767
Term of patent 14 years
U.S. Cl. D8—394

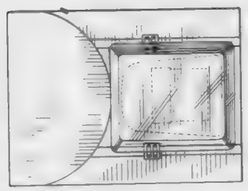


294,557
ACID CONTAINER
Daniel H. Jones, Carranza Rd. R.D. #3, Tabernacle, N.J. 08088
Filed Aug. 12, 1985, Ser. No. 764,310
Term of patent 14 years
U.S. Cl. D9—376



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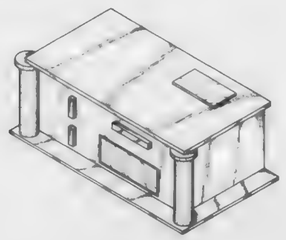
294,558
PACKAGING CONTAINER FOR CASSETTE TAPES AND BOOKS
Janus I. Adams, 30 Shadow La., and Donald L. Klotz, 296 Millstone Rd., both of Wilton, Conn. 06897
Filed Jun. 5, 1984, Ser. No. 617,332
Term of patent 14 years
U.S. Cl. D9—415



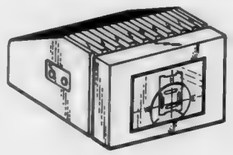
294,559
CARRYING HANDLE
Richard I. Schwalbach, 6325 Kyle Ave. North, Brooklyn Center, Minn. 55429
Filed Mar. 4, 1985, Ser. No. 707,883
Term of patent 14 years
U.S. Cl. D9—434



294,560
DIGITAL CLOCK
Marcus A. Brown, and Thomas E. Leonard, both of P.O. Box 783, Evergreen, Ala. 36401
Filed May 3, 1985, Ser. No. 729,934
Term of patent 14 years
U.S. Cl. D10—15



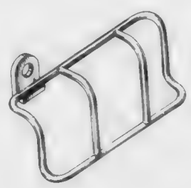
294,561
AUTOMOTIVE COMPASS
Peter G. Blaney, Walnut Creek, Calif., assignor to Zemco, Inc., Walnut Creek, Calif.
Filed Sep. 18, 1985, Ser. No. 777,209
Term of patent 14 years
U.S. Cl. D10—68



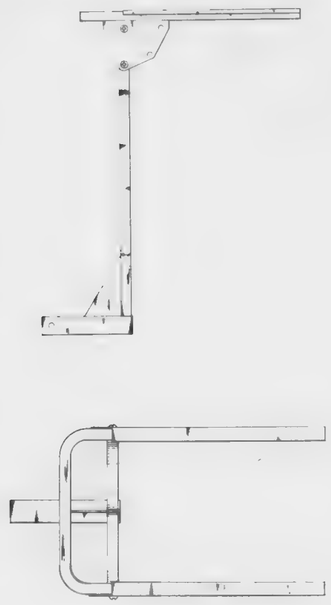
294,562
SLEEPINESS ALARM
Yin-Tsai Chao, 1F, No. 10, Alley 9, Lane 197, Sec. 2, Pa-Teh Rd., Panchiao City, Taipei Hsien, Taiwan
Filed Jul. 15, 1985, Ser. No. 755,311
Term of patent 14 years
U.S. Cl. D10—106



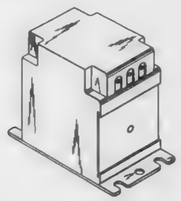
294,563
DERAILLEUR PROTECTOR
Maurice E. L. Coue, Feucherolles, France, assignor to Huret et ses Fils (societe anonyme), Feuquieres en Vimeu, France
Filed Jun. 27, 1985, Ser. No. 749,884
Claims priority, application France, Dec. 27, 1984, 84,5832
Term of patent 14 years
U.S. Cl. D12—127



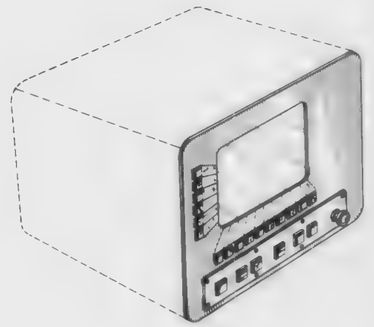
294,564
VEHICLE TRAILER-HITCH-MOUNTED BICYCLE CARRIER
Carl H. Stoecker, 3718 NE. 192nd St., Seattle, Wash. 98155
Filed Nov. 20, 1985, Ser. No. 805,932
Term of patent 14 years
U.S. Cl. D12—158



294,565
VOLTAGE TRANSFORMER
David N. Makinson, Franklin, N.C., and Karl W. Struck, Clayton, Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.
Division of Ser. No. 595,177, Mar. 30, 1984, Pat. No. Des. 289,033. This application Nov. 10, 1986, Ser. No. 928,372
Term of patent 14 years
U.S. Cl. D13—4



294,566
CONTROL PANEL FOR A MACHINE CONTROL SYSTEM
Samuel G. Boytor, Elgin, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.
Filed Apr. 2, 1985, Ser. No. 718,875
Term of patent 14 years
U.S. Cl. D13—35



294,567
COMBINED TAPE RECORDER AND RADIO RECEIVER
Toshiro Fujii, Oomiya, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co. Ltd., both of, Japan
Filed Dec. 24, 1985, Ser. No. 813,253
Claims priority, application Japan, Jun. 27, 1985, 60-27377
Term of patent 14 years
U.S. Cl. D14—5



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294,568
COMBINATION TELEPHONE HANDSET AND CONSOLE STAND ASSEMBLY
Evert Endt, Paris, France, assignor to Horlogerie Photographique Francaise, Bonneville, France
Filed Aug. 4, 1986, Ser. No. 892,929
Claims priority, application France, Feb. 26, 1986, 860932
Term of patent 14 years
U.S. Cl. D14—58

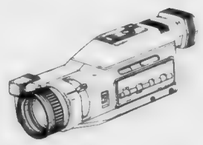


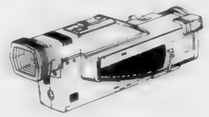


294,569
REMOTE CONTROL RECEIVER
Jos F. C. Geraets, Bree, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 26, 1985, Ser. No. 780,488
Claims priority, application United Kingdom, Apr. 2, 1985, 1.025.938
Term of patent 14 years
U.S. Cl. D14—68



294,570
VIDEO CAMERA
Koya Kurokawa, and Masami Takahashi, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 23, 1985, Ser. No. 758,006
Claims priority, application Japan, Feb. 1, 1985, 60-3496
Term of patent 14 years
U.S. Cl. D14—78

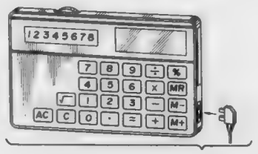




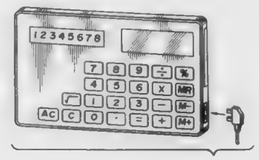
294,571
FLOATING RADIO
David C. Sabin, Rochester Hills, Mich., and Pamela A. Brenner, Chicago, Ill., assignors to CESV, Inc., Bloomfield Hills, Mich.
Filed Nov. 1, 1985, Ser. No. 794,168
Term of patent 14 years
U.S. Cl. D14—68



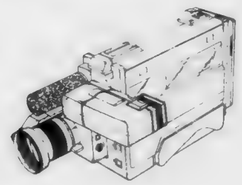
294,572
COMBINED PORTABLE RADIO RECEIVER AND CALCULATOR
Itsumi Ohzu, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1985, Ser. No. 810,415
Claims priority, application Japan, Jul. 16, 1985, 60-30362
Term of patent 14 years
U.S. Cl. D14—69



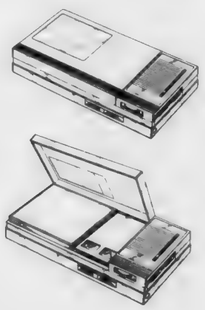
294,573
COMBINED PORTABLE RADIO RECEIVER AND CALCULATOR
Itsumi Ohzu, Fushu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1985, Ser. No. 810,414
Claims priority, application Japan, Jul. 16, 1985, 60-30361
Term of patent 14 years
U.S. Cl. D14—69



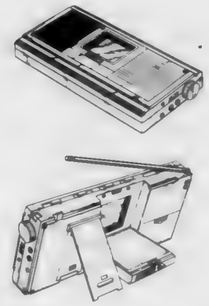
294,574
COMBINED VIDEO CAMERA AND VIDEO TAPE RECORDER
Mitsuo Takanaga, and Kazuhiko Nagata, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 7, 1985, Ser. No. 742,320
Claims priority, application Japan, Dec. 21, 1984, 59-52591
Term of patent 14 years
U.S. Cl. D14—78



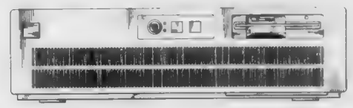
294,575
COMBINED PORTABLE TELEVISION SET AND RADIO
Eiiti Okamoto, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 25, 1985, Ser. No. 806,326
Claims priority, application Japan, Jun. 21, 1985, 60-26456[U]
Term of patent 14 years
U.S. Cl. D14—79



294,576
COMBINED PORTABLE TELEVISION SET AND RADIO
Eiiti Okamoto, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 25, 1985, Ser. No. 806,325
Claims priority, application Japan, Jun. 19, 1985, 60-26012
Term of patent 14 years
U.S. Cl. D14—79



294,577
COMPUTER HOUSING OR THE LIKE
Jeffrey L. Kline, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 17, 1986, Ser. No. 820,463
Term of patent 14 years
U.S. Cl. D14—100

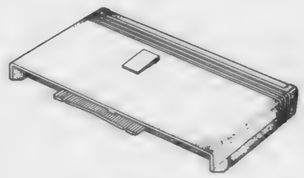


294,578
PORTABLE COMPUTER
Takahisa Yubisui, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jul. 10, 1985, Ser. No. 753,635
Claims priority, application Japan, Jan. 10, 1985, 60-602
Term of patent 14 years
U.S. Cl. D14—106



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294,579
HOUSING FOR A PRINTED CIRCUIT BOARD
Kenneth R. Kirpiuk, Elmwood Park; Joseph G. Murglin, Norridge, and John W. Petras, Mt. Prospect, all of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.
Filed Dec. 23, 1985, Ser. No. 811,980
Term of patent 14 years
U.S. Cl. D14—114

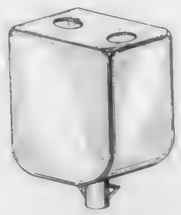


294,580
AUTOMOBILE BRAKE MASTER CYLINDER COVER
William J. Segal, Torrence, Calif.
Filed May 7, 1985, Ser. No. 731,266
Term of patent 14 years
U.S. Cl. D15—5

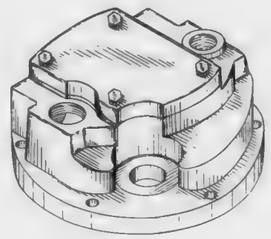




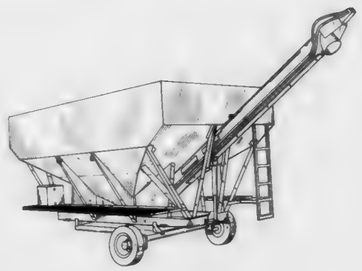
294,581
OIL FILLER
John W. Storlie, Box 56, Santiago, Minn. 55377
Filed Feb. 7, 1985, Ser. No. 699,342
Term of patent 14 years
U.S. Cl. D15—5



294,582
FLUID PUMP ASSEMBLY
Gerald Showman, 440 E. Georgia Ave., Connellsville, Pa. 15245
Filed Aug. 5, 1985, Ser. No. 762,498
Term of patent 14 years
U.S. Cl. D15—7



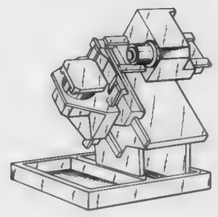
294,583
TENDER
John E. Blumer, and Richard J. Ehmke, both of Beatrice, Nebr., assignors to Dempster Industries, Inc., Beatrice, Nebr.
Filed Aug. 5, 1985, Ser. No. 742,021
Term of patent 14 years
U.S. Cl. D15—27



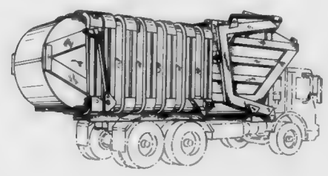
294,584
MIXING DEVICE FOR AN ICE CREAM MACHINE
Ole K. Pedersen, Copenhagen, Denmark, assignor to OK-LICA ApS, Copenhagen, Denmark
Filed Mar. 25, 1985, Ser. No. 715,633
Claims priority, application Denmark, Mar. 7, 1985, 192/85
Term of patent 14 years
U.S. Cl. D15—89



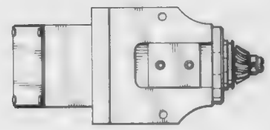
294,585
MULTIOPERATION MACHINE
Ake Sandén, Värnamo, Sweden, assignor to AB Sajo Maskin, Värnamo, Sweden
Filed Apr. 23, 1985, Ser. No. 726,231
Claims priority, application Sweden, Nov. 1, 1984, 84-2924
Term of patent 14 years
U.S. Cl. D15—122



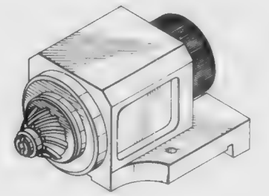
294,586
TRASH COMPACTION BODY
Henry M. Hund, Jr., Knoxville, Tenn., assignor to Dempster Systems Inc., Knoxville, Tenn.
Filed Jul. 22, 1985, Ser. No. 757,427
Term of patent 14 years
U.S. Cl. D15—123



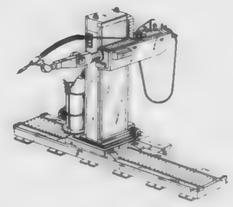
294,587
TOOL HOLDER FOR A DRILL BIT OR THE LIKE
Roger R. Smith, Erin, and Kamalakar K. Rao, Elmira Heights, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Apr. 4, 1985, Ser. No. 719,961
Term of patent 14 years
U.S. Cl. D15—140



294,588
TOOL HOLDER FOR DRILL BIT OR THE LIKE
Roger R. Smith, Erin, and Kamalakar K. Rao, Elmira Heights, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Apr. 4, 1985, Ser. No. 719,962
Term of patent 14 years
U.S. Cl. D15—140

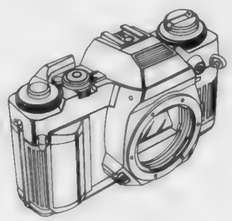


294,589
WELDING ROBOT
Osamu Kajiya, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 8, 1985, Ser. No. 752,731
Claims priority, application Japan, Jan. 8, 1985, 60-107
Term of patent 14 years
U.S. Cl. D15—144

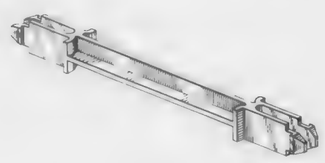


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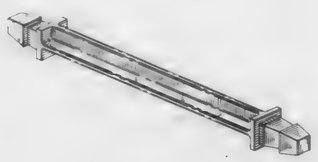
294,590
CAMERA
Tetuya Goto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 19, 1985, Ser. No. 767,123
Claims priority, application Japan, Feb. 18, 1985, 60-005831
Term of patent 14 years
U.S. Cl. D16—8



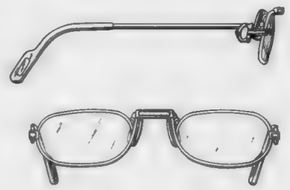
294,591
TIE BAR
James R. Espy, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 13, 1985, Ser. No. 734,081
Term of patent 14 years
U.S. Cl. D16—37



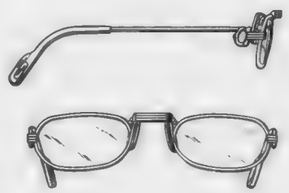
294,592
TIE BAR
James R. Espy, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 24, 1985, Ser. No. 758,527
Term of patent 14 years
U.S. Cl. D16—37



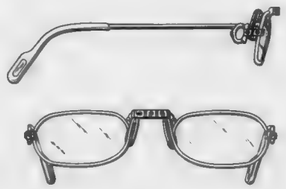
294,593
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 17, 1985, Ser. No. 810,047
Claims priority, application Hague, Jun. 17, 1985, DM/005413
Term of patent 14 years
U.S. Cl. D16—117



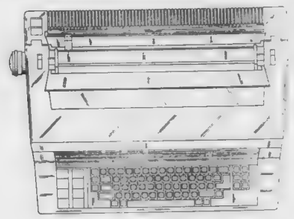
294,594
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 17, 1985, Ser. No. 810,048
Claims priority, application Hague, Jun. 17, 1985, DM/005413
Term of patent 14 years
U.S. Cl. D16—117

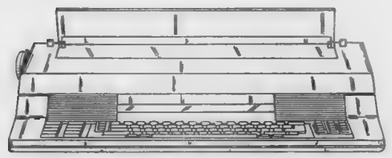


294,595
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 17, 1985, Ser. No. 810,049
Claims priority, application Hague, Jun. 17, 1985, DM/005413
Term of patent 14 years
U.S. Cl. D16—117

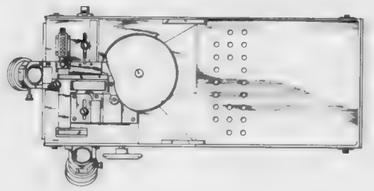


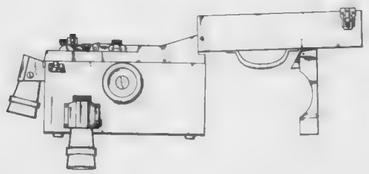
294,596
ELECTRONIC TYPEWRITER
Bernd Gubbe, Nuremberg, and Klaus-Diether Krause, Oberasbach, both of Fed. Rep. of Germany, assignors to Ta Triumph Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany
Filed Jul. 15, 1985, Ser. No. 755,047
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, MR VII 172
Term of patent 14 years
U.S. Cl. D18—1



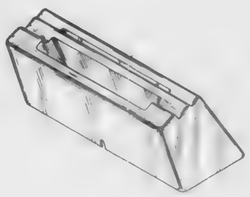


294,597
COIN SORTING, COUNTING, WRAPPING AND BAGGING MACHINE
John B. Lanagan, 4501 63rd Cir. North, Pinellas Park, Fla. 34290
Filed Oct. 11, 1985, Ser. No. 786,758
Term of patent 14 years
U.S. Cl. D18—3





294,598
PAPER FOLDING APPARATUS
Masami Ohmori, Hadano, Japan, assignor to Duplo Seizo Kabushiku Kaisha, Komae, Japan
Filed Jan. 8, 1986, Ser. No. 817,007
Term of patent 14 years
U.S. Cl. D18—22



294,599
MARKING PEN
Tatsuro Funahashi, Komaki, and Shiro Hayashi, Nagoya, both of Japan, assignors to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Sep. 26, 1985, Ser. No. 780,314
Claims priority, application Japan, Apr. 1, 1985, 60-13196
Term of patent 14 years
U.S. Cl. D19—48

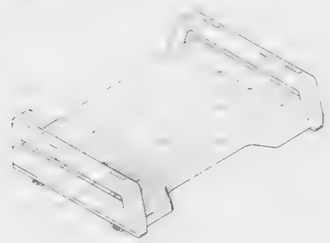


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294,600
BALLPOINT PEN
Tatsuro Funahashi, Komaki, and Shiro Hayashi, Nagoya, both of Japan, assignors to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Sep. 26, 1985, Ser. No. 780,315
Claims priority, application Japan, Apr. 1, 1985, 60-13195
Term of patent 14 years
U.S. Cl. D19—51



294,601
LETTER TRAY OR THE LIKE
Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Oct. 1, 1985, Ser. No. 782,362
Term of patent 14 years
U.S. Cl. D19—92



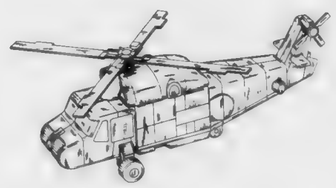
294,602
TICKET DISPENSER
Daniel A. Schwartz, 6270 Parima, Long Beach, Calif. 90802
Filed Feb. 14, 1985, Ser. No. 701,413
Term of patent 14 years
U.S. Cl. D20—2

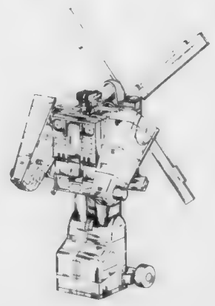


294,603
SIGN
William A. Patzis, 135 Ocean Dr. #210, Miami Beach, Fla. 33139, and Michael D. Diamas, 1160 NE. 110th Ter., Miami Shores, Fla. 33161
Filed Nov. 24, 1986, Ser. No. 934,132
Term of patent 14 years
U.S. Cl. D20—31

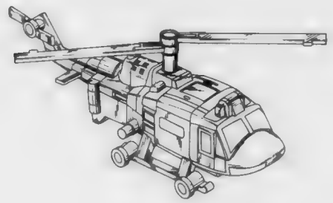


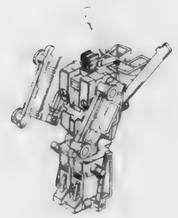
294,604
RECONFIGURABLE TOY HELICOPTER
Daishirou Shibukawa, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 22, 1985, Ser. No. 806,226
Claims priority, application Japan, Oct. 14, 1985, 60-42970
Term of patent 14 years
U.S. Cl. D21—90



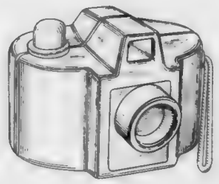


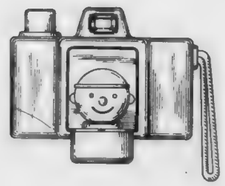
294,605
RECONFIGURABLE TOY HELICOPTER
Kaoru Matsumoto, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1985, Ser. No. 806,783
Claims priority, application Japan, Oct. 24, 1985, 60-44742
Term of patent 14 years
U.S. Cl. D21—90



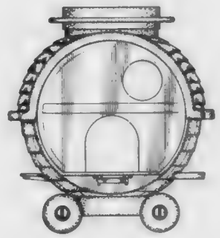


294,606
TOY CAMERA
Patrick Ryland, London, England, assignor to Simon Gompes, Amsterdam, Netherlands
Filed May 10, 1985, Ser. No. 732,849
Term of patent 14 years
U.S. Cl. D21—110





294,607
TOY DOLL HOUSE
Bonnie Zacherle, Norwood; Douglas Harrison, Gloucester, and Frank D. Ventura, Newburyport, all of Mass., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Sep. 25, 1985, Ser. No. 780,069
Term of patent 14 years
U.S. Cl. D21—114

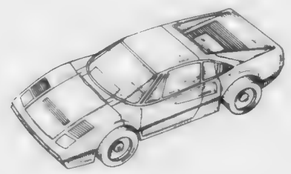


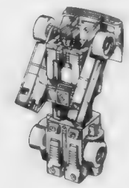
294,608
TOY KITCHEN
Bruce J. Benedetto, Farmington, and Paul S. Santarsiero, Avon, both of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.
Filed Mar. 7, 1986, Ser. No. 842,024
Term of patent 14 years
U.S. Cl. D21—122



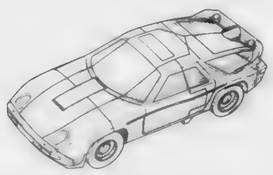
VOL 1088 ISS 2 MR 8 1988 UMI

294,609
RECONFIGURABLE TOY VEHICLE
Kaoru Matsumoto, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1985, Ser. No. 804,760
Claims priority, application Japan, Jul. 31, 1985, 60-32690
Term of patent 14 years
U.S. Cl. D21—136



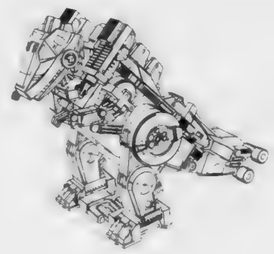


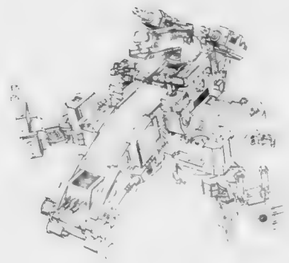
294,610
RECONFIGURABLE TOY VEHICLE
Kaoru Matsumoto, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1985, Ser. No. 804,798
Claims priority, application Japan, Jul. 31, 1985, 60-32693
Term of patent 14 years
U.S. Cl. D21—136

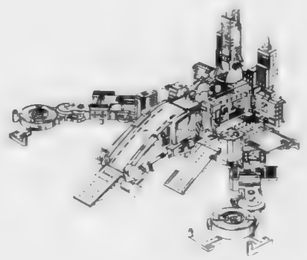




294,611
RECONFIGURABLE DINOSAUR TOY
Muneyoshi Shinohara, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1986, Ser. No. 844,733
Claims priority, application Japan, Feb. 3, 1986, 61-3593
Term of patent 14 years
U.S. Cl. D21—150



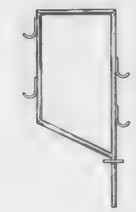




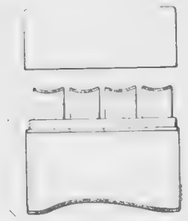
294,612
BEAR
Claire M. Marschak, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1985, Ser. No. 794,056
Term of patent 14 years
U.S. Cl. D21—159



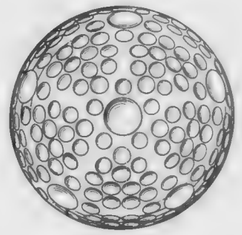
294,613
BARBELL SUPPORT STAND ACCESSORY OR SIMILAR ARTICLE
Robert Chenera, 140 Walton Ave., Union, N.J. 07083
Filed Oct. 2, 1985, Ser. No. 783,154
Term of patent 14 years
U.S. Cl. D21—191



294,614
COMBINED HAND EXERCISE DEVICE AND COVER THEREFOR
John R. Ditsch, Tinley Park; Theodore G. Williams, Lyons, and Luis H. Berrios, Chicago, all of Ill., assignors to HDS, Inc., Tinley Park, Ill.
Filed Jul. 16, 1985, Ser. No. 755,695
Term of patent 14 years
U.S. Cl. D21—198



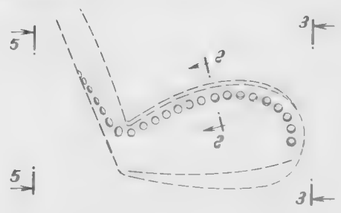
294,615
GOLF BALL
Michael Shaw, and Brian F. Machin, both of Wakefield, England, assignors to Dunlop Limited, United Kingdom
Filed Nov. 19, 1984, Ser. No. 672,883
Claims priority, application United Kingdom, Jun. 9, 1984, 1 020 199
Term of patent 14 years
U.S. Cl. D21—205



294,616
GOLF CLUB HEAD
John McCallister, 3941 Fairbreeze Cr., Westlake Village, Calif. 91361
Filed May 28, 1985, Ser. No. 738,845
Term of patent 14 years
U.S. Cl. D21—214

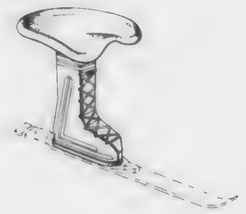


294,617
BALL FLIGHT ON GOLF CLUB HEAD
Sonnie J. Perkins, 1214 169th Ave., NE., Bellevue, Wash. 98008
Filed Jun. 3, 1985, Ser. No. 740,736
Term of patent 14 years
U.S. Cl. D21—220

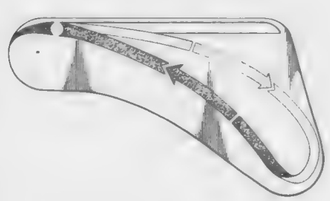


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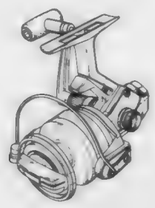
294,618
SKI SEAT
Rachel Fournier, Saskatoon, Canada, assignor to Pelican Narrow U-Fly-In Ltd., Saskatchewan, Canada
Filed Aug. 19, 1985, Ser. No. 767,128
Claims priority, application Canada, Feb. 25, 1985, 25-02-85-3
Term of patent 14 years
U.S. Cl. D21—229



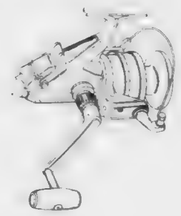
294,619
VISUAL AID FOR GOLF STROKE
John McCallister, 3941 Fairbreeze Cr., Westlake Village, Calif. 91361
Filed May 13, 1985, Ser. No. 733,324
Term of patent 14 years
U.S. Cl. D21—234



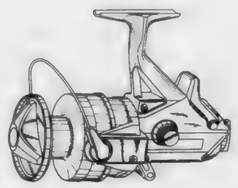
294,620
FISHING REEL
Kanji Iinuma, and Yasuhisa Kameda, both of Tokyo, Japan, assignors to Daiwa Deiko, Inc., Tokyo, Japan
Filed Jul. 26, 1985, Ser. No. 759,241
Claims priority, application Japan, Jan. 29, 1985, 60-2813
Term of patent 14 years
U.S. Cl. D22—141



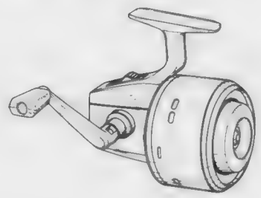
294,621
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 22, 1985, Ser. No. 806,230
Claims priority, application Japan, May 30, 1985, 60-22641
Term of patent 14 years
U.S. Cl. D22—141



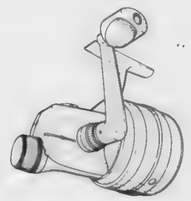
294,622
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 22, 1985, Ser. No. 806,229
Claims priority, application Japan, May 30, 1985, 60-22642
Term of patent 14 years
U.S. Cl. D22—141



294,623
FISHING REEL
Masakazu Sakamoto, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 20, 1985, Ser. No. 805,168
Claims priority, application Japan, May 20, 1985, 60-20900
Term of patent 14 years
U.S. Cl. D22—141



294,624
FISHING REEL
Kanji Iinuma, and Michinori Yasuda, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 8, 1985, Ser. No. 763,719
Claims priority, application Japan, Feb. 15, 1985, 60-5558
Term of patent 14 years
U.S. Cl. D22—141



294,625
BAIT CASTING ROD HANDLE
James T. Rumbaugh, and Brad J. Benit, both of Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa
Filed Sep. 9, 1985, Ser. No. 773,782
Term of patent 14 years
U.S. Cl. D22—142



294,626
SPIN CASTING ROD HANDLE
James T. Rumbaugh, and Brad J. Benit, both of Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa
Filed Sep. 9, 1985, Ser. No. 773,783
Term of patent 14 years
U.S. Cl. D22—142



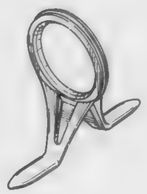
294,627
CASTING ROD HANDLE
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa
Filed Jul. 25, 1985, Ser. No. 759,266
Term of patent 14 years
U.S. Cl. D22—142



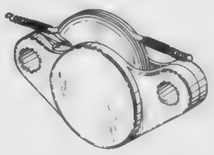
294,628
SPINNING ROD HANDLE
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa
Filed Jul. 25, 1985, Ser. No. 759,071
Term of patent 14 years
U.S. Cl. D22—142



294,629
LINE GUIDE
Junichi Suzuki, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Sep. 20, 1985, Ser. No. 778,500
Claims priority, application Japan, Mar. 29, 1985, 60-12728
Term of patent 14 years
U.S. Cl. D22—143

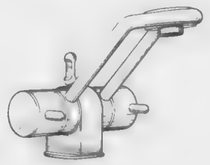


294,630
THREADING DEVICE FOR A FISHING LINE OR THE LIKE
Alan W. Tupper, Chippenham, England, assignor to Latchways Limited, Wiltshire, England
Filed Jun. 14, 1985, Ser. No. 745,318
Term of patent 14 years
U.S. Cl. D22—143

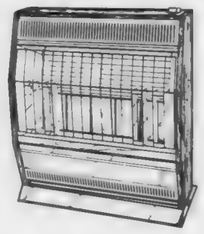


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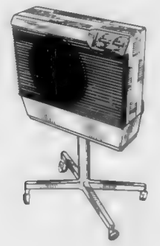
294,631
FAUCET
Georges A. Bourbon, Caluire, France, assignor to Etablissements Mingori, Macon, France
Filed Feb. 11, 1985, Ser. No. 700,780
Claims priority, application France, Aug. 10, 1984, 843592
Term of patent 14 years
U.S. Cl. D23—241



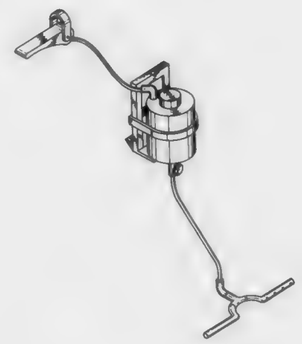
294,632
GAS HEATER
Dennis Tongue, Sutton Coldfield, Great Britain, assignor to Valor Heating Limited, London, England
Filed Dec. 1, 1983, Ser. No. 557,064
Claims priority, application United Kingdom, Jun. 14, 1983, 1013556
The portion of the term of this patent subsequent to Feb. 16, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—342



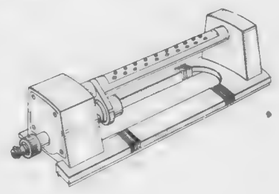
294,633
AIR CONDITIONER
Peter McBratney, St. Marys, Australia, assignor to F F Seeley Nominees Pty Ltd., St. Marys, Australia
Filed Mar. 11, 1985, Ser. No. 710,054
Claims priority, application Australia, Oct. 31, 1984, 7669/84
Term of patent 14 years
U.S. Cl. D23—333



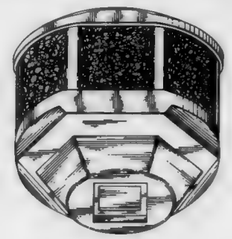
294,634
WATER APPLICATOR ATTACHMENT FOR A CONCRETE FINISHING MACHINE
N. Leon Leach, and William F. Hoffman, both of 440 Thompson St., Winchester, Ind. 47394
Filed Aug. 7, 1985, Ser. No. 763,285
Term of patent 14 years
U.S. Cl. D23—213



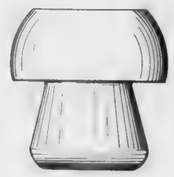
294,635
OSCILLATING SPRINKLER
Kenneth Hattori, Bensenville, Ill., assignor to Suncast Corporation, Batavia, Ill.
Filed Apr. 2, 1986, Ser. No. 847,813
Term of patent 14 years
U.S. Cl. D23—216



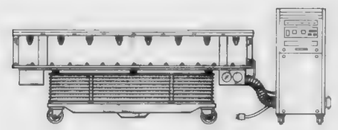
294,636
EVAPORATIVE COOLER
David L. Peltier, 6980 Browning Rd., Highland, Calif. 92346, and John R. Peltier, 6809 Vista del Rincon, Ventura, Calif. 93001
Filed Apr. 8, 1985, Ser. No. 720,634
Term of patent 14 years
U.S. Cl. D23—352



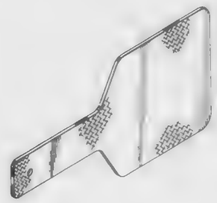
294,637
VAPOR DISPENSING CONTAINER
Earl Hoyt, Franklin Lakes, and Manharbhai K. Patel, Saddle Brook, both of N.J., assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jun. 10, 1985, Ser. No. 742,679
The portion of the term of this patent subsequent to Nov. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—366



294,638
MEDICAL BED FOR TREATMENT OF BED SORES OR BURNS
Hiroshi Tominaga; Yoshio Uno, and Tooru Kazimura, all of Kanagawa, Japan, assignors to Fuji Photo Electric Co., Ltd., Kanagawa, Japan
Filed Aug. 7, 1985, Ser. No. 763,110
Claims priority, application Japan, Feb. 8, 1985, 60-4655
Term of patent 14 years
U.S. Cl. D24—1.1



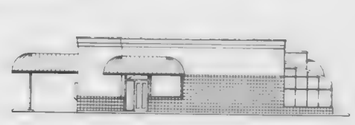
294,639
LIGHT FILTER FOR USE IN CURING DENTAL BONDING RESINS
Theodore P. Croll, 685 S. Chubb Dr., Doylestown, Pa. 18901
Filed Feb. 7, 1985, Ser. No. 699,266
Term of patent 14 years
U.S. Cl. D24—16



294,640
SYRINGE
John E. Wicken, and Geoffrey Ritson, both of Kent, England, assignors to Medimech Limited, London, England
Filed Feb. 19, 1985, Ser. No. 702,819
Claims priority, application United Kingdom, Aug. 22, 1984, 1021643
Term of patent 14 years
U.S. Cl. D24—60

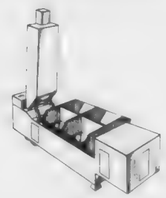


294,641
RESTAURANT BUILDING OR SIMILAR ARTICLE
Lawrence Fournier, Columbus, and David C. Rader, Gahanna, both of Ohio, assignors to Rax Restaurants, Inc., Columbus, Ohio
Filed Mar. 1, 1985, Ser. No. 708,031
Term of patent 14 years
U.S. Cl. D25—1

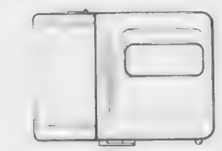


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MOBILE CONCRETE PLANT
Bertil Boström, Umeå, Sweden, assignor to AB Robacks Mekaniska, Umeå, Sweden
Filed Apr. 16, 1985, Ser. No. 723,826
Claims priority, application Sweden, Oct. 17, 1984, 84-2773; Oct. 17, 1984, 84-2774
Term of patent 14 years
U.S. Cl. D25—3

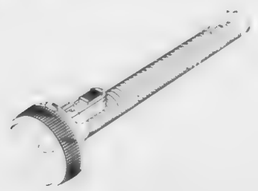


294,643
FLASHLIGHT
Toyomi Arita, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Oct. 9, 1985, Ser. No. 785,769
Claims priority, application Japan, Apr. 9, 1985, 60-14314
Term of patent 14 years
U.S. Cl. D26—48

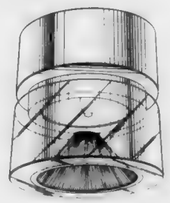




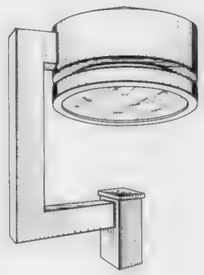
294,644
FLASHLIGHT
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan
Filed Dec. 30, 1985, Ser. No. 814,768
Term of patent 14 years
U.S. Cl. D26—49



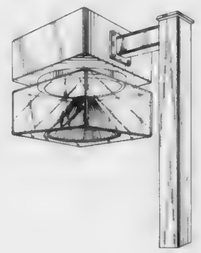
294,645
AREA LIGHT
Robert L. Ewing; John W. Harvey; Richard G. Armstrong, and Herbert A. Fouke, all of Newark, Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Jan. 24, 1986, Ser. No. 822,350
Term of patent 14 years
U.S. Cl. D26—67



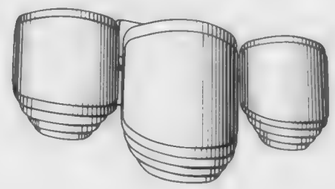
294,646
AREA LIGHT
Robert L. Ewing, 1440 Twin Pines Ct.; John W. Harvey, 495 Courtney Dr.; Richard G. Armstrong, 438 Donovan Dr., all of Newark, Ohio 43055, and Randall P. Crothers, 10109 W. Fremont Ave., Littleton, Colo. 80127
Filed Jan. 29, 1986, Ser. No. 823,880
The portion of the term of this patent subsequent to Feb. 23, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—71



294,647
AREA LIGHT
Robert L. Ewing; Herbert A. Fouke, both of Newark; James S. Hughes, and Bruce G. Bruggeman, both of Columbus, all of Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Feb. 3, 1986, Ser. No. 825,299
Term of patent 14 years
U.S. Cl. D26—71



294,648
WALL LIGHT FIXTURE
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jul. 24, 1985, Ser. No. 758,503
Term of patent 14 years
U.S. Cl. D26—86



294,649
FIRE STARTER
Robert E. Carr, Springfield; Robert L. Dunklee, Palmer, both of Mass., and Peter R. Adams, New York, N.Y., assignors to Diamond Brands Incorporated, Minneapolis, Minn.
Continuation-in-part of Ser. No. 851,404, Apr. 10, 1986. This application Oct. 8, 1986, Ser. No. 916,862
Term of patent 14 years
U.S. Cl. D27—30



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PATENTS WERE ISSUED ON THE 8TH DAY OF MARCH, 1988

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A.K.G.S.: *See—*
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A. Nattermann & Cie GmbH: *See—*
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Aarestad, Jerome K., to Sundstrand Corporation. Gear pump with groove in end wall beginning at outer periphery of pumping chamber and widening toward gear teeth roots. 4,729,727, Cl. 418-78.000.

Abbott Laboratories: *See—*
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Abe, Kozo, to Logical Co., Ltd. Transformer system and direct current power supply. 4,730,115, Cl. 250-551.000.

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Abo, Keiju, to Nissan Motor Co., Ltd. Transmission belt provided with push elements. 4,729,758, Cl. 474-242.000.

Abrahamson, Douglas J.: *See—*
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ACCO World Corporation: *See—*
Kurkjian, Charles V.; and Heggeland, Bruce E., 4,729,475, Cl. 206-425.000.

Aclin, John J.: *See—*
Neuberg, William B.; and Aclin, John J., 4,729,918, Cl. 428-207.000.

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Lynch, Francis deS.; Jepson, John W.; and Brown, Robert A., 4,729,861, Cl. 264-219.000.

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Mihayashi, Keiji; Takada, Shunji; Adachi, Keiichi; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,729,944, Cl. 430-376.000.

Adams, Edward R., to Prince Corporation. Visor rod mount. 4,729,590, Cl. 296-97.00K.

Adams, Michael E. Alarm clock. 4,730,284, Cl. 368-72.000.

Adamson, Alistair H. M. Walking aid. 4,729,395, Cl. 135-67.000.

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MacCrisken, John E., 4,730,348, Cl. 375-122.000.

Advanced Micro Devices, Inc.: *See—*
Chen, Martin, 4,730,126, Cl. 307-290.000.

Advanced Mineral Technologies, Inc.: *See—*
Hutchins, Stephen R.; Davidson, Michael S.; Brierley, James A.; and Brierley, Corale L., 4,729,788, Cl. 75-118.00R.

Advantest Corporation: *See—*
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Stein, Bengt, 4,729,806, Cl. 156-172.000.

Afromowitz, Martin A., to Puget Sound Power & Light Company. Apparatus and method for measuring electric field by electroreflectance. 4,730,109, Cl. 250-226.000.

Agano, Toshitaka: *See—*
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Ahlers, Klaas: *See—*
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Aicerro Chemical Company Limited: *See—*
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Air Industrie Systems: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
Nomura, Yoshihisa; and Sugisawa, Masakazu, 4,729,221, Cl. 60-416.000.

Aizawa, Hitomi; and Yabe, Hiroshi, to Seiko Epson Corporation. Circuit and method for correcting the rate of an electronic timepiece. 4,730,286, Cl. 368-202.000.

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Akamatsu, Takahiko: *See—*
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Akers, James B., Jr.: *See—*
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Akiba, Yutaka; Hirota, Kazuo; Kishiro, Nobuo; Futami, Toshio; and Hamamoto, Tatsuo, to Hitachi, Ltd. Magnetic field confirming case with inclined portions for magnetic bubble memory module. 4,730,271, Cl. 365-2.000.

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Akiyama, Susumu; Katsunori, Ito; Hirabayashi, Yuzi; Kinugawa, Masumi; and Omori, Norio, to Nippondenso Co., Ltd. Engine control apparatus. 4,730,255, Cl. 364-431.050.

Akiyama, Tatsuo: *See—*
Koshino, Yutaka; Akiyama, Tatsuo; and Hiraki, Shunichi, 4,729,966, Cl. 437-39.000.

Akuta, Tomohiko; and Naito, Masamitsu, to Nippon Seiko Kabushiki Kaisha. Laser interferometer. 4,729,654, Cl. 356-4.500.

Akzo America Incorporated: *See—*
Filachek, Lawrence A.; Whitehead, Stanley E., deceased; and Whitehead, James M., executor, 4,730,067, Cl. 556-55.000.

Albach, Manfred: *See—*
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Alberter, Gunther; Bauer, Harald; and Hettich, Gerhard, to Robert Bosch GmbH. Process for establishing the driving direction of a vehicle with an electronic compass. 4,729,172, Cl. 33-356.000.

Albertson, Walter: *See—*
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Alcatel: *See—*
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Alexander, Jerry L.; Narayan, Sankar B.; Gerfast, Sten R.; and Nelson, Charles E., to Minnesota Mining and Manufacturing Company. Recording medium annealing process. 4,729,805, Cl. 156-160.000.

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Krook, Goran; and Karlsson, Per, 4,729,759, Cl. 494-4.000.

Alfranca, Jose-Maria P. Surgical instrument for transcholedochal papillotomy. 4,729,374, Cl. 128-305.000.

Alfred Teves GmbH: *See—*
Boehm, Peter; Wagner, Wilfried; Bischoff, Gilbert; and Breitwieser, Karl, 4,729,287, Cl. 91-369.00A.
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Alig, Roger C.: *See—*
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Allied-Signal Inc.: *See—*
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Allison, John E., to Ford Motor Company. Titanium engine valve and method of making. 4,729,546, Cl. 251-368.000.

Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Francheschi, Giovanni; and Perrone, Ettore, to Farmitalia Carlo Erba S.p.A. Substituted penem derivatives. 4,729,990, Cl. 514-192.000.

Alps Electric Co., Ltd.: *See—*
Kamijo, Yoshimi; Kato, Yoshinori; and Ikarashi, Masami, 4,730,086, Cl. 174-74.00R.

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Altermatt, Willi: *See—*
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Amador, German; and Biek, Paul A., to Dresser Industries, Inc. Ball and disc over-speed shut-off mechanism for a rotary pneumatic tool. 4,729,436, Cl. 173-12.000.

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American Filtrona Corporation: *See—*
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American Standard Inc.: *See—*
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Mezera, Susan A.; and Pieper, Merle K., 4,730,304, Cl. 370-58.000.
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Clark, John H.; and Werth, Dennis L., 4,730,335, Cl. 372-98.000.
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Chang, Paul S., 4,730,309, Cl. 370-86.000.
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Groover, Phillip B.; Baumgartner, Gunther; and Gress, Josef, to Coca-Cola Company, The. Expanded capacity vend basket for a vending machine. 4,729,480, Cl. 211-59.200.

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Gupta, Umesh, to Vickers, Incorporated. Power transmission. 4,729,717, Cl. 417-5.000.

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Markwardt, Herbert W., to Encon Industries, Inc. Mounting system for selectively mounting ceiling fans. 4,729,725, Cl. 417-423.00R.

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Scala, Harry. Anagraphic stand. 4,729,536, Cl. 248-429.000.
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Szeto, Lai-wan M. Apparatus for analyzing signals, to obtain parameters of constituents. 4,730,257, Cl. 364-484.000.

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Taguchi, Hiroaki; Katsushima, Takeo; Ban, Masakazu; Aoki, Shoichi; and Watanabe, Akihiko, to Toyo Boseki Kabushiki Kaisha. Pyrimidine 2,4-dioxamate compounds and pharmaceutical compositions. 4,729,995, Cl. 514-212.000.

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Tauchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; and Yoshimura, Susumu, 4,729,844, Cl. 252-62.200.

Yoshimura, Yoshinobu: *See*—
Nishimura, Tatsuo; Yoshimura, Yoshinobu; and Numata, Mitsuo, 4,729,992, Cl. 514-206.000.

Yoshino, Masahito; and Nishiwaki, Yoshitsugu, to Seiko Epson Corporation. Power supply for electronic timpiece. 4,730,287, Cl. 368-205.000.

Yoshioka, Larry M., to Joseph C. Cox, III. Toothbrush. 4,729,142, Cl. 15-167.100.

Yoshizawa, Kenichi: *See*—
Morisawa, Kunio; Yasue, Hideki; Fukumura, Kagenori; Yoshizawa, Kenichi; and Nakamura, Yasunari, 4,729,450, Cl. 180-249.000.

Young, Ronald L., to BCM Technologies. Antiestrogen therapy for symptoms of estrogen deficiency. 4,729,999, Cl. 514-227.000.

Ytron Dr. Karg GmbH: *See*—
Karg, Roland, 4,729,663, Cl. 366-165.000.

Yu, Zeng-qi: *See*—
Collins, George J.; McNeil, John R.; and Yu, Zeng-qi, 4,730,334, Cl. 372-88.000.

Zack, Larry E., to General Signal Corporation. Cash box identification system. 4,730,117, Cl. 250-568.000.

Zafer, Inccecik: *See*—
Wilhelm, Wilhelm; and Zafer, Inccecik, 4,730,349, Cl. 377-47.000.

Zandel, Adam, to Press Technology Corporation. Built-in lifting and manipulating hydraulic jacks for crossheads of heavy hydraulic presses. 4,729,234, Cl. 72-455.000.

Zapico, Michael M. Sediment sampler. 4,729,437, Cl. 175-20.000.

Zegers Van Duijnhoven, Adriana T. A.: *See*—
Te Velde, Ties S.; and Zegers Van Duijnhoven, Adriana T. A., 4,729,636, Cl. 350-269.000.

Zeidler, Siegmund, to Rasmussen GmbH. Pipe coupling. 4,729,582, Cl. 285-104.000.

Zeiss, James F.; Newman, Allen; and Lissy, Gunther J. Method and apparatus for powder coating elongated objects. 4,729,340, Cl. 118-634.000.

Zeitvogel, Heinrich, to Telefunken electronic GmbH. Circuit arrangement for regulating the rpm of a series motor. 4,730,149, Cl. 318-246.000.

Zenith Electronics Corporation: *See*—
Fendley, James R., 4,730,143, Cl. 313-407.000.
Leahko, Roman W., 4,730,210, Cl. 358-34.000.

Zhed, Viktor P.; Gavrilov, Alexei G.; Kurbatova, Elena I.; Sinelschikov, Andrei K.; Boyarunas, Albert M.; and Smirnov, Vitaly M., to Vsesojuzny Nauchno-Issledovatelsky Institut Instrumenta. Method for production of cutting tools. 4,729,905, Cl. 427-37.000.

Ziegenbein, Keith J. Automatic touch actuated door opener. 4,729,490, Cl. 220-211.000.

Zieringer, Josef, to Robert Bosch GmbH. Stepping mechanism. 4,729,251, Cl. 74-129.000.

Zima, Herbert: *See*—
Wilfinger, Werner; Zima, Herbert; and Stania, Herbert, 4,730,020, Cl. 524-555.000.

Zimmer, George A., to Emerson Electric Co. Roller chain. 4,729,756, Cl. 474-214.000.

Zimmerman, Alan W., to Wells-Gardner Electronics Corporation. Power supply. 4,730,244, Cl. 363-49.000.

Zinser Textilmaschinen GmbH: *See*—
Rohner, Joachim; and Nickolay, Helmut, 4,729,216, Cl. 57-305.000.

Ziyad Incorporated: *See*—
Staniszewski, Tadeusz, 4,729,683, Cl. 400-624.000.

Zletz, Alex, to Amoco Corporation. Copper aluminum borate. 4,729,979, Cl. 502-202.000.

Zom, Walter M. W.; Goos, Hendricus C.; and Stijntjes, Johan, to Polyvinyl Chemie Holland B.V. Process for preparing aqueous dispersions of acrylic-urethane graft copolymers. 4,730,021, Cl. 524-457.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MARCH, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Damadian, Raymond V. Apparatus and method for nuclear magnetic resonance scanning and mapping. Re. 32,619, Cl. 128-653.000.

Iwai, Tomio, to Sanshin Kogyo Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Lubricating system for an outboard engine. Re. 32,620, Cl. 440-77.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwai, Tomio, Re. 32,620, Cl. 440-77.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Iwai, Tomio, Re. 32,620, Cl. 440-77.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ametek, Inc.: *See*—
Hyatt, Robert L.; Niessner, Norbert H.; and Sumser, Richard D., B1 4,226,575, Cl. 417-423.00A.

Hyatt, Robert L.; Niessner, Norbert H.; and Sumser, Richard D., to Ametek, Inc. Wet pick-up vacuum unit. B1 4,226,575, 3-8-88, Cl. 417-423.00A.

Niessner, Norbert H.: *See*—
Hyatt, Robert L.; Niessner, Norbert H.; and Sumser, Richard D., B1 4,226,575, Cl. 417-423.00A.

Sumser, Richard D.: *See*—
Hyatt, Robert L.; Niessner, Norbert H.; and Sumser, Richard D., B1 4,226,575, Cl. 417-423.00A.

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AB Robacks Mekaniska: *See*—
Bostrom, Bertil, 294,642, Cl. D25-3.000.

AB Sajo Maskin: *See*—
Sanden, Ake, 294,585, Cl. D15-122.000.

Adams, Janus I.; and Klotz, Donald L. Packaging container for cassette tapes and books. 294,558, 3-8-88, Cl. D9-415.000.

Adams, Peter R.: *See*—
Carr, Robert E.; Dunklee, Robert L.; and Adams, Peter R., 294,649, Cl. D27-30.000.

Airwick Industries, Inc.: *See*—
Hoyt, Earl; and Patel, Manharbhai K., 294,637, Cl. D23-366.000.

Arita, Toyomi, to Sanyo Electric Co., Ltd. Flashlight. 294,643, 3-8-88, Cl. D26-48.000.

Armstrong, Richard G.: *See*—
Ewing, Robert L.; Harvey, John W.; Armstrong, Richard G.; and Fouke, Herbert A., 294,645, Cl. D26-67.000.
Ewing, Robert L.; Harvey, John W.; Armstrong, Richard G.; and Crothers, Randall P., 294,646, Cl. D26-71.000.

AT&T Teletype Corporation: *See*—
Kirpluk, Kenneth R.; Murglin, Joseph G.; and Petras, John W., 294,579, Cl. D14-114.000.

Benedetto, Bruce J.; and Santarsiero, Paul S., to Coleco Industries, Inc. Toy kitchen. 294,608, 3-8-88, Cl. D21-122.000.

Benit, Brad J.: *See*—
Rumbaugh, James T.; and Benit, Brad J., 294,625, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., 294,626, Cl. D22-142.000.

Berkley, Inc.: *See*—
Rumbaugh, James T.; and Benit, Brad J., 294,625, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., 294,626, Cl. D22-142.000.
Rumbaugh, James T., 294,627, Cl. D22-142.000.
Rumbaugh, James T., 294,628, Cl. D22-142.000.

Berrios, Luis H.: *See*—
Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., 294,614, Cl. D21-198.000.

Blaney, Peter G., to Zemco, Inc. Automotive compass. 294,561, 3-8-88, Cl. D10-68.000.

Blumer, John E.; and Ehmke, Richard J., to Dempster Industries, Inc. Tender. 294,583, 3-8-88, Cl. D15-27.000.

Bostrom, Bertil, to AB Robacks Mekaniska. Mobile concrete plant. 294,642, 3-8-88, Cl. D25-3.000.

Bourbon, Georges A., to Etablissements Mingori. Faucet. 294,631, 3-8-88, Cl. D23-241.000.

Boytor, Samuel G., to F. J. Littell Machine Company. Control panel for a machine control system. 294,566, 3-8-88, Cl. D13-35.000.

Brenner, Pamela A.: *See*—
Sabin, David C.; and Brenner, Pamela A., 294,571, Cl. D14-68.000.

Brown, Marcus A.; and Leonard, Thomas E. Digital clock. 294,560, 3-8-88, Cl. D10-15.000.

Bruggeman, Bruce G.: *See*—
Ewing, Robert L.; Fouke, Herbert A.; Hughes, James S.; and Bruggeman, Bruce G., 294,647, Cl. D26-71.000.

Carr, Robert E.; Dunklee, Robert L.; and Adams, Peter R., to Diamond Brands Incorporated. Fire starter. 294,649, 3-8-88, Cl. D27-30.000.

Casio Computer Co., Ltd.: *See*—
Ohzu, Itsumi, 294,572, Cl. D14-69.000.
Ohzu, Itsumi, 294,573, Cl. D14-69.000.
Okamoto, Eiiti, 294,575, Cl. D14-79.000.
Okamoto, Eiiti, 294,576, Cl. D14-79.000.

CESV, Inc.: *See*—
Sabin, David C.; and Brenner, Pamela A., 294,571, Cl. D14-68.000.

Chao, Yin-Tsai. Sleepiness alarm. 294,562, 3-8-88, Cl. D10-106.000.

Chenera, Robert. Barbell support stand accessory or similar article. 294,613, 3-8-88, Cl. D21-191.000.

Christiansen, Jens H. Sliding clamp for easels. 294,556, 3-8-88, Cl. D8-394.000.

Coggins, Sidney L. Bench seat bin for a pickup truck or the like. 294,539, 3-8-88, Cl. D3-40.000.

Coleco Industries, Inc.: *See*—
Benedetto, Bruce J.; and Santarsiero, Paul S., 294,608, Cl. D21-122.000.

Coue, Maurice E. L., to Huret et ses Fils (societe anonyme). Derailleur protector. 294,563, 3-8-88, Cl. D12-127.000.

Croll, Theodore P. Light filter for use in curing dental bonding resins. 294,639, 3-8-88, Cl. D24-16.000.

Crothers, Randall P.: *See*—
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Daiwa Deiko, Inc.: *See*—
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Daiwa Seiko, Inc.: *See*—
Iinuma, Kanji; and Yasuda, Michinori, 294,624, Cl. D22-141.000.
Suzuki, Junichi, 294,629, Cl. D22-143.000.

De Marr, Catherine F. Umbrella. 294,538, 3-8-88, Cl. D3-5.000.

Dempster Industries, Inc.: *See*—
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Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., to HDS, Inc. Combined hand exercise device and cover therefor. 294,614, 3-8-88, Cl. D21-198.000.

Donnelly, Rosanna K. Electrically cooled punch bowl. 294,551, 3-8-88, Cl. D7-21.000.

Dunklee, Robert L.: *See*—
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Dunlop Limited: *See*—
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Ehmke, Richard J.: *See*—
Blumer, John E.; and Ehmke, Richard J., 294,583, Cl. D15-27.000.

Endt, Evert, to Horlogerie Photographique Francaise. Combination telephone handset and console stand assembly. 294,568, 3-8-88, Cl. D14-58.000.

Espy, James R., to Minnesota Mining and Manufacturing Company. Tie bar. 294,591, 3-8-88, Cl. D16-37.000.

Espy, James R., to Minnesota Mining and Manufacturing Company. Tie bar. 294,592, 3-8-88, Cl. D16-37.000.

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Ewing, Robert L.; Harvey, John W.; Armstrong, Richard G.; and Fouke, Herbert A., to Manville Corporation. Area light. 294,645, 3-8-88, Cl. D26-67.000.

Ewing, Robert L.; Harvey, John W.; Armstrong, Richard G.; and Crothers, Randall P. Area light. 294,646, 3-8-88, Cl. D26-71.000.

Ewing, Robert L.; Fouke, Herbert A.; Hughes, James S.; and Bruggeman, Bruce G., to Manville Corporation. Area light. 294,647, 3-8-88, Cl. D26-71.000.

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Fournier, Rachel, to Pelican Narrow U-Fly-In Ltd. Ski seat. 294,618, 3-8-88, Cl. D21-229.000.

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Fujii, Toshiro, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co. Ltd. Combined tape recorder and radio receiver. 294,567, 3-8-88, Cl. D14-5.000.

Funahashi, Tatsuro; and Hayashi, Shiro, to Shachihata Industrial Co., Ltd. Marking pen. 294,599, 3-8-88, Cl. D19-48.000.

Funahashi, Tatsuro; and Hayashi, Shiro, to Shachihata Industrial Co., Ltd. Ballpoint pen. 294,600, 3-8-88, Cl. D19-51.000.

Geraets, Jos F. C., to U.S. Philips Corporation. Remote control receiver. 294,569, 3-8-88, Cl. D14-68.000.

Gold Star Co., Ltd.: *See*—
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Gubbe, Bernd; and Krause, Klaus-Diether, to Ta Triumph Adler Aktiengesellschaft. Electronic typewriters. 294,596, 3-8-88, Cl. D18-1.000.

Hardinge Brothers, Inc.: *See*—
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Smith, Roger R.; and Rao, Kamalakar K., 294,588, Cl. D15-140.000.

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Hattori, Kenneth, to Suncast Corporation. Oscillating sprinkler. 294,635, 3-8-88, Cl. D23-216.000.

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Hoffman, William F.: *See*—
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Hoyt, Earl; and Patel, Manharbhai K., to Airwick Industries, Inc. Vapor dispensing container. 294,637, 3-8-88, Cl. D23-366.000.

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Jagger, Vivienne D., to Little People Ltd. Eating implement scoop spoon for an infant. 294,553, 3-8-88, Cl. D7-141.000.

Jones, Daniel H. Acid container. 294,557, 3-8-88, Cl. D9-376.000.

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Kanoui, Joseph, to Interdica S.A. Spectacles. 294,594, 3-8-88, Cl. D16-117.000.

Kanoui, Joseph, to Interdica S.A. Spectacles. 294,595, 3-8-88, Cl. D16-117.000.

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Kline, Jeffrey L., to International Business Machines Corporation. Computer housing or the like. 294,577, 3-8-88, Cl. D14-100.000.

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Leach, N. Leon; and Hoffman, William F. Water applicator attachment for a concrete finishing machine. 294,634, 3-8-88, Cl. D23-213.000.

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Litowitz, Robert H. Window shade pull or similar article. 294,550, 3-8-88, Cl. D6-581.000.

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Jagger, Vivienne D., 294,553, Cl. D7-141.000.

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Matsumoto, Kaoru, to Takara Co., Ltd. Reconfigurable toy vehicle. 294,610, 3-8-88, Cl. D21-136.000.

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McCallister, John. Golf club head. 294,616, 3-8-88, Cl. D21-214.000.

McCallister, John. Visual aid for golf stroke. 294,619, 3-8-88, Cl. D21-234.000.

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Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 294,622, 3-8-88, Cl. D22-141.000.

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Ohashi, Keiichi, to Skylite Industry Co., Ltd. Flashlight. 294,644, 3-8-88, Cl. D26-49.000.

Ohmori, Masami, to Duplo Seizo Kabushiku Kaisha. Paper folding apparatus. 294,598, 3-8-88, Cl. D18-22.000.

Ohzu, Itsumi, to Casio Computer Co., Ltd. Combined portable radio receiver and calculator. 294,572, 3-8-88, Cl. D14-69.000.

Ohzu, Itsumi, to Casio Computer Co., Ltd. Combined portable radio receiver and calculator. 294,573, 3-8-88, Cl. D14-69.000.

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Okamoto, Eiiti, to Casio Computer Co., Ltd. Combined portable television set and radio. 294,575, 3-8-88, Cl. D14-79.000.

Okamoto, Eiiti, to Casio Computer Co., Ltd. Combined portable television set and radio. 294,576, 3-8-88, Cl. D14-79.000.

Opsvik, Peter. Seat cushion and support unit for a combined seat and kneeler. 294,545, 3-8-88, Cl. D6-500.000.

Opsvik, Peter. Shin cushion and support unit for a combined seat and kneeler. 294,546, 3-8-88, Cl. D6-500.000.

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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	4,729,737	4,729,528		4,729,407	4,729,601		4,730,007		4,729,277
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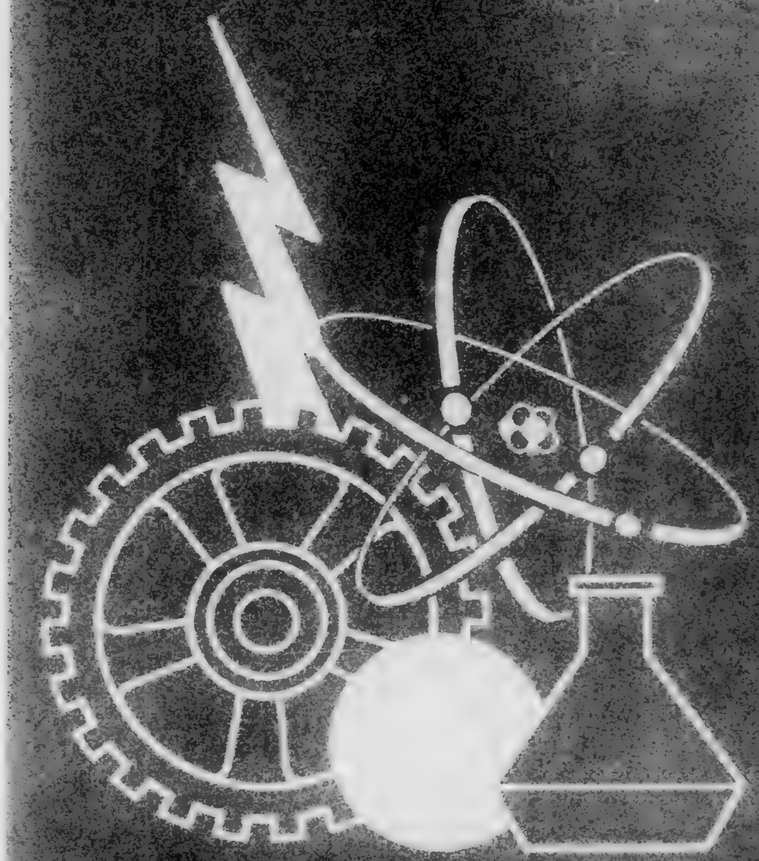
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Mar. 15, 1988, and was announced in the *Official Gazette* at 1087 O.G. 24 on Feb. 16, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1300.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Jan. 21, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 12, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,503,565 through 4,504,976
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

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By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 27, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,422,186	06/419,641	12/27/83
4,422,192	06/444,316	12/27/83
4,422,195	06/310,454	12/27/83
4,422,202	06/359,199	12/27/83
4,422,204	06/403,000	12/27/83
4,422,210	06/320,719	12/27/83
4,422,214	06/261,472	12/27/83
4,422,215	06/267,283	12/27/83
4,422,228	06/277,235	12/27/83
4,422,244	06/327,607	12/27/83
4,422,250	06/397,600	12/27/83
4,422,253	06/414,969	12/27/83
4,422,255	06/363,060	12/27/83
4,422,256	06/387,660	12/27/83
4,422,257	06/333,015	12/27/83
4,422,258	06/361,237	12/27/83
4,422,260	06/301,737	12/27/83
4,422,265	06/273,779	12/27/83
4,422,269	06/255,320	12/27/83
4,422,285	06/316,031	12/27/83
4,422,290	06/296,282	12/27/83
4,422,292	06/271,124	12/27/83
4,422,295	06/307,645	12/27/83
4,422,310	06/298,280	12/27/83
4,422,311	06/366,545	12/27/83
4,422,313	06/308,812	12/27/83
4,422,316	06/283,995	12/27/83
4,422,317	06/342,338	12/27/83
4,422,318	06/226,540	12/27/83
4,422,323	06/341,841	12/27/83
4,422,328	06/310,792	12/27/83
4,422,331	06/364,745	12/27/83
4,422,332	06/264,576	12/27/83
4,422,334	06/312,837	12/27/83
4,422,339	06/436,458	12/27/83
4,422,343	06/360,074	12/27/83
4,422,344	06/281,148	12/27/83
4,422,345	06/301,166	12/27/83
4,422,347	06/268,264	12/27/83
4,422,356	06/388,709	12/27/83
4,422,360	06/296,000	12/27/83
4,422,363	06/276,685	12/27/83
4,422,364	06/282,143	12/27/83
4,422,392	06/382,340	12/27/83
4,422,403	06/366,312	12/27/83
4,422,404	06/339,946	12/27/83
4,422,415	06/277,631	12/27/83
4,422,425	06/473,265	12/27/83
4,422,429	06/379,008	12/27/83
4,422,430	06/307,623	12/27/83
4,422,435	06/257,487	12/27/83
4,422,441	06/275,821	12/27/83
4,422,443	06/260,713	12/27/83
4,422,451	06/360,470	12/27/83
4,422,456	06/299,873	12/27/83
4,422,471	06/381,829	12/27/83
4,422,472	06/316,148	12/27/83
4,422,477	06/238,713	12/27/83
4,422,478	06/233,119	12/27/83
4,422,480	06/351,994	12/27/83
4,422,486	06/227,120	12/27/83
4,422,489	06/436,015	12/27/83
4,422,490	06/233,090	12/27/83
4,422,491	06/282,008	12/27/83
4,422,493	06/331,257	12/27/83
4,422,495	06/238,342	12/27/83
4,422,502	06/397,216	12/27/83
4,422,509	06/375,960	12/27/83

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Patent Number	Serial Number	Issue Date
4,422,511	06/391,457	12/27/83
4,422,513	06/280,346	12/27/83
4,422,514	06/305,915	12/27/83
4,422,516	06/218,332	12/27/83
4,422,526	06/256,709	12/27/83
4,422,533	06/282,080	12/27/83
4,422,544	06/264,632	12/27/83
4,422,549	06/246,731	12/27/83
4,422,563	06/282,624	12/27/83
4,422,580	06/272,023	12/27/83
4,422,583	06/330,265	12/27/83
4,422,589	06/306,566	12/27/83
4,422,598	06/271,764	12/27/83
4,422,606	06/277,353	12/27/83
4,422,610	06/262,312	12/27/83
4,422,614	06/296,797	12/27/83
4,422,625	06/351,557	12/27/83
4,422,640	06/395,138	12/27/83
4,422,641	06/359,430	12/27/83
4,422,643	06/374,435	12/27/83
4,422,644	06/318,336	12/27/83
4,422,645	06/308,860	12/27/83
4,422,647	06/350,529	12/27/83
4,422,655	06/295,772	12/27/83
4,422,656	06/376,539	12/27/83
4,422,658	06/306,227	12/27/83
4,422,660	06/361,239	12/27/83
4,422,664	06/273,565	12/27/83
4,422,666	06/290,350	12/27/83
4,422,672	06/298,173	12/27/83
4,422,678	06/234,737	12/27/83
4,422,681	06/341,869	12/27/83
4,422,692	06/267,166	12/27/83
4,422,693	06/408,854	12/27/83
4,422,695	06/337,760	12/27/83
4,422,708	06/251,203	12/27/83
4,422,722	06/230,605	12/27/83
4,422,728	06/230,409	12/27/83
4,422,738	06/229,232	12/27/83
4,422,750	06/355,463	12/27/83
4,422,756	06/286,196	12/27/83
4,422,758	06/286,415	12/27/83
4,422,761	06/305,974	12/27/83
4,422,768	06/360,350	12/27/83
4,422,784	06/366,524	12/27/83
4,422,789	06/344,545	12/27/83
4,422,791	06/366,207	12/27/83
4,422,796	06/278,324	12/27/83
4,422,797	06/348,877	12/27/83
4,422,799	06/268,557	12/27/83
4,422,802	06/251,775	12/27/83
4,422,813	06/240,625	12/27/83
4,422,819	06/256,245	12/27/83
4,422,829	06/352,361	12/27/83
4,422,836	06/298,475	12/27/83
4,422,850	06/268,860	12/27/83
4,422,865	06/337,793	12/27/83
4,422,883	06/430,798	12/27/83
4,422,887	06/293,960	12/27/83
4,422,907	06/335,773	12/27/83
4,422,910	06/403,953	12/27/83
4,422,912	06/380,444	12/27/83
4,422,929	06/298,810	12/27/83
4,422,934	06/384,208	12/27/83
4,422,975	06/289,323	12/27/83
4,423,001	06/233,297	12/27/83
4,423,014	06/226,977	12/27/83
4,423,033	06/230,312	12/27/83
4,423,034	06/372,824	12/27/83
4,423,035	06/291,157	12/27/83
4,423,038	06/340,680	12/27/83
4,423,039	06/254,823	12/27/83
4,423,042	06/365,675	12/27/83
4,423,043	06/345,990	12/27/83
4,423,044	06/352,346	12/27/83
4,423,046	06/365,482	12/27/83
4,423,047	06/223,760	12/27/83
4,423,053	06/358,561	12/27/83
4,423,092	06/328,976	12/27/83
4,423,098	06/458,303	12/27/83
4,423,119	06/318,881	12/27/83
4,423,159	06/375,232	12/27/83
4,423,165	06/369,077	12/27/83
4,423,196	06/321,277	12/27/83
4,423,208	06/352,013	12/27/83
4,423,210	06/366,797	12/27/83
4,423,212	06/217,935	12/27/83
4,423,216	06/334,208	12/27/83
4,423,221	06/386,921	12/27/83
4,423,226	06/243,876	12/27/83
4,423,232	06/235,814	12/27/83
4,423,236	06/314,423	12/27/83
4,423,246	06/350,912	12/27/83
4,423,248	06/327,059	12/27/83
4,423,259	06/347,728	12/27/83
4,423,263	06/393,441	12/27/83
4,423,267	06/383,412	12/27/83
4,423,270	06/451,482	12/27/83
4,423,285	06/347,290	12/27/83
4,423,291	06/231,452	12/27/83
4,423,306	06/400,595	12/27/83
4,423,317	06/305,116	12/27/83
4,423,342	06/449,806	12/27/83
4,423,347	06/328,618	12/27/83
4,423,360	06/370,528	12/27/83
4,423,402	06/371,674	12/27/83
4,423,413	06/276,021	12/27/83
4,423,417	06/318,856	12/27/83
4,423,420	06/261,286	12/27/83
4,423,445	06/259,745	12/27/83
4,423,457	06/343,966	12/27/83
4,423,473	06/428,112	12/27/83
4,423,499	06/291,121	12/27/83
4,423,500	06/300,120	12/27/83
4,423,501	06/257,943	12/27/83
4,423,522	06/273,547	12/27/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,560,871, Re. S.N. 136,027, Filed Dec. 21, 1987, Cl. 250/288, ACTUATOR FOR CONTROL VALVES AND RELATED SYSTEMS, Ronald R. Bowman, et al., Owner of Record: *Masstron, Inc., Boulder, Colo.*, Attorney or Agent: Philip H. Sheridan, et al., Ex. Gp.: 250

4,562,374, Re. S.N. 135,187, Filed Dec. 18, 1987, Cl. 310/328, MOTOR DEVICE UTILIZING ULTRASONIC OSCILLATION, Toshiiku Sashida, Owner of Record: *Toshiiku Sashida, Tokyo, Japan,* Attorney or Agent: James E. Armstrong, et al., Ex. Gp.: 210

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,112,464, Reexam. No. 90/001,426, Requested: Feb. 1, 1988, Cl. 358/122, SUBSCRIPTION TV DECODER LOGIC SYSTEM, Stanley E. Gulf, et al., Owner of Record: *Oak Industries Inc., Rancho Bernardo, Calif.*, Attorney or Agent: D. C. McEachran, Ex. Gp.: 220, Requester: Owner

4,513,356, Reexam. No. 90/001,427, Requested: Feb. 1, 1988, Cl. 362/226, REPLACEABLE LAMP ASSEMBLY AND LOCKING MECHANISM FOR A SEALABLE REFLECTOR HOUSING, James A. Mikola, Owner of Record: *Ford Motor Co., Dearborn, Mich.*, Attorney or Agent: Paul K. Godwin, Ex. Gp.: 220, Requester: Owner

4,538,056, Reexam. No. 90/001,428 Requested: Feb. 1, 1988, Cl. 235/377, CARD READER FOR TIME AND ATTENDANCE, Jorge A. Young, et al., Owner of Record: *Figgie International Inc., Richmond, Va.*, Attorney or Agent: Knobbe, Martens, et al., Ex. Gp.: 260, Requester: Owner

Patent Term Extended Under 35 USC 156

A certificate extending the term with respect to the following patent was issued under the provisions of 35 USC 156 on Jan. 13, 1988.

Patent No. 4,087,545, granted May 2, 1978, to Robert A. Archer, et al., Owner of Record: Eli Lilly and Co., Title: HEXAHYDRO-DIBENZO[b,d] PYRAN-9-ONES AS ANTIEMETIC DRUGS Classification: 514-454 Product Trade Name: CESAMET Term Extended: 2 years

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Video Future 21 Inc., Mississauga, Ontario, Reg. No. 1,223,252, for the mark VIDEO-VILLE, Canc. No. 16,328.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

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PATENT NOTICES

Certificates of Correction for the Week of Mar. 15, 1988

Re. 32,398	4,665,127	4,689,036	4,697,307
4,340,858	4,666,686	4,689,380	4,697,399
4,446,151	4,667,190	4,689,686	4,697,573
4,530,434	4,669,381	4,689,942	4,697,593
4,533,692	4,669,656	4,690,133	4,697,632
4,534,967	4,670,444	4,690,393	4,698,084
4,540,053	4,670,657	4,690,497	4,698,116
4,548,749	4,670,751	4,690,923	4,698,213
4,551,723	4,671,640	4,691,493	4,698,618
4,555,352	4,673,589	4,692,182	4,698,871
4,589,267	4,674,238	4,692,773	4,698,914
4,593,022	4,675,045	4,693,005	4,699,307
4,597,448	4,675,397	4,693,378	4,699,579
4,598,073	4,676,136	4,693,400	4,699,613
4,599,489	4,676,895	4,693,521	4,699,631
4,624,798	4,677,381	4,693,580	4,700,236
4,624,865	4,677,543	4,693,776	4,700,383
4,628,086	4,678,861	4,694,115	4,700,658
4,629,727	4,679,096	4,694,212	4,700,668
4,639,207	4,680,401	4,694,344	4,700,806
4,644,975	4,680,796	4,694,352	4,700,965
4,646,487	4,681,348	4,694,361	4,701,238
4,646,748	4,681,910	4,694,421	4,701,499
4,648,111	4,682,995	4,694,578	4,701,669
4,648,739	4,683,013	4,694,894	4,701,895
4,648,803	4,683,220	4,695,272	4,702,029
4,652,491	4,683,737	4,695,918	4,702,768
4,653,070	4,684,403	4,696,108	4,703,110
4,653,707	4,684,623	4,696,312	4,703,522
4,655,014	4,684,990	4,696,341	4,703,834
4,655,729	4,686,005	4,696,416	4,704,086
4,657,936	4,686,059	4,696,419	4,704,534
4,661,505	4,686,544	4,696,688	4,705,140
4,662,528	4,687,017	4,696,707	4,705,330
4,663,331	4,687,722	4,697,001	4,705,758
4,665,052	4,688,080	4,697,119	

Disclaimers

4,104,339.—*James G. Fetz,* Baldwin Park, and *Ronald P. Jensen,* Glendale, Calif. METHOD FOR THE MANUFACTURE OF INTRAOCULAR LENSES. Patent dated Aug. 1, 1978. Disclaimer filed Sept. 18, 1987, by the assignee, *Ronald P. Jensen.*

The term of this patent subsequent to Nov. 30, 1993 has been disclaimed.

4,507,783.—*Stewart S. Austin,* Morganville; *Joseph J. Baldini, III,* Lincroft; *Joel E. Jakubson,* Neptune; *Clarke S. Ryan,* Red Bank, all of N.J. ERROR DETECTION CIRCUITRY FOR DIGITAL SYSTEMS. Patent dated Mar. 26, 1985. Disclaimer filed Jan. 14, 1988, by the assignee, *Bell Telephone Laboratories, Inc.*

Hereby enters this disclaimer to claims 1-10 of said patent.

4,526,583.—*Anthony J. Gioffre,* Ridgefield, Conn. POWDERED CARPET TREATING COMPOSITIONS. Patent dated July 2, 1985. Disclaimer filed Jan. 12, 1988, by the assignee, *Union Carbide Corp.*

Hereby enters this disclaimer to claim 12 of said patent.

4,587,509.—*Gillies D. Pitt, Saffron Walden* and *Philip Extance,* Cambridge, United Kingdom. HALL EFFECT DEVICE WITH OVERLAPPING FLUX CONCENTRATORS. Patent dated May 6, 1986. Disclaimer filed Sept. 18, 1986, by the assignee, *STC, plc.*

Hereby enters this disclaimer to claims 1-17 of said patent.

Dedication

4,410,420.—*Barry Liss,* New York, N.Y.; *Michael Calderon,* Spotswood; and *Marvin S. Rakow,* East Brunswick, both of N.J. MULTI-ZONE CONVERSION PROCESS AND REACTOR ASSEMBLY FOR HEAVY HYDROCARBON FEEDSTOCKS. Patent dated Oct. 18, 1983. Dedication filed Dec. 31, 1987, by the assignee, *HRI, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

4,125,554.—*Barry N. Newton,* Lafayette, Ind. IODINATED THIOLCARBONATES AND METHOD FOR USE AS RADIOGRAPHIC CONTRAST AGENTS. Patent dated Nov. 14, 1978. Disclaimer and Dedication filed Dec. 29, 1987, by the assignee, *Alcon Laboratories, Inc.*

Hereby disclaims and dedicates to the Public the term of this patent subsequent to Dec. 31, 1986.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition). Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.
Box 8	All papers for the Office of the Solicitor.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box AF	Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.
Box FWC	Mail related to File Wrapper and Continuations.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents CASSIS. (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, Free Library of	(215) 686-5330
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin -Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 13, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	2-18-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-18-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	4-17-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-5-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	2-18-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-87

Expiration of patents: The patents within the range of numbers indicated below expire during February 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,559,209 to 3,566,408, inclusive
Plant Patents ..... Numbers 3,022 to 3,029 inclusive

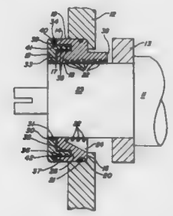
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REEXAMINATIONS

MARCH 15, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,466,620 (821st)
SEALING RINGS
David C. Orlowski, 2901 106th Ave. West, Milan, Ill. 61264
Reexamination Request No. 90/000,967, Mar. 13, 1986.
Reexamination Certificate for Patent No. 4,466,620, issued Aug. 21, 1984, Ser. No. 448,186, Dec. 27, 1982.
Int. Cl.[4] F16K *15/44*
U.S. Cl. 277—53



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–31** are cancelled.

New claims **32–34** are added and determined to be patentable.

32. A sealing ring for placement about a shaft extending through a housing and a bearing assembly means and of the type comprising:

(a) a first ring member;

(b) a second ring member;

(c) said first ring member having at one end thereof an external face adjacent the bearing assembly means and supported by a wall of the housing extending in a radial direction generally perpendicular to the shaft centerline the bearing assembly means being within said housing;

(d) said first ring member having an outermost internal mating face facing in the opposite direction to said external face and at a second end of said first ring member opposite said one end and generally perpendicular to the shaft centerline;

(e) said first ring member having an inner substantially cylindrical face extending axially with respect to the shaft centerline to provide a bore or opening in the first ring member through which the shaft may pass; said inner face along any point on any line perpendicular to said centerline being at a first radius;

(f) said first ring member having an outer face extending generally parallel to the shaft centerline and comprising a perimetrical outer surface, a part of said perimetrical outer surface providing contact between said outer face and said housing for supporting said first ring member, said perimetrical outer surface having an opening extending radially therethrough to an annular recess, said annular recess extending through said internal mating face and axially into said first ring member at said second end;

(g) said inner face having a series of annular grooves substantially perpendicular to the shaft and a trough interrupting said annular grooves so that said annular grooves are absent at said trough, said trough extending from the beginning of said annular grooves located closest to said outermost internal facing surface and thereafter sloping radially outwardly and axially to a third end of said first ring member facing in the same direction as said external face, said third end located between said one end and said second end;

(h) said second ring member having at one end thereof an internal mating face generally perpendicular to the shaft centerline extending in a radial direction complementary with the outermost internal mating face of said first ring member;

(i) said second ring member having an outermost external face extending in a radial direction generally perpendicular to the shaft centerline and facing in the same direction as said outermost internal mating face of said first ring member;

(j) said second ring member having an inner face generally parallel to the shaft centerline to provide an opening for the shaft to pass through and including means so that said second ring member can be supported by the shaft;

(k) said second ring member having an outer face extending generally parallel to the shaft centerline;

(l) said second ring member having an axially extending annular flange located at the internal mating face of said second ring member and extending into and complementary with said annular recess of said first ring member;

(m) said first ring member having an arcuate extension located axially between said third end and said one end of said first ring member, said arcuate extension having its arcuate extent bounded by two side edges, said arcuate extension having an inner substantially cylindrical surface having the same radius as said first radius so that said inner surface is an arcuate extension of said inner face; said inner surface having arcuate grooves therein extending from one of said two side edges to the other; said arcuate grooves of said extension being substantially perpendicular to the shaft, said side edges being circumferentially spaced from said trough, the housing and the shaft being relatively rotatable to each other, said first ring member supported by the housing being relatively rotatable to said second ring member supported by the shaft, the relative rotation causing said arcuate extension to ward off profuse quantities of fluid directed at the shaft, said annular and arcuate grooves and said trough aiding to carry fluid thereat into the housing.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,621

FRAME GIRDER FOR UNDERGROUND DRIFT AND SHAFT CONSTRUCTION

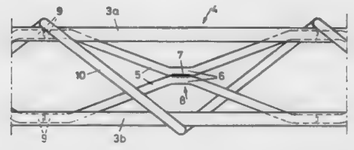
Edgar Arnold, Büron, Switzerland, assignor to Pantex-Stahl AG, Büron, Switzerland

Original No. 4,335,556, dated Jun. 22, 1982, Ser. No. 140,531, Apr. 15, 1980. Application for reissue May 4, 1984, Ser. No. 607,058

Claims priority, application Switzerland, Apr. 18, 1979, 3649/79

Int. Cl.[4] **E04H** *12/10;* **E04C** *3/02*

U.S. Cl. 52—655 **4 Claims**



1. Frame girder *as support* for *and concrete reinforcement in* underground drift and shaft construction, comprising

(a) at least three retainer bars forming a polygon in cross section;

(b) means for connecting said retainer bars in fixed, spaced relation to one another, said means comprising struts [corresponding in number to the number of retainer bars,], each [said strut being] bent so as to define a central [connecting] region and two terminal regions inclined toward [the] *a* corresponding retainer bar, said struts being located interiorly of said polygon formed by the cross sections of said retainer bars, the central connecting regions of said struts being rigidly connected together to form a strut cruciform [with a central stiffening joint], the outer end of each said strut being attached to a said retainer bar [.];

(c) *whereby said strut cruciform constitutes a sole element attached to all of said retainer bars and transmitting stresses to said retainer bars.*

Re. 32,622

METHOD FOR THE MANUFACTURE OF MOLDS USING CASTING SAND OR ANOTHER MIXTURE OF RAW MATERIAL PARTICLES

Christoph Landolt, Flint, Mich., assignor to George Fischer Foundry Systems, Inc., Holly, Mich.

Original No. 4,546,810, dated Oct. 15, 1985, Ser. No. 531,827, Dec. 9, 1982. Application for reissue Jul. 1, 1986, Ser. No. 880,721

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149172

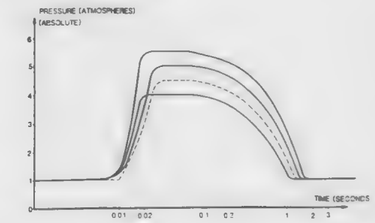
Int. Cl.[4] **B22C** *15/00*

U.S. Cl. 164—37 **26 Claims**

1. A method for manufacturing molds from casting sand or other mixture comprising raw material particles, binder and water, by applying a pressure surge wave to said casting sand or other mixture in a closed chamber, said pressure surge wave being formed by a process comprising the steps of:

(a) starting from atmospheric pressure in said chamber, increasing said pressure with a pressure gradient of at least about 50 atmospheres/sec to a [maximum] pressure of at least about 2 atmospheres;

(b) maintaining said [maximum] pressure [of at least] *in said chamber equal to or above* about 2 atmospheres for at least about 0.01 seconds;



(c) reducing said pressure [from said maximum pressure] to atmospheric pressure within [at least] about 0.2 seconds *or more* from the initiation of the pressure increase.

Re. 32,623

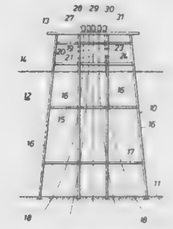
CURVED OFFSHORE WELL CONDUCTORS

Peter W. Marshall, Houston, Tex.; Peter Arnold, Mandeville, La., and Francis P. Dunn, Kingwood, Tex., assignors to Shell Oil Company, Houston, Tex.

Original No. 3,687,204, dated Aug. 29, 1972, Ser. No. 70,101, Sep. 8, 1970; Re. 28,860, dated Jun. 15, 1976, Ser. No. 326,706, Jan. 26, 1973; Reexamination Certificate No. B1 Re. 28,860, dated Sep. 3, 1985, Request No. 90/000,412, Jun. 27, 1983 and Request No. 90/000,607, Aug. 13, 1984. Application for reissue Oct. 14, 1986, Ser. No. 918,195

Int. Cl.[4] **E21B** *7/04, 7/136, 17/00*

U.S. Cl. 175—9 **31 Claims**



1. A method for producing hydrocarbons from a subterranean hydrocarbon-bearing formation located beneath the floor of a body of water, said method comprising the steps of:

installing a platform structure on the floor of said body of water above said formation;

extending at least one well conductor downwardly [with respect to] *within* said platform structure, then curving said conductor *from a normally vertical position within said platform structure* outwardly and downwardly through a *portion of the vertical height of* said platform structure above the floor of said body of water *and thence entering the floor of the body of water along a* [[*curved*]] *path* in a manner maintaining a relatively smooth bore throughout substantially the entire extent of said conductor;

drilling via said conductor down through said floor and into fluid communication with said formation; and

producing formation fluids from said formation via said conductor.

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7. Apparatus for producing hydrocarbons from a subterrean hydrocarbon-bearing formation located beneath the floor of a body of water, said apparatus comprising:

a platform structure disposed on the floor of said body of water;

at least one well conductor extending downwardly [with respect] *within* to said platform structure, then *from a normally vertical position within said platform structure being curved outwardly* and downwardly through *at least a portion of the vertical height of* said platform structure [above] *and out the bottom thereof at* the floor of said body of water *and thence entering the floor of the body water along a* [[*curved*]] *path,* said conductor having a relatively smooth bore throughout substantially the entire extent thereof;

a drilled well communicating with both said conductor and said formation; and

formation fluids recovery means associated with said conductor for recovering formation fluids produced from said formation via said conductor.

Re. 32,624

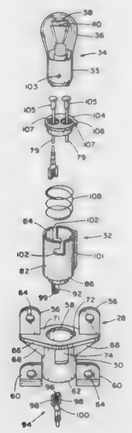
SHOCK-REDUCING LAMP ASSEMBLY FOR VEHICLES

Sam A. Myles, Oak Park, and Paul C. Katz, Chicago, both of Ill., assignors to Triplex Manufacturing Co., Chicago, Ill.

Original No. 4,591,961, dated May 27, 1986, Ser. No. 764,831, Aug. 9, 1985. Application for reissue May 7, 1987, Ser. No. 47,977

Int. Cl.[4] F21V *15/04*

U.S. Cl. 362—390 **17 Claims**



16. An integral shock isolation mount formed of a resilient insulative material for use in a mounting assembly for a vehicular lamp, said mount comprising:

a central portion having a central opening in which is disposed metallic means for establishing electrical contact with said lamp, said portion having a first end and a second end;

a first pair of spaced mounting feet disposed adjacent said first end; and

a second pair of spaced mounting feet disposed adjacent said second end, said foot having a pin-receiving aperture, said first pair of legs extending in a first plane and said second pair of legs extending in a second plane, said planes being spaced and being substantially parallel.

Re. 32,625

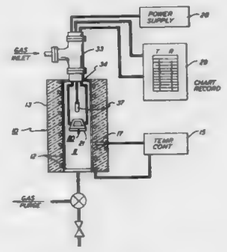
DYNAMIC TESTING OF ELECTRICAL CONDUCTORS

James A. Schwarz, Fayetteville, and Robert W. Pasco, Wappingers Falls, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Original No. 4,483,629, dated Nov. 20, 1984, Ser. No. 455,852, Jan. 5, 1983. Application for reissue Aug. 18, 1986, Ser. No. 898,032

Int. Cl.[4] G01N *27/14;* **G01R** *27/02*

U.S. Cl. 374—57 **10 Claims**



1. A method for determining the kinetic parameters of activation energy and pre-exponential factor which characterizes electromigration failure in a thin film conductor that is subject to high current densities at elevated temperatures, said method [includes] *including* the steps of

placing a thin film conductor in a [predetermined atmosphere] *testing device,*

electrically stressing the thin film conductor, while in said [atmosphere] *testing device,* by applying a uniform current thereto,

heating the stressed conductor to increase the conductor temperature at a linear rate with respect to time,

measuring changes in resistance of the current stressed conductor as it is being heated at a linear rate,

reducing the measured changes in resistance by those changes due to the temperature dependent components of resistance to determine the changes in resistance produced by the electromigration failure process,

determining the activation energy and pre-exponential factor by relating the measured changes in resistance with respect to time produced by the electromigration failure process to the following zeroth order rate expression:

$$1/R_o\, dR/dt = A \exp(-Q/kT)$$

where: R_o is the initial resistance of the thin film conductor, dR/dt is the variation in the conductor resistance produced by the electromigration process, Q is the activation energy for the process, A is the pre-exponential for the process, k is Boltzmann's constant and T is absolute temperature.

PLANT PATENTS

GRANTED MARCH 15, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,127

EUONYMUS PLANT NAMED MOONSHADOW

Thomas F. Dugan, Perry, Ohio, assignor to Dugan Nurseries, Incorporated, Perry, Ohio

Filed Feb. 25, 1986, Ser. No. 833,052

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—63 **1 Claim**

1. A new and distinct cultivar of Euonymus plant known by the cultivar name Moonshadow, as illustrated and described, and characterized particularly as to uniqueness by the combined characteristics of low, rounded, compact and shapely habit of growth; good winter hardiness, and thick broadleaf evergreen foliage having pronounced large yellow centers with very thin dark green margins of irregular depth, with the leaves inside the plant being of the same variegated color as the stem tips, thereby giving the plant as a whole a distinctive and striking light yellow spotted appearance, with curly leaf texture.

6,128

EUONYMUS PLANT NAMED THUNDERBOLT

Thomas F. Dugan, Perry, Ohio, assignor to Dugan Nurseries, Incorporated, Perry, Ohio

Filed Feb. 25, 1986, Ser. No. 833,053

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—63 **1 Claim**

1. A new and distinct cultivar of Euonymus plant known by the cultivar name Thunderbolt, as illustrated and described, and characterized particularly as to uniqueness by the combined characteristics of profuse yellow-green flower display in May; upright, spreading and vigorous habit of growth; good winter hardiness; large thick broadleaf evergreen foliage having pronounced narrow yellow centers with broad dark green margins of irregular depth with the leaves inside the plant being of the same variegated color as the stem tips, thereby giving the plant as a whole a distinctive and dark green appearance accented by irregular bolt shaped stripes of yellow variegation.

6,129

CHRYSANTHEMUM PLANT NAMED PINK AROLA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 25, 1986, Ser. No. 833,054

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct Chrysanthemum plant named Pink Arola, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red-purple ray floret color; diameter across face of capitulum of up to 6.5 cm. at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height when grown as a pinched spray pot mum, and spreading branching pattern.

6,130

CHRYSANTHEMUM PLANT NAMED TOGOS

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1986, Ser. No. 833,175

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct Chrysanthemum plant named Togos, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; greyed-orange ray floret color; diameter across face of capitulum of up to 8 cm. at maturity; uniform nine week photoperiodic flowering responses to short days; tall plant height when grown single stem, and 8 to 13 cm. peduncles on open, terminal sprays.

6,131

CHRYSANTHEMUM PLANT NAMED THEME

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1986, Ser. No. 833,178

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct Chrysanthemum plant named Theme, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red ray floret color, with excellent color retention under high light conditions; diameter across face of capitulum of up to 10 cm. at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height when grown as a pinched disbudded pot mum; and spreading branching pattern.

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PATENTS

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ERRATA

For CLASS	See PATENT NO.
051-387	4,720,430
057-281	4,720,450
057-401	4,720,451
239-416	4,720,784
239-453	4,720,785
239-590	4,720,786
296-197	4,720,870
423-470	4,721,128
514-227	4,721,241
424-112	4,721,307
437-041	4,721,318
528-125	4,721,442
381-063	4,731,835

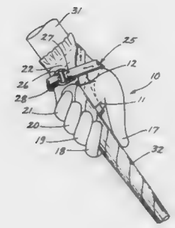
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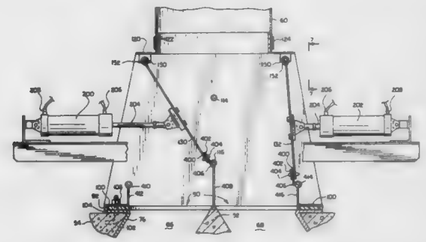
GENERAL AND MECHANICAL

4,730,354
GLOVE
Edwin T. Saito, 3628 Aliamanu St., Honolulu, Hi. 96818
Filed Feb. 26, 1987, Ser. No. 19,428
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A 1 Claim



1. A sport apparatus comprising:
a glove adapted to extend over the hand of a human being, said glove including four finger covering positions, a thumb covering portion, a palm covering portion, a portion for covering the back of a hand and a wrist covering portion wherein all of said portions are interconnected together;
a strap having a metal "D" ring on one end;
a first hook type fastening section on one side of one end of said strap;
a second pile type fastening section means on an intermediate portion of one end of said one side of the strap for selectively attaching or detaching the first hook type fastening section to the second pile type fastening section means;
a first pair of parallel slots disposed in the palm covering portion, said first pair of parallel slots being generally transversely disposed with respect to the longitudinal direction of the thumb covering portion;
a second pair of slots disposed in the portion of the glove for covering the back of the hand; and
said strap extending through said first and second pair of slots and over the glove between the thumb covering section and the adjacent finger covering section, said strap also extending from said pair of slots to said ring on said one end, said ring being positioned over a portion of said wrist covering portion, said strap also extending from said first pair of slots over the base of the thumb covering portion, around the back of the wrist covering portion and around the front of the wrist covering portion, said strap extending through said metal "D" ring and doubled back with a firm pull to engage the first hook type fastening section with the second pile type fastening section means for holding the glove and any hand therein from movement with respect to the wrist section, said strap crisscrossing on the wrist covering portion of the glove adjacent to the palm covering portion.

4,730,355
PNEUMATIC WAVE GENERATOR EMPLOYING FOUR-WAY VALVE ARRANGEMENT
Mark L. Kreinbihl, 136 Creston Rd., Mansfield, Ohio 44906; Randall L. Mosher, 833 W. Main St., Loundonville, Ohio 44842; Kevin D. Pramer, 185 Rowland Ave., Mansfield, Ohio 44903, and Robert P. Miller, 3643 N. Elyria Rd., Wooster, Ohio 44691
Filed May 8, 1986, Ser. No. 861,142
Int. Cl.[4] A47K *3/10*
U.S. Cl. 4—491 16 Claims



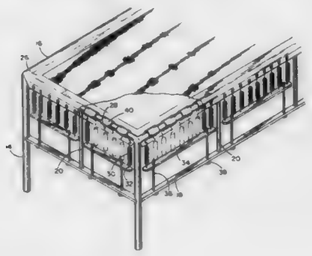
1. Apparatus for pneumatically generating waves in a wave pool having water therein, said wave pool having a plurality of wave generating chambers arranged side-by-side extending across said pool at one end thereof wherein each said wave chamber has a below the water passageway in communication with said pool and a sealed portion located above the normal water level of said pool, each said chamber having an inlet-outlet passageway above said water level, said passageway serving in one mode as an inlet for receiving forced air and in the second mode as an outlet for exhausting air from a said chamber, said apparatus comprising:
a source of forced air; and
valve means communicating with said source and with first and second said inlet-outlet passageways respectively associated with first and second wave generating chambers, said valve means having a first condition for simultaneously providing air flow from said source into both of said first and second chambers, a second condition for providing air flow into said first chamber while exhausting said second chamber, a third condition for providing air flow into said second chamber while exhausting said first chamber, and a fourth condition for blocking air flow from said source while exhausting both said first and second chambers.

4,730,356
BED HAVING ADJUSTABLE TENSION CONTROL
George R. Suzuki, 12861 Wheeler Pl., Santa Ana, Calif. 92705
Filed Oct. 16, 1985, Ser. No. 788,119
Int. Cl.[4] A61G *7/00*; A47C *3/00*
U.S. Cl. 5—187 2 Claims

1. A bed comprising:
a frame;
a stretchable mat; and
means connecting said mat to said frame for selective adjustment of the tension applied to said mat whereby to prevent sagging of said mat otherwise resulting from the use of said bed,
at least one spring tension bar, said mat having a plurality of grommeted holes along the perimeter thereof, said connecting means comprising a plurality of springs, each said

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spring being connected at one end to a grommeted hole and connected at a second end to said spring tension bar,
each said spring tension bar being adjustably connected in spaced relation to said frame whereby adjustment of said spring tension bar for varying said spaced relation changes said tension applied to said mat,
said mat comprising an interleaved mesh of a plurality of vinyl covered polyester cords, and



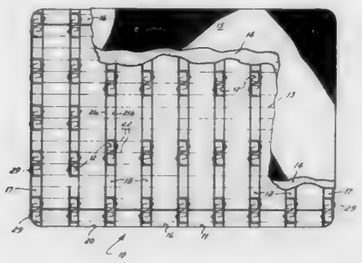
a rubberized plastic material;
a lumbar support affixed to said frame immediately beneath said mat, wherein said lumbar support comprises at least one elongated, substantially planar S-shaped spring configured to protrude into said mat for supporting the lower back region of a user.

4,730,357

BEDDING BOX SPRING

Thomas J. Wells, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 17, 1987, Ser. No. 27,153
Int. Cl.[4] A47C *23/02*
U.S. Cl. 5—247 **19 Claims**



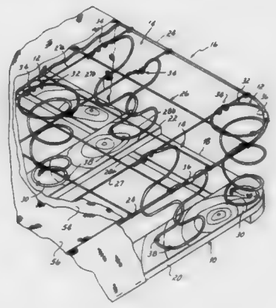
1. A bedding spring product comprising
a horizontally disposed, generally rectangular frame,
a plurality of formed wire springs mounted on said frame and extending upwardly therefrom, each of said springs comprising a unitary wire member having a generally horizontal load supporting portion and yieldable end portions depending from the ends of said load supporting portion, said yieldable end portions of said springs being supported upon said frame,
a generally horizontal grid supported atop said horizontal load supporting portion of said springs, said grid being defined by a first plurality of spaced parallel wires and a second plurality of spaced parallel wires extending perpendicular to said first plurality of wires, said load supporting portion of each of said springs being formed from curvilinear sections formed into a generally S shape, said S-shaped load supporting portion having its opposite ends connected to said yieldable end portions of said spring,
at least two of said first plurality of spaced parallel wires of said grid being secured to said curvilinear sections of each of said S-shaped load supporting portion of each of said springs,
padding over the top of said grid, and
an upholstered covering encasing said frame, wire springs, grid and padding.

4,730,358

SINUOUS SPRING MODULE BOX SPRING ASSEMBLY

Henry Zapletal, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Continuation of Ser. No. 732,373, May 9, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 30,461
Int. Cl.[4] A47C *23/02*
U.S. Cl. 5—247 **15 Claims**



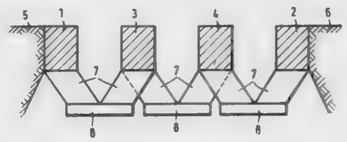
1. A bedding foundation box spring comprising,
a bottom, substantially rectangular, base frame having side and end members and slats extending between said side members,
a substantially planar rectangular top wire grid, said grid comprising a border wire and first and second sets of wires, said border wire being of rectangular configuration and surrounding said first and second sets of wires, said first set of wires comprising a plurality of longitudinally extending, spaced, parallel wires and said second set of wires comprising a plurality of transversely extending, spaced, parallel wires, said first and second sets of wires intersecting one another and being welded together at their intersections, said first and second sets of wires being fixedly connected to said border wire,
a plurality of coil springs interconnecting said bottom frame and said top grid,
a plurality of sinuous wire springs interconnecting said base frame and said wire grid, said sinuous wire springs each comprising a sinuous spring strip made from wire bent back and forth to have oppositely facing edge loops interconnected by straight torsion bar sections, each of said strips being formed into a generally U-shaped configuration having substantially vertical legs interconnected by a substantially flat bottom section, said flat bottom section of each of said sinuous wire springs being fixedly secured to said base frame and the upper ends of said vertical legs of each of said sinuous springs being fixedly secured to said top wire grid,
each of said vertical legs of each of said U-shaped sinuous wire springs consisting of three edge loops interconnected by a pair of straight torsion bars, the topmost one of the edge loops being connected to a third free end straight torsion bar, and said flat bottom section of each of said U-shaped sinuous wire springs consisting of a single edge loop and a pair of straight torsion bars connected to opposite ends of said single edge loop,
a fabric pad overlying said top wire grid, and
an upholstered covering surrounding said base frame, wire grid, border wire, sinuous wire springs, and said fabric pad.

4,730,359

DEVICE FOR CONTROLLING THE SPACING OF THE PLATES ON A BRIDGING ARRANGEMENT FOR EXPANSION JOINTS IN BRIDGES OR THE LIKE

R. Huber, Büilach, Switzerland, and W. Koster, Forsbach, Fed. Rep. of Germany, assignors to Kober AG, Glarus, Switzerland

Filed Sep. 17, 1984, Ser. No. 650,836
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333880
Int. Cl.[4] E01D *19/06*
U.S. Cl. 14—16.5 **7 Claims**



1. Apparatus for controlling the lateral spacing between adjoining members having upper and lower surfaces, comprising
first flexible means deformable in shear extending transversely from a lower surface of one of the adjoining members;
second flexible means deformable in shear extending from a lower surface of another of the adjoining members spaced a distance from the first flexible means; and
means having an upper surface and a first and second end for connnecting the extensions of the first flexible means at said first end and the second flexible means at said second end;
wherein the flexible means form a plurality of chains interlinking the adjoining members; and
wherein at least one of the chains has maximum stress when the spacing between the lateral members is minimum and the spacing of the first and second flexible means is a first distance and said chain is positioned alternately with another of the chains which has minimum stress when the spacing between adjoining members is minimal and the spacing of the first and second flexible means is a second distance;
wherein said adjoining members have a lateral void therebetween and said flexible members are blocks of parallelopipedal elastomeric material.

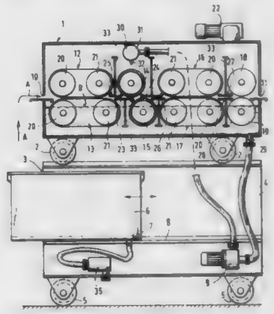
4,730,360

APPARATUS FOR CLEANING TEXTILE SLATS OF VENETIAN BLINDS OR THE LIKE

Peter Brügelmann, Isidor-Caro-Strasse 62, D-5000 Köln 80, Fed. Rep. of Germany

Filed Jul. 31, 1985, Ser. No. 760,902
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501320
Int. Cl.[4] A46B *13/04*
U.S. Cl. 15—77 **45 Claims**

1. Apparatus for cleaning textile slats of Venetian blinds or the like comprising:
a fluid-tight box containing a fluid bath, said box housing at least one driven brush roller pair having an upper brush roller and a lower brush roller mounted so as to form a gap thereinbetween for slats to pass therethrough, said gap having an intake side and a discharge side, said lower brush roller being mounted to dip into the fluid bath in the box;
spray means for directing fluid against the upper brush roller;
conveyor means for advancing slats, said conveyor means having a pair on conveyor belt pairs, a first pair of conveyor belts being mounted upstream of the brush roller pair and the second pair of the conveyor belts being mounted downstream of the brush roller pair, each pair of conveyor belts having a peripheral speed, the peripheral



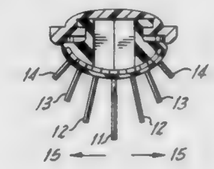
speed of the downstream conveyor belts being higher than the peripheral speed of the upstream conveyor belts; and
guide members for guiding slats, said guide members being arranged at the intake and discharge sides of the gap, said guide members cooperating with said conveyor belt pairs to form a linear guide channel for slats.

4,730,361

HAIRBRUSH CONSTRUCTED AND ARRANGED TO LIFT AND SHAPE HAIR

Henry Koffler, 8956 NW. 9th Pl., Plantation, Fla. 33324

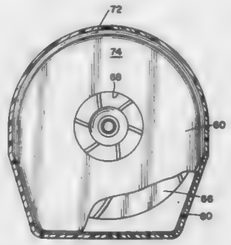
Filed Jul. 21, 1986, Ser. No. 887,216
Int. Cl.[4] A46B *9/02*
U.S. Cl. 15—160 **6 Claims**



1. A hairbrush comprising an arcuately curved base portion supporting hair grooming means consisting essentially of bristles constructed and arranged in a plurality of generally parallel, longitudinally extending, transversely spaced rows in such a manner that the ends of said bristles of a set of at least three of said consecutive rows lie in one flat oblique plane and the ends of said bristles of another set of at least three of said consecutive rows lie in another flat oblique plane that intersects said one flat oblique plane, wherein said rows include a row containing bristles of shortest length at each side of said base flanked by rows of bristles of increasing length from row to row toward a row of longest bristles at the longitudinal center line of said base, all of said bristles lying in one or another of said two flat oblique planes.

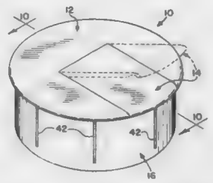
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4,730,362
HAND VACUUM CLEANER
John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Bramhall, Boulder, Colo., assignors to Royal Appliance Manufacturing Co., Cleveland, Ohio
Division of Ser. No. 670,553, Nov. 9, 1984, Pat. No. 4,633,543.
This application Jun. 24, 1986, Ser. No. 877,881
Int. Cl.[4] A47L 9/00
U.S. Cl. 15—339 2 Claims



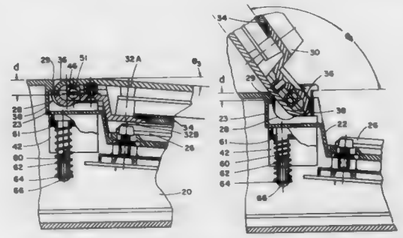
1. A hand-held vacuum cleaner having a housing, a handle depending from the housing, a fan chamber, a fan contained by the housing in the fan chamber, a nozzle and a rotating brush contained by the nozzle;
said housing further including a stone shield circumferentially spaced about said fan including a side wall extending in the fan chamber across the full axial width of the fan in the chamber whereby the stone shield fully blocks items from impinging against the housing from the fan at any point along the axial width of the fan from damaging the housing.

4,730,363
WIRING GROMMET WITH RETRACTABLE LID
Ahmad A. Asbaghi, North Redondo Beach, Calif., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Sep. 17, 1986, Ser. No. 908,285
Int. Cl.[4] F16L 5/00
U.S. Cl. 16—2 3 Claims



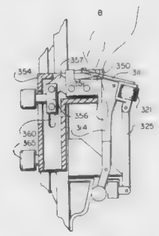
1. A wiring grommet comprising a sleeve having a generally hollow cylindrical outer body and an integral outwardly extending lip at one end, said lip joining with said outer body so as not to extend radially inwardly of said outer body, a cylindrical cover having a planar upper portion and an axially extending portion shaped to nest closely within said outer body, an opening formed in said planar upper portion extending from its center portion to its outer marginal edge, a bar extending transversely across said opening adjacent its innermost end to define a slot therebetween, a retractable lid separably and slidably engaged within said slot, said lid having a shape conforming to the shape of said opening but of slightly smaller dimensions to provide a nesting within said opening in the closed position and having a thickness equal to the thickness of said planar upper portion of said cylindrical cover, an offset flange extending from the inner end of said lid on its lower surface, said flange having an ear extending laterally from each end beyond the width of said lid to provide a stop by the ears abutting one of the underside of the lid or the bar for preventing removal of said inner end of said lid from said slot in an outward direction and a protrusion formed on said lower surface of said lid at its outer end to provide a stop by the protrusion abutting the upper surface of the bar for preventing removal of said outer end of said lid from said slot in an inward direction and a gap being formed between said outer end and said innermost end of said slot when said lid is in the open position to permit pivotal movement of said inner end of said lid relative to said slot when said lid is in the said open position.

4,730,364
DATA PROCESSOR FLUSH HINGE ASSEMBLY
Chan Tat-Kee, Kowloon, Hong Kong, assignor to Bondwell Holding Ltd., Kung Tung, Hong Kong
Filed Oct. 29, 1985, Ser. No. 792,497
Int. Cl.[4] E05D 1/108; E05C 17/64
U.S. Cl. 16—337 11 Claims



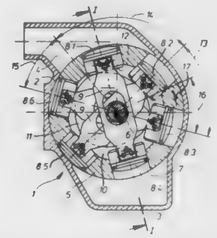
7. For hinging a display panel flush within a recess contained in a surface of a data processor, a combined flush hinge and hold-open, comprising:
a journal box having a cylindrical shaft hole passing through one side about an axis parallel to said surface, a cylindrical bearing hole of larger diameter passing through the opposite side to intersect said shaft hole co-axially to form a stepped shoulder at the bottom thereof normal to said axis, said journal box being slidably-retained within said recess for inward and outward movement relative to said surface;
a spring attached to the inward side of said journal box at one end and to the underside of said surface in said recess at the other for biasing said journal box in said inward direction;
a cylindrical bearing having a cylindrical shaft hole passing co-axially therethrough, said bearing having an inner portion contained co-axially within said bearing hole for rotational movement therein, with a flat, inner end normal to said axis and opposed to said shoulder and an outer portion extending outward from said journal box;
an O-ring compressed co-axially between said bearing inner end and said bearing hole stepped shoulder for a wiping, frictional fit therebetween;
a cylindrical shaft having a head at one end and fastener means at the other, said shaft passing through said bearing shaft hole, said O-ring and said journal shaft hole, for retaining said bearing and said O-ring in said bearing hole with said shaft head and for compressing said O-ring between said bearing end and said stepped shoulder, whereby said wiping, frictional fit may be adjusted by adjustment of said fastener means;
a gudgeon attached to said panel at one edge, said gudgeon having an aperture through one side to receive said bearing outer portion therein without relative rotation, for hingably-attaching said panel to said journal box, said gudgeon having an outwardly-convex, spiral surface about an axis parallel with said bearing hole axis; and
a pillow block mounted in said recess, having an upwardly-concave, involute profile in sliding contact with said gudgeon spiral surface, for forcing said gudgeon outwardly and against said spring when said panel is rotated out of said recess,
whereby said panel may be rotated to a selectable, angular position between 90 and 135 degrees relative to said surface before contacting said recess upper edge, and said panel is held in said selectable position by said wiping, frictional fit.

4,730,365
POULTRY NECK BREAKER ASSEMBLY
Lacy Simmons, 101 Simmons Industrial Blvd., Dallas, Ga. 30132
Continuation-in-part of Ser. No. 761,424, Aug. 1, 1985, Pat. No. 4,619,017, which is a division of Ser. No. 517,811, Jul. 27, 1983, Pat. No. 4,550,473, which is a division of Ser. No. 284,087, Feb. 16, 1981, Pat. No. 4,532,676, which is a continuation-in-part of Ser. No. 873,370, Jan. 30, 1978, abandoned. This application Oct. 27, 1986, Ser. No. 923,264
Int. Cl.[4] A22C 21/00
U.S. Cl. 17—12 3 Claims



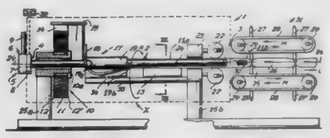
1. A poultry neck breaker assembly, said assembly including a module (**10**) having a support frame (**354**), means for mounting said support frame for vertical sliding movement on said assembly, a breaking block (**350**) carried by said support frame, a cam follower (**355**) mounted in said support frame for vertical sliding movement thereon, and link means (**357**) connected between said cam follower and said breaking block for moving said breaking block horizontally upon vertical movement of said cam follower.

4,730,366
APPARATUS FOR DELIVERING PORTIONS OF A PASTY SUBSTANCE
Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co., KG, Lubeck, Fed. Rep. of Germany
Filed May 20, 1987, Ser. No. 52,771
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617396
Int. Cl.[4] A22C 11/04
U.S. Cl. 17—37 4 Claims



1. An apparatus for discharging portions of at least one of uniform weight and volume of a pasty substance, particularly sausage stuffing, said apparatus comprising
a conveying mechanism, which includes
rotor means, driven to rotate about an axis of rotation and comprising
stationary control cam means designed with a discharge motion controlling section;
a plurality of portion chambers for receiving said substance to be discharged; and
a corresponding number of displacer pistons arranged in said portion chambers to be displaced therein during said rotation of said rotor mean by operatively engaging said cam means; and
casing means, surrounding said rotor and designed with at least one supply and one discharge opening for said substance,
the displacement of said pistons being such that, over a complete rotation of said rotor means, proportionality is obtained between the discharge of the substance and the angle of rotation of the rotor, w h e r e i n said discharge motion controlling section comprises
a run-up section,
an involute section and
a run-off section,
said run-up and run-off sections being designed such that the summation value of the imaginary radii drawn between said rotor axis and points, respectively, defined by said engagement of said displacer pistons with said sections during said discharging of said substance follows a linear function depending on the rotational angle of said rotor means.

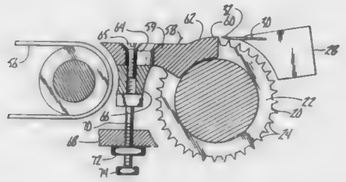
4,730,367
APPARATUS AND METHOD FOR PRODUCING SAUSAGES
Isaac Vinokur, Buenos Aires, Argentina, assignor to Envaril, S.A., Buenos Aires, Argentina
Filed Sep. 22, 1986, Ser. No. 910,723
Claims priority, application Argentina, Sep. 26, 1985, 301.744
Int. Cl.[4] A22C 11/10
U.S. Cl. 17—49 6 Claims



6. A method for producing sausages by forming a strip-like film into a tubular casing and injecting a flowable meat mass into such casing, comprising the steps of:passing said strip-like film through a bending member which converts it into a tubular film with overlapping side edges, the tubular film surrounding and being moved along a tubular member conducting such meat mass while the tubular member and the tubular film are simultaneously rotated; welding the overlapping solid edges of the tubular film so as to form a tubular casing while being rotated; injecting the flowable meat mass from the tubular member into the welded tubular casing; and preventing rotation of the portion of the welded tubular casing containing the meat mass at successive spaced apart locations thereon; whereby successive twisted gaps are formed in said tubular casing at such spaced locations which define a continuous string of sausages.

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4,730,368
METHOD AND MEANS OF SKINNING MEAT
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Continuation of Ser. No. 821,433, Jan. 21, 1986. This application Feb. 2, 1987, Ser. No. 10,161
Int. Cl.[4] A22C 7/12
U.S. Cl. 17—50 4 Claims



2. The method of skinning meat on a skinning machine comprising a frame, a powered grippig roll having a plurality of gripping teeth rotatably mounted on said frame, a cutting blade having a cutting edge mounted on said frame with said cutting edge being closely spaced from and parallel to said roll, a support means on said frame adjacent said gripping roll for supporting meat products having a membrane on the lower surface thereof to be moved towards said cutting blade, a shelf means on said frame immediately adjacent said cutting edge and including a meat supporting edge which extends beyond the periphery of said gripping roll for supporting said meat products comprising,

moving a meat product to be skinned on said support means, and thence on said meat supporting edge in a path beyond the periphery of said gripping roll toward said cutting edge,

movably supporting said meat product immediately adjacent said cutting edge at a position beyond the periphery of said gripping roll until just prior to the time that said meat product moves into contact with said cutting edge to permit said meat product to move in an angular direction towards said gripping roll and into contact with said cutting edge to permit said cutting edge to separate said membrane from said meat product whereby said separated membrane will engage said teeth and be pulled away from said cutting edge by said teeth in a path between said cutting blade and said teeth,

adjusting the position of said shelf means with respect to said cutting edge of said blade to adjust the thickness of said meat product to be removed in conjunction with the removal of the membrane to be removed from said meat product.

4,730,369
METHOD AND APPARATUS FOR MELTING AND RECOVERING SULFUR IN AQUEOUS SLURRIES
Gary J. Nagl, Hoffman Estates, and Leslie C. Hardison, Barrington, both of Ill., assignors to ARI Technologies, Inc., Palatine, Ill.
Filed Jun. 16, 1986, Ser. No. 874,869
Int. Cl.[4] C01B 17/027
U.S. Cl. 23—293 S 4 Claims

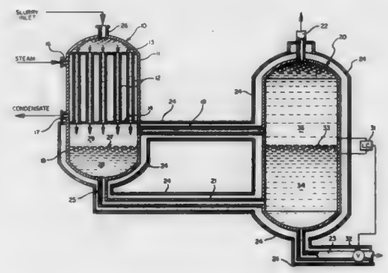
1. Apparatus for liquefying and separating sulfur from a slurry thereof in an aqueous liquid, said apparatus comprising:

a first vessel having an upper and lower end and an upper section and a lower section, said upper section including a shell-and-tube heat exchanger with vertical tubes through which the slurry can be passed downwardly to liquefy the sulfur contained therein, said lower section of said vessel being constructed to act as a gravity separation zone having an upper end wherein separate liquid phases of molten sulfur and aqueous liquid collect;

a slurry inlet in said first vessel communicating with said upper section;

a second vessel having an upper and lower end;

first conduit means for liquid flow communicating from a point adjacent the upper end of said separation zone to an intermediate point in the elevation of said second vessel;

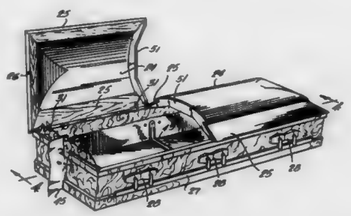


second conduit means for liquid flow communicating from the lower end of said first vessel to a point adjacent the lower end of said second vessel;

an aqueous liquid outlet communicating with said second vessel at its upper end; and

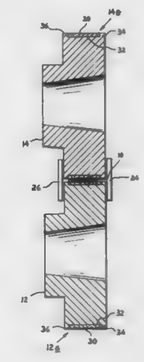
a liquid sulfur outlet communicating with said second vessel at its lower end.

4,730,370
CASKET AND METHOD OF MANUFACTURE
Bruce E. Elder, Royal Oak, Mich., assignor to Vandor Corporation, Royal Oak, Mich.
Filed Oct. 3, 1983, Ser. No. 538,124
Int. Cl.[4] A61G 17/00
U.S. Cl. 27—4 7 Claims



1. A method for forming a casket comprising a base or shell and a lid, the shell having planar bottom, side and end walls, and the lid being domed, which method comprises cutting a planar sheet of corrugated fiberboard to form a blank having interconnected portions of areas corresponding to the bottom, side and end walls of the shell and with the side and end wall areas connected with the bottom wall area along lines corresponding to the edges of the bottom wall of the shell being formed, scoring the cut piece of fiberboard along said lines corresponding to the edges of the bottom wall, flexing the side and end wall areas on the scored lines and thereby position the side and end wall areas of the sheet in the planes of the side and end walls of the shell being formed, securing a rim to the upper edge of the casket shell being formed, forming a cover or lid having marginal bevelled edges and further having a central portion of domed configuration between the bevelled edges, the central domed portion being formed by molding stacked flat fiberboard sheets and corrugated sheets in said domed configuration of the lid, and the bevelled edges being formed by applying a frame surrounding the domed central portion of the lid, and pivotally interconnecting the lid frame and said rim of the shell, and further in which the bevelled edges and domed portion of the lid are formed in two halves and in which the frame secured to the lid joins the two halves, the method still further including securing to the inside of the bevelled edge and domed halves of the lid a pair of transversely extending bridge members, the bridge members being positioned adjacent to the adjoining ends of the lid halves and being spaced from each other in a direction lengthwise of the lid to provide for severing of the lid frame in a vertical plane between said bridge members and thus for alternative use of the lid either as a complete lid for the associated casket or as a split lid for the casket.

4,730,371
COATED CRIMPER ROLLS
Clarke R. Broaddus, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 17, 1987, Ser. No. 15,617
Int. Cl.[4] D02G 1/12
U.S. Cl. 28—269 2 Claims



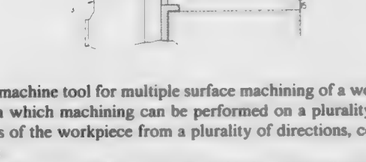
1. In a stuffer box crimping apparatus for crimping synthetic filamentary tow including a stuffer box having an entrance, a pair of driven cylindrical metal rolls having cooperating peripheral surfaces that extend from edge to edge of each roll in a common diameter which form a nip to forward the tow to the stuffer box and which are adjacent said entrance, means to restrict egress of the two from the stuffer box and means to prevent lateral egress of the tow between said nip and said entrance, the improvement comprising, the peripheral surface of each roll having an undercut portion located between opposite edge portions of the roll and a hard wear resistant coating filling said undercut portion to said peripheral surface from edge portion to edge portion whereby each edge of said roll is protected by metal to prevent said coating from chipping during grinding of the roll sides of wear from the means to prevent lateral egrees of the tow between said nip and said entrance.

4,730,372
APPARATUS FOR FABRICATING BLIND
Kazuo Tsuchida, Shiga, Japan, assignor to Tachikawa Corporation, Japan
Filed Aug. 4, 1986, Ser. No. 892,904
Claims priority, application Japan, Aug. 21, 1985, 60-183474
Int. Cl.[4] B23P 19/04
U.S. Cl. 29—24.5 13 Claims

1. An apparatus for fabricating a blind:

said blind having a plurality of horizontal slats, at least a pair of ladders with vertically spaced horizontal members to support said slats, said slats also having insertion holes for ascending-descending cords, and ascending-descending cords at said ladders through said holes in said slats;

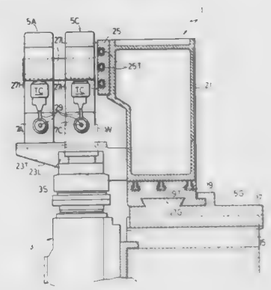
said apparatus comprising: input devices for inputting and storing information with respect to the height of said blind and the length of a said slat; an arithmetic and logic computing means for receiving output signals of the stored information from the input devices for determining the number of steps of said slats which corresponds to the inputted height of said blind and corresponds to positions



on said slats at which said insertion holes for the ascending-descending cords are formed;

and a slat inserting device for receiving output signals from the arithmetic and logic computing means and for cutting slat material to a predetermined length on the basis of the output signals of said arithmetic and logic computing means, for forming said insertion holes in each of the slats for said ascending-descending cord in said slats, and for inserting said slats through a plurality of said ladder cords.

4,730,373
MACHINE TOOL FOR MULTIPLE SURFACE MACHINING
Atsushi Senoh, Anjo, Japan, assignor to Washino Engineering Company, Limited, Japan
Continuation of Ser. No. 716,927, Mar. 28, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 938,352
Claims priority, application Japan, Mar. 30, 1984, 59-060883
Int. Cl.[4] B23P 23/02
U.S. Cl. 29—26 A 2 Claims



1. A machine tool for multiple surface machining of a workpiece in which machining can be performed on a plurality of surfaces of the workpiece from a plurality of directions, comprising:

a workpiece supporting device provided on a first base and having a workpiece supporting portion which is freely rotatable and freely adjustable in a vertical direction;

said workpiece supporting portion being adapted to be indexed to a desired rotary angle;

a slide base freely adjustably movable on said first base in a horizontal direction towards and away from said workpiece supporting device;

a tool supporting table provided on said slide base, said tool supporting table being freely adjustably movable in a

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horizontal direction orthogonal to the direction of movement of the slide base;

a plurality of vertical surface machining devices mounted on said tool supporting table to perform vertical surface machining on a workpiece that is supported by said work supporting portion;

wherein said plurality of vertical surface machining devices are arranged in a multiple of rows in the direction of movement of the slide base and the direction of movement of the tool supporting table, respectively;

a plurality of horizontal machining devices mounted on said tool supporting table and disposed on opposite sides of the workpiece to perform machining on the workpiece from the horizontal direction;

wherein the plurality of horizontal machining devices mounted on said tool supporting table are arranged in the direction of movement of the slide base;

wherein a predetermined number of vertical machining devices and horizontal machining devices are arranged within a same plane; and

further comprising a numerical control device mounted integrally with said machine tool for full automatic control of the machine tool for multiple surface machining.

4,730,374

HEATABLE GLAZING OR CALENDERING ROLL

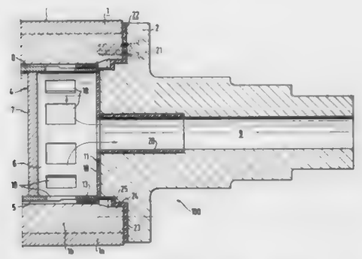
Hans-Friedrich Neuhöffer, and Erich Vomhoff, both of Königsbronn, Fed. Rep. of Germany, assignors to Schwabische Huttenwerke, Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 863,261

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518808

Int. Cl.⁴ B21B *13/00*

U.S. Cl. 29—130 **7 Claims**



1. A heatable glazing or calender roll comprising a cylindrical hollow body, a bearing journal for each end of said cylindrical hollow body, each bearing journal adapted to be secured for rotation at one end of said body and formed of metal having a coefficient of thermal expansion less than the coefficient of thermal expansion of said cylindrical hollow body, a displacement body disposed in said cylindrical hollow body and defining an annular gap between said cylindrical hollow body and said displacement body, supply and discharge lines for a fluid heat carrier which flows through said bearing journals and said annular gap between said displacement body and said cylindrical hollow body causing the temperature of said bearing journals and said cylindrical hollow body to increase with the lesser rate of radial expansion of said bearing journals secured at each end of said cylindrical hollow body generating bending moments opposing a greater rate of radial expansion at the ends of said cylindrical holiow body.

4,730,375

METHOD FOR THE ASSEMBLY OF A SCROLL-TYPE APPARATUS

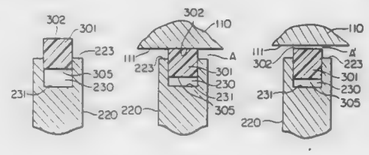
Toshiyuki Nakamura; Masahiro Sugihara; Tsutomu Inaba; Masahiko Oide; Tadashi Kimura, and Norihide Kobayashi, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 734,048, May 15, 1985, Pat. No. 4,655,697. This application Jul. 15, 1986, Ser. No. 885,778

Claims priority, application Japan, May 18, 1984, 59-101267

Int. Cl.⁴ B23P *15/00*

U.S. Cl. 29—156.4 R **6 Claims**



1. A process for assembly of a scroll-type apparatus, comprising the steps of:

(a) supporting a gap adjustment element on the top portion of the spiral wrap of a moving scroll comprising a base plate and a spiral wrap integrally formed with the base plate such that the gap adjustment element extends beyond the top surface of the spiral wrap of the moving scroll for most of the height of the gap adjustment element;

(b) supporting a gap adjustment element on the top portion of the spiral wrap of a stationary scroll comprising a base plate and a spiral wrap integrally formed with the base plate such that the gap adjustment element extends beyond the top surface of said spiral wrap for most of the height of the gap adjustment element;

(c) combining said moving scroll and said stationary scroll such that the base plate of said moving scroll is parallel to the base plate of said stationary scroll and such that the top surface of each spiral wrap is separated from the base plate of the other scroll by a gap smaller than the amount by which each of said gap adjustment elements extended beyond the top surface of their respective spiral wraps prior to said combining, such that each gap adjustment element is pushed in the axial direction by the base plate of the other scroll so that the top surface of each gap adjustment element extends beyond the top surface of its respective spiral member by an amount equal to said gap to form a non-pressurized seal.

4,730,376

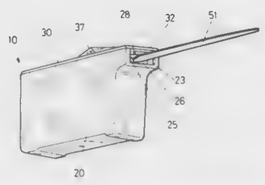
BLADE REMOVAL APPARATUS FOR CHANGEABLE BLADE SCALPEL

Katsumi Yamada, Seki, Japan, assignor to Feather Kogyo Kabushiki Kaisha, Mino, Japan

Filed Nov. 20, 1986, Ser. No. 932,568

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—239 **3 Claims**



1. A blade removal apparatus for a changeable blade scalpel in which a blade is removably mounted on a scalpel handle by fitting a mounting hole formed in the blade over a blade mounting part having a narrow width provided on the tip end of the scalpel handle, said blade removal apparatus comprising:

a box part having an open top and a side wall and an acceptor part projecting laterally from the upper part of said side wall;

a cover part closing said open top and having a visored part extending over said acceptor part;

a guide edge means on said acceptor part defining a lower gap tapered so as to become narrower as it extends to the inside of said box part and into which blade mounting parts of changeable blade scalpels of various types can be inserted;

said cover part having a stopping stepped part defining an upper gap between the lower surface of said visored part and said guide edge and into which upper gap a blade on a scalpel is insertable, said stopping stepped part further having an angle notch engageable by a blade root and edge on a blade, a pair of stoppers projecting from the lower side of said cover part on both sides of said lower gap, and a push button which can be pushed down from said cover into said box part having a pair of projection pieces which, when said push button is pushed down, make contact with said stoppers for forcing the blade surface located on both sides of the blade mounting part on the scalpel down for lifting the blade root end edge of the blade and thereby causing the blade root end edge to be engaged with said angle notch of said stopping stepped part.

4,730,377

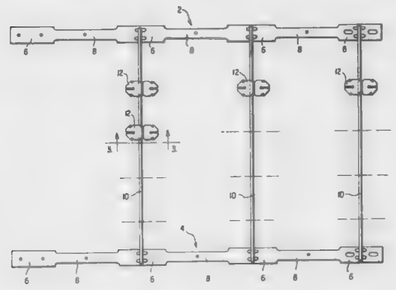
METHOD FOR MAKING A DUCT HEATER

Jimmy L. Sherrill, Cookeville, Tenn., assignor to Tutco, Inc., Cookeville, Tenn.

Division of Ser. No. 659,454, Oct. 10, 1984, Pat. No. 4,628,190. This application Aug. 5, 1986, Ser. No. 893,273

Int. Cl.⁴ B23P *13/00*

U.S. Cl. 29—150 **4 Claims**



1. A method of making a heater comprising the steps

(1) of providing at least a first and second bracket means, wherein each of said bracket means comprises a thin, flat strip,

(2) attaching a frame bar means to each of said first and second bracket means to secure said bracket means in a fixed relative position,

(3) attaching support means for engaging and supporting a heater element to said frame bar means, and

(4) forming said first and second bracket means into respective geometric shapes each having a plurality of corners and a plurality of sections intermediate adjacent corners, said frame bear means being attached at at least one of said intermediate sections, wherein said steps (1), (2), and (3) may be performed in any order and said step (4) is performed after completion of said steps (1), (2), and (3).

4,730,378

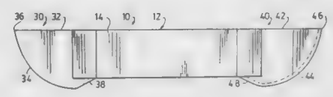
APPLICATOR TOOL

Henry D. Sweeny, Kitchener, and Antonio D. Sabbadin, Waterloo, both of Canada, assignors to Swenco Limited, Ontario, Canada

Filed Feb. 5, 1987, Ser. No. 12,906

Int. Cl.⁴ B25B *27/14*

U.S. Cl. 29—278 **5 Claims**



1. A device for pushing a flexible material into a retaining groove for capture therein comprising: a central body member graspable by a human hand; a first thin blade member at one end of said body member and a second thin blade member at the other end of said body member; each of said blade members including a straight edge surface extending outwardly from adjacent one longitudinal edge of said body member and a convexly arcuate edge surface extending from adjacent the other longitudinal edge of said body member to the outer end of said straight edge surface and defining a sharp corner therewith, the arcuate edge surface of the first blade member being transversely rounded and the arcuate edge surface of said second blade member being transversely V-shaped.

4,730,379

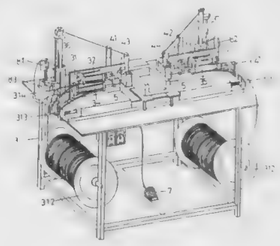
ON THE TABLE AUTOMATIC OPERATION TYPE OF PIVOT-PIN FITTING MACHINE

Yen W. Chen, 51-1, Lane 50 Kwang Ming Street, Tainan City, Taiwan

Filed Aug. 1, 1986, Ser. No. 892,911

Int. Cl.⁴ B23P *11/00;* **B21D** *53/40*

U.S. Cl. 29—434 **6 Claims**



1. A method of automatically inserting a first pin into an object, said object having a right side and a left side, said right side having a first aperture disposed to receive said first pin therein and said left side having a second aperture disposed to receive said second pin therein, said method comprising:

supporting said object in a frame;

supplying a first and a second continuous length of wire to a right cutter and a left cutter;

cutting simultaneously said wire supplied to said right cutter into a first pin and said wire supplied to said left cutter into a second pin;

aligning simultaneously said first path with said first aperture in said object and said second pin with said second aperture in said object;

inserting simultaneously said first pin into said first aperture in said object and said second pin into said second aperture in said object.

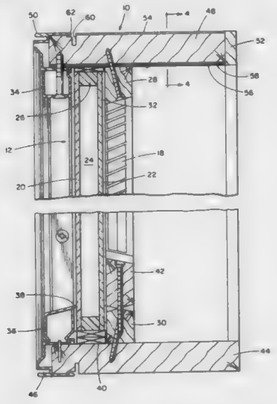
VOL 1088 ISS 3 MR 15 1988 UMI

4,730,380

METHOD OF FORMING A CURVED WINDOW ASSEMBLY

Mearl J. Minter, Oskaloosa, Iowa, assignor to Rolscreen Company, Pella, Iowa

Division of Ser. No. 569,799, Jan. 11, 1984, Pat. No. 4,669,233.
This application Dec. 29, 1986, Ser. No. 947,274
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—445 **11 Claims**



1. A method of assembling a window frame assembly comprising:
- forming a rigid frame member;
- forming a plurality of core blocks;
- forming a flexible frame member;
- bending the rigid frame member to a curved profile;
- securing the plurality of core blocks to the flexible brame member to form a subassembly; and then
- securing the subassembly to the rigid frame member such that the subassembly assumes the cruved profile of the rigid frame member.

4,730,381

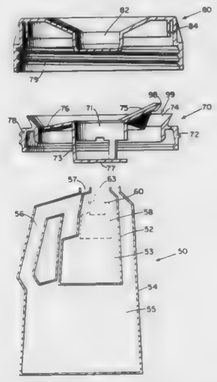
METHOD OF MAKING PLURAL-CHAMBERED DISPENSING DEVICE EXHIBITING CONSTANT PROPORTIONAL CO-DISPENSING

Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 844,919, Mar. 27, 1986, Pat. No. 4,678,103.
This application Feb. 20, 1987, Ser. No. 17,122
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—451 **13 Claims**

1. A method of making a plural-chambered dispensing device for simultaneously dispensing at least two flowable products, said method comprising the steps of:
- (a) forming an outer container defining an outer chamber and having an upper portion, said outer chamber being adapted to contain a first flowable product, said upper portion having a first discharge opening;
- (b) forming an inner container defining an inner chamber adapted to contain a second flowable product, said inner container having a second discharge opening and being capable of exhibiting a collapsed and an uncollapsed state, said inner container having a cross-section which is greater than that of said first discharge opening when said inner container is in its uncollapsed state;
- (c) forming a third empty container capable of exhibiting a collapsed and an uncollapsed state, said third container having a cross-section which is greater than that of said second discharge opening when said third empty container is in its uncollapsed state;
- (d) collapsing said third empty container to its collapsed state, whereby said third container exhibits a cross-section which is smaller than that of said second discharge opening in said inner container;
- (e) inserting said collapsed third empty container into said inner chamber through said second discharge opening of said inner container;
- (f) collapsing said inner container to its collapsed state, whereby said inner container exhibits a cross-section which is smaller than that of said first discharge opening in said outer container;
- (g) inserting said collapsed inner container having said collapsed third empty container therein into said outer chamber through said first discharge opening of said outer container; and
- (h) returning said inner container and said third empty container to their said uncollapsed states.

7. A method of making a plural-chambered dispensing device for simultaneously dispensing at least two flowable products, said method comprising the steps of:
- (a) forming an outer container defining an outer chamber



and having an upper portion, said outer chamber being adapted to contain a first flowable product, said upper portion having a first discharge opening;
- (b) forming an inner container defining an inner chamber adapted to contain a second flowable product, said inner container having a second discharge opening and being capable of exhibiting a collapsed and an uncollapsed state, said inner container having a cross-section which is greater than that of said first discharge opening when said inner container is in its uncollapsed state, said inner container also having a fixed predetermined shape and size while in its uncollapsed state;
- (c) collapsing said inner container to its collapsed state;
- (d) inserting said collapsed inner container into said outer chamber through said first discharge opening of said outer container;
- (e) fixedly securing said collapsed inner container in a predetermined position within said outer chamber; and
- (f) returning said inner container to said fixed predetermined shape and size in said uncollapsed state and spaced from a major portion of the inside surface of said outer chamber.

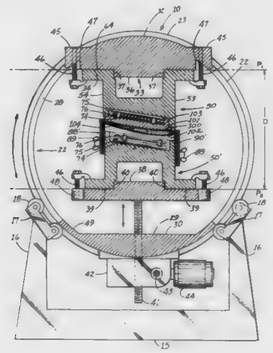
4,730,382

MELTABLE MATRIX CHUCKING AND MACHINING

John T. Parsons, 205 Wellington, Traverse City, Mich. 49684

Division of Ser. No. 644,611, Aug. 27, 1984, Pat. No. 4,629,378.
This application Nov. 17, 1986, Ser. No. 930,906
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 29—563 **4 Claims**

1. For chucking metal blanks of the type having two generally opposite principal surfaces and whose width, between forward and rear edges of such surface, is greater than its thickness between such principal surfaces,
- a chucking center including
- a barrel frame and means to support said barrel frame along a horizontal pivot axis,
- a first track portion on said frame extending parallel to the pivot axis, and including means to support a meltable matrix chuck and establish for it a first generally horizontal plane of reference at a radial distance from said horizontal pivot axis, as well as means to establish the transverse location of a chuck thereon,
- the barrel frame having means to position said track portion at a base level,



- an alternate track portion supported on said barrel frame 180° removed from said first track portion, said alternate track portion including means to support a meltable matrix chuck inverted relative to said first mentioned chuck support means, and including means to establish, for a chuck thereon, a second plane of reference parallel to the first and the transverse location of a chuck thereon,
- means to turn said barrel frame 180° about said horizontal pivot axis, and
- means to adjust the spacing of said alternate track portion from said first track portion, whereby chucks supported within said barrel frame, inverted relative to the other, may be brought from juxtaposed position, at which their planes of reference are at a chosen spacing, to a clearance position at which either said first track portion or said alternate track entrant portion may be at such base level.

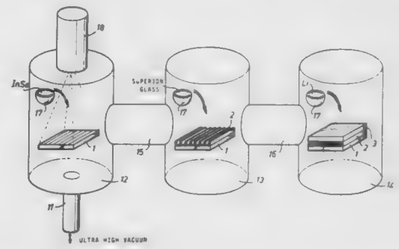
4,730,383

INTEGRABLE SOLID STATE BATTERY AND PROCESS FOR PRODUCING SAME

Minko Balkanski, 2, avenue de Camöens, 75016 Paris, France

Filed May 5, 1986, Ser. No. 859,819
Claims priority, application France, May 3, 1985, 85 06782
Int. Cl.⁴ H01M *10/38*
U.S. Cl. 29—623.5 **7 Claims**

1. A process for producing a solid state battery successively comprising, superimposed between two metallic contact elements, a layer or thin film of an alkali metal which provides a source of ions, a layer of thin film of superionic solid electrolyte glass of high ionic conductivity and a layer or thin film of a layered intercalation compound capable of inserting ions issued from the layer or thin film of alkali metal, the lamellae of the film of layered compound being oriented substantially perpendicularly to the surface of the solid electrolyte, said process comprising the steps of (a) forming on a substrate film surface a grating of electrically charged lines or of oxygenated surface atoms, and (b) molecular beam depositing the layer or thin film of the layered compound by direct grafting on the



substrate film, said grating conditioning the nucleation starting of the layered growth.

4,730,384

MACHINE FOR FASTENING A CONNECTOR TO A CABLE END BY CRIMPING

Hans Frohlich, Simoniusstr. 22, D-7988 Wangen im Allgau, Fed. Rep. of Germany

PCT No. PCT/EP85/00088, § 371 Date Nov. 7, 1985, § 102(e) Date Nov. 7, 1985, PCT Pub. No. WO85/04290, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 8, 1985, Ser. No. 800,129
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3408714
Int. Cl.⁴ H01R *43/04*
U.S. Cl. 29—564.4 **33 Claims**

1. A machine for fastening a connector to a cable end, the connector comprising a crimpable sleeve and a portion not to be crimped, the machine comprising:
- (a) a stationary inlet to receive the cable end;
- (b) means to feed separate individual connectors to the cable end; and
- (c) means for crimping said connector sleeve around said cable end, said crimping means comprising a crimping-/mounting element having, (1) crimping jaws for crimping said crimpable connector sleeve, and (2) gripping jaws for gripping said portion not-to-be-crimped, said gripping jaws being slidably guided along the crimping jaws and being tensioned by springs.

4,730,385

COAX CONNECTOR INSTALLATION TOOL

Michael J. Ryan, Palmdale, and David M. Minor, Santa Ana, both of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Mar. 23, 1987, Ser. No. 28,839
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—750 **6 Claims**

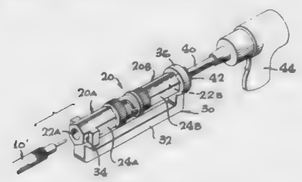
1. A tool to aid in the attaching of coaxial electrical cable ends to one of the connector halves of a coaxial cable connec-

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tor assembly, the connector halves having threaded recesses for receiving the end of the cable, the tool comprising:

means to prevent rotation between the connector halves when the connector halves are joined; and

drive means having means for engaging one of the threaded recesses of said joined connector halves for causing said joined connector halves to rotate;



such that the end of the coaxial cable can be joined to the one connector half by coupling the means to prevent rotation to the jointed connector halves and actuating the drive means, causing said connector halves to rotate while the end of the cable is fed into the recess of the one connector half.

4,730,386

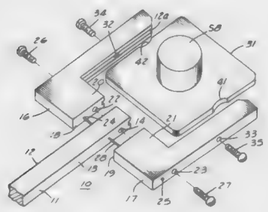
CONNECTOR WRENCH HOLDER

Russell F. Fieberg, and Donald E. Fieberg, both of 25282 Tasman Rd., Laguna Hills, Calif. 92653

Filed Apr. 15, 1987, Ser. No. 40,210

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—758 **3 Claims**



1. A holding tool for use with electrical connectors, comprising:

a rectangular pad conformed to engage a connector, including a first and second opposing lateral edge each said edge being provided with a cutout;

a holder including a first L-shaped bracket and a second L-shaped bracket each characterized by a base leg and an orthogonal leg, a handle conformed for engagement to the ends of said base legs of said first and second bracket, and fastening means for attaching said brackets to said handle, said brackets and said handle including a groove conformed for receiving said pad and engagement means received in said brackets for engaging said cutouts.

4,730,387

APPARATUS FOR FITTING RETAINING RINGS

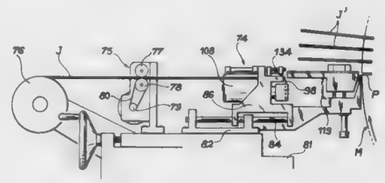
Nicolas Pradel, Lyon, and Alain Bruyere, Ville Fontaine, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France and Etablissement Brochier S.A., Decines Cedex, both of, France

Continuation of Ser. No. 805,955, Dec. 5, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 73,402

Claims priority, application France, Dec. 11, 1984, 84 18898

Int. Cl.[4] B23D *19/00*

U.S. Cl. 29—790 **8 Claims**



1. An apparatus for fitting retaining pins to a support mandrel made from a material able to receive the retaining pins by direct fitting, comprising a frame supporting a fitting head having at least one passage able to receive a retaining pin, at least one fitting rod extending in a given direction and which can be aligned with said passage, and means for moving said rod in said direction, wherein the frame also supports means for cutting the retaining pin when in said passage and means for displacing said head between a supply and cutting position in which the retaining pin can be supplied in uncut form and can be cut by said cutting means, and a fitting position in which said passage is aligned with the fitting rod.

4,730,388

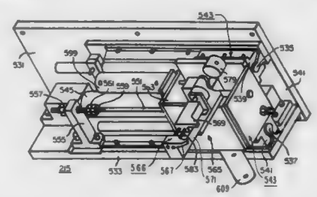
REPLACEMENT OF SPLIT-PIN ASSEMBLIES IN NUCLEAR REACTOR

John D. Nee, Levelgreen, Pa., and Richard A. Green, Farmington Hills, Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 617,854, Jun. 6, 1984, abandoned. This application Dec. 1, 1986, Ser. No. 936,950

Int. Cl.[4] B23Q *7/10;* **B25S** *11/00;* **B66C** *23/00*

U.S. Cl. 29—809 **8 Claims**



1. Apparatus for replacing an old split-pin assembly of a guide tube of a nuclear reactor with a new split-pin assembly, said old split-pin assembly including an old split pin and an old nut securing said old split-pin to said guide tube and said new split-pin assembly including a new split-pin and a new nut to secure said new split-pin to said guide tube in place of said old split-pin, said old split pin and said old nut being radioactive, the said guide tube to be positioned for said replacement submerged in a pool of water with a fragment of an old split-pin assembly in position to be replaced; the said apparatus including a hopper to have positioned therein a plurality of new nuts, said hopper having means, to engage said new nuts, for setting one of said new nuts in position to replace an old nut, said hopper being submerged in said pool of water, a pick-and-put tool, means mounting said pick-and-put tool submerged in said hopper on the other side thereof, said pick-and-put tool having a clamp and also having means, connected to said clamp, for moving said clamp back and forth between a first end position, and a first intermediate position and between a second end position and a second intermediate position, means connected to said clamp, for moving said clamp back and forth between said first and second intermediate positions, and means, connected to said clamp, for clamping said fragment of said old split-pin assembly in said first end position and for releasing said fragment in a disposal facility at a said intermediate position between said first end position and said second end position and for clamping said one new nut in said second end position and positioning said one new nut on said guide tube in position to secure a new pin to said guide tube in said first end position.

4,730,389

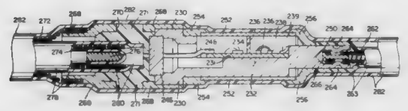
METHOD FOR FABRICATION OF AN IMPLANTABLE HERMETIC TRANSPARENT CONTAINER

Michael D. Baudino, Coon Rapids; Michael D. De Franco, Blaine, and Joseph F. Lessar, Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 15, 1986, Ser. No. 896,693

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 **9 Claims**



1. A method of fabrication of an implantable, hermetic transparent container for electronic circuitry, comprising:

selecting a circular cylindrical tube of transparent material having a proximal end, a distal end, and a circular lumen from said proximal end to said distal end, and having a melting point sufficiently high to permit brazing thereto;

selecting a metal proximal weld collar having a proximal end, a distal end, and a circular lumen extending from said proximal end to said distal end, the proximal end of the lumen of said weld collar having a first diameter at the proximal end of said weld collar and having a circumferential indentation in the distal end surface of said weld collar, said circumferential indentation corresponding to the proximal end of-said tube;

selecting a metal distal weld collar having a proximal end, a distal end and a circular lumen extending from said proximal end to said distal end, the lumen of said weld collar having a second diameter at the distal end of said weld collar and a circumferential indentation in the proximal end surface of said weld collar, said circumferential indentation corresponding to the distal end of said tube;

selecting a metal body having a proximal end and a distal end and having electronic circuitry attached thereto intermediate said proximal and distal ends of said body, said proximal end of said body having a circular cross section of said first diameter and said distal end of said body having a circular cross section of said second diameter, the length of said body exceeding the length of said tube;

inserting the proximal end of said tube into the circular indentation rn the distal end of said proximal weld collar and inserting the distal end of said tube into the indentation at the proximal end of said distal weld collar;

brazing said proximal and distal weld collars to said tube;

after said brazing step, sliding said sapphire tube and said weld collars over said body such that the proximal end of said body extends proximal to the proximal end of said proximal weld collar and such that the distal end of said body extends distally to the distal end of said distal weld collar; and

after said sliding step, welding the distal end of said distal weld collar to the distal end of said body and said proximal end of said proximal weld collar to the proximal end of said body.

4,730,390

METHOD AND DEVICE FOR MAKING OF ELECTRONIC DEVICES AND DEVICES MADE IN ACCORDANCE WITH THE METHOD

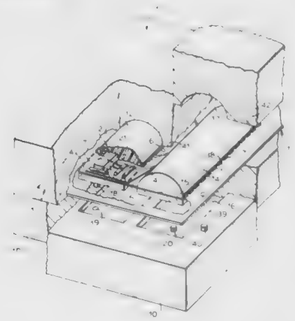
Werner Schaller, Blieskastel, Fed. Rep. of Germany, assignor to Schaller-Automation Industrielle, Blieskastel, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 851,322

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512978

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—836 **14 Claims**



1. In a method for making electronic devices, comprising the steps of providing a flexible conductor foil provided with an etched printed circuit, complementing said foil with electronic structural components, providing folding segments on said foil, folding said foil at predetermined folding edges to adapt to a device shape and inserting said foil with said components into a molding tool having a geometric device shape, and sheathing said foil with a plastic hardenable synthetic material to obtain a housing body, the improvement comprising subdividing the housing body into housing parts in such a manner that the housing parts are joined to a closed housing body during the folding of the conductor foil and said housing parts are mounted as individual synthetic molding parts onto the folding segments of a flat and still unfolded but complemented conductor foil.

4,730,391

WIRE STRIPPER

Harold L. Wood, St. Albans, Australia, assignor to Warren & Brown & Staff Pty. Ltd., Australia

Filed Dec. 19, 1986, Ser. No. 943,778

Claims priority, application Australia, Dec. 23, 1985, PH3993

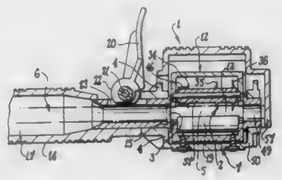
Int. Cl.[4] H02G *1/12*

U.S. Cl. 30—90.1 **29 Claims**

1. A wire stripper including, a body having two parts which are interconnected for relative movement between a closed position and an open position, locating means for receiving a cable end portion and locating that end portion at a particular position on said body, and a plurality of circular cutters mounted on said body for rotation relative thereto and being spaced apart in the direction of the longitudinal axis of a said cable end portion located at said particular position, each said cutter being arranged to engage and penetrate a respective distance into a said cable end portion at said particular position as a consequence of said body parts moving into said closed

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position and being operable to form a respective circumferential cut around that end portion in response to relative rotation



of said body and said cable end portion about said longitudinal axis while the body parts are in the closed position.

4,730,392

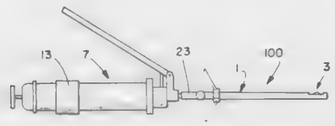
HYDRAULIC PUNCH TOOL FOR HEAT EXCHANGERS

Jackie C. Allen, Pascagoula, Miss., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 635,965, Jul. 31, 1984, Pat. No. 4,597,180. This application Jan. 3, 1986, Ser. No. 816,100

Int. Cl.⁴ B23D *21/06;* **B26B** *27/00*

U.S. Cl. 30—106 **2 Claims**



1. A punch tool for puncturing a hole in a tube comprising:

a hollow cylindrical member having an open end, a closed end, and a central axis running the length of the cylindrical member;

a curved surface on said hollow member coaxial with said central axis, said curved surface surrounding a slot positioned to intersect said curved surface of the member at an angle perpendicular with the central axis and substantially near the closed end, whereby the slot communicates with the hollow portion of the cylindrical member;

a slidable piston fit within the slot, said piston having an upper and a lower side parallel to said central axis;

a cutting point attached to the slidable piston at substantially right angles to the upper side of the piston; and

means for forcing the slidable piston radially, whereby the cutting point may be displaced from within the hollow member to a point beyond the outside diameter of the hollow member so that a puncture results in the tube in which the tool has been inserted wherein the means for forcing the slidable piston outward comprises a grease gun affixed to the aperture of the elongated, tubular member in such a manner so that a fluid tight fit is achieved between the member and the grease gun.

4,730,393

LOCKING KNIFE WITH MOVABLE SCALE

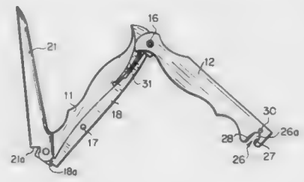
Ronald Coburn, Bradford, Pa., assignor to W.R. Case & Sons Cutlery Co., Bradford, Pa.

Filed Jan. 17, 1986, Ser. No. 820,760

Int. Cl.⁴ B26B *1/10*

U.S. Cl. 30—153 **5 Claims**

1. A folding knife comprising a blade which is movable from a closed position to an operable open position, a first scale in the form of an elongated plate having a blade-end portion and a back end portion position on one side only of the blade and a second scale also in the form of an elongated plate positioned only on the other side of the blade, the first scale plate and second scale plate lying in spaced-apart parallel planes, which scale plates are spaced apart a distance to accommodate between them a back spring-biased element pivotally mounted on the first scale, the blade pivotally mounted on the first scale and the second scale pivotally mounted on the back end of the first scale for pivotal movement to a selected angle with the



first scale for cleaning or for movement to a closed position for operation, the first and second scale plates as spaced-apart permitting the blade to be pivotally moved to its closed position or to its operative open position when the scale plates are in their closed position.

4,730,394

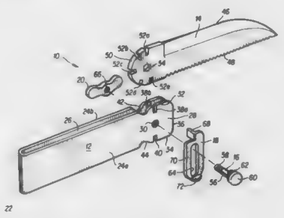
FOLDING CAMP KNIFE

Edwin W. Sonner, Jr., Tasley, Va., assignor to Richard G. Sonner and Betty S. Hallbert, both of Duck Key, Fla.

Filed Dec. 15, 1986, Ser. No. 941,466

Int. Cl.⁴ B26B *3/06*

U.S. Cl. 30—161 **13 Claims**



1. A folding camp knife comprising:

an elongated handle case having aligned opposite side plates with a blade gap therebetween, at an axle end of said handle case said opposite side plates having coaxial, centrally-located handle axle holes therethrough and at least one set of parallel handle locking slots extending from side-edge peripheries of the sideplates, said locking slots being directed approximately toward the centrally-located axle holes of the sideplates;

an elongated blade having an axle end for engaging the axle end of said handle, said blade axle end also having a centrally-located blade axle hole therein, said elongated blade being positioned in said blade gap of said handle case with said blade axle hole being aligned with said handle axle holes, said blade axle end further including a plurality of blade locking slots therein, each extending from the edge periphery of said blade inwardly, approximately directed toward said centrally-located blade axle hole, said blade locking slots registering with said handle locking slots when said blade is rotated to particular angular positions relative to said handle at said handle and blade axle holes;

an axle pin means having an axle pin extending through said handle and blade axle holes for mounting said blade on said handle case to allow selective angular rotation therebetween;

a locking piece engaging said axle pin and being slidable thereon, said locking piece extending radially from said axle pin to the periphery of the handle case and the blade and including a locking flag for extending in a direction approximately parallel with the axle pin across the edge peripheries of said handle sideplates and said blade, said locking flag having a shape and size for fitting into said handle and blade locking slots;

whereby said blade can be rotated relative to said handle case on said axle pin to bring said handle and blade locking slots into registration and said locking piece can be slid on said axle pin to insert said locking flag into said blade and handle locking slots to prevent relative rotation between said handle and blade during use of said camp knife.

4,730,395

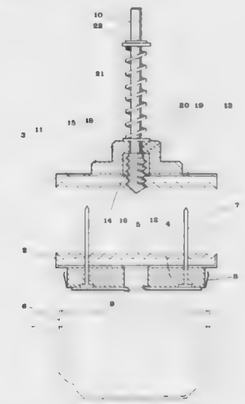
APPARATUS FOR CUTTING HOLES FOR ELECTRICAL WALL OUTLETS IN WALL COVERING PANELS

William R. Blessing, Sr., 95 Saddle Mountain Rd., Colorado Springs, Colo. 80919

Filed Apr. 22, 1985, Ser. No. 726,037

Int. Cl.⁴ B26F *1/00*

U.S. Cl. 30—360 **1 Claim**



1. An apparatus for cutting holes for electrical wall outlets of predetermined size, shape and location in wall covering panels, said apparatus comprised of:

an interior cutting box, said interior cutting box having a rectangular shaped base, said base having a threaded hole, and four forward projecting sidewalls shaped to closely fit into the electrical outlet housing, the sidewalls having a plurality of cutting teeth on the outward projecting edge of said cutting box, said teeth for cutting through the panel wall froom the rearward side forward;

a plurality of aligning fingers, said aligning fingers having the rearward ends perpendicularly fastened to the base of the cutting box and having pointed forward ends such that the aligning fingers can pass through a wall panel when the wall panel is pressed into place against the wall;

a pair of retaining clips, said clips attached to the outer surface of the interior cutting box frame, said retaining clips spring loaded to retain the interior cutting box in the electrical outlet housing;

an exterior cutting box, said exterior cutting box having;

a rectangular shaped base and four rearward projecting sidewalls, the sidewalls having a plurality of cutting teeth on the projecting edges, the teeth for cutting through the panel wall from the forward side rearward, said exterior cutting box,

a plurality of holes in said base of the exterior cutting box, the holes positioned so as to accept close passage of the aligning fingers when the exterior cutting box is properly aligned with the interior cutting box, exterior cutting box,

further having a support bracket, said support bracket fixedly attached to the forward side of the base, said support bracket having a center passage;

a threaded connecting shaft being supported in close passage through said center passage of said support bracket and passing through said threaded hole in said interior cutting box, said threaded connecting shaft having a rearward projecting threaded and point end so as to drill a hole through the panel when pressed rotated against the panel wall;

a drill, said drill connected to the forward end of the shaft so as when activated, the drill rotates the threaded shaft;

a retaining washer, said washer located on the forward end of the shaft; said washer having a surface sufficient to retain a compression spring, and;

a compression spring, said spring located around the body of the threaded connecting shaft and positioned between the retaining washer and the bracket such that when the shaft is not being pressed forward to drill a hole through the panel, the compression spring pushes the threaded connecting shaft to a retracted position.

4,730,396

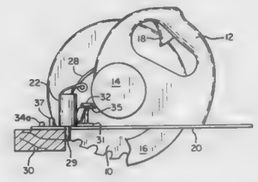
ALIGNING MECHANISM FOR POWER HAND SAWS

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Filed Mar. 26, 1986, Ser. No. 844,156

Int. Cl.⁴ B23D *47/02*

U.S. Cl. 30—371 **12 Claims**



1. A mechanism for aligning a portable power saw to a work piece, the saw being of a type having a motor, a handle, a blade, a base, and a switch to activate the motor and the blade, said mechanism comprising

aligning means for butting against a work piece and means for connecting said aligning means to a saw,

said aligning means for aligning a saw to a work piece for cutting movements,

said aligning means having an operable position and a non-operable position, said operable position of said aligning means being for positioning at least a portion of said aligning means below a saw base for engaging a work piece and said non-operable position of said aligning means being for positioning said aligning means up and away from a work piece,

said aligning means moving forwardly together with a saw during a cutting movement of the latter,

said mechanism also including means to cause said aligning means to move from said operable position below a saw base to said non-operable position away from a work piece during operation of said mechanism.

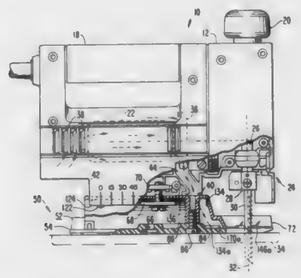
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4,730,397

JIG SAW WITH TWO-PIECE SHOE

David W. Weiford, and Robert I. Somers, both of Raleigh, N.C., assignors to Black & Decker, Inc., Newark, Del.

Filed Aug. 9, 1985, Ser. No. 764,195
Int. Cl.[4] B23D *49/04*
U.S. Cl. 30—392 **23 Claims**



1. Apparatus for use with a jig saw of the type having a reciprocating blade driven by a air-cooled motor and a housing with an exhaust port for the cooling air, the apparatus comprising:

a shoe connectable to the saw housing for engaging the workpiece, said shoe having a shoe portion proximate the location of cutting contact between the saw blade and the workpiece; and

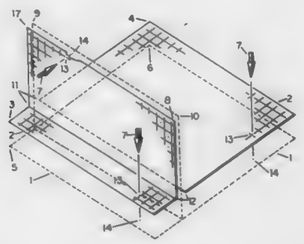
cooling air guide means associated with said shoe for receiving cooling air from the exhaust port, channeling said received air to said shoe proximate portion, and directing said channeled air toward said cutting location to be incident upon said cutting location at an angle substantially different from 0° with respect to the axis of reciprocation of the blade, whereby debris resulting from the sawing operation is blown clear of said cutting location.

4,730,398

PRELIMINARY RECORDING ACTIVITY BY GUIDE AND POINT

Carl A. Stanton, Roff Hill Rd., Pulteney, N.Y. 14874

Filed Feb. 17, 1981, Ser. No. 210,751
Int. Cl.[4] G01C *3/00*
U.S. Cl. 33—1 K **5 Claims**



1. A system means for function of recording graphic information in original form and transmitting therefrom only such of said original information as it is desired to preserve for the purpose of upgrading said original information including:

a topmost sheet, and

the said topmost sheet adapted to receive said original, graphic information, and

the said topmost sheet having an opaque structure, and

means to transfer a selected point of said original graphic information from said topmost sheet to an underlying sheet, and

the said topmost sheet is used only once for each and any graphic requirement, and

the said topmost sheet receives a perforation point through the said selected point of graphic information to transfer said selected point from said topmost sheet to said underlying sheet for a unique data transfer,

whereby said selected point on said underlying sheet can then be modified as desired to effect an upgrading of said original graphic information on said underlying sheet,

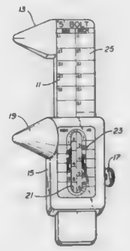
whereby said topmost sheet receives the said perforation point permitting direct data transfer directly toward said underlying sheet from the said topmost sheet thereby having a unique direct data transfer by the perforation point in its throughput space.

4,730,399

WHEEL BOLT CIRCLE GAUGE

Russ Campbell, 5290 St. Helena Hwy., Napa, Calif. 94558

Filed Mar. 9, 1987, Ser. No. 23,143
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—143 M **6 Claims**



1. A wheel bolt circle gauge for determining what type of automobile on which either a four bolt or five bolt automobile wheel will fit comprising

an elongated scale having a first uniformly tapered projection extending from proximate one end thereof perpendicular to the longitudinal axis of said scale,

a movable indicator mounted to slide on said scale and having a second uniformly tapered projection mounted thereon also extending perpendicular to the longitudinal axis of said scale, said tapered projections formed to engage two adjacent lug bolt holes of an automobile wheel to accurately register on said indicator and said scale the distance between the centers of said holes, and

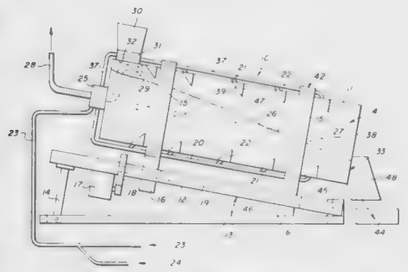
interacting graduated indicia inscribed on said scale and said indicator whereby the bolt circle pattern of a wheel can be determined for identifying on what automobile a wheel will fit from the alignment of marks on said scale and indicator when the projections of said gauge are inserted in adjacent bolt holes of a wheel, said indicia including graduated numbered marks on said scale and said indicator whereby alignment of any two of said marks having the same number, one each on said scale and said indicator, indicates a specific distance between the holes of said wheel and the identity of the automobile on which said wheel will fit can be determined from the aligned numbers.

4,730,400

DRUM REACTOR FOR MANUFACTURING FERTILIZERS AND OTHER RAW MATERIALS BY AEROBIC FERMENTATION

Gunter Johannsen, Bahnweg 3, 2178 Otterndorf, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 807,015
Int. Cl.[4] F26B *3/04, 17/32*
U.S. Cl. 34—12 **18 Claims**



1. An apparatus for manufacturing fertilizers and the like from raw materials comprising:

a drum having a hollow interior;

inlet means for introducing the raw materials into the interior of the drum, said drum having an upstream side near the inlet means;

means for treating saw raw materials introduced into the drum to form said fertilizers and the like, said means for treating including fluid introduction means for introducing a fluid into the interior of the drum, said fluid aiding formation of fertilizers and the like;

outlet means for removing the fertilizers and the like from the interior of the drum after said raw materials have been formed into said fertilizers and the like, said drum having a downstream side near the outlet means; and

a plurality of baffles provided on the interior of the drum and operatively associated with said fluid introduction means, said baffles forming a plow-like arrangement in the interior of the drum and engaging the materials as they move from the inlet means to the outlet means while preventing the clogging of the fluid introduction means in order to aid formation of fertilizers, each of said plurality of baffles being associated with at least one of said fluid introduction means and extending over said associated fluid introduction means, each of said baffles being located on an upstream side of the associated fluid introduction means and being canted from the upstream side of the drum toward the downstream side.

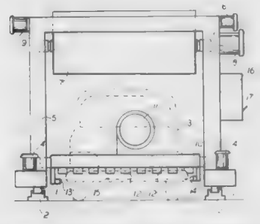
4,730,401

DRIER FOR A VEHICLE WASH AND METHOD OF CONTROLLING SAME

Roy Machin, Im Kalblesbiegel 16, D-741 Reutlingen, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,735
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540767
Int. Cl.[4] F26B *21/06*
U.S. Cl. 34—43 **4 Claims**

1. In a process for control of a drying device for a vehicle wash for a vehicle with a travelling portion of said drying device movable relative to said vehicle with the aid of a travel and a lift motor in a direction of a longitudinal and a lift axis of said vehicle, said travelling portion carrying a drying means and a light barrier whose light beam passes with clearance under said drying means and with a device controller operating said travel and said lift motors guiding said travelling portion on a path which keeps a guaranteed clearance from the contour of said vehicle comprising at the beginning of the drying process moving said travelling portion into a lowered initial position in front of or behind said vehicle and controlling at least the raising and lowering of said portion by a gating signal, the improvement wherein before beginning said drying process the sensitivity or response threshold of a gating device for said gating signal and/or a conditioning device adjusting said gating signal is adjusted automatically to a value sufficient



to define a passage of the light beam capable of signalling its interruption so that before motion of said portion of said drying device, said sensitivity or said response threshold with said light beam present is changed so that said gating signal is varied from a signal indicating light beam continuity to a signal indicating the interruption of said light beam and then said sensitivity or said response threshold is adjusted to a small definite value in the opposing sense.

4,730,402

CONSTRUCTION OF SOLE UNIT FOR FOOTWEAR

Edward J. Norton, Boxford; Craig F. Fram, Haverbill; Kenneth W. Graham, Wakefield, all of Mass., and James A. Smith, St. Louis Park, Minn., assignors to New Balance Athletic Shoe, Inc., Boston, Mass.

Filed Apr. 4, 1986, Ser. No. 848,197
Int. Cl.[4] A43B *13/14, 13/18, 13/04*
U.S. Cl. 36—30 R **23 Claims**

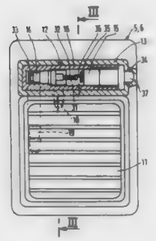


1. A sole unit for footwear characterized as an athletic shoe including a midsole/wedge component having a core extending within the heel region toward the forefoot region, said core formed of a resilient plastic material having a first hardness (Shore A), and a pair of posts, one post located along the outer edge of the medial side of said component and spaced apart along its length from the other post located along the outer edge of the lateral side of said component, said posts throughout their length from the rear of the heel region having a continuous inner surface at the boundary of said core and posts to at least partially describe the outline of said core along said surfaces, said posts also formed of resilient plastic material having a second hardness (Shore A) greater than that of the material of said core, and at least one of said posts having an upper surface comprising a portion of an upper surface of said midsole/wedge component.

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4,730,403
PRESSURIZED SKI BOOT
Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland
Filed Jul. 23, 1986, Ser. No. 888,599
Claims priority, application Switzerland, Jul. 24, 1985, 03200/85
Int. Cl.⁴ A43B *5/04, 7/14*
U.S. Cl. 36—119 **22 Claims**



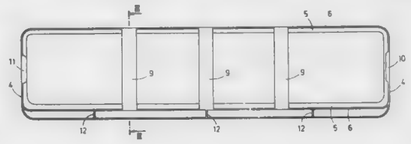


1. A sports shoe, having an inflatable air chamber, enclosed underneath an outer shell of the shoe and disposed in the form of a cushion to be adjacent a foot of the shoe wearer, and a pump system connected to the air chamber that includes a membrane pump chamber and a valve system with a pump pressure valve followed in the direction of venting therefrom by an evacuation valve, said pump system being set into a receiving aperture provided therefor in the outer shell of the shoe, characterized in that:

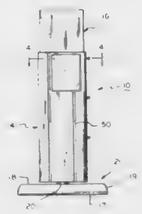
said valves of the valve system are enclosed in a common housing part mounted next to the membrane pump chamber.

4,730,404
MOTOR VEHICLE LICENSE PLATE HOLDER OF SYNTHETIC RESIN
Manfred Utsch, Haspelweg 9, D-5900 Siegen, Fed. Rep. of Germany
Filed Apr. 3, 1986, Ser. No. 848,123
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 8510272[U]
Int. Cl.⁴ G09F *7/00*
U.S. Cl. 40—209 **3 Claims**

1. A motor vehicle license plate of resilient synthetic resin for automotive vehicles, comprising a closed rectangular frame having two opposite relatively long legs and two opposite relatively short legs, the rear edges of said legs lying in a single plane, said license plate being of one-piece molded construction and having a plurality of spaced webs parallel to and spaced from said vertical legs and from each other and interconnecting said long legs and a pair of tongues extending toward each other from both of said short legs, the rear surfaces of said tongues and webs lying in said plane, one of said tongues being shorter than the other.

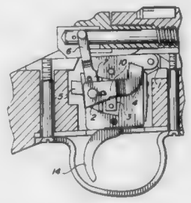


4,730,405
DISPLAY STAND
Daniel G. Baughman, P.O. Box 541, Darien, Wis. 53114
Filed Jan. 20, 1983, Ser. No. 459,329
Int. Cl.⁴ G09F *7/02*
U.S. Cl. 40—611 **15 Claims**



1. A display comprising a display surface having an elongate slot therein, at least one hole in said display surface and extending inwardly from a location generally adjacent said slot, said hole intersecting said slot at an acute angle and extending there beyond, said display further comprising pin means for being selectively inserted and removed from said hole and being of sufficient length to extend outwardly from said display surface when said pin means is inserted into said hole and through said slot.

4,730,406
BOLT RELEASE TRIGGER SAFETY MECHANISM FOR FIREARMS
Melvin D. Forbes, Granville, and William F. Malone, Jr., Morgantown, both of W. Va., assignors to Ultra Light Arms, Inc., Granville, W. Va.
Filed Dec. 10, 1984, Ser. No. 680,328
Int. Cl.⁴ F41C *17/08*
U.S. Cl. 42—70.01 **1 Claim**

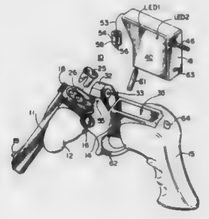


1. A safety mechanism for a rifle having a bolt, a sear, a slidable firing pin, and a trigger housing, said mechanism comprising:

a safety lever;

a bolt arm lock;
a safety arm;
said safety lever being moveably mounted onto said trigger housing;
said safety arm being engaged and moveable with said safety lever;
said bolt arm lock being engaged and moveable with said safety lever;
said safety lever being moveable to a first position causing said bolt arm lock to engage the bolt for preventing the bolt from being rotated, and while said safety arm engages the sear for preventing the firing pin from sliding;
said safety lever being moveable to a second position from said first position, said motion to said second position effecting a corresponding movement of said bolt arm lock for releasing said bolt arm lock from the bolt to thereby permit said bolt to be operated or removed while said sliding of said fire pin remains prevented by said safety arm; and
said safety lever being moveable to a third position from said first position causing said bolt arm lock to disengage the bolt for allowing the bolt to rotate, and while said safety arm disengages the sear for allowing the firing pin to slide forward.

4,730,407
SYSTEM FOR CONVERTING FIREARMS TO ELECTRICAL IGNITION
Dean S. DeCarlo, D & I Carbide, 200 Industrial Dr., Port Richey, Fla. 33568
Continuation-in-part of Ser. No. 774,307, Sep. 10, 1985, abandoned. This application Apr. 7, 1987, Ser. No. 35,600
Int. Cl.⁴ F41C *19/12*
U.S. Cl. 42—84 **7 Claims**



1. A system for converting firearms having a mechanical firing mechanism to electrical ignition for use with rounds of electrically primed ammunition which comprises

a drop in module to replace said firing mechanism which includes

an outer housing,

a power source in said housing,

circuitry means connected to said power source,

said circuitry means being of all solid state construction, and

said circuitry means is engaged with a round of ammunition to provide electrical power thereto to initiate combustion.

4,730,408
FISHING ROD HOLDER
Earl V. Miller, Box 48, Easton, Mo. 64443
Filed Jul. 18, 1986, Ser. No. 886,730
Int. Cl.⁴ A01K *97/12*
U.S. Cl. 43—15 **6 Claims**

1. Apparatus for holding a fishing rod having a fishing line carrying a fishhook, said apparatus comprising:

a support;

a pivot arm having front and back ends, said arm being mounted on said support for pivotal movement about a substantially horizontal pivot axis between a fishing position and a hook setting position;

rod holding means on said arm for receiving and holding the fishing rod with the rod and line extending beyond said front end;

spring means for urging said arm about said pivot axis in a direction toward the hook setting position;

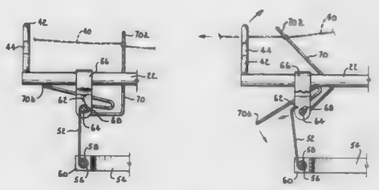
a bolt mounted on said pivot arm for axial rotation at a location offset from said pivot axis;

a trip lever mounted on said support for pivotal movement between an engaged position wherein said lever engages said bolt in a manner to maintain the pivot arm in the fishing position, and a release position wherein the lever is displaced from the bolt to release said arm for movement to the hook setting position under the influence of said spring means;

a trigger element connected rigidly with said bolt in extension therefrom for receiving the fishing line to effect rotation of said bolt when the trigger element is pulled by a pulling force applied to the fishing line; and

a radial projection on said bolt located to engage said trip lever in a manner to displace same from engaged position to the release position when the bolt has been rotated axially through a predetermined arc sufficient to carry said projection against the trip lever.





4,730,409
FISHING LINE APPARATUS
Ernest M. Mitchell, 2943 W. 66th St., Tulsa, Okla. 74132, and Stanley W. Wilcox, 4187 S. St. Louis, Tulsa, Okla. 74105
Filed Mar. 27, 1986, Ser. No. 844,692
Int. Cl.⁴ A01K *87/00*
U.S. Cl. 43—25 **5 Claims**

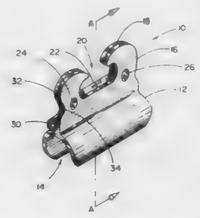
1. A multipurpose fishing line and apparatus comprising:

(a) a tubular means having a longitudinal opening along one side for reversibly snapping on and off of a fishing pole;

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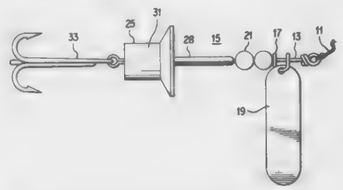
(b) a pair of substantially flat coplanar, superimposed members attached to said tubular means opposite said longitudinal opening and extending essentially radially outward, wherein the outer edge of each of said members has a recess extending inwardly towards said tubular means; and

(c) a cutting edge operatively positioned between said pair



of members such that said cutting edge is exposed only within said recess below the outer edge of said surfaces, wherein at least one of said pair of substantially flat coplanar, superimposed members is further characterized by at least one extension, located near the region of attachment to said tubular means and colinear to the longitudinal opening and wherein said extension extends beyond said tubular means.

4,730,410
SPINNING LURE
Mathew G. Sobieniak, 76 Onondaga St., Lewiston, N.Y. 14092
Continuation of Ser. No. 838,800, Mar. 12, 1986, abandoned.
This application Mar. 2, 1987, Ser. No. 20,863
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.19 **6 Claims**



1. An artifical spinning lure comprising:
a. a spinle having a hook mounted thereon,
b. a spinner blade rotatably attached to said spindle,
c. an elongated resistance body securedly attached in a stationary manner on said spindle, and spacedly positioned between said hook and said spinner blade by a spacing means rotatably attached to said spindle,
d. said resistance body having a front portion and an aft portion, said resistance body being elongated and having a substantially uniform cross-section, and,
e. a stationary, concave resistance face positioned on said front portion of said resistance body, said resistance face being concave toward said spinner blade, said resistance face presented a substantially entirely exposed, non-streamlined, drag-producing surface, said drag-producing surface being sufficient to produce a drag sufficient to substantially entirely overcome the torque produced by the rotation of said spinner blade and to substantially eliminate line twist when the lure is in use.

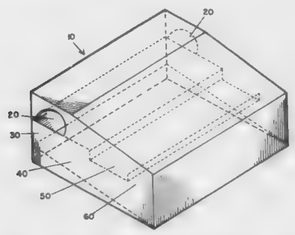
4,730,411
COLLAPSIBLE MARINE TRAP
Peter Katis, 218 Fulton St., Medford, Mass. 02155
Filed Apr. 21, 1986, Ser. No. 854,182
Int. Cl.[4] A01K *69/10*
U.S. Cl. 43—105 **10 Claims**



3. A collapsible trap characterized by a net and a folding frame disposed within and attached to the net, the net having an entrance including a first opening to permit water creatures to enter the trap and to hinder leaving the trap and a second opening for removal of said creatures, said trap comprising:
the net member being formed of a foldably resilient mesh material and having generally spheroidal configured side surface in the erected mode with approximately flat top and bottom portions and a relatively flat generally circular configuration in the collapsed mode;
the folding frame being disposed within said net member and comprising:
first and second annular members attached to said net member in spaced parallel relationship;
a plurality of curved folding longitudinal members joining said first and second annular members together;
each of said longitudinal members comprising a pair of arms having distal and proximal ends;
means pivotally attaching the distal ends of said arms to said annular members;
other means pivotally attaching the proximal ends of said arms together to thereby permit said longitudinal members to be folded inwardly of said net to collapse said trap and unfolded outwardly to erect said trap;
an inwardly extending entrance disposed in the top portion of said net member;
an access opening disposed in the bottom portion of said net member; and
means for closing said access opening while said trap is in use.

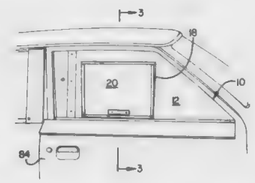
4,730,412
TAMPER-RESISTANT RODENTICIDE BAIT STATION
Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069
Filed Sep. 21, 1987, Ser. No. 98,564
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **4 Claims**

1. A tamper-resistant rodent bait station having two lateral internal levels; said bait station having two portals for rodents to enter and exit at opposing ends; a top level being flush with said portals; a bottom level forming a compartment in cooperation with said top level for the storage and dispensing of rodenticide bait; said top level being set back from the front wall of said bait station forming a trough for a rodent traversing said top level to reach the bait stored in said compartment; said



portals being positioned at the opposing end of the bait station from said trough.

4,730,413
REMOVABLE AUTOMOBILE SIDE WINDOW
Donald J. Henry, New Albany, Pa., assignor to Nami Products, Inc., New Albany, Pa.
Filed Jan. 23, 1987, Ser. No. 6,166
Int. Cl.[4] B60J *1/08*
U.S. Cl. 49—48 **16 Claims**



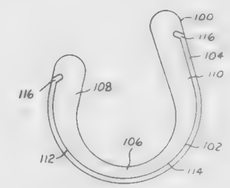
1. A removable automobile side window comprising:
a. A transparent main window panel having:
1. A central cut-out opening,
2. A curved top edge conforming to the shape of an automobile door window opening and
3. A bottom edge;
b. A frame mounted on the outer surface of the main panel surrounding the cut-out opening inwardly of the edges of the main panel, said frame having a pair of opposed parallel channels, said channels
1. Facing each other,
2. Extending along opposite sides of the cut-out opening, and
3. Being spaced outwardly of the main panel;
c. A transparent delivery window mounted in the frame having:
1. Opposed parallel edges movably seated in said frame channels, and
2. Top and bottom edges overlying corresponding portions of the frame
when the delivery window is closed
d. A handle mounted on the interior side of the delivery window adjacent the bottom of the delivery window and extending inwardly therefrom; and
e. Weather seal means forming weather-tight seal between the periphery of the delivery window when closed and the periphery of the frame;
f. Whereby the delivery window may be opened and closed by moving the handle in directions parallel to said edges, said handle extending inwardly from the delivery window sufficiently to engage part of the side window to prevent movement of the delivery window beyond the channels when open.

4,730,414
WINDOW REGULATOR OF AUTOMOTIVE SASHLESS DOOR
Sigeru Nakamura, Odawara, and Yukiharu Tokue, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both of Yokohama, Japan
Filed Feb. 13, 1987, Ser. No. 14,366
Claims priority, application Japan, Feb. 17, 1986, 61-30655
Int. Cl.[4] E05F *11/48, 11/52*
U.S. Cl. 49—348 **17 Claims**



1. A window regulator for regulating a window pane of a door, comprising:
guide means defining an upwardly and downwardly extending given way in said door;
a link motion device including a slide member slidable along said given way, a plate member connected to said window pane to move therewith and two pairs of links each having one end pivotally connected to said slide member and the other end pivotally connected to said plate member, said link motion device having both a contracted condition wherein said plate member is placed close to said slide member and an expanded condition wherein said plate member is placed away from said slide member;
biasing means for biasing said link motion device to assume said contracted condition;
shifting means for changing the condition of said link motion device from said contracted condition to said expanded condition when said slide member is moved up to a predetermined upper position of said given way; and
driving means for driving said slide member to move upward and downward along said given way of the guide means.

4,730,415
NON-METALLIC DOOR EDGE GUARD
Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.
Filed Jan. 20, 1987, Ser. No. 4,658
Int. Cl.[4] B60J *5/00*
U.S. Cl. 49—462 **13 Claims**



1. In combination with the trailing edge of a swinging closure, the improvement in a decorative and protective edge

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guard fitted onto the trailing edge of the swinging closure, comprising a non-metallic body having a curved base fitting over the edge and legs extending from the base to fit against sides of the swinging closure adjacent the edge, said body containing notch structure formed in its surface and having a certain thickness, a layer of non-metallic material having a thickness corresponding essentially to the thickness of said notch structure, and cooperatively joined to said body and fitted to said notch structure, said layer overlying at least a portion of the exterior surface of said base and an adjoining portion of one of the legs.

4,730,416

PERIMETER SEAL AND SEALING SYSTEM

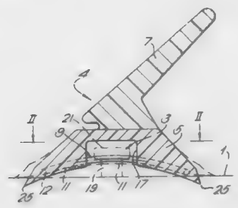
David G. Eames, Coalville, England, assignor to Schlegel (UK) Holdings Limited, Seacroft, England

Filed Sep. 8, 1986, Ser. No. 904,568

Claims priority, application United Kingdom, Sep. 23, 1985, 8523443

Int. Cl.⁴ E06B *7/16*

U.S. Cl. 49—493 **11 Claims**



1. A seal suitable for use as a door seal in a motor vehicle, said seal having a fixing portion and a sealing portion and wherein the fixing portion comprises a resiliently deformable carrier located at least partly in a polymeric material, said carrier having a plurality of resiliently deformable limbs extending transversely of the fixing portion throughout its length, and wherein a channel is formed in said polymeric material, extending lengthwise of the seal, and on either side of said carrier, thereby exposing the carrier in the location of the channel, and wherein the spacing between adjacent limbs of said carrier is such that an enlarged head of a stud may be forced between adjacent limbs during fitting of the seal so that the seal can be fitted to a part to which the stud is connected, and secured to the part by engagement between the underside of said head and said adjacent deformable limbs.

4,730,417

FINISHING METHOD AND APPARATUS

Richard L. Davidson, and Richard S. Davidson, both of Sturgis, Mich., assignors to The Grav-i-Flo Corporation, Sturgis, Mich.

Filed Aug. 29, 1986, Ser. No. 902,143

Int. Cl.⁴ B24B *31/104*

U.S. Cl. 51—7 **6 Claims**

1. A finishing apparatus comprising

a tub for containing loose abrasive material,

mean for rotating the tub at high speeds to cause the material to accumulate along the wall of the tub,

means supporting one or more workpieces to be finished within the material,

means for rotating the workpiece about a vertical axis such that a rapid cutting and finishing action is provided by the relative movement of the tub and the workpieces,

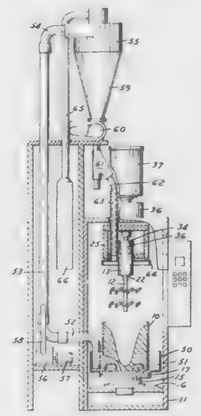
means for removing a portion of the abrasive material from the tube and moving said abrasive material exteriorly of the tub to cool the material and thereafter return the material to the tub,

said means for removing a portion of the abrasive material comprising means defining a trough about the lower edge of the tub,

means on the tub for permitting a portion of the material to pass into said trough,

and pipe means for withdrawing the material, cooling the same exteriorly of the tub, and returning the material to the upper end of the tub,

said pipe means including means for providing a vacuum for drawing said abrasive material through said pipe means,



said pipe means including a cyclone separator for separating the material from air,

an air lock, and a valve for delivering said abrasive material to the open end of the tub,

a first pipe connected to said valve,

a sliding flow tube,

a cover attached to said sliding flow tube and movable with said spindle such that when the spindle is moved into position adjacent the tub, the material is guided by said flow tube and sliding flow tube into the tub.

4,730,418

ABRASING APPARATUS USING MAGNETIC ABRASIVE POWDER

Shuichi Sugawara, Abiko; Hisatsugu Kaji, and Masaaki Shimada, both of Iwaki, all of Japan, assignors to Kureha Chemical Industry Company Limited and Tohbu MX Limited, both of Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 930,151

Claims priority, application Japan, Nov. 15, 1985, 60-257360

Int. Cl.⁴ B24B *31/03*

U.S. Cl. 51—7 **5 Claims**

1. An abrasing apparatus using magnetic abrasive powder comprising:

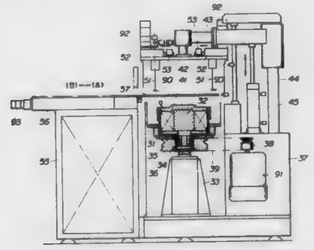
an exciting coil which is wound on an outer periphery of a core disposed between an upper yoke and a lower yoke and is fixedly mounted on a base;

a barrel including an inner plate disposed around an outer periphery of said exciting coil in spaced relationship with the outer periphery, a bottom plate, a cover defining an outer periphery of said barrel and an upper opening to form annular space in which magnetic abrasive powder is filled, said barrel being rotated about a rotational axis by a motor along an outside of said exciting coil on the base;

a bottom magnetic pole which is fixedly mounted to said bottom plate of said barrel and includes a surface in which magnetic members and non-magnetic members are alternately disposed along a rotational direction of the rotational axis of said barrel;

a lateral magnetic pole which is fixedly mounted to said inner plate and includes a surface in which magnetic members and non-magnetic members are alternately disposed along the rotational direction of the rotational axis of said barrel;

an upper magnetic pole which is fixedly mounted to said inner plate of said barrel so that said upper magnetic pole is disposed above said lateral magnetic pole and includes magnetic members and non-magnetic members which are



alternately disposed along the rotational direction of the rotational axis of said barrel in a surface opposed to said surface of said bottom magnetic pole in spaced relationship with said surface of said bottom magnetic pole; and

a spindle inserted into said barrel from upside thereof and including a lower end having a chuck for holding a work of which side portion is disposed within abrasion space surrounded by said bottom magnetic pole, said lateral magnetic pole and said upper magnetic pole, said spindle being rotated by a motor provided on said barrel.

4,730,419

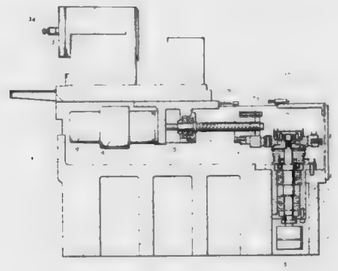
TABLE FEED APPARATUS

Tetsuya Nagata, and Osamu Ohashi, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Jul. 25, 1986, Ser. No. 890,495

Int. Cl.⁴ B24B *47/02*

U.S. Cl. 51—165.89 **11 Claims**



1. A table feed apparatus of the type which converts rotation of a table drive motor into reciprocal movement of a grinder wheel table through a ball-screw assembly to thereby impart a traverse movement to said grinder wheel table between a non-working position and a working position and which converts rotation of a reciprocation axle drive motor into reciprocal movement of said table through an eccentric cam to thereby impart an oscillation movement to said grinder wheel table when the table is in the working position; characterized in that said eccentric cam comprises a cam axle eccentrically extending relative to the axis of rotation of the reciprocation axle drive motor, a cam block slidably connected to an outer surface of said cam plate, a slide-ring, a clutch assembly for effecting connection and disconnection between said cam axle and said cam plate and operative when said axle and plate are connected together to convert said rotation of said cam plate into oscillation movement of the grinder wheel table through the cam block and said slide-ring, and means for effecting adjustment of the amount of eccentricity of said eccentric cam by rotating the cam plate relative to the cam axle by a desired rotation angle;

and drive control means for said eccentric cam comprised of an encoder secured on the reciprocation axle drive motor so as to read the rotation angle of said drive motor, a measurement device for detecting the amount of eccentricity of said eccentric cam, and a control device for controlling rotation of said reciprocation axle drive motor, said drive control means being capable of stopping the eccentric cam at a predetermined angle as a center position of eccentricity in response to a command from said control device and in response to the output of the measurement device, said drive control means also being operable to operate said clutch assembly so as to connect or disconnect to cam plate with the cam axle and thereby to automatically alter the amount of eccentricity of said eccentric cam.

4,730,420

DRILLING DEVICE FOR DRILLING PLATES SUSCEPTIBLE TO BREAKING

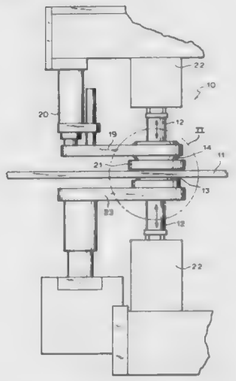
Herbert Stratmann, Bochum; Joachim Korswird, Bramsche III, and Uwe Werner, Enger, all of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 825,099

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 8503153[U]

Int. Cl.⁴ B24B *1/00*

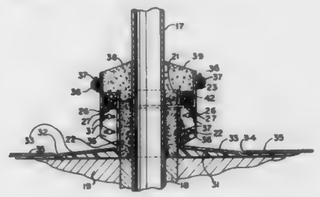
U.S. Cl. 51—283 R **6 Claims**



1. A device for drilling plates susceptible to breaking, particularly glass panes, comprising an annular support for a plate to be drilled; an annular pressing member arranged for movement opposite said support to engage and press the plate; a drill piece supported for movement along an axis passing through openings of said support and said pressing member; said support and said pressing member having respectively an outer jacket in the form of a spherical segment slidably mounted in a correspondingly shaped socket to adjust themselves to inclined positions of the plate relative to said axis.

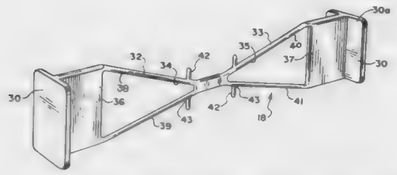
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4,730,421
PITCH BOX
David F. Leeland, R.D. 1, Box 150, Denver, Pa. 17517
Filed Dec. 18, 1986, Ser. No. 943,604
Int. Cl.[4] E04D *1/36*
U.S. Cl. 52—58 10 Claims



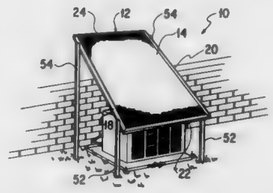
10. A pitch box comprising a molded structure formed of a plastic material which is weather resistant when set and is not subject to degradation due to exposure to sunlight, heat, cold, snow and the like, and said structure comprising an upright tubular body having a base at its bottom with a flange projecting outwardly therefrom, a bottom wall projecting outwardly from said tubular body above said base and flange and below the top of the tubular body and extending to its outer perimeter, and a collar extending upwardly from the outer perimeter of said bottom wall a distance to a height above the top of the tubular body, said bottom wall having perforations within said outer perimeter overlying said flange between said tubular body and said collar.

4,730,422
INSULATING NON-REMOVABLE TYPE CONCRETE WALL FORMING STRUCTURE AND DEVICE AND SYSTEM FOR ATTACHING WALL COVERINGS THERETO
David A. Young, Glen Ellyn, Ill., assignor to Young Rubber Company, Naperville, Ill.
Filed Nov. 20, 1985, Ser. No. 799,933
Int. Cl.[4] E04B *1/00;* E04C *1/00*
U.S. Cl. 52—105 20 Claims



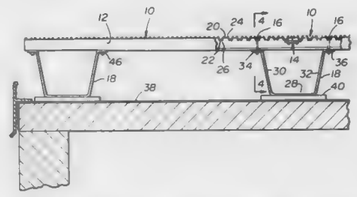
1. In a modular formed plastic concrete form structure, wherein the improvement comprises a pair of modular concrete forming panels each comprised of a series of modular concrete forming sections stacked on top on one another and also disposed in end-to-end relation, the sections each having means on its upper and lower edges and its opposite vertical edges for interlocking the sections in stacked, end-to-end engagement with one another, the panels being positioned in spaced opposed relation, spaced T-shaped tie slots in the opposed sections and which slots are hidden from view when viewing outer surfaces of the stacked forming sections, tie located indicia on outer surfaces of the forming sections for providing blind sighting means to enable screws to be screwed through a wall covering, the indicia, the forming section and into the synthetic plastic ties to securely anchor an exterior wall finishing covering to the forming sections, synthetic plastic wall ties for use with concrete forms, the wall having a pair of T-shaped end sections including a tie stem having a sufficient thickness for receiving an end of a screw in threaded engagement therewith, the T-shaped end sections having parallel cross pieces at opposite ends of the tie secured to said modular concrete forming sections, the tie cross pieces having outer tie faces positioned generally at right angles to a plane through the length of the wall tie enabling said screw to be screwed through into the associated tie stem for attaching a wall covering thereto.

4,730,423
APPARATUS AND METHOD FOR PROTECTING COOLING UNITS
Gary W. Hughes, Little Rock, Ark., assignor to Pulaski Industries, Little Rock, Ark.
Continuation-in-part of Ser. No. 837,123, Mar. 7, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 77,730
Int. Cl.[4] F04B *1/34, 7/02;* A45F *1/14*
U.S. Cl. 52—173 R 28 Claims



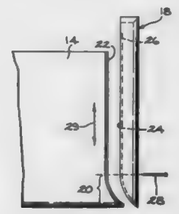
1. A sun protection assembly for shielding a cooling unit from the direct rays of the sun, comprising:
(a) a frame;
(b) a screen attached to said frame, said screen permitting air to flow therethrough; and
(c) supporting means attached to said frame for supporting said assembly a predetermined distance above said cooling unit in a manner whereby said screen shields said unit from direct rays of the sun without interfering with the free flow of air above and around said cooling unit, said supporting means comprising a front leg and a rear leg, said rear leg being longer than said front leg.

4,730,424
ROOFTOP WALKWAY
William J. Green, 65 W. North Ave., Lake Forest, Ill. 60045, and Ralph P. Semmerling, 520 Circle Hill Dr., Arlington Heights, Ill. 60004
Filed Nov. 14, 1986, Ser. No. 930,474
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—180 5 Claims



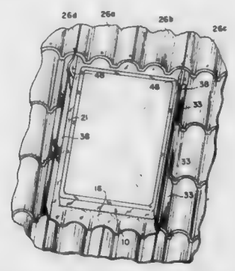
1. A walkway comprising a reticulated plank; a generally U-shaped support stand to which the plank is fastened transversely, said stand having a horizontal flange underlying the plank; and a plurality of T-shaped bolts connecting the plank and the flange, the crossbars of the bolts having a rounded surface in slidable engagement with the plank.

4,730,425
RETURNED STAIR TREAD HAVING MOISTURE COMPENSATED JOINT AND METHOD FOR MAKING SAME
Robert H. Young, P.O. Box 167, Beaver Dam, Ky. 42320
Filed Feb. 24, 1987, Ser. No. 17,863
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—182 18 Claims



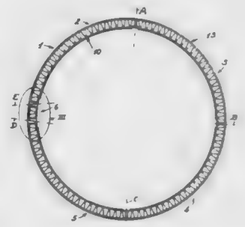
1. A returned tread for use on an open portion of a stairway comprising
a stair tread constructed of wood and having at least one side edge fashioned to fit flush against an opposing surface of a return nosing to form an exposed joint between said stair tread and nosing along a forward end portion of said thread and nosing,
a return nosing fitting flush against said side edge, said stair tread and nosing being slidably connected to one another by tongue and groove construction extending along at least a rear portion of said side edge rearward of said exposed joint, and
means for securing said nosing to said stair tread only in a region containing said exposed joint which is located on a forward end portion of said thread forward of said slidably connected construction to prevent gapping or other deformation of said exposed joint as said stair tread expands or contracts in width over a range due to changing ambient temperature and humidity conditions.

4,730,426
STANDING SEAM SKYLIGHT FOR TILE ROOFS
Kent A. Weisner, Maitland; Lester L. Walls, Jr., Deltona, and Clifford Sanders, Ocoee, all of Fla., assignors to Kenergy Corporation, Orlando, Fla.
Continuation-in-part of Ser. No. 700,106, Feb. 11, 1985, Pat. No. 4,649,680. This application Oct. 14, 1986, Ser. No. 917,846
Int. Cl.[4] E04B *7/18*
U.S. Cl. 52—200 18 Claims



1. A skylight system for installation in a sloping clay-tile roof of the barrel type which includes roof sheathing having a rectangular opening therethrough, said opening having a pair of sloping edges and upper and lower horizontal edges and having a skylight molded from sheet plastic comprising:
a rectangular skylight formed from a sheet of plastic having a pair of parallel longitudinal edges thereof folded upward to form an angle with the plane of said sheet of plastic to thereby produce a pair of standing seam edges;
a flat flange formed along a first lateral edge of said sheet, said flat flange having a riser portion projecting upward therefrom;
a molded flange formed along a second lateral edge of said sheet, said molded flange formed to match the contours of a row of said barrel type roof tiles;
a dome portion in a central portion of said sheet of plastic;
said skylight being disposed over and covering said opening with said standing seam edges disposed along the sloping edges of said opening, said flat flange disposed over said horizontal upper edge of said opening and attached to said roof sheathing and said molded flange disposed over a row of said tiles along said horizontal lower edge of said opening and attached to said tiles and said roof sheathing;
step flashing means disposed along said standing seam edges and having flanges thereof abutting with said standing seam edges, said step flashing means having essentially horizontal flanges thereof formed to match the contours of said barrel type roof tiles, said horizontal flanges attached to roof tiles adjacent said standing seams;
anchor means for attaching said step flashing means and said standing seam edges along said sloping edges of said roof opening; and
a horizontal row of said barrel type tiles disposed along and over said flat flange and resting on said riser portion.

4,730,427
SHUTTERING AND SHORING WALL
Michel Tomsin, Evegnée, Belgium, assignor to Compagnie Francois d'Entreprises CFE S.A., Brussels and Compagnie Internationale des Pieux Armes Frankignoul S.A., Liege, both of, Belgium
Filed May 22, 1986, Ser. No. 866,048
Claims priority, application France, May 28, 1985, 85 07988
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—245 19 Claims



1. Shutting and shoring wall having a cylindrical shuttering surface formed by joining end to end sections which each form a part of said wall limited by two planes perpendicular to the axes of said cylindrical surface, each section having at least one cambered part and consisting of at least two section parts joined together end to end, so that the joining edges are parallel to the axis of said cylindrical surface, and of at least one key (6) inserted between the surfaces of the ends of two section parts facing one another, wherein each section part itself consists of a certain number of identical pivotable main elements (7, 19, 22) and, at each of its means, of an end element (8,9) and of connection and locking means (10), each main element (7, 19, 22) comprises a substantially rectangular shuttering plate (14, 23), one face of which forms the shuttering surface (13), the said plate (14, 23) being equipped, along two edges parallel to one another and to the axis of said cylindrical surface, with means of junction (15,16) with the edge of the adjacent plates (14, 23), the said junction means (15, 16) forming a joint about

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an axis running along the joined edges, each main element (7, 19, 22) further comprising an elongated stiffening core (17, 20, 25) which is spaced from the shuttering plate (14, 23) and is located on the same side as the face opposite the shuttering surface in a parallel direction to the axis of said cylindrical surface and which is connected rigidly to the shuttering plate (14, 23) by means of two connecting elements (18, 26), arranged to form a V, and extending between the stiffening core (17, 20, 25) and the edges of the shuttering plate (14, 23) which are parallel to the axis of the cylindrical surface, each end element (8, 9) likewise comprises a substantially rectangular shuttering plate (29, 30), one face of which forms the shuttering surface (13), and a stiffening plate (31, 32) which is spaced from the shuttering plate (29, 30) and is located on the same side as the face opposite the shuttering surface and which is connected rigidly to the shuttering plate (29, 30) by means of a web (39), each end element (8, 9) is attached to the shuttering plate (14, 23) of the last main element (7, 19, 22) of a section part by a junction means, and on its free end face it is profiled so as to allow connection and attachment to the end element (8,9) of another section part by a translation movement perpendicularly with respect to the axis of the cylindrical surface without rotation, the connection and locking means (10) connect the stiffening cores (17, 20, 25) and stiffening plates (31, 32) in such a way as to keep all the elements (7, 19, 22, 8, 9) of one and the same section part locked in a specific position relative to one another allowing each section part to reach a predetermined curvature radius, the key (6) has a shuttering surface (40) and two lateral insertion surfaces (43, 44), and the end elements (8, 9) adjacent to the key (6) are equipped with means (11, 12) of joining them to the key (6), which are compatible with the lateral insertion surfaces (43, 44) of the latter, so as to allow the key (6) to be inserted by a translation movement perpendicularly with respect to the axis of the cylindrical surface with the shuttering surface (40) at the front.

4,730,428

LOAD BEARING FLOOR OR ROOF MEMBERS

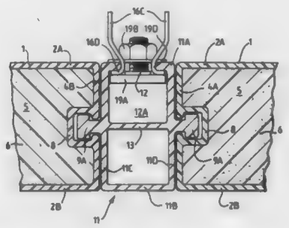
Peter R. Head, Beckenham, and Roy B. Templeman, Bromley, both of England, assignors to G. Maunsell & Partners, London, England

Continuation of Ser. No. 547,924, Nov. 2, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 904,831

Claims priority, application United Kingdom, Nov. 5, 1982, 8231688

Int. Cl.⁴ E04B *5/00*

U.S. Cl. 52—309.11 **5 Claims**



1. A load bearing floor or roof system comprising (a) two or more plank members each plank member including a first major face wall, and a second major face wall spaced from the first major face wall, and opposed side walls, the plank member being a rigid, hollow, unitary pultruded structure of fibre reinforced plastics material, with the major face walls and the opposed side walls being formed in a single pultrusion operation, each opposed side wall having a flat outer surface disposed substantially at right angles to the plane in which at least one of the major face walls lies, and each of the opposed side walls having formed therein an integral undercut channel defined by a slot in the respective outer surface of the side wall and an enlarged inner cavity, and (b) one or more connector members for connecting together adjacent planks by interengagement with the opposed undercut channels of the respective planks, the or each connector member including first transverse wall, a second transverse wall spaced from and parallel to the first transverse wall, a first side wall joining the first and second transverse walls, and a second side wall joining the first and second transverse walls and spaced from and parallel to the first side wall, the first transverse wall including an opening to provide an undercut channel to receive supporting or mounting means, a connector portion projecting laterally from each side wall, the two connector portions projecting in opposite directions and each connector portion being head and neck shaped in cross-section, the undercut channels of the adjacent planks slidably receiving the opposed connector portions of a connector whereby the planks are restrained against lateral separation in the plane of the planks and transverse thereto and may be supported by supporting or mounting means being received in the channel in the first transverse wall of the connector.

4,730,429

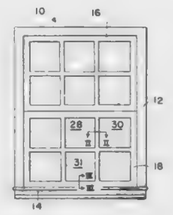
VINYL WINDOW SEAL AND PROCESS

Gary W. Roberts, 19 Newport Ave., Newport News, Va. 23601

Filed Dec. 18, 1986, Ser. No. 943,244

Int. Cl.⁴ E06B *3/30;* **E04G** *23/02*

U.S. Cl. 52—309.13 **9 Claims**



1. A window unit comprising:

(a) a peripheral frame,

(b) a sash contained within said peripheral frame and, combined with said peripheral frame, serving to divide the area within said peripheral frame into at least two open areas;

(c) an individual translucent pane disposed within each opening formed by said sash and said frame;

each said pane having the periphery thereof engaging and supported by portions of said sash;

said peripheral frame and said sash being of wooden construction, said sash having an ornamental interior area and a center rectangular tongue having a base and a tip and extending from said ornamental sash area, a pair of shoulders formed on said ornamental sash area and forming the portions of said sash engaged by and supporting each said translucent pane,

(d) a unitary vinyl support member sealing and retaining each said translucent pane within said sash and having surfaces thereon mating with and overlaying the center rectangular tongue of said sash and portions of said peripheral frame;

(e) sealing means interposed between said unitary vinyl support member and the tip of said center rectangular tongue of said sash and serving to seal said unitary vinyl support member to said sash, and,

(f) additional sealing means interposed between portions of said peripheral frame and the portions of said unitary vinyl support member overlaying said peripheral frame and serving to seal said unitary vinyl support member to said

peripheral frame along a vertical and a horizontal surface of said peripheral frame.

4,730,430

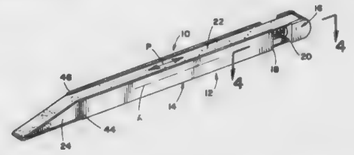
ABRASIVE TOOL

Richard L. Petrovich, 6413 Fordwick Rd., Parma Hts., Ohio 44130

Continuation of Ser. No. 845,549, Mar. 28, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,100

Int. Cl.⁴ B24D *15/02*

U.S. Cl. 51—387 **20 Claims**



1. A slender, hand-held abrasive tool for abrading planar or contoured surfaces comprising an elongated, generally prismatic, unitary body assembly constructed to carry a removable, flexible endless abrasive strip longitudinally about said body assembly along a generally endless path, said body assembly including:

a first, relatively long, prismatic main body section, said first body section including a wedge-shaped workpiece engaging portion;

a second, relatively short body section;

said first and second body sections being of molded plastic construction with each section having laterally disposed, longitudinally extending side walls for aligning said strip with respect to said workpiece engaging portion, and an end adjacent a corresponding end of the other body section, said body sections being in longitudinal alignment and a side wall of each body section being aligned with a corresponding side wall of the other body section to form a handle portion;

biasing means for biasing said body sections longitudinally apart; and,

connecting means permanently joining said body sections and said biasing means to form said unitary body assembly, said connecting means allowing limited longitudinal movement between said body sections, wherein said biasing means is operative to releasably hold said strip under tension in non-slipping relationship to said path.

4,730,431

BEAM

Roger Ericsson, Fågelvägen 5, S-91300 Holmsund, Sweden

PCT No. PCT/SE84/00392, § 371 Date Aug. 9, 1985, § 102(e) Date Aug. 9, 1985, PCT Pub. No. WO85/02878, PCT Pub. Date Jul. 4, 1985

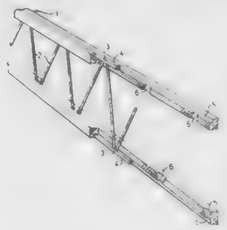
PCT Filed Nov. 19, 1984, Ser. No. 767,273

Claims priority, application Sweden, Dec. 20, 1983, 8307048

Int. Cl.⁴ E04C *3/02*

U.S. Cl. 52—694 **9 Claims**

8. A beam having a longitudinal dimension comprising: two space-apart, parallel flanges at least one of which includes a longitudinally extending member of wood material having a continuous longitudinal channel in a face thereof and coextensive with the flange, the channel containing a continuous flange section of plastics material cast into the channel and coextensive therewith, the flange section containing reinforcing elements, the beam further comprising a metal web of generally zig-zag configuration located between the flanges, the web having a plurality of longitudinally spaced apart bent portions in contact with and joined to the continuous flange



section, said plastics material extending a distance in the longitudinal direction.

4,730,432

MOLDING TRACK FOR CARPETING

Willi Schäfer, Feldafing, and Gunther Sepp, Ottobrunn, both of Fed. Rep. of Germany, assignors to Raumausstattung Willi Schafer, Tutzing, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,735

Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616916

Int. Cl.⁴ E04F *19/04*

U.S. Cl. 52—716 **15 Claims**

1. A molding track for the installation of carpet trim for a carpet of a given thickness, comprising an asymmetric profile composed of an elastic material and having

an upright front lip over which said carpet can be placed and folded;

an upright rear lip spaced from and shorter than said front lip but having a height which is slightly more than half the height of said front lip;

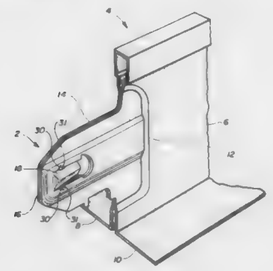
a floor having a width slightly greater than said thickness connecting bases of said lips and lying generally perpendicular thereto, rounded fillets being formed between said lips and said floor internally of said profile;

means forming an anchor chamber on said rear lip of generally square cross section, of a width approximately equal to said thickness, and at a location generally between a middle and upper third of the height of said rear lip for receiving a fastener traversing said front lip in a region of contact between said front lip and said chamber, said rear lip being generally flat except for said anchor chamber, said front lip being resiliently biased toward surface engagement with said chamber in said region; and

an overhang projecting by substantially half said thickness downwardly generally perpendicularly to said floor in a plane of said front lip.

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4,730,433
END DETAIL FOR CEILING RUNNER
James C. Ollinger, Lancaster, and Daniel C. Ziegler, Millersville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Dec. 29, 1986, Ser. No. 946,717
Int. Cl.[4] E04C *3/32*
U.S. Cl. 52—735 3 Claims

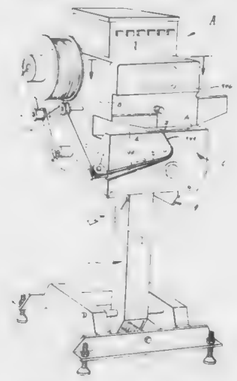


1. An end detail for a ceiling runner wherein the ceiling runner has a vertical web with two horizontal flanges oppositely displaced on either side of the vertical web at the base of the vertical web, said vertical web being formed from two pieces of sheet metal being in an abutting side-by-side relationship, from at least one end of the vertical web there extends integral with the vertical web a tongue in the plane of the vertical web, but with a height less than the height of the vertical web, said tongue being spaced above the horizontal flanges and extends beyond the ends of the horizontal flanges, said tongue at its terminal end being formed with a tapered end, a tab extending from the tongue, said tab having a base, a resilient end and two sides, the tab being cut in part from the two pieces of sheet metal forming the tongue, the base of the tab being uncut from the tongue and being positioned near the terminal end of the tongue, the resilient end and two sides of the tab being cut from the tongue whereby the resilient end can project at an acute angle to the plane of the tongue in the direction away from the terminal end of the tongue, said resilient end having a straight terminal edge, and the tongue having a projection extending therefrom in the plane of the tongue, said projection being positioned near the point where the tongue is integral with the vertical web, said projection having a contact edge extending perpendicular to the plane of the horizontal flanges and being parallel to and spaced from the straight terminal edge of the resilient end of the tab, the improvement comprising:

(a) a means positioned near the base of the tab displacing a portion of the tongue metal laterally within the plane of the tonge behind the tab near its base whereby the displaced metal laterally behind the tab locks the two metal pieces of the tongue together.

4,730,434
MACHINE FOR APPLYING TWIST-TYPE TIES
David S. Knudsen, 3145 Hawthorne Blvd., St. Louis, Mo. 63104
Filed Jul. 3, 1986, Ser. No. 881,730
Int. Cl.[4] B65B *51/08*
U.S. Cl. 53—67 29 Claims

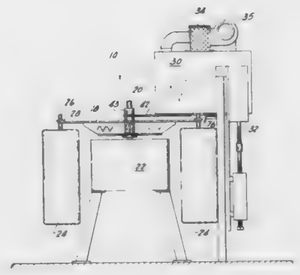
10. A machine for closing a bag with a twist-type ribbon in the region of a gathered neck on the bag; said machine comprising: a frame; means on the frame for defining a path that is configured to accommodate the neck of a bag, so that the bag neck can move through the machine along the path, the path having a tying zone along it; first and second sets of endless belts having opposed passes located in the path ahead of the tying zone, with the direction of movement for the belts being such that the opposed passes move generally toward and terminate substantially at the tying zone, whereby a flattened bag neck which moves into the path will be gripped by the sets of belts at their opposed passes and propelled toward the tying zone where the belts will release it; and tying means located in the region of the tying zone for placing a twist-type ribbon around the bag neck in the form of a loop having first and second segments and for twisting the segments together, so that the neck of the bag is secured in a closed condition and a



sensor located along the belts for sensing the presence of a flattened bag neck while the bag neck is gripped by the belts and for causing the tying means to place a tie around the bag neck when the bag neck is fully within the tying zone.

17. A machine according to claim **10** wherein the endless belts of the first and second sets are along their opposed passes offset both laterally and vertically, so that along the opposed passes the belts of the first set fit generally between the belts of the second set.

4,730,435
STERILE DOCKING SYSTEM FOR FILLING IV BAGS
Richard A. Riddle, Brown Deer; Natale J. Cerami, Waukesha, and Deborah L. Jackman, Hartford, all of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.
Filed Apr. 7, 1986, Ser. No. 849,109
Int. Cl.[4] B05B *55/18*
U.S. Cl. 53—167 17 Claims



1. An apparatus for aseptically filling and sealing preformed flexible bags, said apparatus comprising:

(a) a frame, including a central shaft;

(b) a carousel table rotatably mounted to said shaft, said carousel table designed to hold a plurality of bags around the periphery of said table, each of said bags comprising

an elongate nozzle and a circular diaphragm sealing the top thereof;

(c) means for positioning an individual bag in an operational position; and

(d) a sterile docking unit located above said carousel table, said sterile docking unit comprising:

(1) an open-bottom housing positioned above said carousel table;

(2) means for generating a downward laminar air flow through said housing;

(3) filler means within said housing;

(4) sterilizing means within said housing designed to sterilize the diaphragm and upper portion of the nozzle of a bag in said operational position, wherein said sterilizing means comprises:

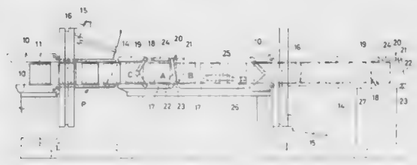
a sterilizing element movable between a first position wherein said sterilizing element is clear of the travel path of said filler means and the nozzle of a bag in said operational position, and a second position wherein said sterilizing element and said diaphragm are in concentric contact;

means connected to said sterilizing means for heating said sterilizing element to a temperature sufficient to sterilize said diaphragm and the upper portion of the nozzle and to at least partially melt said diaphragm; and

means to move said sterilizing element between said first and second positions; and

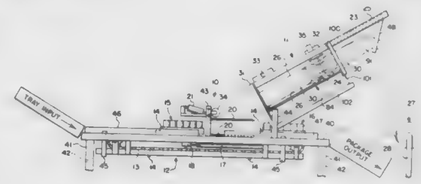
(5) sealing means, located beneath and adjacent to said housing adapted to seal the nozzle of a bag in the operational position.

4,730,436
MACHINE FOR WRAPPING A PACKAGE IN A STRETCHABLE AND THEN COLD-AND/OR HOT-CONTRACTIBLE FILM
Gianfranco Angelino, Alessandria, Italy, assignor to Val.Mec S.r.l., Canelli, Italy
Filed Mar. 5, 1986, Ser. No. 836,442
Claims priority, application Italy, Mar. 13, 1985, 67250 A/85
Int. Cl.[4] B65B *11/58, 11/08*
U.S. Cl. 53—170 3 Claims



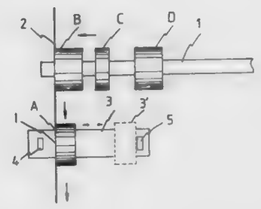
1. A machine for wrapping a package in a stretchable and then contractible film, comprising two successive identical wrapping stations and conveyor means for conveying package to be wrapped first through one said station and then through the other said station, each said station including a support member surrounding said conveyor means, means for supporting a roll of said film on said support member and for advancing said roll of film about the conveyor means to wrap film that unwinds from said roll in a sprial wrapping about packages moving on the conveyor means, a cutting device between said stations to cut the film between two adjacent packages, and means between said cutting means and the stations through which the packages last pass, for rotating the packages through 90°, whereby said film is spiral wound on the packages first in one direction and then spiral wound on the packages at 90° to said first direction.

4,730,437
PACKAGING METHOD AND MACHINE
Edward L. Benno, 17960 W. Hwy. 120, Grayslake, Ill. 60030
Filed May 13, 1987, Ser. No. 49,112
Int. Cl.[4] B65B *9/14, 13/16, 39/02, 43/00*
U.S. Cl. 53—399 20 Claims



6. In a packaging machine for making a package of a generally rectilinear box or tray-like object encircled by a substantially stretched elastic plastics tube, four elongated jaws, frame means for mounting said jaws in two pairs with each pair of two jaws fixed in a parallel spaced-apart relationship, frame supporting means for movably carrying said frame means to align said two pairs of jaws alternately in a relatively small rectilinear pattern position capable of receiving said tube in a substantially unstretched condition thereabout and in a relatively large rectilinear pattern tube stretching position capable of receiving said object therebetween, a tube holding shuttle comprising four elongated members mounted in a parallel spaced-apart rectilinear pattern larger than the small rectilinear pattern of said pairs of jaws and small enough to receive said tube thereabout in a substantially unstretched condition, and means for reciprocatingly mounting said shuttle for movement alternately telescopically over said two pairs of jaws and immediately longitudinally axially removed from said pairs of jaws.

4,730,438
APPARATUS AND METHOD FOR THE ARRANGEMENT AND PACKAGING OF ROLLS
Pauli Koutonen, Jokela, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland
Filed Feb. 6, 1986, Ser. No. 826,602
Claims priority, application Finland, Feb. 8, 1985, 850533
Int. Cl.[4] B65B *59/00*
U.S. Cl. 53—409 18 Claims



1. A method of arranging rolls, in particular paper rolls, into a package suitable for delivery, comprising the steps of:

transferring the rolls, each in its turn, to at least one positioning station,

identifying and end-labelling said rolls one by one,

measuring the width, weight and diameter of said rolls,

comparing identification data and measurement data of each roll together with the corresponding data of at least one preceding roll, if any, placed in a waiting position at the positioning station, with predetermined specification data of the package to be delivered, and,

when said identification data and said measurement data of

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at least one roll received at said positioning station corresponds to said specification data of the package, transferring the at least one roll to a wrapping station.

4,730,439

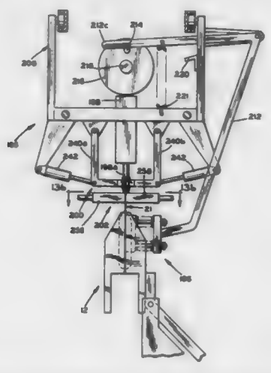
METHOD AND APPARATUS FOR PACKAGING A PRODUCT IN INDIVIDUAL VACUUM SEALED PACKETS

Yun H. Chung, and Dennis E. Chung, both of 6125 Wyandotte West, Maumee, Ohio 43557

Continuation-in-part of Ser. No. 573,492, Jan. 24, 1984, which is a continuation-in-part of Ser. No. 450,275, Dec. 16, 1982, Pat. No. 4,545,180. This application Apr. 30, 1985, Ser. No. 729,152

Int. Cl.[4] B65B *31/06, 43/04, 43/20*

U.S. Cl. 53—433 **27 Claims**



1. A method of packaging a product under vacuum comprising the steps of:

(a) forming an open top packet from a sheet of flexible packaging material;

(b) introducing the product into the open top packet;

(c) inserting a vacuum tube into the open top packet between facing sidewall portions of the packet;

(d) urging the facing surfaces of the sidewall portions against each other and against an outer surface portion of the vacuum tube to temporarily seal the open top packet around the vacuum tube;

(e) subjecting the interior of the packet to a vacuum through the vacuum tube; and

(f) simultaneously with steps (d) and (e), permanently sealing the facing surfaces of the sidewalls together at a location below the lower end of the vacuum tube to close the packet whereby the product therein is sealed under vacuum in the packet.

4,730,440

METHOD AND AN APPARATUS FOR PACKAGING EGGS OR SIMILAR VULNERABLE ARTICLES

Jelle van der Schoot, and Leonardus J. Temming, both of Aalten, Netherlands, assignors to Stasikat B.V., Aalten, Netherlands

Filed Jan. 27, 1987, Ser. No. 7,264

Claims priority, application Netherlands, Jan. 30, 1986, 8600215

Int. Cl.[4] B65B *23/06, 35/56, 35/44*

U.S. Cl. 53—446 **12 Claims**

1. A method for packaging successive rows of eggs or like vulnerable articles in a single package comprising:

(1) supplying the eggs to a conveyor therefor such that successive rows of the eggs extend transversely to the direction of movement of the eggs while being conveyed;

(2) transferring successive rows of the eggs successively from the conveyor into successive rows of cavities extending transversely to the direction of movement of the eggs;

(3) rotating the successive rows of cavities about a central axis after each successive row of cavities is filled with a row of eggs;

(4) continuing the rotation of the rows of cavities with the rows of eggs therein until a row of cavities with a row of eggs therein comes into juxtaposition with a reciprocable plate means;



(5) reciprocating the said plate means while continuing to rotate the rows of cavities with the said rows of eggs therein such that the plate means discharges the row of eggs from one row of cavities as a single row in a package therefor and discharges successive rows of eggs from successive rows of cavities as successive rows of eggs in the said package.

4,730,441

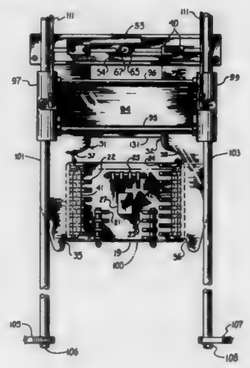
TRAY PACKAGE WRAPPER FOLDING ARMS

Joseph E. Terminella; Frank J. Terminella, and Emanuele J. Terminella, all of Fayetteville, Ark., assignors to Pacmac, Incorporated, Fayetteville, Ark.

Filed May 8, 1986, Ser. No. 860,950

Int. Cl.[4] B65B *11/18*

U.S. Cl. 53—556 **15 Claims**



1. In apparatus for wrapping plastic film around a container such as a food tray including entry transport means, elevator means, coordinated link actuation means, film sheet gripping means and exit transport means, the improvement comprising

a first and a second elongated folding arm each having one partially-constrained end and one free end and being positioned adjacent said elevator means with their long dimensions substantially parallel, each said arm being in a horizontal plane below the uppermost position of said elevator means and above the position of said sheet gripping means,

each of said arms having an outline with a film-engaging edge portion extending in the direction of the width of the film and of a length substantially less than the width of the film sheet being folded, said edge portion being defined by indentations in the outline of said arm at the ends of said edge portion , the depth of said indentations being from about 10% to about 50% of the length of said film-engaging edge portions,

means for constraining the partially constrained end of each said arm for substantially non-rotational movement in a horizontal plane in a direction substantially transverse to its long dimension,

means for coupling said first arm to said link actuation means for causing motion of said first arm toward the center of said elevator means subsequent to elevation of said container by said elevator means,

and means for coupling said second arm to said link actuation means for causing the motion of said second arm to be in a direction opposite to that of said first arm.

4,730,442

APPARATUS FOR PRODUCING PACKS WITH BEVELLED OR ROUNDED LONGITUDINAL EDGES

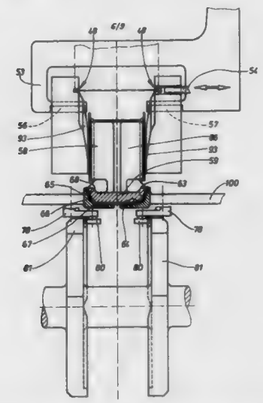
Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jun. 11, 1986, Ser. No. 873,018

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522614

Int. Cl.[4] B65B *47/00*

U.S. Cl. 53—579 **13 Claims**



1. An apparatus for producing essentially cuboid cigarette packs of the hinge-lid type, with bevelled longitudinal edges, from a blank made of thin cardboard and having regions for forming a pack front wall, rear wall, side tabs for side walls, hinge-lid-wall portions and a bottom wall, said apparatus comprising a shaping punch means (**58**), movable up and down, for pressing the blank (**20**) into a vertical pocket (**47**), open at the top, of a folding turret (**46**), the pocket (**47**) and the shaping punch means (**58**) having corresponding mating shaping surfaces in the form of a pocket bottom (**62**) and a punch plate (**59**), respectively, which have bevelled regions at their sides, such that, simultaneously, side tabs (**25,33**) are erected and the bevelled longitudinal edges (**38,39**) are formed between the rear wall and the side walls; said shaping punch means (**58**) having on its radially inner end an upright pressing leg (**86**) which presses a vertical blank leg (**45**) into an upright position relative to a horizontal blank leg (**44**), said vertical blank leg (**45**) containing the bottom wall (**22**) and the front wall (**21**) with its side tabs (**24**), and said horizontal blank leg (**44**) containing the rear wall (**23**) and the hinge-lid wall portions (**30, 31, 32, 33, 34, 35, 36**); and radially-movable side tab former means (**88**) for folding the side tabs (**24**) into a position transverse relative to the upright front wall (**21**), thereby forming the bevelled longitudinal edges (**37**) between the front wall and the side walls.

4,730,443

APPARATUS FOR FOLDING FRONT AND REAR FLAPS IN A WRAPAROUND CASER

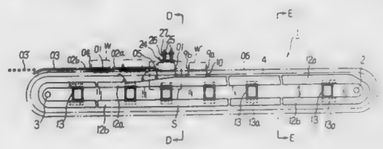
Katsumi Matsuda, and Kunio Kono, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 896,289

Claims priority, application Japan, Sep. 10, 1985, 60-198652

Int. Cl.[4] B65B *11/08*

U.S. Cl. 53—580 **4 Claims**



1. An apparatus for folding flaps of sheets having front and rear flaps into wraparound cases surrounding an article, the apparatus comprising:

an endless conveyor for transporting a sheet;

sheet guide means attached to said endless conveyor for pushing the sheet in the direction of travel of said endless conveyor;

means for supplying the sheet to said endless conveyor;

means for placing an article onto the sheet;

means for folding the sheet around the article;

means, attached to said endless conveyor, for guiding and pressing the article while the sheet is folded around the article;

said means for folding the sheet around the article having cam rail means disposed adjacent and radially spaced from said endless conveyor for transporting the sheet, front and rear flap folding guide members for folding respective front and rear flaps of the sheet, and pivotably attached to said endless conveyor for transporting the sheet, front and rear roller followers respectively attached to said front rear flap folding guide members, said front and rear roller followers being operatively associated with said cam rail means;

said front and rear roller followers adapted to pivot said pivotably attached front and rear flap folding guide members;

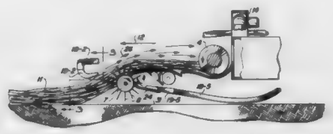
said means for placing an article onto the sheet having means for supplying the article in the direction of movement of the endless conveyor for transporting a sheet;

means for synchronizing the movement of said endless conveyor for transporting a sheet, said means for supplying the article in the direction of movement of said endless conveyor, and said front and rear flap folding guide members;

wherein, said cam rail means is adapted to deflect said front and rear roller followers in turn, whereby when the article is supplied in the direction of movement of said endless conveyor onto the sheet, the front roller follower contacts said cam rail, whereby said front roller follower is deflected, and, hence, said front flap folding guide member is pivotably rotated about its connection to said endless conveyor, and folds the front flap of the sheet, and the article contacts the folded front flap which serves as a stop for the article, then the rear flap is folded against the article by the rear flap folding guide member.

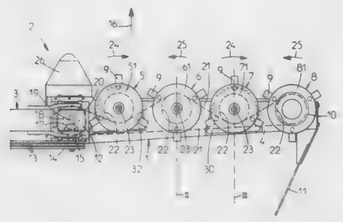
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4,730,444
AIR SEAL FOR PREVENTING SEED LOSS IN CROP PICKUP MECHANISM
Leon E. Leffel, 2743 1st St., and Rick G. Leffel, 2723 W. 1st St., both of Yuma, Ariz. 85364
Filed Apr. 23, 1986, Ser. No. 855,144
Int. Cl.[4] A01D *57/28*
U.S. Cl. 56—13.1 14 Claims



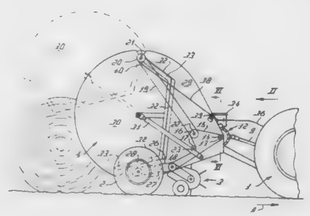
9. In a machine for harvesting seeds from brittle crop material in windrows, the machine including a rotary pickup drum for lifting the windrows over the pickup drum and feeding it into an auger assembly as the machine moves forward against the windrows, wherein the stresses applied to the windrow during the lifting cause large numbers of seeds to be ejected from open pods as a result of cracking of the stems and the resulting shock to the pods, an air seal apparatus comprising means for producing a high velocity first sheet of air that skims over the surface of the lifted windrow, including the upwardly sloped portion from which seeds begin to fly upwardly and outwardly, with sufficient velocity to deflect the flying seeds rearward into the auger assembly, and means for producing a second high velocity sheet of air beneath the lifted windrow and guiding the second sheet of air so that it passes at high velocity upward through gaps between the pickup drum and a rake plate over which the lifted windrow passes.

4,730,445
ROTARY MOWER
Michel Wolff, Hochfelden, France, assignor to Kuhn, S.A., Saverne, France
Filed Jun. 16, 1986, Ser. No. 874,650
Claims priority, application France, Jun. 17, 1985, 85 09292
Int. Cl.[4] A01D *34/66*
U.S. Cl. 56—13.6 16 Claims



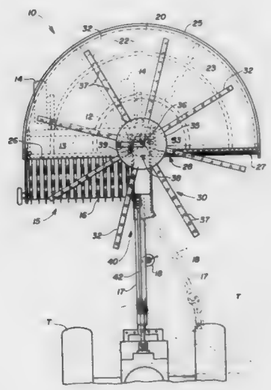
1. A rotary mower adapted to be moved in a work direction during use, said rotary mower comprising:
(a) a beam having an upper face;
(b) at least one first cutting element extending above said beam, said at least one first cutting element being connected to an upwardly directed shaft having a longitudinal axis, said upwardly directed shaft being guided in rotation on said beam, said at least one first cutting element being made up of a cutting tool support provided with cutting tools rotating in a first plane of rotation;
(c) at least one second cutting element extending above said beam and located adjacent to said at least one first cutting element, said at least one second cutting element being connected to an upwardly directed shaft having a longitudinal axis, said upwardly directed shaft being guided in rotation on said beam, said at least one second cutting element being made up of a cutting tool support provided with cutting tools rotating in a second plane of rotation, said second plane of rotation being lower than said first plane of rotation during use of said rotary mower, the volume swept by said cutting tools associated with said at least one second cutting element partially overlapping the volume swept by said cutting tools associated with said at least one first cutting element;
(d) drive means for driving a first one of said cutting elements in rotation; and
(e) transmitting means for transmitting the drive from said first one of said cutting elements to the second one of said cutting elements to drive said second one of said cutting elements in rotation, said transmitting means being able to be desynchronized;
(f) said upper face of said beam comprising in the vicinity of said at least one first cutting element a bulge having an upper face, said upper face of said bulge being at least approximately planar and extending at least approximately parallel to said first plane of rotation of said at least one first cutting element, said bulge covering:
(i) at least approximately the space of said upper face of said beam located under said cutting tool support associated with said at least one first cutting element and
(ii) in part at least the space of said upper face of said beam not swept by said cutting tools of said at least one second cutting element.

4,730,446
BALERS
Cornelis van der Lely, Zug, Switzerland, assignor to Texas Industries Inc., Curacao, Netherlands Antilles
Division of Ser. No. 676,307, Nov. 29, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 811,721
Claims priority, application Netherlands, Dec. 1, 1983, 8304136
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 22 Claims



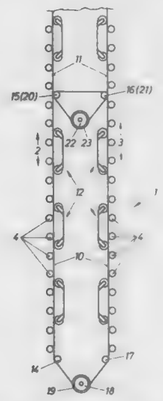
1. A baler comprising a pick-up device for picking up crop lying on the ground, a bale forming space provided with winding elements, a means for driving said winding elements at at least two different speeds, a binding means for winding binding material around a formed bale, and a coupling means for simultaneously actuating said binding means and selecting a driving speed of said winding elements which exceeds the speed maintained while forming the bale.

4,730,447
APPARATUS FOR TURNING A WINDROW OF CROP MATERIAL
Jacob M. Fisher, Gordonville, and Ivan L. Stoltzfus, New Holland, both of Pa., assignors to New Holland Inc., New Holland, Pa.
Continuation-in-part of Ser. No. 639,192, Aug. 9, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,099
Int. Cl.[4] A01D *78/00, 78/10*
U.S. Cl. 56—377 10 Claims



1. An apparatus for inverting and laterally displacing a windrow of crop material from a first path on the ground in which the windrow of crop material is oriented with a dry side on top and a damp side adjacent the ground to a laterally spaced second path in which the windrow of crop material is oriented with the damp side on top and the dry side adjacent the ground, comprising:
a mobile frame adapted for movement over the ground at a forward speed of travel;
a platform mounted on said frame and having a surface over which the windrow of crop material can be conveyed, said platform surface terminating at a discharge edge;
pickup means supported from said frame for engagement with said windrow of crop material in said first path, said pickup means being operable to elevate said windrow from the ground to said platform surface;
conveying means operably engageable with said windrow deposited on said platform surface to convey said windrow along said platform surface to said discharge edge, said windrow being oriented on said platform surface with the dry side on top and the damp side adjacent said platform surface, said conveying means being operable to tumble said windrow of crop material over said discharge edge toward the ground;
adjustment means operably associated with said conveying means for vaying the height thereof relative to the surface of said platform; and
drive means drivingly connected to said pickup means and said conveying means for operation thereof at a speed to permit said windrow of crop material to be inverted upon contatct with the ground under conditions where said frame is moving at a forward speed of travel to orient said windrow in said second path with the dry side adjacent the ground.

4,730,448
TANGENTIAL-BELT DRIVE FOR WORK UNITS OF A MACHINE FOR THE PRODUCTION OF TWISTED OR TWINED YARNS
Horst Wolf, Albershausen; Ernst Halder, Ebersbach, and Norbert Städele, Göppingen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany
PCT No. PCT/DE85/00400, § 371 Date Jul. 10, 1986, § 102(e) Date Jul. 10, 1986, PCT Pub. No. WO86/02958, PCT Pub. Date May 22, 1986
PCT Filed Oct. 16, 1985, Ser. No. 887,101
Int. Cl.[4] D01H *1/241;* F16G *1/14;* F16H *7/02*
U.S. Cl. 57—105 6 Claims



1. A tangential-belt drive for a machine used in the production of twisted or twined yarns comprising:
a plurality of work units of the same kind, arranged next to each other in at least one row, the work units being subdivided in a plurality of sections with at least approximately the same number of work units, and said number allowing an acceptable belt stretch factor;
an endless tangential belt driving each of said sections, each of said tangential belts having a belt stretch factor between 0.6 and 1.5%, a width between 7 and 15 mm and a thickness between 2 and 2.7 mm;
at least one electromotor for driving the tangential belt pertaining to each section; and
guide means assigned to the tangential belt.

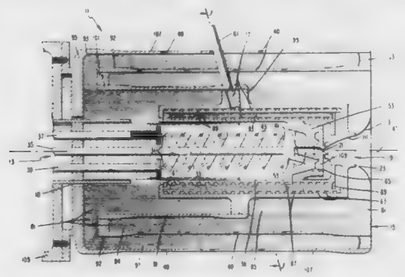
4,730,449
RADIATION TRANSFER THRUSTERS FOR LOW THRUST APPLICATIONS
Gordon L. Cann, Irvine, Calif., assignor to Technion, Inc., Irvine, Calif.
Continuation of Ser. No. 517,265, Jul. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 365,782, Apr. 5, 1982, Pat. No. 4,471,003, which is a continuation-in-part of Ser. No. 359,776, Mar. 19, 1982, abandoned. This application Dec. 19, 1986, Ser. No. 943,887
Int. Cl.[4] G21D *1/00*
U.S. Cl. 60—203.1 71 Claims

1. A thruster assembly for low thrust applications and use with a propellant which may be heated in order to obtain a higher specific impulse which increases the life of a propulsion system, the thruster assembly comprising:
(a) a heating filament and power source controllably connected thereto;
(b) a heater cavity having heater walls having an inner surface;
(c) a supporting structure for the heating filament, the struc-

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ture supporting the filament entirely within the heater cavity in a manner such that the filament is separated from the heater wall and radiation shielding means comprising a plurality of discs mounted about said supporting structure and at least some of said discs having substantially cylindrical reflectors attached to the outer periphery thereof and extending toward said heating filament;

(d) a propellant guiding structure surrounding the heater cavity and having at least one propellant passageway therein, an outer wall of said propellant passageway being attached to an extended length of supporting structure, said extended length being provided with lightening holes to minimize energy loss occurring as a result of thermal conduction through the structural support conduction path, the propellant guiding structure physically isolating



said heating filament from said propellant and having a heat sinking capability whereby the filament may be switched on when the propellant is not flowing through said passageway; said propellant guiding structure leading to expansion nozzle means; and

(e) the propellant guiding structure being further constructed to permit sufficient heat to be transferred to the fluid in order to enable the fluid to be used as a propellant and in said manner obtain a higher specific impulse at times when the filament is switched off, provided that the average amount of energy supplied by the filament over a period of time during which the filament has been placed at an elevated temperature is greater than the amount of energy necessary to heat the propellant passing through the propellant passageway during the period of time.

4,730,450

BOBBIN SUPPLYING SYSTEM IN SPINNING WINDER

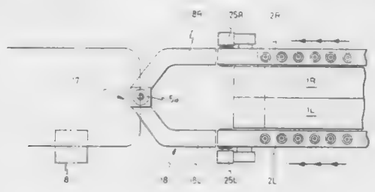
Shoichi Tone, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 2, 1986, Ser. No. 902,503

Claims priority, application Japan, Sep. 3, 1985, 60-194479

Int. Cl.⁴ D01H *9/18, 9/00*

U.S. Cl. 57—281 **19 Claims**



1. A spinning winder, comprising:

a winder having means for producing spinning bobbin demand signals;

a spinning machine, having a first and a second side and having a first machine bed on said first side and a second machine bed on said second side, providing spinning bobbins;

a bobbin transporting passage, connecting said winder with said spinning machine, said bobbin transporting passage having a bobbin supplying station;

a bobbin supplying system for repetitively, alternating the supplying of a single spinning bobin produced from said machine bed on said first side of said spinning machine with a single spinning bobbin produced from said machine bed on said second side of said spinning machine to said bobbin supplying station, in response to said spinning bobbin demand signals.

4,730,451

METHOD FOR PRODUCING A YARN

Helmut Fuchs, Linz, Austria, assignor to Textilmaschinenfabrik Dr. Ernest Fehrer Aktiengesellschaft, Leonding, Austria

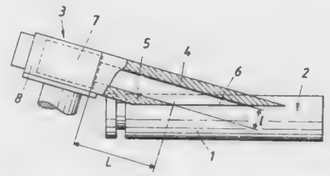
PCT No. PCT/AT86/00021, § 371 Date Oct. 31, 1986, § 102(e) Date Oct. 31, 1986, PCT Pub. No. WO86/05527, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 10, 1986, Ser. No. 930,367

Claims priority, application Austria, Mar. 18, 1985, 791/85

Int. Cl.⁴ D01H *7/892, 7/882*

U.S. Cl. 57—401 **1 Claim**



1. A method of making a yarn in an apparatus comprising two juxtaposed, closely spaced twisting drums adapted to be driven in the same sense and defining a generally triangular twisting space therebetween, a fiber-opening means, and an inclined fiber-guiding duct receiving singled fibers from the fiber-opening means and protruding into the twisting space for supplying the singled fibers thereto, the length of the shortest boundary wall of the fiber-guiding duct facing the twisting space being at least equal to the average length of the longest singled fibers and the duct defining a flow area whose length-to-width ratio is between 10:1 and 2:1, which comprises the step of entraining the single fibers through the duct into the twisting space in an air stream having a mean velocity of flow corresponding to a Reynolds number of 5,000 to 50,000.

4,730,452

POWER PLANT WITH A COMBUSTION CHAMBER WITH COMBUSTION IN A FLUIDIZED BED

Bert Källman, Västerås, Sweden, assignor to ASEA Stal AB, Västerås, Sweden

Filed Aug. 13, 1986, Ser. No. 895,970

Claims priority, application Sweden, Aug. 26, 1985, 8503959

Int. Cl.⁴ F02C *3/26;* **F02G** *1/00*

U.S. Cl. 60—39.464 **8 Claims**

1. A power plant with a combustion chamber having a wall having an outer and inner side, said wall defining a combustion chamber space in which fuel is burnt in a fluidized bed of particulate material said wall comprising:

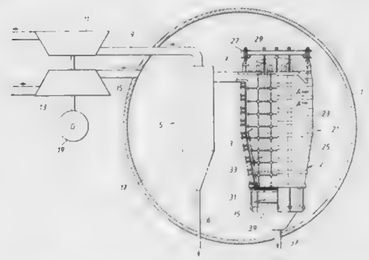
a layer of thermally insulating material provided on the inner side of the wall and including;

a plurality of flanged channel-section members, having flanges directed inwardly toward the combustion chamber and a plurality of U-shaped guiding members;

said channel-section members and said guiding members defining a grid, said grid including a plurality of grid units, each unit including at least two channel-section members and guiding members constituting corners of said unit, each guiding member receiving ends of said channel section members,

at least one end of each channel-section member being movably disposed in said guiding member;

a plurality of cover plates having edge elements, each cover plate covering a respective unit of said grid, said edge



elements extending between said flanges of said channel-section members forming said grid unit;

a plurality of fixing members overlapping corners of said cover plates; and,

means for securing said fixing means to the outer side of the wall and retaining said cover plates in place in said grid unit.

4,730,453

AFTERBURNER FUEL INJECTION SYSTEM

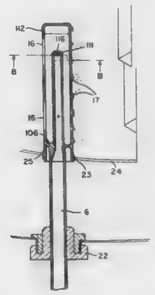
René A. Benoist; Guy J. Lapergue, both of Le Mee sur Seine, and Jacques A. Legueux, Voisenon, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Oct. 20, 1986, Ser. No. 920,435

Claims priority, application France, Oct. 23, 1985, 85 15713

Int. Cl.⁴ F02K *7/10;* **F02C** *7/22*

U.S. Cl. 60—261 **8 Claims**



1. In a gas turbine engine having at least one turbine wheel, an afterburner and a flame holder located in the afterburner such that exhaust gases pass through the turbine wheel into the afterburner from an upstream direction toward a downstream direction generally parallel to a longitudinal axis of the turbojet engine, the improved system for injecting fuel into the exhaust gas stream in the afterburner comprising:

(a) a plurality of individual tubular injectors regularly distributed about the periphery of the afterburner and extending into the afterburner generally perpendicularly to the flow of gases therethrough;

(b) fuel supply means to supply fuel to each of the tubular injectors independently of the other tubular injectors;

(c) atomizing chamber means, one atomizing chamber associated with each tubular injector each atomizing chamber means defining at least one intake orifice to allow exhaust gas to pass into the chamber, and further defining a plurality of exit orifices, such that (i) the number of exit orifices is greater than the number of intake orifices, and (ii) the size of each exit orifice is smaller then the size of the at least one intake orifice; and,

(d) nozzle means associated with each tubular injector to spray fuel into the associated atomizing chamber so as to create a finely atomized fuel mixture which passes through the exit orifices into the afterburner.

4,730,454

PROCESS AND SYSTEM FOR THE OXIDATION OF ENGINE EMISSION PARTICULATES DEPOSITED IN A PARTICULATE FILTER TRAP

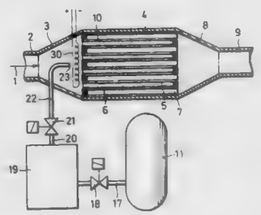
Franz Pischinger, Aachen, and Gerhard Lepperhoff, Eschweiler, both of Fed. Rep. of Germany, assignors to FEV Forschungsgesellschaft für Energie-Technik und Verbrennungsmotoren mbH, Aachen, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,645

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538155

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—274 **24 Claims**



1. A process for the oxidation of a concentration of internal combustion engine emission particulates collected in a particulate filter trap by supplying secondary energy to the deposit at an inlet surface of the filter and/or to the particulate/exhaust gas mixture, comprising the step of adjusting the concentration of particulates in one of: (a) in the filter; (b) in front of the inlet surface of the filter; and (c) in the filter and in front of the inlet surface of the filter, to a value that lies within the explosive range of the particulate/exhaust gas mixture, the adjusting step being carried out by one of: (aa) recycling combustible particulates; (bb) briefly introducing combustible particulates to the exhaust gas flow in front of the inlet face of the filter; and (cc) recycling combustible particulates and briefly introducing combustible particulates to the exhaust gas flow in front of the inlet face of the filter.

4,730,455

PROCESS AND SYSTEM FOR THE REGENERATION OF PARTICULATE FILTER TRAPS

Franz Pischinger, Aachen, and Gerhard Lepperhoff, Eschweiler, both of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,025

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1986, 3608838

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—274 **11 Claims**

8. A process for the regeneration of one particular filter trap employed for purifying the exhaust gas of an internal combustion engine, particularly a motor vehicle diesel engine, by oxidation of particulates collected in the trap, combustion of the particulates being carried out during engine operation by at

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least two fuel burners, respectively associated with areas of the trap, comprising the steps of regenerating one of the trap areas by directing a flame jet from the corresponding burner at high velocity flow for a short duration, transversely to the inflow direction of the exhaust gas to be purified, directly into one of

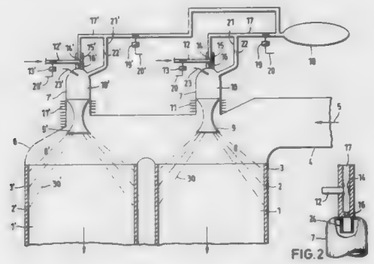


FIG.2

the trap areas associated therewith without mixing with the exhaust gas flow, diverting the exhaust gas, solely by the flame jet, to flow into the other trap area from the vicinity of the one burner, and simultaneously initiating combustion by the flame jet, of the particualtes collected in the corresponding trap area.

4,730,456

TURBO-SUPERCHARGER FOR AN INTERNAL COMBUSTION ENGINE

Tomoo Tadokoro, and Ikuo Matsuda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

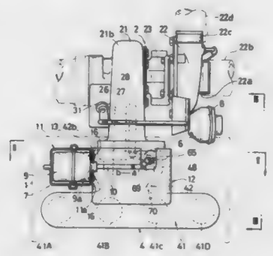
Continuation-in-part of Ser. No. 681,829, Dec. 14, 1984, Pat. No. 4,617,799. This application Mar. 19, 1986, Ser. No. 841,227

Claims priority, application Japan, Dec. 16, 1983, 58-238398; Mar. 19, 1985, 60-56341

The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **12 Claims**



1. A turbo-supercharged for an engine, comprising a supercharging compressor located in an intake system of the engine and an exhaust gas turbine located in an exhaust system of the engine for driving the compressor, said turbine including a turbine casing and a turbine rotor rotatably supported in said turbine casing, said exhaust system of the engine having exhaust pipe means defining an exhaust passage and connected with said turbine casing, said turbine casing having exhaust gas inlet passage means for directing exhaust gas of the engine from the exhaust passage to said turbine rotor, said inlet passage means including at least a first inlet passage and a second inlet passage which are located in a side-by-side relationship with each other, valve means for closing said second inlet passage, characterized by the fact that said first and second inlet passages are opened to said exhaust passage in said exhaust pipe means respectively through first and second inlet ports which are oriented in a direction opposing exhaust gas flow in the exhaust passage, said exhaust pipe means being formed in a portion adjacent to said turbine casing with a sidewardly bulged portion, said valve means including a valve member adapted for seating on a valve seat formed in a peripheral portion of the second inlet port for closing said second inlet port and swingable arm means for supporting said valve member swingably on said exhaust pipe means so that said valve member can be moved from a closed position seating on said valve seat against the exhaust gas flow to an open position in which said valve member is located substantially in said bulged portion.

4,730,457

SUPERCHARGING SYSTEM FOR AUTOMOTIVE ENGINES

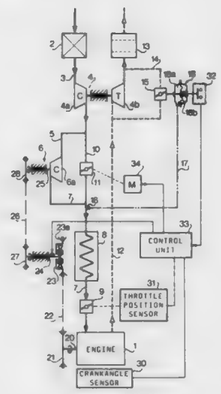
Takemasa Yamada, Niza; Hideo Yabuhara, Musashino, and Fujio Takimoto, Ichikawa, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,276

Claims priority, application Japan, Oct. 29, 1985, 60-242512; Oct. 29, 1985, 60-242513

Int. Cl.[4] F02B *37/04*

U.S. Cl. 60—609 **6 Claims**



1. A supercharging system for an automotive engine comprising:
- a turbocharger driven by exhaust-gas of the engine;
- a supercharger;
- an intake passage connecting the turbocharger and the supercharger in series, for supplying air to the engine;
- driving means for driving the supercharger by the engine;
- clutch means provided in the driving means;
- a first bypass provided around the supercharger;
- a control valve provided in the first bypass;
- a second bypass provided around the turbine of the turbocharger;
- a waste gate valve provided in the second bypass;
- a first actuator for operating the control valve;
- a second actuator for operating the waste gate valve;
- first means for operating the second actuator to open the waste gate valve when supercharging pressure exceeds a predetermined value;
- an engine speed sensor for detecting speed of the engine;
- an engine load sensor for detecting load on the engine;
- a control unit responsive to output signals of the engine speed sensor and engine load sensor for operating the clutch means and first actuator;
- the control unit including second means for disengaging the clutch means at light load on the engine in a predetermined low engine speed range, third means for engaging the clutch means at heavy load in the low engine speed range, fourth means for disengaging the clutch means in a predetermined high engine speed range;
- fifth means for controlling the opening of the control valve in accordance with variation of engine speed and load when the engine operation is in a transient state.

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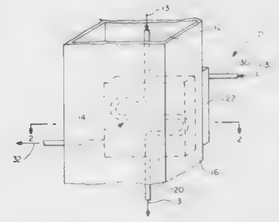
THERMAL ELECTRIC VAPOR TRAP ARRANGEMENT AND METHOD

Terry Alger, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1986, Ser. No. 911,943

Int. Cl.[4] F25B *21/02*

U.S. Cl. 62—3 **1 Claim**



1. An arrangement for trapping condensable vapor passing through a condensing tube, said arrangement comprising: a predetermined section of said condensing tube configured so as to define at least a U-shaped flow path therethrough; a thermally conductive plate member having opposing faces, one of which is positioned directly against said predetermined tube section; a housing for containing said predetermined condensing tube section and plate member, said housing including at least one side wall formed of thermally conductive material and having an internal surface positioned directly against the face of said plate member opposite said predetermined condensing tube section; thermal electric means including a plurality of thermal electric device, said thermal electric means having a hot side and a cold side, the latter being positioned against the outer surface of said side wall in direct alignment with said plate member, said cold side of said thermal electric device being sufficiently cold to condense any vapor passing through said tube section, whereby the condensed vapor becomes trapped within said tube section; a cooling tube disposed directly against the hot side of said thermal electric means for cooling the thermal electric means; means for directing cooling fluid through said cooling tube; and wherein said plurality of thermal electric devices each have a hot side and a cold side, the thermal electric devices being stacked in serial arrangement such that the cold side of a given device cools the hot side of the device directly under it, except for the innermost thermal electric device which has a cold side that cools said predetermined tube section, and the outermost thermal electric device which has a hot side that is cooled by said cooling means.

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THERMOELECTRIC MODULES, USED IN THERMOELECTRIC APPARATUS AND IN THERMOELECTRIC DEVICES USING SUCH THERMOELECTRIC MODULES

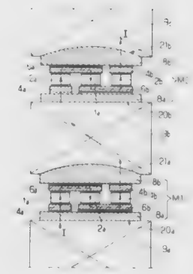
Philippe Schlicklin, Nancy, and John G. Stockholm, Vernouillet, both of France, assignors to Air Industrie, France

Filed Aug. 23, 1985, Ser. No. 768,691

Claims priority, application France, Sep. 12, 1984, 84 13990

Int. Cl.[4] F25B *21/62;* **H01L** *25/30, 25/32*

U.S. Cl. 62—3 **21 Claims**



15. A thermoelectric device comprising stacks of electrically conducting heat exchangers and active thermoelectric units in thermal and electrical contact with said heat exchangers, said active units comprising both N-type modules and P-type modules and said modules each comprising an odd number $(2x+1)$ of thermoelements, wherein (x) is a positive, non-zero integer; said thermoelements being connected electrically in series and thermally in parallel and being secured to corresponding electrical connectors, said electrical connectors being secured to inner face of two electrically conducting members which are in electrical and thermal contact, through the external faces thereof, with the heat exchangers and which act also as electrical terminals for module current flow, said electrical connectors which are secured to thermoelements being either two connectors of a first type secured, respectively, to a face of an inlet thermoelement and a face of an outlet thermoelement and in thermal and electrical contact with a respective one of said electrically conducting members so as to provide a module current inlet and outlet, or connectors of a second type, which are 2x in number, and are respectively secured in two groups of x connectors to the inner faces of said members in thermal contact therewith but electrically insulated therefrom by at least one insulating layer disposed on the surfaces of the second type connectors facing the inner faces of said members, said second type connectors serving to connect two by two the faces of the thermal elements which do not provide the current inlet and outlet so as to provide, in combination with the thermoelements which provide the current inlet and outlet and are secured to the two first type connectors, a preferential path for the current wherein the current is forced to flow through the entire plurality of thermoelements between the current inlet and outlet without flowing through said members, said module further including $(x+1)$ thermoelements of a P or N-type and x thermoelements of the other P or N-type, and the current inlet and outlet being provided by two thermoelements of the type of the said $x+1$ thermoelements, so as to provide one or the other of two kinds of modules which are functionally equivalent ot single N and P-type thermoelements.

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ULTRA - RAPID PLASMA FREEZING WITH HALOCARBON HEAT TRANSFER LIQUIDS

Philip H. Coelho, and Victor Comerchero, both of Folsom, Calif., assignors to Castleton, Inc., Rancho Cordova, Calif.

Filed Feb. 9, 1987, Ser. No. 12,196
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **7 Claims**

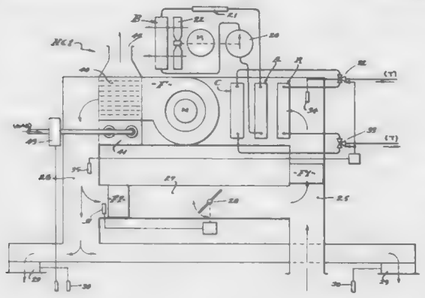
1. A process of freezing plasma comprising the steps of exposing thin wall containers of plasma to be frozen to direct contact with a heat transfer liquid selected from the group consisting of the chlorofluorocarbon 1,1,2 trichloro-1,2,2 trifluoro-ethane (CFC 113) and mixtures of the chlorofluorocarbon 1,1,2 trichloro-1,2,2 trifluoro-ethane (Freon 113), and at least one of the fluorocarbons perfluoropentane (C_5F_{12}), perfluorohexane (C_6F_{14}), perfluoromethylcyclohexane (C_7F_{14}), perfluoroheptane (C_7F_{16}), perfluoromonomethyldimethylcyclohexanes (C_7F_{14}/C_8F_{16}), perfluorodecalin isomers ($C_{10}F_{18}$), mixed perfluorodecalin and methyldecalin isomers ($C_{10}F_{18}+C_{11}F_{20}$), and perfluorinated polyethers ($[OCF(CF_3)CF_2]_n$—$(OCF_2)_m$, and maintaining said liquid at a temperature sufficiently low enough to freeze said plasma in the desired amount of time.

4,730,461

MULTI-ZONE COLD STORAGE VARIABLE AIR VOLUME AIR CONDITIONING SYSTEM

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Jun. 5, 1987, Ser. No. 58,408
Int. Cl.[4] F25B *29/00*
U.S. Cl. 62—159 **16 Claims**



9. A multi-zone thermal energy storage variable air volume heating and cooling air conditioning sytem for capacity effective averaging in the selection of a multiplicity of continuously operable refrigeration cooling units that may vary in capacity and each operable at its optimum capacity and assigned to a separate zone space, and including:

a plurality of zone space heating and cooling units and each comprising a heating means and a refrigeration means between common supply and return air ducts,

the refrigeration means directing refrigerant through a condenser and through an air conditioning coil, an air intake duct from the assigned zone space delivering return air from the zone space and through the air conditioning coil, a supply air duct delivering conditioned air into the zone space from the air conditioning coil, and blower means driving air through said ducts,

a variable air volume by-pass duct from the supply air duct to the intake air duct and with air volume damper means responsive to air pressure in the supply air duct,

a zone space damper means at the discharge of the supply air duct into the zone space,

a chilled water storage tank with pump means circulating the chilled water through a closed circuit,

a charging coil in the supply air duct downstream from the air conditioning coil and a recooling coil in the supply air duct upstream from the air conditioning coil and each selectively in closed circuit by valve means through the chilled water storage tank,

control means responsive to zone space temperature to operate the heating means below a selected temperature,

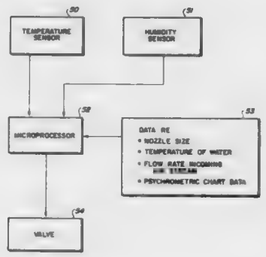
and control means responsive to duct air temperature to open said valve means from the chilled water storage tank and its closed circuit through the charging coil for chilled water storage when excess cooling is available downstream of the air conditioning coil, and alternately to open said valve means from the chilled water storage tank through its closed circuit through the re-cooling coil for cooling when return air temperatrue in the intake air duct is excessive.

4,730,462

EVAPORATIVE PRECOOLING UNIT

Allen R. Rogers, 5358 W. Yucca St., Glendale, Ariz. 85304

Filed May 5, 1986, Ser. No. 859,443
Int. Cl.[4] F28D *3/00*
U.S. Cl. 62—171 **2 Claims**



1. In combination with a refrigeration unit, an evaporative heat exchange unit for precooling an air stream traveling toward and over the condensing coil of the refrigeration unit, said heat exchange unit including

(a) a frame;

(b) a porous heat transfer pad mounted in said frame;

(c) nozzle means carried on said frame for directing a spray mist forwardly of said heat transfer pad, said spray mist emitted from said nozzle means initially traveling in a direction of travel such that said mist will not contact said porous heat transfer pad;

(d) means mounted on said frame for causing the turbulent intermixing of said air stream with said spray mist prior to said air stream passing through the porous heat transfer pad; and,

(e) means for controlling the quantity of water emitted by said nozzle means such that substantially all of said spray mist is intermixed with said air stream prior to

said air stream passing through said heat transfer pad;

said frame being shaped and dimensioned and positioned with respect to said condensing coil such that said air stream passes through said spray mist and heat transfer pad before passing over said coil.

4,730,463

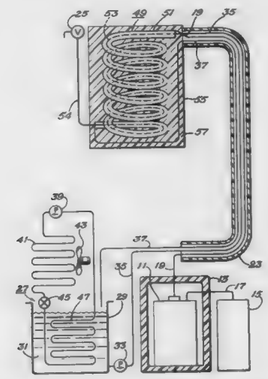
BEVERAGE DISPENSER COOLING SYSTEM

Ted M. Stanfill, 3104 Bellaire Dr. West, Fort Worth, Tex. 76109

Filed May 5, 1986, Ser. No. 859,790
Int. Cl.[4] B67D *5/62*
U.S. Cl. 62—399 **6 Claims**

1. In a beverage dispensing system of the type having a supply container of the beverage located at a storage site, valve means at a dispensing site remote from the storage site for dispensing the beverage, pressure means for supplying the beverage under presssure from the supply container to the

valve means through a beverage conduit, refrigeration means at the storage site for cooling a liquid into a chilled liquid, pump means at the storage site for circulating the chilled liquid from the storage site to the dispensing site through a transmit chilled line and from the dispensing site back to the storage site through a return chilled line, the chilled lines running in parallel with the beverage conduit within an insulated jacket conduit extending between the storage and dispensing sites, the improvement comprising in combination:



an insulated concentric section located at the dispensing site, having an inner conduit concentrically located within an outer conduit; and

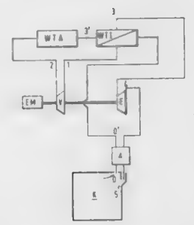
manifold means for connecting the transmit and return chilled lines to oposite ends of one of the concentric conduits, and for connecting the beverage conduit and valve means to opposite ends of the other concentric conduit, to further cool the beverage by heat transfer from the chilled liquid in the concentric section.

4,730,464

REFRIGERATOR AND FREEZER

Helmut Lotz, Giengen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,635
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1985, 3544445
Int. Cl.[4] F25D *9/00*
U.S. Cl. 62—401 **6 Claims**



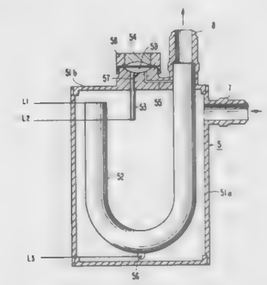
1. Refrigeration apparatus, comprising a cooling chamber having a given useful space therein, and a cold generator having a cold air loop connected to said cooling chamber for cooling said given useful space, said cold air loop including compressing means, a heat exchanger disposed downstream of said compressing means and exposed to the ambient air for cooling air drawn from said useful space with a relatively high temperature level almost to the temperture of the ambient air after compression, cooling means downstream of said heat exchanger, expansion means downstream of said cooling means, the air being returned to said useful space after subsequent expansion and corresponding cooling below the lowest temperature level, and an additional heat exchanger for dehumidifying the circulated air current in said loop, said additional heat exchanger including heat exchanger surfaces and means for drying air drawn from said cooling chamber from the upper temperature level with the aid of expanded cold air by means of condensation of absorbed moisture on said heat exchanger surfaces.

4,730,465

ACCUMULATOR FOR A REFRIGERATION SYSTEM

Atsuo Inoue, Isesaki, Japan, assignor to Sanden Corporation, Japan

Filed Dec. 8, 1986, Ser. No. 938,999
Claims priority, application Japan, Dec. 7, 1985, 60-187932[U]
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—503 **6 Claims**



1. In an accumulator for a refrigeration system having a housing including a cover, an inlet for introducing two phase refrigerant, an outlet port for withdrawing gaseous refrigerant, a U-shaped tube disposed within said housing and having one end connected to said outlet port and the other end open and positioned at a predetermined level within said housing, the improvement comprising:

a conduit vertically extending downwardly within the interior of said housing having a lower end opening below said other end of said U-shaped tube and an upper end connected to said outlet port through a fluid passage above said predetermined level of said other end of said U-shaped tube, wherein said predetermined level of said other end of said U-shaped tube and the level of said lower end opening of said conduit are selected so that when the accumulator is fully charged the refrigerant level in the accumulator lies between said predetermined level of said other end of said U-shaped tube and said level of said lower end opening of said conduit; and

a sight glass disposed on said fluid passage to view refrigerant.

4,730,466

DEVICE FOR SUPPORTING COPS IN CIRCULAR KNITTING MACHINES, PARTICULARLY IN FIXED NEEDLE CYLINDER KNITTING MACHINES

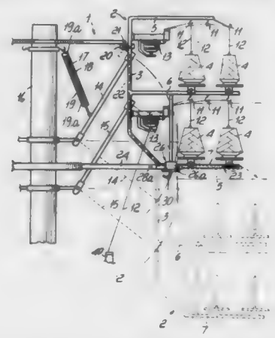
Riccardo Tenconi, Varese, Italy, assignor to MEC-MOR S.p.A., Induno Olona, Italy

Filed Apr. 24, 1986, Ser. No. 855,425
Claims priority, application Italy, May 9, 1985, 20632 A/85
Int. Cl.[4] D04B *3/06*
U.S. Cl. 66—125 R **13 Claims**

1. A device for supporting cops in circular knitting machines, particularly in fixed needle cylinder knitting machines,

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comprising a bearing member defining a device central axis, a plurality of frames for supporting feed cops radially arranged around said bearing member, frame translation means connected to said bearing member and said frame for moving each said frame in a direction having a component substantially parallel to said device central axis and a component substantially perpendicular to said device central axis, said device further comprising controlled operation frame locking means for selectively and removably connecting said frame with said bearing member, thereby each said frame translating between a first raised working position, wherein said frame is arranged close to said bearing member and is locked by said frame locking means, and a second depressed cops doffing position,



wherein said frame is arranged away from said bearing member, said device further comprising safety means including a plurality of rest portions and a plurality of delimiting rods extending radially from said bearing member and defining a plurality of sectors for laterally delimiting said frames, said frames having lateral cooperation means engaging with said delimiting rods, and being laterally locked on opposite sides at said first position, said rest portions being slidingly arranged on said delimiting rods and movable between a first interference point of said delimiting rods and a second noninterference point, said lateral cooperation means comprising lateral projections bearing on said rests in said first position of said frames with said rest at said first interference point.

4,730,467

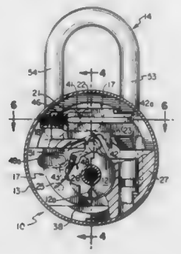
DOUBLE LOCKING COMBINATION LOCK

Horst Lebrecht, West Allis, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Continuation of Ser. No. 703,360, Feb. 20, 1985, abandoned. This application Feb. 5, 1986, Ser. No. 938,188

Int. Cl.⁴ E05B *37/18*

U.S. Cl. 70—25 **5 Claims**



1. A combination lock including a dial and locking mechanism and a shackle having a long and short leg, the improvement comprising:

(a) a lock body;

(b) a lock body cavity with three (3) steel balls therein which balls include end balls and a center ball in general alignment in a first lock position;

(c) a notch in each shackle leg and a steel ball positional in each notch;

(d) a reciprocal cam plate means movable in the body cavity in a direction substantially perpendicular to the axes of the shackle legs to a first lock position to cause the steel end balls to be positioned in the leg notches, and slidable to a second unlock position to permit the center ball to move and with movement of the shackle to cause the steel end balls to exit the leg notches;

(e) an extending arm means mounted on the cam plate means engageable with the dial in the unlocked position so that rotation of the dial with the arm means so engaged causes the cam plate means to reciprocate; and

(f) lock open cam means associated with the cam plate means so that partial removal of a shackle locks the cam plate means in the open position.

4,730,468

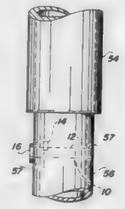
LOCKING PIN FOR SEMI-TRUCK TRAILER LANDING GEAR

Milton Becker, 1246 Bankard, Nogales, Ariz. 85621

Filed Sep. 8, 1986, Ser. No. 904,566

Int. Cl.⁴ E05B *67/38*

U.S. Cl. 70—34 **9 Claims**



1. An anti-theft device for semi-truck trailers preventing the telescoping concentric inner and outer cylinder type landing gear from being raised to inhibit easy moving of the semi-truck trailer comprising:

an elongated pin having a shank with two ends, said shank defining a cylinder having an outer surface with an interior bore and an opening communicating said outer surface to said interior bore, said elongated pin of a length equal to the diameter of said inner cylinder adapted to be emplaced in a transverse opening through the inner cylinder of the landing gear to a position where the end is flush with said inner cylinder;

a head connecting to one end of said elongated pin, said head closing said elongated pin interior bore at the other end; and

locking means situated within said elongated pin interior bore adapted to lock said elongated pin in place in the opening in the landing gear inner cylinder, said locking means including a cog extendable above and retractable below said outer surface of said locking pin shank through said outer surface opening, and said locking means further including a lock operably connected to said cog, said lock situated at the end of said elongated pin opposite the end connected to said head, said cog adapted to prevent removal of said elongated pin from said transverse opening through the inner cylinder of the landing gear whereby retraction of the inner cylinder into the outer cylinder is inhibited preventing the landing gear from being raised and thereby preventing easy theft of the semi-truck trailer by a semi-truck tractor.

4,730,469

LOCK WITH A LOCK CYLINDER FOR A FLOOR LID OF A MOTOR VEHICLE

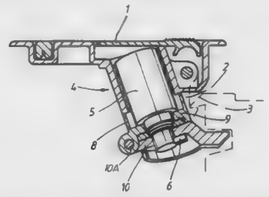
Joachim Hänel, Böblingen; Fritz Häberle, Sindelfingen; Götz Mötting, Böblingen, and Walter Münsinger, Böblingen-Dagersheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1986, Ser. No. 905,928

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532151

Int. Cl.⁴ E05B *65/44*

U.S. Cl. 70—81 **5 Claims**



1. Lock having a closing cylinder for a drop door of a motor vehicle, with a free end of a rotor being provided with a locking projection, characterized in that a ring which can be turned through a certain angle about the rotor longitudinal axis against spring force is mounted on the end of the rotor which is remote from the insertion opening for a key, on which ring a rotary latch body which is acted upon by a spring is coupled in hinged manner, which rotary latch body, in a base area, has a central passage opening for the free end of the rotor and a recess for the passage of the locking projection at a certain angular position, and that the rotary latch body has a projection with a bevelled side face which interacts as a mating piece with an inclined plane fixed to the vehicle.

4,730,470

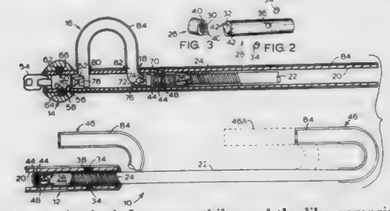
SECURITY LOCK

Peter L. Zane, Southeastern; Michael S. Zane, and Ernest Zane, both of Brookline, all of Mass., assignors to KBL Corp., Boston, Mass.

Filed Sep. 5, 1986, Ser. No. 903,980

Int. Cl.⁴ E05B *65/12*

U.S. Cl. 70—238 **8 Claims**



1. A security lock for automobiles and the like comprising:

(a) a tubular member designed to receive a longitudinal member telescopically therein, one end of said longitudinal member provided with an externally threaded portion;

(b) a stop bushing mounted in said tubular member and designed to fit about said longitudinal member, and an internally threaded stop nut designed to ride about said externally threaded portion of said longitudinal member, both said stop bushing and said stop nut provided with at least one tooth designed to engage one another;

(c) a U-shaped shackle having a pair of legs and hingelike mounted in one end of said tubular member;

(d) a lock cylinder secured in said one end of said tubular member;

(e) a hinge member slidingly disposed within said tubular member, and a pin operatively coupling said one of said pair of legs to said hinge member; and

(f) a protective outer member secured about and enveloping said one end of said tubular member and in a location surrounding said lock cylinder, said protective outer member having a diameter exceeding the diameter of said tubular member.

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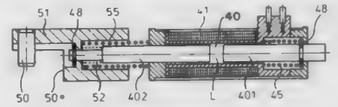
APPARATUS FOR ELECTROMAGNETIC LOCKING ON A LOCK CYLINDER FOR A MECHANICAL/ELECTRONIC LOCKING SYSTEM

Erich Seckinger, Wallisellen, and Arno Kleinhäny, Hinwil, both of Switzerland, assignors to Bauer Kaba AG, Wetzikon, Switzerland

Filed Oct. 21, 1986, Ser. No. 921,200

Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—277 **7 Claims**



1. Locking means for a lock of the type having a lock cylinder with a rotor, a driver mounted on one end of the rotor and restrained against rotation relative to the rotor, a stator substantially surrounding the rotor, electromagnetic locking means mounted adjacent the lock cylinder and a control part having a shaped control surface mounted on a rotatable part of the lock and engageable with the locking means to control unlocking of that rotatable part, wherein the locking means comprises

an energizable electromagnet coil,

a tie rod having first and second coaxial, axially movable parts movable between abutting and spaced positions, said first part being axially movable in a first direction by said electromagnet coil and said parts being axially movable together when an energizing signal is provided when said parts are abutting;

a return spring urging said first part in a direction counter to said first direction; and

a probe fixedly attached to an end of said second tie rod part and engaging said control surface of said control part, said probe preventing rotation of said control part relative to said probe in the absence of an energizing signal provided when said tie rod parts are in an abutting relationship.

4,730,472

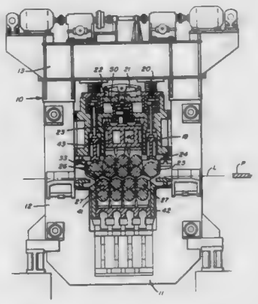
HYDRAULIC CONTOURING MEANS FOR A HOT OR COLD LEVELER MACHINE

Robert H. Ellis, Oakmont, Pa., assignor to United Engineering, Inc., Pittsburgh, Pa.

Filed Jul. 10, 1986, Ser. No. 884,151

Int. Cl.⁴ B21B *37/08;* **B21D** *1/02*

U.S. Cl. 72—8 **24 Claims**



1. In a sheet metal leveling machine having a rigid frame, a

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plurality of parallel upper and lower working rolls journalled for rotation in said frame for receiving, the sheet material to be worked between opposed pairs of rolls which are offset with respect to one another a flexible subframe subject to distortion due to forces imparted thereto by either of said sets of working rolls when the sheet material passes in contact therewith, and means to compensate for said distortion; the improvement comprising, said flexible subframe extending across said machine substantially parallel to the axes of said working rolls and generally transverse to the direction of travel of the sheet material being worked, a plurality of fluid piston-cylinder units mounting said flexible subframe to the rigid frame at least two of said piston-cylinder units being located along a line substantially parallel to the axes of the working rolls, one of the cylinder or piston thereof being associated with said rigid frame and the other of the piston or cylinder being in contact with said flexible subframe, means to sense the position of said pistons in said cylinders and means to vary the fluid pressure above said pistons dependent upon variation of said piston positions from a predetermined position to compensate for the subframe distortion.

4,730,473

METHOD AND APPARATUS FOR ROLLING TUBES

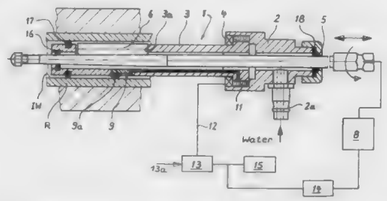
Ulrich Rottländer, Overath, and Gustav Thönes, Gummersbach, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Aug. 13, 1986, Ser. No. 896,427

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528967

Int. Cl.[4] B21D *39/06*

U.S. Cl. 72—16 **7 Claims**



1. A method of rolling tubes into tube plates with a tube roller having expandable rollers, said method including the steps of:

first setting a desired holding expansion value;

rolling a tube;

determining the magnitude of the holding expansion during said rolling step by ultrasonically measuring the changing thickness of the wall of said tube during the expansion;

comparing the actual holding expansion value with the desired holding expansion value; and

upon reading said desired holding expansion value, discontinuing expansion when said desired holding expansion value is reached.

4,730,474

METHOD OF RELIEVING RESIDUAL STRESS IN METAL PIPE

Shota Iwakura; Yuuji Yoshitomi; Takashi Naganawa, all of Ibaraki; Toshio Saitoh, and Tatsuo Seki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

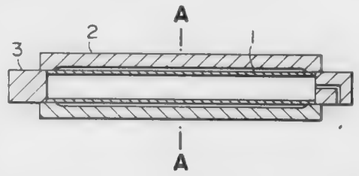
Filed Mar. 31, 1986, Ser. No. 846,144

Claims priority, application Japan, Apr. 1, 1985, 60-66442

Int. Cl.[4] B21D *26/00*

U.S. Cl. 72—61 **2 Claims**

1. A method of relieving residual stress in a worked metal pipe, the method comprising: the steps of placing said worked metal pipe in dies having an inner surface shaped identical with an outer surface shape of said worked metal plate; introducing a liquid into said pipe thereby applying in said pipe a liquid pressure lower than a yield pressure of the metal pipe for preventing said metal pipe from buckling; and simultaneously applying to said pipe an axial compression load greater than a yield pressure for a material of said metal pipe so as to effect a uniform plastic deformation of said metal pipe in its entirety



while maintaining the cross-sectional shape of said metal pipe before being subjected to said internal liquid pressure and said axial compression load, thereby relieving the residual stress in said pipe while suppressing an increase in a wall thickness thereof.

4,730,475

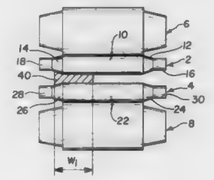
ROLLING MILL METHOD

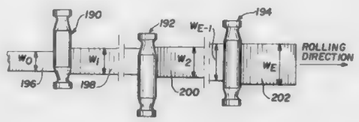
Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to International Rolling Mills Consultants, Inc. and United Engineering Rolling Mills, Inc., both of Pittsburgh, Pa.

Filed May 6, 1986, Ser. No. 860,054

Int. Cl.[4] B21B *1/02, 31/18*

U.S. Cl. 72—234 **14 Claims**





1. A method of rolling a metal workpiece by a series of successive reducing passes, the passes being formed by one or more pairs of cooperative rotating work rolls, said pairs of work having cooperative reducing center and cooperative reducing first and second end sections, the latter for alternately rolling one or more portions of the workpiece, with each said first end section of said rolls being on the same side of said center sections as the other said first end sections and each said second end section of said rolls being on the same side of said center sections as the other said second end sections, the steps comprising:

(a) reducing by a said pair of cooperative center roll sections in a first pass a first portion of the workpiece while forming by a said first cooperative pair of roll end sections on a second portion of the workpiece a thickness greater than said reduced first portion of a predetermined mass,

(b) prior to the next succeeding pass positioning the workpiece and a pair of said rolls relative to each other so one of said portions of the workpiece can be rolled by a second said cooperative pair of roll end sections, and thereafter,

(c) in a first succeeding pass reducing one of said first or said second portions by a said cooperative pair of said center roll sections, while forming by a second cooperative pair of roll end sections on the other of said first or said second portions a thickness greater than said twice reduced center portion of a predetermined mass, and

(d) in a further succeeding pass reducing all previously rolled portions of the workpiece by a said cooperative pair of center roll sections to establish a predetermined increase in the width of the workpiece and a decrease in the thickness of said workpiece to the extent of obtaining a substantially uniform thickness along substantially the entire width of the workpiece.

12. A method of rolling a metal workpiece having a center portion and opposite side portions by a series of successive reducing passes, the passes being formed by one or more pairs of cooperative rotating work rolls, said pairs of work rolls having cooperative reducing center and cooperative reducing end sections, the latter for alternately rolling both side portions of the workpiece, the steps comprising:

(a) reducing by a said pair of cooperative center roll sections in a first pass the center portion of the workpiece while forming by said center roll sections and a cooperative pair of roll end sections on said side portions of the workpiece a thickness greater than said reduced center portion of a predetermined mass,

(b) prior to the next succeeding pass positioning the workpiece and a pair of said rolls relative to each other so that both said side portions of the workpiece can be rolled by a second said cooperative pair of roll end sections, and thereafter,

(c) in a succeeding pass reducing again said center portion by a said cooperative pair of said center roll sections, while reducing by said center roll sections and a second cooperative pair of roll end sections said side portions to a thickness less than said twice reduced center portion,

(d) in a further succeeding pass reducing all previously rolled portions of the workpiece by a said cooperative pair of center roll sections to establish a predetermined increase in the width of the workpiece and a decrease in the thickness of said workpiece to the extent of obtaining a substantially uniform thickness along substantially the entire width of the workpiece,

providing each said roll with two tapered reducing end sections with one said tapered section converging generally outwardly and the other said tapered section diverging generally outwardly, and

positioning said rolls with one said roll having the diverging taper at the end where the other said roll has the converging taper.

4,730,476

PORTABLE CUTTER/CRIMPER

Verne L. Lindberg, Everett, and Dan H. Martin, Lake Stevens, both of Wash., assignors to Rasmussen Co., Inc., Seattle, Wash.

Filed Mar. 17, 1986, Ser. No. 840,018

Int. Cl.[4] B21D *7/00, 41/04*

U.S. Cl. 72—407 **4 Claims**

1. Apparatus for crimping stranded cable comprising:

a. a frame;

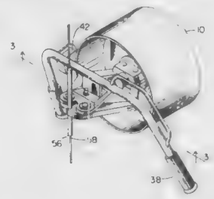
b. a rod having one end connected to the frame, said rod having a baseplate mounted on the other end;

c. a pair of crimping arms having matching arcuate cut-out portions on the ends of said crimping arms for crimping a stranded cable placed therebetween, said crimping arms rotably connected to said frame;

d. connecting arms rotably pinned to said pair of crimping arms to allow rotation of said crimping arms relative to said connecting arms;

e. force transmission means having a hole therethrough to receive said rod; said force transmission means rotably pinned to said connecting arms whereby lateral movement of said force transmission means along the axis of said rod rotates said connecting arms and in turn said crimping arms about their point of connection to said frame and effects closing or opening of the arcuate cut-out portion of said crimping arms;

f. an inflatable air bag between the base plate of said rod and said force transmission means, said inflatable air bag having a hole therethrough to receive said rod and be supported by said rod, said air bag connected to a source of pressurized air, with expansion of said air bag causing



lateral movement of said force transmission means along the axis of said rod;

g. trigger means mounted on said frame, said trigger means connected to said air bag and communicating with the source of pressurized air for allowing rapid expansion of said air bag and lateral movement of said force transmission means along the axis of said rod when said trigger is depressed thereby causing closing of the arcuate cut-out portions of said crimping arms and crimping of stranded cable placed therebetween, releasing said trigger means causing depressurization and contraction of said air bag.

4,730,477

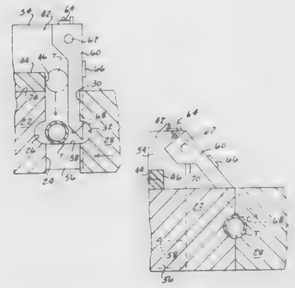
WORKPIECE FEEDING-EJECTION MECHANISM

Robert J. Redman, Indian River, Mich., assignor to Tube Fab of Afton Corporation, Afton, Mich.

Filed Jan. 27, 1987, Ser. No. 6,805

Int. Cl.[4] B21D *43/16*

U.S. Cl. 72—424 **6 Claims**



1. In a die assembly for releasably holding an elongate tubular workpiece in a fixed position with the longitudinal axis extending horizontally and the opposite ends of the workpiece projecting from opposite sides of said die assembly, said die assembly including a frame, a first die fixedly mounted on said frame and having opposite parallel vertical side walls spaced from each other by a distance less than the length of a workpiece, a vertical front face extending between and normal to said side walls and having a horizontal workpiece receiving recess extending entirely across said front face, and a flat top surface extending rearwardly between said side walls, a front edge at the top of said front face, and movable die means

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movable toward and away from said front face between an open position and a closed position and operable when in said closed position to fixedly clamp a tubular workpiece in said fixed position within said recess;

the improvement comprising reciprocating workpiece feed means mounted on said frame for reciprocatory movement relative to said first die between a forward and a rearward end limit of movement, workpiece holding magazine means mounted on said frame and operable when said feed means is at its rearward end limit to dispense a tubular workpiece onto said top surface of said first die with the axis of said workpiece parallel to and spaced rearwardly from said front edge and with the opposite ends of said workpiece projecting beyond the respective side walls of said first die, pusher means on said feed means operable upon movement of said feed means from its rearward end limit to its forward end limit to push the dispensed workpiece forwardly across said top surface beyond said front edge, finger means on said feed means for pivoting movement about a horizontal axis, said finger means operable when said feed means is at said forward end limit to guide said dispensed workpiece downwardly across said front face, vertical stop means on said feed means cooperable with said finger means when said feed means is at said forward end limit for positioning said dispensed workpiece in alignment with said recess in said front face, said finger means and said vertical stop means being located outwardly from said side walls and engageable with the portions of said workpiece which project beyond said side walls, and means operable upon rearward movement of said feed means from said forward end limit for pivotally disengaging said finger means and for reciprocally disengaging said vertical stop means from said dispensed workpiece.

4,730,478

GAS ANALYZER

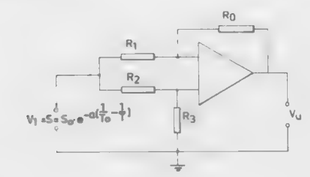
Andras Gedeon, Täby, Sweden, assignor to Icor AB, Bromma, Sweden

Filed Jun. 17, 1986, Ser. No. 875,344

Claims priority, application Sweden, Jun. 18, 1985, 8503017

Int. Cl.[4] G01N *27/00*; H03L *1/02*

U.S. Cl. 73—23 **4 Claims**



1. Apparatus for determining the proportion of a given gas component in a gas mixture, comprising:

a piezoelectric crystal having a surface layer adapted to contact a gas, said surface layer containing a substance capable of reversibly adsorbing said component from a gas mixture;

an oscillator circuit incorporating said crystal for producing an output signal representing the oscillating frequency of the crystal, said frequency corresponding to the proportion of said gas component in the gas mixture;

a temperature-dependent thermistor adapted to be subjected to the same temperature variations as the surface layer of the crystal;

a signal processing amplifying circuit to which said oscillator circuit output signal is applied and in which said thermistor is incorporated such that said amplifying circuit produces an output which substantially compensates for temperature-dependent variations of the adsorbing properties of said substance, said amplifying circuit having a degree of amplification dependent on the value of thermistor;

said amplifying circuit signal further having a resistance feedback path to the one input of the amplifier through a feedback resistance, the output signal of the oscillator circuit being connected to said one input of the operational amplifier through the thermistor and to the other input to the operational amplifier by way of a resistive voltage divider, said feedback resistance being greater than the resistance of the thermistor, and said resistive voltage divider being dimensioned such that the part of the output signal of the oscillator circuit applied to said other input of the operational amplifier constitutes a small part of the total signal.

4,730,479

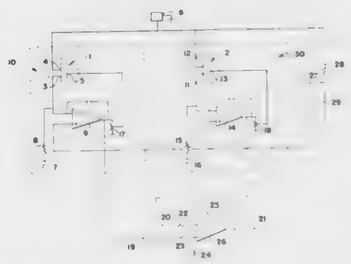
TEMPERATURE AND HUMIDITY COMPENSATION FOR GAS DETECTION APPARATUS

Stephen C. Pyke, Willowick; Donald L. Boos, Cleveland, and Milton L. Brouwer, Warrensville Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 23, 1986, Ser. No. 877,631

Int. Cl.[4] G01N *27/04*

U.S. Cl. 73—23 **14 Claims**



1. A compensated apparatus for monitoring the concentration of at least one selected gas comprising:

a first three terminal field-effect transistor sensor that is responsive to at least one of changes in temperature and humidity and to at least one selected gas;

at least a second field-effect transistor sensor that is responsive to the same at least one of changes in temperature and humidity that said first sensor is and is substantially unresponsive to said at least one selected gas;

means for adjusting the response of at least one of said first and second sensors so that the responses of said sensors to said at least one of said changes in temperature and humidity are essentially the same; and

means for subtracting the response of the second sensor from the response of the first sensor to compensate for the response of said first sensor to changes in the at least one of temperature and humidity.

4,730,480

GAS CHROMATOGRAPH COLLECTION DEVICE AND PROCESS

Dana W. Mayo, Brunswick, Me., and Ronald M. Pike, Pelham, N.H., assignors to Microscale Organic Laboratory Corporation, Newcastle, N.H.

Filed Jun. 24, 1986, Ser. No. 877,740

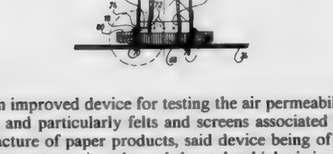
Int. Cl.[4] G01N *31/08*

U.S. Cl. 73—23.1 **7 Claims**

1. Apparatus for collecting the output of a gas chromatograph comprising:

a. a metallic adapter having a first end connectable to a carrier gas output port of a gas chromatograph and a second end mating with a collection tube in sealing relationship; and,

b. a horizontal collection tube having at least on annular enlarged portion and an end for mating with said adapter



in sealing relationship, whereby said collection tube can be seated firmly sealed with said second end and condensate forming in output gases of the chromatograph will be caught in the annular enlarged portion out of the path of carrier gas.

4,730,481

DEVICE FOR TESTING THE AIR PERMEABILITY OF AN ARTICLE

Engelbert Schlipf, Senden, Fed. Rep. of Germany, assignor to Wurttembergische Filtztuchfabrik D. Geschmay GmbH, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 35,488

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611458

Int. Cl.[4] G01N *15/08*

U.S. Cl. 73—38 **17 Claims**

1. An improved device for testing the air permeability of an article, and particularly felts and screens associated with the manufacture of paper products, said device being of the type including a measuring channel through which air is propelled through utilization of a blower mechanism, and including measuring means for measuring the flow rate of air within said measuring channel, said air being propelled through a measuring area immediately adjacent the exposed surface of said article as a function of a controlled constant pressure differences created at said adjacent measuring area, said device further being of the type including a longitudinal positioned belt channel juxtaposed about said measuring channel in which said belt channel is additionally and operably directing propelled air from said blower mechanism, wherein said measuring channel and said belt channel each further include an orifice immediately adjacent to the exposed surface of said article, said improvement in said air permeability testing device further comprising:

said blower mechanism, said measuring channel, said measuring means for determining the rate of air flow in said measuring channel, said measuring area and said belt channel being integrated into a single operational testing device capable of being placed for air permeability testing to one of either of two sides of said article being tested;

said measuring means comprising a fan wheel anemometer having a fan wheel element operably positioned within said measuring channel for direct exposure to the air being propelled therewithin;

said measuring channel containing said fan wheel anemometer wheel element being operably connected to said orifice of said measuring channel immediately adjacent to said article through a channel section element, immediately adjacent said measuring channel orifice having a substantially cylindrical longitudinal construction, with said channel section further and operably being attached to a tappered longitudinal section emanating towards said measuring means in order to insure that said propelled air stream is unidirectional;

said air permeability testing device further including in at least one position upstream from said fan wheel element of said fan wheel anemometer, flow rectifier means for precluding the creation of rotational flows of propelled air onto the surface of said fan wheel element,

said substantially cylindrical longitudinal section immediately adjacent said measuring channel area having one or more sensing means operably associated therewithin for measuring the extent of static pressure created at said area of measuring channel, for the purpose of regulating the rotational speed of the blower mechanism so as to maintain a desired static pressure value;

one or more of said belt channel and said measuring channel means being of such a geometric configuration so as to equalize the propelled air flow volume and velocity longitudinally conducted through said belt channel to the propelled air flow volume and velocity longitudinally directed through said measuring channel.

4,730,482

PROCESS AND APPARATUS FOR MONITORING THE HERMETICITY OF FILLED CONTAINERS CLOSED BY SEALED-ON OR WELDED-ON COVER OF THE LIKE

Gerhard Cerny, Munich; Ewald G. Welp, Erkrath; Alois Gneithing, and Fritz Neber, both of Schwaebisch-Hall, all of Fed. Rep. of Germany, assignors to Gasti Verpackungsmaschinen GmbH, Schwaebisch-Hall, France

Filed Aug. 7, 1986, Ser. No. 894,411

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528248

Int. Cl.[4] G01M *3/36*

U.S. Cl. 73—49.3 **10 Claims**

1. A process for monitoring the hermeticity of material filled containers which have an air or gas cushion present between the material and the sealed-on or welded-on covers comprising,

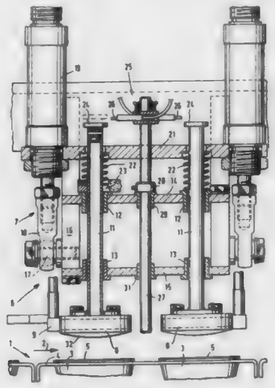
heating the air or gas cushion present between the cover and the material in the container via the cover,

pressing the cover by temporary mechanical impact into a lower initial position,

scanning the change in position of the cover, which changes

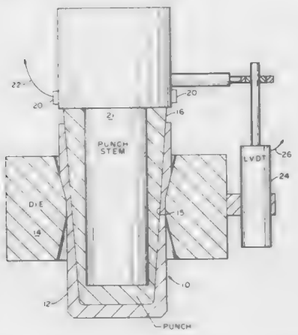
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as a result of an increase in volume of the heated air or gas cushion, and then



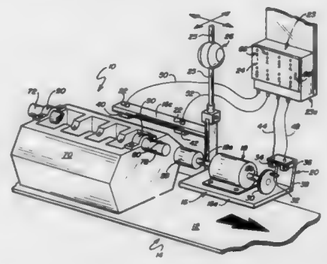
removing the containers which have been scanned and determined to have missing or faulty covers.

4,730,483
MEANS FOR DETERMINING MAXIMUM IRONING REDUCTION
Robert E. Welsh, Mount Lebanon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 14, 1986, Ser. No. 839,782
Int. Cl.[4] G01N *3/28*
U.S. Cl. 73—87 **5 Claims**



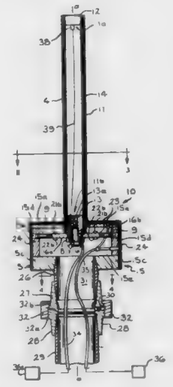
5. A method of determining forming limits in ironing the side wall of cylindrical, hollow articles, comprising the steps of:
providing an ironing die,
providing a punch or mandrel having a portion tapered in a continuous, linear manner from a location adjacent the nose end of the punch to a location remote from the nose end, thereby providing a continuous range of punch-to-die clearances and ironing reductions,
placing a cylindrical article between the die and punch mandrel,
relatively moving the die and punch to iron the side wall of the article until punch-to-die clearance is such that the fracture of the side wall occurs, and
determining the thickness of the fractured side wall.

4,730,484
MISSING BEARING DETECTOR
Robert Olschefski, 3410 Center Rd., Highland, Mich. 48013
Filed Jun. 20, 1986, Ser. No. 876,778
Int. Cl.[4] G01M *15/00*; **G01H** *1/08*
U.S. Cl. 73—119 R **15 Claims**



1. A method of detecting missing parts in a multicylinder engine assembly of the type including a crankshaft and a plurality of out of phase piston assemblies respectively associated with the cylinders of the engine assembly, said method comprising the steps of;
(A) rotating the crankshaft of the engine assembly;
(B) generating a plurality of code signals for each rotation of the crankshaft in timed relation to the crankshaft rotation;
(C) sensing the level of acoustical vibration in the vicinity of the engine assembly during rotation of the crankshaft;
(D) generating a fault signal in response to a sensed acoustical vibration in excess of a predetermined magnitude to indicate that a part is missing in the engine assembly; and
(E) comparing said code signals and said fault signal on a time line basis to determine the particular piston assembly from which the part is missing.

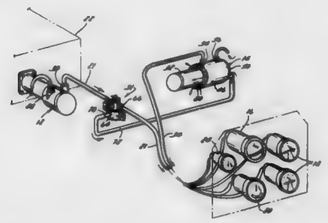
4,730,485
DETECTOR APPARATUS FOR DETECTING WIND VELOCITY AND DIRECTION AND ICE ACCUMULATION
Charles H. Franklin, 1902 Longshore Dr.; Clarence S. Vinton, 1826 Traver St., and Conrad O. Rogne, 2166 Yorktown, all of Ann Arbor, Mich. 48105
Filed Apr. 22, 1986, Ser. No. 854,781
Int. Cl.[4] G01W *1/04*
U.S. Cl. 73—170 R **25 Claims**



1. A detector apparatus which comprises:

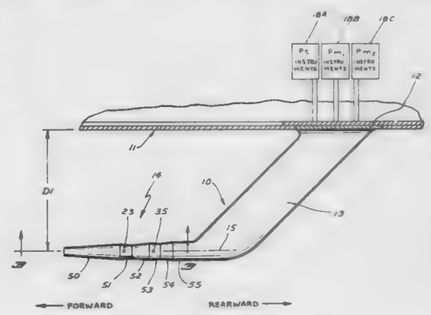
(a) an elongate cylindrically shaped rod having a longitudinal axis and two opposed ends along the longitudinal axis with one supported and the other end unsupported;
(b) support means rigidly mounting the one end of the rod such that the rod is cantilevered from the support means and wherein there is a region of high stress in tension and compression in the rod or support means when a force is applied to the rod;
(c) electrical strain gauges mounted on the region of high stress in uniform relationship to and around the longitudinal axis of the rod, wherein the apparatus includes electrical measuring means which measure wind velocity and direction around the longitudinal axis of the rod and measure weight of accumulated ice on the rod as a function of time in relation to compression or tension on the strain gauges; and
(d) deicer means for removal of ice from the rod.

4,730,486
PRESSURE RELIEF VALVE EXHAUST GAS HEATING MEANS FOR AIRCRAFT BACKUP PUMP
Thomas Zompolas, 7702 Geralayne Dr., Milwaukee, Wis. 53213
Filed Sep. 25, 1986, Ser. No. 911,523
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—178 R **3 Claims**



1. A pump system for use in an air operated instrument system of an aircraft, the aircraft including an engine and at least one air operated instrument, the pump system comprising:
a primary pump, said primary pump including an air inlet port and an air outlet port discharging air under pressure,
means for operably connecting the air operated instrument to the primary pump, said means for operably connecting including a pressure regulating valve for controlling the pressure of the air supplied to the air operated instrument, the pressure regulating valve including an air exhaust port,
a backup pump,
means operably connected to the backup pump for selectively driving the backup pump when the primary pump fails,
means for selectively operably connecting the backup pump to the instrument when the primary pump fails, and
means for heating the backup pump during operation of the primary pump, the means for heating maintaining the temperature of the backup pump above the temperature where the backup pump will be inoperable, said means for heating including means for conveying air discharged by said air exhaust port of said pressure regulating valve to said backup pump.

4,730,487
FAMILY OF AERODYNAMICALLY COMPENSATED MULTIPLE STATIC PRESSURE TUBES
Richard V. DeLeo, Hopkins, and Floyd W. Hagen, Eden Prairie, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.
Filed Jun. 4, 1985, Ser. No. 740,963
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—182 **11 Claims**



11. A multiple static pressure-sensing probe for use at subsonic and supersonic velocities, the probe having mounting means at a rear portion thereof for mounting said probe in spaced relationship to an external surface in a fluid flow stream and having a probe barrel with a longitudinal axis, and a forward external frustoconical surface at an angle with the axis at a forward end, the probe barrel comprising:
a first port on the probe barrel rearward of the forward tapered surface, for sensing static pressure at both subsonic and supersonic speeds;
a second port rearward of the first port, for sensing static pressure at both subsonic and supersonic speeds;
a first frustoconical surface, on the barrel rearward of the forward tapered surface, at an angle with the axis and having the first port thereon;
a second frustoconical surface at an angle with the axis, on the barrel rearward of the first frustoconical surface, the first and second frustoconical surfaces providing both a first compensation pressure at subsonic speeds and a second compensation pressure at supersonic speeds to the first port;
a third frustoconical surface at an angle with the axis, on the barrel rearward of the second frustoconical surface, and having the second port thereon;
a fourth frustoconical surface at an angle with the axis, on the barrel rearward of the third frustoconical surface, the third and fourth surfaces providing both a third compensation pressure, offset from the first pressure, at subsonic speeds and a fourth compensation pressure, substantially equally offset from the second pressure, at supersonic speeds to the second port.

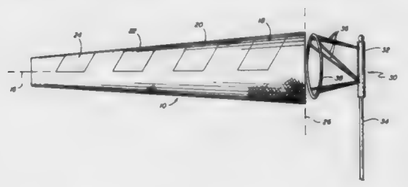
4,730,488
WINDSOCK WITH WIND SPEED INDICATORS
Edward David, Cottekill, N.Y., assignor to The Spark Corp., New York, N.Y.
Filed Jan. 23, 1987, Ser. No. 6,375
Int. Cl.[4] G01W *1/02*
U.S. Cl. 73—189 **17 Claims**

1. A device for indicating wind direction, comprising:
an elongate tapered tube of flexible material having a first opening at one end and a second opening at an opposite end, said second opening having a smaller area than said first opening;
means for supporting said tube at said one end so that said

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first opening is disposed in a substantially vertical plane, said means for supporting including means for enabling rotation of said tube and of said vertical plane about a vertical axis; and

means disposed on an upper side of said tube for enhancing visual detection of said tube and of an angular orientation of said tube about said vertical axis, said means for enhancing including a plurality of discrete irregular geometrical



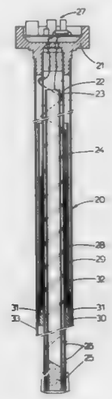
shapes spaced from one another along a line extending from said first opening toward said second opening, each of said geometrical shapes being oriented to define a direction extending along said line, each of said geometrical shapes being visually contrasting with respect to portions of said tube located between said geometrical shapes, each of said geometrical shapes having a point pointing along said line.

4,730,489

VARIABLE LEVEL CAPACITOR SENSOR

Linze Hoekstra, Ede, Netherlands, assignor to Mutech Holland B.V., Arnhem, Netherlands

Filed Oct. 30, 1986, Ser. No. 925,817
Int. Cl.⁴ G01F *23/26*
U.S. Cl. 73—304 C **9 Claims**



1. A liquid level sensor for measuring the level and/or the quantity of a liquid medium in a vessel, comprising:

a carrier, said carrier being adapted for mounting in the wall of said vessel;

a first pipe of extended length fastened to said carrier, said first pipe being electrically conductive and serving as a capacitor electrode;

a sprial winding of extended length of electrically conductive material, and spiral winding being concentric with said first pipe and electrically insulated therefrom, said winding forming the second electrode of a capacitor;

connecting means for connecting said winding and said pipe to external circuitry,

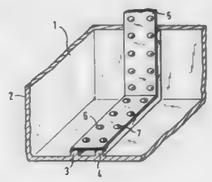
said spiral winding having a variable pitch along its length including alternately increasing and decreasing portions along the length of said spiral winding, the portions of said winding having increased pitch being located at preselected positions along the length of said spiral winding, the capacitance of said capacitor being subject to continuous increase when said sensor becomes progressively submerged lengthwise in said medium, said capacitance increasing in step-like fashion, that is, at a higher rate, when as the liquid level rises to and submerges said portions of said winding with higher pitch.

4,730,490

CONTAINER HAVING A DEVICE FOR THE ELECTRIC MEASUREMENT OF THE LEVEL OF A LIQUID CONTAINED WITHIN IT

Bernhard Kant, Eschborn, and Hans-Georg Lauth, Schmitten, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 623,733, Jun. 22, 1984, Pat. No. 4,621,526.
This application Aug. 26, 1986, Ser. No. 889,460
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322906
Int. Cl.⁴ G01F *23/24*
U.S. Cl. 73—304 R **3 Claims**



1. In a container having a device for the electric measurement of the level of a liquid contained therein, which device comprises a strip-shaped contained therein, which device comprises a strip-shaped conductive foil adapted to be contacted by the liquid on both of its surfaces, the improvement wherein the container comprises

a container wall, and

holding means of said wall for holding the conductive foil in communication with the inside of the container, the foil being uniformly spaced apart from the positioned alongside a surface of the container wall; and wherein

said holding means are wall ribs formed on said container wall, and

rivets fasten said conductive foil to said wall ribs.

4,730,491

MAGNETICALLY ACTIVATED MULTIPLE SWITCH LEVEL DETECTOR

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Sep. 29, 1986, Ser. No. 913,100
Int. Cl.⁴ G01F *23/62*; H01H *35/18*
U.S. Cl. 73—308 **6 Claims**

1. An apparatus for detecting position comprising in combination:

(a) an elongated tubular container;

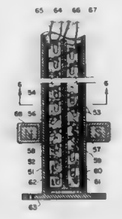
(b) a first elongated electrically conducting member disposed within the elongated tubular container intermediate first and second extremities of the elongated tubular container in a fluidic vessel;

(c) a second elongated electrically conducting member disposed within the elongated tubular container intermediate said first and second extremities of the elongated tubular container, wherein at least one of the first and second elongated electrically conducting members has a high specific ohmic resistance;

(d) a plurality of normally open switches disposed pivotally

in groove means in an elongated dielectric within the elongated tubular container at regular intervals intermediate said first and second extremities of the elongated tubular container, each of said plurality of normally open switches providing electrical connection between said first and second elongated electrically conducting member when said normally open switch is closed; wherein the earth's gravitational pull acting on the normally open switch keeps the normally open switch at open position in the absence of a magnetic force field, and a magnetic force field generally perpendicular to the lengthwise direction of the elongated tubular container closes the normally open switch and thus establishes electrical connection between said first and second elongated electrically conducting members;

(e) a marker guided by the elongated tubular container in a sliding floating relationship wherein said marker slidable over a distance intermediate said first and second extremities of the elongated tubular container indicate positions to be detected, said marker including at least one magnet producing a magnetic force field generally perpendicular to the lengthwise direction of the elongated tubular container;



(f) means for measuring ohmic resistance of first electrical circuit comprising first portions of said first and second elongated electrically conducting members intermediate first extremities of said first and second elongated electrically conducting members and said marker, and one or more of the normally open switches closed by the magnetic force field produced by said marker; and for measuring ohmic resistance of second electrical circuit comprising second portions of said first and second elongated electrically conducting members intermediate second extremities of said first and second elongated electrically conducting members and said marker, and said one or more of the normally open switches closed by the magnetic force field produced by said marker; and

(g) means for converting values of ohmic resistances of said first and second electrical circuits into information on position of said marker wherein conversion from said values of ohmic resitances to said information on position is independent of ohmic resistance contributed by said one or more of the normally open switches closed by the magnetic force field produced by said marker.

4,730,492

MEASURING THE SPEED OF ULTRASOUND IN A MOVING WEB OF PAPER

Gary N. Burk, Columbus, Ohio, assignor to AccuRay Corporation, Columbus, Ohio

Filed May 12, 1986, Ser. No. 862,297
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—597 **10 Claims**

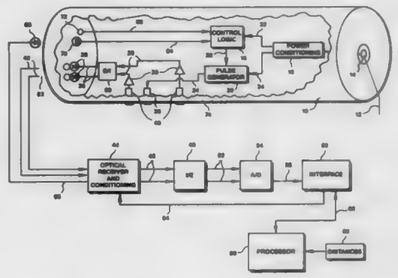
1. An apparatus for producing electrical signals that are to be used in measuring the speed of ultrasound through a moving web of paper, comprising:

(a) a cylinder having a hollow interior and being adapted to contact the moving web;

(b) means for coupling electrical power from a remote source to the interior of the cylinder;

(c) means, disposed within the interior of the cylinder, for conditioning the electrical power to reduce electrical noise resulting from transmission of power through the coupling means;

(d) a first transducer positioned in the cylinder to receive



electrical pulses from the interior of the cylinder and to deliver corresponding ultrasonic pulses to the web;

(e) means, disposed within the interior of the cylinder, for sending electrical pulses to the first transducer; and

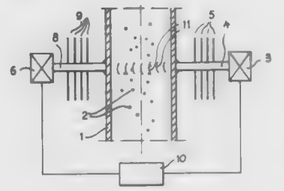
(f) a plurality of second transducers positioned in the cylinder to receive ultrasonic pulses from the web and to deliver corresponding electrical signals to the interior of the cylinder.

4,730,493

PROCESS AND DEVICE FOR ULTRASONIC DETECTION OF GAS BUBBLES IN A LIQUID METAL

Patrice Lebaud, Clamart, and Gérald Isnardon, Courbevoie, both of France, assignors to Novatome, Courbevoie, France

Filed Sep. 30, 1986, Ser. No. 913,294
Claims priority, application France, Sep. 30, 1985, 85 14466
Int. Cl.⁴ G01H *3/12*
U.S. Cl. 73—599 **5 Claims**



1. A process for the ultrasonic detection of gas bubbles in a liquid metal contained in an enclosure, said process comprising the steps of

(a) sending an ultrasonic beam into the liquid metal from a transmission point located outside the enclosure and at a given distance from the enclosure so as to cause the propagation of ultrasounds a given distance through the liquid metal;

(b) detecting the ultrasonic beam outside the enclosure and at a given distance from the enclosure after the beam has travelled through the liquid metal;

(c) comparing the amplitude of detected ultrasonic waves with amplitude of transmitted ultrasonic waves so as determine an attenuation of the ultrasonic wave beam produced by passage through the liquid metal; and

(d) deducing the presence of gas bubbles in the liquid metal

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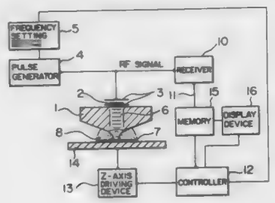
if the attenuation of the ultrasonic wave beam exceeds a given threshold either continuously or in brief pulses.

4,730,494

METHOD FOR EXAMINING A SURFACE OF A SAMPLE BY MEANS OF ULTRASOUND

Isao Ishikawa, Hino; Hiroshi Kanda, Tokorozawa, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,400
Claims priority, application Japan, Oct. 7, 1985, 60-221806
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—606 **4 Claims**



1. Method for examining a surface layer of a stratified structure of a sample by means of ultrasound, comprising:
- a step of irradiating the sample through a liquid medium with a focused ultrasound beam;
- a step of obtaining a curve representing variations of detection output with respect to the distance between said sample and the source of said focused ultrasound beam by detecting ultrasound reflected by said sample while varying the distance;
- a step of measuring the propagation velocity of surface acoustic wave in said sample on the basis of the period in said curve representing variations of detection output;
- a step of obtaining a frequency dependence curve for said propagation velocity by repeating the above measurement while varying the frequency of said focused ultrasound beam; and
- a step of evaluating the thickness of a surface layer of said stratified structure of said sample by using said frequency dependence curve for the propagation velocity.

4,730,495

ULTRASONIC REFLEX TRANSMISSION IMAGING METHOD AND APPARATUS

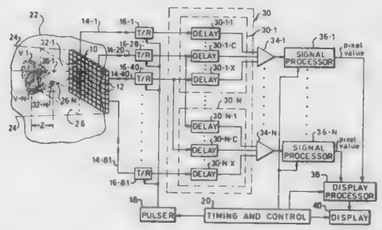
Philip S. Green, Atherton, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 715,199, Mar. 22, 1985, Pat. No. 4,608,868, and a continuation-in-part of Ser. No. 755,287, Jul. 15, 1985, Pat. No. 4,624,143. This application Jun. 17, 1986, Ser. No. 875,317
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—620 **39 Claims**

1. In a reflex transmission ultrasonic imaging system for imaging a section within a subject, which systems includes transducer array means and transmitter means for energizing the transducer array means for beaming ultrasonic wave energy into the subject, said transducer array means receiving reflected ultrasonic waves and converting the same to electrical signals, the combination including;

focusing means, including electronic focusing means responsive to received electrical signals from the transducer array means, for simultaneously focusing the transducer array means at a plurality of focal points at the section to be imaged, said focusing means having a plurality of simultaneous outputs each associated with a focal point, and

signal processing means including a plurality of signal processing channels for simultaneously processing outputs from the electronic focusing means produced in response to reflected ultrasonic waves that are received by said transducer array means from range zones opposite the section to be imaged from the transducer array means and for generating a plurality of pixel values which are substantially dependent upon and provide a measure of attenuation of ultrasonic waves at the focal points, a plurality of said pixel values being recurrently produced substantially simultaneously by said signal processing means.

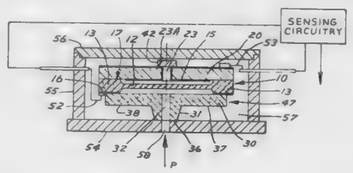


4,730,496

CAPACITANCE PRESSURE SENSOR

Thomas A. Knecht, Eden Prairie, and Roger L. Frick, Chanhassen, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Jun. 23, 1986, Ser. No. 877,281
Int. Cl.[4] G01L *7/08, 9/12*
U.S. Cl. 73—724 **17 Claims**



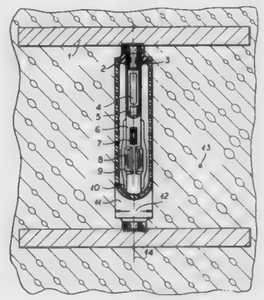
1. A capacitive pressure sensor for connection to a capacitance sensing circuit providing an output representative of a sensed pressure comprising:
- a first layer formed of a dielectric material having at least one substantially planar surface spaced from a second opposite surface thereof and a first aperture extending through the first layer from the first planar surface to the second surface;
- electrical conductive means deposited on the first layer and extending over a first portion of the first planar surface for forming a first capacitor plate and extending over a portion of the second surface to form an electrical contact layer spaced away from the aperture and extending through the aperture to the first capacitor plate for connecting the first capacitor plate to a sensing circuit through the contact layer;
- a diaphragm layer formed of a brittle material having a rim surrounding a diaphragm sealingly bonded to the first surface of the first layer to surround the first capacitor plate, said diaphragm facing and being spaced from the first capacitor plate, said diaphragm forming a second capacitor plate in the brittle material responsive to a pressure applied to the diaphragm; and
- a sealing layer having a peripheral rim overlying the rim of the diaphragm layer to form a peripheral support, the peripheral rim having a sealing surface thereon bonded to the electrical conductive means on the second surface of the first layer for sealing the aperture to provide a reference pressure to the side of the diaphragm facing the first capacitor plate.

4,730,497

DEFORMATION-MEASURING SENSOR

Klaus Rabensteiner, Arnoldstein; Peter Schubert, Salzburg; Johann Golser, Sterneckstrasse 55, A-5020 Salzburg, and Georg Feder, Leoben, all of Austria, assignors to Erich Hackl and Johann Golser, both of Salsburg, Austria

Filed Mar. 20, 1987, Ser. No. 28,523
Claims priority, application Austria, Mar. 20, 1986, A 748/86
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—803 **8 Claims**



1. In a measured-value sensor consisting of a straight support member, which can be loaded in the axial direction on account of the deformation of the surrounding measuring object, and of a sleeve surrounding the support member, as well as of a minimum of two stiff transverse elements, which are connected to the support member, the improvement wherein:
- the extension stiffness value of the support member is smaller than the product of the circumscribed surface of the sleeve cross section and the elasticity modulus of the measuring object,
- a minimum of two transverse elements is provided with a length measured at a right angle to the axis of the support member that is the triple amount of the square root of the cross-sectional surface of the sleeve.

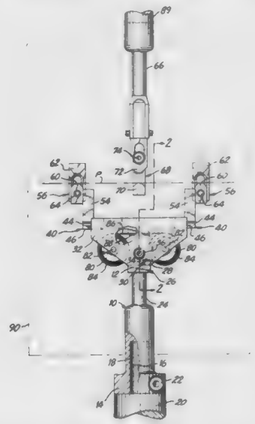
4,730,498

FIXTURE FOR HOLDING A BENDING TEST SPECIMEN

John F. Blanch, Mantoloking, N.J., assignor to Rheometrics, Inc., Piscataway, N.J.

Filed Jun. 1, 1987, Ser. No. 55,920
Int. Cl.[4] G01N *3/20*
U.S. Cl. 73—852 **8 Claims**

1. A fixture for holding a longitudinally elongate test specimen gripped adjacent the opposite ends thereof and subjected to bending by the application of lateral forces at a location intermediate the opposite ends, while maintaining a constant tension in the test specimen along the longitudinal direction, despite temperature changes in the test specimen throughout a range of temperature and consequent longitudinal displacement of the opposite ends thereof, the fixture comprising:
- a pair of longitudinally spaced apart gripping means for gripping the respective opposite ends of the test specimen;
- a pair of carriages, each carriage carrying one of the gripping means, the carriages being movable in longitudinal directions toward and away from one another over a range of movement; and
- a pair of constant-bias devices, one of said devices coupled to each of the carriages so as to bias the carriages in the direction away from one another with a constant biasing force throughout the range of movement of the carriages, such that the constant biasing force will maintain the constant tension in the test specimen despite temperature changes in the test specimen throughout the range of temperature and consequent longitudinal displacement of the opposite ends thereof.

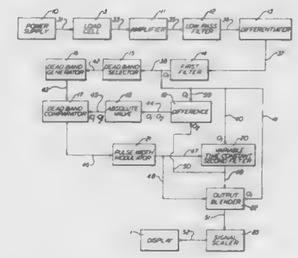


4,730,499

MEASUREMENT OF FLOW RATE OF POWDER FROM A HOPPER

Edward P. Gianella, Teaneck; Bernard R. Katz, Rockaway, both of N.J., and Stephen A. Bauman, Flushing, N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 4, 1986, Ser. No. 927,012
Int. Cl.[4] G01F *1/00*; G01G *11/06*
U.S. Cl. 73—861 **21 Claims**



1. A system for measuring the rate at which powdered material flows from a container, comprising:
- means for producing a first analog signal representing the weight of a container from which powdered material is flowable;
- means for differentiating the first analog signal to obtain a second signal corresponding to the flow rate;
- adaptive filtering means for the second signal including:
- a. a first low pass filter means having a first time constant and

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being receptive of the second signal for producing a third signal;

b. second low-pass filter means having a variable time constant ranging from a minimum value approximately within a factor of 4 of the time constant of the first filter to a maximum value equal to a preselected multiple of the time constant of the first filter and being responsive to a control signal for varying the time constant between the minimum value and the maximum value and wherein the second filter means is receptive of the third signal for producing a fourth signal; and

c. means receptive of the third and fourth signals for producing the control signal, comprising comparator means for comparing the absolute value of the difference between the third and fourth signals to a preselected deadband and means for varying the control signal such as to effect the maximum time constant in the second filter means when the absolute value of the difference is less than the deadband and to effect the minimum time constant when the absolute value of the difference is greater than the deadband; and

means receptive of the fourth signal for scaling same to indicate the powdered material flow rate.

4,730,500

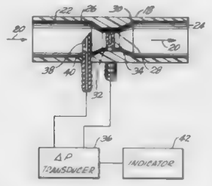
VORTEX GENERATING MASS FLOWMETER

Nathaniel Hughes, Palm Springs, Calif., assignor to Vortran Corporation, Culver City, Calif.

Continuation-in-part of Ser. No. 213,843, Dec. 8, 1980, Pat. No. 4,453,542, which is a continuation-in-part of Ser. No. 40,557, May 21, 1979, Pat. No. 4,240,293, and Ser. No. 109,839, Jan. 7, 1980, Pat. No. 4,372,169. This application Jan. 12, 1984, Ser. No. 570,162

Int. Cl.⁴ G01F *1/32, 1/44*

U.S. Cl. 73—861.22 **27 Claims**



1. A vortex generating flowmeter comprising:

a first port;

a second port;

a flow measurement passage between the ports;

a restriction formed in the flow passage between the first and second ports, the restriction comprising a converging-diverging nozzle;

a rod producing drag in the passage between the restriction and the second port; and

means for sensing gas pressure in the vicinity of the rod.

4,730,501

SINGLE TUBE PARALLEL FLOW CORIOLIS MASS FLOW SENSOR

Andrew K. Levien, San Jose, Calif., assignor to Exac Corporation, Campbell, Calif.

Filed May 19, 1986, Ser. No. 864,595

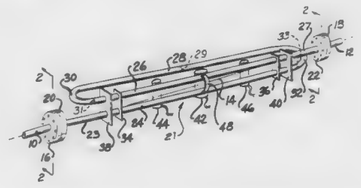
Int. Cl.⁴ G01F *1/84*

U.S. Cl. 73—861.38 **21 Claims**

1. A Coriolis mass flow rate sensor comprising:

a single, continuous tubular conduit formed in a single loop configuration including first and second elongated straight portions which are joined together by a connecting portion, such that said first and second straight portions are mutually parallel and flow through said conduit passes through said first and second straight portions in the same direction;

first and second vibration isolation plate means disposed near respective opposite ends of said straight portions, said isolation plate means being soley supported by, and rigidly connecting together, adjacent ends of said straight portions to define a pair of elongated straight sensor segments which have a shorter length than said connecting portion;



drive means coupled to drive points located midway along the lengths of said sensor segments to apply substantially equal but oppositely directed oscillatory forces thereto; and

sensing means coupled between said sensor segments at sensing points located on opposite sides of said drive points to sense relative motion between the sensing points of said segments and to develop corresponding output signals.

4,730,502

APPARATUS FOR TRANSFERRING MECHANICAL MOTIONS REPRESENTING MEASURED QUANTITIES

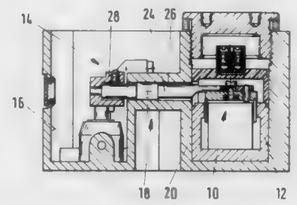
Lothar Kemmler, Mozartstr. 4, Mörfelden, Fed. Rep. of Germany

Filed Aug. 15, 1986, Ser. No. 896,868

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529842

Int. Cl.⁴ G01D *3/08*

U.S. Cl. 73—866.1 **7 Claims**



1. Apparatus for the transmission of mechanical motions representing measured quantities between an explosion-proof space and an explosion-hazarded space for measuring and control purposes, with electrical components subject to the action of electrical energy and with mechanical components subject to the action of mechanical energy, the combination comprising a partition for separating said explosion-endangered space from said explosionproof space, said partition having a bore with a substantially circular cross-section, a transmission rod with a substantially circular cross-section arranged in a low friction, freely movable manner within said bore to provide a breakdown-proof interconnection between said explosion-endangered space and said explosion-proof space, said electrical components being received in an explosion-proof, pressure-encapsulated first chamber having a wall at least partly formed by said partition, said mechanical components being arranged in the explosion-hazarded space and open to the ambient atmosphere and located in a second chamber, said second chamber being separated from said first chamber by said partition, wherein the transmission rod is tiltably arranged about a tilting point in the passage with the formation of a gap connection.

4,730,503

LINEAR DIFFERENTIAL MECHANISM

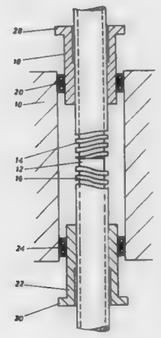
Dov Rosenthal, Kfar Yedidin, Israel, assignor to Robomatix Ltd., Petach-Tikva, Israel

Filed Jan. 13, 1986, Ser. No. 818,355

Claims priority, application Israel, Mar. 7, 1985, 74538

Int. Cl.⁴ F04B *21/02*

U.S. Cl. 74—58 **11 Claims**



1. A differential mechanism comprising:

a housing;

an elongate shaft disposed in said housing, said shaft defining a right-handed thread along a first portion thereof and a left-handed thread along a second portion thereof;

a right-handed nut rotatably mounted within said housing and arranged to engage the right-handed thread of said shaft;

a left-handed nut rotatably mounted within said housing and arranged to engage the left-handed thread of said shaft;

said right-handed and left-handed nuts being mounted in the housing at a fixed axial distance from one another;

first means on said right-handed nut for selectively rotating said right-handed nut; and

second means on said left-handed nut for selectively rotating said left-handed nut, with said first and second means being operative independent of one another to produce rotation of the respective said nuts, whereby selective rotation of said left-handed and right-handed nuts effects movement of said shaft relative to said housing. .

4,730,504

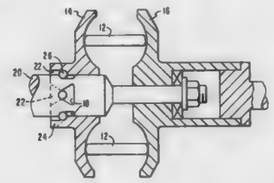
AXIAL CAM STRUCTURE

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Dec. 29, 1986, Ser. No. 946,895

Int. Cl.⁴ F16H *15/38;* **F16D** *3/06*

U.S. Cl. 74—200 **4 Claims**



1. An axial cam structure comprising outer and inner concentric shaft portions adapted to be rotationally and axially movable relative to one another and having radially adjacent inner and outer cylindrical surfaces, the outer of said concentric shaft portions having a camming cavity formed in said inner cylindrical surface thereof and the inner of said concentric shaft portions having a camming cavity formed in said outer cylindrical surface thereof, said camming cavities being arranged so as to be essentially radially adjacent one another, each being essentially V-shaped with the V-shape of the cavities being pointed in opposite axial directions and having radially overlapping areas of predetermined radial depth and a camming ball of a diameter corresponding to the combined radial depth of said cavities disposed in the space formed by the overlapping cavity areas so that any torque transmitted between said inner and outer shaft portions through said camming balls results in corresponding oppositely directed axial forces on said inner and outer shaft portions.

4,730,505

POWER CHANGE-OVER MECHANISM OF A VEHICLE FOR INDUSTRIAL MACHINERY

Noritaka Sumihi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

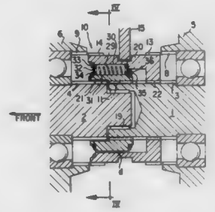
Division of Ser. No. 714,749, Mar. 22, 1985, Pat. No. 4,677,867. This application Dec. 4, 1986, Ser. No. 937,789

Claims priority, application Japan, Mar. 23, 1984, 59-42622[U]

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.⁴ F16H *3/08*

U.S. Cl. 74—332 **1 Claim**



1. A power change-over mechanism of a vehicle for industrial machinery comprising:

a. a first driving shaft and a high-speed gear mounted for rotation thereon;

b. a second driving shaft disposed in coaxial arrangement with said first driving shaft and having a low speed gear mounted for rotation thereon;

c. splines formed in both said shafts and both said gears;

d. a power change-over annular spool disposed between said gears freely slidingly operable in an axial direction from a two-wheel drive position to a four-wheel drive position;

e. said spool being divided into two members; an outer peripheral member having a cylindrical portion with exterior splines for freely meshing with said gears and a radially inwardly extending flange at one end of said cylindrical portion with an interior sub-spline constantly meshing with the spline of the first driving shaft and adapted for axial movement between said two-wheel drive position and said four-wheel drive position;

f. said outer peripheral member being disposed around an internal peripheral side member with an annular clearance between said members;

g. said outer peripheral member also having an annular member on its inner peripheral surface held against axial movement to prevent said member from moving in a direction away from said flange portion; and

h. said inner and outer peripheral member being movably

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connected to each other in the axial direction through a damper means;

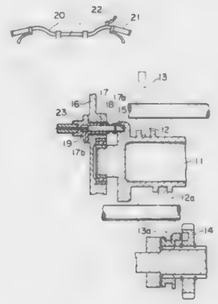
i. wherein said damper means comprises plural spring receiving notches formed on an inner peripheral surface of the outer peripheral side member and an outer peripheral surface of the inner peripheral surface respectively, springs are disposed as the damper in cylindrical spaces formed by both notches, the springs making contact at one end with annular members secured to the outer and inner peripheral side members and at their other ends with an annular member secured to said inner peripheral side member and a flange of said outer peripheral side member.

4,730,506

SPEED CHANGING APPARATUS USABLE FOR A SMALL CAR

Minoru Kageyama, Hamamatsu, Japan, assignor to Suzuki Motor Company Limited, Shizuoka, Japan

Continuation of Ser. No. 756,074, Jul. 17, 1985, abandoned. This application Jun. 23, 1987, Ser. No. 65,109
Claims priority, application Japan, Jul. 20, 1984, 59-149611
Int. Cl.[4] F16H *5/06*
U.S. Cl. 74—337.5 **7 Claims**



1. A speed changing apparatus usable for a saddle-riding type car including a bar-shaped steering handle and a speed changing gear mechanism having plural forward movement stages and a single backward movement stage, said speed changing gear mechanism being located in a transmission case having a side wall, characterized in that shifting of speed changing gears to any one of said forward and backward movement stages is controlled by rotational displacement of a drum-shape rotary type change cam mounted in said transmission case and the apparatus is provided with a stopper means passing through said transmission case side wall and extending substantially parallel to said change cam for axial cooperation with engagement means formed at a side surface of said change cam and adapted to limit rotation of said change cam within the range of an angle of rotation which is determined by said forward movement stages, said stopper means being released from an operative state by means of an actuating member disposed on said bar-shaped steering handle.

4,730,507

INTERCONNECTING CONTROL HEAD FOR TWIN PUSH/PULL CABLES

Jacob Kobelt, 6110 Oak Street, Vancouver, British Columbia, Canada V6M 2W2

Filed May 30, 1986, Ser. No. 868,681
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—480 B **17 Claims**

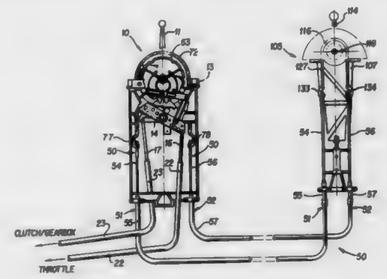
1. A control lever apparatus for actuating two sheathed control cable assemblies, the control lever apparatus having:

(a) a body having journalling means and a longitudinal body axis,

(b) a manual lever and sprocket means cooperating with the journalling means for concurrent rotation relative to the body,

(c) a sheath anchoring means cooperating with the body and having sheath clamp means adapted for securing end portions of sheaths of the two sheathed control cable assemblies relative to the body and laterally spaced apart,

(d) a length of chain passing over the sprockets, the chain having two opposite end portions which can extend generally axially of the body and can be generally aligned with the clamp means, the chain having a length to accommodate full rotation of the lever while maintaining end portions of the chain generally aligned with the sheath clamp means,



(e) core connecting means secured to ends of the chain and adapted to be secured to respective cores of the sheathed control cable assemblies, each core being axially moveable within a respective sheath,

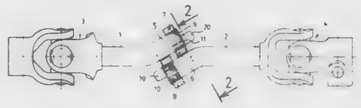
(f) adjusting means for adjusting relative distance between adjacent ends of a core and its respective sheath, the adjusting means being integrated into the control lever assembly to cooperate directly with the control cable assembly and to be independent of adjacent surrounding structure, so as to facilitate installation and essential elimination of any resulting lost motion.

4,730,508

SEPARABLE CONNECTING DEVICE, IN PARTICULAR FOR THE STEERING COLUMN OF A MOTOR VEHICLE

Bernard Haldric; Grégorio Benedi, and Sylvie Baudon née Chardon, all of Vendome, France, assignors to NACAM, Vendome, France

Filed May 13, 1986, Ser. No. 862,800
Claims priority, application France, May 23, 1985, 85 07792
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **18 Claims**



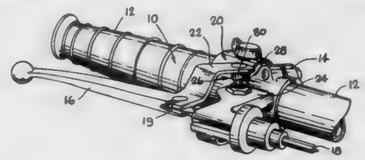
1. A separable connecting device between two shaft sections which have a common axis and which include end portions that are offset with respect to said common axis and that are in overlapping relation to each other, said device comprising two flanges of identical configuration, each said flange having fixed to and extending therefrom respective connecting pins and defining respective openings complementary to said pins, each said flange being fixed to a respective said end portion with said flanges being mounted symmetrically in such manner that said connecting pins of each of said flanges extend slidably through said openings of the other of said flanges, and sleeves of friction material interposed between said connecting pins fixed to each of said flanges and the respective said openings provided in the other of said flanges, said sleeves forming means to provide gripping to ensure controlled sliding between said connecting pins and said respective openings.

4,730,509

BREAKAWAY CONTROL LEVERS

Robert S. Hornady, 1437 Lillian, Livermore, Calif. 94550

Continuation of Ser. No. 726,791, Apr. 24, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 63,719
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 B **19 Claims**



1. A breakaway control lever comprising,

a lever arm,

a load-transmitting means attached to said lever arm for transmitting a controlling force to a mechanism, and

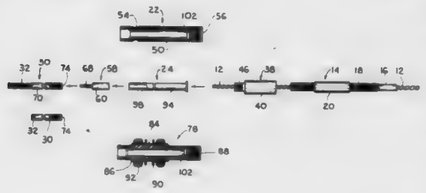
a pivot having a two-pronged fork element and a central element, one of said elements being fixed, the other of said elements being linked to said lever arm, said two-pronged fork element and said central element being movably connected to and spaced apart from each other by a pair of impact dislocating joints, each of said joints being a shaped member in one of said elements engaging a socket in the other of said elements, each of said sockets having structure defining a cavity and a cavity opening, each of said shaped members having a cylindrical body and an engagement end, said engagement ends each being at least partially defined by a tapering segment, each of said cavities of said sockets being shaped to receive said shaped member, the cavity opening of each of said sockets being partially surrounded by a lip and being in engagement with a tapering segment of said engagement ends, said lip of each socket extending a distance beyond the cavity opening toward said one element and defining a range of normal motion, said joint also having at least one biasing means for pushing said shaped member into engagement with said sockets, said joints automatically and nondestructively dislocating upon an impact causing movement of said pivot beyond said range of normal motion.

4,730,510

PUSH-PULL CABLE APPARATUS

Dennis I. Graham, 2955 Revenna Rd., Hudson, Ohio 44236

Continuation of Ser. No. 431,416, Apr. 30, 1982, abandoned. This application Apr. 14, 1986, Ser. No. 851,633
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502 **4 Claims**



1. Control cable apparatus comprising conduit means for slidably supporting a core means, core means slidably supported within the conduit means for relative axial movement therein, hub means generally coaxial with the conduit means, conduit connector means for removably connecting a proximal end of the hub means with a proximal end of the conduit means, actuator rod means generally coaxial with the core means, and core connector means removably connecting a proximal end of the actuator rod means to a proximal end of the core means, said hub means having clamping means for connecting the hub means to a fixed object, and the actuator rod means having at a distal end thereof connection means for connection to a movable object, said hub means and said actuator rod means being selectively interchangeable with substitute hub means and substitute actuator rod means respectively, wherein the conduit connector means is fixed to the distal end of the conduit means and is provided with means for selective connection to and disconnection from the hub means, and wherein the conduit connector means comprises a body portion disposed about the distal end of the conduit means, a head portion coaxial with the body portion having a surface provided with screw threads, and a neck portion extending between the body portion and the head portion and being coaxial therewith, the proximal end of the hub means having a surface provided with screw threads configured to cooperate with the screw threads on said head portion.

3. Control cable apparatus comprising conduit means for slidably supporting a core means, core means slidably supported within the conduit means for relative axial movement therein, hub means generally coaxial with the conduit means, conduit connector means for removably connecting a proximal end of the hub means with a proximal end of the conduit means, actuator rod means generally coaxial with the core means, and core connector means removably connecting a proximal end of the actuator rod means to a proximal end of the core means, said hub means having clamping means for connecting the hub means to a fixed object, and the actuator rod means having at a distal end thereof connection means for connection to a movable object, said hub means and said actuator rod means being selectively interchangeable with substitute hub means and substitute actuator rod means respectively, and wherein the core connector means is fixed to the distal end of the core means and is provided with means for selective connection to and disconnection from the actuator means, and wherein the core connector means comprises a body portion disposed about the distal end of the core means, a head portion coaxial with the body portion having a surface provided with screw threads, and a neck portion extending between the body portion and the head portion and being coaxial therewith, the proximal end of the actuator means having a surface provided with screw threads configured to cooperate with the screw threads on said head portion.

4,730,511

VALVE ACTUATING MECHANISM

Yukio Tsujimura, Higashi-Osaka, Japan, assignor to Osaka Kikiseizo Kabushiki Kaisha, Higashi-Osaka, Japan

Continuation-in-part of Ser. No. 764,412, Aug. 9, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,229
Claims priority, application Japan, Aug. 10, 1984, 59-123000[U]
Int. Cl.[4] F16H *53/00;* **B23Q** *1/04;* **B25B** *1/08, 5/08*
U.S. Cl. 74—567 **12 Claims**

1. A mechanism for actuating a non-slidable disk type valve body, comprising

a hollow cylindrical, stationary casing,

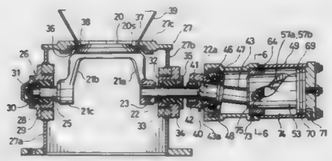
a hollow, grooved cylindrical cam body axially movable within said stationary casing,

an output shaft extending rearward into an internal space of said cam body and being journalled by a bearing member which is interposed between said output shaft and a first bush secured to an internal wall of said stationary casing,

said bearing member having a spherically convexed external surface slidable relative to a spherically concaved internal surface of said first bush,

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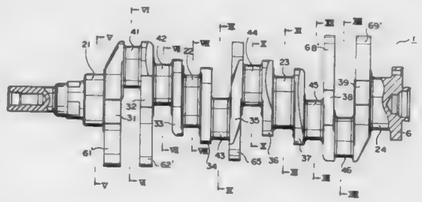
a connector socket extending forward from said bearing member and co-inclinable with said bearing member,
a second bush having a spherically concaved internal surface and secured to an internal wall of a front end portion of said connector socket,
a valve drive shaft having a collar member fixedly mounted thereon,
said collar member having a spherically convexed external surface slidable relative to said spherically concaved internal surface of said second bush,
said valve drive shaft having its rear end engaged with a front end of said output shaft in such a manner that said valve drive shaft is corotatable with said output shaft but free to move crosswise relative to said front end of said output shaft,
means for supporting said valve drive shaft so as to be rotatable about its own axis and inclinable within a limited range,
a guide groove formed in a cylindrical wall of said cam body and including a spiral portion and an oblique front end



portion smoothly joined by an intermediate transitional portion,
a cam follower mounted on a rear end portion of said output shaft and extending into relatively movable engagement with said guide groove,
a valve supporting crank fixedly secured to a front end of said valve drive shaft,
said spiral portion of said guide groove extending spirally with respect to a longitudinal axis of said cam body to impart rotational motion to said output shaft via said cam follower thereby to put said valve drive shaft into rotational motion when said cam body reciprocates with said cam follower engaged in said spiral portion, and
said oblique front end portion of said guide groove extending forwardly from said transitional portion in inclination by a limited angle with respect to said longitudinal axis of said cam body to impart seesaw motion to said output shaft thereby to put said valve drive shaft into seesaw motion when said cam body reciprocates with said cam follower engaged in said oblique front end portion.

4,730,512
ENGINE CRANKSHAFT STRUCTURE
Eiji Ito, Nagoya, and Susumu Fukazawa, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 664,041, Oct. 23, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 919,591
Int. Cl.⁴ F16C *3/04*
U.S. Cl. 74—595 **8 Claims**

1. An engine crankshaft having a front end, a rear end, and a longitudinal axis extending from said front end to said rear end, the crankshaft comprising:
a plurality of longitudinally spaced journals coaxial with said longitudinal axis and a plurality of crank pins each having an axis spaced from and parallel to said longitudinal axis, at least one crank pin being disposed longitudinally between adjacent journals, and a line between the longitudinal axis and the axis of a forwardmost one of said crank pins defining, with said longitudinal axis, a reference plane;
a plurality of transverse arms spaced apart along the longitudinal axis, each arm connecting corresponding ones of said plurality of crank pins and journals, said arms including a front arm, a middle arm, a rear arm, a forward plurality of arms disposed between said front arm and said middle arm, and a rearward plurality of arms disposed between said middle arm and said rear arm;
a front, a middle, and a rear counterweight associated with said front, middle, and rear arms, respectively, said front and rear counterweights providing oppositely directed force vectors lying in said reference plane and balancing each other;
a forward counterweight associated with one of said forward plurality of arms;
a rearward counterweight associated with one of said rearward plurality of arms, said forward counterweight, said rearward counterweight and said middle counterweight balancing each other; and
at least one of said forward plurality of arms and at least one

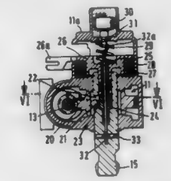


of said rearward plurality of arms being disposed in axial symmetry with each other with respect to said middle arm and having no counterweights associated therewith,
wherein the improvement comprises said forward counterweight providing a force vector disposed at an angle spaced counterclockwise from and in the same quadrant as a line extending from the longitudinal axis at an angle 150 degrees clockwise from said reference plane, said rearward counterweight providing a force vector disposed at an angle spaced clockwise from and in the same quadrant as a line extending from the longitudinal axis at an angle 30 degrees clockwise from said reference plane, when the crankshaft is viewed from the front end, and wherein the force vector of the forward counterweight is disposed at an angle of 135 degrees clockwise from the reference plane and the force vector of the rearward counterweight is disposed at an angle of 45 degrees clockwise from the reference plane.

4,730,513
ELECTROMECHANICAL DEVICE FOR ACTIVATING A ROTATING POST THAT MOVES THE LEAF OF A SWINGING DOOR ON A VEHICLE
Siegfried Heinrich, Ebermunde-Besse; Manfred Horn, Kaufungen, and Uwe Knothe, Kassel, all of Fed. Rep. of Germany, assignors to Firma Gebr. Bode & Co GmbH, Kassel, Fed. Rep. of Germany
Filed Oct. 1, 1986, Ser. No. 914,106
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535259
Int. Cl.⁴ E05B *65/10;* **F16H** *57/00*
U.S. Cl. 74—625 **3 Claims**

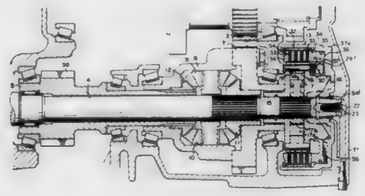
1. In an electromechanical device for activating a rotating post that moves a leaf of a swinging door on a vehicle, having an electric motor with an outtake shaft that activates the post by an intermediate worm gear with an intake shaft, an outtake shaft and a worm wheel, means coupling the motor outtake shaft to the worm-gear intake shaft and means coupling the worm wheel to the worm-wheel outtake shaft which activates the rotating post, the improvement comprising: emergency means for uncoupling the worm-wheel outtake shaft from the worm wheel in relation to their rotation, comprising the worm

wheel mounted completely over the outtake shaft and a coupling that can be disengaged between the outtake shaft and the worm wheel, including recesses in the outtake shaft and axial grooves in an inner surface of the worm wheel and balls forcable into the recesses in the outtake shaft while simultaneously engaging the axial grooves in the inner surface of the worm wheel, wherein the recesses in the worm-wheel outtake shaft are longer axially than the diameter of the balls, wherein one end of the outtake shaft that is remote from the rotating post has an axial bore that the recesses lead into and that accommodates a cylindrical slide having a surface against which the balls rest and an initial longitudinal section with a diameter that ensures that a prescribed volume of each ball will project out of the recesses, and which has an adjacent longitudinal section



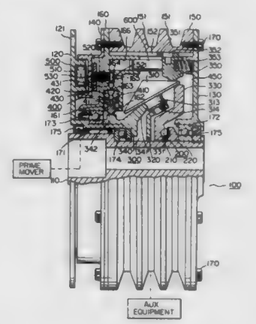
with a diameter that continuously decreases to such a length that the balls will completely enter the recesses; and means for displacing the slide to a prescribed extent against the force of a compression spring, wherein the inside diameter of the axial bore in the worm-wheel outtake shaft is longer at all points than the outside diameter of the cylindrical slide at the same points, means freely suspending the slide comprising a ball-and-socket joint on the means for displacing the slide, wherein the worm gear has a housing and the means for displacing the slide has two parallel annular plates that extend perpendicular to the axis of the slide and can rotate independently, and that have adjacent sloping surface, one plate being axially and frictionally secured to the slide and the other rigidly fastened to the housing of the worm gear.

4,730,514
DIFFERENTIAL SPEED LIMITING DEVICE MECHANISM
Kiyoshi Shikata, Neyagawa, and Bonnosuke Takamiya, Johyoh, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Daikin Seisakusho, Osaka, both of, Japan
Filed Apr. 18, 1986, Ser. No. 853,623
Claims priority, application Japan, Apr. 22, 1985, 60-60040
Int. Cl.⁴ F16H *1/44*
U.S. Cl. 74—711 **9 Claims**



1. A differential speed limiting device in a differential mechanism adapted to receive, via an input shaft, a drive force from a transmission connected to an engine and to distribute the drive force to two output shafts, comprising:
an oil pump interposed between two shafts selected from the input shaft and output shafts and driven by a difference in revolution speed between said selected two shafts, thereby discharging a working oil in an amount proportional to the difference in revolution speed;
a wet clutch equipped with two types of plural disks and a working oil compartment and adapted to connect said selected two shafts to each other by the discharge pressure generated by an orifice; said orifice restricts the amount of said working oil from said oil pump to generate a discharge pressure and to jet lubricating oil to said clutch discs;
passage means which supplies the working oil, discharged from the oil pump, to the working oil compartment of the clutch; and
lubricating passage means with one end in communication with said passage means, and the other end opening near said disks of said clutch;
said orifice being provided with the opening end, or near the opening end, of the lubricating passage means.

4,730,515
DRIVE APPARATUS FOR ENGINE AUXILIARY EQUIPMENT
Kazutoshi Kaneyuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 17, 1985, Ser. No. 776,863
Claims priority, application Japan, Sep. 25, 1984, 59-202261
Int. Cl.⁴ F16H *3/74, 15/50*
U.S. Cl. 74—752 A **7 Claims**



2. A drive apparatus for driving auxiliary equipment of a prime mover comprising:
a rotating input member driven by said prime mover;
a hollow, rotating output member surrounding and supported by said input member for rotating with respect to said input member;
an adjustable, planetary cone-type reduction gear housed within said hollow output member and having a rotating input portion connected for rotation by said input member and having a rotating output portion connected so as to rotate said hollow output member;
said reduction gear including a plurality of cones, each having a stem, a bottom surface, and a top surface, a rotating support member surrounding and supported by said input member and rotatably supporting each of said cones about its axis, and a stationary guide member in rolling contact with said stem, said input portion being in rolling contact with said bottom surface of each of said cones and said output portion being in rolling contact with said top surface of each of said cones, said output portion being slidably connected to said hollow output member so as to be moved in an axial direction of said input member while maintaining rolling contact with the top surface of each of said cones;
adjusting means for adjusting the reduction ratio of said reduction gear housed within said hollow ouput member;
said adjusting means comprising an hydraulic pump, an

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hydraulic ram having one end in fluid communication with said hydraulic pump and the other end contacting said output portion to allow hydraulic pressure generated by said hydraulic pump to provide a driving force pushing said hydraulic ram against said output portion in said axial direction of said input member, a spring disposed inside said pump for applying a compression force on said output portion in a direction opposite to said axial direction of said driving force applied by said hydraulic ram, and valve means for controlling the hydraulic pressure applied to said hydraulic ram by said hydraulic pump; and

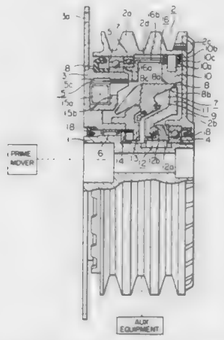
control means for controlling said adjusting means in response to the operating state of said auxiliary equipment driven by said output member.

4,730,516

DRIVE APPARATUS FOR AUXILIARY EQUIPMENT RESPONSIVE TO A CHARGING GENERATOR SPEED REPRESENTING SIGNAL

Kazutoshi Kaneyuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,141
Claims priority, application Japan, Apr. 1, 1985, 60-69508
Int. Cl.[4] F16H *3/74, 15/50*
U.S. Cl. 74—752 D **3 Claims**



1. A drive apparatus driving auxiliary equipment of a prime mover, said auxiliary equipment including a charging generator having a stator winding for one phase, said stator winding having an induced voltage upon rotation of said generator, said drive apparatus comprising:

a rotating input member adapted to be connected to be driven by the prime mover;

a rotating output member connected to said auxiliary equipment so as to drive said auxiliary equipment including said generator;

an adjustable speed change mechanism connected between said rotating input member and said rotating output member so as to transmit rotational force from said input member to said output member; and

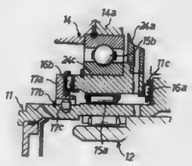
adjusting means for adjusting the reduction ratio of said speed change mechanisms and control means for controlling said adjusting means in response to an electrical input signal indicating the rotational speed of said rotating output member, the electrical input signal being the voltage induced in said stator winding for one phase of said charging generator.

4,730,517

HELICAL PLANETARY GEAR ASSEMBLY

Hideo Hamano; Keiji Takeshita, and Yasumichi Funato, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 27, 1986, Ser. No. 900,893
Claims priority, application Japan, Aug. 27, 1985, 60-130248
Int. Cl.[4] F16H *3/44*
U.S. Cl. 74—785 **5 Claims**



5. A helical planetary gear assembly comprising a housing, a ball bearing secured to a side wall of said housing, a carrier sleeve coupled with an inner race of said ball bearing and being axially and radially restrained by engagement with the inner race of said ball bearing, an input shaft rotatably supported by said carrier sleeve through a radial bearing, an output shaft arranged coaxially with said input shaft for rotation relative thereto, a sun gear secured to said input shaft for rotation therewith, a ring gear secured to an internal wall of said housing, a planet carrier rotatably arranged between said sun and ring gears, said planet carrier including a body member secured to said carrier sleeve for rotation therewith, a plurality of planet gears rotatably supported by said planet carrier and being in meshing engagement with said sun and ring gears, said gears each being in the form of a helical gear, and a clutch sleeve axially slidably mounted on said output shaft and shiftable between a first position in which it effects a direct drive connection between said input and output shafts and a second position in which it is engaged with said planet carrier for transmitting drive torque from said input shaft to said output shaft through said gears,

means for axially restraining said input shaft, said means for axially restraining comprising thrust bearings positioned at opposite ends of said carrier sleeve.

4,730,518

SYSTEM FOR THE TRANSMISSION RATIO OF A CONTINUOUSLY VARIABLE TRANSMISSION

Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 912,936
Claims priority, application Japan, Sep. 30, 1985, 60-218398
Int. Cl.[4] B60K *41/18, 41/12*
U.S. Cl. 74—866 **6 Claims**

1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine having a throttle valve to driving wheels of a motor vehicle through a clutch, the transmission having a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley including a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the control system having a transmission ratio control valve having ports and a shiftable spool, and a first hydraulic circuit having a pump for supplying oil to the first hydraulic cylinder via the transmission ratio control valve and to the second hydraulic cylinder, the improvement in the system comprising:

first means for detecting operating conditions of said engine and for producing a first signal;

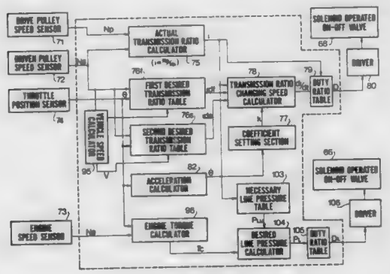
second means responsive to the first signal for producing a

second signal representing a desired transmission ratio for upshifting the transmission;

calculating means for producing an actual transmission ratio signal representing actual transmission ratio;

third means responsive to the second signal and to the actual transmission ratio signal for producing a third signal representing transmission ratio changing speed dependent on the difference between the desired and actual transmission ratio;

said second means sets the second signal to represent a higher transmission ratio changing speed when the transmission is in a large transmission ratio range below a predetermined vehicle speed, and said second means sets the second signal to represent a lower transmission ratio changing speed compared with said higher transmission ratio changing speed when the transmission is in a small transmission ratio range above said predetermined vehicle speed; and



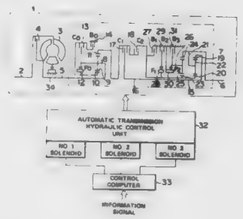
fourth means responsive to the third signal for shifting the spool of the transmission ratio control valve so as to reduce the transmission ratio at a transmission ratio changing speed determined by the third signal.

4,730,519

METHOD FOR CONTROLLING AN AUTOMATIC TRANSMISSION INCLUDING PREDETERMINED TIME DELAY IN SHIFTING

Yasunari Nakamura, Nagoya, and Yoshio Shindo, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 2, 1987, Ser. No. 71
Claims priority, application Japan, Jan. 13, 1986, 61-4751
Int. Cl.[4] B60K *41/18*
U.S. Cl. 74—866 **10 Claims**



1. In a method for controlling an automatic transmission comprising

a plurality of frictional engaging elements arranged in frictional engagement for changing the state of transmission of engine power,

a plurality of hydraulic servo mechanisms cooperated with the corresponding frictional engaging elements for independently engaging or releasing the frictional engaging elements, and

electronic control means for delivering control signals to the hydraulic servo mechanisms,

said method comprising the step of independently engaging or releasing selected ones of said frictional engaging elements to change the power transmission state,

the improvement wherein the delivery of a signal from the electronic control means to the hydraulic servo mechanism to operate one selected frictional engaging element is delayed a predetermined time from the delivery of a signal from the electronic control means to the hydraulic servo mechanism to operate another selected frictional engaging element, the other frictional engaging element taking a present state after having passed an antecedent state and being operated from the present to a subsequent state, and

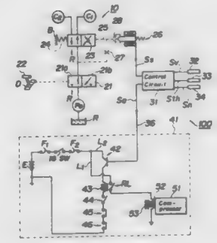
the predetermined delay time being varied depending on the antecedent state of the other frictional engaging element preceding its operation.

4,730,520

CONTROL SYSTEM FOR ENGINE-DRIVEN AUXILLARY EQUIPMENT FOR VEHICLES

Masao Nishikawa, Tokyo; Junichi Miyake, Saitama, and Yoshimi Sakurai, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 802,501, Nov. 27, 1985, Pat. No. 4,658,943. This application Aug. 5, 1987, Ser. No. 82,924
Claims priority, application Japan, Nov. 28, 1984, 59-251332
Int. Cl.[4] B60K *41/18*
U.S. Cl. 74—866 **4 Claims**



1. A control system for an engine-driven auxiliary equipment for a vehicle comprising:

an engine;

an automatic transmission receiving power from said engine to drive a driven wheel;

said automatic transmission consisting of a torque converter of a fluid coupling type having an input shaft thereof at the engine side and an output shaft thereof at the driven wheel side, said automatic transmission having a plurality of gear ranges;

said auxiliary equipment being driven with power from said engine;

transmitting-and-interrupting means for transmitting and interrupting the power from said engine to said auxiliary equipment, said control system for controlling said transmitting-and-interrupting means to thereby control said auxiliary equipment;

first means for determining if said vehicle is in an accelerating state by determining an instantaneous value of a rotational speed ratio of said torque converter in terms of a rotation speed of said output shaft at the driven wheel side of said torque converter divided by a rotation speed of said input shaft at the engine side thereof;

second means for interrupting the power from said engine to said auxiliary equipment by said transmitting-and-interrupting means when said vehicle is in said accelerating state under a condition that said instantaneous value of

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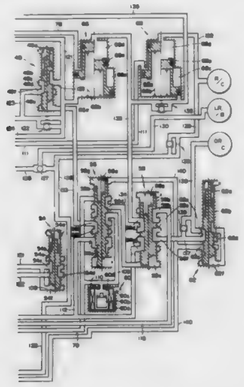
said rotational speed ratio as thus determined of said torque converter is lying in a region where a predetermined value of torque amplification, of said torque converter, is exceeded indicating said accelerating state;
a central control circuit;
vehicle speed detecting means for feeding said control circuit with a signal representative of an instantaneous value of a vehicle speed;
engine throttle opening detecting means for feeding said control circuit with a signal representative of an instantaneous value of an engine throttle opening;
a shift map for said automatic transmission; and
said shift map having as parameters thereof, said vehicle speed and said engine throttle opening; and
said control circuit for controlling the shifting of said automatic transmission in conformity with said shift map.

4,730,521

CONTROL SYSTEM FOR ALLEVIATING SHOCK IN AUTOMATIC TRANSMISSION

Koichi Hayasaki, Fujisawa, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1986, Ser. No. 905,268
Claims priority, application Japan, Sep. 11, 1985, 60-199316
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—867 **8 Claims**



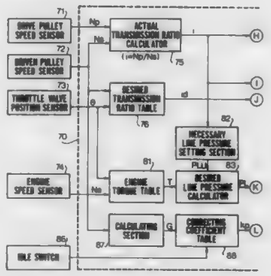
1. An apparatus comprising:
an automatic transmission which is shiftable to a plurality of speed ratios including a predetermined speed ratio other than a first speed ratio and a second speed ratio, the predetermined speed ratio haing a reduction ratio smaller than a reduction ratio of the first or second speed ratio, the automatic transmission being shiftable from neutral to a reverse drive ratio, and a control system comprising:
an accumulator including a piston defining three chambers which are selectively expandable in volume in response to movement of said piston, and resilient means acting on said piston in assisting movement of said piston in one of two directions and yieldably resisting movement of said piston in the other direction which is opposite to said one direction, said three chambers being comprised of a first chamber, a second chamber and a third chamber;
means for supplying a forward drive select hydraulic fluid pressure to said first chamber to act on said piston to urge said piston against said resilient means in such a manner as to decrease the volume of said second chamber when a forward drive range is selected in the automatic transmission and discharging hydraulic fluid from said first chamber when a reverse drive range is selected;
a first friction element adapted to be engaged when the transmission upshifts to the predetermined speed ratio when said forward drive range is selected;
means for initiating an upshift to the predetermined speed ratio by supplying a predetermined speed select hydraulic fluid pressure to said first friction element;
said second chamber of said accumulator communicating with said first friction element to allow said predetermined speed select hydraulic fluid pressure to act on said piston in such a manner as to assist the action of said resilient means to cause said piston to move in said one direction so as to expand the volume of said second chamber, allowing gradual build-up of said predetermined speed select hydraulic fluid pressure supplied to said first friction element;
a second friction element adapted to be engaged when said reverse drive range is selected; and
means for initiating a shift from the neutral to the reverse drive ratio by supplying a reverse drive range select hydraulic fluid pressure to said second friction element when said reverse drive range is selected in the automatic transmission;
said third chamber of said accumulator communicating with said second friction element to allow said reverse drive range select hydraulic fluid pressure to act on said piston against the action of said resilient means in said second direction so as to expand the volume of said third chamber, allowing gradual build-up of said reverse drive range select hydraulic fluid pressure supplied to said second friction element.

4,730,522

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,219
Claims priority, application Japan, Aug. 30, 1985, 60-191049
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—868 **13 Claims**



1. A control system for a continuously variable transmission for transmitting the power of an internal combustion engine to driving wheels of a motor vehicle through a clutch, having a drive pulley having a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc, a belt engaged with both pulleys, a line pressure control valve having ports and a spool, a transmission ratio control valve having ports and a spool, a first hydraulic circuit having a pump for supplying oil to the first cylinder through the line pressure control valve and transmission ratio control valve, the system comprising:
a second hydraulic circuit for supplying control oil to the line pressure control valve so as to shift the spool thereof;
control valve means provided in the second hydraulic circuit for controlling amount of the control oil supplied to the line pressure control valve;

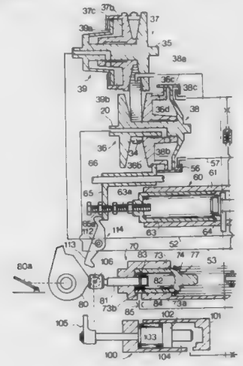
first means for detecting a coasting state of said motor vehicle and for producing a coasting signal;
second means for detecting the magnitude of deceleration of said motor vehicle and for producing a deceleration signal dependent on the magnitude;
third means responsive to the coasting signal and to the deceleration signal for operating the control valve means, so that the spool of the line pressure control valve is shifted to increase the line pressure in dependence on said magnitude of the deceleration.

4,730,523

TRANSMISSION RATIO CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Masahiko Takahashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,896
Claims priority, application Japan, Aug. 17, 1984, 59-172055
Int. Cl.[4] B60K *41/12*
U.S. Cl. 74—868 **9 Claims**



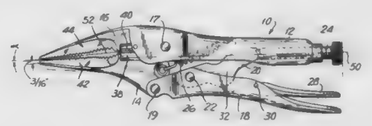
3. In a control system for an infinitely variable transmission for a vehicle powered by an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the control system including a hydraulic circuit having a pump for supplying oil, detecting means for producing a first pressure dependent on engine speed, a transmission ratio control valve having a first spool responsive to the first pressure for controlling the oil for shifting the disc of the drive pulley to change the transmission ratio of the transmission, and a pressure regulator valve having a second spool responsive to the transmission ratio for decreasing line pressure of the hydraulic circuit with a decrease of the transmission ratio, and a selector lever for selecting driving ranges including a small transmission ratio range and a large transmission ratio range, the improvement comprising:
an operating plunger axially movably disposed in the transmission ratio control valve;
a spring provided between the first spool of the transmission ratio control valve and the operating plunger;
first means for shifting the operating plunger in dependency on depression of an accelerator pedal of the vehicle so as to shift the first spool via said spring against the first pressure;
a select range detecting device for detecting the selection of the large transmission ratio range and producing a selection signal;
second means responsive to the selection signal for increasing the load on the spring so as to shift the first spool of the transmission ratio control valve for shifting the disc of the drive pulley to change the transmission ratio into a downshift direction;
the second means comprises an actuator cylinder, an actuator piston provided in the actuator cylinder and operatively connected to said operating plunger, and the hydraulic circuit including an oil passage for supplying oil into the actuator cylinder; and
the select range detecting device comprises a cam operatively connected to the selector lever so as to be rotated by the lever, a valve provided in the oil passage and operated by the cam at the selection of the large transmission ratio range to shift the actuator piston.

4,730,524

LONG NOSE LOCKING PLIER

Christian Petersen, DeWitt, Nebr., assignor to Petersen Manufacturing Co., Inc., DeWitt, Nebr.

Continuation of Ser. No. 241,085, Mar. 6, 1981, Pat. No. 4,541,312, which is a continuation-in-part of Ser. No. 943,180, Sep. 18, 1978, Pat. No. D. 261,096. This application Sep. 16, 1985, Ser. No. 776,225
The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.
Int. Cl.[4] B25B *7/12, 7/02*
U.S. Cl. 81—367 **12 Claims**



1. A long nose locking hand tool having a pair of opposing jaw members, a fixed handle having an adjustment screw, and a movable handle and lever locking means therebetween for maintaining a toggle relationship between the jaw faces of said jaw members when in a closed position; wherein each of said jaw members comprising a jaw face configuration having a total jaw length to average jaw height ratio of from about 6.5 to about 8.5 with a through jaw hardness range of from about 53 to about 57 Rockwell C, with said jaw members made of an alloy spring steel, and wherein said fixed handle having a straight strike surface forming a part of said adjustment screw, and having an axis passing through said strike surface defining the direction of a line of force impartable to the hand tool; and said pair of jaws further defining a bisecting axis or line formed by the angle of said jaws when closed against a workpiece gripped therebetween; and the angle between said axes being less than about 5° when the gripping tips of said jaw members are in a generally touching or closed position.

4,730,525

INDEXABLE CUTTING TOOL

Walter Kelm, Mt. Clemens, Mich., assignor to General Electric Company, Detroit, Mich.

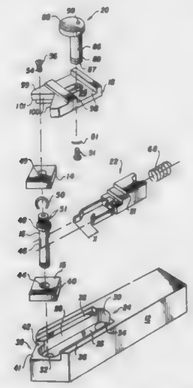
Filed May 1, 1986, Ser. No. 858,346
Int. Cl.[4] B23B *27/16, 29/32*
U.S. Cl. 82—36 A **18 Claims**

1. A cutting tool, comprising:
a shank having an elongated cavity at the cutting end;
an indexable insert having at least one side surface and a plurality of cutting edges;
means rotatably connecting said cutting insert to said shank including a lock pin slidably and rotatably extending through said shank having a ratcheting means about a portion of its length;
a seat adapted to said shank for supporting said insert;
means to secure said cutting insert on said seat in a cutting position comprising a plate moveably mounted to said shank having a pocket for engaging the side surface of the insert in the cutting position; and

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means to index said cutting insert adapted to cooperate with said ratcheting means of said lock pin and with said moveable plate;

said indexing means being effective for rotating said cutting insert upon withdrawing said moveable plate from said insert which pushingly engages said indexing means in said cavity of said shank wherein said indexing means



cooperates with said ratcheting means to effect a first partial rotation of said lock pin and said cutting insert attached thereto then retracting said moveable plate and said indexing means to again cooperate with said ratcheting means to effect a second partial rotation of said lock pin and said cutting insert, then further retracting said moveable plate to secure said cutting insert on the cutting position.

4,730,526

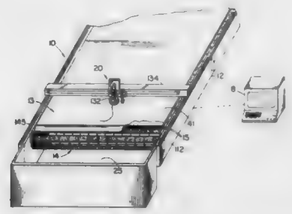
CONVEYORIZED VACUUM TABLE FOR FEEDING SHEET MATERIAL

David R. Pearl, and Lawrence S. Wolfson, both of West Hartford, Conn., assignors to Gerber Garment Technology, Tolland, Conn.

Division of Ser. No. 772,664, Sep. 5, 1985, Pat. No. 4,646,911. This application Dec. 10, 1986, Ser. No. 940,009

Int. Cl.[4] D06H *7/00*

U.S. Cl. 83—71 **11 Claims**



1. An apparatus for working on sheet material comprising:

a work table;

conveyor means mounted on the work table and defining a penetrable support surface with a plurality of airflow passages therethrough for supporting sheet material during a work operation, and a plurality of fluid chambers arranged along the conveyor means, each chamber being connected with at least a portion of the support surface for support thereof and movement therewith, each chamber being in fluid communication with the airflow passages in the portion of the support surface connected with the chamber for evacuating air from the airflow passages and having an evacuation aperture with a cross-sectional area that is small compared to the portion of the support surface supported and evacuated by the chamber;

evacuating means mounted in the work table in fluid communication with the evacuation apertures of the fluid chambers for evacuating the chambers through the small apertures to cause the sheet material to be held down on the support surface, the evacuating means communicating with only a limited exterior area around the small aperture of a fluid chamber to evacuate the chamber whereby the evacuated chamber of the conveyor is only subjected to a limited load attributable to the pressure differential between the ambient pressure and the pressure developed at the small aperture by the evacuation means;

a tool penetrable through the sheet material and support surface for working on the sheet material; and

means for moving said tool and the sheet material on the support surface of the conveyor means relative to one another in working relationship.

4,730,527

FUEL ELEMENT BUNDLE CUTTER HAVING A WITHDRAWAL MECHANISM FOR CUTTING DUST

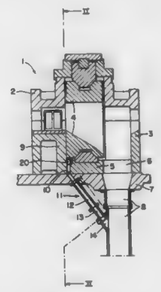
Heinz Eisenacher, Fuldabrück; Peter Kunze, Karlsruhe, and Werner Kirsch, Bruchsal, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Essen and Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, both of, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 887,782

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525504

Int. Cl.[4] B23D *15/04;* **G21C** *19/36;* **B26D** *7/18*

U.S. Cl. 83—100 **6 Claims**



1. A cutter for cutting bundles of fuel elements and including a cutting mechanism with a horizontally displaceable cutter carriage and with said cutter having a horizontal rod bundle feed operatively associated therewith so that cutting dust can pass through means for handling the dust including a gap between the cutter carriage and a housing wall means facing the horizontal rod bundle feed whereby the cutting dust could accumulate in a lower housing location; a portion of the radioactive dust that is produced when a rod bundle is cut is picked up by scavenging air and is withdrawn with the latter via a chute for cut-off rod pieces that fall through an opening into the chute; said cutter further comprises:

cutter means including a cutter housing having the housing wall means with a lower part that includes: a first housing wall that faces said rod bundle feed, housing side walls, and a bottom that is embodied as a grating between said first housing wall and said housing side walls, with said grating having an underside remote from the remainder of said cutter housing;

a base plate connected to said underside of said grating; and

a withdrawal mechanism that includes at least one collecting funnel, each of which is connected to said base plate, and a corresponding number of withdrawal channels, each connected to a respective collecting funnel, for the remainder of said radio-active dust, which is conveyed by a portion of said scavenging air from said cutter housing; each of said withdrawal channels communicates with said chute for cut-off rod pieces.

4,730,528

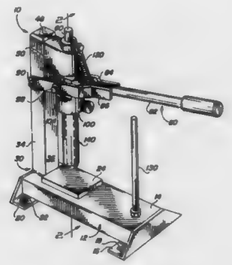
BUTTON COVER CUTTING PRESS APPARATUS

Bradley T. Haskins, Rte. 1, Box 119B, Coolidge, Ariz. 85228

Filed Jul. 25, 1986, Ser. No. 889,239

Int. Cl.[4] B26D *1/44, 1/04*

U.S. Cl. 83—123 **11 Claims**



1. Cutter press apparatus for cutting material, comprising, in combination:

base means;

post means secured to the base means and extending upwardly therefrom;

block means secured to the post means remote from the base means;

rod means secured to the block means, including a rod having a bottom end;

head means movable on the rod of the rod means from an upper position to a lower cutting position;

cutter means secured to and movable with the head means and including a cutter blade disposed adjacent to the bottom end of the rod when the head is in the upper position; and

handle means pivotally secured to the post means between the base means and the block means and to the head means for moving the head means and the cutter means from the upper position to the lower cutting position for cutting material disposed on the base means and for moving the head means and the cutter means from the lower cutting position to the upper position whereby any cut material retained by the cutter means is ejected by the bottom of the rod as the cutter moves upwardly to the upper position in which the cutter blade is disposed adjacent to the bottom of the rod.

4,730,529

CUTTING AND GROOVING DEVICE FOR PAPER AND CARDBOARD WEBS

Lothar Schröder, Elmshorn, Fed. Rep. of Germany, assignor to Peters Maschinenfabrik GmbH, Fed. Rep. of Germany

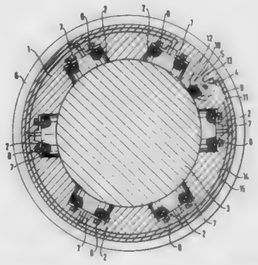
Filed Sep. 10, 1986, Ser. No. 905,546

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535265

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—425.4 **7 Claims**

1. A cutting and grooving device for paper or cardboard webs, comprising at least two rotatably driven shafts each having at least one tool carrier for a tool arranged for sliding movement thereon, said tool carrier having at least one radially movable chuck adapted to be brought into clamping engagement with the respective shaft for locking said tool carrier in an adjusted position relative to the associated shaft, and an actuating device adapted to be controlled from outside the shaft for the chuck, characterized in that the chuck is electro-



magnetically actuable via a current supply means extending along said shaft for remote actuation of said electromagnetic chuck.

4,730,530

GUITAR CONTROLLER PICKUP AND METHOD FOR GENERATING TRIGGER SIGNALS FOR A GUITAR CONTROLLED SYNTHESIZER

Carmine Bonanno, Mamaroneck, N.Y., assignor to CFJ Systems, Inc., Mamaroneck, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,807

Int. Cl.[4] G10H *3/18*

U.S. Cl. 84—1.16 **30 Claims**

30. A device for generating a VELOCITY signal for the control of a synthesizer in response to actuation of a guitar string comprising:

a guitar string subject to off-axial displacement upon actuation by a player;

detecting means juxtaposed with said string and having an AC output upon said off-axial displacement of said string and independent of frequency of vibration of said string but representing direction;

full wave rectifier coupled to output of said detecting means; and

peak detector coupled to output of said full wave rectifier forming said velocity signal.

4,730,531

KETTLEDRUM

Barbara A. Allen, and Rebecca Kite, both of P.O. Box 1954, 4015 N. Louden Rd., Bloomington, Ind. 47402

Continuation-in-part of Ser. No. 667,217, Nov. 1, 1984, Pat. No. 4,674,390, which is a continuation-in-part of Ser. No. 617,747, Jun. 6, 1984, Pat. No. 4,635,524. This application Nov. 6, 1986, Ser. No. 927,852

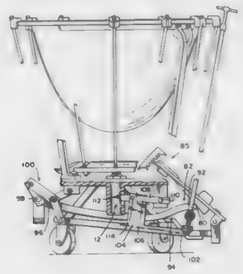
Int. Cl.[4] G10D *13/04*

U.S. Cl. 84—419 **4 Claims**

1. A percussion instrument comprising a body member,

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means for supporting the body member, a percussion head carried by the body member, tensioning rods, means for operatively coupling the tensioning rods to the percussion head, a master tensioning member for tensioning the percussion head, the master tensioning member having a central portion and radially outer portions, means for coupling the tensioning rods to the radially outer portions, means for mounting the master tensioning member for movement relative to the means for supporting the body member, and means for moving the master tensioning member relative to the body member to tune the tension on the portion of the percussion head stretched across the body member selectively, the means for moving the master tensioning member comprising a pedal, a first lever for engaging the pedal, a shaft, means for rotatably mounting the shaft on the means for supporting the body member, means for mounting the first lever to the shaft to turn the shaft in response to movement of the first lever, a second lever, means for pivotally mounting the second lever from the means for supporting the body member, the second lever including means for engaging the master tensioning member such that pivotal movement of the second lever moves the master tensioning member, a third lever, means for pivotally coupling the third lever to the second lever intermediate the ends of the second lever and intermediate the ends of the third lever, and a linkage for coupling the shaft to the third lever such that movement of the first lever causes a corresponding movement of the master tensioning member.



4,730,532

ADD-ON DEVICE FOR A MUSICAL INSTRUMENT, PARTICULARLY A HIGH-HAT MACHINE

Karl R. Bauerfeind, Heideweg 3, D-8521 Langensendelbach, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,116

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1985, 8534176[U]

Int. Cl.⁴ G10D *13/06*

U.S. Cl. 84—422 R **5 Claims**

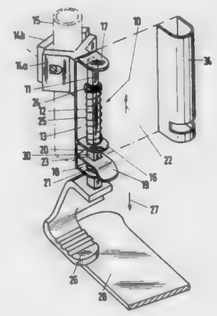
1. An Add-on device for a pedal-operated musical instrument, particularly a Hi-Hat machine having a main pedal operable between a normal position and another position lower than said normal position for corresponding displacement of an elongated pulling rod along a longitudinal direction thereof, said main pedal being normally returnable from said lower position to said normal position, comprising in combination

an elongated stationary member,

a member movable with respect to said stationary elongated member and including means adapted to operatively abut said main pedal to move said main pedal between said normal position and said lower position,

releasably blocking means actuatable so as to block relative movement between said members, thereby inhibiting a return movement of said main pedal from said lower position to said normal position, said releasable blocking means including an apertured plate pivotally mounted on said elongated stationary member so that said movable member passes through said apertured plate with small play, said apertured plate having an actuable portion and being movable between blocking and nonblocking positions, and

a spring for releasably holding said apertured plate in said blocking position,



so that by actuation of said abutting means with one foot a stepless blocking of the relative movement between said members is performed, then by pressing said actuable portion of said apertured plate with the same foot said blocking is automatically removed, and then by releasing said actuable portion said blocking is automatically performed in a new position.

4,730,533

ELECTRONIC KEYBOARD INSTRUMENT

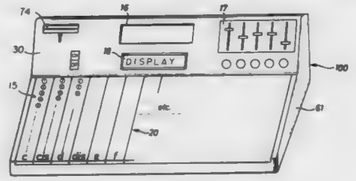
Josef Schoerkmayr, Annenstrasse 50, A-8020 Graz, Austria

Filed Aug. 28, 1986, Ser. No. 901,336

Claims priority, application Austria, Aug. 29, 1985, 2528/85

Int. Cl.⁴ G09B *15/02*

U.S. Cl. 84—478 **14 Claims**



1. A keyboard instrument comprising:

a plurality of keys each of which produces a tone upon being actuated which is correlated to the respective key;

a plurality of optical display means on each of said keys; and

means for simultaneously activating a plurality of said optical display means, each said simultaneously activated optical display means including means for indicating a sequence in which the respective keys are to be actuated.

4,730,534

PLANT FOR REALIZING THE RUNNING-IN OF A FLUID COMPRISING AN EXPLOSIBLE COMPONENT

Jean-Marcel Dupont, Angouleme, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

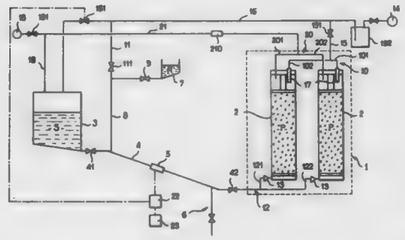
Filed Feb. 14, 1986, Ser. No. 829,498

Claims priority, application France, Feb. 14, 1985, 85 02094

Int. Cl.⁴ F42B *3/00*

U.S. Cl. 86—20.12 **4 Claims**

1. Plant for the manufacture of a block of propellant by the casting method, comprising at least one mold, at least one storage tank for the casting solvent connected to said mold, a source of compressed gas, and a source of vacuum, wherein said storage tank for said casting solvent and said mold both



are connected to said source of vaccum and to said source of compressed gas, and wherein said mold is connected to said source of vacuum by means of a float valve situated in the upper part of said mold.

4,730,535

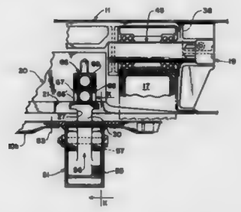
EXTENDABLE RAIL WEAPON LAUNCHER

Harold F. Steinmetz, St. Louis, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 1, 1986, Ser. No. 936,678

Int. Cl.⁴ F41F *5/02*

U.S. Cl. 89—1.54 **13 Claims**



1. An extendable and retractable weapon launch system for an aircraft, comprising:

(a) an extendable rack for providing four point support for a launchable weapon, said rack having a stored position and an extended position relative to said aircraft, said rack having forward and rearward ends and first and second sides and defining a pair of parallel slots along respective said first and second sides;

(b) at least four lugs for attachment to a launchable weapon, said lugs sized and configured for being slidably received by said slots in said rack, two each of said lugs being received by each of said slots to provide said four point support;

(c) a pair of spring loaded bars attached to said rack and disposed along and parallel to respective said slots, each said bar having along its length a shape corresponding to the shape of the slots, said bar biased into the corresponding slot for filling corresponding said slot upon removal of said lugs from said corresponding slot;

(d) a pair of first links of preselected length having respective first and second ends and including means at said first ends thereof for pivotal attachment to said aircraft and means at said second ends for pivotal attachment to said forward end of said rack near respective said first and second sides thereof;

(e) a pair of second links of preselected length shorter than that of said first links having respective first and second ends and including means at said first ends thereof for pivotal attachment to said aircraft and means at said second ends for pivotal attachment to the rearward end of said rack near respective first and second sides thereof;

(f) wherein the respective preselected lengths of the first and second links are selected to provide a preselected degree of inclination of said rack relative to said aircraft in said extended position; and

(g) actuating means operatively connected to said rack for selectively moving said rack between said stored position and said extended position.

4,730,536

METHOD AND APPARATUS FOR MOVING CARTRIDGED AMMUNITION FROM A HULL MAGAZINE TO A TURRET MAGAZINE

Adolf Nordmann, Erkrath, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

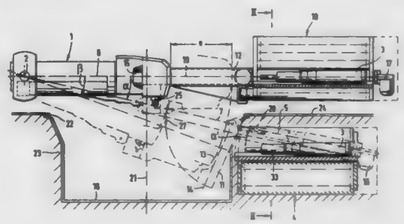
PCT No. PCT/EP86/00159, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO86/06826, PCT Pub. Date Nov. 20, 1986

PCT Filed Mar. 20, 1986, Ser. No. 6,495

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517056

Int. Cl.⁴ F41D *10/38*

U.S. Cl. 89—45 **7 Claims**



1. In a method for moving cartridged ammunition from a magazine in the hull to a magazine in the turret of an armored vehicle having a gun barrel which has a chamber and which is pivotal about a cradle axis, the turret magazine being disposed above the hull magazine and being pivotal about an azimuth axis, the improvement comprising: employing the chamber of the gun barrel as a transporting means for swinging the cartridged ammunition upward from the hull magazine toward the turret magazine, with the turret magazine receiving the chambered ammunition in an orientation horizontal to the azimuth axis.

4,730,537

FIRING PIN SAFETY LOCK FOR AN AUTOMATIC FIREARM

Erich Matzagg, Overndorf-Bettendorf; Gerhard Bilger, Lauterbach, and Helmut Mäder, Schramberg, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,739

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541311

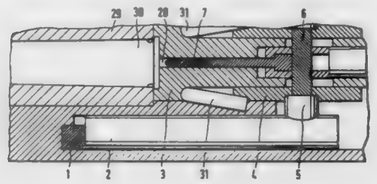
Int. Cl.⁴ F41D *11/00*

U.S. Cl. 89—148 **5 Claims**

1. In an automatic firearm including a casing, a breech mechanism in said casing, a firing pin movable from an inactive position to a priming position, a cartridge chamber and a closing device adapted to move said firing pin between said inactive position and said priming position for engaging a cartridge loaded into said cartridge chamber; a firing pin safety lock comprising, in combination; a locking element mounted in said casing and movable between a blocking position prohibiting movement of said closing device and a release position allow-

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ing free movement of said closing device, said locking element comprising an upper portion with a forked part defining an interior groove, a control element inserted within said groove and affixed to said locking element, an actuator mechanism operatively associated with said locking element for moving said locking element to a selected one of said blocking or release positions, a latch bolt slideably mounted inside a blind hole provided within said casing adjacent to said forked part of said locking element, said latch bolt having an inner sleeve end portion facing the inside of said blind hole, a compression spring mounted inside said latch bolt and protruding from said



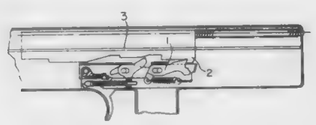
inner sleeve end portion, said compression spring engaging the inside of said blind hole at one end thereof and at the other end biasing said latch bolt outwardly in a direction toward said forked part of said locking element, said latch bolt having a conical end which is adapted to seat inside one of two matching grooves provided on said locking element within said forked part thereof for restraining movement of said locking element when placed in either of said blocking or release positions, said control element having oppositely inclined approach bevels on its surface facing the conical end of said latch bolt for disengaging said latch bolt when moved in either direction by said actuator mechanism.

4,730,538

SAFETY DEVICE FOR AUTOMATIC FIREARMS

Eduardo I. Zamacola, Guipuzcoa, Spain, assignor to Star Bonifacio Echeverria, S.A., Guipuzcoa, Spain

Filed Oct. 6, 1986, Ser. No. 915,553
Claims priority, application Spain, Apr. 3, 1986, 553712
Int. Cl.[4] F41D *11/02*
U.S. Cl. 89—154 **1 Claim**



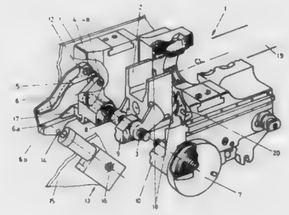
1. In an automatic weapon having a reciprocable breech block and sear for releasably holding the breech block in a predetermined rearmost position under the control of a trigger; the improvement comprising a safety catch in addition to the sear, the safety catch being mounted on the weapon for vertical swinging movement and limited longitudinal movement relative to the weapon, spring means urging the safety catch rearwardly, a detent for releasably retaining the safety catch in a lowered rearmost position, the breech block having a triggering hook on the rear thereof that engages and moves forward and raises the safety catch free from engagement with the detent when the breech block reaches its firing position, the breech block having a cam thereon that depresses the safety catch sufficiently, upon rearward movement of the breech block, to enable the spring means to move the safety catch to said lowered rearmost position when the breech block has moved sufficiently far to the rear to enable said sear to selectively prevent forward motion of the breech block until the trigger is pulled, the breech block having at least one downwardly opening notch thereon between said triggering hook and said cam for engagement with said safety catch in a raised position of said safety catch so as to prevent forward movement of the breech block following an incomplete rearward movement thereof.

4,730,539

APPARATUS FOR INCREASING THE RATE OF FIRE IN AUTOMATIC WEAPONS

Sten Hallqvist, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Apr. 25, 1986, Ser. No. 855,580
Claims priority, application Sweden, Apr. 26, 1985, 8502020
Int. Cl.[4] F41D *10/10*
U.S. Cl. 89—167 **6 Claims**



1. An apparatus for increasing the rate of fire of an automatic weapon comprising: a breech mechanism controlled by means of recoil movements arising in a breech of the weapon in its discharge, and by an operating cam and a spring member included in the breech mechanism; case ejectors for arresting a breech block in the total recoil position of the breech, and holding said breech block in the open position for the subsequent ramming of a new round, said case ejectors being exposable, in the arrest position of the breech block, to a new round in its ramming cycle, said ejectors accompanying the new round and releasing the breech block to be unrestrained for actuation by said spring member towards its closed position, and said operating cam being movably disposed at least when the breech is in the total recoil position, so that said spring member begins actuation of said breech block in its movement towards the arrest position independently of the configuration of said operating cam and at an earlier stage than total recoil position of the breech, and wherein said operating cam is pivotally journalled at its one end and attached to a buffer device at its other end.

4,730,540

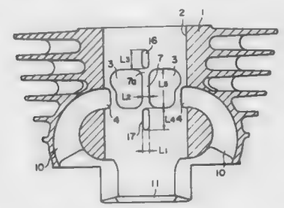
CYLINDER FOR A TWO CYCLE ENGINE

Sosuke Kinouchi, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 27, 1986, Ser. No. 879,302
Claims priority, application Japan, Jul. 12, 1985, 60-154897
Int. Cl.[4] F15B *15/22;* **F01B** *11/02*
U.S. Cl. 91—25 **4 Claims**

1. In a cylinder for a two cycle engine comprising a port formed in said cylinder and opened and closed by a piston in said cylinder, said port being divided into a plurality of port portions by rib means extending in the longitudinal direction of said cylinder, said cylinder further provided with elongated

concave recesses in the inner surface of said cylinder at the respective ends of said rib means extending in the direction of



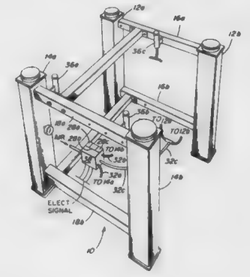
extension thereof for regulating the pressing force per unit of honing process.

4,730,541

NON CONTACTING ELECTRO-PNEUMATIC SERVO FOR VIBRATION ISOLATION

Geoffrey L. Greene, Germantown, Md., assignor to Technical Manufacturing Corporation, Peabody, Mass.

Filed Jun. 3, 1986, Ser. No. 869,981
Int. Cl.[4] F16M *13/00;* **F15B** *13/16*
U.S. Cl. 91—362 **11 Claims**



1. An apparatus for monitoring and controlling the position of a pneumatically supported load which load is supported by an air isolator which comprises:

a sensor adapted to provide a sensor signal corresponding to the position of the supported load the sensor signal varying depending upon the position of the supported load;

means to process the sensor signal and to provide a modulated, two-state, pulsed output signal at a modulation frequency, the duty cycle of the output signal determined by the sensor signal;

a two-state pneumatic valve actuated by the output signal such that there is a net flow of air into or out of the isolator when the load is not at its zero position, whereby as the load moves to its zero position the net flow of air into or out of the air isolator decreases; and

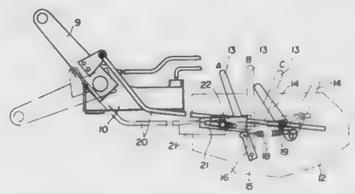
means to control the modulation frequency such that it is higher than the resonant frequency of the free mass/-pneumatic system to ensure that the isolated mass responds only to the net gas flow averaged over many alternation cycles and does not respond to the input and output which occurs in the course of each cycle.

4,730,542

ELEVATING APPARATUS FOR A WORKING APPARATUS

Kiyotomi Maesaka; Nobuo Onoder; Satoshi Matsuzawa; Nobuo Haga, and Yasuo Sugimoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,810
Claims priority, application Japan, Sep. 5, 1985, 60-196367; Sep. 5, 1985, 60-196368; Nov. 18, 1985, 60-176950[U]; Jan. 10, 1986, 61-1802[U]; Jan. 10, 1986, 61-1803[U]
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—368 **7 Claims**



1. An elevating apparatus for a working apparatus, comprising:

a front lifting mechanism and a rear lifting mechanism each having a link arm and arranged to be capable of being elevated by pressure from hydraulic cylinders,

a hydraulic pressure control arrangement for controlling selectively a supply of pressure from at least two hydraulic cylinders,

a feedback rod coupled between the link arm of one of said front and said rear lifting mechanisms and said hydraulic pressure control arrangement,

an adjuster member fixed at a desired position along said feedback rod,

a change-over lever for selecting operation of one of the hydraulic cylinders and an elevating lever for causing the selected hydraulic cylinder to perform an elevation operation of a corresponding lifting mechanism, both said levers forming a part of said hydraulic pressure control arrangement,

an interactive member fixed to a part of said elevating lever for movement with the elevating lever and engaging said adjuster member in camming relation, said change-over lever including rod insertion means in which an end portion of said feedback rod opposite the end of the rod coupled to said link arm is allowed to pass, and

means coupled between the elevating lever and the change-over lever for enabling the elevating lever to be operated, including means for preventing said interactive member from interfering with movement of the adjuster member fixed on said feedback rod when either one of the front lifting mechanism or the rear lifting mechanism is selected and elevated.

4,730,543

CLOSED CENTER HYDRAULIC VALVE CONTROL SYSTEM FOR AERIAL LIFT

William K. Holmes, Delafield, Wis., assignor to Hi-Ranger, Inc., Waukesha, Wis.

Continuation-in-part of Ser. No. 745,514, Jun. 17, 1985, abandoned. This application Sep. 4, 1986, Ser. No. 903,507
Int. Cl.[4] F15B *11/08*
U.S. Cl. 91—448 **14 Claims**

1. An aerial lift comprising:

a base,

an elongated boom supported by said base and including a free end,

a fluid motor operably connected to said elongated boom,

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means for supplying hydraulic fluid to said fluid motor, said means for supplying hydraulic fluid including

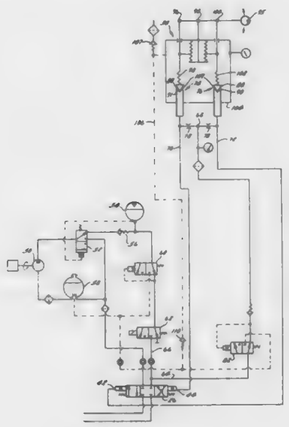
a hydraulic fluid pump operably connected to said fluid motor, and

means for controlling the supply of hydraulic fluid from said hydraulic fluid pump to said fluid motor, said means for controlling including

a pilot operated control valve having a first pilot fluid port and a second pilot fluid port,

means for supplying pilot hydraulic fluid pressure to said first pilot fluid port and to said second pilot fluid port of said pilot operated control valve to control operation of said pilot operated control valve, said means for supplying pilot hydraulic fluid pressure including a first hydraulic fluid conduit operably connecting said hydraulic fluid pump to said first pilot fluid port of said control valve, and a second hydraulic fluid conduit operably connecting said hydraulic fluid pump to said second pilot fluid port of said control valve, and

means for selectively venting hydraulic fluid from said first fluid conduit and said second fluid conduit, said means for



selectively venting hydraulic fluid from said first fluid conduit including a first valve seat and a first valve member selectively engageable with said first valve seat and movable toward and away from said first valve seat, at least one of said first valve member and said first valve seat including notch means defining a first fluid port when said first valve member engages said first valve seat and said first valve seat and first valve member providing for increased fluid flow from said first fluid conduit when said first valve member moves away from said first valve seat, and said means for selectively venting hydraulic fluid from said second fluid conduit includes a second valve seat and a valve member selectively engageable with said second valve seat and moveable away from said second valve seat, at least one of said said second valve member and said second valve seat including notch means defining a fluid port when said second valve member engages said second valve seat and said second valve member and said second valve seat providing for increased fluid flow from said second fluid conduit when said second valve member moves away from said second valve seat.

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CONTROL DEVICE FOR HYDROSTATIC STEERING MEANS OR THE LIKE

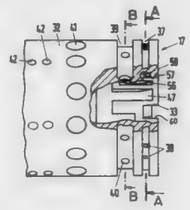
Erik C. Jorgensen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Sep. 11, 1987, Ser. No. 95,144

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635162

Int. Cl.⁴ F15B *9/08*

U.S. Cl. 91—467 **6 Claims**



1. A control device for a hydrostatic steering motor, comprising, supply and return pump and tank connections for said device, a slide valve arrangement in which inner and outer slide element sleeves are rotatable relative to each other to both sides of a neutral position through a limited small angle, said sleeves mutually forming controlled supply and return passages connected to said motor having supply and return throttles which are closed when said sleeves are in a neutral position, bypass throttle means between said pump and tank connections being open when said sleeves are in a neutral position, said bypass throttle means having two circumferentially offset throttle positions formed by two circumferentially offset axially extending bypass throttle grooves in one of said elements and a bridging recess in the other of said elements.

4,730,545

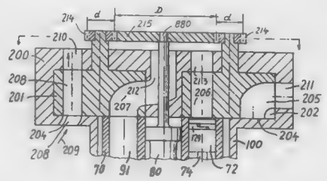
AXIAL PISTON MACHINE HAVING A PLURALITY OF MECHANICALLY ACTUATED ROTARY VALVES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 521,874, Aug. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 64,064, Aug. 6, 1979, abandoned. This application Sep. 30, 1986, Ser. No. 913,440

Int. Cl.⁴ F01B *13/04*; F04B *7/00*

U.S. Cl. 91—480 **14 Claims**



1. A device for the handling of flows of fluid through ports and chambers, comprising, in combination,

a housing with a therein revolvably borne rotor which has a plurality of cylinders with therein reciprocable pistons, while said rotor is provided with a longitudinal medial axis and with a radially planar head face which is normally directed relative to said axis, with said cylinders provided individually around angularly spaced axes which are radially distanced from said axis by a first radial distance

and which port into and through said head face, while said housing includes a housing portion which houses a plurality of valves which are individually moveable around their respective longitudinal medial valve axes, with said valves having radially planar tip faces which are directed towards said head face of said rotor, with said valve axes parallel to said axis of said rotor but angularly spaced and radially distanced from said axis of said rotor by a second radial distance, with said housing portion provided with ports and said valves provided with passages which extend from said tip face of the respective valve through the respective valve to a rear face of the respective valve, while said second radial distance is greater than said first radial distance, said valves and said rotor are provided with a transmission to move said valves around said valve axes in a fixed relation relative to the rotary velocity of said rotor, said passages alternatingly communicating and discommunicating a respective port of said ports of said housing portion with a respective cylinder of said cylinders of said rotor when said valves are moved around their valve axes;

an an improvement which includes

the provision of gearing means provided in said transmission which alternatingly at equal rotary angles of said rotor communicate said cylinders by said valves at the first revolution of a two revolution cycle with first ports in said housing and at the second revolution of said cycle with second ports of said housing.

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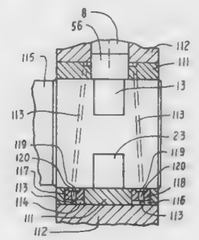
ROTOR BUSH ASSEMBLY IN FLUID MACHINES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 232,746, Feb. 9, 1981, Pat. No. 4,489,641, Division of Ser. No. 910,809, May 30, 1978, abandoned, Division of Ser. No. 911,246, May 31, 1978, abandoned. This application Nov. 29, 1984, Ser. No. 676,152

Int. Cl.⁴ F01B *13/06*

U.S. Cl. 91—498 **4 Claims**



1. In a fluid machine, in combination, a rotor which is associated to a rotary face, a control body which has a control face which slides and seals along said rotary face and a sealing arrangement associated with said rotor, said control body and said faces; fluid conduits extended through said control body to form control ports in said control body while rotor channels which are capable and suitably located to communicate with said control ports periodically when said rotor revolves extend from said rotor face individually through at least a portion of said rotor to port into respective periodically expanding and reducing working chambers in said rotor, whereby fluid can flow through one of said conduits and control ports and at least one of said rotor channels into at least one of said working chambers and out of the respective at least one working chamber through at least one of said rotor channels, said control ports and said conduits, while said sealing arrangement includes means for sealing along said rotor face and said control face,

wherein said rotor has a concentrically located bore which forms a rotor hub which extends axially in said rotor through at least the major length of said rotor, whereby the wall of said hub forms a holding seat of at least partially cylindrical configuration, wherein said control body is a substantially cylindrical control body of a diameter only slightly smaller than the diameter of said rotary face,

wherein said control body has a substantially cylindrical outer face which forms said control face and a bush is inserted into said rotor hub, having an inner face of cylindrical configuration, which forms said rotary face while said bush also has a seat face closely fitted and prevented from relative rotation in said holding seat of said rotor hub,

wherein said control body extends into said bush in said rotor to face said rotary face by said control face, whereby a small clearance is provided between said rotary face and said control face,

wherein said sealing arrangement consists therein, that said rotary face of said bush which revolves with said rotor receives and seals said control face of said control body,

wherein radial spaces are provided in said bush to extend radially through said bush to port to and through said rotary face while said radial spaces are radially outwardly closed by said wall which forms said holding seat, a passage means is provided to extend individually from a respective radial space of said radial spaces to a respective diametrically located working chamber of sai working chambers, and,

wherein radially moveable thrust bodies are closely fitted in said radial spaces which extend radially through said radial bores said thrust bodies are on their radial outer ends subjected to the pressure in the respective radial space wherein they are located and said thrust bodies have radial inner faces complementarily formed to said control face of said control body to be able to smoothly slide along said control face when said thrust bodies are pressed onto said control face by the respective pressure in the respective space of said radial spaces.

4,730,547

PISTONS AND PISTON CASTINGS

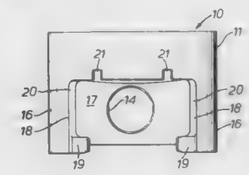
Edward J. Murray, Ilkley, England, assignor to AE PLC, Rugby, England

Filed Apr. 10, 1984, Ser. No. 598,678

Claims priority, application United Kingdom, Apr. 12, 1983, 8309832

Int. Cl.⁴ F01B *31/10*

U.S. Cl. 92—160 **4 Claims**



1. A monolithic piston casting of aluminium or aluminium alloy for forming a piston for an internal combustion engine or compressor and comprising:

a cast generally cylindrical crown having a ring belt extending around the crown for the formation therein of one or more piston ring grooves,

two cast gudgeon pin bosses defining a gudgeon pin bore extending through the piston casting in a direction normal to the piston axis,

two opposed cast skirt thrust surfaces connected to and depending from the ring belt and symmetrically disposed about a plane including the piston axis and normal to the gudgeon pin bore axis,

each skirt thrust surface extending only part the way around

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the piston casting and terminating in respective spaced generally axially extending edges,

cast skirt side panels extending between adjacent edges of the skirt surfaces, the side panels lying in respective planes parallel to, but spaced on either side of, the piston axis, each said gudgeon pin boss extending inwardly of an associated skirt side panel, and

a projection extending circumferentially from each edge of each skirt thrust surface beyond the associated edge at the end of the edge remote from the crown, each projection being spaced inwardly from an imaginary cylindrical extension of the skirt thrust surfaces to provide a platform for steadying the piston casting while it is being machined.

4,730,548

LIGHT METAL ALLOY PISTON

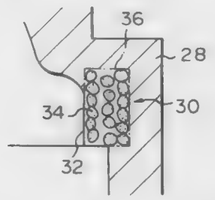
Yorishige Maeda; Yoshiki Tatematsu; Atsuo Tanaka, all of Toyota, and Shiro Machida, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Jan. 28, 1986, Ser. No. 823,480

Claims priority, application Japan, Feb. 2, 1985, 60-17711; Mar. 1, 1985, 60-38921

Int. Cl.⁴ F02F *3/08*

U.S. Cl. 92—225 **2 Claims**



1. A light metal alloy piston for an internal combustion engine, comprising: a skirt section, a pair of diametrically opposed piston pin bosses integral with said skirt section and disposed adjacent to a shoulder portion of the skirt section, said bosses having piston pin receiving bores, said piston further including an annular thermal strut arranged within and along the outer periphery of the shoulder portion of the skirt section to suppress thermal expansion of the skirt section, said thermal strut including an annular fiber-reinforced metal portion having a bundle of high-tensil-strength fibers integrally molded within a matrix light metal alloy forming said piston, said skirt section being shaped such that except for the regions of said piston pin bosses, a substantial portion of the circumferential inner periphery of said thermal strut is exposed radially inwardly to the inside of the skirt section in order to avoid presence of any substantial amount of non-fiber-reinforced matrix metal at the inside of the inner periphery of the thermal strut, said thermal strut being defined in a substantially horizontal plane at a vertical height corresponding to a vertical height of said bores whereby the outer regions of said bores intersect said thermal strut, said outer regions of said bores being enlarged whereby the portions of the strut adjacent to the bores are cut out when said bores are formed.

4,730,549

LIGHT-METAL RECIPROCATING PISTON

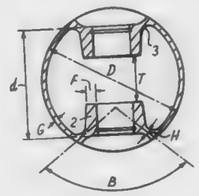
Horst Pfeiffenberger, Fellbach, Fed. Rep. of Germany, assignor to MAHLE GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 15,135, Feb. 26, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 297,573

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808914

Int. Cl.⁴ F16J *1/04*; F02F *3/02*

U.S. Cl. 92—239 **1 Claim**



1. In a cast aluminum base alloy piston for internal combustion engines having a piston head, a cylindrical skirt connected at one end to said head, and two gudgeon pin bosses having bores located on a common axis and extending radially inwards from window-like recesses formed in said skirt,

the improvement comprising:

(a) two hollow frusto-conical struts extending inwardly from said skirt in the region of said window-like recesses, formed integrally with said skirt and with said bosses, respectively, to support said bosses, said frusto-conical struts having a cone angle of 60 to 110 degrees and supporting said bosses at positions whereby

(i). the distance between the radially outer ends of said bosses is from 60 to 80 percent of the outer diameter of said skirt,

(ii). the distance between the radially inner ends of the bosses is 25 to 35 percent of the outer diameter of said skirt, and

(iii). the circumferential length of the cylinder-engaging surfaces of the portions of the skirt which extend between the window-like recesses are each longer than the diameter of the skirt,

said portions of the skirt between the window-like recesses being unsupported so that said portions are flexible, said skirt being continuously free from all openings axially of the piston apart from said window-like recesses in all positions around the circumference of the skirt, and

(b) two head struts disposed axially of the longitudinal axis of the piston extending between said piston head and said bosses respectively and serving to transmit compressive and tensile forces, each head strut being contiguous with the inside surface of the skirt and said bosses and being of such thickness in the direction of the common axis of the bosses that said bosses are supported along substantially their entire lengths.

4,730,550

PISTON CUP AND CYLINDER ASSEMBLY

David A. Bramstedt; Thomas R. Hetzel, both of Sheboygan, and Charles E. LaBelle, Oostburg, all of Wis., assignors to Thomas Industries, Inc., Louisville, Ky.

Continuation of Ser. No. 763,952, Aug. 8, 1985, abandoned. This application Feb. 20, 1987, Ser. No. 18,813

Int. Cl.⁴ F16J *9/08*; F04B *39/10*

U.S. Cl. 92—240 **7 Claims**

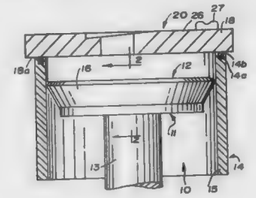
1. A seal and retainer assembly for a piston adapted for movement within a cylinder having a cylinder wall, comprising:

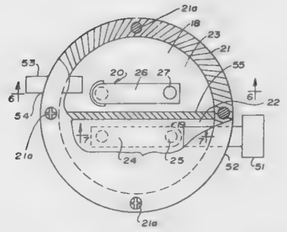
an annular sealing member having a radially extending portion and an axially extending portion, the radially extending portion having an inner edge surface defining a central aperture for the sealing member;

a retainer member generally disc shaped having a peripheral edge portion which overlies the upper surface of a portion of said radially extending portion of said sealing member, the diameter of said retainer member being less than the diameter of the piston by an amount corresponding to the thickness of said axially extending portion of said sealing member, said retainer member including gripping means projecting substantially downwardly from said peripheral edge portion for engaging said upper surface of said radially extending portion of said sealing member; and

means for securing said retainer member to said piston with said portion of said radially extending portion of said sealing member clamped between said edge portion of said retainer member and said piston and with said axially extending portion extending freely outwardly and engaging the cylinder wall to provide a seal between the piston and the cylinder wall;

said gripping means of said retainer member including a plurality of downwardly projecting bosses spaced along the periphery of its edge portion, said bosses engaging corresponding grooves in the upper surface of said radially extending portion of said sealing member when said sealing member and retainer member are assembled together.





2. A seal and retainer assembly for a piston adapted for movement within a cylinder having a cylinder wall, comprising:

an annular sealing member having a radially extending portion and an axially extending portion, the radially extending portion having an inner edge surface defining a central aperture for the sealing member;

a retainer member generally disc shaped having a peripheral edge portion which overlies the upper surface of a portion of said radially extending portion of said sealing member, the diameter of said retainer member being less than the diameter of the piston by an amount corresponding to the thickness of said axially extending portion of said sealing member; and

means for securing said retainer member to said piston projecting substantially downwardly from said peripheral edge portion for engaging said radially extending portion of said sealing member with said portion of said radially extending portion of said sealing member clamped between said edge portion of said retainer member and said piston and with said axially extending portion extending freely outwardly at an obtuse angle relative to said radially extending portion and engaging the cylinder wall to provide a seal between the piston and the cylinder wall;

and a circumferential portion of said sealing member at the junction of said radially and axially extending portions cut away providing a first notch, and a further circumferential portion of said sealing member cut away at the junction of said radial and axial portions providing a second notch located diametrically opposed to said first notch, said notches defining a hinge portion for said sealing member, permitting said free axially extending portion to move pivotally relative to said clamped radially extending portion as said piston is driven within said cylinder.

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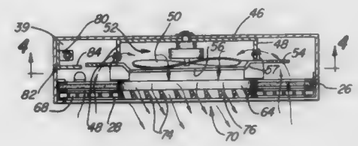
HEAT DISTRIBUTOR FOR SUSPENDED CEILINGS

Walter W. Peludat, 2218 E. Wattles Rd., Troy, Mich.

Filed Nov. 3, 1986, Ser. No. 926,419

Int. Cl.⁴ F24F *1/01*

U.S. Cl. 98—315 **15 Claims**



1. A heat distributor for a room having a suspended ceiling comprising:

a housing having an upper portion defining a chamber and a lower portion having an aperture, said housing adapted for mounting in said suspended ceiling;

a perforated member mounted to said housing, said perforated member spanning said aperture of said housing; said perforated member having at least one inlet opening and an outlet opening;

a filter member mounted to said housing in said chamber above said perforated member;

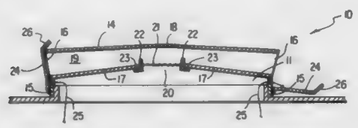
a baffle member mounted in said chamber, said baffle member and said upper portion of said housing defining an inlet passage therebetween for flow communication with said at least one inlet opening of said perforated member, said baffle further having a circular flange portion defining an orifice, said orifice positioned for flow communication with said outlet portion;

means for drawing warm air from an upper portion of said room through said at least one inlet opening of said perforated member into said chamber and directing said warm air downwardly through said orifice of said baffle and said outlet portion of said perforated member to form a column of warm air; and

a lattice member mounted in said inlet opening, said lattice member having a top surface, a bottom surface, and a plurality of wedge portions extending therebetween defining a plurality of passages each of, said plurality of passages being narrower at said bottom surface than at said top surface of said lattice structure such that the velocity of the said column of air is further increased as said column of air passes through said plurality of passages.

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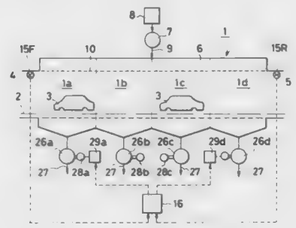
4,730,552
VENT ASSEMBLY
Michael J. Murray, Pialba Caravan Park, Esplanade, Pialba, Australia QLD 4655
Filed Jun. 2, 1986, Ser. No. 869,722
Claims priority, application Australia, Jun. 3, 1985, PH00866
Int. Cl.[4] B60H *1/26*
U.S. Cl. 98—37 10 Claims



1. A ventilating skylight, comprising:
a housing having a top wall and a pair of opposed sidewalls extending downwardly from said top wall of respective roof mountings for fixing said housing to a roof at opposite sides of a roof skylight opening;
front and rear openings in said housing through which sunlight may pass to said skylight opening;
a transparent or translucent dividing wall assembly having front and rear portions extending upwardly and inwardly from said front and rear openings and forming a base wall of an air flow passage extending between said front and rear openings, said flow passage having front and rear ends;
an intermediate vent opening in said base wall assembly communicating with said air flow passage for directing air flow to said skylight opening;
water trap means associated with the vent opening for obstructing rain water passing along said base wall towards said vent opening;
respective closure flaps for closing said front and rear ends of said flow passage, each said closure flap being pivotable between an open position in which said flap does not obstruct air flow through the respective said opening in said housing and a closed position in which said flap extends across the respective said opening in said housing, said closure flaps being biased to an open position and being movable to said closed position by aerodynamic forces.

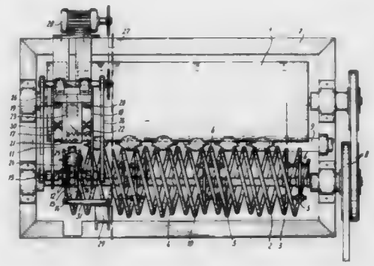
4,730,553
METHOD OF OPERATING AN AIR-SUPPLIED TYPE COATING BOOTH
Michiaki Osawa, Nagoya; Hidetoshi Omori, Toyota; Hidemasa Inoue; Yoshihiro Shibata, both of Seto; Hideyuki Takata, Nagoya; Yasuo Tokushima, Toyota; Shunichi Akiyama, Toyota; Masayuki Kojima, Toyota, and Zyouzi Itou, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Dec. 29, 1986, Ser. No. 947,386
Claims priority, application Japan, Dec. 27, 1985, 60-293217; Dec. 27, 1985, 60-293218
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 11 Claims

10. A method of operating an air-supplied type coating booth, in which conditioned air supplied from an air supply blower to a plenum chamber is enforced downwardly to the inside of a tunnel-shaped coating booth and the air thus enforced in the coating booth is drawn to discharge by exhaust blower means together with paint mists, evaporated organic solvents and the likes to the beneath of the floor,
wherein a plurality of exhaust blowers are disposed each corresponded to each of divisional zones defined along the longitudinal direction of the coating booth and
wherein the method comprises:
a step of detecting the flow velocity and the flow direction of air streams flowing into and out of the inlet and the exit opened at both ends of the coating booth, and
a step of determining the direction and the flow velocity of the air streams at the inlet and the exit, and



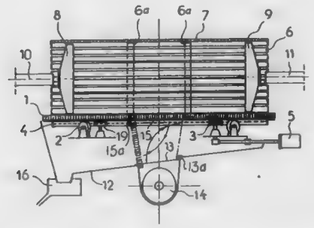
a step of variably controlling the flow rate of exhaust air discharged from exhaust blowers disposed at the inlet and the exit of the coating booth in accordance with the flow direction and the flow velocity of the air streams at the inlet and the exit of the coating booth.

4,730,554
APPLIANCE FOR THE ALIGNMENT OF ONIONS OR OTHER VEGETABLE BULBS
Gerard J. Kristiaan, Wageningen, Netherlands, assignor to Instituut voor Bewaring en Verwerking Van Lanbouwprodukten, Wageningen, Netherlands
Filed Sep. 5, 1985, Ser. No. 772,853
Claims priority, application Netherlands, Sep. 6, 1984, 8402721
Int. Cl.[4] A23N *15/08*; A23P *1/00*
U.S. Cl. 99—546 20 Claims



1. An appliance for the alignment of onions or other vegetable bulbs which comprises:
a. a cylinder with an outer surface and an inner surface, with a helical groove in the outer surface thereof;
b. a roller provided at a distance next to said cylinder; and
c. a driving means to rotate the cylinder and the roller; wherein both the width of the helical groove and the distance between the cylinder and the roller are less than the diameter and axial length of the onions or other vegetable bulbs to be aligned; said cylinder and roller being so configured as to align said onions or other vegetable bulbs to a position in which a line through a top end and a root end of said onion or other vegetable bulb takes up a particular alignment.

4,730,555
WINE PRESS WITH HORIZONTALLY ORIENTED ROTATABLE PLATEN
Claude F. Blanchot, Reims, France, assignor to Ateliers Coquard S.A.R.L., Reims, France
Filed Oct. 23, 1986, Ser. No. 922,463
Claims priority, application France, Oct. 31, 1985, 85 16341
Int. Cl.[4] B30B *9/06*
U.S. Cl. 100—37 12 Claims

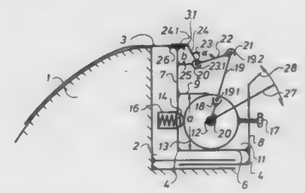


1. An extractor for a substance containing a liquid, comprising:
a horizontally oriented cage delimited in a bottom part thereof by a rotatable perforated circular platen provided at its center with at least one first perforated trap hinged to be movable in the downward direction, said rotatable perforated circular platen being surmounted by two perforated vertical fixed panels having upper edges, the upper edges of said two perforated panels bearing a cover;
two thrust platens, being displaced by jacks, sliding in said cage to vary the volume of the cage, each thrust platen having a working face;
a removal device for discharging residue from said cage;
a recovery tank placed under said rotatable perforated circular platen and provided with at least a second trap arranged in vertical alignment with the center of the rotatable perforated circular platen, said second trap providing access to said removal device for discharging residue; and
a collector arranged for collecting and distributing liquid extracted from the substance by the extractor.

4,730,556
METHOD OF SCREEN PRINTING WITH HOT MELT FOAM COMPOSITIONS
Walter H. Cobbs, Jr., Amherst, Ohio, assignor to Nordson Corporation, Cleveland, Ohio
Filed Oct. 28, 1985, Ser. No. 791,892
Int. Cl.[4] B41M *1/12*
U.S. Cl. 101—129 10 Claims

1. A method of hot melt screen printing a pattern onto a substrate comprising
providing a screen having a desired pattern of porous and nonporous areas adjacent the substrate,
heating a nonaqueous thermoplastic to form a hot melt composition of molten thermoplastic,
foaming said hot melt composition by introducing a gas to form a hot melt foam composition having a lower viscosity and higher heat retention than the unfoamed hot melt composition,
coating onto said screen the hot melt foam composition, and
forcing the hot melt foam composition through the porous areas of the screen to form the desired pattern of the composition on the substrate.

4,730,557
PRINTING PLATE CLAMPING ASSEMBLY
Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany
Filed Jul. 27, 1987, Ser. No. 77,878
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626936
Int. Cl.[4] B41F *27/12*
U.S. Cl. 101—415.1 4 Claims



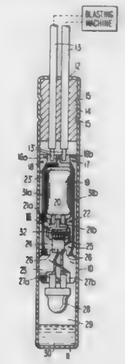
1. A printing plate clamping assembly for clamping an end of a printing plate to a surface of a plate cylinder of a rotary printing machine, said printing plate clamping assembly being carried in a housing located in a groove in said plate cylinder and comprising:
clamping bar having first and second lever arms, a knuckle joint connected to said first one of said lower arms, said clamping bar being pivotable about an axis in said housing by said knuckle joint, and being lockable in a clamping position by movement of said knuckle joint to an overcenter position;
a rotatable adjustment shaft carried in said housing by roller rings and being supported in said housing for both rotational and translational movement relative to said housing, said adjustment shaft effecting movement of said knuckle joint to said over center position; and
a compression spring loaded stop on said housing and contactable by said roller rings to permit said translational movement of said adjustment shaft during clamping of the printing plate end.

4,730,558
ELECTRONIC DELAYED-ACTION EXPLOSIVE DETONATOR
Johann Florin, Troisdorf; Friedrich Heinemeyer, Siegburg; Peter Röh; Ulrich Steiner, both of Troisdorf, and Edward Uden, Barmstedt, all of Fed. Rep. of Germany, assignors to Dynamit Novel Aktiengesellschaft, Fed. Rep. of Germany
Filed Nov. 1, 1985, Ser. No. 793,764
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440016
Int. Cl.[4] F42C *11/06*
U.S. Cl. 102—218 26 Claims

1. An electronic delayed-action explosive detonator comprising a tubular case, a capacitor chargeable by pulses from a blasting machine to store a charge sufficient to enable detonation, integrated circuit means separate from the capacitor for processing pulses from the blasting machine to control elapse of a delay time after the delay time has been set so as to enable detonation, primer means to which current is supplied upon elapse of the delay time for enabling detonation, detonator wires extending from the tubular case for enabling connection of the blasting machine to at least one of the capacitor and integrated circuit means, and supporting plate means separate from the capacitor for carrying the integrated circuit means, the supporting plate means being disposed in a series arrangement with the capacitor within the tubular case, the supporting plate means having a first contact area with connecting pad

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means for enabling attachment of leads of the capacitor, and a second contact area with connecting pad means for enabling



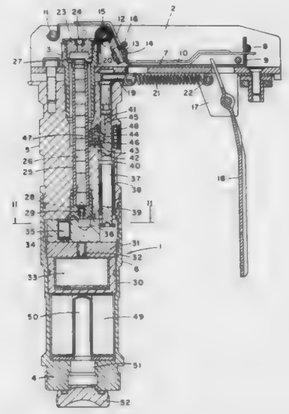
attachment of the detonator wires within the tubular case and extending outwardly therefrom.

4,730,559

SAFETIED DEMOLITION CHARGE FUZE

Jacob Brightman, Ramat Hasharon, Israel, assignor to The State of Israel, Ministry of Defence, Israel Military Industry, Israel

Filed Jun. 8, 1987, Ser. No. 59,522
Claims priority, application Israel, Jan. 8, 1987, 81198
Int. Cl.[4] F42C *15/02, 15/34, 15/00*
U.S. Cl. 102—254 **4 Claims**



1. In a safetied demolition charge fuze of the kind that upon ignition actuation switches from a safe to an armed state and comprises a housing with head and tail ends; an arming lever hinged to said housing and engaging an arming slider slidable by the action of an activating spring from an engaging, safe position to a disengaging, armed position and retained in the safe position by said arming lever; a spring loaded firing pin; a safety lever retaining said spring loaded firing pin, which safety lever is retained by said arming slider in the safe position and swings in the armed state of the fuze out of engagement with said firing pin by the action of the spring of the latter when said safety lever becomes disengaged from said arming slider; a percussion primer assembly at the head end of said housing so positioned that when said safety lever swings out of engagement with the firing pin, the latter strikes said percussion primer; a pyrotechnic delay charge having a first end close to said primer assembly and a second end turned away therefrom, which delay charge is ignitable by said primer; a detonator ignitable by said pyrotechnic delay charge; and a booster charge ignitable by said detonator; the improvement by which:

(i) said detonator is borne within a safe-and-arm slide mounted inside said housing intermediary the second end of said pyrotechnic delay charge and said booster charge, which detonator is slidable between a safe position in which the detonator is out of alignment with said pyrotechnic delay and booster charges, and an armed position in which it is in alignment with both the pyrotechnic delay and booster charges, which safe-and-arm slide is biased into the armed position and retained in the safe position;

(ii) a retainer shaft is provided, associated with spring means by which it is shiftable from a safe position in which said safe-and-arm slide is retained in said safe position, and an armed position in which it clears said safe-and-arm slide whereby the latter is free to move into the armed position;

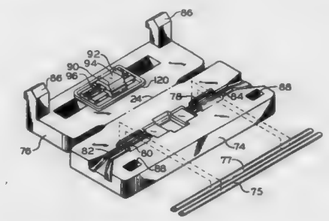
(iii) a detent mechanism is provided for locking said retainer shaft in the safe position, which detent mechanism comprises a casing, a locking member mounted within said casing and engaging a recess in said retainer shaft; means responsive to the action of said spring means of said retainer shaft for pressing said locking member so as to push it away from said retainer shaft; heat sensitive means associated with said locking member which heat sensitive means resist below a present temperature the pressure exerted on said locking member and which soften upon raise of temperature by heat from said pyrotechnic delay charge whereby said locking member yields to the pressure exerted thereon and is pushed out of engagement with said retainer shaft whereby the latter is unlocked and moves by the action of the said associated spring means into the armed position thereby clearing said safe-and-arm slide whereby the latter is free to move into the armed position in which said pyrotechnic delay charge, detonator and booster charge are all aligned.

4,730,560

COMBINATION BLASTING SIGNAL TRANSMISSION TUBE CONNECTOR AND DELAY ASSEMBLY

Stephen W. Bartholomew, Granby, Conn.; Daniel C. Rontey, Lebanon, N.J.; William J. Necker, Collinsville, and Clifford N. Kaiser, Granby, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Oct. 3, 1986, Ser. No. 914,822
Int. Cl.[4] C06C *5/04*
U.S. Cl. 102—275.3 **17 Claims**



1. A combination signal transmission tube connector and delay assembly comprising:

a housing;

means on said housing for engaging at least one signal transmission tube;

means on said housing for cutting said transmission tube to expose at least two transmission tube interior portions;

a signal delay assembly mounted in said housing for interposition between exposed transmission tube interior portions; and

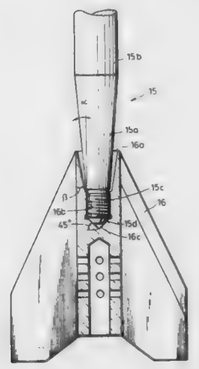
means on said housing for establishing a signal path permitting signal communication between said delay assembly and exposed transmission tube interior portions.

4,730,561

SUBCALIBER PROJECTILE

Henning Schaake, Cologne, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/EP86/00210, § 371 Date Jan. 7, 1987, § 102(e) Date Jan. 7, 1987, PCT Pub. No. WO86/06828, PCT Pub. Date Nov. 20, 1986
PCT Filed Apr. 10, 1986, Ser. No. 17,163
Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517125
Int. Cl.[4] F42B *11/00, 13/16*
U.S. Cl. 102—517 **11 Claims**



1. A fin-stabilized subcaliber projectile, comprising:

an elongated kinetic energy penetrator having a cylindrical surface for most of its length and having a high ratio of length to diameter, the penetrator additionally having a tail end and a rear region with a conically configured surface adjacent the tail end, the conically configured surface having a cone angle α, the penetrator additionally having a cylindrical pin with an external thread at the tail end; and

a rear guide assembly having a recess with a conically configured surface, the conically configured surface of the recess having a cone angle β which is larger than α, the guide assembly additionally having an internally threaded bore which communicates with the recess, the pin of the penetrator engaging the bore to breakably attach the guide assembly to the penetrator, wherein the rear region of the penetrator extends into the recess of the guide assembly and the conically configured surfaces are spaced apart.

4,730,562

VEHICLE TRANSPORTING RAILROAD CAR WITH BRACE BAYS

William R. Baker, Lawrenceville, Ga., and James E. Black, Jr., Trenton, Mich., assignors to Thrall Car Manufacturing Co., Chicago Heights, Ill.

Filed Nov. 7, 1986, Ser. No. 927,860
Int. Cl.[4] B61D *3/18, 17/08*
U.S. Cl. 105—407 **5 Claims**

1. A railroad car for transporting vehicles comprising:

a car underframe having side sills and supported at each end by a railroad truck;

a plurality of spaced apart vertical columns having lower ends rigidly connected to each of the side sills;

a first deck supported by the car underframe;

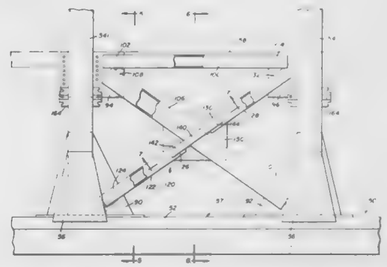
a second deck horizontally located above the first deck and rigidly connected to the columns;

a brace bay between two adjoining first and second columns near each end of each side of the car;

the brace bay having a horizontal member with opposing ends extending between the adjoining columns at the location of the second deck;

the brace bay having a first diagonal brace in the form of a continuous length tube having upper and lower ends extending from the first column downwardly to the second column;

a metal plate connected to one side face of the first diagonal brace;



a second diagonal brace having upper and lower ends extending from the second column downwardly to the first column, with the upper ends of the two braces being located about at the horizontal member and the lower ends of the two braces being located about at the first deck;

the second diagonal brace including two tube sections, with each tube section having an end joined to the metal plate and the other end extending to the column;

a metal strip overlying and connected to the second diagonal brace tube section ends, which are joined to the metal plate, and the first diagonal brace; and

the horizontal member and the two diagonal braces being largely longitudinal metal tubes which are rectangular in cross-section.

4,730,563

POWER PLANT WITH CENTRIFUGAL SEPARATORS FOR RETURNING MATERIAL FROM COMBUSTION GASES TO A FLUIDIZED BED

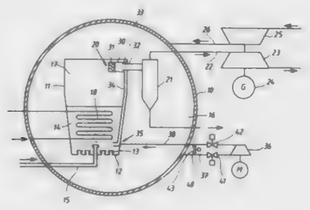
Per Thörnblad, Finspong, Sweden, assignor to Asea Stal Aktiebolag, Finspong, Sweden

Filed Feb. 20, 1987, Ser. No. 16,706
Claims priority, application Sweden, Feb. 21, 1986, 8600799
Int. Cl.[4] F23J *3/00*
U.S. Cl. 110—216 **10 Claims**

1. A power plant with a bed vessel with combustion of a fuel in a fluidized bed of a particulate material and a cleaning plant for separation of solid particles in combustion gases leaving the bed vessel, characterized in that the cleaning plant comprises a coarse cleaner (20) close to the outlet from the combustion chamber (11) with return of separated material, said coarse cleaner including a first cylinder (30) with guide vanes (31) which impart a rotating movement to the gas flow, a second cylinder (32) downstream of the first cylinder (30), an annular gap (33) formed between the cylinders, a space around the second cylinder (32) into which the gap (33) opens out and in which separated material is collected, and a return conduit for

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returning separated material from said space to the bed, and downstream of the coarse cleaner a cleaner (21) of a cyclone



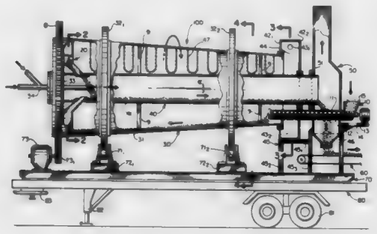
type for separating solid particles which have passed through the coarse cleaner (20).

4,730,564

MULTI-STAGE KILN

Harry I. Abboud, 5845 Clematis Dr., Baton Rouge, La. 70808

Filed Jun. 8, 1987, Ser. No. 59,127
Int. Cl.[4] A47J *36/00, 36/24*
U.S. Cl. 110—246 **15 Claims**



1. A rotary kiln for burning and calcining a waste oil, sludge or slurry to form gases and residual solids which comprises

a pair of tubes each of which is formed by an enclosing side wall,

a first tube oriented with its rearward end raised above its forward end, the forward end being closed by an end wall,

a second tube concentric with and mounted inside said first tube having a diameter sufficiently small to provide an annular passageway between the side walls of said pair of tubes, said annular passageway sloping downwardly from its rearward end toward its forward end, the forward side wall end of said second tube having circumferential openings which communicate the forward end of said annular passageway with the opening extending through said second tube, said second tube being extended downwardly from its forward end to its rearward end in a direction opposite that of said connecting annular passageway formed between the two tubes,

a burner box formed by enclosing side and end walls, located at the rearward end of said first tube, within the forward side wall of which a terminal end of said first tube is mounted, and rotatably sealed such that the annular passageway between said pair of tubes is in open communication therewith, and a rearward portion of said second tube is mounted and rotatably sealed within the rearward end wall of said burner box, and its terminal end extended therethrough,

waste oil, sludge or slurry feed means mounted with its feed discharge end extending into the rearward end of said first tube for introducing a waste oil, sludge or slurry into the annular passageway located between the side walls of said pair of tubes,

one or more burners mounted within the walls of the burner box from which burning gases are emitted into said annular passageway for igniting and burning said waste oil, sludge or slurry introduced into the annular passageway, the burning residue of said waste oil, sludge or slurry moving concurrently with the burning gases from said burners downwardly to the forward end of the annular passageway where the residue is collected and piled,

elevator means located within the forward end of said first tube interfacing with said annular passageway for lifting and elevating the piled residue and introducing same via the circumferential side wall openings into the axial opening extending through said second tube,

one or more burners extending through the enclosing end wall of said first tube into the forward end of said second smaller diameter tube from which burning gases are emitted, the solids and vapors within the axial opening of said second tube being contacted and calcined by the burning gases while moving cocurrently downwardly therewith to the opposite lower end of said second tube wherefrom both the burned gases and calcined solids are discharged,

a chimney within a forward wall of which the rearward terminal end of said second tube is sealed and rotatably contained, the chimney being provided with a lower solids discharge outlet and stack, such that the gases and solids discharged from the rearward end of said second tube therein are separated, the gases passing upwardly through the stack and the solids being discharged via said solids outlet, and

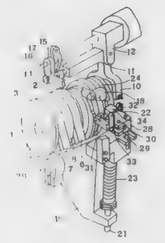
means for rotating said pair of tubes while a waste oil, sludge or slurry is being introduced via the waste oil, sludge or slurry feed means into the rearward end of said first tube, burned, and the burned solids residue passed concurrently with the flow of gas through the continuous passageways formed by the annular passageway between the two tubes and axial opening through the second tube, and discharged into the chimney.

4,730,565

STOPPING DEVICE FOR AN EYELET BUTTON HOLING MACHINE

Tetsuo Iizuka, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 43,149
Claims priority, application Japan, Apr. 28, 1986, 61-98495
Int. Cl.[4] D05B *3/08, 69/22*
U.S. Cl. 112—67 **2 Claims**



1. In an eyelet button holing machine which provides a stopper cam at a main shaft, a stopper arm having a stopper hook which is arranged to engage with said stopper cam by plunging said stopper hook into a recess portion of the stopper cam, a stopping device comprising:

(a) wheel cams provided at the main shaft and arranged to vary the inclination of the stopper arm by engaging with the stopper arm;

(b) a high-speed pulley adapted to transmit the high speed of the main shaft;

(c) a low-speed pulley adapted to transmit the low speed of the main shaft;

(d) a clutch pulley slidably placed between said high-speed pulley and said low-speed pulley;

(e) a clutch cam adapted to rotate in association with the stopper arm; and

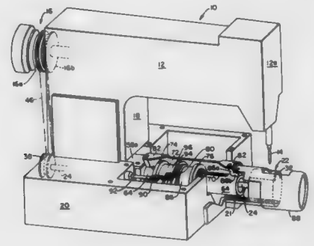
(f) a yoke adapted to cause said clutch pulley to contact with said high-speed pulley or with said low-speed pulley by rotating said clutch cam.

4,730,566

AUTOMATIC POCKET LABEL STITCHER

Thomas G. Brophy, Gloucester, and Michael R. Porter, Topsfield, both of Mass., assignors to Porter Sewing Machines, Inc., Beverly, Mass.

Filed Sep. 18, 1984, Ser. No. 652,174
Int. Cl.[4] D05B *21/00, 3/22, 27/08, 27/14*
U.S. Cl. 112—121.12 **14 Claims**



1. An automatic sewing machine, comprising

parallel upper and lower arms with cooperating upper and lower stitch forming mechanisms including at least one work penetrating reciprocating needle carried by the upper arm,

said lower arm terminating in an end having an upper cylindrical surface with a needle hole for receiving said reciprocating needle, the remainder of said lower arm end being of radial extent less than or equal to that of said cylindrical surface,

a cylindrical work carrying sleeve slidably received over the end of said lower arm coaxial with said cylindrical surface thereof, said sleeve having a sewing window formed therein encompassing said needle hole,

X-Y drive means for imparting to said sleeve translational motion along the axis thereof and rotational motion about the axis thereof in accordance with electronic commands, and

clamp means connected for rotation and translation with said sleeve for releasably clamping the work to said window,

whereby the work can be stitched inside the window as desired by controlling said X-Y drive means with a predetermined stitch program.

4,730,567

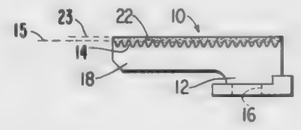
COMPOSITE FEED DOG FOR A SEWING MACHINE

William M. Block, Staten Island, N.Y.; William J. Edwards, Cranbury, N.J.; Charles R. Odermann, Montville, N.J., and Thaddeus J. Zylbert, Morris Plains, N.J., assignors to SSMC Inc., Shelton, Conn.

Filed Oct. 19, 1981, Ser. No. 313,055
Int. Cl.[4] D05B *27/02*
U.S. Cl. 112—324 **9 Claims**

1. A feed dog for a sewing machine comprising:

a hardened body portion having a roughened surface region; and



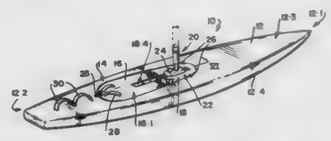
a layer of elastomeric material covering all of said surface region to at least a predetermined minimum depth to define a work engaging plane surface.

4,730,568

WATERBORNE CRAFT

Brian C. Campbell, P O Box 4091, George East, Cape Province, South Africa

Filed Feb. 13, 1987, Ser. No. 14,452
Int. Cl.[4] B63B *7/04, 41/00;* **A63C** *15/05*
U.S. Cl. 114—39.2 **9 Claims**



1. A waterborne craft which includes

a smooth rounded elongate sailboard type hull of little depth and which tapers down in width and in depth from its middle towards its ends and which has smooth upper and lower surfaces and a cockpit extending downwardly into the hull from its upper surface to provide a craft usable in canoe mode; and

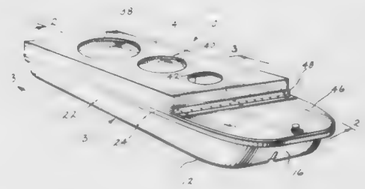
at least one removable reversible buoyant surfboard-like insert which fits snugly in two modes into the cockpit, the upper surface of the insert in one mode, being the paddle-ski mode, having recesses to accommodate the buttocks and feet of a paddle skier when the craft is used in this paddle-ski mode, and the opposite surface of the insert being uppermost in the other mode, being the sailboard mode, the said opposite surface having mounting means for mounting a mast so that the craft can be used as a sailboard in this mode, the insert being usable surfboard fashion by itself independently of the hull.

4,730,569

ICE FISHING TRANSPORT

David Colson, Box 73, Footville, Wis. 53537

Filed Apr. 14, 1987, Ser. No. 38,242
Int. Cl.[4] B62B *15/00*
U.S. Cl. 114—43 **4 Claims**



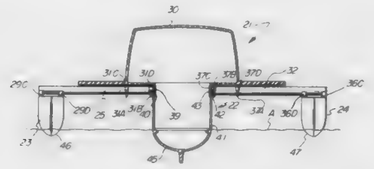
1. An ice fishing transport for transporting ice fishing equipment to and from an ice fishing site, said ice fishing equipment being contained within one or more containers, comprising:

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a substantially flat bottom surface for supporting said containers during transportation, said bottom surface being adapted to glide over frozen surfaces; and

a top surface spaced from and connected to said bottom surface, said top surface including one or more openings disposed therein, said openings being adapted to receive said one or more containers, and wherein said containers fit relatively snugly within said openings so as to prevent more than a small amount of movement of said containers during transportation for maintaining said containers in position on said bottom surface during transportation.

4,730,570
VARIABLE BEAM TRIMARAN
Donald R. Harris, 32021 Pacific Coast Hwy., South Laguna, Calif. 92677
Filed Aug. 28, 1986, Ser. No. 901,142
Int. Cl.⁴ B63B *7/00*
U.S. Cl. 114—61 **5 Claims**



1. A multi-hulled sailing vessel comprising:

a. an elongated main hull, said main hull including a superstructure having a floor extending laterally out from the sides of said main hull, above the water line,

b. an elongated starboard hull,

c. a pair of front starboard crossarms disposed transversely between a forward side section of said main hull and said starboard hull and a pair of rear starboard crossarms disposed transversely between an aft side section of said main hull and said starboard hull for securing said starboard hull to said main hull with the longitudinal axes of said main hull and said starboard hull in parallel alignment,

d. A plurality of starboard apertures through the starboard side of said main hull, each of said starboard apertures adapted to slidably receive a separate one of said starboard crossarms,

e. an elongated port-side hull secured to the port side of said main hull by means of port-side crossarms slidably fastened to said main hull,

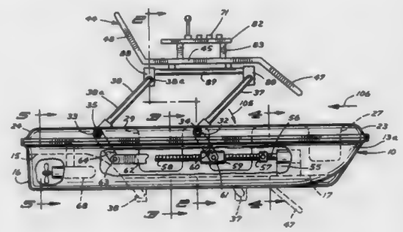
f. a plurality of port-side apertures through the port side of said main hull, each of said port-side apertures being adapted to slidably receive a separate one of said port-side crossarms, and each of said port-side apertures in coaxial alignment with a corresponding starboard aperture,

g. tightenable means for slidably fastening the inner ends of said crossarms to said main hull, said tightenable means comprising a plurality of vertically disposed U-bolts cradling the perimetral surface of said crossarms, said U-bolts being secured to said floor of said supersturcture,

h. removable means for securing the outer ends of said starboard crossarms to said starboard float and said portside crossarms to said port-side float, and

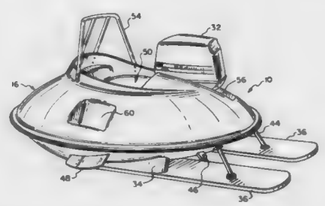
i. means for adjusting the height of the bottom surfaces of said starboard and portside hulls relative to the bottom surface of said main hull, said means comprising a shim of selected thickness adapted to receive the two straight shank portions of said U-bolt and adapted to fit between the upper surface of a crossarm and the lower surface of said superstructure floor.

4,730,571
PONTOON BOAT
Lorry L. Hedlund, and Kevin B. Hedlund, both of New Hope, Minn., assignors to Lee-Zure Line Inc., New Hope, Minn.
Filed Sep. 26, 1986, Ser. No. 912,995
Int. Cl.⁴ B63H *5/08*
U.S. Cl. 114—61 **11 Claims**



5. A pontoon boat for use by a user in a body of water, comprising a pair of elongated pontoons having front end portions and rear end portions, a chair for supporting a user, the chair having a front end portion, a rear end portion and a chair seat, and means mounted by the pontoons for retaining the pontoons in transversely spaced parallel relationship, selectively moving the chair between a lowered position that the chair seat is located below the surface of the body of water and covered by water and an elevated position in which the chair seat is located above the surface of the body of water, and retaining the chair in the selected position, the said means including a first elongated linkage having a first end portion pivotally connected to the front end portion of one of the pontoons and a second end portion pivotally connected to the chair front end portion and a second elongated linkage member having a first end portion pivotally connected to the rear end portion of one of the pontoons and a second end portion pivotally connected to the chair rear end portion.

4,730,572
RUDDERLESS CIRCULAR BOAT
Charles R. Hollingsworth, Evansville, Ind., assignor to Roundabout Boats, Inc., Evansville, Ind.
Filed Jun. 13, 1986, Ser. No. 874,294
Int. Cl.⁴ B63B *1/20*
U.S. Cl. 114—283 **5 Claims**



1. A circular pleasure boat comprising:

dish-shaped bottom and deck members secured together in opposed relationship around the perimeter thereof to provide a circular hull having a longitudinal fore-and-aft axis and a transverse axis;

an amidship cockpit region in said deck member;

a motor well defined by said hull;

motor means operationally mounted in said motor well in fixed alignment with said longitudinal axis;

a pair of transversely space, substantially planar skis rigidly connected to said bottom member and extending longitudinally rearwardly therefrom;

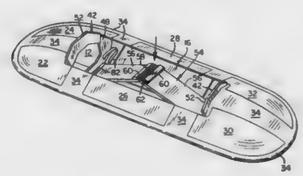
a planar section in said bottom member cooperating with said skis to provide an uninterrupted forwardly extending planing surface with said skis;

opposed fin means associated with said bottom member for assisting in the steering of said boat and each fin means comprising a planar member projecting laterally outwardly from said bottom member on each side thereof and lying along said transverse axis of the circular hull; and

step means in said deck member in vertical registry with said fins whereby an operator stepping on said step means while the boat is planing on said skis will cause a fin to dip into water and turn the boat;

said planing surface acting to elevate said hull substantially above water surface when sufficient forward speed is achieved by the boat whereby said boat planes on said skis and steering of the boat is effected by the shifting of weight of boat operator over one or the other of said skis.

4,730,573
COLLAPSIBLE, FOLDABLE BOAT
Terry D. Koon, Florence, Oreg., assignor to Ottercraft, Inc., Grants Pass, Oreg.
Filed Dec. 11, 1986, Ser. No. 940,654
Int. Cl.⁴ B63B *7/00*
U.S. Cl. 114—353 **14 Claims**

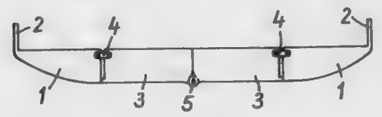


1. A collapsible, foldable boat comprising:

(a) a plurality of waterproof structural plates arranged in spaced relation to each other in the form of a boat hull defined by a bottom with sloping sides, a forward deck, a rear deck, and a central cockpit, the plates being arranged in two spaced longitudinal rows and three spaced transverse rows, and

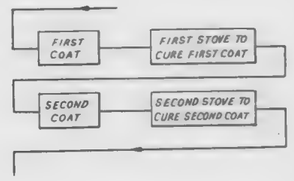
(b) a plurality of waterproof, flexible connecting pieces sealed to the plates and hinging them to each other.

4,730,574
COLLAPSIBLE PONTOON
Wolfgang Diefendahl, Straelen, and Carsten Schmitz, Remscheid, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany
Filed Mar. 25, 1986, Ser. No. 843,553
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1985, 3510778
Int. Cl.⁴ B63B *7/00*
U.S. Cl. 114—354 **14 Claims**



1. In a pontoon including a plurality of side-by-side arranged buoyant bodies articulated to one another to allow the pontoon to be placed in a collapsed or in an extended state; external buoyant bodies on either side of the pontoon being flanking bodies; each said flanking body having a bottom face sloping upwardly in an outward direction and a top face; each said flanking body having an outer portion; further wherein each buoyant body of said pontoon has a top face and said pontoon is collapsible in a W-configuration; the improvement wherein said flanking body has a plate-shaped wall element arranged at said outer portion and extending away from the end thereof; said plate-shaped wall element having a position in which it slopes upwardly and projects to a substantial extent beyond said top face of said flanking body in an upward direction; in the extended state of the pontoon the top faces lying in a plane situated at a level below parts of said plate-shaped wall element in the upwardly sloping position thereof.

4,730,575
COATING OF ARTICLES
Leonard A. Jenkins, Newbury, England, assignor to Metal Box Limited, Wantage, England
Division of Ser. No. 906,792, May 17, 1978, which is a continuation-in-part of Ser. No. 704,833, Jul. 13, 1976, abandoned. This application Sep. 27, 1982, Ser. No. 424,711
Claims priority, application United Kingdom, Jul. 29, 1975, 31782/75
Int. Cl.⁴ B05C *9/14*
U.S. Cl. 118—47 **4 Claims**



1. Apparatus for coating a can body, said apparatus comprising a first coating means for applying a first coating to a can body; a flame source defining means for heating and partially curing and hardening a first coating, support means for exposing said can body having a first coating thereon to the flame with the flame directly impinging on the first coating to partially cure and harden the first coating; second coating means for applying a second fluid coating to the first coating while it is only partially cured and hardened; and means for receiving a can body having a second coating over a partially cured and hardened first coating and fully curing the first and second coatings simultaneously.

4,730,576
SMALL ANIMAL WASHING AND DRYING APPARATUS
Kenji Yoshikawa, 546-5, Akeminosato-cho, Daito, Japan (574)
Filed Apr. 22, 1986, Ser. No. 854,772
Claims priority, application Japan, Apr. 27, 1985, 60-63777[U]
Int. Cl.⁴ A01K *13/00*
U.S. Cl. 119—158 **11 Claims**

1. A small animal washing and drying apparatus, comprising

a washing tub having at least one jet water current generator and at least one warm air outlet connected to a heating device disposed at an upper part of inner side wall, a drain port having a filter disposed at the bottom part of the washing tub,

an outer case containing said washing tub,

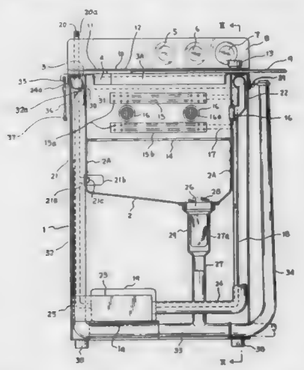
a footing board installed at a lower part of the washing tub by a level adjusting member for mounting the footing board at a level adjustable in the substantially upright direction,

a movable substantially horizontal lid disposed on an opening of the washing tub, said movable lid having a first

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notch as an opening adapted to closely receive at least a portion of a head and neck of a small animal, and

a top panel disposed on the opening of the washing tub, said top panel having a second notch adapted to closely receive at least a portion of the head and neck of the small



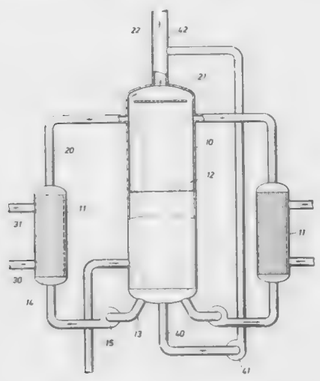
animal, said second notch positioned opposite to and defining with said first notch in a working condition of the apparatus an opening for close receiving the head and neck of the small animal, wherein the head of the small animal is positioned outside of the apparatus and the rest of the small animal is positioned inside of the apparatus.

4,730,577

STEAM GENERATOR FOR THERMAL RECOVERY SYSTEM

John D. Houghton, Friendswood, Tex., assignor to Shell California Production Inc., Houston, Tex.

Filed Dec. 21, 1983, Ser. No. 563,915
Int. Cl.[4] F22B *1/02*
U.S. Cl. 122—33 **5 Claims**



1. A system for producing steam in a cogeneration plant for use in a thermal recovery process for crude oil using brackish water, said system comprising:

a central steam drum-separator unit;

a plurality of once-through shell and tube type heat exchangers, said heat exchangers surrounding said steam drum-separator unit, said brackish water circulating through the tubes of said heat exchangers;

conduit means for coupling the tube side of each of said heat exchangers to both the top and bottom portions of the steam drum-separator unit;

circulation means disposed to establish circulation between the steam drum-separator unit and each of said heat exchangers;

means for circulating steam from the cogeneration plant through the shell side of the heat exchangers; and

means for maintaining the liquid level in the steam drum-separator unit within preset limits.

5. A method for producing thermal recovery steam in a cogeneration plant, said method comprising:

circulating steam from the cogeneration plant through the shell side of at least one heat exchanger;

withdrawing water from a steam drum-separator unit and circulating it through the tube side of the at least one heat exchanger to produce thermal recovery steam;

returning the thermal recovery steam formed on said tube side of the heat exchanger to the steam drum-separator unit;

separating the thermal recovery steam from the water in the steam drum-separator unit and withdrawing the thermal recovery steam from the steam drum-separator unit; and

withdrawing at least a portion of the water from the bottom of the steam drum-separator unit and recombining it with the steam from the steam drum-separator unit.

4,730,578

METHOD FOR OPERATING A HEATING BOILER PLANT AND APPARATUS SUITABLE THEREFOR

Alfred Michel, Erlangen; Hana Kostka, Nürnberg; Hermann O. Berg, Florstadt, all of Fed. Rep. of Germany, and Louis Gosteli, Oetwil, Switzerland, assignors to Siemens A.G., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 234,724, Feb. 17, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,796
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3006048
Int. Cl.[4] F22B *9/00*
U.S. Cl. 122—49 **8 Claims**



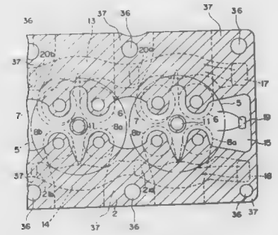
1. A method for operating a heating plant including a burner and a boiler having a combustion chamber with a heat exchanger following the combustion chamber, comprising using a continuously controllable burner and controlling said burner to provide the amount of heat needed and adapting the effective heat exchanger area to the burner output by using a heat exchanger with a plurality of individual elements and selecting the number of individual elements of the heat exchanger, through which the exhaust gas simultaneously flows, as a function which increases monotonically with the burner output.

4,730,579

INTERNAL COMBUSTION ENGINE CYLINDER HEAD WITH PORT COOLANT PASSAGE INDEPENDENT OF AND SUBSTANTIALLY WIDER THAN COMBUSTION CHAMBER COOLANT PASSAGE

Toshio Yamada; Mutsumi Kanda; Yoshihiro Iwashita, and Takeshi Okumura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 1, 1986, Ser. No. 892,825
Claims priority, application Japan, Aug. 2, 1985, 60-170696
Int. Cl.[4] F01P *3/02*
U.S. Cl. 123—41.82 R **3 Claims**



1. An internal combustion engine cylinder head for being clamped to a cylinder block for defining therewith a plurality of combustion chambers arranged in a row, said cylinder block having a coolant jacket, said cylinder head being formed with:

a plurality of intake ports each being opened in a first half side portion of each one of said combustion chambers for introducing intake air or mixture therein;

a plurality of exhaust ports each being opened in a second half side portion opposite to said first half side portion of each one of said combustion chambers for exhausting combustion gases therefrom;

a first coolant passage disposed along the row of said plurality of combustion chambers adjacent said plurality of intake ports so as successively to pass thereby as located on one side thereof remote from central roof portions of said combustion chambers;

a second coolant passage disposed along the row of said plurality of combustion chambers adjacent said pluruality of exhaust ports so as successively to pass thereby as located on one side thereof remote from said central roof portions of said combustion chambers; and

a third coolant passage disposed along the row of said plurality of combustion chambers adjacent said central roof portions of said combustion chambers so as successively to pass thereby;

said first, second and third coolant passages each being independently connected at one end thereof with said coolant jacket of said cylinder block so as individually to receive coolant therefrom, thereby establislhing three parallel flows of coolant through said first, second and third coolant passages with a predetermined triple distribution of flow rates according to certain relative magnitudes of flow resistance of said three coolant passages.

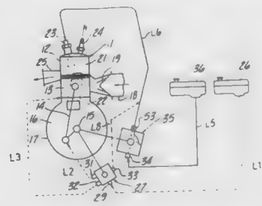
4,730,580

INTERNAL COMBUSTION ENGINE PROVIDED WITH FUEL INJECTION DEVICE

Yukio Matsushita, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatus, Japan

Division of Ser. No. 695,270, Jan. 28, 1985, Pat. No. 4,700,671. This application Mar. 11, 1987, Ser. No. 26,983
Claims priority, application Japan, Jan. 26, 1984, 59-11007; Jan. 26, 1984, 59-11008
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 AD **9 Claims**

1. In a two-cycle internal combustion engine having a crankcase, a combustion chamber, a lubricant pump for delivering lubricant from a lubricant source and a fuel injection pump having an inlet and an outlet for delivering fuel from a fuel source to said combustion chamber independently of said



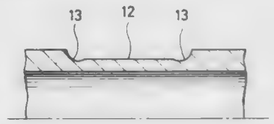
crankcase for combustion, the improvement comprising means for delivering lubricant from said lubricant pump to said crankcase for lubricating the components therein.

4,730,581

HOLLOW CAM SHAFT

Yoshiaki Fujita, Saitama, and Tatsumi Yunokawa, Tokyo, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1986, Ser. No. 873,604
Claims priority, application Japan, Jun. 18, 1985, 60-130773
Int. Cl.[4] F01L *1/04*
U.S. Cl. 123—90.6 **5 Claims**



1. A hollow cam shaft comprising:

a steel pipe having an outer peripheral surface, defining an outer diameter of said steel pipe,

a journal portion formed by cutting a portion of said outer peripheral surface, said journal portion having a uniform axial length and uniform radial depth and having an outer diameter smaller than said outer diameter of the steel pipe,

an annular groove formed at each axial end of said journal portion,

a cam portion assembled to a portion of said outer peripheral surface of the steel pipe adjacent said journal portion.

4,730,582

PERFORMING SPARK PLUG

Maurice E. Lindsay, 114 Standard St., El Segundo, Calif. 90245

Filed Dec. 15, 1986, Ser. No. 941,710
Int. Cl.[4] F02P *15/08;* **H01T** *13/32*
U.S. Cl. 123—169 MG **5 Claims**

1. A spark plug for producing combustion within the combustion chamber of an internal combustion engine, said spark plug comprising:

an elongated housing terminating in an electrical ground ring at one end, said housing being tubular forming an internal chamber, said ground ring defining an enclosing exit opening;

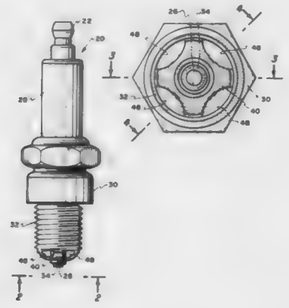
a center electrode mounted within said internal chamber, said center electrode having a tip, said center electrode located within said exit opening with said tip being located exteriorly of said exit opening;

an insulator mounted on said electrode, said insulator termi-

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nating in a core nose directly adjacent to said tip, said exit opening being larger than said insulator;

a fire hole formed within said internal chamber, said fire hole located directly adjacent said exit opening, said fire hole defining an annular space between said insulator and said ground ring, whereby said annular space functions as a precombustion chamber which is to propel an ignited fuel/air mixture exteriorly of said fire hole into the combustion chamber of the internal combustion engine; and



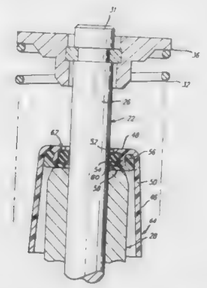
said ground ring including a series of ports, each said port connecting with said annular space of said fire hole, each said port being totally enclosed by said ground ring, whereby ignited fuel/air mixture is to be propelled through said ports into the combustion chamber of the internal combustion engine to facilitate even and complete burning of the fuel/air mixture within the combustion chamber, each said port is to direct a separate stream of ignited fuel/air mixture at a different direction into the combustion chamber to insure even distribution of the ignited fuel/air mixture within the combustion chamber.

4,730,583

VALVE STEM OIL DEFLECTOR

Bernard G. Stritzke, Hanover Park, Ill., assignor to Microdot Inc., Darien, Conn.

Filed Aug. 10, 1987, Ser. No. 83,363
Int. Cl.⁴ F01L *3/08*; F16J *15/32*
U.S. Cl. 123—188 P **1 Claim**



1. An oil deflector for attachment to the stem of a valve of an internal combustion engine or the like comprising

a molded relatively rigid plastic cup-shaped shell having a generally cylindrical wall section and a transverse end wall, the end wall of said shell including an opening for receiving a valve stem, and an annular axially extending flange radially spaced from the cylindrical wall section of said shell and the stem of said valve;

an annular retainer ring having an axially extending flange acceptable between the axially extending flange on said shell and the cylindrical outer wall thereof, and having a radially inwardly extending portion coextensive with the transverse end wall on said shell, and;

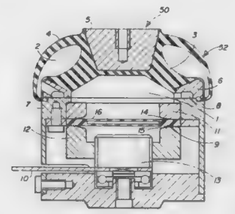
an O-ring disposed between the transverse end wall of said shell and the radially inwardly extending portion of said retainer and resiliently engagable with the valve stem of said valve.

4,730,584

ENGINE MOUNT CONSTRUCTION

Ernst-Günter Jördens, Damme, and Jöhannes Sprute, Osnabruck, both of Fed. Rep. of Germany, assignors to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 33,524
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614161
Int. Cl.⁴ F16F *9/10*; B60K *5/12*
U.S. Cl. 123—192 R **10 Claims**



1. A dual chamber support bed having a fluid cushioning, especially a motor mount support for motor vehicles, comprising a base housing having a side wall with an opening at one end, a resilient material housing overset opening and secured to said base housing and having spaced apart resilient inner and outer annular walls be positioned over and connected to the open end of said base housing and defining a working chamber between said base housing and said resilient material housing and a compensating chamber between said inner and outer wall, the chambers being filled with a fluid, said inner and outer walls having a buckling characteristic controllable to adapt to variations of supporting load, means defining a nozzle chamber between said base housing and said resilient material housing and inter-connecting said compensating chamber and said working chamber, and a means in said working chamber for controlling the buckling characteristic of said resilient material housing.

4,730,585

DIESEL ENGINE FUEL INJECTION SYSTEM WITH A RATE-OF-INJECTION CONTROL ARRANGEMENT

Seiko Abe, Okazaki; Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Akihiro Izawa, and Kiyonori Sekiguchi, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

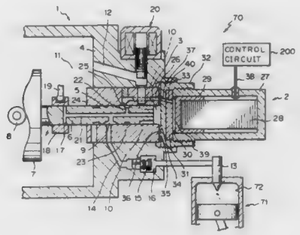
Filed Jun. 25, 1986, Ser. No. 878,772
Claims priority, application Japan, Jun. 28, 1985, 60-142744
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—300 **8 Claims**

1. A fuel injection system for a diesel engine, comprising:

(a) a fuel injection pump for delivering a controlled quantity of high pressure fuel cyclically at a timing synchronized with the operation of the engine, said pump having a pump cylinder and a pump plunger received therein for reciprocating movement to define a pumping chamber;

(b) a fuel injection nozzle hydraulically connected to said injection pump for receiving high pressure fuel therefrom and injecting the fuel into an engine cylinder;

(c) means for controlling a rate of injection of the system in response to operating conditions of the engine, said means having a variable volume chamber and an electronically controlled piezoelectric actuator operable to vary the volume of the variable volume chamber in a controlled timed relationship with the reciprocating movement of the pump plunger; and



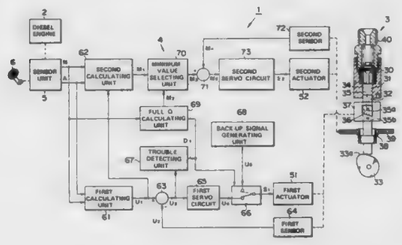
(d) passage means for providing, during each delivery stroke of the pump plunger, fluid communication between said pumping chamber and said variable volume chamber only for a predetermined initial phase of the delivery stroke, whereby said variable volume chamber is hydraulically isolated from said pumping chamber during subsequent phases of the delivery stroke.

4,730,586

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Susumu Yamaguchi, and Hiroshi Ishiwata, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 875,949
Claims priority, application Japan, Jun. 21, 1985, 60-134202
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 123—357 **16 Claims**



1. A fuel injection apparatus for internal combustion engines, comprising:

a fuel injection pump which has a plunger caused to carry out a least reciprocal movement in a predetermined pattern in a bore formed in a plunger barrel to pressurize fuel in the plunger barrel and at least one control sleeve fitted on the plunger, and is capable of regulating both the fuel injection quantity and the timing of the beginning of fuel injection by adjustment of the relative positional relationship between the control sleeve and the plunger;

a first actuator for regulating the position of the control sleeve to regulate the fuel injection rate;

a second actuator for regulating the position of the plunger to regulate the fuel injection quantity;

a first means responsive to at least one condition signal indicating the operating condition of the internal combustion engine for drivingly controlling said first and second actuators in such a way that the optimum fuel injection rate and fuel injection quantity can be obtained at each instant;

a detecting means for detecting any trouble occurring in the control system for regulating the position of the control sleeve; and

a second means for limiting the control operation by said first means so that an excessive rise in the inner pressure of the cylinders in the internal combustion engine is prevented when the occurrence of trouble is detected by the detecting means,

wherein said first means has a first control system responsive to at least the condition signal for feed-back controlling the position of the control sleeve so as to obtain the optimum fuel injection rate, and a second control system responsive to at least the condition signal for feed-back controlling the position of the plunger so as to obtain the optimum fuel injection quantity, and

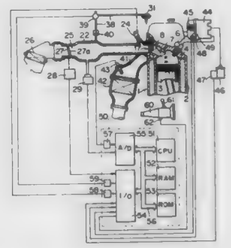
wherein the first control system has a first calculating means responsive to at least the condition signal for calculating and outputting a first target position signal indicating the optimum position of the control sleeve, a first sensor for producing a first actual position signal indicating the actual position of the control sleeve, means responsive to the first target position signal and the first actual position signal for producing a first error signal relating to a first difference between the target position and the actual position of the control sleeve, and means responsive to the first error signal for producing a first signal for driving the first actuator so as to reduce the first difference to zero.

4,730,587

CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Kazuhiko Norota, 2-56, Ekakushin-cho; Takashi Hattori, 3-39-2, Hirashiba-cho, and Nobuyuki Kobayashi, 6-63, Takami-cho, all of Toyota-shi, Aichi-ken, Japan

Continuation of Ser. No. 730,206, May 3, 1985, abandoned. This application Apr. 24, 1987, Ser. No. 52,114
Claims priority, application Japan, May 7, 1984, 59-91593
Int. Cl.⁴ F02P *5/00*
U.S. Cl. 123—416 **11 Claims**



1. A control device for an internal combustion engine having a transmission, an intake passage, an acceleration pedal, and a spark plug arranged in a combustion chamber; said device comprising:

fuel supply means disposed in said intake passage, adapted for feeding fuel into said intake passage;

discriminating means for discriminating whether said acceleration pedal is released and then depressed and whether a speed of said engine decreases by a predetermined amount within a predetermined time period after said acceleration pedal is depressed after said release, and for producing an output signal indicating that said acceleration pedal is released and then depressed and that the speed of said engine decreases by said predetermined amount within said predetermined time period after said acceleration pedal is depressed after said release;

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fuel supply control means, connected to said fuel supply means and controlled in response to the output signal of said discriminating means, for normally forming a lean air-fuel mixture in said intake passage and for temporarily forming a rich air-fuel mixture in said intake passage when said acceleration pedal is released and then the engine speed is decreased by said predetermined speed within said predetermined time period after said acceleration pedal is depressed after said release; and,

ignition timing means, connected to said spark plug and controlled in response to the output signal of said discriminating means, for normally causing ignition at a predetermined basic ignition timing and for temporarily retarding the ignition timing relative to said basic ignition timing when said acceleration pedal is released and then the engine speed is decreased by said predetermined speed within said predetermined time period after said acceleration pedal is depressed after said release.

4,730,588

VALVE OPERATING SYSTEM FOR AN AUTOMOTIVE ENGINE

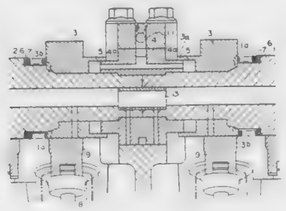
Satoshi Maeda, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 40,403

Claims priority, application Japan, Apr. 25, 1986, 61-96527

Int. Cl.[4] F02B *43/00*; F01L *1/34*

U.S. Cl. 123—432 **3 Claims**



1. In a valve operating system for an automotive engine having two or more intake valves for one cylinder, a camshaft having cams for operating the intake valves, the system comprising:

one of the cams being rotatably and axially slidably mounted on the camshaft;

clutch means for engaging the slidable cam with the camshaft at a predetermined angular position;

shifting means for axially shifting the slidable cam to engage the cam with the camshaft by the clutch means.

4,730,589

AUTOMATIC CHOKE SYSTEM FOR AN AUTOMOTIVE ENGINE

Kiyoshi Ohtaki, Fuchu, and Kazuo Hara, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,398

Claims priority, application Japan, Oct. 22, 1984, 59-222630

Int. Cl.[4] F02M *1/12*

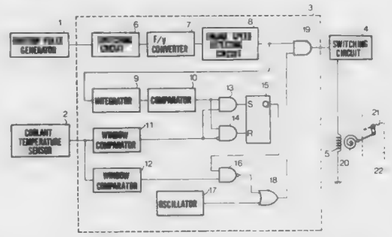
U.S. Cl. 123—438 **5 Claims**

1. In an automatic choke system for an automotive engine having a choke valve, a thermostatic spring operatively connected to the choke valve, a heater operated by current for heating the thermostatic spring so as to open the choke valve, and a circuit for controlling the current passing through the heater, the improvement comprising:

first means for detecting cooling water temperature lower than a predetermined temperature and for producing a low temperature signal;

second means for detecting cooling water temperature higher than a predetermined temperature and for producing a high temperature signal;

third means responsive to the high temperature signal for supplying the current to the heater; and



fourth means responsive to the low temperature signal for decreasing the current so as to retard the opening speed of the choke valve, said fourth means decreases said current responsive to the high temperature signal at starting of the engine.

4,730,590

AIR-FUEL RATIO CONTROL SYSTEM FOR AN ENGINE

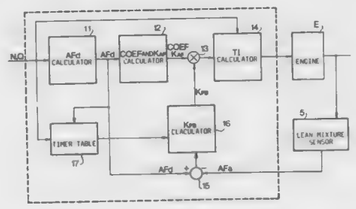
Yoshiyuki Sogawa, Hachiohji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 35,640

Claims priority, application Japan, Apr. 9, 1986, 61-083119

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—489 **4 Claims**



1. An air-fuel ratio control system for an engine, comprising sensing means for sensing engine operating conditions and for producing operating condition signals;

a sensor sensing oxygen concentration of exhaust gas of the engine and producing a feedback signal dependent on the concentration;

first means responsive to the operating condition signals for producing a desired air-fuel ratio signal;

second means for comparing the feedback signal with the desired air-fuel ratio signal and for producing an error signal;

control means responsive to the error signal for deciding amount of fuel supplied to the engine;

third means for detecting variation of the desired air-fuel ratio and for producing a variation signal;

a look-up table storing a plurality of time period data dependent on an engine operating condition, the time period being decided to correspond to a control delay time of the control system;

fourth means responsive to the variation signal for fixing the error signal for a time period derived from the look-up table.

4,730,591

FUEL SUPPLYING SYSTEM OF OUTBOARD MOTOR

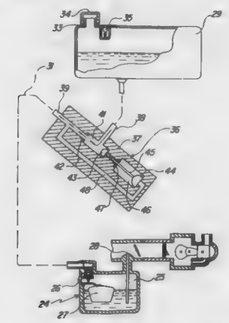
Yoshihiro Gohara, and Yoshikazu Nakayasu, both of Hamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1986, Ser. No. 900,751

Claims priority, application Japan, Aug. 30, 1985, 60-189796

Int. Cl.[4] G05D *7/00*

U.S. Cl. 123—510 **9 Claims**



1. In an outboard motor and a fuel supply system for said outboard motor, said outboard motor having an engine and an induction system comprising a charge former, said outboard motor being supported for pivotal movement about a generally horizontally extending tilt axis between a normal running position and a tilted up position, a fuel tank, conduit means extending from said fuel tank to said charge former for delivering fuel thereto, and position responsive valve means for precluding flow to said charge former from said fuel tank when said outboard motor is in its tilted up position, the improvement comprising means including pressure responsive valve means for relieving the pressure in the portion of said conduit means between siad position responsive valve means and said fuel tank in response to a pressure downstream of said position responsive valve means.

4,730,592

OUTER VENT CONTROL DEVICE FOR A CARBURETOR

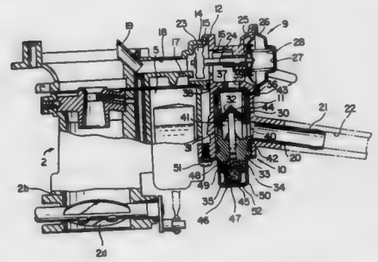
Yasuji Uozumi; Hitoshi Yamabe, both of Saitama; Sachito Fujimoto, Tokyo, and Hideo Kobayashi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,045

Claims priority, application Japan, Mar. 26, 1985, 60-42350[U]

Int. Cl.[4] F02M *33/02*

U.S. Cl. 123—516 **6 Claims**



1. An outer vent control device for use between a carburetor of an engine including a float chamber having an outer wall defining an outer vent port therein and a canister through an outer vent line for delivering fuel vapor from the float chamber to the canister, said outer vent control device comprising:

a valve housing adapted to be attached to the outer wall of the float chamber to provide a direct and continuous thermal conduction path therebetween, said valve housing having an inlet port adapted to communicate with the outer vent port and an outlet port adapted to communicate with the outer vent line;

a first control valve disposed in said valve housing and openable when the engine stops its operation; and

a second thermosensitive control valve disposed in said valve housing and closable when the temperature of the float chamber drops below a preset temperature.

4,730,593

METHOD OF OPERATION AN INTERNAL COMBUSTION ENGINE AND AN INTERNAL COMBUSTION ENGINE DESIGNED FOR CARRYING OUT THIS METHOD

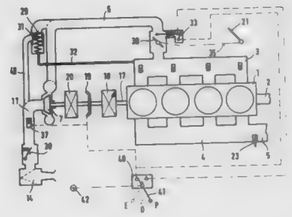
Karl-Nikolaus Regar, Rebhuhnweg 3, 8000 Müchen 60, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 845,707

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512281

Int. Cl.[4] F02D *23/00*

U.S. Cl. 123—561 **4 Claims**



1. A device for operating an internal combustion engine, specifically an Otto engine for a power vehicle, which can run in a suction operation mode or in a supercharge operation mode by means of a supercharger driven by said engine, the device comprising switchover means (**41, 40, 19**) for switching the engine between a suction operation mode (D,E) and supercharge operation mode (U-E, E-R; P); at least one throttle flap (**30**) for continually adjusting an engine torque in said suction operation mode and said supercharge operation mode; said supercharger being formed by a centrifugal compressor; a speed variator (**18**) for driving said supercharger; a supercharge line (**6**) interconnected between said supercharger and said engine to feed pressurized medium into the engine in said supercharge operation mode, said throttle flap being positioned in said supercharge line, the engine having a shaft (**17**) connected to said speed variator; said switchover means including said throttle flap, a gas pedal connected to said throttle flap, and a cutoff clutch (**19**) which is interconnected between said shaft and said supercharger (**7**), said throttle flap (**30**) being adjustable by said gas pedal (**21**) within a suction operation range (O,E) and within a supercharge operation range (P), said switchover means further including an adjusting member (**41**) connected to said cutoff clutch and operated to actuate said cutoff clutch to establish or interrupt a connection between said shaft and said supercharger, said adjusting member (**41**) being adjustable independently from the gas pedal between a suction operation position (O,E) and a continuous supercharge operation position (P) with a continually driven supercharger (**7**).

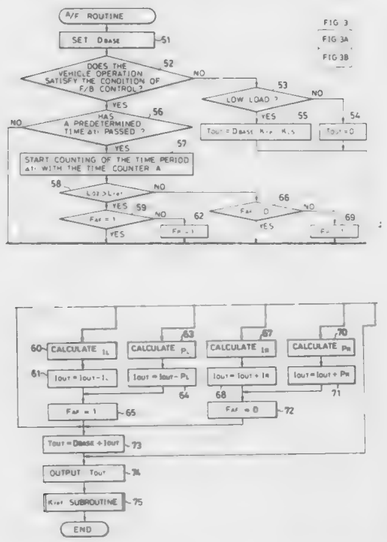
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4,730,594

AIR FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AN IMPROVED OPEN LOOP MODE OPERATION

Yoshitaka Hibino, and Takeshi Fukuzawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,470
Claims priority, application Japan, Oct. 5, 1985, 60-222172
Int. Cl.[4] F02M *23/08, 23/10*
U.S. Cl. 123—589 **3 Claims**



1. In an air/fuel ratio control system for an internal combustion engine, the system including a plurality of sensors for sensing engine opertional parameters relating to an engine load, an exhaust gas sensor for sensing a concentration of an exhaust gas component of the internal combustion engine, and an air/fuel ratio controller for controlling an air/fuel ratio of a mixture supplied to the engine in response to an output value determined on the basis of signals from said sensors, the system comprising:

means connected to said plurality of of sensors for setting a base value of air/fuel ratio control in response to said engine parameters at intervals of a predetermined time period, the base value being obtained from a plurality of predetermined values stored in a first memory means comprising a read only memory;

means for adjusting said base value in response to a result of comparison between a target air/fuel ratio and a detected air/fuel ratio obtained by an output signal of said exhaust gas sensor to provide said output value;

means for calculating correction values to compensate for possible errors of said base value each time said output value is produced;

second memory means for storing each calculated value of said correction values in connection with each value of said plurality of engine operational parameters, said second memory means comprising a random access memory;

means for detecting a predetermined operational condition of said internal combustion engine; and

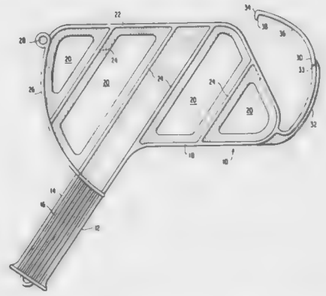
means for stopping said adjustment of said base value in response to the output signal of said exhaust gas sensor when said predetermined operational condition is detected, and correcting said base value by a value chosen from said correction values stored in said second memory means to provide said output value, said chosen value corresponding to present values of said plurality of engine operational parameters, wherein said means together form a control unit of the air/fuel ratio.

4,730,595

DISC LAUNCHER

Herbert G. Glass, 4402 S. Park Ave., Dothan, Ala. 36301, and Henry G. Glass, P.O. Box 7553, Roanoke, Va. 24019

Filed Sep. 15, 1986, Ser. No. 907,255
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—5 **5 Claims**



1. A disc and disc launcher comprising a disc having a peripheral recess, and a disc launcher being of one piece molded plastic construction including a handle, a flat head portion extending outwardly from one end of the handle and disposed in a common plane with said handle, disc support means disposed along one peripheral end of said head portion on one side of the axis of said handle and projecting perpendicular to said plane an equal distance on opposite sides of said plane, a curved flexible resilient arm integrally formed with said head portion and having a free end extending outwardly from a flex point on the opposite peripheral end of said head portion on the other side of said axis in said plane with portions of said arm projecting on opposite sides of said plane for gripping the disc between said flexible resilient arm and said disc support means on either side of said head portion and projection means on the free end of said arm adapted to cooperate with said recess on said disc for engaging said disc and imparting a spinning action to said disc as the disc leaves the launcher upon flexing of the arm about said flex point under the action of centrifugal force imparted thereto.

4,730,596

ROLL-TYPE DRESSING UNIT

Horst E. Maack, and Manfred M. Funke, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 6, 1986, Ser. No. 915,461
Int. Cl.[4] B24B *53/14;* **F16C** *7/04*
U.S. Cl. 125—11 CD **1 Claim**

1. In a grinding machine, including: a base; a rotatable grinding wheel supported by said base; a wheel dressing assembly including a powered dressing roll; and means for moving the dressing assembly and said grinding wheel relatively towards each other, an improved dressing roll mounting unit, comprising:

(a) a substantially rigid dressing housing, having

a pair of substantially thick opposed walls, each wall including shaft-clamping means, with

a pair of in-line bores through said walls and shaft-clamping means;

(b) a dressing roll body positioned between said walls, said roll body having a bearing bore generally in line with said pair of in-line bores;

(c) a roll support shaft extending through said roll body and said pair of in-line bores, said shaft comprising at least:

a pair of cylindrical opposite-end portions securely affixed to said opposed walls by clamping said opposite-end portions in said pair of in-line bores for substantially the entire length of said opposite-end portions; and

a cylindrical middle portion joining said end portions;

(d) an annular space defined about said cylindrical middle portion of said shaft by said roll body bearing bore;

(e) a pair of spaced-apart bearing sections on said cylindrical middle portion of said shaft, corresponding to said bearing bore, each of said bearing sections comprising:

a plurality of relief sectors formed in the cylindrical surface of said shaft, at equal spacings around the circumferences thereof, said relief sectors being of generally wedge-shaped cross-section, extending in the same circumferential direction, said relief sectors being formed of

constant width along the axis of said shaft, and formed to

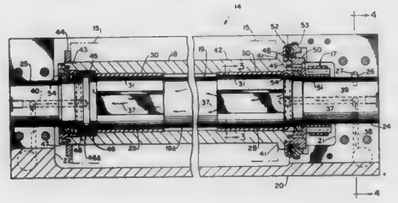
full depth at the beginning of said sector thereafter

blending gradually to said shaft cylindrical surface at the end of said sector;

(f) a fluid medium maintained in said annular space and said relief sectors; and

(g) means for rotatably driving said roll body about said shaft

whereby said relief sectors establish a wedge of fluid coacting with said annular space to create a hydrodynamic pressure as said roll body is rotated.



4,730,597

BIOMASS STOVE

Fred W. Hottenroth, 1740 Interlachen St., Seal Beach, Calif. 90740, and Fred W. Hottenroth, III, 411 S. Country Dr., Anaheim, Calif. 92807

Filed Jul. 25, 1986, Ser. No. 889,359
Int. Cl.[4] F24C *15/08*
U.S. Cl. 126—2 **18 Claims**

1. A stove which comprises:

an outer chamber having a hollow interior, said outer chamber having an outer chamber bottom wall and an essentially continuous outer chamber side wall operatively connecting to said bottom wall, together said outer chamber side wall and said outer chamber bottom wall surrounding said hollow interior; said outer chamber having an essentially open top opening into said outer chamber hollow interior;

chamber air inlet means for introducing air into said interior of said outer chamber, said air inlet means located in at least one of said outer chamber bottom wall and said outer chamber side wall;

a fuel basket having a hollow interior for containing fuel, said fuel basket including an essentially continuous fuel basekt side wall surrounding said fuel basket hollow interior, said fuel basket side wall having a top edge and a bottom edge, said fuel basket sized and shaped so as to be at least partially temporarily locatable in said outer chamber, said fuel basket having an essentially open top opening into said fuel basket hollow interior;

a grate located in said hollow interior of said fuel basket and positioned within said hollow interior of said fuel basket spaced upwardly from said bottom edge of said fuel basket side wall;

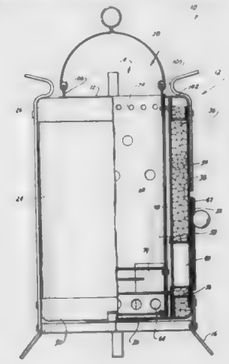
a reflecting means for reflecting heat, said reflecting means located in said fuel basket below said grate and spaced upward from said bottom edge of said fuel basket side wall;

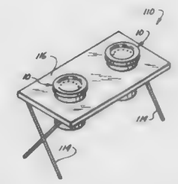
said reflecting means includes a first reflecting element and a second reflecting element, said first reflecting element positioned below said grate, said second reflecting element positioned below first reflecting element and above said fuel basket side wall bottom edge;

fuel basket air inlet means for introducing air into said fuel basket, said fuel basekt air inlet means at least partially located on said fuel basket below said grate means.

18. A stove for burning biomass which comprises:

a support housing;





said support housing including at least two burner supports;

at least two burners;

each of said burner including an outer chamber having a hollow interior, said outer chamber having an outer chamber bottom wall and an essentially continuous outer chamber side wall operatively connecting to said bottom wall, together said outer chamber side wall and said outer chamber bottom wall surrounding said hollow interior, said outer chamber having an essentially open top opening into said outer chamber hollow interior;

each of said burners further including air inlet means for introducing air into said interior of said outer chamber, said air inlet means located in at least one of said outer chamber bottom wall and said outer chamber side wall;

each of said burners further including an fuel basket having a hollow interior for containing fuel, said fuel basket including an essentially continuous fuel basket side wall surrounding said fuel basket hollow interior, said fuel basket side wall having a top edge and a bottom edge, said fuel basket sized and shaped so as to be at least partly

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temporarily contained in said outer chamber, said fuel basket having an essentially open top opening into said fuel basket hollow interior;

each of said burners further including a grate located in said hollow interior of said fuel basket and positioned within said hollow interior of said fuel basket spaced upwardly from said bottom edge of said fuel basket side wall;

each of said burners further including a reflecting means for reflecting heat, said reflecting means located in said fuel basket below said grate and spaced upward from said bottom edge of said fuel basket side wall;

said reflecting means includes a first reflecting element and a second reflecting element, said first reflecting element positioned below said grate, said second reflecting element positioned below first reflecting element and above said fuel basket side wall bottom edge;

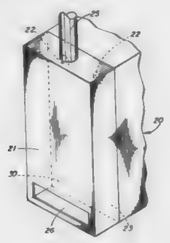
fuel basket air inlet means for introducing air into said fuel basket, said fuel basket air inlet means at least partially located on said fuel basket below said grate means.

4,730,598

DRAFT-ASSISTING CHAMBER

Michael C. Swinton, 27 Gentle Gate Crescent, Ottawa, Ontario, Canada K1T 1Z9

Filed Aug. 25, 1986, Ser. No. 900,082
Claims priority, application Canada, Aug. 27, 1985, 489426
Int. Cl.⁴ F24C *1/14*
U.S. Cl. 126—80 **14 Claims**



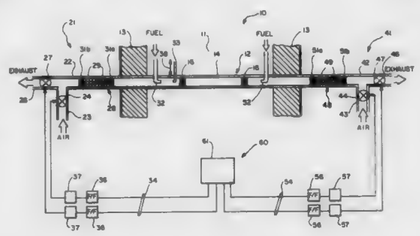
1. A generally vertical chamber adapted to be positioned proximate of the combustion gas exhaust port of a heating appliance and of the flue pipe attached to the heating appliance and to be in flow communication with both the exhaust port and the flue pipe, the horizontal cross-section of the chamber at all vertical positions having a mean area at least approximately four times the area of the exhaust port, the roof of the chamber being above the exhaust port of the heating appliance such that exhaust gas from the heating appliance flows generally laterally into the upper portion of the chamber, the flue pipe being connected to the chamber at a position above the exhaust port of the heating appliance, the chamber extending downwardly from the exhaust port a substantial portion of the height of the heating appliance, the inside of the chamber being in flow communication with ambient air outside of the heating appliance through at least one aperture proximate of the bottom of the chamber, whereby the initial exhaust gases leaving the heating appliance through the exhaust port after start-up of the heating appliance and prior to a sufficient draft being created in the flue pipe are collected in the chamber, those exhaust gases spreading in a downward direction in the chamber until such time as their buoyancy creates the steady-state draft in the flue pipe, the height of the chamber being sufficient to provide such buoyancy and the volume of the chamber being sufficient to accommodate such temporary collection of exhaust gases.

4,730,599

RADIANT TUBE HEATING SYSTEM

Robert M. Kendall, Sunnyvale; John P. Kesselring, Mountain View, both of Ca'if.; Michael A. Lukasiewicz, Chicago, Ill.; John J. Lannutti, Saratoga, and Richard J. Schreiber, San Jose, both of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Sep. 4, 1986, Ser. No. 903,584
Int. Cl.⁴ F24C *3/00*
U.S. Cl. 126—91 A **5 Claims**



1. A radiant tube heating system comprising: (1) a tubular catalytic combustion chamber having first and second orifices defining a combustion flow path therethrough; (2) fuel inlet means for injecting fuel into the combustion flow path; (3) first and second combined inlet and exhaust units each of which comprises a conduit, said conduit of the first unit communicating with said first orifice and said conduit of the second unit communicating with said second orifice, each of said conduits further comprising heat regenerator means, inlet means for selectively opening and closing fluid communication between a source of gas under pressure and said combustion chamber and outlet means for selectively opening and closing an exhaust path for discharge of products of combustion from the combustion chamber; (4) means for igniting the fuel with the gas in the combustion chamber; and (5) control means for operating the inlet and outlet means in a cycle which includes a first phase with the first unit having its inlet means open and its outlet means closed while concurrently the second unit has its inlet means closed and its outlet means open, and a second phase in which the first unit has its inlet means closed and its outlet means open while concurrently the second unit has its inlet means open and its outlet means closed, said control means in the first phase directing the flow in a direction from the inlet of the first unit to the outlet of the second unit and in the second phase directing the flow in a direction from the inlet of the second unit to the outlet of the first unit.

4,730,600

CONDENSING FURNACE

William T. Harrigill, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 16, 1981, Ser. No. 331,167
Int. Cl.⁴ F24H *3/00*
U.S. Cl. 126—108 **16 Claims**

1. A furnace comprising:

a combustion chamber,

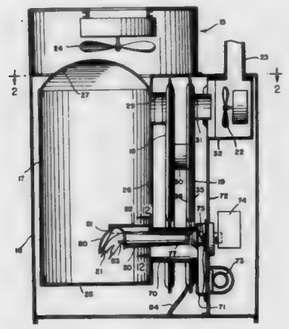
burner means in the combustion chamber for providing a gas flame,

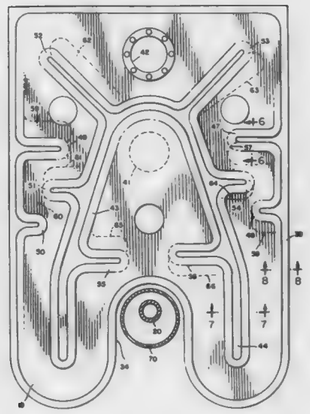
a first heat exchanger adjacent the combustion chamber and having a combustion gas inlet and a combustion gas outlet, one of said gas inlet and gas outlet being positioned above the other to cause combustion gases to flow in a counterflow direction,

connecting means extending between the combustion chamber and the combustion gas inlet of the first heat exchanger for permitting combustion gases to flow form the combustion chamber to the first heat exchanger,

a second heat exchanger adjacent the first heat exchanger and having a combustion gas inlet and a combustion gas outlet, one of said gas inlet and gas outlet of the second heat exchanger being positioned below the other to cause combustion gases to flow in a counterflow direction,

connecting means extending between the combustion gas outlet of the first heat exchanger and the combustion gas inlet of the second heat exchanger for permitting combustion gases to flow from the first heat exchanger to the second heat exchanger, and





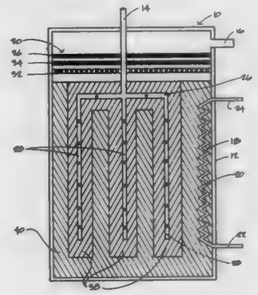
a baffle having an inverted U-shape within each of the first and second heat exchangers for preventing direct flow of combustion gases from the combustion gas inlet to the combustion gas outlet of the heat exchanger, each of the U-shaped baffles including a midportion between the gas inlet and gas outlet of the heat exchanger and a pair of leg portions extending downwardly from the midportion whereby combustion gases flowing between the gas inlet and gas outlet of each heat exchanger must flow downwardly around the leg portions of the baffle in the heat exchanger.

4,730,601

STEAM ENGINE REACTION CHAMBER, FUEL COMPOSITION THEREFORE, AND METHOD OF MAKING AND OPERATING SAME

Norman D. Hubele, and Kim L. Johnson, both of Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 681,160, Dec. 13, 1984, Pat. No. 4,643,166.
This application Oct. 15, 1986, Ser. No. 919,281
Int. Cl.⁴ F24J *1/00, 3/00*
U.S. Cl. 126—263 **13 Claims**



1. Apparatus comprising a chambered housing defining an inlet to and an outlet from the chamber therein, a main fuel part composed essentially of metallic aluminum and metallic magnesium substantially in two-to-one molal relation, repectively, disposed in a lower portion of said chamber, a water reactive hypergolic starting fuel part disposed both in heat transfer relation with said main fuel part and in juxtaposition with said inlet, said starting fuel part being composed essentially of lithium hydride and a metallic element from the group including magnesium and aluminum, said starting fuel part including both metallic magnesium and metallic aluminum along with lithium hydride in substantially one-to-one-to-one molal relationship, said starting fuel part and said main fuel part being present in one-to-four weight relation, respectively, means in association with said inlet for receiving water flow and delivering said water flow first to said starting fuel part for hypergolic reaction therewith and then to said main fuel part, filter means in association with said outlet for allowing passage of subtantially only hydrogen gas therethrough, and heat transfer means in association with said fuel parts.

4,730,602

APPARATUS FOR AUTOMATICALLY DIRECTING SOLAR RADIATION FOCUSED BY A REFLECTOR

Mario Posnansky, Melchenbuhlweg 18, 3006 Bern, Switzerland, and Hernan Posnansky, P.O. Box 17792, San Diego, Calif. 92117

PCT No. PCT/CH83/00076, § 371 Date Feb. 16, 1984, § 102(e) Date Feb. 16, 1984, PCT Pub. No. WO84/00068, PCT Pub. Date Jan. 5, 1984
Continuation of Ser. No. 805,598, Dec. 10, 1985, abandoned, which is a continuation of Ser. No. 589,066, Feb. 16, 1984, abandoned. This PCT application Jun. 16, 1983, Ser. No. 48,471
Claims priority, application Switzerland, Jun. 16, 1982, 3728/82
Int. Cl.⁴ F21J *3/02*
U.S. Cl. 126—425 **9 Claims**

1. A solar power plant, comprising:

a stationary solar radiation collector;

a balanced reflector having a low friction mounting adjustable about a swivel axis for focusing solar radiation;

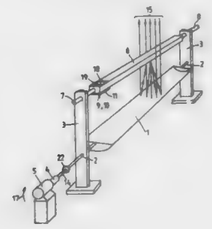
an adjusting mechanism for adjusting said reflector to direct the focused solar radiation onto said collector;

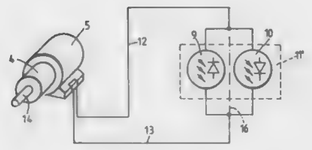
an electric motor having sufficient torque to drive said ad-

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justing mechanism through a reduction gear having a high gear ratio, and

as least two solar cells disposed on said collector, said solar cells being connected in a parallel circuit opposite to one another, said parallel circuit being directly connected to





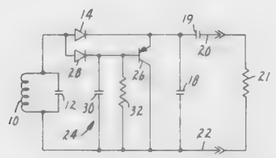
said motor so that upon irradiation of said solar cells with focused solar radiation electrical voltages are produced which counteract one another and which drive said motor without amplification, said produced voltages being the sole supply of power to said motor.

4,730,603

RECEIVER OF AMPLITUDE MODULATED SIGNALS

Robert J. Fretz, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 28, 1987, Ser. No. 7,986
Int. Cl.⁴ A61B *19/00*
U.S. Cl. 128—1 R **20 Claims**



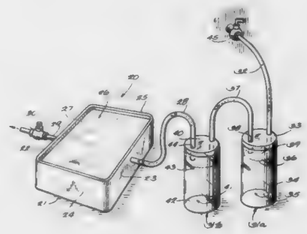
1. An improvement to an implantable amplitude modulated radio frequency receiver having an output adapted for connection to the body of a patient to apply the signal that is used as the modulating signal for an amplitude modulated radio frequency signal received by the receiver which includes a tuned circuit for receiving the amplitude modulated signal and a demodulator circuit portion connected to the tuned circuit for obtaining the modulating signal from the received amplitude modulated radio frequency signal for presentment to the output of the receiver, the demodulator circuit portion including a diode that has its output connected to a blocking capacitor and to a resistor that provides a discharge path for limited discharge of the blocking capacitor, the improvement including an active circuit portion that replaces the resistor, said active circuit portion having an active semiconductor device connected to the diode and blocking capacitor for providing a discharge path for limited discharge of the blocking capacitor, said active semiconductor device providing a level of conductivity which is inversely related to the level of conduction of the rectifier, said active circuit portion having a control circuit connected between the tuned circuit and said active semiconductor device for controlling the conductivity of said active semiconductor device whereby less power is used by said circuit portion than by the resistor replaced by said active circuit portion to provide a receiver of improved efficiency.

4,730,604

ARHYTHMIC BABY BED

Randy S. Boggs, 111 Belmont Ave., Asheville, N.C. 28806

Filed Mar. 16, 1987, Ser. No. 26,086
Int. Cl.⁴ A61H *23/04, 1/00*
U.S. Cl. 128—33 **3 Claims**



1. In combination, an air mattress for supporting an infant, means for causing an arhythmic vibrations of the upper surface of said mattress, said means including at least one bubble chamber,

said bubble chamber being partially filled with water,

said bubble chamber having an air inlet conduit extending to below the level of said water,

said bubble chamber having a second conduit extending to a point above the level of the water therein, and connected to said air mattress,

said air mattress having a discharge conduit and a valve in said discharge conduit,

said conduits, bubble-chamber and mattress being constructed so that a constant flow of air into the first bubble chamber will be converted to an erratic bubbling flow of air through the second conduit and into the mattress, thereby creating an arhythmic vibration of the upper surface of the mattress.

4,730,605

PERCUSSING BODY MASSAGER HAVING AMPLITUDE ADJUSTMENT MEANS

Edward D. Noble, Willowdale, and Duke Harding, Markham, both of Canada, assignors to Wellness Innovations Corp., Markham, Canada

Filed Jul. 14, 1986, Ser. No. 884,851
Int. Cl.⁴ A61H *23/02*
U.S. Cl. 128—55 **10 Claims**

1. A body massager comprising:

a base structure including a casing having handles for manipulating the massager;

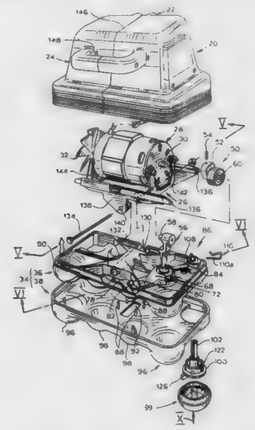
a drive unit carried by said base structure;

a massage head having an external massage surface contoured symmetrically about a transverse centre line for percussive massage of the body, the massage head being coupled to the base structure for pivotal rocking movement about an axis parallel to said transverse centre line; and,

means coupling said drive unit with said massage head to reciprocate said massage head in a direction generally

normal to said axis at a position spaced from said centre line, for producing said rocking movement of the head;

wherein two said handles are provided and are disposed one at each side of the casing generally at opposite ends of said



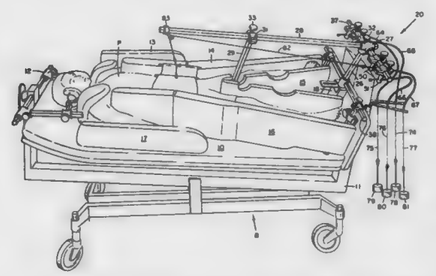
axis, each said handle comprising a generally U-shaped formation extending outwardly of the casing with one handle disposed generally parallel to a general plane containing the massage head and the other handle at right angles to said plane.

4,730,606

APPARATUS FOR APPLYING TRACTION DURING OSCILLATORY THERAPY

Peter A. Leininger, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 821,276, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 560,258, Dec. 12, 1983, abandoned, which is a continuation of Ser. No. 389,767, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 134,774, Mar. 28, 1980, abandoned. This application Dec. 17, 1986, Ser. No. 944,245
Int. Cl.⁴ A61F *5/04;* **A47D** *9/02*
U.S. Cl. 128—75 **4 Claims**



1. A traction apparatus for an oscillating therapeutic bed having a non-oscillating portion and an oscillating patient support platform comprising:

a generally vertical support bar rigidly mounted to the oscillating patient support platform for oscillation therewith;

a generally horizontal, transverse support bar rigidly mounted to said vertical support bar;

a support bar mounted on the portion of the oscillating therapeutic bed which does not oscillate with the oscillating patient support platform of the oscillating therapeutic bed provided with one or more spaced cable support means to position force applying means spaced from the longitudinal center line of the oscillating patient support platform;

a cable having a weight at one end and means for engaging a patient lying on the oscillating patient support platform on the other end;

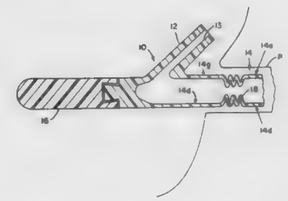
a cable conduit slidably receiving said cable, said cable conduit being connected at one end to said transverse support bar spaced from said longitudinal centerline and at the other end to said support bar mounted on the portion of the oscillating therapeutic bed which does not oscillate with the oscillating patient support platform and transmitting the constant downward force applied to the end of said cable by the weight into a substantially constant force on the patient engaging means.

4,730,607

STIFFENER CYLINDER FOR AN INFLATABLE PENILE ERECTION DEVICE

Robert E. Fischell, 1027 McCeney Ave., Silver Spring, Md. 20901

Continuation-in-part of Ser. No. 642,244, Aug. 20, 1984, abandoned. This application Sep. 5, 1985, Ser. No. 772,734
Int. Cl.⁴ A61F *2/26*
U.S. Cl. 128—79 **36 Claims**



1. A stiffener cylinder for a penile erection device, comprising:

an elongated flexible pendulous portion having a wall with an outer surface and an inner surface defining an interior, said pendulous portion having an erect state when said interior is at a first pressure and having a flaccid state when said interior is at a second pressure lower than said first pressure; and

elongation means defining a portion of the wall of said pendulous portion, including portions of the inner and outer surfaces of the wall, for increasing the length of said pendulous portion when in said erect state and for decreasing the length of said pendulous portion when in said flaccid state, said elongation means being capable of elongation to increase the length of said pendulous portion without being placed in any significant tension.

4,730,608

EXTERNAL BONE-ANCHORING FIXATOR

Allen P. Schlein, 107 Curtis Ter., Fairfield, Conn. 06432

Filed Mar. 5, 1986, Ser. No. 836,538
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 Z **14 Claims**

1. An external fixator for bridging a bone fracture for use with bone pins intended to be inserted in groups into the fracture fragments, said fixator comprising:

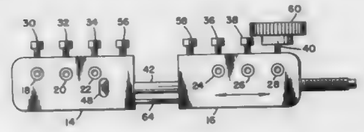
first and second elongated solid planar members formed of a moldable and/or machinable plastics material, said planar members being generally rectangular in shape and cross-section and having a width dimension greater than the thickness dimension, said planar members being arranged in end-to-end relationship in a common plane and each having openings therethrough transverse to its longitudal

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axis in the direction of the thickness dimension distributed along its length and disposed on a line displaced from one edge of the member by a distance less than half said width dimension for receiving and supporting the pins of a respective one of two groups of pins

separate means associated with each of said openings for releasably clamping a pin therein comprising a screw extending inwardly from said one edge of the planar member into engagement with the pin, said screw having a head of predetermined shape and size,

an elongated lead screw anchored at one end for relative rotation in said first planar member at the end thereof which confronts an end of said second planar member and extending completely through and projecting beyond the other end of said second planar member and threadably engaging a threaded longitudinal bore therein, said lead screw being disposed along an axis parallel to and dis-



placed slightly inwardly from said line of openings and when rotated relative to said second planar member effecting an adjustment in distance between the confronting ends of said first and second planar members whereby to establish a definite extension of the fracture, the projecting end of said lead screw having the same shape and size as the heads of said clamping screws whereby a single tool having an opening of said predetermined shape and size can be used interchangeably to rotate said lead screw to effect said adjustment in distance or to actuate said clamping screws, and

a rod secured at one end and in the end of said first planar member which confronts an end of said second planar member and slidably engaging a bore in said second planar member, the axis of which is parallel to and off-set from the axis of said lead screw for normally coacting with said lead screw to maintain said planar members in a common plane.

4,730,609
SURGICAL DRAPE WITH LIMB SECURING STRUCTURE AND METHOD FOR SECURING A SURGICAL SITE
Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401
Filed Feb. 27, 1985, Ser. No. 706,346
Int. Cl.[4] A61B *17/56, 19/08*
U.S. Cl. 128—132 D **8 Claims**

1. An improved drape for covering a patient during a surgical procedure comprising, in combination:

a covering sheet of conformable material having a first opening for receiving a patient's limb or other body extremity and having portions adjoining said first opening for shielding the patient with respect to direct contact and ambient air flow, and said sheet of conformable material having a second opening defining a window for framing a surgical site on a selected body portion of said patient;

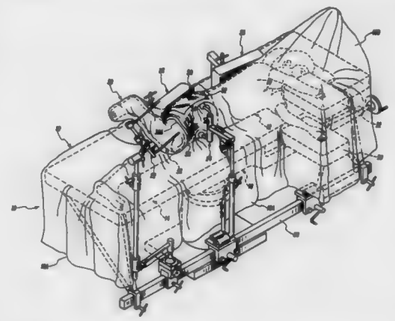
a boot of conformable material attached to said covering sheet about the periphery of said first opening, said boot having a tubular sidewall defining a pocket for receiving a patient's limb adjoining the selected surgical site, said boot pocket being disposed in registration with said first sheet opening and said tubular sidewall being sealed to the covering sheet portions forming the peripheral border of said first opening;

a panel of transparent, flexible material attached to said covering sheet and disposed coextensive with said window defined by said second sheet opening; and,

a tie strap attached to said covering sheet at a location intermediate said boot and said window panel for securing said covering sheet about the patient's limb.

5. A method for maintaining a surgical site on a selected body portion of a patient in sterile condition during a surgical procedure in which a limb of the patient adjoining the selected body portion is manipulated, comprising the steps:

sterilizing the desired surgical site on the selected body portion;



forming a sterile boundary about the sterilized surgical site;

covering the sterilized surgical site with a conformable, transparent panel;

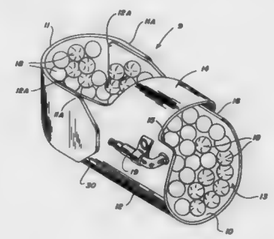
covering the patient's skin surface surrounding the transparent panel with a sterile drape;

aligning the patient's limb with the opening of a sterile boot;

inserting the patient's limb into the sterile boot; and,

securing the surgical drape by tie straps about the patient's limb at a location intermediate the boot and conformable transparent panel.

4,730,610
FOOT AND ELBOW CUSHION DEVICE
Robert H. Graebe, 4 Signal Hill Boulevard, Belleville, Ill. 62223
Continuation-in-part of Ser. No. 730,467, May 6, 1985, abandoned. This application Jan. 21, 1986, Ser. No. 820,211
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—149 **11 Claims**



1. A cushion device for supporting a part of a human body such as a foot or elbow, said cushion device comprising:

(a) flexible sheet material having face and back surfaces and being shaped initially in flat form to provide a major panel, a minor panel smaller than said major panel, and a web joining said major and minor panels;

(b) cushion means carried by said face surface of said major and minor panels, said cushion means consisting of an array of pressure fluid containing cells distributed over the face surfaces of said major and minor panels and being in

spaced apart arrangement and projecting outwardly to different heights from said face surface to present a plurality of individual support surfaces to the human body part, said cells having freedom of movement to adapt the surfaces thereof to move with the motion of the body parts supported thereon;

(c) first cooperating attachment means carried by and between said major and minor panels for securing said minor panel in position to form said major panel into a partial channel configuration; and

(d) second cooperating attachment means carried by said major panel in position for further shaping said major panel into a channel configuration.

4,730,611
MEDICAL DRESSING DEVICE
Patrick J. Lamb, Madison, Conn., assignor to Absorbent Cotton Company, Valley Park, Mo.
Continuation of Ser. No. 902,667, Sep. 2, 1986, abandoned. This application Mar. 6, 1987, Ser. No. 22,863
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **21 Claims**



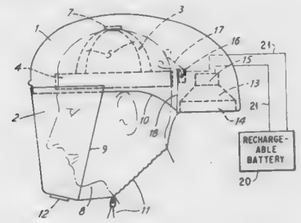
1. A wound management device, comprising:

a polyurethane foamed pad of a selected size and having a hydrophilic side for contact with a patient and a hydrophobic side for facing away from the patient;

a porous, non-woven fibrous sheet of a larger selected size and having an adhesive on one side, said hydrophobic side of said pad being positioned against said adhesive side of said sheet to present said hydrophilic side and said adhesive for use in contact with a wound; and

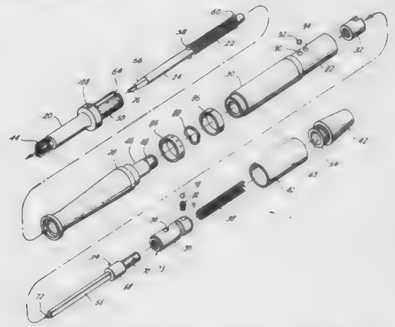
a non-sticking removable cover placed over said adhesive side of said sheet, said cover being removable to expose said pad and said adhesive.

4,730,612
HELMET WITH AUXILIARY, ELECTRICALLY OPERATED SERVICE
Ian T. Dampney, London, England, assignor to Helmets Limited, Hertfordshire, England
Filed Mar. 19, 1986, Ser. No. 842,367
Claims priority, application United Kingdom, Mar. 27, 1985, 8507916
Int. Cl.[4] A62B *18/00*
U.S. Cl. 128—201.24 **9 Claims**



1. A protective helmet comprising a headshell which in use extends over and serves to protect the forehead top and sides of the head of a user, transparent visor means mounted on the headshell and providing protection for the eyes and face of the user, a harness suspended from the headshell and which, during use, is adapted to engage the head of the user therein, an auxiliary electrically operated device, provided on the headshell, a battery power source in electrical connection with the auxiliary device, and switch means mounted within the helmet for operating said auxiliary device by connection thereof to the power source, said switch means mounted proximate to the harness to switch said device into and out of operation as the head of the user is respectively engaged within and disengaged from said harness.

4,730,613
SURGICAL SCALPEL
Walker L. Gordy, Corona, Calif., assignor to Cilco, Inc., Bellevue, Wash.
Filed Jun. 13, 1986, Ser. No. 873,951
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **10 Claims**



1. An adjustable depth surgical scalpel, comprising:

(a) a barrel with first and second portions that are rotatably movable relative to each other and means for preventing the first portion from moving longitudinally relative to the second portion;

(b) a blade holder with one end adapted to hold a blade, the blade holder mounted in the barrel so that the blade is capable of moving longitudinally relative to the first portion of the barrel between extended and retracted positions, and means for preventing the blade holder from rotating relative to the first portion;

(c) blade holder moving means for connecting the blade holder and the second portion and moving the blade holder longitudinally relative to the first portion through rotation of the second portion;

(d) first thread means on one of said blade holder and movement means and first engagement means on the other of said second position blade holder and movement means for causing relatively rapid longitudinal movement of the blade holder relative to the first portion as the second portion is rotated;

(e) lock means for locking said first thread means and first engagement means when the blade holder has traveled a predetermined distance toward the extended position of the blade; and

(f) second thread means on one of said blade holder and movement means and second engagement means on the other of said blade holder and movement means for causing relatively slow longitudinal movement of the blade holder relative to the first portion as the second portion is rotated and the first thread engagement means are locked together.

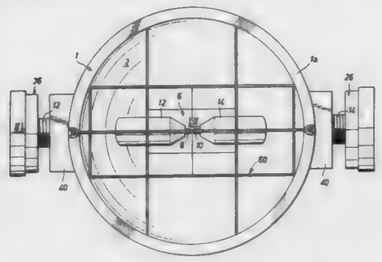
VOL 1088 ISS 3 MR 15 1988 UMI

4,730,614

DEVICE FOR ADVANCING AN ELECTRODE-HOLDER ELEMENT IN AN APPARATUS GENERATING PULSES FOR THE DESTRUCTION OF TARGETS SUCH AS KIDNEY STONES

Bernard Lacruche, Chelles; Jean-Louis Mestas, and Dominique Cathignol, both of Lyons, all of France, assignors to Technomed International, Paris and Institut National de la Sante et de la Recherche Medicale (Inserm), Lyon, both of, France

Filed Jun. 11, 1986, Ser. No. 872,961
Claims priority, application France, Jan. 31, 1986, 86 01380; Apr. 30, 1986, 86 06318
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 24 Claims



10. A device for advancing an electrode-holder element in a pulse-generating apparatus comprising an ellipsoidal reflector having a cavity for reflecting said pulses toward a target; said electrode-holder element being mounted for axial translation in an insulating support fixed on the wall of the ellipsoidal reflector, being formed by a rod disposed in a cylindrical cavity in the insulating support, and having a front part holding an electrode, an intermediate part, and a rear part; and said advancing device comprising:

(a) wheel means mounted on the electrode-holder element and being axially fixed relative to the insulating support, the electrode-holder element being rotatably fixed but axially movable relative to said wheel means and the wheel means comprising:

(i) a central, coaxial through orifice through which one of the intermediate and rear parts of the electrode-holder element passes, and

(ii) rotation means provided on its periphery;

(b) a control member acting on said rotation means for rotating the wheel means and the electrode-holder element, the control member comprising means movable in a plane perpendicular to the axis of translation of the electrode-holder element and passing through the plane of said rotation means for engaging and rotating the wheel means and the electrode-holder element; and

(c) axial translation means on one of the intermediate and rear parts of the electrode-holder element for producing axial translation of the electrode-holder element upon rotation of the wheel means by the control member;

said electrode-holder element being adapted to be dismounted with respect to said advancing device.

4,730,615

STERNUM CLOSUHE DEVICE

Lloyd A. Sutherland, Levittown, N.Y., and Alfred V. Vasconcellos, Edison, N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,394
Int. Cl.[4] A61B *17/08*; B65D *63/00, 77/10*
U.S. Cl. 128—335 9 Claims

1. A sternum closure device comprising:

a head portion;

a flexible spine portion;

and a tail portion;

said head portion being adapted to receive said tail and spine portion, said head portion having locking means to engage said spine portion such that when the spine portion is received in the head portion the spine portion is prevented from backward movement therein;

said spine portion being a biocompatible metal coated with a



biocompatible polymer along a portion of its length, said locking means including means for piercing said biocompatible polymer to lock said closure device, said spine portion having upper and lower edges with serrations located therebetween; and

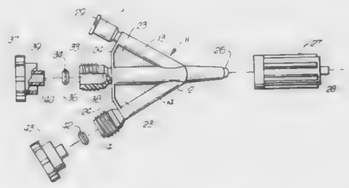
said tail portion having a sharpened needle integral with the spine portion to pierce intercostal tissue and said head portion being adapted for location in the intercostal space.

4,730,616

MULTIPLE PROBE ANGIOPLASTY APPARATUS AND METHOD

Jeffrey S. Frisbie, San Jose, and Wilfred J. Samson, Saratoga, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 522,835, Aug. 12, 1983, Pat. No. 4,582,181. This application Apr. 7, 1986, Ser. No. 848,776
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—348.1 17 Claims



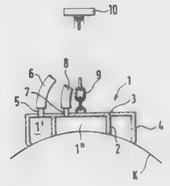
1. In a hemostatic valve: an exit port adapted for connection to a guiding catheter or the like, an instrumentation port in fluid communication with the exit port, a first access port in communication with the exit port and adapted to receive a first elongated element which passes through the guiding catheter, means for sealing the first access port about the first elongated element, a second access port in communication with the exit port and adapted for receiving a second elongated element which passes through the guiding catheter and can be manipulated independently of the first element, and means for sealing the second access port about the second elongated element.

4,730,617

OBSTETRIC VACUUM EXTRACTOR AND METHOD OF USING THE SAME

Siegfried King, Neuried, Fed. Rep. of Germany, assignor to Herrmann Hepp, Munich, Fed. Rep. of Germany, a part interest

Filed Aug. 7, 1986, Ser. No. 894,207
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528397; Oct. 1, 1985, 3535055
Int. Cl.[4] A61B *17/42*
U.S. Cl. 128—352 28 Claims



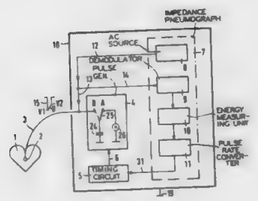
1. An obstetric vacuum extractor for aiding fetal passage through the birth canal has a vessel which comprises an evacuable vessel chamber open to one side, and on which a pulling device is fastened, characterized in that the vessel (1) is divided into at least two vessel chambers (1', 1") open to one side, which can be evacuated separately.

4,730,618

CARDIAC PACER FOR PACING A HUMAN HEART AND PACING METHOD

Anders Lekholm, and David C. Amundson, both of Bromma, Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,585
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 10 Claims



1. A cardiac pacer for pacing a human heart in a patient comprising

(a) means for generating pacing pulses at a predetermined pacing rate;

(b) means for transmitting the pacing pulses to the heart for pacing;

(c) means for making a body activity measurement of the patient;

(d) means for obtaining a body activity signal depending on the body activity measurement, said signal varying according to the body activity level;

(e) means for non-linearly amplifying all of the body activity signal such that signal portions having higher amplitudes are more amplified than signal portions having lower amplitudes;

(f) means for integrating the non-linearly amplified body activity signal over a period of time; and

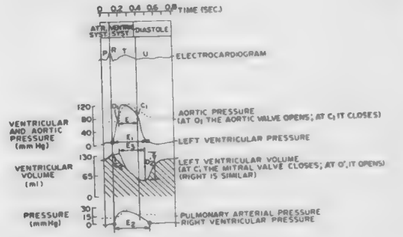
(g) means for varying the predetermined pacing rate dependent on the integrated signal.

4,730,619

APPARATUS AND METHOD FOR ADJUSTING HEART/PACER RATE RELATIVE TO EJECTION TIME TO OBTAIN A REQUIRED CARDIAC OUTPUT

Gerrit Koning, Vries, Netherlands, and Edward A. Schroeppel, Miamar, Fla., assignors to Telectronics, N.V., Antilles, Netherlands

Continuation of Ser. No. 722,574, Apr. 11, 1985, abandoned. This application Oct. 30, 1986, Ser. No. 924,764
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 33 Claims



1. An apparatus for pacing a heart in accordance with the heart/pacer rate needed to produce a required cardiac output while the person is exercising relative to ejection time of the right ventricle and changes thereof, comprising:

a demand pacer for implantation in a human body, said pacer having a pulse generator and control circuitry, which may be realized by a microprocessor, mounted therein;

a pacing lead for implantation in a heart, said lead including a lead body having a tip electrode adapted to engage and supply pacing pulses to a right ventricle of a heart;

sensing means mounted on said lead body for sensing changes in the right ventricle of the heart for determining the ejection time of the right ventricle and changes in ejection time over time in the right ventricle, such sensing including measurements selected from the group consisting of measurements of changes in volume of the right ventricle, measurements of changes in pressure in the right ventricle and measurements of changes in impedance of the fluid in the right ventricle; and

said control circuitry including means for determining ejection time from the sensing of changes in the right ventricle and for relating ejection time and the changes in ejection time in the right ventricle with the required pacing rate and changes in the existing pacing rate needed to supply a desired cardiac output and for causing said pacer to pace the heart at the required rate when the heart is not naturally paced.

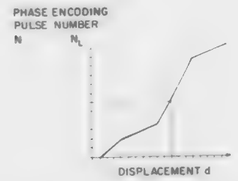
VOL 1088 ISS 3 MR 15 1988 UMI

4,730,620

NUCLEAR MAGNETIC RESONANCE METHOD AND APPARATUS FOR REDUCING MOTION ARTIFACTS

David R. Bailes, London, England, assignor to Picker International, Ltd., Wembley, England

Continuation-in-part of Ser. No. 751,186, Jul. 2, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,668
Claims priority, application United Kingdom, Jul. 6, 1984, 8417290
Int. Cl.[4] A61B 5/05
U.S. Cl. 128—653 10 Claims



7. A nuclear magnetic resonance apparatus for imaging a region of a body in which part of the region is moving with a motion such that its displacement with respect to time is a nonmonotonic function during a time period over which a plurality of NMR data signals, which together define an image, are collected, the apparatus comprising: excitation means arranged to excite nuclear magnetic spins preferentially in said region; encoding means arranged to encode said magnetic spins; data collection means arranged to collect data signals representative of encoded magnetic spins; display means responsive to a plurality of collected data signals to display an image of said region; measuring means arranged to produce an output indicative of the displacement of said moving part of said region; and control means for controlling the encoding means during said time period in dependence on the output of said measuring means so that data signals collected during said time period are collected in an order dependent on said motion such that motion artifacts are reduced.

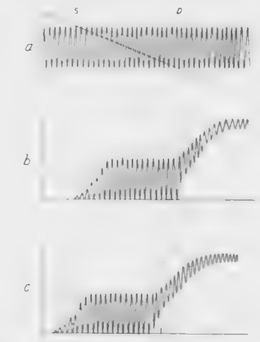
4,730,621

BLOOD PRESSURE MEASUREMENT

Frank D. Stott, Oxford, United Kingdom, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 409,345, Aug. 18, 1982, abandoned. This application Dec. 3, 1985, Ser. No. 804,242
Claims priority, application United Kingdom, Aug. 21, 1981, 8125592
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—667 4 Claims

1. A method of measuring blood pressure, comprising:
variably occluding a body zone by progressive application of external pressure between values above that of systolic pressure and below that of diastolic pressure, such application being effected during a period extending over a plurality of successive cardiovascular pulses;
detecting the maximum and the minimum levels of the blood volume in said zone for each of said pulses;
identifying the one of said maximum levels next preceding the first one of said minimum levels to depart significantly from zero with reduction of said applied pressure;
determining systolic pressure as the value of said external pressure when said maximum levels are about half way between zero and said one maximum level; and



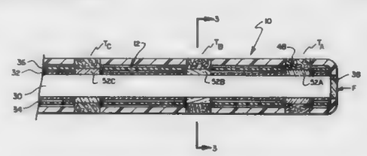
determining diastolic pressure as the value of said external pressure when said minimum levels are about half way between zero and said one maximum level.

4,730,622

PRESSURE AND OXYGEN SATURATION CATHETER

Donald M. Cohen, Miami, Fla., assignor to Cordis Corporation, Dade, Fla.

Continuation-in-part of Ser. No. 881,476, Jul. 1, 1986, Pat. No. 4,703,757, which is a continuation of Ser. No. 671,913, Sep. 16, 1984, abandoned. This application Aug. 12, 1986, Ser. No. 895,898
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—667 15 Claims



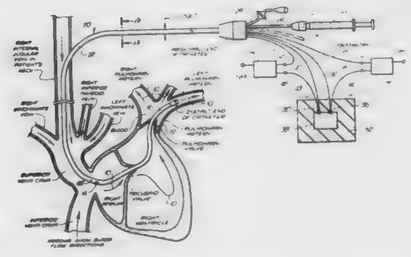
1. Apparatus for use in measuring the degree of oxygen saturation in blood while simultaneously measuring blood pressure and comprising:
an elongated tubular catheter having a proximal end and a distal end with the latter being adapted to be inserted into a blood vessel within a body;
an elongated optical fiber member carried within said catheter and extending throughout the length thereof, said optical fiber member having a light transmitting core coaxially surrounded by cladding means essentially throughout its length, said core being uncladded for at least a portion of its length proximate to the distal end thereof;
filter means located at the distal end of said catheter and positioned forwardly of the distal end of said optical fiber member to receive light therefrom, said filter means being transmissive to light greater than that of a wavelength W, in the red and infrared wavelength region, and reflecting light at wavelengths less than wavelength W so that light of longer wavelengths may be transmitted through said filter means into blood containing both oxygenated and unoxygenated blood and be reflected therefrom back into the distal end of said catheter; and
said catheter having at least one side port located adjacent the distal end thereof while proximal of said filter means and in registry with a said uncladded portion of said core, pressure transducer means located in said side port including a flexible transducer member having a pitted surface facing said uncladded core portion and making surface area contact therewith such that the contacting surface area varies with pressure applied to said transducer member acting transversely thereof, said transducer member being constructed of material exhibiting a greater index of refraction than said cladding means so that the intensity of light passing through said core proximate to said transducer means is modulated in its intensity as a function of said pressure.

4,730,623

CARDIAC OUTPUT ESTIMATION METHOD AND APPARATUS

Arnold St. J. Lee, 1033 Hilts Ave., Los Angeles, Calif. 90024

Filed Jun. 14, 1985, Ser. No. 744,757
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—692 14 Claims



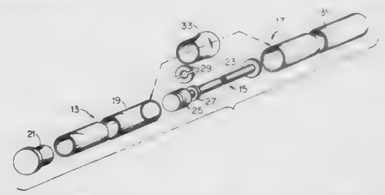
1. An apparatus for estimating the flow rate of blood in a bloodstream comprising:
means for injecting into such bloodstream a quantity of fluid whose temperature is distinctly different from that of the blood;
means, having a reference thermocouple, for measuring changes in the temperature of the blood at a point downstream from the injection point; and
a reference heat sink which is not temperature-controlled, thermally connected to the reference thermocouple of the means for measuring changes;
the change-measuring means including:
a sensing thermocouple disposed at the downstream point,
a reference thermocouple disposed to substantially assume the temperature of the reference heat sink, and
means for measuring the voltage produced by the sensing and reference thermocouples, operating as an opposed thermocouple pair, while the injected fluid passes the downstream point; and
electronic means responsive to the measured voltage for determining the blood temperature changes sensed by the sensing thermocouple independently of the temperature of the reference thermocouple considered singly wherein said electronic means compensates for changes in the temperature of the heat sink while the injected fluid passes the downstream point.

4,730,624

DEVICE AND METHOD FOR DRAWING A BLOOD SAMPLE

John R. Waters, Towson, Md., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 284,148, Jul. 16, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,332
Int. Cl.[4] A61B 5/14
U.S. Cl. 128—764 2 Claims



1. A blood collection and transport system comprising:
(a) a preevacuated sample collection and transport container having a first forward open end and a second rearward open end;
(b) a first self-sealing puncturable stopper affixed to said first end of said container, said stopper being penetrable by one end of a double ended needle to provide fluid communication between a passageway through the needle and the interior of the container;
(c) a second sealing stopper for said second end of said container;
(d) a piston assembly comprising a piston rod affixed to said second sealing stopper for said second end of said container, said second stopper being slidable within said sample collection container upon application of force to said piston rod;
(e) a collet affixed to said piston rod and a retaining clip removably affixed to said piston rod and positioned between said collet and the end of said collection container whereby said collet bears upon said retaining clip, said collet and retaining clip restraining said second stopper from movement into said preevacuated sample collection container until a sample collected therein is to be discharged; and
(f) a protective cover removably fitted over said piston rod and a removable seal fastened around said protective cover to prevent removal of said protective cover until actuation of said piston rod is required.

4,730,625

POSTURE MONITORING SYSTEM

Gregory A. Fraser, Dollard des Ormeaux, and Simon Raab, Lorraine, both of Canada, assignors to Faro Medical Technologies Inc., Montreal, Canada

Filed Dec. 15, 1986, Ser. No. 941,695
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—781 6 Claims



1. A posture monitoring system for monitoring the posture of a subject, comprising:
an article of wearing apparel to be worn on the upper body

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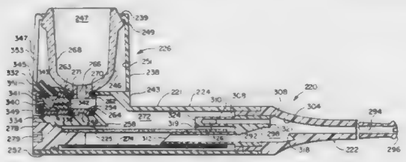
of the subject including a portion for covering the back of the subject;
a plurality of sensor means for sensing changes in posture of said subject, said sensor means including means for providing electrical signals proportional to the degree of change in posture;
first means on said portion for removably mounting said sensor means;
electronic means for analyzing said electrical signals and for providing an output, which can be sensed by said subject, when the posture of the subject deviates from a pre-set postural position by a predetermined amount; and
second means for removably mounting said electronic means on said article of wearing apparel.

4,730,626

DRY BOWL SMOKER'S PIPE

Edward H. Calkins, P.O. Box 186, Gaylord, Mich. 49735

Continuation-in-part of Ser. No. 331,316, Dec. 16, 1981, Pat. No. 4,577,645, which is a continuation of Ser. No. 213,725, Dec. 5, 1980, Pat. No. 4,362,169. This application Mar. 25, 1986, Ser. No. 843,971
Int. Cl.[4] A24F *5/00, 9/00*
U.S. Cl. 131—196 **10 Claims**



1. A smoker's pipe comprising
an elongate hollow shank having a forward and a rearward end;
a bowl assembly connected to said forward end of said shank and in fluid communication therewith;
an elongate bit having a bore therethrough and removably connected to said rearwad end of said shank in longitudinal alignment and in fluid communication therewith, the bowl assembly, shank and bit defining a fluid path through said pipe;
flow separation means in said pipe for dividing said fluid path into a gaseous smoke path and a liquid path, said separation means comprising a smoke conduit which forms part of said smoke path and a liquid conduit which forms part of said liquid path, said liquid and smoke conduits having shank portions located in said shank and having bit portions located in said bit; and
means for rotatably connecting said bit to said rearward end of said shank, said connecting means including first means for sealingly connecting said smoke conduit bit and shank portions together and second means for sealingly connecting said liquid conduit bit and shank portions together.

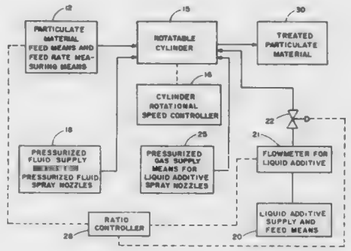
4,730,627

METHOD AND APPARATUS FOR TREATING PARTICULATE MATERIAL

Walter E. Burcham, Jr., Yadkinville, and Wilbur J. French, Jr., Walkertown, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 28, 1986, Ser. No. 936,050
Int. Cl.[4] A24B *3/06, 3/12*
U.S. Cl. 131—305 **15 Claims**

1. Improved apparatus for treating particulate material with a liquid additive comprising in combination
(a) an elongated rotatable cylinder whose longitudinal axis is disposed in a substantially horizontal position and having an entrance end for introducing particulate material into the cylinder and an exit end for discharging treated particulate material, said cylinder also having an inner wall that has associated therewith a plurality of flights designed to enhance the lifting action exerted on the particulate material as it is carried upwardly to a predetermined point by the portion of the inner wall that is rising during rotation the of cylinder,
(b) means for rotating said elongated rotatable cylinder at a speed that is sufficient to cause said particulate material to be carried upwardly to said predetermined point,
(c) a group of stationary nozzles arranged adjacent to the inner wall of the cylinder with the nozzles in said group of stationary nozzles extending in a longitudinal direction along a substantial length of the inner wall of the cylinder and being oriented so that fluid streams emerging from the nozzles impinge obliquely against a portion of the inner wall that is rising during rotation of the cylinder at or above said predetermined point and in a direction that is substantially opposite to the direction of movement of said



inner wall thereby causing any particulate material adhering to the rising inner wall to be dislodged therefrom, said fluid streams emerging from the nozzles also serving to augment the agitation action resulting from the gravitational effect on the particulate material that has temporarily separated from the rising inner wall,
(d) a plurality of liquid additive spray nozzles positioned within the cylinder at a location that permits liquid additive supplied to said plurality of nozzles to be sprayed onto the particulate material as it is subjected to said agitation action,
(e) means for supplying a pressurized fluid to said group of stationary nozzles,
(f) means for monitoring the feed rate of particulate material introduced into the entrance end of the cylinder and
(g) means for supplying quantities of liquid additive to said plurality of liquid additive spray nozzles which are regulated with respect to said feed rate of the particulate material into the entrance end of the cylinder.

4,730,628

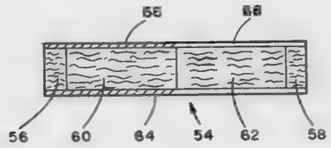
CIGARETTE RODS HAVING SEGMENTED SECTIONS

David E. Townsend, and Thomas A. Perfetti, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 21, 1986, Ser. No. 887,463
Int. Cl.[4] A24D *1/00;* **A24B** *15/00*
U.S. Cl. 131—364 **38 Claims**

1. A rod suitable for the manufacture of a cigarette, said rod comprising filler material contained in wrapping material and having the two ends thereof open to expose the filler material, wherein
(A) said filler material forms at least four segments within said rod and each segment is defined by its density, wherein
(i) the first segment is disposed at the extreme end of the rod which is to be lit;

(ii) the second segment is disposed at the end of the rod opposite the end which is to be lit;
(iii) the third segment is disposed adjacent to the first segment; and
(iv) the fourth segment is disposed adjacent to the second segment;
wherein each of the third segment and the fourth segment has a substantially uniform density in the region along the longitudinal axis of the rod and across the rod in a plane perpendicular to the longitudinal axis thereof, and the density of the fourth



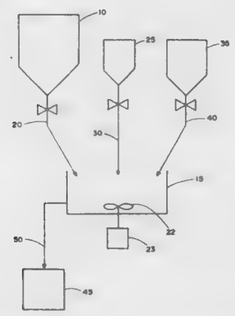
segment is less than that of the third segment such that the density differential therebetween is at least about 15 percent; and
(B) said wrapping material has
(i) a relatively high burn rate capability at least in a substantial region thereof which overlies the third segment, and
(ii) a relatively low burn rate capability at least in a substantial region thereof which overlies the fourth segment.

4,730,629

PROCESS FOR PROVIDING TOBACCO EXTENDER MATERIAL

William H. Graves, Jr., Pfafftown, and Gerard E. Leonard, Kernersville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Mar. 17, 1986, Ser. No. 840,260
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—369 **20 Claims**



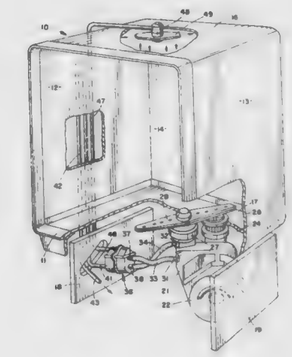
1. A process for providing tobacco extender in sheet-like form, said process comprising the steps in combination
(a) providing filler material in the form of tobacco material and/or carbonized material, and
(b) providing in essentially dry, substantially non-binding form binding agent which is capable of being activated, and
(c) contacting the filler material and the binding agent, and then
(d) subjecting the filler material and binding agent to high shear agitation (i) in the presence of sufficient moisture to provide activation of the binding agent but in the presence of a moisture content of less than about 30 weight percent based on the total weight of moisture and filler material, and (ii) for a period of time sufficient to activate the binding agent, and then
(e) forming sheet-like tobacco extender from the filler material so subjected to high shear agitation.

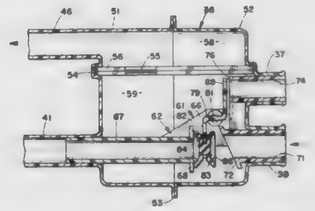
4,730,630

DISHWASHER WITH POWER FILTERED RINSE

Paul H. Ranft, Columbus, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Oct. 27, 1986, Ser. No. 923,413
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—111 **11 Claims**





1. A dishwasher having a tub defining a washing chamber having a bottom and a top, a sump at the bottom of said washing chamber, a first spray arm at the bottom of said washing chamber above said sump, a second spray arm at the top of said washing chamber, a pump mounted below said sump and having an inlet connected to said sump, said pump having a first outlet connected to said first spray arm, a filter housing having an interior and having an inlet and first and second outlets, a filter screen in said filter housing, said filter screen dividing the interior of said filter housing into first and second filter chambers, said first filter outlet being connected to said first filter chamber, conduit means connecting said first filter outlet to said second spray arm, said filter inlet and said second filter outlet being connected to said second filter chamber, said pump having a second outlet connected to said filter inlet, said second filter outlet being connected to an external drain, said second filter chamber having a second filter inlet and said pump having a third outlet in parallel with said first pump outlet and connected to said second filter inlet so that said fluid can flow to said second spray arm through said filter screen from both said second and said third pump outlets.

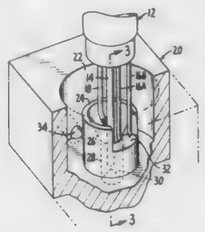
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4,730,631

PROBE WASH STATION

Henry L. Schwartz, Los Gatos, Calif., assignor to Sequoia-Turner Corporation, Mountain View, Calif.

Filed Jul. 22, 1985, Ser. No. 757,742
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—155 **7 Claims**



1. For use with an apparatus for performing fluid analyses, said apparatus having a probe assembly that includes a primary probe and at least one auxiliary probe juxtaposed to said primary probe, a probe washing station for washing said primary probe and said auxiliary probe with a washing fluid, comprising

a washing reservoir that comprises a frustoconical top portion and a cylindrical lower portion, said cylindrical lower portion being adapted to receive said primary probe and to retain a volume of washing fluid in which to partially immerse the primary probe; and

a washing platform that is adapted to assist in the washing of said auxiliary probe, wherein

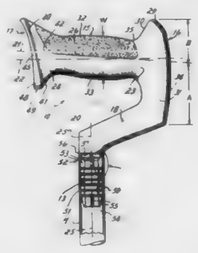
the cylindrical lower portion of the reservoir includes a conical member positioned at the base of said lower portion with its apex proximate to said primary probe in order to prevent splashing of said washing fluid that is exiting said primary probe.

4,730,632

CANE WITH HANDLE FEATURING GRIPPING AIDS

Ronald L. Mace, Raleigh, N.C., assignor to Jung Corporation, Cincinnati, Ohio

Filed Apr. 17, 1986, Ser. No. 853,131
Int. Cl.[4] A45B *9/02*; B62K *21/26*
U.S. Cl. 135—76 **6 Claims**



1. A cane comprising

a cane shaft, said cane shaft having a longitudinal axis oriented vertically upright during normal use of said cane, and

a one piece molded handle connected to said cane shaft, said handle having

a hand grip of a generally egg-shaped configuration when viewed from the top, as well as from the side, to provide a broader cross-sectional area in the area of the middle of a user's hand in order to accommodate arthritic hands of the elderly, said hand grip having a roughened area on a top surface when said can shaft is vertically upright to increase gripping friction with the user's hand, said hand grip having an axis oriented at about 5° relative to a line noraml to said can shaft's axis, and said hand grip having opposed ends substantially equidistantly spaced on opposite sides of said cane shaft's axis,

upstanding shoulders at said hand grip's opposed ends, said shoulders functioning to prevent a user's hand from slipping off said handle during use,

an index finger support rib oriented generally vertical to said hand grip's axis on each side of said hand grip at one of said handle's ends to enhance control of said can during during use, said index finger supports extending downwardly from said hand grip's axis a distance about one and one-half times the width of said hand grip when said cane shaft is vertically upright, said index finger support ribs each comprising a concave arcuate rib at the outer edge of said handle's one end, each finger support being curved inwardly from said rib when viewed from a top view to provide an index finger support area on both sides of said cane handle, said shoulder and vertical index finger support ribs being substantially symmetrical relative to said hand grip's longitudinal enter plane so said handle may be gripped equally conveniently by a user's left hand or right hand, and

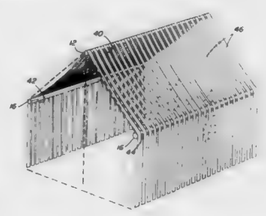
a brace connecting said support ribs to said can shaft so that said handle has an overall generally C-shaped configuration, said cane shaft's top end thereby being connected to one end of said hand grip and not to the middle thereof so a user's hand does not interfere with said cane shaft when the user is gripping said cane, and said brace being oriented so that the center of said hand grip is located approximately on said cane shaft's longitudinal axis so as to tend to ensure that downward pressure of a user's hand on said hand grip is generally co-axial with said cane shaft's axis when the shaft is vertically oriented.

4,730,633

STRIPFLEX

George Greenbaum, 6770 E. Carondelet Dr. #218, Tucson, Ariz. 85710

Filed Dec. 17, 1986, Ser. No. 943,311
Int. Cl.[4] A01G *9/00*
U.S. Cl. 135—93 **21 Claims**



1. A structure for defining a controlled environment which comprises:

a skeletal framework formed of pipe-like members, at least some of said members having a plurality of disk-like ribs secured therein, the ribs secured within the pipe in spaced apart relationship by adhesives, the outer edges of the ribs having grooves and the adhesives are received in the grooves; and

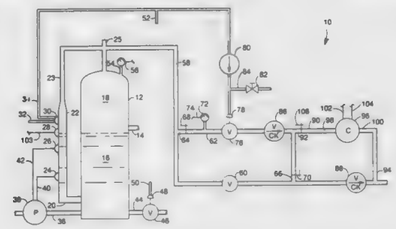
tiers secured to the framework to define the enclosed environment, said tiers each comprising a saddle secured to some of said members, ribbons secured to the saddle and extending downwardly, the ribbons extending from one end of the saddle to the other, the ribbons configured to allow moisture and air therethrough, to control radiation entering the controlled environment and further said ribbons being treated to inhibit the entry of deleterious substances into the defined environment.

4,730,634

METHOD AND APPARATUS FOR CONTROLLING PRODUCTION OF FLUIDS FROM A WELL

Clifton R. Russell, Odessa, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 19, 1986, Ser. No. 876,311
Int. Cl.[4] B01D *19/00*
U.S. Cl. 137—1 **18 Claims**



1. A method for controlling production of fluids from a well of the type having produced fluids introduced into a vessel in which the fluids separate into gas and liquid phases, said vessel having a gas conduit for transporting gas therefrom and a liquid conduit for transporting liquid therefrom, said gas conduit having a pressure control valve therein for controlling gas pressure in said vessel, said method comprising the steps of:

providing a bypass conduit having a first end connected upstream from said pressure control valve and a second end connected downstream from said pressure control valve, said bypass conduit having a bypass valve therein;

monitoring the level of liquid in said vessel;

maintaining said bypass valve in an open condition for so long as said liquid is below a preselected level; and

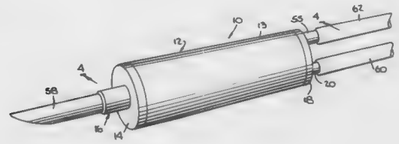
closing said bypass valve when said liquid rises above said preselected level.

4,730,635

VALVE AND METHOD

Harry A. Linden, Santa Barbara, Calif., assignor to Hall Surgical, Carpinteria, Calif.

Filed Aug. 19, 1987, Ser. No. 87,140
Int. Cl.[4] F16K *31/126*; F16L *55/10*
U.S. Cl. 137—1 **17 Claims**



1. A valve comprising

a. a housing having a first inlet means for receiving flow of a first fluid,

b. a first outlet means for directing the flow of said first fluid from said housing,

c. a fluid pressure responsive valve means provided between said first inlet means and said first outlet means, said pressure responsive valve means including a valve opening, a valve seat and a valve seal member for sealing and unsealing said valve opening, said valve means having a closed position wherein said valve seal member seals said valve opening to prevent the flow of said first fluid from said first inlet means to said first outlet means, said valve means having an open condition wherein said valve member does not seal said valve opening thereby permitting said first fluid to flow from said first inlet means through said valve opening to said first outlet means, and

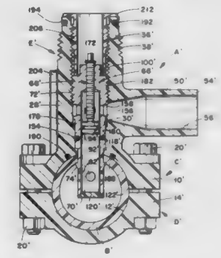
d. pressure receiving means for receiving a second fluid and cooperable with said valve means for deforming the valve means inwardly and against said valve seal member so as to move said valve seal member away from said valve seat and define a space between said valve seat and said valve seal member and for unsealing the valve opening permitting passage of said first fluid from said inlet to said outlet in response to a predetermined pressurized condition of said pressure receiving means, the pressure receiving means having a depressurized condition which moves the valve means outwardly and the valve member against the valve seat and causes sealing of the valve opening.

4,730,636

VALVE AND TAPPING TEE APPARATUS AND METHOD

Frank R. Volgstadt, Madison; Albert H. Reschke, Chagrin Falls, and Ralph L. Hart, Madison, all of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Nov. 19, 1986, Ser. No. 932,323
Int. Cl.[4] B23B *41/08*; F16L *41/04*; F16K *43/00*
U.S. Cl. 137—15 **33 Claims**



1. An apparatus adapted for tapping an associated tubular member comprising:

a support means adapted for engaging the exterior surface of an associated tubular member;

a branch cooperatively associated with said support means, and having an an interior passage; and,

a cutting tool axially movable in said branch interior passage, said cutting tool having:

(a) a first generally cylindrical member having a bore extending therethrough and an annular cutting surface at one end adapted for selective cutting passage forming an opening through the sidewall of the associated tubular member, a conical flange peripherally disposed on said first member at an area thereof axially spaced a predetermined distance from said cutting surface, said conical flange adapted to spread the opening as the cutting tool advances through the sidewall of the tubular member, an inlet extending through a sidewall of said first member into communication with said bore at an area thereof between said annular cutting surface and said conical flange, a land disposed between said conical flange and the other end of said first member, said land adapted to sealingly engage the sidewall at the opening and an exteriorly threaded portion disposed at said other end said land being separated from said conical flange by a first shoulder, said shoulder passing through the opening and adapted to abuttingly engage the interior of the associated tubular member;

(b) a second member having an end portion adapted to be

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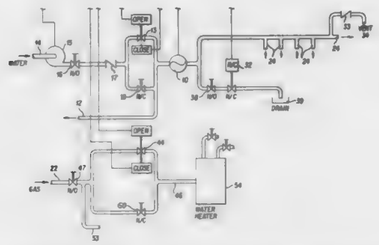
received in said first member central bore, said second member adapted for selective movement in said first member bore to open and close said inlet.

4,730,637

FLUID LOSS, DAMAGE PREVENTION AND CONTROL SYSTEM

F. Grove White, P.O. Box 4, Midlothian, Va. 23113

Filed Feb. 20, 1987, Ser. No. 16,866
Int. Cl.[4] E03B *7/12*; F16L *55/00*
U.S. Cl. 137—62 **8 Claims**



1. A fluid loss and damage control system for a fluid distribution system comprising:

(a) system control means for receiving input data on fluid flow and pipe temperatures in the fluid distribution system, processing said data and providing output control signals to valves in the distribution system responsive to programmed limit conditions, said control means comprising a programmable controller settable for operating various parameter conditions simultaneously or independently,

(b) flow sensing means in the fluid supply line for sensing flow in the line and providing an input signal to the controller proportional to the rate of flow in the line for controlling fluid flow through the distribution system;

(c) temperature sensing means for sensing the temperature at points along the fluid distribution system of the facility providing a signal to the controller when the temperature at a point in the system approaches freezing;

(d) fluid supply control means for controlling the fluid supply to the distribution system, said fluid supply control means located adjacent to the main supply shut-off valve and said fluid supply control means operated by a signal provided by the controller:

(e) auxiliary control means for controlling a gas distribution system said auxiliary control means being controlled by signals provided by the controller, said auxiliary control means including a gas heater control means;

(f) drain means for draining the distribution system, said drain means installed at desired points of the distribution system and controlled by signals provided by the controller;

(g) means for providing an audible and visual alarm when the system controller senses an out-of-limit condition of flow or temperature in the fluid distribution system, so that when the control means receives a flow signal from the flow sensing means for a period which exceeds a programmed limit it transmits a signal operating said fluid supply control means to a closed position and said heater control means to an off position for shutting off the gas supply to the gas distribution system, and when the system control means receives a signal from the temperature sensing means which indicates that a freezing condition is present it operates said fluid supply control means to a closed position for shutting off the fluid flow to the distribution system and simultaneously operates said heater control means to an off position for shutting off the gas supply to the gas distribution system and said drain means to an operative position for allowing the system to drain and,

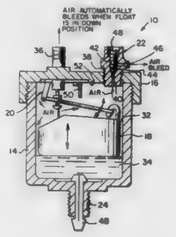
(h) manual over-ride means for maintaining said fluid and gas distribution systems and drain means operative in the event of electrical power failure.

4,730,638

COMBINATION AUTOMATIC AND MANUAL BLEED VALVE

Carl Hazelton, 23 MacDonald Ave., Amityville, N.Y. 11701

Filed Feb. 17, 1987, Ser. No. 15,809
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—202 **1 Claim**



1. A combination automatic and manual bleed valve for a hot water heating system comprising:

(a) a housing having an externally threaded inlet port to be connected to said system and a chamber for holding water therein;

(b) a cover threadably connected to top of said housing so that access to within said valve can be accomplished while said valve is still connected to said system;

(c) a float within said housing to sit upon top of said water;

(d) an automatic air bleed fitting having an outlet port, said automatic bleed fitting mounted on said cover and mechanically connected to said float so that when said water is low and said float is in a down position said automatic air bleed fitting will open to allow air within said chamber to exit through said outlet port;

(e) means for manually releasing said air from said chamber of said housing when said automatic air bleed fitting fails to operate, said manually releasing menas is a manual air bleed fitting including an externally threaded sleeve having an internal bore with a threaded portion, a seat therein and a transverse outlet port extending from said threaded portion of said internal bore, said sleeve being threaded into said cover, and a bleed screw threaded into said threaded portion of said internal bore to engage with said seat so that when said screw is manually loosened away from said seat, said air from within said chamber of said housing will be released through said transverse outlet port;

(f) a tongue member mounted securely within said inlet port of said housing to keep said inlet port clear of any sediment within said hot water heating system from entering said chamber of said housing and clogging said valve; and

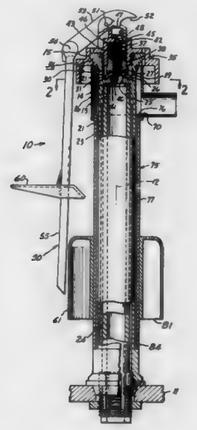
(g) a dividing strip mounted to underside of said cover between said automatic air bleed fitting and said manual air bleed fitting so as to make said automatic air bleed fitting air bound when said water is high thus preventing corrosion to said automatic air bleed fitting.

4,730,639

TANK VALVE WITH SHUTTER TYPE DIVERTER

Bruce A. Antunez, 1143 Indian Springs Dr., Glendora, Calif. 91740

Filed Sep. 26, 1986, Ser. No. 912,579
Int. Cl.[4] F16K *31/26, 47/08*
U.S. Cl. 137—413 **4 Claims**



1. A two-function tank valve for both refilling a water storage tank and for providing a stream of water for another purpose during a drain and refill cycle for the tank, said valve comprising:

a supply conduit adapted to be mounted to the tank and having an outer wall which is substantially vertically oriented when the valve is installed in said tank, said supply conduit having an outlet port;

valving means mounted to said supply conduit comprising a valve seat surrounding said outlet port and a valve seal movable against said valve seat to close the outlet port and to move away from it to open said outlet port to flow;

a discharge tube mounted to said supply conduit and surrounding said outer wall at an upper region thereof, said discharge tube being closed at its top and open at its bottom, leaving a spacing between said supply conduit and itself receptive of water passed by said valving means, and discharging water downwardly through said spacing;

a diversion port opening into said spacing through said discharge tube, adapted to be connected to conduitry for said another purpose;

shutter means adapted to slide axially along the outer wall of said supply conduit to occlude varying proportions of said diversion port at least a portion of, said shutter means being disposed in said spacing and axially movable therein for controlling the stream of water to said diversion port;

float means responsive to water level changes in the tank and connected to said shutter means adjustably to vary said occlusion of said diversion port by said axial movement, which is a function of the water level within the tank, at least within an upper range of water levels; and

water level responsive means for causing said valving means to open to flow when the water level in the tank is below a pre-selected upper level, and to close to flow when the water level is at or above said pre-selected upper level.

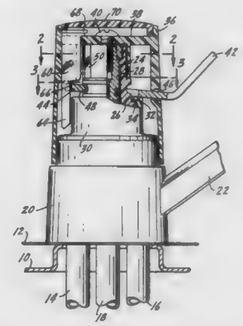
4. A tank valve according to claim 1 in which said valving means is actuated by a differential pressure.

4,730,640

HANDLE CONSTRUCTION FOR MIXING VALVE

Alfred M. Moen, Destin, Fla., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 22, 1986, Ser. No. 944,009
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—625.17 **3 Claims**



1. A hot and cold water mixing valve including a sleeve formed and adapted to fit within a valve fixture such as a kitchen faucet, lavatory faucet or shower/tub control, and a rotatable and reciprocal stem within the sleeve,

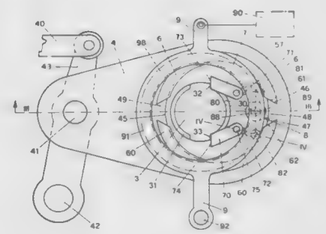
handle means for said mixing valve including a cap attached to said stem and a lever connected to said sleeve, an opening in said cap, with said lever extending through said opening, a partition in said cap adjacent the exterior end therof, an opening in said partition, an opening in said lever in alignment with said partition opening, a removable locating key within said cap and positioned in the aligned partition and lever opening to thereby interlock said cap and lever, said locating key having finger gripping means thereon extending in spaced relation to said partition for ease in removal of said locating key and thereby facilitating the assembly and disassembly of said cap and lever.

4,730,641

ROTATIONAL DOBBY

Rudolf Schwarz, Horgen-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Dec. 12, 1985, Ser. No. 808,411
Claims priority, application European Pat. Off., Dec. 18, 1984, 84115669.8
Int. Cl.[4] D03C *1/00*; G05G *1/00*; F16D *11/06*
U.S. Cl. 139—76 **16 Claims**



15. A rotational dobby, comprising a rotatably supported drive shaft having a groove therein, an eccentric ring which is of circular shape and has therethrough an eccentrically positioned opening which freely rotatably receives said drive shaft therethrough, a connecting rod having a circular opening

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therethrough in which said eccentric ring is freely rotatably supported, means for operatively coupling said connecting rod to a heddle frame of a weaving machine, two pawls which are each supported on said eccentric ring for pivotal movement about a respective pivot axis extending substantially parallel to said drive shaft, and a toggle joint which includes two plate members having first ends coupled to each other by a swivel axle extending substantially parallel to said drive shaft, wherein a second end of each said plate member remote from said first end thereof is pivotally coupled to a respective said pawl at a location spaced radially from the pivot axis of such pawl, including means for effecting movement of said swivel axle of said toggle joint in directions approximately radially of said drive shaft between a first position in which said plate members extend outwardly from said swivel axle in diametrically opposite directions and a second position in which said plate members form a angle with respect to each other, including means for preventing rotation of said eccentric ring when said swivel axle is in said second position, wherein each said pawl has an engaging end thereon at a location spaced radially outwardly from the pivot axis thereof, wherein as the swivel axle of the toggle joint is moved from its second to its first position said plate members effect pivotal movement of said pawls in a direction causing said engaging end of each said pawl to move from a location spaced from said drive shaft to a position engaging said groove in said drive shaft, and wherein said engaging ends of said pawls can simultaneously engage said groove in said drive shaft at angularly spaced locations therein.

4,730,642

SHAFT CONTROL MECHANISM OF A WEAVING MACHINE

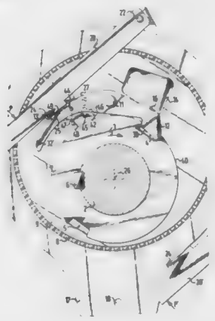
Paul Surkamp, Kempen, and Ferdinand Sziics, Willich, both of Fed. Rep. of Germany, assignors to Johann Kaiser GmbH & Co., KG, Bayreuth, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 892,597

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528504

Int. Cl.⁴ D03C *1/00*

U.S. Cl. 139—76 **3 Claims**



1. Shaft control mechanism for controlling a shaft of a weaving machine according to a pattern, comprising a connecting rod operatively connected to the shaft, a drive element intermittently rotating and standing still in a dead center position, an eccentric disc rotatably supported on said connecting rod, a coupling element connected to said eccentric disc, means for moving said coupling element into a recess formed in said drive element interconnecting said drive element and said eccentric disc in a coupled position, a controllable locking element securing said coupling element against movement out of said recess into an uncoupled position until said drive element reaches said dead center position along with said eccentric disc, at least one control element controlling said locking element and transmitting an external force to said coupling element according to the pattern while said drive element and said eccentric disc are rotating, said external force being required to move said coupling element into said uncoupled position when said dead center position of said drive element and said eccentric disc are reached, said coupling element having a tooth gap formed therein, said control element having a shifting tooth formed thereon matching said tooth gap and being movable into said tooth gap only when said eccentric disc is in said dead center position, said locking element including a control extension projecting into said tooth gap and being moved by said shifting tooth as said shifting tooth enters said tooth gap for releasing said locking element.

4,730,643

MISPICK REMOVING DEVICE FOR A SHUTTLELESS LOOM

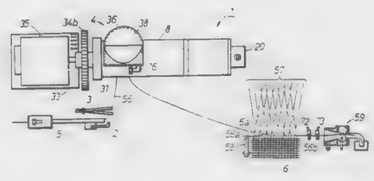
Yasuyuki Tamatani, Ishikawa, Japan, assignor to Tsudakoma Corp., Kanazawa, Japan

Filed Dec. 8, 1986, Ser. No. 939,381

Claims priority, application Japan, Mar. 11, 1986, 61-051479

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—116 **7 Claims**



1. A mispick removing apparatus for a shuttleless loom having a picking nozzle which picks weft yarns along a picking path into a shed formed by warp threads of a fabric, comprising:

selectively actuable picking-side mispick removing means disposed on the same side of the fabric as said picking nozzle;

selectively actuable receiving-side mispick removing means disposed on a side of the fabric opposite from said picking nozzle; and

mispick detecting means responsive to the presence of a mispicked yarn in the shed for actuating at least one of said picking-side and receiving-side removing means; wherein said mispick detecting means actuates both said picking-side mispick removing means and said receiving-side mispick removing means in response to a mispicked yarn which is broken; and wherein said mispick detecting means actuates only said picking-side mispick removing means in response to a mispicked yarn which is unbroken.

4,730,644

LOOM

Erwin Schwarz, Hindwil, Switzerland, assignor to Sulzer Brothers Limited, Switzerland

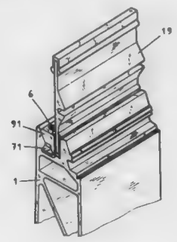
Filed Dec. 8, 1986, Ser. No. 939,034

Claims priority, application Switzerland, Dec. 17, 1985, 05368/85

Int. Cl.⁴ D03D *49/60*

U.S. Cl. 139—188 R **3 Claims**

1. A loom comprising a sley having an upwardly opening elongated channel in the top face thereof extending along the length of the sley, the front of said channel being formed by a substantially vertical front wall, the bottom portion of said channel being formed by a groove having a forward and upwardly inclined rear wall, and the top portion of said channel being formed by a trough having a forwardly and downwardly inclined rear wall intersecting said rear wall of said groove; a reed unit having a vertically extending lower portion extending into said channel in abutting relation to said front wall; a first clamping member adapted to be inserted downwardly into said groove and having an upwardly and forwardly inclined surface for cooperation with said rear wall of said groove; a second clamping member insertable downwardly into said



trough, having a rear surface bearing against said rear wall of said trough, and having a front surface bearing against the rear of said lower portion of said reed unit; and screw means for drawing said first and second clamping members toward one another to hold said clamping members and said lower portion of said reed unit in place in said channel.

4,730,645

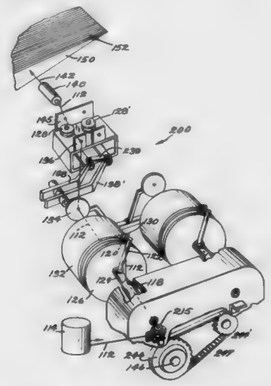
QUICK CHANGE KIT FOR FLUID JET LOOM

Jody Baird; James A. Eastridge, and Herman Timbs, all of Mountain City, Tenn., assignors to Burlington Industries, Inc.

Filed Feb. 4, 1987, Ser. No. 10,694

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **14 Claims**



1. A quick change kit for modifying a pick and pick unit of a fluid jet for weaving machines, said pick and pick unit having a pair of yarn inlets, a pair of drum means for holding measured amounts of yarn, a pair of means for winding the measured amounts of yarn on the drum means, a pair of means for gripping the yarn, means for actuating each gripping means at a given rate, and fluid jet nozzle means for alternately projecting the measured amounts of yarn across the loom, wherein the kit comprises:

a first gear means adapted to be driven by the loom;

a second gear means, adapted to be driven by the first gear means, for driving the pick and pick unit;

said first and second gear means having a respective two-to-one tooth ratio;

a guide means, adapted to be mounted at one of the yarn inlets, for permitting entry of the yarn into the one yarn inlet with reduced friction; and

means for joining each of the actuating means to cause them to move together so that one of the gripping means is actuated by each of the actuating means;

whereby the pick and pick unit can be quickly changed to function as a single pick unit.

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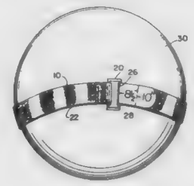
METHOD FOR CONTROLLING PROPER INFLATION OF ATHLETIC BALLS

Barry H. Traub, Dunwoody, Ga., assignor to Select Service & Supply Co., Inc., Atlanta, Ga.

Filed Aug. 19, 1986, Ser. No. 897,839

Int. Cl.⁴ A63B *41/12*

U.S. Cl. 141—4 **8 Claims**



1. A method for obtaining proper inflation of an inflatable athletic ball having predetermined dimensions at proper inflation, using a flexible strap having a length greater than the circumference of the object at proper inflation and having securing means for securing the ends of the strap to one another so as to form a continuous configuration the circumference of which can be set to any of a plurality of predetermined lengths corresponding to the dimensions at proper inflation of a plurality of different inflatable balls, comprising:

setting the securing means of the strap to a circumference corresponding to the predetermined dimension at proper inflation of the ball to be inflated;

placing the strap around the ball to be inflated;

inflating the ball until further inflation is limited by the strap; and

discontinuing inflation and removing the ball from the strap.

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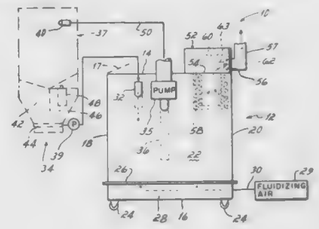
POWDER FEEDER APPARATUS

Douglas C. Mulder, Wellington, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 8, 1986, Ser. No. 939,090

Int. Cl.⁴ B65B *1/04, 5/02*

U.S. Cl. 141—67 **10 Claims**



1. Apparatus for feeding powder material to powder applicators mounted in a powder spray booth, said powder spray booth having a powder recovery system for collecting oversprayed powder material and a powder pump for pumping

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powder from said powder recovery system, said apparatus comprising:

a powder feed hopper having a housing formed with an interior having an inlet and an outlet, said inlet being adapted to be connected to said powder pump of said powder spray booth which transmits air-entrained powder material from said powder recovery system of said powder spray booth through said inlet and into said interior of said housing;

discharge means for collecting powder material ejected from said inlet into said interior of said housing and for discharging said collected powder material through said outlet of said housing, said discharge means being adapted to transmit powder material from said outlet to said powder applicators in said powder spray booth;

a clean air chamber mounted to said housing, said clean air chamber being formed with an inlet communicating with said interior of said housing and an outlet outside of said housing;

means communicating with said outlet of said clean air chamber for creating a negative pressure within said clean air chamber, said negative pressure drawing air from said interior of said housing through said inlet in said clean air chamber to vent said housing; and

filter means mounted in the path of the air drawn through said inlet of said clean air chamber to filter powder material therefrom.

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LOADING PUMP FOR METERING LIQUID TO PASTY PRODUCTS INTO CUPS

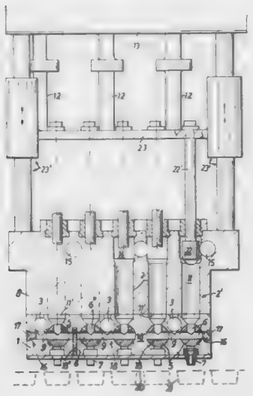
Kurt Walter, Glauburg, Fed. Rep. of Germany, assignor to Hassia Verpackungsmaschinen GmbH, Heegweg, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,559

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543504

Int. Cl.⁴ B65B *37/06*

U.S. Cl. 141—91 **3 Claims**



1. A dispensing pump for metering a liquid-to-pasty product into bowls cyclically advanced in a continuous strip defining a group of said bowls arrayed in at least one row, which comprises

(a) a cylinder block comprising a corresponding group of metering piston pumps having a number of said metering piston pumps corresponding to the number of said bowls and arrayed in a respective row in alignment with the row of bowls,

(b) a common drive means for the metering piston pumps,

(c) a flat valve block arranged below the cylinder block and comprising a corresponding group of rotary slide valves, a respective one of the slide valves being associated with, and arranged below, a respective one of the metering piston pumps,

(1) each rotary slide valve defining a product carrying channel consisting of a through bore and a loading bore connected centrally thereto and extending perpendicularly therefrom, and

(2) the flat valve block defining respective distributor channels for the product between respective pairs of the rotary slide valves, the product distributor channels extending parallel to the axes of the rotary slide valves, and a respective transverse channel leading from each product distributor channel to the slide valve product carrying channel,

(d) a common drive means for the rotary slide valves arranged to pivot the rotary slide valves of each of said pairs about the axes thereof between a first position wherein the through bores thereof are in communication with the transverse channels and a second position wherein the loading bores face each other and are in communication with the transverse channels,

(e) a respective dispensing nozzle associated with each one of the rotary slide valves and in alignment therewith and with the associated metering piston pump, each dispensing nozzle being in communication with the associated metering piston pump through the through bore when the associated rotary slide valve is in the second position,

(f) at least one product supply channel passing through the cylinder and valve blocks parallel to the metering piston pumps, the product supply channel being connected to the product distributor channels for supplying the product thereto,

(g) a product reservoir arranged above the cylinder block, and

(h) a conduit means connecting the product supply channel to the reservoir.

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LIQUID DELIVERY NOZZLE

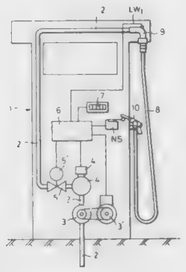
Hiroshi Matsumura; Siro Masai; Noboru Oguma, and Haruhisa Yamada, all of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1986, Ser. No. 906,010

Claims priority, application Japan, Sep. 13, 1985, 60-201672; Feb. 17, 1986, 61-30955

Int. Cl.⁴ B67C *5/377;* **B65B** *3/36*

U.S. Cl. 141—95 **10 Claims**



7. A liquid delivery nozzle comprising

a body portion having a passage for conducting liquid, vlave means arranged in the passage, means for actuating said valve means, and a connector chamber,

a mount arranged opposite to the connector chamger, for connecting a flexible supplier hose with the body portion so as to communicate the hose with the passage,

said mount having a half portion which is diametrically and rotationally inserted into the body portion and terminated at the connector chamber and is formed with an opening for communication the nose with the passage, and another half portion protruded from the body portion so as to be connected with the hose,

a barrel portion having an open end as a liquid outlet while the other end is connected with the body portion so that, when said valve means is opened by said actuating means, liquid supplied through said hose may be delivered out of said outlet,

a casing mounted on the inner wall surface of the barrel portion in the vicinity of the outlet and having light emitting means and light receiving means mounted therein so as to detect rising liquid level and generate a detection signal, and

connector means arranged for electrical connection of first leads extending through the hose and fixed at their one end to the mount and second leads extending through said barrel portion into said light emitting means and light receiving means and fixed at their one end to the connector chamber,

said connector means essentially comprising a flat and flexible sheet on which a desired number of leads are parallelly arranged, said flat and flexible sheet being spirally formed in the connector chamber.

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DEVICE FOR DETERMINING THE FLUID LEVEL IN A CONTAINER AND CONTAINER HAVING SUCH A DEVICT

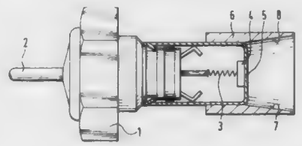
Klaus Ziegler, Furtwangen, and Reiner Liebl, Schwalbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 926,374

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538741

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—95 **8 Claims**



1. A device for detecting a filling level of fluid in a container, comprising

a membrane;

means for holding said membrane within said container with one side of said membrane facing the fluid to be measured;

an electromechanical transducer disposed within said holding means contiguous the side of the membrane opposite said one side for placing the membrane in vibration, which vibration is damped by contact of the membrane with the fluid; and wherein

said holding means includes a protective tube encircling said membrane and extending beyond the membrane towards the fluid to be measured.

4,730,651

DEVICE AND PROCESS FOR TAPPING TANKS, IN PARTICULAR BREWERY TANKS

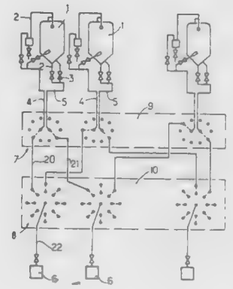
Pierre Millet, Vandoeuvre, France, assignor to Institut Francais des Boissons de la Brasserie Malterie, Nancy, France

Filed May 30, 1986, Ser. No. 868,722

Claims priority, application France, Jun. 3, 1985, 85 08435

Int. Cl.⁴ B67C *3/00*

U.S. Cl. 141—236 **18 Claims**



6. A tapping system for a liquid storing and treating installation, comprising;

a plurality of recipients each adapted to contain a liquid therein;

a plurality of bridging tables releasably connected to be in liquid communication with said plurality of recipients, wherein each of said plurality of bridging tables comprises at least one automatic tapping device for handling the liquid contained in said plurality of recipients;

a plurality of service stations releasably connected to be in liquid communication with said plurality of bridging tables such that the liquid contained in said plurality of recipients may be transported to said plurality of service stations through said bridging tables; and

a positioning means;

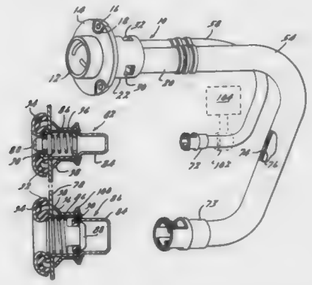
wherein said plurality of bridging tables are releasably connected to said plurality of recipients and said plurality of service stations by a plurality of liquid transport means;

wherein at least one of said automatic tapping devices comprises automatic connection means for connecting said liquid transport means with said positioning means, said positioning means cooperating with said automatic connection means, wherein said positioning means comprises a uniplanar support member having a plurality of holes arranged to form a first set of holes located at the center thereof and a second set of holes being located around the periphery, wherein said first set of holes comprises a first center hole for connecting said at least one of said automatic tapping devices with one of said service stations and a second center hole for connecting said at least one of said automatic tapping devices with another one of said stations, wherein said second set of holes is arranged to comprise holes arranged in a first semi-circle for connecting one of said recipients with said automatic at least one of said tapping devices and holes arranged in a second semi-circle for connecting another one of said recipients with said at least one of said automatic tapping devices;

wherein said first center hole is equidistant from each of said holes arranged in said first semi-circle and said second center hole is equidistant from each of said holes arranged in said second semi-circle.

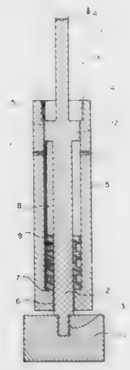
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4,730,652
AUTOMOTIVE FUEL FILLER SYSTEM
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.
Continuation of Ser. No. 668,763, Nov. 6, 1984, Pat. No. 4,610,284. This application Sep. 2, 1986, Ser. No. 903,215
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—302 **8 Claims**



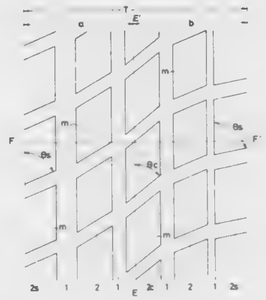
1. A fuel filling system for dispensing fuel from a dispensing nozzle into the fuel tank of an automotive vehicle comprising:
an inlet housing secured on said automotive vehicle which defines vent chamber means;
a fuel delivery pipe coupled between said inlet housing and said automotive vehicle fuel tank;
a vent pipe coupled between said inlet housing and said automotive vehicle tank and communicating with said vent chamber means for enabling isolated venting of said automotive vehicle fuel tank.

4,730,653
LOG SPLITTER
Paul Pantone, Garden Valley, and Dell W. Bolton, Diamond Springs, both of Calif., assignors to Edward L. Scott and Ronald P. Lasher, both of Castleton, N.Y.
Filed Apr. 11, 1985, Ser. No. 722,118
Int. Cl.⁴ B27L *7/00*
U.S. Cl. 144—193 C **9 Claims**



1. A log splitter comprising in combination:
a. a wedge means adapted to be placed adjacent the log to be split,
b. a rod means fixed to an end of said wedge means remote from the log and carried within an overlying housing means having an inner bore stop means for limiting the degree of travel of said rod means and wedge means beyond said housing means,
c. and means for propelling said rod means, and therefore said wedge means, into the log to be split, connected to said housing means at an end remote from said wedge means, including vent means on said housing means,
and wherein said stop means includes a piston carried on said rod means, said piston being dimensioned to correspond substantially to the inner bore of said housing means, said housing means further including a stop flange at an end of said housing means adjacent said wedge means.

4,730,654
ASYMETRIC PNEUMATIC RADIAL TIRE TREAD FOR PASSENGER CAR
Takashi Yamashita; Tetsuya Kuze, both of Hiratsuka, and Tuneo Morikawa, Hadano, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1986, Ser. No. 943,394
Claims priority, application Japan, Jan. 29, 1986, 61-15740
Int. Cl.⁴ B60C *11/11*
U.S. Cl. 152—209 A **1 Claim**



1. A pneumatic radial tire for passenger cars having, on the ground-contacting portion of the tire, a block pattern asymmetric about the right and left portions and formed by three or more straight grooves provided in the circumferential direction of said tire so as to form a loop and a plurality of subgrooves extending from the straight grooves towards the axial direction of said tire, wherein (1) the area ratio of the grooves in the inner half portion in the axial direction of the ground-contacting portion of said tire mounted on a vehicle is 1.2 to 1.4 times that of the grooves in the outer half portion in the axial direction of the ground-contacting portion of the tire, (2) the angle of the subgrooves provided at the central portion in the axial direction of the ground-contacting portion of said tire relative to the circumferential direction of said tire is 45° to 75° and (3) the angle of the subgrooves provided at both end portions in the axial direction of the ground-contacting portion of said tire relative to the circumferential direction of said tire is 65° to 90° and is by at least 5° larger than that of the subgrooves located at the central portion of the ground-contacting portion of said tire.

4,730,655
TIRE CHAIN DEVICE FOR AUTOMOBILES TRAVELLING ON SNOW-COVERED TERRAIN
Ming F. Yang, 95, Jin-ho Rd., Tainan, Taiwan
Filed Dec. 18, 1985, Ser. No. 815,138
Int. Cl.⁴ B60C *27/12;* **B21D** *7/00;* **B21F** *15/00*
U.S. Cl. 152—213 A **1 Claim**

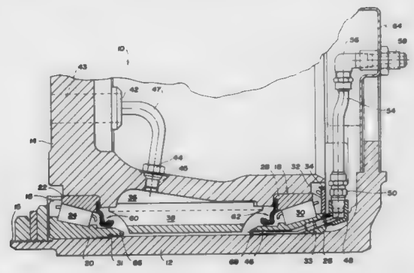
1. A tire chain device for mounting to a tire of an automobile travelling on snow-covered terrain, comprising:
first and second steel hoops connected by a plurality of equal short lengths of chains,

each said hoop having a gap between the respective ends of said hoop, each end of each said hoop being formed into a ring;
a plurality of plastic tube lengths in sequence enclosing each of said steel hoops;
two packings located between adjacent ones of said plurality of plastic tubes on each of said two hoops;
a guide ring disposed between every two packings of said second steel hoop for guiding a binding chain therethrough;



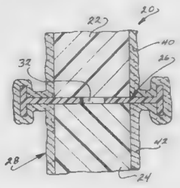
a ring member disposed at each end of each of said two steel hoops; and
said binding chain connected at a first end to one ring member of said first hoop, said binding chain having a spring-loaded hook at a second end;
whereby said binding chain is attachable by said hook to said second hoop, to tightly fit said first hoop round an inner side of said tire and said second hoop round an outer side of said tire so that said plurality of equal short lengths of chains are disposed across the outer periphery of said tire substantially parallel to the axis of rotation of said tire.

4,730,656
VEHICLE WHEEL END ASSEMBLY
Fred L. Goodell, Grosse Ile, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corporation, South Bend, Ind.
Filed Jul. 8, 1985, Ser. No. 752,576
Int. Cl.⁴ B60C *23/00*
U.S. Cl. 152—417 **27 Claims**



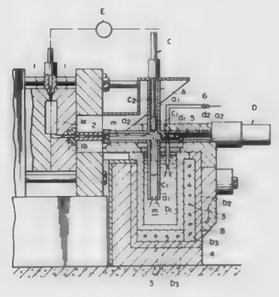
1. A vehicle wheel end assembly adapted for use with an automated system for controlling tire pressurization comprising:
a spindle mounted in fixed relation to the vehicle;
a hub mounted for rotation on the spindle and having an internal chamber adapted to form at least a portion of an air path between the automated system and the respective tire;
bearing means disposed in operative position between the spindle and the hub;
rotary seal means for communicating the internal chamber in the rotational hub to an adjacent inboard portion of the air path in a non-rotational member, said rotary seal means being positioned in fixed relation to said bearing means; and
wherein the bearing means comprises first and second axially spced bearing sets, each having an inner race and an outer race, and at least one of said races includes means for locating and seating the rotary seal means.

4,730,657
METHOD OF MAKING A MOLD
Daniel P. Carson, Minerva, and Francis E. Cozza, Hanoverton, both of Ohio, assignors to PCC Airfoils, Inc., Euclid, Ohio
Filed Apr. 21, 1986, Ser. No. 854,338
Int. Cl.⁴ B22C *7/02, 9/04*
U.S. Cl. 164—23 **24 Claims**



1. A method of making a ceramic mold, said method comprising the steps of providing a pattern, providing a body of expansion material which has a greater coefficient of thermal expansion than the ceramic material of the mold, covering the pattern and body of expansion material with a layer of ceramic mold material, heating the layer of ceramic mold material and body of expansion material, and cracking the layer of ceramic mold material during performance of said step of heating the ceramic mold material and body of expansion material by thermally expanding the body of expansion material to a greater extent than the layer of ceramic mold material.

4,730,658
INJECTION METHOD IN A HOT CHAMBER TYPE DIE CASTING MACHINE AND INJECTION APPARATUS FOR CARRYING THE METHOD
Akio Nakano, 14-1, Ichikawaminami 3-chome, Ichikawa-shi, Chiba-ken, Japan
Filed Nov. 25, 1986, Ser. No. 934,690
Claims priority, application Japan, Nov. 26, 1985, 60-266806; Nov. 30, 1985, 60-270481
Int. Cl.⁴ B22D *17/04*
U.S. Cl. 164—113 **5 Claims**



1. An injection method in a hot chamber type die casting machine of the type having an injection cylindrical body having one open end and connected to a sprue of a mold and a drawing-up cylindrical body in fluid communication with the

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injection cylindrical body and positioned crosswise thereto with a lower open end of the drawing-up cylindrical body dipped into molten metal within a retaining furnace to form a cross-shape sleeve, said method comprising the steps of:

slidably inserting a drawing-up plunger tip into the drawing-up cylindrical body;

drawing up the molten metal within the retaining furnace by reciprocable motion of said drawing-up plunger tip so as to pour the drawn-up molten metal into the injection cylindrical body through the drawing-up cylindrical body of the cross-shaped sleeve when said drawing-up plunger tip slides above said injection cylindrical body;

slidably inserting an injection plunger tip into the injection cylindrical body;

injecting the molten metal poured into the injection cylindrical body into a mold by reciprocable motion of said injection plunger tip so as to inject and fill the mold with the molten metal.

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CASTING APPARATUS

Peter J. Clark, Cannock; Anthony W. Hudd; Stephen T. Bloor, both of Sutton Coldfield, all of England, and Erling Roller, Essen, Fed. Rep. of Germany, assignors to IMI Refiners Ltd., Walsall, England

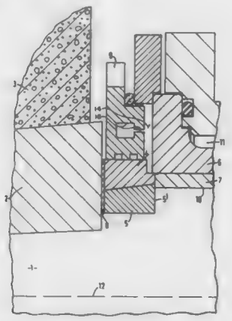
Continuation of Ser. No. 692,543, Jan. 18, 1985, Pat. No. 4,640,335. This application Jan. 30, 1987, Ser. No. 9,215

Claims priority, application United Kingdom, Jan. 25, 1984, 8401976

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—440 **7 Claims**



1. In a mould assembly for the continuous horizontal casting of copper and copper alloys in which there is provided feed means to feed molten metal into a graphite lined horizontally disposed tube which forms the mould, the improvement which comprises:

(i) a composite sleeve sealingly disposed axially between the feed means and the mould,

(ii) the composite sleeve comprising a graphite inner ring and an outer ring of thermal insulating material engaged on the inner ring,

(iii) the graphite inner ring being in contact with the graphite lining of the tube over part only of the thickness of the graphite lining, and

(iv) the graphite inner ring forming a downstream facing annular shoulder at the entrance to the mould.

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PROCESS FOR CASTING MOLTEN METAL INTO SEVERAL STRANDS

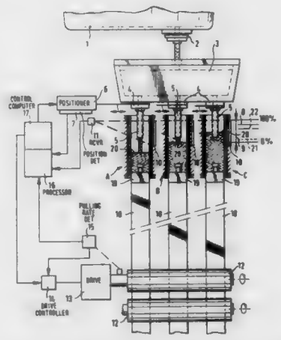
Bernhard Tinnes, Zollikerberg, Switzerland, and Heinz Kreuzberg, Bernau, Fed. Rep. of Germany, assignors to Metacon Aktiengesellschaft, Zurich, Switzerland

Continuation-in-part of Ser. No. 772,747, Sep. 4, 1985, abandoned. This application Oct. 7, 1986, Ser. No. 916,394

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432611; Oct. 26, 1985, 3538222

Int. Cl.⁴ B22D *11/18, 11/20*

U.S. Cl. 164—453 **6 Claims**



1. A process for casting molten metals from a tundish into a plurality of continuous casting molds by means of a plurality of controllable valves, each of the molds having a corresponding valve and a measuring section within which the level of the metal is measured, the filling level in each of the molds being maintained at a desired level with respect to the measuring section corresponding thereto and the developing strands emanating from said molds being pulled by a common strand puller drive unit at a steady rate, the process comprising the steps of:

opening all of the valves at the start of a casting operation;

allowing the actual metal level in each of the molds to rise above corresponding dummy bar heads contained therein until such time that the actual metal level reaches a first predetermined level in the lower area of its corresponding measuring section and then throttling the corresponding valve in each of the molds so as to equalize the actual metal levels in all of the molds; and

turning on the strand puller drive unit; or,

alternatively, if no level equalization of the actual metal level in all of the molds occurs, turning on the strand puller drive unit at such time that at least one of the actual metal levels in the molds reaches a second predetermined level which is below the desired level in the molds.

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PROCESS AND DEVICE FOR MELTING AND REMELTING METALS IN PARTICLE FORM INTO STRANDS, ESPECIALLY INTO SLABS

Herbert Stephan, Bruchköbel, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Rodgau, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 890,400

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527628

Int. Cl.⁴ B22D *11/04, 11/10*

U.S. Cl. 164—469 **10 Claims**

1. A process for melting and remelting metals in particle form, these metals being conveyed in the horizontal direction to a melting zone and melted by electron beam bombardment, whereupon the molten metal is fed to a continuous casting

mould, from which the metal is drawn off in the form of a solidified strand, the process comprising the steps of:

(a) scattering the metal particles from a horizontally displaceable conveying device substantially evenly over the horizontally positioned floor of a fusion ladle;

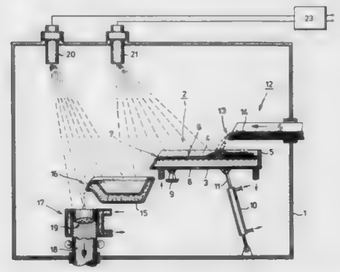
(b) joining the particles together into a plate-shaped structure by means of the electron beam which momentarily melts the surfaces of these particles;

(c) moving the floor of the fusion ladle into a position inclined relative to the horizontal;

(d) guiding the electron beam upwards over the sloping, plate-shaped particle structure, the energy density of the beam being so distributed that the particle structure is firstly preheated in strips and fused directly thereafter;

(e) simultaneously keeping the molten metal the lower part of the floor liquid by electron beam bombardment;

(f) guiding the electron beam back downwards over the sloping floor of the fusion ladle while removing the molten metal; and



(g) returning the floor of the fusion ladle to the horizontal starting position and again charging the fusion ladle with metal particles according to step (a).

8. A device for carrying out the process of claim 1, comprising a horizontally operating conveying device with a discharge edge for the particles, an electron beam source for bombarding the particles with melting energy and a continuous casting mould, characterized by

a fusion ladle (2) swivellable around a horizontal axis (9) between a horizontal position of the floor (6) and at least one floor position inclined relative to the horizontal, over which fusion ladle (2), when it is in its horizontal position, the discharge edge (13) of the conveying device (12) may be displaced,

at least one electron beam source (20, 21) allocated to the fusion ladle (2) and having a dynamic X-Y sweeping device, and

a control unit (23) provided for the electron beam source (20, 21) for the control of intensity and for sweeping the beam during steps (d), (e) and (f).

4,730,662

AUTOMOTIVE AUTOMATIC AIR CONDITIONING SYSTEM WITH VARIABLE TEMPERATURE DEMIST MODE

Shinma Kobayashi, Hiratsuka, Japan, assignor to Nissan Shatai Company, Kanagawa, Japan

Filed Apr. 25, 1984, Ser. No. 603,904

Claims priority, application Japan, Sep. 14, 1983, 58-169731; Sep. 30, 1983, 58-183678

Int. Cl.⁴ B60H *3/00;* **F25B** *29/00;* **B61D** *27/00*

U.S. Cl. 165—25 **11 Claims**

1. A blower speed control system for an automotive air conditioning system comprising:

an air induction system including a variable-speed, motor-driven blower;

an evaporator and a heater core, first and second cooling air passages, first and second heating air passages, said evaporator feeding a cooling air through said first and second cooling air passages, and said heater core incorporating means for introducing a controlled amount of cooling air flowing in at least one of said first and second cooling air passages into said heater core and for feeding heating air through said first and second heating air passages;

a plurality of air outlets for conducting conditioned air into a vehicle cabin, said outlets including a defrosting outlet directed toward a front windshield, an upper vent air outlet and a lower vent air outlet;

first and second air mix chambers connected to said first and second cooling air passages and said first and second heating air passages for mixing cooling and heating air from said evaporator and said heater core, said first air mix chamber receiving cooling air flowing through said first cooling air passage and heating air flowing through said first heating air passage for adjusting temperature of said conditioned air to be discharged through at least one of said defroster and said upper vent outlets, and said second air mix chamber receiving cooling air flowing through said second cooling air passage and heating air flowing through said second heating air passage for adjusting temperature of said conditioned air to be discharged through said lower vent outlet;

means for setting first and second temperatures for controlling said introduction means for adjusting said controlled amount of cooling air to be introduced into said heater core and adjusting a proportion of heating air to be distributed into said first and second heating air passages according to said first and second temperatures;

a plurality of shutter means each of which is associated with a corresponding air outlet for opening and closing the corresponding outlet depending upon a selected operational mode of the air conditioning system; and

a mode selector associated with said shutter means for selecting a specific combination of outlets to be opened depending upon the selected operational mode of the air conditioning system, said mode selector allowing selection of a DEMIST mode in which said upper vent air outlet is closed and said defrosting outlet and said lower vent air outlet are open in order to discharge air from both said defrosting outlet and said lower vent air outlet with the temperatures of said conditioning air being adjusted in said first and second air mix chambers according to said first and second temperatures; and

a blower speed control means for controlling the speed of said motor-driven blower for adjusting air flow through the air induction system, said blower speed control means controlling the blower speed within a predetermined speed range defined by predetermined maximum and minimum speeds and including a predetermined medium speed, and said blower speed control means being respon-

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sive to selection of said DEMIST mode for modifying the speed range of said blower only if said blower speed is below said medium speed by adjusting the blower speed to said medium speed.

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PASSIVE COOLING ARRANGEMENT

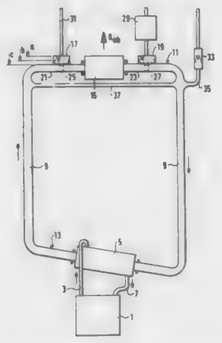
Heinrich Völkl, Schliersee; Heinrich Sandner, Gröbenzoll, and Bernd Heits, Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 10,439

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603566

Int. Cl.[4] **F28B** *1/06;* **F28D** *15/02;* **G05D** *23/00*

U.S. Cl. 165—32 **4 Claims**



1. A passive cooling arrangement comprising:

a secondary convection cooling circuit for conducting a coolant which reduces in volume in response to a drop in temperature, said secondary convection cooling circuit having an upper portion and a lower portion;

a primary hot-cooling circuit including a condenser for receiving the medium to be cooled, said condenser being connected into said lower portion to facilitate a transfer of heat from said medium to said coolant;

heat exchanger means mounted in said upper portion for transferring heat received by the coolant to the ambient to thereby cool the coolant to approximately the temperature of the ambient; and,

throttling means for throttling or interrupting the flow of the coolant through said secondary convection cooling circuit in response to a reduction in the volume of the coolant.

4,730,664

COOLING SYSTEM FOR COOLING A LIQUID COOLANT IN AN IMMERSIBLE MOTOR VEHICLE

Peter Forsthuber, Klosterneuburg, and Erhard Kauer, Schützen am Gebirge, both of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Oct. 9, 1986, Ser. No. 916,883

Claims priority, application Austria, Oct. 28, 1985, 3102/85

Int. Cl.[4] **F01P** *7/00;* **B63B** *35/00;* **B63H** *21/38;* **B60K** *11/04*

U.S. Cl. 165—41 **20 Claims**

1. In a cooling system for cooling a liquid coolant in an immersible motor vehicle, comprising

a chamber structure defining a chamber,

inlet means for admitting fluid to said chamber at one end thereof,

outlet means for delivering fluid from said chamber at the opposite end thereof,

a radiator disposed in said chamber between said ends thereof and comprising heat exchange surface means having heat exchange surfaces defining on one side a flow path for said liquid coolant and exposed on the other side to said chamber,

a fan, which is operable to cause air to flow from said inlet means through said chamber in contact with said other side of said heat exchange surface to said outlet means, wherein

said inlet and outlet means permit also a flow of water through said chamber in contact with said heat exchange surfaces on said other side,

the improvement residing in that

a partition is provided, which divides said chamber into first and second compartments and divides said heat exchange surfaces at least on said other side into first and second sections,

said inlet means comprise an air inlet communicating with said first compartment and a water inlet communicating with said second compartment,

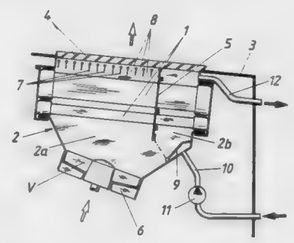
said outlet means comprise an air outlet communicating with said first compartment and a water outlet communicating with said second compartment,

outlet valve means are provided for selectively opening and closing said air outlet,

said first and second compartments communicate with each other through a passage disposed between said air inlet and said radiator,

a selector valve is provided for selectively opening and closing said passage, and

said fan is disposed upstream of said passage.



10. A cooling system for cooling a liquid coolant in an immersible motor vehicle, comprising

a chamber including a partition for dividing said chamber into a first and a second compartment,

a radiator disposed in said chamber, said radiator including a heat exchange surface for cooling a liquid coolant, said partition dividing said heat exchange surface into first and second sections,

an air inlet connected to said first compartment, said air inlet operable to allow air to flow into said chamber, said first and second compartments being connected by a passage disposed between said air inlet and said radiator, said first and second sections being cooled by air when said vehicle is not immersed,

an air outlet connected to said first compartment for allowing air to pass out of said chamber,

a first closing means connected to said air outlet for closing said air outlet when said motor vehicle is immersed,

a water inlet connected to said second compartment, said water inlet operable to allow water to flow into said second compartment when said vehicle is immersed,

a water outlet connected to said second compartment for allowing water to flow out of said second compartment, and

a second closing means for selectively opening and closing said passage, said second closing means being closed and said second section being cooled by water when said vehicle is immersed.

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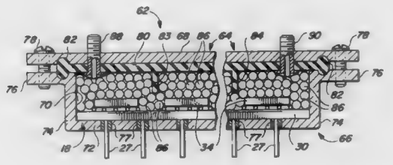
APPARATUS FOR COOLING HIGH-DENSITY INTEGRATED CIRCUIT PACKAGES

John M. Cutchaw, Scottsdale, Ariz., assignor to Technology Enterprises Company, Scottsdale, Ariz.

Continuation-in-part of Ser. No. 721,074, Apr. 8, 1985, Pat. No. 4,612,978, which is a continuation-in-part of Ser. No. 513,618, Jul. 14, 1983, Pat. No. 4,531,146. This application Sep. 19, 1986, Ser. No. 909,182

Int. Cl.[4] **H01L** *23/46*

U.S. Cl. 165—80.4 **19 Claims**



1. An apparatus for containing and cooling a high-density integrated circuit package comprising in combination:

(a) a base housing defining an upwardly opening chamber;

(b) at least one high-density integrated circuit package mounted in the bottom of the upwardly opening chamber of said base housing, said circuit package including a substrate having at least one discrete integrated circuit mounted on the upper surface of said substrate;

(c) said base housing being configured so that upwardly opening chamber thereof is deeper than the height dimension of said high-density integrated circuit package;

(d) a plurality of thermally conductive spheroids in said upwardly opening chamber of said base means so as to substantially fill that chamber and be thermally conductive contact with said high-density integrated circuit package;

(e) a cover demountably attached on the upper end of said base housing for sealingly enclosing the upwardly opening chamber of said base housing;

(f) biasing means interposed between said plurality of spheroids and said cover for biasing said spheroids into thermally conductive contact with each other and with said high-density integrated circuit package; and

(g) an inlet port and an outlet port by which a dielectric immersion coolant is passable through the chamber defined by said base housing.

10. An apparatus for containing and cooling high-density integrated circuit packages comprising in combination:

(a) a base housing defining an upwardly opening chamber;

(b) at least one high-density integrated circuit package mounted in the chamber of said base housing, said package including,

i. an edge board connector having an elongated socket with an upstanding guide track on each of its opposite ends.

ii. a printed circuit board demountably mounted in said edge board connector;

(c) said base housing being configured so that the upwardly opening chamber thereof is deeper than the height dimension of said circuit package and is longer than the length dimension of said circuit package to provide a coolant distribution chamber in one end of said base housing and a coolant collection chamber in the opposite end thereof;

(d) an inlet port in the one end of said base housing for admitting a dielectric immersion coolant into the coolant distribution chamber and an outlet port in the opposite end of said base housing throughwhich the dielectric immersion coolant exits said base housing;

(e) a pair of perforated partition means each at a different end of said edge board connector for separating the coolant distribution chamber and the coolant collection chamber from said integrated circuit package;

(f) a plurality of thermally conductive spheroids in said upwardly opening chamber of said base means and located between said pair of perforated partition means so as to substantially fill the space between said pair of perforated partition means and be in thermally conductive contact with said high-density integrated circuit package; and

(g) a cover demountably attached on the upper end of said base means for sealingly enclosing the upwardly opening chamber of said base housing.

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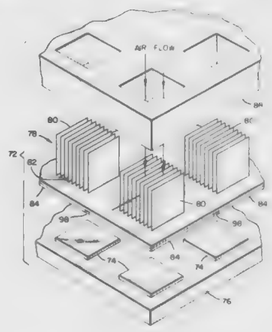
FLEXIBLE FINNED HEAT EXCHANGER

Ephraim B. Flint, Garrison; Kurt R. Grebe, Beacon; Peter A. Gruber, Mohegan Lake, and Arthur R. Zingher, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1986, Ser. No. 858,318

Int. Cl.[4] **F28F** *7/00;* **H01R** *13/00*

U.S. Cl. 165—80.4 **17 Claims**



1. A heat exchanger for transferring heat from an array of electric circuit chips to a fluid coolant comprising:

a flexible sheet of thermally conductive material sufficiently large to cover the array of chips and sufficiently flexible to conform to individual orientations of the chips to make thermal contact therewith; and

a set of thermally conductive fins upstanding from said sheet, said fins being integrally formed with said sheet to permit alignment of said heat exchanger upon said circuit chips such that said fins are oriented in the direction of desired flow of coolant for guiding the coolant among the fins for extraction of heat therefrom.

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LIQUID TO SOLIDS HEAT EXCHANGER

Alex Chevion, 14 Tremont Ter., Livingston, N.J. 07039

Filed Jun. 4, 1986, Ser. No. 870,638

Int. Cl.[4] **F28F** *5/00*

U.S. Cl. 165—84 **25 Claims**

1. A liquid to solids heat exchanger wherein there is no direct contact between the liquid and the solids comprising:

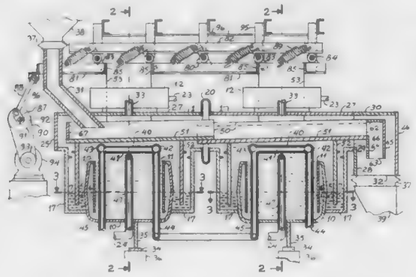
(a) a liquid pool within a reservoir;

(b) means for heating or cooling said liquid pool;

(c) at least one wall having side walls, said wall having a top surface and a bottom surface, said wall with said side walls being immersed in said liquid pool such that the bottom surface but not the top surface is in contact with the liquid pool; and

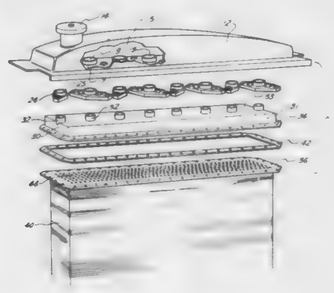
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(d) means for imparting an oscillatory motion to said wall relative to said reservoir thereby causing any solids pres-



ent on said top surface to be conveyed along the top surface while exchanging heat with the liquid pool.

4,730,668
RADIATOR ADAPTOR AND ASSEMBLY
William LeMaster, 1207 George St., Peoria, Ill. 61605
Filed Feb. 13, 1987, Ser. No. 14,687
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—137 **12 Claims**



9. A system for replacing core modules within a radiator, wherein the core modules are sealably engaged in the floor of the upper and lower tank portions of the radiator including sealing members between the core modules and the tank portions, the system comprising:

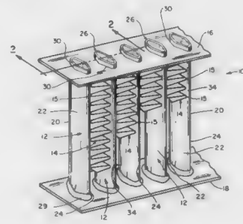
a. removing the core modules from the radiator system;

b. maintaining intact the upper and lower tank portions and the respective sealing members contained within the ports in the tank portions;

c. providing a conventional replacement core having upper and lower faces, each face provided with a plurality of flow bores therethrough for allowing fluid to flow through the core;

d. providing an adaptor assembly having on its upper portion a plurality of nipples for engaging the respective bores in the radiator and seal members, and having on its lower portion means for sealably engaging the faces of the replacement core, so that fluid flow through the replacement core and through the adaptor can flow into the upper and lower radiator tanks without replacing other components of the radiator system.

4,730,669
HEAT EXCHANGER CORE CONSTRUCTION UTILIZING A DIAMOND-SHAPED TUBE-TO-HEADER JOINT CONFIGURATION
Marvin D. Beasley, Mount Vernon; Michael G. Simpson, Ashley, and William T. Shepard, III, Mount Vernon, all of Ill., assignors to Long Manufacturing Ltd., Ontario, Canada
Filed Feb. 3, 1986, Ser. No. 825,470
Int. Cl.[4] F28D *1/04, 1/02*
U.S. Cl. 165—151 **3 Claims**

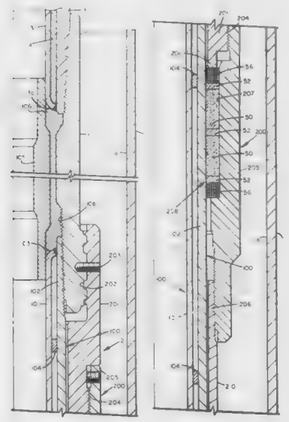


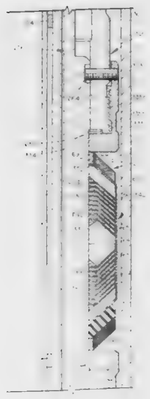
1. A heat exchanger core construction consisting essentially of a plurality of header plates, a plurality of tube members adapted to receive a fluid medium therethrough extending in generally spaced parallel relationship between respective pairs of said header plates, and a plurality of fin elements disposed between respective pairs of said header plates in heat exchange relationship with said plurality of tube members, each of said tube members including a flat oval middle body portion and a diamond-shaped end portion located at each opposite end thereof, each of said tube members including transition portions extending from below each opposite end of said tube body portion to said respective diamond-shaped tube end portions, said diamond-shaped tube end portions having a reduced cross-sectional height and an increased cross-sectional width relative to the cross-sectional height and width of said flat oval middle body portion of said tube members and having an outside perimeter substantially the same as the outside perimeter of said flat oval middle body portion of said tube members, each of said header plates including a plurality of diamond-shaped tube slots extending therethrough, said plurality of diamond-shaped tube slots being positioned and arranged such that the diamond-shaped end portions of each of said tube members are receivable in respective ones of said diamond-shaped tube slots.

4,730,670
HIGH TEMPERATURE PACKER FOR WELL CONDUITS
Yung J. Kim, Hacienda Heights, Calif., assignor to Baker Oil Tools, Inc., Orange, Calif.
Continuation of Ser. No. 806,031, Dec. 6, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 64,560
Int. Cl.[4] E21B *33/129*
U.S. Cl. 166—134 **4 Claims**

1. A packer for a subterranean well having a casing extending through a production zone requiring steam treatment to improve fluid production from such zone, comprising, in combination, an inner tubular body assembly having connector means at its upper end for detachable threaded connection to the bottom of an insulated tubing string, whereby the packer may be run into the casing to a position above the production zone to be steam treated; an outer tubular body assembly mounted in surrounding relationship to said inner tubular body assembly; said outer tubular body assembly mounting a slip mechanism including peripherally spaced slips and upper and lower cone elements cooperable therewith, and a non-elastic, high temperature resistant, external packing element deformable by axial force to sealingly engage the bore of the casing; means for setting said packer by engaging said slips with the casing wall and deforming said external packing element into

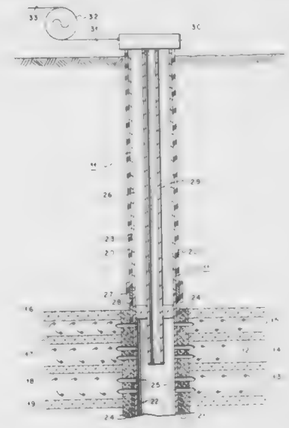
sealing engagement with the casing wall; said internal tubular body assembly defining an internal annular recess; an inner packing assembly of non-elastic, high temperature resistant materials axially compressed in said internal annular recess; a tubular mandrel connectable at its upper end to the insulated tubing string; said mandrel having an elongated, cylindrical outer wall slidably and sealably engaged with said internal packing element to accommodate thermal expansion and con-





traction of the insulated tubing string; said mandrel extending downwardly through the entire outer tubular assembly, said mandrel further having an internal tubular sleeve concentric with and spaced inwardly from said the bore wall of said mandrel and extending through the entire length of said mandrel, thereby reducing heat loss radially through the packer from the steam passing through the mandrel to the production zone.

4,730,671
VISCOUS OIL RECOVERY USING HIGH ELECTRICAL CONDUCTIVE LAYERS
Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Jun. 30, 1983, Ser. No. 509,838
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—248 **14 Claims**



1. In a method of recovering oil from an interbedded hydrocarbon-bearing subsurface formation wherein the electrical conductivity of the hydrocarbon-bearing layers is significantly lower than the electrical conductivity of the other layers, the steps comprising:

(a) lowering into a borehole traversing layers of said formation a metal tubular electrode;

(b) covering the exposed exterior surface of an upper portion of said tubular electrode with electrical insulation as said tubular electrode is being lowered into said borehole while leaving a portion of the exterior surface of said tubular electrode free of electrical insulation;

(c) lowering said insulation-free portion of said tubular electrode and at least a part of said upper portion of said tubular electrode to a preselected first point, said first point having been selected so that said insulation-free portion lies opposite a part of said formation and said insulated upper portion traverses a part of said formation;

(d) thereafter adding cement to said borehole in a manner such that said cement covers the exterior of said insulation-free portion of said tubular electrode and said part of said upper portion traversing said part of said formation;

(e) perforating said electrode and cement at second preselected vertically spaced apart points, said points having been selected to be opposite a part of said hydrocarbon-bearing part of said formation;

(f) connecting an alternating current power source to said tubular electrode;

(g) causing alternating current to flow from said tubular electrode into said layers of said formation opposite said tubular electrode; and

(h) producing oil from said formation, said oil flowing into said tubular electrode.

4. A well completion for recovering oil from an interbedded hydrocarbon-bearing subsurface formation wherein the electrical conductivity of the hydrocarbon layers is significantly lower than the electrical conductivity of the other contiguous layers comprising:

(a) a metal casing string extending from the surface of the earth in a borehole leading into said formation, said casing string being divided into an upper casing part and a lower casing part, said upper casing part being a nonmagnetic

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metal, said casing string extending downward in a borehole from near the surface of the earth in a manner such that said lower casing part traverses layers of said formation, a portion of said lower casing part being electrical insulation-free, said insulation-free portion being opposite layers of said formation;

(b) electrical outer first insulation on the exterior surface of said upper casing part and a portion of said lower casing part, said first insulation extending downward from near the surface of the earth and traversing a part of said formation;

(c) cement in the annulus between said lower casing part and said borehole, said cement covering the exterior of said insulation-free portion of said lower casing part and the part of said first insulation traversing said part of said formation;

(d) flow passages in said lower casing string and said cement extending into a hydrocarbon-bearing part of said formation at vertically spaced apart points;

(e) inner electrical insulation covering most of the interior surface of said upper casing part and a portion of said lower casing part;

(f) an inner tubing string extending from surface of the earth downward inside said casing string through at least a portion of said lower casing part, said tubing string being adapted to conduct fluids between the surface and a predetermined subsurface point; and

(g) an alternating current power source electrically connected to said casing string.

4,730,672

METHOD OF REMOVING AND CONTROLLING VOLATILE CONTAMINANTS FROM THE VADOSE LAYER OF CONTAMINATED EARTH

Frederick C. Payne, Charlotte, Mich., assignor to Midwest Water Resource, Inc., Charlotte, Mich.

Filed Mar. 4, 1987, Ser. No. 22,105
Int. Cl.[4] E21B *43/40*
U.S. Cl. 166—266 **9 Claims**



1. A method of recovering and controlling a volatile contaminant from a vadose layer of contaminated earth comprising the steps of:

establishing a first borehole in said contaminated earth, said first borehole terminating in said vadose layer;

establishing a second borehole spaced from said first borehole in said contaminated earth and which terminates in said vadose layer;

positioning a first conduit in said first borehole, said first conduit extending from said borehole to above ground level, with said first conduit being of smaller diameter than said first borehole;

positioning a second conduit in said second borehole, with the second conduit extending from said second borehole to above the ground level, with said second conduit being of smaller diameter than said second borehole;

packing a fill material about each first and second conduit in their respective boreholes;

operatively connecting said first and second conduits by a third conduit wherein said first conduit is in fluid flow communication with said second conduit;

positioning means for neutralizing said volatile contaminant along said third conduit in flow communication therewith;

positioning first pump means for drawing gasses from said contaminated earth in flow communication with said first and second conduits;

activating said first pump means wherein gas is drawn out of said vadose layer to create an area of substantially reduced pressure which causes substantial quantities of said volatile contaminant to vaporize and be drawn up through said first conduit into said neutralizing means to produce clean air;

positioning a second pump means between said neutralizing means and said second conduit in flow communication therewith wherein said clean air is passed under pressure from said neutralizing means into said second conduit to enhance gas flow in said vadose layer towards said first borehole; and

positioning a cover formed of fluid impervious material atop said ground level about each borehole whereby said clean air remains in said vadose layer and urges said contaminant towards said first borehole.

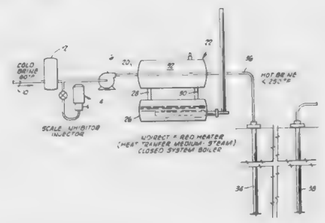
4. Apparatus for recovery and neutralization of volatile contaminants from a vadose layer of contaminated earth, said apparatus comprising a first conduit positioned within a first borehole terminating in said vadose layer, said conduit extending from said first borehole above ground level, a second conduit positioned within a second borehole spaced from said first borehole and terminating in said vadose layer, said second conduit extending from said second borehole to above said ground level, said first conduit operatively connected to and in flow communication with said second conduit by a third conduit, first pump means positioned along one of said first and third conduits for drawing gasses from said vadose layer to produce a substantial area of reduced pressure in said first conduit wherein said volatile contaminant is vaporized and drawn from the ground, means for neutralizing said volatile contaminant positioned in flow communication with one of said first and third conduits to produce a purified fluid, said apparatus further including a cover formed of fluid impervious material positioned atop said ground level about each borehole whereby said purified fluid remains in said vadose layer and urges said contaminant towards said borehole, and second pump means for passing said purified fluid from said neutralizing means into said second conduit and back into said vadose layer under pressure to enhance gas flow in said vadose layer towards first borehole.

4,730,673

HEATED BRINE SECONDARY RECOVERY PROCESS

Bryant W. Bradley, 3516 Stratford Dr., Norman, Okla. 73069

Filed Aug. 8, 1983, Ser. No. 521,433
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—272 **16 Claims**



1. A method of recovering residual hydrocarbons from a subterranean formation comprising:

extending an injection well and a producing well into the formation at horizontally spaced locations;

treating water containing in excess of 1,000 ppm total dissolved solids, and significant quantities of scale-forming ions, with a water soluble scale inhibitor compound in the minimum amount of such inhibitor required to maintain at least 90% of the scale forming ions in solution during subsequent heating of the water to a temperature not exceeding 400° F.;

heating the water by contact with a heat exchange medium having a temperature not exceeding 400° F.; then

pumping the heated water containing the inhibitor down the injection well and into the formation under a pressure adequate to displace hydrocarbons toward the production well.

4,730,674

PLUGGING A TUBING/CASING ANNULUS IN A WELLBORE WITH A POLYMER GEL

David N. Burdge, Highlands Ranch; Richard W. McAtee, and Robert D. Sydansk, both of Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 22, 1986, Ser. No. 945,413
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—295 **12 Claims**

1. A process for plugging an annulus formed between a casing and a tube internal and concentric to the casing in a wellbore in fluid communication with a subterranean hydrocarbon-bearing formation, comprising:

(a) preparing a gelation solution at the surface comprising a water-soluble carboxylate-containing polymer and a complex capable of crosslinking said polymer comprising a chromic species and a carboxylate species;

(b) injecting said gelation solution into said annulus to be plugged; and

(c) crosslinking said gelation solution to substantial completion in said annulus to form a gel which substantially plugs said annulus.

4,730,675

PLUGGING AN ABANDONED WELL WITH A POLYMER GEL

Noel D. Wygant, Sedalia, and Robert D. Sydansk, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 22, 1986, Ser. No. 945,412
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **14 Claims**

1. A process for plugging an abandoned well in fluid communication with a subterranean formation below an earthen surface, comprising:

(a) admixing a gelation solution at the surface consisting essentially of a water-soluble carboxylate-containing polymer, a complex capable of crosslinking said polymer and formed of at least one chromic species and at least one acetate species, and a solvent for said polymer and said complex;

(b) injecting said gelation solution into a wellbore of said abandoned well; and

(c) crosslinking said gelation solution in said wellbore to substantial completion to form a non-flowing rigid gel which substantially plugs said abandoned well.

4,730,676

DOWNHOLE FOAM GENERATOR

Thomas J. Luers, and Vincent G. Reidenbach, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 6, 1982, Ser. No. 446,924
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—309 **11 Claims**

1. Apparatus for generation of foam in a well bore, comprising:

tubing means disposed in said well bore;

a well bore annulus surrounding said tubing means;

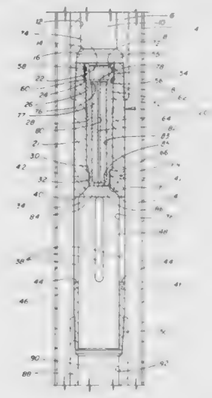
a liquid in said well bore annulus;

a pressurized gas in said tubing means;

foam generator means including tubular body means having gas choke means associated therewith , adapted to communicate with the bore of said tubing means and receive said pressurized gas therefrom, aperture means through the wall of said body means adapted to direct said liquid from said well bore annulus into said foam generator means below said gas choke means, and foaming chamber means defining a bore having no physical obstruction disposed therein below said aperture means.

9. A method of generating foam in a well bore, comprising:

disposing tubing means in said well bore;



disposing foam generator means having aperture means through the wall thereof from said tubing means;

pumping a liquid down the annulus defined by said tubing means and the wall of said well bore;

pumping a gas stream down said tubing means into said foam generator means;

increasing the velocity of said gas and lowering the pressure thereof substantially adjacent said aperture means;

drawing said liquid through said aperture means into turbulent impingement on said gas stream; and

generating a foam substantially solely through said turbulent impingement of said liquid on said gas stream.

4,730,677

METHOD AND SYSTEM FOR MAINTENANCE AND SERVICING OF SUBSEA WELLS

Joseph L. Pearce; Phillip S. Sizer, both of Dallas; John C. Gano, Carrollton; John H. Yonker, Carrollton; Robert L. Thurman, Carrollton; James F. O'Sullivan, Jr., Houston; Dayton M. Simpson, Missouri City; Richard A. Roberts, Houston, all of Tex.; Anthony J. Healey, Carmel, Calif., and Urie G. Nooteboom, Houston, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 22, 1986, Ser. No. 944,874
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—345 **28 Claims**

1. A system for servicing a subsea well with its wellhead located adjacent to the ocean floor and production flow lines extending therefrom along the ocean floor comprising:

a. flexible riser means;

b. a surface support vessel with means for raising, lowering and attaching the flexible riser means to the wellhead;

c. means, located on the support vessel, for performing maintenance on the subsea well via the flexible riser means;

d. a lower riser package attached to the flexible riser means; and

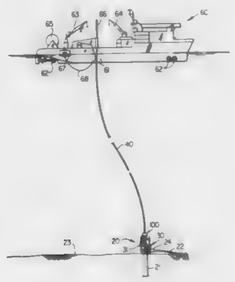
VOL 1088 ISS 3 MR 15 1988 UMI

e. the lower riser package including mating and sealing surfaces to releasably engage the wellhead and establish communication between the flexible riser means and the wellhead.

21. The method of servicing a subsea well with its wellhead located adjacent to the ocean floor comprising:

a. positioning a support vessel on the ocean surface within a preselected offset from the wellhead;

b. launching a remotely operated vehicle from the support vessel to locate the wellhead and remove its tree cap;



c. deploying a flexible riser means with an attached lower riser package into the water from the support vessel;

d. guiding the lower riser package to the wellhead by the remotely operated vehicle after the wellhead has been prepared;

e. attaching the lower riser package to the wellhead to establish communication between the wellhead and flexible riser means; and

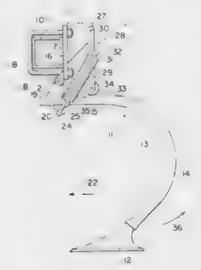
f. performing maintenance on the subsea well from the support vessel via the flexible riser means.

4,730,678

HEAVY-DUTY TRIP MECHANISM FOR GROUND WORKING IMPLEMENTS

Phillipe F. Denis, and Bernard Denis, both of P.O. Box 250, Vonda, Saskatchewan, Canada

Filed Mar. 7, 1986, Ser. No. 837,297
Claims priority, application Canada, Dec. 3, 1982, 416959
Int. Cl.[3] A01B *61/04*
U.S. Cl. 172—265 **5 Claims**



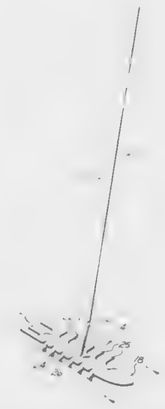
1. A shank tripping mechanism for ground working implements comprising in combination a frame, at least one implement shank assembly including a shank having a substantially planar horizontal portion pivotally mounted on said frame and ground working means on the distal end thereof, said shank tripping mechanism including at least one tension spring, means mounting said tension spring by one end thereof to said shank adjacent to and below the pivotal connection thereof to the implement frame and swing arm means pivoted by one end thereof to the implement frame and movably engaging the upper surface of said substantially horizontal planar portion of said shank, by the other end thereof, said tension spring being connected by the other end thereof to said swing arm means intermediate the ends thereof and means adjusting the effective tripping release force of said shank, within limits, said swing arm including an arm situated substantially vertical when said shank is in the working position and being pivotally connected at said one end thereof to said frame with the other end depending downwardly therefrom.

4,730,679

GARDEN TOOL WITH HOE PARTS, POINTED NOSE AND ARCHED PROJECTIONS

James V. Tallerico, and Apolonia Tallerico, both of 2573 N. Woodmere Ridge, LaPorte, Ind. 46350

Filed Nov. 17, 1986, Ser. No. 931,195
Int. Cl.[4] A01B *1/20*
U.S. Cl. 172—375 **2 Claims**



1. In a garden tool including a handle, and an attached head part for performing gardening tasks, the improvement wherein said head part is substantially four sided having two ends and two sides of longer dimensions than said ends, one of said ends formed into a first slotted hoe part, the other of said ends terminating in a substantially pointed nose, one of said sides formed into a second slotted hoe part, with the other of said sides including arched projections extending from said head part downwardly away from said handle, said arched projections alternating with second projections extending substantially straight outwardly from said head part, said second projection being flat with respect to said head part, such that the free ends of said second projections are spaced from the free ends of said arched projections.

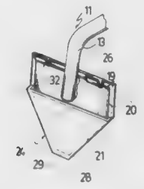
4,730,680

HOE AND GUARD THEREFOR

Harry Indzeoski, 729 Scotland Avenue, Winnipeg, Manitoba, Canada R3M 1W7

Filed Sep. 12, 1986, Ser. No. 906,807
Claims priority, application Canada, Sep. 27, 1985, 491708
Int. Cl.[4] A01B *1/10;* **A45C** *11/00*
U.S. Cl. 172—375 **2 Claims**

2. A guard for a hoe blade, wherein the hoe blade is secured to an elongated handle, said hoe blade having a substantially planar, truncated, triangular configuration when viewed in front elevation and having an upper edge attached to said handle, a pair of side edges inclining inwardly and away, one from each end of said upper edge and a relatively short lower edge extending between the distal ends of said side edges, and parallel to said upper edge, said side edges and said lower edge being sharpened, said guard comprising in combination a pocket adapted to receive the portion of the associated hoe blade defined by said side and lower edges and means extending from said guard above said pocket adapted to detachably secure said guard to the upper edge of the associated blade, said means including at least one flexible tab detachably engageable over the upper edge of the blade in snap engagement therewith, said guard, when viewed in front elevation, including an upper edge, a pair of spaced and parallel side edges extending at right angles to said upper edge, a pair of pocket side edges extending from the distal ends of said side edges of said guard and converging inwardly therefrom and a horizontal base extending between the distal ends of the side edges of said pocket, parallel to said upper edge of said guard, said means adapted to detachably secure said guard to the upper edge of the associated blade situated on said upper edge of said guard, said pocket terminating in a horizontal open side intermediate the upper and lower edges of said guard.

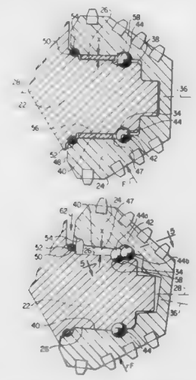


4,730,681

ROCK BIT CONE LOCK AND METHOD

Roy D. Estes, Weatherford, Tex., assignor to Rock Bit Industries U.S.A., Inc., Fort Worth, Tex.

Filed Aug. 29, 1986, Ser. No. 902,463
Int. Cl.[4] E21B *10/22, 12/02*
U.S. Cl. 175—39 **25 Claims**



11. A method of preventing wear-induced dislodgement of a cutting cone from a journal pin of a rock bit, said cutting cone being captively retained on said journal pin by an internal annular array of ball bearings, said method comprising the steps of:

(a) permitting only a predetermined amount of rotationally-induced wear between preselected laterally facing surfaces disposed within said cutting cone, said predetermined amount of wear being below a wear amount sufficient to allow axial dislodgement of said cutting cone from said journal pin;

(b) causing at least one ball bearing to shift axially of said journal pin, and out of said annular array, in response to the attainment of said predetermined amount of rotationally-induced wear; and

(c) utilizing the shifted ball bearing to inhibit subsequent rotation of said cutting cone relative to said journal pin.

24. A rotary rock bit comprising:

(a) a journal pin having a depression formed thereon;

(b) a cutting cone captively retained on said journal pin and rotatably relative thereto;

(c) a plurality of lockup members carried between said journal pin and said cutting cone in said depression; and

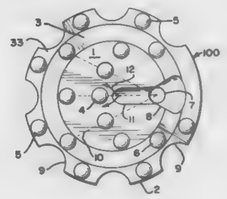
(d) means, responsive to a predetermined degree of wear between said journal pin and said cutting cone, for causing one or more of said lockup members to shift relative to said journal pin and become wedged between said journal pin and said cutting cone to thereby materially inhibit rotation of said cutting cone relative to said journal pin, said means for causing one or more of said lockup members to shift including means for causing one or more of said lockup members to be displaced from said depression.

4,730,682

EROSION RESISTANT ROCK DRILL BIT

Joseph R. Ditzig, Portland, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 23, 1985, Ser. No. 812,267
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—393 **5 Claims**



1. A rock drill bit of generally cylindrical form adapted for attachment to a drill at its one back end comprising:

a cylindrical body having a longitudinal axis extending parallel to the direction of drilling;

a cutting face disposed on said body towards the other or front end of said body and oriented in a plane perpendicular to said longitudinal axis of said body;

said face being accessed by a source of pressure fluid at a source point on said face;

said source point further being provided with a means for directing pressure fluid across said face in a preferred direction;

a plurality of cutting means for effecting rock cutting disposed on said face along at least one line of radial extension from said source point in said preferred direction of resulting flow; and

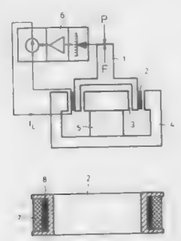
said means for directing pressure fluid comprises a predominately cross flow channel oriented perpendicular to said axis and extending in a shallowing manner radially outward with reducing depth from the face as it progresses from said source point in said preferred direction.

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4,730,683
ELECTROMAGNETIC LOAD-COMPENSATION WEIGHING APPARATUS INCLUDING TEMPERATURE COMPENSATION MEANS

Arthur Reichmuth, Wetzikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Mar. 3, 1987, Ser. No. 21,208
Claims priority, application Switzerland, Apr. 18, 1986, 1569/86
Int. Cl.⁴ G01G *7/00*
U.S. Cl. 177—212 **9 Claims**



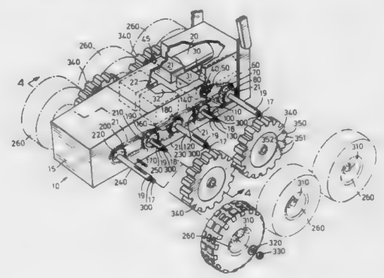
1. weighing apparatus of the electromagnetic load compensation type, comprising:
(a) stationary permanent magnet means (4);
(b) a load-receiving member (1) mounted for movement relative to said permanent magnet means,
(c) at least one load compensation winding (2) connected with said load receiving member;
(d) means (6) for supplying load compensation current (i_L) to said load compensation winding for maintaining said load-receiving member at its initial no-load position, whereby the magnitude of said load compensation current is a function of the load applied to said load-receiving member; and
(e) temperature-responsive means for generating a parameter for compensating for the influence of temperature changes in said load compensation winding on the measurement result, including:
(1) sensor winding means on said movable load-receiving member; and
(2) means (10; 11, 14; 15–17; 9) for measuring the temperature-dependent resistance (R_L; R_Z) of said sensor winding means as a function of its voltage (u; U) and current (i_L; I).

4,730,684
VEHICLE

Borge Pedersen, 12 Principal Rd., Unit 2, Scarborough, Ontario, Canada M1R 4Z3

Filed Jul. 22, 1986, Ser. No. 888,182
Int. Cl.⁴ B62D *61/10*
U.S. Cl. 180—22 **13 Claims**

1. A vehicle comprising a body; a plurality of first load bearing wheels rotatably mounted about respective first axes to a chassis to support the vehicle; and at least one secondary wheel which is rotatably mounted to the vehicle about a respective second axis, said second axis positioned longitudinally between the said first axes, and which secondary wheel extends below the axis of a pair of longitudinally spaced first wheels and overlaps the adjacent first wheels sufficiently to prevent a ground projection extending vertically and horizontally across the vehicle path from engaging a space between adjacent wheels to impede movement of the vehicle, wherein the lowermost part of each secondary wheel is above the lowermost parts of the adjacent load bearing wheels, and wherein the diameter of each secondary wheel is less than the diameter of the adjacent load bearing wheels, and the axis of

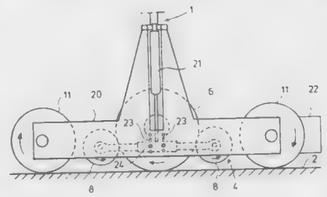


rotation of the secondary and adjacent load bearing wheels are in the same horizontal plane.

4,730,685
APPARATUS FOR MOVING A MULTI-WHEELED VEHICLE

Matti Sinkkonen, Vaajakoski, Finland, assignor to Tana Jyra Ky, Finland

Continuation-in-part of Ser. No. 649,714, Sep. 12, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 905,858
Claims priority, application Finland, Sep. 13, 1983, 833275
Int. Cl.⁴ B64F *1/04*
U.S. Cl. 180—74 **63 Claims**

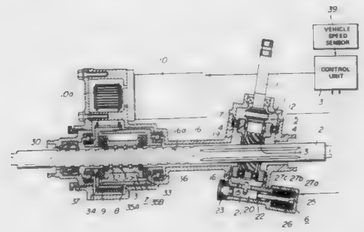


1. An auxiliary apparatus for moving a vehicle having at least one wheel assembly on a surface, the apparatus comprising in combination:
at least two friction rollers mounted spaced from each other;
a connecting member for interconnecting said at least two friction rollers;
positioning means adapted to permit said rollers to be positioned on opposite sides of a wheel assembly of said vehicle;
pressing means for controlling the length of said connecting member between said rollers to thereby press said rollers against and into frictional contact with said wheel assembly; and
drive means for rotating at least one of said rollers;
whereby at least one wheel of said wheel assembly may be rotated by said roller to move said vehicle.

4,730,686
MOTOR-DRIVEN POWER STEERING SYSTEM AND METHOD OF CONTROLLING SAME

Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,676
Claims priority, application Japan, Apr. 8, 1986, 61-80658
Int. Cl.⁴ B62D *5/04*
U.S. Cl. 180—79.1 **6 Claims**



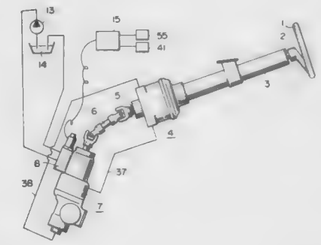
1. A motor-driven power steering mechanism for a vehicle, comprising:
a steering mechanism adapted to operatively interconnect a steering wheel and steerable wheels;
an electric motor for applying assistive power to said steering mechanism;
steering torque detecting means for detecting a steering torque applied to said steering mechanism and producing a signal representative of the direction and magnitude of the steering torque;
steering rotation detecting means for detecting steering rotation of said steering mechanism and producing a signal indicative of the direction and speed of the steering rotation;
returning motion detecting means for detecting returning motion of said steering mechanism to a neutral position thereof;
vehicle speed detecting means for detecting the speed of travel of the vehicle and producing a signal representing the speed of travel of the vehicle;
correcting means for limiting a signal corresponding to the speed of steering rotation from said steering rotation detecting means below a preset value based on the signal from said vehicle speed detecting means, when returning motion of said steering mechanism is detected by said returning motion detecting means; and
motor control means for determining a motor control signal based on the signal from said steering torque detecting means, and the signal from said steering rotating detecting means including the limited signal from said correcting means, and for controlling said electric motor with said determined motor control signal.

4,730,687
STEERING FORCE CONTROL DEVICE FOR POWER STEERING SYSTEM

Isamu Chikuma, and Hiroshi Eda, both of Maebashi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,665
Claims priority, application Japan, Dec. 26, 1984, 59-273427; Mar. 27, 1985, 60-60996; Jul. 5, 1985, 60-146698; Jul. 26, 1985, 60-113801; Nov. 21, 1985, 60-178295
Int. Cl.⁴ B62D *5/08*
U.S. Cl. 180—142 **22 Claims**

1. In a power steering system, which generates a steering assistance force and a steering reaction force in accordance with steering torque acting on an input shaft steering a vehicle, and which includes a control unit for setting a steering force based on a detective signal of detecting means for detecting a physical quantity factor which varies depending on a travelling condition and a steering condition of said vehicle, a steering force control device comprising:
a variable orifice valve for dividing a supply passage from a pump into first and second passages, respectively, for generating said steering assisting force and said steering reaction force, said variable orifice valve selecting a flow rate rates between said first and second passages in accordance with a control signal from said control unit, said variable orifice valve operating such that when a communicating area of one passage of said first and second passages increases, a communicating area of the the other passage decreases;

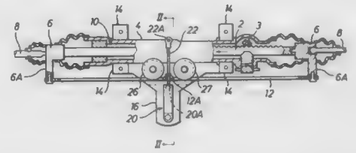


a passage changeover valve having first and second directional control valves formed in a common rotary valve having a spool interlocked to the input shaft and an outer sleeve secured to the steering members, said first and second directional control valves being connected to said first and second passages of said variable orifice valve, each of said first and second directional control valves changing over a working fluid under a unitary control in accordance with a direction and an amount of the steering torque acting on said input shaft;
a steering assisting force generating mechanism for generating a steering assistance force for said input shaft by the working fluid supplied from said second directional control valve of said passage changeover valve.

4,730,688
STEERING SYSTEM FOR WHEELED VEHICLE

Akira Hasegawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 23, 1986, Ser. No. 922,469
Claims priority, application Japan, Oct. 24, 1985, 60-163476[U]
Int. Cl.⁴ B62D *5/06*
U.S. Cl. 180—148 **5 Claims**



1. A steering system for a wheeled vehicle having a steering linkage in the form of a rack bar in a power assisted steering system of the rack and pinion type, said rack bar being arranged to be assisted by a power cylinder associated therewith and being operatively connected at its opposite ends with a pair of dirigible road wheels to steer the road wheels in accordance with a driver's steering effort applied thereto, comprising:

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a lateral rod operatively connected in parallel with said rack bar for displacement therewith; and

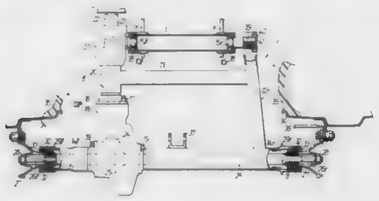
a single pneumatic cylinder arranged perpendicularly to said lateral rod and having a piston contained therein and a piston rod extending outwardly from said piston and being operatively connected to said lateral rod in such a manner that said piston is located in a stroke end when said lateral rod is in a neutral position and that said piston rod is moved in accordance with displacement of said lateral rod to increase an internal pressure in said pneumatic cylinder, whereby the internal pressure in said pneumatic cylinder acts on said lateral rod as a reaction force against the driver's steering effort.

4,730,689

APPARATUS FOR SUPPORTING A SWING FRAME IN A VEHICLE

Hirotake Takahashi, and Kunio Nanno, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 728,777
Claims priority, application Japan, May 1, 1984, 59-88126
Int. Cl.[4] B62D *61/08*
U.S. Cl. 180—215 **6 Claims**



1. In a vehicle having a rear axle and a drive shaft operatively coupled to said rear axle, the combination including:

a longitudinally extending vehicle frame;

a frame pipe extending transversely of said vehicle frame and rigidly fixed thereto; and

a swing frame connected for pivotal movement to said vehicle frame, comprising:

a rear axle case enclosing said rear axle;

laterally spaced left and right rear arms extending longitudinally of said vehicle, said rear arms each having one end thereof secured to said rear axle case; and

coaxially aligned left and right pivot shafts extending laterally inwardly from the other ends of said rear arms, to extend into and be pivotally supported by opposite ends of said frame pipe.

4,730,690

OBJECT SENSING ARRANGEMENT

Robert L. McNutt, and John E. Wible, both of Painesville, Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 2, 1986, Ser. No. 902,726
Int. Cl.[4] B60K *28/10*
U.S. Cl. 180—274 **18 Claims**

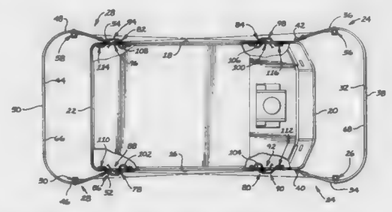
1. An object sensing arrangement for a vehicle having a frame, said frame having first and second spaced apart sides and first and second spaced apart end portions connected to and between the first and second spaced apart sides, comprising:

a first reflective target;

a first mounting means for movably connecting the first reflective target to the frame first side at a location on the frame first side adjacent the frame first end portion;

first signaling means for delivering a first signal to the first reflective target and receiving a reflection of said first delivered signal from said first reflective target;

first connecting means for movably connecting said first signaling means to said frame first side at a first location on the frame first side between the frame first and second end portions and adjacent the frame second end portion, and for maintaining said first signaling means for movement in



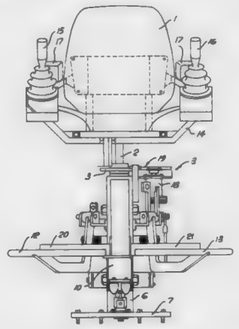
a direction toward said frame first side, in a passing relationship with said frame first side, and to a location between the frame first and second sides in response to an external force being applied to said first connecting means in a direction toward said frame first side.

4,730,691

BI-DIRECTIONAL VEHICLE CONTROL STATION

Frank W. Grigg, Corinda, Australia, assignor to M.I.M. Holdings Limited and University of Queensland, both of Brisbane, Australia

Filed Aug. 26, 1986, Ser. No. 900,405
Claims priority, application Australia, Aug. 27, 1985, PH02150
Int. Cl.[4] B60N *1/06*; B62D *33/06*
U.S. Cl. 180—329 **5 Claims**



1. A control station for use by a driver in a vehicle adapted to be driven alternately in forward and reverse directions, said control station comprising:

a seat mounted for swivel rotation about an upright axis by means comprising a shock-absorbing suspension, said axis extending substantially through the center of gravity of the seated driver, said seat being free to swivel while the vehicle is in motion;

foot rest means fixed relative to the swivel rotation of the seat for facilitating controlled swivelling of the seat by the driver's foot pressure while the vehicle is being driven; and

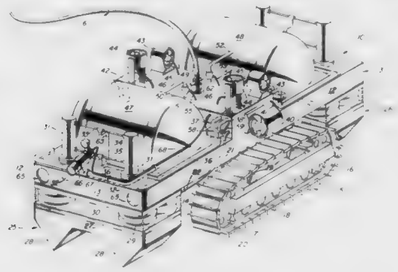
foot controls adjacent said foot rest means and extending around said axis such that they may be operated at all operational rotational positions of the seat, said foot controls and said foot rest means being mounted to rise and fall with the seat.

4,730,692

APPARATUS FOR MARINE SHEAR WAVE PROSPECTING

Delbert W. Fair, and Graydon L. Brown, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 12, 1980, Ser. No. 215,945
Int. Cl.[4] G01V *1/14*
U.S. Cl. 181—114 **19 Claims**



1. An underwater vibrator for use in a body of water having a surface and a seabed, comprising:

(a) a frame;

(b) locomotion means confined within said frame and attached to said frame for moving said frame over said seabed;

(c) cable means connected between a surface support means on the surface of said water and said underwater shear wave vibrator;

(d) buoyancy means attached to said frame means;

(e) means for selectively controlling said buoyancy means;

(f) vibrator means attached to said frame and disposed under said frame;

(g) hydraulic lift means positioned normal to the surface of said frame, slidably mounted through said frame, and attached to said vibrator means for engaging and disengaging said vibrator means from said seabed; and

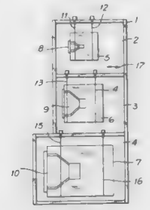
(h) means carried by said cable means for controlling said hydraulic lift means, said vibrator means, said buoyancy means, and said locomotion means.

4,730,693

MULTICHANNEL LOUDSPEAKER ENCLOSURE

Stanislas Kobus, 27, rue Denfert-Rochereau, 91120 Palaiseau, France

Filed Apr. 16, 1986, Ser. No. 852,611
Claims priority, application France, Apr. 18, 1985, 8505867
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—145 **7 Claims**



1. A loudspeaker enclosure comprising:

a framework comprised of a plurality of horizontal and vertical members, said vertical members maintaining said horizontal members in spaced apart relation for defining a plurality of cells between said horizontal members;

a module disposed in each cell, each module comprising a loudspeaker and a housing supporting said loudspeaker; and

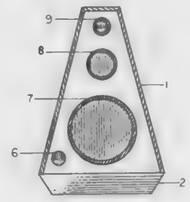
means for supporting said modules on the framework for relative movement of each module independently of the other modules and of said framework.

4,730,694

ELECTRO-MECHANICAL REPRODUCTION OF SOUND

Lawrence S. Albarino, 450 Ardsley Rd., Scarsdale, N.Y. 10583

Filed Mar. 1, 1985, Ser. No. 707,212
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—153 **6 Claims**



1. A high fidelity sound speaker enclosure, comprising;

an upper housing section consisting of a plurality of walls or panels substantially forming a four sided pyramid configuration, at least one of said panels having a plurality of transducer mounted therein, a bass reflex porting mounted in at least one of said panels;

a lower housing section consisting of a plurality of walls or panels substantially forming an inverted four sided truncated pyramid configuration, said lower housing section being connected to the upper housing section and forming a pedestal, therefore;

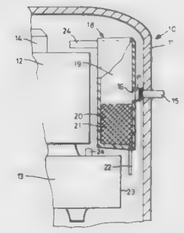
said upper housing section and lower housing section together exhibiting a generally hexagonal shape when viewed in a frontal position.

4,730,695

MUFFLER FOR HERMETIC COMPRESSOR

Alfredo Bar, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Dec. 1, 1986, Ser. No. 936,256
Claims priority, application Italy, Jan. 10, 1986, 42901 A/86
Int. Cl.[4] F01N *1/10*; F25D *19/00*
U.S. Cl. 181—252 **4 Claims**

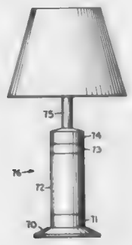


1. A hermetically sealed compressor unit comprising a shell, a compressor and muffler within said shell, said muffler being connected to the suction side of said compressor and to the shell and comprising first and second portions, said first portion being shaped to attenuate the gas pulsations of the compressor and defining an inlet for oil and refrigerant gas, said oil

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and gas being separated in said first portion, said second portion containing first means for damping gas pulsations and second means for discharging the oil from said first or second portion.

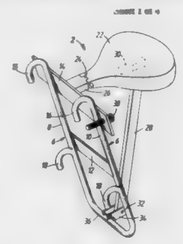
4,730,696
EMERGENCY ESCAPE ROPE APPARATUS
Arven Johnson, 6324 NW. Waukomis Dr., Kansas City, Mo. 64151
Filed Aug. 6, 1987, Ser. No. 82,383
Int. Cl.⁴ A62B *1/02*
U.S. Cl. 182—20 **23 Claims**



1. An emergency escape apparatus comprising:
(a) an elongated flexible line having opposite ends and a plurality of protuberances spaced therealong to form line segment lengths of said line between two sequential protuberances;
(b) an elongated protuberance receiving means, said protuberance receiving means having a wall;
(c) said wall having an elongated slot formed therein, said slot having an open end and an opposite closed end; and
(d) said protuberances being received sequentially within said protuberance receiving means through said open end of said slot from a first end of said line to an opposite free end of said line with each line segment length of said line forming a loop of line which extends outward from said protuberance receiving means through said slot when the pair of protuberances adjacent said segment length of line are positioned within said protuberance receiving means, such that said protuberances slide sequentially along said slot and out of said slot thereby paying out said line in an orderly manner upon said free end of said line being pulled.

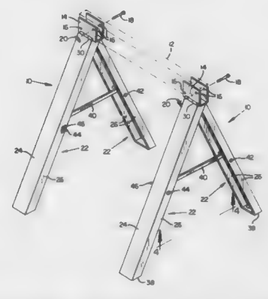
4,730,697
SEAT DEVICE FOR A LADDER
John C. Campbell, 11A Cheriton Avenue, Clayhall, Ilford, Essex, England
Filed Jan. 8, 1987, Ser. No. 1,387
Claims priority, application United Kingdom, Jan. 24, 1986, 8601711; Apr. 4, 1986, 8608340
Int. Cl.⁴ E06C *7/16*
U.S. Cl. 182—121 **4 Claims**

1. A seat device for a ladder, which seat device comprises a frame, first hook means extending from the frame and for fitting over a first rung of the ladder, second hook means extending from the frame and for fitting over a second and adjacent rung of the ladder, a seat which extends from the frame and which is foldable upwardly with respect to the frame, a support member having a first end portion which is remote from the seat and which is permanently pivotally mounted to the frame and a second end portion which is operatively connectible to the seat for the purpose of enabling the support member to support the seat and which is separable from the seat for the purpose of allowing the seat to be folded, and releaseable locking means between said seat and said second end portion for maintaining the seat in its unfolded position so that the seat cannot collapse to its folded position as a



result of being pushed upwardly as a person is climbing the ladder.

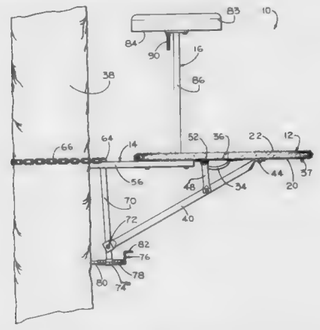
4,730,698
FOLDABLE SAWHORSE
James E. Harris, 11912 SE. Powell Blvd., Portland, Oreg. 97266
Filed Sep. 28, 1987, Ser. No. 102,015
Int. Cl.⁴ B27B *21/00*
U.S. Cl. 182—153 **6 Claims**



1. A foldable sawhorse comprising; a pair of end supports, each end support having a bracket and a pair of support legs projected downwardly and outwardly from said bracket in a work position, pivotal connecting means pivotally connecting each leg support to the bracket to permit outward pivoting of the legs, a cross brace extended between the legs and fastened to both legs, and removably fastened to one of the legs, said cross brace preventing outward pivoting of the legs in the work position, and stop means positively preventing pivoting of the legs inwardly from said work position, said cross brace being releasable from said one of the legs for pivoting of the legs back and over the bracket to bring the legs substantially together in parallel relationship in an upwardly projected compact position for storage.

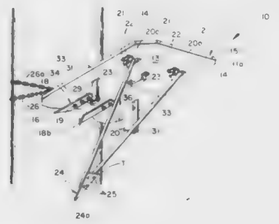
4,730,699
PORTABLE TREE STAND FOR HUNTERS
Robert G. Threlkeld, Rt. 3, Box 85B, Moberly, Mo. 65270
Filed Jun. 25, 1987, Ser. No. 66,230
Int. Cl.⁴ A01M *31/02;* **A45F** *3/26;* **A47C** *9/10*
U.S. Cl. 182—187 **4 Claims**

1. A tree stand for hunters or the like, comprising:
a platform presenting an upper surface and an underside;
means operatively coupled with said platform and depending from said underside for mounting the platform to the trunk of a tree and in an elevated position;
a seat; and
means including an upright, elongated support coupling said seat to said platform for full 360 degree rotational movement of the seat about an upright axis,
said upright support being fixedly secured to said seat, said platform having an aperture therein, the end of said support remote from said seat being adapted for insertion into said platform aperture for rotation of the seat as desired,
the area above said platform upper surface being open and essentially free of trunk-connected mounting structure or the like whereby a person sitting on said seat may turn the seat as desired without impediments,



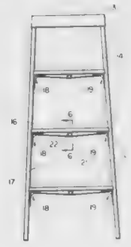
said platform further including a passageway therethrough separate from said aperture, said passageway being of a diameter greater than the effective diameter of said support whereby said support may pass through the passageway for close alignment of the seat and platform when the stand is in a collapsed, carrying position, there being means for releasably securing said seat in said closely aligned, collapsed condition.

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PORTABLE TREE STAND
Stanley A. Miller, 527½ Rapidan Town, Mankato, Minn. 56001, and Thomas E. Miller, R.R. 1, Box 178, Kilkenny, Minn. 56052
Filed Feb. 17, 1987, Ser. No. 15,338
Int. Cl.⁴ A01M *31/02;* **A45F** *3/26*
U.S. Cl. 182—187 **2 Claims**



1. A portable tree stand, comprising:
a flat, generally rectangular-shaped platform having upper and lower surfaces, opposed longitudinal edges and end edges, one of said end edges having a recess therein for accommodating the trunk of a tree,
a pair of elongate flat, laterally spaced apart substantially parallel penetrating elements, each being secured to said platform and projecting outwardly from the recessed end edge thereof, each penetrating element having an oblique beveled outer end defining a sharpened penetrating edge for penetrating a tree trunk and thereby preventing slippage of the platform, the oblique outer edge of each penetrating element converging inwardly towards the oblique outer edge of the other penetrating element,
a pair of elongate substantially straight brace members, means pivotally securing one end portion of each brace to the platform adjacent the lower surface thereof, said braces being pivotable between the collapsed and extended positions, said braces, when in the extended position, extending downwardly at an angle of approximately 45 degrees from said platform towards the recessed end edge thereof, and, when in the collapsed position, being positioned closely adjacent said platform, said braces converging towards each other and towards said recessed end edge,
a substantially flat penetrating member rigidly affixed to the convergent end portions of said braces and being disposed substantially parallel to the platform when the braces are in the collapsed position,
an elongate flexible tree-engaging element having one end thereof secured to said platform adjacent the recess edge thereof and being adapted to engage a tree trunk, releasable locking means on said platform adjacent said recessed end edge and being engageable with said flexible member to secure the platform to a tree, said penetrating elements on said platform and said penetrating member on said braces penetrating the tree trunk when the flexible member is secured to the tree trunk, and
a pair of carrying straps secured to said platform to permit ready support of the tree stand by a user as a backpack, said carrying straps extending around and engaging the braces to hold the same closely adjacent the platform when the tree stand is in the collapsed position.

4,730,701
STEPLADDER ASSEMBLY
Norman L. Miller, Jr., Wooster; John D. Vasichko, Pataskala; Clarence H. Bucher, and Nevin L. Sindlinger, both of Smithville, all of Ohio, assignors to Bauer Corporation, Wooster, Ohio
Filed Mar. 4, 1987, Ser. No. 21,681
Int. Cl.⁴ E06C *7/08, 7/10*
U.S. Cl. 182—218 **12 Claims**



1. A ladder step bracket comprising a unit of material formed to provide:
a step receiver and a ladder rail mount, said receiver and mount being at about a right angle relationship to each other;
gusset means formed in the receiver and mount to strengthen the angular relationship between the receiver and mount;
a pocket in said mount adjacent said gusset means to receive and retain the head of a truss rod in said pocket;
an aperture in said receiver adjacent said mount, to receive the head of a truss rod therethrough;
said pocket having a slot communicating with said aperture to receive a headed truss rod in the slot when the truss rod head is received in the pocket.

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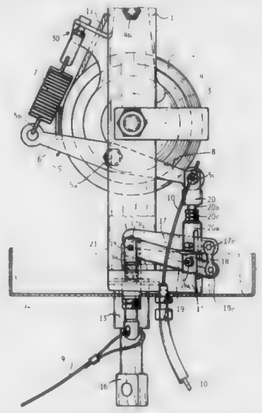
4,730,702
TREE-CLIMBING APPARATUS
Vernon A. Torbett, P.O. Box 33, Culp Creek, Oreg. 97427
Filed Aug. 4, 1987, Ser. No. 81,364
Int. Cl.[4] A63B *27/00*
U.S. Cl. 182—221 7 Claims



1. An apparatus for climbing trees and the like, comprising:
a rigid frame including:
rear boot support means;
means adjacent said rear boot support means for preventing rearward slippage of a user's boot and having a cushion disposed thereon;
an extended vertical member attached to said rear boot support means;
leg wrapping means carried by said vertical member to support the leg relative said frame;
means for cushioning a user's leg carried by said vertical member;
a spike angularly extending downwardly from said rear boot support means opposite said vertical member;
front boot support means; and
two laterally spaced apart parallel members having boot wrapping means and provided with opposite ends connected to said rear boot support means and said front boot support means.

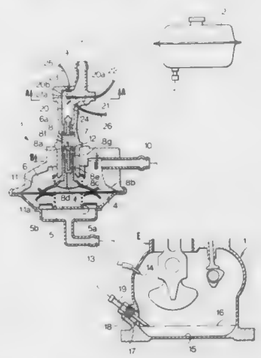
4,730,703
LOAD LOWERING DEVICE WITH A ROPE OR CABLE DRUM
Hans Neuendorf, Balve, Fed. Rep. of Germany, assignor to AGIMA Innovation & Management AG., Zurich, Switzerland, a part interest
Filed Mar. 13, 1987, Ser. No. 25,610
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609824
Int. Cl.[4] A62B *1/10*
U.S. Cl. 182—235 7 Claims

1. A rope or cable drum device for lowering a weight, such as a person, from an elevated location with a controllable lowering speed, comprising a frame, axle means rigidly secured to said frame, a drum rotatably mounted on said axle means, elongated flexible means wound on said drum and having a first end to be secured at said elevated location and a second end secured to said drum, means for attaching a load to said device, brake means operatively connected to said device for controlling said lowering speed of said drum, first spring means for biasing said brake means into a defined state, a rocker type brake lever (5) operatively arranged for cooperation with said brake means, first control means operatively connected to said rocker type brake lever for manually controlling a brake action in one direction, second control means operatively connected to said rocker type brake lever for manually controlling said brake means in an opposite direction, and lever linkage means operatively interposed between said means for attaching a load to said device and said rocker type brake lever, said lever linkage means being also operatively interposed between at least one of said first and second control means for applying a control force to said brake means through said lever linkage means and second spring means arranged between said load attaching means and said frame for counteracting an attached load for influencing said rocker type brake lever in such a way that a load of smaller weight reduces the



braking force while a load of larger weight increases the braking force, whereby a constant lowering speed is achieved when said first and second control members are not operated.

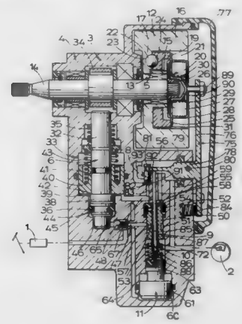
4,730,704
LUBRICATING OIL SUPPLY SYSTEM FOR INDUSTRIAL ENGINES
Katsuhiko Ohno, Ohmiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 1, 1986, Ser. No. 847,070
Claims priority, application Japan, Apr. 4, 1985, 60-50915[U]
Int. Cl.[4] F01M *1/18;* F04B *49/00;* G08B *17/06*
U.S. Cl. 184—6.4 14 Claims



1. A lubricating oil supply system for an engine having a pump for automatically supplying lubricating oil from an oil tank to a crankcase of the engine through a passage, comprising:
a control member comprising a bimetallic strip cantilevered on a wall of the passage so as to reduce the cross-sectional area of the passage at the control member when the temperature of the control member rises and to increase the cross-sectional area at the control member when the temperature lowers; and
an electric circuit comprising said strip, a pair of contacts

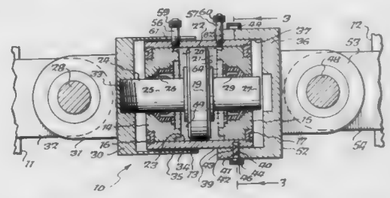
connected in said circuit, a warning lamp, and a battery, in series; and
said strip engages respective of said contacts when the strip bends with a change of temperature to respective predetermined upper limit and lower limit temperatures.

4,730,705
SKID-SENSING MEANS FOR VEHICLE HYDRAULIC ANTI-SKID BRAKING SYSTEMS
Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, England
Filed Mar. 6, 1986, Ser. No. 837,000
Claims priority, application United Kingdom, Mar. 15, 1985, 8506706
Int. Cl.[4] B60T *8/16*
U.S. Cl. 188—181 A 8 Claims



1. Skid sensing means for vehicle hydraulic anti-skid braking systems comprising a brake for a wheel on a vehicle, a source of fluid under pressure for applying said brake hydraulically, a shaft driven from said wheel to be braked by said brake, a housing having a fluid chamber and a fluid-tight seal sealing said fluid chamber from atmosphere, a dump valve for relieving pressure applied to said brake and movable between an open position and a closed position, said dump valve being disposed within said fluid chamber, a flywheel assembly in said housing mounted on said shaft, a clutch through which said flywheel assembly is driven from said shaft, said flywheel assembly comprising a flywheel member, a reaction member, and a ball and ramp mechanism co-operating with said two members and so constructed and arranged that relative angular movement between said members which occurs when the deceleration of said braked wheel exceeds a predetermined value is accompanied by relative axial movement therebetween into an expanded condition in order to open said dump valve to relieve said pressure applied to said brake, said clutch being arranged to slip at a predetermined threshold torque so that said two members can continue to rotate together or "overrun", in said expanded condition with respect to said shaft to maintain said dump valve in said open condition, at least until said wheel has recovered a predetermined rotational speed, wherein said dump valve comprises a valve seating, and a valve member for engagement with said seating, and said flywheel assembly acts on said valve member through a lever assembly comprising a single member, a fixed pivot in said housing and about which said member is angularly movable in response to relative axial movement between said members of said flywheel assembly, and said single member is constituted by an elongate lever, and an arm rigid with said lever, said lever having a force receiving part spaced from said pivot and with which said flywheel co-operates, and said arm having a force transmitting part spaced from said lever and which projects into said fluid chamber in said housing through said fluid-tight seal and acts to co-operate directly with said valve member of said dump valve to urge said member away from said seating against a force due to fluid brake-pressure in said fluid chamber which acts normally to urge said valve member into engagement with said seating in said closed position of said dump valve.

4,730,706
SNUBBER WITH INTEGRAL TEST STRUCTURE
Douglas P. Taylor, N. Tonawanda, N.Y., and David A. Lee, Santa Monica, Calif., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.
Filed Jul. 9, 1986, Ser. No. 883,700
Int. Cl.[4] F16F *9/24*
U.S. Cl. 188—297 30 Claims



1. A snubber for connection between first and second relatively movable external members and having structure which permits said snubber to be tested without being disconnected from said first and second external members comprising a cylinder, first and second end walls in said cylinder, a piston in said cylinder between said first and second end walls, first and second chambers in said cylinder on opposite sides of said piston, a piston rod mounting said piston and having a piston rod portion extending through said first end wall and having a piston rod end located outside of said cylinder on the opposite side of said first end wall from said piston, fluid in said cylinder in said first and second chambers on opposite sides of said piston, a seal in said first end wall surrounding said piston rod portion, first securing means for securing said piston rod end to said first external member, a housing for attachment to said cylinder, attachment means for selectively fixedly attaching said housing to said cylinder to cause both to act as a unit for normal buffer operation and for detaching said housing from said cylinder for permitting relative movement between said cylinder and said housing for testing of said snubber, support means for causing said housing to support said cylinder after said attachment means detach said housing form said cylinder to permit said relative movement therebetween, and second securing means for securing said housing to said second external member whereby said cylinder can be supported for relative movement in said housing while said first and second securing means maintain their connections with said first and second external members, respectively.

4,730,707
AUTOMOBILE DRUM BRAKE
David J. Edwards, Utica, Mich., and Peter Baum, Seligenstadt, Fed. Rep. of Germany, assignors to Rockwell-Golde GmbH, Fed. Rep. of Germany
Filed Dec. 18, 1986, Ser. No. 943,221
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545235
Int. Cl.[4] F16D *51/24*
U.S. Cl. 188—326 1 Claim

1. In an automobile drum brake of the duo-duplex type comprising two brake shoes floatingly disposed on a brake bracket, a web supporting each brake shoe, each shoe slidably supported on tightening devices and each brake shoe being rigidly mounted diametrically opposite the other on the brake bracket and said two brake shoes being slidably movable against a support bearing mounted on the brake bracket with the ends of the supporting webs being connected by springs, that improvement consisting of:

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each said tightening device for each brake shoe comprising a self-adjusting tightening device including piston means connected to the supporting web for said brake shoes and adapted to tighten as well as loosen said brake shoes in one direction away from each other and in another direction toward each other;

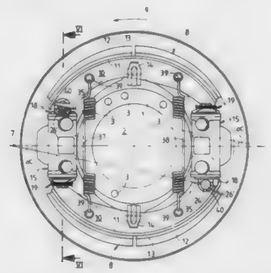
a seating bore in the piston means of each of the tightening devices adapted to receive a bushing;

a bushing in each of said seating bores;

a support pin rotatably journalled in each said bushing;

each said bushing having a slit for passage of one of the brake shoe webs;

said support pins serving as support bearings for said webs of said brake shoes which are mounted about an axis of rotation of said pin which is oriented parallel to the rotational axis of the brake;



each said support bearing having a depressed bearing surface in the form of a transverse groove in said pin formed in said support pin below a circumferential surface thereof whereby said bearing surface extends transversely and rectilinearly to the axis of said support pin in which groove said brake shoe is laterally guided;

each of said brake shoe webs having a counter surface which extends rectilinearly on the associated end of said web of said brake shoe;

said counter surface being oriented at an acute converging angle toward the center of said brake, said converging acute angle being measured between the counter surface and the axis of symmetry of said brake bracket and being less than 20°;

said bearing surface and said counter surface both being flat; and

the axis of rotation of said support pin being located in the plane of said bearing surface.

4,730,708

IDLING CONTROL METHOD AND SYSTEM FOR INTERNAL COMBUSTION ENGINE PROVIDING ANTI CREEP ACTION

Yukio Hamano, and Yuji Kashihara, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1986, Ser. No. 868,513

Claims priority, application Japan, May 30, 1985, 60-117559; Apr. 11, 1986, 61-083748; Apr. 11, 1986, 61-083749

Int. Cl.[4] B60K *41/22*

U.S. Cl. 192—0.033 **30 Claims**

1. In a vehicle comprising an engine and an automatic transmission including a fluid torque converter, a forward clutch and a manual range setting valve, a method of controlling said automatic transmission for anti creep ready-to-start temporary stop of the vehicle, comprising the steps of:

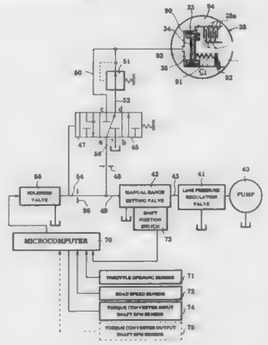
detecting that the vehicle is substantially stopped with said manual range setting valve being set to a forward speed range,

detecting a rotational speed associated with said fluid torque converter, and

controlling said forward clutch by engaging said forward clutch with reference to said rotational speed associated with said fluid torque converter, to such an extent that said rotational speed associated with said fluid torque converter does not drop below a certain rotational speed value.

16. In a vehicle comprising an engine and an automatic transmission including a fluid torque converter, a forward clutch and a manual range setting valve, a system for controlling said automatic transmission for anti creep ready-to-start temporary stop of the vehicle, comprising:

first means for detecting a vehicle speed,



second means for detecting a setting position of said manual range setting valve,

third means for detecting a rotational speed associated with said fluid torque converter, and

means for controlling said forward clutch with reference to said rotational speed associated with said fluid torque converter detected by said third means such that said rotational speed associated with said fluid torque converter does not drop below a certain rotational speed value when said first means is detecting that the vehicle is substantially stopped and said second means is detecting that said manual range setting valve is set to a forward speed range.

4,730,709

LOCKUP CLUTCH CONTROL SYSTEM

Shoji Kawata, and Tsuyoshi Yoshida, both of Okazaki, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 564,277, Dec. 22, 1983, abandoned. This application Jul. 30, 1986, Ser. No. 890,984

Claims priority, application Japan, Dec. 25, 1982, 57-231171

Int. Cl.[4] F16H *45/02*

U.S. Cl. 192—3.31 **5 Claims**

1. A lockup clutch control system for use on a vehicle of the type having a torque converter including input and output shafts and a lockup clutch for directly connecting said input and output shafts of said torque converter, said system comprising:

lockup discrimination circuit means for generating a lockup signal;

a lockup solenoid for actuating said lockup clutch in response to said lockup signal;

a speed sensor for detecting the speed of the vehicle;

deceleration detecting circuit means for detecting the deceleration of the vehicle based on a signal from said speed sensor; and

discriminator circuit means for de-energizing said lockup solenoid for at least a minimum interval of time in response to detection by said detecting circuit means of a rate of deceleration higher than a predetermined level, wherein said minimum interval of time is substantially independent of the vehicle speed subsequent to de-energizing said lockup solenoid and is determined by said detecting circuit means which also determines the rate of deceleration at which said lockup clutch is to be released.



4,730,710

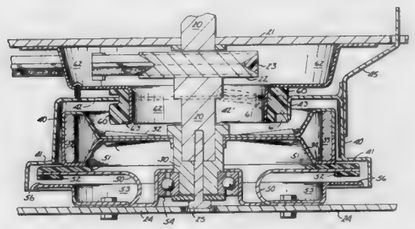
CLUTCH-BRAKE ASSEMBLY

Robert J. Granitz, Roseau, Minn., assignor to Polaris Industries, Inc., Roseau, Minn.

Continuation of Ser. No. 540,767, Oct. 11, 1983, abandoned. This application Dec. 10, 1986, Ser. No. 939,268

Int. Cl.[4] F16D *67/02;* **A01D** *69/08*

U.S. Cl. 192—18 R **19 Claims**



1. A clutch-brake assembly for a power-driven implement having a stationary frame and a power-driven shaft having an axis, comprising

a clutch plate attached to the shaft and rotatable therewith;

a brake plate carried coaxially of the shaft;

a driven member carried by the shaft and freely rotatable thereon;

a brake pad and a clutch pad for engagement, with the brake plate and clutch plate, respectively, and at least one leaf spring carried by the driven member and spaced radially from the shaft axis, the at least one leaf spring directly carrying the brake and clutch pads in alignment with the brake and clutch plates, respectively, and normally biasing the clutch pad into engagement with the clutch plate to drive the driven member; and

motion transmitting attachment means for attaching the brake plate to the frame coaxially of the shaft to cause axial movement of the brake plate in response to rotation thereof between a first axial position out of engagement with the brake pad and a second axial position in braking contact with the brake pad and spacing the clutch pad from the clutch plate.

4,730,711

ELECTROMAGNETIC CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

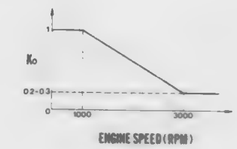
Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,889

Claims priority, application Japan, Aug. 31, 1984, 59-182315

Int. Cl.[4] B60K *41/28, 41/02;* **F16D** *37/02*

U.S. Cl. 192—0.052 **10 Claims**



1. A system for controlling an electromagnetic clutch of an engine for a motor vehicle having a transmission, comprising:

engine speed sensing means for producing an engine speed signal dependent on speed of the engine;

vehicle speed sensing means for producing a vehicle speed signal at low vehicle speed;

an accelerator pedal position sensor for producing an acceleration signal when an accelerator pedal of the motor vehicle is depressed;

selector lever position detecting means for producing a selector lever signal when a selector lever of the transmission is positioned at a position other than a neutral position and a parking position;

circuit means for supplying clutch current to a magnetizing coil of the electromagnetic clutch for engaging the clutch;

said circuit means comprising:

first means responsive to the vehicle speed signal, acceleration signal and selector lever signal for initiation of engagement of the clutch; and

second means for determining the clutch current at said initiation of the engagement of the electromagnetic clutch in accordance with the engine speed signal, the clutch current at the initiation of the engagement of the clutch being determined by the engine speed at the initiation and by a coefficient, said coefficient being a function of engine speed at the initiation and is reduced as the engine speed at the initiation is increased such that the clutch current at the initiation of the engagement of the clutch is reduced as the engine speed at the initiation is increased.

4,730,712

SYSTEM FOR CONTROLLING A CLUTCH FOR A MOTOR VEHICLE

Hiroya Ohkumo, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,863

Claims priority, application Japan, Mar. 31, 1986, 61-73691

Int. Cl.[4] F16D *37/02;* **B60K** *41/02, 41/28*

U.S. Cl. 192—0.076 **3 Claims**

1. A system for controlling a clutch for a motor vehicle having an accelerator pedal for operating a throttle valve of an engine, comprising:

first means for increasing clutch torque of the clutch with time when the accelerator pedal is depressed;

second means for increasing idling speed of the engine at cold engine operation, for providing a fast idle state;

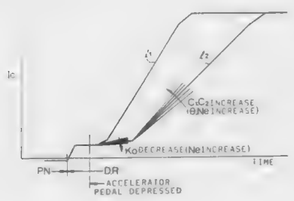
first detector means for detecting speed of the engine and for producing an engine speed signal dependent on the speed;

second detector means for detecting opening degree of the throttle valve and for producing a throttle signal dependent on the opening degree;

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third detector means for detecting the fast idle state and for producing a fast idle signal;

first control means responsive to the fast idle signal for decreasing rate of increasing the clutch torque at the depression of the accelerator pedal;



second control means responsive to the fast idle signal, to the engine speed signal, and to the throttle signal for increasing the rate of increasing the clutch torque with increase of the engine speed and/or the opening degree of the throttle valve.

4,730,713

VEHICLE PLATE CLUTCH

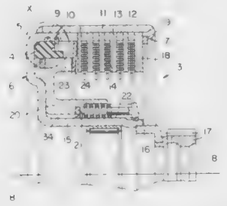
Juergen Pickard, Wernau; Helmut Sandner, Neuhausen; Reudiger Giesen, Althuette, and Erwin Nussbaumer, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 15, 1986, Ser. No. 906,909

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532759

Int. Cl.[4] **F16D** *25/063*

U.S. Cl. 192—85 AA **8 Claims**



1. A plate clutch assembly comprising an annular cylinder chamber; an annular cylinder portion means mounted in a transition region of the annular cylinder chamber to define in part the annular cylinder chamber between a radial flange means of the annular cylinder chamber and cylindrical external clutch plate carrier means of the annular cylinder chamber; said cylindrical external clutch plate carrier means being integral with the radial flange means; means for axial positioning of the annular cylinder portion means relative to the external clutch plate carrier means including the radial flange means which prohibits movement of the annular cylinder portion in one axial direction of an axis of the clutch and a circlip prohibiting movement in an opposite axial direction of an axis of the clutch; and where the annular cylinder portion means is supported against movement in an outward radial direction from the axis of the clutch by means of an elastic ring seal so that the annular cylinder portion means can be elastically supported on the external clutch plate carrier of the annular cylindrical chamber.

4,730,714

DRIVE SYSTEM FOR SELF-PROPELLED MACHINE

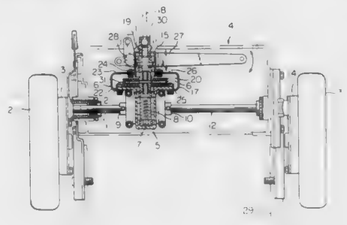
Junichi Akaike, Chofu, and Masatoshi Satoh, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 896,016

Claims priority, application Japan, Sep. 5, 1985, 60-135108[U]

Int. Cl.[4] **F16D** *13/40*

U.S. Cl. 192—89 R **7 Claims**



1. A drive system for a self-propelled machine comprising:

a prime mover mounted on a machine body having wheels;

clutch means for transmitting motive force from the prime mover to respective ones of said wheels for driving the machine to perform an operation;

wherein said clutch means comprises

a drive-side main body rotatably supporting a pressure contact disc drivenly connected to the prime mover,

a driven-side main body rotatably supporting a clutch disc drivenly connected to the wheels located in axial alignment with the pressure contact disc to allow the latter disc to move into and out of contact with the former disc, one of said drive-side main body and driven-side main body being secured to the machine body, and

resilient means extending substantially around said two discs for connecting the other main body there through to the one main body whereby the other main body can move in floating movement with respect to the machine body to bring the two discs into and out of contact with each other.

4,730,715

EXCHANGEABLE COIN COLLECTION BOX FOR COIN-OPERATED AUTOMAT

Fritz Siegenthaler, Trub, Switzerland, assignor to Autelca AG., Gümligen, Switzerland

Filed Jul. 25, 1986, Ser. No. 889,498

Claims priority, application Switzerland, Aug. 22, 1985, 3619/85

Int. Cl.[4] **G07F** *9/06*

U.S. Cl. 194—351 **4 Claims**

1. An exchangeable coin collection box for coin-operated automats, comprising

a wall **(1)** on the coin collection box having a coin feed opening **(16)** for receiving coins from the automat;

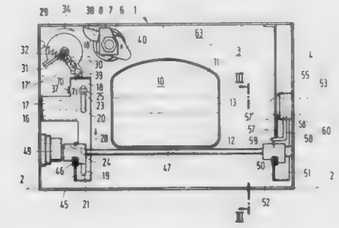
closure means **(17)** for said coin feed opening **(16)** having a first position **(17)** in which said coin feed opening **(16)** is closed, and second position **(17')** in which said coin feed opening **(16)** is open;

take-up means **(55)** adapted to receive a member **(53)** undetachably provided in the automat, when the box is inserted therein for receiving coins at said coin feed opening **(16)**;

latch means **(58)** arranged on said take-up means **(55)** and having an inoperative first position **(58)** and a second position **(58')** adapted to prevent said take-up means **(55)** from receiving the member **(53)** and adapted to secure the

member **(53)** in said take-up means **(55)** when received therein with said latch means **(58)** in said first position;

moving means **(49, 46, 45, 50, 52)** and coupling means **(47)** for collectively moving said closure means **(17)** and said latch means **(58)** from their first **(17, 58)** to their second positions **(17', 58')** and vice versa;



catch means **(57)** resiliently mounted on said take-up means **(55)** in a rest position **(57)** blocking said closure means **(17)** and said latch means **(58)** against movement from their first **(17, 58)** to their second positions **(17', 58')**, and adapted to be deflected to an inoperative position **(57')** by the member **(53)** when it **(53)** is received by said take-up means **(55)**.

4,730,716

STEEP ANGLE CONVEYOR WITH ARTICULATED FRAMES

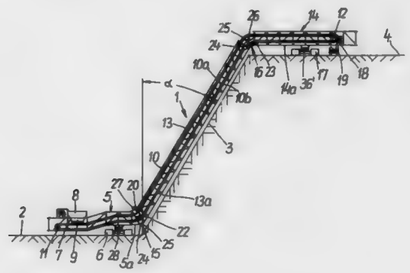
Gregor Enneking, Neuenkirchen, Fed. Rep. of Germany, and Herbert Von Blomberg, North Sidney, Australia, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,555

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530810; Jul. 15, 1986, 3623813

Int. Cl.[4] **B65G** *41/00*

U.S. Cl. 198—304 **13 Claims**



1. A steep angle conveyor for transporting bulk material from a lower level to a higher level, comprising:

a lower conveyor frame having first and second ends;

a lower drive mechanism which supports the lower frame, above a lower surface, at a support position between the first and second ends of the lower frame;

an upper conveyor frame having first and second ends;

an upper drive mechanism which supports the upper frame, above an upper surface, at a support position between the first and second ends of the upper frame, the upper conveyor frame being positioned above the lower conveyor frame;

an intermediate frame having first and second ends;

a first hinge articulately connecting the first end of the intermediate frame to the lower frame, the first hinge having a horizontally oriented axis that is disposed transverse to the lower frame;

a second hinge articulately connecting the second end of the intermediate frame to the upper frame, the second hinge having a horizontally oriented axis that is disposed transverse to the upper frame;

an endless belt;

means for movably mounting the belt to the frames so that a portion of the belt is accommodated by the lower frame, a portion of the belt is accommodated by the intermediate frame, and a portion of the belt is accommodated by the upper frame,

horizontally longitudinally displaceable means, between one of the upper and lower frames and the respective drive mechanism, for permitting the respective support position to move within predetermined limits between the first and second ends of the respective frame, the support position for the other of the upper and lower frames in the longitudinal direction being fixed;

a lower turntable;

a lower universal joint operatively connected to the lower turntable, the lower turntable and lower joint being disposed between the lower drive mechanism and the lower frame so that the lower frame is supported via the lower turntable and joint;

vertically disposed lower hydraulic cylinders operatively connected to the lower joint to control the orientation of the lower joint;

an upper turntable;

an upper universal joint operatively connected to the upper turntable, the upper turntable and upper joint being disposed between the upper drive mechanism and upper frame so that the upper frame is supported via the upper turntable and joint; and

vertically disposed upper hydraulic cylinders operatively connected to the upper joint to control the orientation of the upper joint.

4,730,717

CURVED ESCALATOR

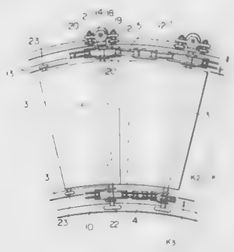
Kazuhiko Sugita, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 647,650, Sep. 6, 1984, abandoned. This application Feb. 18, 1987, Ser. No. 17,034

Claims priority, application Japan, Sep. 12, 1983, 58-167828; Sep. 12, 1983, 58-167831

Int. Cl.[4] **B66B** *21/02*

U.S. Cl. 198—328 **2 Claims**



1. A curved escalator having:

guide rails defining a stairway path,

a plurality of segment-shaped steps movable along the stairway path,

a step axle carrying each step, and

an inner and an outer endless loop of step chains connected to the step axles and driven by sprocket wheels on sprocket shafts at upper and lower turn-around portions,

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the sprocket wheels having teeth formed by first recessed portions in which each step axle is received and second recessed portions between the first recessed portions, the step axles being inclined at an angle and turning around a conical surface at the upper and lower turn-around portions so that said steps circulate along the endless loops,

each step chain including:

joint pieces and link members,

each joint piece being engaged with an end part of one of said step axles,

said link members having one end part connected with one end part of one of said joint pieces,

said link members including rollers,

means including a spherical roller and bearing providing a spherical joint connecting said end part of each joint piece to said one end part of each link member in a threedimensionally deflectable manner so as to allow said step axles to be disposed at an angle to said step chains in the turn-around portions, thus reducing the force exerted on said step chains,

said spherical joint including a first roller having a spherical exterior surface and mounted on said one end part of said joint piece, a second roller having an interior surface matching the exterior surface of said first roller and mounted on said one end part of the connected link member, whereby said interior surface of said second roller and said exterior surface of said first roller form a sliding surface of said joint,

bottom surfaces of the first recessed portions of the sprocket wheels being between respective teeth and sloped relative to the sprocket shafts so as to conform to the angle of the step axles in the turn-around portions and allow smooth transmission of driving force to the step axles,

each of said step axles having:

a roller mount rotatably mounted on an end of said step axle,

a guide roller rotatably mounted on said roller mount, said guide roller being rotatable about an axis perpendicular to and intersecting the longitudinal axis of said step axle and being engageable with one of said guide rails, and

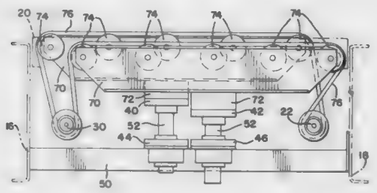
drive rollers mounted on both sides of said guide roller, said drive rollers each being rotatable about an axis parallel to said step axle and being engageable with one of said guide rails, whereby the position of said roller mount is regulated by said drive rollers to restict the angle of inclination of said guide roller and minimize slippage of said guide roller on the cooperating guide rail while allowing the steps to be kept horizontal while moved smoothly along the stairway path.

4,730,718

BI-DIRECTIONAL TRANSFER MECHANISM

Rosario Fazio, Perth Amboy, N.J., and James L. Frank, Grand Haven, Mich., assignors to Ermanco Incorporated, Spring Lake, Mich.

Filed Oct. 23, 1986, Ser. No. 922,194
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—372 **28 Claims**



1. A bi-directional transfer mechanism for use with conveyor systems comprising:

frame means;

first and second lift tables mounted for vertical movement on said frame means, each of said lift tables having means for guiding a conveying member mounted thereon;

said conveying member being driven by a power source which includes a drive shaft and further operatively engaging said guide means of said first and second lift tables, said conveying member being reeved around said guide means and said drive shaft such that the portion of said conveying member operatively associated with said first lift table is driven in one direction on said guide means of said first lift table and the portion of said conveying member operatively associated with said second lift table is driven in a different direction on said guide means of said second lift table; and,

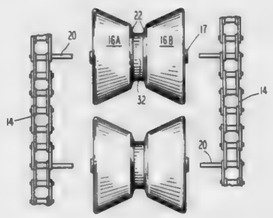
means for selectively positioning said first and second lift tables with respect to each other between respective article engaging and non-engaging positions, whereby one of said lift table guide means is located in said article engaging position such that the portion of said conveying member operatively engaging said one of said lift table guide means is raised above the conveying surface of said conveyor system, while the other of said lift table guide means is located in said article non-engaging position such that the portion of said conveying member operatively engaging said other of said lift table guide means is positioned below said conveying surface.

4,730,719

ROLLER FOR ORIENTATION OF FRUIT

Ian A. Brown; Everett P. Ristow, and Richard D. Walters, all of Tulare County, Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 757,559, Jul. 22, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 891,007
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—387 **2 Claims**



1. An improved roller for use with chain means of conveying apparatus for transporting and orienting articles thereon such as fruit and the like, said chain means having spaced pin means extending therefrom, said roller comprising

(a) a pair of symmetrically disposed united and interlocked cones rotatable as a unit having a common axis, each of said cones having lateral surfaces or slant heights forming article-contacting surfaces, each of said lateral surfaces forming an angle with the horizontal of about 25° and sloping uniformly inwardly from the base of said cone towards said axis,

(b) sheave portions provided inwardly from each of said lateral surfaces, outer portions of each of said sheave portions coinciding with the circumference of said lateral surfaces at the innermost portion of said lateral surfaces, the sheave portion of each cone forming an angle of about 17° with the vertical or the sheave portions together having between them an included sheave angle of about 34°,

(c) said sheave portions terminating inwardly at a centrally horizontally disposed root diameter surface having a circumference or peripheral portion with an axis coinciding with said common axis, and

(d) an axial bore through said roller coinciding with said common axis,

said pin means extending from said chain means engaging said roller bores, said rollers rotatable around said pin means,

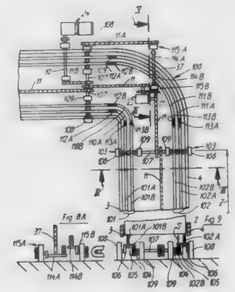
said sheave portions being engageable by drive belt means for controlling the speed and direction of rotation of said rollers.

4,730,720

DEVICE FOR TRANSPORTING CANS

Jürg Bischofberger, Elsau, and Manfred Feige, Frauenfeld, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Division of Ser. No. 616,403, Jun. 1, 1984. This application Sep. 5, 1986, Ser. No. 904,345
Claims priority, application Switzerland, Jun. 8, 1983, 3133/83
Int. Cl.[4] B65G *25/02*
U.S. Cl. 198—457 **4 Claims**



1. A device for transporting fiber sliver cans comprising

a vertical can guide system having a pair of vertical boards for guiding a can horizontally therebetween in a non-linear guide path; and

a can feed means for moving the can in a stepwise manner between and along said boards, said can feed means including two sets of parallel transport rails disposed in angular relation to each other, a set of curved rails between said sets of parallel rails, adjustable joints connecting said parallel rails to said curved rails to compensate for changes in distance between said parallel rails and said curved rails, each set of rails including two pairs of horizontally spaced rails and means for moving said pairs of rails through an endless path relative to said guide path and moving one pair of rails relative to the other pair of rails with a can supported on either pair of rails having forward movement during forward movement of said rails.

4,730,721

TOBACCO HARVESTER

Leon J. Demaiter, R. R. #1, and Gerard J. Demaiter, R. R. #1, both of Langton, Ontario, Canada N0E 1G0.

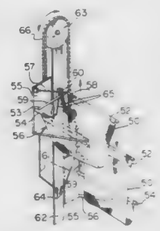
Division of Ser. No. 626,979, Jul. 2, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 818,898
Int. Cl.[4] B65G *17/32*
U.S. Cl. 198—715 **1 Claim**

1. A vertical conveyor mechanism suitable for use in a location of limited horizontal space, which comprises:

a pair of baskets, each comprising a sling of flexible material supported at two opposite edges by a pair of spaced parallel supporting rods lying, when said baskets are in an unflattened condition, in a substantially horizontal plane;

means for vertically raising and lowering said baskets in substantially vertical paths between upper and lower positions such that as one basket ascends, the other descends, said substantially vertical paths partially overlapping such that said baskets would collide in a region where said baskets pass each other if they remained in said unflattened conditions; and

means for folding one of said baskets to an upright flattened condition in said region where the baskets pass each other by rotating the one basket around its supporting rod lying horizontally most distant from the other of said baskets until its supporting rods lie in a generally vertical plane spaced horizontally away from the other of said baskets;



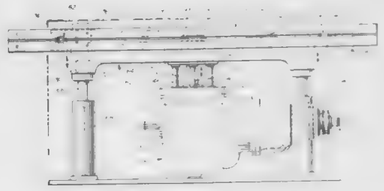
said means for folding comprising a pair of angled vertical guide rails separated horizontally to leave a gap therebetween, a spring closure device at upper ends of said guide rails and a peg means associated with each basket, the peg means and guide rails being aligned such that the peg means of an ascending basket passes between said guide rails and through said spring closure device, whereas the peg means of a descending basket is constrained by said spring closure device to contact one of said pair of rails which thereby causes said basket to rotate in said region where said baskets pass.

4,730,722

WALKING BEAM DRIVE APPARATUS

Don G. Sandrock, McHenry, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 16, 1987, Ser. No. 3,809
Int. Cl.[4] B65G *25/04; B23Q 7/04*
U.S. Cl. 198—774 **8 Claims**



1. A walking beam drive apparatus comprising in combination:

a cam-actuated single drive member including two drive cams affixed to a common cam shaft so as to constantly remain in timed relationship one with the other, and an output member operatively driven by said two drive cams and providing both rotary and lifting output motions;

rotary motion transfer means carried by said output member;

lift carriage assembly means supported upon said output member for linear reciprocation along a first direction;

slide carriage assembly means supported upon said lift carriage assembly means for sliding movement relative

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thereto along a second direction which is normal to said first direction;

bearing connection means operatively mounted between said output member and said lift carriage assembly means, whereby rotary motion of said output member is permitted without being transferred to said lift carriage assembly means; and

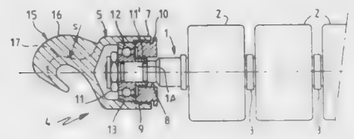
means drivably interconnecting said rotary motion transfer means with said slide carriage assembly means, whereby rotary motion of said output member and said rotary motion transfer means carried thereby is converted into sliding motion of said slide carriage assembly means relative to said lift carriage assembly means.

4,730,723

HOOKING DEVICE FOR CONVEYOR ROLLER

Bernard Mossot, Fontainebleau, France, assignor to Equipement Minier, Seichamps, France

Filed Apr. 15, 1987, Ser. No. 41,433
Claims priority, application France, Apr. 17, 1986, 86 05537
Int. Cl.⁴ B65G *39/10*
U.S. Cl. 198—827 **10 Claims**



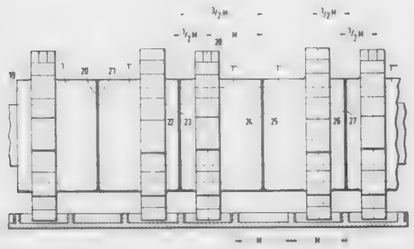
1. A hooking device for conveyor roller means comprising an internally threaded casing, the bottom of which is provided externally with a hook, and a hollow roller holding nut provided with external threading matched so as to screw into the inside of said casing, said hook of said casing being outwardly provided with a plurality of parallel stiffening winged ribs, the protruding dimension of which being normally greater than their width, and said casing and nut being in moulded plastic material said conveyor roller means supported by an elongated rotatable support means having one end passing through the opening in said hollow roller holding nut and being rotatably supported within said casing by a bearing means.

4,730,724

GEAR FOR A LINK CONVEYOR BELT

Nicholaas J. Poerink, Borne, Netherlands, assignor to Draadindustrie Jonge Poerink B.V., AA Borne, Netherlands

Continuation of Ser. No. 618,772, Jun. 11, 1984, abandoned, which is a continuation of Ser. No. 330,368, Dec. 14, 1981, abandoned. This application Mar. 24, 1986, Ser. No. 848,892
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048759
Int. Cl.⁴ B65G *23/06*
U.S. Cl. 198—834 **16 Claims**



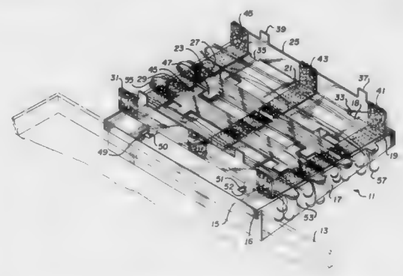
1. A modular construction comprising: a shaft for torque transmitting engagement and at least two gears, said gears being of plastic material and having a hub which is adapted to be slid on the shaft, said hub having a bore the cross-sectional configuration of which has, in a plane normal to the hub axis, the shape of a polygon, the hub having an outer body of a corresponding geometric cross-sectional configuration enlarged by the dimension of the material thickness of the hub body, said hub having opposite end faces defining a hub having an overall length of 3/2 M, said hub having an off-center gear rim with a center line spaced at ½ M from one end face of the hub and 1 M from the other end face of the hub, whereby said gear is adapted to be positioned relative to an adjacent gear on said shaft so that the distance between the gear rim center lines of adjacent gears is from 1 M to 2 M.

4,730,725

SUTURE TRAY

William M. Marshall, Sr., Salem, and Nancy R. Gaut, Roanoke, both of Va., assignors to MORF, Inc., Salem, Va.

Filed Apr. 13, 1987, Ser. No. 37,900
Int. Cl.⁴ A61L *17/02*
U.S. Cl. 206—63.3 **7 Claims**



1. A tray for holding sutures, vessel loops, umbilical tapes, and the like, comprising

a rigid base having a substantially flat upper surface;

a lip integral with said base, said lip being spaced from and extending downwardly from an edge of said flat upper surface;

one side of a loop and hook fastener secured to said flat upper surface adjacent opposed edges thereof;

t least one cover having a substantially flat underside of substantially the same dimensions as said upper surface;

means for removably inserting one edge of said cover into said flat upper surface, said cover being pivotable relative to said upper surface; and

the other side of said hook and loop fastener being secured to said underside and edge of said cover in a mating location with said one side of said fastener.

4,730,726

SEALED STERILE PACKAGE

Henry A. Holzwarth, Weston, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 21, 1987, Ser. No. 40,924
Int. Cl.⁴ B65D *81/26*
U.S. Cl. 206—204 **16 Claims**

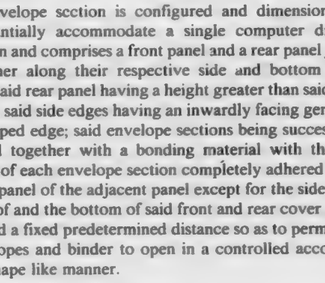
1. A sealed sterile package comprising

a sterilized surgical instrument having a moisture-sensitive component;

a formed plastic layer having at least one recess receiving said instrument therein;

a permeable layer secured to said plastic layer about said recess;

a desiccant pack disposed on a side of said permeable layer opposite said plastic layer and adjacent said moisture-sensitive component of said instrument; and



a moisture impervious layer secured to said permeable layer to encas said desiccant pack therebetween.

4,730,727

DISKETTE FILE

John Petroff, 6035 Broadway, Apt. 6-A, Riverdale, N.Y. 10471

Continuation of Ser. No. 728,681, Apr. 29, 1985. This application Jan. 22, 1987, Ser. No. 8,140
Int. Cl.⁴ B05D *27/08*
U.S. Cl. 206—311 **9 Claims**

1. A binder for storing computer magnetic diskettes comprising a plurality of envelope sections attached to one another in an accordian-type manner and encased within a cover wherein:

each envelope section is configured and dimensioned to substantially accommodate a single computer diskette therein and comprises a front panel and a rear panel joined together along their respective side and bottom edges with said rear panel having a height greater than said front panel, said side edges having an inwardly facing generally U-shaped edge; said envelope sections being successively joined together with a bonding material with the rear panel of each envelope section completely adhered to the front panel of the adjacent panel except for the side edges thereof and the bottom of said front and rear cover panels spaced a fixed predetermined distance so as to permit said envelopes and binder to open in a controlled accordian, fan-shape like manner.

4,730,728

GOLF ACCESSORY CARRYING DEVICE

Mark E. Larkin, 419 Northgate, Lindenhurst, Ill. 60046

Filed Apr. 14, 1986, Ser. No. 851,823
Int. Cl.⁴ B65D *85/00*
U.S. Cl. 206—315.9 **1 Claim**

1. A golf accessory carrying device comprising:

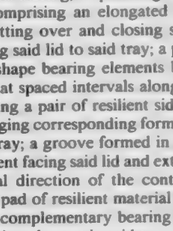
a flexible tubular member having an upper end and a lower end, said flexible tubular member constructed and arranged to receive and eject golf balls from either said upper and/or said lower end;

a pair of inwardly facing rims formed on the inside of said flexible tubular member at said upper end and said lower end;

an outwardly extending flange formed co-planar with the upper end of said flexible tubular member;

a plurality of various sized holes formed in said outwardly extending flange;

tapered tubular members extending downwardly from a portion of said holes, said tapered tubular members constructed and arranged to retain golf accessories;



a skirt downwardly depending from the outer edge of said outwardly extending flange;

a plurality of rib members located underneath said outwardly extending flange behind said skirt, said rib members being positioned between said tapered tubular members;

a strap member extending from said outwardly extending flange;

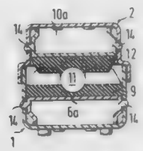
one of said holes being constructed and arranged to be engageable with said strap member.

4,730,729

CONTAINER FOR ENDOSCOPES AND SPARE PARTS

Harry Mönch, Schwabstrasse 4, 7134 Knittlingen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,183
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436489
Int. Cl.⁴ A61C *2/26*
U.S. Cl. 206—370 **12 Claims**



1. A container for storing, dispatching and sterilizing medical instruments comprising an elongated tray having lateral side walls; a lid fitting over and closing said tray; releasable clamps for securing said lid to said tray; a plurality of substantially inverted U-shape bearing elements being releasably secured in said tray at spaced intervals along its length, each of said elements having a pair of resilient side-arms with formations thereon engaging corresponding formations in said lateral side walls of the tray; a groove formed in an upper surface of each bearing element facing said lid and extending transversely to the longitudinal direction of the container, each groove accommodating a pad of resilient material to bear against said instrument; and a complementary bearing element in said lid, opposite each bearing element in said tray, each of the bearing elements in the lid having a transverse groove therein accommodating a pad of resilient material cooperating with the pad of the opposite bearing element of the tray to hold said instru-

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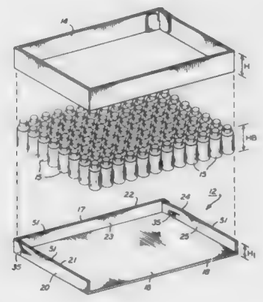
ment, the bearing elements of at least said tray being interchangeable with other such elements of different dimensions to enable different instruments to be accommodated in said container.

4,730,730

PACKAGE AND METHOD OF FILLING AND DISPENSING A PLURALITY OF BOTTLES

Walter J. Clarkson, Fairport, N.Y., assignor to Nalge Company, Rochester, N.Y.

Filed Jan. 21, 1987, Ser. No. 5,825
Int. Cl.⁴ B65D *71/08;* **B65B** *13/00;* **B65G** *65/34*
U.S. Cl. 206—497 **12 Claims**



1. A package adapted for holding a plurality of bottles or other like articles comprising:
- a tray having a bottom supporting surface, an upstanding confining wall and one open dispensing edge;
- a band for surrounding and confining said bottles placed on said tray;
- a sheet of heat shrinkable film shrunken around said tray, band and bottles.

9. A method of packaging a plurality of plastic bottles or other like articles in a tray having a bottom, three upstanding side walls and one open substantially straight edge comprising the steps of:
- filling said tray with a plurality of plastic bottles by positioning said open substantially straight edge against a shaker table which dispenses said bottles on to said tray until said tray is filled;
- placing a band around said bottles for surrounding and confining said bottles on said tray, said band being positioned directly adjacent the inside surface of said upstanding walls;
- enclosing said tray, bottles and band with a sheet of heat shrinkable material;
- applying heat so as to cause said shrinkable material to shrink tightly around said tray, band and bottles.

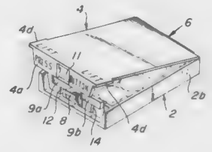
4,730,731

CHILD-RESISTANT CONTAINER

Blaine Allison, Pemberville, Ohio, assignor to Lumelite Corporation, Pawling, N.Y.

Filed Nov. 4, 1986, Ser. No. 926,556
Int. Cl.⁴ B65D *83/04*
U.S. Cl. 206—540 **4 Claims**

1. A unitary child-resistant container for pills or the like, comprising:
- (a) a rectangular tray-shaped body member having bottom, side, front and rear end walls;
- (b) a generally rectangular top closure member operable, when in a closed position, to overlie said body member to define a closed chamber;
- (c) integral hinge means pivotally connecting the upper edge of said body rear wall with the adjacent edge of said top closure member, thereby to afford pivotal movement of said top closure member from said closed position to an open position relative to said body member, said top closure member, when in the closed position, including a downwardly extending front wall arranged in face-to-face relation opposite the outer surface of said body front wall;
- (d) latch means for releasably fastening said top closure member to said body member when said closure member is in the closed position, said latching means including at least one horizontal latching projection normally extending from one of said front walls of said top closure and body members for insertion within a corresponding recess contained in the other of said members, respectively;
- (e) latch release means including a release button connected with the outer surface of said body member front wall and extending horizontally forwardly therefrom through, and outwardly beyond, an opening contained in said closure member front wall, said body front wall being resiliently



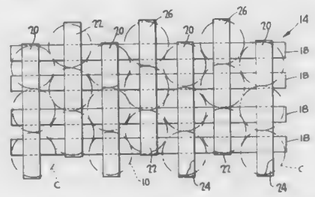
deformable upon depression of said button release said latching projection from said recess; and
- (f) opening resisting means for resisting opening of said top closure member from said body member when said latching projection is release from said recess, including a pair of stiffening ribs arranged on the lower surface of said top closure member when said top closure member is in the closed condition for frictional engagement with the adjacent surfaces of the side walls of said body member, respectively, thereby to frictionally resist pivotal movement of said closure member in the direction from the closed position toward the open position;
- (g) said body member front wall containing a pair of horizontally spaced vertical slots (**12,14**) extending downwardly from the upper edge thereof, thereby to define a deformable front end wall portion (**2c'**) carrying both said latch release means and one of said latching means, whereby said deformable portion is operable independently of said side walls and said opening resisting means.

4,730,732

PALLET AND TOP FRAME FOR SCROLLED DRUM PALLETIZED PACKAGE

Walter R. Wagonseller, Naperville, Ill., assignor to Continental Fibre Drum, Inc., Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 432,038
Int. Cl.⁴ B65D *19/24*
U.S. Cl. 206—597 **5 Claims**



1. A pallet for forming a package of plural cylindrical members, said pallet comprising a plurality of generally like length and parallel flat supporting surface engaging stringers, and a plurality of flat article receiving like center-to-center spaced support members secured to and extending transversely of said stringers, said stringers including first and second outer stringers, at least one end portion of each of said support members extending transversely of an adjacent one of said outer stringers, said end portions of said support members projecting alternatingly from said first outer stringer and said second outer stringer, said members overlying said stringers, and that part of each support member end portion extending beyond a respective one of said outer stringers having a spacer underlying the same, said spacer being of a thickness according to the thickness of said stringers.

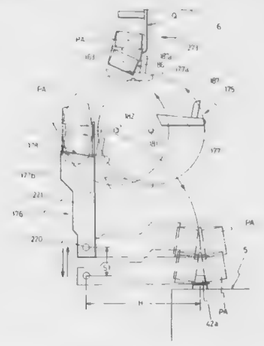
3. A pallet for forming a package of plural cylindrical members, said pallet comprising a plurality of generally like length and parallel flat supporting surface engaging stringers, and a plurality of flat article receiving like center-to-center spaced support members secured to and extending transversely of said stringers, said stringers including first and second outer stringers, at least one end portion of each of said support members extending transversely of an adjacent one of said outer stringers, said end portions of said support members projecting alternatingly from said first outer stringer and said second outer stringer, and a hold-down, said hold-down overlying said pallet and having support members corresponding to said pallet support members and of a like alternating projection.

4,730,733

SYSTEM FOR DELIVERING AND INSPECTING PACKAGES

Shuzo Kawamura, Joyo, and Kazuo Nakanishi, Uji, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 4, 1986, Ser. No. 903,678
Claims priority, application Japan, Sep. 6, 1985, 60-197417; Sep. 9, 1985, 60-200116
Int. Cl.⁴ B07C *5/02, 5/36;* **B65G** *43/08*
U.S. Cl. 209—538 **17 Claims**



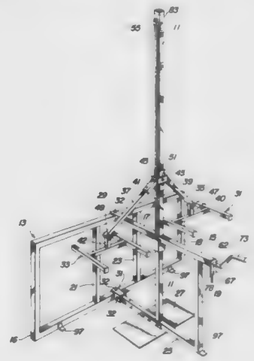
1. A system for delivering and inspecting packages including an apparatus for deliverying packages and an inspecting device of packages delivered from said apparatus characterized in that said apparatus for delivering packages comprises a first receiving and delivering device for receiving packages from a path of their transportation and delivering said packages to a first location and a second receiving and delivering device for receiving said packages at said first location and delivering them to said inspecting device, each of said first and second receiving and delivering devices including a package receiving member and a mechanism for changing the package receiving position of each said package receiving member in accordance with the kind of said package.

4,730,734

SECURITY DEVICE

Ronald C. Dwelley, 1517 Sunset La., Fullerton, Calif. 92633; Dale Matsuda, 9342 Woodcrest Dr., Fullerton, Calif. 92633, and Robert B. Tanaka, 2766 Loreto Ave., Costa Mesa, Calif. 92626

Filed Dec. 5, 1985, Ser. No. 805,277
Int. Cl.⁴ E05B *73/00*
U.S. Cl. 211—8 **9 Claims**



1. A security device for securing a stack of product or packing device articles comprising:
- a vertical column member having a lower end;
- sleeve means slidably mounted with respect to said vertical column member;
- an arm means connected to said sleeve means;
- a clamping pad connected to said arm means;
- means for pivoting said arm means with respect to said sleeve means;
- a base means;
- means for attaching said base means adjacent the lower end of said vertical column member beneath said clamping pad;
- means for moving said clamping pad up and down on said vertical column member and for locking said clamping means in position against a stack of said articles to retain said articles in a secure and locked position between said base means and said clamping means; and
- means for pivoting said clamping pad with respect to said arm means.

4,730,735

TAPE STORAGE SYSTEM

Lloyd Lechner, Mayville, Wis., assignor to Tab Products Company, Palo Alto, Calif.

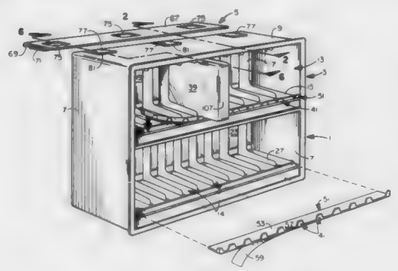
Filed Oct. 30, 1986, Ser. No. 924,778
Int. Cl.⁴ A47F *7/00*
U.S. Cl. 211—41 **26 Claims**

1. In a container having a plurality of open sided compartments, each compartment partially defined by a floor and a pair of spaced vertical ribs, the compartments being adapted to hold selected data storage cartridges manufactured with a notch at a predetermined location on one of the cartridge surfaces, the cartridges being insertable into the compartments with the notched surfaces thereof in facing contact with the compartment floors and the notches located near the compartment open sides,

the improvement comprising:

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rigid means secured to the compartment floors for inflexibly and releaseably engaging the cartridge notches to posi-



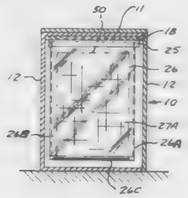
tively retain the cartridges within the respective compartments.

4,730,736

HANGER STRIP FOR ART PRINTS

Dale C. Lindquist, Willmar, and Mark E. Quale, New London, both of Minn., assignors to The Fountainhead Corporation, Willmar, Minn.

Filed Mar. 9, 1987, Ser. No. 23,197
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—46 **13 Claims**



1. For use in combination with sheet material that has an edge that is to be protected, a hanger strip comprising:

a support having a first leg, said first leg having a desired length along a longitudinal axis and having first and second ends, a second leg spaced from said first leg and generally parallel thereto, said second leg having a length in a direction perpendicular to the longitudinal axis shorter than the first leg;

first means joining said first and second legs at first ends therof;

second means for supporting said first means with the first and second legs extending in a direction away from the second means; and

said first leg having hinge means between its first and second ends, said hinge means extending longitudinally for permitting hinging along an axis parallel to the longitudinal axis of the first leg to permit pivoting the second leg and the first means joining the first and second legs in a direction to move the second leg to postion to permit access to the edge of sheet material supported on the first leg.

4,730,737

PORTABLE CLOTHES HANGER RACK

Edward Robinson, 388 Braeside Ave., E. Stroudsburg, Pa. 18301

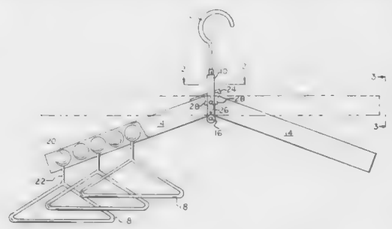
Filed Jun. 20, 1986, Ser. No. 876,723
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—113 **1 Claim**

1. A portable clothes hanger rack comprising:

(a) a generally rectangular yoke, one end of said yoke including a hook for self retention;

(b) a pair of hollow elongated parallelpipedal arms pivotably mounted to said yoke proximate said yoke's other end, each said arm including a first end and a second end, two sides, and top and bottom walls, said first end hingeably attached to said yoke and including a notch, said second arm end including a removable cover hinged to said second end, said bottom wall including a longitudinal slot to receive hanger necks;

(c) a plurality of hangers, each said hanger including a neck and a sphere mounted at the apex of said neck, said sphere sized to be movably retained in said arm's hollow interior



through said second arm end with said hanger neck slidably received in said arm bottom wall's slot;

(d) a latch mechanism to secure said arms in a plane perpendicular to said yoke, said latch mechanism including

(i) a hook mounted on said top wall of one arm proximate said arm's first end; and,

(ii) hook retention means mounted on said top wall of said opposite arm proximate said opposite arm's first end; and,

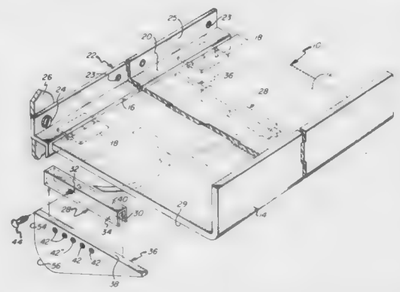
(e) a pin transversely mounted through said yoke at a point such that when said arms are horizontal, said notches face each other and overfit said pin, thereby stabilizing said arms in the horizontally extended position.

4,730,738

ADJUSTABLY TILTABLE WALL SHELF ASSEMBLY

John Bartus, Poquonock, and Vincent Dicioccio, Rocky Hill, both of Conn., assignors to United Plastic Technologies, Inc., New Britain, Conn.

Filed Oct. 6, 1986, Ser. No. 915,765
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—90 **15 Claims**



1. An assembly for supporting a bracket in each of a multiplicity of angular orientations, comprising: a brace piece having an upper portion with a substantially rectilinear top face extending along a first axis, and a back portion with a contoured end face, said end face having an upper element that is outermost on said brace piece and that lies adjacent said first

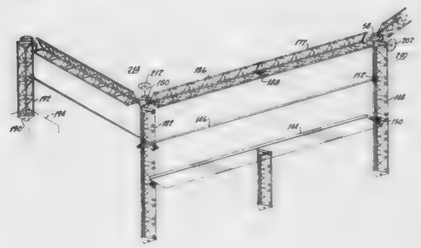
axis on a second axis that is perpendicular thereto, and said end face having a plurality of lower elements below said upper element and accessible for direct contact on an adjacent flat surface, said lower elements being spaced inwardly from said second axis by distances that increase progressively with increasing distance from said first axis, so that any one of said lower elements that is disposed further from said first axis than any other of said lower elements will also be spaced further from said second axis than is said other lower element; a mounting piece said upper portion said brace piece in each of a multiplicity of relative position along said top face; and means for disengageably affixing said brace piece to said mounting piece in each of said relative positions.

4,730,739

OPEN FRAMEWORK MERCHANDISE DISPLAY SYSTEM

Robert J. Semerau, Jr., 28541 Casanal, Mission Viejo, Calif. 92692

Filed Feb. 4, 1987, Ser. No. 10,759
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—189 **11 Claims**



1. An open framework merchandise display system comprising:

(a) a plurality of trusses, each of which comprises:

(i) three parallel tubes; and

(ii) a plurality of cross members which are arranged in trios along the tubes, each member of the trio joining a pair of tubes, each truss having a cross section which is the same as that of any other truss and has the shape of the isosceles triangle formed by joining two adjacent corners of a square with the midpoint of the side of the square opposite those corners;

(b) a plurality of junction plates, each of which comprises:

(i) a plate;

(ii) three rods which protrude perpendicularly from one face of the plate and are so sized and situated as to penetrate the tubes of a truss; and

(iii) a post which is in the shape of a rectangular parallelepiped, protrudes perpendicularly from the face of the plate opposite the rods, has an axis which intersect the center of the square from which the cross section of the truss was formed, has sides which are parallel to the sides of the square, has a hole through it, the axis of which is parallel both to the plate and to a pair of the sides of the post, and intersects the axis of the post; and has a slot through it, whose center plane is determined by the axis of the hole and the axis of the post, and which extends toward, but not to, the hole from the end of the post opposite the plate;

(c) a plurality of junction flanges, each of which comprises:

(i) a first horizontal plate which contains sixteen holes which each have a diameter approximately equal to that of a junction plate post hole, and are arranged in two concentric regular octagons which have parallel sides and have radii which differ by a distance approximately equal to the distance between the slot the hole of a junction plate post; and

(ii) a second horizontal plate which has sixteen holes opposite the holes in the first horizontal plate, of equal diameter, and is above the first horizontal plate by a distance which is approximately equal to the distance between opposite sides of a junction plate post;

(iii) eight rods which each have a diameter approximately equal to the thickness of a junction plate post slot, are perpendicular to, and join, the inner octagon of holes in the horizontal plates;

(iv) a first vertical plate which is joined to the bottom of the first horizontal plate, offset from the center of the octagons, and includes a pair of holes which have diameters equal to those of a junction plate post hole are on a vertical line which intersects the point on the first vertical plate which is closest to the center of the octagons, and are separated by a distance approximately equal to the distance between the slot and the hole of a junction plate post;

(v) a second vertical plate which is also joined to the bottom of the first horizontal plate, offset from the center of the octagons by an equal distance, but opposite direction, as the first vertical plate, is parallel to the first vertical plate, is separated from the first vertical plate by a distance approximately equal to the distance between opposite sides of a junction plate post, and includes a pair of holes opposite to, and of the same diameter as, the holes in the first vertical plate;

(d) a multiplicity of means for fastening the junction plates to the junction flange, the diameters of which are approximately equal to those of the junction plate post holes;

(e) one or more means for displaying merchandise; and

(f) one or more means for attaching each display means to a truss, each attaching means comprising either a single attaching member or a spaced pair of parallel attaching members, the spacing being fixed and equal to the length of the side of the square from which the cross section of the truss was formed;

whereby each vertical truss supports a junction plate oriented vertically, which in turn supports the bottom of a junction flange, the sides of which in turn support one or more junction plates oriented horizontally, each of which in turn supports a horizontal truss;

whereby, at any increment of 45 degrees, a horizontal truss may be joined to a junction flange and an attaching means, parallel to and generally below the horizontal truss, with a single attaching member, may be used to attach the display means to the vertical truss; and

whereby, at any increment of 90 degrees, the vertical truss further provides a pair of truss tubes to which an attaching means, parallel to and generally below the horizontal truss, with a spaced parallel pair of attaching members, may be used to attach the display means to the vertical truss without changing their spacing or parallelism.

4,730,740

DISPLAY SYSTEM

Russell K. Winter, Crownsville; Thomas D. Harvey, Rockville, and Nedim Savas, Bethesda, all of Md., assignors to Russell William, Ltd., Odenton, Md.

Continuation of Ser. No. 661,599, Oct. 17, 1984, Pat. No. 4,646,923. This application Mar. 3, 1987, Ser. No. 21,073
Int. Cl.[4] A47F *43/00*
U.S. Cl. 211—189 **15 Claims**

1. A movable display system displaccable with respect to and interfacing with a base surface for displaying articles mounted thereon comprising:

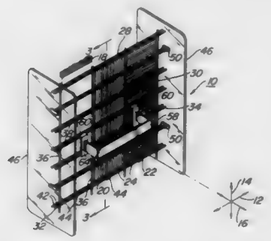
(a) at least one panel member having a predetermined width, said panel member having opposing frontal and rear surfaces, at least one of said surfaces having indicia formed thereon;

(b) a frame body for releasably capturing said panel member therein, said frame body including at least a pair of vertically extending column members longitudinally displaced

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each from the other by a dimension substantially equal to a longitudinal dimension of said panel member and at least a pair of longitudinally extending row members fixedly secured to said vertically extending column members, said vertically extending column members being sandwiched between said pair of row members for providing an insert guideway for insert and removal of said panel member, said pair of longitudinally extending row members providing a display mounting member adapted to hold a display bracket, said column members and said row members being displaced by a distance sufficient so that said indicia may be viewed; and,

(c) a base member for providing a stabilized mounting for said movable display system on said base surface, said pair of vertically extending column members being secured to said base member.

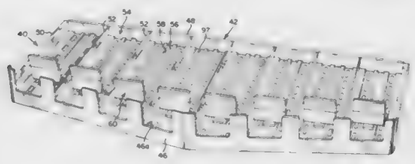


4,730,741

PRESSURE-FEED TRAY SYSTEM

William C. Jackle, III, Scottsdale, Ariz.; Richard A. Sherwood, Dallas, Tex.; Frederick M. Avery, and James V. Seifert, both of Phoenix, Ariz., assignors to The Niven Marketing Group, Des Plaines, Ill.

Filed Oct. 16, 1986, Ser. No. 920,042
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—59.3 27 Claims



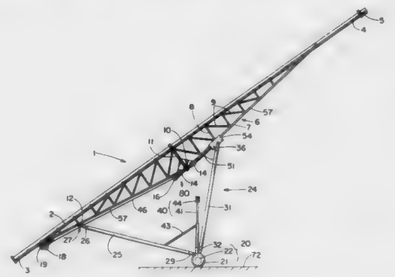
1. A product dispensing apparatus comprising a fixed support means and a tray slidably supported thereon and movable from a product dispensing first position substantially coextensive with said support means to a second product replenishing position extending forwardly away from said support means, said tray having a front end and a rear end, guide means extending along a bottom portion of said tray between said front end and said rear end, pusher plate means slidably mounted in said guide means, biasing means between said support means and said pusher plate means for biasing said pusher plate means towards said front end, latch means adjacent said front wall for maintaining said tray in said first position, and stop means on said support means for restraining movement of said pusher plate means with said tray when said tray is moved from said first position to said second position.

4,730,742

APPARATUS FOR LIFTING AN ELONGATE MEMBER

Leon G. Feterl, Salem, S. Dak., assignor to Core Industries, Inc., Bloomfield Hills, Mich.

Filed Dec. 29, 1986, Ser. No. 947,088
Int. Cl.[4] B66C 23/78
U.S. Cl. 212—189 19 Claims



1. In combination with an elongate member movable upwardly and downwardly between a lowered position and an elevated position and having first and second ends, an apparatus for supportably elevating and lowering said elongate member between said lowered and elevated positions, comprising:

longitudinal rail means attached to said elongate member and generally coextending with a portion thereof;

an undercarriage for supporting said elongate member, comprising:

(a) a base;

(b) a lower undercarriage arm having an inner end attached to said base, and having an opposite, outer end pivotably mounted on said elongate member;

(c) roller support means movably supporting said elongate member along said coextending rail means;

(d) a load-bearing undercarriage lift arm having an inner end attached to said base and an opposite, outer end attached to said roller support means;

(e) riser post means attached to said lower undercarriage arm and extending generally upright from said base for supporting said elongate member while elevating said elongate member from said lowered position and lowering said elongate member to said lowered position; and

(f) riser post sheave means mounted to the upper portion of said riser post means;

a winch cable operatively associated with said roller support means to mechanically coact therewith;

a winch having said cable wound thereon for alternately retracting and extending said winch cable to move said roller support means along said generally coextending rail means; and

central sheave means mounted on said elongate member to guide said cable, said cable being guided on said central sheave means and supportably on said riser post sheave means when said elongate member is in said lowered position whereby said elongate member is supported on said riser post sheave means for supportably elevating and lowering said elongate member between said lowered position and said elevated position.

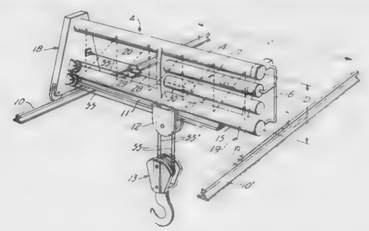
4,730,743

HYDRAULICALLY OPERATED BRIDGE CRANE

Alan H. Rosman, Woodland Hills, Calif., assignor to Dynamic Hydraulic Systems, Inc., Canoga Park, Calif.

Filed Dec. 15, 1986, Ser. No. 941,330
Int. Cl.[4] B66C 17/00
U.S. Cl. 212—205 16 Claims

14. As an article of manufacture, an elongate travelling bridge with end-support means for riding spaced parallel horizontal rails to be spanned by said bridge, said bridge comprising spaced upper and lower closed elongate cylinders defining substantially the full bridge span, hydraulic-accumulator means having a gas-pressurized volume, said cylinders having fluid communication and coating to define substantially the entire gas-pressure volume of said hydraulic-accumulator means, means rigidly connecting said cylinders to each other and defining their spacing, the end-support means being rigidly



connected to the respective ends of said cylinders, a traction cylinder and piston carried by said bridge within a first fraction of said span, the tail end of said piston having externally accessible means of cable connection, an elongate piston/cylinder having a gas connection at one end to one of said upper and lower cylinders, and hydraulic-circuit means comprising a reversibly controllable hydraulic power integrator connecting the other end of said piston/cylinder to the tail end of said traction cylinder.

4,730,744

BABY BOTTLE WITH VALVE

Mark T. Vinciguerra, 51 E. 23rd St., Riviera Beach, Fla. 33403

Filed Jun. 17, 1987, Ser. No. 63,071
Int. Cl.[4] A61J 9/04
U.S. Cl. 215—11.5 12 Claims



1. A bottle for feeding a baby, comprising:

(a) a nipple on the bottle,

(b) a plurality of walls,

(c) an opening in the one of said walls, and

(d) a valve having an open position and a closed position located in said opening, said valve comprising:

(1) a body having a first portion extending into the interior of the bottle and a second portion extending exterior to the bottle,

(2) an air inlet extending through said body from the second portion to the first portion,

(3) seal means cooperating with said first portion and said opening, and

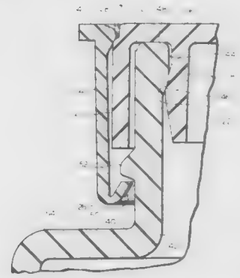
(4) spring means for urging said first portion toward said one wall to close said opening.

4,730,745

TAMPER INDICATING PLUG STYLE CLOSURE

Robert A. Perry, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Mar. 30, 1987, Ser. No. 31,968
Int. Cl.[4] B65D 41/46, 41/58
U.S. Cl. 215—230 19 Claims



1. A composite, tamper indicating closure for a container having an annular neck, the annular neck having an inner surface and an outer surface terminating in a rim, the outer surface of the annular neck having an outwardly projecting portion, said closure comprising, in combination:

an inner member, said inner member comprising,

a top panel portion, said top panel portion being adapted to span the rim of the container;

an inner annular portion, said inner annular portion extending downwardly from a juncture with said top panel portion and having an outer surface, said inner annular portion being adapted to be positioned within the annular neck of the container with said outer surface of said inner annular portion in engagement with the inner surface of the annular neck of the container, and

an outer annular portion, said outer annular portion extending downwardly from said top panel portion and having an inner surface, said inner surface of said outer annular portion being adapted to be positioned adjacent to the outer surface of the annular neck of the container when said inner annular portion of said inner member is positioned within the annular neck of the container;

an annular outer member, said outer member comprising;

a skirt;

container engaging means, said container engaging means extending inwardly and upwardly from said skirt and being adapted to engage the outwardly projecting portion of the outer surface of the annular neck of the container to prevent the removal of said annular outer member from the container over the rim of the container without visible alternation of the condition of said annular outer member; and

locking means for locking said annular outer member to said inner member to prevent the removal of said inner member from the container without said visible alteration of the condition of said annular outer member.

4,730,746

ENCLOSURE

Gerald K. Yankoff, Cincinnati, Ohio, assignor to Ulticon Systems, Inc., Blue Ash, Ohio

Filed Aug. 29, 1986, Ser. No. 902,156
Int. Cl.[4] B65D 6/16, 43/08
U.S. Cl. 220—4 F 5 Claims

1. A sheet metal enclosure, comprising:

a base;

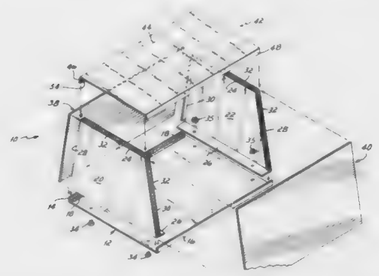
a pair of spaced endwalls each having a top edge, opposed side edges and a bottom edge connected to said base, said

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side edges of each said endwalls tapering inwardly toward one another from said bottom edge to said top edge of said endwalls;

a pair of spaced sidewalls each having a bottom edge engaging said base, each of said sidewalls extending between said endwalls and engaging a side edge thereof so that said sidewalls taper inwardly toward one another from bottom to top;

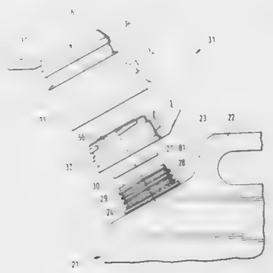
a top cover having a sheet and opposed side flanges, said



opposed side flanges being connected to said sheet and tapering outwardly at an angle relative to one another forming opposed inner surfaces, a strip of resilient material being mounted to each of said inner surfaces;

said top cover being insertable over said tapered sidewalls so that said strips of resilient material mounted to said inner surfaces of said opposed side flanges engage said sidewalls, said sidewalls being wedged between said opposed side flanges of said top cover to lock said sidewalls against said endwalls and to lock said top cover to said sidewalls.

4,730,747
SCREW STOPPER FOR SYNTHETIC PLASTICS MATERIAL CANS
Wolfram Schiemann, Eugen-Nagele-Str. 17, 7140 Ludwigsburg, Fed. Rep. of Germany
Filed Feb. 24, 1987, Ser. No. 17,540
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—288 **23 Claims**



1. Screw stopper for synthetic plastic cans in the range of 10 liters and above, comprising:

a pouring spout which is rigidly connected with said synthetic plastic can,

said pouring spout having a geometric longitudinal axis, an external threading, and an end face with an annular seal thereon,

a cap for said pouring spout, which is rotatable between a closed position and an open position,

said cap having an external circumference and an internal threading fitting said external threading on said pouring spout,

a projecting device projecting from said external circumference of said cap for manual transmission of a torque,

a connectin device between said pouring spout and said cap, which makes said cap non-loseable and permits rotation of said cap in relation to said pouring spout, and

the improvement wherein:

(a) said external threading is provided in three or more sectors in relation to said geometrical longitudinal axis of said pouring spout,

(b) said internal threading is provided in three or more sectors in relation to said geometrical longitudinal axis of said pouring spout, with said internal threading sectors fitting in circumferential angle into said external threading sectors and vice versa,

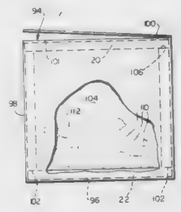
(c) said internal and external threadings have equal pitch, which pitch is high enough that rotation of said cap through 180 degrees plus/minus 30 derees rotates said cap from said closed position to said open position and vice versa,

(d) said cap has an upper side and said projecting device comprises a handle on said upper side of said cap, said handle being provided with a handle grip that protrudes far beyond said external circumference of said cap and a handle web with an end region pivotably articulated with said cap,

(e) said connection device includes a retaining ring which guides said cap in a shape-engaging manner and a guide device that is rigidly connected with said pouring spout and guides said retaining ring substantially nonrotatably in relation to said geometrical longitudinal axis, and

(f) said guide device has a partial region arranged as an arrestor for said handle grip in said closed position of said cap.

4,730,748
REUSABLE INSULATED BOX
William Bane, 1303 Delaware Ave., Wilmington, Del. 19806
Continuation of Ser. No. 838,447, Mar. 11, 1986, abandoned, which is a continuation of Ser. No. 664,833, Oct. 25, 1984, abandoned. This application Apr. 24, 1987, Ser. No. 52,189
Int. Cl.[4] B65D *5/56*
U.S. Cl. 220—400 **20 Claims**



1. A reusable insulated box, comprising:

(a) a shipping container having a plurality of interconnected sides integral with a closed bottom and a sealable top;

(b) bottom, top and side generally rectangular insulating plate members positioned in said container;

(c) each of said insulating plate members comprised of first and second spaced parallel generally planar reflective layers comprising an aluminized surface and a rigid foamed insulating core member disposed between and bonded to each of said layers;

(d) each of said plate members sheathed in a heat shrunk film of a heat shrinkable thermoplastic insulating film and said film having a portion contiguous with each of said layers;

(e) an anti-blister opening in each of said portions of the film sheathing each of said plate members and overlying each of said layers for preventing blistering of the film by allowing air entrapped by each portion to vent during shrinking of the film;

(f) each of said plate members having inner and outer generally parallel surfaces and having four side edges and an opposite two of said side edges of each of said side plate members being mitred and the other two side edges being non-mitred;

(g) said bottom plate member outer surface contiguous with and conforming to said closed bottom;

(h) the outer surface of each of said side plate members contiguous with one of said sides of said container and a first non-mitred side edge of each side plate member engages said inner surface of said bottom plate member and said mitred edges of each side plate member are in abutting relation with the mitred edges of the adjacent side plate members;

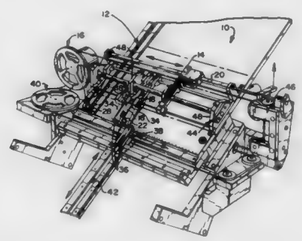
(i) said top plate member engaged with the other non-mitred side edge of each side plate member and thereby provides a bounded space for receiving materials;

(j) the thickness of said top and bottom plate members plus the height of a side plate member is substantially equal to the height of the sides of said container so that said sealable top may be closed;

(k) said insulating film being folded along one of said non-mitred side edges and having a continuous seam extending along the associated mitred edges and along the other non-mitred side edge of each plate member whereby said seams cooperate with said abutting mitred edges for locking said side plate members in position; and,

(l) said film on said one non-mitred edge of each side plate member being continuous and uninterrupted and contiguous with the film of one of said top and bottom plate members.

4,730,749
SINGULATORY APPARATUS
Jonathan P. Buesing, and James P. Buettner, both of St. Paul, Minn., assignors to Micro Component Technology, Inc., St. Paul, Minn.
Filed Sep. 20, 1985, Ser. No. 778,415
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—123 **9 Claims**



5. Apparatus for singulating integrated circuit devices and conveying them to an electronic testing and sorting area, comprising:

(a) an inclined platen down which the circuit devices pass;

(b) a plurality of tracks, spaced laterally along said platen, for aligning circuit devices on said platen;

(c) a first and a second stop arraanged along each of said tracks for controlling the movement of circuit devices along said tracks;

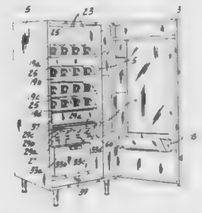
(d) a gang of actuator arm assemblies, each of said gang associated with one of said tracks and mounting a corresponding first of said stops to actuably engage a second lowermost device to prevent passage of said device and all devices thereabove along the track with which the actuator arm is associated;

(e) a gang of rocker arm assemblies, each of said rocker arm assemblies being associated with one of said tracks and that track's associated actuator arm assembly, and each of said rocker arm assemblies mounting a corresponding second of said stops and being responsive to movement of an associated actuator arm assembly when it is pivoted to engage its corresponding first stop with a second lowermost device in the associated track, wherein said corresponding second stop retracts to allow passage of a lowermost circuit device along the associated track;

(f) a selector arm moveable laterally with respect to said gang of actuator arm assemblies to selectively initiate movement of one of said actuator arm assemblies; and

(g) means for longitudinally adjusting the position of each of said first stops relative to its corresponding second stop to accommodate circuit devices of various sizes.

4,730,750
VENDING MACHINE FOR DISPENSING REFRIGERATED AND UNREFRIGERATED FOODS
Leonard A. Ficken, St. Louis County, Mo., assignor to Unidynamics Corporation, New York, N.Y.
Filed Apr. 3, 1986, Ser. No. 857,937
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—124 **12 Claims**



1. A vending machine for dispensing refrigerated and unrefrigerated foods comprising:

housing means having a refrigerated storage and dispensing area for the refrigerated foods separate from an unrefrigerated storage and dispensing area for the unrefrigerated foods;

means contained in the housing means for cooling the refrigerated foods in the refrigerated storage and dispensing area;

common receiving means adjacent the refrigerated and unrefrigerated storage and dispensing areas for receiving dispensed foods from either area;

means for selecting one of the refrigerated foods or unrefrigerated foods to be dispensed to the common receiving means;

means responsive to the selecting means for dispensing the selected food to the common receiving means; and

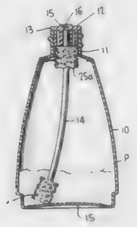
another housing means for enclosing the refrigerated storage and dispensing area to contain the cooling, the other housing means having an opening for inserting the refrigerated foods into the refrigerated storage and dispensing area and having a door covering the opening, and spring means tending to keep the door closed.

4,730,751
SQUEEZE BOTTLE POWDER DISPENSER
Leonard Mackles, 311 E. 23d St., New York, N.Y. 10010, and Leonard Chavkin, R.D.I. Box 90, Bloomsbury, N.J. 08804
Filed May 16, 1986, Ser. No. 864,564
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—189 **5 Claims**

1. In a dry powder dispenser capable of being operated in at least a substantially upright position, comprising a squeeze

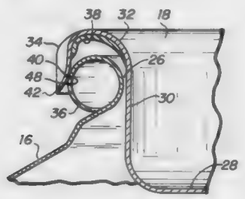
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container having at least a resiliently flexible wall portion and a connected neck portion, a plug fixedly secured within said neck and having a mixing chamber, a discharge orifice leading from said chamber, and at least one first passage extending inwardly from said chamber to the interior of the container, a hollow dip tube supported at one end within said plug and extending to said chamber, said dip tube defining a second passage to said chamber from an opposite end of said tube lying adjacent a wall of the container opposite said neck portion, said second passage at said opposite end of said tube defining an inlet opening, whereby upon application of external pressure to the container the air therewithin forces powder through said second passage and is mixed with air entering said chamber from said first passage before being discharged through said



orifice when dispensing in said subtantially upright position of the container, the improvement wherein a first pad of open cellular foam material is attached to said opposite end of said tube overlying said inlet opening to said second passage for moderating the flow of powder entering said inlet opening to effect smooth and uniform powder flow through said second passage without clogging during dispensing, said pad being submerged in the dry powder during operation of the dispenser in said upright position, and said pad comprising a sieve having from 10 to 100 cell openings per linear inch presenting a tortuous path for breaking up agglomerated powder particles and for allowing only unpacked powder particles to enter said inlet opening solely upon application of the external pressure to the container causing air within the container to force the powder through the tortuous path and into said second passage.

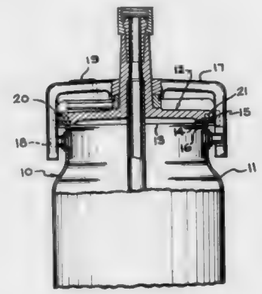
4,730,752
ANTI-SEATING VALVE CUP
James F. Kimball, and Karl A. Kohler, both of Racine County, Wis., assignors to S. C. Johnson & Son Inc., Racine, Wis.
Filed May 19, 1986, Ser. No. 864,381
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—394 **35 Claims**



1. A valve cup for use on an aerosol container comprising:
a cylindrical shaped cup having a sidewall ending in a radially, outwardly extending flange adapted to seat on the periphery of an opening of the aerosol container to seal said opening, said sidewall having at least one surface irregularity extending partially along the circumference of said sidewall that provides resistance to seating on said periphery and to sealing said opening.

11. A method for partially inserting a valve cup having a sidewall which terminates in a flange into an aerosol container comprising the steps of:
providing a first set of dimples positioned on said sidewall to retard removal of said valve cup after insertion into said aerosol container; and
placing at least one surface irregularity on said sidewall to inhibit complete insertion of said valve cup into said aerosol container.

4,730,753
PAINT CUP VENT
Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Dec. 27, 1982, Ser. No. 453,407
Int. Cl.[4] B65D *51/16*
U.S. Cl. 222—481 **11 Claims**

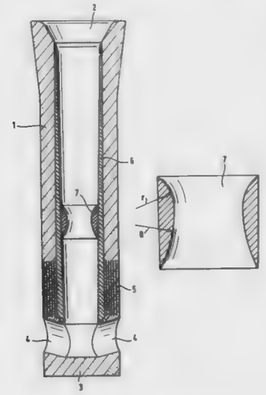


1. For a suction feed paint spray gun, an improved vented closure for a paint cup comprising a lid having a first annular groove positioned for abutting a rim on the paint cup and a second annular groove located within said first annular groove substantially in alignment with such cup rim when said lid is positioned on the cup rim, removeable gasket means positioned in said first groove, the cup rim pressing said gasket means into said first groove when said lid is attached to the cup for sealing said second groove and for sealing said lid to the paint cup rim, said lid further having a first passage connecting said second groove to the interior of the paint cup and a second passage spaced from said first passage connecting said second groove with atmosphere exterior to the paint cup.

4,730,754
REFRACTORY IMMERSION TUBE PROVIDING LAMINAR FLOW OF MOLTEN METAL
Heinz Buhr, Meerbusch, Fed. Rep. of Germany; Jacques Brihay, Roux, Belgium, and Manfred Winkelmann, Krefeld, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany
Filed Mar. 2, 1987, Ser. No. 20,734
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607104
Int. Cl.[4] B22D *11/10*
U.S. Cl. 222—594 **10 Claims**

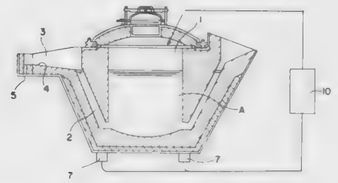
1. In a refractory immersion tube for use in discharging molten metal from a metallurgical vessel into a mold under the static pressure of the molten metal, said immersion tube having an inner passage through which passes the molten metal and including an inlet opening for receiving the molten metal and at least one outlet opening extending from said passage for discharging the molten metal into a mold, the improvement comprising means for preventing the flow of molten metal

from said outlet opening from being turbulent and for ensuring that said flow is laminar, said means comprising:
an annular member positioned within said passage and restricting the cross-sectional area thereof, wherein said annular member having therethrough an orifice defined



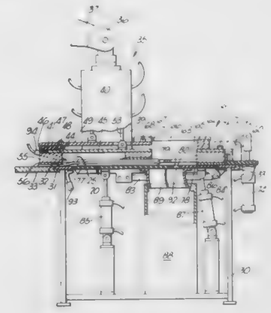
by a curved surface including, in longitudinal section, an upstream first surface portion and a downstream second surface portion, said first surface portion being defined by a smaller radius of curvature than said second surface portion.

4,730,755
AUTOMATIC POURING FURNACE
Shizuo Hayashi, Suzuka, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Jun. 6, 1983, Ser. No. 501,158
Claims priority, application Japan, Jun. 5, 1982, 57-96803
Int. Cl.[4] B22D *39/06*
U.S. Cl. 222—595 **9 Claims**



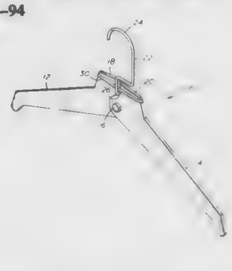
1. In an automatic pouring furnace having a reservoir for molten metal, a throat, a pouring chamber communicating with the reservoir through said throat, a down sprue communicating with said pouring chamber, means for applying air of a predetermined base pressure to the molten metal with the pouring chamber to urge the molten metal up to a present level while causing the reservoir to keep the metal in store, said means for applying air being adapted to apply an additional shot pressure into the reservoir to tap a predetermined quantity of the molten metal through the down sprue,
the improvement comprising a memory means for storing information representative of at least one pouring pattern, comprising a first additional shot pressure and an associated period of time during which the first additional shot pressure is applied, and a second additional shot pressure and associated period of time during which the second additional shot pressure is applied, said second additional shot pressure being different from said first additional shot pressure, whereby a pouring pattern corresponding to a mold is read out of said memory means to effect a pouring operation in two stages.

4,730,756
UNFOLDING DEVICE
John Flavell, and Michael A. Nash, both of Coventry, United Kingdom, assignors to Courtaulds Clothing Limited, England
PCT No. PCT/GB86/00019, § 371 Date Sep. 3, 1986, § 102(e) Date Sep. 3, 1986, PCT Pub. No. WO86/03948, PCT Pub. Date Jul. 17, 1986
PCT Filed Jan. 13, 1986, Ser. No. 913,647
Claims priority, application United Kingdom, Jan. 14, 1985, 8500836
Int. Cl.[4] A41H *43/02*
U.S. Cl. 223—37 **16 Claims**



1. A method of unfolding a doubled piece of flexible material comprising a first piece of material and further piece of material disposed adjacent a surface of the first piece of material, which method comprises the steps of holding the said first piece of material in a region remote from a junction of said first piece of material and said further piece of material, leaving said further piece of material free and creating an air current to move the said further piece of material away from the said surface of the first piece of material.

4,730,757
COLLAPSIBLE CLOTHES HANGER
Roger L. Keller, 5305 Palmetto, Houston, Tex. 77081
Filed May 11, 1987, Ser. No. 48,349
Int. Cl.[4] A47G *25/40*
U.S. Cl. 223—94 **3 Claims**



1. A collapsible clothes hanger comprising,
a first arm and a second arm having overlapping first ends, a pivoting axle rotatably securing said first ends of each of the arms together for pivoting the arms from an extended position to a downwardly retracted position,
said first arms including extensions extending upwardly above the pivoting axle when the arms are extended,

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a supporting hook connected to the pivoting axle and having an offset portion above the pivoting axle which extends between the extensions for providing a stop limiting the extended motion of the arms, and

a resilient loop connected around the extensions for resiliently holding the arms in the extended position but allowing the arms to be retracted downwardly, said loop positioned above said offset portion whereby said offset portion prevents the middle of the loop from moving downwardly past the pivoting axle when the arms are moved to a retracted downward position.

4,730,758

DETACHABLE BICYCLE BASKET

David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.

Filed Jan. 21, 1986, Ser. No. 821,025
Int. Cl.⁴ B62J *7/06*
U.S. Cl. 224—36 **12 Claims**



1. A basket assembly for bicycles, comprising;

a basket supporting bracket having hooks adapted to mount over a handlebar of a bicycle;

a basket having a pivotable rigid wire handle, said basket being detachably mounted upon said basket supporting bracket; and

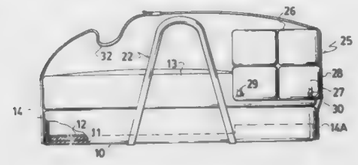
locking means including a generally L-shaped extension on said wire handle, said extension being movable with said pivotable handle for selectively engaging said bracket and locking said basket to said basket supporting bracket and for releasably unlocking said basket from said basket supporting bracket.

4,730,759

BABY CARRIER

Yoga Naidu, Bay B-5, 416 Meridian Rd., Calgary, Alberta, Canada T2A 1X2

Filed Jun. 20, 1986, Ser. No. 876,465
Int. Cl.⁴ A61G *1/00*
U.S. Cl. 224—158 **17 Claims**



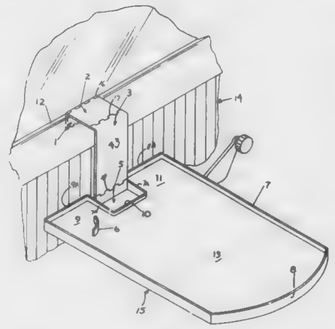
1. A carrier for babies or small children comprising in combination a base, a pair of spaced apart longitudinally extending, parallel side panels extending upwardly from said base and a part of transverse end panels extending upwardly from said base and extending between respective ends of said side panels, a stiffening board in said base and a detachable mattress pad on said board, a cover detachably secured along a major portion of each said side panel and around one end panel on upper edges thereof, a looped carrying handle on each side panel spanning the center of gravity of said carrier and a detachable hood for said carrier, means on said side panels and the other end panel of said carrier to detachably and selectively receive said hood in either of two positions, namely, in a raised position extending above a minor portion of each of said side panels and said other end panel of said carrier or in a stored position engaged around the minor portion of each of said side panels and said other end panel and a part of the underside of said base.

4,730,760

TRAY FOR AUTO PASSENGER COMPARTMENTS

Karen S. Keller, 929 N. 77th St., Seattle, Wash. 98103

Filed Oct. 8, 1986, Ser. No. 916,893
Int. Cl.⁴ B60R *7/00*
U.S. Cl. 224—273 **10 Claims**



1. A tray adapted to be supported at one end on a door panel extending into an auto passenger compartment, said door of the type having a window recess, comprising:

a generally planar, rectangular tray member;

a bracket mounted on said one end of said tray member having a generally hook-shaped portion extending above and facing away from said tray member with a downwardly bent end section thereof insertable in said window recess, said bracket having a bottom section connected to said hook portion to extend beneath said tray member;

a slot recess extending lengthwise into said one end of said tray member and receiving said bottom section of said bracket, said slot recess opening through said tray member so as to allow in-and-out movement of said hook shaped portion of said bracket therein, said bracket able to be adjusted in said slot to dispose the one end of said tray member against the surface of said door with said hook-shaped portion end section inserted in said window recess; and securement means for securing said bracket in any adjusted position in said slot recess, whereby said tray member may be supported in a level attitude by doors of varying configurations.

4,730,761

CUTTING FLEXIBLE FORMED PRODUCTS FROM FOAM RETAINING SHEET

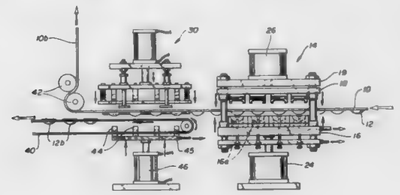
John D. Spano, Bordentown County, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1986, Ser. No. 897,463
Int. Cl.⁴ B26F *3/00;* **B26D** *9/00*
U.S. Cl. 225—2 **11 Claims**

1. A method for cutting a flexible formed shell product from a flexible plastic foam sheet, comprising:

(a) providing at least one formed foam shell integrally attached to a foam sheet, and positioning the formed shell within a cavity of a cutting die assembly having spaced die units;

(b) clamping said formed shell into the cutting die assembly, then moving the die units together and clamping the foam sheet and attached formed shell in the die assembly;



(c) cutting the formed shell from the plastic foam sheet at all points along the shell edge except for at least one link located at opposite ends of the formed shell, which links serve to loosely retain the shell to the sheet; and then

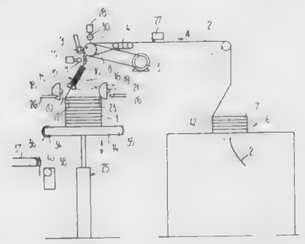
(d) breaking the connecting links and removing the formed shell product from the foam sheet.

4,730,762

PROCESS AND EQUIPMENT FOR MANUFACTURING INDIVIDUAL STACKS CONSISTING OF A LENGTH OF MATERIAL FOLDED IN ZIG ZAG FORM

Willi Felix, Strengelbach, Switzerland, assignor to Jos. Hunkeler Ltd., Wikon, Switzerland

Continuation of Ser. No. 817,473, Jan. 9, 1986, abandoned. This application May 15, 1987, Ser. No. 52,208
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3500766
Int. Cl.⁴ B26F *3/02*
U.S. Cl. 225—4 **25 Claims**



1. Process for the production of individual zigzag folded stacks from a continuous length of material containing sections defined by cross perforations, comprising the steps of:

a. continuously feeding the length of material to a buffer;

b. withdrawing from the buffer a quantity of said length of material sufficient to form an individual stack;

c. feeding said quantity to a zigzag folder and stacker;

d. folding and stacking said quantity;

e. separating said quantity from the remainder of said length of material at a selected cross perforation intended to be the end of said quantity by simultaneously

(i) gripping the section of said quantity preceding said selected cross perforation before it is folded, and

(ii) driving in an upstream direction the portion of the remainder of said length of material following said selected cross perforation;

f. releasing the last section of said quantity to complete said individual stack;

g. removing the finished stack from the zigzag folder and stacker; and

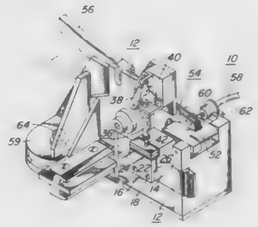
h. resuming forward flow from the buffer of a next quantity of said length of material sufficient to form a next individual stack according to steps c through g.

4,730,763

MEANS AND METHOD FOR SCORING AND SEVERING AN OPTICAL FIBER

Charles T. Smith, Holmes, Pa., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 629,940, Jul. 12, 1984, abandoned. This application Jan. 9, 1987, Ser. No. 5,384
Int. Cl.⁴ B26F *3/00*
U.S. Cl. 225—96 **8 Claims**



1. Apparatus for scoring and parting an optical fiber in such a way as to form mirror smooth parting surfaces on the fiber, comprising:

a supporting body,

optical fiber securing means for gripping an optical fiber to be scored and parted with a portion of the fiber extending beyond said securing means;

a fiber gripping and scoring device for gripping and locally scoring said extending fiber portion;

said fiber gripping and scoring device comprising a pair of pads having confronting surfaces for receiving said fiber portion between said surfaces, actuating means for effecting relative movement of said pads toward and away from one another to frictionally grip and release said fiber portion, and fiber scoring means for scoring the fiber portion upon relative movement of said pads toward one another, to grip the fiber portion, and

means mounting said securing means and pivotal mounting means for mounting said scoring and gripping device on said body for rotation toward and away from said securing means and for relative movement between said scoring and gripping device and said securing means generally lengthwise of the fiber portion to a scoring position wherein said device is disposed to grip and score said fiber portion to produce a flaw therein, and to stress the fiber in tension across and part the fiber at said flaw.

4,730,764

ULTRASONIC WELDING WIRE TERMINATION APPARATUS

Rodney H. Hawkins, Orange; Mark W. Dearth, Milford, and Michael J. Patrikios, Stratford, all of Conn., assignors to American Technology, Inc., Milford, Conn.

Filed Apr. 6, 1987, Ser. No. 34,848
Int. Cl.⁴ B23K *1/06, 3/00*
U.S. Cl. 228—1.1 **8 Claims**

1. An ultrasonic welding apparatus adapted to weld the terminal end of a wire to a wire terminal, comprising:

an ultrasonic horn;

an ultrasonc welding tip attached to said horn;

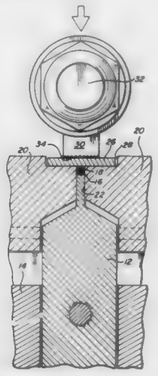
a base;

an anvil attached to said base;

chamber means disposed between said horn and said anvil, said chamber means including a chamber being adapted to receive said terminal end of a wire;

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seat means disposed at one end of said chamber adapted to receive said wire terminal; and



elastic means associated with said chamber means for adjusting the size of said chamber during ultrasonic welding whereby the terminal end of a wire maintains a tight contact with the wire terminal.

4,730,765

METHOD OF BONDING BY USE OF A PHOSPHORUS CONTAINING COATING

Peter N. Tomlinson, 315 Enford Road, Mondeor, Johannesburg, Transvaal; Klaus Tank, 9 Warbleton Road, Essexwold, Johannesburg, Transvaal, and Karl Schrittwieser, 104 Van Buuren Street, Bedfordview, Transvaal, all of South Africa

Filed Dec. 4, 1985, Ser. No. 805,201

Claims priority, application South Africa, Dec. 6, 1984, 84/9506

Int. Cl.[4] B23K *1/20*

U.S. Cl. 228—124 **11 Claims**

1. A method of bonding a cemented carbide surface to a metal surface, including the steps of applying an alloy layer to one or both of the surfaces, the alloy comprising a major amount of nickel or copper and a minor amount of phosphorus, heat treating each said alloy layer at a temperature of from 500° to 1200° C. for a time of from 5 to 300 minutes, said temperature being below the liquidus of said alloy but sufficiently high that said heat treatment results in the alloy's diffusing substantially into the surface to which it is applied thereby to cause diffusion bonding between the surface and the alloy, and bonding the surfaces together by means of a solder or braze alloy.

4,730,766

SEALING OF VOID AREA AT THE TOP OF CUP BEAD OF HOT MELT

Robert E. Fear, Wheaton, Ill., assignor to Continental Bondware, Inc., Rolling Meadows, Ill.

Filed Dec. 20, 1985, Ser. No. 811,395

Int. Cl.[4] B65D *5/08*

U.S. Cl. 229—137 **5 Claims**

1. A gable top carton wherein when said top is closed a heat seal is formed between front and rear sealing flaps and folded end sealing flaps between said front and rear sealing flaps, the improvement wherein said folded end sealing flaps having aligned folded portions purposely spaced apart to leave an intended void between said front and rear sealing flaps, said carton top being open and there being an intentional leak path between said sealing flaps, and a bead of hot melt material



carried by one of said front and rear sealing flaps in alignment with the intended position of said leak path.

4,730,767

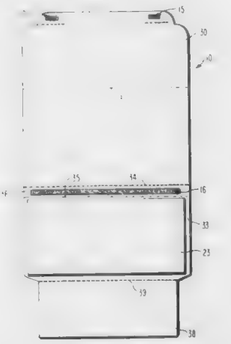
LETTER SHEET WITH RETURN ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 30, 1986, Ser. No. 847,530

Int. Cl.[4] B65D *27/06*

U.S. Cl. 229—73 **3 Claims**



1. An envelope assembly prepared from two separate blanks of envelope material comprising a first blank of envelope material having inner and outer surfaces which is cut and scored to provide a first mailing piece consisting of four interconnected elements, said elements including front and rear panels, a first closure flap and an integral return coupon, and a second blank of envelope material having four edges that is adhered along at least three of its edges to the inner surface of the rear panel of said first blank to form an enclosed pocket between the second blank and the rear panel for return mailing, said coupon being attached to one edge of said rear panel along a first perforated line and said front panel being attached to an opposite edge of said rear panel along a second perforated line.

4,730,768

REMAILABLE ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 325,020

Int. Cl.[4] B65D *27/06*

U.S. Cl. 229—73 **3 Claims**

1. A remailable envelope formed from one piece blank having inner and outer surfaces wherein the envelope structure for remailing is smaller than the envelope structure for first mailing comprising:

(a) a front panel having side, top and bottom edges;

(b) a rear panel having side, top and bottom edges;

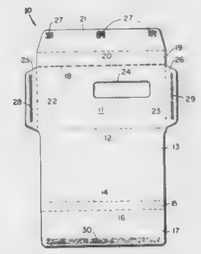
(c) the front and rear panels being joined together at their bottom edges about a first fold line and arranged so that their inner surfaces lie in opposed relation when the envelope is formed;

(d) a first extension panel attached to the top edge of said front panel along a perforated line;

(e) a second extension panel attached to the top edge of said rear panel along a second fold line;

(f) the nominal height of said rear panel between said first and second fold lines being greater than the nominal height of said front panel between the first fold line and the perforated line;

(g) a first closure flap foldably attached to the first extension panel along a third fold line;



(h) a second closure flap foldably attached to the second extension panel along a fourth fold line and folded inside said envelope about the fourth fold line for first mailing; and,

(i) a pair of side closure flaps foldably attached to the side edges of the front panel and adhered to a surface of said rear panel to maintain the inner surfaces of the front and rear panels in opposed relation wherein said envelope is prepared for first mailing by folding only the first closure flap over about the third fold line before it is sealed to the outer surface of said rear panel, and is prepared for remailing by removing the first closure flap and first extension panel along the perforated line provided therefor, and then closed, after extracting the second closure flap from the inside thereof, by folding the second closure flap and second extension panel over about the second fold line before the second closure flap is sealed to the outer surface of the front panel to provide a remailing envelope structure that is smaller in height than the first mailing structure.

4,730,769

PACKAGING FOR LIQUIDS AND PROCESS AND APPARATUS FOR ITS MANUFACTURE

Sven O. S. Stark, Ystad, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

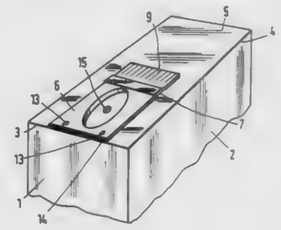
Filed Apr. 11, 1986, Ser. No. 850,932

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3513976

Int. Cl.[4] B65D *5/72*

U.S. Cl. 229—125.15 **8 Claims**

1. In packaging for liquid, having surfaces made of cardboard or similar material, which on at least one of its surfaces is made impermeable to liquid by a plastic coating, and which has side-walls, bottom and top walls, which are connected to each other at least partially by connecting means, with a tear-off pouring aperture located in the top wall, close to an edge, and which has a separate plastic strip, which in the zone of the pouring aperture at least covers the latter and which is disposed around the edge of the pouring aperture and in sealed relation at least at the underneath portion thereof, and which also has an outer cover strip; characterised in that the plastic strip covers and seals the entire pouring aperture and is fixed via thereto at two sealing areas to the outer cover strip; in a hole located in a zone above the pouring aperture, in that with



both sealing areas being smaller than the surface of the cover strip, the first sealing area being located at a distance from the hole and outside the pouring aperture, the second sealing area being located outside the hole in the cover strip and within the pouring aperture, and with the outer cover strip being fixed to the top wall of the package at a third sealing area lying outside the plastic strip.

4,730,770

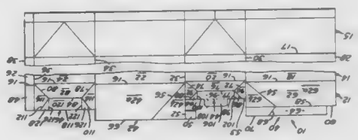
FLAT TOP END CLOSURE FOR LIQUID CONTAINERS

Janet L. Walton, Marietta, Ga., assignor to Pure-Pak Inc., Walled Lake, Mich.

Filed Jun. 22, 1987, Ser. No. 64,669

Int. Cl.[4] B65D *5/08*

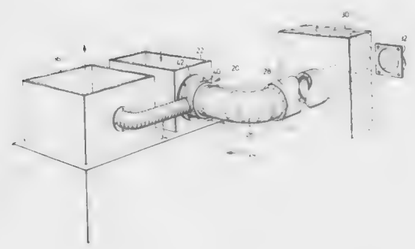
U.S. Cl. 229—125.42 **5 Claims**



1. A blank for a flat top end closure for a liquid-carrying paperboard container, said blank comprising four body panels, front and back in-fold panels, and one longer and one shorter outer closure panels, said in-fold and outer closure panels being connected at their inner edges by score lines to respective body panels with their outer edges being free edges, a first lift tab formed on a side edge of the longer panel extending over a portion of the front in-fold panel, each of said front and back in-fold panels including a laterally extending score line formed across a central portion of the width thereof, oppositely disposed converging and diverging score lines extending from opposite ends of the laterally extending score line to respective body panels and the free edges of said in-fold panels, a pair of parallel score lines formed on each of said in-fold panels extending from said ends of each laterally extending score line to said respective free edges, and a second lift tab connected by a perforated line to a central portion of the free edge of said front in-fold panel.

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4,730,771
AIR DUCT
Charles G. Shepherd, and Thomas E. Squires, both of Oakville, Canada, assignors to B. D. Wait Co. Limited, Oakville, Canada
Filed May 27, 1986, Ser. No. 866,856
Claims priority, application Canada, May 30, 1985, 482850
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—13 3 Claims



1. An air mixer for use with a forced air heating system, including a forced air furnace having an inlet plenum and an outlet plenum, the inlet plenum feeding the furnace with return air and the outlet plenum conveying warm air from the furnace for distribution to premises being heated by the furnace, the air mixer comprising:

a housing having means for attachment to the inlet plenum of the furnace at one end of the housing, and connection means on the side of the housing to receive warm air from a warm air duct connected to the outlet plenum;

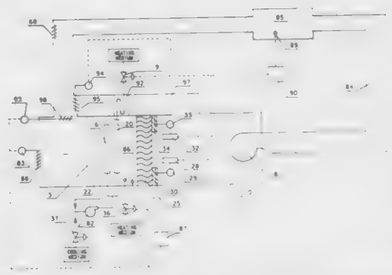
an inner tube attached to the other end of the housing and defining an annular space between this tube and the housing for distribution of warm air from the warm air duct as this air passes through the housing and into the inlet plenum, the inner tube projecting outside the housing at said other end for attachment to an outside air duct for receiving outside make-up air;

a butterfly valve element comprising a plate having a pair of integrally formed oppositely directed extensions which transverse the inner tube walls for pivotally supporting the valve element in the inner tube, the butterfly valve element being movable between a closed position to stop possible flow of outside make-up air and at least one open position allowing flow of outside make-up air into the air mixer for mixing with the warm air in the housing before flowing into the inlet plenum;

heat sensitive biasing mean coupled to one of said extensions of the element and located in the flow of said warm air for responding to the warm air to move the butterfly valve element from the closed to the open position whereby when the furnace is activated warm air will flow through the warm air duct, and upon heating the biasing means, the valve element will move away from the closed position to allow any required make-up air to flow through the outside air duct; and

a valve limiter coupled to the housing and located in the path of movement of the valve element to stop movement of the butterfly valve element away from the closed position at a preselected angle and so limit the flow of outside make-up air.

4,730,772
MOISTURE ELIMINATOR FOR AIR WASHER
Richard P. Lortie, Winston-Salem, N.C.; Philippe H. Vercaemert, Littleton, Mass., and Douglas L. Gunnell, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.
Division of Ser. No. 599,245, Apr. 11, 1984, Pat. No. 4,627,568.
This application Aug. 4, 1986, Ser. No. 892,623
Int. Cl.[4] B01F *3/02*
U.S. Cl. 236—44 R 26 Claims



1. An air washer for treating an air stream moving through the air washer which comprises:

(a) spray means for injecting controlled amounts of water into the moving air stream,

(b) a moisture eliminator downstream of said spray means for removing water droplets entrained in the moving air stream, said moisture eliminator having a maximum effective face area through which the moving air stream passes,

(c) means for controlling the volume of air moving through the air washer per unit of time and

(d) an air obstructing device positioned adjacent to said moisture eliminator for changing the effective face area of said moisture eliminator in response to changes in the volume of air moving through the air washer per unit of time, said air obstructing device being provided with means responsive to a control signal for moving said device into an air obstructing position for reducing said effective face area when the volume of air moving through the air washer per unit of time falls to a predetermined level and for moving said device into a non-obstructing position for increasing the effective face area when the volume of air moving through the air washer per unit of time rises to a predetermined level.

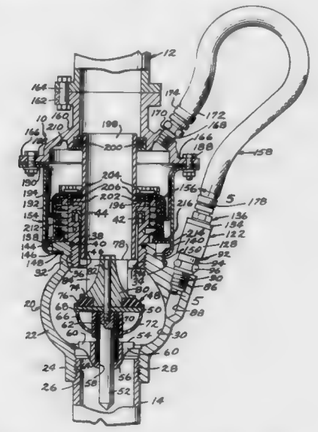
4,730,773
ACCESS ASSEMBLY FOR UNDERGROUND IRRIGATION SYSTEMS AND ACCESSING ASSEMBLY COOPERABLE THEREWITH
Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.
Filed Jun. 6, 1986, Ser. No. 871,374
Int. Cl.[4] B05B *17/04*
U.S. Cl. 239—1 44 Claims

40. A method of temporarily connecting separate accessing structure with access structure having a main outlet and a pilot pressure outlet so as to communicate fluid under pressure contained within said access structure with said accessing structure through the main outlet of said access structure which comprises the steps of

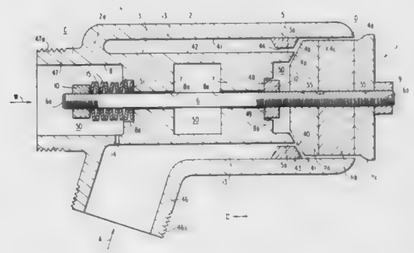
manually establishing a mechanical connection of said accessing structure with said access structure without establishing communication of the fluid under pressure contained in said access structure with said accessing structure through said main outlet,

manually establishing a controllable pilot pressure flow path through the pilot pressure outlet to said accessing structure for fluid under pressure contained within said access structure, and

utilizing fluid under pressure communicated to said accessing assembly through said pilot pressure flow path as a power source to establish communication of the fluid under pressure contained in said access structure with said accessing structure through said main outlet.

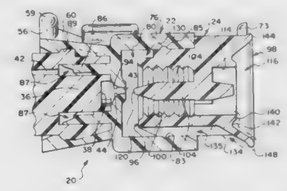


4,730,774
DUAL PRESSURE COMPENSATING SNOWMAKING APPARATUS
James H. Shippee, P.O. Box 47, Vernon, Vt. 05354
Filed Jan. 12, 1987, Ser. No. 2,366
Int. Cl.[4] F25C *3/04*
U.S. Cl. 239—14.2 12 Claims



1. A dual pressure compensating snowmaking apparatus comprising an outer housing including concentric, radially spaced inner and outer tubes defining a first annular flow passage between said tubes and a second cylindrical flow passage within said inner tube, first nozzle means secured by said housing for tending to close off said second flow passage at said open end of said inner tube and defining a first nozzle gap between said first nozzle means and the open end of said inner tube, second means nozzle means carried by said housing for tending to close off said first flow passage at the open end of said outer tube and defining a second nozzle gap, means for supplying compressed air to said first flow passage, means for supplying water under pressure to said second flow passage such that; water under pressure passes through said first gap towards second gap, and compressed air impinges the flow of water exiting from said first nozzle gap, mixes with said water and entrains the water as minute water particles and flows through said second nozzle gap, and means for commonly, continuously self-adjusting said first and second nozzle means to vary said first and second nozzle gaps in response to vary in pressure of the compressed air and water to automatically increase air flow with increase in water pressure and water flow and a reduction in compressed air flow at lower water pressure to maintain the snowmaking capability of the apparatus irrespective of ambient temperature variation and variation in pressure of the compressed air and water supplied therein.

4,730,775
TWO PIECE FOAMER NOZZLE ASSEMBLY
Joseph W. J. Maas, Someren, Netherlands, assignor to AFA Division of Waynesboro Textiles, Inc., Forest City, N.C.
Filed Jan. 10, 1986, Ser. No. 817,935
Int. Cl.[4] B05B *1/02, 1/12, 7/04*
U.S. Cl. 239—120 25 Claims



1. A foamer nozzle assembly adapted to be mounted to a body of a hand manipulated pumping apparatus including a pumping mechanism and a nozzle bushing mounted at the front end of the body, the nozzle bushing being of the type which will eject fluid in a swirling spray, said foamer assembly comprising: a first piece including a body having a front end from which fluid is discharged and a rear end, a first cavity in the body opening onto the rear end and being adapted to be received over the nozzle bushing mounted at the front end of the body of the hand manipulatable pumping apparatus, said first cavity receiving the swirling spray ejected from the nozzle, said first piece further comprising a barrel portion having a second cavity opening onto said front end thereof and an intermediate wall within said first piece between said first and second cavities, said intermediate wall having an orifice therethrough with a rear end thereof communicating with said first cavity and a front end communicating with said second cavity, liquid being ejected in a spray pattern from said front end of said orifice, a second piece connected to said first piece in a manner forming a foaming apparatus and having a rearwardly extending formation sized to be received and fixed within said second cavity of said first piece, said formation having a foam generating chamber therein opening onto the rear end of said second piece in front of said front end of said orifice, said foam generating chamber having side walls with an internal irregular surface therein, said second piece having a front end with a nozzle opening therein and said foam generating chamber being in communication with said nozzle opening whereby liquid sprayed in a generally conical pattern into said foam generating chamber and impinging upon said irregular surface mixes with air and creates foam which is ejected through said nozzle opening, said rearwardly extending formation of said second piece having a portion cut away and extending toward the front end of said second piece so as to form passage means into said second cavity and into an entrance area between the front end of said orifice and said foam generating chamber, said passage means in an operative position of said nozzle assembly being positioned to face downwardly so that foam that may drip around said nozzle opening will be sucked back into said passage means to said entrance area and then into said foam generating chamber on repeated strokes of the pumping mechanism of the pumping apparatus.

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DISPLACEABLE AND LOCKABLE CHOPPER CUTTING EDGE

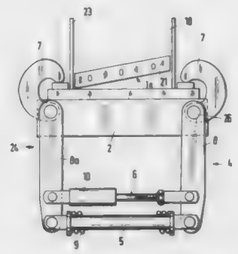
Xaver Lenzer, Koetz; Eberhard Wistuba, Rettenbach, and Martin Nusser, Niederstotzingen, all of Fed. Rep. of Germany, assignors to Karl Mengele & Sohne GmbH & Co., Günzburg, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,280

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535902

Int. Cl.⁴ B02C *18/18*

U.S. Cl. 241—241 **8 Claims**



1. A chopper comprising a chopper housing (**23**) including a circumferentially extending retaining wall (**22**), said retaining wall having an inlet opening into said housing, at least one cutter (**21**) having a cutting edge (**1***a*) rotatably mounted about an axis (**20**) within said housing and said cutting edge arranged to sweep over said retaining wall and past an opposing knife edge (**1**) located at the inlet opening to said housing, said cutting edge (**1**) is rotatable around a circle of revolution and maintains a gap with the retaining wall and opposing knife edge during rotation, said opposing knife edge (**1**) is elongated in the direction of rotation of said cutter and has a pair of opposite ends and is supported on a support (**2**), an adjustment device (**3**) for adjusting the gap between said opposing knife edge (**1**) and said cutting edge (**1***a*) of said cutter (**21**), a locking device (**4**) for clamping said opposing knife edge in position, said adjustment device (**3**) being accessible at a location on the exterior of said chopper housing, wherein the improvement comprises that said locking device includes a clamping device (**24**) for pressing the opposite ends of said opposing knife edge (**1**) against said support (**2**), said clamping device (**24**) includes clamping means and a force accumulator for pressing the clamping means against said opposing knife edge, and a releasing device (**6**) acting counter to said force accumulator (**5**) for releasing the clamping of said opposing knife edge.

4,730,777

METHOD AND APPARATUS FOR WINDING RING CORES, RING COILS, RING CORE PARTS OR RING COIL PARTS

Otto Graul, Bamberg, and Michael Dressel, Burgebrach, both of Fed. Rep. of Germany, assignors to MWB Messwandler-Bau Aktiengesellschaft, Bamberg, Fed. Rep. of Germany

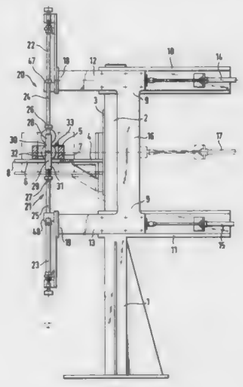
Filed Jul. 29, 1985, Ser. No. 760,061

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430055

Int. Cl.⁴ B65H *81/02*

U.S. Cl. 242—4 R **32 Claims**

1. Method for tightly and uniformly winding ring devices having a ring opening such as ring cores with a winding material from a a winding material storage unit means which is initially wound with the winding material and the dimensions of which are smaller than the ring opening of the ring device, by moving the winding material storage unit means through said opening and about the ring device on a rotating roller in a winding direction while continuously and alternately transferring the winding material storage unit means from a first transfer means to a second transfer means and then back again to the first transfer means; comprising the steps of: one, connecting the winding material storage unit to the first transfer means; two, moving the first and second transfer means toward one another to a first transfer place inside of the opening of the ring device; three, disconnecting the winding material storage unit means from the transfer means and connecting it to the second transfer means; four, then moving the two transfer means away from one another; five, moving the second transfer means connected to the winding material storage means in the winding direction at a distance from the ring device while the rotating roller rotates along the ring device with its axis of rotation tangentially aligned to the point of the ring core to be wound and while the winding material is reeled off the winding material storage unit means and wound on the ring device; sixth, at the same time, moving the other transfer means opposite the winding direction until both transfer means are located outside the opening of the ring device; seven, then moving both the transfer means axially outside the ring device into a position relative to one another to cause the rotating roller to rotate on a connecting first front side of the ring device; eight, moving both transfer means toward one another



to approach one another at a second transfer place located outside of the ring device; nine, then disconnecting the winding material storage unit from the second transfer means and connecting it back to the first transfer means; ten, then moving the first transfer means at a distance located outside of the ring device in the winding direction with the rotating roller rotating on the outside of the ring device while the winding material continues to reel off from the winding material storage unit means onto the ring device while at the same time, the second transfer means is moved in an unwinding and opposite direction; eleven, after both transfer means are located outside of the ring device in the area over the front side of the ring device, moving both transfer means relative to the ring device into a position where there are axially aligned with the axis of alignment being within the opening of ring device while the rotating roller rotates along a second front side of the ring device and while the winding material continues to unwind and is applied to the second front side of the ring device; twelve, moving both transfer means toward one another to approach the first transfer point; and then repeating the cycle of steps three to twelve until a desired number of windings is wound on the ring device while rotating the ring device continuously or step-by-step about its central axis during the winding process.

4,730,778

CONTAINER FOR ROLL OF LIGHT-SENSITIVE STRIP MATERIAL

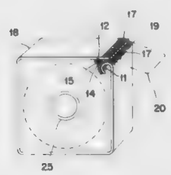
Mutsuo Akao, and Yoshihiro Nishiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1986, Ser. No. 909,470

Claims priority, application Japan, Sep. 19, 1985, 60-143255[U]; Dec. 4, 1985, 60-186114[U]

Int. Cl.⁴ B65H *16/06;* **G03B** *1/02, 17/26*

U.S. Cl. 242—68.7 **18 Claims**



1. A container for a roll of light-sensitive strip material provided with a opening for drawing out said light-sensitive strip material from said container, teremp cloth being provided in said opening, the teremp cloth comprising a ground fabric structure including warp and weft yarns with pile yarn would around one of said warp and weft yarns in the ground fabric structure and defining a knit structure, more than 20% of the pile yarns being looped around one of said warp and weft yarns.

4,730,779

EXPANDING MANDREL ASSEMBLY FOR A WEB-COILING CORE

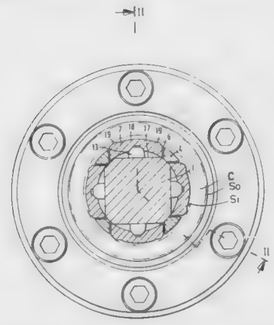
Karl Thievessen, Grevenbroich, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 874,283

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521582; Jun. 15, 1985, 8517584[U]

Int. Cl.⁴ B65H *16/04, 18/04, 67/00*

U.S. Cl. 242—72 R **20 Claims**



1. In an expanding mandrel apparatus for clamping a tubular member, especially a tubular core on which a paper web is adapted to be coiled, comprising a horizontal pin journaled for rotation about a horizontal axis, a plurality of angularly equispaced tubular segmental radially displaceable clamping elements surrounding said pin and mounted thereon, a cage surrounding said pin and maintianing said elements in position therearound, a cage surrounding said pin and maintaining said elements in position therearound, and respective bracing members between said pin and each of said elements for urging said elements radially outwardly into engagement with an inner surface of said tubular core, the improvement wherein:

said elements have outer curvilinearly convex surfaces generally with a curvature corresponding to that of said inner surface, engageable with said inner surface and provided with widely spaced domed rises separated by a broad continuous convex surface.

4,730,780

INK RIBBON CASSETTE

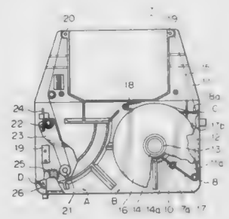
Noboru Shimoyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,626

Claims priority, application Japan, May 22, 1985, 60-109638

Int. Cl.⁴ B41J *33/52, 32/00*

U.S. Cl. 242—75.45 **4 Claims**



1. An ink ribbon cassette including:

a case;

a supply core rotatably held by said case and having a detent portion thereof;

an ink ribbon wound on said supply core,

a take-up core rotatably held by said case to take up the ink ribbon; and

an elongated spring bent and fixed at its center to have a first free end which is in resilient engagement with the detent portion of said supply core and a second free end which is in resilient contact with the outer periphery of the ink ribbon wound on said supply core, said second free end moving according to the amount of the ink ribbon wound on said supply core to reduce urging force to the ink ribbon and impart to the ink ribbon a substantially constant tension for all amounts of ink ribbon wound on the supply core.

4,730,781

CONVEYOR FOR FEEDING STRIP MATERIAL IN A MACHINE FOR WORKING ON THE SAME

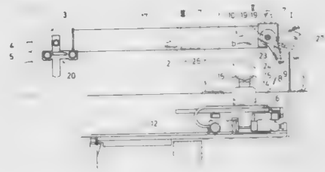
Gerhard Richter, Charlottenstrasse 6, D-5910 Kreuztal 5, and Axel Barten, Im Gensterfeld 20, D-5900 Siegen-Sohlbach, both of Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,612

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1986, 3600372

Int. Cl.⁴ B65H *19/12;* **B21C** *47/16*

U.S. Cl. 242—78.8 **6 Claims**



1. Apparatus for feeding thin gauge strip material from the

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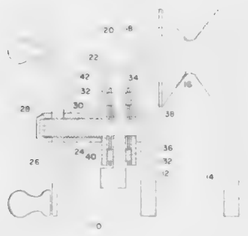
underside of a coil of the same into a rolling mill for movement through the rolling mill in a strip feed direction, comprising a motor-driven coil cart, means supporting the cart for movement toward and away from the rolling mill in the strip feed direction between a readying station remote from the mill and an unwinding station adjacent the mill, a clamping device for seizing an end of the strip material in said readying station, means mounting said clamping device for vertical swinging movement about a horizontal axis to invert the seized end of the strip material, and means mounting said clamping device for movement along said strip feed direction independently of said cart to move said seized end toward said mill.

4,730,782

FISHING REEL WITH PAD DRAG MECHANISM

John N. Young, Fairfax, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.

Filed Jul. 18, 1986, Ser. No. 886,884
Int. Cl.⁴ A01K *89/02*
U.S. Cl. 242—84.5 A **3 Claims**



1. In a fishing reel including:
a reel body;
a shaft rotatable on said reel body;
a member freely rotatable on said shaft;
stop means on said shaft on one side of said member to limit sliding movement thereof;
a pressure plate slidably but not rotatably carried on said shaft on the other side of said member;
a friction device interposed between said pressure plate and said member; and
a drag adjustment nut threaded on said shaft to push said pressure plate and said friction device axially;
said friction device comprising;
at least two pads of friction material; and
means defining a carrier ring rotatable and slidable on said shaft;
said pads being thicker than said carrier ring and positioned and held by said carrier ring symmetrically about said shaft and so that opposite surfaces thereof are exposed on opposite sides of said carrier ring for engagement between a pressure plate and said member.

4,730,783

TAPE MEASURE

Robert D. Lamson, Seattle, Wash., assignor to Spencer Products Company, Seattle, Wash.

Continuation-in-part of Ser. No. 537,638, Sep. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 352,127, Feb. 25, 1982, abandoned. This application Aug. 5, 1985, Ser. No. 762,699
Int. Cl.⁴ B65H *75/48;* **G01B** *3/10*
U.S. Cl. 242—84.8 **8 Claims**

1. An improved gearless, open-spooled, direct-drive tape measure of the spring recoil type, including a means for adjusting tension of said spring relative to said tape measure, said tape measure having a spool including a flat wound recoil spring, a tape measure having one end attached to the outer end of said spring, said spool including a spring-retaining disk having a diameter at least about equal to the diameter of the retracted tape and spring together, said disk having a spring-retaining well on one side of the disk defined by a wall substantially concentric with the disk, said wall having a slot therein through which said spring and tape end may pass, said well holding said spring with said tape wound around the outside of the well wall, wherein the periphery of said disk guides rewinding of said tape, and an input disk having a diameter substantially equal to said spring-retaining disk, seated atop the wall of the spring well to retain said spring in the well, wherein the outer periphery of said input disk guides rewinding of said tape, said improved spring tension adjusting tape measure comprising:
a pair of covers for holding said spool between them, said covers spaced apart by a plurality of collars to accommodate the spool, said collars arranged about the periphery of said spool, one of said covers including a hub fixed to one face for rotationally mounting said spool and securing the inner end of said spring, said covers including:
a first cover, larger in diameter than said spool, to which one end of said collars is fixed, and



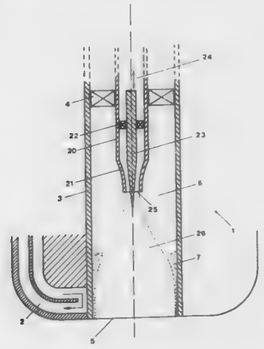
a second cover, smaller in diameter than the locus of the outer edge of the diameters of said collars about said spool and at least equal in diameter to said spool;
at least one locking ring engageable with said second cover for securing said second cover to the opposite end of said collars fixed to said first cover, whereby said locking ring is of sufficient outer diameter to be fastened to said collars and has an inner diameter which overlaps the periphery of said second cover; and
fastening means for securing said locking ring, while holding said second cover in position, to said collars and for securing said first cover to the opposite end of said collars, with the spool held between said covers, wherein loosening said fastening means securing either cover and rotating said cover with respect to the cover remaining secured to the collars cause relative rotation of the hub, to which one end of the spring is fastened, with respect to the tape end, whereby the tension of said spring with respect to said tape is adjusted.

4,730,784

OXYGEN BLAST NOZZLE

André Bock, Luxembourg; Romain Henrion; Jean Liesch, both of Esch/Alzette; Carlo Heintz, Luxembourg; Henri Klein, Niedercorn, and Jean-Francois Liesch, Esch/Alzette, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Feb. 20, 1987, Ser. No. 17,763
Claims priority, application Luxembourg, Feb. 25, 1986, 86322
Int. Cl.⁴ B05B *7/12*
U.S. Cl. 239—416.4 **10 Claims**



1. A nozzle for the refining of metals or ferroalloys by oxygen blasting from above the melt, the nozzle including a nozzle head, the nozzle head having at least one blast pipe therethrough for delivering jets of gas, the gas being at least partly composed of oxygen wherein the blast pipe comprises:
an inner duct having a lower portion, said lower portion including a throat between a convergent section and a divergent section, said convergent section being upstream of said divergent section and said divergent section terminating at the mouth of the inner duct wherein said convergent section, throat and divergent section define a laval nozzle and wherein said inner duct mouth is spaced upstream from the mouth of said blast pipe;
an outer duct coaxial to said inner duct and having a greater cross section than said inner duct, said outer duct terminating at the mouth of said blast pipe;
means for varying the cross sectional area of said throat of said inner duct;
flow control valve means associated with said inner duct; and
means associated with said outer duct to limit the velocity of gas flowing therethrough to subsonic speeds.

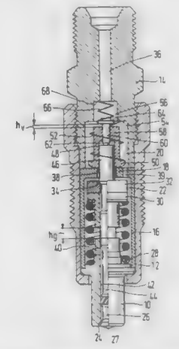
4,730,785

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00127, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/06441, PCT Pub. Date Nov. 6, 1986
PCT Filed Mar. 26, 1986, Ser. No. 25,151
Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515723
Int. Cl.⁴ F02M *61/08, 61/16*
U.S. Cl. 239—453 **4 Claims**

1. Fuel injection nozzle for internal combustion engines, comprising a valve needle which is movable during an opening stroke in the fuel flow direction; a piston which is connected to said valve needle; a cap having a shoulder and mounted on said piston and formed with a damping chamber limited by said piston and filled with fuel, said dampening chamber being connected with a flow path of the fuel by only a throttle passage, said cap being retained at least in a defined range of the operating performance graph with respect to the movable valve needle; a pressure piece which is displaceably mounted in said cap; a return spring, said pressure piece at a side thereof



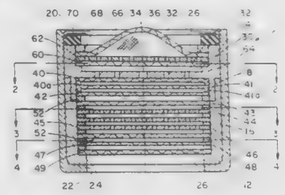
which faces away from said dampening chamber being loaded by said return spring and by fuel pressure in the flow path, said pressure piece engaging on the piston at the start of an opening stroke and coming into engagement on said shoulder of said cap for preventing its further movement after a prestroke of the valve needle, said pressure piece (**60**) being mounted in a bottom of said cap (**48, 70**) and having a smaller diameter than that of the piston (**46**).

4,730,786

LOW NOISE, FLOW LIMITING, LAMINAR STREAM SPOUT

Walter R. Nelson, 8771 Alta Loma Dr., Alta Loma, Calif. 91701

Continuation-in-part of Ser. No. 641,042, Aug. 15, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,957
Int. Cl.⁴ B05B *1/14*
U.S. Cl. 239—590.3 **24 Claims**



1. A spout attachment comprising:
a generally cylindrical housing having an inlet end adapted for coupling to a spout and an outlet end, said housing defining a flow passage connecting said ends;
a flow-limiting plate disposed across said flow passage near the inlet end, the plate having a plurality of flow-limiting orifices of predetermined diameter, the plate further including a flow-trimming orifice having a diameter selected to place the flow rate of the spout attachment within a selected portion of a predetermined flow range;
a first and a second series of spaced wire screens disposed across said flow passage downstream of said flow-limiting plate; and
a series of spaced, perforated disks disposed across said flow passage between said first and second series of wire screens, said screens and disks arresting the flow velocity

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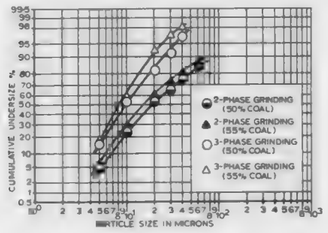
and providing a more uniform velocity profile across the flow passage.

4,730,787

METHOD OF SEPARATING SOLIDS BY SIMULTANEOUS COMMINUTION AND AGGLOMERATION

Olev Trass, Toronto, Canada, assignor to The University of Toronto Innovations Foundation, Toronto, Canada

Filed Jun. 19, 1984, Ser. No. 622,340
Int. Cl.⁴ B02C *23/18*
U.S. Cl. 241—15 **27 Claims**



1. A process for separating a solid having two or more components, at leastone of which is lyophobic and at least one of which is lyophilic, comprising:

In a single step comminuting a mixture of the solid in a first liquid to which one of the components is lyophilic and to which the other component is lyophobic and in a second liquid which is immicible with the first liquid and which will wet the lyophobic component to form agglomerates of the lyophobic component and the second liquid, in a mill having positive transport capability such that the mill causes the mixture to be transported therethrough; and

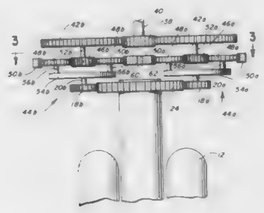
thereafter, the further step of separating the agglomerates from the mixture.

4,730,788

REACTION COUPLED, TORQUE BALANCED GEARTRAIN

Jeffrey D. Metcalf, and David J. Lang, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 13, 1985, Ser. No. 775,663
Int. Cl.⁴ B64C *25/50*
U.S. Cl. 244—50 **6 Claims**



1. A multipath power transmission for providing power to a load, wherein the power transmitted by each path in the power transmission is balanced, comprising:

a source of input power;

an input gear coupled to the source of input power;

a load to be driven;

first and second geartrains in side-by-side relationship, each of the first and second geartrains interconnecting the input gear and the load to be driven;

the first and second geartrains being driven by the source of input power through the input gear;

the first and second geartrains together transmitting power to drive the load; and

means independent of the input gear for movably but resistibly interconnecting the first and second geartrains to equalize the power provided to the load by each of said first and second geartrain.

6. A power system for the nosewheel steering of an aircraft, the power system providing the power to steer a nosewheel in the aircraft, comprising:

a source of input power;

an input gear coupled to the source of input power;

a first and a second planetary gear set;

each of the first and the second planetary gear sets having a sun gear, at least one planet gear and a ring gear, with the sun gear in each planetary gear meshed to its planet gear(s), the planet gear(s) in turn being meshed to the ring gear in the respective planetary gear set;

the input gear being meshed with the sun gears of both the first and the second planetary gear sets to provide power to each planetary gear set;

a first and a second output pinion, one for each planetary gear set;

each of the first and the second output pinions being coupled to the planet gear(s) of the first and second planetary gears, respectively;

a nosewheel gear;

the nosewheel gear coupled to the nosewheel to steer the nosewheel;

the first and second output pinions meshed to the nosewheel gear to in turn steer the nosewheel; and

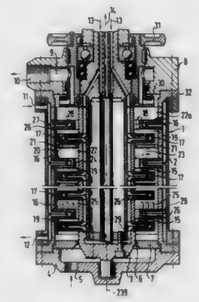
the first and second planetary gears having their respective ring gears externally meshed to equalize the power provided by each planetary gear to steer the nosewheel and provide a reaction coupled, torque balanced geartrain.

4,730,789

AGITATOR MILL

Armin Geiger, Bichwil, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Nov. 17, 1983, Ser. No. 552,756
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245825
Int. Cl.⁴ B02C *17/16*
U.S. Cl. 241—69 **34 Claims**



1. An agitator mill, comprising:

a milling container surrounding a milling chamber and having first and second axially spaced apart ends;

an agitator extending into said milling chamber and being supported within said milling container for rotation about an axis, said agitator having a drive end adjacent said first end of said container and a separator end disposed adjacent said second end of said container;

drive means for rotatably driving said agitator;

a plurality of attritive elements in said milling chamber, said attritive elements having a predetermined maximum size;

inlet means on said container adjacent said first end for the entry into said milling chamber of a product to be ground, said product being suspended in a liquid;

outlet means comprising a hollow bore extending within said agitator from said separator end to said drive end;

wherein said separator end of said agitator comprises at least one radially extending passage connecting said milling chamber to said hollow bore; and

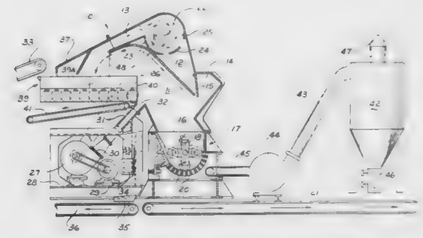
wherein said at least one radially extending passage is bounded exclusively by rotatable wall means and has a cross-section greater than said predetermined maximum size of said attritive elements.

4,730,790

WASTE MATERIAL CLASSIFYING AND REDUCING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Jan. 5, 1987, Ser. No. 372
Int. Cl.⁴ B02C *13/286*
U.S. Cl. 241—81 **2 Claims**



1. In material classifying apparatus for processing waste material composed of uncrushable components, abrasive components and grindable components in a mill structure having an internal chamber provided with air inlet and material trap and outlet means in an air moving system for the internal chamber and material grinding means connected to the internal chamber of the mill structure for receiving the grindable components, the improvement comprising:

(a) a rotary disc screen connected into the internal chamber of the material classifying apparatus, said rotary disc screen having an inlet end for receiving the collective composition of the waste material components and an outlet end in the internal chamber adjacent the air inlet means of the air moving system, said rotary disc screen operating to screen out the abrasive waste material components in advance of the remainder of the waste material composed of uncrushables and grindable components reaching the internal chamber for separation of the uncrushable components which collect in said air inlet trap adjacent said rotary disc screen outlet end; and

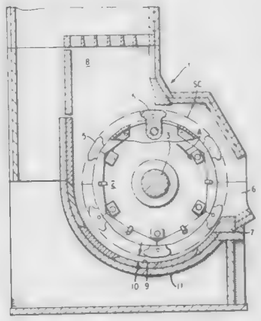
(b) conveyor means adjacent said rotary disc screen for collecting and removing the screened out abrasive components before it enters the internal chamber to protect the material grinding means from processing abrasive components of the waste material.

4,730,791

ARRANGEMENT OF THE WORKING GAP OF A CRUSHING MACHINE HAVING A HORIZONTALLY DISPOSED HAMMER CRUSHER ROTOR

Dietrich Häusler, Vellmar, and Dimitrios Kottis, Espenau, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,220
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431658
Int. Cl.⁴ B02L *13/26, 13/282*
U.S. Cl. 241—189 R **6 Claims**



1. In an arrangement including a working gap of a crushing machine having a housing in which is disposed a hammer crusher rotor including hammers thereon describing a striking circle via a horizontally disposed shaft on which said rotor is rotatably mounted; said working gap being disposed between the striking circle described by the hammers of said rotor as the latter rotates, and a bottom, trough-like inner housing surface that faces said rotor; said housing having an outlet for passage of material that has been comminuted and reduced in size by the hammers of said rotor, with said outlet extending tangential relative to said rotor; said housing also having an inlet that is provided with an anvil, with said inlet for material extending approximately radially relative to said rotor;

the improvement therewith wherein an entire width of said working gap, when viewed in the direction of rotation of said hammer crusher rotor, is crescent-shaped, said working gap having a height that constantly changes in a path extending from said anvil at said inlet to said tangential outlet for the material.

4,730,792

A BRAKING DEVICE FOR A VIDEO CASSETTE RECORDER

Jae H. Jang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 22, 1986, Ser. No. 899,084
Claims priority, application Rep. of Korea, Aug. 23, 1985, 10784/1985
Int. Cl.⁴ B65H *16/10;* **G11B** *15/32;* **F16D** *51/00*
U.S. Cl. 242—204 **1 Claim**

1. A braking device for a video cassette recorder which comprises:

braking members operatively connected to a supply reel table and a take-up reel table, each of said braking members pivot about a pivot pin disposed on the center thereof,

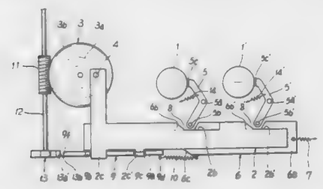
a movable member including a first trapezoidal recess and a second trapezoidal recess disposed on a rear portion thereof, said first and second recesses being connected to said braking members, respectively,

a connecting plate operatively disposed on said movable member, said connecting member including a first trape-

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zoidal recess and a cut out portion which are disposed on the rear portion thereof and corresponded to said first and second recesses of the movable member respectively, a connecting portion extended from the rear portion thereof, and latching portions disposed on the front portion thereof,

a ratchet having a triangular protrusion and a latching recess for corresponding to said latching portions of the connecting member, and



a cam including a worm gear disposed on the circumferential surface thereof for operatively engaging with a worm, said cam being operative engaged with a pin mounted to the connecting portion of the connecting plate, said worm secured to an axial rod which connects to a pair of inclined surfaces for abutting against the edge of one end of said ratchet whereby during operation of the reel tables of the video cassette recorder, the reel tables stop quickly by rotating the worm clockwise.

4,730,793

ORDNANCE DELIVERY SYSTEM AND METHOD INCLUDING REMOTELY PILOTED OR PROGRAMMABLE AIRCRAFT WITH YAW-TO-TURN GUIDANCE SYSTEM

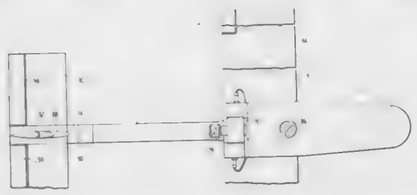
Charles H. Thurber, Jr.; Frederick A. Behrens, both of Springfield, and John H. Hunton, Annandale, all of Va., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 292,260, Aug. 12, 1981, Pat. No. 4,530,476. This application Jan. 26, 1984, Ser. No. 566,163

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.⁴ F41G *7/00;* **F42B** *15/053*

U.S. Cl. 244—3.1 **19 Claims**



1. A system for guiding an expendable pilotless aircraft to an electromagnetic wave energy emitting target comprisng:

an aircraft having control surfaces asymmetrical in the pitch and yaw planes, a sensor, and a guidance system operative in the terminal portions of the flight of the aircraft in a yaw-to-turn mode with a substantially zero roll rate; and

rapidly deployable aircraft launching means.

4,730,794

METHOD AND APPARATUS FOR ANGLE CODING

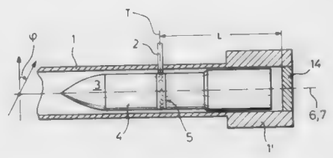
Wolfgang Knauer, Kienberg, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,664

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625649

Int. Cl.⁴ F41G *7/00*

U.S. Cl. 244—3.14 **2 Claims**



1. A method for angle coding in a projectile, adapted to be guided by a data transmission device, the projectile adapted to be launched from a smooth walled tube and beginning to rotate immediately after leaving the launching tube, the method comprising the steps of providing the launching tube with a coding device for attaching a marking to the projectile serving for guiding the projectile as a position reference, disposing a codable device on the projectile arranged at the circumference of the projectile jacket, which corresponds to the location of the coding device of the launching tube, and irreversibly coding said codable device with said coding device.

4,730,795

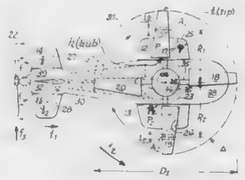
HELIPLANE

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Continuation-in-part of Ser. No. 593085, Mar. 26, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 833,667

Int. Cl.⁴ B64C *27/22, 27/54*

U.S. Cl. 244—6 **20 Claims**



1. An aircraft comprising:

an elongate fuselage;

a pair of wings extending from either side of an intermediate portion of the fuselage;

a plurality of movable control surfaces extending from a rear portion of the fuselage;

a pair of rotors each having two opposite blades, the blades of each rotor mounted for limited rotation about a common substantially horizontal pitch axis to vary the pitch thereof;

means for mounting the rotors onto an upper portion of the fuselage for rotation and at a fixed angular position relative to and about a common substantially vertical axis;

a motor mounted in the fuselage for driving said rotors;

means mounted on the fuselage for providing a forward thrust;

pilot control means for selectively varying the collective pitch of the blades of the rotors for producing a lift force on the aircraft; and

means for mounting and coupling oppositely mounted blades for maintaining axial alignment and for rotation together and for limited free rotation about the horizontal pitch axis in response to a set of aerodynamic torques applied thereon and for continuous balancing of said torques, resulting in self-adjusting cyclic pitch of said blades during rotation of the rotors about their vertical axis in response solely to airstream forces acting thereupon and resulting from the aircraft forward speed.

4,730,796

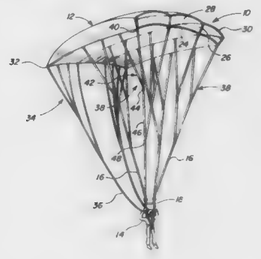
CANOPY LOADING SYSTEM FOR RAM AIR PARACHUTES

Elek Puskas, Mount Holly, N.J., assignor to Para-Flite, Inc., Pennsauken, N.J.

Continuation of Ser. No. 503,883, Jun. 10, 1983, abandoned, which is a continuation of Ser. No. 815,789, Jan. 3, 1986, abandoned. This application Jan. 20, 1987, Ser. No. 5,305

Int. Cl.⁴ B64D *17/24*

U.S. Cl. 244—142 **8 Claims**



6. A ram air inflated parachute having an airfoil shape and made of flexible material which comprises:

an upper surface, a lower surface and spanwise spaced ribs sewn to and extending between the upper surface and the lower surface to divide the canopy into an uneven number of side-by-side chordwise extending cells;

a load suspension system connected to all of the ribs including a plurality of primary suspension lines having upper and lower ends, four (4) branch lines connected to the upper end of each of the primary suspension lines and means for attaching each of the four (4) branch lines to spanwise and chordwise spaced locations on the lower surface; and

a pair of spaced risers connected to the lower ends of said primary suspension lines.

4,730,797

INFLATABLE CORE ORBITAL CONSTRUCTION METHOD AND SPACE STATION

Michael A. Minovitch, 2832 St. George St. #6, Los Angeles, Calif. 90027

Filed Aug. 12, 1985, Ser. No. 764,713

Int. Cl.⁴ B64G *1/12*

U.S. Cl. 244—159 **48 Claims**

26. A system for constructing a structure in orbit comprising:

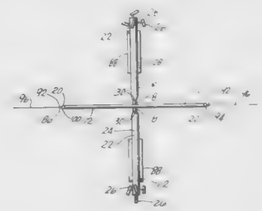
a lightweight inflatable surface;

means for inflating said surface with gas so as to form a semi-rigid, thin-walled, guide structure;

an automated wrapping wheel;

at least one long sheet of flexible wrapping material mounted on said wrapping wheel; and

means for moving said wrapping wheel around said inflated guide structure such that as said wheel moves around said



inflated structure, said wrapping material is automatically wrapped around said inflated guide structure.

4,730,798

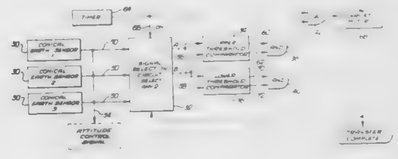
AUTONOMOUS SPACECRAFT CONTROLLER AND RELATED METHOD

James R. Wertz, 2362 W. 228th St., Torrance, Calif. 90501

Filed Mar. 8, 1985, Ser. No. 709,566

Int. Cl.⁴ B64G *1/36*

U.S. Cl. 244—171 **12 Claims**



1. An autonomous controller for use in a spacecraft, to effect a transition at low acceleration from one elliptical orbit about a celestial body to another such orbit, the controller comprising:

sensing means located entirely on board the spacecraft, for providing a signal indicative of the angular diameter of the celestial body; and

comparator means, for comparing the signal provided by the sensing means with a threshold signal indicative of an angular diameter equivalent to a threshold altitude at points in the orbit substantially removed from and spaced symmetrically with respect to the apogee and perigee, at which points a spacecraft motor is to be controlled, the comparator means including means for generating a spacecraft motor control signal, to activate a spacecraft motor at relatively low thrust over a relatively long segment of the spacecraft orbit extending between the points at which the threshold altitude is sensed, whereby the signal provided by the sensing means has a relatively high rate of change at the level of the threshold signal, to facilitate precise detection of the threshold and generation of the spacecraft motor control signal.

4,730,799

GLUE GUN ORGANIZER

Gerald E. Foss, and William C. Magnuson, both of Minnetonka, Minn., assignors to Best Tool, Inc., Plymouth, Minn.

Filed Apr. 28, 1987, Ser. No. 43,428

Int. Cl.⁴ F16L *3/00*

U.S. Cl. 248—51 **8 Claims**

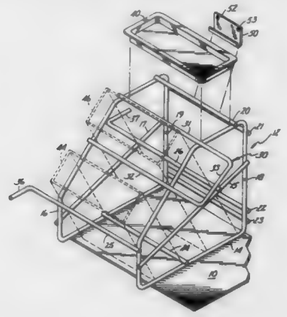
1. Apparatus for use with a heat glue gun comprising:

a generally flat metal base member;

a wire structure fastened to and extending away from said base member, said wire structure including first and second main members each having a substantially horizontal

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portion a distance "H" from the base member and a slat portion angled from the horizontal portion towards the base member, the main members being fastened to the base member a distance "W" apart; said wire structure further including a plurality of cross braces each having a first portion fastened to said first main member and a second portion fastened to said second main member, a first pair of cross braces and the horizontal portions of the main members forming a first outline of predetermined configu-



ration; a second pair of cross braces and the slant portions of the main members forming a second outline of predetermined configuration; a tray member sized to fit within the first configuration and the second configuration operating to permit the stacking of first extra glue sticks; and

U-shaped means on said wire structure, lying at an acute angle to the base member and extending beyond the distance "W" by an amount "B" so as to hold a glue gun in a position which allows any excess glue therefrom to drip onto said base.

4,730,800

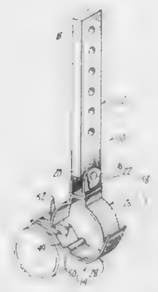
UNIVERSAL TAILPIPE HOLDING BRACKET

Milton C. Engman, 624 Glenview Dr., Des Moines, Iowa 50312

Filed Jul. 2, 1986, Ser. No. 881,328

Int. Cl.[4] E21F *17/02*

U.S. Cl. 248—62 **4 Claims**



1. A bracket for holding a tailpipe, comprising:

a support means for attachment to a vehicle frame,

a first clamp section being substantially semi-circular in shape, and having opposite first and second ends, and being pivotally secured to said support means,

a detent means on said first end of said first clamp section, and a flange means on said second end thereof,

a second clamp section being substantially semi-circular in shape and having opposite first and second ends, and being complementary in shape to said first clamp section so that said first and second clamp sections form a substantially circular opening when said first and second ends of said first clamp sections engage said first and second ends, respectively, of said second clamp section;

a plurality of slot openings in said second clamp section in spaced relation along the longitudinal axis thereof adjacent said first end thereof, each of said openings being adapted to receive therein said detent means on said first clamp section, such that the diameter of said circular opening can be adjusted to hold different diameter tailpipes,

a flange on said second end of said second clamp section adapted to be superimposed on said flange on said first clamp section,

closure means on said flanges of said first and second clamp sections for drawing them towards each other when said tailpipe extends through said circular opening and said detent on said first clamp section is received in one of the openings in said second clamp sections to draw said first and second clamp sections into tight engagement with said tailpipe,

said closure means being adjustable between a tightened position wherein said flanges are securely connected to one another and a loosened position wherein said flanges are loosely connected to one another and free to move relative to one another such that said detent can be selectively received within one of said slot openings, and

said closure means extending through an opening in said flange on said second end of said first clamp section and through an elongated opening in said flange on said second end of said second clamp section, said elongated opening permitting pivotal movement of said second clamp section about a horizontal axis when said closure means is in said loosened position whereby said first end of said second clamp section is movable away from said first end of said first clamp section so as to define an enlarged mouth through which said tailpipe is passed for receipt into said circular opening without "complete removal of said closure means from said flanges, said elongated opening further comprising an enlarged opening in the semicircular portion of said second clamp section to provide clearance for a socket wrench used for tightening and loosening said closure means" has been inserted after "flanges".

4,730,801

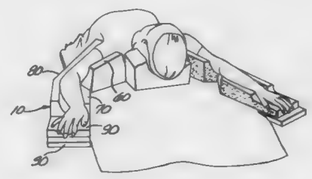
SURGICAL ARM REST

Ralph B. Cloward, Honolulu, Hi., assignor to Surgical Equipment International, Inc., Honolulu, Hi.

Filed Jun. 20, 1986, Ser. No. 876,477

Int. Cl.[4] B68G *5/00*

U.S. Cl. 248—118 **6 Claims**



1. A surgical arm rest for supporting and protecting a patient's arm while the patient is in the prone position, comprising an elongated member having a first end designed to be placed under the patient's upper arm and a second end designed to be placed under the patient's lower arm, said elongated member having ridges formed in it which define a U-shaped channel which extends substantially the entire length of said elongate member, said channel being shaped to accept the

arm of the patient, said elongated member being tapered from said first end to said second end, said elongate member having sufficient depth of its first end such that when placed under the patient's upper arm it will slightly elevate the patient's shoulder joint, and in which a section of the elongated member at approximately its middle is removed to allow the elongated member to bend in order to accomodate the folding of the patient's arm at the elbow, and to permit access to the anticubical fossa of the patient.

4,730,802

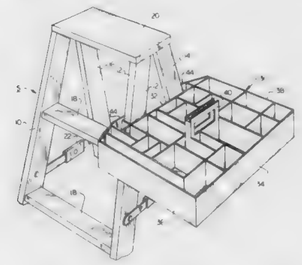
DETACHABLE TRAY FOR STEPLADDERS

Richard W. Chatham, P.O. Box 6361, Greensboro, N.C. 27405, and Charles G. Setliff, Rt. 1, Box 681B, Pelham, N.C. 27311

Filed Aug. 26, 1987, Ser. No. 89,435

Int. Cl.[4] E06C *7/14*

U.S. Cl. 248—238 **4 Claims**



1. A detachable tray for mounting on the side rails or stringers of a conventional stepladder in the open position comprising:

(a) a tray member including opposing side walls and opposing end walls;

(b) one of said side or end walls including a stepladder side rail engaging bracket means associated therewith;

(c) said stepladder side rail engagement bracket means including opposed, diverging channel members which rest upon the exposed edges of said side rails when said stepladder is in the open, operative position.

4,730,803

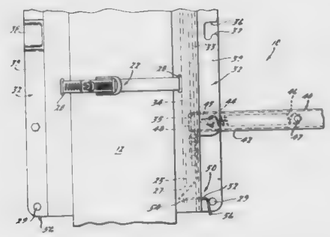
GROUND ACCESS ELEVATED POLE BANNER

David U. Hillstrom, Novi, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Sep. 10, 1986, Ser. No. 905,774

Int. Cl.[4] A47F *5/00*

U.S. Cl. 248—297.2 **18 Claims**



17. A sign-supporting device for supporting and displaying a sign at a preselected display position on a surface of an object, said sign-supporting device comprising:

a track including a pair of opposed elongated channels spaced laterally apart from one another, and a track discontinuity on said track;

track mounting means for securing said track to the surface of the object;

at least one slider received within said opposed elongated channels for sliding movement therein in a longitudinal direction along said track, said slider including a slider discontinuity defining a slider opening therein;

a support arm for supporting the sign thereon, said support arm being interconnected with said slider for sliding movement therewith relative to said track to and from the preselected display position, said support arm being pivotally interconnected with said slider for pivotal movement relative thereto between an extended position protruding generally transversely away from said track and a retracted position oriented generally longitudinally adjacent said channels, said support arm having at least one protuberance thereon interlockingly and selectively releasably engageable with said slider opening when said support arm is pivoted to said retracted position;

a pivot pin extending through said support arm and fixed to said slider for pivotally interconnecting said suppor. arm with said slider, said pivot pin being received within an elongated opening in said support arm in order to allow limited movement of said support arm toward and away from said pivot pin, said support arm further including resilient arm biasing means for resiliently biasing said support arm inwardly toward said pivot pin, said slider including a cam portion extending into said slider opening from a laterally outer portion thereof, said cam portion urging said support arm to move generally away from said pivot pin when said protuberance slidably engages said cam portion as said support arm is moved to and away from said retracted position, said resilient arm biasing means urging said support arm toward said pivot pin when said protuberance is out of engagement with said cam portion; and

a locking member interconnected with said slider, said locking member being interlockingly and selectively releasably engageable with said track discontinuity on said track when said slider and said support arm are slidably moved to the preselected display position in order to releasably secure said slider and said support arm in said preselected display position.

4,730,804

SEAT SLIDE RAIL DEVICE

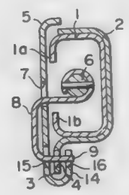
Kazuo Higuchi; Takayuki Sugama, both of Utsunomiya; Kiichi Sasaki, Wako, and Tadanori Honda, Utsunomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,036

Claims priority, application Japan, Oct. 26, 1984, 59-225338; Nov. 2, 1984, 59-231762; Nov. 2, 1984, 59-166603[U]

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—429 **23 Claims**



1. A seat slide rail structure, comprising: a lower rail having a channel member with a substantially C-shaped cross-section fixedly attached to a floor surface and having an open side end; a slider, fixedly secured to a seat, having a vertical portion

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opposing the open side end of the lower rail and combined with the lower rail in axially slidable manner by way of a bearing member; and a lock member fixedly secured to a lock lever shaft which is in turn rotatably supported by the slider and adapted to be rotated by an actuating means, further comprising:

the bearing member being fixedly secured to the slider and positioned inside the lower rail;

the lock lever shaft positioned inside the lower rail and rotatably supported on the slider by the bearing member;

a lower member depending from a lower portion of the lower rail; and

a slider extension bent from a lower end of the slider so as to oppose both surfaces of the lower member;

the slide position of the seat being adjustable by selective engagement of a lock tooth formed in a free end of the lock member and a plurality of lock holes provided in the lower rail.

4,730,805

FORM FOR FORMING CONCRETE

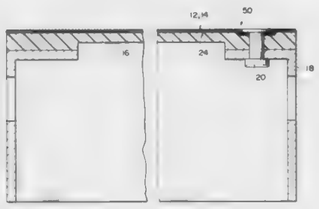
Takayoshi Yokota, Tokyo; Shigekazu Horiya, and Kenjiroh Tanaka, both of Kanagawa, all of Japan, assignors to Kabushiki Kaisha Kumagaigumi, Fukui, Japan

Filed May 15, 1986, Ser. No. 863,565

Claims priority, application Japan, May 28, 1985, 60-115139; May 28, 1985, 60-079781[U]; Jul. 3, 1985, 60-101467[U]

Int. Cl.⁴ E04G *9/10;* **B28B** *7/36*

U.S. Cl. 249—113 **10 Claims**



1. A form for forming concrete, comprising:

a first sheet permitting surplus water in concrete cast in said form to pass through said first sheet, but capable of blocking the passage of said concrete;

a second sheet secured to said first sheet and permitting said surplus water to be absorbed into said second sheet;

a spacer secured to said second sheet; and

a plate secured to said spacer;

said spacer having on at least one surface a plurality of lugs spaced from each other, and defining paths for said surplus water having passed through said first and second sheets.

4,730,806

GATE VALVE

Igor Krasnov, Fountain Valley, Calif., assignor to Vetco Gray Inc., Houston, Tex.

Continuation of Ser. No. 763,728, Aug. 8, 1985, abandoned. This application Aug. 22, 1986, Ser. No. 900,224

Int. Cl.⁴ F16K *3/02, 31/128*

U.S. Cl. 251—62 **5 Claims**

1. A gate valve comprising,

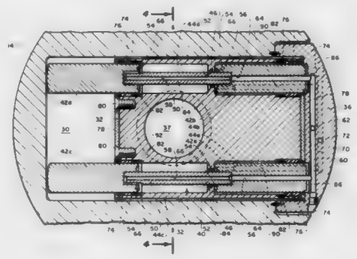
a valve body with a main bore therethrough,

a gate cavity in said valve body disposed transverse to said main bore,

said gate cavity having a closed end and an open end,

a reciprocable gate body of essentially uniform cross section throughout its length, insertible only through and removable only through said open end, for closing said main bore in a first position and for opening said main bore in a second position,

valve operator means totally within said gate cavity and within said gate body and insertible through and removable only through said open end along with said gate body for reciprocating said gate body in response to fluid pressure,



said valve operator means including fluid passageways for the communication of said fluid pressure and piston chambers cooperating with stationary pistons to open and close said main bore in response to said fluid pressure, said piston chambers being formed as bases within said gate body and independent of said valve body, and

cap means for removably closing said gate cavity.

4,730,807

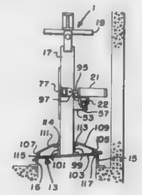
SURF POOL GATE VALVE

Robert P. Miller, Wooster, Ohio, assignor to WaveTek International, Inc., Mansfield, Ohio

Continuation of Ser. No. 556,303, Nov. 30, 1983, abandoned. This application Sep. 10, 1985, Ser. No. 775,936

Int. Cl.⁴ F16K *25/00*

U.S. Cl. 251—84 **16 Claims**



1. A surf pool gate valve for controlling the flow of water through a water carrying conduit from a water storage chamber of a surf pool which storage chamber when full with water provides a hydraulic head of at least ten feet, said valve comprising:

a frame,

a valve seat attached to the periphery of an end of a water carrying conduit,

a foot for selectively controlling the flow through the conduit by seating against the valve seat,

axially extending leg means fixedly connected to the foot for suspending the foot from the frame for pivoting movement about an axis,

a peripheral seal connected to one of the foot and valve seat, said seal including first portions defining a first plane inclined with respect to the axis of the leg means when the foot is seated against the valve seat whereby the hydraulic head tends to compress the seal between the foot and valve seat,

the seal having second portions defining a second plane disposed at an angle with respect to the first plane

whereby abrasion of the seal upon movement of the foot is reduced, and

actuating means for moving the leg means and foot against the hydraulic head between seated and open positions.

4,730,808

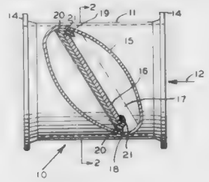
FLUE GAS SHUT-OFF VALVE

Donald F. Shaw, Denville, and Arthur A. Lietz, Oakhurst, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 17, 1987, Ser. No. 15,706

Int. Cl.⁴ F16K *3/00*

U.S. Cl. 251—326 **10 Claims**



9. A sliding plate valve comprising:

a valve body with a longitudinal flow passage therethrough;

an opening in the side of said valve body;

a horizontally disposed valve bonnet covering said opening in said valve body;

an orifice plate extending from the bonnet into the flow passage of the valve body and transverse to the longitudinal flow passage, said orifice plate having a central opening within the valve body, said central opening being surrounded by an inclined seating surface, said seating surface being located within the flow passage of the valve body and facing the flow of fluid under conditions of use;

a reciprocally removable inclined plate positioned for bearing on the seating surface of said orifice plate when said valve is closed, guide means located at the top and bottom of said orifice plate, said guide means located at the bottom having an inclined supporting surface for said sliding plate, said giude means extending from said bonnet into said valve;

said orifice plate said sliding plate and said inclined surface of said guide means, each inclined at an angle variably selected to provide a predetermined seating force between said orifice plate seating surface and said sliding plate which is a function of the weight of said sliding plate and said angle of each of said orifice plate, said sliding plate and said supporting surface of said guide means to thereby minimize the magnitude of the weight of said sliding plate carried by said guide means.

4,730,809

TAUT WIRE FENCE SYSTEM

Arie Stoler, Holon, Israel, assignor to Israel Aircraft Industries Ltd., Israel

Filed Oct. 17, 1984, Ser. No. 661,912

Claims priority, application Israel, Oct. 30, 1983, 70087

Int. Cl.⁴ E04H *17/00*

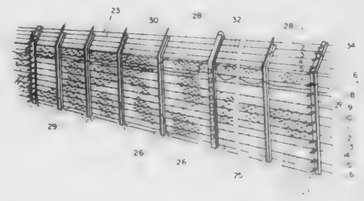
U.S. Cl. 256—1 **9 Claims**

1. A taut wire fence system comprising:

a plurality of lengths of taut non-electrified wire strung in generally parallel orientation and mounted between a pair of anchoring posts, a least two of said plurality of lengths forming a set being interconnected mechanically on at least one anchoring post of said pair of anchoring posts, with multiple interconnected sets being provided, and

sensor means mounted on a sensor post, said sensor means comprising a plurality of sensors each being adapted to interact with a different one of said lengths in said multiple interconnected sets so as to provide an indication of changes in tension therein,

said mechanical interconnection in each of said multiple interconnected sets enabling a single disturbance producing a change in tension in one of said lengths to cause a



corresponding change in tension in at least another one of said lengths, said changes in tension mechanically actuating a plurality of said sensors to provide said indication of changes in tension in at least two of said lengths of taut wire.

4,730,810

PROTECTIVE BARRIER AGAINST FALLS OF STONES

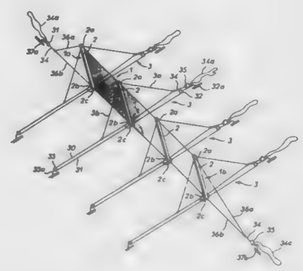
Pascal Rambaud, Le Russey, France, assignor to Mecanroc, Mirmande, France

Filed Jan. 10, 1986, Ser. No. 817,575

Claims priority, application France, Jan. 14, 1985, 85 00452

Int. Cl.⁴ E01F *7/04;* **B64F** *1/02*

U.S. Cl. 256—12.5 **13 Claims**



1. A protective barrier against falls of stones on sloping ground, comprising at least one sheet of netting oriented substantially transversely to the slope, rigid posts holding the sheet spread out upright, mooring cables adapted to be disposed upslope of the sheet, the mooring cables being disposed in line with the posts and connected to anchorages, and shock-absorbing means associated with the respective mooring cables and adapted to supply a length of reserve cable in response to a tensile force exceeding a set value, the sheet being connected to the posts at least at their upper and lower ends, plural stays for holding each of said posts erect, each of said posts and its associated stays being coupled to guide means whichin turn is coupled to said mooring cable and to said shock-absorbing means, said posts being yieldably retained and movable downslope and along said guide means in response to a fall of stones.

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4,730,811

HEAT TREATMENT APPARATUS WITH A FLUIDIZED-BED FURNACE

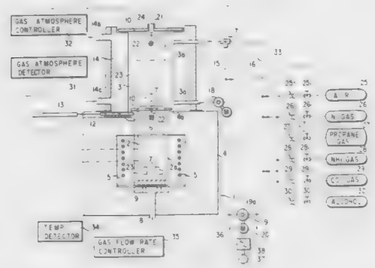
Hisashi Hattori; Hidemitsu Takenoshita; Yoichiro Hanada, and Tohru Fukuda, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 15, 1986, Ser. No. 896,783

Claims priority, application Japan, Aug. 20, 1985, 60-126004[U]; Dec. 6, 1985, 60-273525

Int. Cl.[4] C21D *11/00*

U.S. Cl. 266—81 7 Claims



1. A heat treatment apparatus for metals, comprising a fluidized-bed furnace for heating use in which a fluidized bed comprised of refracting particles is accomodated therein; a cooling chamber disposed above said fluidized-bed furnace through a partition capable of being opened and closed freely and which is arranged to cool immediately the articles which have been subjected to heat treatment in said fluidized-bed furnace; a circulating circuit means provided with a heat-resisting fan for circulating together the heated furnace gas in the fluidized-bed furnace and the cooling fluid in the cooling chamber; a heat-treating gas supply means connected to said circulating circuit means upstream of the heat-resisting fan so as to supply selectively a predetermined heat-treating gas into the fluidized-bed furnace; and, a flow rate controller arrangement connected to said circulating circuit means in the vicinity of said heat-resisting fan so as to control the flow rate of the circulating furnace gas and cooling fluid and that of the heat-treating gas to be supplied.

4,730,812

APPARATUS FOR SHIELDING A MOLTEN METAL STREAM

Hans Mielke, Krefeld, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,100

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342071

Int. Cl.[4] B22D *41/08*

U.S. Cl. 266—236 11 Claims

1. In an apparatus for discharging molten metal from a metallurgical vessel, said apparatus being of the type including a refractory discharge sleeve having an outlet end located above an inlet end of a molten metal receiving member with a space therebetween, the improvement comprising means for shielding from the surrounding air a stream of molten metal during passage thereof through said space between said outlet end of said discharge sleeve and said inlet end of said receiving member, said shielding means comprising:

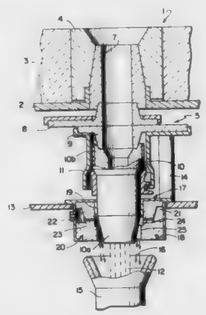
an annular refractory sleeve surrounding said discharge sleeve and positioned above and spaced from said receiving member;

said refractory sleeve and said discharge sleeve defining therebetween an annular, downwardly directed gap;

said refractory sleeve having a gas collection chamber;

outer inlet means for supplying pressurized inert gas to said gas collection chamber; and

means for supplying said inert gas from said gas collection chamber into said annular gap and thereby for producing



a downwardly directed hollow jet of inert gas having a maximum length of approximately 20 cm as a gaseous shield in said space surrounding a molten metal stream discharged from said outlet end of said discharge sleeve.

4,730,813

OXYGEN NOZZLE FOR METAL REFINING

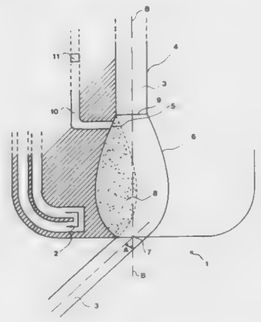
André Bock, Luxembourg; Romain Henrion; Jean Liesch, both of Esch; Carlo Heintz, Luxembourg; Henri Klein, Niedercorn, and Jean-Francois Liesch, Esch, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Feb. 20, 1987, Ser. No. 17,156

Claims priority, application Luxembourg, Feb. 25, 1986, 86321

Int. Cl.[4] C21C *5/32*

U.S. Cl. 266—266 9 Claims



1. A nozzle for use in refining metals or ferroalloys which includes a nozzle head terminating at a first mouth, the nozzle also including therein at least one blast pipe terminating at a second mouth, the blast pipe being adapted for directing a jet of refining oxygen, said nozzle further including:

chamber means interposed between said second mouth of said blast pipe and said first mouth of said nozzle head, said chamber means widening progressively from said blast pipe second mouth and narrowing toward said nozzle head first mouth; and

at least one lateral duct communicating with said chamber means at an exit opening in the vicinity of said blast pipe second mouth, each of said at least one lateral ducts being associated with flow control valve means and being adapted for connection to a source of gas.

4,730,814

BLAST PIPE FOR REFINING NOZZLE

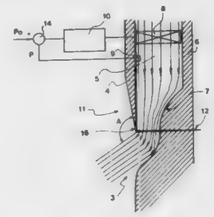
André Bock, Luxembourg; Roamin Henrion; Jean Liesch, both of Esch; Carlo Heintz, Luxembourg; Henri Klein, Niedercorn, and Jean-Francois Liesch, Esch, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Feb. 20, 1987, Ser. No. 17,883

Claims priority, application Luxembourg, Feb. 28, 1986, 86329

Int. Cl.[4] C21C *5/32*

U.S. Cl. 266—266 13 Claims



1. A blast pipe for a refining nozzle, the blast pipe being positioned in a gas supply duct and being associated with a pressure regulating valve, the blast pipe terminating at a blast pipe exit orifice, the blast pipe comprising:

a straight wall section, one side of said straight wall section terminating at an edge, said edge defining a portion of the blast pipe exit orifice, wherein gas flows in a linear path along the straight wall section and strikes said edge; and

a bent wall segment located adjacent to and downstream of the remainder of said straight wall section, said bent wall segment defining the remainder of said blast pipe exit orifice.

4,730,815

LEAF-SPRING

Eckart von Estorff, Hagen, and Josef Wienand, Werdohl, both of Fed. Rep. of Germany, assignors to Krupp Büninghaus GmbH, Werdohl, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,173

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524077

Int. Cl.[4] F16F *1/18, 1/36*

U.S. Cl. 267—52 27 Claims



1. A leaf spring to be clamped between a saddle of a vehicle axis and a clamping plate by means of at least two connecting elements spaced from one another in a longitudinal direction, said saddle and said clamping plate having respective predetermined lengths;

the leaf spring comprising in combination,

an elongated spring member composed of a fiber-reinforced duroplastic synthetic material;

at least two supporitng plates, each having a length exceeding the length of the saddle and of the clamping plate, and each having an inner region located between the connecting elements, and an outer region located outside the connecting elements, one of said supporting plates being located at one said of said spring member, so as to be arranged between said spring member and said saddle, the other of said supporitng plates being located at the other side of said spring member, so as to be located between said spring member and said clamping plate, said supporting plates abutting against said spring member in said inner region; and

at least two pressure cushions composed of a rubber-elastic material, each being located between a respective one of said supporitng plates and said spring member and only in said outer region outside the connecting elements.

22. A method of manufacturing a leaf spring to be clamped between a saddle of a vehicle axle and a clamping plate by means of connecting elements spaced from one another in a longitudinal direction, the method comprising the steps of

providing at least one elongated spring member extending in the longitudinal direction and being composed of a fiber-reinforced duroplastic synthetic plastic material and having two sides;

covering each of said sides of said spring member with a fiber-reinforced duroplastic protective layer;

covering each of said sides of said spring member with a thermoplastic cover layer;

removing the cover layers in the region between the connecting elements completely;

removing the protective layers in the region between the connecting elements partially;

providing two supporting plates;

connecting each of said supporting plates with pressure cushions of a rubber-elastic material; and

connecting the supporting plates together with said pressure cushions, and with said sides of said spring member so that said pressure cushions are located between the spring member and the supporting plates.

4,730,816

APPARATUS FOR CONTROLLING VEHICLE SPRING FIRMNESS

Konrad Eckert, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

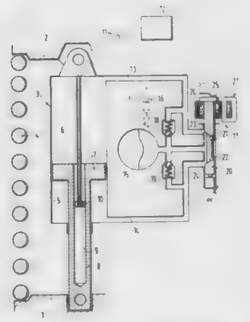
Continuation of Ser. No. 700,838, Feb. 12, 1985, abandoned.

This application Jun. 22, 1987, Ser. No. 63,789

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414258

Int. Cl.[4] F16F *9/50*

U.S. Cl. 267—64.11 13 Claims



1. An apparatus for controlling a spring-type firmness of a road vehicle, comprising a hydraulic load bearing element provided with two work chambers separated by a piston, a hydraulic control valve arranged to simultaneously communicate with a connection from each of said two work chambers and adapted to control fluid flow to and from each of said work chambers, each of said two work chambers being connected simultaneously to a hydropneumatic reservoir, said hydropneumatic reservoir and said hydraulic load bearing element adapted to serve as a hydropneumatic spring, said hydraulic load bearing element being connected at least to said hydropneumatic reservoir, a one-way check valve in a by-pass

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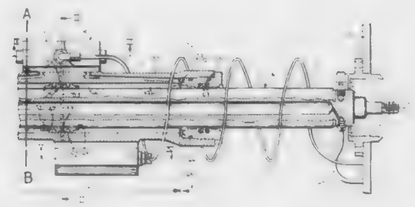
line between said reservoir and each of said work chambers that by-pass said hydraulic control valve, said hydraulic control valve being adapted to provide control of shock absorber firmness and level control for a suspension in said road vehicle, and means for operating said control valve at a frequency that is several times higher than inherent frequencies occurring in the overall vehicle suspension.

4,730,817

HYDROPNEUMATIC SUSPENSION ELEMENT OF A HEAVY VEHICLE OR A LANDING SET OF WHEELS OF AN AIRCRAFT

Philippe Joseph, Carpentras, France, assignor to S.A.M.M. Societe d'Applications des Machines Motrices, France

Filed Dec. 4, 1985, Ser. No. 804,570
Claims priority, application France, Dec. 12, 1984, 84 19015
Int. Cl.⁴ F16F *9/14, 9/42, 9/06;* **B64C** *25/58*
U.S. Cl. 267—64.15 **11 Claims**



1. A hydropneumatic suspension element for a heavy, and in particular armoured, vehicle or a landing set of wheels of a vehicle such as an aircraft, said element comprising a tubular body for connection to a hub of a wheel and for pivotal connection to an arm pivotally connected to the bottom of a chassis of a vehicle, a rod for pivotal connection to the chassis of the vehicle and slidably mounted in said tubular body, said tubular body containing a gas chamber and a hydraulic liquid chamber, a central ring fixed to said rod and dividing said liquid chamber into two compartments, and a device disposed outside said tubular body for drawing the hydraulic liquid; wherein said drawing device comprises a second body fixed laterally on said tubular body, said second body containing a first chamber and a second chamber communicating with each other, two hydraulic liquid circulation conduits arranged in said tubular body, opening onto opposed ends of said hydraulic liquid chamber and communicating with said first and second chambers, said first and second chambers each containing check-means, one of which check-means is adapted to assure the damping of the compression while the other of said check-means is adapted to assure the damping of the expansion.

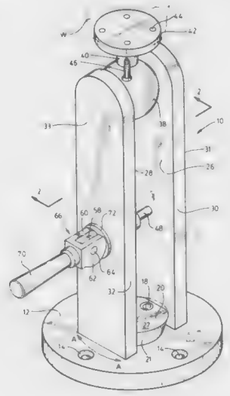
11. A hydropneumatic suspension element for a heavy, and in particular armoured, vehicle or a landing set of wheels of a vehicle such as an aircraft, said element comprising a tubular body for connection to a hub of a wheel and for pivotal connection to an arm pivotally connected to the bottom of a chassis of the vehicle, a rod for pivotal connection to the chassis of the vehicle and slidably mounted in said tubular body, said tubular body containing a gas chamber and a hydraulic liquid chamber, a central ring fixed to said rod and dividing said liquid chamber into two compartments, and a device disposed outside said tubular body for drawing the hydraulic liquid; and further comprising an expansion chamber of the hydraulic liquid fixed to said tubular body and communicating with said drawing device and containing a piston biased by elastically yieldable means so as to allow expansion of the liquid in the event of great heating.

4,730,818

HOLDING DEVICE

Douglas A. Price, 25 Bonacres Avenue, West Hill, Canada

Filed Feb. 5, 1987, Ser. No. 11,325
Int. Cl.⁴ B23Q *1/04*
U.S. Cl. 269—75 **3 Claims**



1. A holding device adapted to hold a workpiece and to permit such a workpiece to be disposed in a plurality of angular orientations and which holding device comprises:

a base member adapted to be secured to a supporting surface;

a fixed boss having a longitudinal axis and projecting from said base member and an annular flange provided by said boss having an inwardly and downwardly sloping surface;

first and second mutually spaced and mutually opposed support arms mounted on said base member for conjoint rotation of 360 degrees around said boss and about said longitudinal axis thereof, generally opposed and concave rcesses being formed in said first and second support arms at positions located outwardly therealong relative to said boss; and opposed arcuate recesses formed in said support arms in proximity to lower ends thereof and receiving said annular flange, said arcuate recesses being formed with inwardly and downwardly sloping surfaces engaging said inwardly and downwardly sloping surface of said annular flange;

a generally spherical movable member disposed between said support arms and partly received within said concave recesses for rotational movement therein in a first plane of 360 degrees about said longitudinal axis, movement of at least 180 degrees in a second plane and lesser rotational movement in a third plane;

biassing means interconnecting said support arms and urging said arms toward each other and into gripping engagement with both said movable member and said boss to hinder both said rotational movement of said movable member between said support arms and said conjoint rotation of said support arms about said boss as well as to retain said movable member within said concave recesses;

clamping means interconnecting said support arms which in turn comprises a shaft extending freely through said support arms at a location between said arcuate recesses and said concave recesses therein so as to project beyond outer surfaces of said support arms, stop means on one end of said shaft engaging said outer surface of said first support arm and movable toggle means on a second end of said shaft engaging said outer surface of said second support arm, and movable between a released position and a clamping position in which said clamping means is operative to maintain said support arms in clamping engagement both with said movable member and with said boss so then to prevent both said rotational movement of said movable member between said support arms and said conjoint rotation of said support arms about said boss and said inwardly and downwardly sloping surfaces of said annular flange and of said arcuate recesses co-operating so as to urge said support arms into engagement with said base; and

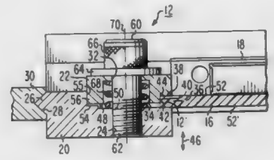
a workpiece-attachment member secured to said movable member and adapted to have a workpiece attached thereto.

4,730,819

PRINTED CIRCUIT BOARD CLAMP FIXTURE

Marc P. Hirschhorn, Bensalem, Pa., and James H. Magown, Stratford, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1986, Ser. No. 869,296
Int. Cl.⁴ B25B *1/06*
U.S. Cl. 269—221 **4 Claims**



1. A clamp fixture for minimizing warping of a printed circuit board during wave soldering comprising:

first and second parallel mirror image elongated clamps for clamping a printed circuit board therebetween;

each clamp comprising a support rail and a facing mating clamp rail having facing planar clamp surfaces, said clamp surfaces being adapted to receive substantially a corresponding edge area of the printed circuit board therebetween to clamp against opposite respective corresponding broad face surfaces of the board at said edge areas;

said clamp rail including a locating surface lying in a plane normal to and adjacent to a plane of one of said clamp surfaces for abutting and clamping to an edge surface of the board terminating at and located between said opposite broad face surfaces; and

clamp tightening means coupled to the rails for urging the rails in a direction to clamp said board edge therebetween and a means for locking said clamp rail between said support rail and said printed circuit board edge area.

4,730,820

COMB FILE FOR FLAKE/SCALE FEEDING OF PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

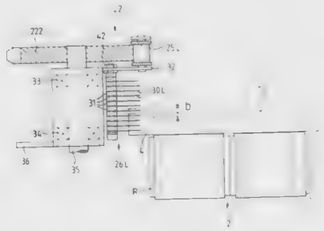
Filed Jul. 1, 1986, Ser. No. 880,824
Claims priority, application Switzerland, Aug. 22, 1985, 3611/85
Int. Cl.⁴ B65H *5/30*
U.S. Cl. 270—55 **25 Claims**

1. An apparatus for adjusting the relative positions of like portions of elements in a scale flow of flat, folded products moving in a predetermined direction comprising the combination of

first and second sets of equal numbers of shift blades on opposite sides of the scale flow; and

first and second means for movably supporting the shift blades of said first and second sets, respectively, such that the blades in each set are longitudinally spaced apart relative to the direction of scale flow and individual ones of the blades are opposite each other and operate in pairs, each said means including

a support for each said shift blade for moving its supported blade longitudinally along said scale flow such that pairs of said blades can engage and longitudinally advance an individual product, and



drive means for driving said support at a selected longitudinal speed different from the speed of movement of said scale flow.

4,730,821

DEVICE FOR SEPARATING PREFOLDED, FOLDABLE SHEETS

Daniel Flückiger, Walkringen, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed Sep. 19, 1986, Ser. No. 909,781
Claims priority, application Switzerland, Sep. 20, 1985, 04083/85
Int. Cl.⁴ B65H *39/02, 7/02*
U.S. Cl. 270—58 **19 Claims**

13. A method for isolating of prefolded, foldable sheet pieces comprising

providing a support for placing a stack of sheet pieces, which support has a ledge joining the support at an edge at an angle of about 90 degrees;

controlling the motion of a side wall disposed opposite to the ledge and making an angle of more than about 60 degrees with a plane of the support against the placed sheet pieces for supporting and guiding the placed sheet pieces at a side of the sheet pieces, with a control system for actuating an electromechanical drive based on a first sensor disposed at the support and connected to the control system, where the first sensor responds to sheet pieces placed on the support, a second sensor disposed at the ledge of the support and connected to the control system, where the second sensor responds to a force directed against the plane of the ledge of the support, and a third sensor disposed at the side wall and connected to the control system, where the third sensor responds to a motion of the side wall for expanding a slot formed between the ledge of the support and the side wall;

actuating the side wall with the electromechanical drive connected to the side wall for changing the width of the slot against a spring elastic connection between the electromechanical drive and the side wall;

moving the side wall such that the width of the slot formed between the ledge of the support and the side wall is adjustable and such that the slot is adapted for receiving of prefolded sections of sheet pieces; and

serially removing a lowest level sheet piece in each case with a sheet piece separator.

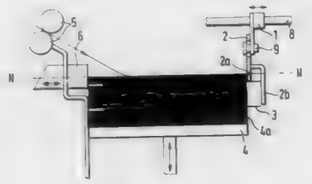
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4,730,822

APPARATUS FOR MARKING INDIVIDUAL RUNS OR PORTIONS OF A STACK OF PRINTED SHEETS

Josef Wagner, Wiesbaden-Delkenheim, Fed. Rep. of Germany, assignor to Neue Rotaprint GmbH, Berlin, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 786,007
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437348
Int. Cl.[4] B65H 45/22
U.S. Cl. 270—95 19 Claims



1. Apparatus for identifying runs or portions of stacks of sheets on a sheet receiving deck of a printing machine mounted to a means for gradually lowering said deck to compensate for increasing stack height, comprising:

stop means for stopping the movement of sheets received on said deck;

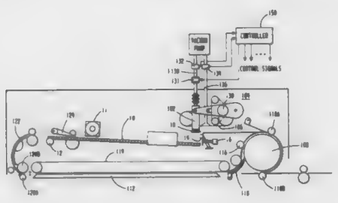
means for moving said stop means relative to said deck between first and second positions so as to define first and second stop positions, said first stop position defining a normal side boundary of said stack and said second stop position being spaced outwardly a predetermined distance from said normal side boundary so that sheets stopped at said second stop position will project outwardly beyond said normal side boundary, said means for moving said stop means including means for moving said stop means relative to a stack on said deck to define said second stop position after a predetermined number of sheets have been disposed on the stack so that a path is defined for a next discharged sheet to move toward and be stopped at said second stop position and means for moving said stop means relative to the stack to define said first stop position after said next discharged sheet has been disposed on the stack.

4,730,823

ADAPTIVE DOCUMENT FEED PICK MECHANISM

Daniel A. Barela, Boulder; Mark A. Beran, Niwot; Louis A. Bustamante, Berthoud; Cecil M. McDonald, Longmont; Ronald E. Reese, Boulder, and Roger D. Shepherd, Rollinsville, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1986, Ser. No. 935,886
Int. Cl.[4] B65H 3/08
U.S. Cl. 271—31 10 Claims



10. In a sheet feeder apparatus having means for adusting the height of a stack of sheets to be fed, means for producing a vacuum, picker means including suction cup means operable from said vacuum producing means for removing the top sheet from said stack of sheets, and control means for receiving and supplying signals, the improvement comprising:

sensing means disposed between said vacuum producing means and said suction cup means for supplying a signal when the vacuum changes due to the suction cups engaging a sheet;

means in said control means for moving said picker means to a reference position with respect to said stack of sheets;

means in said control means for moving an engaged sheet to a removal position in response to the signal; and

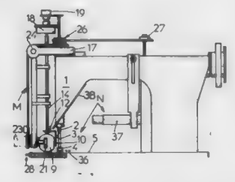
means in said control means for altering the position of said stack of sheets if said signal is supplied before said picker means are moved to said reference position.

4,730,824

UNIT FOR THE GUIDANCE OF SHEETS OF FLEXIBLE MATERIAL FOR THE PURPOSE OF FORMING A THREE-DIMENSIONAL ASSEMBLY

Christian Huau, Fontenay aux Roses; Pierre J. A. Facon, Versailles, and Alain Pelleray, les Clayes sous Bois, all of France, assignors to Bertin & Cie, Plaisir Cedex, France

Filed Jul. 24, 1986, Ser. No. 888,993
Claims priority, application France, Aug. 2, 1985, 85 11858; Aug. 2, 1985, 85 11859
Int. Cl.[4] B65H 7/14
U.S. Cl. 271—227 7 Claims



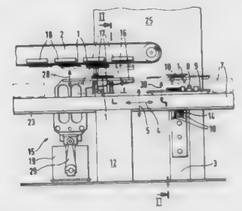
1. Apparatus for the guidance of sheets of flexible material for the purpose of forming a three-dimensional assembly, said apparatus including a drive device formed from at least one bearing plate, a drive wheel constructed and arranged to press flexible sheet material to be guided onto said bearing plate, means for control of said drive wheel, and a position detector for detecting the position of an edge of sheet material on said bearing plate, said detector including at least one photoelectric detector placed in front of said edge used in the guidance of said sheet material and electronic circuits converting the signals provided by said detector into a control signal for said drive device, wherein the drive device includes a spherical drive wheel which moves freely around a spindle, said spindle being parallel to a bearing plate and said spindle being attached at one end to an axially movable shaft by an extension, said extension being approximately orthogonal to said bearing plate and said shaft, said shaft having a means of rotational control provided at the end of said shaft opposite the end attached to said spindle by said extension; and a drive roller having an axis which is parallel to said bearing plate and which controls the rotation of said spherical drive wheel, wherein said shaft and said drive roller are supported by common frame means which provide the appropriate angular positions of said shaft and said drive roller.

4,730,825

INSTALLATION FOR FEEDING SHEET METAL BLANKS TO A FIRST WORKING STAGE OF A MULTI-STAGE PRESS

Gerald Mikusch, Goeppingen; Heinz Schweitzer, and Dieter Wolz, both of Heiningen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,544
Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519334
Int. Cl.[4] B65H 5/10
U.S. Cl. 271—268 6 Claims



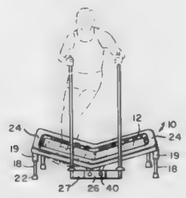
1. An installation for feeding blanks to a first working stage of a multi-stage press, comprising feed means for depositing blanks in an intermediate deposit station, transfer rail means operable to be driven in a transfer direction, in a lifting and lowering direction and in a closing and opening direction by transfer rail drive means, gripping means mounted on said transfer rail means for seizing the blanks in the intermediate deposit station and for transporting the blanks through the working stages, the intermediate deposit station including deposit means liftably and lowerably supported in guide means, and movement transmission means connected between the deposit means and the transfer rail drive means for producing seizing of said blanks by said gripping means simultaneously with producing synchronous lifting movement of the deposit means and transfer rail means.

4,730,826

REBOUNDING EXERCISE DEVICE

James L. Sudmeier, 56 Village Brook La., #10, Natick, Mass. 01760

Filed Aug. 21, 1986, Ser. No. 898,481
Int. Cl.[4] A63B 5/00, 69/18
U.S. Cl. 272—65 10 Claims



1. A rebounding exercise device comprising:

mat means;

a plurality of springs attached about the periphery of said mat means, each spring having an outer end extending from said mat means;

a frame to which the outer ends of said plurality of springs are attached, said frame having a low center portion and two high ends at opposite ends of said frame, such that said mat means is formed with a low center portion and two inclined portions when supported by said frame so that a person may jump back and forth on said two portions; and

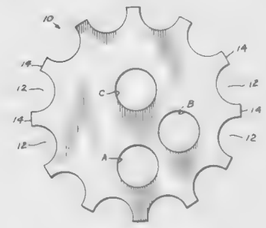
means attached to the low center portion of said mat means for pulling said low portion of said mat means down.

4,730,827

HAND REHABILITATION DEVICE

George R. Williams, 504 Countryside Trail, Edmond, Okla. 73034

Filed Nov. 21, 1986, Ser. No. 933,520
Int. Cl.[4] A63B 21/30
U.S. Cl. 272—68 2 Claims



1. A hand rehabilitation device, comprising:

a planar circular disk formed from material returning to a position of repose after being manually flexed,

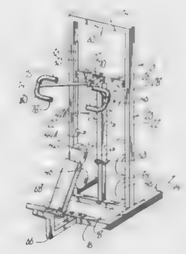
said disk having an uninterrupted circumferential series of closely spaced substantially semicular recesses extending about the entire periphery of said disk, thereby separately nesting an intermediate portion of a patient's respective fingers when transversely disposed therein and having at least one thumb receiving aperture in its central portion diametrically spaced from a designated arc of the disk periphery a distance requiring a patient to fully open his hand when simultaneously inserting his thumb in the thumb aperture and disposing intermediate portions of his fingers in the designated arc recesses.

4,730,828

BODY STRENGTH AND CONDITIONING FRAME STRUCTURE

Mark R. Lane, Jefferson, Iowa, assignor to American Sports International, Ltd., Jefferson, Iowa

Filed Jan. 12, 1987, Ser. No. 2,516
Int. Cl.[4] A63B 21/06
U.S. Cl. 272—118 18 Claims



1. A basic frame adaptable for use with a plurality of strength and conditioning devices, comprising,

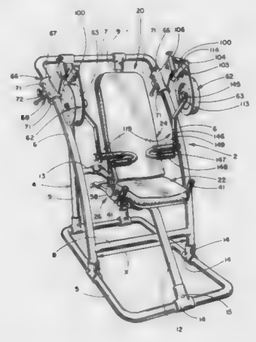
a base support,

a pair of vertical parallel spaced posts secured by the lower ends to said base support and connected by their upper ends to a horizontal cross member;

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a movable T-shaped frame comprising a vertical hollow tube and a horizontal cross bar secured to the upper end of said tube;
means for guiding the movement of the opposite ends of said cross bar along said posts; and
a stationary post rigidly secured to said base support and said tube slidably extending over said post.

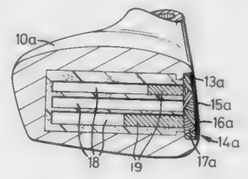
4,730,829
EXERCISE MACHINE
Robert B. Carlson, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.
Division of Ser. No. 675,366, Nov. 27, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 67,185
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—129 **4 Claims**



1. An exercise machine, which comprises:
(a) a frame having an elongated frame member which extends over a particular distance;
(b) an electromagnetic resistance means carried on the frame member for generating a force that must be overcome by the user to achieve an exercise benefit, wherein the electromagnetic resistance means is bodily movable on the frame member between different positions for exercising different muscle groups;
(c) driving means for moving the resistance means on the frame member, wherein the driving means includes a control element which is manually manipulated by the user to operate the driving means;
(d) first locking means for locking the resistance means relative to the frame member; and
(e) second locking means for locking the resistance means relative to the frame member. wherein the second locking means is operatively associated with the control element to be released as the user manipulates the control element, whereby the second locking means is capable of retaining the resistance means on the frame member after the first locking means has been released until such time as the user manipulates the control element to operate the driving means.

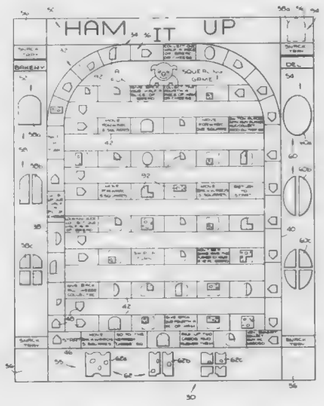
4,730,830
GOLF CLUB
Gordon J. Tilley, Manor Farm, 4 Bennetts Hill, Dunton Bassett, Lutterworth, Leicestershire, England
Filed Apr. 9, 1986, Ser. No. 849,909
Claims priority, application United Kingdom, Apr. 10, 1985, 8509185
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—171 **5 Claims**

1. A golf club comprising:
a hollow head;
a filling material having multiplicity of spaced apart blind bores disposed in said hollow head;
an insert detachably mounted on said hollow head, said insert normally covering the open ends of said bores and



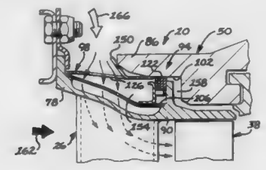
permitting access to said bores when detached from said hollow head; and
at least one weight removably receivable in respective ones of said bores when said insert is detached for adjusting the balance of said hollow head.

4,730,831
GAME WITH BOARD, PLAYING PIECES AND AWARD PIECES
Gina De Sio, 3979 N. Merrimac, Chicago, Ill. 60634
Filed Mar. 27, 1986, Ser. No. 844,602
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—243 **1 Claim**



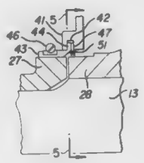
1. A game to be played by a plurality of players in competition, comprising,
a board having a plurality of paths indicated thereon, and each path including a plurality of squares with instructions as to steps to be performed by a player,
a playing piece for each player for placing on and moving along the paths,
a plurality of award pieces certain ones of which constitute a part of, but less than, a complete object, and adapted to be fitted together and thereby capable of constituting a recognizable greater part of the object,
the award pieces also including complete objects, and the part pieces including so many as to be capable of forming complete objects,
the complete objects being capable of being fitted together to form recognized compound objects,
the compound objects being sandwiches, the complete objects being parts that make up a sandwich including bread pieces and filler pieces, and the part pieces being of smaller size than, and constituting portions of, sandwich parts of predetermined shape and size.

4,730,832
SEALED TELESCOPIC JOINT AND METHOD OF ASSEMBLY
Philip J. Cederwall, and Boris Glezer, both of San Diego, Calif., assignors to Solar Turbines Incorporated, San Deigo, Calif.
Division of Ser. No. 775,879, Sep. 13, 1985, Pat. No. 4,635,332. This application Aug. 22, 1986, Ser. No. 899,136
Int. Cl.[4] B23P *15/00;* **B21D** *39/00;* **F16J** *15/16*
U.S. Cl. 277—2 **8 Claims**



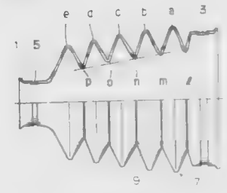
1. A sealed joint comprising:
a housing having an inner cylindrical surface and a longitudinal axis;
a carrier telescopically disposed in the housing, said carrier defining an annular groove opening towards the inner cylindrical surface of the housing;
a radially-resilient annular seal installed in the groove and having a radial peripheral surface which sealedly contacts the inner cylindrical surface of the housing; and
a separate annular member maintained concentrically around the carrier and axially spaced from the radial peripheral surface of the seal, said annular member having an internal annular surface which is diametrically tapered along the longitudinal axis in decreasing fashion towards the seal, said internal annular surface having a pair of opposite end portions wherein one end portion of the internal annular surface has an enlarged internal diameter which is of a preselected magnitude sufficient to surround both the carrier and the installed seal in radially-spaced relation when the annular member is at a first axial position during assembly of the joint, said other end portion of the internal annular surface having a reduced internal diameter of another preselected magnitude sufficient to radially-inwardly compress the seal further in the groove when the annular member is at a second axial position during assembly of the joint.

4,730,833
LARGE DIAMETER DIRT AND OIL SEAL FOR A TRACTION MOTOR GEARCASE
Robert B. Foster, and Dale C. Walker, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.
Filed Dec. 29, 1986, Ser. No. 946,723
Int. Cl.[4] F16J *15/12;* **F16H** *57/02;* **F16P** *1/02*
U.S. Cl. 277—12 **6 Claims**



1. Improved means for sealing the annular gap between a sidewall of a gearcase of a traction vehicle and the adjacent thrust flange of a non-rotatable, motor-supporting axle bearing disposed on a rotatable axle of the vehicle in a cap that is fastened to the frame of an electric motor the rotatable shaft of which is drivingly coupled to the axle by means of a gear train housed inside the gearcase, the gear train including an axle gear the hub of which is adjacent to said thrust flange, wherein the improvement comprises:
a. an annular member of elastomeric material having a sleeve portion that is adapted to snugly encircle the circumference of said thrust flange and having a flange portion that projects radially outwardly from said sleeve portion and is adapted to fit inside a seal-receiving annular groove formed in an edge of the gearcase sidewall surrounding said axle gear hub, said flange portion being thinner than the width of said groove;
b. means for firmly securing said sleeve portion of said annular member to the circumference of said thrust flange; and
c. a reinforcing ring of relatively stiff material having an annular outer section attached to said flange portion of said annular member, the thickness of said outer section in an axial direction being approximately equal to the difference between the thickness of said flange portion and the width of said groove so that the reinforced flange portion of said annular member will fit tightly in said groove, said reinforcing ring also having an annular inner section adapted to extend radially inwardly from said groove to within close proximity of the perimeter of said axle gear hub.

4,730,834
MECHANICAL SHAFT JOINT BOOT
Mikio Ukai, Nagoay, and Kenji Miyamoto, Inazawa, both of Japan, assignors to Toyoda Gosei Co., Ltd., Japan
Filed Apr. 18, 1986, Ser. No. 853,760
Claims priority, application Japan, Apr. 19, 1985, 60-085246
Int. Cl.[4] F16J *3/04, 15/52*
U.S. Cl. 277—212 FB **13 Claims**



1. A mechanical shaft joint boot made of a resin formed by blow molding, which comprises:
(a) a large-diameter ring;
(b) a small-diameter ring; and
(c) a bellows formed between said large-diameter ring and said said small-diameter ring,
said bellows being connected to said small-diameter ring through said large-diameter ring, each crest i having a radius of curvature at the top R_i (i=1, 2, . . . n; $4 \leqq n \leqq 7$) in order and said bellows having at least one crest k in said crests i which satisfy the factor given below:

$$R_1 > R_k > R_{jmax}$$

wherein k satisfies $2 \leqq k \leqq n+\frac{1}{2}$ and R_{jmax} is the maximum value of R_j satisfying $n+\frac{1}{2} < j$.

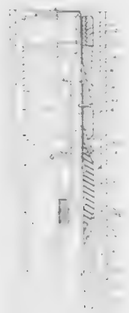
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4,730,835

ANTI-EXTRUSION SEAL ELEMENT

Raymond K. Wilcox, Dallas, and Gary L. Harris, Houston, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Sep. 29, 1986, Ser. No. 912,253
Int. Cl.[4] F16J 15/28; E21B 33/128
U.S. Cl. 277—230 12 Claims



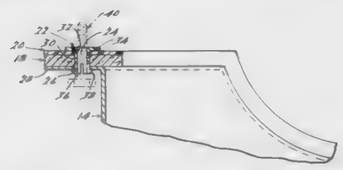
1. A seal assembly for sealing the the annulus between two telescopically related, concentric tubular conduits of a subterranean well, said seal assembly comprising: at least one pressure deformable annular sealing element; an anti-extrusion element disposed axially adjacent to said annular sealing element; and means for applying an axial compressive force to said annular sealing element through said anti-extrusion element thereby radially expanding said anti-extrusion element into snug engagement with the surfaces defining said annulus; said anti-extrusion element being formed from an annular mass of metallic wire mesh initially molded to a maximum diametrical dimension at least equal to the large diameter of said annulus, and subsequently being remolded to a dimension permitting the free assemblage of said anti-extrusion element with said annulus, such that the initial molding and remolding process reduces the axial compressive force necessary to radially expand said anti-extrusion element.

4,730,836

GASKET ALIGNMENT INSERT

Paul H. Miller, Wheaton; Brian F. Rericha, Downers Grove, and Paul J. Stoeck, Northlake, all of Ill., assignors to Microdot Inc., Darien, Conn.

Filed Apr. 6, 1987, Ser. No. 34,998
Int. Cl.[4] F16J 15/06; F16B 2/04; F02F 7/00, 11/00
U.S. Cl. 277—235 B 11 Claims



1. A gasket assembly for retention of fluid in an internal combustion engine comprising

a plurality of gasket elements having ends of reduced thickness which overlap with one another to form a continuous gasket, each of said overlapping ends having a circular aperture formed therein, and

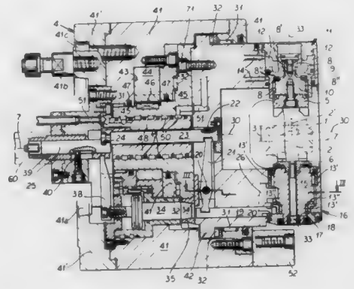
a cylindrical insert having a central longitudinal circular aperture and a radially outwardly projecting flange on one end, said insert being inserted through the apertures formed in the ends of said gasket elements, whereby said elements are joined.

4,730,837

JAW CHUCK FOR WORKPIECES HAVING A PLURALITY OF PROCESSING AXES

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 811,100
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446826
Int. Cl.[4] B23B 31/14
U.S. Cl. 279—5 13 Claims



1. A chuck for holding a workpiece rotatable about a machining axis of rotation for performing machining operations with respect to at least two workpiece axes, disposed at a distance from one another, said apparatus comprising:

a mounting body connectable to a machine-tool spindle, said mounting body including a base member for coupling said mounting body to said spindle, and a turning member adapted to be locked at said base member at least in a first position and a second position, whereby in each of said positions said workpiece axes intersect a pivot axis perpendicular to said machining axis;

a chuck unit on said turning member for clamping said workpiece;

a pivot unit on said turning member for rotating the clamped workpiece relative to said turning member about said pivot axis;

journal means for rotation of said turning member on said base member about a turning axis parallel to the machining axis intersecting said pivot axis midway between said workpiece axis, said chuck unit including a pair of chuck jaws clamping said workpiece between them and journal means for journaling said jaws relative to said turning member about said pivot axis, said journal means including:

a piston chamber formed in said base member extending arcuately about said turning axis;

a vane piston displaceable in said piston chamber and connected to said turning member; and

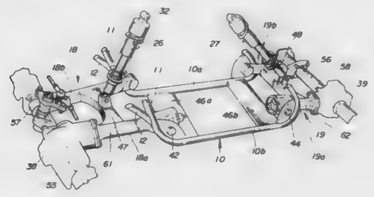
means for supplying a pressure medium to said piston chamber for selectively pressuring said vane piston on opposite sides thereof.

4,730,838

MOTOR VEHICLE WITH LEVELING MECHANISMS

Hirotake Takahashi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 898,125
Claims priority, application Japan, Aug. 21, 1985, 60-127479[U]
Int. Cl.[4] B60G 17/00; B62D 17/00
U.S. Cl. 280—6 R 6 Claims



1. A four-wheeled motor vehicle comprising:

a frame assembly;

a pair of steerable front wheels;

a pair of rear wheels;

front wheel supporting means angularly movable mounted on a lower portion of said frame assembly and supporting said front wheels, said front wheel supporting means comprising a leading swing arm and said front wheels being supported at a positive caster angle when said front wheel supporting means is held at an angle to said frame assembly;

rear wheels supporting means angularly movably mounted on said frame assembly and supporting said rear wheels;

at least one damper interconnected between an upper portion of said frame assembly and said front wheel supporting means;

at least one damper interconnected between said frame assembly and said rear wheel supporting means; and

leveling mechanisms combined with said dampers, respectively, for adjusting distances between said frame assembly and said front and rear wheel supporting means and for reducing the positive caster angle at which said front wheels are supported by increasing the length of said dampers.

4,730,839

FOUR-WHEEL STEERING APPARATUS FOR VEHICLES

Akihiko Miyoshi, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 4, 1987, Ser. No. 10,781
Claims priority, application Japan, Feb. 7, 1986, 61-24059
Int. Cl.[4] B62D 5/00, 7/00
U.S. Cl. 280—91 19 Claims

19. In a four-wheel steering apparatus for a vehicle equipped with a front wheel turning mechanism for turning the front wheels and a rear wheel turning mechanism for turning the rear wheels and designed to turn the rear whels in association with the front wheels in response to the operation of a steering wheel, a four-wheel steering apparatus comprising of:

an electromagnetic actuator for turning the rear wheels by driving the rear wheel trning mechanism;

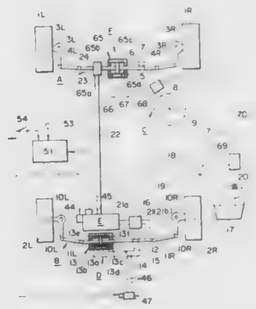
turning angle detecting means for detecting a turning angle of the steering wheel;

target turning ratio determining means for determining a target turning ratio on the basis of a predetermined turning ratio characteristics;

integrating means for integrating a signal from the target turning ratio determining means on the basis of a predetermined time constant;

discriminating means for discriminating whether the direction of changing the turning ratio is in the same phase direction or in the reverse phase direction by comparing from the target turning ratio determining means with a signal from the integrating means;

time constant setting means for setting the time constant received from the discriminating means so as to become larger when the directin of changing the turning ratio is in the reverse phase direction rather than when the direction of changing the turning ratio is in the same phase direction;



target turning angle determining means for determining a target turning angle of the rear wheel on the basis of outputs from the integrating means and the turning angle detecting means; and

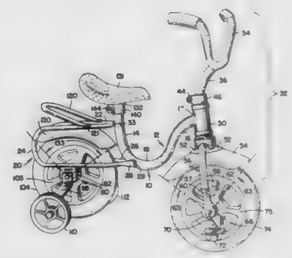
drive controlling means for controlling the actuator so as to become the target turning angle.

4,730,840

MINIATURE FRONT WHEEL DRIVE BICYCLE FOR CHILD

Steven Goldmeier, Old Bethpage, N.Y., assignor to Rand International, Farmingdale, N.Y.

Filed May 14, 1987, Ser. No. 50,503
Int. Cl.[4] B62H 1/12; B62J 7/04; B62K 3/06
U.S. Cl. 280—210 10 Claims



1. A miniature bicycle of a size suitable for children 1½ to 3 years old comprising: (A) an integral, tubular metal frame having (i) a midsection in the form of a unitary goose-neck shaped body tube, said goose-neck shaped body tube having an upwardly extending rear portion, an inclined forward portion and a bow-shaped midportion intermediate said rear and forward portions; (ii) a rear section in the form of a metal tube bent in double to provide (a) a first "U"-shaped bend extending in a first plane, and bent again to provide (b) a second and a third "U"-shaped bend extending in two separate substantially parallel planes which are substantially perpendicular to said first plane and (c) a pair of generally parallel terminal portions, each of said terminal portions being shaped to conform to the periphery of the bow-shaped portion of said integral tubular,

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metal frame and fixedly attached thereto by brazing or welding, and said first "U"-shaped bend being positioned adjacent the upwardly extending rear portion of said body tube and being affixed thereto by brazing or welding, (iii) a forward section in the form of a metal head tube being fixedly attached to said body tube by brazing or welding, said forward section being engaged to (B) a steerable front wheel assembly rotatably engaged with said head tube, said steerable assembly comprising (i) a handle bar connected to a handle bar stem (ii) a front wheel having an axle rotatably coupled to said handle bar stem and fixedly attached to pedal arms to enable front wheel drive, said rear section of said metal frame being engaged to (C)(i) a seat post slidably engaged with said upwardly extending rear portion of said body tube (ii) clamping means to fixedly attach said seat post to said rear portion of said gooseneck shaped body tube; and (D) said rear section of said metal frame being engaged to a rear wheel assembly comprising (i) a pair of training wheel metal brackets, each of said brackets being fixedly engaged to opposite sides of the rear section of the metal frame (ii) a pair of traning wheels, each of said wheels being rotatably engaged to an opposite bracket (iii) a rear wheel having an axle rotatably engaged to said rear section.

4,730,841

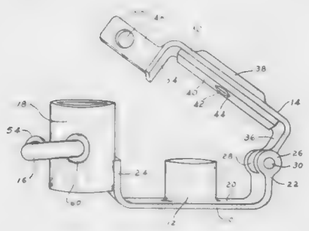
TRAILER HITCH LOCKING DEVICE

Joe L. Ponder, 123 Cheryl, Longview, Tex. 75604

Filed Jun. 22, 1987, Ser. No. 64,595

Int. Cl.[4] B60D *1/12, 1/06*

U.S. Cl. 280—507 **9 Claims**



1. A theft prevention device to lockably obstruct the socket of a trailer hitch coupler, comprising

an elongate base plate of shallow U-shaped configuration;

a post interconnected to said base plate intermediate its two ends;

an elongate closure plate of shallow U-shaped configuration hingeably interconnected at one end to one end of said base plate in opposing relationship thereto;

an elongate locking plate interconnected at one end to said closure plate near its end opposite its hingeable interconnection to said base plate, said locking plate being penetrated by an aperture intermediate its two ends;

a hollow open-ended locking means enclosure having a continuous side wall, interconnected to said base plate near its end opposite its hingeable interconnection to said closure plate, said wall of said locking means enclosure being penetrated by an aperture coaxially alignable with the aperture penetrating said locking plate; and

a locking rod, one end of which is adapted to be inserted through the aperture in said locking plate and through the aperture in the wall of said locking means enclosure into the interior of said locking means enclosure, said end of said locking rod being penetrated by an aperture adapted to receive the shaft of a padlock or other suitable locking means.

4,730,842

ADJUSTABLE WHEELCHAIR

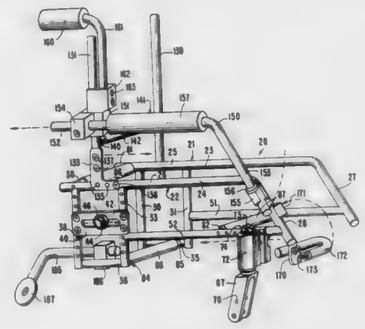
Patrick D. Summers, West Simsbury, and Richard A. Eden, Bloomfield, both of Conn., assignors to Wheel Ring, Inc., Manchester, Conn.

Continuation of Ser. No. 853,402, Apr. 18, 1986, abandoned.

This application Aug. 5, 1987, Ser. No. 82,990

Int. Cl.[4] A61G *5/00*

U.S. Cl. 280—638 **10 Claims**



1. A horizontally adjustable wheelchair comprising:

a supporting frame having a front, a rear, and a pair of sides defining a seat portion therebetween;

a pair of main wheels rotatably mounted to said frame, and a pair of secondary wheels rotatably mounted to said frame for pivotal movement with respect thereto;

said frame including means for continuous adjustment of the width of said seat portion over a defined range; and

seat means fastened to said seat portion for receiving a human in a seated position, wherein said frame includes a plurality of corresponding pairs of crossbars, each of said crossbars of a respective pair being fixed by attached to a respective one of said frame sides, and said width adjusting means includes continuously adjustable split clamp means for adjustably joining each of said corresponding pair of crossbars.

4,730,843

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara; Shinichi Takeuchi, both of Okazaki; Masanaga Suzumura, Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi, and Hiroki Abe, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,666

Claims priority, application Japan, Jan. 24, 1984, 59-7194[U]; Jan. 24, 1984, 59-7195[U]; Jan. 24, 1984, 59-7196[U]; Jan. 24, 1984, 59-7200[U]; Jan. 24, 1984, 59-7203[U]; Jan. 24, 1984, 59-7206[U]; Jan. 24, 1984, 59-7209[U]; Jan. 24, 1984, 59-7218[U]; Jan. 24, 1984, 59-7220[U]; Jan. 24, 1984, 59-7222[U]; Jan. 24, 1984, 59-7224[U]; Mar. 22, 1984, 59-39916[U]; Mar. 22, 1984, 59-39919[U]; Mar. 22, 1984, 59-39920[U]

Int. Cl.[4] B60G *17/04*

U.S. Cl. 280—689 **4 Claims**

1. A suspension apparatus comprising:

suspension units mounted on respective wheels, each unit having a fluid spring chamber;

fluid supply means for supplying a fluid to each fluid spring chamber through a fluid supply valve;

fluid exhaust means for exhausting the fluid from each fluid spring chamber through a fluid exhaust valve;

first communicating means connecting a first communication control valve to said fluid spring chambers of the right and left front wheel suspension units;

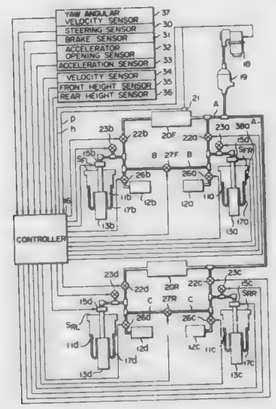
second communicating means connecting a second communication control valve to said fluid spring chambers of the right and left rear wheel suspension units;

steering angle detecting means for detecting steering angle;

velocity detecting means for detecting a vehicle velocity;

a controller for generating a communication control signal and a roll control signal when both the steering angular velocity, which is calculated from the steering angle detected by said steering angle detecting means, and the vehicle velocity, which is detected by said velocity detecting means are higher than their prescribed levels, said first and second communication control valves being closed by said communication control signal, and said fluid supply valves in the fluid spring chambers located on the contracted side with respect to a roll direction and said fluid exhaust valves in the fluid spring chambers located on the elongated side with respect to the roll direction being open during a present control time by said roll control signal;

said controller determining the length of a first control time in accordance with the steering angular velocity which is



calculated from the steering angle detection by said steering angle detecting means and with the vehicle velocity detected by said vehicle velocity detecting means, and adopting said first control time as said preset control time;

said controller comprising a first memory for storing a plurality of control time corresponding to the vehicle velocity and the steering angular velocity, the length of a first control time being obtained from said first memory in accordance with the detected vehicle velocity and steering angular velocity;

said controller also comprising a second memory which stores the first control time obtained from said first memory and which has a contents thereof cleared when said communication control valves are open, said controller generating a supplementary roll control signal, when a first control time newly obtained from said first memory after the outputting of said roll control signal is longer than the first control time already stored in said secon memory, for opening said fluid supply and exhaust valves for an additional period of time equal to the difference between the already stored first control time and the newly obtained first control time, and replacing the contents of said second memory with the newly obtained first control time.

4,730,844

VEHICLE SEAT BELT SYSTEM

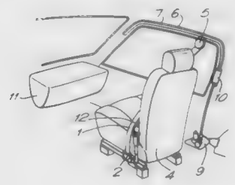
Michael Patterson, Carlisle, England, assignor to ASE (UK) Limited, Carlisle, England

Filed May 12, 1986, Ser. No. 863,829

Claims priority, application United Kingdom, May 10, 1985, 8511902

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **26 Claims**



1. A passive vehicle seat belt system comprising:

a seat belt movable between an out-of-use position and an in-use position,

a retractor from which said seat belt can be withdrawn against a retractive bias,

latch means adapted to be enabled to latch said retractor against belt withdrawal in response to a first, predetermined condition,

an electric drive motor for moving said seat belt between said out-of-use and in-use positions,

circuit means for controlling energization of said drive motor to effect said belt movements in response to command signals generated in response to second predetermined conditions, and

disabling means for disabling said latch means from latching said retractor against belt withdrawal in response to a command signal for effecting belt movement requiring belt withdrawal from said retractor.

4,730,845

ANCHORING DEVICE FOR A SLIDABLE UNIT, COMPRISING A TONGUE, IN PARTICULAR FOR A PASSIVE SAFETY BELT DEVICE

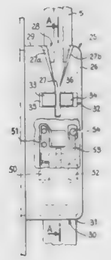
Joseph J. Betencourt, Pont-de-Roide, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jul. 25, 1986, Ser. No. 889,538

Claims priority, application France, Jul. 26, 1985, 85 11494

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **12 Claims**



1. In an anchoring device for a slidable unit comprising a tongue of use in particular in a passive safety belt device for a seat of a motor vehicle having a frame and a body, the device comprising a strap constituting a shoulder strap, a winder connected to an end of the strap for winding the strap, a buckle carried by a free end of the strap and cooperative with the

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tongue, a guide and retaining rail fixed to the body of the vehicle, the slidable unit being mounted on the rail to be movable between a standby postion, in which a user has access to the seat, and an active position for retaining the user on the seat, actuating means for moving the slidable unit between the standby position and the active postion and comprising driving means and a belt connecting the slidable unit to the driving means, maintaining means for maintaining the tongue firmly fixed relative to the frame of the vehicle and cooperative with the tongue in said active position so as to resist tensile forces exerted on the tongue, said device comprising means for locking the slidable unit in said active position, adapted to prevent the displacement of the unit in a direction parallel to the guide and retaining rail, and the maintaining means being disposed between the guide rail and the means for driving the slidable unit; the improvements wherein the maintaining means comprise a case having a front side, a first lateral side and a second lateral side, the front side defining a slot through which slot the tongue projects, the slot having edges which define two bearing surfaces cooperative with the tongue for withstanding tensile forces exerted on the tongue, a first opening provided in the first lateral side of the case and communicating with the slot and aligned with the guide and retaining rail so as to permit the passage of the slidable unit, a second opening provided in the second lateral side of the case for allowing the passage of a part of the belt, and the locking means comprise at least one cavity provided in the front side of the case, at least one locking element having active portions and disposed in said cavity, the locking element being mounted to be movable between a retracted position, allowing selectively the insertion of the tongue and the withdrawal of the tongue from the active position, and a locking position in which the active portions of the locking element are cooperative with complementary portions of the tongue and with said cavity for retaining the tongue in the active position;

said device further comprising elastically yieldable means combined with the locking element for biasing the locking element to the retracted position thereof; and

wherein the locking element comprises a metal strip having adjacent a first end thereof a portion bent at 90° so as to form a hook constituting an active portion of the locking element, the tongue having an opening for receiving the active portion of the locking element in the locking position, the strip having, in a central part thereof, an articulation surface, and, adjacent a second end opposed to said first end, a first bearing surface and a second bearing surface, the device further comprising an inner structure mounted inside the case and having a bearing surface on which the articulation surface of the locking element bears, the first bearing surface being cooperative with said elastically yieldable means, and an actuating element connected to the slidable unit being cooperative with the second bearing surface for selectively displacing and maintaining the locking element in the locking position thereof.

4,730,846

PATIENT MEDICATION RECORD SYSTEM

Judith M. Sheehan, 2 Woodcrest Dr., Armonk, N.Y. 01504, and Peter J. Eagelman, Stamford, Conn., assignors to Judith Sheehan, Essex, Conn.

Division of Ser. No. 544,363, Oct. 21, 1983, Pat. No. 4,614,360. This application Sep. 16, 1985, Ser. No. 776,515

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.⁴ B42D *17/00;* **B42F** *21/00;* **G09F** *3/18*

U.S. Cl. 281—45 **11 Claims**

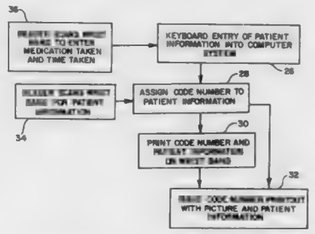
1. A hospital patient data record card system, comprising, in combination,

a flat card member including a front face having a printed design and data associated with said design relating to a particular patient and patient treatment instructions including type of treatment and time of adminstration of such treatment, said card member including opposed generally horizontal top and bottom edges and having opposed generally vertical side edges,

means for supporting said card member extending between said horizontal top and bottom edges and said vertical side edges and including horizontal upper and lower portions generally aligned with said horizontal top and bottom edges and vertical side portions generally aligned with said vertical side edges, said means for supporting being a transparent flat support member having reverse front and rear faces, said card member being positioned flat against said rear face of said support member, said support member including gripping means for holding said card member,

guide means connected to said front face of said support member and extending along one of said horizontal upper and lower portions between said vertical side portions,

markings associated with said guide means visible to a person viewing said front face of said card member, said markings indicating general times for administrating said treatment, said markings extending along said one of said horizontal top and bottom edges between said vertical edges of said card member,



marker means for indicating selected markings of said markings designating a particular time for administrating said treatment, said guide means being for slidably mounting said marker means between said vertical side portions, said marker means including viewing means for observing any of said selected markings through said marker means,

holding means associated with said marker means and with said guide means for releasably positioning said marker means to said guide means at one of said selected markings, and

means connected to said means for supporting for removably attaching said means for supporting to a general file of patient treatment record cards.

4,730,847

COMPUTER-ASSISTED LABORATORY NOTEBOOK KIT

Grace M. Donnelly, Hasbrouck Heights, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 806,891, Dec. 9, 1985, Pat. No. 4,620,726. This application Jul. 16, 1986, Ser. No. 886,586

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

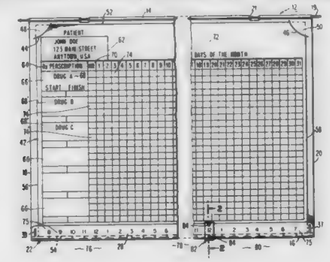
Int. Cl.⁴ B41L *1/00, 1/20;* **B65B** *15/00, 47/00*

U.S. Cl. 282—1 R **6 Claims**

1. A computer-assisted laboratory notebook kit comprised of a wrapped packet of papers for insertion into a binder to form a permanent laboratory notebook said packet including:

(a) a separate title page sheet and at least one separate table of content sheets, said title page sheet being preprinted with a character designation which will distinguish said title page from other comparable title pages, said table of content sheets being designed to permit manual entry of information and said title page sheets and table of content sheets containing aligned punched-out holes for accepting binding posts or rings;

(b) a fan-folded, continuous strip of rectangular, two-ply sets of paper sheets for feed to a computer printer, wherein information printed on the top ply is simultaneously recorded on the face of the bottom ply, and wherein the sheets are distinguished by perforated tear lines perpendicular to the edges of the strip, said tear lines providing for separation of the continuous strips into separate sets of paper sheets, said strips containing left and right edge



perforated tear strips with each of said tear strips containing a linear array of apertures designed to permit engagement with sprocket wheels of edge feed computer printers, each sheet being preprinted with the character designation present on the title page and a sequential sheet number, said sheet numbers begining with numeral one, and wherein both plys of each set of paper sheets possess identical sheet numbers and further each sheet containing punched-out holes aligned with the holes present in the title page; and

(c) a sealed wrapper surrounding said packet of papers.

4,730,848

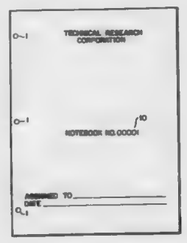
CREDIT CARD TRANSACTION SLIPS PACK AND METHOD OF MAKING

Joseph A. McCormick, Manhattan, Ill., assignor to General Credit Card Forms, Inc., Earth City, Mo.

Filed May 19, 1986, Ser. No. 869,008

Int. Cl.⁴ B41L *1/20*

U.S. Cl. 282—8 R **14 Claims**



1. In a pack of credit card transaction slips for recording information relating to a credit card transaction, including at least a top transaction slip of translucent paper joined in the pack above a duplicating medium slip for imprinting duplicating medium representing said information on the lower face of the top transaction slip, the improvement comprising:

a pigment coating on the lower face of said top transaction slip; and

said pigment coating having a color which color contrasts with said duplicating medium to improve the visibility of the duplicating medium imprint on the lower face of said top transaction slip when said imprint is viewed through the upper face of said top transaction slip.

4. A method of making a pack of credit card transaction slips comprising the steps of:

providing a top transaction slip of translucent paper for the pack;

providing a bottom transaction slip for the pack;

providing a duplicating medium slip for imprinting duplicating medium on the lower face of the translucent paper and on said bottom transaction slip;

coating the lower face of said top transaction slip of translucent paper with a colored pigment coating which contrasts with the color of the duplicating medium and which enables the translucent top slip to be more nearly opaque than the translucent top slip without the applied pigment coating;

joining the top transaction slip, the duplicating medium slip, and the bottom transaction slip to form a pack of credit card transaction slips with the duplicating medium slip between the top and bottom transaction slips and the lower face of the top transaction slip adjacent the duplicating medium slip;

so that there is a significant improvement in visibility and legibility of the duplicating medium imprint on the lower face of the top transaction slip when viewed through the upper face of the top transaction slip.

4,730,849

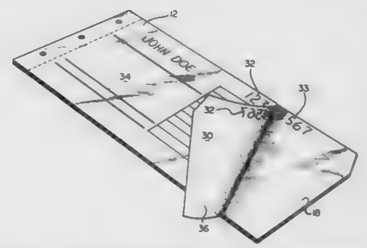
MEDICATION DISPENSING IDENTIFIER METHOD

Harold B. Siegel, Clearwater, Fla., assignor to Seigel Family Revocable Trust, Clearwater, Fla.

Filed Feb. 5, 1987, Ser. No. 11,018

Int. Cl.⁴ B42D *15/00;* **G09C** *5/00, 1/04;* **G06F** *15/42*

U.S. Cl. 283—70 **4 Claims**



1. A method of dispensing medication and for maintaining a close surveillance over both a patient for whom the medication is solely intended and over a prescribed medication to be dispensed, comprising the steps of:

initially recording and storing a photograph of the patient for whom the medication is solely intended;

initially recording and storing vital information relating to the prescribed patient medication and the dosage thereof;

providing label means;

creating and imprinting the label with:

(a) a visual record of the stored photograph; and

(b) a printout of the stored vital patient information;

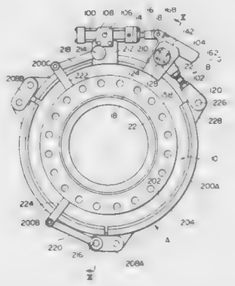
providing a container for transporting to the patient, the prescribed medication as described in the printout;

affixing the imprinted label to the container; and

comparing the photograph imprinted on the label with the patient to whom the medication is to be dispensed, before any medication is dispensed.

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4,730,850
QUICK RELEASE COUPLING DEVICE
Susumu Takahasshi, Koshijimachi, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan
Filed May 7, 1986, Ser. No. 860,666
Claims priority, application Japan, May 11, 1985, 60-69789[U]; Jul. 18, 1985, 60-158758; Mar. 19, 1986, 61-61355
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—3 **12 Claims**



1. A quick release coupling device for securing end flanges of two adjacent pipes together comprising:

a clamp assembly including

(i) a plurality of clamping members disposed to straddle said two end flanges therearound in circumferentially distributed relation so as to generally circumscribe said two end flanges, each clamping member resiliently urged radially outwardly of said end flanges, and

(ii) a plurality of connecting members for connecting respective adjacent pairs of clamping members together so as to form an annulus provided with a gap between first and second end clamping members; and

(iii) coupling means disposed in said gap for releasably connecting said first and second end clamping members together against the resilient urging of said clamping members so as to complete said annulus and to hold said clamp assembly securely on said end flanges, each of said clamping members includes an arcuate spring plate which has an arcuate inner surface of radius of curvature larger than a radius of said end flanges in released condition, in which said first and second end clamping members are disconnected, and is flexed to circumscribe said end flanges in a coupled condition in which said first and second end clamping members are coupled by said coupling means, and each of said connecting members comprising a connecting fitting attached to each adjacent pair of clamping members.

4,730,851
DOWNHOLE EXPANDABLE CASTING HANGER
Gerald D. Watts, Richmond, Tex., assignor to Cooper Industries, Houston, Tex.
Filed Jul. 7, 1986, Ser. No. 882,873
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—4 **6 Claims**

1. A hanger assembly for suspending an inner pipe string within and from an outer casing comprising:

an elongated tubular hanger body with one end adapted for releasable connection to a well tool and the other end adapted as a lower end for connection to an inner pipe string;

said hanger body having a recessed exterior surface portion intermediate its ends and an enlarged diameter locking surface superjacent said recessed portion;

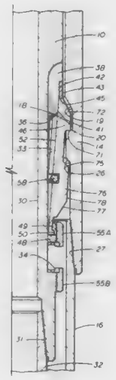
a locking assembly sleeved around the recessed surface portion of the hanger body, said locking assembly being comprised of a plurality of longitudinally extending latching fingers arranged circumferentially about the hanger body, said locking assembly including a retainer ring divided into a pair of semi-circular elements arranged in co-planar circumferential relation around the hanger body and about the lower ends of the latching fingers;

cooperative means on said semi-circular retainer elements and said latching fingers for mounting the latching fingers to the hanger body for limited pivotal movement about their lower ends,

means for connecting said semi-circular retainer elements to the hanger body whereby said locking assembly is connected to the hanger body;

means for continually and yieldably urging the free ends of the latching fingers away from the hanger body whereby said locking assembly is continually biased toward an expanded condition;

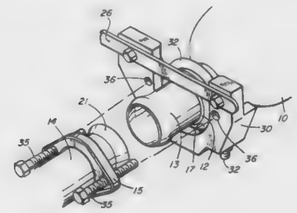
said means for continually and yieldably urging the free ends of the latching fingers comprises a split circular spring carried on the inner surfaces of each of the latching fingers to urge pivoted movement of the latching fingers about their lower ends;



a downward facing stop surface provided on each said latching finger adjacent the upper free end thereof whereby when said hanger assembly with a pipe string suspended therefrom is lowered into an outer casing string, the latching fingers of the locking assembly are adapted to expand outwardly at their free ends in pivotal movement about their lower ends whereby the stop surfaces thereon are adapted to engage a mating surface formed in the inner profile of a segment of the outer casing string and arrest further downward movement of the hanger assembly; and

shear means for restraining relative axial movement of the locking assembly on said hanger body until the stop surfaces of the latching fingers engage said mating surfaces of the outer casing string whereby the shear means for restraining relative axial movement is adapted to be shorn by a predetermined weight of the pipe string to permit relative sliding movement between the latching fingers and the hanger body whereby the locking surface holds the upper ends of the latching fingers in expanded latched relation with the outer casing and prevents inward movement of the upper ends of the latching fingers.

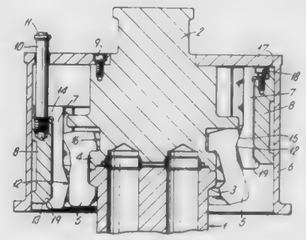
4,730,852
VEHICLE EXHAUST REPAIR DEVICE
Christopher Arscott, 550 Oak Park Drive, London, Ontario, Canada (N6H 3N7)
Continuation of Ser. No. 623,563, Jun. 22, 1984, abandoned.
This application Oct. 28, 1986, Ser. No. 925,521
Claims priority, application Canada, Mar. 2, 1984, 448696
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—15 **3 Claims**



1. A repair bracket assembly for use in mounting a catalytic converter to an exhaust pipe along the underside of a vehicle after corrosive failure of an original bracket welded to a pipe extending from the downstream side of the catalytic converter, that converter pipe having a downstream end connecting to the upstream end of an exhaust pipe, the connection being by means of a bulbous end on the converter pipe and a mating cupped end on the exhaust pipe, the converter pipe and exhaust pipe being held together prior to the corrosive failure by a collar and a fastener means, the collar extending around the exhaust pipe so as to abut the exterior of the cupped end, and the fastener means connecting the collar to the original bracket, the corrosive failure of the original bracket allowing movement between a first portion of that original bracket welded to the converter pipe and a second portion to which the fastener means connects, the repair bracket assembly comprising a U-shaped block having two generally parallel arms and a surface facing said collar, the inner edge of the U-shaped block being shaped to define a recess in the surface of the block facing the collar, and inwardly extending shoulders at the inner edges of said arms, said recess being adapted to receive a complementary external enlargement on the converter pipe, and also comprising a U-bolt adapted to fasten to the block such that the converter pipe is tightly held between the block and the U-bolt, the distance between the inner edges of the shoulders of the two arms being slightly greater than the diameter of the converter pipe so as to prevent said converter pipe from moving axially with respect to the block in a direction away from the exhaust pipe, the block having means for securely holding the fastener means extending from the collar, whereby after corrosive failure of the original bracket, repair is accomplished by fastening the repair bracket assembly to the converter pipe by fastening the U-bolt to the block so as to tightly hold that pipe and securing the collar to the repair bracket assembly using the fastener means or using new similar fastener means;

said means for securely holding the fastener means comprising respective internally threaded openings formed in said two arms of said U-shaped block of said repair bracket, these openings being oriented to open towards said collar so that the fastener means which extend from said collar may be threaded into said repair bracket for pulling said collar against the cupped end on the exhaust pipe while pulling said repair bracket against the bulbous end on the converter pipe.

4,730,853
ARRANGEMENT IN A REMOTE-CONTROLLABLE SUBSEA CONNECTOR
Harald Gjessing, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway
Filed Jan. 27, 1986, Ser. No. 923,957
Claims priority, application Norway, Nov. 12, 1985, 854510
Int. Cl.[4] F16L *37/08*
U.S. Cl. 285—18 **10 Claims**

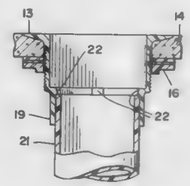


1. In an arrangement in a remote-controlled subsea connector, expecially for use in oil production systems, wherein the connector components may be locked together by the aid of a collet finger ring and an actuator ring that is controllable in the axial direction of said connector for fingers of said collet finger ring, the improvement wherein said actuator ring further comprises a maneuver ring, and a radially flexible annular shaped retaining means in contact with the maneuver ring, and positioned against the fingers of the collet finger ring,

wherein said retaining means is axially movable relative to said collet finger ring between an unlocked position and a locked position, and

wherein at said locked position, said collet fingers are provided with a cylindrical surface opposing said retaining means.

4,730,854
SEALABLE DRAIN FITTING
Casper Cuschera, 1047 77th Ave., Oakland, Calif. 94621
Filed Jul. 28, 1981, Ser. No. 287,549
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—42 **4 Claims**

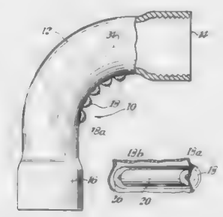


1. A floor drain, including a cylindrical drain body having external threads formed about an upper portion thereof, a flange extending radially outwardly from the upper end of said drain body and disposed flush with the floor surface, a threaded nut secured to said external threads of said drain body to engage the lower surface of the floor, said drain body including a lower bore portion adapted to receive the upper end of a waste discharge pipe, the pipe being secured therein by adhesive or the like, shoulder stop means extending inwardly from the upper end of the lower bore portion to limit the upward position of the waste discharge pipe and to expose the upper end surface of the waste discharge pipe, and sealant bead means disposed at the junction of said end surface and said lower bore portion to seal the assembly of the waste discharge

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pipe and said lower bore portion, said shoulder stop means including a plurality of shoulder stops extending radially inwardly in said lower bore portion and spaced circumferentially thereabout, said shoulder stops extending inwardly a distance which is less than the thickness of the wall of said waste discharge pipe.

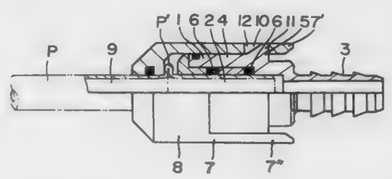
4,730,855
ELBOW PIPE FOR ELECTRIC CONDUIT
Gilles J. Pelletier, Boynton Beach, Fla., assignor to B.P. Technologies, Beaumont, Tex.
Continuation-in-part of Ser. No. 246,627, Apr. 15, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 352,051
Int. Cl.[4] F16L *43/00*
U.S. Cl. 285—179 **4 Claims**



1. A unitary functionally integral elbow pipe joint for use in a pipe system for housing electrical wiring, cable or conductors comprising:
(a) a gradually curved impervious pipe section extending initially from the inlet of said section at an angle of 0° to the outlet thereof at 90°;
(b) a plurality of identically shaped cylindrical rollers rotatably mounted along the inner surface of the inner curvature of said intermediate section;
(c) said rollers being so arranged and mounted that a portion of the cylindrical surface of each of said rollers protrudes slightly into the interior of said curved pipe section without significantly reducing the effective interior cross-sectional area of said curved pipe section;
(d) one of said rollers being mounted contiguous to said inlet and another of said rollers being mounted contiguous to said outlet;
(e) at least one additional roller mounted along the inner curvature of said curved section of said pipe section and disposed between said rollers mounted at the said outlet and inlet and being spaced therefrom at least a distance equal to the diameter of said rollers;
(f) the number of said rollers being so selected to allow improved conveyance of an electrical conductor through said section with minimal force; and
(g) the inner surface of said pipe section being so shaped to accomodate said remaining portions of the cylindrical surfaces of each of said plurality of rollers.

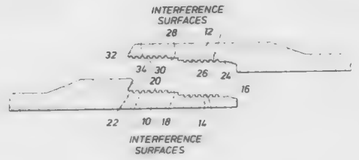
4,730,856
PIPE JOINT FOR CONNECTING A PIPE HAVING A SMALL DIAMETER
Katsushi Washizu, Sunto, Japan, assignor to Usui Kokusai Sangyo Kabushika Kaisha, Shizuoka, Japan
Filed May 28, 1987, Ser. No. 55,034
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—319 **5 Claims**

1. A pipe joint for connecting a pipe and a tubular member, said pipe comprising an end portion extending inwardly from one axial end of said pipe and further comprising a radially outwardly projecting wall portion adjacent the end portion of said pipe, said end portion being dimensioned to and receiving a plurality of annular seal rings thereabout, said pipe joint comprising:
a generally cylindrical main body having opposed first and second axial ends, and being characterized by an axial bore extending entirely therethrough, the first axial end of said main body defining a tubular extension dimensioned to connect with said tubular member, said axial bore of said main body being characterized by at least one annular step generally facing said first end of said main body and defining a smaller cross-sectional portion of said axial bore, the portion of said axial bore intermediate said annular step and said second end being dimensioned to receive both the end portion of said pipe and the annular seal rings mounted thereabout, said main body further comprising cap engaging means projecting from its outer peripheral surface;
a flanged bush comprising a generally cylindrical portion



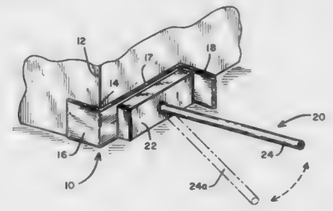
dimensioned to be received intermediate said main body and the end portion of said pipe and to retain said seal rings intermediate said annular step and the flanged bush, said flanged bush further comprising an outwardly extending annular flange dimensioned to abut against the second end of said main body;
a generally cylindrical cap having an end wall portion provided with a central opening dimensioned to permit the pipe to be extended therethrough, and a plurality of resilient arms projecting from said end wall portion, each of said resilient arms having a free end provided with means with which said cap engaging means of said main body is engageable, said end wall portion being engageable with said wall portion of said pipe to hold said pipe in a connected position relative to said main body, said end wall further surrounding at least the flanged bush and the second end of said main body to prevent intrusion of dirt to said joint.

4,730,857
CYLINDRICAL THREADED CONNECTION WITH UNIFORM INTERFERENCE
Brian E. Schwind, Houston, Tex., assignor to The Hydrill Company, Houston, Tex.
Filed Sep. 13, 1985, Ser. No. 775,826
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—390 **12 Claims**



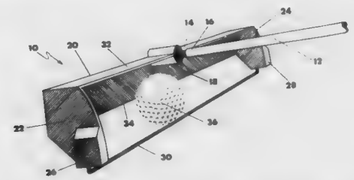
1. A cylindrical threaded connection comprising a pin end and a box end with threads of substantially uniform, taperless radial dimensions within the respective thread sets of said pin end and said box end and provided with free running radial clearance between the threads of said respective thread sets, said connection, having the improvement comprising uniform radial interference in at least one of the threads during the last revolution of at least one of the pin end and box end to provide an interference engagement prior to completed thread makeup as provided by an interfering thread configuration of uniform root-to-crest radial dimension.

4,730,858
CARPET STRETCHER TOOL
Theodore N. Humann, 6353 Wilryan Ave., Edina, Minn. 55435
Filed Jul. 30, 1982, Ser. No. 403,296
Int. Cl.[4] A47G *47/04, 27/04*
U.S. Cl. 294—8.6 **8 Claims**



1. A tool for cooperative use with a carpet stretching machine, comprising
(a) a planar center section having a length greater than its width, and having two opposing flat surfaces encompassing substantially the entire length and width of said center section;
(b) a first end section depending from one end of said center section at approximately a right angle, said first end section having two flat opposing surfaces extending from respective center section flat surfaces to form an unobstructed L-angle extension; and
(c) a second end section depending from a second end of said center section at approximately a right angle, said second end section being oppositely directed from said first end section, and said second end section having two flat opposing surfaces extending from respective center section flat surfaces to form an unobstructed L-angle extension.

4,730,859
GOLF BALL RETRIEVER
Ronald M. Gabinet, 10251 Ruskin Road, Richmond, British Columbia, Canada V7A 2P3
Filed Nov. 7, 1986, Ser. No. 928,851
Int. Cl.[4] A63B *47/02*
U.S. Cl. 294—19.2 **10 Claims**



1. A golf ball retriever for affixation on the end of a handle, said golf ball retriever comprising:
(a) a rigid, elongate member having an upper edge and opposed ends;
(b) means for affixation of said upper edge on the end of said handle, such that said member is centered on the end of said handle with said opposed ends extending perpendicularly to either side of said handle;
(c) first and second rigid side members affixed, respectively, to said opposed ends to project forwardly of said elongate member, beneath and toward said handle when said elongate member is affixed to said handle;
(d) a thin rigid rod extending between the lowermost forward edges of said side members; and,
(e) a cap member disposed between said side members and above said rod to deflect toward said rod golf balls contacted underwater by said rod and deflected upwardly thereby; and wherein said cap member is disposed toward the rear edges of said side members.

4,730,860
MECHANICAL VIBRATING SHOVEL
Edwin Padgett, P.O. Box 400, Lady Lake, Fla. 32659
Filed Jun. 18, 1987, Ser. No. 63,399
Int. Cl.[4] A01B *1/02*
U.S. Cl. 294—49 **3 Claims**



1. A mechanical vibrating shovel, comprising:
a handle;
a blade;
a spring actuated vibrator;
means for mounting said spring actuated vibrator between said handle and said blade; and
said spring actuated vibrator further comprising mechanical means for vibrating said blade when a force is applied to said handle against said blade;
said means for mounting said spring actuated vibrator between said handle and said blade further comprising:
a mounting cylinder affixed to the top of said blade;
said mounting cylinder further comprising a vertical cylinder rising above said blade;
said vertical cylinder having parallel vertical slots;
said handle further comprising a piston slidingly engaged inside said vertical cylinder;
said piston further comprising stopper bolts slidingly engaged inside said parallel vertical slots wherein said stopper bolts limit the travel of said piston inside said vertical cylinder;
said piston further comprising said spring actuated vibrator.

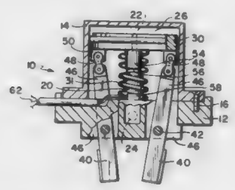
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4,730,861

FINGER GRIPPER WITH STATE INDICATOR

R. Mark Spencer, Waltham, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Continuation of Ser. No. 599,767, Apr. 13, 1984, abandoned. This application Feb. 25, 1987, Ser. No. 20,153
Int. Cl.[4] B66C *3/16;* F15B *13/42*
U.S. Cl. 294—86.4 5 Claims



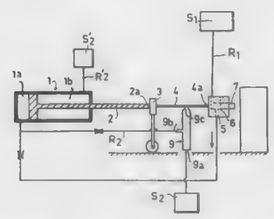
1. In a fingered gripper having a driver for moving gripper fingers toward a defined state, the improvement comprising a Hall-effect sensor having (i) a first element mounted on said driver and movable therewith and including magnet means for generating a magnetic field, and (ii) a second element including a Hall-effect generator mounted on said fingered gripper and responsive to the magnetic field generated by said magnet means to provide an output signal indicative of the strength thereof as determined at said second element, which output signal is, in turn, indicative of the relative positions of said first and second elements and, thereby, of the corresponding state of the gripper fingers.

4,730,862

PNEUMATIC, TACTILE GRIPPER GENERATING A GRIPPING FORCE CONTROLLED BY THE WEIGHT OF THE HANDLED OBJECT

Robert Caen, Cugnaux, and Christian Fonade, Ramonville Saint-Agne, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Jan. 20, 1987, Ser. No. 4,567
Claims priority, application France, May 30, 1985, 85 08694
Int. Cl.[4] B66C *3/16;* B25J *15/00*
U.S. Cl. 294—88 7 Claims



1. A multi-digital gripper to seize and maneuver objects, comprising at least one movable finger (5) driven by a pneumatic jack or actuator (1) of which the two internal chambers (1*a*, 1*b*) are connected by feed lines (R1, R2 and R'2) to at least one supply source (S1, S2, S'2), wherein each movable finger comprises: a flexible blade (4) solidly joined to the movable member (2) of the actuator (1) so that a free portion of said blade can bend in a direction (Δ) perpendicular to its longitudinal axis, a stop member (5) fastened to the free end of the blade (4) and having a contact surface (5*a*) that will come to rest against the object to be seized, proximity sensors (7) for the object to be seized and distribution means (6) for the fluid flow to each chamber (1*a*, 1*b*) of the actuator (1), said distribution means being controlled by the sensors and being designed to:

(a) command a relative pressure difference for the two chambers (1*a*, 1*b*) of the actuator to drive the movable member (2) of the actuator (1) in the absence of contact between the stop member (5) and the object to be seized,

(b) command an approximate re-balancing of the relative pressures of the two actuator chambers in the presence of contact between the stop member (5) and the object to be seized,

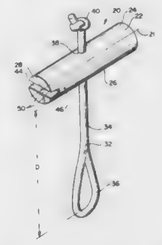
at least one pneumatic potentiometer (9) consisting of a fluid container provided with a feed intake (9*a*) connected to a source (S2) of fluid, of a nozzle provided with a leakage aperture (9c) and a fluid outlet (9*b*) connected to a chamber (1*a*) of the actuator (1), the leakage aperture (9c) of said potentiometer being located opposite the free portion of the flexible blade (4) so as to obtain a pneumatic magnitude directly related to the blade bending at the potentiometer outlet (9*b*).

4,730,863

APPARATUS FOR CARRYING CLOTHING SUSPENDED ON A COAT HANGER

James A. Guadnola, 1272 - 16½ Rd., Fruita, Colo. 81521

Filed Oct. 14, 1986, Ser. No. 919,062
Int. Cl.[4] A45C *13/26;* B65D *69/00*
U.S. Cl. 294—156 9 Claims



1. Apparatus for carrying clothing which is supported on a hanger having a lower clothing suspension portion and an upper hook portion, the apparatus comprising:

a. a handle having a first upper surface, a second lower surface, a hole which extends between said first surface and said second surface, and cord first retaining means;

b. cord means including i) a first portion which is located above said handle first surface, ii) a second portion which extends through said handle hole and which is slidably engaged within said handle hole, said cord first portion having cord second retaining means for preventing withdrawal of said cord means from said handle hole, and iii) a third portion having a looped end portion for receiving the hanger hook portion therethrough; and

c. said carrying apparatus being arranged so as to be able to have two operational modes including

(1) a first mode in which said upper hook portion is inserted through said looped end portion and said handle is grasped by a user in a manner to suspend said hanger and clothing thereon, said looped end portion being disengaged from said hole, and

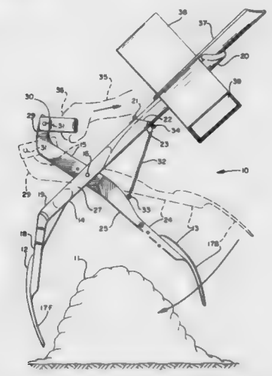
(2) a second mode in which said apparatus is secured to said hanger by i) engagement of said looped end portion within said handle hole so as to tighten said looped end portion about said upper hook portion, and ii) releasable engagement of said cord first portion to said cord first retaining means in a manner to retain said looped end portion in said handle hole.

4,730,864

ARM MOUNTED HAND OPERATED LEAF AND TRASH GRABBER

Tommy G. Sample, 1414 W. Illinois, Dallas, Tex. 75224

Filed Feb. 24, 1987, Ser. No. 17,570
Int. Cl.[4] A01D *7/10*
U.S. Cl. 294—50.9 12 Claims



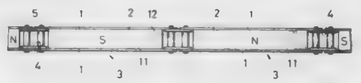
1. An arm mounted hand operated debris gathering tool comprising: a forward gathering head with downward extended tines; a rear gathering head with downward extended tines; first handle means extended upward and to the rear from said forward gathering head; second handle means extended upward from said rear gathering head; pivot interconnect means interconnecting said first handle means and said second handle means for pivotal movement of said forward and rear gathering heads toward and away from each other; said first handle means having a rear portion holding fastening means for mounting of said first handle means and the tool on the arm of a user; and hand hold means on said second handle means positioned to be grasped by the hand of the user's arm fastened to said first handle means for manipulative movement of said forward and rear gathering heads toward and away from each other in grasping and releasing debris.

4,730,865

ASSEMBLY FOR SECURING A WINDSHIELD COVER TO A VEHICLE

Tadashi Iwata, 2472, Oaza Kanogami, Kano-cho, Tsuno-gun, Yamaguchi-ken, Japan

Filed Dec. 30, 1986, Ser. No. 947,815
Int. Cl.[4] B60J *1/02*
U.S. Cl. 296—95 C 3 Claims



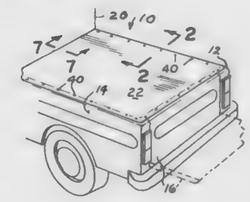
1. Anchor means for detachably securing a windshield cover to a vehicle body, comprising: a plurality of magnetic units each having a magnetic piece of the same size and configuration and each being of rectangular cross-sectional configuration; a pair of side members one extending along each of the sides of one of the magnetic units for supporting the magnetic unit; each of said side members being formed to have a width not greater than the width of said magnetic piece and a predetermined length longer than that of said magnetic piece with both of its ends projecting beyond the ends of the magnetic piece a predetermined distance; each of said magnetic units together with the side pieces associated therewith forming a link; a plurality of connecting members for pivotally interconnecting said links in tandem to form a flexible chain-like means by connecting the ends of each link to the end of an adjacent link, each connecting member being formed to have a width equal to or less than that of said links and a length not exceeding twice the thickness of said magnetic unit, said connecting members being of a length to permit said magnetic units to be folded to lay parallel to and in contatct with an adjacent magnetic unit.

4,730,866

PICKUP BED TONNEAU COVER MOUNTING

James A. Nett, P.O. Box 825, Norman, Okla. 73070

Filed Mar. 20, 1987, Ser. No. 28,357
Int. Cl.[4] B60J *7/10*
U.S. Cl. 296—100 7 Claims



1. A tonneau cover attachment for a pickup truck bed having a front end wall, a tail gate and opposing sidewalls, the sidewalls having a generally horizontal top surface terminating laterally inward in a depending flange transversely not greater than the transverse width of the horizontal top surface, comprising:

a flexible cover having a top and bottom surfaces and having marginal side and end edges adapted to fit over the corresponding side and end limits of a pickup truck bed;

elongated rail means, coextensive with and substantially flatly overlying each sidewall top surface, including web connected parallel vertically spaced horizontal base and top walls and lateral rail sides respectively having coextensive opposing inner and outer laterally open slots;

elongated fulcrum clamp means secured at its upper end portion in depending relation to the rail laterally inward side and having an upwardly open throat loosely receiving the sidewall depending flange, the clamp means having a lateral arm extending outwardly from a lower end portion of the clamp means and abutting the inward surface of the pickup sidewall; and,

means for releasably fastening the cover to the rail outer slot.

4,730,867

VEHICLE ARM REST

Frank M. Cluba, 605 215 Chestnut Oak Cir., Altamonte Springs, Fla. 32701

Filed Sep. 24, 1986, Ser. No. 911,116
Int. Cl.[4] A47B *97/00*
U.S. Cl. 296—153 3 Claims

1. An arm rest for a vehicle, said arm rest comprising:

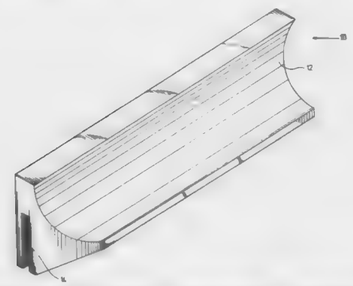
a. body means;

b. groove integrally formed in said body means, said groove being formed along a complete axial length of said body means, said groove being positionable over an edge of a window in said vehicle; and,

c. arm support means attached to said body means, said arm support means being integrally formed in said body

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means, said arm support means having a concave shape, said arm support means extending along a complete axial



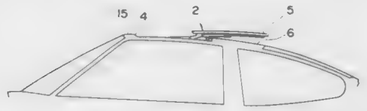
length of said body means, said arm support means being positioned substantially inwardly of said groove.

4,730,868

SLIDING ROOF FOR AUTOMOBILES

Toshiaki Niwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 510,336, Jul. 1, 1983, abandoned. This application Jul. 30, 1986, Ser. No. 890,975
Claims priority, application Japan, Jul. 2, 1982, 57-115271
Int. Cl.[4] B60J *7/047, 7/057*
U.S. Cl. 296—216 **16 Claims**



15. A sliding roof for vehicles of the type in which a slidable panel slides outwardly and rearwardly of a roof opening, comprising:

a panel for closing a roof opening;

a roof frame defining said roof opening;

guide means for guiding said panel slidably in the longitudinal direction of the vehicle body;

said guide means being provided on said roof frame;

an actuator for actuating said panel;

a front stay and a rear stay both slidably supporting said panel through said guide means;

tilt-up means for tilting up said panel at a rear end thereof;

said tilt-up means being provided near a rear end of said roof opening on said roof frame;

an engaging means provided on said panel for engagement with said rear stay;

said front stay being slidably connected to a portion of said guide means;

said rear stay being operatively connected between said guide means and said engaging means; and

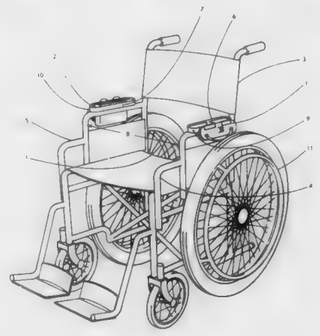
said front stay, said rear stay and said guide means being formed such that, as said front stay approaches said rear stay with said panel caused to move rearwardly of the vehicle body, said front stay is raised from an initial position thereof and an uppermost portion of said front stay supporting said panel is raised relative to an uppermost portion of said rear stay supporting said panel.

4,730,869

WHEELCHAIR ARMREST STORAGE COMPARTMENT

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

Filed Aug. 15, 1986, Ser. No. 896,836
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—194 **14 Claims**



1. Storage compartments acting as a wheelchair armrest comprising:

at least one storage compartment of substantially rigid material extending substantially above the top of a wheelchair armrest frame;

at least one deep storage compartment of substantially rigid material extending substantially below the top of a wheelchair armrest frame;

a cover for said storage compartments;

means on said storage compartments to support said compartment cover in a closed position;

a compartment cover hinge means;

means to hold said compartment cover closed;

means to open said compartment cover;

means to mount one of said storage compartments to a wheelchair armrest frame.

4,730,870

MODULAR VEHICLE CONSTRUCTION AND ASSEMBLY METHOD

Delbert D. DeRees, Romeo, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Mar. 14, 1986, Ser. No. 839,873
Int. Cl.[4] B62D *25/00, 25/20*
U.S. Cl. 296—197 **15 Claims**

1. A modular vehicle construction comprising:

a first module having a chassis frame and a passenger platform;

a second module including a lower dash cowl frame and an upper windshield frame integrally formed with said lower dash panel frame;

a third module including a flooring platform, two first side wall structures secured to opposite sides of said flooring structure, and at least one closure means for selectively enclosing an area above said flooring platform intermediate said side wall structures;

a fourth module having a hood panel, two second side walls and reinforcement means for supporting said second side walls in a fixed position with respect to each other, said hood panel being supported on said second side walls and means for displaceably mounting at least a portion of said fourth module with respect to said first module;

wherein said second, third and fourth modules are supported on said first module;

wherein said chassis frame comprises at least two elongated rails;

wherein said passenger platform comprises an upper panel and a lower panel; and

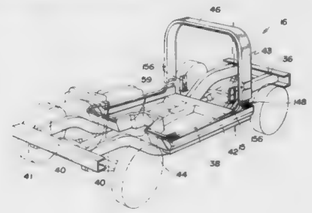
wherein said elongated rails are secured intermediate said upper and lower panels at laterally spaced apart positions and extend longitudinally beyond said passenger platform.

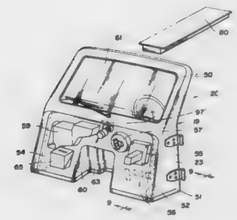
13. A modular vehicle construction comprising:

a first module having a chassis frame and a passenger platform;

a second module including a lower dash cowl frame and an upper windshield frame integrally formed with said lower dash panel frame;

a third module including a flooring platform, two first side wall structures secured to opposite sides of said flooring structure, and at least one closure means for selectively enclosing an area above said flooring platform intermediate said side wall structures;





a fourth module having a hood panel, two second side walls and reinforcement means for supporting said second side walls in a fixed position with respect to each other, said hood panel being supported on said second side walls and means for displaceably mounting at least a portion of said fourth module with respect to said first module;

wherein said second, third and fourth modules are supported on said first module;

wherein said passenger platform comprises stamped sheet panels and a reinforcement beam integrally formed at one end of said platform by shaped panel portions of said stamped panels, and wherein said second module includes a hollow lip extending transversely across a lower front edge of said dash panel frame; and

wherein said lip is configured to matingly engage said reinforcement beam.

4,730,871

ADJUSTABLE BACK REST

Samuel Sheldon, Marblehead, Mass., assignor to Nepsco, Inc., Holliston, Mass.

Filed Aug. 14, 1986, Ser. No. 896,432
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—230 **4 Claims**

1. A back rest comprising

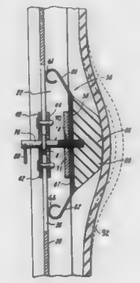
a relatively rigid frame having a front and back, lower end and central portion,

a horizontal base plate secured to the lower end of the frame,

a vertical track secured at its lower end to the base plate and connected to the central portion of the frame,

a guide mounted on and movable up and down on the track, said guide being a vertically elongated member made of spring steel and with at least one of its ends mounted in the track and its central portion being spaced forwardly from the track,

a horizontally extending lumbar support disposed in front of the frame and carried by the central portion of the guide and movable up and down with the guide,



adjusting means carried on the track for moving the central portion of the guide toward and away from the track so as to adjust the distance of the lumbar support from the front of the frame, said adjusting means being connected to the central portion of the guide so as to move that portion and the lumbar support toward and away from the front of the frame,

cushioning means covering the front of the frame and lumbar support,

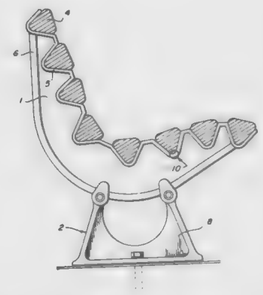
and a cover fabric enclosing the frame, lumbar support, track and guide.

4,730,872

BENCH WITH V-SHAPED SLATS

Siegbert Gölzer, Keplerstrasse 3, 660 Saarbruecken, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 888,005
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1985, 3526106
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—232 **15 Claims**



1. A sitting bench comprising:

two stands having an angled configuration and a plurality of V-shaped support surfaces;

a plurality of seat slats having a triangular cross-section and arranged to have an apex lie within the V-shaped surface

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in said V-shaped support surfaces, to extend between said stands and to define a seating surface;

slat-securing means for fastening said slats to said stands; and

mounting means for fastening said stands to a mounting surface.

4,730,873

SEAT SHELL FOR A MOTOR VEHICLE SEAT

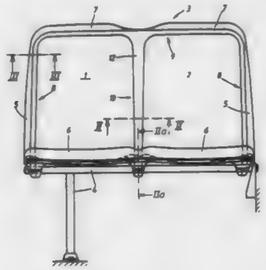
Gerhard Janz, Rohrau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,387

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519941

Int. Cl.⁴ A47C *7/16*; B60N *1/00*

U.S. Cl. 297—457 **15 Claims**



1. A single seat shell for a motor vehicle seat, having an integrally formed outer edge and a first channel portion having an integral channel bottom area and an open top area which runs along at least said outer edge from a front side of the seat up to an upper side of a seat back and which is provided with reinforcing members for accommodating fastening means for supporting the seat shell, with the channel being set back from a rear side of the seat shell, from a seating and seat back surface, and the channel being closed by closure means configured to the surface of the seat shell to define a hollow space wherein:

the single seat shell comprises at least two individual seats connected in one piece to one another, and that

a connecting area between the seating area of two individual seats is formed by two adjacent portions of the seating area having downwardly extending portions defining side walls of a channel portion of the seat shell and having a bottom portion connecting said downwardly extending portions and an open top area, the channel portion being closed by a closure portion means.

and wherein said closed channel portions provide internal rigidity to the single seat shell.

4,730,874

SEAT FOR VEHICLE

Tatsushi Kubota; Mitsuo Inukai, and Kazuyoshi Kato, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Aug. 28, 1986, Ser. No. 901,401

Claims priority, application Japan, Sep. 3, 1985, 60-134760[U]

Int. Cl.⁴ B60R *21/10*

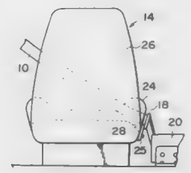
U.S. Cl. 297—464 **3 Claims**

1. A seat for use in a vehicle equipped with an automatic sealbelt system of the type in which an occupant restraining webbing, which is wound up from one end thereof into a webbing retractor disposed in the substantially central portion of the vehicle as viewed in the lateral direction thereof and which is retained at the other end thereof by a door of the vehicle, is automatically fastened to and unfastened from the body of an occupant in response to the operation of closing and opening said door, and which includes a belt guide for slidably guiding an intermediate portion of the webbing, wherein said belt guide is connected to a plate which is rigidly affixed to side of the vehicle seat, comprising:

(a) a seat cushion having an upper surface for supporting the buttocks of an occupant of the vehicle;

(b) a seat back for supporting the back of the occupant;

(c) a pivotal connection between said belt guide and said plate that is located at substantially the same height as the upper surface of the seat cushion, and



(d) a webbing passage provided in said seat cushion for preventing the webbing from rubbing against the seat cushion when the occupant extends and retracts the webbing incident to fastening and unfastening the webbing, said passage being formed by a recessed portion provided along part of the width of the seat cushion which extends below the upper surface of the seat cushion to the side surface thereof adjacent to said belt guide, said recessed portion being dimensioned so that said webbing will not contact the surface of the recessed portion even when said webbing is twisted in the vicinity of the belt guide.

4,730,875

WEBBING GUIDE FOR USE WITH SEAT BELT APPARATUS

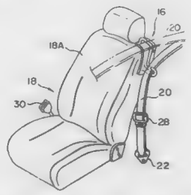
Noritada Yoshitsugu, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 17, 1987, Ser. No. 75,068

Claims priority, application Japan, Jul. 22, 1986, 61-112565[U]

Int. Cl.⁴ A62B *35/00*

U.S. Cl. 297—468 **19 Claims**



1. A webbing guide for use with a seat belt apparatus having a length of webbing which consists of continuous shoulder and lap webbing portions and has an end portion adapted to be wound onto a reel device, said webbing guide being disposed on and at the side of a seat back of a seat on which a passenger in a vehicle may sit and having a guide hole opening in the fore-and-aft direction of said vehicle for passage therethrough of said shoulder webbing portion; wherein said guide hole is in the form of a slot and comprises a first slot portion extending substantially vertically, a second slot portion which is continuous with the upper part of said first slot portion and extends in the widthwise inner direction of said seat back, and a third slot portion which is continuous with the lower part of said first slot portion and extends substantially horizontally in the widthwise outer direction of said seat back.

4,730,876

APPARATUS FOR MANUFACTURING A BRUSH SEAL

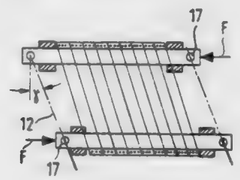
Klemens Werner, Munich; Horst Berger, Lochham; Herbert Merz, Munich, and Thomas Schunn, Emmering, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,189

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527499; Feb. 27, 1986, 3606284

Int. Cl.⁴ A46D *1/08*

U.S. Cl. 300—2 **4 Claims**



1. Apparatus for making a brush seal comprising a wrapping frame on which filamentary material can be wrapped to form a filament package of substantially oval section, said frame being a hinged parallelogram frame including two parallel base beams displaceable parallel to one another and cross beams coupled to said base beams to permit relative parallel displacement thereof, and means for rotating said frame about an axis to wrap material around said base beams to form said package, the wrapped material of said package being capable of being cut between said base beams to form two opposed brushes, said parallelogram frame further including means for controlling the relative displacement of the base beams parallel to one another including a pair of cam disks on each base beam, the disks on one beam resting on the disks of the other beam, said cam disks having cam surfaces which ride on one another when the base beams are displaced relative to one another and which are shaped so that the length of winding of a filament remains the same during relative displacement of the base beams.

4,730,877

BRAKE SYSTEM WITH HYDRAULIC BRAKE FORCE BOOSTING AND PEDAL TRAVEL SIMULATOR

Wolfram Seibert, Pfungstadt; Norbert Ocvirk, Offenbach am Main, and Juergen Schonlau, Niedernhausen, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

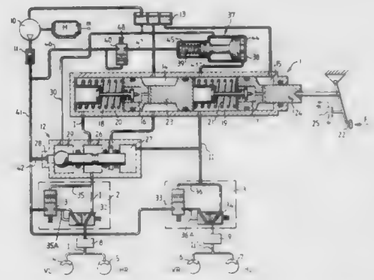
Filed Jul. 10, 1986, Ser. No. 884,194

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526556

Int. Cl.⁴ B60T *13/12, 15/06, 8/44*

U.S. Cl. 303—52 **6 Claims**

1. A dynamic brake system comprising a pedal operated brake pressure generator connected to fluid conduits for providing brake pressure to the wheel brakes of an automotive vehicle, an auxiliary pressure supply system including pump means and control valve means for providing auxiliary fluid pressure proportional to the force operating the pedal operated brake pressure generator, valve means in said fluid conduits, said valve means having a first position for connecting the pedal operated brake pressure generator to the wheel brakes and a second position for connecting the auxiliary pressure supply system to the wheel brakes and for disconnecting the pedal operated brake pressure generator therefrom, and a pedal travel simulator for permitting pedal travel proportional to force operating the pedal operated brake pressure generator, the pedal travel simulator comprising a piston and a cylinder, said cylinder being connected to a pressure chamber in the pedal-operated brake pressure generator so that pressure in the pressure chamber acts on one side of said piston and is proportional to the force operating the pedal operated brake pressure generator, said cylinder also being connected to the auxiliary



pressure supply system so that auxiliary fluid pressure acts on the other side of said piston, and a restoring spring in said cylinder acting or the other side of said piston whereby said piston is displaceable by pressure in the brake pressure generator against the force of the restoring spring and the auxiliary fluid pressure.

4,730,878

SKID-CONTROLLED HYDRAULIC BRAKE SYSTEM

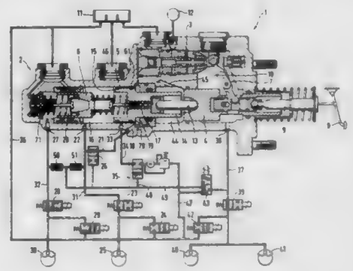
Hans D. Reinartz, Frankfurt am Main, and Helmut Steffes, Eschborn, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,833

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531437

Int. Cl.⁴ B60T *8/32, 8/44, 8/48, 13/12*

U.S. Cl. 303—114 **4 Claims**



1. A hydraulic skid-controlled brake system for use with motor vehicles comprising a master cylinder (**2**) having a master cylinder piston and being pressurizable by a hydraulic force booster (**1**) having a booster piston, wherein valve means (**24, 29, 42** and **23, 28, 39** and **43**, respectively) are provided between the master cylinder (**2**) and the wheel brakes (**25, 30, 40, 41**) connected to the master cylinder through which pressure fluid is discharged from the wheel brakes (**25, 30, 40, 41**), with pressure fluid discharged from the wheel brakes being reloadable from the pressure chamber (**10**) of the hydraulic force booster (**1**) and wherein, during slip control, the stroke of the brake pedal (**8**) is limited, wherein an annular chamber (**19**) is disposed between the booster piston (**4**) and the master cylinder piston (**5**) which annular chamber is traversed by a

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small step (14) facing the booster piston (4) of the master cylinder (5) formed as a stepped piston, and in which annular chamber a large step of the master cylinder piston (5) is sealingly guided, with the annular chamber (19) being in communication, by way of a pressure fluid conduit (18, 21, 22) in which a valve (26) is provided with a working chamber (16) of the master cylinder (2), and with the cylinder wall of the annular chamber (19) being provided with a connector (33) which, upon movement of the master cylinder piston (5) in the actuating direction is opened by the latter, and which is in communication with the intake reservoir (11) by way of a pressure fluid conduit (34, 47, 36) in which a blockable current control valve (35) is provided, the valve (26) provided in the pressure fluid conduit (18, 21, 22) leading from the annular chamber (19) to the working chamber (16) of the master cylinder (2) is a 2-way/2-position valve which is controlled by the pressure in a main conduit (49) connected to a main valve (43), with said 2-way/2-position valve (26) taking its blocking position when, during the skid control, the main valve (43) opens a passage for the controlled pressure from the pressure chamber (10) of the hydraulic force booster (1) to the main conduit (49), the current control valve (35) comprises a blocking piston (57) which is supported by a control piston (63) to which the controlled pressure of the force booster (1) is applied and which, during the skid control, takes its opening position thereby permitting the passage of the pressure fluid through an aperture (59) of the current control valve (35).

4,730,879

ANTI-SKID APPARATUS FOR AUTOMOTIVE VEHICLE

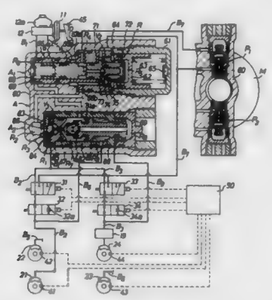
Yoshiharu Adachi, Gamagori; Masamoto Ando; Hiroaki Takeuchi, both of Toyota; Noboru Noguchi, and Nobuyasu Nakanishi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 17, 1987, Ser. No. 15,322

Claims priority, application Japan, Feb. 14, 1986, 61-031224; Feb. 17, 1986, 61-032110

Int. Cl.[4] B60T *8/36, 8/88, 13/16*

U.S. Cl. 303—116 **6 Claims**



1. An anti-skid apparatus for installation in a vehicle braking system including a braking circuit connecting a master cylinder to a wheel brake cylinder, comprising:

a bypass circuit connected in parallel with an intermediate portion of said braking circuit;

a fluid reservoir connected to said bypass circuit to store an amount of hydraulic fluid;

a hydraulic power pressure source disposed within said bypass circuit and connected to said fluid reservoir to produce a hydraulic power pressure higher than a braking pressure applied to said wheel brake cylinder from said master cylinder;

first switchover valve means disposed within said braking circuit and said bypass circuit to be activated when a road wheel tends to be locked in braking operation, said first switchover valve means being arranged to permit the flow of fluid under pressure supplied to said wheel brake cylinder through said braking circuit in its deactivated condition and to interrupt said braking circuit and connect said wheel brake cylinder to said fluid reservoir through said bypass circuit in its activated condition; and

second switchover valve means disposed within said braking circuit between said master cylinder and said first switchover valve means and being connected to said power pressure source through said bypass circuit to permit the flow of fluid under pressure supplied to said wheel brake cylinder through said braking circuit while said first switchover valve means is maintained in its deactivated condition and to interrupt said braking circuit and permit the flow of fluid under pressure supplied to said wheel brake cylinder from said power pressure source in response to a decrease of the pressure in said wheel brake cylinder caused by activation of said first switchover valve means;

wherein a regulator valve is disposed within said bypass circuit between said power pressure source and said second switchover valve means to control the hydraulic power pressure in dependence upon the braking pressure created in said master cylinder in braking operation, and a relief valve is disposed within said bypass circuit between said power pressure source and said second switchover valve means and associated with said fluid reservoir to discharge the fluid under pressure from said power pressure source into said fluid reservoir when the hydraulic power pressure exceeds a predetermined value.

4,730,880

EQUIPMENT STAND, PARTICULARLY FOR DENTAL IMPLEMENTS

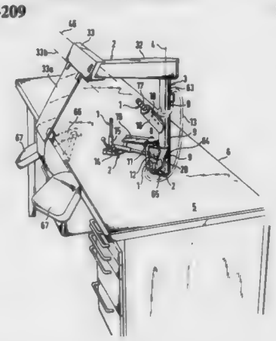
Helmut Schmidt; Anton Bodenmiller, both of Leutkirch, and Alfred Straka, Isny, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,883

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339656

Int. Cl.[4] A47B *81/00*

U.S. Cl. 312—209 **34 Claims**



1. In an equipment stand located above a table top of a work table, particularly for dental implements; including support means mounting holders for the implements arranged on said support means for receiving said implements during the nonuse thereof, the improvement comprising in that said support means mounting said implement holders is a vertically extending column comprising a hollow cylindrical support stand which is mounted to said table top to be rotatable about its longitudinal axis but to be otherwise fixedly mounted thereto, said implement holders being superimposed vertically above each other on said hollow cylindrical support stand by individual bearing rings supported thereon such that each implement holder is individually rotatable about said hollow cylindrical support stand which is mounted to said table top, and wherein at least one of the implement holders arranged at the upper end of said column support means comprises a cantilever retainer element for an illuminating member arranged at the free end of the cantilever retainer element, said illuminating member being pivotable about an axis of the retainer element extending transverse to the longitudinal extent of the retainer element to define different pivoted latching positions and being fixed through a latching means in the different pivoted latching positions, said latching means having a movable latching member engaging cooperating latching portions of the retainer element to define the different pivoted latching positions.

4,730,881

MONITOR DISPLAY UNIT

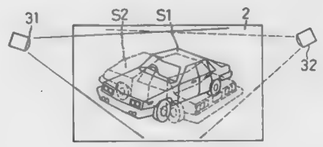
Masahiro Taguchi, Hazu; Satosi Kuwakado, and Kuniaki Nakamura, both of Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 6, 1986, Ser. No. 927,591

Claims priority, application Japan, Nov. 18, 1985, 60-258391

Int. Cl.[4] G03H *1/02*

U.S. Cl. 350—3.77 **6 Claims**



1. A monitor display unit comprising:

a hologram dry plate having multiply recorded light interference fringes of a plurality of three-dimensional images which indicate the arrangement of equipments to be monitored;

image reproduction light illuminating means, each being directed toward said hologram dry plate at a different angle from each other for illuminating reproduction light toward said hologram dry plate thereby to reproduce one of said three-dimensional images on said hologram dry plate;

light emitting means, each being provided in a position corresponding to each of said equipments on said three-dimensional images reproduced by said image reproduction light illuminating means; and

control means for operating said image reproduction light illuminating means to reproduce a desired one of said three-dimensional images, which indicates the arrangement of equipments to be monitored and for lighting said light emitting means corresponding to the eqiupments to be monitored.

4,730,882

MULTIPLE INTERNAL REFLECTANCE SPECTROSCOPY SYSTEM

Robert G. Messerschmidt, Westport, Conn., assignor to Spectra-Tech, Inc., Stamford, Conn.

Filed Feb. 10, 1986, Ser. No. 827,367

Int. Cl.[4] G02B *6/00;* **G01J** *3/00*

U.S. Cl. 350—96.1 **11 Claims**

1. An internal reflectance spectroscopy system, especially for the spectroscopic analysis of a surface, wherein radiant energy undergoes internal reflection at a constant angle of incidence and reflection in an internal reflectance crystal, comprising:

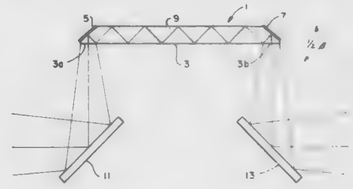
a first side;

a second side;

a first beveled edge oriented at an acute angle with respect to said first side;

a second beveled edge on said crystal being oriented at an acute angle to said first side;

first radiation transfer means for condensing a beam of the radiant energy into the crystal to form an optical path extending directly through said first side to said first beveled edge, from said beveled edge directly back to said first side, from said first side directly to said second side,



from said second side directly to said first side, from said first side directly to said second beveled edge, and from said second beveled edge directly through said first side, said first radiation transfer means defining an entrance for the radiant energy; and

second radiation transfer means for receiving a diverging beam of the radiant energy that is reflected from said second beveled edge through said first side of the crystal, said second radiation transfer means defining an exit for the radiant energy.

4,730,883

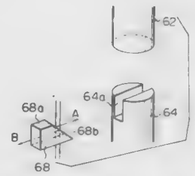
PHOTORADIATOR INCLUDING LIGHT CONTROL DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 555,866, Nov. 28, 1983. This application Jul. 16, 1986, Ser. No. 886,864

Int. Cl.[4] G02B *6/00, 7/18;* **F21V** *7/04*

U.S. Cl. 350—96.10 **16 Claims**



1. A photoradiator for radiating solar light propagating therethrough in a desired direction and a desired quantity to the ambiance comprising a first and a second cylindrical light conducting means each having a longitudinal axis and each having an outer cylindrical wall, said first cylindrical light conducting means having a first longitudinal end section with a first flat end wall, said second cylindrical light conducting means having a second longitudinal end section, said second longitudinal end section having a transverse recess, and a transparent control member removably disposed in said recess for controlling the quantity of light radiating to the ambiance by controlling the position of the control member in said recess, said control member having a flat surface and an inclined surface, said first and second end sections being diposed in axial alignment, solar light being propagated through said first cylindrical light conducting means and transmitted to said second cylindrical light conducting means via said flat surface on said control member while the rest of the solar light being propagated is partly reflected laterally outwardly to the ambi-

VOL 1088 ISS 3 MR 15 1988 UMI

ance by said inclined surface and partly transmitted through said inclined surface into said second cylindrical light conducting means.

4,730,884

BIPOLAR VOLTAGE CONTROLLED OPTICAL SWITCH USING INTERSECTING WAVEGUIDES

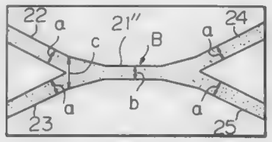
Minoru Seino, Atsugi; Hirochika Nakajima, Kawasaki; Ippei Sawaki, Sagamihara, and Hidehiro Mishiro, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 535,985, Sep. 26, 1983. This application Jul. 29, 1986, Ser. No. 890,974

Claims priority, application Japan, Sep. 30, 1982, 57-171218; Nov. 19, 1982, 57-203067; Dec. 28, 1982, 57-230096

Int. Cl.⁴ G02B *6/10*

U.S. Cl. 350—96.14 **15 Claims**



1. A bipolar 2×2 type optical switch for single mode light comprising:

an electro-optic crystal substrate;

a central waveguide positioned in said substrate, having a center, two ends and a width that is greater at said ends than at said center;

a pair of input waveguides positioned in said substrate, connected to said central waveguide at one of said two ends, and having an intersecting angle of less than 2°;

a pair of output waveguides positioned in said substrate, connected to said central waveguide at the other of said two ends so as to be symmetrical with said pair of input waveguides about said central waveguide, and having an intersecting angle of less than 2°;

a refractive-index-changed region positioned in said central waveguide and having a narrower width than said width of said central waveguide, and being formed symmetrically with respect to the center of said central waveguide; and

a means for introducing a change in the refractive index of the refractive-index-changed region.

4,730,885

LASER FIBER CONNECTOR

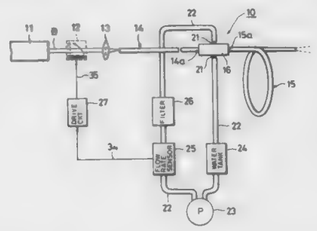
Yuzuru Doi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,341

Claims priority, application Japan, Jul. 11, 1985, 60-152778

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **2 Claims**



1. A laser fiber connector (**10**) for optically connecting optical fibers (**14**, **15**) to transmit laser light from a power laser light source (**11**) operably coupled to one of the optical fibers to the other optical fiber, the connector comprising:

(a) a hollow connecting housing (**17**) for securing both optical fibers;

(b) means (**18**, **19**, **20**) for sealably positioning end faces (**14***a*, **15***a*) of the optical fibers in a closely proximate and axially aligned relationship within said housing;

(c) liquid circulating means (**22**, **23**, **24**, **26**) defining a predetermined path of liquid flow for circulating a light-transmissible cooling liquid through said housing and transversely across said end faces of the optical fibers;

(d) a flow rate sensor (**25**) disposed in the liquid flow path;

(e) a normally closed shutter mechanism (**12**) interposed between the laser light source and the optical fiber receiving the light source, and

(f) drive means (**27**) for opening the shutter mechanism in response to a signal from said flow rate sensor indicating that the liquid flow rate through the liquid circulating means is above a predetermined value.

4,730,886

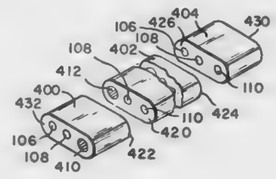
FIBER LASER SENSOR

John W. Hicks, 312 Howard St., Northboro, Mass. 01532

Filed Aug. 6, 1985, Ser. No. 763,126

Int. Cl.⁴ G02B *6/26;* **H01S** *3/30*

U.S. Cl. 350—96.15 **49 Claims**



14. A fiber laser sensor for sensing the magnitude of a variable, said sensor comprising,

a first fiber laser oscillator,

a second fiber laser oscillator, said fiber oscillators being spatially arranged parallel to each other,

an optical fiber optically coupled to said first oscillator and to said second oscillator to allow energy transfer between said first oscillator and said fiber and between said second oscillator and said fiber, said fiber constituting a loss element for all net energy transferred to said fiber from energy transfers between said fiber and said first and second oscillators, said coupling causing said oscillators to oscillate at one of a plurality of a common frequencies,

means for making the optical path length of one said oscillators longer than the optical path length of the other of said oscillators so that both of said oscillators have sufficient gain to sustain oscillation at only one of said plurality of common frequencies, and

means for changing the optical path length of at least one of said oscillators in accordance with the magnitude of said variable.

4,730,887

FIBER OPTIC COUPLING DEVICE AND METHOD OF CONSTRUCTING SUCH A DEVICE

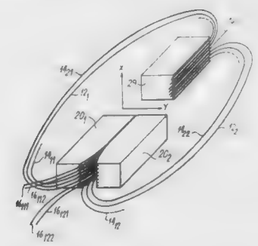
Daniel Boscher, Perros Guirec; Jean-Michel Landouar, and Marie Morin, both of Lannion, all of France, assignors to Etat Francais represente par le Ministre des PTT (Centre National d'Etudes des Telecommunications), France

Filed Jan. 21, 1986, Ser. No. 820,616

Claims priority, application France, Jan. 22, 1985, 85 00855

Int. Cl.⁴ G02B *6/28*

U.S. Cl. 350—96.16 **8 Claims**



1. A fiber optic coupler for coupling 2^n inputs and one output, n being an integer greater than zero, comprising:

two separate halves of a same solid part formed with 2^n-1 identical convex grooves parallel to a midplane of said part which is orthogonal to a fractioning plane along which said part was separated into said two halves;

a plurality of optical fiber lengths each located in one of said grooves, said halves and fiber lengths being cut along a plane transverse to said midplane and to said fractioning plane at a depth selected for eliminating substantially half of the cross-section of said fiber lengths in said midplane and for forming respective planar abutment surfaces on said halves; and

an auxiliary part formed with 2^n-1 grooves having the same distribution as the 2^n-1 grooves in said halves.

said two halves being in mutual contact through their respective abutment surfaces and end portions of said fiber lengths being located in said grooves of said auxiliary part which is retained in abutment against said fractioning plane of said halves, at such a location that there is coupling between each of said end portions and the end surfaces of two respective ones of said fiber lengths, whereby 2^n-1 elementary 2-to-1 couplings are achieved.

4,730,888

OPTIMIZED GUIDED WAVE COMMUNICATION SYSTEM

Thomas E. Darcie, Hazlet, and Matthew S. Whalen, Rumson, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 20, 1986, Ser. No. 831,461

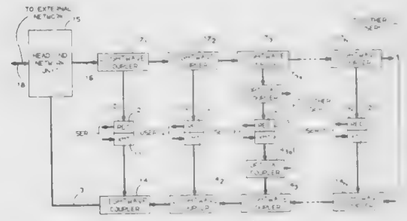
Int. Cl.⁴ G02B *6/28;* **H04B** *9/00*

U.S. Cl. 350—96.16 **9 Claims**

1. A guided wave communication system or network associated with a plurality of users, the system or network comprising:

a guiding means (**16**) including a first end for propagating signal waves introduced into the first end thereof; and

a plurality of directional couplers (**17**) disposed in a spaced apart relationship along the guiding means, each coupler (a) being separately associated with at least one user of the system or network, and (b) being arranged with a separate coupling coefficient for coupling out from the signal power arriving at the coupler in the guiding means only a minimal signal power level which is necessary to provide



a signal with a predetermined bit error rate to the at least one user.

4,730,889

PLUG CONNECTOR FOR A LIGHT CONDUCTOR UTILIZING TWO-POINT CONTACT

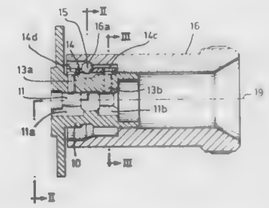
Hans D. Becker, deceased, late of Königsbronn; Christa Becker, heir, Heidenheim, and Volkmar Binder, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,417

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 8535264

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **7 Claims**



1. A plug connector for a light conductor having a longitudinal axis, the plug connector comprising:

a plug pin having a longitudinal pin axis connected to the end of the light conductor so as to be coaxial therewith;

a plug housing having a receiving bore formed therein for receiving said plug pin therein said bore defining a longitudinal axis; and,

fixing means for fixing said plug pin in position in said receiving bore, said fixing means including:

two longitudinal grooves formed in the wall of said receiving bore so as to be disposed one behind the other in the direction of said axis and spaced a predetermined distance from each other;

two press pieces movably mounted in said housing so as to lie opposite the approximate centers of corresponding ones of said longitudinal grooves, said two press pieces having respective end faces facing away from said grooves;

a latching member mounted on said housing so as to be movable between first and second positions in the direction of said pin axis, said latching member and said housing conjointly defining a space at the region of said press pieces;

an intermediate piece movably mounted in said space between said housing and said latching member so as to be movable toward and away from said end faces of said press piecess; and,

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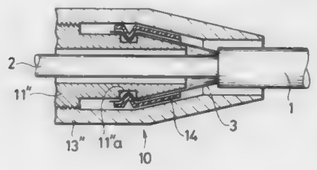
abutment means for imparting a force to said intermediate piece when said latching member is moved into said second position so as to cause said intermediate piece to engage and press both of said press pieces directly against said plug pin thereby clamping the latter against respective ones of said grooves to fix said plug pin in position in said receiving bore.

4,730,890

PLUG SET FOR OPTICAL CONNECTOR FOR OPTICAL FIBER CABLES

Noritake Kashimura, Ohmiya, and Hiroaki Saitoh, Kawaguchi, both of Japan, assignors to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Filed Nov. 23, 1982, Ser. No. 443,886
Claims priority, application Japan, Nov. 27, 1981, 56-189301
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **4 Claims**



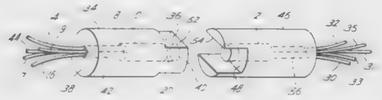
1. A plug set for optical connection for optical fiber cables comprising a bushing having a bore for receiving an inner shield member of an optical fiber cable and having an end portion with a tapered outer surface formed so that said tapered outer surface becomes smaller in diameter toward said end portion thereof, a thermo-shrinkable tube means for attachment to a portion of the outer surface of said bushing including said tapered outer surface with reinforcing fibers of said optical fiber cable being placed around at least a portion of said outer surface of said bushing including said tapered outer surface so that said reinforcing fibers are covered with said thermo-shrinkable tube, and a tightening nut to be screwed onto said bushing in order to tighten and fix said reinforcing fibers to said bushing with said thermo-shrinkable tube attached therebetween, said plug set for optical connector for optical fiber cables being arranged to fix said reinforcing fibers to said bushing by heating said thermo-shrinkable tube after attaching said thermo-shrinkable tube to said bushing, said tightening nut having an interior surface which is tapered and is positionable next to said tapered outer surface of said bushing.

4,730,891

MULTIPLE-CHANNEL OPTICAL FIBER CONNECTOR ASSEMBLY

Thomas J. Poorman, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 14, 1986, Ser. No. 839,728
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **4 Claims**



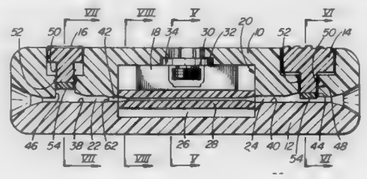
1. A multi-channel optical-fiber connector assembly, comprising:
a first connector half;
said first connector half including an elongated body having front and back surfaces, a circular recess extending longitudinally from said front surface partially through said elongated body, a polygonal passageway, having internal corners, extending from said back surface to communicate with said circular recess in axial alignment therewith;
a common transfer lens having inner and outer surfaces, mounted in said circular recess, said outer surface being set back from the front surface of said elongated body;
a plurality of optical fibers, having terminal ends, mounted in said polygonal passageway, the terminal ends abutting said inner surface of said common transfer lens;
means for wedging said optical fibers into the vee-grooves formed by the corners of said polygonal passageway;
a second connector half, optically configured as a mirror image of said first connector half; and
means for mating said first and second connector halves so as to axially align said connector halves and to allow a small separation between the outer surfaces of the common transfer lenses that are secured in the respective connector halves.

4,730,892

OPTICAL FIBER MECHANICAL SPLICE

John C. Anderson, Ottawa; Frederick D. King, Richmond, and John C. Goodwin, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 17, 1986, Ser. No. 840,102
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.21 **13 Claims**



1. A device for holding a pair of fibers in axial alignment, comprising:
a resiliently compressible cylindrical tubular member having an opening of circular cross-section extending axially therethrough for slidably receiving and axially aligning ends of a pair of fibers;
a base member having an axially extending V-groove for receiving the tubular member; and
means for urging the tubular member in a transverse direction into the V-groove to compress the tubular member onto the fiber ends.

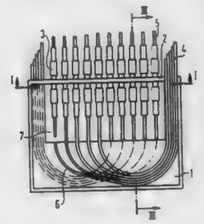
4,730,893

SUPPORT ASSEMBLY FOR LIGHT WAVEGUIDE COUPLINGS

Klaus-Dieter Burmeister, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 5, 1986, Ser. No. 871,202
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526843; Jul. 26, 1985, 3526854; Jul. 26, 1985, 3526853
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.22 **3 Claims**

1. A flat panel-shaped support assembly for couplings of light waveguides, into which assembly incoming and outgoing light waveguides are hung in loops and connected arranged in rows parallel to the plane of the support assembly, said incoming light waveguides are branched into two separate bundles which are separately guided on the support assembly such that one of said bundles is connected to a semi-row of couplings and the other of said bundles is connected to the other semi-row of couplings, whereby the light wavegides of the two bundles are guided to the couplings from different sides of the support assembly, and such that the two bundles are guided along opposite plate-like longitudinal sides of the support assembly and semi-circularly extend to a respectively opposite semi-row



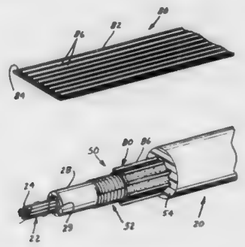
of couplings in a mirror-inverted fashion and cross one another, and further wherein the support assembly includes a large-area opening in the central region between the opposite sides through which opening the conductors of at least one of said bundles are led to a respective semi-row of couplings.

4,730,894

OPTICAL FIBER CABLE HAVING A PREFABRICATED STRENGTH SYSTEM AND METHODS OF MAKING

Candido J. Arroyo, Gwinnett County, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 27, 1986, Ser. No. 845,105
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **29 Claims**



1. An optical fiber cable, which includes:
a core which comprises at least one optical fiber;
a strength member system which is disposed about said core and which includes a carrier tape that encloses said core and a plurality of longitudinally extending strength members spaced about the periphery of the core in a predetermined relationship to one another, said strength member system having sufficient resistance to tensile and compressive forces to prevent damage to the at least one optical fiber; and
a jacket which is made of a plastic material and which encloses said strength member system, said tape being effective to hold said strength members in the predetermined relationship to one another while said jacket is being caused to enclose said strength member system.

4,730,895

FIBER OPTIC LINE GENERATOR SUITABLE FOR USE WITH INCANDESCENT LIGHT SOURCE

Melvin P. Siedband, Madison, Wis., and Charles Lescrenier, 660 Crescent Ct., Wauwatosa, Wis. 53213, assignors to Charles Lescrenier, Wauwatosa, Wis.

Filed Aug. 30, 1982, Ser. No. 413,056
Int. Cl.⁴ G02B *6/04*
U.S. Cl. 350—96.24 **17 Claims**



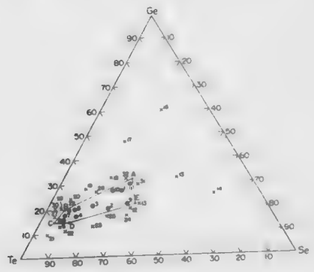
1. Apparatus for providing a line of light indicative of a property of an X-ray beam on an object comprising:
an incandescent light source means providing a stationary beam of light;
condensing lens means for focusing the light; and
optical fiber means comprising an elongated solid bundle of aligned optical fibers having a first end light transmissively coupled to said light source means for receiving the focused light from said lens means, said first end of said optical fiber means having a diameter not greater than the image of said light source applied to said optical fiber means, said bundle of aligned optical fibers having a second end flattened to a width of at least one optical fiber for providing a plane of light forming the line of light indicative of the property of the X-ray beam when applied to the object.

4,730,896

MEMBER FOR INFRARED RAY TRANSMISSION

Toshio Katsuyama, Hachioji, and Hiroyoshi Matsumura, Saitama, both of Japan, assignors to Hitachi, Ltd. and Hitachi Cable Ltd., both of, Japan

Filed Nov. 20, 1985, Ser. No. 799,974
Claims priority, application Japan, Nov. 21, 1984, 59-244501
Int. Cl.⁴ G02B *6/00*; C03C *13/04*; F21V *9/04*
U.S. Cl. 350—96.34 **4 Claims**



1. A member for transmitting infrared rays, which comprises a Ge-Se-Te ternary chalcogenide glass having a composition which in a compositional diagram of the ternary chalcogenide glass shown in FIG. 1 falls within a region bounded by the respective straight lines connecting points A, B, C, D, E and A in this order, which points A, B, C, D, and E indicate Ge:Se:Te molar proportions of 32:25:43, 20:6:74, 15:5:80, 15:10:75, and 22:31:47, respectively.

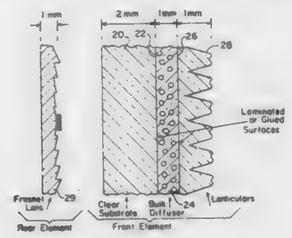
VOL 1088 ISS 3 MR 15 1988 UMI

4,730,897

PROJECTION SCREEN HAVING HIGH RESOLUTION AND GOOD MECHANICAL STABILITY

Thomas S. McKechnie, Ossining, and Jill F. Goldenberg, Pelham Manor, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 21, 1987, Ser. No. 40,969
Int. Cl.[4] G03B *21/60*
U.S. Cl. 350—128 21 Claims



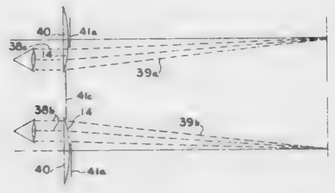
1. Projection screen comprising:
a mechanically stable front element having a predetermined thickness in a first predetermined direction and comprising a plurality of lenticules, bulk diffuser particles disposed within a first predetermined distance of said lenticules in said first predetermined direction, and a clear substrate for maintaining mechanical stability of said screen and having a substrate thickness substantially exceeding said predetermined distance, in mechanical contact with said lenticules; and
a rear element in mechanical contact with at least part of said clear substrate, said rear element having a lens structure thereon.

4,730,898

STEREOSCOPIC VIEWER OF THE LORGNETTE TYPE

James J. Curtin, Clearwater, Fla., assignor to RCI Group, Inc., Clearwater, Fla.

Filed Oct. 31, 1986, Ser. No. 925,550
Int. Cl.[4] G02B *27/22*
U.S. Cl. 350—133 5 Claims



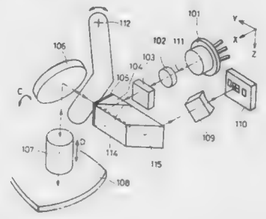
1. A stereoscopic viewing device, comprising:
a planar in configuration base member;
a pair of laterally spaced lens members positioned in said base member;
positioning means to position said base member and hence said lens members a predetermined proper distance from the eyes of a viewer using said device;
said positioning means provided in the form of a planar in configuration bridge member hingedly mounted to said base member;
said bridge member having an operative position and a stored position, said hinged mounting thereof being operative to allow said bridge member to be positioned in either of said positions;
said bridge member positioned normal to said base member when in its operative position;
said bridge member positioned parallel to said base member when in its stored position;
and said bridge member having a predetermined dimension so that when in its operative position normal to said base member, it maintains the eyes of a viewer using said device at a proper distance from said lens members.

4,730,899

OPTICAL SIGNAL READING DEVICE

Kenjiro Kime; Kazuo Okada, and Mitsushige Kondou, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 539,056
Claims priority, application Japan, Oct. 14, 1982, 57-181854
Int. Cl.[4] G02B *27/14;* G01J *1/20;* G11B *7/00*
U.S. Cl. 350—173 19 Claims



1. An optical signal reading device comprising a light source,
an objective slidable in the direction of the optical axis which is at right angles to a disc surface of a disc-like record carrier, said objective serving to focus the light emitted from said light source on the disc surface as a spot of light, the reflected light from the disc surface falling on said objective,
a light detector receiving the light reflected from said disc surface via said objective, and
a beam splitter composed of a single optical part disposed between said light source, light detector, and objective, said splitter having a pair of reflecting surfaces disposed approximately parallel to each other to ensure that the incident light from said light source and the reflected light guided to said light detector are generally parallel and opposite to each other.

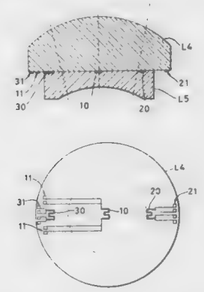
4,730,900

PROJECTION OPTICAL APPARATUS

Makoto Uehara, Tokyo; Hideo Mizutani; Kiyoyuki Muramatsu, both of Yokohama; Takeshi Asami, Kawasaki, and Akikazu Tanimoto, Yokohama, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,085
Claims priority, application Japan, Feb. 3, 1984, 59-18887
Int. Cl.[4] G02B *7/02, 27/52;* G01J *5/00*
U.S. Cl. 350—253 19 Claims

10. An optical imaging apparatus for forming on a substrate an image of an object, comprising:
means for holding said object;
means for holding said substrate;
means for supplying a light beam to illuminate said object;
a projection optical system provided between said object and said substrate and having an optical axis and optical elements arranged on said optical axis, wherein said projection optical system receives light from the illuminated object and forms an image therefrom on the substrate, and wherein the optical performance of said projection optical system varies as a function of the manner in which the received light heats said projection optical system;
a plurality of thermometer elements provided on a surface of one of said optical elements at different distances from said optical axis and producing a plurality of corresponding outputs; and



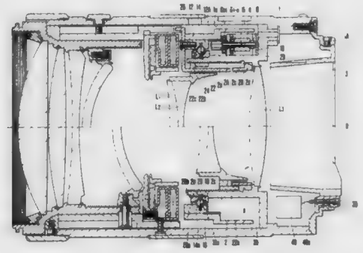
means for detecting the temperature distribution of said one optical element in a direction radial to said optical axis in response to said plurality of outputs of said thermometer elements to determine the variation of said optical performance of said projection optical system in response to the detected temperature distribution.

4,730,901

LENS BARREL WITH INTERNAL MOTOR FOCUSING

Ryuji Suzuki; Masao Aoyagi, both of Kanagawa; Shigeru Kamata, Tokyo; Keiichi Yasuda, Tokyo, and Hiroshi Furukawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,896
Claims priority, application Japan, Jan. 10, 1986, 61-001909[U]; Dec. 9, 1986, 61-189646[U]
Int. Cl.[4] G02B *7/04*
U.S. Cl. 350—255 14 Claims



1. A lens barrel comprising:
a stationary tube secured to an inner side of a stationary lens barrel member with a predetermined space kept between said stationary tube and said stationary lens barrel member;
a motor arrangement disposed within said predetermined space;
a first helicoidal surface formed on an inner circumferential side of said stationary tube;
a second helicoidal surface formed on a lens carrying frame which is arranged to carry and shift movable lenses in the direction of the optic axis of said lenses, said second helicoidal surface being in screwed engagement with said first helicoidal surface;
a rotary tube arranged in between said lens barrel member and said stationary tube to be rotatable by the rotation output of said motor arrangement; and
a transmission member arranged to transmit therethrough the rotation of said rotary tube to said lens carrying frame and to cause said lens carrying frame to move in the direction of the optic axis by rotating said lens carrying frame with the rotation output of said motor arrangement.

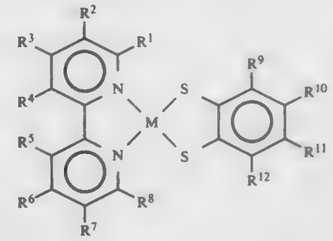
4,730,902

INFRARED ABSORBENT

Yoshiaki Suzuki, and Gouichi Hayashi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 13, 1986, Ser. No. 895,952
Claims priority, application Japan, Aug. 13, 1985, 60-178325
Int. Cl.[4] F21V *9/04;* G02B *5/20;* C07F *11/00, 9/00*
U.S. Cl. 350—311 19 Claims

1. A compound represented by the formula:



wherein M represents nickel, palladium or platinum; R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8, which may be the same or different from one another, each independently represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an alkoxycarbonyl group, or a substituted or unsubstituted phenyl group; each pair of R^1 and R^2, R^2 and R^3, R^3 and R^4, R^4 and R^5, R^5 and R^6, R^6 and R^7, and R^7 and R^8 may be bonded to each other to form a ring; and R^9, R^{10}, R^{11} and R^{12} each represent a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted amino group, which may be the same or different from one another.

4,730,903

FERROELECTRIC CRYSTAL DISPLAY PANEL AND MANUFACTURING METHOD THEREOF

Shunpei Yamazaki; Takashi Inushima; Akira Mase; Toshimitsu Konuma, and Mitsunori Sakama, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1986, Ser. No. 821,840
Claims priority, application Japan, Jan. 23, 1985, 60-010299; Jan. 23, 1985, 60-010300
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 27 Claims

1. A liquid crystal display panel comprising:
(A) first and second substrate members disposed opposite at a predetermined distance in substantially parallel relation to each other; and ferroelectric liquid crystal filled between the first and second substrate members;
(B) wherein the first substrate member comprises (a) a first substrate having an insulating surface, (b) a plurality $m \times n$ ($m>1$, $n>1$) of first conductive layers C_{11} to C_{1n}, C_{21} to C_{2n}, . . . C_{m1} to C_{mn} arranged in a matrix form on the first substrate, (c) a layer member A_{ij} formed on the first conductive layer C_{ij} (where $i=1, 2 \ldots m$ and $j=1, 2 \ldots n$) and (d) a stripe-like second conductive layer F_1 extending in the row direction and making contact with the layer members A_{i1},

VOL 1088 ISS 3 MR 15 1988 UMI

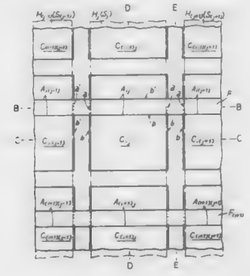
A_{i2}, . . . A_{in} on the side opposite from the first conductive layers C_{i1}, C_{i2} C_{i3}, . . . C_{in}, wherein the opposing side surfaces of the layer member A_{ij} defining its length are substantially aligned with the opposing side surfaces of the first conductive layer C_{ij} defining its width, respectively, and wherein the opposing side surfaces of the layer member A_{ij} defining its width are substantially aligned with the opposing side surfaces of the second conductive layer F_i defining its wdith, respectively;

(C) wherein the second substrate member comprises (a) a second substrate having an insulating surface and (b) a plurality n of stripe-like third conductive layers H_1, H_2, . . . H_n sequentially arranged in the row direction on the second substrate and extending in the column direction, the third conductive layer H_j being opposite to the first conductive layers C_{ij} to C_{mj}, and

(D) wherein the laminate member A_{ij} constitutes a non linear element U_{ij}, and a first part of the first conductive layer C_{ij} on which the layer member A_{ij} does not extend, a second part of the conductive layer H_j confronting the first part of the first conductive layer C_{ij}, and a third part of the ferroelectric liquid crystal between the first part of the first conductive layer C_{ij} and the second part of the second conductive layer H_j constitute a ferroelectric liquid crystal element L_{ij}.

22. A method for the manufacture of a liquid crystal display panel, comprising the steps of:

(A) preparing a first substrate member by the steps of:



(a) forming, on a first substrate, a first layer member which has a first conductive layer formed on the first substrate and a second layer member formed on the first conductive layer, the second layer member having a third layer member formed on the first conductive layer and a second conductive layer formed on the third layer member, the third layer member have a non-single-crystal layer member or a first insulating layer which permits the passage therethrough of tunnel current;

(b) patterning the first layer member into a plurality m of fourth laminate members B_1, B_2, . . . B_m sequentially arranged in the column direction and extending in the row direction, the fourth layer member B_i (where i=1, 2 . . . m) having a third conductive layer F_i formed by the first conductive layer on the first substrate and a fifth layer member D_i formed by the second layer member on the third conductive layer F_i;

(c) depositing, on the first substrate, a photosensitive organic resin layer to cover the fourth laminate members B_1 to B_m;

(d) forming, by the photosensitive resin layer, a second insulating layer surrounding each of the layer members B_1 to B_m on the first substrate, the second insulating layer forming step including exposure of the photosensitive organic resin layer to light applied from the side of the first substrate and development of the exposed photosensitive organic resin layer;

(e) depositing, over the first substrate, a fourth conductive layer extending on the fourth layer members B_1 to B_m and the second insulating layer;

(f) patterning the fourth conductive layer, the fifth layer members D_1 to D_m and the second insulating layer into fifth conductive layer C_{11} to C_{1n}, C_{21} to C_{2n}, . . . C_{m1} to C_{mn} formed by the fourth conductive layer, sixth layer members A_{11} to A_{1n}, A_{21} to A_{2n}, . . . A_{m1} to A_{mn} formed by the fifth layer member D_1 to D_2, . . . D_m on the third conductive layers F_1, F_2, . . . F_m, respectively, third insulating layers K_{11}' to K_{1n}', K_{21}' to K_{2n}', . . . K_{m1}' to K_{mn}' and fourth insulating layer K_{11}'' to K_{1n}'', K_{21}'' to K_{2n}'', . . . K_{m1}'' to K_{mn}'' formed by the second insulating layer on the first substrate the third insulating layer K_{ij}' being formed under the fifth conductive layer C_{ij} and making contact with the first surface of the third conductive layer F_i and the first surface of the sixth layer member A_{ij}, the fourth insulating layer K_{ij}'' being formed under the fifth conductive layer C_{ij} and making contact with the second surface of the third conductive layer F_i and the second surface of the sixth layer member A_{ij}, the first and second surfaces of the third conductive layer F_i defining its width, and the first and second surface of the sixth layer member A_{ij} defining its width.

(B) preparing a second substrate member by the steps of:

forming, on or over a second substrate having an insulating surface, a plurality n of sixth conductive layers H_1, H_2, . . . H_n sequentially arranged in the row direction and extending in the column direction;

(C) turning the second substrate member upside down and deposing the first and second substrate members in opposing and substantially parallel relation to each other; and

(D) filling ferroelectric liquid crystal in a space between the first and second substrate members.

4,730,904

ORGANOSILICON COMPOUNDS

Detlef Pauluth, Darmstadt; Klaus Bofinger, Mühltal; Michael Römer, Rodgau; Bernhard Scheuble, Alsbach, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 873,913

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521201; Jan. 22, 1986, 3601742

Int. Cl.[4] **C09K** *19/56, 19/54;* **G02F** *1/13;* **C07F** *7/04*

U.S. Cl. 350—340 **19 Claims**

1. An organosilicon compound of the formula

$$R^1—A^1—A^2—O—C_nH_{2n}—SiX_aY_bZ_c$$

wherein

R^1 is H, alkyl of 1–10 C atoms, alkyl of 1–10 C atoms wherein one or two non-adjacent CH_2 groups are replaced by 0 atoms, F, Cl, Br or CN,

A^1 and A^2 are each independently 1, 4-phenylene (Phe) or 1,4cyclohexylene (Cy),

X, Y and Z are each independently H, F, Cl, Br, I, CN, NC, OCN, NCO, SCN, NCS, N_3, alkoxy of 1 to 15 C atoms, 1-methyl-3-oxobut-1-enyloxy or alkoxy of 1–15 C atoms wherein one or more non-adjacent CH_2 groups are replaced by an oxo —O— atom or —CH=CH—,

a, b and c are 0, 1, 2 or 3 and

n is 2, 3, 4, 5 or 6,

with the provisos that a+b+c+3, at least one of X, Y and Z is other than H and X, Y and Z are not all Cl.

4,730,905

EYEPIECE HAVING A RADIAL GRADIENT INDEX LENS

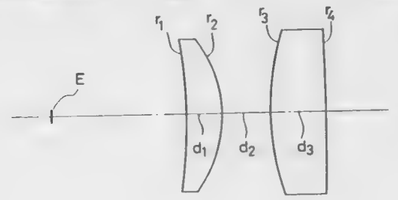
Katsuhiro Takada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

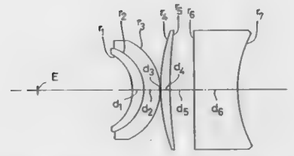
Filed Aug. 4, 1986, Ser. No. 893,082

Claims priority, application Japan, Aug. 6, 1985, 60-171841

Int. Cl.[4] **G02B** *25/00, 9/06, 9/12*

U.S. Cl. 350—410 **6 Claims**





1. An eyepiece comprising a plurality of lenses, comprising, in the order from the eye point side, a first lens component having positive refractive power which comprises a positive meniscus lens having a concave surface on the eye point side, and a second lens component located in rear of said first lens component, said eyepiece being arranged with said first lens component comprising a graded refractive index lens formed so that the refractive index thereof is graded according to the radial distance from the optical axis.

4,730,906

BRIGHT WIDE-ANGLE ZOOM LENS

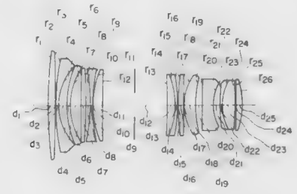
Sadao Okudaira, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1986, Ser. No. 868,461

Claims priority, application Japan, May 31, 1985, 60-118614

Int. Cl.[4] **G02B** *15/14, 13/18, 13/04, 9/64*

U.S. Cl. 350—426 **8 Claims**



1. In a compact and high-performance bright wide-angle zoom lens comprising, in order from the object side, a front group having a negative refractive power and a rear group having a positive refractive power, with a stop diaphragm being disposed between the front and rear groups, said front group, said stop diaphragm and said rear group being capable of independent mechanical movement in response to a change in the focal length of the overall system, the improvement wherein the rear group having a positive refractive power is composed, in order from the object side, of a positive lens unit, a negative lens unit, and a positive lens unit, with a lens element having a refractive index gradient profile along the optical axis being disposed in the positive lens unit on the image side of the rear group.

4,730,907

COMPACT ZOOM LENS SYSTEM

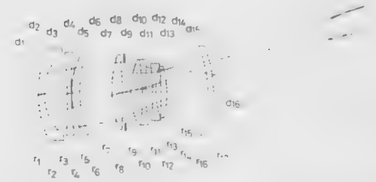
Juro Kikuchi, and Toshihiro Imai, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 678,160

Claims priority, application Japan, Dec. 5, 1983, 58-228483

Int. Cl.[4] **G02B** *15/177, 15/163*

U.S. Cl. 350—426 **6 Claims**



1. A compact zoom lens system consisting of a first lens unit having negative refractive power and arranged as a movable lens unit, a second lens unit having positive refractive power and arranged as a movable lens unit, and a third lens unit arranged as a fixed lens unit, said third lens unit comprising a meniscus lens arranged to be concave toward the object side and said compact zoom lens system fulfilling the conditions (1), (2) and (3) shown below:

$$|f_3|f_W>10 \quad (1)$$

$$r_a \simeq r_b \quad (2)$$

$$f_3>0 \quad (3)$$

where, reference symbol f_3 represents the focal length of said third lens unit, and reference symbol f_W represents the focal length of the lens system as a whole in the wide position, and where reference symbol r_a and r_b respectively represent radii of curvature of respective surfaces of said third lens unit.

4,730,908

ZOOM LENS

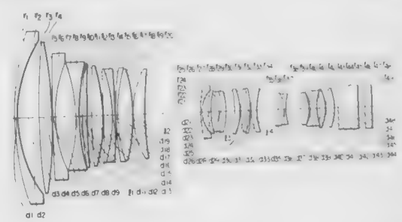
Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,378

Claims priority, application Japan, Jun. 15, 1984, 59-123153

Int. Cl.[4] **G02B** *15/14*

U.S. Cl. 350—427 **3 Claims**



1. A zoom lens comprising, in succession from the object side to the image side, a positive first lens group movable for

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focusing, a negative second lens group movable for zooming, a positive third lens group movable for zooming, a negative fourth lens group movable for zooming and moved with said second lens group, and a stationary fifth lens group, and wherein when β_i is the lateral magnification of the ith lens group as counted from the object side, the lateral magnification of each of said lens groups satisfies at a point in zooming of zooming integral curves

$$\beta_2<0,\ \beta_4<0,\ \beta_2\beta_4=1,\ \beta_3=-1$$

and satisfies at said point

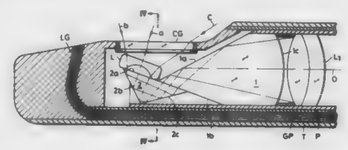
$$-1.3<\beta_2<-1.025.$$

4,730,909

VIEW DIRECTION CHANGING OPTICAL SYSTEM FOR ENDOSCOPES

Susumu Takahashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,562
Claims priority, application Japan, Sep. 20, 1983, 58-173627
Int. Cl.⁴ G02B *23/26, 17/00, 23/02*
U.S. Cl. 350—445 **4 Claims**



1. A view direction changing optical system for endoscopes comprising:
- a housing having a longitudinal axis, a front end and a rearward portion;
- a top entrance lens arranged on said housing so that its light entrance surface is oriented obliquely rearwardly of said housing;
- a first reflecting surface arranged under said top entrance lens and reflecting rearwardly incident light;
- a second reflecting surface reflecting the incident light so as to make the light travel along the longitudinal axis of the housing of the endoscope,

said second reflecting surface being positioned rearwardly of said top entrance lens and being formed on one surface of a first optical member arranged behind said top lens; and
- a third reflecting surface provided for directing the light reflecting by said first reflecting surface to said second reflecting surface and arranged between said first reflecting surface and said second reflecting surface,

said first reflecting surface and said third reflecting surface being formed on two surfaces of a second optical member arranged on the lower part of the front side of said first optical member,

said light reflected by said first reflecting surface entering said third reflecting surface after said light has been reflected by a surface of said second optical member.

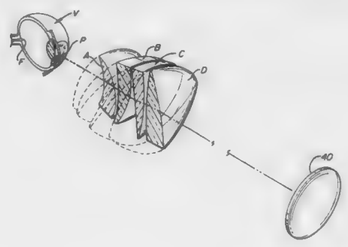
4,730,910

WIDE ANGLE LENS SYSTEM HAVING FLARE REJECTION PROPERTIES

William E. Humphrey, Oakland, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Sep. 18, 1985, Ser. No. 777,371
Int. Cl.⁴ G02B *13/18, 9/34, 27/00*
U.S. Cl. 350—436 **16 Claims**

1. A flare rejection refracting lens train having two aspherical sequential lens elements wherein each lens element includes at least one surface having an aspheric shape to impart to the lens the object to image optical path length the same for each



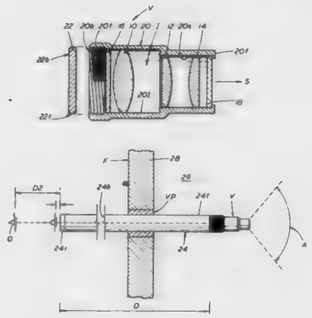
passing ray, each lens element further including a segment of less than one-half of a symmetrical lens element.

4,730,911

WIDE ANGLE OPTICAL VIEWER

Stephen C. Wood, 303 Laurel, Friendswood, Tex. 77546, and Paul F. Thompson, Friendswood, Tex.

Filed Jan. 27, 1986, Ser. No. 822,747
Int. Cl.⁴ G02B *7/00, 5/00, 23/00;* **F21V** *9/06*
U.S. Cl. 350—575 **4 Claims**



2. An improved vessel viewer of the type containing a biconvex or double convex lens positioned to permit a viewer to view into a heated interior of a vessel, the improvement comprising:

two substantially identical plano-convex lenses, axially aligned with said bi-convex optical lens and positioned with convex surfaces facing each other, said bi-convex optical lens having a diameter which is larger than the diameter of said plano-convex lenses, and said bi-convex lens and said plano-convex lenses comprising an axially aligned three-lens system; two planar, heet resistant lenses, axially aligned with and encasing said three-lens system between the two planar lenses, a cylindrical lens housing means having an interior bore for holding the lenses in a spaced apart series, wherein said lenses are inserted into said interior bore of the housing, and said housing means maintains the lenses in a desired axial alignment, and said lenses are mounted at a desired distance from one another to provide the optimum image clarity and angle of view, and a tube of sufficient length to reach to the interior of a furnace or burner, having one end affixed to a viewing end of the housing, whereby said viewer looks into an end of the tube to view the interior of the furnace, while the end of said tube affixed to said wide angle lens apparatus is inserted into the interior of a furnace or burner, and further, said appartus affords the viewer a wide angle view

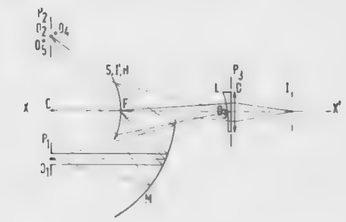
regardless of the viewer's distance from the viewing device.

4,730,912

DISTORTIONLESS SIGHT UTILIZING HOLOGRAPHIC COMPONENTS

Fernand Loy, Sceaux, and Jean-Claude Perrin, Paris, both of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Nov. 16, 1984, Ser. No. 700,932
Claims priority, application France, Nov. 16, 1984, 83 18209
Int. Cl.⁴ G02B *5/32, 27/10*
U.S. Cl. 350—503 **5 Claims**



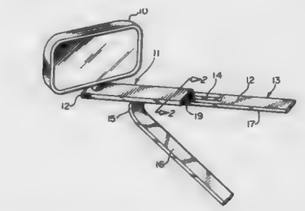
1. A sight comprising an image carrier having an exit aperture and forming, from an observed image, an intermediate image at the focus of an ocular comprised of a spherical mirror on the same optical axis as the image carrier, the focus being conjugated through said spherical mirror with at least one exit aperture of the sight located outside the optical axis common to the spherical mirror and to the image carrier; a holographic beam deflection element placed at the focus of the spherical mirror, the intermediate image being formed on the focal surface of the ocular and the holographic beam deflection element being disposed on a surface of a support, said surface being substantially geometrically identical with the focal surface, said holographic beam deflection element in association with the spherical mirror conjugating in stigmatic fashion the exit aperture of the image carrier with the exit aperture of the sight.

4,730,913

ADJUSTABLE MOUNT FOR LATERAL REAR VIEW MIRROR

Craig H. Boothe, Ferndale, Wash., assignor to Lee H. Boothe, Alpine, Utah

Filed Aug. 4, 1986, Ser. No. 892,280
Int. Cl.⁴ G02B *5/08, 7/18;* **B60R** *1/08*
U.S. Cl. 350—604 **4 Claims**



1. An adjustable mirror mount for attachment to the side of a vehicle for enabling lateral adjustment of the mirror with respect to the vehicle, said mount comprising:
- a side mirror support brace adapted for attachment to a side portion of the vehicle and including a substantially flat upper surface which forms a track of uniform width, said brace including an opening through the track for insertion of a locking screw therethrough;
- a slidable mount operable with respect to the track of the mirror support brace, said mount comprising:
- an elongated base member having a substantially flat (i) top and (ii) bottom surface, (iii) opposing side walls extending downward along opposing side edges of the base member, (iv) opposing base member ends, and (v) a volume contained within items (i) through (iv) of the base member;
- the base member including means for pivotally attaching a mirror at the top surface thereof in an orientation suitable for providing rear view to an observer seated in the vehicle;
- the remaining top surface of the base member having a closed configuration to conceal components thereunder and to provide an appearance of the top surface as a mere extension of the flat, upper surface of the mirror support brace;
- the bottom surface of the base member comprising a pair of opposing flat shoulders partially extending from the opposing edges toward each other and terminating at an elongated slot which extends between the shoulders and along a central portion of the bottom surface, said shoulders forming the primary loadbearing surface between the adjustable mount and the flat, upper surface of the brace;
- the contained volume of the base member including a T-slot extending substantially the full length of the base member, said T-slot having a cross-sectional configuration resembling a T shape having a single base end and a flat, top section;
- the base end of the T-slot forming the elongated slot between the shoulders of the bottom surface of the base member, the T-slot extending upward therefrom into the contained volume, the flat, top section of the T-slot being most proximate to the top surface of the base member, the T-slot forming a track guide within the contained volume;
- an elongated tracking member having a cross-sectional shape as a T substantially corresponding to the T-slot track guide and being adapted to be slidably disposed therein, the tracking member having a bottom surface which extends no lower than the bottom surface of the base member;
- locking means coupled to the tracking member and the support brace for locking the tracking member in fixed position within a desired location along the length of the T-slot to thereby lock the position of the adjustment mount with respect to the mirror support brace; and
- a rearview mirror coupled to the top surface of the base member.

4,730,914

ELONGATE, ARCUATE MIRROR WITH GENERALLY CONVEX SURFACE PORTIONS

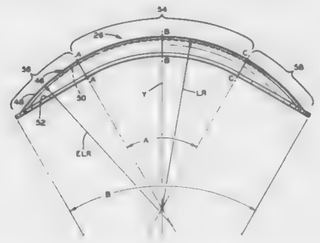
Thomas R. Stout, Lambertville, Mich., assignor to Safety Cross Mirror Co., Inc., Lambertville, Mich.

Filed Dec. 22, 1986, Ser. No. 944,564
Int. Cl.⁴ G02B *5/10;* **B60R** *1/08*
U.S. Cl. 350—629 **20 Claims**

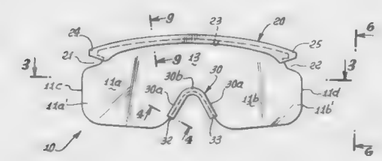
1. An elongate, convex mirror comprising a transparent sheet with a convex surface and a concave surface, said sheet having a reflective layer on the concave surface, said sheet having a substantially constant longitudinal radius of predetermined value throughout a central portion of said mirror, said sheet having a substantially constant transverse radius of a value exceeding the value of said longitudinal radius throughout the same central portion of said mirror, end portions of said

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sheet beyond said central portion to the ends thereof having generally segmental spherical shapes, said mirror being symmetrical about a longitudinal plane taken centrally through said mirror.

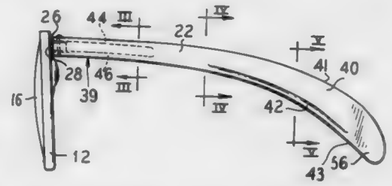


4,730,915
DETACHABLE COMPONENT SUNGLASSES
James H. Jannard, Laguna Niguel, Calif., assignor to Oakley, Inc., Irvine, Calif.
Continuation-in-part of Ser. No. 690,642, Jan. 11, 1985, Pat. No. 4,674,851. This application Oct. 15, 1985, Ser. No. 787,242
Int. Cl.[4] G02C *9/00*
U.S. Cl. 351—47 **14 Claims**



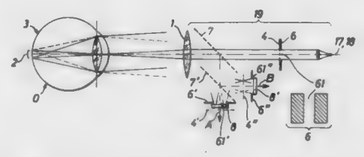
1. Sunglasses, comprising, in combination:
(a) a unitary transparent pane located to extend in a curved plane in the path of the wearer's field of vision, both frontally and sidewardly, said curved plane being everywhere substantially cylindrical, the pane having an upwardly humped lower edge bounding a space to receive the wearer's nose,
(b) a top frame extending along and bounding elongated upper edge extent of the pane, and stems attached to the top frame at opposite ends thereof and adapted to extend rearwardly to the wearer's ears,
(c) and the top frame having an elongated slot formed to extend upwardly in the frame from the lower side of the frame, along frame length, to removably vertically receive and closely fit the pane upper edge,
(d) the pane being notched downwardly at two locations respectively proximate the upper opposite ends of the pane, the notches opening sidewardly above opposite end extents of the pane, the top frame having end portions overhanging said notches, and spaced above notch lower edges, said upper edges terminating at said notches,
(e) the pane including projections overhanging portions of the the notches to interlock within end portions of said slot in the top frame.

4,730,916
SPECTACLE TEMPLES
Philip J. Liautaud, 446 Balsam La., Palatine, Ill. 60067, and Robert J. Boryca, 1442 Cindy La., Des Plaines, Ill. 60018
Filed Nov. 16, 1982, Ser. No. 442,034
Int. Cl.[4] G02C *5/18, 5/14*
U.S. Cl. 351—117 **11 Claims**



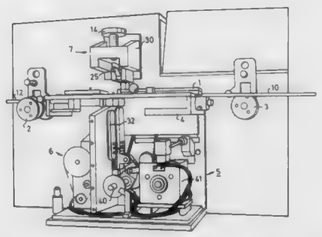
1. Spectacles comprising:
a frame and lens means carried by said frame; and
a pair of temples each extending rearwardly of said frame and each comprising upper and lower edges including a rigid first section and a resilient second section therebetween, and a distal end,
said first section pivotally connected to said frame and including a pair of ridges along the upper and lower edges of said temple, respectively, providing a U-shaped cross-section and tapering rearwardly towards said second section, and
said second section connected to and extending rearwardly of said first section, said upper and lower edges extending divergently so that said second section includes a wide portion which is substantially wider than said first section and normally bowed inwardly so as to flex outwardly and then inwardly as the spectacles are donned to gently embrace and firmly hold the spectacles in place while distributing the resilient spring forces against the head to provide a firm and gentle fit thereto.

4,730,917
METHOD AND AN APPARATUS FOR DETERMINING THE REFRACTION
Helmut Krueger, Toblerstrasse 76, Zurich, Switzerland
Division of Ser. No. 552,053, Oct. 7, 1983, Pat. No. 4,637,700. This application Aug. 28, 1986, Ser. No. 901,259
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204876; PCT Int'l Appl., Feb. 10, 1983, 002511
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—211 **23 Claims**



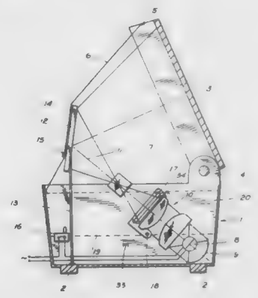
1. A method for determining the time dependent refraction of the human eye comprising the steps of:
(a) imaging a target object having an extension in depth in the direction of the optical axis in an object space onto the retina of the eye with an optometer lense system such that the retinal image of said object is re-imaged via said lense system into the object space and into an image plane which is conjugated with respect to the retina and depends on the refraction of the eye and the index of refraction of the lense system, the distance of said conjugated image plane from said lense system being a measure of refraction,
(b) separating the beam of rays from the target object from the beam of rays from the retinal image by means of said target object comprising at least two parial portions, said partial portions being edges of the target object and extending parallel to each other, and
(c) simultaneously analyzing the beam of rays from the retinal image at at least two different distances from the conjugated image plane by means of said target object.

4,730,918
AUTOMATIC PRINTING MACHINE FOR PRINTING TEXT ON CINEMATOGRAPHIC FILM
Björn Selin, Solna, Sweden, assignor to AB Film-Teknik, Solna, Sweden
PCT No. PCT/SE86/00066, § 371 Date Oct. 22, 1986, § 102(e) Date Oct. 22, 1986, PCT Pub. No. WO86/05004, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 17, 1986, Ser. No. 930,179
Claims priority, application Sweden, Feb. 22, 1985, 8500882
Int. Cl.[4] G03B *21/32*
U.S. Cl. 352—90 **2 Claims**



1. An automatic printing machine for printing text on cinematographic film, comprising a film transport path (**8**) having a film-feed means incorporating a gripping mechanism (**4**) for feeding the film intermittently frame by frame; a printing-block position located in the film transport path; a pressure plate (**31**), means for synchronized movement of the pressure plate with the gripping mechanism towards and away from the printing-block position for printing said text; a counter-pressure plate (**16**) mounted on the side of the film transport path (**8**) remote from the printing-block position; a pressure-generating means for producing a variable pressure force between the pressure plate (**31**) and the counter-pressure plate (**16**); a first printing-block transport path (**10**) intended for the supply of printing blocks and extending parallel with the film transport path (**8**) along one edge side thereof; insertion means (**61, 62**) for moving a printing block along a glide path from the first printing-block transport path (**10**) to the printing block position; and a second printing-block transport path (**12**) which also extends parallel with the film transport path and which receives a printing block displaced from the printing block position; wherein the insertion means (**61, 62**) includes a slide path which extends beneath the film transport path parallel with the glide path and which incorporates a slide (**61**) provided with a flap (**62**) which is journalled on a shaft (**62A**) extending parallel with the direction of the slide path, the flap being provided with a tooth (**70**) which is arranged to be moved into the glide path when the flap is swung to an activating position, and to displace a printing block (**29**) located in the printing block position when the slide executes a working movement along the glide path, said slide simultaneously displacing a printing block (**29'**) located in the first printing-block transport path; and in that the flap (**62**) in its activating position covers the glide path from one side and prevents printing blocks from leaving said path; and means for manipulating the slide for reciprocating movement with the flap in its activating position, said means comprising a drive mechanism (**6**) which can only be activated when the means (**5**) for movement of the pressure plate (**31**) are in their passive mode.

4,730,919
SLIDE VIEWER
Albert Schuch, Schwechat, Austria, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H, Munich, Fed. Rep. of Germany
Filed Oct. 1, 1985, Ser. No. 782,705
Claims priority, application Austria, Oct. 5, 1984, 3165/84
Int. Cl.[4] G03B *23/00*
U.S. Cl. 353—79 **11 Claims**



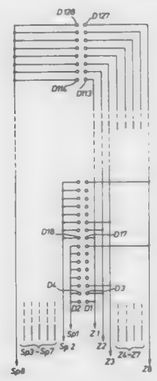
1. A slide viewer comprising a housing having a horizontal base surface, said housing comprising a light source, a lens system having an optical axis, an image trap, an image changer and a reflector, said housing provided with a back projection screen and a magazine guide having a longitudinal and substantially horizontal axis, wherein the optical axis of the lens system is inclined at an angle to the horizontal base surface of the housing, said projection screen pivotally connected within the housing and swingable between a first position in which said projection screen is lying at the upper side of the housing, and a second, operating position and is provided with a lightproof screen, the image trap is hinged and is swingable between a first position in which it is arranged in a plane perpendicular to said longitudinal axis of the magazine guide, and a second position in which it is arranged in a plane perpendicular to said optical axis of the lens system, and the reflector arranged in the optical axis of the lens system when the projection screen is in its second position, whereby a film slide may be transported by means of said image changer from a magazine positioned in said magazine guide into said image trap being in its first position, and further transported to a projecting position by means of the image trap by swinging the latter to its second position.

4,730,920
OPTOELECTRONIC STADIA
Harald Schlemmer, Karlsruhe, and Rainer Stuhlmüller, Bruchsal, both of Fed. Rep. of Germany, assignors to Nestle & Fischer, Dornstetten, Fed. Rep. of Germany
Filed Mar. 24, 1986, Ser. No. 842,819
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1985, 3512708
Int. Cl.[4] G01C *3/08;* G01B *11/26*
U.S. Cl. 356—4 **10 Claims**

1. An optoelectric stadia for a surveying system with a rotary laser beam which comprises: a plurality of optoelectronic elements provided on one side of the stadia; display means; and evaluation means connecting said optoelectronic elements to said display means; wherein said optoelectronic elements are connected to a circuit arrangement which defines at least one matrix having at least two column components and at least two line components, wherein the optoelectronic

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elemtns are arranged in at least one vertical row with each said row being defined by two adjacent columns of said elements and with two adjacent optoelectronic elements in said two columns forming a matrix node, each said row being subdivided into stages of the same length with each stage forming a



modular arrangement; and wherein a first signal representative of a line component of said matrix and a second signal representative of a column component of said matrix are generated when the elements forming one of said matrix nodes are contacted by said laser beam, said signals being used to identify said one matrix node and to identify a height value.

4,730,921

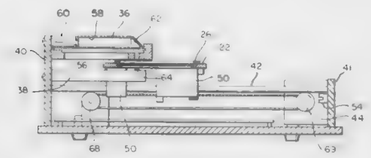
PHOTODENSITOMETER FOR MINIMIZING THE REFRACTIVE EFFECTS OF A FLUID SAMPLE

Gerald L. Klein, Edmonds; Gene D. Russell, Seattle; Steven R. Day, Bothell, and Jerrold D. Liebermann, Seattle, all of Wash., assignors to Genetic Systems, Inc., Seattle, Wash.

Filed Oct. 31, 1985, Ser. No. 793,653

Int. Cl.[4] G01N *33/48*

U.S. Cl. 356—39 **39 Claims**





1. A photometric method for minimizng the optical effect of a meniscus on a fluid sample, comprising the following steps:

generating light from a light source;

collecting the generated light and forming a light beam having a central optical axis;

focusing the light beam to form a vertical cone of light; and

axially positioning the meniscus of a fluid sample substantially at the narrowest portion of the light cone so that a central portion of the meniscus illuminated by the light cone has a minimal refractive effect on the light beam.

4,730,922

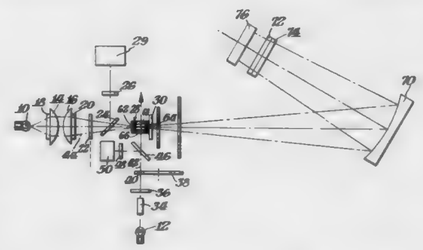
ABSORBANCE, TURBIDIMETRIC, FLUORESCENCE AND NEPHELOMETRIC PHOTOMETER

David T. Bach, Wilmington, and Charles W. Robertson, Jr., Rockland, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1985, Ser. No. 731,781

Int. Cl.[4] G01N *21/49, 21/59, 21/64*

U.S. Cl. 356—73 **10 Claims**



1. In a multi-function photometer having a sample cell for containing a liquid to be measured, a grating, an array of photodiodes, and a source of radiation directed along a first axis through the cell to the grating for dispersing the radiation according to wavelength onto respective different ones of the photodiodes, thereby to provide output signals corresponding to the intensity of radiation at each wavelength, the improvement wherein the sample cell defines an exit aperture perpendicular to the first axis, the exit aperture being positioned to be the entrance aperture for the grating.

4,730,923

HEADLIGHT OPTICAL AXIS AIMING MEASURING APPARATUS AND METHOD

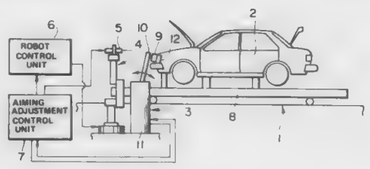
Hideaki Kosugi, Ebina; Keiichi Fukuda, Kitakyusyu; Kazuhiro Yoshitomi, Atsugi, and Kouji Takao, Zama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 13, 1986, Ser. No. 818,266

Claims priority, application Japan, Jan. 14, 1985, 60-4561; Nov. 19, 1985, 60-259546

Int. Cl.[4] G01J *1/00*

U.S. Cl. 356—121 **14 Claims**



1. An apapratus for measuring a headlight optical axis aiming, comprising:

means for measuring horizontal and vertical inclinations of a front lens surface of a headlight installed in a vehicle and

producing outputs indicative of said incliantions, said measuring means comprising:

a plurality of displacement sensors spaced from each other, and

contacting means for coming into contact with the front lens surface, the contacting means being displaced in accordance with the inclinations of the front lens surface,

each of said displacement sensors having a measuring rod connected to and movable with said contacting means for sensing said displacement of said contacting means when said contacting means comes into contact with said front lens surface;

means supporting the displacement sensors; and

means for determining the headlight optical axis aiming on the basis of a fixed relationship between the inclinations of a headlight optical axis and the front lens surface and said outputs from said measuring means.

4,730,924

LENS METER AND METHOD OF MEASUREMENT OF PROGRESSIVE MULTIFOCAL LENS USING THE SAME

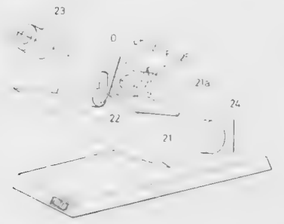
Henri Allard, Quebec; Robert Drummond, Ontario; Charles P. Villeneuve, Quebec, all of Canada, and Yukio Ikezawa, Tokyo, Japan, assignors to Tokyo, Koganu, Kikai, Kabushiki, Kaisha, Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 835,055

Claims priority, application Japan, Mar. 2, 1985, 60-41714

Int. Cl.[4] G01B *9/00*

U.S. Cl. 356—125 **14 Claims**



1. A method of measuring, by the use of a lens meter, the refraction characteristics of a progressive multifocal lens to be examined, comprising:

a first step of optically aligning the optical center of the lens with a measurement optical axis of said lens meter;

a second step of moving the lens in such a manner that the far-distance refraction characteristics measuring portion of the lens will be aligned with said measurement optical axis by geographically moving said optical center by a predetermined distance of movement for the far-distance using said measurement optical axis as a point of origin;

a third step of measuring the far-distance refraction characteristics of the lens in said far-distance refraction characteristics measuring portion obtained in said second step;

a fourth step of moving the lens in such a manner that said optical center will be geographically moved by a predetermined distance of movement for near-distance using said measurement optical axis as a point of origin;

a fifth step of setting the near-distance refraction characteristics measuring portion of the lens so as to be aligned with said measurement optical axis in such manner that said optical center of the lens is geographically moved toward the nose side thereof by a predetermined amount of nose-side movement distance using the moved position obtained in said fourth step as a point of origin, or that the moved position obtained in said fourth step allows a maximum value to be obtained for an additional degree of the near distance calculated from a measured value at the time when said optical center of the lens is moved to the nose-side using the moved position obtained in said fourth step as a point of origin; and

a sixth step of measuring the near-distance refraction characteristics of said near-distance refraction characteristics measuring portion set in said fifth step.

4,730,925

METHOD OF SPECTROSCOPICALLY DETERMINING THE COMPOSITION OF MOLTEN IRON

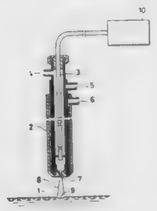
Koichi Chiba; Akihiro Ono, both of Kawasaki; Takamasa Ohno, Sakai; Masaki Okajima, Sakai; Hiroshi Yamane, Sakai, and Minoru Hayata, Sakai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 9, 1986, Ser. No. 905,330

Claims priority, application Japan, Sep. 20, 1985, 60-207975; Dec. 28, 1985, 60-293658

Int. Cl.[4] G01N *21/71, 21/72*

U.S. Cl. 356—311 **9 Claims**



1. A method of spectroscopically determining the composition of molten iron which comprises the steps of producing a hot spot [illegible] olowing oxygen or an oxygen-containing mixed gas against the surface of the molten iron and measuring the spectra of radiations emitted from the hot spot.

4,730,926

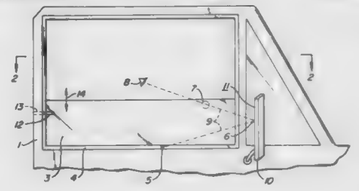
ACCU-RIGHT MIRROR ALIGNMENT SYSTEM

Gerald T. Wedemeyer, Manhattan, Kans., assignor to Lowell R. Wedemeyer, Davis, Calif., a part interest

Filed Jul. 28, 1986, Ser. No. 891,467

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—138 **10 Claims**



1. A method of enabling one unaided person to restore a desired setting of a mirror that is externally mounted on a vehicle for a vehicle occupant's view through the vehicle's window pane, comprising:

I. Initially setting the mirror in the desired configuration;

II. Identifying an adjuster's position from which a person wishing to restore the desired setting of the mirror:

A. can reach the mirror to adjust it, and

B. can see through the window pane an image of some portion of the vehicle reflected in said mirror; and

III. Placing a first alignment mark on the vehicle, which first alignment mark is positioned to make a reflected image thereof visible in said initially-set mirror to a person in said adjuster's position; and

IV. Placing a second alignment mark on said mirror, superim-

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posed on the reflected image in said mirror of said first alignment mark, viewed from the adjuster's position looking into said mirror;

V. Placing a third alignment mark on said window pane, positioned to simultaneously superimpose the images of said first, second and third marks when viewed by a person in said adjuster's position looking into said mirror; and

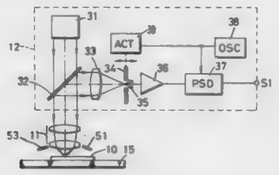
VI. Thereafter restoring said desired initial setting of the mirror, as needed, by moving the mirror to superimpose the images of said first, second and third marks, viewed from the adjuster's position looking into the mirror.

4,730,927

METHOD AND APPARATUS FOR MEASURING POSITIONS ON THE SURFACE OF A FLAT OBJECT

Taro Ototake, Kanagawa, and Tatsumi Ishizeki, Saitama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,754
Claims priority, application Japan, Apr. 9, 1985, 60-73549
Int. Cl.[4] G01B *11/30*
U.S. Cl. 356—371 **7 Claims**



1. A method of measuring positions of a plurality of measuring points on a surface of a flat object mounted, along a reference plane, on a stage movable parallel to said reference plane, said method comprising the steps of:

(a) moving said stage and measuring coordinate positions of each of said measuring points and of a plurality of adjacent points thereof in said reference plane;

(b) detecting an amount of vertical deviation of each of said plurality of adjacent points from said reference plane;

(c) determining an incline of the surface of said object between each said plurality of adjacent points in accordance with said coordinate positions and amounts of vertical deviation of each of said plurality of adjacent points; and

(d) correcting said coordinate positions of said measuring points in accordance with said inclines.

4,730,928

POSITION MEASUREMENT BY LASER BEAM

David Gabriel, Kingston; David S. Audus, Marlow, and Malcolm A. Chennell, Perivale, all of England, assignors to Lasercheck Limited, Burnham, England

PCT No. PCT/GB84/00217, § 371 Date Feb. 21, 1985, § 102(e) Date Feb. 21, 1985, PCT Pub. No. WO85/00222, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 21, 1984, Ser. No. 705,469
Claims priority, application United Kingdom, Jun. 21, 1983, 8316875; Jul. 12, 1983, 8318821
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—373 **13 Claims**

1. Apparatus for montoring deflections of a structure relative to a laser beam, comprising:

(a) a structure to be monitored;

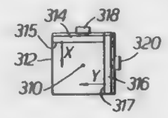
(b) a laser mounted at a first location to direct a laser beam along a path extending adjacent a portion of the structure;

(c) at least one target mounted to said structure at a location adjacent the path of the laser beam, wherein said target comprises:

(d) a support portion fixed to the structure at the target location,

(e) at least one member having a beam intercepting edge movable with respect to said support portion between positions displaced from and intercepting the beam, respectively,

(f) actuator means acting between said support portion and said member to move said member between said positions,



(g) means for detecting the interception of the beam by said member, and

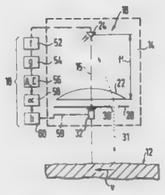
(h) means for measuring the position of the member relative to the support portion at beam interception.

4,730,929

METHOD AND DEVICE FOR THE CONTACTLESS MEASUREMENT OF MOVEMENT

Günther Dausmann, Schlachthausstr. 9, D-8058 Erding, Fed. Rep. of Germany

PCT No. PCT/DE84/00065, § 371 Date Nov. 20, 1985, § 102(e) Date Nov. 20, 1985, PCT Pub. No. WO85/04257, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 21, 1984, Ser. No. 807,036
Int. Cl.[4] G01P *3/36*
U.S. Cl. 356—373 **17 Claims**



1. Method of contactless measurement of relative movement of an object with respect to a scannable pattern of structural elements, comprising the steps of moving a device with the object for scanning the pattern along a guidance curve and for generating a scanning signal in the device from a sequence of scanning pulses corresponding respectively to the scanned pattern of structural elements, scanning the pattern along a scanning path, said scanning path results as a superposition of the scanning movement along the guidance curve and the relative movement of the pattern and object, wherein the improvement comprises deriving a density signal from the scanning signal indicating the chronological progression of the reciprocal value of the time interval between the momentary scanning signal with respect to the preceding scanning signal, and determining the time phase of the density signal with said time phase being indicative of the angle between a reference direction integral with the object and the direction of motion of the pattern relative to the object.

4,730,930

SCANNING APPARATUS AND METHOD

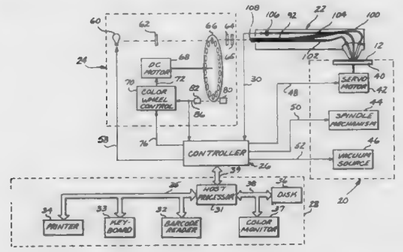
Robert J. Thoreson, and Steven J. White, both of Seattle, Wash., assignors to Technical Arts Corporation, Redmond, Wash.

Filed Jun. 24, 1986, Ser. No. 878,046
Int. Cl.[4] G06K *11/00, 7/12*
U.S. Cl. 356—407 **25 Claims**

1. A scanner for scanning a sheet such as a chart, the scanner comprising:

scanning means including support means for mounting the sheet, illumination means for directing light onto an illuminated area of the sheet, the illuminated area being elongated along a scan direction, means for causing the illuminated area to move in a movement direction across the sheet, the movement direction being normal to the scan direction; and,

detection means comprising a photodetector array and a coherent fiber optic bundle, the array comprising a plurality of photodetector elements positioned side by side along a line, the coherent fiber optic bundle having essentially linear first and second apertures and a plurality of fiber optic cables extending between the first and second



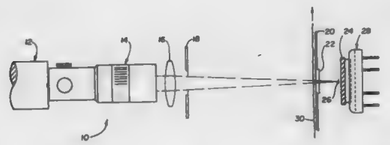
apertures such that the relative position of a given cable at one aperture is the same as the relative position of the given cable at the other aperture, the coherent fiber optic bundle being tapered such that the width of the first aperture is greater than the width of the second aperture, the first aperture being positioned adjacent and parallel to the illuminated area such that light reflected by the sheet can enter the first aperture, the second aperture being positioned adjacent and parallel to the photodetector array such that light exiting from the second aperture falls on the photodetector elements.

4,730,931

METHOD AND APPARATUS FOR OPTICALLY MONITORING FIBER ORIENTATION IN NONWOVEN WEBS

Robert L. Watson, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1986, Ser. No. 866,436
Int. Cl.[4] G01N *21/86, 21/89*
U.S. Cl. 356—429 **10 Claims**



1. Method for measuring the angular orientation and uniformity of orientation of fibers within a nonwoven web and wherein the major axis of said web lies along the machine direction for feed of the web and the minor axis of said web lies perpendicular to said major axis, said method comprising:

selecting a cross-sectional configuration of a coherent light beam that will encompass a number of said fibers within the web sufficient to detect and record measurements of said angular orientation and uniformity.

illuminating a section of said web with said coherent light beam,

establishing relative movement between the web and the coherent light beam along said machine direction, and

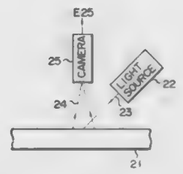
detecting refracted and diffracted components of light scattered from the fibers illuminated by said coherent light beam and determining therefrom the preferred direction of light scatter relative to said major axis and to said minor axis of said web and the variability from point-to-point within said web of such preferred direction.

4,730,932

TRANSMISSIVITY INSPECTION APPARATUS

Masahiko Iga, Saitama; Yoshihiro Yamato, Yokohama, and Yoshio Yamaguchi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toyo Glass Co., Ltd., Tokyo, both of, Japan

Filed Feb. 2, 1987, Ser. No. 9,752
Claims priority, application Japan, Jan. 31, 1986, 61-19615
Int. Cl.[4] G01N *21/17*
U.S. Cl. 356—432 **11 Claims**



1. A transmissivity inspection apparatus, comprising:

light source means for supplying coherent light to an object to be inspected;

reflection detection means for detecting irregular reflection components of the coherent light emitted from said object; and

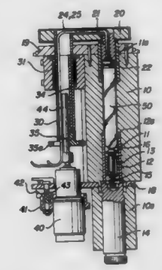
transmissivity inspection means, coupled to said reflection detection means, for inspecting a transmissivity of said object with respect to said coherent light based on a specific pattern of said irregular reflection components, and generating an inspection signal indicating that said object includes a material having a transmissivity lower than a predetermined transmissivity.

4,730,933

PHOTOMETRIC MEASURING APPARATUS

Willi Lohr, Ginsterweg 75, D-7547 Wildbad, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 930,472
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540823
Int. Cl.[4] G01N *21/13, 21/01*
U.S. Cl. 356—440 **11 Claims**



1. A photometric measuring apparatus having a measuring chamber with an open top for receiving a sample vessel containing material to be measured, a first sealing means in said chamber for sealing said measuring chamber from extraneous light when said sample vessel is removed, a plunger for insertion into said open top of said measuring chamber after a sam-

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ple vessel to be measured is positioned in said measuring chamber, a second sealing means on said plunger for sealing said measuring chamber from extraneous light when said plunger is inserted into said open top of said measuring chamber, a vertically slidable and horizontally pivoted arm on said plunger for pivoting said plunger and aligning said plunger with said open top of said measuring chamber characterized in a guide means for guiding said vertically slidable and horizontally pivotal arm for vertical and pivotal movement and a drive mechanism for driving and controlling said vertical and horizontal movement of said arm and said plunger.

4,730,934

MOBILE MIXER, PREFERABLY HAVING COUNTERROTATIONAL EMPTYING, FOR BUILDING MATERIALS, IN PARTICULAR CONCRETE

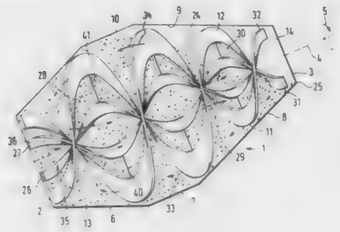
Gerhard Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Fed. Rep. of Germany

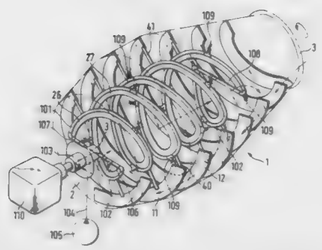
Continuation of Ser. No. 938,325, Dec. 2, 1986, abandoned, and Ser. No. 814,761, Dec. 30, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,990

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 84116485; Oct. 25, 1985, 85113601

Int. Cl.[4] B28C *7/04, 7/16*

U.S. Cl. 366—40 **34 Claims**





1. Mobile mixer, preferably having counterrotational emptying, for building materials, in particular concrete, in a mixing drum (**1**) which, on its inner wall (**9**), has one or more flat elevators (**11**, **12**) following a helix and extending from the closed drum base (**2**) to the drum opening (**3**), which elevators (**11**, **12**) are driven about the drum axis during rotation of the mixing drum (**1**) and drive the building material in front of the closed drum base (**2**) during transport and during mixing, with one or more flat sections (**26**, **27**) which are helically curved about the mixing drum axis (**4**) being mounted for driving during the mixing drum rotation (**5**) in the mixing drum space enclosed by the elevations acting as mixing spirals (**11**, **12**), which flat sections (**26**, **27**) are arranged counterrotationally to the mixing spirals (**11**, **12**) in such a way that, during the transport and during the mixing of the building material (**13**), they produce a counterflow in the building material filling core surrounded by the mixing spirals (**11**, **12**), wherein the flat sections (**26**, **27**) start from the mixing drum base (**2**) and end in front of the mixing spirals (**11**, **12**) and the mixing drum opening (**3**), and wherein the flat sections (**26**, **27**) of the counterflow spirals are mounted to the elevators of the mixing spirals (**11**, **12**) and via the mixing drum base (**2**) to the mixing drum wall (**9**).

6. Mobile mixer, preferably having counterrotational emptying, for building materials, in particular concrete, having a mixing drum (**1**) which, on its inner wall, has one or more flat elevators (**11**, **12**) following a helix and extending from the closed drum base (**2**) to the drum opening (**3**), which elevators (**11**, **12**) are driven about the drum axis during rotation of the mixing drum (**1**) and drive the building material to the front of the closed drum base (**2**) during transport and during mixing, wherein nozzles (**109**) are arranged on the end faces of the mixing spirals (**11**, **12**), which end faces point toward the drum center and which nozzles (**109**) are connected to one another by pipes (**101**, **102**, **108**), following the course of the mixing spirals (**11**, **12**), and are connected by a supply line (**104**) to a pump (**105**) via pipelines (**106**, **107**) and a rotary transmission coupling (**103**) which is arranged on one of the front sides (**2**, **3**) of the drum (**1**), with the nozzles (**109**) being directed in such a way that their openings lie in the mixing flow path during the mixing operation of the drum (**1**).

4,730,935

EXTRUSION APPARATUS FOR THE PRODUCTION OF MIXTURES OF MOLTEN SYNTHETIC MATERIAL

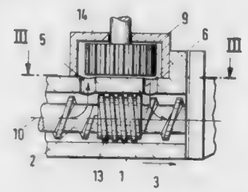
Klaus-Dieter Kolossow, Hambühren, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,352

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615586

Int. Cl.[4] B29B *1/04;* **B01F** *15/02*

U.S. Cl. 366—82 **1 Claim**



1. An extrusion apparatus for extruding mixtures of molten synthetic material comprising a hollow cylinder, said cylinder including opposed first and second end regions, a screw rotatable within said hollow cylinder for conveying said mixture to be extruded from said first end region to said second end region of said hollow cylinder, flow obstruction means formed on said screw, gear pump means located on the exterior of said hollow cylinder in the region of said flow obstruction means, said gear pump means comprising a housing and two meshing gear pump wheels rotatable in said housing, said cylinder defining first aperture means disposed upstream of said obstruction means to cause the interior of said cylinder to communicate directly with the interior of said housing upstream of said gear wheels and second aperture means disposed downstream of said obstruction means to cause said interior of said cylinder to communicate directly with said interior of said housing downstream of said gear wheels, the line joining the centre of said gear wheels extending at right angles to the longitudinal axis of said cylinder and the common tangent to the pitch circles of said gear wheels lying in the same vertical plane as said longitudinal axis of said cylinder, said gear wheels each having opposed major surfaces, said major surfaces extending horizontally.

4,730,936

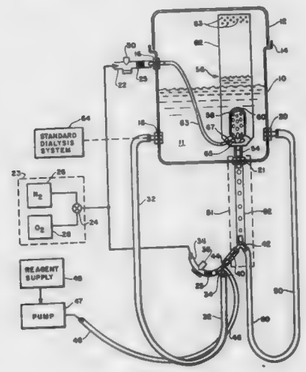
GAS DRIVEN SYSTEM FOR PREPARING LARGE VOLUMES OF NON-OXIDIZED, PYRIDOXYLATED, POLYMERIZED STROMA-FREE HEMOGLOBIN SOLUTION FOR USE AS A BLOOD SUBSTITUTE

Philip S. Thorjusen, Jr., Ocean Springs, Miss., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 10, 1986, Ser. No. 917,573

Int. Cl.[4] B01F *13/02*

U.S. Cl. 366—101 **11 Claims**



1. An apparatus for mixing reagents into a solution, comprising:

(a) a solution reservoir;

(b) a reagent supply;

(c) first connector means having first, second and third fittings and an infusion port;

(d) a first stopcock attached to the first connector means through the infusion port;

(e) a pressurized gas supply;

(f) first conduit means for delivering pressurized gas from the pressurized gas supply to the first fitting of the first connector means;

(g) second conduit means for delivering solution from the solution reservoir to the second fitting of the first connector means;

(h) third conduit means for delivering reagent from the reagent supply to the first stopcock; and,

(i) fourth conduit means for returning solution from the third fitting of the first connector means to the solution reservoir.

4,730,937

PLASTICIZING UNIT FOR AN INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lossburg 1, Fed. Rep. of Germany

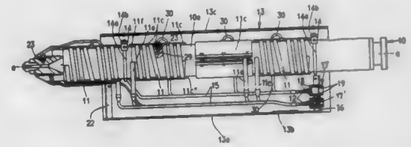
Filed Jul. 9, 1986, Ser. No. 883,745

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1985, 3546415

Int. Cl.[4] B29F *1/00, 1/06*

U.S. Cl. 366—146 **12 Claims**

1. In a plasticizing unit for an injection molding machine, including a plasticizing cylinder having an outer face, a length and a longitudinal axis; a plurality of separately energizable resistance heaters arranged on said outer face along said length; each said resistance heater including heating wires and lead wires connected thereto and a supply cable containing said lead wires; clamping sleeves surrounding said resistance heaters and being oriented generally coaxially with said plasticizing cylinder, clamping elements tightening said clamping sleeves for pressing said resistance heaters against said outer face; and a support means carried by said plasticizing cylinder for stably supporting said plasticizing unit; the improvement comprising a protective casing at least partially surrounding said plasticizing cylinder along at least one part of the length thereof; said protective casing being spaced from said clamping sleeves; said protective casing including said support means; mounting means attaching said protective casing to said plasticizing cylinder; further wherein each said resistance heater comprises a flat-tube heater body including consecutive first and second length portions; said first length portion containing said heating wires and having a helical course about said outer face of said plasticizing cylinder; said second length



portion forming an end of said flat-tube heater body; said second length portion being free from heating wires and containing said lead wires; said second length portion being bent out of said helical course and being accommodated in a space defined between said outer face of said plasticizing cylinder and said protective casing; the improvement further comprising a terminal panel secured to a rear terminus of said protective casing and being oriented generally perpendicularly to said longitudinal axis of said plasticizing cylinder; each supply cable being accommodated in said space; terminal plugs attached to said supply cables; and means supporting said plugs in said terminal panel for displacements of limited extent in a direction parallel to said longitudinal axis.

4,730,938

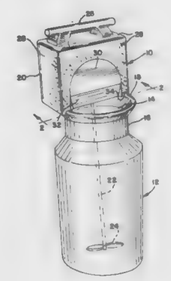
MIXER HOUSING

Lyman D. Dunn, Chicago, Ill., assignor to Zantek, Inc., Chicago, Ill.

Filed Apr. 21, 1986, Ser. No. 854,549

Int. Cl.[4] B01F *7/22*

U.S. Cl. 366—282 **3 Claims**



1. For a food mixing container having an open mouth adjacent the top of same and a side wall defining a lower food ingredient receiving container portion below the container mouth, above which container mouth is disposed an upstanding rim that is centered on the container mouth and is in circumambient relation to the container mouth, with the container sidewall and rim being concentric about a common axial center that forms the axial center of the container and extends heightwise of the container,

a mixer therefor adapted to seat on the mixing container rim for performing mixing operations on food ingredients

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when the food ingredients received in the mixing container lower portion,

said mixer comprising:

a generally quadrilateral housing having a top wall, a bottom wall, a front wall, a rear wall, and a pair of opposed side walls extending between said rear wall and said front wall on either side of said housing,

handle means connected to said housing for manual grasping of said housing to apply same to the container rim and lift same therefrom,

mixing means dependent from said housing in substantial perpendicular relation to and through said bottom wall and including an elongate rectilinear shaft substantially centered on said housing and having a depending end equipped with blade means adjacent said shaft depending end for reception in and mixing the food ingredients when the food ingredients are received in the mixing container lower portion and said mixer is seated on the mixing container rim,

means mounted in said housing for driving said shaft and mixer blade means in mixing relation to the food ingredients when the food ingredients are received in the mixing container lower portion and said mixer is seated on the mixing container rim,

said housing bottom wall defining a generally semicircular downwardly opening channel for seating said housing on the container rim with said mixer housing mixing means disposed within the container lower portion, and with said mixer being free of engagement with the container side wall,

said bottom wall channel having a floor and end portions disposed adjacent to, and open at, the lower portion of said housing front wall and the front of said mixer housing,

said bottom wall channel defining a midlength portion that is intermediate of said channel end portions lengthwise of said channel and is disposed between said shaft and said housing rear wall,

said channel further defining in said floor thereof, adjacent each of said channel end portions and within said channel, a downwardly directed boss, with said bosses similarly depending below said channel floor,

whereby, when said mixer is seated in upright relation to the container rim with the container rim received within said mixer housing bottom wall channel, with said shaft and blade means of said mixing means disposed within the container, and said mixer resting on said channel midlength portion and said bosses, said bosses tilt said mixer so that said mixer shaft is disposed away from the container side wall and toward the container axial center.

4,730,939

MIXING AND WHIPPING WHISK

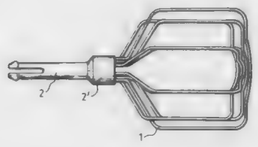
Michael Haas, Kronberg/Ts., and Hagen Reker, Eschborn, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 19, 1986, Ser. No. 909,780

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533834

Int. Cl.⁴ B01F *7/32*

U.S. Cl. 366—342 **11 Claims**



1. Mixing and whipping whisk for electric mixing machines and hand mixers which is composed of a shaft adapted to be coupled with the motor drive and of at least two crossing coiled wires, each said wire having free end portions which are secured by clamping engagement in recesses of a mounting head secured to said shaft,

characterized in that said mounting head comprises an indentation that is concentric relative to the shaft axis, in the wall of which indentation there are shaped longitudinal grooves arranged in pairs opposite to each other and extending in the axial direction, into which longitudinal grooves said free end portions of said coiled wires are inserted, and a plug-shaped clamping element which comnforms to said indentation secured in said indentation in a self-clamping manner, the said end portions being radially outwardly pressed into the grooves and being clamped therein by means of said plug-shaped clamping element.

4,730,940

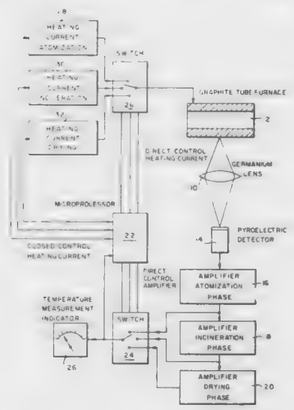
DEVICE FOR PYROMETRIC TEMPERATURE MEASUREMENT

Robert F. M. Herber; Herman J. Pieters, both of Amsterdam; Anna M. Roelofsen, Nymegen, and Wouter van Deijck, Maarssen, all of Netherlands, assignors to Gruen Analysengeraete GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 903,784

Int. Cl.⁴ G01J *5/08*

U.S. Cl. 374—127 **4 Claims**



1. A device for the pyrometric measurement of the temperature of a radiating body, said device comprising:

(a) a spectral filter having a transmissivity that begins at about $\lambda=1$ μm and then rapidly rises and remains almost constant up to a wavelength of $\lambda \geqq 8$ μm;

(b) radiation receptor means, for receiving radiation passing through said spectral filter, for generating the temperature dependent signal based on the radiation received by said radiation receptor means, wherein said radiation receptor means comprises a pyroelectric detector having a spectral sensitivity from at least about $\lambda=1$ μm to $\lambda \geqq 8$ μm;

(c) amplification means for receiving the temperature dependent signal generated by said radiation receptor means, said amplification means comprising a plurality of amplification stages, the output of each amplification stage being independently selectable; and

(d) control means, coupled to said amplifier means, for selecting the output signal generated by one of said amplification stages and determining the temperature of said radiating body based on said selected signal.

4,730,941

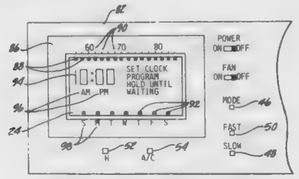
TEMPERATURE RANGE DISPLAY DEVICE FOR ELECTRONIC THERMOSTAT

Michael R. Levine; James T. Russo; Anthony C. Cairo, and Victor H. Rigotti, all of Ann Arbor, Mich., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 709,918, Mar. 8, 1985, Pat. No. 4,606,401. This application Aug. 7, 1986, Ser. No. 894,297

Int. Cl.⁴ G01K *7/00;* **G05D** *23/19*

U.S. Cl. 374—170 **6 Claims**



1. In a thermostat for controlling the application of electrical power to first and second temperature modifying loads, the improvement comprising:

display means for displaying first and second preselected temperatures associated with the first and second temperature modifying loads respectively, the display means including an elongate area of energizable indicia corresponding to an associated linear temperature scale, whereby the first and second preselected temperatures are represented on the display means by energizing the entire elongate energizable area between limits defined by the first and second preselected temperatures on the associated temperature scale.

4,730,942

FLEXIBLE BULK CONTAINERS

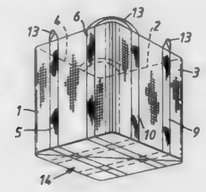
James E. Fulcher, Knaresborough, England, assignor to Bowater Packaging Company, London, England

Filed Aug. 15, 1986, Ser. No. 897,194

Claims priority, application United Kingdom, Aug. 19, 1985, 8520725

Int. Cl.⁴ B65D *30/02, 30/10, 33/02, 33/14*

U.S. Cl. 383—7 **5 Claims**



1. A flexible bulk container comprising a tubular side wall structure of a square woven polypropylene fabric, with warp threads extending from top to bottom of the side wall structure and weft threads extending around the side wall structure, lifting means at an upper end of the side wall structure, and a base closing the lower end of the side wall structure, the base being in the form of a polygon having an even number of sides and comprising a plurality of thicknesses of said woven fabric, each thickness being formed by two joined flaps of woven fabric forming integral extensions of the side wall structure and each extending from one side of the polygon towards the opposed side thereof, in which, in each thickness of the base, each flap is of substantially right-angled triangle shape having a first adjacent side lying alone one side of the polygon and a second adjacent side extending at right angles from said one side to the opposed side of the polygon, and the two flaps are secured together substantially along the hypotenuses thereof, the hypotenuses of the flaps being on the bias with respect to the fabric, and the resulting seam being a bias seam.

4,730,943

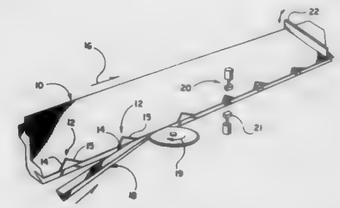
PLASTIC BAG WITH CARRYING HANDLE

James R. Johnson, 3819 Greenhill Dr., Chamblee, Ga. 30341

Filed Nov. 7, 1986, Ser. No. 928,202

Int. Cl.⁴ B65D *33/10, 30/00*

U.S. Cl. 383—8 **11 Claims**



1. A bag for receiving merchandise, wherein said merchandise has a generally rectangular form and urges said bag into said rectangular form, said bag including opposed side walls having a lower edge, an upper edge and two side edges, a bottom gusset between said side walls and attached to said lower edge of said side walls, a plurality of angle seals sealing each side of said bottom gusset to one side wall of said opposed side walls, a pair of side seams sealing said side edges of said side walls together and extending from said lower edge to said upper edge of said side walls, each of said angle seals extending substantially from one of said side seams to said lower edge of said side walls and defining a triangle at the corner of said bag, and a handle for said bag, said handle comprising a strip of handle material extending from one of said side seams to the opposite one of said side seams, said handle material being within said bottom gusset, and further including rectangular sealing means for fixing said handle material to said bottom gusset, said rectangular sealing means providing rectangular seals within said triagnles at the corners of said bag, the arrangement being such that said meachandise squares off said bag and a portion of said side walls forms end panels for said bag, said end panels being defined by said angle seals, and said rectangular seals are located within said end panels and are bisected by said side seams.

4,730,944

ROLLER CIRCULATING SHOE WITH CLAMPING DEVICE

László Fiák; Sándor Derzsényi; Sándor Darin, all of Debrecen; László Molnár, Miskolc, and János Vinkler, Debrecen, all of Hungary, assignors to Magyar Gordulocsapagy Muvek, Debrecen, Hungary

Filed Feb. 19, 1987, Ser. No. 16,765

Claims priority, application Hungary, Feb. 20, 1986, 714/86

Int. Cl.⁴ F16C *29/06, 23/06*

U.S. Cl. 384—43 **1 Claim**

1. An adjustable anti-friction device, comprising:

(a) a roller circulating shoe arranged to provide roller contact on one side with a support surface,

(b) said shoe being provided on its other side with a surface inclined relative to said support surface,

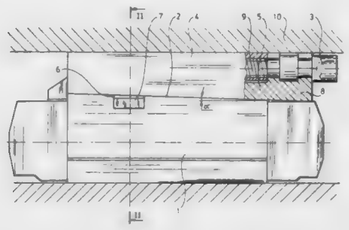
(c) an adjusting wedge movably mounted on the inclined surface of said shoe and arranged for engagement with a supported surface,

(d) a guide insert disposed between said shoe and said adjusting wedge and having a grooved projection at one end,

(e) an adjusting screw received and positioned in said grooved projection,

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(f) said guide insert having a locating projection formed on at least one side and engageable with said shoe, and



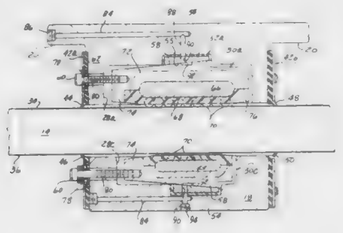
(g) said wedge being threadably engagable with said adjusting screw, whereby said wedge may be adjustably moved relative to said shoe for adjusting the height of said device.

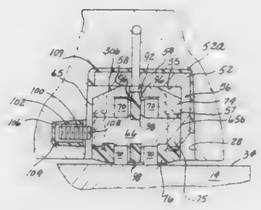
4,730,945

INTEGRALLY ADJUSTABLE WAY BEARINGS

Thomas A. Luther, Matthew; Robert E. Ward, Jr.; Joel D. Galliher, both of Charlotte, all of N.C., and William J. Ryan, Muskego, Wis., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 31, 1986, Ser. No. 925,208
Int. Cl.[4] F16C *29/06, 29/12*
U.S. Cl. 384—45 **11 Claims**





1. A recirculating roller bearing installation of the type including a roller bearing assembly (**30**) and a housing structure (**18**), said roller bearing assembly (**30**) including a track member (**6**) having a surface (**18**) defining a circulation path about which a plurality of roller elements (**70**) are adapted to roll in a direction defining a bearing axis to enable relative motion of a bearing supported structure (**10**) on a way surface (**34**) of a supporting structure, (**14**) said roller bearing assembly (**30**) also including a bearing cover (**72**) enclosing said track member (**66**) so as to confine said roller elements (**70**) while allowing said roller elements (**70**) to protrude on one side of said roller bearing assembly (**30**) to be able to run on said way surface (**34**) of said supporting structure (**14**); said roller bearing installation housing structure formed with a recess (**28**) receiving said roller bearing assembly (**30**), said installation characterized by:

an inclined surface (**58**) formed atop and extending along the length of said bearing cover (**72**) and a complementary inclined lengthwise surface (**55**) forming a portion of said recess (**28**) configured to be enegaged by the inclined surface (**58**) of the bearing cover (**72**) to produce a bearing depth adjustment by a lengthwise position adjustment of said roller bearing assembly (**30**) in said recess (**28**);

an adjustment element (**60**) mounted to said housing structure (**18**) extending parallel to the axis of said bearing assembly (**30**) and threadably engaging said bearing assembly (**30**) to cause said lengthwise position adjustment upon rotation thereof; and a guide surface (**57**) disposed in said recess (**28**) extending alongside said bearing cover inclined surface (**58**) but parallel to the bearing axis with said bearing assembly (**30**) in position against said inclined surface (**55**); an angled gib plate having formed thereon said recess inclined and guiding surfaces (**55, 57**), said angled gib plate (**52**) affixed to said housing structure (**18**); and

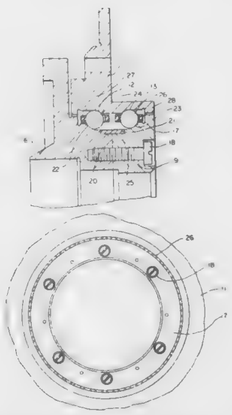
means (**100**) for urging said bearing assembly (**30**) sideways against said guide surface (**57**) whereby said bearing assembly (**30**) is held in said housing structure (**18**) to be parallel to said bearing axis.

4,730,946

PRECISION BEARING ASSEMBLY AND METHOD

Earl S. Cain, Napa, Calif., assignor to Tribotech, Napa, Calif.

Filed Apr. 21, 1987, Ser. No. 40,605
Int. Cl.[4] F16C *33/60;* **B24B** *1/00;* **B21D** *53/12;* **B21K** *1/04*
U.S. Cl. 384—506 **4 Claims**



1. A bearing assembly comprising inner and outer rings provided with cooperating axially outwardly and inwardly facing bearing races in which the ring having axially inwardly facing races is split to form two ring portions each of said ring portions having a centering recess, the centering recesses facing one another, a centering band disposed in said recesses to radially align said ring portions one with respect to the other, means for circumferentially locating said ring portions with respect to one another, and means for securing said ring portions to one another at said circumferential location.

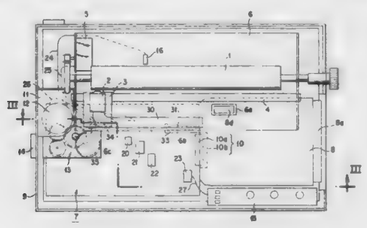
4. The method of forming and assembling a precision bearing assembly including inner and outer rings comprising the steps of forming on one of said rings precision axially outwardly facing bearing races, splitting said other ring into two ring portions, forming in said ring portions centering recesses, applying a centering band to said ring portion at said recesses and securing said portions to one another, forming on each of said ring portions axially inwardly facing bearing races, disassembling said ring portions, inserting a first bearing row in the facing races of one of said portions and the other ring, inserting a second bearing row on the other face of said other ring, inserting said other ring portion and centering the portions by said centering band, and securing said ring portions to one another in the same circumferential alignment as when the grooves were formed.

4,730,947

PRINTER HAVING A CONTROL CIRCUIT SECTION OF CASSETTE TYPE

Hiroshi Ikeda, Tokorozawa; Kimihiro Kosugi, Tanashi, and Kazumi Hasegawa, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,882
Claims priority, application Japan, Aug. 19, 1985, 60/125725[U]; Sep. 10, 1985, 60/137555[U]
Int. Cl.[4] B41J *5/30, 29/02*
U.S. Cl. 400—61 **9 Claims**



1. A printer with operating sections including a printing mechanism and a sheet feeding mechanism, and a control circuit device adapted to be connected to an external controller through cord means for drivingly controlling said operating sections, comprising:

said control circuit device including a control circuit section arranged in the form of a cassette and having an outer end portion thereof on which one half portion of a connector means is mounted, the one half portion of the connector means being adapted to be connected to an other half portion of the connector means which is connected to an associated end of said cord means; and

a receiving section defined in an internal space of said printer for accommodating therein said control circuit section, said receiving section having an insert port which opens into a first side of said printer different from a second side of said printer along which a printing sheet is fed to said sheet feeding mechanism, said control circuit section being detachably mounted in said receiving section through said insert port.

4,730,948

METHOD AND APPARATUS FOR CONTROLLING A PRINTER

Nobuhisa Kato, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

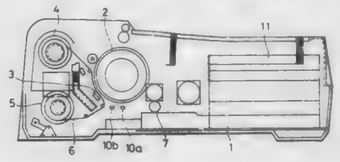
Filed Dec. 11, 1986, Ser. No. 940,659
Claims priority, application Japan, Dec. 11, 1985, 278723
Int. Cl.[4] B41J *3/20;* **G01D** *15/10*
U.S. Cl. 400—120 **4 Claims**

1. An apparatus for controlling an overlay printer in which an image is transferred in a plurality of superimposed layers of colors to a recording medium removably secured on a rotatable drum subject to vibration on starting comprising:

first sensor means for generating a first signal corresponding to the home position of the rotatable drum;

second sensor means for generating a signal when the level of vibration due to the rotation of the drum is at a minium; and

a controller responsive to said first signal to control the



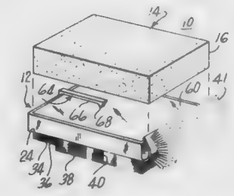
securing of the recording medium on the rotatable drum and responsive to said second signal to control the start of the transfer of the first of the plurality of superimposed layers of color.

4,730,949

SURGICAL SCRUB BRUSH

Earl D. Wilson, Ingleside, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 24, 1986, Ser. No. 843,446
Int. Cl.[4] A46B *11/02;* **A47K** *7/03*
U.S. Cl. 401—132 **3 Claims**



1. A single use scrub brush for medical cleansing purposes, comprising:

a housing having a base having an arrangement of walls disposed about said base;

a plurality of bristles extending from said base;

an array of bristles disposed outwardly adjacent one edge of said base;

a foam element secured to the housing;

a resevoir within said housing for containment of treating material;

a sealing means comprising a sheet of foil material arranged between said resevoir and said foam element about the periphery of said walls of said housing; and

a sharp piercing means comprising an arm fixedly arranged between said sealing means and said foam element from the wall of said housing, to pierce said sealing means upon selected pressure applied to said foam element.

4,730,950

BINDING DEVICE

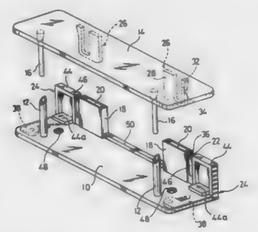
Kiyoshi Ominato, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 48,904
Claims priority, application Japan, Apr. 28, 1986, 61-96890
Int. Cl.[4] B42F *13/32, 13/34*
U.S. Cl. 402—48 **10 Claims**

1. A binding device which comprises an elongated fixture having at least one pipe fitting in the vicinity of one longitudinal side end thereof and a cover plate having along one longitudinal edge thereof at least one coupling rod adapted to be inserted into said pipe fitting, wherein the fixture is provided with support members along its longitudinal opposite side end

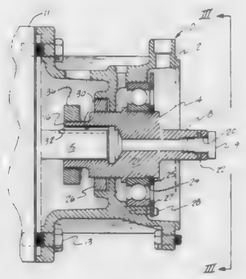
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at a predetermined distance, each of said support members being provided with a vertically extended slit and an external recess in communication with the slit and the fixture is further provided at its opposite cross ends with elastic arm members, each of said elastic arm members at its one end being secured to the fixture and at its opposite free end being confronted with



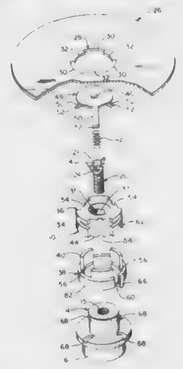
the recess of the support member, while the cover plate is provided in the vicinity of its longitudinal opposite end with insertion members each comprising a vertical guide piece member and a flexible piece member with an outward protrusion and arranged symmetrically to cope with the support members of the fixture.

4,730,951
DRIVE COUPLING
Gebus Barnsfather, Taylorsville, Ind., assignor to Reliance Electric Company, Greenville, S.C.
Filed Feb. 2, 1987, Ser. No. 9,706
Int. Cl.[4] F16B *2/06*
U.S. Cl. 403—24 **17 Claims**



1. A drive coupling for connection to an output shaft of drive means, said coupling comprising;
a bracket adapted for securement to the drive means;
a coupling member rotatably received within said bracket, including a first end portion defining a sleeve for securement to the output shaft, said sleeve defining at least one elongated slot therethrough, and said member further including an opposite end portion defining a coupling output shaft adapted for coupling to a pinion shaft; and
clamping means received about said sleeve for tightening same about the drive means output shaft.

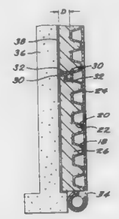
4,730,952
QUICK CHANGE MECHANISM FOR CIRCULAR SAW BLADES
Edward R. Wiley, 4259-144th La. SE., Bellevue, Wash. 98006
Filed Aug. 4, 1986, Ser. No. 893,230
Int. Cl.[4] B25G *3/00;* **F16B** *7/00*
U.S. Cl. 403—316 **6 Claims**



1. A quick change mechanism, operable in seconds, to change rotatable work contacting members, such as circular saw blades with respect to the drive shafts of power tools, comprising, the preassembly of:
(a) a splined slide lock having lands and grooves, with the lands extending as sliding lock fingers and having foot holder slots;
(b) a splined circular saw blade holder for placement on the splined slide lock and inside the sliding lock fingers, and having a smooth centered hole, a blade locking groove, and foot and leg receiving grooves;
(c) an installation bolt passed essentially through both the splined slide lock and the splined circular saw blade holder, having threads to secure it in a threaded hole of an arbor shaft, a head to be received in the smooth centered hole of the splined circular saw blade holder, a complementary centered hole to receive an allen wrench, and a centered cavity to position an end of a coiled spring;
(d) a coiled spring for axial placement using the centered cavity of the installation bolt; and
(e) a release button having depending spring legs and feet, and a centered hole to pass an allen wrench, is initially used as a fastener to hold this preassembly together, as it is lowered over the coiled spring with its spring legs extending beyond the installation bolt, and down in between the splined slide lock and the splined circular saw blade holder, utilizing the foot and leg receiving grooves on this blade holder, and then completing the subassembly, as the feet are positioned in the foot holder slots of this splined slide lock.

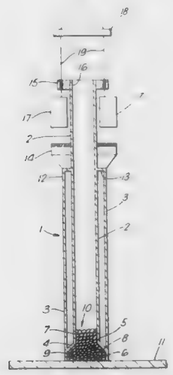
4,730,953
INSULATED WATERPROOF DRAINAGE MATERIAL
Paul L. Tarko, 383 S. Main St., Windsor Locks, Conn. 06096
Filed Oct. 15, 1986, Ser. No. 919,134
Int. Cl.[4] E02B *11/00;* **E02D** *31/02*
U.S. Cl. 405—45 **10 Claims**

1. An insulative waterproof drainage material comprising:
a sheet of rigid material having a plurality of hills and valleys therein to define a core, said core having opposed surfaces;
permeable fabric material attached to one of said opposed surfaces;
a layer of thermally insulative material on said other of said opposed surfaces, said insulative material having a first surface covering said hills and valleys and having a second surface oppositely disposed from said first surface defining an outer surface, said outer surface being spaced a pre-



selected distance D from said hills of said core, said pre-selected distance D defining an insulative material thickness corresponding to a pre-selected thermal value.

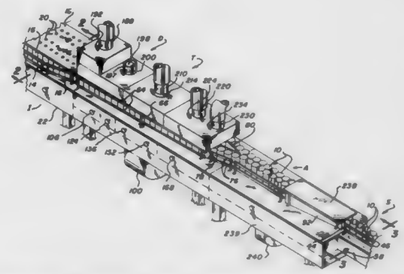
4,730,954
GROUND TREATMENT
Ziemowit J. Sliwinski, London, and Wilfred G. K. Fleming, Chorleywood, both of England, assignors to Cementation Piling & Foundations Limited, United Kingdom
Filed Oct. 2, 1986, Ser. No. 914,378
Int. Cl.[4] E02D *3/08, 5/38*
U.S. Cl. 405—240 **16 Claims**



1. Apparatus for forming a stone column in the ground, which comprises: a pair of concentric tubes the inner one of which is open at its upper end, and at or near its lower end is integrally connected by an imperforate connecting member to the outer tube; and a driving plate attached at or close to the upper end of one of said inner and outer tubes, so as to extend around said one tube; and driving means for applying a downwardly acting force against said driving plate whereby the apparatus may be driven into or against the ground, and wherein the space within said inner tube defines a cavity for receiving stone.

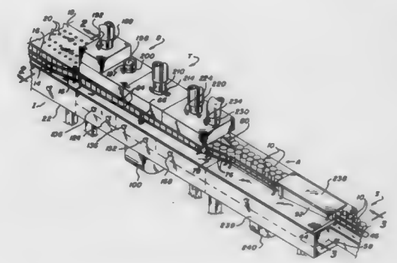
4,730,955
DIVERGENT SINGLE FILER
Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.
Filed May 13, 1986, Ser. No. 862,708
Int. Cl.[4] B65G *51/00*
U.S. Cl. 406—88 **22 Claims**

1. A method of transporting upright, cylindrical articles, wherein each article has an exterior surface with a high coefficient of friction with respect to an adjacent article that substantially inhibits relative sliding motion of one article with respect to an adjacent contiguous article, in a wide mass at an upstream location along an air table and into single file at a downstream location, said method comprising:
separating the articles into two spaced apart single file rows at the upstream location;



converging the spaced rows into contiguous nested rows of articles as they move downstream;
moving the nested two rows of articles downstream as a unit;
accelerating the articles in the two nested rows as they move downstream to separate them each from the other; and
converging the articles into single file while they are separated as they move to the downstream location.

4,730,956
SHOCK ABSORBANT SINGLE FILER
Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.
Continuation-in-part of Ser. No. 919,371, Oct. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 862,708, May 13, 1986. This application Dec. 4, 1986, Ser. No. 938,037
Int. Cl.[4] B65G *51/00*
U.S. Cl. 406—88 **14 Claims**



1. A shock absorbant single filer for the transport of upright, cylindrical articles from a multiple row arrangement at an upstream location to a single file arrangement at a downstream location and providing a shock absorbant buffer zone between said upstream location and said downstream location to separate and isolate the articles at said upstream location from the articles to said downstream location, said single filer comprising:
a table extending from said upstream location to said downstream location, having a surface, side edges and an underside with a prearranged pattern of flotation air jets, wherein said air jets are in rows spaced laterally inward from said side edges, slanted in a downstream direction

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and communicating said surface and said underside of said table;

a plenum connectable to a source of air under pressure and attached to said underside of said table surface;

means at said upstream location for supplying the articles to said buffer zone in two contiguous nested rows wherein the articles form an equilateral triangular configuration with the surfaces of all adjacent articles in contact with each other;

converging, open side rails extending along said table through said buffer zone to reduce the articles from a two article width at said upstream location to single file adjacent said downstream location;

cover means over said buffer zone to create a high pressure area within said buffer zone to isolate and separates the articles at said upstream location from any movement of the articles at the downstream location in a reverse upstream direction due to sequential engagement of the single file row of articles by other apparatus performing additional work on the articles;

imperforate side walls extending through said buffer zone, having a downstream edge, for selectively decreasing the air pressure from said buffer zone to said downstream location; and

acceleration jets in said table along said buffer zone for accelerating the articles so that they can be converged by said side walls into single file as they are separated from the contiguous triangular configuration.

4,730,957

METHOD OF CALIBRATING A PNEUMATIC CONVEYING APPARATUS

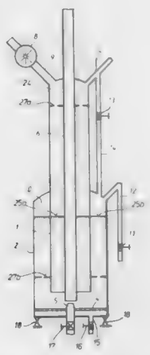
Franz-Josef S. Adrian, Lippetal, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 909,604

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537538

Int. Cl.[4] B65G *53/18*

U.S. Cl. 406—142 **2 Claims**



1. In a method of calibrating a pneumatic conveying apparatus including;

(a) a conveyor vessel having a conveying nozzle in its base, a material supply in its upper region, and a pneumatic conveyor pipe near the conveying nozzle, said conveying apparatus having a pneumatic conveying pressure and a conveying capacity determined by the level of material in the conveyor vessel;

(b) a storage chamber connected to the conveyor vessel according to the principle of communicating pipes, said conveying apparatus having a discharge capacity which is increased by transferring material from the storage chamber to the conveyor vessel and reduced by transferring material from the conveyor vessel to the storage chamber;

the improvement comprising:

(c) interrupting the supply of material to said conveyor vessel and during the interruption numerically integrating the pressure difference (p) between the pressure (p') at the which the material is being conveyed within the conveyor pipe and the resistance (p'_o) within said pipe at zero conveying capacity and determining the reduction (Δm) in the weight of material present in the conveyor vessel occurring in a period of time (Δt);

(d) taking the weight $m(t_1)$ of material in said conveyor vessel at the beginning of the calibration and the start of the integration of the pressure difference (p) occurring only after the filling weight has fallen approximately evenly during a predetermined period of time after interruption of the material supply;

(e) ending the integration of the pressure difference (p) and at the same time taking the weight $m(t_2)$ of material then existing in said conveyor vessel when a minimum quantity [m(min)] has been extracted and the filling weight has fallen approximately evenly during a predetermined further period of time;

(f) discontinuing the calibration when a predetermined maximum quantity [Δm(max)] is exceeded; and

(g) determining from the results so obtained a calibrating factor (k) for the conveying apparatus without restricting the running thereof or altering the pneumatic conveying capacity.

4,730,958

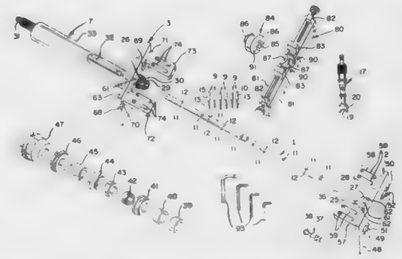
OVERHEAD CAMBEARING LINE BORING TOOL

Bela Banoczky, 1460 Livorna Rd., Alamo, Calif. 94507

Filed Oct. 15, 1985, Ser. No. 787,670

Int. Cl.[4] B23B *41/12*

U.S. Cl. 408—54 **4 Claims**



1. A portable overhead cambearing line boring tool for reboring the camshaft bearing surfaces in cylinder heads that have cast-in overhead camshaft bearings and cam-oil-seal and/or oil-plugs at both ends of said cylinder head comprising:

a. an elongated cutting bar formed with a plurality of longitudinally spaced cutting tool bores transverse to the longitudinal axis of said elongated cutting bar and a plurality of threaded bores angular intersecting each of said cutting tool bores;

b. a plurality of cutting tools respectively removably mounted in each of said cutting tool bores;

c. set screw means mounted in each of said threaded bore and releasably holding said cutting tools in seleced positions radial to said cutting bar;

d. a pair of end mounting means adapted for releasably mounting on said ends of said cylinder head and each end mounting means including a locator built-in-bushing having an internal opening dimensioned for rotatably and slidably receiving said cutting bar in close fitting relation and each locator built-in bushing having an outside cylindrical surface adapted for close machine fit with one of said end cam-oil-seal and/or oil-plugs formed in said cylinder head ends for precisely aligning said cutting bar;

e. feed means mounted on one of said pairs of end mounting means and removably connected to said bar for advancing said bar longitudinally with respect to said cylinder head upon rotation of said bar; and

f. means releasably connected to said bar for rotating said bar.

4,730,959

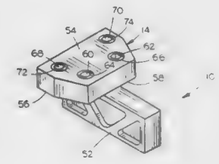
EDGE JOINING FIXTURE

Frank D. Aerni, and Deborah J. Aerni, both of 4533 Colfax Cir., Lincoln, Nebr. 68504

Filed Sep. 28, 1987, Ser. No. 101,835

Int. Cl.[4] B23B *47/28*

U.S. Cl. 408—115 R **3 Claims**



1. An edge joining fixture for facilitating the drilling of dowel holes in the edges of a pair of board members which will be subsequently secured together, each of the board members being oriented during the drilling operation so as to define upper and lower edges, first and second ends, and spaced-apart faces, comprising,

a T-shaped spacer comprising a vertically disposed base portion having inner and outer ends, and a leg portion extending inwardly from the inner end of said base portion,

said leg portion of said spacer being positioned between the pair of board members which are to be joined together with the ends of one of the faces of each of the board members being positioned adjacent opposite sides of said leg portion and said one end of each of the board members being in engagement with the inner end of said base portion,

means positioning and holding said spacer between said board members during the drilling operation,

a selectively movable body member comprising a vertically disposed leg portion adapted to be positioned between a pair of board members, said leg portion of said body member having the same thickness as said leg portion of said spacer, and a horizontally disposed top portion extending laterally outwardly from the upper end of said leg portion of said body member over said board members,

said top portion having at least first and second, spaced-apart openings formed therein extending downwardly therethrough, said openings being spaced apart a predetermined distance, relative to said leg portion, whereby a drill means may be rotatably extended downwardly therethrough to drill aligned dowel holes in the upper edges of said board members,

and clamping means for selectively holding said body member in a fixed position relative to said board members during the drilling of the two dowel holes,

said clamping means being selectively releaseable to permit said body member to be moved along the upper edges of the board members for subsequent drilling operations.

4,730,960

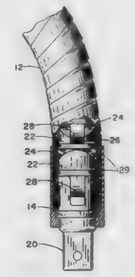
FLEXIBLE SOCKET EXTENSION

Wilbur Lewis, 109 Wilkens Rd., Fayetteville, Ga. 30214, and David F. Aberin, P.O. Box 386, Keno, Oreg. 97627-0386

Filed Dec. 15, 1986, Ser. No. 941,776

Int. Cl.[4] B23B *47/02;* **B25B** *23/00*

U.S. Cl. 408—127 **2 Claims**



1. A flexible extension tool comprising:

(a) a hollow helically wound flexible cable;

(b) a pair of end caps wherein one of said end caps is operatively attached to one end of said flexible cable and the other of said end caps is attached to the other end of said flexible cable and wherein one end cap has an opening therein colinear with the interior of said flexible cable;

(c) a plurality of essentially identical, torque transmitting elements within said flexible cable wherein each of said elements consists of a cylindrical cross-sectional element with curved surface and centrally positioned radial groove means at one end and an orthogonal centrally positioned radially curved tongue means at the other end wherein said tongue means is adapted to operatively fit into said groove means thus completing a flexible sequence of torque transmitting elements free of any attachment linkage;

(d) a plurality of plastic ring spacer means, wherein each of said plurality of torque transmitting elements contain at least one of said plastic ring spacer means externally surrounding and radially extending beyond said cylindrical cross-sectional element such as to partially occupy the annular space between said hollow helically wound flexible cable and said torque transmitting elements such as to allow smooth, low friction transmission of applied torque;

(e) a female connector means passing through the opening in one of said end caps and operatively engaged to said flexible sequence of torque transmitting elements within said flexible cable and wherein said female connector is adapted to engage to and be driven by a conventional ratchet wrench; and

(f) a male connector means passing through the opening in the other of said end caps and operatively engaged to the other end of said flexible sequence of torque transmitting elements within said flexible cable and wherein said male connector is adapted to engage to and drive a conventional socket.

4,730,961

EDGING MACHINE PREFERABLY FOR CHAINS

Marisa Cassan, Via Lago, 13 - Arcugnano (Vicenza), Italy

Filed Dec. 16, 1985, Ser. No. 809,562

Claims priority, application Italy, Dec. 18, 1984, 63392/84[U]

Int. Cl.[4] B23C *3/00*

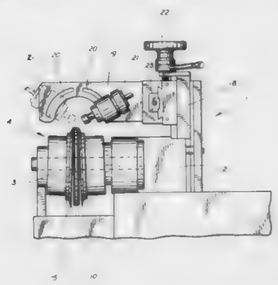
U.S. Cl. 409—166 **6 Claims**

1. A machine for edging chains, chainlets or similar articles by machining two chain sides simultaneously comprising:

a vice for gripping and feeding a chain to be edged including

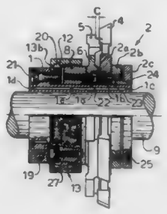
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(a) a shaft;
(b) first and second fixed cylindrical bodies rotatably mounted on said shaft at an angle inclined with respect to an axis of said shaft;
(c) third and fourth cylindrical bodies rotatably mounted on said first and second bodies, respectively, one of said third and fourth bodies being connected to said shaft for rotation therewith;
(d) first and second plates mounted on a side of said third and fourth bodies, respectively, and opposing each other on said shaft, said plates being mounted to said third and fourth bodies at an angle complementary to said inclination;



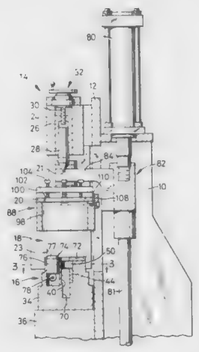
(e) a disc mounted on said shaft substantially perpendicular to said axis, said disc having a circumferential seat for holding said chain, said first and second plates contacting said disc at one portion of its periphery and not at other portions; and
(f) means for urging said first and second bodies together, whereby the rotation of one of said third and fourth bodies and its associated plate is transferred through said disc to the other of said third and fourth bodies and its associated disc to grip and feed said chain;
machining means for machining said chain including a stirrup positioned above said vice substantially at the point where said plates contact said disc, said stirrup having arc shaped slot which support edging elements.

4,730,962
DIVIDED MILLING CUTTERS
Lennart Johannesson, Parkgatan 41, NÄSSJÖ , Sweden (S-571 00)
Continuation-in-part of Ser. No. 455,825, Jan. 5, 1983, Pat. No. 4,552,496. This application Aug. 30, 1985, Ser. No. 771,058
Claims priority, application Sweden, Jan. 7, 1982, 8200034
Int. Cl.⁴ B23C *5/08*; B27G *13/08*
U.S. Cl. 409—209 **6 Claims**



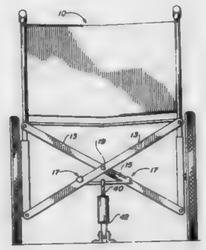
1. A two-part tool comprising a tool spindle, an inner sleeve slidable onto an securable to said tool spindle, said inner sleeve being comprised of a hydraulic sleeve comprising an inner wall, an outer wall, a substantially annular chamber defined by said walls and containing a pressure medium, an inlet to said chamber, and an outlet form said chamber a ring-shaped member surrounding and releasably secured to said hydraulic sleeve and forming together therewith an annular groove on the external surface of said inner sleeve, a first tool half releasably secured to said inner sleeve, a second tool half releasably secured to said inner sleeve, and means for positioning said second tool half on said inner sleeve in a position which is adjustable in the axial direction with respect to said first tool half, said positioning means comprising said annular groove in the external surface of said inner sleeve, a second sleeve surrounding at least part of said inner sleeve and having internal threads and a radially inwardly directed annular flange for engaging said annular groove, a third sleeve which at least partially is in sliding engagement with said inner sleeve and is provided with external threads for cooperation with said threads of said second sleeve, said second tool half being fastened to the end of said third sleeve which is adjacent to said first tool half, said inner outer walls of the inner sleeve being deflectable radially inwardly against said spindle and outwardly against said third sleeve and said tool halves, respectively, when said second and third sleeves are in threaded engagement with each other and said annular chamber is pressurized for centering and locking of said sleeves and tool halves to the tool spindle, said tool further comprising a first ring which is in said first tool half and is in sliding engagement with said inner sleeve, said first ring having an external frusto-conical portion surrounding said inner sleeve with a minute clearance therebetween, a second ring located adjacent to said first ring on the opposite side thereof with respect to said second tool half, said second ring having an internal frusto-conical surface associated with and cooperating with the external frusto-conical surface of said first ring, and means for pressing said second ring towards said first ring in the axial direction of the rings to thereby clamp the first ring and said first tool half against said inner sleeve through a wedging action between said frusto-conical surfaces.

4,730,963
BROACHING MACHINE FOR EXTERNAL BROACHING OF ROTOR
Yosio Kuroiwa, Toyota; Hosao Shirai, Aichi; Takuo Sibata, Okazaki, and Sakae Sugishima, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 6, 1986, Ser. No. 893,949
Claims priority, application Japan, Aug. 8, 1985, 60-121970[U]
Int. Cl.⁴ B23D *41/06*
U.S. Cl. 409—278 **15 Claims**



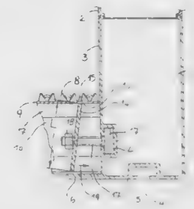
1. A broaching machine for broaching an outer surface of a rotor assembly by feeding a broach in a broaching direction parallel to an axis of rotation of the rotor assembly, said rotor assembly including a lobe-type rotor having a pair of lobes so as to form an external cross-sectional profile similar in shape to that of a peanut shell and forming said outer surface, and a support shaft which projects from opposite end faces of said lobe-type rotor in opposite directions parallel to said axis of rotation, said broaching machine comprising:
a backing plate for backing said rotor assembly such that said backing plate is held in contact with one of said opposite end faces of said lobe-type rotor at which said broach terminates a broaching cut in said broaching direction;
a positioning pin extending from said backing plate toward said one end face of said lobe-type rotor and engaging a positioning hole formed in an end face of one of said pair of lobes of said lobe-type rotor, thereby positioning said rotor assembly in a circumferential direction thereof; and
means for centering said rotor assembly to align said axis of rotation thereof with a line of feed of said broach in said broaching direction, said means for centering said rotor assembly comprising a first centering device which includes a center portion engageable with one of opposite ends of said support shaft so as to hold and center said support shaft at said one end thereof, and a second centering device including a V-block and a retainer block which are engageable with the other end of said support shaft so as to hold and center said support shaft at said other end thereof.

4,730,964
WHEELCHAIR RESTRAINT SYSTEM
Albert W. Joyner, 3390 Fox Lake Rd., Titusville, Fla. 32780
Filed Nov. 14, 1986, Ser. No. 930,414
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 410—23 **5 Claims**



1. An automatic tie-down restraint system for safely securing a person in a wheelchair while traveling in a motor vehicle, the wheelchair having a pair of front wheels and a pair of rear wheels, said automatic tie-down restraint system comprising:
(a) coupling means adapted to be attached to the frame of the wheelchair for coupling the wheelchair to the motor vehicle;
(b) retractable engaging means including a retractable arm and a hook secured to said arm said arm rotatable from a horizontal position on the vehicle floor to a vertical position for engaging said coupling means in order to secure the wheelchair to the floor of the motor vehicle;
(c) rear chock means adapted to be attached to the floor of the motor vehicle for restraining rearward motion of the wheelchair;
(d) adjustable restraint means cooperating with said retractable engaging means for restraining forward motion of the wheelchair when said retractable engaging means is engaged to said coupling means; and
(e) power actuating means for operating said engaging means in order to secure the wheelchair to the floor of the motor vehicle and in order to selectively release the wheelchair, said power actuating means including an electromechanical actuator, a multiple position retractable piston movably coupled with said actuator, an extension rod, a clevis and pin assembly connecting said piston to one end of said rod, a cable coupling said retractable arm to the other end of said extension rod, connecting means for operatively coupling said retractable engaging means to said adjustable restraint means so that the wheelchair can be simultaneously secured to the floor and restrained from forward motion; and
(f) means for activating said electromechanical actuator and for controlling said retractable engaging means.

4,730,965
BOLT CONNECTION TO CONNECT A HOLLOW PROFILED MEMBER TO A PROFILED MEMBER DISPOSED TRANSVERSE THERETO
Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany
Filed Nov. 14, 1986, Ser. No. 931,478
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540604
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—15 **7 Claims**



1. A bolt connection for securing bridges or ramps provided with roadways, walkways as well as other travel surfaces and for connecting a given first hollow profiled member to a given second profiled member that is disposed transverse thereto, with said first hollow profiled member having an inside height; said connection comprises:
a plate-like member that is resistant to bending and is shiftably disposed in said first hollow profiled member at a steep angle; said plate-like member has a length that is greater than said inside height of said first hollow profiled member; said plate-like member furthermore has a first edge end that displaceably rests on an inner surface of said first hollow profiled member, and a second edge end that rests against an abutment provided on said first hollow profiled member remote from said inner surface thereof; and
a bolt that includes opposite ends and that is supported at the opposite ends of said bolt by said second profiled member and said plate-like member respectively and also is provided with means for pulling first and second ends of said plate-like member against said abutment and said inner surface of said first hollow profiled member into a rigidly fixed position as clamped and wedged at the steep angle substantially transversely inside said first hollow profiled member and at the same time via said bolt holding said second profiled member fixed in transverse positioning thereof relative to said first hollow profiled member.

4,730,966
EXPANSION BOLT ASSEMBLY
Erwin Schiefer, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft
Filed Jul. 14, 1986, Ser. No. 884,997
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525244
Int. Cl.⁴ F16B *13/06*; E21D *20/00*
U.S. Cl. 411—55 **10 Claims**

1. An expansion bolt assembly comprising an axially elon-

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gated anchor bolt having a first end and a second end, said anchor bolt includes an axially extending conically shaped expansion head formed on the first end of the anchor bolt with the axially extending conically shaped surface of said expansion head tapering inwardly from the first end toward the second end of said anchor bolt, a shank extending from the smallest diameter end of said expansion head toward the second end of said anchor bolt, and axially extending second end portion of said anchor bolt located between said shank and the second end of said anchor bolt, said second end portion having means thereon for attaching a load to said anchor bolt, an expansion sleeve laterally enclosing said shank and arranged to be expanded by said expansion head, wherein the improvement



comprises that said second end portion comprises a plurality of angularly spaced axially extending projections protruding radially outwardly from said shank and being uniformly spaced apart around the axis of said anchor bolt, each said projection having a radially outer axially extending surface, said projections being spaced apart by axially extending indentations coextensive with said projections with said indentations located radially inwardly of said projections, said means for attaching a load to said anchor bolt comprises a thread extending circumferentially around said radially outer surfaces of said projections with said thread interrupted by said indentations, and a nut engageable with said thread for securing a load to said anchor bolt.

4,730,967

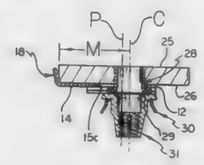
ADJUSTABLE ANTI-ROTATION DEVICE FOR A FASTENER RECEPTACLE

Roy L. Warkentin, Lomita, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 652,798, Sep. 21, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,021

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—103 **4 Claims**



1. A device in combination with a through-hole substructure, a fastener receptacle and a cage for the fastener receptacle, comprising:

said substructure having an edge in a portion thereof and a through-hole positioned within a predetermined range of distances from said edge;

said device having a first portion and a second portion connected to said first portion, said first portion having a free end and a surface, said surface being substantially flush with said substructure, said second portion being constructed so as to extend at an angle from said first portion and in relationship with said substructure edge so as to prevent rotation of said device relative to said substructure;

said fastener receptacle constructed and arranged for securement with said device by said cage, said receptacle including a portion with an opening therein provided for alignment with said substructure through-hole; and

means for permitting self-centering of said receptacle opening with said substructure through-hole within said given range of distances of said substructure through-hole from said substructure edge;

said means including said device having a pair of channel members extending in a direction opposite said substructure, each of said channel members being a given length relative to said substructure through-hole range of distances, and further including said cage being constructed for sliding engagement within said channel members,

whereby said receptacle captivated by said cage engaging said channel members is movable within said channel members along said predetermined range of distances, permitting said receptacle opening to be centered with said substructure through-hole.

4,730,968

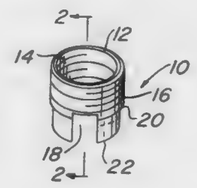
SELF-TAPPING, SELF-ALIGNING THREAD REPAIR INSERT

David Diperstein, 125 Buckley Rd., Glenside, Pa. 19038, and Joseph D. Pagliuca, Paramus, N.J., assignors to David Diperstein, Glenside, Pa. and Groov-Pin Corporation, Ridgefield, N.J.

Filed Sep. 8, 1986, Ser. No. 905,081

Int. Cl.[4] F16B *37/12*

U.S. Cl. 411—178 **11 Claims**



1. A self-aligning thread insert comprises:

an annular sleeve having a wall and a threaded interior surface, a partially threaded exterior surface, and a radial opening through said sleeve wall;

said exterior surface having a tapered threaded portion between a straight threaded portion and a straight non-tapered thread-free portion, said opening extending axially through said tapered threaded portion to provide a cutting means;

said thread-free portion and said opening being adjacent an end of said sleeve;

said thread-free portion being free of threads for a distance of at least 1.5 thread widths from said end of said sleeve and engaging and aligning said sleeve in a bore.

4,730,969

SELF-DRILLING SCREW

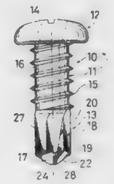
Kameo Dohi, Shiga, Japan, assignor to Nisco Inc., Shiga, Japan

Filed Feb. 12, 1986, Ser. No. 828,645

Claims priority, application Japan, Feb. 12, 1985, 60-25904; Mar. 25, 1985, 60-60212

Int. Cl.[4] F16B *25/00*

U.S. Cl. 411—387 **31 Claims**



1. A self-drilling screw to be screwed into a workpiece, said screw comprising:

a threaded shank having a head at one end and a drill bit at the other end;

said drill bit including a pair of oppositely disposed inclined intrusion faces and a pair of oppositely disposed vertically extending flutes;

a chisel edge formed at a lower extremity of said drill bit and divided into two chisel edge portions by a downwardly projecting apex formed on said chisel edge, said two chisel edge portions extending from said apex in opposite directions with each of said chisel edge portions being slightly inclined at an inclination angle of from 5° to 20° relative to a plane defined as being perpendicular to a longitudinal axis of said drill bit and containing said apex; and

a pair of oppositely disposed and substantially vertically extending rake faces, said rake faces are substantially flat and substantially adjoin each other at an adjoining point disposed on said chisel edge and extend upwardly from said chisel edge in a vertical plane substantially containing said chisel edge and a longitudinal axis of said screw,

wherein said apex is offset from the central longitudinal axis of the screw by a distance corresponding to 5/100–20/100 of a maximum diameter of said drill bit.

4,730,970

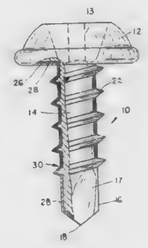
SELECTIVELY HARDENED SELF DRILLING FASTENERS

Jacob Hyner, Waterbury, and Steven Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Company, Thomaston, Conn.

Filed Nov. 12, 1986, Ser. No. 930,007

Int. Cl.[4] F16B *25/00*

U.S. Cl. 411—387 **5 Claims**



1. A screw fastener comprising:

a tip area configured as a drill point;

a screw shank carrying cutting threads proximate to the drill point and non-cutting threads proximate to the cutting threads; and

a screw head connected to the screw shank;

wherein said tip area and cutting threads are formed of hardened steel and said screw head and non-cutting threads are formed of unhardened steel.

4,730,971

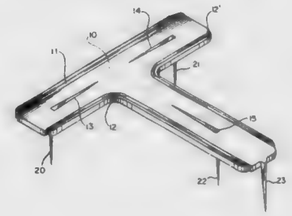
SPIKE PLATE FOR JOINING TWO OR MORE SEPARATE PARTS

Sinii Lin, No. 18-6, Shiao Ping Ding, Tanshui Town, Taipei Hsien, Taiwan

Filed Sep. 23, 1985, Ser. No. 779,283

Int. Cl.[4] F16B *15/00*; **E04B** *1/38*

U.S. Cl. 411—463 **29 Claims**



1. A dog nail body having an upper surface:

a lower surface; and

a first end joining said upper surface and said lower surface, said upper surface having at least two opposing sides which extend at an angle from said first end and define generally along their borders a raised surface, said lower surface having at least two opposing sides located directly opposite of said two opposing sides of said upper surface, said two opposing sides of said lower surface defining an indentation along their borders, said indentation disposed opposite of said raised surface on said upper surface;

at least one body spike having a top end and a bottom end opposite said top end, said top end being formed integral of said body of said dog nail and situated between said raised surfaces on said opposing sides of said top surface, said body spike being disposed away from said body of said dog nail to extend at an angle from said upper and said lower surfaces;

at least one end spike having a top end and a bottom end opposite said top end, said top end of said at least one end spike being formed integral with said first end of said dog head and extending at an angle from said upper and said lower surfaces, said end spike and said body spike being both generally concave along their lengths and narrowing from their said top ends to their bottom ends such that said bottom ends each form a sharp point, said end spike and said body spike each forming a V in lengthwise cross section.

4,730,972

BOOK BINDING METHOD, PAPER SHEETS BINDER AND ADJUSTABLE SPINE

Rickson Sun; David M. Kelley; Craig F. Sampson; Cynthia L. Benjamin, all of Palo Alto, and Dennis J. Boyle, San Mateo, all of Calif., assignors to Taurus Holdings, Inc., Mountain View, Calif.

Filed Mar. 14, 1986, Ser. No. 840,124

Int. Cl.[4] B42C *1/00*; **B42B** *5/08*; **B42F** *3/04, 13/14*

U.S. Cl. 412—7 **50 Claims**

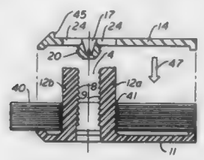
1. A method of binding a book having plurality of sheets formed with a plurality of spaced apertures adjacent a margin of said book comprising:

inserting a first clamping member, having a pair of spaced

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posts with ratcheted surfaces extending across said posts and facing each other, into and through at least one of spaced apertures;

placing a second clamping member, having a hinged pawl means extending across said second clamping member, over said pair of posts such that said pawl means meshes with at least one of said ratcheted surfaces;



pressing said first and second clamping members together with a force until said pawl means is pushed into said spaced apertures of said plurality of sheets and is forced into the most inward of at least one of said ratcheted surfaces dependent on the thickness of said plurality of sheets and the amount of said force; and then

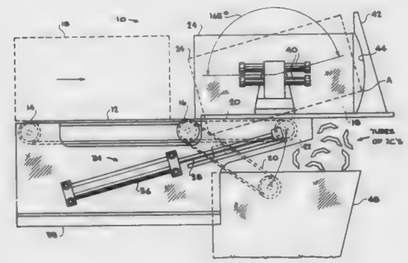
breaking-off at a ratcheted surface any excess of length of said posts which extends beyond said second clamping member outboard of said pawl means.

4,730,973

AUTOMATIC UNLOADING MECHANISM

Paul J. Sokolovsky, Sunnyvale, and Huyhn W. Tan, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 5, 1987, Ser. No. 21,960
Int. Cl.⁴ B65G *65/23*
U.S. Cl. 414—421 **18 Claims**



1. An unloading mechanism for unloading a box comprising:

conveyor means including a conveyor belt extension for transporting a box to be unloaded;

cage means for receiving the box to be unloaded from said conveyor means;

means for pivoting downwardly said belt extension from a first horizontal position to a second position so as to permit rotation of said cage means; and

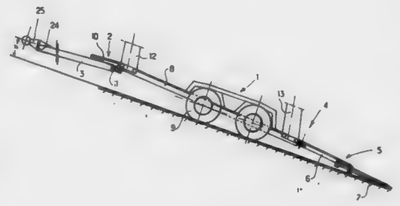
means for rotating said cage means through approximately 165° in a first direction in order to unload the contents of the box into a hopper only when said conveyor belt extension is in the second position.

4,730,974

TILT TRAILER IN PARTICULAR FOR A ROAD TRANSPORT VEHICLE CARRIER

Jean-Luc Andre, Dangolsheim, France, assignor to Lohr S.A., Hangenbieten, France

Filed Oct. 2, 1985, Ser. No. 783,203
Claims priority, application France, Nov. 6, 1984, 84 16972
Int. Cl.⁴ B60P *1/00*
U.S. Cl. 414—483 **1 Claim**



1. In a trailer adapted to be connected with a front end thereof to a rear-end of a carrier vehicle, said front end of the trailer being held in an operative position of said trailer at a predetermined height above ground, when said trailer is connected to the rear-end of said carrier vehicle, the trailer including a frame defining a trailer frame plane extending in a hauling position of the trailer substantially parallel to the ground, a front extension and a rear extension of said trailer frame extending substantially along said trailer frame plane, said front extension being connected between said front end and the trailer frame, said trailer front end including an elongated drawbar defining a drawbar plane subtending a first angle close to 180° with said trailer frame plane in said hauling position, the improvement comprising

angle varying means for changing said first angle to a second angle when said trailer frame is in a position for providing access to vehicles to be loaded onto the trailer for subsequent passage to said carrier vehicle, said predetermined height being similar in said hauling and vehicle access positions of said trailer frame, whereby said rear extension touches the ground when said drawbar plane subtends said second angle with said trailer frame plane, so as to provide a gently sloping vehicle access ramp,

wherein said angle varying means comprises a cylinder-piston unit, and articulated leverage means being connected near one end thereof to a piston rod of said cylinder-piston unit, having another end thereof articulatably connected to said trailer front extension, and having an intermediate hinge thereof connected to said drawbar,

wherein said articulated leverage means is movable between a hauling state and a vehicle access state, and further comprises self-locking means for preventing movement of said leverage means out of said hauling state along at least one direction when said trailer frame is in said hauling position, and

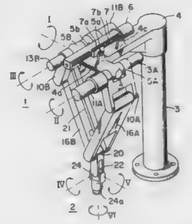
wherein said articulated leverage means comprises a first arm hingeably connected with one end thereof to an end of said piston rod, and hingeably connected with another end thereof to said drawbar, and an elbow-shaped arm hingeably connected with one end portion thereof to said other end of said first arm, the other end portion of said elbow-shaped arm constituting said other end of said leverage means.

4,730,975

INDUSTRIAL ROBOT

Tadashi Munakata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1986, Ser. No. 853,444
Claims priority, application Japan, Apr. 22, 1985, 60-84407
Int. Cl.⁴ B66C *18/00*
U.S. Cl. 414—735 **6 Claims**



1. An industrial robot of a type having an arm made of pentagonally connected links, an uppermost link thereof extending horizontally and having a horizontal axis and being secured to a stationary member to be rotatable around the horizontal axis, said robot comprising:

a first motor provided between said stationary member and said uppermost link for rotating said uppermost link around its axis;

second and third motors provided at opposite ends, respectively, of said uppermost link for operating upper links of said pentagonally connected links in a swingable manner, said upper links being downwardly connected with lower links of the pentagonally connected links, respectively, and the lower ends of the lower links being connected with each other in a pivotal manner; and

a wrist assembly pivotally connected to the lower ends of the lower links so as to be swingable in a plane defined by said lower links.

4,730,976

ARTICULATED ARM TRANSFER DEVICE

James C. Davis, and Norman B. Brooks, both of Carlisle, Mass., assignors to Aeronca Electronics, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 466,091, Feb. 14, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 695,899
Claims priority, application PCT Int'l Appl., Feb. 13, 1984, PCT/US84/00185
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.⁴ B65G *65/00*
U.S. Cl. 414—749 **12 Claims**

1. An apparatus for transferring objects, comprising:

a support;

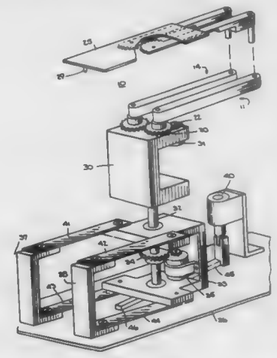
first and second articulated arms supported on said support;

said first articulated arm having a drive segment disposed for rotation about a first axis and a driven segment;

said second articulated arm having a drive segment disposed for rotation about a second axis and a driven segment, said drive segment of said second articulated arm being coupled to and driven by rotation of said drive segment of said first articulated arm;

holding means pivotally coupled to said driven segments of said first and second articulated arms, said driven segments being engaged so as to prevent rotation of said holding means; said first and second articulated arms and said holding means being mounted for movement within a vacuum chamber; and

means capable of driving said drive segment of said first articulated arm for rotation through an angle in the range of from at least 120 degrees up to and including 180 degrees at a constant rotational speed to move said holding means between an extended position and a retracted position such that said holding means moves with harmonic motion;

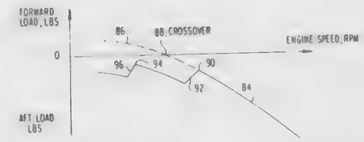


4,730,977

THRUST BEARING LOADING ARRANGEMENT FOR GAS TURBINE ENGINES

Frederic G. Haaser, Montgomery, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 31, 1986, Ser. No. 948,370
Int. Cl.⁴ F01D *3/00*
U.S. Cl. 415—104 **12 Claims**



1. In a gas turbine engine including a stationary wall and a rotor comprising a compressor and a turbine, a thrust bearing loading arrangement comprising:

(a) means for mounting said rotor for rotating movement, said means including a thrust ball bearing;

(b) said engine including at least one sealed cavity between a portion of said rotor and said stationary wall;

(c) said cavity including an aft wall and a forward wall, one of said walls having a greater surface area than the other of said walls;

(d) said stationary wall having an opening aft of said compressor for providing a path for flow of compressor discharge air into said cavity to increase the load on said thrust bearing;

(e) means responsive to compressor discharge pressure for controlling flow of compressor discharge air into said cavity to insure unidirectional loading on said thrust bearing throughout the normal operating range of said engine.

4,730,978

COOLING AIR MANIFOLD FOR A GAS TURBINE ENGINE

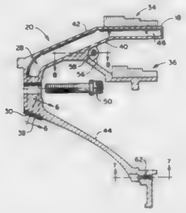
Walter J. Baran, Jr., South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 28, 1986, Ser. No. 924,008
Int. Cl.⁴ F01D *5/14*
U.S. Cl. 415—115 **3 Claims**

1. A cooling air delivery manifold for supplying an annular

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rotating flow of cooling air to one side of a rotating turbine disk, comprising:
- a first generally frusto-conical wall extending radially outward and axially upstream from adjacent the rotating disk;
- a second generally frusto-conical wall, spaced radially inward and axially upstream of the first wall;
- a third wall, secured to the upstream end of the first wall and extending radially outward and axially upstream therefrom, the third wall including an annular mounting flange at the radially outer end for supportably engaging an annular combustor outlet nozzle;
- a plurality of flow dividers extending between the first and



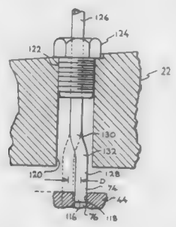
second walls for forming a plurality of separate air flow channels therebetween, the radially inner end of each flow divider being skewed circumferentially with respect to the rotation axis of the disk for forming a plurality of skewed flow nozzles, and the axially upstream end of each flow divider including a thickened portion defining a boss, the boss including an axially extending hole therethrough for receiving a mounting bolt; and
- a plurality of skewed cooling air holes disposed proximate the mounting flange of the third wall, the holes being skewed with respect to the rotation axis for delivering a flow of cooling air adjacent the periphery of the rotating disk.

4,730,979

SENSOR GUIDE TUBE ASSEMBLY FOR TURBINE WITH CLEARANCE RESTORATION ADJUSTMENT

Richard B. Hook, Jr., Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1985, Ser. No. 811,976
Int. Cl.[4] G01K *7/02;* **F01D** *25/00*
U.S. Cl. 415—118 **3 Claims**



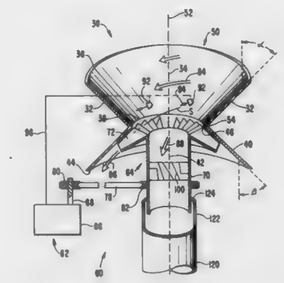
1. A guide tube assembly for a turbine, said turbine including a housing and an inner member, said inner member being displaceable in a predetermined direction a predetermined distance D with respect to said housing, comprising:
- a guide tube extending between said housing and said inner member;
- a guide tube access hole through said housing;
- a sealable fitting in said guide tube access hole;
- an upper portion of said guide tube passing sealably through said sealable fitting;
- a lower portion of said guide tube;
- an end of said lower portion fitting into an opening in said inner member;
- first and second bends in said guide tube effective to displace said lower portion from said upper portion by a distance substantially equal to half of said distance D while maintaining said upper and lower portions substantially parallel to each other; and
- said sealable fitting being of a type permitting said guide tube to be rotated at least 180 degrees therein, whereby said lower portion is moveable said distance D in said predetermined direction.

4,730,980

AIR SUPPLY SYSTEM

George W. Hughes, 2178 N. Orange Grove, Pomona, Calif. 91767

Filed Jul. 23, 1985, Ser. No. 758,059
Int. Cl.[4] F04D *29/00*
U.S. Cl. 415—143 **9 Claims**



1. An air supply system comprising:
- an air acceleration chamber, said chamber including
  - (i) a hollow, open-ended intake duct in the shape of a truncated cone, and
  - (ii) a hollow, open-ended exhaust duct in the shape of a second truncated cone, wherein said intake and exhaust ducts are coaxially aligned along a chamber axis and are joined at their respective truncated conical ends to form a minimum flow area throat edge;
- fan means for generating first and second accelerated air streams in said air acceleration chamber, said fan means including
  - (i) fan drive means,
  - (ii) a fan impeller mounted in said exhaust duct for rotation about the exhaust duct axis, said fan impeller being operatively connected to be rotatingly driven by said fan drive means, said impeller having a hollow, open-ended hub and a first set of blades mounted on the outer periphery of said hub, said first accelerated air stream flowing between the outer periphery of said hub and said exhaust duct, and said second accelerated air stream flowing through the interior of said hub.

4,730,981

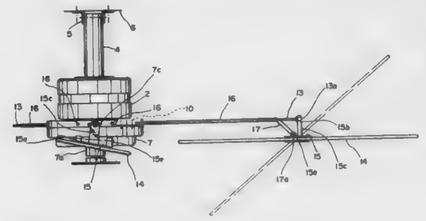
CEILING FAN

Yuzo Kawai, Nara, Japan, assignor to Kabushiki Kaisha Suiden, Osakashi, Japan

Filed Jul. 17, 1986, Ser. No. 886,338
Claims priority, application Japan, Aug. 3, 1985, 60-171658
Int. Cl.[4] F04D *29/36*
U.S. Cl. 416—83 **4 Claims**

1. A ceiling fan having flapping vanes, the ceiling fan comprising:
- a motor casing accommodating a motor;
- a worm shaft fixed to the motor casing;

- a motor shaft means rotatively passed through the worm shaft to drive said worm shaft and to also rotatingly drive the fan;
- a gear box having a boss through which the driving shaft is passed;
- a driver gear provided in the gear box, the gear being connected to the driving shaft through a bevel gearing on the worm shaft;
- a follower gear train including a plurality of follower spur gear means engageable with the driver gear;



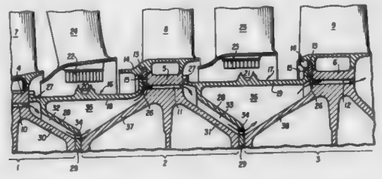
- a number of crank rod means corresponding to the number of flapping vanes, the crank rod means being pivotally connected to the correspondingly selected number of follower gear means for reciprocating movement in a substantially horizontal plane; and
- flapping vanes rotatively connected to the crank rods so that the vanes flap in accordance with the substantially horizontal reciprocal movement of the crank rods.

4,730,982

ASSEMBLY FOR CONTROLLING THE FLOW OF COOLING AIR IN AN ENGINE TURBINE

Robert Kervistin, Le Mee sur Seine, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jun. 17, 1987, Ser. No. 63,075
Claims priority, application France, Jun. 18, 1986, 86 08776
Int. Cl.[4] F01D *5/18, 5/08*
U.S. Cl. 416—95 **5 Claims**



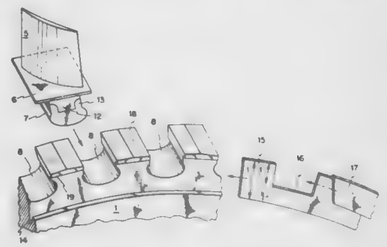
1. In an engine turbine comprising
- turbine rotor discs having sockets in the outer peripheries thereof,
- turbine rotor blades mounted on said discs with root portions of said blades in said sockets,
- cooling passages at the bottom of said sockets for the flow of cooling air therethrough,
- labyrinth carriers separating said discs, and
- an assembly for controlling the flow of cooling air through said passages comprising
  - annular closure means at the upstream and downstream ends of said labyrinth carriers adapted selectively to block and unblock said cooling passages in response to differential radial expansion of said discs and said labyrinth carriers,
  - blocking of said passages being determined by the positions of said closure means and of said passages, which positions are in turn determined by the dimensions and thermal expansion coefficients of said discs and said labyrinth carriers.

4,730,983

SYSTEM FOR ATTACHING A ROTOR BLADE TO A ROTOR DISK

Jacky Naudet, Bondoufle, and Jean-Louis Bertrand, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA" , Paris, France

Filed Aug. 26, 1987, Ser. No. 89,414
Claims priority, application France, Sep. 3, 1986, 86 12357
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—220 R **13 Claims**



1. A system for removably attaching and sealing a rotor blade to a rotor disk for a turbojet engine having a longitudinal axis comprising:
- (a) a plurality of substantially axially extending notches defined in the periphery of the rotor disk;
- (b) a foot formed on each rotor blade and adapted to be substantially axially slidably received in a notch of the rotor disk, the foot having thereon locating means to axially locate the foot with respect to the rotor disk, and a downstream flange defining a substantially circumferentially extending first groove opening radially inwardly;
- (c) a substantially circumferentially extending second groove defined by the rotor disk, the second groove opening radially outwardly; and
- (d) locking means to axially lock and seal the blade foot to the rotor disk comprising:
  - (i) a first split ring member adapted to engage the first and second grooves; and,
  - (ii) a second split ring member adapted to engage only the first grooves such that the sum of the axial thicknesses of the first and second members is substantially equal to the axial thickness of the first grooves.

4,730,984

BLADED ROTOR STRUCTURE HAVING BIFURCATED BLADE ROOTS

Ralph J. Ortolano, 3776 Coolheights Dr., Rancho Palos Verdes, Calif. 90274

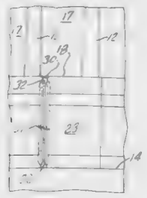
Filed Sep. 8, 1986, Ser. No. 904,363
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—222 **20 Claims**

1. A rotor apparatus for axial flow coupling to a fluid, the apparatus comprising:
- (a) a rotor disc having circumferential rib attachment means;
- (b) an annular array of blades for contacting the fluid, the each blade having a root portion externally engaging opposite sides of the attachment means, the blade extending outwardly from the root portion, the root portions having an aggregate circumferential thickness of slightly less than an associated circumference of the disc;
- (c) at least one pair of liner members, each pair of the liner members being located on opposite sides of the attachment means between the root portions of the adjacent

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blades for spacing apart the adjacent blades, thereby adjusting the aggregate circumferential thickness of the root portions to the disc circumference; and

(d) means for retaining the liner members proximate the attachment means, comprising the root portion of at least



one of the blades adjacent to each of the liner members being adapted for forming a retainer member extending circumferentially over a portion of the liner member for preventing movement of the liner member away from the attachment means.

4,730,985

PROP-FAN WITH IMPROVED STABILITY

Edward A. Rothman, Glastonbury, and John A. Violette, Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 699,119, Feb. 7, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 892,882

Int. Cl.⁴ B64C *11/18*

U.S. Cl. 416—228 **6 Claims**



1. A prop-fan comprising a plurality of swept, rotatable airfoil blades pivotally mounted to a hub for pitch change movement with respect thereto, and having a solidity ratio of 1.0 or greater at the roots of said blades and less than 1.0 at the tips of said blades, said prop fan being operable at or above critical Mach numbers and at transonic or supersonic tip speeds, and being characterized by:

each of said blades having a leading edge, said leading edge, from a location thereon at approximately a midportion of the span and said blade, outwardly to the tip thereof, being curved in a chordal direction to define blade sweep while exhibiting no significant offset curvature in a span-wise direction.

4,730,986

VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR WITH WOBBLE ANGLE CONTROL VALVE

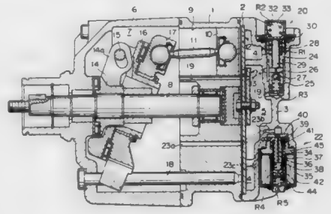
Hiroaki Kayukawa; Masaki Ohta; Shinichi Suzuki, and Kenji Takenaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 20, 1987, Ser. No. 40,484

Claims priority, application Japan, Apr. 25, 1986, 61-097246

Int. Cl.⁴ F04B *49/00, 1/76*

U.S. Cl. 417—222 **10 Claims**



1. A variable displacement wobble plate type compressor adapted for use in an air-conditioning circuit of a vehicle, comprising:

a housing element having therein a suction chamber for a refrigerant before compression and a discharge chamber for a refrigerant after compression;

a cylinder block defining therein a plurality of cylinder bores arranged so as to surround an axial drive shaft and having therein associated reciprocatory pistons disposed so as to draw the refrigerant from the suction chamber and to then discharge the refrigerant after compression into the discharge chamber;

a crankcase having defined therein a chamber communicating with the cylinder bores and containing therein a drive plate mounted in such a manner that it is capable of rotating with the drive shaft as well as changing an inclination thereof with respect to the drive shaft and a non-rotating wobble plate held by the drive plate;

a plurality of connecting rods connected between said wobble plate and the pistons;

a first passageway means for fluidly communicating said chamber of said crankcase with said discharge chamber of said housing element;

a first valve means arranged in said first passageway means, for opening and closing said first passageway means;

a second passageway means for providing a fluid communication between said chamber of said crankcase and said suction chamber of said housing element;

a second valve means arranged in said second passageway means, for varying an extent of opening of a part of said second passageway means;

a first valve control means including a first means for sensing a change in a fluid pressure value indicative of a change in a refrigerating load applied to said air-conditioning circuit, with respect to a predetermined first level, and a second means for controlling an operation of said first valve means in response to a signal from said first means, said first valve control means mechanically moving said first valve means between a first position opening a part of said first passageway means and a second position closing said part of said first passageway means, and;

a second valve control means including a first actuating means for electrically actuating said second valve means in response to at least one of electrical signals indicating a change in a physical value relative to said air-conditioning circuit and the vehicle to be air-conditioned, respectively, said first actuating means of said second valve control means moving said second valve means between a first position minimizing the extent of opening of said part of said second passageway means and a second position maximizing the extent of opening of said part of said second passageway means.

4,730,987

VARIABLE DELIVERY COMPRESSOR

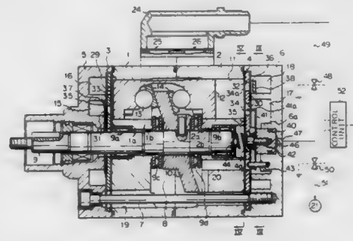
Katsunori Kawai; Hiroyuki Deguchi; Hisao Kobayashi, and Shuichi Sugizono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Sep. 24, 1986, Ser. No. 910,948

Claims priority, application Japan, Oct. 4, 1985, 60-222561

Int. Cl.⁴ F04B *1/26*

U.S. Cl. 417—270 **10 Claims**



1. A variable delivery compressor adapted for use in compressing a refrigerant gas of an air-conditioning circuit of a vehicle comprising:

cylinder block means having therein a plurality of compression chambers in which reciprocatory compression pistons are received, respectively;

housing means having therein a suction chamber from which the refrigerant gas before compression is sucked into the plurality of compression chambers and a delivery chamber into which the compressed refrigerant gas is delivered from the compression chambers;

a valve plate arranged between said cylinder block means and said housing means, and having therein suction ports providing a fluid communication between respective said compression chambers and said suction chamber and delivery ports providing a fluid communication between respective said compression chambers and said delivery chambers;

a suction flange element attached to said cylinder block means, for introducing said refrigerant gas before compression from said air-conditioning circuit into said suction chamber;

a delivery flange element attached to said cylinder block, for delivering said compressed refrigerant gas from said delivery chamber to said air-conditioning circuit;

delivery valve means for closing said delivery ports that provide a fluid communication between said plurality of compression chambers and said delivery chamber, said delivery valve means being opened by said compressed refrigerant gas when delivered from the compression chambers into said delivery chamber;

suction valve means for closing said suction ports that provide a fluid communication between said plurality of compression chambers and said suction chamber, and capable of being opened by said refrigerant gas sucked from the suction chamber into respective said compression chambers;

a spool means axially slidably mounted in a pressure chamber defined by inner wall means projected inside said housing

a valve pressing plate means held by said spool means so as to be moved together with said spool means and adapted for forcibly displacing a predetermined part of said suction valve means from a first position for closing said suction ports of said valve plate to a second position for opening said suction ports when said valve pressing plate means is moved toward said suction valve means;

a plurality of valve pressing tongues projected outwardly from an outer periphery of said valve pressing plate means, each said valve pressing tongue being axially extended toward said suction valve means so as to be engaged with said suction valve means when said spool means is moved toward said suction valve means;

means for permitting said predetermined part of said suction valve means which has been forcibly opened by said valve pressing plate means and said valve pressing tongues to return to said first position from said second position in response to movement of said compression pistons toward top dead centers thereof;

a control unit for providing a control signal indicating that a change in a delivery amount of said compressor is needed in response to a change in a cooling load applied to said air-conditioning circuit, and;

an actuating means for causing movement of said spool means toward said suction valve means upon being energized by said control signal of said control unit.

4,730,988

OIL FOAM ENHANCING AND TURBULENCE REDUCING APPARATUS IN A COMPRESSOR

Wei-Ming W. Ma, Williamsville, N.Y., assignor to American Standard Inc., New York, N.Y.

Filed Nov. 6, 1986, Ser. No. 927,619

Int. Cl.⁴ F04B *39/00, 39/02*

U.S. Cl. 417—313 **17 Claims**

1. Noise suppression apparatus for a compressor having a sump in which oil collects and in the bottom of which debris settles, comprising:

a mechanical stirrer mounted for movement in the oil sump of the compressor to create turbulence and foam in oil collected therein; and

means for locally containing the turbulence created in said oil by the movement of said stirrer while simultaneously enhancing the foaming of said oil for purposes of noise suppression, said containing means being cup-like and including a base portion that is spaced from and overlies the bottom of the oil sump so that debris settling at the bottom of the oil sump beneath said base portion is shielded from the turbulence created by said stirrer.

4,730,989

ROTODYNAMIC PUMP WITH SPHERICAL BEARING

Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011

Continuation-in-part of Ser. No. 695,915, Oct. 11, 1984, abandoned. This application Aug. 12, 1986, Ser. No. 895,962

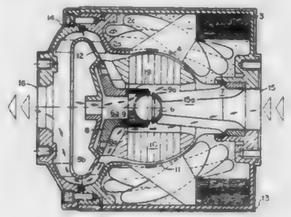
Int. Cl.⁴ F04B *17/00, 35/04*

U.S. Cl. 417—357 **5 Claims**

1. A canned pump-motor unit for increasing the pressure of a flux of liquid, whose motor has a stator and a rotor separated by a spherical magnetic cap, the rotor forming a rotating unit around an axis of rotation with an impeller which separates the

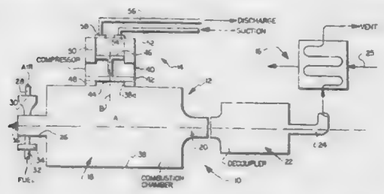
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pressure region from a suction region of the pump part of said pump motor unit, said rotating unit being supported by a spherical bearing consisting of a ball having a radius and a bearing cap, the ball being mounted on a stationary pedestal, the bearing cap forming part of the rotor-impeller-unit and riding on a surface of the ball, characterized in that the rotor impeller unit (**8,10**) is located between the pressure region (**16***a*) and the suction region (**15***a*), said bearing cap (**9**) having a slot shaped channel (**19,30**) defined by two wide and two narrow walls, said channel extending from one axial end of said bearing cap (**9**) to the other, the two wide walls of said channel (**19,30**)



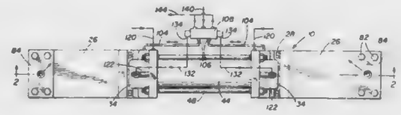
having a substantially longer radial extension than the radius of the ball (**6**), said wide walls following essentially radially aligned planes running parallel to the axis of rotation, and one of the two narrow walls of said channel running parallel to said axis of rotation at a distance which is considerably larger than the radius of the ball (**6**), a part of said channel which is defined by said narrow wall and adjacent parts of the two longer walls forming an aperture together with the surface of the ball (**6**), to cause considerable back flow of the liquid conveyed, created by the pressure of the pump, from the pressure region (**16***a*) to the suction region (**15***a*).

4,730,990
PULSE COMBUSTION ENGINE AND HEAT TRANSFER SYSTEM
Richard J. Priem, Middleburg Heights; M. Reza Ghassemzadeh, Cleveland, and James C. Griffiths, Lyndhurst, all of Ohio, assignors to American Gas Association, Cleveland, Ohio
Division of Ser. No. 855,809, Apr. 24, 1986, Pat. No. 4,685,510. This application Apr. 10, 1987, Ser. No. 37,189
Int. Cl.⁴ F04B *17/00*
U.S. Cl. 417—381 **17 Claims**



1. A pulse combustion powered apparatus for heating and pressurizing fluids comprising in combination a pulse combustion heat engine, compressor means, and primary heat exchange means for transferring heat rejected by the heat engine to a primary fluid to be heated, said heat engine including chamber means for pulse combustion of a fuel to provide combustion gases which have cyclic periods of positive and negative pressure, said compressor means including piston means arranged for reciprocatory motion to pressurize a fluid to provide the work output of said compressor and means drivingly interconnecting said piston means and chamber means to reciprocate said piston means in response to said positive and negative pressures of said combustion gases.

4,730,991
GAS ACTUATED PROPORTIONING PUMP
Gerard J. Handfield, Edmonton, Canada, assignor to James M. Greentree, Edmonton, Canada
Filed Jul. 29, 1986, Ser. No. 890,395
Int. Cl.⁴ F04B *35/00*
U.S. Cl. 417—397 **6 Claims**

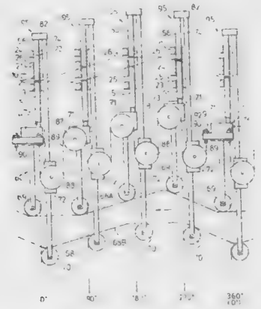


1. A natural gas driven pump for glycol metering in a dehydrator system of a gas well, said pump including support structure defining a pair of spaced apart first mounting portions, a pair of cylinder heads removably stationarily supported from said mounting portions in predetermined positions thereof, an open ended drive cylinder extending between and removably mounted from said heads in keyed positions relative thereto, a pair of second mounting portions carried by said support structure spaced from and on remote sides of said heads, said heads including aligned central bores formed therethrough, a drive piston reciprocal in said drive cylinder and including oppositely axially projecting pump pistons projecting through said central bores, first radially fixed annular seal means removably mounted in the remote ends of said central bores, said second mounting portions including mounting flanges disposed generally normal to said cylinder and having through bores formed therein substantially coaxial with said drive cylinder and central bores, the remote ends of said through bores including counter bores in which second radially shiftable annular seal means are seated and through which said pump pistons are sealingly slidingly received, a pair of axially aligned pump cylinders including closed remote ends and open adjacent ends, said open adjacent ends beings removably mounted from said flanges over said counter bores closing said adjacent ends and removably securing said second annular seal means in adjusted radially shifted positions in said counter bores, said pump pistons being sealingly and slidingly received through said second annular seal means and projecting into the adjacent ends of said pumping cylinders, fluid pressure supply and discharge means operatively associated with each of the remote ends of said drive cylinder for supplying and discharging drive fluid under pressure to and from said drive cylinder ends and incorporating fluid pressure actuated reversing valve means for alternately inversely communicating said drive cylinder ends with a pressurized drive fluid source and a drive fluid discharge, each drive cylinder end including pressurized operating fluid supply means and drive piston engageable control means for supplying operating fluid under pressure to said valve means for alternate actuation thereof responsive to reciprocation of said drive piston in said drive cylinder, the remote ends of said pumping cylinders each including check valve equipped fluid inlet and outlet means for receiving and discharging fluid to be pumped.

4,730,992
CONTINUOUSLY OPERABLE HYDRAULIC DEVICE
Kenji Ogawa, Musashino, Japan, assignor to Neuberg Company Limited, Tokyo, Japan
Filed Mar. 24, 1987, Ser. No. 30,205
Claims priority, application Japan, Mar. 26, 1986, 61-67696
Int. Cl.⁴ F04B *19/00, 19/22*
U.S. Cl. 417—465 **5 Claims**

1. A continuously operable hydraulic device, wherein a plurality of unit hydraulic devices are provided, each of said unit hydraulic devices comprises: a hollow port block; first and second ports communicated with the interior of said port block and provided at positions a predetermined distance apart from

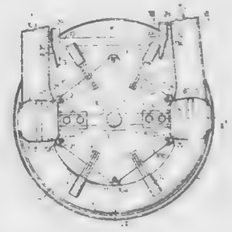
each other; first and second plungers inserted into said port block in a manner to be axially slidable on one and the same axial line and the end faces of which are opposed to each other; and and a rotating cam mechanism for driving the first and second plungers relative to said port block in a predetermined relationship with each other, said rotating cam mechanism having: an introducing function of moving the first and second plungers in directions for separating both plungers from each other by a predetermined value to introduce fluid of a predetermined value into a space formed between both plungers in a state where the space formed between the end faces of the first and second plungers, which are opposed to each other, is communicated with the first port; a valve switching means for moving the first and second plungers relative to said port block to positions where a portion of the fluid introduced in the space



formed between the first and second plungers is communicated with the second port in such a manner that the first and second plungers are held in said positional relationship; and a discharging means for effecting a movement of the first and second plungers toward each other by a predetermined value after both plungers are moved toward the second port, to thereby discharge the fluid introduced into the space formed between the first and second plungers, and timing means for the timing of actions of said unit hydraulic devices such that the total quantity of the fluid caused to be discharged from the unit hydraulic devices by said rotating cam mechanism becomes constant at all times, said rotating cam mechanism being connected with a rotary angle detecting mechanism, a braking mechanism and a driven component, whereby fluid is supplied to the first port, so that said driven component is driven commensurate to the supplied value of the fluid.

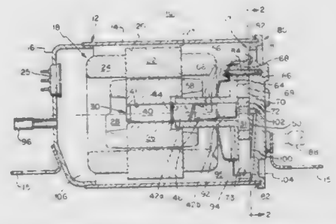
4,730,993
SQUEEZE PUMP
Noboru Iwata, Gifu, Japan, assignor to Daiichi Engineering Co., Ltd., Gifu, Japan
Continuation-in-part of Ser. No. 628,705, Jul. 9, 1984, Pat. No. 4,632,646, which is a continuation-in-part of Ser. No. 440,214, Aug. 2, 1982, Pat. No. 4,492,538. This application May 22, 1986, Ser. No. 866,826
Claims priority, application Japan, Dec. 13, 1980, 55-176235; Mar. 25, 1981, 56-44490; Jul. 6, 1981, 56-105354; Jul. 23, 1981, 56-116270; PCT Int'l Appl., Jul. 30, 1982, PCT/JP81/00364; Japan, Dec. 30, 1985, 60-297234; Dec. 30, 1985, 60-297235; Jan. 13, 1986, 61-4660
Int. Cl.⁴ F04B *43/12, 15/02*
U.S. Cl. 417—477 **7 Claims**

1. A squeeze pump comprising:
(a) a casing (**1**) having an arcuate inner peripheral surface;
(b) a resilient tube (**14**) bent arcuately in said casing (**1**) and having opposite ends projecting outwardly from said casing (**1**) through openings (**28**),(**29**) therein;
(c) a rotary shaft (**3**) disposed in an axis of said casing (**1**); and
(d) at least a pair of squeezing means mounted on said rotary shaft (**3**) in said casing (**1**), said squeezing means including a pair of roller shafts (**5**) extending perpendicularly to said rotary shaft (**3**), and a pair of squeeze rollers (**7**) rotatably mounted on the respective roller shafts (**5**) and rollable on opposite side surfaces of said resilient tube (**14**) and revolvable at the same time about said rotary shaft (**3**) for compressing said resilient tube (**14**) from opposite sides thereof to transmit slurry in said casing (**1**), each of said



squeeze rollers (**7**) being divided along its axis into three independently rotatable roller sections, namely, a base end roller section (**67**) constituting a base portion of said squeeze roller (**7**), a distal end roller section (**77**) constituting a distal end portion of said squeeze roller (**7**), and an intermediate roller section (**87**) constituting an intermediate portion between said base end roller section (**67**) and said distal end roller section (**77**).

4,730,994
COMPRESSOR WITH IMPROVED EXPOSED OUTBOARD THRUST PLATE AND METHOD OF ASSEMBLY
Michael J. Maertens, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Dec. 12, 1986, Ser. No. 940,852
Int. Cl.⁴ F04B *17/00, 39/02*
U.S. Cl. 417—572 **6 Claims**



1. A hermetically sealed rotary compressor comprising:
a housing having an open end and a closed end;
an end plate sealing said open end and cooperating with said housing to define a housing cavity; and
means for compression of gaseous fluids positioned in said housing cavity; said end plate including an interior surface, an exterior surface, a groove at the perimeter of said interior surface, and a centroidal plane through the center of mass of said end plate generally parallel to and approximately midway between said interior and exterior surfaces, wherein said housing matingly contacts said groove and said housing cavity is hermetically sealed by a weldment joining said housing and said end plate approximately in said centroidal plane.

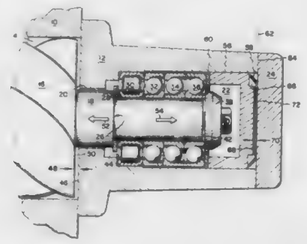
VOL 1088 ISS 3 MR 15 1988 UMI

4,730,995

SCREW COMPRESSOR BEARING ARRANGEMENT WITH POSITIVE STOP TO ACCOMMODATE THRUST REVERSAL

Randy E. Dewhirst, Onalaska, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Sep. 25, 1986, Ser. No. 911,539
Int. Cl.[4] F04C *18/16*
U.S. Cl. 418—1 **19 Claims**



1. A method for precluding the contact of the high pressure end face of a screw rotor with the high pressure end wall of the working chamber in a screw compressor due to the development of reverse axial thrust on the rotor comprising the steps of:

establishing an operating clearance between the high pressure end face of said rotor and the high pressure end wall of the compressor working chamber by fixing the location of the bearings on the shaft which extends from the high pressure end face of the screw rotor;

compressing a spring against a fixed surface in said compressor;

transmitting the force developed by the compression of said spring, through an element having a contact surface, to the rotor bearings so as to preload the bearings and so as to impart a continuous axial load to the rotor which urges the rotor away from the high pressure end wall of the working chamber; and

establishing a gap between the contact surface of the force transmitting element and a fixed surface of said compressor which is less than the operating clearance established between the rotor and working chamber end wall so that the contact surface of the transmitting element comes into contact with a fixed compressor surface prior to the contact of the rotor with the working chamber end wall when sufficient axial thrust is developed in the compressor to drive the rotor toward the high pressure end wall of the compressor working chamber.

4,730,996

ROTARY COMPRESSOR WITH TWO DISCHARGE VALVES HAVING DIFFERENT FREQUENCIES

Masahiro Akatsuchi, Fuji, and Tsugio Itami, Numazu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1986, Ser. No. 890,336
Claims priority, application Japan, Jul. 29, 1985, 60-115075[U]; Jul. 31, 1985, 60-116496[U]
Int. Cl.[4] F04C *29/06;* F16K *15/16, 51/00*
U.S. Cl. 418—15 **7 Claims**

1. A rotary compressor comprising: a case storing lubrication oil therein;

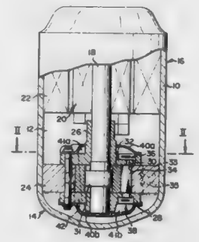
a compression section including a cylinder arrangned in the case and first and second bearings fixed on both sides of the cylinder to define a compression chamber together with the cylinder, for compressing a fluid taken into the compression chamber;

a drive section arranged in the case to drive the compression section;

a first discharge mechanism including a first discharge port formed in the first bearing and a first discharge valve for opening and closing the first discharge port, for discharging a fluid compressed in the compression chamber into the outside of the compression chamber;

a first muffler cover provided on the first bearing to cover the first discharge mechanism and defining a muffling chamber communicating with the first discharge port;

a second discharge mechanism which involves a second discharge port formed in the second bearing and a second discharge valve for opening and closing the second discharge port, for discharging fluid compressed in the compression chamber into the outside of the compression chamber, the second discharge port having a cross sectional area at least one and a half times larger than that of the first discharg port; and



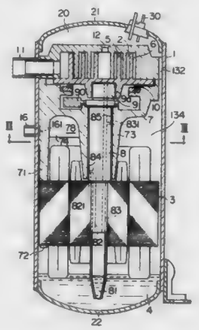
a second muffler cover provided on the second bearing to cover the second discharge mechanism and defining a second muffling chamber communicating with the second discharge port, the second muffler cover being immersed in the lubrication oil, and the compression section having a passage, through which the second muffling chamber communicates with the first muffling chamber.

4,730,997

HERMETIC SCROLL COMPRESSOR HAVING CONCAVE SPACES COMMUNICATING WITH A DELIVERY PORT

Takahiro Tamura; Naoshi Uchikawa; Akira Murayama, and Takao Mizuno, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,211
Claims priority, application Japan, Oct. 14, 1985, 60-226726
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 **7 Claims**



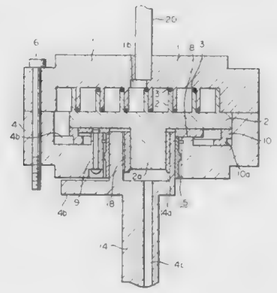
1. A hermetic scroll compressor comprising: a hermetic casing; a scroll compressor section disposed in an upper portion of said hermetic casing and including a pair of scroll members each having an end plate and a scroll wrap formed on said end plate, said scroll members being assembled so that the wraps thereof mesh with each other and define closed spaces between said wraps and said end plates, said closed spaces being progressively decreased in volume when said closed spaces are moved towards a center of said compressor as a result of a relative orbiting motion between said scroll members; an electric motor section for driving said scroll compressor section disposed in a lower portion of said hermetic casing; an oil reservoir formed in a bottom portion of said hermetic casing; a delivery port formed in a portion of said hermetic casing between said compressor section and said electric motor section; and a plurality of fluid passages formed in an outer periphery of said compressor section and along an inner surface of a wall of said hermetic casing, so that a compressed fluid discharged from said compressor section in a discharge space of said hermetic casing is introduced to said delivery port through said fluid passages; a frame to which said compressor section and said electric motor section are secured, a portion of said frame between said compressor section and said electric motor section having a plurality of concave spaces formed therein comunicating with one another, one of said concave spaces being in direct communication with said delivery port while each of the other concave spaces are in communication with at least one of said plurality of fluid passages.

4,730,998

SCROLL-TYPE APPARATUS HAVING A PIVOTING MAIN JOURNAL BEARING

Masayuki Kakuda; Etsuo Morishita; Hiromu Narumiya, all of Amagasaki; Masahiro Sugihara, Wakayama; Tsutomu Inaba, Wakayama, and Tadashi Kimura, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,636
Claims priority, application Japan, Sep. 27, 1985, 60-215450
Int. Cl.[4] F01C *1/04, 21/02;* F16C *17/03*
U.S. Cl. 418—55 **5 Claims**



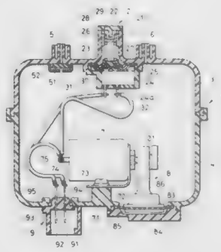
1. An improved scroll-type apparatus of the type having a stationary scroll, a drive shaft, a movable scroll intermeshed with said stationary scroll, a stationary main bearing housing having a hole formed in its center, a main journal bearing disposed in the hole in said main bearing housing for journalling said drive shaft and having an outer surface parallel to the surface of said drive shaft and spaced from to provide clearance with an inner surface of the hole in said housing, and means for drivingly connecting said drive shaft to said moving scroll so that said moving scroll revolves about a center of said stationary scroll without rotating about its own axis when said drive shaft is rotated, and means interposed in the clearance for pivotably supporting said main journal bearing so that its bearing surface remains parallel to the surface of said drive shaft when said drive shaft is caused to tilt within the clearance in response to variations in load applied to said drive shaft by said moving scroll.

4,730,999

NEGATIVE PRESSURE SUPPLY APPARATUS FOR AUTOMOBILES

Yoshiaki Tsukuda, Naka, and Akira Tomita, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,251
Claims priority, application Japan, Aug. 5, 1985, 60-171070; Sep. 4, 1985, 60-193774
Int. Cl.[4] F16D *3:/02*
U.S. Cl. 417—44 **16 Claims**



2. A negative pressure supply apparatus for automobiles comprising: a vacuum tank being connected to an engine intake manifold and storing a negative pressure therein thereby the negative pressure is supplied to a control apparatus as occasion demands; a pressure detecting means for detecting a pressure in said vacuum tank; and a pump section being driven by said pressure detecting means and discharging an air in said vacuum tank into an atmosphere; characterized in that

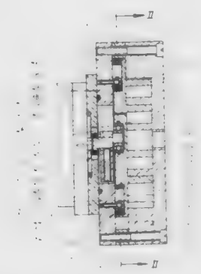
a part of said pressure detecting means and a part of said pump section are formed respectively at a wall of said vacuum tank, and thereby said pressure detecting means and said pump section are formed integrally on said vacuum tank.

4,731,000

SPIRAL COMPRESSOR WITH GUIDES FOR FIXING THE SPIRAL ELEMENT AGAINST ROTATION

Gottlob Haag, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,703
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1986, 3604235
Int. Cl.[4] F04C *18/04*
U.S. Cl. 418—55 **9 Claims**



1. A spiral compressor, comprising a first housing portion having a spiral chamber; a second housing portion closing said first portion; a displacement element displaceably supported between said first and second portions, said element having a spiral wall extending into said spiral chamber and enclosing with said spiral chamber an outer suction chamber and an inner

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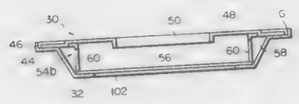
high pressure chamber; a drive shaft; an eccentric carried on one end of said shaft and supported in said displacement element; and means for fixing said element against rotation, said means including at least three guides (30) spaced from each other along a periphery of said element at equal angles and arranged in a plane perpendicular to said drive shaft, said element having pocket bores (32); each guide (31) including a guide bearing (33) positioned in a respective pocket bore of said element and extending into and being fastened to said second housing portion, a plastic sleeve (35) inserted in a respective pocket bore under slight prestressing with interposition of two rubber elastic O-rings spaced from each other, an inner diameter of said plastic sleeve being smaller than a sum of the diameter of said guide bearing and the diameter of said eccentric.

4,731,001

APPARATUS FOR MAKING COTTON CANDY

Isao Yamamoto; Akio Iida, both of Maebashi, and Kaoru Kikuchi, Gunma, all of Japan, assignors to Toshiba Electric Appliances Co., Ltd., Maebashi, Japan and Robeson Industries Corp., Mineola, N.Y.

Filed Aug. 19, 1986, Ser. No. 898,023
Claims priority, application Japan, Oct. 31, 1985, 60-167626[U]; May 23, 1986, 61-76881[U]
Int. Cl.⁴ B28B *13/00*
U.S. Cl. 425—7 **13 Claims**



1. An apparatus for making a cotton candy, comprising:
an electric motor having an output shaft extending upward;
a fan rotated together with the output shaft to produce an upward air flow;
heater means arranged above the fan;
a rotary member arranged above the heater means and rotated together with the output shaft, the rotary member being provided with a sugar chamber defined inside the rotary member and path means for guiding molten sugar from the sugar chamber melted by heat from the heater means to a peripheral edge of the rotary member, the path means having openings open at the peripheral edge of the rotary member; and
deflecting means, disposed between the heater means and the fan, for deflecting air flow from the fan upon rotation thereof toward the peripheral edge of the rotary member.

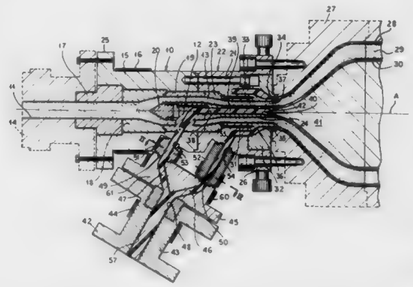
4,731,002

TRIPLE-WALL FOAM COEXTRUSION APPARATUS

Steven E. Spence; Robert F. Shamet; Flavio Da Silva, and Horst Eigruber, all of McPherson, Kans., assignors to American Maplan Corporation, McPherson, Kans.

Filed Nov. 19, 1986, Ser. No. 932,636
Int. Cl.⁴ B29C *47/12*
U.S. Cl. 425—133.1 **4 Claims**

1. A triple-wall foam coextrusion apparatus, comprising:
a body formed with an intermediate axial passage communicating at one end with a source of a foamable synthetic resin adapted to form an intermediate wall of a triple wall coextrusion;
a spider in said intermediate passage formed with a central member extending along said intermediate passage and diverting a flow of said foamable synthetic resin around said spider, said spider having an inner passage with an upstream end coaxial with said intermediate passage and terminating in said intermediate passage at a downstream end of said central member and said inner passage;
means forming in said body an outer passage coaxial with said intermediate and inner passages and extending axially over part of the length of said member around said intermediate passage, said outer passage having a downstream end and an upstream end;
a feed fitting secured to said body and connected to a second source of synthetic resin adapted to form inner and outer walls of said coextrusion, said feed fitting being formed with a feed channel having an axis at an acute angle to an axis of said body and said passages and converging toward said axis of said body in a direction of flow of said synthetic resins, a first distribution channel diverging from said feed channel and opening into said upstream end of said inner passage, and a second distribution channel diverging from said feed channel and opening into said upstream end of said outer passage, both of said distribution channels being inclined to said axis of said body at said acute angle where the distribution channels open into the inner and outer passages, respectively; and



a cone positioned at said downstream end of said central body for deflecting outwardly an inner stream of synthetic resin from said inner passage to form an inner wall of the coextrusion, deflecting outwardly a stream of said foamable synthetic resin adapted to form said intermediate wall on said inner wall, and deflecting outwardly an outer stream of synthetic resin onto said intermediate wall to form an outer wall in said intermediate wall, said feed channel being parallel to said distribution channels and is connected thereto by a pair of mutually divergent bores opening into said distribution channels from said feed channel, said mutually divergent bores being provided in a member formed with said mutually divergent bores and which is connected to said body by respective tubular spacers of different lengths, each forming part of a respective one of said distribution channels.

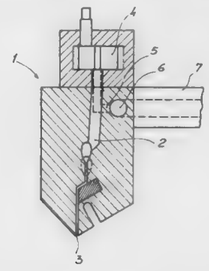
4,731,003

EXTRUDER HEAD FOR EXTRUDING SHEET OR FILM

Fare' Maurilio, Via Pastrengo 31/33, 21054 Fagnano Olona (Milano), and Fare' Rosaldo, Via Pastrengo 13/33, 21054 Fagnano Olono (Milano), both of Italy

Filed Nov. 4, 1986, Ser. No. 926,957
Claims priority, application Italy, Jul. 29, 1986, 21300 A/86
Int. Cl.⁴ B29C *47/14*
U.S. Cl. 425—133.5 **1 Claim**

1. A flat extruder head for extruding thermoplastics material into sheet or film, comprising;
an extruder head body,
means defining an elongate product output slot in said extruder head body through which slot, in use of said extruder head, plastics materal is extruded into sheet on film,
a source of plastics material in a plastic state,
plastics material conveyance ducts for conveying said plastics material from said source of plastics material to said output slot, said plastics material conveyance ducts including a plurality of feed ducts communicating with said slot,
means for causing the plastics material to flow through said plastics material feed ducts to said slot in such a way that said plastics material flows through said slot with a substantially constant coefficient of flow along the entire length of said slot,
said feed ducts being spaced regularly along said extruder head body, and each said feed duct having an axis extending orthogonally with respect to the length of the output slot,
said plastics material conveyance ducts further including a



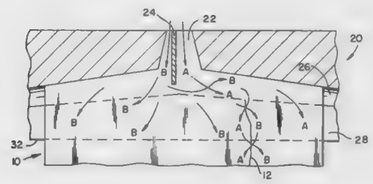
main duct extending longitudinally of said extruder head body and in communication with said source of plastics material, and a plurality of transfer ducts in communication with said main duct, said means for causing said plastics material to flow through said feed ducts comprising a plurality of respective associated volumetric pumps which operate to draw said plastics material to be extruded through said transfer ducts from said main duct extending longitudinally of said extruder head body,
said main duct, transfer ducts, feed ducts and volumetric pumps being all located within said extruder head, said volumetric pumps being positioned between their respective transfer ducts and feed ducts.

4,731,004

SIDE-BY-SIDE CO-EXTRUSION OF FILM USING MULTIPLE MATERIALS

Herbert J. Wenz, Jr., Garland, Tex., assignor to Princeton Packaging, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 660,222, Oct. 12, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,348
Int. Cl.⁴ B29C *47/10, 47/14, 47/92*
U.S. Cl. 425—133.5 **13 Claims**



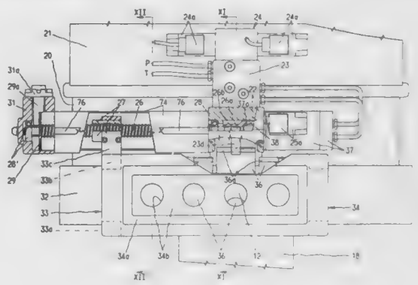
1. An apparatus for forming a co-extruded film in a die, the die having an entry manifold opening into a distribution manifold, the distribution manifold for distributing material along the width of the die for extrusion through a die extrusion slot, comprising:
at least one barrier positioned in the entry manifold, said barrier extending parallel to the direction of extrusion of the material and perpendicular to the width of the die, to define first and second mutually isolated passages through at least a portion of the entry manifold;
first means to provide a flowable first material to the first passage for flow through the die at a first predetermined rate;
second means to provide a flowable second material to the second passage for flow through the die at a second predetermined rate; and
said first and second means controlling the predetermined rates of said materials with the first and second materials flowing side by side along a portion of the width of the die in the distribution manifold and extruding the first and second materials from the die slot side by side in a film of uniform thickness, the first and second materials joining along their common edge to form the film, said first and second means further for determining the location of the common edge by the relative rates of flow of said first and second predetermined rates.

4,731,005

INJECTION MOLDING UNIT FOR AN INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lossburg 1, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 876,806
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526710; Feb. 19, 1986, 3605219
Int. Cl.⁴ B29C *45/07*
U.S. Cl. 425—185 **15 Claims**



1. In an injection molding machine for plastic materials, having an injection molding unit including a plasticizing unit having a plasticizing cylinder and a feed screw rottably and axially shiftably received in said plasticizing cylinder; the injection molding unit further including a supply block having a central passage adapted to receive an end portion of said plasticizing cylinder and a chute having first and second opposite open ends; said first end of said chute communicating with said passage; the improvement comprising
(a) a carriage arranged at said injection molding unit for displacement with respect to said chute along a travel path;
(b) means defining a plurality of spaced drop holes on said carriage for travel therewith; said drop holes being arranged in a series extending generally parallel to said travel path and being adapted to be individually brought into alignment in a material charging position with said second end of said chute dependent on locations of said carriage on said travel path;
(c) a plurality of conduits for admitting plastic material to said chute from a location externally of said injection molding unit; each conduit being coupled to a separate said drop hole;
(d) a plurality of gates mounted on said carriage for travel therewith; each gate cooperating with a separate said drop hole and each gate having an open position in which

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plastic material may pass through the respective drop hole from the conduit connected thereto; each said gate having a closed position in which passage of the plastic material through the respective drop hole is blocked;

(e) gate control means mounted stationarily with respect to said chute for moving a single selected gate, associated with the drop hole dwelling in the material charging position, into the open or closed position; and

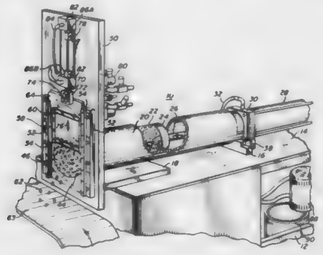
(f) coupling means for connecting said single selected gate to and disconnecting it from said gate control means.

4,731,006

APPARATUS FOR PROCESSING FOOD PRODUCTS

Gerald Freda, Palatine; Joseph Bogacz, Chicago; Joseph Freda, Barrington Hills, and Dennis Olson, Elgin, all of Ill., assignors to C&F Packing Co., Inc., Chicago, Ill.

Filed Aug. 6, 1985, Ser. No. 763,034
Int. Cl.[4] B29C *47/54, 47/66;* A23P *1/12*
U.S. Cl. 425—190 **14 Claims**



1. An apparatus for extruding a food product comprising:

guide means for receiving the food product in a location for extrusion;

means for engaging and advancing the food product through the openings of an extrusion plate in communication with said guide means and at least a portion of one of said guide means and said engaging and advancing means further being pivotally disposed for movement from a first position to a second position at one side of said first position, the axis of said guide means substantially aligned with the axis of said engaging and advancing means in at least one of said first and second positions, said engaging and advancing means being reciprocable within said guide means for moving the food product therethrough; and

means at one end of said guide means for successively cutting said extruded food product into a desired thickness.

4,731,007

DOUGH FEEDING ASSEMBLY

Robert J. Schiek, Miami, Fla., assignor to Royal Bakery Equipment, Inc., Miami, Fla.

Filed Jul. 1, 1987, Ser. No. 68,476
Int. Cl.[4] A21C *5/04*
U.S. Cl. 425—238 **12 Claims**

1. A dough feeding assembly designed to remove individual dough portions from a supply hopper and disposed such portions to a delivery site, said assembly comprising:

a. a dispensing means for collecting and dispensing the dough portions comprising a cylindrical outer surface,

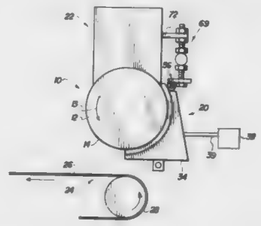
b. a plurality of ports formed in said dispensing means and each extending from said outer surface inwardly into said dispensing mean so as to form a dough holding pocket,

c. said dispensing means rotatably mounted and disposed to define a path of travel of said plurality of ports at least from the supply hopper to the delivery site upon rotation of said dispensing means.

d. each of said plurality of ports including a piston head reciprocally movable within a cooperating pocket of said respective cylinder and said piston head positionable between an open position and a closed position respectively defined by an inwardly recessed orientation and a substantially flush orientation relative to said open end of said respective port,

e. pressurizing means for applying a negative pressure to said plurality of ports and mounted exteriorly or adjacent to said dispensing means and in at least partially sealing engagement to said outer surface thereof,

f. said pressurizing means comprising a cap structure disposed exteriorly of the dispensing means and in at least



partially sealing engagement with said outer surface and a vacuum pump means connected to said cap structure for supplying a negative pressure to said plurality of ports when said piston head is in said open position and when said outer surface is disposed in underlying and movably sealing engagement with said cap structure, and

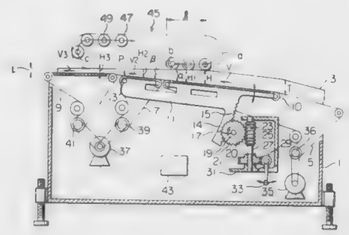
g. said plurality of ports transferable from aligned registry with said cap structure to receiving engagement with dough within the supply hopper when said piston heads are in said open position and said plurality of ports are under a negative pressure upon rotation of said dispensing means.

4,731,008

APPARATUS FOR CONTINUOUSLY STRETCHING A STRIP OF DOUGH

Torahiko Hayashi, 3-4, Nozawa-machi, and Koichi Hirabayashi, 942-16, Mobara-cho, both of Utsunomiya-shi, Tochigi-ken, Japan

Filed Aug. 7, 1986, Ser. No. 893,979
Claims priority, application Japan, Aug. 7, 1985, 60-173745
Int. Cl.[4] A21C *3/02*
U.S. Cl. 425—335 **9 Claims**



1. An apparatus for continously stretching a strip of dough, which is fed from an upstream direction and stretched in a downstream direction, comprising:

a base, and a conveyor mechanism supported on said base comprising a plurality of serially arranged conveyors, including in order from the upstream direction to the downstream direction an entrance belt conveyor, an intermediate belt conveyor, and an exit belt conveyor, each conveyor running from an upstream end to a downstream end, the speed of each conveyor being variable, the speed of any downstream conveyor of the plural conveyors being higher than that of the nearest upstream conveyor,

dough holding means, including a roller mechanism comprising a plurality of rollers rotatable about their axes and movable along a path, including a straight portion, above the plural conveyors, moving at a speed higher than that of the conveyors, the straight portion of the roller path being positioned over the plural conveyors, thereby holding the dough fed between the roller mechanism and the plural conveyors to produce the strip of dough; and

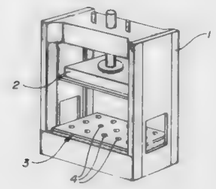
means for adjusting an inclined feeding angle from the upstream direction between said straight portion of said roller path and said entrance and intermediate conveyors, including a first frame supporting the two conveyors, a first pivot mounted on the base and disposed at or adjacent the downstream end of the intermediate conveyor, wherein a downstream end of the frame is pivotally mounted to said first pivot, and a first lowering and lifting means for moving an upstream end of the frame vertically, thereby adjusting the feeding angle of the two conveyors from the upstream direction relative to the straight portion of the roller mechanism.

4,731,009

SPRING-LOADED PLATEN ROLLERS WITH A SEALED AXLE

Milton Morse, Fort Lee, N.J., assignor to Nena Morse, Fort Lee, N.J.

Continuation-in-part of Ser. No. 786,674, Oct. 11, 1985. This application Oct. 8, 1986, Ser. No. 914,821
Int. Cl.[4] B30B *15/02*
U.S. Cl. 425—406 **7 Claims**



1. A mold-supporting arrangement for a press comprising:

a press platen having a plurality of spaced seating holes formed in an upper surface thereof, said seating holes being generally cylindrical in shape and having a hemispherical portion formed therein along the wall of said cylinder;

a plurality of load-bearing units seated in a selected number of said seating holes, each of said load-bearing units including a roller mounted on an axle, said axle extending across the entire diameter of said seating hole and into said hemispherical portion for limiting the rotation of said load-bearing unit in said aperture, said axle being supported by a unit body having an upper axle supporting portion and a lower bottom portion;

sealing means supported by the roller and connected to said axle for sealing a portion of the space between said axle and said upper axle supporting portion;

a compression spring coupled between said upper and lower portions; and

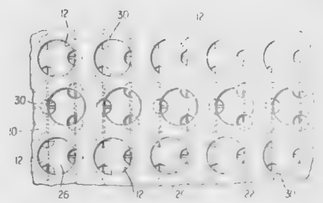
means connecting said upper and lower portions for compressing said spring.

4,731,010

EXTRUSION DIE FOR FORMING THIN-WALLED HONEYCOMB STRUCTURES

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 22, 1987, Ser. No. 52,875
Int. Cl.[4] B29B *47/12*
U.S. Cl. 425—461 **11 Claims**



1. An extrusion die for extruding and forming a thin-walled honeycomb structure, said die including a body plate and a face plate each having an inlet surface and an outlet surface, the outlet surface of said body plate being in facing, abutting contact with the inlet surface of said face plate, said body plate having a plurality of parallel, elongated, primary feed holes each having a longitudinal axis, said primary feed holes extending from the inlet to the outlet surface of said body plate, the inlet surface of said face plate having a plurality of recesses to thereby define a plurality of feed reservoirs, an outlet end of each of said primary feed holes communicating with a respective feed reservoir, said face plate also having a plurality of parallel, secondary feed holes, the outlet surface of said face plate having a plurality of intersecting slot segments defining a plurality of pins, each pin bordered and defined by a plurality of slot segments, an outlet end of each of said secondary feed holes communicating with an associated, respective, intersection of said slot segments, each feed reservoir communicating with inlet ends of an associated plurality of said secondary feed holes, said primary feed holes being arranged in horizontal rows and being substantially uniformly spaced from each other in any horizontal row, and wherein corresponding primary feed holes of adjacent horizontal rows are horizontally displaced from each other to thereby define columnwise staggered primary feed holes, whereby material to be extruded passes from an inlet to the outlet end of each primary feed hole, thence to a respective feed reservoir, thence to the inlet end of each of a plurality of associated secondary feed holes, thence to the outlet end of each said secondary feed hole, thence to an associated slot segment intersection, thence both horizontally and downwardly from each associated slot intersection, to thereby form a honeycomb extrudate having continuous and interconnected parallel channels therein.

4,731,011

INJECTION BLOW MOLDING MACHINE

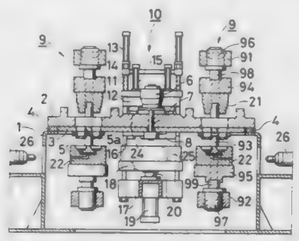
Yoshinori Nakamura; Kouhei Koga; Toshio Fujiwara, and Satoru Kosuge, all of Sakakimachi, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

PCT No. PCT/JP86/00299, § 371 Date Feb. 11, 1987, § 102(e) Date Feb. 11, 1987, PCT Pub. No. WO86/07305, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 13, 1986, Ser. No. 27,207
Claims priority, application Japan, Jun. 14, 1985, 60-129371
Int. Cl.[4] B29C *49/04, 49/12*
U.S. Cl. 425—529 **6 Claims**

1. An injection blow molding machine comprising a circular rotary disk rotatably mounted on an underside of a base plate, said rotary disk being connected to an intermittently rotating and driving device installed on a central portion of said base plate, a required number of hold molds also serving as a mold for molding a mouth portion of a container, said hold molds

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being provide at regular intervals on the undersurface of said rotary disk, a clamping device for an injection mold and a clamping device for a blow mold, each said clamping device provided at stop positions of said hold molds so that said clamping devices are located vertically above and below the



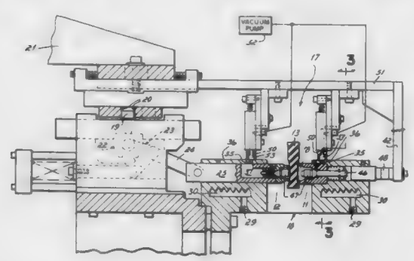
base plate, characterized in that said rotary disk is placed on the upper surface of a machine bed with peripheral portions of said rotary disk fixed to said machine bed fixed, and an interior of the machine bed formed into a molding operating space to accommodate therein a lower clamping mechanism of each of said clamping devices.

4,731,012

ROTARY VACUUM BLOW-MOLDING MACHINE

George W. Manzke, Jr., Mystic, Conn., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 3, 1986, Ser. No. 926,115
Int. Cl.⁴ B29C *51/10, 51/36*
U.S. Cl. 425—540 **3 Claims**



1. Apparatus for molding articles out of uncured vulcanized material comprising:

a rotatable wheel having a peripheral surface;

a plurality of fixed dies carried within said peripheral surface of said rotatable wheel;

a plurality of axially movable dies carried within said peripheral surface of said rotatable wheel, each of said axially movable dies aligned with a fixed die to form a pair of molding dies;

means for rotating said wheel to a molding station;

means for moving a strip of uncured material between each pair of said molding dies at said molding station;

means for closing said molding dies about said strip of uncured material to form a mold cavity for forming molded articles;

a shoe, fixedly mounted and located adjacent the station where said molding dies close, and slidable with respect to said peripheral surface as said wheel rotates;

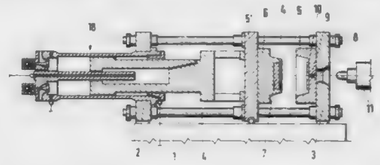
means for applying a vacuum to said shoe, each of said fixed dies having a passage leading to said peripheral surface, each of said passages being in the path of and in communication with said slidable shoe as said wheel rotates through said molding station.

4,731,013

INJECTION MOLDING APPARATUS FOR THE INJECTION MOLDING OF DATA STORAGE DISCS

Werner Schrammel, Emmendingen, Fed. Rep. of Germany, assignor to Klöckner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,218
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613334
Int. Cl.⁴ B29C *45/26*
U.S. Cl. 425—542 **4 Claims**



1. An injection molding apparatus for the injection molding of data storage discs of thermoplastic synthetic material having information pits on one side, particularly compact discs of polycarbonate or polymethylmethacrylate, comprising a pair of spaced, parallel support plates, guide rods affixed to and extending between said plates and lying parallel to the central axis thereof, a die plate mounted on said rods for movement therealong, a fixed die mounted on one of said support plates, a movable die confronting said fixed die and being mounted on said die plate for movement therewith, a hydraulic piston and cylinder unit for moving said movable die relative to said fixed die during the molding operation, said one support plate and said fixed die having coaxial die openings, an embossing plate mounted on said movable die confronting said fixed die for embossing the information pits on said one side of said discs during the molding operation, and an insert mounted on said fixed die confronting said embossing plate and forming a die nest therewith in a closed position of said dies, said insert comprising a plate having a die opening coaxial with said die openings through which the thermoplastic synthetic material may be injected into the die nest formed between said dies, said insert being of non-corrosive and essentially non-porous, non-metallic material, and said insert having a highly polished, essentially smooth and unpitted surface facing said embossing plate, whereby said discs formed during the molding operation each have a smooth side opposite said one side so as to avoid any interference when scanning said information pits following said molding operation.

4,731,014

REAR OPENING MOLD

John W. Von Holdt, 6864 Lexington Ln., Niles, Ill. 60648

Filed Mar. 12, 1986, Ser. No. 838,764
Int. Cl.⁴ B29C *45/44*
U.S. Cl. 425—556 **19 Claims**

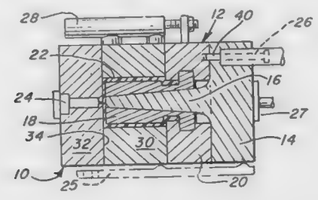
1. In an injection mold for producing articles having undercut surfaces, said mold comprising a cavity member and a core member, said cavity and core members being relatively movable between open and closed positions to define a first parting line and a molding chamber between said core and cavity members in the closed position, and a sprue aperture communicating with the molding chamber, the improvement comprising, in combination:

said cavity member defining forward and rear portions which are movable between open and closed positions and proportioned whereby objects molded in said molding chamber can be removed from between said forward and

rear portions when the cavity member is in said open position; said core member also defining a core base, and a core ring separating said core base from the cavity member, collapsible core means having an inner portion connected to the core base and an outer, collapsible portion connected to the core ring and the inner portion, said outer collapsible portion to be collapsible upon withdrawal of said inner portion; said core base and core ring being moveable between a closed position for molding and an open position in which said withdrawal takes place; and opening means for causing said injection mold to open from its closed position by first moving said core base to transfer said core base and core ring from their closed position to their open position, and then opening said first parting line between the cavity and core member.

10. In an injection mold for producing articles having undercut surfaces, said mold comprising a cavity member and a core member, said cavity and core member being relatively movable between open and closed positions to define a first parting line and a molding chamber between said core and cavity member in the closed position, and a sprue aperture communicating with the molding chamber, the improvement comprising, in combination:

said cavity member defining forward and rear portions



which are movable between open and closed position, the forward portion of said cavity member carrying tapered sliding members which define at least part of the outer wall of said molding chamber, said sliding members being capable of sliding rearwardly and outwardly from said forward portion when the cavity member is in said open position, to disengage articles molded in said molding chamber for facilitating their removal, whereby objects molded in said molding chamber can be removed from between said forward and rear portions of the cavity member when the cavity member is in its open position; said core member also defining a core base, and a core ring separating the core base from the cavity member, collapsible core means having an inner portion connected to the core base and an outer, collapsible portion connected to the core ring and the inner portion, said outer collapsible portion to be collapsible upon withdrawal of said inner portion; said core base and core ring being movable between a closed position for molding and an open position in which said withdrawal takes place; and opening means for causing said injection mold to open from its closed position by first moving said core base to transfer said core base and core ring from their closed position to their open position, and then opening said first parting line between the cavity and core member.

4,731,015

BURNER UNIT

Arthur C. W. Johnson, 2611 Lake Charnwood, Troy, Mich. 48084

Filed Aug. 22, 1986, Ser. No. 899,235
Int. Cl.⁴ F23D *11/36;* **F24C** *3/00*
U.S. Cl. 431—154 **15 Claims**

1. A burner unit comprising:

(A) a front flange plate having an aperture;

(B) a front tube passing through said aperture and rigidly secured to said front flange plate;

(C) a back flange plate having an aperture;

(D) a back tube passing through said back flange plate aperture and rigidly secured to said back flange plate;

(E) means releasably coupling the inboard ends of said tubes together in coaxial relation;

(F) an annular cover coacting with the outer peripheries of said flange plates to define an enclosure enclosing the coupled inboard ends of said tubes;

(G) a control assembly positioned within said enclosure outside of said tubes;

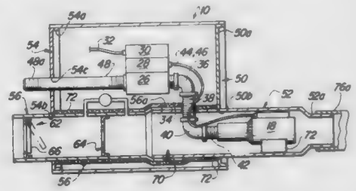
(H) a burner nozzle positioned in said front tube;

(I) an outlet pipe assembly extending from the outlet of said control assembly and through said tubes to the interior of said tubes for connection to said burner nozzle; and

(J) an inlet pipe assembly extending into said enclosure for connection to the inlet of said control assembly.

10. A method of assembling a burner unit comprising:

(A) preparing a burner subassembly including a control assembly, a burner nozzle, and piping interconnecting the outlet of said control assembly and the inlet of said burner nozzle and positioning said control assembly in a laterally offset position relative to the central axis of the burner nozzle;



(B) preparing a front housing subassembly including a front flange plate and a front tube passing through an aperture in said front flange plate;

(C) preparing a back housing subassembly including a back flange plate and a back tube passing through an aperture in said back flange plate;

(D) inserting the burner nozzle of the burner subassembly into the inboard end of the front tube of the front housing subassembly to position the burner nozzle in coaxial relation within the front tube and position the control assembly in an offset position relative to the axis of the front tube and the burner nozzle;

(E) positioning the back tube of the back housing assembly in coaxial relation to the front tube of the front housing subassembly and coupling the inboard ends of the front and back tubes together with the piping of the burner subassembly passing laterally through the coupled tubes to position the front and back flange plates in axially spaced relation and position the control assembly between the front and back flange plates outside of the aligned and coupled inboard ends of the tubes; and

(F) positioning an axially extending annular cover over the peripheral edges of the front and back flange plates to form an enclosure enclosing the control assembly and the coupled inboard ends of the front and back tubes.

4,731,016

EXPLOSION RELIEF SEALING APPARATUS FOR A PAINT BAKING OVEN

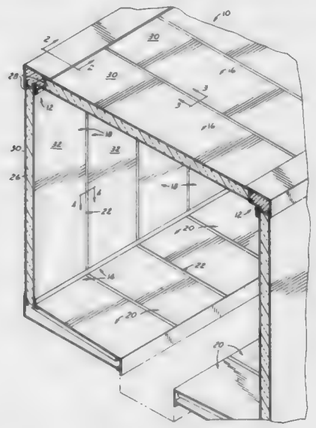
James M. Dixon, Washington, Mich., assignor to Tri-Mark Metal Corporation, Detroit, Mich.

Filed Feb. 3, 1987, Ser. No. 10,396
Int. Cl.⁴ F27D *21/00*
U.S. Cl. 432—35 **13 Claims**

1. A baking oven having a direct flame heating system which comprises: a plurality of modules each having a pair of up-

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standing and laterally spaced apart side panels, a top panel removably carried by such pair of side panels, first members having a longitudinally extending tongue, second members having a longitudinally extending tongue slidably received in said groove when assembled therewith and removable from said groove when such top panel disengages from such side panels, one of said members fixed and sealed to each side panel adjacent its upper end and the other of said members fixed and



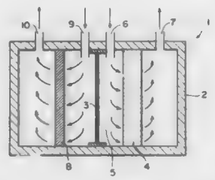
sealed to said top panel adjacent each of its ends, a flexible and compressible cord rope of a thermal resistant material received in and extending generally longitudinally of each groove, and when the top panel is carried by such side panels each tongue is received in an associated groove and bears on and compresses the rope cord received therein to thereby provide a releasable seal between the top panel and such side panels of the modules.

4,731,017

RADIATION HEATING APPARATUS

Ryozo Echigo, Tokyo; Toshio Tomimura, Yokohama; Chikashi Nishino, Hasaki, and Noboru Sue, Urawa, all of Japan, assignors to Mitsubishi Petrochemical Engineering Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 792,666, Oct. 29, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 22,507
Claims priority, application Japan, Nov. 1, 1984, 59-228949
Int. Cl.[4] F27B *3/20*; F24C *3/04*
U.S. Cl. 432—175 **34 Claims**



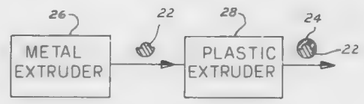
1. A radiation heating apparatus comprising within a housing therefor,
(a) a first heating zone,
(b) a second zone to be heated through a gas non-permeable boundary member,
(c) said gas non-permeable boundary member separating and defining the boundary between the two zones and being made of a material substantially optically non-transparent to radiation energy,
(d) at least one means selected from means for generating or introducing a high-temperature gas, said means being positioned in a sub-zone within the heating zone adjacent to the boundary member,
(e) a porous radiator member in the heating zone, said porous radiator member having pores through which the high-temperature gas formed in, or introduced into the sub-zone is discharged, and
(f) a porous heat-receiving member in the zone to be heated, whereby said porous heat-receiving member is heated through the gas non-permeable boundary member.

4,731,018

ORTHODONTIC ARCH WIRES

Loren S. Adell, Dallas, Tex., assignor to Trident Laboratories, Inc., Sunnyvale, Tex.

Filed Dec. 29, 1986, Ser. No. 946,976
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—20 **15 Claims**



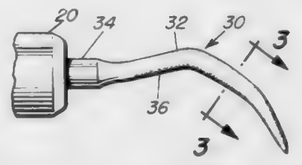
15. An improved orthodontic arch wire which comprises a metallic part and a non-metallic part securely joined together, said metallic part having outer and inner peripheral portions, said outer peripheral portion of the metallic part being disposed labially when the arch wire is applied to an arch, and said non-metallic part covering the entire outer peripheral portion of the metallic part, but leaving at least some of the inner peripheral portion exposed, said metallic and non-metallic parts having complementary transverse cross sections cooperatively forming the arc wire's cross section, but the transverse cross section of the non-metallic part by itself being different from the transverse cross section of the metallic part by itself.

4,731,019

DIAMOND COATED SCALER DENTAL INSTRUMENT FOR ULTRASONIC OPERATION

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20910

Continuation of Ser. No. 616,843, Jun. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 439,724, Nov. 8, 1982, abandoned. This application Apr. 9, 1986, Ser. No. 861,292
Int. Cl.[4] A61C *1/07*
U.S. Cl. 433—119 **3 Claims**



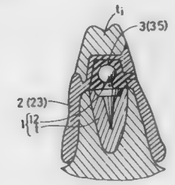
1. A dental instrument suitable for affixing to a holder means, such as an ultrasonic device, comprising:
a mounting portion, said mounting portion being suitable for being removably affixed to a holder means;
an instrument portion, said instrument portion being integral with and a continuation of said mounting portion, said instrument portion having the distal end thereof further configured for dental-type operations, said distal end of said instrument portion being hook-like in configuration with a conical pointed end as a specific configuration thereof, said hook-like configuration in a vertical plane through the longitudinal axis thereof being configured from a first horizontal section thereof as an axial extension of said mounting portion, to a second section canted slightly upward from said first horizontal section, thence to a third section bent downwardly at an approximate angle of 45° to the axis of said second section, then to a fourth section being further bent downwardly at less than 45° from said third section, the cross-sectional configuration of said hook-like configuration being cylindrical with the extreme distal end of said fourth section tapering to a point; and
a plurality of abrasive particles, said abrasive particles being diamond particles, said diamond particles being available in a plurality of relative sizes, said diamond particles being suitably affixed to enclose said distal end and to surround said second, third and fourth sections of said instrument portion configured for said dental-type operations.

4,731,020

REMOVABLE DENTURE RETAINING STRUCTURE

Haruyuki Kawahara; Hiroki Wada, both of Osaka; Takashi Tsutsumi, Hyogo, and Ikuya Matsuo, Ibaragi, all of Japan, assignors to Wada Seimitsu Shiken Kabushiki Kaisha, Osaka; Nippon Mektron Kabushiki Kaisha, Tokyo and Haruyuki Kawahara, Osaka, all of, Japan

Division of Ser. No. 652,314, Sep. 19, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 890,064
Claims priority, application Japan, Oct. 7, 1983, 58-189050
Int. Cl.[4] A61C *3/12*
U.S. Cl. 433—180 **8 Claims**



1. A removable denture retaining structure including a support base and denture body, said removable denture retaining structure being characterized in that said denture body is integrated with an elastic mounting member which is made from any of polyurethane rubber, segmented polyurethane rubber and composite materials of these rubber materials and has at least the physical characteristics of the modulus of elasticity of 10 to 10,000 kg/cm^2, a coefficient of friction of 0.03 to 1.8 and a compression ratio of 0.32 to 0.50, and said elastic mounting member is removably pressure-fitted to said support base to elastically be in frictional contact therewith, so that said denture body does not float from or sink in said support base during normal biting motion, and so that said denture body can be removed from said support base when a great external force different from the biting force is applied to remove said denture body by compressing to deform said elastic mounting member.

4,731,021

CLASSIFICATION LANGUAGE AND METHOD

See F. Chan, 4709 Newtown Rd., Astoria, N.Y. 11103

Continuation-in-part of Ser. No. 650,520, Sep. 14, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,348
Int. Cl.[4] G09B *1/00*
U.S. Cl. 434—156 **20 Claims**

1. A classification medium; comprising:
(a) a plurality of word block means each corresponding to a particular word means;
(b) each of said word block means carrying a plurality of selected symbols arranged in a predetermined order;
(c) the meaning of each of said word block means being defined by comprising a plurality of distinguishing characteristic subblocks for definition each associated with one of said selected symbols and corresponding to a particular distinguishing characteristic and together giving a meaning associated with said word block means;
(d) a group of particular word block means including one or more identical distinguishing characteristic subblocks of definition constituting a particular classification group;
(e) each word block means within a particular classification group including at least one distinguishing characteristic subblock for definition that distinguishes it from other particular word block means within a particular classification group;



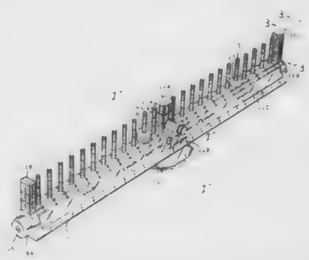
(f) each of said selected symbols carried on subblocks forming a particular word block means, representing a different corresponding distinguishing characteristic of definition of said particular word block means;
(g) identical distinguishing characteristic subblocks for definition of particular word block means from within a particular classification group bearing identical selected symbols;
(h) said predetermined order for said selected symbols being identical for identical distinguishing characteristic subblocks of definition for particular word block means of a particular classification group and differing for those distinguishing characteristics of definition that distinguish one particular word block means from another particular word block means for a particular classification group.

4,731,022

TEACHING ARITHMETIC PRINCIPLES

Thomas A. Garland, 76 Reservoir Cir., Jamestown, R.I. 02835

Filed Aug. 18, 1986, Ser. No. 897,218
Int. Cl.[4] G09B *1/00*
U.S. Cl. 434—194 **11 Claims**



1. Apparatus for teaching arithmetic principles comprising, balance arm means for receiving balancing weights and having ends,
support means for pivotally supporting said balance arm means at a predetermined horizontal pivot axis,

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said balance arm means including a plurality of upstanding pin means at spaced locations between said ends for receiving balancing weights and each having a top and bottom,

said balance arm means having horizontal and vertical calibration indicia for identifying the location and height respectively of weights relative to said pivot axis,

there being a plurality of said vertical calibration indicia at a respective location with adjacent ones separated by a predetermined interval.

4,731,023

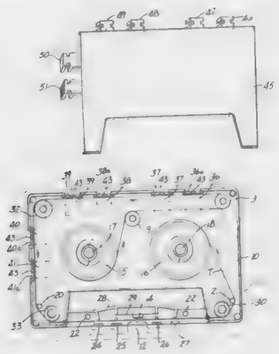
TEACHING SYSTEM USING PRERECORDED TAPE

Andrew D. Salvo, 10 Gloria Pl., East Haven, Conn. 06512

Continuation-in-part of Ser. No. 915,727, Oct. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 680,802, Dec. 13, 1984, Pat. No. 4,615,682. This application Dec. 5, 1986, Ser. No. 938,254

Int. Cl.[4] G09B *7/06*

U.S. Cl. 434—321 **9 Claims**



1. An educational system comprising a prerecorded tape and a tape player including a drive motor for driving said tape and a playback head,

said tape including at least one sector which has a message recorded thereon and two windows for passing light through the tape, said message sector and said windows being at predetermined distances from each other,

first means photoelectric detecting means positioned along the path of the tape for photoelectrically detecting one of said windows and deenergizing said drive motor,

a plurality of other photoelectric detecting means positioned along the path of said tape, the position of said second window in said tape being selected such that said second window is adjacent one of said other detecting means when said one of said windows is detected by said second detecting means, and

a plurality of operator selection means, each corresponding to one of said other detecting means, the recorded message posing a question or choice of selection to the operator, and means for indicating that operation of one of said selection means corresponds to said detecting means adjacent said second window,

said tape being in a cassette, said photoelectric detecting means being mounted on a removable carrier which may be fitted to said cassette with said photoelectric detecting means positioned to detect said windows in said tape.

4,731,024

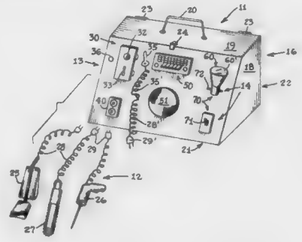
CHILDREN'S AMUSEMENT CENTER

Hilary F. Kavanagh, 6677 Fairfax Rd., Chevy Chase, Md. 20815

Filed Apr. 17, 1987, Ser. No. 39,266

Int. Cl.[4] G09B *19/24*

U.S. Cl. 434—260 **12 Claims**



1. An amusement apparatus for children; wherein, the apparatus comprises:

a housing unit;

simulated, reduced size, and actual size components adapted to connected to said housing unit; wherein, the components are representative of common objects found in many households; and,

an electrical circuit means operatively connected to selected ones of said components, and having a battery and electrical switch elements to electrically activate the selected components.

4,731,025

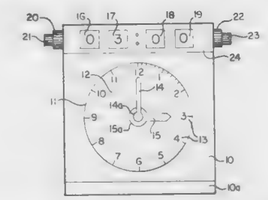
TIME TEACHING DEVICE

Frank J. Taylor, 1132 N. Paseo DeGolf, Green Valley, Ariz. 85614

Filed Jul. 18, 1986, Ser. No. 886,609

Int. Cl.[4] G09B *19/12*

U.S. Cl. 434—304 **1 Claim**



1. A device for teaching how to read time values indicated by an analogue clock and by a digital clock and how to convert analogue clock values into digital clock values, or vice versa; said device being a housing having a front portion equipped with a simulated analogue clock and a simulated digital clock, each-clock being independently controllable, and wherein said analogue clock comprises a face having a plurality of radially spaced numerals representing hours of the day and minute divisions therebetween, a centrally and rotatably affixed hour hand and a centrally and rotatably affixed minute hand, said hour hand and said minute hand being rotatable independently from each other; and wherein said digital clock comprises a plurality of numerals representing the hours of the day and numerals representing minute values imprinted on individual bands, said bands forming loops around upper and lower rolls, said upper rolls being rotatable and affixed to shafts connected to knobs which are located outside said housing and are rotatable independently from each other, the lower rolls being rotatably mounted on shafts.

4,731,026

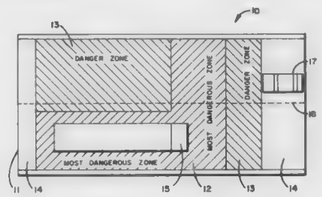
METHOD AND APPARATUS FOR TEACHING SCHOOL BUS SAFETY

Hector R. Fenton, 385 Elan Ct., Woodbury, Minn. 55125

Filed Mar. 25, 1987, Ser. No. 30,213

Int. Cl.[4] G09B *19/14*

U.S. Cl. 434—305 **10 Claims**



1. School bus educational apparatus, comprising:

(a) a surface depicting a street area with designated zones of varying degrees of danger, including a most dangerous zone;

(b) a movable, three-dimensional school bus sized and configured to be placed upon said surface so that said most dangerous zone completely surrounds said school bus; and

(c) a movable, three-dimensional child figure sized and configured relative to said school bus, wherein said child figure can be positioned in different areas of said surface to illustrate various degrees of danger.

4,731,027

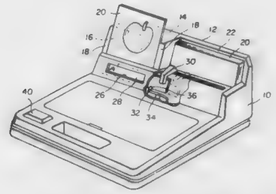
EDUCATIONAL TEACHING TOY

Raymond C. Phinney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 17, 1986, Ser. No. 920,695

Int. Cl.[4] G09B *3/00*

U.S. Cl. 434—348 **18 Claims**



1. An educational teaching toy comprising:

a card holder for holding a card having a visible picture thereon of an object, the card further having aligned spaced-apart letters adjacent the object for defining the name of the object; and

a slider for covering the name, having a plate at one end for covering the name, and a handle at the opposite end by which the slider can be moved in increments across the name from one end thereof to the other and detent means for releasably engaging and stopping the slider after each letter is uncovered to expose the letters one at a time to assist the child to identify the object.

4,731,028

APPARATUS FOR VISUALLY DISPLAYING AND ENHANCING SALES OF AUTOMOTIVE FLUIDS

Nathan A. Dickerson, 608 S. 5th St., Nederland, Tex. 77627

Filed Mar. 30, 1987, Ser. No. 31,796

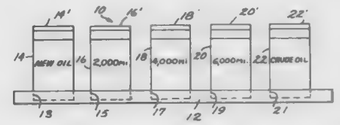
Int. Cl.[4] G09F *5/00*

U.S. Cl. 434—388 **5 Claims**

1. Apparatus for visually displaying and enhancing sales of automotive fluids, said apparatus comprising:

base member means for placement onto a separate supporting surface during normal use of said apparatus;

a plurality of three or more transparent containers mounted on said base member means and juxtaposed with respect to each other in a predetermined manner; and



a predetermined type of automotive fluid, or its visual equivalent, within predetermined ones of said containers, each of said predetermined containers having therein said fluid, or its visual equivalent, which has been subjected to automotive use for a predetermined period different from the period of use of said fluid within each of the other ones of said predetermined containers.

4,731,029

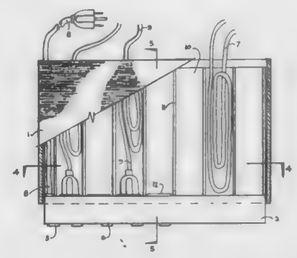
WIRE AND CABLE MANAGER

Lawrence Lerner, Beverly Hills, and Stephen P. Diskin, Los Angeles, both of Calif., assignors to MEGA/ERG Inc., Beverly Hills, Calif.

Filed Oct. 23, 1986, Ser. No. 922,534

Int. Cl.[4] H01R *19/14*

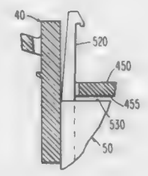
U.S. Cl. 439—4 **4 Claims**



1. In a wire and cable manager, enclosure means having an open front side and at least an additional aperture means, containing means located within the enclosure means and providing lateraly adjacent compartments into which excess length of power cords or wiring of any common small appliance or electric component may be inserted and then formed into substantially elongated coils and with the aperture means provided in the enclosure such that the remaining, uncoiled portion of said wiring, once inserted and coiled within the device may be allowed to exit to the exterior, and wherein said containing means consists of a single tray of dimensions substantially similar to that of the inside of the enclosure means and with said enclosure means open along the entirety of its open front side such that the tray may slide in and out, and with the opposite end of the tray substantially accessible through the aperture means in the enclosure.

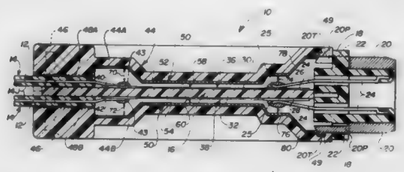
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,030
TILT AND SWIVEL ASSEMBLY FOR TERMINAL MONITOR
John N. Johnston, North Plainfield, N.J., assignor to Unisys Corporation, Blue Bell, Pa.
Filed Jan. 9, 1987, Ser. No. 1,798
Int. Cl.[4] H01R *39/00*
U.S. Cl. 439—6 **3 Claims**



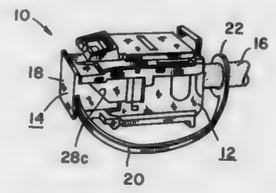
1. A tilt-swivel assembly for a terminal monitor comprising:
a base support including (1) a horizontal stand portion which is adapted to rest on a table and (2) a central hollow, open-ended cylinder, a plurality of locking members inside said cylinder; and
a vertical keyway inside said cylinder;
a lower connector carrier seated inside said cylinder, with a lower key in said keyway, and carrying a lower electrical connector and its leads, said lower connector carrier being held in place by said locking members; and
an assembly coupled to said base support including an upper connector carrier carrying an upper connector and its wires with said lower and upper connectors being connected together, said upper connector carrier having an upper key seated in said keyway;
a cylindrical member coupled to said upper connector carrier and having an annular flange at its upper end,
a coupling member, in the shape of a section of a sphere, having a slot in its body said coupling member being adapted to be secured to the cabinet of a terminal monitor,
the flange of said cylindrical member being pivotably and slidably coupled to said coupling member in the slot therein whereby, when said coupling member slides in said slot with respect to said spherical section, said monitor tilts and, when said coupling member turns with respect to said spherical section in said slot, said monitor rotates.

4,731,031
TRANSMISSION CABLE CONNECTOR HAVING A CONTOURED SHELL
Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 15, 1986, Ser. No. 919,029
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—76 **12 Claims**



1. In a connector of the type having a plurality of contacts, a planar substrate having an array of tracings on at least one surface thereof, the contacts being adapted to engage electrically the tracings on the substrate so that the individual tracings are connected to a respective one of the contacts as well as to a respective one of a plurality of individual conductor wires of a cable, the cable having predetermined electrical characteristics associated therewith, the connector having a shell thereon, the improvement comprising:
a conductive inner layer disposed on the shell, the shell being contoured to space the conductive inner layer at a first predetermined clearance distance from the surface of the substrate such that, in use, with the inner surface of the shell connected to a predetermined electrical potential the tracings on the surface of the substrate and the conductive inner surface of the shell cooperate to impart to the tracings predetermined electrical characteristics that closely match the electrical characteristics of the cable.

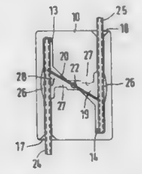
4,731,032
PROTECTIVE COVER FOR ELECTRICAL CONNECTOR
Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Apr. 9, 1986, Ser. No. 849,667
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—136 **15 Claims**



1. A cover for attachment to an open end of an electrical connector having electrical contacts exposed thereat, comprising:
an insulative body including a generally planar wall and a bottom wall extending substantially perpendicular to said planar wall;
two engagement surfaces separated from each other and projecting outwardly from said planar wall and substantially parallel to said bottom wall;
two contact surfaces separated from each other and projecting outwardly from said planar wall and substantially parallel to said bottom wall, said contact surfaces being spaced from said engagement surfaces, said engagement surfaces and said contact surfaces defining an opening for receipt therein of a portion of an electrical connector at the open end thereof; and
at least two spaced guiding members projecting outwardly from said planar wall, said guiding members each including a guiding surface on a respective one of said contacting surfaces for contacting spaced walls of said electrical connector at said open end for guiding said electrical connector portion between said engagement surface and said contact surface.

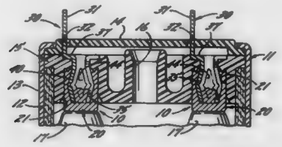
4,731,033
INSTANT CONNECTOR FOR THE CONTACTING OF TWO ELECTRICAL WIRES
Walter Bajohr, Troisdorf, and Willi Bornheim, Troisdorf-Oberlar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 15, 1986, Ser. No. 896,872
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529443
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 **10 Claims**

1. An instant connector for contacting two electrical wires, which comprises a flat housing exhibiting on two mutually opposed end faces, respectively, one opening of a blind duct for an electrical conductor, the blind ducts being mutually offset in the transverese direction of the housing and extending essentially in parallel to each other; the housing comprising a cavity extending transversely between the blind ducts wherein a contact blade is mounted to be pivotable about an axis extending in parallel to the end faces; and stops in the housing for limiting the movement of the contact blade in such a way that,



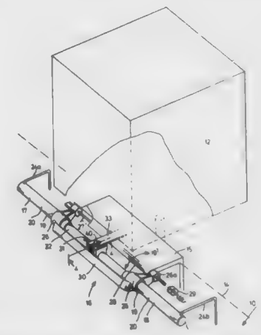
in a first end position, the ends of the contact blade project obliquely into the blind ducts in the direction toward closed ends of the ducts and, in a second end position, the contact blade is aligned essentially at a right angle to the blind ducts; the ends of the contact blade having v-shaped cutout portions and base zones of the cutout portions of the ends of the contact blade, respectively, terminating in an elongated slot.

4,731,034
ELECTRICAL TERMINAL ASSEMBLY AND METHOD OF MAKING THE SAME
Robert A. Hagan, Roscoe, and Ernest W. Reinwall, McHenry, both of Ill., assignors to Elco Industries, Inc., Rockford, Ill.
Filed Mar. 16, 1987, Ser. No. 26,031
Int. Cl.[4] H01R *13/415*
U.S. Cl. 439—891 **7 Claims**



1. An electrical terminal assembly comprising a tubular post made of deformable and flowable conductive material and further comprising an electrical terminal made of a single piece of yieldable conductive material, said post defining a socket having an open end and an opposite closed end, said terminal comprising an elongated connector prong extending away from the open end of said socket, an elongated tubular element formed integrally with said prong, said tubular element being telescoped into said socket and having first and second ends, the first end of said tubular element being located in engagement with the closed end of the socket, said first end of said tubular element being open and receiving some of the flowable material at the closed end of said socket to help captivate said tubular element in said socket, said tubular element being generally arcuate in transverse cross-section, angularly spaced and longitudinally extending slots formed throught said tubular element, some of said flowable material extending through said slots and into said tubular element and coacting with the flowable material in said first end of said tubular element to lock said tubular element tightly in said socket.

4,731,035
STEERING MECHANISM FOR OUTBOARD MOTORS
William Wagner, West Vancouver, Canada, assignor to Wagner Engineering Ltd., N. Vancouver, Canada
Filed May 15, 1986, Ser. No. 864,084
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **8 Claims**



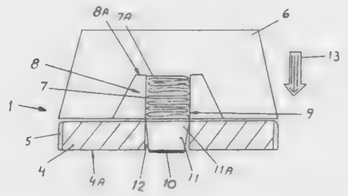
1. A steering mechanism for an outboard motor rotatable about a steering axis by a tiller arm and tiltable about a tilt tube defining a tilt axis relative to a mounting bracket, said steering mechanism comprising:
a pair of opposed single acting cylinders maintained in spaced relationship along a common axis by an elongate frame member,
a pair of brackets to connect said cylinders to said motor, said brackets holding each of said cylinders near one end thereof, and extending transverse to said common axis, said brackets terminating at connection means to pivotally connect said mechanism to said tilt tube, the ends of said elongate member joining said brackets, said connection means including a plurality of bores formed in each of said brackets, the axis of each of said bores lying in the same plane, each of said bores in one of said brackets being coaxial with a respective bore in the other of said brackets, so as to receive a rod member upon said pivotal connection with said tilt tube,
a piston rod received in and extending between said cylinders, and
a lost motion linkage connected to the central region of said piston rod for movement therewith and connectable to a tiller arm to induce steering movement of said motor upon actuation of said piston rod.

4,731,036
INDICATOR MEANS
Ericstam Ulf, Stureplatsen 2, S-411 39, Göteborg, Sweden
PCT No. PCT/SE85/00270, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/00861, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 4, 1985, Ser. No. 852,247
Claims priority, application Sweden, Jul. 26, 1984, 8403866
Int. Cl.[4] B63B *22/00;* **G01D** *5/12*
U.S. Cl. 441—2 **18 Claims**

1. A device for indicating the presence of a magnetically responsive object submerged in a fluid, comprising magnet means having an active surface to contact said object, a floating body, means coupling said floating body to said magnet

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means, said magnet means and at least one ejector protrusion extending beyond said active surface for deactivating said



coupling means when said protrusion is moved by attraction between said object and said magnet means.

4,731,037

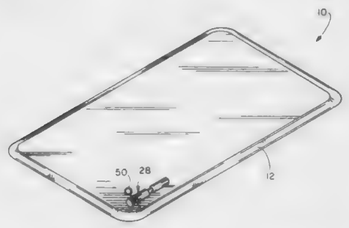
WATER SURVIVAL KIT

Mark A. Rhodes, 14361 Joyce Ave., Westminster, Calif. 92683

Filed Feb. 2, 1987, Ser. No. 9,482

Int. Cl.[4] B63B *35/38*

U.S. Cl. 441—41 **6 Claims**



1. A new and improved inflatable life raft assembly comprising:

inflatable life raft means;

valve assembly means directly attached to said inflatable life raft means by a conduit without any other intervening support structure positioned between said valve assembly means and said raft, said valve assembly means includes a manually reciprocable valve member means for effecting inflation of said life raft means; said manually reciprocable valve member means including a non-shearable pin means positioned for manual removal within an aperture contained within a shaft of said valve member for manual removal to permit reciprocation of said valve member, said shaft formed with a manually engageable first end extending outwardly and exteriorly of a housing first end and extending interiorly of said housing terminating in a pointed second end proximate a compressed gas means securable to said housing at a housing second end remote from said housing first end,

said non-shearable pin means positioned exteriorly of said housing, and

said compressed gas means operably attachable to said valve assembly means for releasing gas to said inflatable raft means upon reciprocation of said valve member to rupture said compressed gas means;

container means including a closure flap for enabling complete removal of said raft and valve member from said container means and for carrying said inflatable life raft means in a deflated condition, and

attachment means for effecting a direct attachment to a user prior to an inflation of said inflatable life raft means.

4,731,038

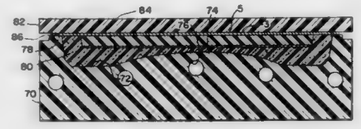
PREFORMED CORE AND MOLDED PRODUCT AND METHOD OF MANUFACTURE

Kendal Hancock, and Robert S. Scheurer, both of P.O. Box 539, Wichita Falls, Tex. 76307

Filed May 1, 1985, Ser. No. 732,011

Int. Cl.[4] B32B *31/14;* **A63C** *15/00*

U.S. Cl. 441—68 **22 Claims**



1. Ski apparatus comprising deck means, strengthening means connected to a lower surface of the deck means for strengthening the ski apparatus, an inner surface means connected to the strengthening means remote from the deck means for cooperating with the strengthening means and strengthening the ski apparatus, ski body means connected to the deck means for enclosing the strengthening means and the inner surface means and for forming the ski body, wherein the strengthening means has a difficult strength and density than the ski body means.

4,731,039

FLOATS TO BE USED PAIRWISE TO WALK ON WATER

Karl R. Zeiss, Gilgenmatten 1, D-7800 Freiburg, Fed. Rep. of Germany

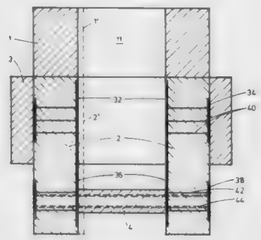
PCT No. PCT/DE84/00108, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO84/04694, PCT Pub. Date Dec. 6, 1984

Continuation of Ser. No. 704,319, Jan. 18, 1985, abandoned. This PCT application May 12, 1984, Ser. No. 906,963

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318384

Int. Cl.[4] A63C *15/03*

U.S. Cl. 441—76 **10 Claims**



1. An elongate float to be used with another such float for walking on water, the two floats being arranged longitudinally in a side by side relationship such that the floats have inside edges facing one another and corresponding outside edges, each float comprising:

a foot holder for receiving a respective foot of a user, such foot holder being arranged in the float such that a mass distribution of the float is asymmetrical in a-transverse direction to cause a greater buoyancy force between the inside edge and said foot holder than between the outside edge and said foot holder, when loaded by the user placing his foot in said foot holder.

4,731,040

METHOD AND APPARATUS FOR MANUFACTURING CATHODE RAY TUBE

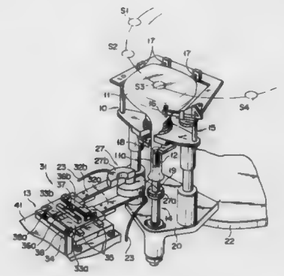
Fujio Tominaga, Himeji; Akihiro Hayashi, Tatsuno, and Yasunori Minamoto, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1986, Ser. No. 945,526

Claims priority, application Japan, Dec. 26, 1985, 60-294375

Int. Cl.[4] H01J *9/26*

U.S. Cl. 445—45 **11 Claims**



1. A cathode ray tube manufacturing method for welding a neck portion of a cathode ray tube bulb and a stem of an electron gun inserted in the neck portion, comprising the steps of:

holding said cathode ray tube bulb;

inserting and holding said electron gun at a predetermined position in the neck portion;

positioning an annular burner, which has an inner peripheral surface with a plurality of burner holes formed in substantially the entire area along a circumferential direction thereof, such that the inner peripheral surface is coaxially located outside the neck portion and opposes the stem of the electron gun, said burner being formed to be capable of being divided into halves in a radial direction;

injecting flames from the burner holes toward the neck portion; and

reciprocally rotating the annular burner about its axis through a predetermined angle.

4,731,041

CONNECTABLE POLYGONAL CONSTRUCTION MODULES

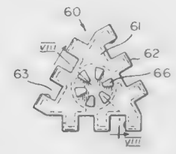
James T. Ziegler, #506, 4500-39th St., NW., Calgary, Alberta, Canada T3A 0M5

Continuation-in-part of Ser. No. 698,698, Feb. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 512,638, Jul. 11, 1983, abandoned. This application Sep. 19, 1986, Ser. No. 908,919

Claims priority, application Canada, Mar. 30, 1983, 424896

Int. Cl.[4] A63H *33/08*

U.S. Cl. 446—115 **12 Claims**



1. A polygonal construction module comprising a body portion having edge faces, a top face and a bottom face, each said edge face having a plurality of substantially identical outwardly projecting fingers with substantially identical gaps therebetween, said fingers being arranged to provide a snap-together lateral interlock between fingers of adjacent modules while providing hinging action between modules on an axis parallel to said side face, and at least one annular connector element projecting perpendicularly from the body portion top face for establishing a friction fit with a like connector element in face-to-face interlocking engagement, said connector element comprising a series of projections arranged in a uniform circular array, each projection being segmental in shape with radial side walls and the space between each pair of projections being the same shape and size as each projection whereby to receive a projection of said like connector element when engaged therewith, the engaging projections being held in interlocking engagement solely by frictional contact between engaging projection side walls, and the body portion directly beneath each connector element being thin relative to the height and width of each projection to thereby provide said array as a whole with substantially greater flexibility than the intrinsic flexibility of each projection thereby to accommodate dimensional inaccuracies of the projections when engaged with a said like connector element and enhance the firmness of frictional contact between engaging radial side walls.

4,731,042

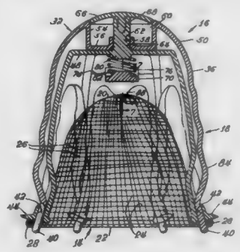
SNARE TOY AND METHOD OF CAPTURING A TOY VICTIM

Robert S. McKay, 7420 Beckwith Rd., Morton Grove, Ill. 60053; Steven S. Starr, Chicago, and William D. Nelson, Elgin, both of Ill., assignors to Robert S. McKay, Wood Dale, Ill.

Filed Nov. 7, 1986, Ser. No. 928,016

Int. Cl.[4] A63H *33/00, 3/36;* **A01K** *71/00;* **B65D** *33/24*

U.S. Cl. 446—309 **16 Claims**



1. A method of capturing an intended toy victim, comprising the steps of

providing a snare net large enough in an opened condition to fit over at least part of the intended victim, and in a closed position to fit at least partially over and around the intended victim;

loading the snare net on a carrier having a body and a plurality of legs depending downwardly from the body, the legs being arranged in an array spaced apart sufficiently to fit over and at least partially down around the intended victim, and the net being held in the opened condition on the ends of the legs remote from the body;

stalking the victim by moving the carrier, with the net thereon, to a position vertically over the intended victim;

moving the carrier, with the net thereon, downwardly to a position with the carrier legs and net at least partially around the intended victim; and

releasing the snare net from the free ends of the carrier legs to allow it to shift to the closed position over the victim.

4. A toy for capturing an intended toy victim, comprising the combination of

a structural carrier having a body and a plurality of legs depending downwardly from the body and spaced apart in a somewhat annularly arranged array sized to fit at least partially down and around the intended victim;

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an elongated generally flexible tubular snare net having an open end and a closed end;

said snare net being sized in an open condition, to fit over at least part of the intended victim, and being formed of an open weave pervious fabric;

said snare net also being adapted in the opened condition to fit within the array of spaced carrier legs, with the closed net end being located next to the carrier body, and the open net end being located next to the ends of the legs remote from the carrier body;

means near said remote ends of the carrier legs for holding spaced regions of the snare net proximate the open net end, in order to hold the snare net in the open condition and relative to the carrier; and

means to release the snare net from the holding means on the legs, said release means being manually controlled from proximate the carrier body.

4,731,043

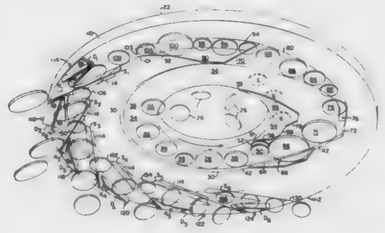
COIN SORTER

Victor G. Ristvedt, and Mark E. Ristvedt, both of Manchester, Tenn., assignors to Ristvedt-Johnson, Inc., Mt. Prospect, Ill.

Continuation of Ser. No. 872,629, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 561,722, Dec. 14, 1983, abandoned. This application Jan. 28, 1987, Ser. No. 9,111

Int. Cl.[4] **G07D** *3/16*

U.S. Cl. 453—6 **39 Claims**



1. A coin sorter for sorting coins in terms of their diameter comprising:

a horizontally positioned circular coin carrying disc having a resilient top surface onto which coins may be fed;

a guide plate having a central circular opening and a configured lower surface positioned over and closely adjacent to said disc, and wherein said configured surface includes an arcuate central recess within which coins are free to move radially, and said central recess generally extends outward from said central opening and having an outer edge which extends outward in a spiral, along which coins form in a single file;

coin positioning means including a second recess, of lesser depth than said central recess, positioned to intercept coins rotated by said disc from said central recess, and said second recess having an outwardly extending, outwardly facing edge positioned to intercept an inner positioned edge of coins and urge said coins outward for radially positioning with their inner edge at a fixed diametric position;

a plurality of coin ejection assemblies positioned circumferentially around said guide plate generally along a circular path traversed by coins rotated by said disc from said coin positioning means, and wherein each said coin ejection assembly comprises:

an outwardly extending slot in said guide plate positioned to intercept said path, and

depression means positioned outside of and generally parallel with each said slot, and wherein each said depression means comprises a ramp configured to engage an outer positioned edge region of one diametric size of coin and thereby pressing the outer edge of the coin downward, and wherein the inner edge of the coin is urged upward by said disc into a said slot, and whereby a combination of circular force applied to the coin and said slot causes the coin to be moved outward as captured by the slot and ejected; and

wherein a depression means of each ejection assembly is positioned at a discrete spacing from a said slot, whereby with graduately smaller spacings for slot-ramp combinations as they appear around the disc in a direction of rotation, a large coin is ejected first, and smaller coins are ejected in an order of their diminishing size.

4,731,044

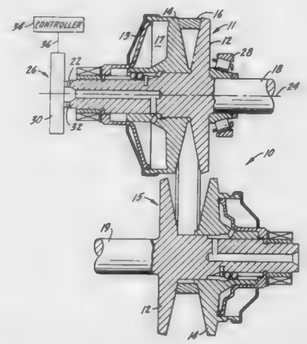
TENSION SENSOR AND CONTROL ARRANGEMENT FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Philip J. Mott, Des Plaines, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Dec. 18, 1985, Ser. No. 810,461

Int. Cl.[4] **F16H** *55/56*

U.S. Cl. 474—8 **16 Claims**



1. A tension sensor for a continuously variable transmission including a primary pulley mounted on a first shaft adapted to receive torque input, a secondary pulley mounted on a second shaft, and torque transfer means intercoupling the primary and secondary pulleys and maintained in tension, each pulley having a movable sheave to maintain tension in said torque transfer means, means for controlling movement of said movable sheaves, said tension sensor comprising a force responsive device positioned to respond to a force transmitted through one of said first and second shafts, and means for coupling said force responsive device to said control means.

4,731,045

DERAILLEUR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 16, 1986, Ser. No. 919,438

Claims priority, application Japan, Oct. 24, 1985, 60-163244[U]

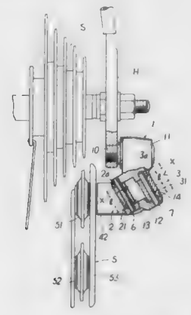
Int. Cl.[4] **F16H** *9/06*

U.S. Cl. 474—78 **4 Claims**

1. A derailleur for a bicycle, for shifting a driving chain from one sprocket to another of a multistage sprocket assembly, said derailleur comprising:

a linkage mechanism comprising a base member, an inner linkage member, an outer linkage member, and a movable member carrying a chain guide; and

a connecting means comprising a pair of first connecting pins for respectively pivotally supporting one end of each of said inner linkage member and said outer linkage member to said base member and a pair of second connecting pins for respectively pivotally supporting said movable member to the other end of each of said inner linkage member and said outer linkage member, said first and second connecting pins being oriented obliquely with respect to a predetermined plane adapted to be positioned perpendicular to an axis of said multistage sprocket assembly when said derailleur is mounted on said bicycle, said chain guide, responsive to deformation of said linkage mechanism, being movable axially and radially of said multistage sprocket assembly when said derailleur is mounted on said bicycle;



said inner linkage member having an upper surface at its said one end connected to said base member which is positioned at a predetermined position adapted to be located on a side closer to said axis of said multistage sprocket assembly relative to a phantom extension line extending from an upper surface of said outer linkage member at its said one end connected to said base member and perpendicular to an axis of the one of said first connecting pins which connects said outer linkage member to said base member.

4,731,046

CONTROL DEVICE FOR THE PRESELECTION AND INDEXATION OF BACK GEAR CHANGES IN BICYCLES AND SIMILAR VEHICLES

Henri Juy, Dijon, France, assignor to Etablissements le Simplex, France

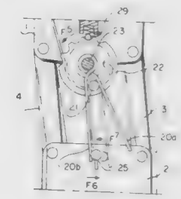
Filed Nov. 26, 1985, Ser. No. 801,875

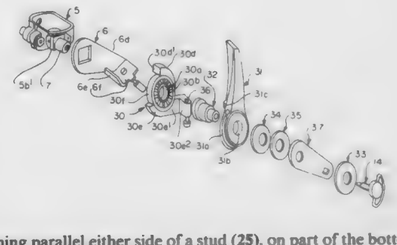
Claims priority, application France, Nov. 28, 1984, 84 18490; Oct. 28, 1985, 85 16322

Int. Cl.[4] **F16H** *11/08*

U.S. Cl. 474—80 **15 Claims**

1. Device for control, preselection and indexing of gear changes for cycles designed to move a chain guide transversely in relation to stepped sprocket wheels forming a single piece with a hub of a rear wheel, with the gear change V being linked via a control cable (C) made of a series of twisted strands to a control mechansim of the level type (**31**), specially shaped and designed to work with control, adjusting and indexing devices (**30***b*), capable of (1) ensuring the tensioning or slackening of the cable with each reversal of the direction of the lever and, (2) acting on the said cable for the transverse movement of the chain guide for changing or selecting one or more gears, with the control mechanism (**31**) consisting of a basic quadrant (**6**) indexed at an angle on a supporting device (**5**) shaped for mounting the whole assembly on an appropriate part of the cycle, a pivot pin (**7**) being indexed in conjunction with the quadrant (**6**) designed for the passage of the cable and to serve as a support for the protective mechanism of the said cable, wherein on one cylindrical contact face of the pivot pin (**7**), a shaped quadrant (**30**) rotates freely, having devices to make contact with corresponding parts of the fixed basic quadrant (**6**) in accordance with two extreme angular positions of the said moving quadrant (**30**) also has devices working together with other devices on the lever (**31**) so that; (A) it is driven simultaneously with the lever as far as one of the stop positions corresponding to the tensioning or slackening of the control cable according to the direction of pivoting of the lever and, (B) permits the movement of the lever alone in accordance with preset positions corresponding to a number of gears selected, with the said moving quadrant (**30**) remaining in the fixed stop position; said gear change is of the deformable parallelogram type, comprising a top supporting clevis (**1**) and a bottom supporting clevis (**2**) articulated by means of two links (**3**) and (**4**) for the transverse movement of a chain guide on the bottom clevis (**2**), characterized in that part of the top supporting clevis (**1**) takes a torsion spring (**20**) whose two ends (**20***a*) and (**20***b*) are interlaced starting from a crank pin (**21**) and





running parallel either side of a stud (**25**), on part of the bottom supporting clevis (**2**), with the said crank pin (**21**) being in a single piece with a part shaped to be moved at an angle under the pull of cable (C) and returned to position by an elastic mechanism for driving simultaneously, in one direction or the other, the bottom support in conjunction with spring (**20**); and wherein the lever (**31**) rotates freely on one cylindrical contact face of a spacer pin (**32**) which, together with the devices for clamping and fixing lever (**31**) to pivot pin (**7**), permits by means of friction, under the effect of the angular movement of the lever and with each reversal of the direction of pivoting of the latter, the simultaneous movement of the moving quadrant as far as one of the two stop positions.

4,731,047

APPARATUS FOR MAKING FILTER FRAMES

David R. Lobb, Pomeroy, Pa., assignor to A. G. Custom Machine Co. Inc., Scranton, Pa.

Continuation of Ser. No. 646,450, Aug. 31, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 887,338

Int. Cl.[4] **B31B** *1/00*

U.S. Cl. 493—10 **7 Claims**

1. An apparatus for the formation of rectangular frames for filters from a reel of framestock wherein sections of framestock are cut, notched and fed through the apparatus without stopping comprising:

a. an elongated frame;

b. a pair of opposing infeed rollers mounted rotationally on said frame which advance a continuous strip of framestock into the apparatus

c. a series of guide rails mounted lengthwise on said frame to maintain a proper position of the framestock;

d. a pair of engageable opposing pinch-score rollers slidingly

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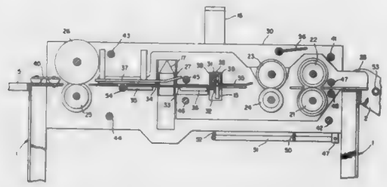
mounted to the frame downstream to said infeed rollers through which the framestock passes which pinch and score the framestock when engaged;

e. means for adjusting the location of the pinch-score rollers relative to the width of the framestock, said means mounted on the frame and connected to the pinch-score rollers;

f. first means for cutting the framestock to a predetermined length, said means mounted downstream to the pinch-score rollers;

g. second means for cutting three notches in the framestock at predetermined positions along the length of the framestock, said means mounted downstream to first cutting means;

h. a second set of rotationally mounted opposing outlet rollers mounted on said frame downstream to second



cutting means through which the framestock passes and is pre-folded;

i. a third set of rotationally mounted opposing fold rollers mounted on the frame downstream to cutting means through which the pre-folded framestock passes;

j. means for adjusting the position of the second fold rollers relative to the width of the framestock;

k. a discharge surface mounted to the frame on the end opposite the feeding means onto which the framestock, notched, folded and cut to length is discharged;

l. means for supplying power to the apparatus mounted on a said frame; and

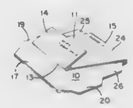
m. means for controlling the operation of cutting means g and f to set the position of the respective notches along the length of framestock and to set the length of each frame, respectively.

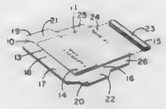
4,731,048

METHOD OF MAKING ENVELOPE AND LETTER ASSEMBLY WITH BUSINESS LETTER FOLD

Gary L. Marella, Minnetonka, and David T. Gardella, Long Lake, both of Minn., assignors to Victory Envelope, Inc., Chanhassen, Minn.

Filed Dec. 17, 1986, Ser. No. 942,610
Int. Cl.[4] F16H *55/36*
U.S. Cl. 493—188 **18 Claims**





1. A method of forming an envelope with a separate business-letter-folded removably enclosure, from a single elongated sheet of material having an envelope end portion and a central but somewhat narrower letter end portion with certain areas at each of the sides of said envelope portion extending laterally beyond the side edges of said letter end portion, said method having the steps of:

(a) transversely folding an end section of said letter end portion back upon said letter end portion in a predetermined direction and thereby forming a panel extending along one side of the remainder of said letter end portion;

(b) folding said sheet of material back upon itself in an opposite direction along a transverse fold line adjacent the juncture of said letter end portion and said envelope end portion to thereby form a triple layer, with said panel being one of the outermore of said layers;

(c) severing said envelope portion from said letter end portion along a transverse line adjacent said fold line to form two separate pieces of sheet material in superimposed relation; and

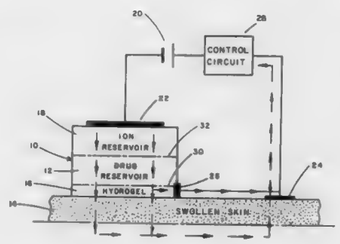
(d) folding said two separate pieces of sheet material simultaneously in said opposite direction each into folded superimposed engaging relation with itself to thereby form a quintuple layer which comprises an envelope with a removable business-letter-folded enclosure therewithin in which said first folded panel is the innermost layer of the letter.

4,731,049

CELL FOR ELECTRICALLY CONTROLLED TRANSDERMAL DRUG DELIVERY

Edgardo J. Parsi, Lexington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jan. 30, 1987, Ser. No. 9,301
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **9 Claims**



1. A cell for the electrically controlled delivery of a drug into and through the skin of a subject patient comprising in combination:

a. a drug reservoir containing therein a drug bound to an immobilized ligand affinity medium or an ion-exchange medium;

b. an electrode communicating with said reservoir; and

c. a source of current connected between said electrode and said skin.

4,731,050

ACUPRESSURE TYPE MOXIBUSTION CASE

Minoru Harada, 963, Myohoji Aza Kitsune, Suma-Ku, Kobe, and Hiroji Harada, 1576-18 Nozoe, Harima-cho, Kakogun, Hyogo, both of Japan

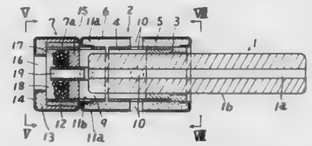
Filed Jul. 9, 1986, Ser. No. 883,890
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—24 **20 Claims**

1. An acupressure-type moxibustion case comprising:

a cylindrical body having a rear end portion and a front end portion; a moxa holder attached to the rear end portion of the cylindrical body; a cylindrical moxa slidably held by said moxa holder in a longitudinal direction coaxially within said cylindrical body, said cylindrical moxa being

removably inserted into said moxa holder from the rear end portion of the cylindrical body and forming a space between said cylindrical moxa and said cylindrical body in the front end portion of said cylindrical body;

a cap member having a rear end portion removably, rotatably and coaxially fitted to the front end portion of said cylindrical body to engage said cylindrical body, said cap member having a front wall for contact with affected body parts and an opening in said front wall communicating with said space formed between said cylindrical body and said cylindrical moxa for discharging combustion gas from firing said cylindrical moxa, wherein said front wall of said cap member is made of aluminium and comprises a



plurality of small protrusions formed and arranged at regular intervals in said front wall and flush with said front wall, and wherein said discharge opening for said moxa combustion gas comprises a plurality of small openings recessed between said protrusions; and

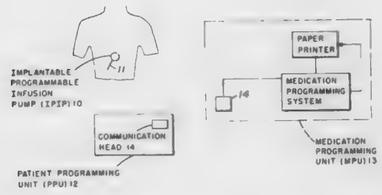
first air supply openings formed along the length of said cylindrical body between said rear end portion and said front end portion and second air supply openings formed along the length of and in said cap member where sid cap member engages the front end portion of said cylindrical body, wherein said first and second air supply openings communicate with the space formed between said cylindrical moxa and said cylindrical body.

4,731,051

PROGRAMMABLE CONTROL MEANS FOR PROVIDING SAFE AND CONTROLLED MEDICATION INFUSION

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 34,155, Apr. 27, 1979, Pat. No. 4,373,527. This application Feb. 15, 1983, Ser. No. 466,494
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—67 **112 Claims**



30. A medication infusion system having a controller to actuate an infusion pump means for infusion of medication into a selected site in a patient, said controller comprising:

a microprocessor;

a pump means operably controlled by said microprocessor for selectively delivering medication to said patient;

a memory means operably associated with said microprocessor for storing prescription parameters; and wherein said microprocessor comprises:

a control means operably connected to said memory means for selecting at least one of said prescription parameters from said memory means;

a delivery state subroutine means for providing actuation commands to said pump means in accordance with said at least one selected prescription parameter, and;

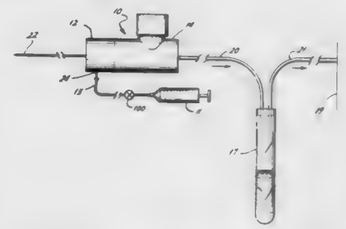
a limiting means operably coupled to said delivery state subroutine means for inhibiting said pump means actuation commands when medication delivery requested by said delivery state subroutine means exceeds a dosage limit.

4,731,052

METHOD FOR REMOVING TISSUE AND LIVING ORGANISMS

H. Michael Seitz, Jr., 214 Airdale Rd., Rosemont, Pa. 19010

Filed Jan. 14, 1987, Ser. No. 3,133
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—51 **7 Claims**



1. In a method of artificially inseminating an egg, of the type wherein viewing means are applied to a female patient for locating and viewing at least one ovary to remove an egg from a follicle thereon by suction with needle means, said needle having suction means attached thereto, the steps comprising:

(a) while viewing said follicle introducing a needle portion of an aspiration and flushing means into the abdominal cavity, invading the follicle and aspirating the egg therefrom, removing said egg by aspiration while providing a smooth, non-turbulent and continuous pathway for said egg to prevent egg damage during aspiration, introducing flushing fluid through said needle portion by way of a syringe passageway, said aspiration and flushing steps including actuating aspiration upon depression of a valve means controlling said aspiration and ceasing aspiration upon release of said valve means;

(b) said invasion of said follicle being accompanied by puncturing said follicle with said needle;

(c) said aspiration being accompanied by pressing valve means connected to said suction means and actuating suction through said needle to evacuate said follicle;

(d) said step of introducing flushing fluid into said follicle being accomplished through said needle portion from a syringe passageway to redistend said follicle; and

(e) repeating steps (c) and (d) until an egg is evacuated from said follicle.

4,731,053

CONTAINER DEVICE FOR SEPARATELY STORING AND MIXING TWO INGREDIENTS

James P. Hoffman, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 23, 1986, Ser. No. 945,749
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—89 **4 Claims**

1. A device for separately storing two ingredients and subsequently mixing said ingredients in said device comprising:

(A) a flexible bag; and

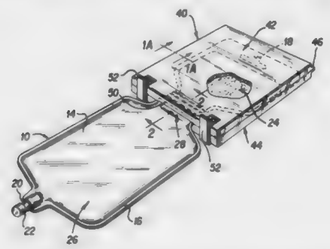
(B) an encapsulating container, wherein said encapsulating container:

(a) encapsulates a portion of said flexible bag; and

(b) comprises releasable partitioning means for: forming a first compartment comprising said encapsulated portion of said flexible bag and a second compartment compris-

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ing said non-encapsulated portion of said flexible bag, sealing said first compartment from the atmosphere external to said encapsulating container ; and securing said encapsulating container to said flexible bag,



wherein upon the release of said releasable partitioning means said encapsulating container is no longer secured to said flexible bag.

4,731,054

MEDICAL REPOSITORY PROBE

Werner Billeter, Winterthur, and Peter Bittmann, Herrliberg, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 20, 1986, Ser. No. 877,228
Claims priority, application Switzerland, Jul. 2, 1985, 2826/85
Int. Cl.[4] A61M *11/00*
U.S. Cl. 604—93 **19 Claims**



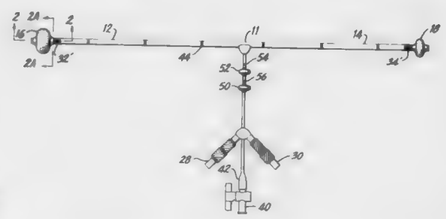
1. A medical repository probe comprising
a tubular probe head having a plurality of individual mutually separated segments and a plurality of flexible joint zones disposed in alternating arrangement with said segments;
a plurality of medicine carriers in said probe head, each said carrier being disposed in a respective segment and having an axial extent of at most three times the longest linear cross-sectional dimensions of said probe head; and
a tubular probe end part extending from said probe head.

4,731,055

BLOOD FLOW CONDUIT

Lev A. Melinyshyn, Mt. Prospect; Jeffrey M. Stupar, Chicago, and Edward M. Goldberg, Glencoe, all of Ill., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 25, 1986, Ser. No. 899,624
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—100 **13 Claims**



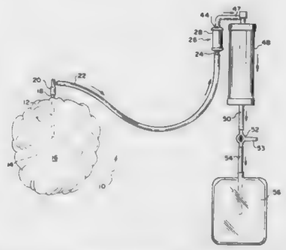
1. A blood flow conduit comprising:
a resilient tube having a passageway therethrough and at least two end portions provided with external inflatable balloons encircling the tube adjacent to said end portions for retaining the end portions within respective blood vessels;
rigid means, positioned at one of said end portions, for preventing the collapse of one of said end portions in the event of the application of excessive force directed inwardly toward said one end portion by the over-inflation of said balloon positioned closest to said rigid means; and
an inflation tube joined to said resilient tube between said end portions, said inflation tube having at least two inflation lumens with each of said lumens being in fluid communication with one of said balloons for inflating said balloons.

4,731,056

EXTERNAL DRAINAGE ANTISIPHON DEVICE

William S. Tremulis, Newport Beach, Calif., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 703,022, Feb. 19, 1985, abandoned.
This application Nov. 24, 1986, Ser. No. 935,105
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—118 **15 Claims**



1. An external ventricular drainage apparatus comprising:
a ventricular catheter;
an antisiphon device comprising an elongated body having an interior chamber therein, an inflow tract and valve seat at one end of said body communicating with said chamber, an outflow tract communicating with other end of said chamber, said body being positioned in a generally upright position with said outflow tract and valve seat being located above said inflow tract and movabale means

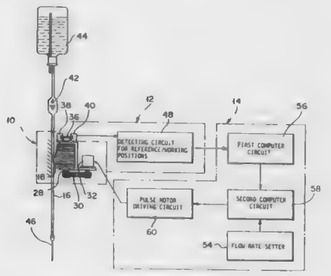
in said chamber for sealing said inflow and said outflow tracts during differing flow patterns through said elongate body such that upon excess pressure said moveable means seals off said outflow tract at a position above said inflow tract valve seat;
means for connecting said catheter to said inflow tract of said antisiphon device;
a drip chamber;
means for connecting said outflow tract of said antisiphon to said drip chamber;
a drainage bag; and
means for connecting said drip chamber to said drainage bag.

4,731,057

TRANSFUSION APPARATUS

Shigeru Tanaka; Tetsuya Miyatake, and Yasushi Miki, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 892,185
Claims priority, application Japan, Aug. 5, 1985, 60-171241
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—153 **3 Claims**



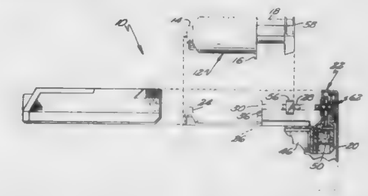
1. Transfusion apparatus comprising:
a finger-type peristaltic pump including (1) a resilient, longitudinal transfusion tube containing liquid to be fed by the transfusion apparatus, (2) a plurality of finger elements disposed in a series along the longitudinal axis of said transfusion tube, and (3) drive means for momentarily actuating said finger elements one after another in a recurrent succession so that the actuated finger elements press on and occlude said transfusion tube and cause the liquid in said tube to move longitudinally along the tube ahead of the actuated finger elements;
means responsive to said peristaltic pump for producing a reference position indicating output signal each time the finger elements of said pump reach a predetermined reference point in said recurrent succession, and for producing a succession of working position indicating output signals each indicating that said recurrent succession has progressed a predetermined increment beyond said reference point; and
drive control means responsive to said reference and working position indicating output signals for determining the rate at which said finger elements must be actuated at the point in said recurrent succession at which said reference and working position indicating signals indicate that the pump currently is in order to maintain a constant liquid delivery amount of the pump and for causing said drive means to actuate said finger element at that rate.

4,731,058

DRUG DELIVERY SYSTEM

Phong D. Doan, Shoreview, Minn., assignor to Pharmacia Deltec, Inc., St. Paul, Minn.

Filed May 22, 1986, Ser. No. 865,687
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—155 **31 Claims**



1. System for delivering a drug to a patient including a reservoir for storing the drug to be delivered to the patient by the system and a plunger assembly reciprocally received in the reservoir for forcing the drug to the patient from the reservoir when advanced into the reservoir,' with the plunger assembly having a free end, comprising, in combination: a chassis; a lead screw having a first end; means for mounting the lead screw for rotation and at least limited axial movement from a first axial position with respect to the chassis; a motor having an output shaft; means for rotatably relating the output shaft of the motor with the lead screw for rotating the lead screw with respect to the chassis; a drive nut threadably received on the lead screw and removeably attached in a nonrotatable manner to the free end of the plunger assembly for advancing the plunger assembly in the reservoir in response to the rotation of the lead screw by the motor and the rotatably relating means; and switch means actuated by the first end of the lead screw for electrically interrupting the operation of the motor when the lead screw is moved into its first axial position as the result of an increase of force necessary to advance the plunger assembly into the reservoir due to excessive reservoir back pressure caused by occlusion, plunger assembly friction, a depleted reservoir, and like conditions, with the switch means including means for axially biasing the lead screw with respect to the chassis out of its first axial position and in the direction of axial movement of the plunger assembly for advancing the plunger assembly into the reservoir for forcing the drug from the reservoir.

4,731,059

COMBINATION NEEDLE SHIELD/NEEDLE GUARD DEVICE POSITIVELY LOCKED ONTO DETACHABLE NEEDLE ASSEMBLIES FOR AN EVACUATED BLOOD COLLECTION SYSTEM AND A HYPODERMIC SYRINGE

Alan A. Wanderer, Englewood, and William E. Sagstetter, Denver, both of Colo., assignors to Medical Safety Products, Inc., Denver, Colo.

Filed Oct. 14, 1986, Ser. No. 918,020
Int. Cl.[4] A61B *5/14*
U.S. Cl. 604—192 **45 Claims**

1. A first embodiment of an evacuated blood collection system with a combination needle shield/needle guard device positively locked onto a double-ended needle assembly, the invention comprising;
said evacuated blood collection system with said double-ended needle assembly comprising first needle, second needle, housing having a forward end and a rear end, said first needle extending outwardly from forward end of said housing, and said first needle adapted for insertion into a patient's blood vessel, said second needle extending outwardly from rear end of said housing, said second needle enveloped by self-recoverable elastic sheath, said second

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needle adapted for insertion into stopper of evacuated container;

a means within said housing of double-ended needle assembly for directing fluid flow unidirectionally from said first needle to said second needle which is engaged into said evacuated container;

threads on rear exterior of said housing of double-ended needle assembly, said threads with double lead-in threads;

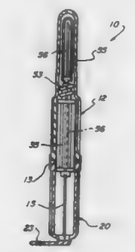
container holder with internal mating threads on its forward end, said internal mating threads with double lead-in threads;

the improvements of our invention for said first embodiment of an evacuated blood collection system comprising;

said double-ended needle assembly with extended housing between said first needle extending outwardly from forward end of said extended housing and said second needle extending from rear end of said extended housing, groove system on said extended housing, said extended housing with double external protrusions strategically located on rear exterior of said extended housing;

a needle shield/needle guard device comprising a hollow cylindrical housing sealed at its proximal end with an integral pull-off tab, an internal protrusion extending internally from distal inner wall of said cylindrical housing;

a means for positive locking said needle shield/needle guard device into first extended lock position of said extended housing of double-ended needle assembly which prevents the forward clockwise and counterclockwise rotation of



said needle shield/needle guard device in relation to front end of said extended housing;

a means for said needle shield/needle guard device as a needle shield to enclose said first sterile needle;

a sterile package container for said double-ended needle assembly;

a means for removal of said double-ended needle assembly with positively locked needle shield/needle guard device from said sterile package container;

a container holder with duplicate groove systems and notches located at strategic distances from each other;

a primary means for engaging and securing said double-ended needle assembly to said container holder by a simultaneous clockwise rotation of said needle shield/needle guard device and said extended housing without separate clockwise rotation of said needle shield/needle guard device in relation to said extended housing of double-ended needle assembly;

a means for alignment of longitudinal groove on said extended housing of double-ended needle assembly with one of two longitudinal grooves of said container holder;

said means for alignment of said longitudinal grooves also providing a secondary locking means for securing of said double-ended needle assembly to said container holder;

a means for aperture formation on proximal end of said cylindrical housing of said needle shield/needle guard device;

a means to provide resistance for retraction of said cylindrical housing of said needle shield/needle guard device in relation to said extended housing of double-ended needle assembly;

a means for said cylindrical housing as a needle guard after said aperture has been formed, such that said cylindrical housing can retract distally into retracted lock position on said container holder, uncovering said first needle;

a means provided to facilitate movement of said cylindrical housing from said first extended lock position to said retracted lock position;

a means for positively locking said cylindrical housing into said retracted lock position which prevents the forward, backward, and clockwise rotation of said cylindrical housing in relation to front end of said container holder;

a tertiary means for locking said double-ended needle assembly to said container holder;

a length extension of said extended housing of double-ended needle assembly providing means for shallow or acute angulation to insert said first needle into planar surface of skin and blood vessel;

a means for said cylindrical housing as a needle guard, such that said cylindrical housing can re-extend into second extended lock position on said extended housing of double-ended needle assembly, re-covering said first needle from behind needle point of said first needle;

a means provided to facilitate movement of said cylindrical housing from said retracted lock position to said second extended lock position;

a means for positive locking said cylindrical housing into said second extended lock position on said double-ended needle assembly which prevents the forward, backward, clockwise and counterclockwise rotation of said cylindrical housing in relation to said extended housing of double-ended needle assembly; and

a means for disengaging said double-ended needle assembly from said container holder while maintaining coverage of said first needle with said cylindrical housing.

4,731,060

HYDROSTATIC FLOAT VALVE AND INTRAVENOUS SYSTEM SUPPLIED THEREWITH

Marc L. Catalano, 2501 Bahama Dr., Miramar, Fla. 33023

Filed Nov. 17, 1986, Ser. No. 931,089
Int. Cl.[4] A61M 5/16
U.S. Cl. 604—254 **17 Claims**



1. A system for supplying fluid to a patient at a controlled rate of fluid flow and to stop said flow automatically when said flow rate becomes uncontrolled comprising

a valve chamber,

means to deliver said fluid at a controlled rate to said valve chamber,

a valve seat fixed in position within said valve chamber to separate said valve chamber into an upper chamber portion and a lower chamber portion,

a valve extending through said valve seat and movable relative thereto,

primary tubing communicating with said lower chamber portion to deliver said fluid by gravity from said valve chamber to a catheter constructed and arranged for insertion into the body cavity of a patient, and

manual valve means constructed and arranged to cooperate with said primary tubing to form a closed portion of said fluid feeding system between said valve seat and said manual valve means when said manual valve means is closed,

characterized by the fact that said lower chamber portion is flexible to develop a back pressure against gravity when said flexible lower chamber portion is pinched while said manual valve means is closed,

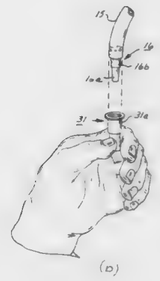
said valve has a specific gravity slightly more than that of said fluid but less than the combination of the buoyant force of said fluid and said back pressure against gravity that develops when said flexible lower portion is pinched to lift said valve from said valve seat by said combination when said back pressure is sufficiently great and to maintain said valve spaced from said valve seat as long as said back pressure is sufficiently great and to allow said valve to lower onto said valve seat when a net outflow of fluid from the closed portion of said system reduces said back pressure sufficiently until said combination of buoyancy and said reduced back pressure is so small that said valve lowers by gravity to engage said valve seat.

4,731,061

APPARATUS AND METHOD FOR REDUCING RISK OF CONTAMINATION AND DELIVERING TO A PATIENT PHARMACEUTICALLY-ACCEPTABLE MATERIAL

Vlado I. Matkovich, Glen Cove, N.Y., assignor to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 763,917, Aug. 8, 1985, abandoned. This application Jun. 24, 1987, Ser. No. 63,798
Int. Cl.[4] A61M 5/325
U.S. Cl. 604—263 **3 Claims**



1. In a recirculating system for delivering a pharmeceutically-acceptable material, a filter assembly forming a Y-connection and comprising:

a housing having top and bottom sections joined by a side section so as to provide a chamber of filter material;

first and second ports on the top section of the housing which cooperate to recirculate the material without the material passing through the filter material; and

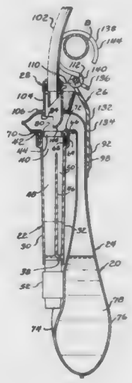
a third port on the bottom section of the housing for communication with the first and second ports so as to provide a flow route for the material through the filter material, the third port of the housing includes an extension line integrally secured at a first end to the third port so as to provide a conduit for flow of material exiting said third port, said extension line having a second end mated to a connector protected by a cap, wherein said cap includes means for protecting said connector from contamination by capillary attraction or splashing of material as it flows from said connector during priming of said filter assembly, said means comprising first and second generally cylindrical sections joined by a thin annular area that enables said second section to be torn away from said first section so as to allow the priming of said filter assembly, said first section having a central opening for allowing said first section to fit over the outer surface of said connector and for removing said first section from said connector so as to expose said outer surface for mating with a complementary connector and said second section having means for blocking flow of material through said connector when said cap is mated to said connector.

4,731,062

URINE METER

James R. Gross, St. Charles, and Helmut W. G. Rosenberg, McHenry, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jun. 20, 1986, Ser. No. 876,622
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—322 **48 Claims**



1. A urine meter, comprising:

a receptacle having a wall defining a cavity and an opening extending through the top of the receptacle when in a collection position and communicating with the cavity;

a container having a flexible wall defining a chamber, said container being secured adjacent the top of the receptacle with a portion of the container extending over the top opening of the receptacle and having an opening in register with the receptacle opening and communicating with the chamber and the cavity through the receptacle opening said container extending along side of the receptacle when in said collection position whereby the container can hold collected liquid when the receptacle is in the collection position;

inlet conduit means extending through the portion of the container which extends over the receptacle opening to a position aligned with the cavity for draining liquid into the cavity; and

means for movably mounting the receptacle between a first lower upright position to collect liquid in the cavity, and a second upper tilted position sufficient to dump collected liquid from the cavity into the chamber.

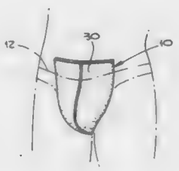
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,063

DISPOSABLE ANTISEPTIC DEODORIZED INSERT FOR A SUPPORTER OR THE LIKE

Reginald H. Newkirk, Sherman Oaks, Calif., assignor to Newkirk Enterprises, Inc., Sherman Oaks, Calif.

Filed Aug. 16, 1985, Ser. No. 766,242
Int. Cl.[4] A61F 5/40
U.S. Cl. 604—347 3 Claims



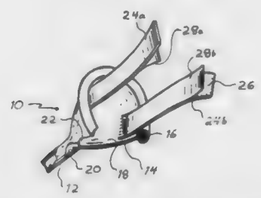
1. A disposable insert for use with a supporter or the like, comprising:
an insert body member of antiseptically treated open cellular foam material comprising two elongated pre-cut and pre-shaped identical flat panels, each of said flat panels having
a top linear edge;
a side edge convex for the length of the panel and having one end contiguous with one end of the top edge;
and a continuous edge joining the other end of the top edge with the other end of the side edge;
said continuous edge having an upper elongated concave edge portion extending from the top edge for a major portion of the length of the panel, and a lower relatively short convex edge portion subtending an angle of approximately 90° and extending to said other end of the side edge;
the continuous edges of the panels being joined by a seam to form a flat pre-shaped unitary insert body member;
the two pre-shaped joined panels lying in parallel planes and conforming in shape to each other;
the width of each panel between said side edge and said concave edge portion being substantially uniform;
said side edges when separated and each moved through an angle of approximately 90° about said seam, forming the top edges into a continuous slightly concave top edge to provide a substantially wide upper body member portion to conform to adjacent abdomen body surfaces;
said lower convex edge portions upon separation of said side edges forming a lower body member portion of three-dimensional pouch form having an internal concave continuous surface comfortably accommodating male genitals and margins conforming to the groin area.

4,731,064

URINE DRAINAGE DEVICE WITH ADHESIVE TABS

Eugene L. Heyden, S. 627 Bernard # 8, Spokane, Wash. 99204

Continuation of Ser. No. 834,560, Feb. 28, 1986, abandoned.
This application Apr. 23, 1987, Ser. No. 48,993
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—352 14 Claims



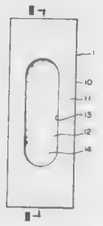
1. A drainage device for managing the discharge of urine when externally applied to a penis, said drainage device having distal and proximal ends and comprising:
a generally tubular sheath of flexible material presenting a longitudinal axis and a centrally open region therein, said sheath including
a distal portion of longitudinal extent defining a open central discharge fluid passage,
a conical body portion emerging from said distal portion and providing a distal discharge opening therein in fluid communication with said open central fluid passage, said conical body portion conically smallest in the vicinity of said distal portion, and
a proximal portion opposing said distal portion and emerging from said conical body portion and from a conically largest portion thereof, said proximal portion in a rolled up state in a position in the vicinity of said conical body portion and of a dimension adapted to circumferentially cover a substantial length of said penis when unrolled thereupon; and
at least one longitudinally extending integral flap member means secured to said sheath and having an inner surface and emerging externally from said sheath at an internal location between said distal discharge opening and a location on said proximal portion adjacent said conically largest portion when said proximal portion is in a rolled up state, said flap member means comprising a member of said sheath adapted to extend directionally away from said distal portion and provided to achieve an attached relation to a substantial length of said penis by flap member securing means, so that said flap member means may maintain a penis in the vicinity of said distal discharge opening and within said sheath while said proximal portion is being unrolled to cover a substantial length of said penis.

4,731,065

SANITARY NAPKIN

Yutaka Yamada, 5-15-9, Minamikarasuyama, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 535,272, Sep. 23, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 788,515
Claims priority, application Japan, Jan. 24, 1983, 58-8615[U]; Jan. 24, 1983, 58-8616[U]; Apr. 15, 1983, 58-57142[U]; Apr. 15, 1983, 58-57143[U]; Jun. 30, 1983, 58-101365[U]
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—355 8 Claims



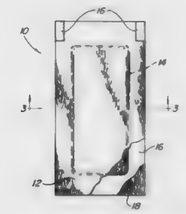
1. A sanitary napkin for receiving bodily excretions, said sanitary napkin comprising
an elongated, flexible, absorbent element having opposite front and rear surfaces which are smooth and elongated, said absorbent element comprising a lamination of a plurality of elongated water-absorbing paper layers which are rimpled in their elongate dimension, some of said elongated water-absorbing paper layers nearest said front surface of said absorbent element including portions which are folded back inwardly of said absorbent element so as to provide an excretion-receiving recess in said absorbent element extending from its front surface towards its rear surface and a generally C-shaped excretion-receiving passage space communicating with said recess, said generally C-shaped passage space having a generally triangular-shaped cross section, the capillaries between said water-absorbing paper layers communicating with said recess and said generally C-shaped passage space, and
an elongated, waterproof bag element securely surrounding said absorbent element, said bag element having a front surface covering the front surface of said absorbent element and a rear surface covering the rear surface of said absorbent element, the front surface of said bag element including an opening which is in alignment with the recess in the absorbent element therein.

4,731,066

ELASTIC DISPOSABLE DIAPER

Ralf Korpman, Bridgewater, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation of Ser. No. 595,181, Mar. 30, 1984, abandoned.
This application Feb. 10, 1987, Ser. No. 12,984
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—366 4 Claims



1. An elastic, laminated disposable diaper comprising: a liquid-impermeable backing comprised of a pressure sensitive film having an outer backing fabric laminated to said elastic film, said backing fabric having at least about 25% extensibility, an absorbent core and a liquid-permeable facing comprised of fabric having at least about 25% extensibility and being coextensive with said backing, said absorbent core being laminated between said facing and said backing.

4,731,067

EXTENDED SHELF LIFE WATER-ABSORBING COMPOSITION WHICH FACILITATES FIBER FORMATION

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Company, Newtown Square, Pa.

Filed Oct. 6, 1986, Ser. No. 915,455
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—367 17 Claims

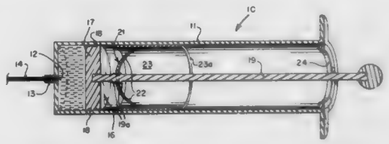
1. An article of manufacture comprising a cured water-absorbing composition and a means for supporting said composition for absorption usage, wherein said water-absorbing composition comprises a blend of:
(a) a copolymer containing from about 25 to about 75 mole percent recurring units of at least one α,β-unsaturated monomer bearing at least one pendant unit selected from the group consisting of carboxylic acid units and derivatives of carboxylic acid units and from about 75 to about 25 mole percent recurring units of at least one copolymerizable comonomer, wherein from about 20 to about 80 percent of the total pendant units introduced through the recurring units of the α,β-unsaturated monomer must either be carboxylic acid units or must be converted into carboxylic acid units, and wherein from about 80 to about 20 percent of the total pendant units must either be carboxylate salt units or must be converted into carboxylate metal salt units; and
(b) at least one monomer containing at least two hydroxyl groups selected from the group consisting of: alkylene glycols containing 2–10 caroon atoms and their ethers; cycloalkylene glycols; Bisphenol A; hydroxy alkylene derivatives of Bisphenol A; hydroquinone; phloroglucinol; hydroxy alkylene derivatives of diphenols; glycerol; erythritol; pentaerythritol; and all natural monosaccharides.

4,731,068

NON-RELOADABLE SYRINGE

John E. Hesse, 827 Stetson St., Moss Beach, Calif. 94038

Filed May 1, 1987, Ser. No. 45,867
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—110 7 Claims



1. A non-reloadable syringe capable of being charged and discharged only once comprising an elongate right cylindrical barrel, a small opening at one end of said barrel and means for supporting a hypodermic needle at said one end in fluid communication with said opening, a plunger assembly disposed within said barrel for movement between advanced and retracted positions therealong to load said syringe, said positions being defined by the internal extremities of said barrel, respectively the needle end and the other end thereof, said plunger assembly including a piston fitted snugly within said barrel and a drive rod carried axially of said barrel from said piston to protrude from said barrel at the other end thereof, said rod serving to retract said piston outwardly of said barrel for loading same from the extremity at the needle end thereof and to urge said piston inwardly thereof to discharge the contents therefrom, means for inhibiting further retraction of said piston to prevent reloading of the syringe, and the interior side wall of said barrel being continuously smooth from said one end to the other.

4,731,069

INTRAVENOUS TUBE AND CONTROLLER THEREFOR

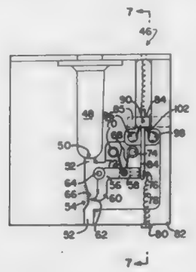
John F. Krumme, Woodside, Calif., assignor to Beta Phase, Inc., Menlo Park, Calif.

Division of Ser. No. 857,974, May 1, 1986, Pat. No. 4,713,063, which is a continuation-in-part of Ser. No. 733,036, Apr. 29, 1985, Pat. No. 4,645,489, which is a continuation of Ser. No. 445,390, Nov. 30, 1982, abandoned. This application Feb. 26, 1987, Ser. No. 19,181
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—250 8 Claims

1. An intravenous flow rate controller comprising:
a passage means in said controller for receiving a tube through which intravenous fluid may flow;
a knife edge means located on one side of said passage means,
a wall means projecting into said passage opposite said knife edge means;
a first spring in operative contact with said knife edge means for biasing said knife edge means into engagement with said wall means;
a first shape-memory member in operative contact with said knife edge means, said first shape-memory member when heated capable of countering the force of said spring and causing said knife edge means to move away from said wall means proportional to the degree of heating of said first shape-memory member; and
brake means operatively connected to said knife edge means

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for locking said knife edge means with respect to said wall means and countering the force of said spring when said



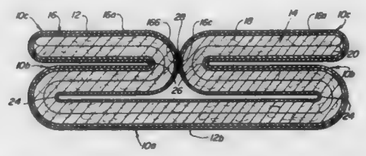
first shape-memory member is unheated to maintain precise positioning of said knife edge means with respect to said wall means.

4,731,070

ADULT INCONTINENT ABSORBENT ARTICLE

Shirley A. Koci, Moamouth Junction, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation of Ser. No. 601,830, Apr. 19, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,204
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R 10 Claims



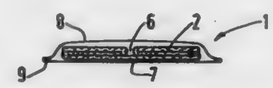
1. An absorbent article comprising: an absorbent batt having opposite major faces; a moisture impervious sheet covering one major face of said batt, said moisture impervious sheet being wider than said batt and including flap portions folded over opposite side marginal edges of said batt and providing inwardly extending, spaced, moisture impervious sheet portions disposed against the other major face of said absorbent batt; a moisture pervious liner covering the other major face of said absorbent batt and at least the inwardly extending portions of said moisture impervious sheet; said absorbent article being folded so as to dispose inner edge sections of said inwardly extending moisture impervious sheet portions in facing relationship with respect to one another; said inner edge sections of said inwardly extending moisture impervious sheet portions being covered by overlying portions of said moisture pervious liner, and means acting through said overlying portions of said moisture pervious liner for securing said inner edge sections of said inwardly extending moisture impervious sheet portions to one another, said securing means being offset toward one end of said absorbent article to thereby define a urine receptable pocket at the opposite end of said absorbent article.

4,731,071

LIQUID-ABSORBENT DISPOSABLE ARTICLE

Raymond Pigneul, Durrenentzen, France, assignor to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR84/00248, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02110, PCT Pub. Date May 23, 1985
PCT Filed Nov. 6, 1984, Ser. No. 756,976
Claims priority, application France, Nov. 8, 1983, 83 17723
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R 6 Claims



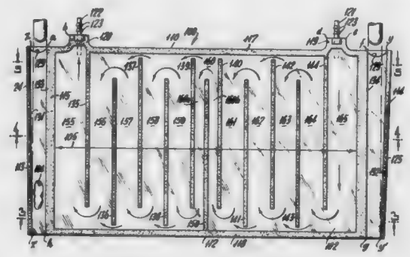
1. Liquid-absorbent disposable article comprising an absorbent pad of substantially rectangular shape and covered on its inner face with a sheet which is permeable to fluids and on its outer face by a sheet impermeable to fluids, said sheets being partially or totally sealed along their edges to form an envelope, said absorbent pad including a continuous outer layer and inwardly positioned therefrom a plurality of juxtaposed half layers defining a narrow channel between said half layers, each of said half layers having a width equal to or substantially equal to one-half the width of said outer layer, the innermost of said half layers extending beyond the longitudinal edges of the outer layer to form two lateral single layer extensions which conform to the sealed edges of said envelope.

4,731,072

APPARATUS FOR HEATING OR COOLING FLUIDS

James D. Aid, St. Petersburg, Fla., assignor to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 262,162, May 11, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,582
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—408 21 Claims



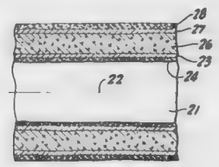
1. A flexible container means adapted to be received in a frame means having a cross member from which extends a pair of substantially parallel arm elements and in which a liquid may be stored or through which a liquid may be circulated, said container means comprising a pair of walls including two relatively thin, generally flexible sheets of a polymeric material, a top edge, a bottom edge, a centrally located compartment for containing said liquid, an elongated sleeve adjoining each side edge of said compartment, an inlet for introducing said liquid into said compartment and an outlet for withdrawing said liquid from said compartment, each of said sleeves having an inner edge and an outer edge, the straight-line distance between the outer edges of said sleeves being greater along the top edge of the container means than the straight-line distance between the outer edges of said sleeves along the bottom edge of said container means.

4,731,073

ARTERIAL GRAFT PROSTHESIS

Thomas C. Robinson, Berkeley, Calif., assignor to Thoratec Laboratories Corporation, Berkeley, Calif.

Division of Ser. No. 234,116, Feb. 13, 1981, Pat. No. 4,604,762. This application May 21, 1984, Ser. No. 612,997
Int. Cl.[4] A61F *2/06*
U.S. Cl. 623—1 15 Claims



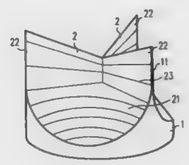
1. An arterial graft prosthesis formed of a core zone of porous elastomer disposed about the longitudinal axis of the prosthesis, an inner zone of solid elastomer concentric with and homogeneously joined to the inside of said zone of porous elastomer, an outer zone of solid elastomer, said outer zone of solid elastomer being concentric with and homogeneously joined to the outside of said zone of porous elastomer.

4,731,074

HEART VALVE PROSTHESIS, METHOD FOR PRODUCING A HEART VALVE PROSTHESIS AND MOULD APPLIED THEREBY

Eduard P. M. Rousseau, Maastricht; Antonius A. van Steenhoven; Joannes D. Janssen, both of Nuenen, and Leonardus H. G. Wouters, Weert, all of Netherlands, assignors to Stichting voor de Technische Wetneschappen, Netherlands

Filed Feb. 24, 1986, Ser. No. 832,914
Claims priority, application Netherlands, Feb. 26, 1985, 8500538
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 17 Claims



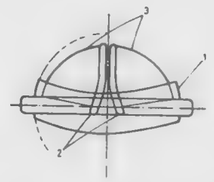
1. Heart valve prosthesis comprising a substantially rigid frame including a base, said frame being provided therein with several synthetic membranes extending across the frame wherein each membrane is a fibre-reinforced matrix material, characterized in that the fibres are arranged in parallel in the matrix material across the membrane and perpendicular to the locus of points forming the commissure line of said membranes and in substantial parallelism with said base and wherein the fibre material and the matrix material are chemically identical.

4,731,075

BICUSPATE CARDIAC-VALVE PROSTHESIS

José I. Gallo Mezo, Po Menéndez Pelayo 10; Manuel Carrion Alvarez, Avda. Los Castros 35, both of Santander; Blanca Ruiz, Paseo Migueletes 20, San Sebastian, and Carlos Gomez Duran, Servicio de Cirugía Cardiovascular, Santander, all of Spain

Filed Dec. 17, 1985, Ser. No. 810,066
Claims priority, application Spain, Dec. 19, 1984, 283.533[U]
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 8 Claims



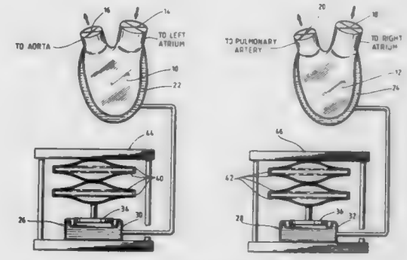
1. A bicuspate cardiac-valve prosthesis for use in human clinical medicine as a mitral valve graft, comprising a support ring having an arched central or diametral crosspiece joined at its ends to the lower portion of said support ring, said central crosspiece being double edged, to both sides of which central crosspiece the inner edges of respective valve flaps are attached, while their opposite edges move freely during function of the apparatus and, when the valve is closed, abut against the inner surface of the support ring in a low, domed profile, and wherein the central crosspiece contains a series of apertures along its length to permit passage of a certain quantity of blood to prevent the formation of clots.

4,731,076

PIEZOELECTRIC FLUID PUMPING SYSTEM FOR USE IN THE HUMAN BODY

George P. Noon; Louis W. Feldman; Paul I. Weiss, and Michael E. DeBakey, all of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

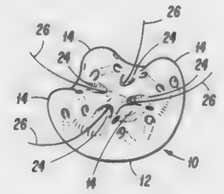
Filed Dec. 22, 1986, Ser. No. 944,100
Int. Cl.[4] A61F *2/22*; A61M *1/10*; A61H *1/02, 7/00*
U.S. Cl. 623—3 18 Claims



1. An implantable blood pump comprising,
an artificial heart,
a hydraulic bladder connected to the exterior of the artificial heart for contracting and releasing the heart in response to hydraulic pressure,
a hydraulic pump connected to the hydraulic bladder, and
a valveless piezoelectric drive system connected to and driving the hydraulic pump, said system having a frequency in the range of 60 to 120 cycles per minute and providing a hydraulic flow rate of 8 liters per minute.

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4,731,077
UNIVERSAL IMPLANT FOR ARTIFICIAL EYES
Edwin L. Allen, 1192 E. Jefferson, Iowa City, Iowa 52240
Filed Jun. 25, 1987, Ser. No. 66,312
Int. Cl.[4] A61F *2/14*
U.S. Cl. 623—4 4 Claims



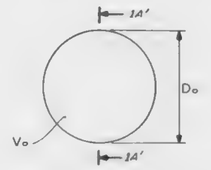
1. An implant for use with a prosthetic eye comprising a main body having top and bottom edges that are straight across and parallel to each other joined by rounded corners to sides that are straight and parallel to each other to form a substantially square configuration that has an anterior portion and a smooth convex posterior surface, a plurality of circumferentially-spaced outwardly-tapered mounds forming a part of the anterior portion, a mound being located at each of the rounded corners of the main body and terminating in a rounded extremity, the anterior portion also having formed between the mounds shallow valleys to accommodate the severed ends of the four rectus muscles of the eye during the implant procedure, one valley extending between the top and bottom edges and the other valley extending between the sides of the main body, the two valleys crossing at the center of the anterior portion to form a relatively flat central portion, and a pair of interconnected suture holes formed in each of the valleys in the central portion to provide for securing the ends of the rectus muscles to each other and to the implant.

4,731,078
INTRAOCULAR LENS
Vladimir A. Stoy, and George P. Stoy, both of Princeton, N.J., assignors to Kingston Technologies Limited Partnership, Dayton, N.J.
Filed Aug. 21, 1985, Ser. No. 767,808
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 26 Claims



1. An artificial intraocular lens for insertion into an eye comprising
an optical body for placement across the optical axis of said eye for refracting images received via the cornea of said eye in order to focus said images on the retina of said eye,
an outer surface that encloses said optical body and is exposed to fluid within said eye,
said optical body comprising an outer layer on which said outer surface lies and an inner layer having an internal refractive surface, and
means for selectively changing the refractive power of said internal refractive surface by changing the contour of said internal refractive surface.

4,731,079
INTRAOCULAR LENSES
Vladimir Stoy, Princeton, N.J., assignor to Kingston Technologies, Inc., Dayton, N.J.
Filed Nov. 26, 1986, Ser. No. 935,224
Int. Cl.[4] A61F *2/16;* A45C *13/10*
U.S. Cl. 623—6 24 Claims



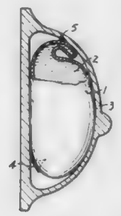
1. In an intraocular lens which includes at least a non-toxic, biocompatible, hydrolytically and enzymatically stable, photodegradation resistant, polymeric optical zone portion,
wherein the improvement comprises said polymeric optical zone portion having the following characteristics, when in osmotic equilibrium with body liquids:
(a) softening temperature T_s between about 0° C. and about 42° C.;
(b) damaging temperature T_d higher than 42° C.;
(c) refractive index greater than 1.39; and
(d) temperature range of elastic deformation Te, above T_s but below T_d, and
when said polymeric optical zone portion is heated to T_e and one of its original dimensions is reduced by at least 20%, then cooled to at least 5° C. below T_s and,
upon reheating to T_e said polymeric optical zone portion will return to its original dimensions existing prior to said first heating to T_e, dimensional reduction and cooling.

4,731,080
COATED INTRAOCULAR LENS
Miles A. Galin, 823 United Nations Plaza, New York, N.Y. 10017
Continuation-in-part of Ser. No. 692,672, Jan. 18, 1985, abandoned. This application May 20, 1986, Ser. No. 865,381
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 22 Claims

1. An intraocular lens coated with a non-smudging biologically compatible hydrophobic crosslinked vinyl-containing silicone polymer coating material selected from the group consisting of polymethylvinyl siloxane and polymethylphenylvinyl siloxane.

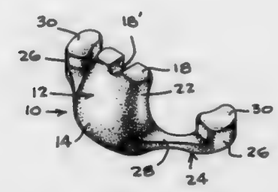
4,731,081
RUPTURE-RESISTANT PROSTHESIS WITH CREASABLE SHELL AND METHOD OF FORMING SAME
John S. Tiffany, Ventura, and R. Alastair Winn, Santa Barbara, both of Calif., assignors to Mentor Corporation, Goleta, Calif.
Continuation of Ser. No. 649,954, Sep. 11, 1984, abandoned, which is a continuation of Ser. No. 350,916, Feb. 22, 1982, abandoned. This application Sep. 17, 1985, Ser. No. 778,158
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—8 6 Claims

1. An implantable rupture-resistant inflatable mammary prosthesis comprising:
a flexible, biocompatible, inflatable shell; and
a biocompatible inflating fluid occupying effectively the entire interior space, said inflating fluid further comprising saline and an aqueous liquid carrier having a separate lubricating material uniformly dispersed therein, the lubricating material selected from the group consisting of polyvinylpyrrolidine, polyvinyl alcohol, hydroxyethyl starch, lecithin, peanut oil, cottonseed oil, fatty acid salts



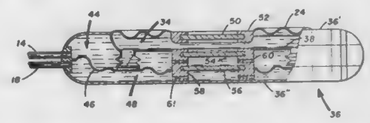
and fatty acid esters, wherein the lubricating material is less than 70% by weight of the inflating fluid.

4,731,082
PRE-MAXILLARY IMPLANT
Stephen X. Giunta, 4600 King St., Alexandria, Va. 22302
Filed Jul. 21, 1987, Ser. No. 77,121
Int. Cl.[4] A61F *2/18*
U.S. Cl. 623—10 14 Claims



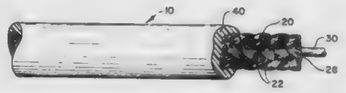
1. A pre-maxillary implant device to be surgically inserted in the pre-maxillary area of the human face to increase the protrusion of the base of the nose, comprising a unitary integral implant member of semi-solid plastic material or the like, compatible upon insertion with surrounding tissue, comprising a laterally elongated body of a width providing opposite end portions of appropriate size to correspond substantially to the distance between the lateral alar bases of the recipient including a central riser formation forming an upright pedestal portion for supporting the miesiel crucra having a convex front face extending upwardly along an arcuate path having an approximately 70° posterior inclination and having a concave rear face, the pedestal portion being provided with a posterior notch extending substantially vertical along the mid-region of said rear face to provide fit against the anterior nasal spine, the pedestal portion to be inserted under the DSN muscle to provide a foundation for nasal base protrusion and tip projection, the implant member having a substantially flat horizontal bottom surface across the entire width thereof and the pedestal portion having a substantially flat top surface of less lateral span than the bottom surface, and a pair of relatively thin opposite lateral extensions providing wing formations projecting from the lowermost portions of the pedestal portion and terminating in vertically enlarged terminal formations providing support for the lateral alar bases.

4,731,083
MANUALLY ACTUATED HYDRAULIC SPHINCTER
Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.
Division of Ser. No. 421,441, Sep. 21, 1982, Pat. No. 4,571,749. This application Aug. 29, 1985, Ser. No. 770,448
Int. Cl.[4] A61F *2/02*
U.S. Cl. 623—14 12 Claims



1. An implantable hydraulic urinary sphincter system comprising:
a control unit contained in a casing and implanted in a subcutaneous position, comprising:
an actuation chamber filled with an incompressible actuation fluid, said actuation chamber mounted inside said casing, a first wall of said actuation chamber containing a flexible actuation diaphragm positioned on said casing, at least part of said first wall of said actuation chamber containing an outer septum, a second wall of said actuation chamber containing at least one extensible portion, pressing on said flexible actuation diaphragm causes said at least one extensible portion to elongate, at least part of said second wall including an inner septum, said inner septum located below said outer septum;
a sphincter fluid chamber filled with an incompressible sphincter fluid, said sphincter fluid chamber mounted inside said casing, the second wall of said actuation chamber also forming at least part of one wall of said sphincter fluid chamber, an additional wall of said sphincter fluid chamber containing an elastic diaphragm, said elastic diaphragm maintaining said sphincter fluid at a minimum pressure, said sphincter fluid chamber positioned adjacent to said actuation chamber such that said at least one extensible portion when elongated presses against said elastic diaphragm increasing the volume of said sphincter fluid chamber and decreasing the pressure on said sphincter fluid thereby allowing said patient to urinate; and,
an artificial sphincter directly coupled hydraulically to said sphincter fluid chamber, said artificial sphincter chamber being pressurized at a fluid pressure essentially equal to said sphincter fluid; and,
an access means for selectively accessing fluid in said actuation fluid chamber and said sphincter fluid chamber after said control unit has been implanted.

4,731,084
PROSTHETIC LIGAMENT
Richard L. Dunn, Birmingham; Danny H. Lewis, Hartselle, both of Ala.; Thomas W. Sander, and Richard W. Treharne, III, both of Memphis, Tenn., assignors to Richards Medical Company, Memphis, Tenn.
Filed Mar. 14, 1986, Ser. No. 840,298
Int. Cl.[4] A61F *2/08*
U.S. Cl. 623—13 17 Claims



1. A prosthetic ligament for permanently, flexibly connecting first and second body members comprising:
a nonaugmented load bearing member having a longitudinal

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axis for permanently spanning the distance between said first and second body members for providing a prosthetic ligament having parameters of strength, flexibility, extension and recovery that at least approximate those of a natural ligament, said load bearing member being formed into a braid from a plurality of biocompatible high strength polypropylene yarns positioned at angles of from about 0° to 55° relative to said longitudinal axis, each said yarn being comprised of a plurality of fibers, each said fiber being less than 100 microns in diameter and having a tensile strength greater than or equal to about 50,000 psi.

4,731,085

ENOSSAL IMPLANT AND PROCESS FOR INSERTING AN ENOSSAL IMPLANT IN THE JAWBONE

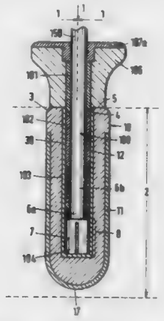
Werner-Lutz Koch, Liebenau/Hanover, Fed. Rep. of Germany, assignor to Implanto-Lock Gesellschaft mit beschränkter Haftung für Implantatforschungund Entwicklung, Hamburg, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,650

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440952; Apr. 26, 1985, 3515154; Sep. 10, 1985, 3532125

Int. Cl.[4] **A61F** *2/28;* **A61C** *8/00*

U.S. Cl. 623—16 **8 Claims**



1. Enossal implant for the securing of a fixed or removable dental prosthesis, comprising two interconnectable parts, whereof one part is constructed as a primary cylinder (**10**) with a central longitudinal bore (**13**), which can be introduced into the jawbone and is anchored therein and the other part is constructed as a secondary cylinder (**100**) having a post (**111**), which can be introduced into the longitudinal bore of the primary cylinder and is detachably held therein, said post being constructed as its free upper end for the connection of the dental prosthesis, characterized in that the implant post (**150**) of the secondary cylinder (**100**) is surrounded by a force line system (**101, 102, 103**) diverting the horizontal, vertical, torsional or any combination of the three forces and oscillations occuring in the vicinity of the dental prosthesis or mouth into the lower region of the secondary cylinder (**100**) and from there into the primary cylinder (**10**), said system comprising several superimposed modular members (**101, 102, 103, 104**) with different elastic characteristics, in such a way that a bottom, inelastic region (**103, 104**) is followed by a region (**102**) with a limited elasticity and onto the latter is connected a region (**101**) with a high elasticity.

4,731,086

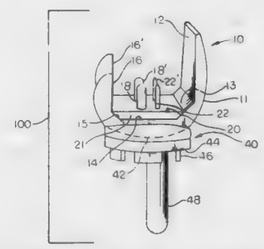
SHIM FOR FEMORAL KNEE JOINT PROSTHESIS AND METHOD OF USING

Leo A. Whiteside, Chesterfield, Mo., and Walter P. Spires, Jr., Germantown, Tenn., assignors to Dow Corning Wright, Arlington, Tenn.

Filed Apr. 20, 1987, Ser. No. 40,530

Int. Cl.[4] **A61F** *2/38*

U.S. Cl. 623—20 **14 Claims**



1. For an implantable femoral knee joint component having a face which is to seat against the distal end of a femur and a peg extending from said joint component face, said peg being insertable into said distal end of said femur, a prosthetic shim for placement between said joint component and said femur for increasing the effective thickness of said joint component, said shim comprising:

a platform having a first surface to cooperatively engage said joint component face and a second surface to engage said distal end of said femur to provide level support and increase the effective thickness of said joint component.

8. A method of increasing the effective thickness of an implantable femoral knee joint component having a face which is to seat against the distal end of a femur and a peg extending from said joint component face, said peg being insertable into said distal end of said femur, comprising the steps of:

(a) selecting a prosthetic shim of appropriate thickness, said shim comprising a platform having a first surface to cooperatively engage said joint component face and a second surface to engage said distal end of said femur,

(b) placing said selected prosthetic shim against said joint component face,

(c) inserting said joint component peg into said distal end of said femur until said second surface of said shim engages said femur thereby anchoring said joint component to said femur with said shim between said joint component and said distal end of said femur to provide level support and increase the effective thickness of said joint component.

4,731,087

METATARSAL-PHALANGEAL PROSTHESIS

Thomas P. Sculco, New York, N.Y.; Albert H. Burstein, and Timothy M. Wright, both of Stamford, Conn., assignors to New York Society for the Relief of the Ruptured and Crippled, New York, N.Y.

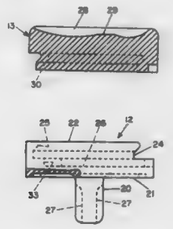
Filed Jan. 6, 1987, Ser. No. 662

Int. Cl.[4] **A61F** *2/42*

U.S. Cl. 623—21 **8 Claims**

1. A prosthesis for replacement of the first metatarsal-phalangeal articulation comprising a metatarsal component and a phalangeal component, the metatarsal component having a convex articulating surface and concave distal aspect, the metatarsal articulating surface being curved so as to approximate the natural articular surface of the first metatarsal bone and furthermore to articulate smoothly with a phalangeal articulating surface of the phalangeal component, the phalangeal component including a metal base member and an insert of a high molecular weight plastic, the base member having a distal aspect adapted to engage and be secured to a resected

end of the phalanx bone and a proximal aspect adapted to receive and have permanently attached thereto the insert, the insert having a proximal aspect that includes the phalangeal articulating surface, and the insert having a distal-proximal



thickness selected so as to cause tension in the natural soft tissue surrounding the prosthesis after implantation which proximates the tension of the soft tissue of the natural metatarsal-phalangeal articulation.

4,731,088

ENCLOSURE MEMBER FOR PROSTHETIC JOINT

John P. Collier, Hanover, N.H., assignor to Boehringer Mannheim Corp, Indianapolis, Ind.

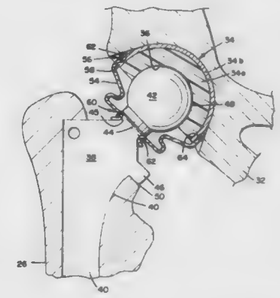
Filed Jun. 2, 1986, Ser. No. 869,592

Int. Cl.[4] **A61F** *2/34*

U.S. Cl. 623—22 **8 Claims**

1. In an artificial joint for replacing a damaged natural joint in a skeletal structure of a body including a prosthesis having a first cooperating member secured to a first bone and a second cooperating member secured to a second bone, said first and second cooperating members being interengaging and relatively movable to permit relative movement between the first and second bones, the improvement comprising:

a generally tubular flexible porous sheath having pores of a size less than 10 microns across surrounding the interengaging region between said first and second members and



having first and second opposed ends, said first end being affixed to said first member, said second end being affixed to said second member, said sheath being capable of permitting the passage of fluid therethrough while isolating from the remainder of the body wear particles which develop at the interengaging region of said first member and said second member.

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4,731,089

LEATHER TANNING PROCESS USING ALUMINIUM (III) AND TITANIUM (IV) COMPLEXES

Anthony D. Covington, Northampton, England, assignor to Tioxide Group PLC, London, England

Filed Oct. 16, 1985, Ser. No. 788,065

Claims priority, application United Kingdom, Oct. 24, 1984, 8426851

Int. Cl.[4] **C14C** *3/04*

U.S. Cl. 8—94.29 **14 Claims**

11. A process for tanning an animal skin comprising contacting the animal skin with a tanning agent, the tanning agent comprising a mixed complex of aluminum (III) ions, titanium (IV) ions and compound having the general formula

$$HOCH_2(CHOH)_nCO_2M$$

wherein M is an alkali metal, n is 2 to 6, the tanning agent having a pH in the range of from about 3 to about 5.

4,731,090

PROCESS FOR PROTECTING KERATINOUS MATERIAL FROM ATTACK BY INSECTS FEED ON KERATIN WITH PYRIDYLOXYTRIFLUOROMETHANESULFONANILIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Bernardo de Sous, Riehen, Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany; Werner Schmid, Riehen; Hermann Rempfler, Ettingen, and Hans Tobler, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

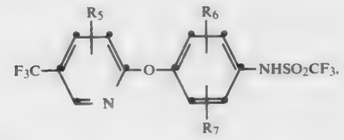
Filed Dec. 12, 1984, Ser. No. 680,685

Claims priority, application Switzerland, Dec. 23, 1983, 6885/83

Int. Cl.[4] **D06M** *3/00;* **C07D** *213/64*

U.S. Cl. 8—127.5 **11 Claims**

1. A process for providing keratinous material with a protective finish against attack by insects that feed on keratin, which process comprises treating the material to be protected with a compound of the formula



wherein

R_5 is hydrogen or chlorine,

R_6 is hydrogen, methyl or isopropyl and

R_7 is hydrogen or methyl.

10. The keratinous material finished according to claim **1**.

4,731,091

THERMAL TRANSFER PRINTING METHOD AND PRINTING PAPER WITH CELLULOSE FIBER BASE CONTAINING RESIN FIBERS OR RESIN COATING

Osamu Majima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

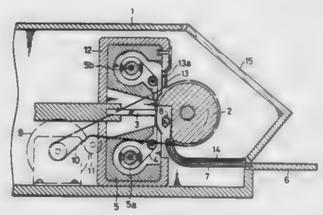
Division of Ser. No. 400,424, Jul. 21, 1982, Pat. No. 4,505,975. This application Dec. 20, 1984, Ser. No. 684,284

Claims priority, application Japan, Jul. 25, 1981, 56-109806[U]; Jul. 27, 1982, 57-29831[U]

Int. Cl.[4] **D06P** *1/52;* **B41M** *5/26;* **D21H** *3/36;* **B32B** *29/06*

U.S. Cl. 8—471 **26 Claims**

1. In the method of forming an image on printing paper by the transfer thereto of disperse dye from a dye carrier of flexible sheet material in response to the application of thermal energy to the carrier while in contact with a surface of the printing paper; the improvement of forming said paper having a base of cellulose fibers combined with a resin selected from the group consisting of polyester and acetyl cellulose, said resin having distances between molecules thereof greater than the dimensions of molecules of said disperse dye, such that said disperse dye diffuses into said resin for producing a clear definition of said image and including the further step at the time of forming said paper of adding to said cellulose fibers a filling material selected from the group consisting of titanium oxide and calcium carbonate for improving the whiteness of the



coated paper and for imparting roughness to the surface thereof which is to receive the transferred disperse dye and further comprising the step of laminating a transparent film by means of a polyester adhesive formed of an aqueous solvent solution of a styrene monomer and chain-bonded alkyd resin onto said surface of the printing paper after the forming of said image thereon by transfer of said disperse dye from said dye carrier.

4,731,092

PROCESS FOR PRINTING OR DYEING CELLULOSE-CONTAINING TEXTILE MATERIAL WITH REACTIVE DYES IN AQUEOUS FOAM PREPARATION CONTAINING ACRYLIC GRAFT CO-POLYMER

Hans-Ulrich Berendt, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 20, 1987, Ser. No. 40,664

Claims priority, application Switzerland, Apr. 30, 1986, 1771/86

Int. Cl.[4] **D06P** *1/52, 3/66*

U.S. Cl. 8—477 **17 Claims**

1. A process for printing or dyeing cellulose-containing textile material with reactive dyes by printing or dyeing the textile material with a foamed, aqueous preparation and fixing the dyes through the action of heat, the preparation containing a reactive dye, a foaming agent, a fixing alkali, a homopolymer or copolymer of acrylamide or methacrylamide or a graft polymer which is obtainable from an addition product of an alkylene oxide onto an at least trihydric aliphatic alcohol having 3 to 10 carbon atoms and acrylamide or methacrylamide, wherein the preparation additionally contains a graft polymer which possesses as grafting base a copolymerization product from (A) an alkyl acrylate or methacrylate, the alkyl radical having at least 8 carbon atoms, with (B) a dicarboxylic acid diester of an ethylenically unsaturated aliphatic dicarboxylic acid and a polyethylene glycol, a terminal hydroxyl group of the glycol having been etherified with a C_1–C_{14}-alkyl radical, and contains as graft constituent side chains which stem from a grafted-on polymerizable monomer which is an ethylenically unsaturated mono- or di- carboxylic acid or a sulfonic acid in each case having at most seven carbon atoms.

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4,731,093

PROCESS FOR FIXING PIGMENTS ON FIBER MATERIALS AND SHEETLIKE STRUCTURES

Gerhard Pfeiffer, Bad Soden am Taunus, and Erhard Doschke, Barsbüttel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 18, 1985, Ser. No. 788,803

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1984, 3438639

Int. Cl.⁴ C09B *67/00*

U.S. Cl. 8—583 **8 Claims**

1. In a process for fixing pigments on fiber materials and sheet-like structures by means of curable synthetic resins or synthetic resin precursors which are cured by cross-linking at elevated temperatures in the presence of an acid or a compound which acts as an acid under the reaction conditions to form a water-insoluble film in order to adhere to the applied pigment on the surface of the substrate, the improvement which comprises:

applying to the substrate a padding liquor or print paste which, in addition to pigment, contains a pigment-binder system comprising:

(I) the aqueous solution of an essentially non-cross-linked polyester resin obtained by polycondensation of aliphatic or aromatic dibasic or polybasic carboxylic acids with polyetherdiols to the semi-ester thereof and subsequent reaction with aliphatic or aromatic epoxy resins under continued esterification of the semi-ester up to an acid number of less than 5 to yield a polycondensate still having available free hydroxyl groups for cross-linking,

(II) a fixing agent which comprises the aqueous solution of a non-plasticized phenol-, urea-, or melamine-aldehyde resin, and

(III) as curing agent a compound which acts as an acid under the reaction conditions,

and after padding or printing, fixing by dry heat.

4,731,094

DYE MIXTURES

Helga Kaiser, Efringen-Kirchen, Fed. Rep. of Germany; Hans-Jörg Angliker, Reinach, and Peter E. Eugster, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

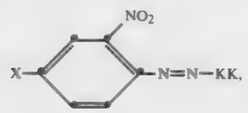
Filed Apr. 1, 1987, Ser. No. 33,322

Claims priority, application Switzerland, Apr. 4, 1986, 1319/86

Int. Cl.⁴ C09B *67/22*

U.S. Cl. 8—639 **20 Claims**

1. A mixture comprising 75 to 99% by weight of a dye of formula



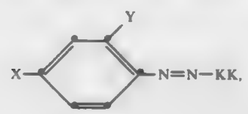
(1)

wherein

X is hydrogen, chlorine, bromine or methyl, and

KK is the radical of a coupling component that does not contain water solubilising groups,

and 1 to 25% by weight of a dye of formula



(2)

wherein X and KK have the given meanings and Y is chlorine or bromine

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4,731,095

NITROGEN CONTAINING COPOLYMERS USEFUL AS ADDITIVES FOR LOWERING THE CLOUD POINT OF HYDROCARBON MIDDLE DISTILLATES AND COMPOSITIONS CONTAINING THEM

Jacques Garapon, Lyons; Bernard Sillion, Rocquencourt; Bernard Damin, Oullins, and Robert Leger, Grigny, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Elf France, Paris, both of, France

Continuation-in-part of Ser. No. 500,696, Jun. 3, 1983, abandoned. This application Sep. 16, 1985, Ser. No. 776,988

Claims priority, application France, Jun. 4, 1982, 82 09908

Int. Cl.⁴ C10L *1/16, 1/18*

U.S. Cl. 44—62 **27 Claims**

1. A composition, useful as an additive for decreasing the cloud point of middle distillates, having a number-average molecular weight of 1,000–10,000, and being a copolymer consisting essentially of:

15–40% mole of recurrent units (A) from at least one unbranched α-olefin of at least 16 carbon atoms;

20–70% by mole of imidized recurrent units (B) from condensation, prior or subsequent to copolymerization, of at least one unsaturated α,β-dicarboxylic compound, in the form of a diacid, a lower alkyl diester or an anhydride, with at least one compound having a single primary amine group, having the formula:

$$R—Z—[(CH_2)_n—NH]_m—H \quad (I)$$
$$HO—CH_2—R''—NH_2 \quad (II)$$

wherein R is a monovalent saturated aliphatic radical having 1–30 carbon atoms, Z is 0, NH or NR', wherein R' is a monovalent saturated aliphatic radical having 1–30 carbon atoms; n is an integer from 2 to 4; m is zero or an integer from 1 to 4 when Z is NH, or an integer from 1 to 4 when Z is 0 or NR''; and R'' is a divalent saturated aliphatic radical having 1–18 carbon atoms; and

15–40% by mole of recurrent units (C) from at least one alkyl ester of an unsaturated monocarboxylic acid.

4,731,096

HYDROCARBON COMPOSITIONS OF HIGH ELONGATIONAL VISCOSITY AND PROCESS FOR MAKING THE SAME

Henry F. Hamil, New Braunfels; William D. Weatherford, Jr., and George E. Fodor, both of San Antonio, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 21, 1986, Ser. No. 854,104

Int. Cl.⁴ C10L *1/14*

U.S. Cl. 44—62 **8 Claims**

1. A hydrocarbon composition consisting essentially of a hydrocarbon liquid and an ionic-association or coordination-complex polymer in an amount sufficient to increase and maintain the elongational viscosity of said composition at a level greater than that of said hydrocarbon alone; said polymer capable of dissociation upon application of the high shear regime to which said hydrocarbon is subjected, and reassociation upon withdrawal of the high shear.

4,731,097

GAS COOLING DEVICE FOR A GASIFER

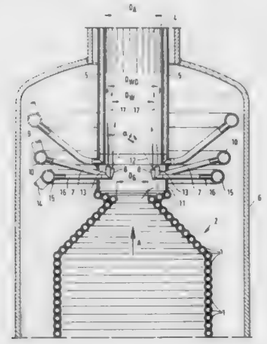
Klaus Köhnen, Mühlheim; Hans Niermann, and Norbert Ullrich, both of Essen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,702

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601786

Int. Cl.⁴ C10J *3/82*

U.S. Cl. 48—76 **3 Claims**



1. A gasification reactor including a tubular first pipe wall structure enclosing a reaction space wherein a hot producer gas is generated at an increased pressure by reaction between a pulverized fuel and oxygen, said first pipe wall structure having a constricted end portion forming a circular gas discharge opening, a gas outlet connection piece including a tubular second pipe wall structure coaxially arranged above said gas discharge opening and having an inner diameter which exceeds an inner diameter of said discharge opening, and a sealing means connecting a lower end of said second pipe wall structure to a rim of said constricted end portion of the first pipe wall structure, means for circulating a cooling medium through pipes of the respective pipe wall structures, a device for cooling a stream of hot producer gas exiting through gas discharge opening comprising a plurality of water feeding conduits having ends projecting through said sealing means, each of said ends of the water feeding conduits being provided with a water spraying nozzle directed downwardly against the exiting stream of producer gas, said nozzles being located around a center axis of said second pipe wall structure in a region determined by a circle whose diameter is larger than said inner diameter of the gas discharge opening but smaller than said inner diameter of the second pipe wall structure.

4,731,098

DEVICE FOR MANUFACTURING A PRODUCT GAS CONTAINING HYDROGEN AND CARBON OXIDE

Hans-Dieter Marsch, Dortmund, Fed. Rep. of Germany, assignor to Uhde GmbH, Fed. Rep. of Germany

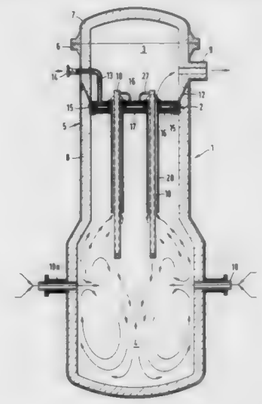
Filed Feb. 19, 1987, Ser. No. 16,658

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605811

Int. Cl.⁴ C01B *3/34, 3/38;* **B01J** *8/06*

U.S. Cl. 48—95 **8 Claims**

1. Device for use in manufacturing a product gas containing hydrogen and carbon oxide from a feedgas mixture comprised substantially of hydrocarbons mixed with steam, said device comprising a vertically extending vessel having an interior space, a horizontally extending tubesheet connected in said vessel for dividing the interior space into a first chamber on one side of said tubesheet and a second chamber on an opposite side of said tubesheet, a plurality of axially extending reformer tubes having closed ends and open ends located within the interior space and extending through said tubesheet from said first chamber into said second chamber, said tubesheet forming a distribution chamber for supplying a feedgas mixture into said reformer tubes, said tubesheet comprising an inner hollow body and an outer hollow body surrounding said inner hollow body on all sides, an inlet line connected to and communicating with an interior of said inner hollow body for the admission of a feedgas mixture into the interior of said inner hollow body, said inner hollow body having a flow opening for communication between the interior of said inner hollow body and a space between the interior of said inner hollow body and a space between said inner hollow body and said outer hollow body,



and a connecting tube connected between the closed end of each of said reformer tubes and said outer hollow body for communicating the interior of said reformer tubes with the space between said inner and outer hollow bodies, a jacket laterally enclosing and spaced outwardly from each said reformer tube for forming an annular space extending along each said tube from the first chamber through the tubesheet and for at least a part of the axial length of each said tube within said second chamber for establishing communication between said first and second chambers, and an outlet nozzle connected to said first chamber for the outlet of product gas from the second chamber.

4,731,099

PROCESS FOR TREATING AQUEOUS CONDENSATE

Jakob Ergezinger, Bad Vilbel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 925,881

Claims priority, application European Pat. Off., Nov. 1, 1985, 85201775

Int. Cl.⁴ C10J *3/16, 3/08, 3/14*

U.S. Cl. 48—197 R **3 Claims**

1. A process for treating aqueous condensate obtained by the cooling of raw gas produced by the gasification of granular solid fuels with gasifying agents which contain oxygen, water vapor and carbon dioxide under a pressure of 5 to 100 bars, wherein the fuels constitute a fixed bed which descends slowly and the incombustible mineral constituents of the fuel are withdrawn below the bed as solid ash or liquid slag, comprising the steps of:

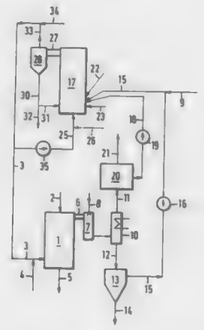
(a) cooling the raw gas from the gasification and producing a cold raw gas having a temperature in the range of 120° to 180° C. and a raw condensate;

(b) treating said raw condensate in a separator and withdrawing a heavy phase which is rich in dust and tar and a high-water phase;

(c) removing sulfur compounds from said cold raw gas and part of the carbon dioxide in a purification zone;

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(d) withdrawing from said zone a purified gas and an exhaust gas containing sulfur compounds and carbon dioxide;
(e) combusting fine coal in a fluidized bed furnace and feeding said high-water phase, said exhaust gas, calcium compounds and an oxygen-containing gas into said furnace, the temperature in said furnace being maintained at 750° to 1000° C.;

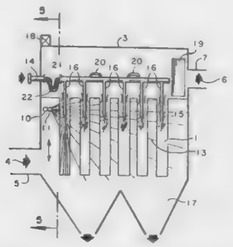


(f) withdrawing from said furnace a combustion gas containing water vapor,;
(g) recycling part of said combustion gas as a fluidizing gas into said furnace; and
(h) supplying the balance of said combustion gas into said gasification.

4,731,100
METHOD AND APPARATUS FOR WASHING A PLURALITY OF FILTER ELEMENTS

Rudolf Loeffelmann, Langenfeld; Hubert Freese, Duesseldorf, and Ulrich Martini, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 607,344, May 4, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 797,177
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316527
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—96 **11 Claims**

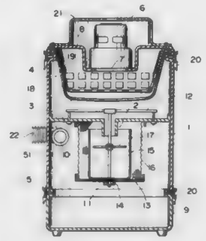


1. A method of washing a plurality of generally tubular open at the top and closed at the bottom filter elements of a gas filtering apparatus without removing the elements from the apparatus, the filter elements being vertically suspended from an orifice plate and disposed in a regular array of rows and columns within a housing between an inlet for dustladen gas and an outlet for filtered gas, the gas flowing from the exterior surface to the interior surface of the elements, comprising the steps of:
positioning in said housing adjacent a side of said array a horizontal, vertically displaceable first liquid conduit having a plurality of first spray nozzles axially spaced on said conduit for delivering a plurality of first jets of washing liquid exteriorly along one or more rows of filter elements; supplying washing liquid through said first conduit for discharge through said nozzles to wash exteriorly said filter elements;
positioning in said housing above said array a horizontal, horizontally and vertically displaceable, second liquid conduit having a plurality of second spray nozzles axially spaced on said conduit for delivering a plurality of second jets of washing liquid interiorly to the filter elements of at least one row; and
supplying washing liquid through said second conduit for discharge through said second nozzles to wash interiorly said filter elements;
said first and second conduits being supplied with washing liquid simultaneously or successively.

4,731,101
DUST COLLECTOR

Kinzo Kanda, 6-27, Doshida 4-chome, Nerima-ku, Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,417
Claims priority, application Japan, Oct. 14, 1985, 60-157686[U]
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—323 **8 Claims**

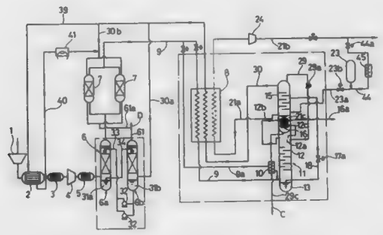


1. A cyclone dust collector comprising:
an airtight shell;
a horizontal dividing plate mounted in said shell and dividing the interior of said shell into upper and lower dust chambers;
suction means communicating with said upper dust chamber;
a communicating duct extending downward into said lower chamber from said dividing plate and comprising means for providing air flow communication between said upper and lower chambers;
tangential air inlet means in said lower chamber, whereby said suction means can cause dust laden air to enter said lower chamber through said air inlet means and form a cyclone flow therein;
a cyclone drum in said lower chamber and having a circumferential surface, an unrestricted open top end and a closed bottom end;
means for supporting said cyclone drum in said lower chamber such that an air gap is formed between said plate and an edge of said circumferential surface at said open top end, said air gap being dimensioned such that swirling air entering said cyclone drum therethrough is accelerated at said air gap, and such that a bottom of said communicating duct extends into said cyclone drum; and
a horizontal disc supported in said cyclone drum between said bottom of said communicating duct and said bottom end of said cyclone drum, whereby said cyclone drum is vertically divided into two chambers, a lower one of which is isolated from swirling air in an upper one thereof.

4,731,102
OXYGEN GAS PRODUCTION APPARATUS

Akira Yoshino, Osaka, Japan, assignor to Daidousanso Co., Ltd., Osaka, Japan

PCT No. PCT/JP86/00409, § 371 Date Apr. 7, 1987, § 102(e) Date Apr. 7, 1987, PCT Pub. No. WO87/01184, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 8, 1986, Ser. No. 53,293
Claims priority, application Japan, Aug. 12, 1985, 60-178232
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—11 **2 Claims**



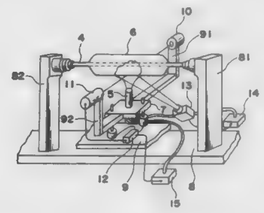
1. An oxygen gas production apparatus comprising an air compression means for compressing air from an outside source, a purification means for removing carbon dioxide gas and water vapor from the air compressed by said air compression means, a heat exchange means for chilling the compressed air from said purification means to a cryogenic temperature, a fractionation column for liquefying and fractionating the compressed air chilled to a cryogenic temperature by said heat exchange means and holding nitrogen in gaseous state and oxygen in liquid state, a liquid oxygen storage means for receiving liquid oxygen from an outside source and storing the same, a line for continuously introducing into said fractionation column the liquid oxygen from said liquid oxygen storage means for use as a refrigerant for liquefaction of compressed air in lieu of the generated refrigeration from a cold heat generating expansion means, an oxygen gas withdrawal line for guiding the liquid oxygen within said fractionation column as a refrigerant to said heat exchange means and withdrawing the gasified oxygen produced by heat exchange as a product oxygen gas, and a pressurizing means for pressurizing the product oxygen gas withdrawn from said oxygen withdrawal line.

4,731,103
METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Futoshi Mizutani, and Gotaro Tanaka, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 706,388, Feb. 27, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 928,644
Claims priority, application Japan, Mar. 1, 1984, 59-39559
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—312 **4 Claims**

1. An outside vapor-phase deposition (OVD) method for producing an optical fiber glass preform with a desired bulk density distribution in the radial direction of said preform, comprising the steps of:
forming glass soot particles by jetting and combusting a gaseous glass-forming material and a fuel gas from a burner in the presence of oxygen,
depositing the glass soot particles along the length of a glass rod to form a soot-coated rod preform while simultaneously measuring the temperature of a part of the preform on which the glass soot particles are being deposited, the temperature which is measured being that of the deposited soot particles immediately after their deposit, and generating a first feedback signal indicative of the temperature, and then,
controlling said temperature by adjusting the fuel gas jetting rate in response to said first feedback signal, wherein direct response and control is made with sufficient speed



throughout the rod formation to correct deviations and to form a uniform product having a bulk density gradient in the radial direction, and then
sintering the rod preform to obtain a transparent glass preform.

4,731,104
METHOD FOR CONTROLLING YELLOW NUTSEDGE USING *PUCCINIA CANALICULATA*

Sharad C. Phatak; Donald R. Sumner; Homer D. Wells; Durham K. Bell, and Norman C. Glaze, all of Tifton, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 591,367, Mar. 20, 1984, abandoned. This application Sep. 20, 1985, Ser. No. 778,048
Int. Cl.[4] A01N *63/04*
U.S. Cl. 71—79 **2 Claims**

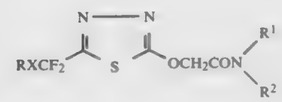
1. A method of biologically controlling yellow nutsedge comprising: inoculating in the spring of the year an agricultural field containing said yellow nutsedge with a sufficient amount of a strain of the rust fungus *Puccinia canaliculata* identified as ATCC #40199 and a carrier to initiate an epidemic and thereby control or eliminate said yellow nutsedge as a result of reducing competition from the yellow nutsedge and inhibiting reproduction.

4,731,105
1,3,4-THIADIAZOLES USEFUL AS HERBICIDES

Graham P. Jones, Sawston, England, assignor to FBC Limited, England

Filed Aug. 13, 1986, Ser. No. 895,921
Claims priority, application United Kingdom, Aug. 17, 1985, 8520655
Int. Cl.[4] A01N *43/82*; **C07D** *419/12, 285/12*
U.S. Cl. 71—90 **14 Claims**

1. A thiadiazolyloxyacetamide of the formula:



(I)

wherein: R is alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, or phenyl which is unsubstituted or substituted by one or two halogen atoms or alkyl or alkoxy groups of 1 to 4 carbon atoms; R^1 and R^2, which may be the same or different, each represent hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, alkenyl of 2 to 6 carbon atoms, benzyl, or phenyl which is unsubstituted or substituted by one or two halogen atoms, nitro groups, or alkyl or alkoxy groups of 1 to 4 carbon atoms; or R^1 and R^2 are linked to form

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a 5- or 6-membered saturated carbon chain and which is unsubstituted or substituted by one or two alkyl groups of 1 to 4 carbon atoms; and X is oxygen, sulphur, or $-S(O)_n-$ where n is 1 or 2.

10. A method of combating weeds which comprises applying to a locus infested or liable to be infested therewith an effective amount of at least one compound according to of claim 1 or claim 2.

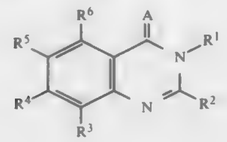
4,731,106

FUNGICIDAL AZOLE COMPOUNDS

David E. Green, Linton, and Albert Percival, Hauxton, both of England, assignors to Schering Agrochemicals Limited, England

Continuation-in-part of Ser. No. 801,480, Nov. 11, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 28,974
Claims priority, application United Kingdom, Nov. 24, 1984, 8429739
Int. Cl.⁴ A01N *43/54*; A61K *31/505*; C07D *403/04*
U.S. Cl. 71—92 **10 Claims**

1. A compound of formula I:



(I)

where:

A is oxygen or sulphur;

R^1 is phenyl or substituted phenyl in which the substituent is at least one member selected from the group consisting of halogen, C_{1-6}-alkyl, C_{1-6}-haloalkyl, C_{1-6}-alkoxy, C_{1-6}-haloalkoxy and nitro;

R^2 is 1-imidazolyl or 1,2,4-triazol-1-yl; and

R^3, R^4, R^5 and R^6, which may be same or different, are each hydrogen, halo, C_{1-6}-alkyl or C_{1-6}-alkoxy.

7. A fungicidal or plant growth regulant composition which comprises a compound claimed in claim 1 in admixture with an agriculturally acceptable diluent or carrier.

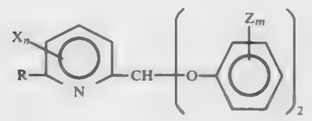
4,731,107

CERTAIN 6-DIPHENOXYMETHYL-2-PYRIDINYL-OXY-PROPANOATES HAVING HERBICIDAL PROPERTIES

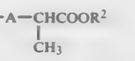
Sudarshan K. Malhotra, Walnut Creek, and Ingrid L. Evoy, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 814,840, Dec. 30, 1985, Pat. No. 4,685,953. This application Nov. 21, 1986, Ser. No. 933,504
Int. Cl.⁴ C07D *213/30, 213/64*; A01N *43/40*
U.S. Cl. 71—94 **9 Claims**

1. A compound corresponding to the formula

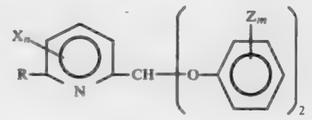


wherein A is oxygen or sulfur; R represents the radical

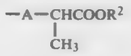


wherein R^2 is hydrogen or alkyl of 1 to 4 carbon atoms; X represents bromo, chloro or fluoro; n represents an integer of 0 to 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

7. A method for controlling the growth of undesirable plants which comprises applying to plants, plant parts or their habitat a composition which comprises an inert carrier in admixture with a herbicidally effective amount of a compound corresponding to the formula



wherein A is oxygen or sulfur R represents the radical



wherein R^2 is hydrogen or alkyl of 1 to 4 carbon atoms; X represents bromo, chloro or fluoro; n represents an integer of 0 or 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

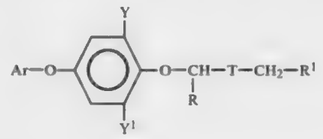
4,731,108

DERIVATIVES OF 4-((ARYLOXY)PHENOXY)ALKENOLS AND THEIR HERBICIDAL USES

James A. Turner, Pittsburg; Wendy S. Jacks, Walnut Creek, and Paul S. Zorner, Clayton, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

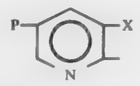
Filed Mar. 7, 1986, Ser. No. 837,229
Int. Cl.⁴ C07D *213/64*; A01N *43/40*
U.S. Cl. 71—94 **37 Claims**

1. A compound or an optical isomer thereof corresponding to the formula



wherein

Ar represents



Y and Y^1 each independently represent —H or —F;

X represents —H, —Br or —Cl;

R represents methyl or ethyl;

T represents $-(CH_2-CH_2)_a-(CH=CH)_b-$ and the cis (Z) or trans (E) stereoisomers thereof or $-(CH_2-CH_2)_a-(C\equiv C)-$;

a represents the integer 0, 1 or 2;

b represents the integer 1 or 2;

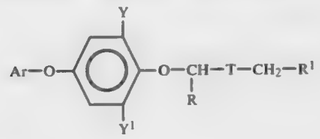
P represents —Br, —Cl, —I or $—CF_3$;

R^1 represents $—OSO_2R^2$

R^2 represents C_1–C_4 alkyl or C_2–C_4 alkenyl.

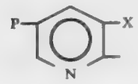
25. A method for the postemergent kill and control of grassy weeds which comprises applying to said weeds a herbicidally

effective amount of a composition comprising an agriculturally acceptable inert adjuvant in intimate admixture with, as the active material, a compound corresponding to the formula



wherein

Ar represents



Y and Y^1 each independently represent —H or —F;

X represents —H, —Br or —Cl;

R represents methyl or ethyl;

T represents $-(CH_2-CH_2)_a-(CH=CH)_b-$ and the cis (Z) or trans (E) stereoisomers thereof or $-(CH_2-CH_2)_a-(C\equiv C)-$;

a represents the integer 0, 1 or 2;

b represents the integer 1 or 2;

P represents —Br, —Cl, —I or $—CF_3$;

R^1 represents $—OSO_2R^2$

R^2 represents C_1–C_4 alkyl or C_2–C_4 alkenyl.

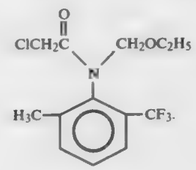
4,731,109

HERBICIDAL 2-HALOACETANILIDES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 333,345, Dec. 22, 1981, abandoned, and a continuation of Ser. No. 133,718, Mar. 25, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 358,967
Int. Cl.⁴ A01N *37/22*; C07C *103/32*
U.S. Cl. 71—118 **4 Claims**

1. The compound N-(ethoxymethyl)-2'-trifluoromethyl-6'-methyl-2-chloroacetanilide having the formula



4,731,110

HYDROMETALLURIGCAL PROCESS FOR PRODUCING FINELY DIVIDED SPHERICAL PRECIOUS METAL BASED POWDERS

Nelson E. Kopatz, Sayre; Walter A. Johnson, and Joseph E. Ritsko, both of Towanda, all of Pa., assignors to GTE Products Corp., Stamford, Conn.

Filed Mar. 16, 1987, Ser. No. 26,222
Int. Cl.⁴ B22F *9/24*
U.S. Cl. 75—0.5 A **12 Claims**

1. A process comprising:

(a) forming an aqueous solution containing at least one precious metal value,

(b) forming a solid reducible material selected from the group consisting of precious metal salts, precious metal oxides and mixtures thereof,

(c) reducing said solid material to form precious metal based particles,

(d) entraining at least a portion of said precious metal particles in a carrier gas,

(e) feeding said entrained particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom and

(f) cooling said droplets to form precious metals based metallic particles having essentially a spherical shape and a majority of said particles having a size less than 20 micrometers.

4,731,111

HYDROMETALLURICAL PROCESS FOR PRODUCING FINELY DIVIDED SPHERICAL REFRACTORY METAL BASED POWDERS

Nelson E. Kopatz, Sayre; Walter A. Johnson, and Joseph E. Ritsko, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 16, 1987, Ser. No. 26,312
Int. Cl.⁴ B22F *9/24*
U.S. Cl. 75—0.5 AB **14 Claims**

1. A process comprising:

(a) forming an aqueous solution containing at least one refractory metal,

(b) forming a solid reducible material having a major portion selected from the group consisting of reducible refractory metal salts, oxides and mixtures thereof,

(c) reducing said solid reducible material to form refractory metal based powder particles,

(d) entraining at least a portion of said refractory metal particles in a carrier gas,

(e) feeding said entrained particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom and

(f) cooling said droplets to form refractory metal based metallic particles having essentially a spherical shape and a majority of said particle having a size less than 20 micrometers.

4,731,112

METHOD OF PRODUCING FERRO-ALLOYS

Glenn E. Hoffman, Pineville, N.C., assignor to Midrex International, B.V. Rotterdam, Zurich Branch, Zurich, Switzerland

Continuation-in-part of Ser. No. 718,688, Apr. 1, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,126
Claims priority, application Australia, Feb. 19, 1986, 53751/86
Int. Cl.⁴ C22B *4/00*
U.S. Cl. 75—10.22 **5 Claims**

1. A method of producing a ferro-alloy comprising:

forming compacts consisting essentially of a mixture of from 50% tp 88% metallized direct reduced iron fines which fines are from 60% to 97% metallized, from 5% to 15% solid carbonaceous material, and from 7% to 35% of an oxide of a metal selected from the group consisting of, silicon, nickel, chromium, manganese, titanium, vanadium, molybdenum, and cobalt;

charging only said compacts, additional solid carbonaceous material to provide additional heat and reactive carbon, and slag formers to a melting furnace; and

burning said solid carbonaceous material to reduce the oxides in said compacts, to melt the constituents, and to form a high alloy melt.

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4,731,113

METHOD FOR THE RECOVERY OF PRECIOUS METALS FROM ORES

Roger H. Little, 225 S. Second, Custer, S. Dak. 57730

Continuation-in-part of Ser. No. 766,060, Aug. 15, 1985, Pat. No. 4,645,535. This application Aug. 13, 1986, Ser. No. 896,823
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—101 R 52 Claims

1. A process for the recovery of precious metals from ore containing the same comprising:

forming an acidic aqueous lixiviant solution containing a thiourea compound, urea and an alkaline lignin sulfonate;

exposing the ore to said lixiviant solution to extract the precious metals therefrom; and

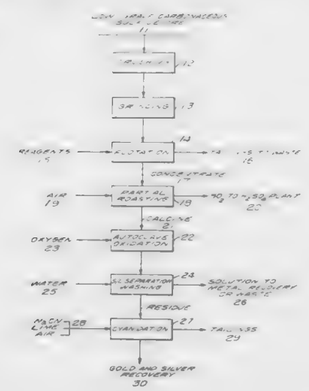
recovering the dissolved precious metals from said solution.

4,731,114

RECOVERY OF PRECIOUS METALS FROM REFRACTORY LOW-GRADE ORES

Gopalan Ramadorai, Golden; Mahesh C. Jha, Arvada, both of Colo., and Marcy J. Kramer, Rye, N.Y., assignors to Amax Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 701,258, Feb. 13, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,581
Int. Cl.[4] C22B *11/00*
U.S. Cl. 75—118 R 8 Claims



1. The process for treating a refractory low-grade ore containing precious metals from the group consisting of gold and silver to recover the precious metal content thereof which comprises partially roasting a concentrate of said ore to oxidize a major portion of sulfur present to sulfur dioxide but to oxidize a minor portion only of carbon present therein, subjecting the partially roasted calcine to an oxygen pressure leach to oxidize remaining sulfur and carbon, to decompose any ferrites present and to dissolve base metals and some silver, and then subjecting the residue from said oxygen pressure leach to cyanidation to dissolve substantially all the precious metals present therein.

4,731,115

TITANIUM CARBIDE/TITANIUM ALLOY COMPOSITE AND PROCESS FOR POWDER METAL CLADDING

Stanley Abkowitz, Lexington; Harold L. Heussi, Essex, and Harold P. Ludwig, Woburn, all of Mass., assignors to Dynamet Technology Inc., Burlington, Mass.

Filed Feb. 22, 1985, Ser. No. 704,263
Int. Cl.[4] C22C *29/02*
U.S. Cl. 75—236 52 Claims



1. A microcomposite material having a matrix consisting essentially of a titanium-base alloy, said material further including about 1 to 80% by weight TiC substantially uniformly dispersed in the matrix, said microcomposite material being formed by sintering at a temperature disposed to preclude diffusion of the TiC into the matrix.

4,731,116

SPUTTER TARGET AND PROCESS FOR PRODUCING SPUTTER TARGET

Erich Kny, Pflach, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Filed Dec. 18, 1986, Ser. No. 943,930
Claims priority, application Austria, Dec. 23, 1985, 3723/85
Int. Cl.[4] G22C *29/04*
U.S. Cl. 75—238 9 Claims

1. A process for producing a sputter target the bulk of said sputter target comprised of carbides and/or nitrides and/or borides of a refractory metal, comprising: providing a dense composite body the bulk of which being comprised of (1) one or more carbides and/or nitrides and/or borides of the metals of Group IV A to VI A of the periodic table and (2) a metallic binding agent comprised of one or more metals of the iron group of the periodic table; densifying said composite body by pressing and/or sintering; preferably machining the densified composite body before and/or after sintering to form a shaped sputter target; and removing the binding agent by chemical and/or electrochemical treatment.

4,731,117

NICKEL-BASE POWDER METALLURGY ALLOY

John E. Stulga, Homestead, and Frank J. Rizzo, McMurray, both of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1986, Ser. No. 926,541
Int. Cl.[4] C22C *19/05*
U.S. Cl. 75—243 6 Claims

1. An age-hardenable, corrosion-resistant, nickel-base fully dense article of compacted prealloyed particles, said article having a fine, uniformly distributed gamma prime phase and comprising an alloy consisting essentially of, in weight percent,

carbon	.05 max.
chromium	15–25
molybdenum	6.5–10
columbium	4–6.5
iron	9 max.
aluminum	.2–.8
nitrogen	.05 max.
titanium	.6 max

-continued

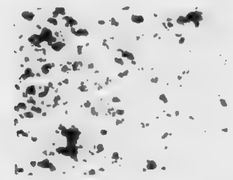
nickel	balance.

4,731,118

HIGH IMPACT STRENGTH POWER METAL PART AND METHOD FOR MAKING SAME

Mark Svilar, University Hts., and Erhard Klar, Beachwood, both of Ohio, assignors to SCM Metal Products, Inc.

Continuation-in-part of Ser. No. 879,502, Jun. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 866,184, May 20, 1986, abandoned. This application Nov. 28, 1986, Ser. No. 935,854
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—246 38 Claims



1. A copper infiltrated ferrous powder metal part infiltrated with copper or a copper alloy characterized as having after infiltration an overall density of at least 7.50 g/cm^3 and a diffusion depth of copper into the steel matrix of less than about 4 micrometers as determined by chemical etching or less than about 8 micrometers as determined by electron dispersive X-ray analysis, wherein said ferrous metal is plain carbon steel having a combined carbon content in the range of about 0.15% to about 1.25%.

4,731,119

DESENSITIZING GUM FOR PLANOGRAPHIC PRINTING PLATES

Tadao Toyama, and Kesanao Kobayashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 2, 1986, Ser. No. 881,272
Claims priority, application Japan, Jul. 4, 1985, 60-147458
Int. Cl.[4] C09D *5/20;* C08L *3/00;* G03F *7/00*
U.S. Cl. 106—2 15 Claims

1. A desensitizing gum containing water-soluble carboxy alkylated starch wherein the carboxy alkyl group number of said carboxy alkylated starch is from 0.03 to 0.5, and wherein about 90 wt. % or more of the starch skeleton of said carboxy alkylated starch is of amylopectin type.

4,731,120

FILL, COVERING MATERIAL AND EMBEDDING MATERIAL INCORPORATING A HYDRAULIC AND A LATENT-HYDRAULIC BINDER

Kyösti Tuutti, Spånga, Sweden, assignor to Cementa AB, Danderyd, Sweden

Continuation of Ser. No. 714,927, Mar. 22, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 11,420
Claims priority, application Sweden, Mar. 30, 1984, 8401776; Jul. 5, 1984, 8403582; Oct. 25, 1984, 8405344
Int. Cl.[4] C04B *18/30, 18/06*
U.S. Cl. 106—97 6 Claims

1. A fill and ground-binding agent for filling and re-filling cavities and holes, such as pipe and cable laying trenches, floor cavities and holes in streets, roads, etc., and for covering waste mounds, rubbish tips and other less harmful material, or for totally encapsulating dangerous waste material, characterized in that it contains 2–30% by weight cement and 10–40% by weight de-sulphurization product, balance essentially at least one member selected from the group consisting of fly-ash and granulated blast-furnace slag in mixture with water, and at least 5% by volume air.

4,731,121

VISCOUS CELLULOSE-CONTAINING MIXTURE (PASTE) AND USE THEREOF IN THE PRODUCTION OF AQUEOUS COATING DISPERSIONS

Erhard Lühmann, Bomlitz; Lutz Hoppe; Klaus Szablikowski, both of Walsrode, and Hans-Joachim Traenckner, Krefeld, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,176
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444493
Int. Cl.[4] C08L *1/08, 1/10*
U.S. Cl. 106—181 6 Claims

1. A viscous cellulose-containing paste by weight comprising approximately 5.0 to 60% of cellulose nitrate, 0.0 to 55% of a conventional lacquer resin, 0.0 to 40% of a plasticizer, 0.05 to 1.5% of a sulphosuccinic acid derivative of an ethoxylated nonylphenol as an anion-active emulsifier, 5 to 45% of at least one organic solvent, and 0.0 to 30% of water; the ratio of solids to organic solvent being at least equal to 1 and the anion-active emulsifier being present in at most 1.5% by weight, based on the solids content.

4,731,122

PROCESS FOR MANUFACTURING A THERMOPLASTIC MOLDING COMPOSITION

Richard Cortese, Los Gatos; Jeremy C. Wright; James B. Eckenhoff, both of Los Altos, and David L. Rivera, San Jose, all of Calif., assignors to ALZA Corporation, Pala Alto, Calif.

Filed Mar. 30, 1987, Ser. No. 31,824
Int. Cl.[4] C08L *1/08*
U.S. Cl. 106—198 3 Claims

1. A process for the manufacture of a thermoplastic composition, wherein the composition comprises: at least one member selected from the group consisting of cellulose acetate butyrate and cellulose acetate, at least one of a member selected from the group consisting of tributyl citrate and triethyl citrate and wherein the process sequentially comprises: comminuting cellulose acetate butyrate to a smaller particle size; blending at least one member of tributyl citrate, and triethyl citrate, and polyethylene glycol to a uniform blend; adding the comminuted cellulose acetate butyrate to the continuously mixing blend; adding the cellulose acetate to the blending ingredient and blend to produce a homogeneous thermoplastic composition; compacting the thermoplastic composition to produce a compacted composition; and, granulating the compacted composition into granules sized for use in a molding machine.

4,731,123

PROCESS FOR PRODUCING AN INORGANIC FOAM

John R. Humphries, Hayes, England, assignor to EMI Limited, Hayes, England

Filed Oct. 29, 1985, Ser. No. 792,405
Claims priority, application United Kingdom, Nov. 3, 1984, 8427851
Int. Cl.[4] C09D *1/00;* C04B *35/02*
U.S. Cl. 106—286.5 2 Claims

1. A process for producing a binding medium for an inorganic foam comprising the steps of:

mixing a metallic nitrate, capable of decomposition by heating to a metallic oxide, with an acid or acidic solution, capable of reacting with said metallic oxide, and

heating said mixture to a pre-determined temperature to cause said decomposition of said metallic nitrate to said

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metallic oxide, thereby enabling a reaction to occur between said metallic oxide and said acid or acidic solution to produce a binding medium for said foam.

4,731,124

APPLICATION TECHNIQUE FOR THE DESCALING OF SURFACES

David Bradbury, Gloucestershire; Timothy Swan, Bristol, and Michael G. Segal, Clifton, all of England, assignors to Central Electricity Generating Board, London, England

Continuation-in-part of Ser. No. 287,610, Jul. 28, 1981, Pat. No. 4,470,951. This application Aug. 31, 1984, Ser. No. 646,307

Claims priority, application United Kingdom, Aug. 11, 1980, 8026102

The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.

Int. Cl.[4] **G21C** *19/28;* **C23G** *1/00, 1/02;* **G21F** *9/00*

U.S. Cl. 134—3 **14 Claims**

1. Method of applying a descaling reagent comprising a one-electron reducing agent which is a low oxidation state transition metal ion based on V^{II} or Cr^{II} in combination with a complexing agent to a surface to be treated to descale the surface which method comprises:

(i) maintaining the low oxidation state transition metal ion either in solution under an inert atmosphere in a container made of or lined with an inert material or as a solid salt under an inert atmosphere;

(ii) preparing a solution of the complexing agent and removing oxygen therefrom; and

(iii) mixing the ingredients from steps (i) and (ii) either in situ in contact with the surface to be treated or mixing the ingredients from steps (i) and (ii) prior to application to the surface to be treated under conditions whereby no substantial decomposition of the so-formed reagent occurs.

4,731,125

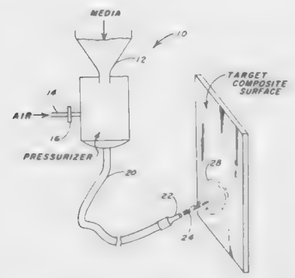
MEDIA BLAST PAINT REMOVAL SYSTEM

Lawrence S. Carr, 150 Silvarado Trail-#53, Napa, Calif. 94559

Continuation of Ser. No. 601,805, Apr. 19, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,696

Int. Cl.[4] **B08B** *7/00*

U.S. Cl. 134—17 **13 Claims**



1. A method of removing paint from the surface of composite structural material which is formed of bonded layers of a fiber reinforced matrix, in which the matrix is a type of material selected from the group consisting of polyester, polyurethane and epoxy and the reinforcing fibers are strands selected from the group consisting of glass, graphite and Kevlar, the method comprising the steps of: providing a granular plastic media consisting of particles of plastic material having a Mohs scale hardness number in the range of 2.5 to 3.5, accelerating said media using media propelling means to produce a substantially continuous media flow for blast cleaning paint from a target composite surface without damaging the underlying composite surface, including producing said substantially continuous media flow at a pressure of 40 pounds per square inch or less at a media outlet, and directing said media flow at the target composite surface whereby paint is removed by the action of said media flow.

4,731,126

COMPOSITION AND METHOD FOR PURGING POLYMERIC RESIDUES

Thuan P. Dixit, Midland, and David V. Dellar, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 852,855, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 658,963, May 9, 1984, abandoned. This application Jun. 8, 1987, Ser. No. 59,203

Int. Cl.[4] **B28B** *7/04*

U.S. Cl. 134—38 **6 Claims**

1. A method for removing accumulated polymeric residue from polymer processing equipment which comprises as the essential cleaning step contacting such equipment with a mixture comprising a thermoplastic polymer and an effective amount to remove accumulated residues of a hydroxymethyl substituted carboxylic acid corresponding to the formula:

$$C_mR_{2m+2}$$

wherein R independently each occurrence is hydrogen, —COOH, —CH_2OH, or an inert substituent, provided that R in at least one occurrence each is —CH_2OH and —COOH but in not more than three occurrences for every two polymer chain backbone carbons, and m is an integer from one to about 30, said method being carried out in the absence of pentaerythritol.

4,731,127

THERMOCOUPLE DEVICE

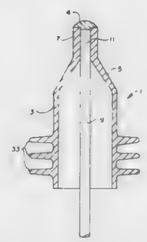
Masaru Itoyama, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 749,901, Jun. 28, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,308

Claims priority, application Japan, Jun. 30, 1984, 59-135915

Int. Cl.[4] **H01L** *35/28*

U.S. Cl. 136—228 **3 Claims**



1. A thermocouple device comprising:

an outer thermocouple element having a hollow first end portion, said outer thermocouple element being made of a Fe-Cr-Ni alloy;

an inner thermocouple element a first end portion fitted within the hollow first end portion of the outer thermocouple element, said inner thermocouple element being made of constantan; and

a solder layer securing the respective first end portions of the inner and outer thermocouple elements to one another, said solder layer being an alloy having 14% by weight Pt, 3% by weight Au and the balance Pd.

4,731,128

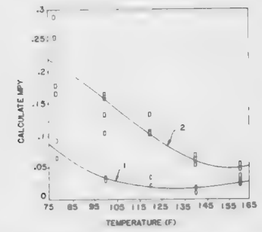
PROTECTION OF COPPER FROM CORROSION

Frank J. Casullo, Cortland, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1987, Ser. No. 52,337

Int. Cl.[4] **C23U** *22/52*

U.S. Cl. 428—470 **13 Claims**



1. A method for protecting copper from corrosion which comprises:

(a) contacting a copper-containing surface with a first azole to form a first layer thereon; and

(b) contacting the copper from step (a) with a second and different azole;

wherein the first azole chemically reacts more readily with copper than does the second and different azole with copper; and wherein the adsorbency of the second and different azole on copper is greater than the adsorbency of the first azole.

4,731,129

SUPERPLASTIC ZINC/ALUMINUM ALLOY

Charles G. Purnell, Wantage, England, assignor to BNF Metals Technology Centre, Oxon, England

Filed Aug. 22, 1986, Ser. No. 899,142

Claims priority, application United Kingdom, Aug. 22, 1985, 8521017

Int. Cl.[4] **C22C** *18/04;* **C22F** *1/16*

U.S. Cl. 148—11.5 R **7 Claims**

6. A two-phase alloy consisting of

content, % by weight	
Al	18–30
Mg	0.003–0.2
Cu	0.5–2.5
Fe	0.02–0.5
Si	0–0.1
Zn	balance (including impurities)

which alloy is superplastic at a temperature of 240° C. or above at a strain rate greater than 1 sec^{-1}.

4,731,130

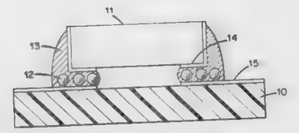
SOLDERING COMPOSITION

Daniel J. O'Leary, Natick, Mass., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed May 27, 1987, Ser. No. 54,697

Int. Cl.[4] **B23K** *35/34*

U.S. Cl. 148—24 **2 Claims**



1. A soldering composition suitable for soldering leadless component carriers and to provide an offset to printed circuit boards, comprising:

(a) particulate solder;

(b) flux; and

(c) solder plated copper powder.

4,731,131

METHOD OF SUBJECTING WELDED STRUCTURE TO HEAT TREATMENT

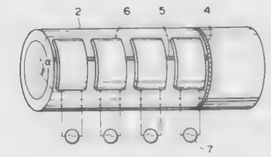
Shinji Sakata, Katsuta; Tasuku Shimizu, Hitachi; Kunio Enomoto, Ibaraki, and Hirotsugu Fujimoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,669

Claims priority, application Japan, Jan. 23, 1985, 60-8996

Int. Cl.[4] **C21D** *9/08*

U.S. Cl. 148—127 **6 Claims**



1. A method of subjecting a welded structure to heat treatment in which a tensile yield is produced on an inner surface of the welded structure and a compressive yield is produced on an outer surface of the welded structure by the steps of placing a cooling medium in the interior of the welded structure and heating the outer surface of the welded structure to cause a difference in temperature to exist betweem the inner surface and the outer surface of the welded structure, the method comprising the steps of locally heating a weld by a plurality of heating members arranged along the weld to improve residual stress in a localized area of the weld, and repeating the improvement of residual stress in another localized area of the weld so that residual stress in the whole of the weld is improved.

4,731,132

OXIDE DISPERSION HARDENED ALUMINUM COMPOSITION

Guy B. Alexander, Salt Lake City, Utah, assignor to Technical Research Associates, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 654,476, Sep. 26, 1984. This application Sep. 2, 1986, Ser. No. 902,946

Int. Cl.[4] **C22C** *21/06, 21/16*

U.S. Cl. 148—437 **16 Claims**

1. A metallic product in cast form, said cast product comprising:

a matrix consisting essentially of aluminum;

particles of a strengthening oxide dispersed throughout said matrix;

said strengthening oxide having a free energy of formation greater than 100 K Cal/gram atom of oxygen in the oxide;

and a wetting metal for said stengthening oxide;

said wetting metal being reactive to form an oxide having a free energy of formation greater than that of said strengthening oxide;

said particles of strengthening oxide having a mean particle size no greater than 0.025 microns;

said particles of strengthening oxide occupying no greater than 1% of the volume of said metallic product;

the interparticle spacing for said particles being less than 0.2 microns;

said cast product being weldable without destroying its physical properties at the temperature of welding.

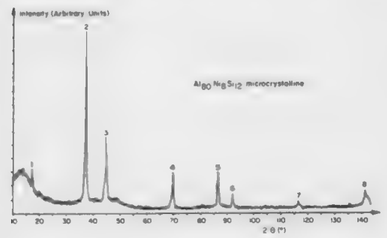
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4,731,133

AMORPHOUS AL-BASED ALLOYS ESSENTIALLY CONTAINING NI AND/OR FE AND SI AND PROCESS FOR THE PRODUCTION THEREOF

Salim Dermarkar, Paris, France, assignor to Cegedur Pechiney, Paris, France

Filed Feb. 13, 1986, Ser. No. 829,061
Claims priority, application France, Feb. 27, 1985, 85 03318
Int. Cl.⁴ C22C *21/02*
U.S. Cl. 148—437 **11 Claims**



1. Microcrystalline Al-based alloy produced by annealing an alloy formed initially in a substantially amorphous state by rapid solidification, between 10^5 and 10^4 °K./sec., from a temperature range at around 100° C. above the liquidus of the alloy produced, consisting essentially of, in atomic %:

from 5 to 30% Si

from 11 to 22% Ni

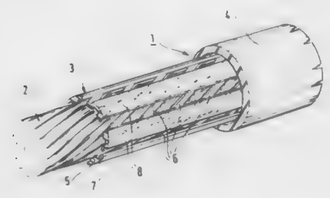
wherein the Ni may be partially substituted by Fe up to 10%, by V or B up to 5% each, or totally substituted by Mn up to 22%, and wherein Fe+Ni+Si≦42% the balance being formed by Al and the usual production impurities, said alloy containing, in the microcrystalline state, in the vicinity of the first crystallization peak, a metastable hexagonal phase whose crystalline parameters are about a=0.661 nm and c=0.378 nm.

4,731,134

METHODS OF MANUFACTURING ELECTRIC CABLE FOR TRANSPORTING VERY HIGH CURRENT AT LOW VOLTAGE

Michel Alloin, Trevoux, and Charles Flamand, Francheville, both of France, assignors to Les Cables de Lyon, Clichy, France

Division of Ser. No. 700,201, Feb. 11, 1985, Pat. No. 4,647,712. This application Sep. 16, 1986, Ser. No. 907,944
Claims priority, application France, Feb. 10, 1984, 84 02099; Nov. 15, 1984, 84 17425
Int. Cl.⁴ H01B *13/08, 13/14*
U.S. Cl. 156—53 **7 Claims**



1. In a method of manufacturing an electric cable for transporting very high current at low voltage and including the step of

covering at least one multi-strand conductor with an outer sheath facilitating water circulation, the improvement comprising, prior to placing said sheath around

said at least one multi-strand conductor, the steps of separately inserting said at least one multi-strand conductor into the center of an extruder, and extruding simultaneously two layers of material onto said at least one multi-strand conductor in the form of at least one strip for each layer, with the strips defining said two layers being non-aligned, such that said strips of respective layers are fixed to each other at the areas of strip crossovers, and wherein said inner layer at least one strip is extruded by means of a punch, and said outer layer at least one strip is extruded by means of a die.

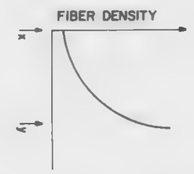
3. In a method of manufacturing an electric cable for transporting very high current at low voltage including the step of covering at least one multi-strand conductor with an outer sheath facilitating water circulation, the improvement comprising, prior to placing the sheath around said at least one multi-strand conductor, the steps of winding a first tape layer helically around said at least one multi-strand conductor, inserting said at least one multi-strand conductor in a device for impregnating or for hot gluing, and placing a second tape layer thereon with the tape of said second layer non-aligned with the tape of the first layer, and impregnating and hot gluing said second layer to the first layer at areas of tape crossover.

4,731,135

PROCESS FOR MAKING A FILTER HAVING A CONTINUOUS DENSITY GRADIENT

Yatsuhiro Tani, Kyoto; Susumu Ohmori, and Hideki Komagata, both of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha and Nippon Denso Company, Ltd., both of, Japan

Continuation of Ser. No. 627,586, Jul. 3, 1984, abandoned, which is a division of Ser. No. 522,248, Aug. 10, 1983, abandoned, which is a continuation of Ser. No. 320,984, Nov. 12, 1981, abandoned. This application Mar. 4, 1986, Ser. No. 837,574
Claims priority, application Japan, Nov. 12, 1980, 55-159959
Int. Cl.⁴ D04H *3/12*
U.S. Cl. 156—62.6 **1 Claim**



1. A process for the production of a filter having an inlet side and an outlet side and comprising fibers bonded to each other with a binder, said filter having a fiber density of 0.01 to 0.1 at the inlet side and a fiber density of 0.05 to 0.5 at the outlet side and having a continuous fiber density gradient from the inlet side to the outlet side while having a uniform distribution of the different types of fibers, comprising the steps of:

drawing a gas, containing a powdery binder having a particles size of 1 to 150μ, by suction through webs having a fiber density of 7×10^{-4} to 1×10^{-2} at a flow rate of not more than 4 m/second, thereby adhering the binder to the fibers of the webs in an amount of 10 to 80% by weight to the total weight of webs so that the adhered amount of the binder is rich at the inlet side and is poor at the outlet side;

hot-pressing the binder-containing webs at a fiber density of not higher than 0.2; and

recovering the webs from the pressing.

4,731,136

PROCESS FOR RECYCLING USED TIRES

Leandro Risi, S. Michele in Escheto/Lucca, Italy, assignor to T.R.S. Tyres Recycling System S.A., Grono, Switzerland

Filed Jul. 30, 1985, Ser. No. 760,655
Claims priority, application Switzerland, Feb. 11, 1985, 842/85
Int. Cl.⁴ B60C *21/00;* B29C *35/00*
U.S. Cl. 156—64 **4 Claims**

1. Process for recycling used tires comprising: control of the condition of the used tire; restructuring; and reconstruction; wherein control comprises the following stages:

(a_1) visual control by inspection of the used tire to ascertain that the body does not have irreparable ruptures;

(b_1) using an inspection device to check the condition inside the tire and the bead of said tire, discarding tires having broken cords, cracks or gaps near the bead or having a predetermined number of broken cords on the body;

(c_1) placing the tire between two flanges inside a sealed chamber and pumping up the tire to a higher than normal pressure in order to detect pressure deformations;

(d_1) using a laser to check the structure of the tire from bead to bead;

(e_1) setting-up a schedule for the restructuring program and calculating a total restructuring cost; and

(f_1) selecting suitable tires from unsuitable ones; and wherein restructuring comprises the following stages:

(a_2) removing the tread of the tire, metallic belts and any extraneous body;

(b_2) forming craters at places where there are damaged and contaminated parts including splits, partial oxidations, and lacerations due to striking against blunt objects at all layers of the tire;

(c_2) spraying a rubber-solvent mixture on all parts to be restructured;

(d_2) filling the craters with a mixture comprising non-vulcanized rubber to restore a smooth surface along the entire area to be restructured including the sides;

(e_2) subsequently mounting on the tire:

a first rubber sheet to obtain the original radial structure of the tire;

a first metallic belt;

a second metallic belt;

a third metallic belt; and

a layer of non-vulcanized rubber completely covering all said metallic belts and in an amount required by the dimensions of a matrix having a smooth surface in which said tire is subsequently to be positioned for vulcanization;

(f_2) vulcanization in a press provided with a punch having a smooth surface, wherein rows of adjustable sensors are positioned longitudinally along the entire periphery of the tread, said sensors being provided with tips adapted to hold the metallic belts during vulcanization, said tips being internally pierced and engaged by elastic devices which allow their automatic retraction during vulcanization by letting air and gases flow freely out through internal holes;

(g_2) using a laser to detect possible existence of air bubbles between replaced parts, wherein at the location of any detected air bubbles a crater is formed and subsequently filled with vulcanized rubber so as to obtain a perfect tire assembly having no tread;

and reconstruciton comprises the following stages:

(a_3) brushing the entire periphery of the tire;

(b_3) spraying the tire with a rubber-solvent solution;

(c_3) applying a sheet of non-vulcanized rubber for joining with a prepunched band, said sheet of non-vulcanized rubber to be used as a tread; and

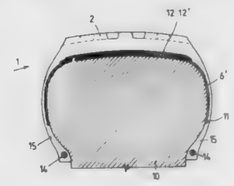
(d_3) vulcanizing the tire.

4,731,137

TIRE MADE OF CASTABLE OR SPRAYABLE ELASTOMERS

Oskar Schmidt, Bruck/Leitha, and Wladislaw Kubica, Hainburg/Donau, both of Austria, assignors to Lim Kunststoff Technologie Gesellschaft mbH, Kitsee, Austria

Division of Ser. No. 720,095, Apr. 5, 1985. This application Sep. 2, 1986, Ser. No. 902,481
Claims priority, application Australia, Apr. 6, 1984, 1181/84; Mar. 26, 1985, 897/85
Int. Cl.⁴ B29D *30/16;* B29C *45/14, 31/08*
U.S. Cl. 156—125 **6 Claims**



1. A method of building a tire, comprising the steps of:

providing a mold defining a mold cavity in the shape of a tire with tread, sidewall and bead portions between a mold core and an outer mold member;

tying to said mold core in the region of said tread and sidewall portions of said cavity a flexible mesh fabric by tying together corresponding ends of strings running through respective edges of the fabric extending around respective sides of the core and spaced radially of said bead portions;

laying a reinforcement in said cavity in contact with said fabric whereby said fabric forms a spacer between said reinforcement and an inner surface of the tire to be formed; and

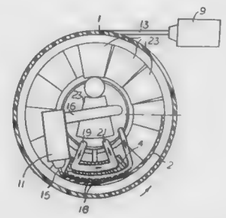
introducing an elastomer into said cavity to form a tire body of the shape of the mold cavity with a tread, sidewalls and beads, with elastomer penetrating into said fabric to form said inner surface therewith.

4,731,138

APPARATUS FOR PRODUCING DOUBLE-WALLED CORRUGATED PIPES

Manfred A. A. Lupke, 10 McLeary Court, Concord, Ontario, L4K 2Z3, Canada

Filed Apr. 23, 1987, Ser. No. 41,538
Claims priority, application Canada, Jun. 4, 1986, 510772
Int. Cl.⁴ B65H *81/00*
U.S. Cl. 156—429 **1 Claim**



1. An apparatus for producing helically wound double-walled thermoplastic pipes having a corrugated outer wall and a smooth inner wall, both the walls being fused together, the apparatus comprising:

extruder means communicating respectively with first and second dies having extrusion orifices for extruding accordingly the first and second bands of a thermoplastic

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material for forming appropriately the outer and inner walls of the produced double-walled pipe;

a former located between said dies, downstream of the first die and upstream of the second die, their extrusion orifices being situated substantially along the former, the same having a lateral surface adapted to receive the first extruded band, to shape the corrugated configuration of the latter and to helically wind the same into the outer corrugated tube of the produced pipe, the inside of said outer tube receiving the second band helically wound into the inner smooth tube of the pipe;

an elongate tubing mounted inside the former and connecting the second die with its extruder means;

a cooled pressing element conforming to the inner wall and engaging the second band as it emerges from the second die and pressing the same to the outer wall to fuse them together;

the improvement, wherein said pressing element has passages communicating with the second band and with a vacuum means.

4,731,139

METHOD FOR PREPARING AN EMBOSSED LAMINATE CONTAINING AT LEAST TWO LAYERS

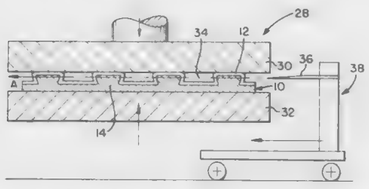
Ulrich Feyerabend, Weinheim, and Gerhard Graab, Mannheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Continuation of Ser. No. 702,920, Feb. 19, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,340

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420381

Int. Cl.[4] B32B *31/00*; B26D *7/14*

U.S. Cl. 156—154 **6 Claims**



1. A method for making an embossed laminate of at least two layers, comprising: backing a thin top layer of stretchable material with an unvulcanized bottom layer of rubber; pressing the backed thin top layer with a counterplaten having recesses distributed pattern-wise and having a depth exceeding the thickness of the top layer to form projections; bonding and solidifying the two layers together by vulcanization to form a laminate with a surface having projections; exposing the surface of the laminate having projections to pressure acting perpendicularly to said surface to deform said projections, said pressure resulting from pressing surfaces extending parallel to one another; and rectilinearly removing at least a top layer of said deformed projections while under pressure by a cutting, milling or grinding process to form a domed surface on the projections.

4,731,140

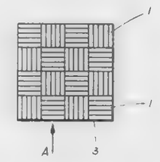
WOODEN TILE AND A METHOD OF MAKING THE SAME

Bunlue Yontrarak, 86, Suksawas Road, T. Laemfepha A. Muang, C. Samutorakarn, Thailand

Continuation of Ser. No. 663,819, Oct. 22, 1984, abandoned, which is a continuation of Ser. No. 315,083, Oct. 26, 1981, abandoned. This application Jun. 17, 1985, Ser. No. 745,678

U.S. Cl. 156—154 **33 Claims**

1. A method of making a flexible wooden tile consisting essentially of the steps of subjecting a piece of timber to a stress relieving process to relieve stresses in the timber, knife cutting a stress relieved sheet of wood of a predetermined thickness from the piece of timber, cutting the sheet of wood into a plurality of members each having substantially parallel major planar surfaces and peripheral edge surfaces, positioning a plurality of said members into a single layer tile with an edge surface of one member substantially abutting an edge surface of



another member so that said major planar surfaces of said members lie substantially in a single plane, and bonding said members together by means of an adhesive applied to the peripheral edge surfaces before said members are assembled to produce a flexible wooden tile in which said wooden members are flexible and the adhesive bonds between said members are rigid.

4,731,141

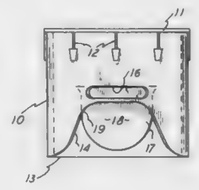
ACOUSTIC DRUM

Terry R. Thirion, 5910 Thomas Ave., Schofield, Wis. 54476

Filed Oct. 30, 1984, Ser. No. 666,436

Int. Cl.[4] G10D *13/02*

U.S. Cl. 156—171 **11 Claims**



1. A method of making an acoustic drum, comprising the steps of snugly positioning a low-friction MYLAR coated paper endlessly around and onto a mandrel and with the coat in contact with the mandrel, applying a uniformly thick layer of an uncured fiberglass-laden material in liquid form endlessly onto said paper, curing said fiberglass-laden material to have it adhere to said paper, and sliding the resultant fiberglass-laden material and paper off the mandrel by virtue of said low friction MYLAR.

4,731,142

METHOD OF MAKING A PERSONALIZED FOLDER WITH POCKETS AND PAGE INSERTS FROM A CONTINUOUS WEB

John W. Stenner, Orange, Conn., assignor to Kurt H. Volk, Inc., Milford, Conn.

Filed Apr. 24, 1987, Ser. No. 42,346

Int. Cl.[4] B31F *5/04*

U.S. Cl. 156—226 **13 Claims**

1. A method for producing an article suitable for mailing, that comprises a folder having a front cover and a back cover, a pocket in at least one of the covers, and a printed sheet insertable in the pocket, the article being produced from a composite sheet comprising:

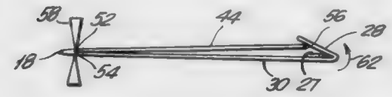
(i) a folder section defining a front cover and a back cover joined together along a longitudinal line;

(ii) an insert section joined to said folder section along a first transverse line;

(iii) a pocket member joined to said front and back covers along a second transverse line;

the method comprising the steps of:

(a) trimming said insert section to a width less than the adjoining folder section;



(b) folding said trimmed insert section along said first transverse line to a superposed position over at least one of said front and back covers;

(c) folding said pocket member toward said insert section and said superposed cover;

(d) separating said insert section from said folder section; and

(e) folding along said longitudinal line to superpose said covers.

4,731,143

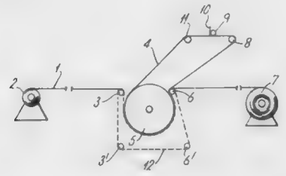
PROCESS OF TRANSFERRING A LATEX FILM ONTO A SUBSTRATE

Jimmy D. Cross, Signal Mountain, Tenn., assignor to Polysar Financial Services, S.A., Fribourg, Switzerland

Filed Jun. 17, 1986, Ser. No. 875,446

Int. Cl.[4] B32B *25/10, 25/12, 25/14, 31/30*

U.S. Cl. 156—231 **5 Claims**



1. A continuous process for producing a film having a thickness from 0,001 to 0.05 inches from an aqueous compound comprising per 100 parts by dry weight of a latex containing from 50 to 75 weight % of a rubbery polymer comprising:

(i) a homopolymer of C_{4-6} aliphatic diolefins which may be unsubstituted or substituted by a chlorine atom;

(ii) copolymers comprising

(a) 20 to 80 weight percent of a C_{8-12} vinyl aromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atoms;

(b) 80 to 20 weight percent of a C_{4-6} aliphatic diolefin; and

(c) 0 to 10 weight percent of one or more monomers selected from the group consisting of:

C_{3-6} ethylenically unsaturated carboxylic acids

amides of C_{3-6} ethylenically unsaturated carboxylic acids which amides may be unsubstituted or substituted at the nitrogen atom by up to two radicals selected from the group consisting of C_{1-4} alkyl radicals and C_{1-4} hydroxy alkyl radicals;

C_{1-6} alkyl and hydroxy alkyl esters of C_{3-6} ethylenically unsaturated carboxylic acids; and

C_{3-6} ethylenically unsaturated aldehydes; and

(iii) copolymers comprising

(a) 60–99.5 weight percent of a C_{1-4} alkyl or hydroxy alkyl ester of acrylic or methacrylic acid,

(b) up to 40 weight percent of one or more monomers selected from the group consisting of C_{8-12} vinyl aromatic monomers which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom; C_{3-6} alkenyl nitriles, vinyl chloride, and vinylidene chloride; and

(c) 0 to 10 weight percent of one or more monomers selected from the group consisting of:

C_{3-6} ethylenically unsaturated carboxylic acids

amides of C_{3-6} ethylenically unsaturated carboxylic acids which amides may be unsubstituted or substituted at the nitrogen atom by up to two radicals selected from the group consisting of C_{1-4} alkyl radicals and C_{1-4} hydroxy alkyl radicals;

C_{1-6} alkyl and hydroxy alkyl esters of C_{3-6} ethylenically unsaturated carboxylic acids; and

C_{3-6} ethylenically unsaturated aldehydes;

up to 80 parts by weight of a filler; on a surface of a flexible web substrate selected from the group consisting of webs of nonwoven natural or synthetic organic fibers having a weight of from 5 to 130 g/yd^2; batts of glass fibers having a density of from 5 to 12 lb/ft^3; and foamed backed carpet; which comprises:

(a) applying a thin film of said aqueous compound to an endless carrier belt made of a material selected from the group consisting of C_{2-3} polyolefins, C_{2-3} polyolefin terephthalate resin, polyvinyl chloride and polyvinylidene chloride;

(b) contacting said web and said coated carrier belt without drying said compound to bring said wet compound into direct contact with said web and maintaining them in relative position while passing them around at least a portion of the surface of a hot drum laminator at a temperature from 100° to 150° C. to dry said compound and transfer it to said substrate to produce a flexible web having a smooth-surfaced film strongly bonded thereto; and

(c) delaminating said web from said carrier belt.

4,731,144

METHOD OF SHAPING AN ANTENNA PANEL

Prasad Kommineni, Melbourne, Fla.; Paul E. Hollandsworth, Roanoke, Va., and John W. Jones, Melbourne Beach, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 14, 1986, Ser. No. 885,515

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—245 **6 Claims**



1. A method for shaping an antenna panel including the steps of:

adjusting a plurality of threaded studs located in a base member so that the tops of said plurality of threaded studs define a desired antenna panel contour;

placing a front-side sheet material on top of said plurality of threaded studs;

bonding a honeycomb structure to said front-side sheet material using an adhesive;

bonding a back-side sheet material to the exposed side of said honeycomb structure;

enclosing said plurality of threaded studs, said base member, said honeycomb structure, and said front-side and said back-side sheet materials in an enclosure;

drawing a vacuum within said enclosure so that said front-side sheet material is urged against the tops of said plural-

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ity of threaded studs, wherein said front-side and said back-side sheet materials are deformed into the shape defined by the tops of said plurality of threaded studs, and wherein when said adhesive cures said front-side and said back-side sheet materials hold the shape defined by the tops of said plurality of threaded studs;

releasing said vacuum after a predetermined time.

4,731,145

METHOD FOR PRODUCING SHEETS OF WOOD WITH DIFFERENTIATED POROSITIES

Giovanna Senzani, Via Gramsci No. 34, Modigliana, Forli, Italy

Filed Jul. 16, 1985, Ser. No. 755,569

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—264 **24 Claims**



1. Method for producing sheets of precomposed wood with differentiated porosity, suitable for imitating sheets of natural wood, according to which the final sheets of precomposed wood are sliced from a block of wood obtained by overlapping numerous sheets of wood glued together, comprising the following steps:

preparing natural wood sheets having a homogenous structure and a first degree of porosity;

preparing first precomposed wood sheets having a fibrous structure and a second degree of porosity, higher than said first degree of porosity;

forming a first block of precomposed wood by overlapping said natural wood sheets and said first precomposed wood sheets, sutiably provided with an adhesive substance;

making the sheets adhere to one another by exerting pressure on the first block;

slicing second precomposed wood sheets from said first block, in a direction parallel to a pre-established cutting plane;

forming a second block of precomposed wood by overlapping said natural wood sheets and said second precomposed wood sheets, suitably provided with an adhesive substance;

making the sheets adhere to one another by exerting pressure on the second block; and

slicing third precomposed wood sheets from said second block in a direction parallel to a pre-established cutting plane, thus obtaining final sheets of wood presenting grains with desired amounts of alternate bands of at least one of different widths, appearance and porosity.

4,731,146

ADHESION PROMOTING PRIMER ACTIVATOR FOR ANAEROBIC COMPOSITIONS

Paul J. Clark, West Simsbury, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Aug. 30, 1985, Ser. No. 771,391

Int. Cl.⁴ C09J *5/04*; B32B *5/06*; C08F *30/04*

U.S. Cl. 156—314 **9 Claims**

1. In a method of curing a liquid composition on a substrate, the cureable composition comprising a mixture of at least one (meth)acrylic, an effective amount of an monomer accelerator and a peroxy initiator, and the method comprising applying a solution of a cure activator in a volatile organic solvent to the substrate surface and allowing the activator solvent to evaporate, subsequently applying the curable composition to the substrate surface and allowing the composition to cure, the improvement comprising that the activator solution comprises a solution in a volatile organic solvent of a salt of a metal ion selected from Cu(II), Co(II), Mn(II) Mn(III) and Cr(III) and a counterion derived from a (meth)acrylic functional acid phosphate monomer.

4,731,147

MACHINE FOR LABELING CONTAINERS AROUND THEIR COMPLETE CIRCUMFERENCE

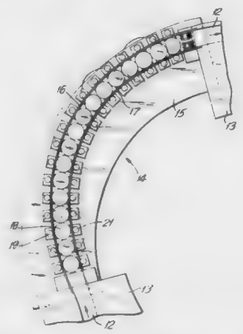
Hans W. Mohn, Kaarst, Fed. Rep. of Germany, assignor to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,403

Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515684

Int. Cl.⁴ B65C *9/04*

U.S. Cl. 156—456 **11 Claims**



1. In a machine for labeling containers completely around their circumference, having a driven rotating turntable with rotating plates that are positioned around the circumference of the turntable and accommodate the containers, and drive means for rotating the plates at different individual speeds as the plates travel past a labeling station, including roller cams and a recessed cam defining a cam path for adapting to the cross-sections of different containers, the improvement wherein: one section of the recessed cam comprises yieldable cam elements each comprising spaced apart spring steel leaf springs that are positioned at intervals along the cam path, wherein the leaf springs have mutually facing inner surfaces supported by spacing rollers and mutually remote outer surfaces supported by supporting elements and wherein the spacing rollers have a diameter that equals the distance between the leaf springs and means for retaining the spacing rollers between the leaf springs to prevent the spacing rollers from being lifted out of the cam path, and adjustable means for supporting the cam elements.

4,731,148

TAPE SPLICING BLOCK ASSEMBLY

Claude M. Karczmer, 182-25 Tudor Rd., Jamaica Estates, N.Y. 11432

Filed Dec. 9, 1986, Ser. No. 939,745

Int. Cl.⁴ B65H *69/06*; G03D *15/04*

U.S. Cl. 156—502 **8 Claims**

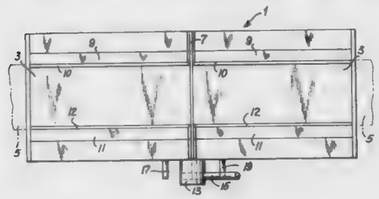
1. An improved tape splicing block assembly comprising:

(a) a block member defined in part by a longitudinal flat bed surface for supporting a length of tape thereon;

(b) a pair of releasable clamp members carried by the block member and disposable between a first position for clamping the tape to the bed surface and a second position for permitting removal or insertion of the tape with respect to the bed surface;

(c) means carried by the clamp members for clamping substantially continuous inwardly disposed regions of the tape edges along substantially the length of the bed surface, whereby the entire length of tape on the bed surface may be securely clamped thereto while permitting sufficient access to the tape for completing a proper splice joint; and

(d) means for disposing the clamp members between the first and second positions.



4,731,149

APPARATUS FOR USE IN SPACING LETTERS

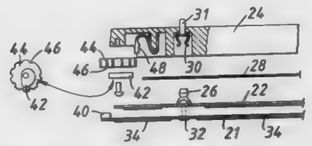
Martin E. Dowzall, Wyckoff, and Vazgen J. Houssian, Union City, both of N.J., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,220

Claims priority, application United Kingdom, Oct. 5, 1984, 8425200

Int. Cl.⁴ B44C *1/16*; B32B *31/00*; G01B *3/22*

U.S. Cl. 156—541 **6 Claims**



1. In apparatus for providing a spaced legend on a receptor surface, the legend being built up from indicia sequentially transferred from a dry transfer sheet provided with horizontal lines of indicia, the apparatus including a support base adapted to support a receptor, and a holder cooperating with the support base for holding a dry transfer sheet, and enabling the sheet to be moved bodily in the plane of the sheet both along the lines of indicia and transverse thereto, the holder consisting essentially of a first portion to be held in fixed position relative to the support base, and a second portion including means for attaching said dry transfer sheet to said second portion and connected to said first portion by means enabling said first and second portions to be moved relative to one another in the direction of said longitudinal lines of indicia by a small distance amount, the improvement comprising connecting said first and second portions together via a lost motion connection whereby the dry transfer sheet held in said second portion can be freely moved horizontally in the direction of the lines of indicia relative to a receptor held supported on the base by said small distance amount.

4,731,150

APPARATUS FOR GLUEING TOGETHER MATERIAL LAYERS

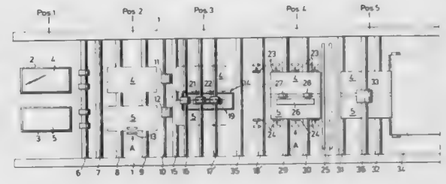
Sture Wiholm, Johanneshov, Sweden, assignor to Bind-O-Matic AB, Stockholm, Sweden

PCT No. PCT/SE85/00005, § 371 Date Aug. 27, 1986, § 102(e) Date Aug. 27, 1986, PCT Pub. No. WO86/04025, PCT Pub. Date Jul. 17, 1986

PCT Filed Jan. 7, 1985, Ser. No. 902,405

Int. Cl.⁴ B32B *31/04, 31/10, 31/12*

U.S. Cl. 156—546 **3 Claims**



1. In an apparatus for glueing together two different material layers (**4**, **5**), of which one is intended to form a first cover in a folder, file or the like, and the other a second cover and/or a spine in the folder, file or the like, wherein said apparatus includes:

glueing means (**14**) for coating one side of one of said layers with a glue strip along or close to one edge thereof to accommodate the glueing together of said layers (**4**, **5**) in an area where the layers (**4**, **5**) overlap each other:

layer aligning means (**23–25**) for aligning said layers (**4**, **5**);

press means (**26–28**) for pressing both layers (**4**, **5**) towards each other in the area of overlap during a pressing operation; and

feed means (**6–10**, **15–18**, **29–32**) for feeding the layers (**4**, **5**) in a feeding direction parallel to the length of said glue strip along a feed path through the apparatus from an upstream region of the apparatus to a downstream region of the apparatus;

said apparatus characterized in that:

said feed means (**6–10**, **15–18**, **29–32**) comprise rolls allowing both layers (**4**, **5**) to be horizontally displaced thereon;

said aligning means (**23–25**) comprise a first means (**25**) for engaging the leading end edges of both layers (**4**, **5**) on the rolls in order to align the leading and edges of said layers (**4**, **5**) relative to each other along a line perpendicular to the feeding direction, said first means (**25**) including a stop member (**25**) which is disposed in the immediate vicinity of the press means (**26–28**) and downstream of both said glueing means (**14**) and said press means (**26–28**) and against which the layers (**4**, **5**) are moved for engagement before the pressing operation, said stop member (**25**) being displaceable into and out of said feed path to permit continued feeding of the layers (**4**, **5**) after the pressing operation; and

said aligning means (**23–25**) also comprise a second means (**23**, **24**) downstream of glueing means (**14**) for displacing both layers (**4**, **5**) on the rolls perpendicular to the feeding direction to overlap the layers (**4**, **5**) in the overlapping area and align the longitudinal edges of said layers (**4**, **5**) relative to a line parallel to the feeding direction which is parallel to the length of said glue strip.

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4,731,151

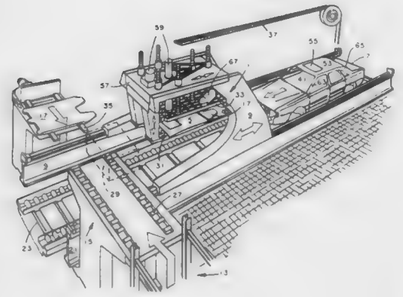
APPARATUS FOR MOUNTING READY-MADE HEADLINERS INTO AUTOMOTIVE BODIES

Adolf Kaller, Baar; Wilfried Michel, Stammham, and Josef Motzet, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi AG., Ingolstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 760,155, Jul. 29, 1985, abandoned, which is a continuation of Ser. No. 550,597, Nov. 8, 1983, abandoned. This application Apr. 20, 1987, Ser. No. 40,135

Int. Cl.⁴ B32B *31/04, 31/20, 31/26*

U.S. Cl. 156—556 **19 Claims**



1. An apparatus for mounting ready-made headliners into automotive bodies moved in a predetermined direction by conveyor means at a substantially constant speed and at predetermined intervals at least between first and second positions along an assembly line, comprising:

a frame member mounted for movement parallel to said conveyor means between said first and second positions and comprising an opening for passing said automotive bodies therethrough;

means for selectively connecting said frame member to said conveyor means for synchronous movement therewith from said first position to said second position;

jig means mounted on said frame member and comprising a first horizontally disposed member for supporting a headliner thereon and a second substantially horizontally disposed member superposed over said first member;

means for moving said first and second members between an elevated position in which said automotive bodies may pass through said opening and a lower position in which said first member is aligned with a window cut-out of one of said automobiles;

means for moving said first member, when it is in its lower position, in a direction parallel to said predetermined direction between a position outside of said automotive body and a position inside of said automotive body;

means for vertically moving said first member, when it is inside of said body and said frame member is connected to said conveyor means, between said inside position and a third position in which it presses said headliner into engagement with the ceiling of said automotive body;

means for substantially simultaneously moving said second member into engagement with the roof of said automotive body to counteract the pressure exerted by said first member; and

means for disconnecting said frame member from said conveyor means at said second position.

4,731,152

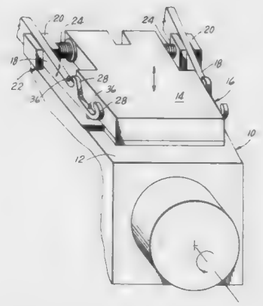
SHOE SUBSTRATE REINFORCING MACHINE

Douglas H. Crowell, Beverly; John F. Martin, Essex; Albert I. Morse, Beverly, and Lawrence P. Ciccia, Medford, all of Mass., assignors to DVSG Patentverwaltungs, Frankfurt, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,841

Int. Cl.⁴ B05C *13/00*

U.S. Cl. 156—580 **3 Claims**



1. A shoe substrate reinforcing machine for depositing a powder in a selected configuration, fusing the configured powder into a laminate and adhering the fused laminate to a shoe substrate to reinforce the substrate, said machine comprising a work transfer device adapted to displace a shoe substrate clamped thereon to a join station where a fused laminate can be adhered thereto, said work transfer device including

a substrate mounting assembly having a support pad, and clamp means on either side of said support pad each including

a lever arm, and

swivel bracket means,

said lever arm having

a catch and

detent means on the lever arm cooperating with said catch for releasably securing a connecting pin within said catch, and

said swivel bracket means having a slot for slidably receiving said catch and including a connecting pin extending across said slot for insertion into said catch as said swivel bracket means is connected to said lever arm, said slot being selectively configured so that said swivel bracket can be reoriented around said pin but will be held in said catch by said pin when said clamp means is clamped on the support pad.

4,731,153

METHOD TO MANUFACTURE $BAPB_{1-x}BI_xO_3$ SINGLE CRYSTAL

Shinichi Hirano, Meidai Yadacho Syukusya 123-gou, 66, Yadacho 2-chome, Higashi-ku, Nagoya, Aichi-ken, and Shigeharu Naka, 11-25, Kasumigaoka 1-chome, Chigusa-ku, Nagoya, Aichi-ken, both of Japan, assignors to Shinichi Hirano; Shigehara Naka, both of Aichi and Seiko Instruments Inc., Tokyo, all of, Japan

Filed Mar. 7, 1986, Ser. No. 837,515

Claims priority, application Japan, Mar. 18, 1985, 60-53891

Int. Cl.⁴ C30B *7/10*

U.S. Cl. 156—623 R **18 Claims**

1. A method of manufacturing $BaPb_{1-x}BiO_3$ single crystal wherein $BaPb_{1-x}Bi_xO_3$ is grown by hydrothermal synthesis which applies heat and pressure to the crystal within an aqueous solution, the hydrothermal synthesis being carried out at a temperature above 350° C.

4,731,154

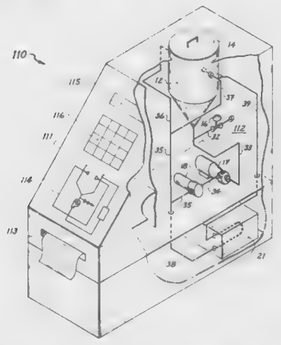
METHOD AND APPARATUS FOR QUANTITATIVE MEASUREMENT OF ORGANIC CONTAMINANTS REMAINING ON CLEANED SURFACES

Andrea Jo Hausman Hazlitt, and Warren F. Richey, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 877,636, Jun. 23, 1986, which is a continuation-in-part of Ser. No. 821,933, Jan. 24, 1986, abandoned. This application Jun. 9, 1987, Ser. No. 60,139

Int. Cl.⁴ B44C *1/22;* **B29C** *37/00*

U.S. Cl. 156—626 **39 Claims**



1. A method for determining organic contamination on an electronic circuit assembly (ECA) comprising:

(a) contacting a previously defluxed ECA with a solvent adapted for removing organic contaminant species on the surface of the ECA,

(b) measuring the spectral absorbance, in the ultraviolet or the visible region, of the organic contaminant species in the solvent contacted with the ECA, and

(c) comparing the resultant absorbance units to a standard.

4,731,155

PROCESS FOR FORMING A LITHOGRAPHIC MASK

Louis S. Napoli, Hamilton Township, Mercer County, and John P. Russell, Pennington, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1987, Ser. No. 40,401

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *37/00*

U.S. Cl. 156—643 **14 Claims**

1. A process of forming a patterned layer on a substrate for the lithographic processing of the substrate comprising: providing a layer of an embossable polymeric material on the substrate; embossing a surface relief pattern in said layer; and dry etching said patterned layer to remove the thin portion thereof, thus exposing a corresponding portion of the substrate.

4,731,156

PLASMA PROCESSES FOR SURFACE MODIFICATION OF FLUOROPOLYMERS USING AMMONIA

Francis H. Montmarquet, Little Falls, N.J., assignor to ITT Avionics, A Division of ITT Corporation, Nutley, N.J.

Filed Feb. 25, 1987, Ser. No. 18,666

Int. Cl.⁴ B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*

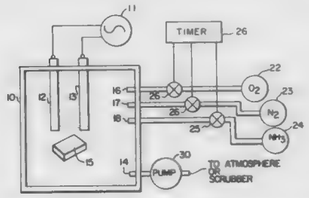
U.S. Cl. 156—643 **15 Claims**

1. A method of raising the surface energy of a fluoropolymer, comprising the steps of:

(a) placing said fluoropolymer in a sealed chamber,

(b) introducing a combination of gases including oxygen and ammonia gas into said chamber within a predetermined pressure range,

(c) creating a plasm discharge in said chamber during the introduction of said gases for an interval sufficient to remove a substantial amount of fluorine from the surface of said fluoropolymer to thereby raise the surface energy of said fluoropolymer to allow said fluoropolymer to be wetted.



4,731,157

PROCESS FOR THE PRODUCTION OF A MAGNETIC HEAD FOR PERPENDICULAR RECORDING

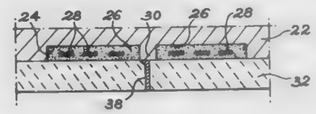
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 696,490, Jan. 30, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,068

Claims priority, application France, Feb. 3, 1984, 84 01880

Int. Cl.⁴ B44C *1/22;* **C23F** *1/02;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **1 Claim**



1. A process for the production of a magnetic read-write head for perpendicular recording, comprising the steps of depositing a film of magnetic material on an insulating support, etching in said magnetic film a first wide, closed channel, which leaves intact a central elongated portion having a rectilinear axis, forming a coil in the channel surrounding the central portion by filling said first channel with a dielectric material to form a dielectric layer, etching of said dielectric layer, so as to obtain a spiral groove surrounding said central portion, depositing a conductive material in said spiral groove and filling said spiral groove with said dielectric material depositing a coating of a first hard dielectric material on the coil and the central portion, etching in said coating a second channel having a planar lateral edge parallel to the axis of the central portion and facing the latter, said second channel partly exposing the central portion, depositing a thin magnetic film on the hard dielectric layer and in the second channel, said magnetic film having longitudinal parts and one lateral edge, depositing a thin film of a second hard dielectric material, reactive ion etching of said second dielectric material so as to only leave a lateral edge deposited on the lateral edge of the magnetic film, chemically etching of the longitudinal parts of the magnetic film, stripping of the lateral edge of the second dielectric layer, so as to leave the lateral edge of the magnetic film, filling the second channel with a third hard dielectric materail similar to the first hard dielectric material, the lateral edge of said magnetic film constituting a thin magnetic spacer between the first and the second hard dielectric materials.

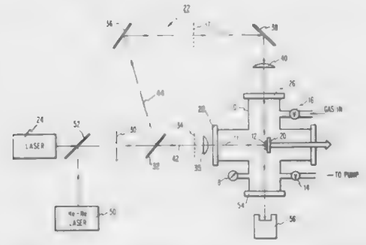
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4,731,158

HIGH RATE LASER ETCHING TECHNIQUE

James H. Brannon, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1986, Ser. No. 906,490
Int. Cl.⁴ C23F *1/00*; H01L *21/306*
U.S. Cl. 156—643 **10 Claims**



1. A method for increasing the rate of laser dissociative etching on a material in a semiconductor chip, comprising the steps of:

etching by disposing a gas mixture of a fluorine-containing molecules and H_2 present in an amount sufficient to increase the lasar dissociative etch rate over that rate which would exist in the absence of H_2, over the surface of said material in a semiconductor chip to be etched, wherein said fluorine-containing molecule has at least one strong absorption line; and

directing a laser beam of energy adjacent to said material surface to be etched, with said laser energy beam having a frequency which approximately matches said at least one strong absorption line of said fluorine-containing molecule, and having sufficient energy to cause said molecule to dissociate to initially form at least one fluorine atom per molecule, to thereby cause said dissociation and cause very fast etching of said material surface.

10. A method for high-rate etching a silicon surface comprising the steps of:

disposing a gas mixture of NF_3 and H_2 with an NF_3/H_2 pressure ratio in the range 2–14 over an unmasked surface of silicon to be etched;

directing a laser beam adjacent to said silicon surface to be etched, said energy beam having a wavelength which approximately matches a strong absorption line of said NF_3 and having sufficient energy to cause said NF_3 to dissociate to initially form at least one fluorine atom per molecule to thereby cause said dissociation and cause high-rate etching of said silicon surface.

4,731,159

EVAPORATOR

John E. Porter, Newcastle-upon-Tyne, and Colin Ramshaw, Norley, both of England, assignors to Imperial Chemical Industries plc, London, England

Continuation of Ser. No. 580,137, Feb. 14, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,330
Claims priority, application United Kingdom, Mar. 1, 1983, 8305595
Int. Cl.⁴ B01D *1/22*
U.S. Cl. 159—6.1 **7 Claims**

1. An evaporator for passing an at least partially condensible vapor in indirect heat transfer relationship with an at least partially vaporizable liquid, said evaporator comprising:

housing means defining a first confined space;

a plurality of coaxially arranged, axially spaced, two-faced plates located in said housing along an axis;

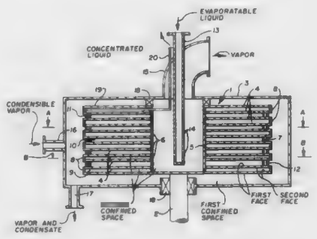
rotor wall means, including axially extending, radially inner and radially outer sidewall means joining axially adjacent twos of said plates to constitute a rotor having a manifold located radially centrally of said plates and defining a second confined space enclosed by said rotor, with:

a first face of each plate openly communicated with said first confined space but isolated from open communication with said second confined space, and

a second face of each plate openly communicated with said second confined space but isolated from open communication with said first confined space;

means defining a vapor inlet for an at least partially condensible vapor to said first confined space and means defining an outlet for at least partially condensed vapor from said first confined space, said inlet and said outlet being so arranged relative to one another that, in use, condensible vapor introduced to said first confined space through said vapor inlet will flow in contact with said first face of each plate, lose heat thereto and at least partially condense before leaving said first confined space through said outlet;

means defining a liquid feedstock inlet for an at least partially vaporizable liquid from externally of said housing means to said manifold of said second confined space, means defining a vapor outlet from said manifold of said second confined space to externally of said housing means, and means defining a concentrated liquid outlet from sites located between and in communication with said second



faces of repsective neighboring twos of said plates radially of said manifold to externally of said housing means, said liquid feedstock inlet to said second confined space and said concentrated liquid outlet means and said vapor outlet being so arranged relative to one another that, in use, partially vaporizable liquid introduced into said second confined space through said liquid feedstock inlet will flow radially outwardly along said plates in contact with said second face of each plate, gain heat lost by said partially condensible vapor therefrom, and at least partially vaporize before leaving said housing means, respectively as concentrated liquid through said liquid outlet means and as vapor from said vapor outlet, after back-flowing radially inwardly between said plates and into said manifold;

means sealing and journalling said rotor with respect to said housing means;

means for rotating said rotor about said axis of said plurality of plates at a rotary speed which subjects liquid flowing thereon to a mean acceleration, measured radially of said axis, that is within the range of from 5 to 1000 times acceleration due to gravity; and

said first face of each plate being provided with surface means for reducing formation of a continuous film of liquid condensate of said partially condensible vapor thereof.

4,731,160

DRAINAGE CHARACTERISTICS OF MECHANICAL PULP

J. Robert Prough; Michael D. Fahey, both of Glens Falls, N.Y., and Pule Calderon, Williamsport, Pa., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,236
Int. Cl.⁴ D21C *3/00, 9/08*; D21B *1/16*
U.S. Cl. 162—55 **7 Claims**



1. A method of producing bleached mechanical pulp, comprising the steps of:

(a) separating a stream of mechanical pulp directly from a primary refiner into a minor fines fraction comprising at least 80% of the pulp having a size under about 200 mesh, and a major fiber fraction having a size above about 200 mesh, the major fraction having better drainage characteristics relative to the drainage characteristics of said stream of mechanical pulp;

(b) non-displacement bleaching the minor fraction with hydrogen peroxide;

(c) displacement bleaching the major fraction with hydrogen peroxide to produce a bleached mechanical pulp having higher brightness per unit of hydrogen peroxide consumed than if the stream of mechanical pulp were bleached without the practice of step (a); and

(d) combining the bleached fractions from steps (b) and (c) to obtain said bleached mechanical pulp.

4,731,161

SEMIBLEACHING LIQUOR FOR KRAFT PAPER PRODUCTS

F. Joseph Ehrhardt, Haddonfield, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jul. 31, 1986, Ser. No. 891,106
Int. Cl.⁴ D21C *3/00, 3/02*; C01B *15/037*
U.S. Cl. 162—78 **6 Claims**

1. A method of preparing a stabilized bleaching liquor which comprises:

providing an aqueous solution consisting essentially of 0.005 to 0.2 weight percent of a water soluble magnesium salt and 0.05 to 2 weight percent of hydrogen peroxide; and

then adding to said solution 0.05 to 2.0 weight percent of an alkali metal hydroxide.

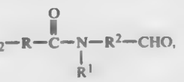
4,731,162

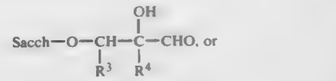
POLYSACCHARIDE DERIVATIVES CONTAINING ALDEHYDE GROUPS FOR USE AS PAPER ADDITIVES

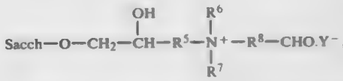
Daniel B. Solarek, Somerville; Patrick G. Jobe, Westfield, and Martin M. Tessler, Edison, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 758,634, Jul. 24, 1986, Pat. No. 4,675,394, which is a continuation-in-part of Ser. No. 641,820, Aug. 17, 1984, abandoned. This application Mar. 31, 1987, Ser. No. 32,266
Int. Cl.⁴ C08B *11/00*; D21H *3/28, 5/12*
U.S. Cl. 162—175 **18 Claims**

1. In a method for making paper having dry strength, wet strength, temporary wet strength, or combinations thereof, the step which comprises adding, as a strength aid, to the stock at any stage prior to forming a web, an effective amount of an aldehyde-containing polysaccharide having the general structure







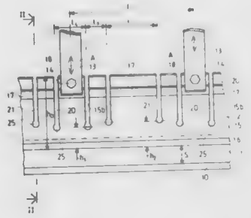
wherein Sacch—O— represents a polysaccharide molecule; R is $(CH_2)_n$, with n being 0 or greater; R^1, R^6, and R^7 are independently hydrogen or an alkyl, aryl, aralkyl, or alkaryl group; R^2, R^5 and R^8 are independently $(CH_2)_m$ with m being 1–6; R^3 is hydrogen or a lower alkyl group; R_4 is hydrogen or an alkyl, aryl, aralkyl, or alkaryl group; and Y^- is an anion.

4,731,163

PROFILE BAR IN A HEAD BOX OF PAPER MACHINE

Erkki Ilmoniemi, Vaajakoski, Finland, assignor to Valmet Oy, Finland

Filed Feb. 11, 1987, Ser. No. 13,449
Claims priority, application Finland, Dec. 13, 1986, 860669
Int. Cl.⁴ D21F *1/06*
U.S. Cl. 162—344 **8 Claims**

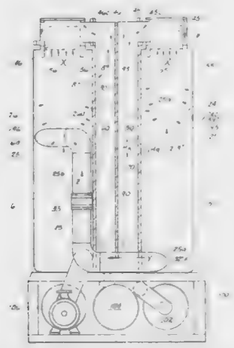


1. Profile bar for a discharge opening in combination with a head box in a paper machine, by means of which the profile of a discharge jet of the paper machine is controlled, the profile bar being connected to a plurality of adjustment spindles or corresponding bending members by means of which the profile bar can be bent in a plane transverse to direction of flow of the discharge jet, wherein

said profile bar is structured so that bending stiffness of said profile bar in a direction of bending to be achieved by means of said adjustment spindles or corresponding bending members, is substantially lower at the adjustment spindles or bending members than at the middle between adjacent adjustment spindles or bending members.

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4,731,164
MULTI-STAGE FLASH EVAPORATOR
William R. Williamsom, 8310 Pilgrim Rd., Pensacola, Fla. 32504
Continuation-in-part of Ser. No. 617,760, Jun. 6, 1984, Pat. No. 4,548,257, which is a continuation of Ser. No. 350,804, Feb. 22, 1982, abandoned. This application May 10, 1985, Ser. No. 732,861
Int. Cl.[4] B01D *3/06, 5/00*
U.S. Cl. 202—173 18 Claims



1. A multi-stage flash evaporator comprising:
a. a plurality of cyclonic flash chambers each having a substantially vertical shell which is closed at the bottom and open at the top;
b. means for tangentially introducing a fluid to be evaporated in a liquid-vapor phase successively into each of said flash chambers in a first fluid flow zone intermediate said chamber's vertical height so as to establish a swirling body of fluid in each of said chambers and which defines a surface at and above said liquid-vapor introducing means, said surface being of a generally parabolic form about a substantially vertical axis;
c. means positioned below said tangential introducing means for tangentially discharging said liquid from each of said flash chambers, thereby generating a force for moving said liquid to the next successive cyclonic flash chamber's tangential introducing means in said liquid-vapor phase flow; and
d. means for vertically discharging said vapor from the upper portion of each of said flash chambers to a second fluid flow zone wherein said vapor is condensed.

4,731,165
METHOD OF DECOLORATION OF TRIETHYLENETETRAMINE USING SULFONIC ACID ION EXCHANGE RESINS
Dennis L. Niebruegge, Humble, Tex.; Timothy J. Dempsey, Crossett, Ark., and S. Bennett Willis, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 16, 1985, Ser. No. 808,983
Int. Cl.[4] B01D *3/34;* C07C *85/26*
U.S. Cl. 203—29 14 Claims

1. A method of reducing triethylenetetramine (TETA) coloration comprising the steps of:
(a) heating TETA to selected pressures and temperatures;
(b) conducting the heating step in the presence of an ion exchange resin having a sulfonic acid functional group wherein the resin remains stable at the temperatures of the heating step; and
(c) after a period of heating the TETA in the presence of the resin, then distilling the TETA to recover TETA with reduced coloration.

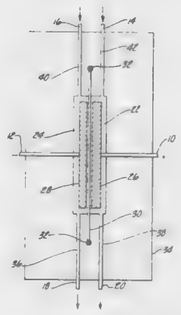
4,731,166
METHOD OF PRODUCING AN ADHERENT, SMOOTH DEPOSIT OF CHROMIUM ON A NODULAR IRON SUBSTRATE
Allen R. Jones, Belford, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.
Filed Jan. 12, 1986, Ser. No. 929,923
Int. Cl.[4] C25D *5/36*
U.S. Cl. 204—34 6 Claims

1. A method of producing an adherent, smooth deposit of chromium on a nodular ferrous substrate which comprises the step of
a. activating said substate with an activation solution to loosen the nodules,
b. then treating said activated substrate in water by applying ultrasonic energy to remove the loosened nodules,
c. then electroplating chromium thereon to produce said desired chromium deposit.

4,731,167
METHOD OF ELECTROPLATING AN ADHERENT CHROMIUM ELECTRODEPOSIT ON A CHROMIUM SUBSTRATE
Hyman Chessin, Brick, and Warren H. McMullen, East Brunswick, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.
Filed Nov. 12, 1986, Ser. No. 928,949
Int. Cl.[4] C25D *5/12*
U.S. Cl. 204—41 11 Claims

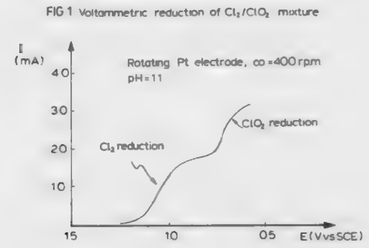
1. A method of electroplating an adherent chromium deposit on a chromium substrate which comprises the step of chemically oxidizing the chromium substrate by hydrogen ion before electrodepositing chromium from a chromium electroplating bath, said hydrogen ion being furnished by an acid which can be oxidized by chromic acid in said bath to form a gaseous product.

4,731,168
ELECTROGENERATIVE CELL FOR THE OXIDATION OR HALOGENATION OF HYDROCARBONS
John M. McIntyre, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 18, 1986, Ser. No. 830,049
Int. Cl.[4] C25B *3/06*
U.S. Cl. 204—80 11 Claims



1. A process for producing electric power by the electrogenerative halogenation or oxidation of at least one unsaturated hydrocarbon in an electrochemical cell having an anode and cathode separated by a permselective membrane or electrolyte permeable diaphragm comprising:
(A) flowing a first liquid electrolyte and said unsaturated hydrocarbon to an anolyte compartment of said cell containing a porous anode;
(B) flowing a second liquid electrolyte and a halogen or oxygen gas to a catholyte compartment of said cell containing a porous cathode;
(C) reacting said unsaturated hydrocarbon with said halogen or said oxygen at ambient or elevated temperatures and pressures;
(D) recovering a halogenated or oxygenated hydrocarbon;
(E) recycling said electrolytes, unsaturated hydrocarbon, and halogen or oxygen gas to said cell.

4,731,169
SELECTIVE REMOVAL OF CHLORINE FROM SOLUTIONS OF CHLORINE DIOXIDE AND CHLORINE
Marek Lipsztajn, Rexdale, Canada, assignor to Tenneco Canada Inc., Islington, Canada
Filed Oct. 29, 1986, Ser. No. 924,570
Int. Cl.[4] C25B *1/26*
U.S. Cl. 204—130 12 Claims



1. A method of treatment of an aqueous solution of chlorine dioxide and chlorine, which comprises selectively cathodically reducing at least a portion of said chlorine at a pH of said aqueous solution of up to about 4, without substantially decreasing the concentration of said chlorine dioxide in the resulting treated solution.

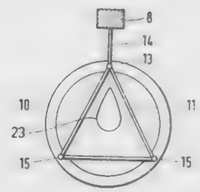
4,731,170
PROCESS FOR PREPARING ALPHA, OMEGA-HALOPERFLUOROALKANES
Gerardo Caporiccio; Gianangelo Bargigia; Claudio Tonelli, and Vito Tortelli, all of Milan, Italy, assignors to Ausimont S.p.A., Milan, Italy
Filed Feb. 24, 1986, Ser. No. 832,391
Claims priority, application Italy, Feb. 26, 1985, 19652 A/85
Int. Cl.[4] C07C *17/20, 19/08;* C07G *13/0*
U.S. Cl. 204—157.95 10 Claims

1. A process for preparing tetrafluoroethylene telomers of the formula $X(C_2F_4)_nY$, wherein n is an integer from 2 to 6, and X and Y, the same or different, are Cl or Br, which comprises:
(a) telomerizing tetrafluoroethylene with a telogen of the formula $Z(C_2F_4)I$, wherein Z is I, Br, or Cl, to form a telomer of the formula $Z(C_2F_4)_nI$, and
(b) reacting $Z(C_2F_4)_nI$ with chlorine or bromine at a temperature between 0° and 180° C. in the absence of solvent or diluent.

8. The process according to claim 1, wherein the reaction of $Z(C_2F_4)_nI$ with chlorine or bromine is effected at a temperature between 0° and 50° in the presence of UV radiation.

4,731,171
PROCESS FOR MAKING A LID HAVING A TEAR-AWAY OPENING
Georg Bolte, Vechelde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany
Filed Apr. 30, 1986, Ser. No. 858,938
Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515672
Int. Cl.[4] C25D *13/00;* B65G *15/58, 17/46;* B21D *51/44*
U.S. Cl. 204—181.6 1 Claim





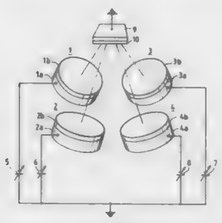
1. A method of coating a container cover of ferromagnetic material having a turned rim with an anticorrosive lacquer, comprising the steps of:
engaging said cover and holding said cover vertically on a holder having three generally horizontal pins extending into said rim and contacting said cover only within said rim;
transporting said holder with said cover engaged thereon along a transport path;
retaining said cover on said pins by maintaining said holder in a predetermined space relationship alongside a magnetic rail extending along the length of said transport path whereby a magnetic field from said rail attracts said cover onto said pins;
providing a bath of said lacquer along said path so that while said cover is maintained vertical, it is displaced through said immersed in said bath; and
electrophoretically depositing said lacquer from said bath on said cover while it is immersed in said bath.

4,731,172
METHOD FOR SPUTTERING MULTI-COMPONENT THIN-FILM
Hideaki Adachi; Hidetaka Higashino; Tsuneo Mitsuyu, and Osamu Yamazaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Apr. 17, 1986, Ser. No. 856,783
Claims priority, application Japan, Apr. 18, 1985, 60-82872; Jul. 9, 1985, 60-150746; Oct. 9, 1985, 60-225110; Jan. 10, 1986, 61-3780
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.26 9 Claims

1. A method for sputtering a multi-component thin film, comprising:
sputtering a first layer of a first multi-component material of a first formula on a substrate;
sputtering a second, transition layer of a second multi-component material of a second, variable formula on said first layer; and

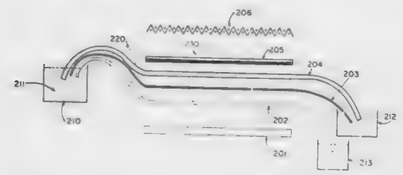
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sputtering a third layer of a third multi-component material of a third formula on said transition layer, said second formula being variable in a range from said first formula at



the boundary between said first and second layers to said third formula at the boundary between said second and third layers, each of said multi-component materials comprising lead, lanthanum, zirconium, titanium and oxygen.

4,731,173
ARTICLE FOR CONSTRUCTING AN ELECTROLYTIC CELL
John S. C. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.
Filed Nov. 20, 1986, Ser. No. 932,832
Int. Cl.[4] C25B *9/00, 13/02, 13/08*
U.S. Cl. 204—265 **8 Claims**



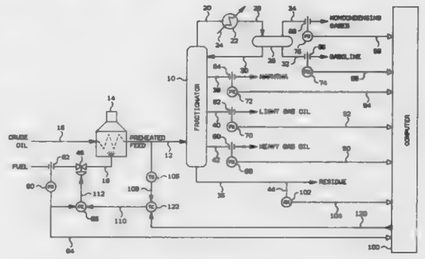
1. An article of manufacture useful to construct an electrolytic cell suitable for the manufacture of hydrogen peroxide by the reduction of oxygen at a cathode, the article of manufacture comprising layers in sequence; a first nonconductive porous means inert to an alkaline liquid, separating means, a second nonconductive porous means inert to an alkaline liquid containing hydrogen peroxide, and a porous cathode, said separating means being substantially permeable both to ions and to bubbles of gases but being substantially impermeable to liquids, said first and second porous means being permeable to fluids, fastening means holding each of said layers in contact with a surface of the adjacent layer.

8. An electrolytic cell employing the article of manufacture of claim **1**, said electrolytic cell suitable for the manufacture of hydrogen peroxide comprising a generally horizontal conductive sheet suitable for use as an anode, said article of manufacture disposed on top of said anode with the first foraminous means in contact with the anode, and a current conducting means in electrical contact with the cathode of the article of manufacture, said electrical conducting means provided with channels to permit a gas to pass therethrough to contact the anode.

4,731,174
PROCESS FOR CRACKING NITROGEN-CONTAINING FEEDSTOCKS
Mario L. Occelli, Yorba Linda, and Edward J. Aitken, Brea, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Continuation of Ser. No. 856,829, Apr. 28, 1986, abandoned. This application Jun. 24, 1987, Ser. No. 65,889
Int. Cl.[4] C10G *11/05, 17/095*
U.S. Cl. 208—120 **20 Claims**

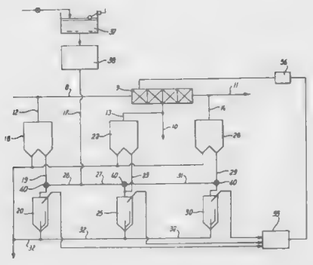
1. A process for the catalytic cracking of a nitrogen-containing hydrocarbon feedstock which comprises:
(a) mixing said feedstock with a solid dicarboxylic acid; and
(b) contacting the mixture formed in step (a) with a cracking catalyst under cracking conditions in the substantial absence of added molecular hydrogen in a cracking zone to convert components of said feedstock into lower molecular weight constituents.

4,731,175
PREHEAT CONTROL FOR A FRACTIONAL DISTILLATION PROCESS
Gary L. Funk; Terrence A. Davis, and Bruce A. Jensen, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jul. 7, 1986, Ser. No. 882,576
Int. Cl.[4] B01D *3/42*
U.S. Cl. 208—347 **12 Claims**



1. Apparatus comprising:
a distillation column;
a furnace for preheating feed to said distillation column;
means for supplying fuel to said furnace wherein the combustion of said fuel supplies heat to said feed;
means for introducing feed heated in said furnace into said distillation column;
means for withdrawing at least one distillate stream from said distillation column, wherein each said distillate stream flows a fraction of said feed;
means for establishing a first signal representative of the total distillate flow rate;
means for establishing a second signal representative of the fuel flow rate to said furnace;
means for establishing a third signal representative of the ratio of said first signal to said second signal;
means for withdrawing a residue stream from the bottom of said distillation column;
means for establishing a fourth signal representative of the viscosity of said residue based on the experimentally determined relationship of said viscosity to said third signal;
means for establishing a fifth signal representative of the actual viscosity of said residue;
means for establishing an initial value of a sixth signal representative of the desired viscosity of said residue, wherein said initial value of said sixth signal is responsive to said fourth signal;
means for updating said sixth signal, wherein said sixth signal is incremented or decremented responsive to changes in said third signal;
means for comparing said fifth signal and said sixth signal and for establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal wherein said seventh signal is scaled so as to be representative of the temperature of said furnace required to maintain said fifth signal substantially equal to said sixth signal; and
means for manipulating the temperature of said furnace in response to said seventh signal.

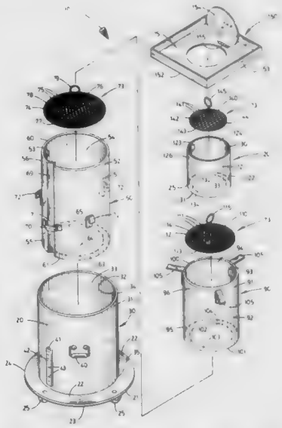
4,731,176
CONTROL SYSTEM FOR FROTH FLOTATION PROCESSES
John R. Macdonald, Sydney, Australia, assignor to Century Autoflote Pty. Ltd., Australia
Filed Mar. 18, 1987, Ser. No. 27,340
Claims priority, application United Kingdom, Mar. 20, 1986, 8606944
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 **24 Claims**



1. A method for monitoring the operation of a froth flotation process having an input stream consisting of raw feed slurry, a first output stream consisting of frothed product to be reclaimed and a second output stream consisting of tailings to be discarded, the method comprising sensing variations in solids content of said input stream, adjusting the dosage of flotation reagent employed in the process in accordance with said input variations, sensing variations in solids content of at least one of said output streams after a predetermined time lapse, comparing said input and output readings with control data relating input and output solids content, and re-adjusting the dosage of flotation reagent dependent on the difference between the actual readings and the control data.

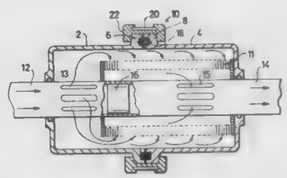
4,731,177
MULTI-STAGE STRAINING APPARATUS
Edward B. Hemman, 2107 9th St., Sanger, Calif. 93657
Filed Dec. 30, 1986, Ser. No. 947,867
Int. Cl.[4] B01D *23/02*
U.S. Cl. 210—86 **5 Claims**

1. A multi-stage straining apparatus for removing debris and foreign matter suspended in a solution of paint and the like comprising:
a vacuous vessel for receiving the paint which has been strained, said vacuous vessel having a top edge which mounts the multi-stage strainer;
a first strainer assembly slidably mounted in internal mating receipt and into fluid-flow communication with the vacuous storage vessel, said first strainer having a substantially cylindrical main body which has a first end which mounts a first removable filter element and a second end, the cylindrical main body further mounting a plurality of mounting assemblies which engage the top edge of the vacuous storage vessel;
a second strainer assembly slidably received in a predetermined telescoping attitude internally of the first strainer, said second strainer having a substantially cylindrical main body which has a first end which mounts a second removable filter element, and a second end which mounts a plurality of stabilizing bars which rest in facing mating engagement with the second end of the first strainer assembly; and
a third strainer assembly slidably mounted in telescoping receipt internally of the second strainer assembly, said third strainer assembly having a substantially cylindrical



main body which has a first end that mounts a third removable filtering element, and a second end which mounts a pivotally mounted closure member, the multi-stage strainer apparatus adapted to receive the solution of paint into the third strainer assembly; the paint thereafter travelling through the first, second and third removable filter elements and into the vacuous storage vessel, the individual filter elements removing the foreign matter and debris suspended in the solution of paint to produce a homogeneous paint solution.

4,731,178
CLAMPING BAND FOR SECURING FLANGED MEMBERS TOGETHER
Peretz Rosenberg, Moshav Beit Shearim, Israel
Filed Dec. 2, 1986, Ser. No. 936,850
Claims priority, application Israel, Dec. 12, 1985, 77317
Int. Cl.[4] B01D *35/30;* **F16L** *23/00*
U.S. Cl. 210—232 **19 Claims**



1. A clamping band for securing together two flanged members formed with annular flanges, comprising:
an elongated flexible member wrappable about the annular flanges of said two flanged members;
means for fixing the ends of said elongated flexible member; and
a plurality of rigid inserts receivable on said elongated flexible member and spaced along the length thereof, each

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of said rigid inserts being formed with a recess on one face, said recess constituting the inner face of the rigid insert, for receiving the flanges of said two flanged members;

each of said rigid inserts being flat and of sufficiently short length relative to the length of the clamping band such that said elongated flexible member of appropriate length, and with an appropriate number of said inserts, can be used with annular flanges of almost any outer diameter.

4,731,179

VESSEL FOR ANAEROBIC FERMENTATION

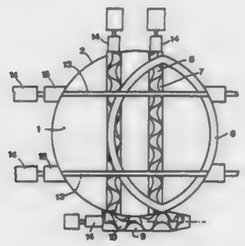
Luc De Baere, Gent, Belgium, assignor to Arbios S.A., Charleroi, Belgium

Filed Mar. 31, 1986, Ser. No. 846,095

Claims priority, application European Pat. Off., Apr. 2, 1985, 85870050

Int. Cl.⁴ C02F *11/04*

U.S. Cl. 210—251 **12 Claims**



1. A flat plate vessel comprising:

an extraction device having a sliding frame on the flat plate, the frame cooperating with at least one upwardly open channel in and substantially parallel to the flat plate, said open channel being provided with a transport screw, a cover for closing the vessel having at least one opening communicting with an inlet duct for material to be subjected to anaerobic fermentation and an opening communicating with a discharge duct for gas produced during fermentation, at least one drive shaft for the sliding frame and a drive shaft for each transport screw, each said drive shaft being surrounded by a sealing gland device, each channel being equipped with a transport screw terminating at at least one discharge channel, the cross-section of which narrows said discharge channel narrowing towards the outlet opening and having a transport screw disposed therein and extending towards the outlet opening, without reaching the opening, whereby the transport screw forms, in the region of the discharge channel of narrow cross-section, a plug of fermented material of a density sufficient to prevent escape of gas produced during anaerobic fermentation through the outlet opening of the discharge channel.

4,731,180

WATER-SOLIDS SEPARATOR AND WIPER BLADE

Karl C. Huff, 1214 W. Glenlake, Chicago, Ill. 60616

Filed Aug. 3, 1983, Ser. No. 520,057

Int. Cl.⁴ B01D *29/38*

U.S. Cl. 210—298 **18 Claims**

1. A water solids separator comprising

a casing having an inlet and an outlet,

a filter screen assembly located in said casing between said inlet and said outlet,

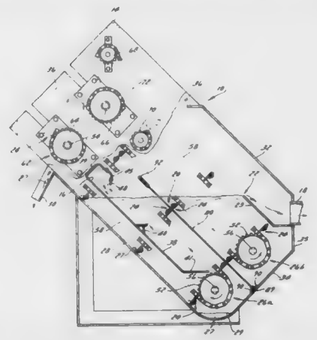
said assembly including a perforated screen member,

means mounted in said casing for simultaneously wiping the surfaces of both sides of said screen member,

said wiping means including at least one wiper blade assembly located on each side of said screen member in opposing relation,

each wiper blade assembly including a resilient wiper blade,

conveyor means for supporting said wiper blade assemblies for movement across the surface of said screen member



with the wiper blades arranged to move into abutting relation in the perforations,

and drive means operatively connected to drive said conveyor means whereby said resilient wiper blades will squeeze any foreign material from the perforations in the screen.

4,731,181

APPARATUS FOR MEMBRANE SEPARATION

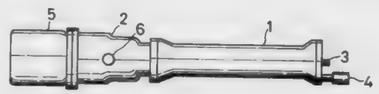
Keiji Uemura, Yokohama, Japan, assignor to Kurita Water Industries Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,497

Claims priority, application Japan, May 30, 1985, 60-81384[U]

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.89 **17 Claims**



1. An apparatus for membrane separation, comprising:

a module of membranes for permeatingly treating fluid to be treated;

a pressure vessel incorporating therein said module;

means for taking out the module-permeated fluid and means for taking out the thickened fluid, which are provided in said pressure vessel;

means for feeding the fluid to be treated under pressure into said pressure vessel, said feeding means being connected to said pressure vessel to form a unitary structure and including a plunger type pump and a motor with a shaft for driving the pump, said pump including a casing, a rotary shaft situated inside the casing and connected to the shaft of the motor, an inclined plate provided on said rotary shaft and inclined to a plane normal to the axis of said rotary shaft, a ring concentrical with said rotary shaft on the side opposite to the motor, a ring shaped groove with a smooth wall formed inside the ring, a plurality of plungers slidably situated in the casing and having spherical forward ends situated in the ring shaped groove, and a plurality of coil springs for pressing said plungers such that the forward ends of the plungers are pushed into the ring shaped groove.

4,731,182

DECANTER CENTRIFUGE

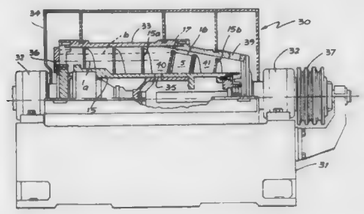
Robert E. High, St. Ives, Australia, assignor to Decanter Pty. Limited, Australia

Filed Nov. 14, 1986, Ser. No. 930,774

Claims priority, application Australia, Nov. 18, 1985, PH3461

Int. Cl.⁴ B04B *3/04*

U.S. Cl. 210—374 **10 Claims**



1. A centrifuge for the separation and recovery from an input sludge of at least a light phase and a heavy phase materials, comprising a rotatable elongated bowl, a rotatable coaxial screw conveyor within the bowl and having a hub supporting a plurality of helical flights defining a helical chamber extending between opposite ends of the bowl; discharging means near opposite ends of the bowl for said light and heavy phase material; and a baffle forming a partition within said bowl, said partition dividing said helical chamber into a separating zone having entry means for said sludge and connecting with said discharging means for the light phase material, and into a discharging zone connecting with said discharging means for the heavy phase material, and having an edge spaced from the bowl inner wall to provide a restricting passageway between said zones; and further comprising means for preventing blockage of said restricted passageway by a cake of heavy phase material including means for providing said baffle as a frame fixed between an adjacent pair of said helical flights, and having a displaceable flap sealably closed against said frame under centrifugal force in operation of the centrifuge and opened under pressure from said cake of heavy phase material to permit passage thereof from the separating zone to the discharging zone.

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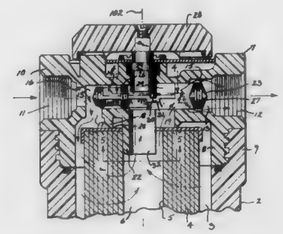
FILTER WITH VALVE-IN-HEAD CONSTRUCTION

Robert G. Schumacher, II, Sheboygan Falls, Wis., assignor to Ametek, Inc., Sheboygan, Wis.

Filed Jan. 27, 1987, Ser. No. 7,324

Int. Cl.⁴ B01D *29/42, 35/30*

U.S. Cl. 210—419 **5 Claims**



5. For use in a device for filtering fluids and wherein the device includes a housing forming a chamber for receiving a filter cartridge, a valve head assembly (7) for attachment to the said housing, said assembly comprising, in combination:

(a) a valve body (10) having an axis (102) and having a fluid inlet (11) and a fluid outlet (12),

(b) a walled passage (13) disposed in said body and extending between said inlet and outlet,

(c) a plunger (23) slideably disposed in said passage,

(d) means (284 31) to position said plunger within said passage at closed and open valve positions,

(e) a locator (22) extending from said valve body (10) and with said locator being adapted to engage a filter cartridge relative to its housing,

(f) the construction being such that fluid flows around said locator when said plunger is in an open valve position,

(g) and means (32) formed by said locator to reduce back pressure of fluid flowing therearound,

(h) locator (22) being generally annular and said back pressure reducing means comprising a cut-back open portion (32) disposed in said locator so that fluid flows freely therethrough.

4,731,184

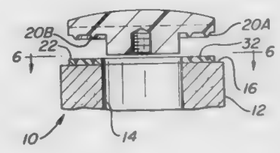
FILTER ELEMENT

Eugene A. Ostreicher, Farmington, Conn., and Joseph R. Infantino, Chappaqua, N.Y., assignors to Cuno Incorporated, Meriden, Conn.

Continuation of Ser. No. 736,873, May 22, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,122

Int. Cl.⁴ B01D *27/08, 35/30*

U.S. Cl. 210—450 **4 Claims**



1. A filter element comprising:

porous a thick-walled cylindrical integral self-supporting fibrous tubular filter structure having at least one end adapted to coact with a housing for the filter;

annular gasket means sealing the end of the filter with a coacting housing for the filter;

said gasket means comprising:

a sheet of resilient thermoplastic closed cell foam;

the surface of the gasket sheet remote from said filtering structure being adapted to resiliently coact with a filter housing;

the surface of the gasket sheet abutting said filtering structure having a surface of melted closed cell material and

adhering means to adhere the said gasket to the end of the filter consisting of said surface of melted closed cell material of the gasket.

4,731,185

BIOLOGICAL WASTEWATER TREATING SYSTEM

Michael S. K. Chen, Zionsville, and Marshall L. Spector, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 282,674, Jul. 13, 1981, abandoned. This application Jul. 12, 1983, Ser. No. 513,194

Int. Cl.⁴ C02F *3/30*

U.S. Cl. 210—605 **9 Claims**

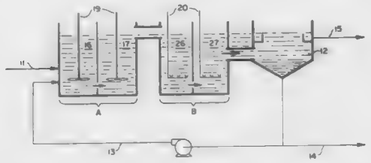
1. In a method for operating an activated sludge system to produce a non-bulking sludge having rapid settling characteristics and containing an activated biomass species capable of removing phosphate values which comprises:

(a) forming a mixed liquor in a BOD sorption zone, said mixed liquor being formed by mixing an activated biomass with a soluble BOD_5 containing wastewater influent

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under conditions such that at least 25% of the soluble BOD_5 is sorbed by said biomass;

(b) oxidizing the BOD_5 in the mixed liquor, including at least part of the BOD_5 sorbed in said biomass, in an oxidation zone by contacting the mixed liquor with an oxidizing agent, said oxidizing being effective for oxidizing at least 30% of the total influent BOD_5 in the mixed liquor;



(c) settling the resulting oxidized mixed liquor in a settling zone thereby forming a supernatent liquor and a dense sludge containing activated biomass; and

(d) recycling at least a portion of the dense sludge to the BOD sorption zone;

the improvement which comprises: incorporating oxidizing agent into said oxidation zone at a rate not substantially exceeding the rate of oxidation.

4,731,186

MAGNETIC FLUID TREATING METHOD AND DEVICE

David Belasco, 10702 Rhonda Ave., Garden Grove, Calif. 92643

Filed Oct. 3, 1985, Ser. No. 783,411

Int. Cl.[4] C02F *1/48*; B01D *35/06*

U.S. Cl. 210—695 **8 Claims**



1. A method of conditioning water and removing magnetic particles therefrom, comprising

providing a magnetic conditioning assembly and directing the water to flow past the assembly in a predetermined manner to condition the water, and

prior to passing the water past the assembly, filtering the water to remove magnetic particles therefrom,

said magnetic conditioning assembly comprising

(a) an elongated housing having an inlet into which the water flows and an outlet from which conditioned water exits,

(b) a plurality of spaced magnets sealed within a non-magnetic tubular member which is disposed along the longitudinal axis of the housing, said magnets being arranged to provide an effective conditioning field,

(c) baffle means within the housing for directing the flow of water past the magnets, said baffle means including a solid wall element which surrounds the row of magnets, is generally parallel to the longitudinal axis of the housing, and has an opening therein upstream of the effective conditioning field so that substantially all the water flows through said opening and past the magnets generally parallel to the longitudinal axis of the assembly between said tubular member and the baffle wall.

4,731,187

REMOVAL OF HEAVY METALS FROM WASTE WATER

Masafumi Moriya, Kasukabe; Kazuo Hosoda, Saitama; Akira Nishimura, Asaka, and Takao Imachi, Chiba, all of Japan, assignors to Miyoshi Yushi Kabushiki Kaisha, Tokyo

Filed Jul. 22, 1986, Ser. No. 887,945

Claims priority, application Japan, Aug. 5, 1985, 60-172128; Sep. 17, 1985, 60-204629

Int. Cl.[4] C02F *1/54*

U.S. Cl. 210—719 **8 Claims**

1. A process for removing heavy metal ions in waste water comprising adding a metal scavenger containing at least one carbodithio group, at least one carbodithioate salt group or at least one carbodithio group and at least one carbodithioate salt group as N-substituents per mole and at least one sodium sulfide selected from the group consisting of sodium monosulfide, sodium polysulfides and sodium hydrogensulfide in a weight ratio of metal scavenger to sodium sulfide of from 20:80 to 98:2 to heavy metal ion containing waste water in an amount of from 0.7 to 4 mole equivalents based on the total amount of heavy metal ions in the waste water, adjusting the pH of the waste water to a pH of 4–9, forming a metal ion containing floc, and removing the floc by filtration.

4,731,188

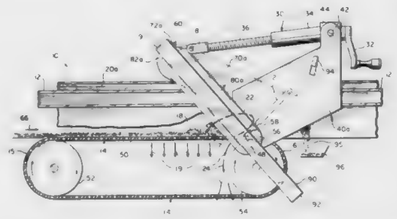
ADJUSTABLE RAMP FOR DEWATERING DEVICE

Harold W. Johnson, Kingwood; Thomas R. McClughan, and Joseph V. Zapata, both of Houston, all of Tex., assignors to Ashbrook-Simon-Hartley, Houston, Tex.

Filed Apr. 3, 1986, Ser. No. 847,774

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—783 **29 Claims**



22. An apparatus for use with a dewatering device of the type having a frame which carries a perforate conveyor with upstream and downstream ends, the conveyor also having an upper surface on which material being dewatered is deposited and through which conveyor water is drained, which apparatus is for enhancing the performance of the dewatering device, the apparatus for use with the dewatering device comprising:

(a) a ramp for disposition adjacent the downstream end of the conveyor and for disposition at an incline with respect to the upper surface of said conveyor, said ramp receiving the material being dewatered and causing the material to roll back upon itself as the moving material tends to move up the ramp but partially falls back as a result of the incline, which rolling back action enhances dewatering; and

(b) means coupled with said ramp for completely lifting said ramp out of the path of the material being dewatered during operation of the dewatering device.

25. A method of dewatering sludge comprising the steps of:

(a) depositing the sludge on a moving perforate conveyor having an upper surface,

(b) advancing the sludge along the conveyor while water drains from the sludge through the perforate conveyor;

(c) interposing adjacent the downstream end of the conveyor a ramp, which is inclined with respect to the upper surface of the conveyor, into the path of the moving sludge so as to cause the sludge to roll back upon itself as the sludge tends to move up the ramp but partially falls back as a result of the incline, which rolling back action enhances dewatering; and

(d) adjusting an actuator coupled with said ramp to, in turn, adjust the incline of the ramp with respect to the upper surface of the conveyor while the sludge is advancing on the conveyor in order to optimize dewatering.

4,731,189

BULLET LUBRICANT AND METHOD OF COMPOUNDING SAID LUBRICANT

George L. Gregg, Jr., 25606—14th Pl. S., Kent, Wash. 98032

Filed Sep. 29, 1986, Ser. No. 912,413

Int. Cl.[4] C10M *125/02, 125/22*

U.S. Cl. 252—23 **8 Claims**

1. A bullet lubricating composition which comprises an admixture of petroleum and silicone oil metallic soap greases and molybdenum disulfide combined with graphite and a wax base consisting essentially of beesax wherein within the admixture molybdenum disulfide is present in an amount of more than about 5 wt. % and less than about 24 wt. %, mineral oil is present in an amount of more than about 10wt. % and less than about 32 wt. %, silicone oil is present in an amount more than about 13 wt. % and less than about 31 wt. %, and metallic soap grease is present in an amount more than about 34 wt. % and less than about 61 wt. %; and wherein on a volumetric basis beewax is present in an amount between about 55% and 89% of the total composition.

4,731,190

ALKOXYLATED GUERBET ALCOHOLS AND ESTERS AS METAL WORKING LUBRICANTS

Anthony J. O'Lenick, Jr., Lilburn, and Raymond E. Bilbo, Snellville, both of Ga., assignors to Alkaril Chemicals Inc., Winder, Ga.

Filed Feb. 6, 1987, Ser. No. 11,771

Int. Cl.[4] C10M *145/38, 173/00, 101/02, 129/66*

U.S. Cl. 252—49.3 **33 Claims**

1. A process for forming a metal container including processing the metal in at least one of the operations including drawing, cupping, forging, ironing, rolling, wrinkling or canning by contacting the metal with a sufficient amount of the guerbet composition of the formula

$$RCH(R')CH_2O(EO)_x(PO)_y(EO)_zR^2$$

wherein R and R′ are the same or different saturated aliphatic groups; EO is ethylene oxide; PO is a propylene oxide group; the sum of x, y and z is a positive integer; and R^2 is hydrogen or an acyl group —COR^3 wherein R^3 is an aliphatic moiety to reduce the friction in the operation.

4,731,191

METHOD FOR PROTECTING CARBONYL IRON POWDER AND COMPOSITIONS THEREFROM

Terence J. Swihart, Essexville, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 31, 1985, Ser. No. 815,417

Int. Cl.[4] H01F *1/26*

U.S. Cl. 252—62.54 **9 Claims**

1. A method for preparing a composition containing carbonyl iron powder and a silicone binder, said method comprising heating and mixing the carbonyl iron powder with an amount of a silicon compound which contains one or more reactive silicon-bonded radicals, said amount being sufficient to reduce the atmospheric oxidation of the carbonyl iron powder, and then mixing the resulting carbonyl iron powder with the binder.

9. The composition produced by the method of claim 1.

4,731,192

CLEANING SYSTEM FOR CONTACT LENSES AND PROCESS FOR CLEANING THE SAME

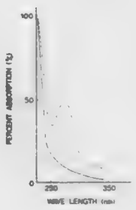
Hideki Kenjo, Otsu, and Teruo Jyono, Shiga, both of Japan, assignors to Toray Industries, Inc., Otsu, Japan

Filed Mar. 20, 1986, Ser. No. 841,828

Claims priority, application Japan, Mar. 26, 1985, 60-61599

Int. Cl.[4] C11D *7/54*

U.S. Cl. 252—95 **22 Claims**



1. A cleaning system for contact lenses, comprising:

(a) a chlorite salt in aqueous solution, capable of decomposition to form free oxygen for removing impurities from a contact lens; and

(b) a solid component, comprising:

an agent for accelerating the decomposition of the chlorite to form free oxygen, comprising at least one member selecting from the group consisting of acids and organic acid salts;

an oxygen-consuming agent for consuming excess free oxygen from the decomposition of the chlorite after impurities have been removed from a contact lens being cleaned; and

polyvinylpyrrolidone as a decomposition inhibitor for said agent for accelerating the decomposition of the chlorite.

4,731,193

AQUEOUS FOAM CONTAINING CHLORINE DIOXIDE COMPOSITION AND PREPARATION THEREOF

John Y. Mason, Plymouth; Bruce W. Hicks, Rio Linda, and Donald C. English, Carmichael, all of Calif., assignors to Rio Linda Chemical Company, Inc., Sacramento, Calif.

Continuation of Ser. No. 636,309, Jul. 31, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 879,907

Int. Cl.[4] C11D *3/48*

U.S. Cl. 252—95 **2 Claims**

1. A foam composition containing chlorine dioxide for cleaning and disinfecting purposes, said composition being comprised of:

five parts of a first aqueous solution containing approximately 14.03% dodecylbenzene sulfonic acid, 7.8% of a phosphate ester, 9.72% of hexamethylene glycol, 2.45% of hydrochloric acid, 3.86% of sodium xylene sulfonate and 62.14% of water;

one part of a second aqueous solution containing approximately 18.5% of technical sodium chlorite, 2.2% of sodium xylene sulfonate and 79.3% water; and

six hundred and twelve parts of water.

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4,731,194

SILICA-CONTAINING ALKALINE DISPERSIONS AND THEIR USE IN CLEANING SOLID SURFACES

Christian Rossmann, Langenfeld, and Horst Flüchter, Kaarst, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 700,079, Feb. 11, 1985, abandoned, which is a continuation of Ser. No. 537,590, Sep. 30, 1983, abandoned. This application Aug. 6, 1986, Ser. No. 894,516
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246080
Int. Cl.⁴ C11D 7/06
U.S. Cl. 252—160 8 Claims

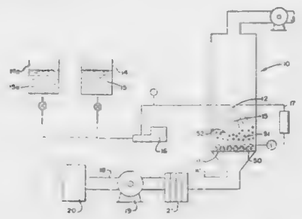
1. An aqueous two-component composition useful for cleaning and degreasing hard surfaces comprising, as one component, (a) a strongly alkaline active-substance concentrate consisting of about 50% by weight of sodium hydroxide or potassium hydroxide and, as the other component, (b) an acidic or neutral active-substance concentrate consisting of a silica dispersion containing from about 5 to 40% by weight, based on the total weight of the active-substance concentrate (b), of silica selected from the group consisting of pyrogenic silica, precipitated silica and mixtures thereof, component (a) being present in an excess sufficient to cause an alkaline medium having a pH above about 11 when components (a) and (b) are combined prior to use.

4,731,195

ENCAPSULATED BLEACH PARTICLES WITH AT LEAST TWO COATING LAYERS HAVING DIFFERENT MELTING POINTS

Keith E. Olson, Apple Valley, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Division of Ser. No. 838,276, Mar. 10, 1986, Pat. No. 4,657,784. This application Oct. 31, 1986, Ser. No. 926,111
Int. Cl.⁴ C11D 17/00; A01N 00/00; B05D 3/02
U.S. Cl. 252—174.13 10 Claims



1. An encapsulated particle comprising a coated particle having (i) a bleach core particle, (ii) an inner, heat-treated coating of a first coating material, and (iii) an outer coating of a second coating material; the first coating material having a melting point lower than the melting point of the second coating material and the inner coating heat-treated by intentionally heating the coated particle to a temperature above the melting point of the first coating material but below the melting point of the second coating material so as to substantially liquefy the inner coat.

4,731,196

PROCESS FOR MAKING BLEACH ACTIVATOR

James S. Staton, Pride, and Patrick C. Hu, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 28, 1986, Ser. No. 923,891
Int. Cl.⁴ C09K 3/00
U.S. Cl. 252—184 14 Claims

1. A process of making a manganese (II) exchanged zeolite for use as an activator for a peroxygen laundry bleach, said process comprising:

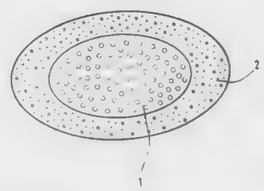
(a) adding about 1000 parts by weight of Zeolite A powder to a mixing vessel;
(b) slowly adding about 100–600 parts by weight of sulfuric acid which contains an amount of H_2SO_4 sufficient to lower the pH of the mixture to about 7.0–10.5 while mixing to obtain a damp Zeolite A powder;
(c) slowly adding an aqueous maganese (II) salt solution in an amount to provide 2–50 parts by weight of manganese per 1000 parts of initial Zeolite A while mixing to form a damp Mn-exchanged Zeolite A;
(d) without separating or drying said solid damp Mn-exchanged Zeolite A, adding and mixing in about 50–1500 parts by weight of a chelating agent;
(e) adding and mixing in a binding agent in an amount sufficient to provide the desired physical properties;
(f) slowly adding water in an amount sufficient to agglomerate the blend into small granules while mixing; and
(g) drying the granules to obtain a peroxygen bleach activator.

4,731,197

POTASSIUM SUPEROXIDE PELLET

Wolfgang Eckstein, Sereetz; Carl-Ernst van der Smissen, Lübeck; Rainer Ernst, Curau, and Bernhard Westrup, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 19, 1987, Ser. No. 27,722
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609378; Nov. 15, 1986, 3639146
Int. Cl.⁴ A62D 9/00; C01B 15/043
U.S. Cl. 252—186.32 6 Claims



1. A pellet comprising:
a body made of potassium superoxide for releasing oxygen and an additive catalyst material for stimulating the release of the oxygen; and,
said body including a pressed core with said catalyst material being a constituent of 0 to 0.05% of said core; and, a pressed jacket surrounding said core with said catalyst material being a constituent of 0.15 to 2.0% of said jacket.

4,731,198

POSITIVELY CHARGED ANTIMONY PENTOXIDE SOL AND PREPARATION THEREOF

Yoshitane Watanabe, Tokyo; Masayuki Teranishi, and Keitaro Suzuki, both of Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,580
Claims priority, application Japan, Apr. 3, 1985, 60-70720
Int. Cl.⁴ B01J 13/00
U.S. Cl. 252—313.1 14 Claims

1. A positively charged antimony pentoxide sol, comprising colloidal particles of antimony pentoxide sol coated on their surfaces with at least one of trivalent and tetravalent metals, the content of said metals being 1 to 50% by weight in terms of the metal oxide based on antimony pentoxide in said antimony pentoxide sol.

4,731,199

ULTRA HIGH MOLECULAR WEIGHT CONCURRENTLY SINTERED AND CROSS-LINKED POLYETHYLENE PRODUCT

Tadao Matsuo, Kakogawa; Fumio Matsuoka, Kobe; Nobuo Yokota, and Masaaki Yamamoto, both of Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Continuation of Ser. No. 707,390, Mar. 1, 1985, abandoned, which is a division of Ser. No. 549,828, Nov. 9, 1983, Pat. No. 4,518,552. This application Jun. 26, 1986, Ser. No. 879,824
Int. Cl.⁴ H01B 1/02, 1/06
U.S. Cl. 252—511 12 Claims



1. A concurrently sintered and cross-linked ram extruded product comprising
a mixture of ultra high molecular weight polyethylene powder, a cross-linking agent, an electrically conductive agent selected from the group consisting of conductive carbon black, metallic oxide, and metallic powder, and a lubricant, said product having a transverse dimensional deviation of less than approximately 2 mm., said electrically conductive agent being present in the amount of 0.5 wt. parts per 100 parts of said polyethylene powder.

2. A concurrently sintered and cross-linked ram extruded product comprising
a mixture of ultra high molecular weight polyethylene powder, a cross-linking agent, an electrically conductive agent, and a lubricant, said electrically conductive agent comprising zinc oxide provided in an amount between 15 to 50 wt. parts per 100 wt. parts polyethylene powder, said product having a transverse dimensional deviation of less than approximately 2 mm.

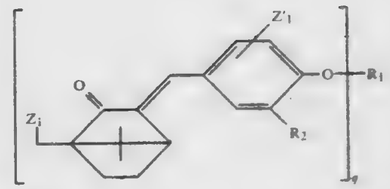
4,731,200

ALCOHOLIC OR AQUEOUS-ALCOHOLIC COMPOSITIONS CONTAINING NATURAL ESSENCES AND BENZYLIDENE-CAMPHOR DERIVATIVES

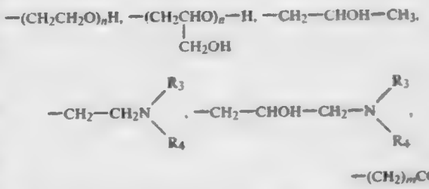
Gerard Lang, Saint Gratien; Andre Deflandre, Orry-la-Ville, and Irena Beck, Villepinte, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 573,145, Jan. 23, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 885,392
Claims priority, application Luxembourg, Jan. 26, 1983, 84607
Int. Cl.⁴ A61K 7/46; C11B 9/00
U.S Cl. 512/5 18 Claims

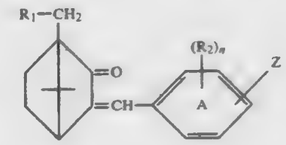
1. Detoxified alcoholic or aqueous-alcoholic composition in a form selected from the group consisting of a perfume, a toilet water, an eau de cologne, a pre-shave gel, a pre-shave lotion, an after-shave gel and an after-shave lotion, said composition comprising a natural essence containing a phototoxic dose of furocoumarin and an amount of about 0.01 to 2% by weight of at least one benzylidenecamphor derivative filtering out UV-A radiation and reducing the phototoxicity of said furocoumarin selected from the group consisting of:
the 3-p-oxybenzylidenebornan-2-ones of the formula:



in which:
Z_1 and Z'_1 respectively denote a hydrogen atom, a radical SO_3H or a salt of this sulphonic acid with an inorganic or organic base, at least one of the two radicals Z_1 or Z'_1 representing a hydrogen atom; R_1 denotes a hydrogen atom, an optionally branched alkyl radical containing 2 to 18 carbon atoms, an alkenyl radical containing 3 to 18 carbon atoms or a radical

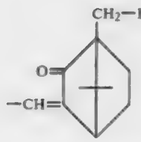


in which R denotes H, an alkyl radical containing 1 to 8 carbon atoms, $-(CH_2)_3-SO_3H$ or a salt of this acid with an organic or inorganic base, or alternatively a divalent radical $-(CH_2)_m$ or $-CH_2-CHOH-CH_2$, m having the values 1 to 10 and n having the values 1 to 6, and R_3 and R_4 each representing a hydrogen atom or an optionally branched or hydroxylated alkyl radical, or together forming an aminoaliphatic heterocycle with the nitrogen atom; R_2 denotes a hydrogen atom, an alkoxy radical containing 1 to 4 carbon atoms or a divalent radical —O— joined to the radical R_1 in the case where the latter is also divalent; and q denotes 1 or 2, it being understood that if q has the value 2, R_1 is a divalent radical, and that if R_1 denotes hydrogen, R_2 also denotes hydrogen; moreover, if R_2 denotes alkoxy, R_1 can also denote methyl;
the benzylidenecamphor derivatives of the formula:

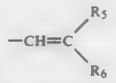


in which:
R_1 denotes a hydrogen atom or a radical $-SO_3\ominus M\oplus$, in which
M denotes a hydrogen atom, an alkali metal or a group $\oplus N(R_3)_4$,
R_3 denoting a hydrogen atom or a C_1 to C_4 alkyl or hydroxyalkyl radical;
n=0, that is to say R_2 denotes a hydrogen atom; and Z represents a group

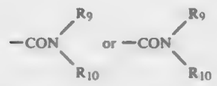
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in which R_4 has the same meanings as R_1 and can be equal to R_1 or different from R_1, or alternatively a group



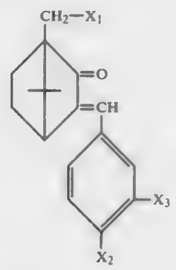
in which R_5 denotes a hydrogen atom, a C_1 to C_4 alkyl radical, an aryl radical optionally substituted by halogen atoms or by C_1 to C_4 alkyl or alkoxy groups, or a group —CN, —$COOR_7$ or



and R_6 denotes a group —$COOR_8$,

R_7 and R_8, which are identical or different, being alkyl, alkenyl, cycloalkyl or aralkyl radicals containing at most 20 carbon atoms, which are optionally substituted by hydroxyl, alkoxy, or amine, and R_9 and R_{10}, which are identical or different, denoting a hydrogen atom or alkyl, alkenyl, cycloalkyl or aralkyl radicals containing at most 20 carbon atoms, which are optionally substituted by hydroxyl, alkoxy, or amine, or alternatively if R_5 denotes a hydrogen atom or an alkyl or optionally substituted aryl radical, R_6 can also represent a radical —COO^-M^+, M being defined as above, the two methylidenecamphor radicals, on the one hand, and Z, on the other hand, being attached to the aromatic nucleus A in the para position relative to one another;

the sulphonamides derived from 3-benzylidenecamphor of the formula:



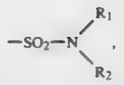
in which:

X_1 denotes the radical Y;

X_2 denotes a radical Z; and

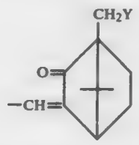
X_3 denotes a hydrogen atom,

Y denoting the group



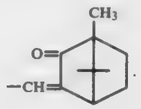
in which R_1 denotes a hydrogen atom or a C_1–C_4 alkyl or hydroxyalkyl radical and R_2 denotes a hydrogen atom, a linear or branched alkyl or alkenyl radical or a cycloalkyl, aryl or aralkyl radical, it being possible for these various C_1–C_{20} radicals t be substituted by one or more hydroxyl, alkoxy or dialkylamino groups, it being impossible for R_1 and R_2 simultaneously to denote a hydrogen atom, and Z denoting one of the following groups:

Z_1=



in which Y has the above-mentioned meaning, or

Z_2=



4,731,201

SHAMPOO METHOD AND COMPOSITION

Clarence Robbins, Piscataway, and Charles Reich, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 12, 1986, Ser. No. 895,764

Int. Cl.[4] C11D *1/29*

U.S. Cl. 252—551 **25 Claims**

19. A hair cleaning composition for removing a mono C_{12}–C_{18} alkyl quaternary ammonium conditioner from hair having said conditioner thereon which consists essentially of 5% to 50% by weight of a water-soluble C_6–C_{10} alketh (1–5) sulfate salt as the principal detergent, said sulfate being prepared by sulfating and neutralizing the base-catalyzed, condensation product of a C_6–C_{10} alkanol with an average of one to five moles of ethylene oxide and containing less than 17% by weight of decyl monoethoxy sulfate salt and being at least 75% by weight of the total weight of anionic detergent present; and 50% to 95% by weight of a compatible, non-toxic cosmetic vehicle.

4,731,202

PROCESS FOR THE HYDROCARBOXYLATION OF ACETYLENICALLY UNSATURATED COMPOUNDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1986, Ser. No. 836,777

Claims priority, application United Kingdom, Mar. 12, 1985, 8506367

Int. Cl.[4] C07C *51/14*

U.S. Cl. 260—544 A **20 Claims**

1. In a process for the hydrocarboxylation of acetylenically unsaturated compounds of the formula RC≡CR, wherein each R is individually selected from the group consisting of hydrogen and alkyl groups having from 1 to about 8 carbon atoms, which comprises reacting the acetylenically unsaturated compounds with carbon monoxide and a carboxylic acid in the liquid phase at a temperature in the range from 50° C. to 200° C. and in the presence of a catalyst system formed by combining a divalent palladium compound with a tri-organic phosphine, the improvement which comprises combining the said divalent palladium compound with the said tri-organic phosphine in a ratio of mols of tri-organic phosphine to gramatoms of divalent palladium which is at least about 25.

4,731,203

PROCESS FOR USING FINELY DIVIDED HIGHLY REACTIVE MAGNESIUM

Borislav Bogdanovic, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim/Ruhr, Fed. Rep. of Germany

Division of Ser. No. 669,209, Nov. 7, 1984, Pat. No. 4,659,373. This application Aug. 12, 1986, Ser. No. 895,658

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340492

Int. Cl.[4] C07F *3/02*

U.S. Cl. 260—665 G **9 Claims**

1. In the formation of a compound including a —C—Mg—X moiety wherein X denotes a heteroatom selected from the group consisting of halogen, oxygen, sulfur, nitrogen, phosphorus, by reacting magnesium with a compound containing a poorly reacting —C—X moiety, the improvement which comprises using magnesium produced by thermally decomposing a magnesium-containing compound selected from the group consisting of

(i) a magnesium anthracene and/or its derivatives prepared from magnesium and anthracene and/or its alkyl or phenyl derivatives,

(ii) a magnesium butadiene and/or its alkyl or phenyl derivatives prepared from magnesium and a conjugated diene having the general formula R^1—CH=CR^2—CH=CH—R^3, wherein R^1, R^2 and R^3 are the same or different and represent H, a linear or branched alkyl group having from 1 to 6 carbon atoms or a phenyl residue, and

(iii) a magnesium hydride-prepared from magnesium and hydrogen either in the presence of homogenous catalysts comprising a halide of a metal of the Subgroups IV to VII of the Periodic System and an organomagnesium compound or a magnesium hydride and in the presence of a polycyclic aromatic or a tertiary amine, after hydrogenating magnesium with magnesium anthracene or magnesium diene, said thermal decomposition taking place at a pressure from 10^{-6} to 1 bar and in the absence or presence of an organic aprotic solvent, either the decomposition being carried out in the presence of a co-reactant being added only after completion of the precipitation of the highly reactive magnesium, or in the absence of such co-reactant, the magnesium obtained by said decomposition being isolated as a highly reactive powder.

4,731,204

HUMIDIFIER UNIT FOR REFRIGERATED DISPLAY CABINETS

Kouichi Noma, Ota; Kazuto Matsuda, Gunma, and Toshio Sakurai, Ashikaga, both of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Division of Ser. No. 634,801, Jul. 26, 1984, Pat. No. 4,612,777. This application Jul. 30, 1986, Ser. No. 891,909

Claims priority, application Japan, Jul. 27, 1983, 58-138141; Aug. 10, 1983, 58-124568; Aug. 18, 1983, 58-150585; Oct. 11, 1983, 58-157599

Int. Cl.[4] B05B *3/05*

U.S. Cl. 261—30 **4 Claims**

1. A humidifier unit comprising:

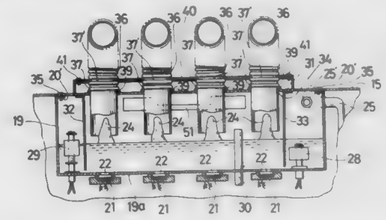
a hollow casing body,

a horizontally elongate atomizing water tank disposed in one side of said body and having a plurality of ultrasonic vibrators mounted on a bottom thereof and arrayed in a transverse direction thereof,

an air blower disposed in an opposite side of said body for supplying air drawn from a suction port of said body into said atomizing water tank,

a plurality of outlet pipes having lower ends located above said atomizing water tank and mounted in coaction with said ultrasonic vibrators, respectively, for transferring a mist generated by said ultrasonic vibrators in said atomizing water tank and air from said air blower out of said body, and

a member closing an upper opening of said atomizing water



tank and having a plurality of holes in which said outlet pipe lower ends may be fitted,

said outlet pipes comprising hollow cylindrical bent pipes having connector mouths opening laterally and independently rotatably extending through said member,

wherein said member has circular holes in which lower ends of said outlet pipes are fitted, said outlet pipes having annular ridges around outer peripheral surfaces thereof, further including seal gaskets fitted around said outlet pipes respectively and sandwiched between said annular ridges and upper surfaces of said member around said circular holes, and a retaining plate fixed to said member for preventing said outlet pipes from being removed.

4,731,205

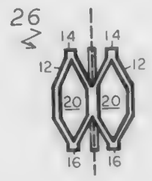
RANDOM PACKING FOR FLUID CONTACT DEVICES AND METHOD OF PREPARING SAID PACKING

Kenneth J. McNulty, Salem, N.H., assignor to Koch Engineering Company, Inc., Wichita, Kans.

Filed Sep. 8, 1986, Ser. No. 904,986

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—94 **31 Claims**



1. A random packing for gas-liquid or liquid-liquid contact, which packing consists essentially of:

(a) a longitudinal strip of expanded sheet material having a one end and another end and having at least three generally uniform linearly disposed spaces in said strip, in the form of only one to about two full rows, wherein there is at least one full row of enclosed spaces, said strip having struts defining said spaces, and said struts having a one and an other end; and

(b) the ends of said longitudinal strip disposed about a vertical axis generally perpendicular to the longitudinal axis of

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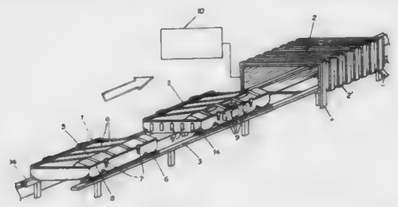
said strip to form a partially or fully enclosed packing body.

4,731,206

PROCESS AND DEVICE FOR THE PRODUCTION OF SHAPED BODIES IN MOLDS

Arnulf Schubert, Radstadt, Austria, assignor to Naue & Naue Gesellschaft m.b.H. & Co., Mandling, Austria

Filed Jan. 6, 1986, Ser. No. 816,492
Claims priority, application Austria, Jan. 17, 1985, 104/85
Int. Cl.⁴ H05B *1/00*
U.S. Cl. 264—25 **14 Claims**



13. A process for producing a molded body having a selected shape from a material to be molded, said process comprising the steps of:

introducing the material into an electrically conductive mold for imparting the selected shape to the material, said mold including a lid member and a bottom container member with said members being adapted to inductively heat under the influence of a magnetic field, means on said mold members for distributing eddy current flow to obtain a uniform temperature distribution in said members, and electrical insulation means disposed between said members for limiting current flow in said mold to a flow of eddy currents in said members;

introducing said mold into an electrical induction heating means including means for providing an alternating magnetic field having a frequency of from 1 to 30 KH about said mold to produce eddy currents in said members to inductively heat said members, said electrical insulation means limiting current flow in said mold to eddy currents;

permitting the material to react within said mold;

heating a portion of the material in contact with said inductively heated mold members.

4,731,207

METHOD FOR MANUFACTURE OF HIGH-FREQUENCY DIELECTRIC CERAMICS

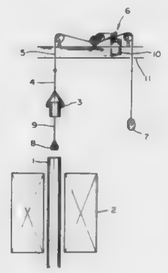
Kazutoshi Matsumoto, Matsudo; Koh Takada, and Takehiro Hyuga, both of Ichikawa, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 793,108
Claims priority, application Japan, Oct. 30, 1984, 59-228557
Int. Cl.⁴ C04B *35/00*
U.S. Cl. 264—25 **12 Claims**

1. A method for the production of $BaO\text{-}MgO\text{-}Ta_2O_5$ type dielectric ceramic which contains no Mn, said method comprising the steps of

(a) providing a green compact composed of a material consisting essentially of $xBa_o.yMgO.zTa_2O_5$, wherein x, y and z satisfy the following relationships: $0.56 \leqq x \leqq 0.64$, $0.18 \leqq y \leqq 0.22$, $0.18 \leqq z \leqq 0.22$, and $x+y+z=1$, said material containing no Mn, by combining suitable amounts of $BaCO_3$, MgO and Ta_2O_5 to form a mixture, calcinating the mixture and subsequently compression molding the calcined mixture,

(b) heating said green compact at a rate of 100° C. to 1,600° C. per minute to a temperature of 1,500° C. to 1,700° C., and



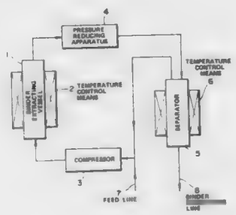
(c) maintaining said heated green compact at between 1,500° C. and 1,700° C. for at least 30 minutes.

4,731,208

METHOD OF REMOVING BINDER MATERIAL FROM A SHAPED CERAMIC PREFORM BY EXTRACTING WITH SUPERCRITICAL FLUID

Nobuaki Nakajima; Seiji Yasuhara, and Mamoru Ishihara, all of Hiratsuka, Japan, assignors to Sumitomo Heavy Industries, Ltd., Kanagawa, Japan

Filed Dec. 24, 1985, Ser. No. 812,986
Claims priority, application Japan, Dec. 26, 1984, 59-273488
Int. Cl.⁴ C04B *35/64*
U.S. Cl. 264—37 **16 Claims**



13. A method of producing an article from a fired particulate configuration whereby binder material is removed from the particulate configuration prior to firing without deformation of the configuration prior to the firing thereof, comprising the steps of:

(a) mixing together predetermined amounts of sinterable particulate material and binder whereby said binder covers substantially all of the surface of the particles of said particulate material;

(b) forming said mixture into a desired configuration;

(c) exposing said configuration to a supercritical fluid, the substance of which is gaseous under the ambient pressure and the ambient temperature whereby to dissolve and binder materials into the fluid;

(d) isolating the binder materials from the fluid by controlling the pressure or the temperature of the fluid thereby to recover the binder materials and fluid for further use thereof, and then,

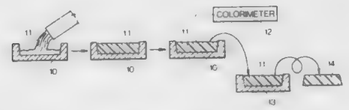
(e) sintering said formed configuration.

4,731,209

METHOD OF MAKING STANDARD COLOR MODELS USED FOR JUDGING BEEF

Hiroyasu Nakai, Matsudo; Toshio Ikeda, Ibaragi; Shiro Ando, Ibaragi, and Kyohei Ozutsumi, Ibaragi, all of Japan, assignors to National Institute of Animal Industry, Ibaragi, Japan

Filed Mar. 24, 1986, Ser. No. 843,311
Claims priority, application Japan, Apr. 30, 1985, 60-93298
Int. Cl.⁴ B29C *39/44;* **G01J** *3/46*
U.S. Cl. 264—40.1 **6 Claims**



1. A method of making several standard color models graded in tone for judging beef, which comprises the steps of:

measuring colors of sections of a plurality of beef carcasses by a colorimeter;

classifying the colors into a predetermined number of grades of tone;

pouring a colored plastic sol in a glass cell for each grade;

measuring each colored plastic sol with a colorimeter and performing color matching with each colored plastic sol to reach the classifiifed grades of tone;

pouring each color matched colored plastic sol into a female mold having an irregular surface resembling a surface of a section of beef; and

taking out each colored matched colored plastic sol from the female mold when it becomes gel.

4,731,210

PROCESS FOR THE PREPARATION OF LIPOSOMAL MEDICAMENTS

Hans G. Weder, Langnau; Otmar N. Zumbühl, Wolfenschiessen; Reto A. Schwendener, Arosa, and Maximilian Asanger, Zurich, all of Switzerland, assignors to Hans Georg Weder, Zurich, Switzerland

Filed Jan. 7, 1982, Ser. No. 337,806
Claims priority, application Switzerland, Jan. 7, 1981, 53/81
Int. Cl.⁴ A61K *9/52;* **B01J** *13/02*
U.S. Cl. 264—4.3 **4 Claims**

1. A process for preparing liposomal medicaments from non-liposomal associates of at least one amphiphilic bilayer-forming substance and a solubilizing agent therefor in an aqueous phase, comprising, increasing the molar ratio of the bilayer-forming substance to the solubilizing agent in such associates, at a rate which is essentially constant in time and location and which is sufficiently high for the associates to combine to form liposomes essentially all of which have a predetermined number of double layers, and which have a predetermined essentially homogeneous size,

wherein the increase in molar ratio is effected by lowering the concentration of free dissolved solubilizing agent in the aqueous phase by diluting the aqueous phase.

4,731,211

CELLULAR THERMOSETTING FLUOROPOLYMERS AND PROCESS FOR MAKING THEM

Sheng Y. Lee, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 29, 1986, Ser. No. 867,987
Int. Cl.⁴ C08J *9/04*
U.S. Cl. 264—50 **9 Claims**

1. A process for making thermosetting fluorodiepoxide polymer foam products including the steps of:

mixing, in fluid form, thermosetting fluorodiepoxide polymer components, said components having a fluorine content, by weight, of 30% or higher, including a thermosetting fluorodiepoxide polymer resin and a curing agent or a catalyst, or both, which is, or are, effective for curing said resin;

placing said fluid mixture into a substantially pressure tight chamber;

filling said chamber with a substantially unreactive gas;

allowing sufficient time for said mixture to gel, to trap said gas in the resulting fluorodiepoxide polymer; relieving the pressure on said gelled polymer;

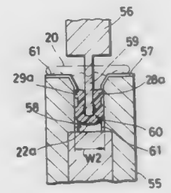
heating said fluorodiepoxide polymer; to simultaneously cure and foam said fluorodiepoxide polymer.

4,731,212

METHOD FOR CONTINUOUSLY MANUFACTURING SLIDE FASTENER COUPLING ELEMENTS

Akira Hasegawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 687,288, Dec. 28, 1984, abandoned. This application Dec. 15, 1986, Ser. No. 941,830
Claims priority, application Japan, Dec. 29, 1983, 58-245937
Int. Cl.⁴ B29D *5/00*
U.S. Cl. 264—167 **3 Claims**



1. A method of continuously manufacturing molded slide fastener coupling elements, comprising the steps of:

(a) introducing thermoplastic synthetic resin successively into cavities around a circumferential surface of a die wheel while the latter is rotating, to mold strip of coupling element blanks:

(b) removing said strip of coupling element blanks continuously out of said cavities;

(c) continuously folding the strip of coupling element blanks about its longitudinal axis while still hot into a U-shaped cross-section by forcing the strip of coupling element blanks into a first groove having a width larger than the desired width of the slide fastener coupling elements to be ultimately shaped, while holding the coupling element blanks in a uniformly-spaced relation to one another by retaining and guiding said coupling element blanks during said folding in said first groove by a pair of spaced guide ridges respectively disposed on opposite sides of said first grooves above said coupling element blanks in said first groove;

(d) thereafter heating the folded strip of coupling element blanks while being fed along a path;

(e) shaping the folded coupling element blanks into slide fastener coupling elements of a final shape and dimensions, while still hot and being continuously fed along, by forcing, in a number of discrete steps, the folded coupling element blanks into a second groove having a width equal to the desired width of the ultimately-shaped slide-fastener coupling elements, while holding the folded coupling element blanks in a uniformly-spaced relation to one another by retaining and guiding said coupling element blanks during said shaping in said second groove by a pair of space guide ridges respectively disposed on opposite sides of said second groove above said coupling element blanks in said second groove;

(f) cooling said slide fastener coupling elements while being

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continuously fed along, to set in their final shape and dimensions; and

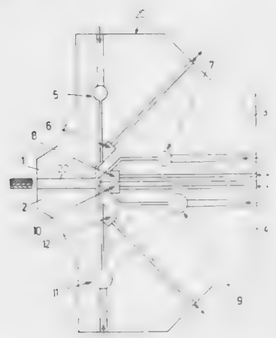
(g) discharging said slide fastener coupling elements continuously at a speed which is substantially the same as the speed at which the strip of coupling element blanks is molded continuously on said die wheel.

4,731,213

METHOD OF PRODUCING COMPOSITE BOARDS OR LAMINATES

Wilhelm Klepsch, Kaprun, Austria, assignor to Senoplast Klepsch & Co., Austria

Filed Feb. 26, 1986, Ser. No. 833,891
Claims priority, application Austria, Nov. 14, 1985, A3315/85
Int. Cl.[4] B29C *49/22*
U.S. Cl. 264—512 2 Claims



1. A method for the production of bath tub inserts for a deep-drawing process comprising coextruding a support of acrylic nitrile-butadiene-styrene and a coating of polymethyl methacrylate which is on the support, through a sheet die, while forming a coating of acrylic glass over the support which has a melt flow index of at most 2.0 (MFI 230° C./318) according to DIN 53735 by conducting the coating and the support directly to the die through different channels so as to form panels, producing bathtub inserts by a deep-drawing.

4,731,214

PROCESS FOR PREPARING A THERMALLY SHRINKABLE MULTILAYER FILM

Kazuo Kondo, and Nobuya Ishiguro, both of Marugame, Japan, assignors to Okura Industrial Co., Ltd., Kagawa, Japan

Filed Oct. 21, 1986, Ser. No. 921,161
Claims priority, application Japan, May 16, 1986, 61-113260
Int. Cl.[4] B29C *55/10*
U.S. Cl. 264—514 10 Claims

1. A process for preparing a thermally shrinkable multilayer film comprising the steps of:

(a) biaxially orienting an unoriented laminate film coextruded so as to be composed of a polyamide resin layer as one surface layer and a sealant material layer as the other surface layer;

(b) then contacting the polyamide resin layer with water to allow the polyamide resin layer to absorb water in the amount of 7.0% by weight or more while maintaining the temperature of the oriented laminate film at 90° C. or lower;

(c) heating the oriented laminate film to temperatures ranging from 50° C. to 90° C. after or during step (b); and

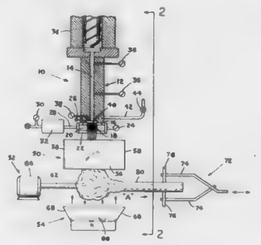
(d) drying the oriented laminate film so as to cause the water content of the polyamide resin layer to be in the range from 2.5% by weight to 6.5% by weight while maintaining the oriented laminate film at temperatures of 90° C. or lower after or during step (c), step (d) being conducted after step (c) when step (c) is conducted during step (b).

4,731,215

PROCESS FOR FORMING NON-WOVEN WEBS FROM HIGHLY ORIENTED MELT BLOWN FIBERS

Eckhard C. A. Schwarz, Neehah, Wis., assignor to Biax Fiberfilm Corporation, Neenah, Wis.

Continuation of Ser. No. 385,903, Jun. 7, 1982, abandoned. This application Oct. 9, 1986, Ser. No. 917,186
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—517 6 Claims



1. A process for producing a tubular sleeve of non-woven fibers, which comprises:

(a) heating a thermoplastic condensation polymer selected from the group consisting of polyethylene terephthalate and nylon 6,6 to a molten state to a temperature sufficient to attain an apparent melt viscosity of less than 50 poise;

(b) spinning by melt blowing said molten thermoplastic condensation polymer in the presence of a first gaseous medium heated to melt blowing conditions to form oriented, heat shrinkable, melt blown fibers, said melt blown fibers exhibiting a shrinkage of at least about 19%;

(c) collecting said melt blown fibers on a rotating mandrel to form a loose tubular sleeve of said oriented melt blown fibers;

(d) contacting said tubular sleeve with a second gaseous medium heated to a temperature of from 70° to 265° C. to thereby shrink and entangle said melt blown fibers and form a rigid cartridge having a density of at least 0.1 gram/cc; and

(e) removing said cartridge from said rotating mandrel.

4,731,216

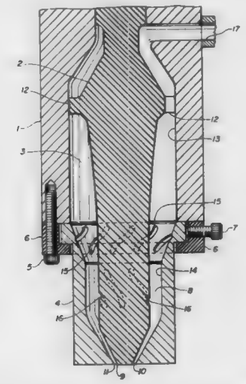
PROCESS FOR MANUFACTURING A SEAMLESS LAMINAR ARTICLE

Alvin S. Topolski, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 739,034, May 29, 1985. This application Mar. 28, 1986, Ser. No. 845,736
Int. Cl.[4] B29C *49/04*
U.S. Cl. 264—503 9 Claims

1. A process for manufacturing a laminar, molded, hollow, article of polymeric material comprising the steps of: (i) establishing a molten, heterogeneous, blend of a first polymer component and a second polymer component imcompatible with the first by heating the blend above the melting point of the highest melting polymer component; and (ii) molding the melted blend to have a knit line curved through the thickness of the article resulting from such molding by (a) extruding the body of the melted blend through a die wherein internal surfaces of the die have streamlined irregularities positioned to

displace surface material of the melted blend relative to core material of the melted blend and (b) cooling the extruded body



to below the melting point of the lowest melting polymer component.

4,731,217

METHOD FOR MELT SPINNING THERMOPLASTIC FILAMENT YARN

Siegmar Gerhartz, Remscheid; Rolf Kalthoff, Wermelskirchen, and Siegfried Putsch, Wuppertal, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 764,840
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1984, 3429308; Aug. 18, 1984, 3430481; Oct. 27, 1984, 3439447
Int. Cl.[4] D01D *5/08;* B65H *54/38*
U.S. Cl. 264—555 8 Claims



8. A method of winding an advancing thermoplastic textile yarn into a bobbin supported package to produce a stepped precision wind, and including the steps of

winding the advancing yarn about a rotating bobbin to form a wound package, and including traversing the yarn laterally back and forth across the face of the package, while maintaining the rotational surface speeed of the package substantially constant and such that the rotational speed of the bobbin gradually decreases during the build of the package, and while varying the traversing speed of the yarn during each of a series of sequential steps of the winding operation by decreasing in each of the steps of the traversing speed of the yarn from an initial value and proportionally to the decreasing rotational speed of the package for a substantially uniform winding ratio and then rapidly increasing the traversing speed to about the initial value, and

heating the advancing yarn so as to lower its modulus of elasticity and so that the yarn tension and the yarn denier remain within predetermined ranges of variation during each of the winding steps, and such that the yarn tension does not vary by more than about + or −0.04 CN/dtex froma mean value, thereby avoiding undesirable tension fluctuations during the rapid increases of the traversing speed.

4,731,218

METHOD FOR PRODUCING FLAT POLYMERIC YARN

Hubert Damhorst, Neumünster; Karl-Heinz Erren, Aukrug-Homfeld, and Hans-Joachim Petersen, Neumünster, all of Fed. Rep. of Germany, assignors to Norddeutsch Faserwerke GmbH, Neumunster, Fed. Rep. of Germany

Filed Sep. 26, 1985, Ser. No. 780,194
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435474
Int. Cl.[4] D01D *5/092*
U.S. Cl. 264—555 23 Claims



1. A method of producing a flat polymeric yarn of uniform quality comprising the continuous steps of

melt spinning a polymer to form a plurality of running filaments,

combining the filaments so as to form a running bundle of filaments,

supplying a metered quantity of fluid onto a surface so as to form a relatively narrow ribbon of fluid,

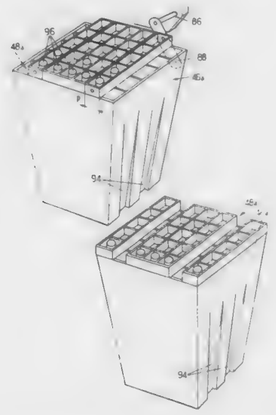
guiding the running bundle of filaments into contact with said ribbon of fluid and in alignment therewith, and so as to apply a controlled quantity of the fluid to the bundle which is at least about 20 percent of the weight of the bundle, and so that the ability of the bundle to internally absorb the applied fluid is exceeded and the bundle is soaked with the fluid and the external surface of the bundle is surrounded by a fluid coating,

guiding the fluid coated bundle in a vertical downward direction over a plurality of serially arranged curved braking surfaces, with the direction of curvature alternating between adjacent braking surfaces, and such that the bundle is deflected at an angle of less than 70° from the vertical as it moves between the braking surfaces, and the frictional forces between the bundle and braking surfaces are essentially hydrodynamic, and

withdrawing the running bundle from the braking surfaces by contacting the bundle with draw roll means and so as to draw the bundle.

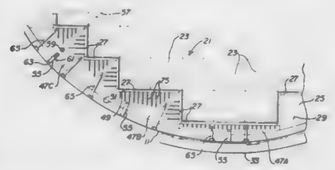
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4,731,219
METHOD AND APPARATUS FOR COMPACTING A BUNDLE OF FUEL ELEMENTS
Jean Beneck, Ormesson; Jean P. Louvat, Velizy Villacoublay, and Claude Quayre, Neuilly Plaisance, all of France, assignors to Framatome, Courbevoie, France
Filed Aug. 29, 1986, Ser. No. 901,903
Claims priority, application France, Aug. 29, 1985, 85 12898
Int. Cl.[4] G21C *19/32*
U.S. Cl. 376—261 **10 Claims**



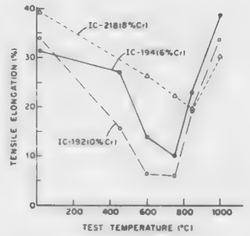
2. A nuclear fuel element compacting apparatus for consolidating a bundle of fuel elements originally disposed in a square lattice arrangement as a packed array of elements in a triangular lattice, comprising: a compacting chamber of pyramidal shape having faces converging downwardly and of rectangular cross-section, two opposite of said faces of the compacting chamber being formed with projections whose depth is greater near the bottom so as to change the configuration of fuel elements from a square to a triangular pattern; dividing walls situated within said compacting chamber, perpendicular to said faces provided with projections, for separating and guiding lines of elements in an upper part of the compacting chamber, and grid means situated at the top part of the compacting chamber defining compartments for introducing elements into said compacting chamber and formed in several movable fractions which may be moved apart and toward each other in a direction parallel to the dividing walls.

4,731,220
NEUTRON REFLECTOR
Roy F. Kim, Jr., Ross Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 14, 1985, Ser. No. 765,466
Int. Cl.[4] G21C *11/06*
U.S. Cl. 376—458 **9 Claims**



1. Neutron reflector apparatus for the generally annular spaces formed between vertically spaced former plates traversing the irregular space between a generally cylindrical array of elongated rectilinear fuel assemblies in a nuclear reactor and a cylindrical core barrel surrounding the array, said apparatus comprising:
- a plurality of reflector units which together substantially fill said generally annular spaces, each unit extending angularly through a sector of an annular space and comprising a metallic mass; and
- mounting means for each reflector unit comprising a pin extending substantially radially outward from each reflector unit substantially along an extended radial line passing through the center of mass of the unit and secured to the core barrel to support the weight of said reflector unit, said reflector units being sized and spaced such that they are free to expand in all directions from said pin, said mounting means further including fastener means for connecting the reflector unit to the core barrel at at least one point spaced from said pin to resist overturning moments about said pin while allowing said free thermal expansion of the reflector unit relative to the core barrel between said pin and said fastener means.

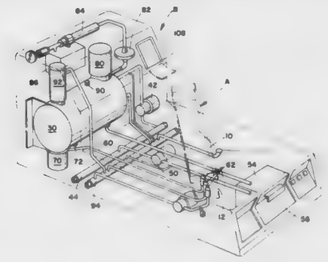
4,731,221
NICKEL ALUMINIDES AND NICKEL-IRON ALUMINIDES FOR USE IN OXIDIZING ENVIRONMENTS
Chain T. Liu, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Continuation-in-part of Ser. No. 730,602, May 6, 1985. This application Oct. 11, 1985, Ser. No. 786,562
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—445 **4 Claims**



1. A nickel aluminide consisting essentially of:
- a Ni_3Al base;
- a sufficient concentration of a Group IVB element or mixtures thereof to increase high temperature strength;
- a sufficient concentration of boron to increase ductility; and
- a sufficient concentration of chromium to increase ductility at elevated temperatures in oxidizing environments.

4,731,222
AUTOMATED LIQUID STERILIZATION SYSTEM
Raymond C. Kralovic, Springfield, Pa., and Edward T. Schneider, Mentor, Ohio, assignors to Innovative Medical Technologies
Filed Feb. 6, 1986, Ser. No. 826,730
Int. Cl.[4] A61L *2/18, 2/24;* **C23F** *13/00*
U.S. Cl. 422—37 **12 Claims**

11. A sterilization apparatus comprising:
- a source of liquid rinse fluid;
- a sterilizing means operatively connected with the source for sterilizing the liquid rinse fluid;
- a module including a closure means which has opened and closed configurations therefore, where in the opened configuration, said module is opened to receive an item to be sterilized, and in the closed configuration, said module isolates the received item from the ambient atmosphere and other sources of microbial contamination;
- a detachable module interconnecting means;
- interconnecting tubing detachably connecting the source and said module with the detachable module interconnecting means; means for selectively filling both the interconnecting tubing and the connected module with a liquid sterilant; and means for selectively keeping the interconnecting tubing and the module filled with the liquid sterilant for a sufficient duration to sterilize the module, the item, the module interconnecting means and the interconnecting tubing from the source to the module.

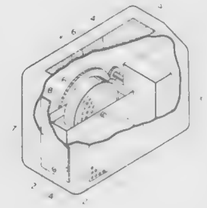


4,731,223
COMPOSITION FOR AUTOMATIC CLEANING OF TOILET BOWLS
Lucienne Forestier, Paris; Francois-Xavier Bonnet, Velizy, and Alain Lacroix, Jouy en Jucas, all of France, assignors to Cotelle S.A., Boulogne-Billancourt, France
Continuation of Ser. No. 627,865, Jul. 5, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 797,182
Claims priority, application France, Jul. 8, 1983, 83 11845
Int. Cl.[4] E03D *9/02*
U.S. Cl. 422—37 **2 Claims**

1. A method of automatically cleaning a toilet bowl which comprises the steps of:
- (a) applying to the toilet tank or to the toilet bowl an effective amount for cleaning of a composition which comprises at least one coloring agent which remains stable even in the presence of a chlorine-containing disinfectant, and which further comprises a combination of at least one amine oxide with a pH regulating agent in order to maintain the pH of the resulting aqueous mixture in the toilet bowl at about 6.3±0.5; and
- (b) forming a protective coating of the amine oxide on the inner walls of the toilet bowl to prevent fecal material as well as the coloring agent from adhering thereto.

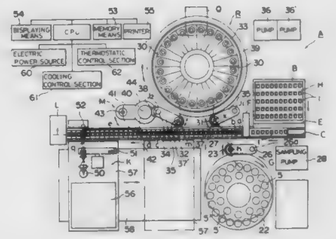
4,731,224
DEODORIZER
Mikio Kawashima, Kashiwa, Japan, assignor to Hitachi Elevator Engineering and Service Co., Ltd., Tokyo, Japan
Filed Sep. 23, 1985, Ser. No. 778,964
Claims priority, application Japan, Dec. 14, 1984, 59-262903
Int. Cl.[4] B01D *47/00;* **D01D** *47/02*
U.S. Cl. 422—49 **3 Claims**

1. A deodorizer comprising:
- (a) a casing containing an air intake opening, an air discharge opening, and a reservoir inserting opening;
- (b) a blower disposed in said casing in opposition to said air intake opening so as to create an air stream from said air intake opening to said air discharge opening;
- (c) a reservoir which, in use, contains an aqueous odor-absorbing liquid;
- (d) a filter composed of a flattened drum-like container having through-holes therethrough and containing non-hygroscopic fibers, said filter being rotatably mounted in said reservoir such that, in use, an upper portion of said filter is in the air stream produced by said blower and a lower portion of said filter extends into said reservoir, said reservoir and said filter comprising an assembly detachably operatively mounted in said casing;



- (e) a motor disposed in said casing and detachably operatively connected to said filter, said motor serving, when operatively connected to said filter, to rotate said filter about an at least substantially horizontal axis automatically and continuously; and
- (f) a plate integral with said reservoir and positioned so as to close said reservoir inserting opening when said assembly is detachably operatively mounted in said casing.

4,731,225
AUTOMATIC ANALYSIS APPARATUS
Koichi Wakatake, Koganei, Japan, assignor to Kabushiki Kaisha Nittec, Koganei, Japan
Filed Aug. 28, 1986, Ser. No. 901,383
Claims priority, application Japan, Jan. 31, 1986, 61-18011; Apr. 19, 1986, 61-59443[U]; Apr. 28, 1986, 61-96951
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **7 Claims**



1. An apparatus for carrying out automatic analysis of a specimen carried in a transparent reaction vessel, said apparatus comprising:
- a transfer path along which reaction vessels are transferred one by one in a linear manner, said path having therealong and in the recited order a specimen discharging position, at least one reagent discharging position, a series of successive optical measuring positions, and a reaction vessel disposal position;
- a reaction vessel transfer device for successively transferring reaction vessels along said transfer path for bringing successive reaction vessels to each position one at a time;
- a specimen discharging device at said specimen discharging position for discharging a predetermined amount of a specimen to be analyzed into a reaction vessel at said specimen discharging position;
- at least one reagent discharging device at said at least one

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reagent discharge position for discharging a predetermined amount of a reagent at said reagent discharging position;

a stirring device along said transfer path between said at least one reagent discharge position and the first of said series of optical measuring positions for supplying gas for stirring the liquid in each reaction vessel;

an optical measuring device for passing a beam of light through the liquid in each rotation vessel, said optical measuring device including a light source and a photoelectric element disposed on opposite sides of said transfer path in face-to-face opposed relation to each other, and a filtering device in the path of the light beam from said light source for permitting the passage of light having a specific wavelength corresponding to the specimen being analyzed, said optical measuring device being movable along said transfer path past said succession of optical measuring positions in the direction of movement of reaction vessels along said transfer path for directing the beam of light through each reaction vessel at said optical measuring positions;

an optical measuring device transfer means connected to said optical measuring device for moving said optical measuring device along said transfer path;

a control device connected to said optical measuring device and comprising means for analyzing the data obtained by said optical measuring device; and

a disposal device at said reaction vessel disposal position for discarding, without cleaning, each reaction vessel for which the optical measurements are finished.

4,731,226

GAS SENSOR

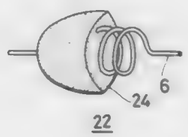
Kei Takahata, Yokkaichi, and Yoshinobu Matsuura, Toyonaka, both of Japan, assignors to Figaro Engineering Inc.

Filed Jun. 18, 1986, Ser. No. 875,470

Claims priority, application Japan, Jun. 24, 1985, 60-138811

Int. Cl.⁴ G01N *27/12*

U.S. Cl. 422—98 **6 Claims**



1. A gas sensor which comprises:

an electrode; and

a gas sensitive element which is connected to said electrode, said gas sensitive element comprising:

SnO_2; and

at least one rhenium containing material selected from the group consisting of elemental rhenium and oxides of rhenium.

4,731,227

POLYMERIZATION PROCESS AND APPARATUS

Charles F. Pulvari, 2014 Taylor St., Washington, D.C. 20018

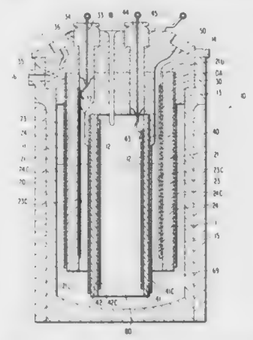
Continuation of Ser. No. 454,319, Dec. 29, 1982, abandoned. This application Nov. 24, 1986, Ser. No. 931,983

Int. Cl.⁴ B01J *1/12;* **B06B** *7/00*

U.S. Cl. 422—127 **15 Claims**

1. A polymerization method comprising placing polymerizable constituent monomer molecules in an autoclave having a heated reactor vessel for receiving said constituent monomer molecules, immersing the end of a high energy piezoelectric shock producing device in said constituent monomer molecules and then electrically charging said piezoelectric shock producing device to a high voltage (E) via a pair of electrodes on said piezoelectric shock producing device, operating an discharge switch means in shunt with said pair of electrodes for periodically discharging said piezoelectric shock producing device through said electrical switch and thereby producing high energy mechanical shock waves, the energy of which are proportional to the square of said high voltage (E^2) and inversely proportional to the impedance (R) of said piezoelectric shock producing device, said high energy mechanical shock wave being capable of breaking some of the covalent and bivalent bonds of constituent monomer molecules in said reactor vessel.

6. A polymerization reactor comprising, an autoclave having a heated reactor vessel for receiving constituent monomer molecules, a high energy piezoelectric shock producing device mounted in said reactor vessel, said piezoelectric shock producing device having a pair of electrodes thereon and an impedance R, high voltage supply means connected to said pair of electrodes for electrically charging said piezoelectric shock producing device to a high voltage (E), a normally open electrical switch means connected in shunt with said pair of electrodes for periodically discharging said piezoelectric shock producing device, means for periodically operating said switch closed and thereby producing high energy non-ultrasonic mechanical shock waves in said constituent monomers only on closure of said switch and the discharge of said high voltage, said high energy mechanical shock wave being proportional to the square of said high voltage (E^2) divided by said resistance (R) and being capable of breaking some of the covalent and bivalent bonds of constituent monomer molecules in said reactor vessel.



4,731,228

REACTOR AND HORIZONTAL CYCLONE SEPARATOR WITH PRIMARY MASS FLOW AND SECONDARY CENTRIFUGAL SEPARATION OF SOLID AND FLUID PHASES

Thomas S. Dewitz, Houston; John E. Gwyn, Katy; Wesley A. Parker, Houston, and Donald E. Hardesty, Brookshire, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,966

Int. Cl.⁴ B01J *8/24;* **B01D** *45/12*

U.S. Cl. 422—144 **10 Claims**

1. A reactor and separator apparatus for the separation of solid and fluid phases which comprises:

(a) a horizontal elongated vessel having a diameter, a horizontal body comprising an imperforate top, a first imperforate side wall, a bottom having a center line and a second perforate side wall for penetration of a fluid phase outlet withdrawal conduit;

(b) an elongated tubular reactor having a cross section diameter and interconnecting a portion of said bottom of said vessel at a position adjacent said second perforate side wall and off center from the center line of said bottom defining and off-center ingress as defined by a vertical plane through the diameter of said horizontal body for passage of an admixture of a solid phase admixed with a fluid phase into said horizontal elongated vessel;

(c) a downcomer elongated relatively vertical conduit interconnecting said horizontal elongated vessel bottom adjacent said first imperforate side wall of said horizontal elongated vessel opposite interconnection of said vessel bottom with said elongated tubular reactor for passage downward through said downcomer elongated vertical conduit of a relatively small amount of the solid phase;

(d) a fluid phase outlet withdrawal conduit having a diameter and situated in said perforate second side wall of said vessel juxtaposed to said elongated tubular reactor interconnection with said horizontal elongated vessel bottom for the continuous removal of the fluid phase after secondary centrifugal separation from the solid phase after passage through said vessel of the fluid phase to said imperforate end and reversal of the flow of the fluid phase in the opposite direction to said withdrawal conduit;

(e) an inclined slot solid dropout means interconnecting said bottom of said horizontal elongated vessel and said downcomer elongated relatively vertical conduit to form a continuous opening along the entire bottom of said horizontal vessel for the primary mass separation of the solid phase from the fluid phase by centrifugal acceleration of the solid phase about an angle in said horizontal elongated vessel wherein the solid particles are accelerated against said horizontal body of said horizontal elongated vessel to

cause primary separation of the solid phase from the fluid phase and to pass the majority of the solid phase through said inclined slot solid dropout means to said downcomer vertical conduit;

(f) a structure support means in said inclined slot solid dropout means for support of said inclined slot solid dropout means; and

(g) wherein said fluid phase withdrawal conduit, said horizontal elongated vessel and said tubular reactor are constructed to insure that the diameter of said fluid phase withdrawal conduit is smaller than the diameter of said horizontal elongated vessel and said off center ingress of the solid and fluid phases into said horizontal elongated vessel through the diameter cross section of said tubular reactor form a swirl ratio of greater than 0.2 as defined by the tangential velocity of the fluid into said horizontal elongated vessel divided by the superficial axial velocity of the fluid through said withdrawal conduit to form a vortex of the fluid phase in a helical flow path extending from said first imperforate side wall opposite said fluid phase withdrawal conduit and extending in a helical flow path to exit through said fluid phase withdrawal conduit and to cause secondary centrifugal separation and disengagement of entrained solid phase from the fluid phase and thereby passage of the disengaged solid phase to the point of interconnection of said horizontal elongated vessel with said downcomer vertical conduit to pass the disengaged and secondarily separated solid phase downward through said downcomer elongated vertical conduit.

4,731,229

REACTOR AND PACKING ELEMENT FOR CATALYZED CHEMICAL REACTIONS

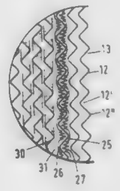
August Sperandio, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 23, 1986, Ser. No. 855,510

Claims priority, application European Pat. Off., May 14, 1985, 85105936

Int. Cl.⁴ B01J *10/00, 12/00, 35/02*

U.S. Cl. 422—188 **17 Claims**



1. A reactor for performing heterogeneous catalyzed chemical reactions comprising

at least one packing element including a plurality of corrugated plates disposed in said reactor parallel to a longitudinal of said reactor flow axis, each plate having corrugations disposed at an inclination to said axis and oppositely directed in adjacent plates, and at least one catalyst member of tape form, said catalyst member being disposed between a pair of adjacent corrugated plates and being fluted on a pitch less than the pitch of said corrugations of an adjacent plate to provide a relatively large catalytically operating area relative to said adjacent plate.

14. A packing element for catalyzed chemical reactions comprising

a plurality of corrugated plates disposed in parallel to a common axis, each plate having corrugations disposed at an inclination to said axis and oppositely directed to said corrugations of an adjacent plate; and

at least one catalyst member of tape form, said member being disposed between a pair of adjacent plates and being fluted on a pitch less than the pitch of said corrugations of an adjacent plate to provide a relatively large catalytically active area relative to said adjacent plate.

4,731,230

PROCESS FOR THE PREPARATION OF $TiCl_4$

Günter Lailach; Walter Deissmann, and Karl-Heinz Schultz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 67,499

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623322

Int. Cl.⁴ B01D *37/02;* **C01G** *23/02*

U.S. Cl. 423—77 **11 Claims**

1. An improved process for the preparation of $TiCl_4$ comprising

(a) chlorinating a raw material containing titanium and vanadium impurities to produce a crude $TiCl_4$ reaction product,

(b) separating the crude reaction product into solid by-products and $TiCl_4$-containing liquid,

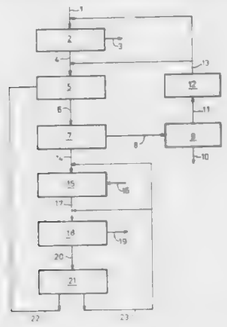
(c) reacting the $TiCl_4$-containing liquid with a reducing agent whereby vanadium impurities are converted into solid compounds,

(d) separating pure $TiCl_4$ from the solid vanadium containing reaction products, and

(e) separating the solid by-products and reaction products

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from $TiCl_4$ is improved by adding solid products of the vanadium reduction reactions according to step (c) to the



crude $TiCl_4$ reaction product prior to the separating step (b).

4,731,231

NO REDUCTION USING SUBLIMATION OF CYANURIC ACID

Robert A. Perry, 524 Hazel St., Livermore, Calif. 94550, assignor to Robert A. Perry, Livermore, Calif.

Filed May 5, 1986, Ser. No. 859,951
Int. Cl.⁴ C01B *21/00;* B01J *8/00*
U.S. Cl. 423—235 **27 Claims**

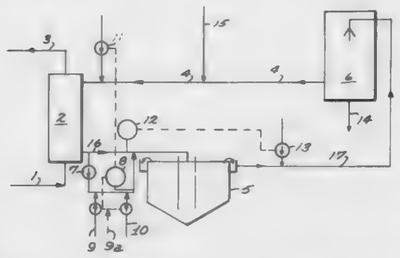
1. A method of reducing the NO content of a gas stream comprising contacting the gas stream with an amount of HNCO at a temperature effective for heat induced decomposition of HNCO, said amount and temperature being effective for resultant lowering of the NO content of the gas stream and said HNCO having been previously generated in gaseous form prior to being conducted into admixture with said gas stream.

4,731,232

PROCESS FOR THE PURIFICATION OF INDUSTRIAL GASES OR WASTE GASES

Joachim Fischer, Rodenbach, and Helmut Knorre, Seligenstadt, both of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,568
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534677
Int. Cl.⁴ B01D *53/34*
U.S. Cl. 423—236 **22 Claims**



1. In a process for the pu[illegible]ation of industrial gas or waste gases which contain hyd[illegible]en cyanide by a circulating wash with water and formaldehyde and a simultaneous oxidative treatment or a subsequent oxidative treatment of the circulating water removed from the circuit the improvement comprising dosing the formaldehyde into the gas wash circuit before the gas washer and controlling the amount of formaldehyde added so that it is stoichiometrically equal to the cyanide content by continuously measuring the redox potential with a pair of electrode consisting essentially of a noble metal and a reference electrode in a measuring side stream branched off after the washer and controlling the pH of the side stream to a pH between 7 and 1 by dosing in alkali or acid in the presence of at least 1 ppb of silver ions.

4,731,233

METHOD AND COMPOSITION FOR UTILIZING LIME-UREA HYDRATES TO SIMULTANEOUSLY REDUCE NO_x AND SO_x IN COMBUSTION EFFLUENTS

Richard E. Thompson, 27121 Puerta del Oro, Mission Viejo, Calif. 92691, and Lawrence J. Muzio, 29541 Vista Plz., Laguna Niguel, Calif. 92677

Filed Jan. 9, 1986, Ser. No. 817,319
Int. Cl.⁴ B01J *8/00;* C01B *17/00, 21/00*
U.S. Cl. 423—231 **13 Claims**

1. A method for simultaneously reducing sulfur and nitrogen oxides from a gaseous oxygen containing stream at a temperature of at least about 400° F., said method comprising:

introducing into said stream at a predetermined ratio as a sorbent for the sulfur and nitrogen oxides, a composition comprising hydrated lime and a carboxamide in an amount sufficient to reduce the sulfur and nitrogen oxides in said effluent stream, wherein said composition is prepared by hydrating lime in an aqueous medium containing said carboxamide and removing uncomplexed water to provide dry particles, and wherein said predetermined ratio is in an amount to provide a calcium to sulfur molar ratio of about 0.1 to 10 and carboxamide amino nitrogen to NO_x equivalent ratio in the range of about 0.2 to 20.

4,731,234

PROCESS FOR PRODUCING ZIRCONIUM SOLS AND GELS, AND PROCESS FOR PRODUCING ZIRCONIA USING THE SAME

Takeo Wada, Kawanishi; Hiroshi Onaka, Nagaokakyo, and Hideaki Matsuda, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 24, 1986, Ser. No. 947,417
Claims priority, application Japan, Dec. 25, 1985, 60-294792
Int. Cl.⁴ C01B *35/10, 35/14*
U.S. Cl. 423—280 **5 Claims**

4. A boratozirconium ammonium carbonate sol produced by reacting a zirconium ammonium carbonate sol with boric acid or ammonium borate in B/Zr molar ratios of about 0.3–1.2.

4,731,235

METHOD OF MAKING SILICON NITRIDE

John L. Schrader, Jr., Towanda, Pa., and Patience G. Dowd, Albuquerque, N. Mex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 31, 1984, Ser. No. 687,885
Int. Cl.⁴ C01B *21/068*
U.S. Cl. 423—344 **6 Claims**

1. In the manufacture of silicon nitride powder by the vapor phase reaction of a silicon halide with ammonia at an elevated temperature in a system where the silicon halide and ammonia are introduced into the entrance end of a reactor tube, pass through a hot zone thereof where they react with each other to form a reaction product, and where the reaction product passes out of the reaction tube at the exit end thereof and thence to collection means where the reaction product is collected in powder form, the improvement which comprises introducing moisture into the system at a point between the exit end of the reactor tube and the collection means while preventing the entry of room air into the system, both at the entrance end and exit end of the reactor tube, the moisture

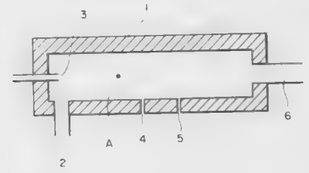
being introduced into the system under controlled conditions by flowing nitrogen through water and thence into the system.

4,731,236

PROCESS FOR PRODUCING SIALON

Norihiro Murakawa, Shimonoseki; Kazuyoshi Isogaya, Tokyo; Kensaku Maruyama, and Fumio Nakamura, both of Shimonoseki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,436
Int. Cl.⁴ C01B *33/26*
U.S. Cl. 423—327 **8 Claims**



1. A process for producing a sialon powder, which process comprises the steps of:

introducing a decomposable silicon compound, decomposable aluminum compound and a decomposable carbon compound into a steam-containing hot gas to decompose said decomposable silicon compound, aluminum compound and carbon compound in said hot gas into silicon oxide, aluminum oxide and elemental carbon, respectively, thereby producing a fine solid particle mixture consisting essentially of said silicon oxide, aluminum oxide and elemental carbon dispersed in said gas;

collecting said fine solid particle mixture dispersed in said gas from the gas phase by a solid-gas separating technique to obtain a carbon-containing composition consisting essentially of said silicon oxide, aluminum oxide and elemental carbon, and calcining said composition in a nitrogen containing gas atmosphere.

4,731,237

IMMUNE RESPONSE TO VIRUS INDUCED BY ANTI-IDIOTYPE ANTIBODIES

Kevin J. Reagan, Wycliffe, Del.; Tadeusz J. Wiktor, and Hilary Koprowski, both of Wynnewood, Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 7, 1983, Ser. No. 549,506
Int. Cl.⁴ A61K *39/42;* C12N *15/00, 5/00*
U.S. Cl. 424—86 **13 Claims**

1. A method of inducing an immunological response to a rabies virus comprising:

(a) providing an anti-idiotype antibody, an epitope identified by said anti-idiotype antibody being the parotope of an anti-rabies virus antibody; and

(b) stimulating in a mammal the production of anti(anti-idiotype) antibodies that identify an epitope on a rabies virus particle by administering said anti-idiotype antibody to said mammel.

11. An immortal B lymphocyte that produces an anti-idiotype antibody, the epitope identified by said anti-idiotype antibody being the parotope of an anti-rabies virus antibody, wherein said B lymphocyte has been immortalized by fusion with a malignant lymphocyte to produce a hybridoma.

4,731,238

NOVEL MONOCLONAL HYBRIDOMA AND CORRESPONDING ANTIBODY

Alexander M. Neville, Surrey; Christopher S. Foster; Paul A. W. Edwards, both of Sutton, and Robert A. J. McIlhinney, Carshalton, all of United Kingdom, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Dec. 5, 1983, Ser. No. 558,538
Claims priority, application United Kingdom, Dec. 10, 1982, 8235216
Int. Cl.⁴ A61K *39/395, 39/00;* C12N *5/00;* C07K *15/14*
U.S. Cl. 424—85 **4 Claims**

1. In a method for autologous bone marrow rescue wherein a sample of bone marrow in subjected to a clean-up procedure in vitro prior to reintroduction the improvement which comprises subjecting some or all of the sample to cytotoxic treatment with an antibody designated LICR-LON Fib 75 generated by the murine hybridoma designated LICR-LON Fib 75 (CNCM, I-22), or a toxin conjugate thereof, adapted to kill cancerous cell lines while leaving viable colony-forming units of bone marrow and reintroducing the treated sample material to the blood stream of the patient.

4. An antigen capable of binding to the antibody designated LICR-LON Fib 75 generated by the murine hybridoma designated LICR-LON Fib 75 (CNCM, I-22) characterised as a glycoprotein having a molecular weight of 19,000±700 D as determined by electrophoresis on polyacrylamide, which is relatively rich in glutamate, aspartate, leucine and valine, relatively poor in methionine and contains no detectable proline, which has approximately 30% by weight of glycoside and has as the major glycosidic ingredients galactose and glucosamine.

4,731,239

METHOD FOR ENHANCING NMR IMAGING; AND DIAGNOSTIC USE

Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60076

Continuation of Ser. No. 816,695, Jan. 6, 1986, abandoned, which is a continuation of Ser. No. 460,889, Jan. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 456,555, Jan. 10, 1983, abandoned. This application Oct. 7, 1986, Ser. No. 916,350
Int. Cl.⁴ A61K *49/00;* A61B *6/00, 5/05*
U.S. Cl. 424—9 **18 Claims**

1. A method for nuclear magnetic resonance (NMR) imaging of a patient comprising, prior to the NMR imaging of a patient, administering to said patient ferromagnetic, paramagnetic or diamagnetic particles effective to enhance an NMR image.

4,731,240

PREPARATION FOR PROPHYLAXIS AND TREATMENT OF MYIASES OF ANIMALS

Alexandr A. Zakomyrdin, Bolshoi Rogozhsky pereulok, IO, korpus I, kv. I27; Mark A. Simetsky, Teply Stan, 4 mikroraion, 45, kv. I36, both of, Moscow; Elena I. Pilipets, prospekt Pravdy, 64, kv. I49, Kiev; Vladimir M. Repin, ulitsa Polimernaya, 7, kv. 49, Moscow; Vitaly I. Ilyaschenko, ulitsa Dorozhnaya, 75, kv. 3, Kustanai; Dmitry G. Klientovsky, Preobrazhensky val, 39, kv. I8, Moscow; Ljudmila I. Golik, Almalyk, ulitsa Navoi, 7, kv. I35; Viktor A. Samkin, Almalyk, ulitsa Lenina, 42, both of, Tashkentskaya oblast, and Nina P. Kuznetsova, Zheleznodorozhny, ulitsa Novaya, 5, kv. 32, Moskovskaya oblast, all of U.S.S.R.

Filed Jun. 5, 1986, Ser. No. 870,789
Int. Cl.⁴ C07C *19/02*
U.S. Cl. 424—45 **8 Claims**

1. A preparation for prophylaxis and treatment of myiases of animals comprising the following components, % by mass:

an insecticide exhibiting a larvicidal effect: 1.4 to 2.3

a 5–20% solution, in ethanol, of polyvinylbutyral and a resol-

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type phenolformaldehyde resin taken in a ratio of 1:10–45: 16.0 to 35.0
a plastifying agent improving elasticity of the formed polymeric film: 1.0 to 20.0
an antibiotic: 0.1 to 0.7
an organic solvent: the balance.

4,731,241

PERCUTANEOUS PHARMACEUTICALS PREPARATION FOR EXTERNAL USE

Masayuki Yamada, and Yoshiaki Uda, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 874,703, Aug. 1, 1986, abandoned, which is a continuation of Ser. No. 611,540, May 17, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 22,515
Claims priority, application Japan, May 26, 1983, 58-93153; Mar. 23, 1984, 59-56923
Int. Cl.⁴ A61L *31/535, 31/19;* **A61K** *15/03*
U.S. Cl. 514—227 **5 Claims**

1. A percutanneous pharmaceutical preparation for external application which comprises
(a) N-ethoxycarbonyl-3-morpholinosydnonimine; and
(b) at least 0.01 weight part of an absorption promoter per weight part of (a) which promoter is an aliphatic monocarboxylic acid of 5 to 30 carbons.

4,731,242

WATERPROOF SUNSCREEN COMPOSITIONS

Victor Palinczar, 435 Adeline St., Trenton, N.J. 08611

Filed Mar. 21, 1986, Ser. No. 842,559
Int. Cl.⁴ A61K *7/42, 7/44*
U.S. Cl. 424—59 **21 Claims**

1. A water-proof sunscreen composition comprising:
A. from about 15% to about 90% by weight of a monohydric alcohol;
B. from about 0.1% to about 40% by weight of a water-insoluble polyamide polymer;
C. from about 1.0% to about 30% by weight of an active ultraviolet radiation absorber;
wherein the improvement comprises:
D. from about 0.1% to about 5.0% by weight of an acrylic acid crosslinked polymer having a molecular weight from about 400,000 to about 5,000,000; an average equivalent weight from about 72 to about 80 and a specific gravity from about 1.30 to about 1.50 and represented by the formula $(CH_2CHCOOH)_n$; and
E. from about 0.1% to about 5.0% by weight of an alkaline neutralizing agent.

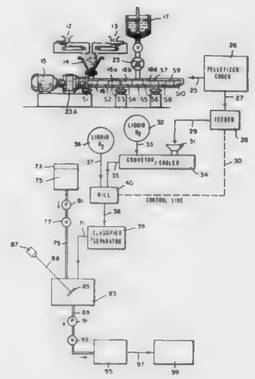
4,731,243

ANTIPERSPIRANT AND/OR DEODORANT STICK HAVING SUSPENDED THEREIN FRAGRANCE-CONTAINING POLYMERIC PARTICLES

Jerome I. Lindauer, Hillsdale, N.J.; Sharon L. Reich, Briarwood; Rose L. Trizzino, Staten Island, both of N.Y.; Valerie M. Suran, Kingston, and David E. Cincotta, South Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 662,681, Oct. 19, 1984. This application Feb. 14, 1986, Ser. No. 829,484
Int. Cl.⁴ A61K *7/32*
U.S. Cl. 424—65 **6 Claims**

1. A deodorant or antiperspirant solid suspension comprising a deodorant or antiperspirant-containing suspension agent selected from the group consisting of:
(i) hydrocarbon wax; and
(ii) sodium stearate
and suspended therein perfume-containing thermoplastic polymer particles having an average particle size of between 50 and 225 microns, said thermoplastic polymer being selected from the group consisting of:
(1) low density polyethylene;
(2) high density polyethylene;
(3) co-extruded high molecular high density polyethylene and low density polyethylene;
(4) polypropylene;
(5) a co-polymer of ethylene and vinyl acetate;
(6) polyvinyl chloride;
(7) a copolymer of ethylene and ethyl acrylate;
(8) a copolymer of ethylene and methyl acrylate;
(9) a copolymer of ethylene and butyl acrylate;
(10) a copolymer of ethylene and acrylic acid; and
(11) the hydrolyzed co-polymer of ethylene and vinyl acetate
said polymeric particles containing from 1 up to about 80% by weight of perfume, said polymeric particles being produced according to the process comprising the steps of:
(i) co-extruding the thermoplastic polymer with from about 1% up to about 80% of said perfume thereby forming an extrudate with the polymer feed rate range being from 80 up to 300 pounds per hour and the feed rate range of perfume being between 1.01% and 400% of the feed rate range of thermoplastic polymer;



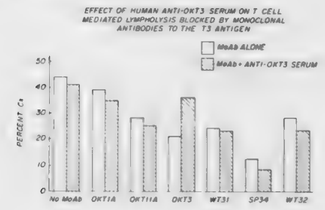
(ii) quick-chilling said extrudate by contacting said extrudate with an inert cooling liquid at a temperature of from about 5° C. up to about 60° C. whereby extrudate pellets are formed;
(iii) cryogenically grinding the resulting extrudate pellets to a particle size of from about 10 up to about 500 microns and an average particle size of between 50 and 225 microns thereby forming cryogenically ground extrudate pellets;
(iv) intimately admixing the resulting cryogenically ground extrudate pellets with said deodorant-containing suspension composition or said antiperspirant-containing suspension composition whereby a liquid suspension is formed; and
(v) forming the thus created liquid suspension into deodorant or antiperspirant sticks.
the weight percent of cryogenically ground polymer in the resulting suspension being from about 2% up to about 8%, the resulting polymeric particles in said suspension being capable of controlled release of said perfume therefrom into and through the resulting deodorant sticks or anti-perspirant sticks.

4,731,244

MONOCLONAL ANTIBODY THERAPY

Mary A. Talle, Piscataway; Walter Newman, North Plainfield; Patricia E. Rao, Princeton Junction, and Gideon Goldstein, Short Hills, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 13, 1985, Ser. No. 797,712
Int. Cl.⁴ A61K *39/395*
U.S. Cl. 424—85 **16 Claims**



1. A method for prolonging the time period a patient can be effectively subjected to therapeutic monoclonal antibody treatment, comprising:
(a) administering to said patient an effective amount of a first monoclonal antibody, or an antigen binding fragment thereof, until the patient produces a detectable amount of an anti-idiotype antibody against said first antibody or fragment thereof; and
(b) thereafter administering to said patient an effective amount of a second monoclonal antibody, or an antigen binding fragment thereof, wherein said second antibody or fragment is idiotypically distinct from said first antibody or fragment but functionally equivalent to said first antibody or fragment in binding to the same antigen.

4,731,245

VACCINE, ANTIGEN AND ANTIBODY FOR TREATING MICROORGANISMS OF THE MCLS-TYPE *STREPTOCOCCUS SANGUIS*

Takashi Tsurumizu, Ichikawa; Takashi Hashimoto, Chofu, and Makoto Sato, Tokushima, all of Japan, assignors to Kitasato Kenkyusho, Japan

Continuation-in-part of Ser. No. 686,347, Dec. 26, 1984, abandoned. This application Jul. 24, 1985, Ser. No. 758,576
Claims priority, application Japan, Dec. 29, 1983, 58-251976; Jun. 21, 1985, 60-135416
Int. Cl.⁴ A61K *39/09, 39/395*
U.S. Cl. 424—92 **8 Claims**

1. A vaccine for the treatment of the microorganisms MCLS-type *Streptococcus sanguis* in the oral cavity of an animal subject, said microorganism having a high pathogenic potential and capable of decomposing raffinose and mellibiose, which comprises as active ingredient or effective amount of an antigen derived from a member selected from at least a part of the cell of said microorganism and culture thereof, and a pharmaceutically acceptable carrier.

4,731,246

LIQUID BRAN DRINK

Leonard Chavkin, Bloomsbury, N.J., and Leonard Mackles, New York, N.Y., assignors to Product Resources International, Inc., New York, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,174
Int. Cl.⁴ A61K *35/78, 31/715*
U.S. Cl. 424—195.1 **10 Claims**

1. An aqueous potable suspension of ground wheat bran consisting substantially of:
(a) wheat bran containing from about 30 to about 50% by weight of starch and about 50–70% by weight of fiber, having a particle size of less than 40 mesh and comprising between about 5 and about 15% by weight of the suspension,
(b) a physiologically acceptable acidification agent in a quantity sufficient to provide a pH of between about 3.5 and about 5.5 to said suspension,
(c) an inorganic complex of hydrate colloidal magnesium aluminum silicate wherein the silicon dioxide content is between about 62 and about 69% by weight, and the aluminum oxide content is from about 10 to about 15% by weight and the magnesium oxide content is about 3 to about 12% by weight, said complex comprising between about 0.1 and about 1.0% by weight of said suspension.

4,731,247

ARTIFICIAL FISH BAITS WITH SUSTAINED RELEASE PROPERTIES

Troy D. Wolford, and George K. Greminger, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 535,491, Sep. 26, 1983, abandoned. This application Aug. 9, 1985, Ser. No. 765,017
Int. Cl.⁴ A01N *17/14*
U.S. Cl. 426—1 **21 Claims**

17. A sustained release anhydrous artificial bait for fish or other water-living animal comprising
(a) a normally solid polymeric material comprising
(i) a matrix-forming amount of a non-thermoplastic water-soluble cellulose ether composition, and
(ii) an effective amount of a temperature-activated plasticizing solvent for said cellulose ether; and
(b) a functionally effective amount of an attractant for fish or other water-living animal, wherein said attractant can be released in active form upon immersing said bait in water.

4,731,248

PRODUCTION OF PALATABILITY ENHANCERS FROM THE AUTOLYSIS OF FILAMENTOUS FUNGI

William C. Hogan, Bridgeton; Dennis L. Gierhart, High Ridge, both of Mo., and Gary D. Hayen, Cincinnati, Ohio, assignors to Ralston Purina Company, St. Louis, Mo.

Filed Feb. 18, 1986, Ser. No. 829,886
Int. Cl.⁴ A23K *1/00*
U.S. Cl. 426—54 **41 Claims**

1. A process for the production of a palatability enhancing autolysate for pets comprising;
(a) forming a slurry comprising an edible filamentous fungal biomass obtained from filamentous fungi selected from the genuses consisting of Aspergillus and Rhizopus grown on a fermentation medium comprising soybean whey
(b) autolyzing said slurry in the absence of an added autolysis initiator, at a pH of about 2.5–10.5 wherein autolysis is initiated by heating of the slurry to a first temperature stage sufficient to activate endogenous protease and nuclease activity, followed by heating said slurry to a second temperature stage, higher than the first stage that is sufficient to further increase endogenous nuclease activity and provide a palatability enhancing autolysate.

4,731,249

ANIMAL FEED BLOCK PACKAGE AND METHOD

John E. Findley, Claremont, Calif., assignor to Pacific Kenyon Corp., Long Beach, Calif.

Continuation-in-part of Ser. No. 771,603, Sep. 3, 1985, abandoned. This application Jun. 2, 1986, Ser. No. 869,222
Int. Cl.⁴ A23K *1/22*
U.S. Cl. 426—69 **19 Claims**

1. In a method for the preparation of an animal feed supplement in the form of a homogeneous, single-piece block from 1 to about 750 pounds wherein an aqueous feed supplement containing sugars and proteins and from 10 to 35 weight percent water is poured into a mold at a temperature up to 150° F. and solidifies therein, the improvement comprising: lining the

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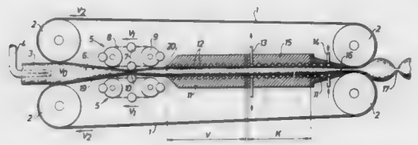
mold with a film with a thickness from 0.5 to about 10 mils and formed entirely of a water soluble plastic selected from the group consisting of: polyvinyl alcohol, polyvinyl acetate, ethylene-vinyl acetate copolymers and alkyl cellulose esters, permitting said supplement to solidify into a solid block and removing said mold to obtain said block sealed within a, plastic outer covering.

4,731,250

METHOD AND AN ARRANGEMENT FOR THE CONTINUOUS HEAT TREATMENT AND PACKAGING OF A LIQUID PRODUCT

Sven O. S. Stark, Ystad, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 700,004, Feb. 8, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 39,761
Claims priority, application Sweden, Feb. 16, 1984, 8400827
Int. Cl.⁴ A23L *3/04;* **B65B** *55/06, 55/14*
U.S. Cl. 426—234 **14 Claims**



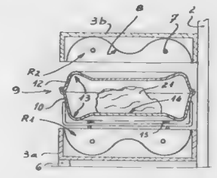
1. A method for continuous heat treatment and packaging of a liquid product, having a predetermined boiling point contained in a packing material for reducing micro-organism content of the product, the product and packing material being heated and subsequently cooled, comprising the steps of:
(a) moving a flexible tube of the packing material;
(b) introducing the product into the flexible tube;
(c) passing the tube and th roduct contained therein into gap formed between two opposed, substantially parallel bands driven synchronously at a first substantially constant speed in a longitudinal direction;
(d) exposing the product to a pressure zone wherein the product and tube are heated and cooled, said pressure zone being maintained by compressing the tube and limiting expansion thereof between the bands by moving the bands toward one another between opposed, spaced apart supports sufficient for transporting the tube with the bands at said first speed, and simutlaneously reducing the cross-sectional area of the tube to a space of substantially uniform gap width, and said pressure zone further being maintained by pumping said product through said gap at a second substantailly constant speed, greater than said first speed, sufficient for increasing the pressure of said product so as to increase said predetermined boiling point;
(e) heating the moving tube and the product contained in the tube for a predetermined period in a heating zone within said pressure zone to a temperature sufficient for sterilizing said product below said increased boiling point;
(f) cooling the moving heated tube and the product contained in the tube in a cooling zone within the pressure zone;
(g) relieving said increased pressure in said moving cooled tube in a throttling zone wherein said uniform gap width is reduced by guiding said belts between portions of said opposed supports spaced closer together than in said pressure zone; and
(h) subsequently relieving compression of said moving tube and dividing said cooled tube and product into individual sterilized packaging units through repeated transverse sealing of the tube.

4,731,251

METHOD OF AND APPARATUS FOR COOKING OF FOODS

Dragomir Jovanovic, 6, Impasse Jean-Moulin, Pont-de-Claix, France

Filed Jun. 24, 1986, Ser. No. 877,989
Int. Cl.⁴ A23L *1/01;* **A21B** *2/00*
U.S. Cl. 426—243 **4 Claims**



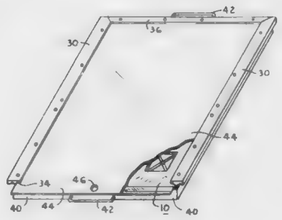
1. A method of cooking a foodstuff which comprises the steps of:
introducing said foodstuff into a vessel having an upwardly open infrared transparent bottom portion formed with a central rise upon which said foodstuff is disposed and surrounded peripherally by a trough adjoining a side wall of said bottom portion of said vessel;
introducing a predetermined amount of water into said trough;
closing said vessel with a downwardly concave infrared transparent cover having a planar portion closely
with said foodstuff and substantially coextensive superposed with said rise and surrounded peripherally with a downwardly extending side wall substantially contiguous with said side wall of said bottom portion; and
placing the closed vessel between two infrared radiating members at least coextensive with said vessel and subjecting the foodstuff to infrared irradiation through said vessel of a radiation power and frequency sufficient to bring water in said trough to a boil, thereby causing in repetitive evaporation/condensation cycles water to evaporate exclusively from infrared molecular activation and to condense on said foodstuff, cooking of said foodstuff by the in-depth penetration of heat into the foodstuff by the heat released by the condensation of water vapor on the foodstuff, and superficial cooking of the foodstuff by said infrared irradiation directly.

4,731,252

HAMBURGER COOKER AND METHOD OF COOKING HAMBURGERS

William D. Duncan, P.O. Box 9225, Fort Myers, Fla. 33902

Filed Oct. 22, 1986, Ser. No. 921,382
Int. Cl.⁴ A23L *1/01;* **A47J** *37/04*
U.S. Cl. 426—523 **5 Claims**



1. A hamburger cooker comprising a broiler plate having a smooth upper surface, and a plurality of patty molds each having a meat well having an upper surface aligned with the upper surface of the broiler plate, each patty mold having an aperture to permit the escape of liquified grease to a grease pan during the cooking operation, and means including a flat plate aligned with the upper surface of the broiler plate to close the meat wells to confine the hamburgers in the patty molds to permit inverting the broiler plate to release the hamburgers from the patty molds.

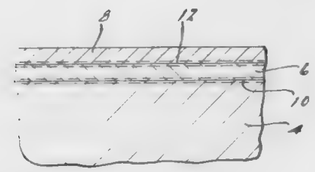
5. A method of cooking hamburgers which comprises the steps of (1) providing a broiler plate having a smooth upper surface, and having a plurality of spaced meat wells each having an upper surface aligned with the smooth upper surface of the broiler plate, a grease escape aperture in each of the meat wells to permit the escape of liquified grease from each of the meat wells during the cooking process; (2) loading hamburger patties on the broiler plate and filling the meat wells to the top of the broiler plate with the hamburger patties; (3) (6) placing the broiler plate with the meat wells filled with the hamburger patties in a grease pan; (4) cooking the hamburger patties in the meat wells by heating the broiler plate and the patties; (5) covering the smooth upper surface of the broiler plate and the meat wells with a flat plate to form an assembly when the cooking operation is complete to permit inverting the broiler plate with the patties in place; (6) inverting the assembly; and (7) removing the flat plate to release the cooked hamburger patties from the meat wells of the broiler plate.

4,731,253

WEAR RESISTANT COATING AND PROCESS

Samuel C. DuBois, Britton, Mich., assignor to Wall Colmonoy Corporation, Madison Heights, Mich.

Filed May 4, 1987, Ser. No. 46,438
Int. Cl.⁴ B05D *1/08*
U.S. Cl. 427—34 **15 Claims**



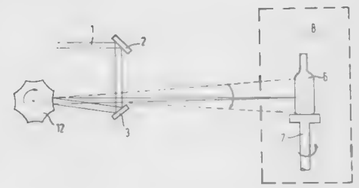
1. A method of applying a wear and corrosion resistant alloy layer on a metallic substrate which comprises the steps of forming a powder mixture containing about 40% to about 85% by weight of prealloyed particles and about 60% to about 15% by weight of primary wear resistant particles, said prealloyed particles containing from about 0.5% to about 1.7% by weight carbon, about 22% to about 36% by weight chromium, about 0.5% to about 2% by weight boron, about 1% to about 2.8% by weight silicon, up to a maximum of about 5% by weight iron, about 3% to about 14% by weight tungsten, up to a maximum of about 2% by weight cobalt, up to a maximum of about 2% by weight of conventional residuals and impurities and the balance comprising nickel; heating said powder mixture to a temperature of at least about 2,350° F. and effecting a melting of said prealloyed particles and applying the heated said powder mixture in the presence of an inert gas atmosphere to a metallic substrate in the form of a layer and thereafter cooling said layer.

4,731,254

METHOD OF, AND APPARATUS FOR, REPAIRING MECHANICAL AND/OR CHEMICAL DAMAGE TO THE SURFACE OF BOTTLES DESTINED FOR RE-USE

Alfred H. Heineken, Amsterdam, Netherlands; Reinhard Baumert, Frankfurt, Fed. Rep. of Germany; Hans Gaar, Frankfurt, Fed. Rep. of Germany; Ulrich Hoffmann, Frankfurt, Fed. Rep. of Germany; Ulrigh Roth, Frankfurt, Fed. Rep. of Germany, and Wolfgang Schwämmlein, Frankfurt, Fed. Rep. of Germany, assignors to Heineken Technisch Beheer B.V., Amsterdam, Netherlands

Filed Aug. 14, 1986, Ser. No. 896,754
Int. Cl.⁴ B05D *3/06;* **B32B** *35/00;* **C03B** *29/02;* **B23K** *9/00*
U.S. Cl. 427—53.1 **23 Claims**



1. A method of repairing mechanical and/or chemical damage to the surface of glass bottles destined for reuse, comprising the steps of: bringing a bottle to be repaired to a temperature in the region of the transformation point of the glass of the bottle; thermally treating the bottle with laser beams; and linearly scanning the surface of the bottle with laser beams while rotating the bottle about its longitudinal axis, wherein the bottle is not translated linearly.

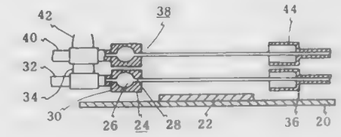
8. A method as claimed in claim 1, wherein, during or after the thermal treatment, a layer of titanium oxide or tin oxide is applied to the bottle surface.

4,731,255

GAS-PHASE GROWTH PROCESS AND AN APPARATUS FOR THE SAME

Kazuo Maeda; Noboru Tokumasu; Toshihiko Fukuyama, and Tsugiaki Hirata, all of Tokyo, Japan, assignors to Applied Materials Japan, Inc., Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,205
Claims priority, application Japan, Sep. 26, 1984, 59-201230; Sep. 28, 1984, 59-204975
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—54.1 **22 Claims**



1. A gas-phase growth process for growing films of uniform thickness or having a prescribed pattern form or growing films sequentially onto a substrate, which comprises:
flowing a reaction gas over the surface of said substrate in parallel with said surface;
flowing an inert gas over the flow of said reaction gas so as to create a laminar flow with the flow of said reaction gas;
preheating both gases to about the same temperature, so as to induce a surface reaction of the reaction gas; and growing a film onto the substrate, said process being conducted in the absence of a reaction chamber and with generally a complete particle generation suppression.

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16. A gas-phase growth apparatus for growing films of uniform thickness or having a pattern form or growing films sequentially onto a substrate, which comprises:

reaction-gas supply nozzles for flowing a reaction gas over the surface of said substrate in parallel with said surface;

inert-gas supply nozzles for flowing an inert gas over the flow of said reaction gas so as to create a laminar flow with the flow of said reaction gas; and

a heating means serving to preheat both gases to about the same temperature, said apparatus further characterized as not being comprised of a reaction chamber.

4,731,256

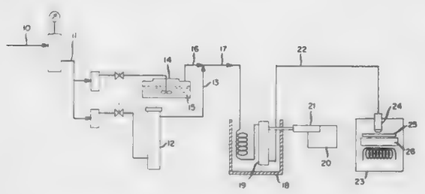
LIQUID COATING COMPOSITION FOR PRODUCING HIGH QUALITY, HIGH PERFORMANCE FLUORINE-DOPED TIN OXIDE COATINGS

David A. Russo, Edison, N.J.; Georg H. Lindner, Vlissingen, and Marinus K. Schilders, Kapelle, both of Netherlands, assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 784,279, Oct. 4, 1985, Pat. No. 4,601,917, which is a continuation-in-part of Ser. No. 705,595, Feb. 26, 1985, which is a continuation-in-part of Ser. No. 687,065, Dec. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 598,623, Apr. 10, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 887,309

Int. Cl.⁴ B05D *7/22, 5/12;* **C02C** *17/245*

U.S. Cl. 427—109 **22 Claims**



1. A liquid coating composition for making high quality fluorine-doped tin oxide coatings having a low sheet resistance and high visible light transmission including the reaction product of a reactive organic fluorine dopant compound where at least one fluorine atom is located alpha or beta to a functional group wherein carbon is bonded to oxygen, selected from carboxylic acid, anhydride, ester, alcohol, or acid halide: and an organotin compound which is an alkyltin trichloride, a dialkyltin dichloride, an alkyldichlorotin acetate, or an ester tin trichloride: or tin tetrachloride.

4,731,257

PROCESS FOR PRODUCING A TEMPERATURE AND MOISTURE SENSITIVE ELEMENT

Fusaoki Uchikawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

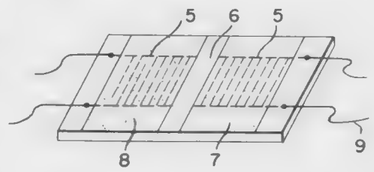
Filed Nov. 20, 1985, Ser. No. 800,024

Claims priority, application Japan, Dec. 20, 1984, 59-268961; Dec. 20, 1984, 59-268963

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 427—122 **8 Claims**

1. A process for producing a temperature and moisture sensitive element, which comprises a step of forming a first coating layer by applying a composition comprising a polymerized organo-silicon compound and an inorganic material comprising at least one member selected from the group consisting of a metal oxide, a compound metal oxide, a metal powder, an alloy powder, a carbon powder and a selenium powder onto a surface of an aluminum substrate, a step of forming a second coating layer apart from the first coating layer by applying the same composition as defined above onto the same surface, a step of heat-treating the first coating layer to form a moisture sensitive section, and a step of treating the second coating layer to form a temperature sensitive section by a treatment different from the heat treatment of the first coating layer, said heat-treating of the first coating layer being at



about 500° C. to about 700° C., and said treating of the second coating layer being at less than about 450° C. or at more than about 800° C.

4,731,258

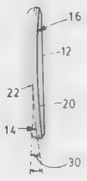
METHOD FOR APPLYING PLASTER AND CEMENT TO WALLBOARD AND THE LIKE

Isak Liberman, 9238 Barberry La., Des Plaines, Ill. 60016

Division of Ser. No. 802,682, Nov. 29, 1985, Pat. No. 4,654,919. This application Nov. 14, 1986, Ser. No. 930,516

Int. Cl.⁴ B32B *35/00;* **B05D** *3/12*

U.S. Cl. 427—140 **3 Claims**



1. A method of applying plaster, or the like, to wallboard surfaces, or the like, in order to plaster over tape adjoining two adjacent wallboard-surface portions, or to plaster over cracks in the wallboard surfaces, comprising:

(a) applying plaster onto one face of a member having at least one contoured surface portion such that the curvature thereof projects toward the wall surface portion to which the plaster is to be applied, such that the end-edge tips of the surface portion lie closer to the wall surface portion than the mid-portion of the contoured surface thereof;

(b) applying pressure to the other face of the member remote from the one face facing toward the wall surface portion to which the plaster is to be applied;

(c) said step of applying pressure comprising urging the mid-portion of the outer edge-surface of the member toward the directly adjacent wall surface portion, so that the mid-portion lies substantially within the same plane as the end edge-tips of the outer edge surface of the member; and

(d) moving the member along the surface portion of the wall to thereby apply the plaster to said wall surface portions to thus simultaneously smooth out the plaster thereon.

4,731,259

DESCALING PROCESS

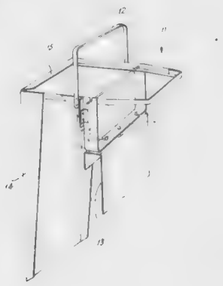
David J. Lloyd, Baldivis, Australia, assignor to Gardner Bros. & Perrott (W.A.) Pty. Ltd., Western Australia, Australia

Continuation-in-part of Ser. No. 763,149, Jul. 1, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 937,343

Claims priority, application Australia, Nov. 1, 1983, PG2145; PCT Int'l Appl., Oct. 31, 1984, PCT/AU84/00220

Int. Cl.⁴ B05D *5/08;* **F16L** *58/10*

U.S. Cl. 427—155 **13 Claims**



1. A method of preparing processing equipment vessels, conduits, piping and the like to facilitate descaling surfaces which are subject to the reactive effects of caustic liquors comprising cleaning the surface to remove substantially all surface contaminants, applying a coating to the surface comprised of at least a base coat which will bond with the surface and an outer coat that reacts to the preceding coat to form a bond therewith said outer coat being resistant to caustic attack and to high pressure fluid blasting, said coating being resistant to penetration by caustic liquor and providing an outer surface which is not reactive to the caustic liquor to promote the formation of scale thereon.

4,731,260

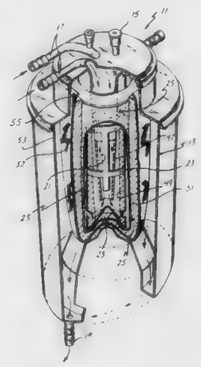
HYDROPHOBIC FILTER MATERIAL AND METHOD

David P. Balding; Li-Chien Hsu, both of Mission Viejo; Sun De Tong, Tustin, and Steven A. Craw, Mission Viejo, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 18, 1984, Ser. No. 683,252

Int. Cl.⁴ B01D *13/04*

U.S. Cl. 427—236 **2 Claims**



1. A method of making blood filter material comprising spraying a solution which includes a wetting agent and a solvent on hydrophobic filter media and evaporating the solvent leaving the wetting agent on the filter media, said wetting agent consisting essentially of material selected from the group consisting of polysorbate 20, polysorbate 40, polysorbate 60, polysorbate 80, and mixtures thereof, said filter media including first and second layers of filter media joined together along three sides to form a tube having one end closed, said step of spraying including spraying the inside and outside of the first and second layers of filters media at least adjacent the closed end, and said method including, additionally to said spraying step, depositing an additional solution of said wetting agent and said solvent onto the interior of the tube adjacent the closed end.

4,731,261

METHOD FOR COATING A METAL COVERED WITH METAL OXIDE FILM WITH REFRACTORY METAL OXIDE

Kazuo Tsuchitani, Himeji; Shoichi Ichihara, Toyonaka, and Tetsuji Ono, Amagasaki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 24, 1986, Ser. No. 832,406

Claims priority, application Japan, Feb. 27, 1985, 60-36624

Int. Cl.⁴ B05D *3/02*

U.S. Cl. 427—376.5 **12 Claims**

1. A coating method comprising immersing a metallic carrier having a metal oxide film in an aqueous slurry, said slurry containing a refractory metal oxide having an average particle diameter of 0.7 to 3 microns and a sol of a refractory metal oxide wherein the weight ratio of the refractory metal oxide having an average particle diameter of 0.7 to 3 microns to the refractory metal oxide in the sol is 30:1 to 8:1, blowing off the surplus slurry from the carrier, drying the carrier and calcining the carrier.

4,731,262

METHOD OF PAINTING ARTICLE FORMED OF SYNTHETIC RESIN

Masashi Ohno, Hatano; Takashi Toyama, Yokohama, and Kiminori Ishii, Ebina, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 2, 1986, Ser. No. 869,691

Claims priority, application Japan, Jun. 3, 1985, 60-118936

Int. Cl.⁴ B05D *1/36, 3/02, 7/00*

U.S. Cl. 427—379 **18 Claims**



1. A method of painting an article formed of a synthetic resin, comprising the steps of:

applying a bake-curable paint comprising a pigment of a desired color and an aprotic polar solvent which comprises from about 5 to about 40 wt % of the entire paint directly to a cleaned surface of the article formed of the synthetic resin; and

drying and baking the paint applied to said surface to thereby form a solid paint film of a desired color on said surface.

6. A painting method according to claim 1, further comprising the steps of applying in the absence of an aprotic polar solvent a second paint which comprises a pigment of a second desired color onto said paint film, and drying and baking said

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second paint applied onto said paint film to thereby provide an at least partly two-layered paint coating.

4,731,263
METHOD FOR THE PREPARATION OF IONOMER FILMS

Charles R. Martin, Bryan, and Robert B. Moore, III, College Station, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1986, Ser. No. 912,701
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—385.5 20 Claims

1. A method for forming a perfluorosulfonate ionomer film comprising:
(a) forming a solution of a perfluorosulfonate ionomer in its salt form;
(b) coating a substrate with the perfluorosulfonate ionomer solution; and
(c) heating the coated substrate to a temperature of at least about 120° C. for sufficient time to deposit a solvent-resistant film of a perfluorosulfonate ionomer onto the substrate.

4,731,264
SOL-GEL COMPOSITIONS CONTAINING SILANE AND ALUMINA

Chia-Cheng Lin, Gibsonia, and Charlene A. Falleroni, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1986, Ser. No. 915,344
Int. Cl.[4] B05D *3/02;* C08G *77/06*
U.S. Cl. 427—387 20 Claims

1. A composition of matter comprising the polymerization reaction product of the hydrolyzate of an aluminum alkoxide and an organoalkoxysilane of the general formula

$$R_xSi(OR')_{4-x}$$

wherein R is an organic radical, R' is a low molecular weight alkyl radical and x is at least one and less than 4.

4,731,265
METHOD OF MANUFACTURING MODIFIED WOOD MATERIAL

Shozo Hirao, Suita; Ayumu Yasuda, Hirakata; Yoshihiro Ohta, Takatsuki; Takashi Nakai, Shijonawate, and Kazuo Seto, Toyonaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 15, 1986, Ser. No. 896,964
Claims priority, application Japan, Nov. 15, 1985, 60-257204; Nov. 15, 1985, 60-257206; Nov. 20, 1985, 60-261701; Dec. 19, 1985, 60-285974
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—440 15 Claims

1. A method for manufacturing a modified wood material made to contain therein an insoluble, non-flammable inorganic compound, the method comprising a step of immersing a raw wood material in a first bath of a first water-soluble inorganic substance solution containing an effective amount of metallic ions other than copper or sodium high in affinity for said wood material so as to fix said metallic ions in said wood material, wherein said metallic ions are insoluble and non-flammable in said wood material, and a step of immersing said wood material in a second bath of a second water-soluble inorganic substance solution containing an effective amount of negative ions other than chromate for producing said insoluble, non-flammable inorganic compound upon reaction of said negative ions with said metallic ions, said wood material being immersed in said first and second baths for a time sufficient to effective fix throughout said wood material and insoluble, non-flammable inorganic compound.

4,731,266
WATER-RESISTANT POLYVINYL ALCOHOL FILM AND ITS APPLICATION TO THE PREPARATION OF GAS-IMPERMEABLE COMPOSITE ARTICLES

Claude Bonnebat, Pontault-Combault; Louis Macabrey, Mitry-le-Neuf, and Gilbert Roullet, Clamecy, all of France, assignors to Rhone-Poulenc, S.A., Courbevoie, France

Continuation-in-part of Ser. No. 716,101, Mar. 26, 1985, abandoned, and a continuation-in-part of Ser. No. 735,721, May 20, 1985, abandoned, which is a continuation of Ser. No. 556,556, Nov. 30, 1983, abandoned, said Ser. No. 716,101, is a continuation of Ser. No. 384,760, Jun. 3, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 751,491
Claims priority, application France, Jun. 3, 1981, 81 11119; Dec. 1, 1982, 82 20119
Int. Cl.[4] B32B *27/06, 27/30;* B29C *45/14*
U.S. Cl. 428—35 25 Claims

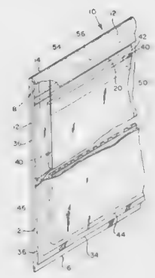
1. A composite thermoplastic article comprising a gelled, non-tacky, buffle-free film which is composed of polyvinyl alcohol and which is resistant to water at ambient temperature adhered to a thermoplastic material.

22. A composite thermoplastic article comprising a gelled, non-tacky, bubble-free film which is composed of polyvinyl alcohol and which is resistant to water at ambient temperature adhered to a thermoplastic material, wherein said polyvinyl alcohol film is obtained by
fluxing and melting granules of polyvinyl alcohol, said granules containing from aabout 25% to about 35%, by weight, of water, at a temperature above the equilibrium melting point of the polyvinyl alcohol/water mixture forming said granules; and
extruding the melted granules through a die at a temperature above the equilibrium melting point of the polyvinyl alcohol/water mixture, but below the temperature at which the water vapor pressure would be sufficient to cause the formation ob bubbles when the material is exposed to the air.

4,731,267
ARTICLE AND METHOD FOR WOOD PRESERVATIVE TREATMENT

Sharon J. Makus, and Warren L. Bennett, both of 11620 S.E. 45th Pl., Bellevue, Wash. 98006

Filed Jul. 28, 1986, Ser. No. 891,304
Int. Cl.[4] B27K *3/12, 3/14*
U.S. Cl. 428—35 3 Claims

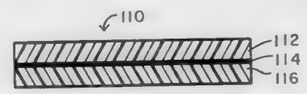


1. A wrap around article for wood preservative treatment of wood poles, posts and the like, comprising:
(a) a backing sheet of sufficient length to extend around the circumference of a pole through a predetermined zone with some overlap thereof, said backing sheet being made of flexible plastic sheet which is also water proof and which of a predetermined length between its upper and lower ends,
(b) generally rectangular pocket bag means secured to said backing sheet and which bag means extends around substantially all of the circumference of said pole, said bag means having on the inside thereof a substantially flat absorbant pad to a which a wood preservative solution is added so as to hold said wood preservative solution and wherein said bag means is also sealed so as to prevent leakage of said solution, and wherein before said wrap around article is applied to a pole substantially all of the exposed side of each said bag means is removed so that the absorbant pad means with said solution therein contacts said pole to permit the wood preservative solution to penetrate the wood.

4,731,268
MULTIPLE LAYER SHEET MATERIAL

Lee J. Murray, Jr., Appleton, and Suzanne E. Schaefer, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 687,202, Dec. 28, 1984. This application Jul. 31, 1986, Ser. No. 891,031
Int. Cl.[4] B32B *1/02*
U.S. Cl. 428—35 8 Claims



1. A container made from a multiple layer sheet material, said sheet material comprising:
(a) a first layer of high density polyethylene as an exterior layer of said sheet material;
(b) a second layer, the composition of said second layer being chosen from the group consisting of polymers and adhesives; and
(c) a third primer layer of polyethylene imine,
said third primer layer being between said first and second layers and in contact with said first layer, said first layer being disposed toward the inside of said container, all the layers of said sheet material being firmly adhered to each other.

4,731,269
FLAT STOCK FIBROUS CELLULOSIC FOOD CASINGS CONTAINING A LOW LEVEL OF TOTAL PLASTICIZER

James R. Hansen, Tinley Park, and Jerome J. M. Rasmussen, Burbank, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Jan. 27, 1986, Ser. No. 822,864
Int. Cl.[4] F16L *11/02;* A22C *13/00*
U.S. Cl. 428—36 32 Claims

16. A cut flat stock cellulosic fibrous food casing containing as the total plasticizer, about 10 wt.% glycerine and about 3 wt.% propylene glycol, and between about 14 wt.% and about 17 wt.% water, all based on the weight of bone dry cellulose in the casing.

17. A method of manufacturing a flat stock cellulosic fibrous food casing which comprises the step of adding at least one plasticizer to the casing, in an amount sufficient to provide a total plasticizer content in the casing of between about 10 wt.% and about 17 wt.%, including at least 9 wt.% polyol, both based upon the weight of bone dry cellulose in the casing.

4,731,270
LAMINATED TROUGH FOR A SPIRAL CONCENTRATOR AND PROCESS FOR CONSTRUCTION OF SAME

Edward W. Kent, and John W. S. Roeder, both of 2310 Empire Way, Boise, Id. 83709

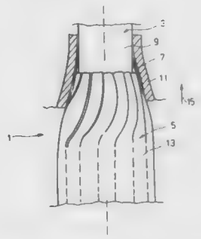
Filed Jun. 16, 1986, Ser. No. 874,395
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—36 4 Claims

1. A trough for a spiral concentrator, said trough including a top laminate comprising an abrasion resistant soft elastomer for engaging working materials and a bottom laminate comprising a rigid material chemically bonded to said top laminate for providing a structural support therefor.

4,731,271
CABLE CONNECTION SLEEVE

Karl H. Heucke, and Albrecht Ott, both of Hamburg, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 2, 1987, Ser. No. 20,565
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610370
Int. Cl.[4] H02G *15/00, 15/18*
U.S. Cl. 428—36 9 Claims



1. A sleeve for enclosing a cable connection, comprising a bendable sheet adapted to be laid around the cable connection, the sheet having a series of equally spaced longitudinal cuts in at least one marginal portion to be arranged transversely of the longitudinal direction of the cable connection, the cuts subdividing the marginal portion into tongues, the cuts being formed by cutting lines which extend in a direction deviating from the longitudinal direction so that the free ends of the tongues are offset with respect to the base portions of the tongues in a direction transversely of the longitudinal direction, whereby when the sheet is being laid around the cable connection the tongues can readily be laid with a partial overlap tapering down onto the cable sheath at the end of the cable connection.

4,731,272
SHRINKABLE CABLE SLEEVE

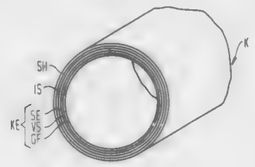
Hans-Juergen Meltsch, Schwerte-Ergste, Fed. Rep. of Germany, assignor to RXS Schrumpftechnik-Garnituren GmbH, Hagen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,154
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543930
Int. Cl.[4] B32B *31/26;* H02G *15/08*
U.S. Cl. 428—36 34 Claims

1. In a shrinkable cable sleeve composed of a shrinkable outer envelope and an inner cable sleeve insert which is formed of a plurality of layers the improvements comprising said outer evelope having a heat meltable adhesive layer facing the cable sleeve insert and the cable sleeve insert being a layer composite having a basic foil layer distributed over the full surface of the cable insert, a layer of activatable material when subjected to

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heat and reinforcing elements being arranged on the basic foil layer with the layer of activatable material when subjected to heat and reinforcing elements being arranged on the basic foil layer with the layer of activatable material facing the outer



envelope and being a material different than said adhesive layer so that when heat is applied. the layer of activatable material and the heat meltable adhesive layer melt to bond the outer envelope to the cable sleve insert.

4,731,273

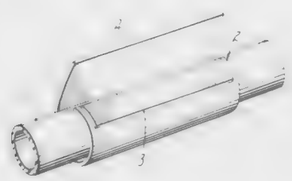
HEAT-RECOVERABLE CLOSURE WITH CROSSLINKED PRESSURE-SENSITIVE ADHESIVE

Thomas J. Bonk, Stillwater; Tsung-I Chen, Woodbury; Patricia M. Olson, and Douglas E. Weiss, both of Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 8, 1985, Ser. No. 752,946

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—57 **17 Claims**



1. An article useful as a wrap-around protective closure comprising:

(a) a sheet of flexible heat-recoverable material with a low surface-energy, having a unidirectional direction or recovery;

(b) a layer of an effective amount of a crosslinked pressure-sensitive adhesive having an exposed face and a face in contact with said sheet, adhered to at least a portion of said sheet transverse to said direction of recovery of said sheet; and

(c) a primer graft-polymerized to at least a portion of said sheet of heat-recoverable material.

4,731,274

NAPPED FUSIBLE INTERLINING CLOTH WITH ADHESIVE POWDER ON TIPS OF NAP

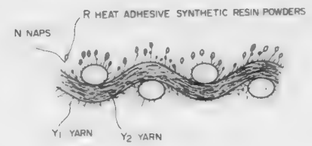
Shumpei Ishida, Osaka, and Sadao Obe, Itami, both of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jul. 9, 1987, Ser. No. 71,754

Claims priority, application Japan, Jul. 11, 1986, 61-163181

Int. Cl.[4] B32B *3/02, 33/00*

U.S. Cl. 428—87 **9 Claims**



1. A fusible interlining which comprises a base fabric having naps distributed thereon and heat adhesive synthetic resin powders applied mainly onto the surface of tip portion of said naps.

4,731,275

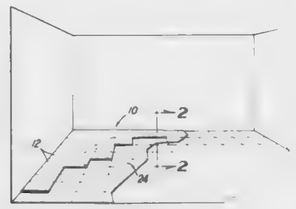
CARPET ASSEMBLY WHICH RESISTS LATERAL MOVEMENT AND PROCESS OF PRODUCING THE SAME

Walter R. Andersen, Dalton, Ga., assignor to 501 Andersen Company, Inc., Dalton, Ga.

Filed Dec. 29, 1986, Ser. No. 946,894

Int. Cl.[4] A01N *3/00*

U.S. Cl. 428—95 **15 Claims**



1. A carpet tile assembly for application over and engagement with a base layer, said tile assembly comprising a tile member having an upper traffic-bearing layer integrally engaged with a substrate, a second layer of elastomeric material integrally bonded to said substrate, said second layer having a plurality of protrusions extending radially downwardly therefrom throughout the surface area thereof and a base layer having an upper surface including means for engaging said protrusions for resisting lateral movement of said tiles applied thereon.

4,731,276

SCRIM REINFORCED, QUILTED CLOTH-LIKE COMPOSITE LAMINATE AND A METHOD OF MAKING

James H. Manning, and Wayne P. Sorenson, both of Appleton, Wis., assignors to The James River Corporation, Richmond, Va.

Continuation of Ser. No. 627,641, Jul. 3, 1984, abandoned. This application Apr. 8, 1985, Ser. No. 720,809

Int. Cl.[4] B32B *5/12*

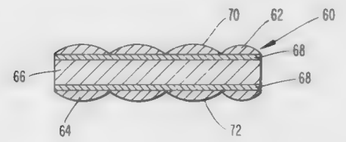
U.S. Cl. 428—110 **30 Claims**

1. A method of making a quilted cloth-like composite laminate comprising the steps of:

(a) inserting a scrim coated with a thermoplastic binder between two nonwoven layers each of the nonwoven

layers being formed of three-dimensional cellulosic fibers bound with a latex adhesive;

(b) heating the scrim and the two nonwoven layers to a temperature sufficient to activate the thermoplastic binder while maintaining unequal tension on the scrim and the two nonwoven layers; and



(c) pressing the scrim and the two nonwoven layers together to form a quilted cloth-like composite laminate having substantially all of each nonwoven layer of cellulosic fibers adhered to opposite sides of the scrim, the surface of each nonwoven layer being quilted and interrupted by the scrim.

4,731,277

NONWOVEN TEXTILE SPONGE FOR MEDICINE AND HYGIENE, AND METHODS FOR THE PRODUCTION THEREOF

Dieter Groitzsch, Hirschberg, and Hans-Jürgen Kühlwein, Viernheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,815

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528524

Int. Cl.[4] A61F *13/16;* **A61L** *15/01*

U.S. Cl. 428—137 **15 Claims**

1. A nonwoven textile sponge comprising at least one absorbent fiber layer and at least one perforated water-repellent outer fiber layer covering it on a wound side thereof, the repellent fiber layer consisting of at least 80% of synthetic heterofil filaments having a low-melting and a high-melting component, said fiber layers merged flowingly with one another as a result of heating, wherein the perforated regions contain no substantial fiber entanglement, and the entire material is consolidated thermally exclusively by the bonded filaments without binding agents.

4,731,278

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Masatoshi Takahashi, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1986, Ser. No. 862,724

Claims priority, application Japan, May 13, 1985, 60-101078

Int. Cl.[4] G11B *5/706, 5/708*

U.S. Cl. 428—141 **6 Claims**

1. A magnetic digital recording medium comprising a magnetic layer containing ferromagnetic fine particles and a binder coated on one side of a non-magnetic support and a backing layer coated on the opposite side of the non-magnetic support, wherein said ferromagnetic fine particles have a cobalt content of from 2 to 10 wt % with respect to the iron oxide content thereof, the content of divalent iron (Fe^{2+}) of from 1 to 10 wt % with respect to the trivalent iron (Fe^{3+}) content thereof, and the specific surface area of from 30 to 50 m^2/g, said binder comprises a copolymer of vinyl chloride-vinyl acetate-maleic acid contained in an amount of 40 wt % or more with respect to the total binder content of the magnetic layer, an abrasive agent having a Mohs hardness of 6 or more is contained in said magnetic layer, and the resulting magnetic tape has a coercive force of from 750 to 900 Oe at 25° C.

4,731,279

ASSEMBLY BLOCK FORMED FROM A POLY-OLEFIN FOAM

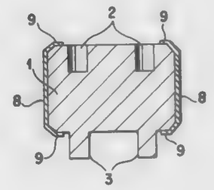
Tadao Isshiki, Kure, Japan, assignor to Rakkasan Company Ltd., Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,332

Claims priority, application Japan, Mar. 20, 1986, 61-62880; Jul. 11, 1986, 61-164322

Int. Cl.[4] B32B *3/02, 3/10, 3/26*

U.S. Cl. 428—159 **8 Claims**



1. An assembly block comprising a molded body of a poly-olefin foam having a rectangular, circular, oval or polygonal cross-section, said body having a pair of opposite surfaces of which one is provided with a plurality of regularly spaced apart holes, while the other of said surfaces is provided with a plurality of regularly spaced apart projections of which each can be fitted into one of said holes in said one surface of another block, at least one bore extending through said body between said surfaces thereof.

4,731,280

RIBBED ARTICLE AND METHOD OF MAKING A RIBBED ARTICLE

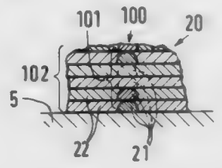
Max Geisseler, Ettenhausen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 18, 1986, Ser. No. 944,254

Claims priority, application Switzerland, Dec. 23, 1985, 5487/85

Int. Cl.[4] B32B *3/28, 3/30, 1/00, 3/00*

U.S. Cl. 428—163 **4 Claims**



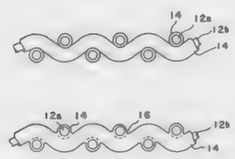
1. A ribbed article comprising

a base member; and

a plurality of ribs disposed on said base member with at least two of said ribs disposed in overlapping relation in an overlap zone and being formed of an equal number of multiple layers of weld seams, at least one weld seam in one of said two ribs extending continuously through said overlap zone and at least one weld seam in the second of said two ribs being interrupted in said overlap zone whereby said overlap zone is of equal height to the remainder of said two ribs relative to said base member.

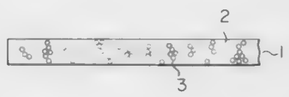
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4,731,281
PAPERMAKERS FABRIC WITH ENCAPSULATED MONOFILAMENT YARNS
Thomas B. Fleischer, Raleigh, N.C., and Walter M. Palmer, Greenville, Tenn., assignors to Huyck Corporation, Wake Forest, N.C.
Continuation of Ser. No. 665,666, Oct. 29, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 834,153
Int. Cl.[4] B01D *39/08;* **B32B** *5/02;* **D03D** *15/00;* **D21F** *1/10*
U.S. Cl. 428—196 **11 Claims**



1. A papermaker's forming fabric comprising an endless belt woven from:
monofilament machine direction yarns precoated prior to weaving with a polymer to impart anti-sticking characteristics to the papermaker's forming fabric and having a uniform, polymeric coating of a first thickness;
monofilament cross-machine direction yarns precoated prior to weaving a polymer to impart anti-sticking characteristics to the papermaker's forming fabric and having a uniform, polymeric coating of a second thickness, said first and second thicknesses being different.

4,731,282
ANISOTROPIC-ELECTROCONDUCTIVE ADHESIVE FILM
Isao Tsukagoshi, Shimodate; Yutaka Yamaguchi, Yuuki, and Tadamitsu Nakayama, Yokohama, all of Japan, assignors to Hitachi Chemical Co., Ltd., Japan
Continuation of Ser. No. 660,229, Oct. 12, 1984, abandoned. This application Apr. 23, 1986, Ser. No. 854,808
Claims priority, application Japan, Oct. 14, 1983, 58-193237; Dec. 15, 1983, 58-236883
Int. Cl.[4] B32B *5/16;* **C09J** *7/02*
U.S. Cl. 428—220 **10 Claims**

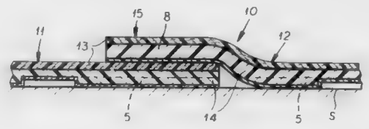


1. An adhesive film capable of exhibiting anisotropic-electroconductivity by applying pressure or pressure and heat to each of its major surfaces, said film comprising a polymeric adhesive component in the form of a film and electroconductive particles dispersed in the adhesive component in an amount of 0.1 to 10% by volume, said film being formed by cast molding a solution containing the adhesive component, the electroconductive particles and a solvent and thereafter evaporating the solvent, said electroconductive particles having an average particle size of 1 to 10 μm, with a ratio of the minimum particle diameter to the maximum particle diameter of each particle being 0.5 to 1.0, and the thickness of the film being not more than 50 μm, said adhesive film exhibiting a total light transmittance of 40% or more and electroconductivity only in the thickness direction thereof upon the application of pressure or pressure and heat to said major surfaces.

4,731,283
WATERPROOF CLOTH AND PROCESS FOR PRODUCTION THEREOF
Isamu Sakane, Ohtsu; Satuski Kawauchi, Shiga; Tsuneo Gemba, Okayama, and Minoru Maekawa, Toyonaka, all of Japan, assignors to Kuraray Co., Ltd., Okayama and I.S.T. Corporation, Shiga, both of, Japan
Filed Oct. 6, 1986, Ser. No. 915,569
Claims priority, application Japan, Oct. 7, 1985, 60-223960
Int. Cl.[4] B32B *17/10, 27/08, 27/28;* **D06M** *15/256*
U.S. Cl. 428—251 **15 Claims**

1. A waterproof cloth comprising
(1) a base cloth woven or knitted from treated yarns formed by impregnating yarns of heat-resistant fibers with a dispersion of fluorine resin, drying the impregnating yarns, and sintering the dryed yarns to adhere fluorine resin to the surfaces thereof and
(2) a film of a fluorine resin fused integrally to at least one surface of the base cloth.

4,731,284
THERMALLY BONDABLE ROOFING MATERIAL
Dieter Hailer, Düsseldorf, and Kurt Schult, Dorsten, both of Fed. Rep. of Germany, assignors to Dr. Kohl GmbH & Cie Dachbelag- und Bautenschutzmittel Fabrik, Dorsten, Fed. Rep. of Germany
Filed Oct. 21, 1986, Ser. No. 921,673
Int. Cl.[4] B32B *9/00, 11/00, 3/10;* **B65B** *63/00*
U.S. Cl. 428—291 **10 Claims**

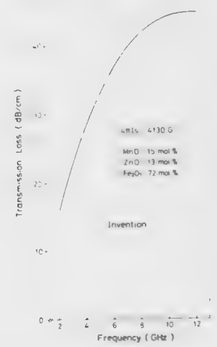


1. A roof covering material comprising a polybitumen sealing web composed of:
a thermally weldable closed homogeneous sealing layer formed along an underside with antibonding means and pressure equalizing means for affording fluid communication over an internal region of juxtaposition of said web with a roof surface; and
a support of a filamentary web impregnated with a polymer-bitumen on an upper surface of said substantially fluid-impermeable web,
said pressure-equalizing means including means forming a channel system along the underside of said sealing layer which consists of mutually intersecting longitudinal and transverse grooves formed in said sealing layer, and
said antibonding means including a layer covering said underside and resisting adhesion to the roof surface.

4,731,285
WATER-RESISTANT PHOTOGRAPHIC PAPER SUPPORT
Reiner Anthonsen, Bramsche, Fed. Rep. of Germany, assignor to Felix Schoeller, Jr. GmbH & Co. KG, Osnabruck, Fed. Rep. of Germany
Filed Sep. 8, 1986, Ser. No. 905,281
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3535954
Int. Cl.[4] B32B *5/16, 27/08;* **G03C** *1/86*
U.S. Cl. 428—323 **12 Claims**

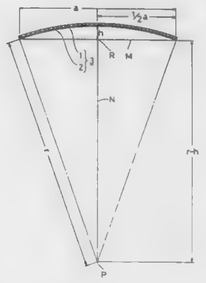
1. A water-resistant photographic paper support with at least one coating of a resin mixture thereon which is hardened by electron beams, wherein said resin mixture for the coating contains acrylated or methacrylated phosphoric acid or itaconic acid.

4,731,286
RADIO-WAVE ABSORPTIVE GASKET
Hiroshi Yamashita, Ichikawa; Yoshiaki Okada, Koshigaya, and Hiroshi Suzuki, Ichikawa, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Mar. 19, 1985, Ser. No. 713,518
Claims priority, application Japan, Sep. 18, 1984, 59-193943
Int. Cl.[4] H01P *1/26*
U.S. Cl. 428—329 **4 Claims**



1. In a radio-wave absorptive gasket, the improvement comprising:
a mixture of a Mn-Zn magnetic ferrite powder consisting of 4–22 mol percent MnO, 10–18 mol percent ZnO, and 68–78 mol percent Fe_2O_3 and a member selected from the group consisting of a rubber, a plastic, and mixtures thereof.

4,731,287
PROCESS FOR PRODUCING POLYIMIDE/METALLIC FOIL COMPOSITE FILM
Yuzuru Noda, Osaka, and Masanori Imai, Fukui, both of Japan, assignors to Nitto Electric Industrial Co., Ltd, Osaka, Japan
Division of Ser. No. 716,313, Mar. 27, 1985, Pat. No. 4,623,563. This application Aug. 5, 1986, Ser. No. 893,435
Claims priority, application Japan, Mar. 31, 1984, 59-64224
Int. Cl.[4] B32B *15/08, 27/06;* **H05K** *1/03*
U.S. Cl. 428—332 **1 Claim**



1. A polyimide/metallic foil composite film having a curvature radius of at least 25 cm and which is substantially free from curling, comprising a metallic foil having a thickness of 1 to 500 μm and a polyimide film which is prepared from a polyimide precursor which comprises a diamine component comprising p-phenylenediamine and an aromatic tetracarboxylic acid component comprising 3,3',4,4'-biphenyltetracarboxylic dianhydride or a derivative thereof.

4,731,288
VINYLIDENE FLUORIDE RESIN FILM AND METALLIZED FILM THEREOF
Toshiya Mizuno; Yoshikichi Teramoto, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 27, 1985, Ser. No. 716,461
Claims priority, application Japan, Mar. 31, 1984, 59-63495
Int. Cl.[4] C08F *14/22;* **B32B** *27/06*
U.S. Cl. 428—333 **8 Claims**

1. A vinylidene fluoride resin film comprising a homopolymer or copolymer of vinylidene fluoride having an inherent viscosity of 0.8 to 1.8 dl/g as measured in dimethylformamide at a concentration of 0.4 g/dl at 30° C., said vinylidene fluoride resin film having the characteristics (1) to (3) shown below:
(1) a crystal melting point giving a heat absorption peak of from 182° C. to about 196° C. as measured by a differential scanning calorimeter in a nitrogen atmosphere at a temperature elevation speed of 10° C./min.;
(2) a diffraction point corresponding to (1 1 $\bar{1}$) of the α-phase crystal at a wide angle X-ray diffraction photograph; and
(3) an orientation degree of the crystal of from 0.85 to about 0.94 when measured under irradiation of X-ray incident vertically on a major surface of the film.

4,731,289
ABRASION RESISTANT POLYURETHANE COATINGS FOR RIGID PLASTICS
Charles R. Coleman, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 500,123, Jun. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 121,343, Feb. 14, 1980, abandoned. This application Nov. 24, 1986, Ser. No. 935,107
Int. Cl.[1] C08G *18/64;* **B32B** *27/36, 27/40*
U.S. Cl. 428—334 **9 Claims**

1. An abrasion resistant branched polyurethane coated rigid plastic transparency comprising:
a. a transparent rigid plastic substrate; and
b. an abrasion resistant transparent branched polyurethane coating at least 5 mils thick formed from the reaction of an aliphatic diisocyanate and a polyol comprising a polyester polyol, said polyurethane having a durometer value at 70° F. between Shore A 50 and Shore D 80 and said polyol comprising sufficient triol to produce a branched polyurethane with a molecular weight between branch points between 1000 and 13,000

4,731,290
PROCESS FOR IMPROVING THE APPEARANCE OF A MULTILAYER FINISH
David C. K. Chang, Birmingham, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 11, 1986, Ser. No. 906,195
Int. Cl.[4] B05D *1/36, 7/00;* **B32B** *27/00;* **C08F** *82/80*
U.S. Cl. 428—335 **12 Claims**

10. A primer coated substrate having a cured multilayer finish comprising a layer of the guide coating composition in adherence to the primer coated substrate, a pigmented base coating in adherence to the guide coating composition and a clear top layer in adherence to the base coating wherein the guide coating composition comprising about 10–75% by weight of binder and 25–90% by weight of an aqueous carrier; wherein the binder consists essentially of
60–95% by weight of a dispersed acrylic polymer consisting essentially of about 10–20% by weight based on the weight of the polymer of methyl methacrylate, 70–80% by weight, based on the weight of the polymer of butyl acrylate, 2–9% by weight, based on the weight of the polymer of hydroxy ethyl acrylate and 1–5% by weight based on the weight of the polymer of methacrylic acid; 5–40% by weight of an alkylated melamine formaldehyde

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resin and containing pigment in a pigment to binder ratio of about 0.5/100–300/100.

11. The coated substrate of claim **10** in which the guide coating is about 0.1–1.0 mils thick, the base coating is about 0.2–1.5 mils thick and the clear top coating is about 0.5–6 mils thick.

4,731,291

WATER-RESISTANT PHOTOGRAPHIC PAPER SUPPORT

Alois-Bernhard Kerkhoff, Bissendorf, and Dietmar Bunke, GM-Hutte, both of Fed. Rep. of Germany, assignors to Felix Schoeller, Jr. GmbH & Co. KG, Osnabruck, Fed. Rep. of Germany

Filed Nov. 21, 1986, Ser. No. 933,488

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543597

Int. Cl.[4] **B32B** *27/32, 29/00;* **G03C** *1/76*

U.S. Cl. 428—342 **20 Claims**

1. A water-resistant photographic paper support, comprising a base paper internally sized with at least one hydrophobizing sizing agent, surface sized with an aqueous coating mixture, and coated with a polyolefin on both sides, said aqueous coating mixture including a copolymer of an ethylenically unsaturated monobasic carboxylic acid and vinyl alcohol with a saponification grade of at least 96% and having a carboxyl group content of about 1.5–7 mol. %.

4,731,292

MAGNETIC RECORDING MEDIUM

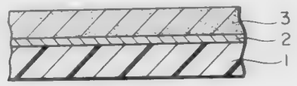
Kunitsuna Sasaki; Yoshitaka Yasufuku; Toshiaki Shibue, and Kazumasa Matsumoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1986, Ser. No. 930,777

Claims priority, application Japan, Nov. 18, 1985, 60-258840; Nov. 19, 1985, 60-259526

Int. Cl.[4] **G11B** *5/702*

U.S. Cl. 428—425.9 **11 Claims**



1. A magnetic recording medium comprising a support and, provided thereon, a magnetic layer comprising

(a) copolymer resin comprising a monomer unit of vinyl chloride, a first monomer unit having an alkali metal salt of sulfonic acid or an alkali metal salt of phosphoric acid, a second monomer unit having an epoxy group, and a third monomer unit having a hydroxy group;

(b) a fatty acid or a fatty acid ester;

(c) magnetic particles; and

(d) a polyurethane resin; said polymer is present in the ratio of from 90 to 10 parts by weight of said copolymer to 100 parts of said copolymer plus said polyurethane.

4,731,293

FABRICATION OF DEVICES USING PHOSPHORUS GLASSES

David T. Ekholm, Mountainside; William H. Grodkiewicz, Glen Gardner; Bertram Schwartz, Westfield; Shobha Singh, Summit; LeGrand G. Van Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

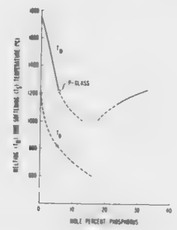
Filed Jun. 20, 1986, Ser. No. 876,442

Int. Cl.[4] **B32B** *17/06*

U.S. Cl. 428—426 **16 Claims**

15. A device comprising a surface at least partially coated with a phosphosilicate glass layer, said layer fabricated by electron beam deposition from a phosphosilicate glass target material characterized in that the phosphosilicate glass target material used in the electron beam deposition procedure is prepared by a procedure comprising the steps of

a. mixing together a substance A comprising P_2O_5 and a substance B comprising SiO_2 to form a mixture; and,



b. heat treating the resulting mixture at a temperature of at least 1700 degrees C. for at least 12 hours.

4,731,294

ORGANOPOLYSILOXANE COATING COMPOSITIONS HAVING IMPROVED HARDNESS

Jean-Marie Pouchol, Lyons, and Louis Gros, Solaize, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoir, France

Filed May 5, 1986, Ser. No. 859,708

Claims priority, application France, May 3, 1985, 85 06734

Int. Cl.[4] **B32B** *9/04*

U.S. Cl. 428—447 **11 Claims**

1. An organopolysiloxane composition of matter, comprising:

(A) 100 parts of a methylphenylpolysiloxane resin, in organic solvent solution, which comprises recurring units of the formulae $CH_3SiO_{1.5}$, $(CH_3)_2SiO$, $(C_6H_5)CH_3SiO$, $C_6H_5SiO_{1.5}$ and $(C_6H_5)_2SiO$, distributed in a C_6H_5/Si ratio of 0.3 to 0.85 and a $(C_6H_5+CH_3)/Si$ ratio of 1.1 to 1.65, and having a concentration of hydroxyl groups bonded to silicon atoms of 0.5 to 9%;

(B) 3 to 25 parts of a finely divided silica having a BET specific surface of at least 40 m^2/g; and

(C) 5 to 45 parts of aluminum powder, with the proviso that the weight ratio [(B)+(C)]/(A) ranges from 0.15 to 0.50

4,731,295

COATING COMPOSITION FOR CONTROLLING HYDROGEN ABSORPTION

Takashi Yamamoto, Souraku; Toshihiro Okai, Katano, and Mitsuyuki Oda, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

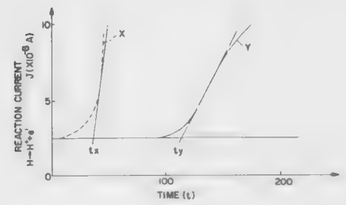
Continuation-in-part of Ser. No. 663,451, Oct. 22, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,581

Claims priority, application Japan, Oct. 22, 1983, 58-198022; Oct. 29, 1983, 58-203362; Feb. 9, 1984, 59-23873

Int. Cl.[4] **B32B** *11/00*

U.S. Cl. 428—472 **1 Claim**

1. A method for controlling hydrogen absorption of steel which consists essentially of directly coating the surface of said steel with a composition containing resin solids and a metal oxide, with said metal oxide being selected from the group consisting of vanadium pentoxide and molybdenum trioxide



and being employed at 1 to 500 percent by weight, based on 100 percent by weight of said resin solids.

4,731,296

DIAMOND-COATED TUNGSTEN CARBIDE-BASE SINTERED HARD ALLOY MATERIAL FOR INSERT OF A CUTTING TOOL

Noribumi Kikuchi; Tetsuro Komatsu; Hiroaki Yamasita, and Hironori Yoshimura, all of Ohmiya, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 66,698

Claims priority, application Japan, Jul. 3, 1986, 61-156781; Jul. 3, 1986, 61-156782

Int. Cl.[4] **B22F** *3/00*

U.S. Cl. 428—552 **6 Claims**

1. A sintered hard alloy material for an insert of a cutting tool, comprising:

(1) a matrix of a sintered hard alloy consisting essentially of 1–4 percent by weight cobalt, and the balance of tungsten carbide and inevitable impurities, the tungsten carbide having a coarse grain structure having an average grain size of 2–10 microns; and

(2) a diamond coating layer formed over surfaces of the matrix by forming an etching layer over the matrix surfaces and then forming the diamond coating layer over the matrix surfaces via the etching layer by a low pressure vapor-phase synthesization method.

4,731,297

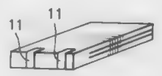
LAMINATED COMPONENTS OF OPEN MAGNETIC CIRCUIT TYPE

Minoru Takaya, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,545

Int. Cl.[4] **B32B** *15/02*

U.S. Cl. 428—553 **9 Claims**



1. Laminated components of the open magnetic circuit type including, or incorporating, inductors of the same type, each of which comprises a plurality of magnetic layers and a plurality of fragmentary conductor strips formed along the outermost edges of the magnetic layers to constitute about half a turn of coil each, said conductor strips being joined between and across the magnetic layers to form altogether a spiral coil-forming conductor pattern in which the strips are vertically superposed and connected on the same spiraling loci, the outermost peripheries of the conductor pattern being exposed from between the magnetic layers to the outside.

4,731,298

CARBON FIBER-REINFORCED LIGHT METAL COMPOSITES

Akio Shindo, Kawanishi, and Kuniaki Honjo, Ikeda, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of Industrial Trade & Industry, both of Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,397

Claims priority, application Japan, Sep. 14, 1984, 59-193469

Int. Cl.[4] **B32B** *15/14*

U.S. Cl. 428—611 **14 Claims**

1. A carbon fiber-reinforced light metal composite, comprising at least one light metal selected from the group consisting of aluminum alloy, magnesium and magnesium alloy, and carbon fibers having a layer formed of at least 95% by weight of free carbon, a layer formed preponderantly of at least one compound selected from the group consisting of metal carbides, titanium nitride, and boron nitride, and a layer formed preponderantly of at least one compound selected from the group consisting of titanium-boron, boron, and silicon-boron superposed on said carbon fibers outwardly in the order mentioned.

4,731,299

COMPOSITE MAGNETIC MATERIAL

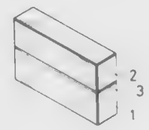
Kazuhiko Sato; Satoshi Miyaguchi, and Miroyuki Ota, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,385

Claims priority, application Japan, Oct. 31, 1984, 59-229460; Oct. 31, 1984, 59-229461

Int. Cl.[4] **H01F** *1/00*

U.S. Cl. 428—611 **12 Claims**



1. In a composite magnetic material including a first body (**2**) made of a magnetic metal material and a second body (**1**) made of an oxide magnetic material joined together, the improvement comprising a thin magnetic film (**3**) formed on said second body, and fastening means for joining said second body, having said thin magnetic film, to said first body, said fastening means being disposed between said film and said first body.

4,731,300

PERPENDICULAR MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF

Noboru Watanabe; Yasuo Ishizaka; Kazuo Kimura, all of Yokohama, and Eiichiro Imaoka, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Feb. 26, 1986, Ser. No. 834,236

Claims priority, application Japan, Mar. 7, 1985, 60-45326; Jun. 18, 1985, 60-132184; Jun. 18, 1985, 60-132185; Jun. 18, 1985, 60-132186; Jun. 18, 1985, 60-132182; Jun. 18, 1985, 60-132192; Jun. 18, 1985, 60-132189; Jun. 18, 1985, 60-132188; Jun. 18, 1985, 60-132183

Int. Cl.[4] **B32B** *32/00*

U.S. Cl. 428—636 **6 Claims**

1. A perpendicular magnetic recording medium on which a signal is recorded and from which the signal is reproduced by a magnetic head, said perpendicular magnetic recording medium comprising:

a recording medium base; and

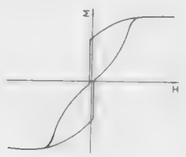
a magnetic layer comprising a low coercivity layer and a

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high coercivity layer, said magnetic layer as a whole having a thickness of under 0.3 micron, said low coercivity layer having a thickness in a range of 0.05 to 0.15 micron,

said low coercivity layer being formed on said recording medium base and having a low coercivity in an in-plane direction thereof,

said high coercivity layer being formed on said low coercivity layer and having a high coercivity in a direction perpendicular to a surface of said low coercivity layer,



said low coercivity layer and said high coercivity layer being formed from the same magnetic material which is a magnetic material including cobalt-chromium added with at least one of niobium and tantalum,

said magnetic layer having an in-plane M-H hysteresis characteristic described by an in-plane-M-H hysteresis loop which has a sharp rise in the vicinity of the origin.

4,731,301

TINNED STEEL SHEET HAVING A HIGH DEGREE OF CORROSION RESISTANCE AND A METHOD OF PRODUCING THE SAME

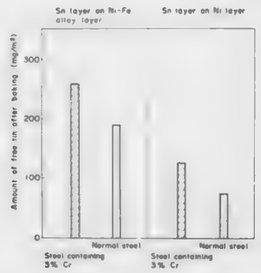
Seijun Higuchi; Yashichi Oyagi; Tomonari Oga; Toshinori Mizuguchi; Senkichi Tsujimura; Toshinori Katayama; Fumio Yamamoto, and Kenichi Asakawa, all of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,761

Claims priority, application Japan, Jul. 23, 1985, 60-162592; Aug. 1, 1985, 60-170502

Int. Cl.[4] B32B *15/18*

U.S. Cl. 428—648 **14 Claims**



1. A coated steel sheet of high corrosion resistance consisting essentially of:

a sheet of steel consisting essentially of up to and including 0.1% by weight of carbon, 0.005 to 0.08% by weight of soluble aluminum and 0.1 to 20% by weight of chromium, the balance being essentially iron;

a first coating layer electroplated on at least one surface of said steel from a material selected from nickel and a nickel alloy, and having a thickness of 0.001 to 1.5 microns; and

a second coating layer of tin electroplated on said first coating layer and having a thickness of at least 0.05 microns.

4,731,302

HARD COATINGS FOR MECHANICALLY AND CORROSIVELY STRESSED ELEMENTS

Christian Weissmantel; Bernd Rau; Klaus Bewilogua, all of Karl-Marx-Stadt; Dietmar Roth, Wuestenbrand, and Bernd Rother, Karl-Marx-Stadt, all of German Democratic Rep., assignors to Technische Hochschule Karl-Marx-Stadt, German Democratic Rep.

Filed Oct. 6, 1986, Ser. No. 915,848

Claims priority, application German Democratic Rep., Dec. 17, 1985, 2844075

Int. Cl.[4] B32B *7/02, 15/18*

U.S. Cl. 428—698 **16 Claims**

1. A hard coating for mechanically and corrosively stressed parts, such as tools, tool inserts, bearings or corrosively stressed modules, comprising a boron nitride layer having an amorphous network structure with an atomic short-range order similar to that of hexagonal crystalline phases, bound hydrogen in an amount of from 5 atom percent to 50 atom percent for stabilizing the structure, and an additional material selected form the group consisting of metals, boron, silicon, inert gases and mixtures thereof intercalated in the structure in an amount of from 1 atom percent to 50 atom percent.

9. A hard coating for mechanically and corrosively stressed parts, such as tools, tool inserts, bearings or corrosively stressed modules, comprising a carbon layer having an amorphous network structure with an atomic short-range order similar to that of hexagonal crystalline phases, bound hydrogen in an amount of from 5 atom percent to 50 atom percent for stabilizing the structure, and an additional material selected from the group consisting of metals, boron, silicon, inert gases and mixtures thereof intercalated in the structure in an amount of from 1 atom percent to 50 atom percent.

4,731,303

CUBIC BORON NITRIDE COATED MATERIAL AND PRODUCING METHOD OF THE SAME

Shin-ichi Hirano, Nagoya, and Susumu Yamaya, Kawasaki, both of Japan, assignors to Toshiba Tungaloy Co., Ltd., Japan

Filed Jul. 16, 1986, Ser. No. 886,068

Claims priority, application Japan, Jul. 17, 1985, 60-157682

Int. Cl.[4] C04B *35/58;* **B32B** *15/04*

U.S. Cl. 428—700 **8 Claims**

1. A cubic boron nitride coated material comprised of a substrate, an outer layer consisting essentially of cubic boron nitride, said outer layer being provided on a surface of the substrate, and at least one intermediate layer interposed between the substrate and the outer layer, said intermediate layer comprising at least one nitrogen-containing compound selected from the group consisting of nitrides and nitroxides of Al, Ga, In and Tl and mutual solid solutions of the aforesaid nitrides and nitroxides, wherein

(i) said intermediate layer presents a densely nitrogen-packed crystalline surface upon which said outer layer is formed and

(ii) said outer layer, in its outermost portion, presents a crystalline face that lies substantially in a **(111)** plane.

4,731,304

BATTERY SEPARATOR

Joseph T. Lundquist, Jessup; Christian B. Lundsager, Ashton, both of Md.; Nigel I. Palmer, New York, N.Y., and Howard J. Troffkin, Potomac, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 734,431, May 15, 1985, Pat. No. 4,650,730. This application Dec. 3, 1986, Ser. No. 937,241

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] H01M *2/18, 10/50*

U.S. Cl. 429—62 **32 Claims**

1. A sheet product having at least two plies comprising:

(a) at least one first ply in the form of a microporous sheet having pores of average pore size of from about 0.005 to about 50 microns in diameter and the pores occupy at least about 10 volume percent of the total volume of the first ply and of a predetermined length and breadth and a thickness of less than 10 mils (0.025 cm), said ply being capable, while a component of the sheet product, of transforming to a substantially non-porous membrane sheet at a transformation temperature of between about 80° C. and 150° C. while substantially maintaining the predetermined length and breadth dimensions; and

(b) at least one second ply in the form of a microporous sheet of a predetermined length and breadth and a thickness of less than 10 mils (0.025 cm) having pores of average pore size of from about 0.005 to about 5 microns in diameter wherein said pores occupy at least about 25 percent of the total volume of said sheet, said second ply being capable, while a component of the sheet product of substantially maintaining said microporous structure and said determined length, breadth and thickness at temperatures of from about ambient to at least about 10° C. greater than the transformation temperature of said first ply; each of said first and second ply being bonded together to provide a unitary sheet product.

4,731,305

CYLINDRICAL BIPOLAR ELECTRODE BATTERY

Franz Goebel, Sudbury; David C. Batson, Amesbury; Anthony J. Miserendino, Acton, and Gerard Boyle, Concord, all of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.

Filed May 15, 1987, Ser. No. 50,122

Int. Cl.[4] H01M *6/48*

U.S. Cl. 429—94 **2 Claims**



1. A battery comprising

(a) cylindrical housing;

(b) concentrically arranged cylindrical electrode structures within said cylindrical housing including:

(i) a first polarity cylindrical electrode structure

(ii) a second polarity cylindrical electrode structure; and

(iii) at least one bipolar cylindrical electrode structure having a conductive carrier, a first polarity electrode layer on the side of the carrier facing said second polarity cylindrical electrode structure, and a second polarity electrode layer on the side of the carrier facing said first polarity cylindrical electrode structure;

(c) a porous separator between each cylindrical electrode structure;

(d) a quantity of electrolyte solution; and

(e) means to couple electrical current from said first polarity and second polarity cylindrical electrode structures.

4,731,306

BATTERY ARRANGEMENT

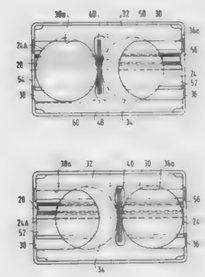
Gerhard Dumbser, Niederwerrn, Fed. Rep. of Germany, assignor to Sachs-Huret SA, France

Filed Dec. 16, 1986, Ser. No. 942,540

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 8535374[U]

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—98 **12 Claims**



1. A battery arrangement for an electronic appliance equipped with a data memory **(16)**, comprising a battery accommodation chamber **(14)** with electric contact terminal strips, **(28, 30)** wherein the improvement comprises that the battery chamber **(14)** is equipped for the simultaneous accommodation and electric connection of at least two batteries **(24, 24A)** so that in battery replacement the old battery **(24)** can remain in the battery chamber **(14)** and in electrical connection with the contact terminal strips **(28, 30)** until the new battery **(24A)** is inserted into the chamber **(14)** and is in electrical connection with the contact terminal strips **(28, 30)**.

4,731,307

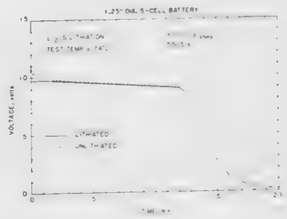
METHODS FOR ACHIEVING THE EQUILIBRIUM NUMBER OF PHASES IN MIXTURES SUITABLE FOR USE IN BATTERY ELECTRODES, E.G., FOR LITHIATING FES_2

Ronald A. Guidotti, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1986, Ser. No. 872,728

Int. Cl.[4] H01M *6/36;* **C01B** *17/00*

U.S. Cl. 429—112 **17 Claims**



1. In a method for preparing lithiated, particulate FeS_2 useful as a catholyte material in a lithium thermal battery, whereby the latter's voltage regulation properties are improved, comprising admixing FeS_2 and an amount of a lithium-containing compound whereby the resultant total composition falls in an invariant region of the metallurgical phase diagram of its constituent components,

the improvement comprising admixing said lithium-containing compound and FeS_2 together with a solid electrolyte

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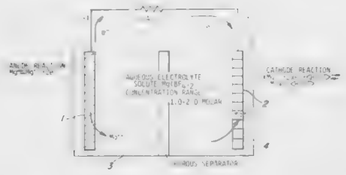
compatible with said catholyte, and heating the mixture in an inert atmosphere at a temperature above the melting point of said electrolyte and at which said mixture reaches its thermodynamic equilibrium number of phases.

4,731,308
BATTERY COMPONENT
Franz Goebel, Sudbury; David C. Batson, Amesbury; Anthony J. Miserendino, Acton, and Gerard Boyle, Concord, all of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.
Filed May 15, 1987, Ser. No. 50,121
Int. Cl.[4] H01M *2/38*
U.S. Cl. 429—121 **1 Claim**



1. A mechanical component for reserve type electrochemical batteries having cylindrical porous members, comprising a disc having:
(i) a plurality of circular grooves in one flat side for accepting said porous members;
(ii) at least one radial channel in the opposite flat side in fluid communication with said grooves.

4,731,309
HIGH RATE AND HIGH ENERGY DENSITY CELL
Ronald J. Hoffman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 744,828, Jun. 14, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,541
Int. Cl.[4] H01M *6/04, 10/44*
U.S. Cl. 429—188 **14 Claims**

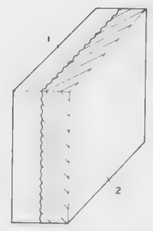


1. In an electric current producing primary electrochemical cell containing an alkaline earth metal anode active material, a cathode, and an aqueous electrolyte containing an ionizable salt, the improvement comprising using a cathode active material capable of intercalating ions of said anode active material and an aqueous electrolyte having a pH of about 1 to about 5 and essentially nonreactive with said cathode.

4,731,310
CATHODIC ELECTRODE
Menahem Anderman, Boyds, and Joseph T. Lundquist, Jr., Jessup, both of Md., assignors to W. R. Grace & Co., New York, N.Y.
Filed Aug. 15, 1986, Ser. No. 896,690
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—194 **16 Claims**

1. A cathodic electrode suitable for use in a non-aqueous battery system comprising at least one substantially homogeneous, microporous sheet product having a void volume of from 15 to 25 volume percent and having a composition consisting essentially of from about 90–94 weight percent of particulate material consisting essentially of titanium disulfide having an average particle size of less than about 20 microns, from about 6–10 weight percent of high density polyethylene having a weight average molecular weight of from about 200,000 to 500,000 and from 0 to about 2 weight percent of an organic plasticizer for said polyethylene; and a current collector composed of a conductive material, said collector being in intimate contact with each of said at least one microporous sheet product.

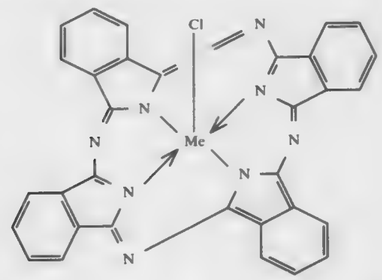
4,731,311
ELECTRICALLY CONDUCTIVE MATERIAL AND SECONDARY BATTERY USING THE ELECTRICALLY CONDUCTIVE MATERIAL
Tetsumi Suzuki, Isehara; Kazumi Hasegawa, Yokohama; Nobuhiro Furukawa; Koji Nishio, both of Hirakata; Masahisa Fujimoto, Osaka, and Noriyuki Yoshinaga, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Mitsubishi Chemical Industries Limited, Tokyo, both of, Japan
Filed Oct. 9, 1986, Ser. No. 917,051
Claims priority, application Japan, Oct. 9, 1985, 60-225761; Nov. 20, 1985, 60-260923; Apr. 30, 1986, 61-99564; May 14, 1986, 61-110372; May 14, 1986, 61-110373
Int. Cl.[4] H01M *4/60*
U.S. Cl. 429—213 **17 Claims**



1. An electrically conductive material containing no substantial amount of water and oxidizing agent and prepared by polymerizing, in the presence of an oxidizing agent, a pyrrole or thiophene compound on a base material in a gas phase and then washing the resultant product with an organic solvent, wherein said base material has spaces capable of retaining said oxidizing agent and said electrically conductive material contains no substantial amount of said compound.

4,731,312
PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY COMPRISES INDIUM PHTHALOCYANINE
Masakazu Kato; Yoichi Nishioka, and Katsuaki Kaife, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Division of Ser. No. 786,717, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 591,526, Mar. 20, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 15,599
Claims priority, application Japan, Mar. 25, 1983, 58-48963; Mar. 25, 1983, 58-48964; Mar. 25, 1983, 58-48965
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—31 **9 Claims**

1. In a method for electrophotography with a light source having a wavelength of about 650 nm or greater, which comprises exposing a photoconductor comprising an electroconductive substrate, a carrier generation layer vapor deposited on said substrate, and a carrier transport layer formed on the carrier generation layer, to a light image from said light source, the improvement wherein said carrier generation layer is made of an indium phthalocyanine having the formula



wherein Me represents indium, and said carrier generation layer having a transmittance with respect to applied wavelength as shown in FIG. 5.

4,731,313
APPARATUS FOR FORMING COLOR IMAGES AND METHOD OF USE THEREOF
Satoshi Haneda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Aug. 18, 1986, Ser. No. 897,781
Claims priority, application Japan, Aug. 23, 1985, 60-186437; Oct. 8, 1985, 60-225641; Oct. 15, 1985, 60-229524
Int. Cl.[4] G03G *15/01*
U.S. Cl. 430—42 **6 Claims**

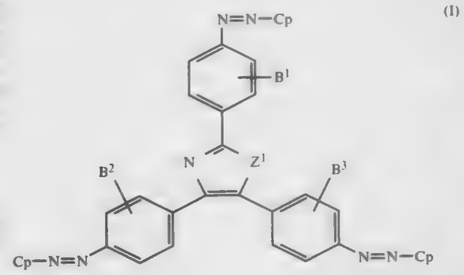
1. An image forming apparatus comprising a photosensitive member having a photoconductive layer, an insulating layer, and a differently colored fine filter layer, a charger for uniformly charging said photosensitive layer, means for exposing an image, at least two developing means, means for flattening the potential of the surface of said photosensitive member after an image exposure by said means for exposing, said means for flattening being placed between said means for exposing and said developing means, means for uniformly exposing said photosensitive member by using one of said at least two colors, said means for uniformly exposing being placed between said means for flattening and said developing means.

4,731,314
PRINTING MEMBER FOR ELECTROSTATIC PRINTING HAVING A HIGH CRYSTALLIZATION REGION OF AN INTRINSIC SEMICONDUCTOR LAYER FORMED BY IRRADIATION WITH LIGHT AND METHOD OF MANUFACTURING THEREOF
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory, Co., Ltd., Kanagawa, Japan
Filed May 7, 1986, Ser. No. 860,449
Claims priority, application Japan, May 7, 1985, 60-96389; May 7, 1985, 60-96390
Int. Cl.[4] G03G *13/26*
U.S. Cl. 430—49 **12 Claims**

1. A printing member for electrostatic photocopying, comprising:
a substrate having a conductive surface; and
a photo-electrically-sensitive, electrically chargeable layer on the conductive surface of the substrate;
wherein the photo-electrically-sensitive, electrically chargeable layer has (a) a first layer member formed on the conductive surface of the substrate, the first layer member having a P or N or I type first non-single-crystal semiconductor layer or a first semi-insulating or insulating layer, (b) a second layer member formed on the first layer member, the second layer member being a first laminate member having an I type second non-single-crystal semiconductor layer and an I type third non-single-crystal semiconductor layer having smaller energy band gap than that of the second non-single-crystal semiconductor layer, and (c) a third layer member formed on the second non-single-crystal semiconductor layer, the third layer member having an I type fourth non-single-crystal semiconductor layer having equal to or larger energy band gap than that of the second non-single-crystal semiconductor layer, or a second semi-insulating or insulating layer, or a second laminate member having the fourth non-single-crystal semiconductor layer or second semi-insulating layer and the insulating layer; and
wherein the third non-single-crystal semiconductor layer has a higher degree of crystallization than does the second non-single-crystal semiconductor layer.

4,731,315
ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING A TRISAZO COMPOUND AND A CHARGE TRANSPORT MATERIAL
Seiji Horie; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 8, 1986, Ser. No. 894,534
Claims priority, application Japan, Aug. 9, 1985, 60-175396
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—77 **17 Claims**

1. An electrophotographic photoreceptor comprising a conductive support having provided thereon a light-sensitive layer, wherein said light-sensitive layer contains as a charge generating material a trisazo compound represented by formula (I)



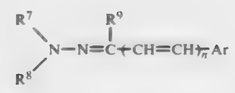
(I)

wherein Cp represents a coupler residue; Z^1 represents

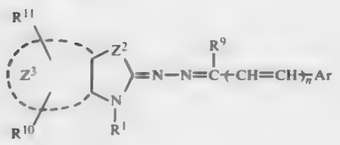


—O—, —S—, or —Se—, wherein R^6 represents a hydrogen atom, a substituted or unsubstituted lower alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted aryloxycarbonyl group, or a substituted or unsubstituted acyl group; and B^1, B^2, and B^3 each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted lower alkyl group, a substituted or unsubstituted lower alkoxy group, a substituted or unsubstituted lower alkoxycarbonyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aryloxy group, or a substituted or unsubstituted aryloxycarbonyl group; and contains as a charge transporting material at least one compound represented by one of formulae (II) to (VI)

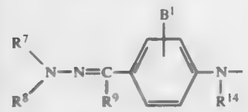
VOL 1088 ISS 3 MR 15 1988 UMI



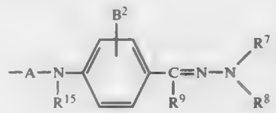
(II)



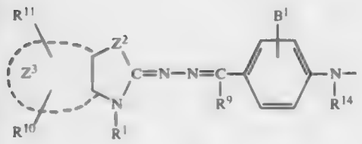
(III)

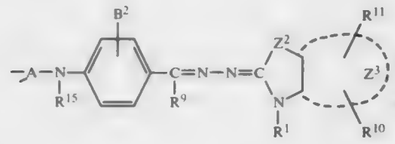


(IV)

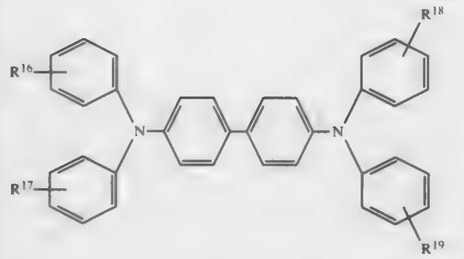


(V)



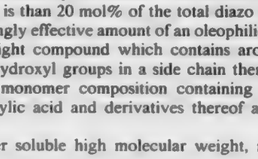


(VI)



wherein R^7, R^8, R^{14}, and R^{15} each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; or R^7 and R^8 together form a heterocyclic ring, or R^{14} and R^{15} together form an N-containing heterocyclic ring; R^9 represents a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group; B^1 and B^2 are the same as defined above; R^1 represents a substituted or unsubstituted alkyl group, or a substituted or unsubstituted phenyl group; R^{10} and R^{11} each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aralkoxy group, or a substituted or unsubstituted amino group; R^{16}, R^{17}, R^{18}, and R^{19} each represents a hydrogen atom, a halogen atom, or an alkyl group; Ar represents a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; Z^2 represents

—O—, —S—, —Se—, or a substituted or unsubstituted methine group; Z^3 represents an atomic group forming a benzene ring or a naphthalene ring; n represents 0 or 1; and A represents a group of the formula



wherein l and m represent 0 or an integer of from 1 to 6; n represents 0 or 1; and B^1 and B^2 are the same as defined above, or B^1 and B^2 together form a condensed polycyclic aromatic ring.

4,731,316

PHOTOSENSITIVE COMPOSITION

Hiroshi Tomiyasu, Kawasaki; Yoshihiro Maeda, Yokohama; Kiyoshi Goto, and Norihito Suzuki, both of Hachioji, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Konishiroku Photo Industry Co., Ltd., both of Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,454

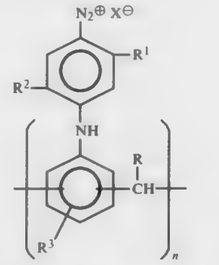
Claims priority, application Japan, Oct. 12, 1984, 59-212677

Int. Cl.[4] **G03C** *1/60;* **G03F** *7/08*

U.S. Cl. 430—157 **19 Claims**

1. A photosensitive composition, comprising an admixture of:

(a) a photosensitively effective amount of a photosensitive diazo resin of formula (I):



wherein R^1, R^2 and R^3 each represents hydrogen, alkyl or alkoxy, R represents hydrogen, alkyl or phenyl, X represents PF_6 or BF_4 and n represents a number from 1 to 200, and wherein the fraction of resin which has a molecular weight defined by the number n in the above formula as 5 or more is than 20 mol% of the total diazo resin present;

(b) a bindingly effective amount of an oleophilic high molecular weight compound which contains aromatic or aliphatic hydroxyl groups in a side chain thereof prepared from a monomer composition containing acrylic acid, methacrylic acid and derivatives thereof as monomeric units;

(c) a water soluble high molecular weight, non-hydroxyl group containing organic acid which contains carboxylic acid groups, said ingredient (c) being present in an amount of from 1.5 to 30% by weight based on solid matter in said composition.

4,731,317

LASER IMAGABLE LITHOGRAPHIC PRINTING PLATE WITH DIAZO RESIN

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Weston, Conn., assignors to Howard A. Fromson, Rockville, Conn.

Continuation of Ser. No. 618,586, Jun. 8, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 939,263

Int. Cl.[4] **G03C** *1/94, 1/52, 1/54, 1/60*

U.S. Cl. 430—159 **5 Claims**

1. Coated planar lithographic printing plate comprising a grained, anodized aluminum substrate and coating thereon comprising a diazo resin in admixture with particulate energy absorbing material that will absorb incident radiation and re-radiate it as radiation that will change said diazo resin coating which is imageable with a Crosfield Datrax 760 YAG laser plate maker producing incident laser radiation at 1.06 microns, said grined and anodized substrate having an anodic coating thickness equal to at least the wavelength of said incident laser radiation but not greater than 1.30 microns and being capable of absorbing at least 50% of the laser radiation used for imaging, the topography of said substrate and said particulate material in said coating trapping and converting a substantial portion of said incident laser radiation which passes through said coating without substantially affecting same into radiation that will change said coating.

4,731,318

INTEGRATED CIRCUIT COMPRISING MOS TRANSISTORS HAVING ELECTRODES OF METALLIC SILICIDE AND A METHOD OF FABRICATION OF SAID CIRCUIT

Alain Roche, La Tronche, and Joseph Borel, St. Egreve, both of France, assignors to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux - E.F.C.I.S., Grenoble, France

Filed Feb. 24, 1986, Ser. No. 831,851

Claims priority, application France, Feb. 26, 1985, 85 02760

Int. Cl.[4] **G03C** *5/00, 5/04;* **H01L** *21/00;* **B44C** *1/22*

U.S. Cl. 437—41 **3 Claims**

1. A method of fabrication of an integrated circuit, wherein said method comprises the following successive steps:

(a) formation of an insulating thin film constituting the gate insulator of a field-effect transistor on a substrate of monocrystalline silicon of a first conductivity type in an active zone of said substrate;

(b) etching of the insulating layer with a view to baring the monocrystalline silicon in source and drain electrical contact zones between source and drain regions and corresponding electrodes;

(c) uniform deposition of a metallic silicide over the entire substrate so that the silicide rests on the gate insulatr at locations in which said insulator is present and comes into direct contact with the monocrystalline silicon on the remainder of the active zone;

(d) deposition of a photosensitive layer which is capable of affording resistance to the silicide etching products and of serving as a mask for stopping impurities at the time of an operation involving implantation of impurities;

(e) photoetching of the photosensitive layer in order to form a resin pattern comprising a portion of resin above the gate insulator, said portion being intended to correspond to the pattern of the gate to be formed, and portions of resin defining a source electrode, a drain electrode and interconnections, the resin being removed along the edges of the gate above the active zone and permitted to remain above the silicide in portions of active zone in which the silicon;

(f) removal of the silicide by etching at locations in which it is not protected by the resin;

(g) ion implantation of impurities in order to define source and drain regions;

(h) removal of the resin;

(i) annealing of the substrate.

4,731,319

POSITIVE-WORKING NAPHTHOQUINONE DIAZIDE PHOTORESIST COMPOSITION WITH TWO CRESOL NOVOLAC RESINS

Hidekatsu Kohara, Chigasaki; Hatsuyuki Tanaka, Samukawa; Masanori Miyabe, Sagamihara; Yoshiaki Arai, Yokohama; Shingo Asaumi, Fujisawa, and Toshimasa Nakayama, Hiratsuka, all of Japan, assignors to Tokyo Ohka Kogy Co., Ltd., Kanagawa, Japan

Filed Jul. 18, 1986, Ser. No. 886,839

Claims priority, application Japan, Aug. 9, 1985, 60-174314

Int. Cl.[4] **G03C** *1/54, 1/60*

U.S. Cl. 430—192 **2 Claims**

1. A positive-working photoresist composition which comprises an admixture of:

(A) 100 parts by weight of a cresol novolac resin as a film-forming constituent; and

(B) from 25 to 60 parts by weight of a naphthoquinone diazide sulfonic acid ester as a photosensitive constituent, the cresol novolac resin being a combination composed of:

(A-1) a first cresol novolac resin having a weight-average molecular weight of at least 5000 and produced from an isomeric mixture consisting essentially of 60 to 80% of m-cresol and 40 to 20% of p-cresol; and

(A-2) a second cresol novolac resin having a weight-average molecular weight not exceeding 5000 and produced from an isometric mixture consisting essentially of 10 to 40% of m-cresol and 90 to 60% of p-cresol

in such a proportion that the overall cresol moiety in the component (A) is comprised of from 30 to 46.5% of the m-cresol moiety and from 70 to 53.5% of the p-cresol moiety.

4,731,320

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Masao Sasaki; Toyoki Nishijima; Shun Takada; Takashi Kadowaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

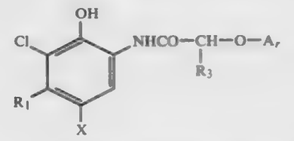
Continuation of Ser. No. 716,164, Mar. 26, 1985, abandoned. This application Aug. 13, 1986, Ser. No. 896,564

Claims priority, application Japan, Mar. 29, 1984, 59-61555

Int. Cl.[4] **G03C** *1/40, 1/46*

U.S. Cl. 430—505 **6 Claims**

1. A silver halide photographic material having one or more silver halide emulsion layers formed on a support, wherein at least one of said silver halide emulsion layers contains at least one cyan coupler of Formula (I) dispersed therein with the aid of a high-boiling organic solvent having a dielectric constant of not more than 6.0:



(I)

wherein R_1 is a straight-or branched-chain alkyl group having 2 to 4 carbon atoms; X is a hydrogen atom or a group capable of leaving upon coupling reaction; R_3 is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms; and Ar is an aryl group.

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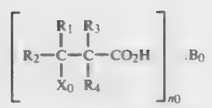
4,731,321

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Kozo Sato; Yoshiharu Yabuki; Hiroyuki Hirai, and Ken Kawata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 769,290, Aug. 26, 1985, abandoned.
This application Dec. 16, 1986, Ser. No. 942,042
Claims priority, application Japan, Aug. 24, 1984, 59-176398
Int. Cl.[4] G03C *1/06*
U.S. Cl. 430—559 27 Claims

1. A heat developable light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer comprising light-sensitive silver halide and a binder, and at least one layer on said support comprises as a base precursor a compound represented by the following general formula (I):



(I)

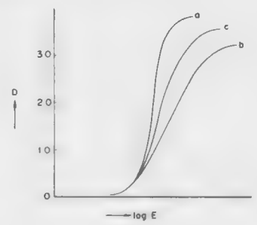
wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a carboxy group or a salt thereof; R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a halogen atom a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted sulfamoyl group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted acyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted amino group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted aryloxycarbonyl group, a substituted or unsubstituted acyloxy group, a phosphoryl group substituted with a substituted or unsubstituted alkyl group or aryl group, a phosphinyl group substituted with a substituted or unsubstituted alkyl group or aryl group, a thio group substituted with a substituted or unsubstituted alkyl group or aryl group, a sulfinyl group substituted with a substituted or unsubstituted alkyl group or aryl group or a sulfonylamino group substituted with a substituted or unsubstituted alkyl group or aryl group, a cyano group, a hydroxy group, a carboxy group or a salt thereof; X_0 represents a group capable of accelerating decarboxylation selected from the group consisting of an alkoxy group, an aryloxy group, an acylamino group, a sulfonylamino group, an imido group, an acyloxy group, an alkylthio group, an arylthio group, an alkoxycarbonyloxy group, an aryloxycarbonyloxy group, a dialkylcarbamoyloxy group and a nitrogen-containing heterocyclic group; B_0 represents an organic base; and n_0 represents 1 when B_0 represents a monoacidic base or 2 when B_0 represents a diacidic base, said light-sensitive material containing a reducing agent.

4,731,322

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL FOR X-RAY PHOTOGRAPHY

Akio Suzuki; Masatoshi Iwata; Katsutoshi Machida, and Chika Honda, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 609,891, May 14, 1984, abandoned.
This application Jul. 29, 1986, Ser. No. 892,889
Claims priority, application Japan, May 20, 1983, 58-87609
Int. Cl.[4] G03C *1/02, 5/24*
U.S. Cl. 430—567 6 Claims



1. A method for preparing a light-sensitive silver halide photographic material for X-ray photography comprising chemically sensitizing a monodispersed silver halide emulsion and chemically sensitizing a polydispersed silver halide emulsion, said monodispersed emulsion containing grains of a larger mean grain size than the grains of said polydispersed emulsion and then mixing said monodispersed emulsion with said polydispersed emulsion, the mean grain sizes of said polydispersed emulsion and said monodispersed emulsion are from 0.3 to 1.35 μm and the ratio of the former to the latter is 1:1.2 to 1:2.4, thereby preparing a light-sensitive silver halide photographic material having a characteristic curve whose gamma between optical densities of 0.50 and 1.50 is 2.7 to 3.3 and gamma between optical densities of 2.00 and 3.00 is 1.5 to 2.5 when processed by the following Developer-I:

Potassium sulfite	55.0 g
Hydroquinone	25.0 g
1-Phenyl-3-pyrazolidone	1.2 g
Boric acid	10.0 g
Potassium hydroxide	21.0 g
Triethylene glycol	17.5 g
5-Methylbenztriazole	0.04 g
5-Nitrobenzimidazole	0.11 g
1-Phenyl-5-mercaptotetrazole	0.015 g
Glacial acetic acid	16.0 g
Potassium bromide	4.0 g
Water to make up one liter.	

4,731,323

METHODS OF MEASUREMENT AND DETECTION EMPLOYING PHOTOSENSITIVE COMPOSITIONS AND PRODUCTS

Anthony Cerami, Flanders, N.J., and Michael A. Yamin, New York, N.Y., assignors to Evreka, Inc., New York, N.Y.

Division of Ser. No. 348,113, Feb. 11, 1982, Pat. No. 4,466,941.
This application Aug. 15, 1984, Ser. No. 641,082
Int. Cl.[4] C12Q *1/00, 1/32;* C12M *1/34*
U.S. Cl. 435—4 10 Claims

1. A method for measuring the presence of bioactive materials known to absorb ultraviolet light energy comprising:

A. disposing a quantity of a medium suspected of containing at least one of said bioactive materials in a container transmissive to ultraviolet light energy;

B. locating said container in the path of a beam of ultraviolet light energy emitted from a source therefor;

C. locating an indicator sensitive to said light energy beam in operative position adjacent said container and in the path of said light energy beam to receive any of the light energy of said beam that may pass therethrough, said indicator comprising a water and solvent-insoluble substrate on which is disposed a quantity of a photosensitive composition consisting essentially of a complex of a hydrophobic leuco dye and animal-derived serum albumin, said leuco dye and said serum albumin are bound to each other in said complex by hydrophobic bonds;

D. activating said light energy source to direct said beam against said container; and

E. determining the presence of said bioactive materials by inspecting said indicator after said beam has been directed against said container to measure the presence and amount of any of said light energy absorbed by said indicator, wherein the absence of a color reaction on said indicator reveals the presence of said bioactive materials.

4,731,324

VIRAL LYSIS ASSAY

Anthony H. Huang, Mountain View; Brenda Heath, and Francis J. Martin, both of San Francisco, all of Calif., assignors to Cooper-Lipotech, Inc., Menlo Park, Calif.

Filed May 21, 1984, Ser. No. 612,421
Int. Cl.[4] C12Q *1/70;* C12N *7/00;* G01N *33/554, 33/555*
U.S. Cl. 435—5 6 Claims

1. A method for the determination of a soluble analyte comprising

providing hemolytic virus particles having a lipid bilayer surface, surface-bound HN and F paramyxovirus proteins, and a surface array of non-viral, anti-analyte molecules composed of an anti-analyte which is not reactive toward red blood cell antigens and which is derivatized with a lipid moiety which anchors the molecules to the particle bilayer surfaces,

providing lysable target cells which (a) are substantially devoid of surface receptors capable of binding to such HN or F proteins, (b) have surface bound exogenous, analyte or analyte analogue molecules which are anchored to the target cell surfaces through a lipophilic moiety, and are effective to compete with the analyte for specific binding to such anti-analyte molecules, thereby by initiate target cell lysis, and (c) contain an encapsulated reporter which is detectable upon cell lysis,

reacting the analyte with the hemolytic particles and the target cells, to bind virus particles to the cells in inverse proportion to the amount of analyte present, and

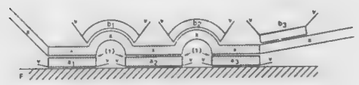
determining the extent of cell lysis produced as a result of said reacting, as evidenced by the extent of reporter release.

4,731,325

ARRAYS OF ALTERNATING NUCLEIC ACID FRAGMENTS FOR HYBRIDIZATION ARRAYS

Airi M. Palva, Helsinki; Tuula M. Ranki, and Hans E. Söderlund, both of Espoo, all of Finland, assignors to Orion-yhtymä , Espoo, Finland

Filed Jan. 24, 1985, Ser. No. 694,325
Claims priority, application Finland, Feb. 17, 1984, 840655
Int. Cl.[4] C12Q *1/70, 1/68;* C12P *19/34;* G01N *33/566*
U.S. Cl. 435—6 22 Claims



1. A nucleic acid reagent for use in a sandwich hybridization array to detect the identity of a nucleic acid, said nucleic acid reagent comprising at least two sets of a least two alternating nucleic acid fragments which are homologous to the nucleic acid which is to be identified, said alternating nucleic acid fragments being not homologous to one another, wherein at least one of the sets of nucleic acid fragments are labeled and at least one set of nucleic acid fragments are affixed to a solid carrier.

4,731,326

DISEASE DIAGNOSIS BY DETECTION OF SHED NORMAL TISSUE ANTIGENS

Russell E. Thompson, Marshfield; Robert H. Rubin; Nina T. Rubin, both of Brookline, and Teresa H. Chan, Burlington, all of Mass., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Jun. 4, 1984, Ser. No. 616,991
Int. Cl.[4] G01N *33/535, 33/545, 33/574, 33/577*
U.S. Cl. 435—7 55 Claims

1. A method for diagnosing disease or other conditions affecting the proximal tubules of the human kidney resulting in the release of normal proximal tubule associated antigens into a body fluid comprising the steps of:

(a) providing a solid phase surface having immobilized thereon a first antibody produced by cell line deposited as ATCC HB8540 or ATCC HB8428 and specific for a first epitopic site on said antigen;

(b) providing a second antibody from the other of said deposited cell lines, said second antibody having associated therewith a detectable entity and specific for a second epitopic site on said antigen;

(c) contacting said first and second antibodies with said body fluid sample suspected of containing the proximal tubule associated antigen to be detected under conditions suitable for immunological reactions whereby said antigen reacts with said first and second antibodies to form a sandwich complex;

(d) detecting the entity associated with said sandwich complex whereby the presence of said antigen may be determined.

4,731,327

METHOD FOR STABILIZING RECOMBINANT DNA MOLECULES AND ENHANCING THE EXPRESSION THEREOF IN STRAINS OF BACILLUS

Yoshio Furutani, Miura; Masaru Honjo; Kazuaki Manabe, both of Yokohama; Hiroaki Shimada, Kamakura, and Noboru Tomioka, Mobara, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Continuation of Ser. No. 580,123, Feb. 14, 1984, abandoned.
This application Aug. 18, 1986, Ser. No. 896,583
Claims priority, application Japan, Feb. 19, 1983, 58-25523
Int. Cl.[4] C12N *15/00;* C12P *21/00*
U.S. Cl. 435—172.3 17 Claims

1. A method for stabilizing and enhancing expression of recombinant DNA molecules comprising

(a) providing a temperature-sensitive mutant strain of genus Bacillus in which an initiation of chromosomal DNA replication is inhibited in a specific temperature range,

(b) introducing a recombinant DNA molecule into the temperature-sensitive mutant strain having a vector with a replication origin of pUB110 in which replication is initiated independently of a temperature-sensitive mutant gene of the temperature-sensitive mutant strain and

(c) culturing the temperature-sensitive mutant strain in a temperature range from and including 30° C. to below 45° C. and where initiation of chromosomal DNA replication of the temperature-sensitive mutant strain is partially inhibited,

such that said recombinant DNA molecules during said chromosomal DNA replication are stably retained and a copy number of said recombinant DNA molecules is increased.

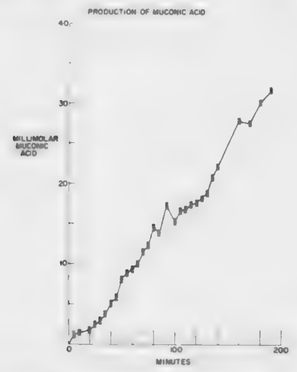
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4,731,328

PROCESS FOR THE PRODUCTION OF MUCONIC ACID

Peter C. Maxwell, New Providence, N.J., assignor to Celgene Corporation, Warren, N.J.

Continuation-in-part of Ser. No. 287,344, Jul. 27, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,088
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.[4] C12N *1/20, 15/00;* **C12P** *7/44;* **C12R** *1/40*
U.S. Cl. 435—253 **8 Claims**



1. A microbial culture having the following characteristics:
(a) possesses active benzoate dioxygenase;
(b) possesses active 1,2-dihydrodihydroxybenzoate dehydrogenase;
(c) lacks active catechol 2,3-oxygenase;
(d) does not grow on benzoate or halobenzoate;
wherein the microbial culture is capable of metabolizing catechol quantitatively to an accumulated quantity of muconic acid greater than about one gram or more per liter of a bioconversion medium, and wherein the microbial culture exhibits enzymatic activity characteristic of ATCC No. 31916 strain of *Pseudomonas putida* Biotype A.

4,731,329

ETHANOL PRODUCTION BY HIGH PERFORMANCE BACTERIAL FERMENTATION

Hugh G. Lawford, Mississauga, Canada, assignor to George Weston Ltd., Toronto, Canada

Continuation of Ser. No. 641,364, Aug. 15, 1984, Pat. No. 4,647,534, which is a continuation of Ser. No. 217,066, Sep. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 184,508, May 9, 1980, abandoned. This application Dec. 22, 1986, Ser. No. 944,072
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] C12P *7/14*
U.S. Cl. 435—162 **10 Claims**

1. A continuous process for producing ethanol by fermentation in an aqueous medium which comprises cultivating *Zymomonas mobilis* ATCC 29191 in two stages in order to increase ethanol concentration in the fermentation medium, as compared to ethanol concentration in a fermentation medium obtained by continuous cultivation of said *Zymomonas mobilis* microorganism in a single stage, said process consisting essentially of
(i) producing a bacterial biomass comprising a cell suspension of said Zymomonas together with ethanol in an ethanol concentration range which does not substantially inhibit production of said Zymomonas cells in a medium containing glucose and a source of nitrogen; and
(ii) producing ethanol in the absence of substantial production of said Zymomonas cells, by the addition of a medium containing glucose to the bacterial cell suspension produced in (i), wherein sugar concentration in stage (ii) does not exceed about 6% w/v;
wherein in step (i) the source of nitrogen is a mineral salt medium containing NH_4+ ions as the sole source or a mineral salt medium containing NH_4+ ions supplemented with an organic source of nitrogen,
and ethanol reaches a steady state concentration of about 10% w/v in the biomass in (ii).

4,731,330

WHOLE BLOOD CONTROL SAMPLE

James L. Hill, San Jose, and Laura J. Winfrey, Belmont, both of Calif., assignors to Biotrack, Inc., Mt. View, Calif.

Filed Jul. 1, 1986, Ser. No. 880,696
Int. Cl.[4] G01N *31/00, 33/86*
U.S. Cl. 436—16 **22 Claims**

1. A whole blood control sample, which comprises:
a lyophilized mixture comprising (1) fixed red blood cells, and (2) plasma solids including coagulation factors capable of producing clotting, wherein said mixture prior to lyophilization comprises 30–55% fixed red blood cells and 70–45% plasma.

12. A method of preparing a whole blood control sample, which comprises:
collecting a whole blood sample from one or more donors;
separating each whole blood sample into red blood cells and plasma;
fixing said red blood cells;
mixing said fixed red blood cells with plasma from the same or a different donor to produce a suspension containing 30–55% fixed red blood cells and 70–45% plasma including coagulation factors capable of producing clotting;
quick-freezing said suspension before said red blood cells can settle; and
lyophilizing said frozen suspension.

4,731,331

RATE METHOD FOR THE DETERMINATION OF INORGANIC PHOSPHORUS

Frank R. Shu, LaHabra Heights, and James H. Francis, Brea, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

PCT No. PCT/US84/00549, § 371 Date Jul. 17, 1984, § 102(e) Date Jul. 17, 1984, PCT Pub. No. WO85/04721, PCT Pub. Date Oct. 24, 1985
PCT Filed Apr. 9, 1984, Ser. No. 824,689
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 436—34 **14 Claims**

1. A rate method for measuring the amount of inorganic phosphate in a sample comprising:
(a) mixing a sample of biological fluid with a rate reagent comprising an acid, a molybdate salt, a nonionic surfactant, polyvinylpyrrolidone (PVP), and at least one sugar alcohol to produce a mixture; and,
(b) measuring the rate of formation of phosphomolybdate in the mixture as a measure of the amount of inorganic phosphate in the sample.

4,731,332

METHOD AND TEST KIT FOR DETERMINING THE AMOUNT OF POLAR SUBSTANCES IN FAT

Michael M. Blumenthal, Metuchen, N.J., and Jerry R. Stockler, Wantagh, N.Y., assignors to Oil Process Systems, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 621,050, Jun. 15, 1984, abandoned. This application May 31, 1985, Ser. No. 739,930
Int. Cl.[4] G01N *21/01, 33/03*
U.S. Cl. 436—61 **19 Claims**

1. A process for the determination of the amount of polar substances in fat, said process comprising the steps of:
(1) mixing a predetermined amount of a one phase test solution with a predetermined amount of the fat, said test solution including an indicator and a solvent, wherein the indicator is soluble in the solvent and the fat is substantially immiscible with the solvent, wherein the pH of the test solution is sufficiently acidic or basic such that any change in color of said test solution is not due to the presence of acids or bases extracted from said fat into said test solution, and said indicator in combination with polar substances extracted from the fat will provide polychromatic visible or fluorescent color changes in said test solution in response to characteristic amounts of polar substances in the fat, and wherein the indicator and solvent are present in amounts effective to provide said polychromatic visible or fluorescent color change in relation to the amount of polar substances in the fat;
(2) allowing the fat and test solution to separate into a solvent phase and a fat phase; and
(3) determining the amount of polar substances in the fat from the color developed in the solvent phase by comparing said developed color to a known standard.

4,731,333

METHOD FOR DETECTING GASEOUS HYDRIDES

Koichi Kitahara, and Takashi Shimada, both of Kanagawa, Japan, assignors to Japan Pionics., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,537
Claims priority, application Japan, Jun. 25, 1985, 60-138751
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—72 **8 Claims**

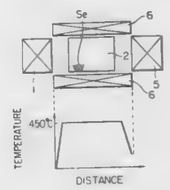
1. A method of detecting gaseous hydrides comprising contacting a solid detecting reagent comprising a basic copper carbonate as a color changing component with a waste gas discharged from a process of production of semiconductors containing at least one gaseous hydride selected from the group consisting of arsine, phosphine, diborane, hydrogen selenide, germane, monosilane, disilane and dichlorosilane and observing a change in color of the detecting reagent.

4,731,334

METHOD AND APPARATUS FOR DETECTING AND QUANTITATIVELY DETERMINING SELENIUM

Hajime Oosaka, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 20, 1985, Ser. No. 811,760
Claims priority, application Japan, Jan. 9, 1985, 60-941; Jan. 9, 1985, 60-942
Int. Cl.[4] G01N *21/62, 33/20*
U.S. Cl. 436—73 **5 Claims**



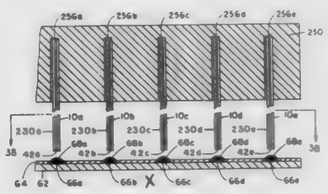
1. A method of detecting and quantitatively determining selenium, which comprises directing a spectrum line having a wavelength of 335 nm upon gaseous selenium at a temperature lower than the atomizing temperature of selenium, measuring the absorption of the spectrum line by the gaseous selenium and detecting and quantitatively determining selenium from the peak height of the intensity.

4,731,335

METHOD FOR TREATING THIN SAMPLES ON A SURFACE EMPLOYING CAPILLARY FLOW

David J. Brigati, Dauphin, Pa., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Sep. 13, 1985, Ser. No. 775,864
Int. Cl.[4] G01N *1/12*
U.S. Cl. 436—180 **36 Claims**



1. A method for applying liquid to a thin sample on a first surface which comprises the steps:
(a) providing a thin sample on a first surface,
(b) maintaining a second surface substantially parallel to and space by a first distance from the first surface, thereby providing a gap between the first and second surfaces,
(c) contacting a single edge of the gap with a discrete aliquot of liquid, the first surface, second surface and gap extending in a substantially vertical direction and the single edge being a lower edge,
the first distance being sufficiently small to cause liquid to migrate by capillary action within the gap and
(d) drawing liquid upwardly by capillary action within the gap from the single lower edge of the gap into contact with the sample.

4,731,336

IMMUNOASSAY FOR COMPLEMENT FRAGMENTS

Paul S. Satoh, Portage, Mich., assignor to Amersham International plc, Buckinghamshire, England

Continuation of Ser. No. 806,111, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 754,661, Jul. 11, 1985, abandoned, which is a continuation of Ser. No. 518,603, Jul. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 388,068, Jun. 14, 1982, abandoned. This application Nov. 3, 1986, Ser. No. 928,608
Int. Cl.[4] G01N *33/564, 33/536*
U.S. Cl. 436—506 **15 Claims**

1. A method for assaying complement fragment C_3a, C_4a or C_5a or the des-Arg derivative thereof in a biological sample which comprises combining equal volumes of the biological sample and a solution of 0.8 to 1.6% of an acridine derivative selected from the group consisting of acrinol, acriflavine, acriflavine hydrochloride, and aminacrine, incubating the mixture for about one minute to 2 hours at about 25° C., recovering the supernatant from the resultant precipitate, incubating the supernatant with a known amount of a labeled complement fragment selected from C_3a, C_4a or C_5a or the des-Arg derivative thereof and a known amount of antibody which recognizes said complement fragment or des-Arg derivative thereof, separating the free labeled complement fragment from the bound labeled complement fragment, measuring the amount of labeled complement fragment in either the free or antibody bound complement component, and determining the concentration of complement fragment or the des-Arg derivative thereof in the biological sample by comparison to a standard curve.

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4,731,337

FLUORIMETRIC IMMUNOLOGICAL ASSAY WITH MAGNETIC PARTICLES

Juhani E. I. Luotola, and Hannu Harjunmaa, both of Espoo, Finland, assignors to Labsystems Oy, Helsinki, Finland

Filed Jul. 24, 1985, Ser. No. 758,539
Claims priority, application Finland, Jul. 26, 1984, 842992
Int. Cl.⁴ G01N *33/533, 33/538, 33/553*
U.S. Cl. 436—526 **28 Claims**

1. A method of immunological assay for a target antibody or target antigen comprising:
   a. attaching an antigen or antibody to solid magnetic particles;
   b. contacting the magnetic particles resulting from (a) with
      (1) a sample containing either the target antibody or target antigen, and
      (2) fluorescently labeled antibody or fluorescently labeled antigen, respectively, said contacting taking place in a measurement vessel;
   c. forcing the magnetic particles resulting from (b) against the wall of the measuring vessel by an applied magnetic field;
   d. irradiating, through the walls of the measuring vessel, the magnetic particles adhering to the wall as a result of (c); and
   e. measuring the resultant fluorescent or phosphorescent radiation with a detector after this radiation has passed through the walls of the measuring vessel.

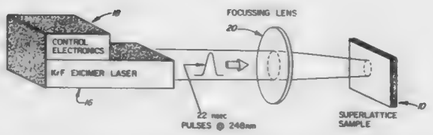
4,731,338

METHOD FOR SELECTIVE INTERMIXING OF LAYERED STRUCTURES COMPOSED OF THIN SOLID FILMS

John D. Ralston, Ithaca, N.Y.; Anthony L. Moretti, Lisle, and Ravinder K. Jain, Warrenville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 9, 1986, Ser. No. 916,818
Int. Cl.⁴ H01L *21/265, 21/203*
U.S. Cl. 437—22 **18 Claims**





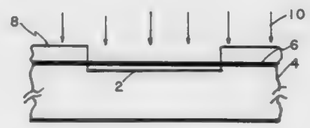
1. A method for selective intermixing of a multilayer structure, commonly known as a compositional superlattice, formed by a plurality of alternating layers of two different semiconducting materials, such that one set of layers, known as the quantum-well layers, is composed of a semiconductor material of smaller energy band gap, and the other set of layers, known as the barrier layers, is composed of a semiconductor material of larger band gap, to obtain laterally and/or vertically isolated regions, said regions exhibiting optical and electronic properties different than those of the alloy generated by intermixing said quantum-well layers and said barrier layers, said method comprising the steps of:
   providing a compositional superlattice; and
   irradiating said compositional superlattice with an energy source to selectively intermix the quantum-well layers and the barrier layers in said compositional superlattice.

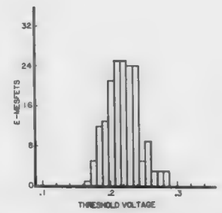
4,731,339

PROCESS FOR MANUFACTURING METAL-SEMICONDUCTOR FIELD-EFFECT TRANSISTORS

Frank J. Ryan, Agoura; Mau-Chung F. Chang, Thousand Oaks, both of Calif.; Dennis A. Williams, Colorado Springs, Colo., and Richard P. Vahrenkamp, Camarillo, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1986, Ser. No. 899,574
Int. Cl.⁴ B44C *1/22*
U.S. Cl. 437—29 **8 Claims**





1. A method of forming a metal-semiconductor field-effect transistor (MESFET) comprising the steps of:
   providing a semiconductor having a dielectric film;
   implanting ions through said dielectric film to form an N^- layer in a selected area of said semiconductor;
   forming a dummy gate on said dielectric film over said N^- layer using a single-level photoresist process;
   implanting ions through said dielectric film to form an N^+ region in said selected area while using said dummy gate to mask said N^- layer and retain an N^- layer for the gate of said MESFET;
   reducing the length of said dummy gate by reactive ion etching;
   depositing an SiO_x dielectric on said dielectric film covering said N^+ implanted region and on the portion of said N^- layer not covered by said dummy gate, while using said dummy gate to mask the underlying portion of said N^- layer;
   lifting off said dummy gate;
   annealing said N^- layer and said N^+ region;
   etching source and drain openings in said dielectric film and in said SiO_x dielectric;
   depositing ohmic metal contacts in said openings to form the source and drain of said MESFET;
   recessing said N^- layer by exposing it to a reactive ion etch plasma to obtain the desired threshold voltage; and
   depositing gate metallization on said N^- layer.

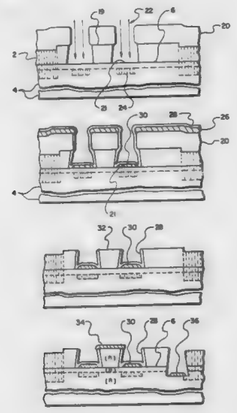
6. A method of forming a metal-semiconductor field-effect transistor (MESFET) comprising the steps of:
   providing a semiconductor having a dielectric film;
   implanting ions through said dielectric film to form an N^- layer in a selected area of said semiconductor;
   forming a dummy gate on said dielectric film over said N^- layer using a single-level photoresist process;
   implanting ions through said dielectric film to form an N^+ region in said selected area while using said dummy gate to mask said N^- layer and retain an N^- layer for the gate of said MESFET;
   reducing the length of said dummy gate by reactive ion etching;
   depositing an SiO_x dielectric on said dielectric film covering said N^+ implanted region and on the portion of said N^- layer not covered by said dummy gate, while using said dummy gate to mask the underlying portion of said N^- layer;
   lifting off said dummy gate;
   annealing said N^- layer and said N^+ region;
   etching source and drain openings in said dielectric film and in said SiO_x dielectric;
   depositing ohmic metal contacts in said openings to form the source and drain of said MESFET;
   depositing gate metallization on said N^- layer.

4,731,340

DUAL LIFT-OFF SELF ALIGNING PROCESS FOR MAKING HETEROJUNCTION BIPOLAR TRANSISTORS

Mau-Chung F. Chang, Thousand Oaks, and Peter M. Asbeck, Newbury Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 24, 1987, Ser. No. 17,957
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—31 **18 Claims**



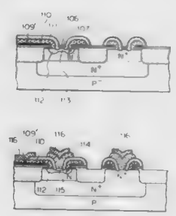
1. A method of fabricating a heterojunction bipolar transistor (HBT), comprising:
   providing a heterojunction bipolar semiconductor wafer having a first layer of a semiconductor of one conductivity type, a second layer of a semiconductor of an opposite conductivity type on the first layer forming a first p-n junction, and a third layer of a semiconductor of the one conductivity type on the second layer forming a second p-n junction, at least one of the p-n junctions being a heterojunction;
   forming a photoresist pattern on the wafer with an opening which defines a base location of the HBT;
   etching the third layer through the opening to the second layer;
   depositing base contact metal on the second layer through the opening;
   depositing dielectric on the base contact metal and on the sidewalls of the opening;
   lifting off the photoresist with its overlying dielectric and metal while maintaining dielectric on the sidewalls;
   defining a location for emitter contact metal of the HBT on the third layer;
   depositing emitter contact metal on the emitter contact location;
   providing an opening to the first layer, and;
   depositing collector contact metal on the first layer through the opening.

4,731,341

METHOD OF FABRICATING BIPOLAR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Akira Kawakatsu, Tokyo, Japan, assignor to Oki Electric Industrial, Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1986, Ser. No. 913,303
Claims priority, application Japan, Oct. 2, 1985, 60-218069
Int. Cl.⁴ H01L *21/265, 21/385*
U.S. Cl. 437—31 **6 Claims**



1. A method of fabricating a bipolar semiconductor integrated circuit device comprising the steps of:
   (a) forming a two-layered film composed of both a thin oxide film and a nitride film on the surface of an impurity doped layer of a first conductivity type which is formed on a semiconductor substrate;
   (b) forming a resist layer on a selected surface of said two-layered film, said resist layer having an overhanging cross section;
   (c) depositing a high melting metal on the surface of the structure obtained by the above step in such manner that said metal does not cover the surface of said nitride film under the overhanging portion of said resist layer;
   (d) selectively removing said two-layered film under said overhanging portion of said resist layer to expose the surface of said impurity doped layer;
   (e) depositing a semiconductor material on an entire surface of the structure obtained by the above step, said semiconductor material being deposited under said overhanging portion of said resist layer;
   (f) removing said resist layer to expose the surface of said nitride film;
   (g) implanting impurities of a second conductivity type into said semiconductor material;
   (h) oxidizing said semiconductor material layer to convert the surface of said semiconductor material layer into an oxide layer;
   (i) diffusing impurities from said semiconductor material layer to form a diffused region in said impurity doped layer;
   (j) removing said exposed nitride and oxide films to expose the surface of said impurity doped layer; and
   (k) forming a semiconductor material layer containing said first conductivity type impurities on said exposed surface of said impurity doped layer.

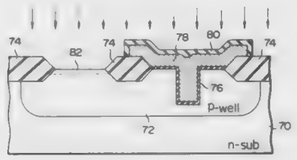
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4,731,342

METHOD OF MANUFACTURING A MEMORY CELL FOR A DYNAMIC TYPE RANDOM ACCESS MEMORY

Hidemi Ishiuchi, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1986, Ser. No. 901,520
Claims priority, application Japan, Aug. 30, 1985, 60-191573
Int. Cl.[4] H01L *21/425*
U.S. Cl. 437—48 3 Claims



1. A method of manufacturing a memory cell for a dynamic type random access memory, comprising:
- a first step of forming at least one well region of a first conductivity type in the surface of a semiconductor substrate;
- a second step of forming a field insulating layer surrounding part of a surface of said well region, as an element region;
- a third step of forming a groove in the surface of said well region;
- a fourth step of forming a capacitor electrode insulatively on the surface of said well region corresponding to said groove;
- a fifth step of forming a covering layer on said capacitor electrode;
- a sixth step of doping a predetermined amount of an impurity of the second conductivity type into the surface of said well region, with the use of said field insulating layer and covering layer as masks, so that said well region has a reduced carrier density in the vicinity of the impurity-doped surface, said predetermined amount of said impurity being in a range in which the conductivity type of said well region is not changed during manufacture;
- a seventh step of forming a gate electrode insulatively on the impurity-doped surface of said well region; and
- an eighth step of forming source and drain regions of the second conductivity type in the impurity-doped surface of said well region.

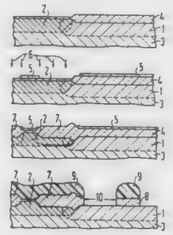
4,731,343

METHOD FOR MANUFACTURING INSULATION SEPARATING THE ACTIVE REGIONS OF A VLSI CMOS CIRCUIT

Willy Beinvogl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 802,258, Nov. 27, 1985, abandoned.
This application Jul. 31, 1987, Ser. No. 80,197
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445527
Int. Cl.[4] H01L *21/76*
U.S. Cl. 437—63 5 Claims

1. A method for the manufacture of CMOS circuits which comprises:
- providing a p-doped silicon substrate,
- applying an implantation mask consisting of resist and silicon nitride over portions of said substrate,
- implanting and diffusing ions into said substrate through said mask to form an n-doped zone (n-well),
- removing said resist after said implanting of ions,
- oxidizing the surface of said substrate to produce an oxide layer thereover,
- implanting ions into said substrate to form a p-doped zone of lesser depth than said n-doped zone,
- depositing and structuring a layer of silicon nitride over said substrate to cover said n-doped zone while leaving portions of said p-doped zone in which field implantation is to occur uncovered,
- injecting boron ions into the uncovered portions,
- generating field oxide regions in said p-doped zone by local oxidation using the silicon nitride as a mask,



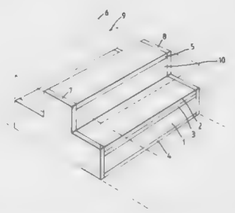
- removing the silicon nitride masking,
- masking the oxide layer over the p-doped zones with a photoresist layer while leaving portions of said n-doped zone uncovered, and
- etching moats into the oxide layer over said n-doped zone to provide ridges which insulate active regions of said substrate from one another.

4,731,344

METHOD OF MAKING A SINGLE HETEROSTRUCTURE LASER CHIP HAVING SAWN CAVITIES AND SECONDARY SAW CUTS

Kevin Canning, and Alan J. Perryman, both of Paignton, Great Britain, assignors to STC Plc, London, England

Filed Mar. 4, 1986, Ser. No. 835,990
Claims priority, application United Kingdom, Mar. 8, 1985, 8506072
Int. Cl.[4] H01L *21/304*
U.S. Cl. 437—129 6 Claims



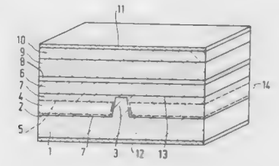
1. A method of making a sawn cavity laser chip, which method includes the steps of preparing a single heterostructure device structure single crystal semiconductor wafer by the epitaxial growth of a layer of GaAlAs of one conductivity type upon a GaAs substrate of the opposite conductivity type, cleaving the wafer to obtain a bar of semiconductor material sawing the bar into individual chips, and making secondary saw cuts parallel with the sawn edges to define a laser chip with an inverted Tee cross-section, wherein the secondary saw cuts are made to a depth terminating short of the active region of the laser chip defined by its heterostructure.

4,731,345

METHOD OF MAKING A SEMICONDUCTOR LASER BY CONTINUOUS LIQUID PHASE EPITAXY WITH OUT-DIFFUSION FROM ONE OR MORE ADJACENT LAYERS

Theodorus G. J. Van Oirschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 595,091, Mar. 30, 1984, Pat. No. 4,653,037.
This application Dec. 31, 1986, Ser. No. 948,387
Claims priority, application Netherlands, Apr. 15, 1983, 8301331
Int. Cl.[4] H01L *21/208*
U.S. Cl. 437—129 5 Claims



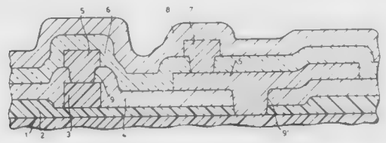
1. A method of manufacturing a semiconductor device, which comprises:
- providing a highly doped semiconductor substrate of a first conductivity type;
- etching said substrate to form a substantially planar surface with at least one strip-shaped raised portion thereon;
- growing a semiconductor blocking layer of a second, opposite conductivity type on said surface and said raised portion;
- growing a passive semiconductor layer of the first conductivity type on said blocking layer;
- growing a thin active semiconductor layer on said passive layer;
- growing a passive semiconductor layer of the second conductivity type on said active layer, the steps of growing the blocking layer, the active layer and the two passive layers being conducted substantially continuously; and
- forming a diffused zone of the first conductivity type which connects the passive layer of the first conductivity type to said raised portion by diffusing dopant from said passive semiconductor layer of the first conductivity type into said blocking layer.

4,731,346

HETEROGENEOUS CONFORMAL CVD OF ARSENOSILICATE GLASS

Gareth W. B. Ashwell, Ipswich, England, assignor to British Telecommunications Public Limited Company, London, England

Filed Jan. 16, 1985, Ser. No. 691,819
Claims priority, application United Kingdom, Jan. 18, 1984, 8401250
Int. Cl.[4] H01L *29/167, 29/78, 21/95*
U.S. Cl. 437—240 13 Claims



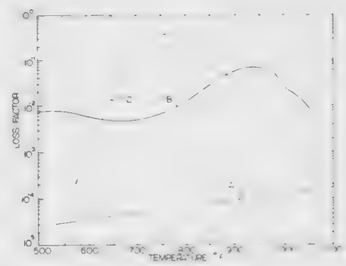
1. A process for fabricating a semiconductor device having a conformal dielectric coating of arsenosilicate glass disposed over underlying material layers having a topography which includes abrupt changes in vertical elevation, said process comprising the steps of
- locating said semiconductor device with said underlying material layers within chemical vapor deposition apparatus;
- maintaining the temperature of said device below about 500° C. while controllably admitting a gaseous mixture comprising SiH_4, O_2, AsH_3 and non-reactive diluent into the environment of said device wherein the volume ratio of silane to arsine lies in the range 3.8:1 to 11.7:1, with the volume ratio of oxygen to silane in the range of 18.5:1 to 41:1 so as to establish a predominantly heterogeneous deposition reaction onto the surface of said device and thereby achieve said conformal dielectric coating.

4,731,347

GLASS FRIT COMPOSITION

Alvin R. Stetson, San Diego, Calif., assignor to Solar Turbines Incorporated, San Diego, Calif.

Filed Mar. 21, 1986, Ser. No. 855,211
Int. Cl.[4] C03C *8/02, 3/108, 3/089*
U.S. Cl. 501—21 8 Claims



1. A glass frit having a firing temperature of less than about 1100° F. and a coefficient of thermal expansion approximating that of stainless steel and many nickel-base alloys comprising about 60% by weight of glass formers, 30% by weight of monovalent fluxes and 10% by weight of divalent fluxes; the glass formers consisting essentially of SiO_2 and B_2O_3; the monovalent fluxes consisting essentially of Li_2O, Na_2O and K_2O; the divalent fluxes being selected from the group consisting of CaO, SrO, and BaO; and additional trace elements not exceeding 10% by weight.

7. A glass frit capable of being fired at less than 1100° F. and having the following composition, in terms of oxides:

Oxide	Percent by weight
SiO_2	44 to 54
B_2O_3	10 to 14
Li_2O	3 to 4
Na_2O	13 to 16
K_2O	10 to 13
CaO	4 to 6
SrO	1 to 2
BaO	2 to 3

and other elements not exceeding 10% by weight.

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4,731,348

ALUMINOSILICATE OPTICAL GLASS

Carlos Gonzales-Oliver, Geneva, Switzerland, assignor to Batelle Memorial Institute, Geneva, Switzerland

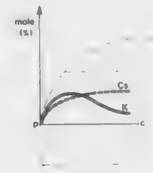
PCT No. PCT/CH85/00038, § 371 Date Nov. 7, 1985, § 102(e) Date Nov. 7, 1985, PCT Pub. No. WO85/03928, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 4, 1985, Ser. No. 800,596

Claims priority, application Switzerland, Mar. 7, 1984, 1131/84

Int. Cl.⁴ C03C *3/062, 3/083*

U.S. Cl. 501—54 **6 Claims**



1. An aluminosilicate optical glass without boron oxide, characterized in that it contains:
(a) 60–95 mole % of silica;
(b) at least 2 mole % of alumina; and
(c) at least 2 mole % of a modifying metal component selected from the group consisting of
(i) an oxide of silver,
(ii) a mixture of an oxide of silver and an oxide of thallium,
(iii) a mixture of a oxide of silver and an oxide of cesium, and
(iv) a mixture of an oxide of silver, an oxide of thallium and an oxide of cesium.

4,731,349

PROCESS OF PRODUCING ALUMINA-TITANIUM CARBIDE CERAMIC BODY

Minyoung Lee; Lawrence E. Szala, and Marcus P. Borom, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,041

Int. Cl.⁴ C04B *35/10, 35/56*

U.S. Cl. 501—87 **15 Claims**

1. In a process of making a multi-phase, substantially crystalline, sintered ceramic body, consisting essentially of
(i) preparing a mixture consisting essentially of 40% to 80% by weight aluminum oxide powder and from about 20% by weight to about 60% by weight titanium carbide powder,
(ii) consolidating said mixture under pressure to produce a pressed powder body;
(iii) heating said body in an unconfined state to at least a sintering temperature;
(iv) holding said body at sintering temperature for a period at least sufficiently long enough to achieve uniform temperature distribution throughout the body; and
(v) recovering said sintered body, the improvement which consists essentially of including in said mixture a member selected from the group consisting of zirconium hydride, hafnium hydride, niobium hydride, tantalum hydride, titanium hydride, vanadium hydride and a mixture thereof, said member ranging from about 0.5% by weight to about 5% by weight of said mixture and being present in an amount sufficient to produce a sintered body having a minimum Rockwell A hardness of 91, said sintering temperature ranging from about 1650° C. to about 1950° C., said sintering being carrried out in a partial vacuum or atmosphere which has no significantly deleterious effect thereon.

4,731,350

ETHYLENE OXIDE CATALYST

Gosse Boxhoorn; Otto M. Velthuis, and Ann H. Klazinga, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1987, Ser. No. 12,918

Claims priority, application United Kingdom, Apr. 29, 1986, 8610441

Int. Cl.⁴ B01J *21/04, 23/04, 23/50, 27/12*

U.S. Cl. 502—231 **11 Claims**

1. A catalyst for the production of ethylene oxide from ethylene and molecular oxygen which comprises silver and an alkali metal promoter supported on a carrier, which carrier is prepared by a process which comprises mixing an aluminum compound with water and an alkali metal hydroxide and with an organic fluorine compound and calcining the resultant mixture at a temperature between 1200° C. and 1700° C.

4,731,351

CATALYST COMPOSITION

James B. Kimble, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 541,935, Oct. 14, 1983, Pat. No. 4,476,344. This application Jul. 20, 1984, Ser. No. 632,935

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.⁴ B01J *23/02*

U.S. Cl. 502—349 **5 Claims**

1. A catalyst composition comprising lithium, titanium and a promoter selected from the group consisting of molybdenum, tin and antimony, wherein the atomic ratio of lithium to titanium is above about 1.8:1.

4,731,352

PROCESS FOR PRODUCING SUPPORTS FOR CATALYSTS

Yasuo Sekido; Shinji Takase, and Akira Inoue, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,690

Claims priority, application Japan, Sep. 19, 1985, 60/207336

Int. Cl.⁴ B01J *20/02*

U.S. Cl. 502—439 **8 Claims**

1. A process for producing a support for use with catalysts which comprises:
(a) combining a refractory inorganic oxide precursor with a salt of an olefin-maleic anhydride copolymer;
(b) stirring the mixture with heat;
(c) molding the same; and
(d) drying and calcining the molded product.

4. A process according to claim 1 wherein said precursor is a salt in the form of solution, sol, gel or powder of alumina, silica, titania, boria, zirconia, silica-alumina, silica-magnesia, alumina-magnesia, alumina-titania, silica-titania, alumina-boria, alumina-zirconia, silica-zirconia or alumina-phospha.

4,731,353

HEAT-SENSITIVE RECORDING MATERIAL

Fumio Hama, Osaka; Nobuo Kanda, Hirakata, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Limited, Tokyo, Japan

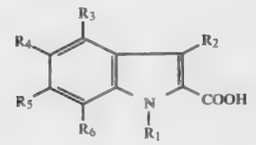
Filed Feb. 12, 1987, Ser. No. 13,781

Claims priority, application Japan, Feb. 24, 1986, 61-38816

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—210 **6 Claims**

1. A heat-sensitive recording material comprising a base sheet and a heat-sensitive record layer formed over the base sheet and comprising a colorless or pale-colored basic dye and a color developing material capable of forming a color when contacted with the dye, the heat-sensitive recording material being characterized in that the heat-sensitive record layer contains as the color developing material at least one multivalent metal salt of an indole-2-carboxylic acid derivative represented by the formula



(I)

wherein

R_1 is hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted alkynyl group, substituted or unsubstituted aryl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted alkylcarbonyl group or substituted or unsubstituted arylcarbonyl group; and

R_2 through R_6 each represent hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted alkynyl group, substituted or unsubstituted aryl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted cycloalkyloxy group, substituted or unsubstituted alkenyloxy group, substituted or unsubstituted alkynyloxy group, substituted or unsubstituted aryloxy group, substituted or unsubstituted aralkyloxy group, substituted or unsubstituted alkylcarbonyloxy group, substituted or unsubstituted arylcarbonyloxy group, substituted or unsubstituted alkylcarbonyl group, substituted or unsubstituted arylcarbonyl group, substituted or unsubstituted carbamoyl group, substituted or unsubstituted amino group, halogen atom, nitro group, cyano group or hydroxyl group.

4,731,354

THERMOSENSITIVE RECORDING MATERIAL

Keishi Taniguchi, and Hiromi Huruya, both of Shizuoka, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

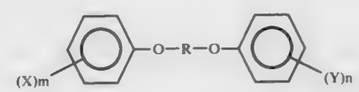
Filed Nov. 17, 1986, Ser. No. 931,086

Claims priority, application Japan, Nov. 20, 1985, 60-262024

Int. Cl.⁴ B41M *5/22*

U.S. Cl. 503—209 **9 Claims**

1. A thermosensitive recording material comprising a support material and a thermosensitive coloring layer formed thereon comprising a leuco dye, a color developer capable of inducing color formation in said leuco dye upon application of heat thereto and a diether compound having the following general formula (I):



(I)

wherein R represents a straight or branched hydrocarbon having 2 to 12 carbon atoms, including 1 to 4 double bonds therein, X and Y each represent an alkyl group having 1 to 6 carbon atoms; an alkoxy group having 1 to 6 carbon atoms; halogen; an aryl group; an aralkyl group; an acyloxy group (R′COO—), wherein R′ is an alkyl group having 1 to 6 carbon atoms; an aryloxy group; or an aralkyloxy group; and m and n each represent an integer of 1 to 3.

4,731,355

IMAGE-RECEIVING SHEET FOR THERMAL DYE-TRANSFER RECORDING

Hiroshi Iwasaki, and Kazuo Watanabe, both of Hyogo, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 748,861, Jun. 26, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 915,902

Claims priority, application Japan, Jun. 27, 1984, 59-133517

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 503—227 **20 Claims**

1. A recording system comprising:
a. a coloring material-transferring sheet containing a heat-sublimable dye; and
b. a thermal dye-transfer recording, a heat-sublimable dye-receiving sheet comprising a support having thereon a heat-sublimable dye-receiving layer containing a butyral resin for receiving heat-sublimable dye from the coloring material-transferring sheet.

10. A method for obtaining a thermal dye-transferred recorded image comprising the steps of:
a. superimposing (1) a coloring material-transferring sheet, comprising a substrate having coated thereon a coloring material, over (2) a thermal dye-transfer recording, heat-sublimable dye-receiving sheet, comprising a support having thereon a heat-sublimable dye-receiving layer containing a butyral resin, in such a manner that the coloring material coated on the substrate comes into contact with the heat-sublimable dye-receiving layer; and
b. heating the substrate of the coloring material transferring sheet to selectively transfer at least a portion of the coloring material to the heat-sublimable dye-receiving layer.

4,731,356

UNSATURATED ALIPHATIC KETONE AND USE OF SAME AS PERFUMING INGREDIENT

Karl-Heinrich Schulte-Elte, Onex, and Dietrich Kastner, Givrins, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

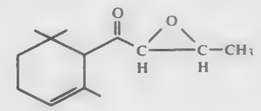
Division of Ser. No. 784,126, Oct. 4, 1985. This application Jun. 4, 1987, Ser. No. 58,108

Claims priority, application Switzerland, Oct. 15, 1984, 4926/84

Int. Cl.⁴ C61K *7/46;* **C11B** *9/00*

U.S. Cl. 512—13 **3 Claims**

1. A perfume composition, a perfume base and a perfumed consumable material having added thereto a perfuming effective amount of an epoxy ketone of the formula



4,731,357

UROGASTRONE

Trevor J. Franklin; Harold Gregory, and William P. Morris, all of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 26, 1986, Ser. No. 844,154

Claims priority, application United Kingdom, Apr. 12, 1985, [redacted]

Int. Cl.⁴ A61K *37/02*

U.S. Cl. 514—10 **8 Claims**

1. A method of promoting bone and/or tendon repair in a warm blooded animal which comprises the topical or parenteral administration of an effective amount of human urogastrone or a human urogastrone fragment to said animal.

VOL 1088 ISS 3 MR 15 1988 UMI

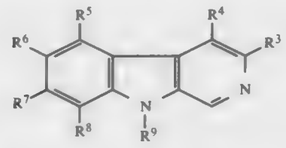
4,731,358

β-CARBOLINES AND THEIR USE AS TRANQUILIZERS

Andreas Huth; Dieter Rahtz; Dieter Seidelmann; Helmut Schmiechen; Helmut Biere, all of Berlin, Fed. Rep. of Germany, and Claus T. Braestrup, Roskilde, Denmark, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Coatinuation of Ser. No. 546,357, Oct. 28, 1983, Pat. No. 4,435,403. This application Sep. 2, 1986, Ser. No. 902,855
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240514
Int. Cl.[4] A61K *31/395;* C07F *9/32;* C07D *471/04*
U.S. Cl. 514—81 23 Claims

1. A β-carboline of the formula



wherein

R^3 is halogen;

OR^I, wherein R^I is H, C_{1-5} alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10}-aryl;

$NR^{II}R^{III}$, wherein R^{II} *is H,* C_{1-5} alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10}-aryl and R^{III} is C_{1-5} alkyl, C_{1-3}-alkanoyl, C_{1-6} alkoxycarbonyl, carbamoyl, or R^{II} and R^{III} together with the connecting N-atom are pyrrolyl or piperidino;

SO_nR^I, wherein n is 0, 1 or 2 and R^I is as defined above;

$PO_3R^{IV}R^V$, wherein R^{IV} and R^V each independently is H, C_{1-5}-alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10} aryl; or

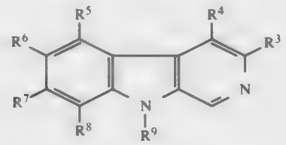
C_{3-7}-cycloalkyl, C_{8-12}-aralkenyl, or C_{6-10}-aryl, each of whose alkyl portion is optionally substituted by 1 to 3 of halogen, OR^I, $NR^{II}R^{III}$, SO_nR^I, $COOR^I$, $CONR^{II}R^{III}$, $CSNR^{II}R^{III}$, $PO_3R^{IV}R^V$, COR^I or CN, wherein R^I, R^{II}, R^{III}. R^{IV}, R^V and n are as defined above;

R^4 is H, C_{1-5} alkyl, C_{1-5} alkoxy-C_{1-5}-alkyl, COR^{VI} or CSR^{VII}, wherein R^{VI} is H, C_{1-5}-alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl, OH, O-C_{1-5}-alkyl, O-C_{3-7}-cycloalkyl, O-C_{7-10}-aralkyl or $NR^{II}R^{II}$, wherein R_{II} is as defined above and the R^{II}s together with the N are pyrrolyl or piperidino and wherein R^{VII} is H, C_{1-5} alkyl, C_{3-7}-cycloalkyl or C_{7-10}-aralkyl;

R^5–R^8 each independently is H, halogen. NO_2, OR^I, NR^{II}-R_{III}, $PO_3R^{IV}R^V$, $SO_2NR^IR^V$, $COOR^I$, $CONR^{II}R^{III}$, $CSNR^{II}R^{III}$ and COR^I wherein $R^{I\text{-}V}$ are as defined above and at most two of R^5–R^8 can be non-H; and

R^9 is H, C_{1-5} alkyl, C_{1-3}-alkanoyl, carbamoyl, C_{1-6}-alkoxycarbonyl, or SO_2R^{VIII} wherein R^{VIII} is methyl or p-tolyl, and a pharmaceutically acceptable carrier.

19. A pharmaceutical composition comprising a tranquilizing effective amount of a compound of the formula



wherein

R^3 is halogen;

OR^I, wherein R^I is H, C_{1-5} alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10}-aryl;

$NR^{II}R^{III}$, wherein R^{II} is H, C_{1-5} alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10}-aryl and R^{III} is C_{1-5} alkyl, C_{1-3}-alkanoyl, C_{1-6}alkoxycarbonyl, carbamoyl, or R^{II} and R^{III} together with the connecting N-atom are pyrrolyl or piperidino;

SO_nR^I, wherein n is 0, 1 or 2 and R^I is as defined above;

$PO_3R^{IV}R^V$, wherein R^{IV} and R^V each independently is H, C_{1-5}-alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl or C_{6-10} aryl; or

C_{3-7}-cycloalkyl, C_{8-12}-aralkenyl, or C_{6-10}-aryl, each of whose alkyl portion is optionally substituted by 1 to 3 of halogen, OR^I, $NR^{II}R^{III}$, SO_nR^I, $COOR^I$, $CONR^{II}R^{III}$, $CSNR^{II}R^{III}$, $PO_3R^{IV}R^V$, COR^I or CN, wherein R^I, R^{II}, R^{III}, R^{IV}, R^V and n are as defined above;

R^4 is H, C_{1-5} alkyl, C_{1-5} alkoxy-C_{1-5}-alkyl, COR^{VI} or CSR^{VII}, wherein R^{VI} is H, C_{1-5}-alkyl, C_{3-7}-cycloalkyl, C_{7-10}-aralkyl, OH, O-C_{1-5}-alkyl, O-C_{3-7}-cycloalkyl, O-C_{7-10}-aralkyl or $NR^{II}R^{II}$, wherein R_{II} is as defined above and the R^{II}s together with the N are pyrrolyl or piperidino and wherein R^{VII} is H, C_{1-5} alkyl, C_{3-7}-cycloalkyl or C_{7-10}-aralkyl;

R^5–R^8 each independently is H, halogen. NO_2, OR^I, NR^{II}-R_{III}, $PO_3R^{IV}R^V$, $SO_2NR^IR^V$, $COOR^I$, $CONR^{II}R^{III}$, $CSNR^{II}R^{III}$ and COR^I wherein $R^{I\text{-}V}$ are as defined above and at most two of R^5–R^8 can be non-H; and

R^9 is H, C_{1-5} alkyl, C_{1-3}-alkanoyl, carbamoyl, C_{1-6}-alkoxycarbonyl, or SO_2R^{VIII} wherein R^{VIII} is methyl or p-tolyl.

4,731,359

PROLONGED ACTION DRUG FORMULATION

James Swarbrick, Chapel Hill, N.C., assignor to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 343,663, Jan. 28, 1982, Pat. No. 4,461,770, which is a continuation-in-part of Ser. No. 142,279, Apr. 22, 1980. This application Feb. 6, 1984, Ser. No. 577,422
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/10, 31/44, 31/54, 31/135, 31/165, 31/56*
U.S. Cl. 514—169 8 Claims

1. A prolonged action drug formulated for intramuscular or subcutaneous administration, comprising in combination:

a pharmacologically effective amount of a drug in solid particulate form, said drug being selected from steroids, neuroleptics, antileprotics, antimalarials, andrenergics, and antituberculars; and

a solid chemical derivative of said drug in the form of a coating on particles of said drug obtained by acylation at the surface of said drug particles, said derivative having an aqueous solubility of less than 0.20 mg/ml in a concentration which is sufficient to substantially prolong the time during which said drug is pharmacologically active and having at said concentration minor pharmacological activity relative to said drug, said drug constituting about 25–95 weight percent of said formulation.

4,731,360

ACYLCARNITINES AS ABSORPTION-ENHANCING AGENTS FOR DRUG DELIVERY THROUGH MUCOUS MEMBRANES OF THE NASAL, BUCCAL, SUBLINGUAL AND VAGINAL COMPARTMENTS

Jose Alexander; A. J. Repta, and Joseph A. Fix, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 16, 1985, Ser. No. 766,378
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] A61K *31/43, 31/545*
U.S. Cl. 514—201 4 Claims

1. A method of enhancing the rate of absorption of a β-lactam drug administered to the nasal, buccal, sublingual or vaginal cavity, which comprises administering a composition comprising a therapeutically effective dosage amount of said drug and an acylcarnitine absorption enhancing agent of the formula:

$$[(CH_3)_3N^+CH_2CH(OCOR)CH_2CO_2H]X^-$$

wherein R is saturated alkyl (C_2–C_{20}), alkenyl (C_2–C_{20}) with 1 to 6 double bonds, hydroxyakyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoakyl (C_4–C_{20}), unsaturated hydroxyakyl(C_5–C_{20}), carboxyakyl (C_4–C_{20}), arylakyl (C_5–C_{20}), alkylaryl (C_7–C_{20}) or carbalkoxyalkyl (C_5–C_{20}) and X is a pharmaceutically acceptable counterion.

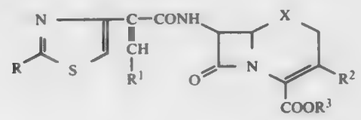
4,731,361

ALKENEAMIDOCEPHALOSPORIN ESTERS

Yoshio Hamashima, Kyoto; Koji Ishikura; Kyoji Minami, both of Nara; Tadatoshi Kubota, and Tadashi Yoshida, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 27, 1986, Ser. No. 845,305
Claims priority, application Japan, Mar. 29, 1985, 60-67280
Int. Cl.[4] C07D *501/20;* A61K *31/545*
U.S. Cl. 514—202 17 Claims

1. A 7β-[2-(2-amino-4-thiazolyl)alkenoylamino]-3-cephem-4-carboxylic acid pharmaceutically acceptable ester represented by the following formula:



wherein

R is amino, X is sulfur, and

R^1 is ethyl; R^2 is $CH_2OCH_2CH{=}CH_2$; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is $CH_2OCH_2CH_2F$; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is CH_2OMe; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is $CH_2OCH(Me)_2$; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is H; and R^3 is pivaloyloxymethyl;

R^1 is methyl; R^2 is CH_2OCONH_2; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is CH_2OCONH_2; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is H; and R^3 is 1-ethoxycarbonyloxyethyl;

R^1 is ethyl; R^2 is H; and R^3 is pivaloyloxyethyl;

R^1 is ethyl; R^2 is H; and R^3 is acetoxyethyl;

R^1 is ethyl; R^2 is H; and R^3 is acetoxymethyl;

R^1 is methyl; R^2 is H; and R^3 is pivaloyloxymethyl;

R^1 is ethyl; R^2 is CH_2OCONH_2; and R^3 is acetoxyethyl;

R^1 is ethyl; R^2 is CH_2OCONH_2 and R^3 is 1-ethoxycarbonyloxyethyl; or

R^1 is cyclopropylmethyl; R^2 is H; and R^3 is pivaloyloxymethyl.

17. An oral antibacterial preparation containing an antibacterially effective amount of a compound claimed in claim 1.

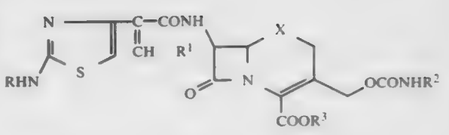
4,731,362

ALKYLCARBAMOYLOXYMETHYLCEPHEM COMPOUNDS

Yoshio Hamashima, Kyoto; Teruji Tsuji; Tetsuo Okada, both of Osaka; Kyoji Minami, Nara; Hiroyuki Ishitobi, Osaka, and Koji Ishikura, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jul. 23, 1986, Ser. No. 888,435
Claims priority, application Japan, Aug. 5, 1985, 60-172660
Int. Cl.[4] C07D *501/20;* A61K *31/545*
U.S. Cl. 514—202 5 Claims

1. 7β-[2-(2-amino-thiazol-4-yl)-2-alkenamido]-3-(alkyl-carbamoyloxymethyl)-3-cephem-4-carboxylic acid derivative represented by the following formula:



wherein

R is hydrogen or an amino-protecting group having 1 to 19 carbon atoms and is a 1C to 8C alkyl, 7C to 19C aralkyl, 1C to 8C alkylthio, 6C to 8C arylthio, 5C to 8C cycloalkylidene, 1C to 8C alkanoyl, 2C to 8C alkoxycarbonyl, 8C to 19C aralkoxycarbonyl, 7C to 12C aroyl, 3C to 9C trialkylsilyl, 3C to 9C alkoxydialkylsilyl, 3C to 9C trialkylstannyl, 1C to 8C alkylideneamino or 7C to 12C aralkylideneamino,

R^1 is 1C to 8C alkyl,

R^2 is methyl or ethyl,

R^3 is acetoxymethyl, 1-(acetoxy)ethyl, 1-(cyclohexylcarbonyloxy)-1-cyclohexylmethyl, 1-(cyclohexylmethoxycarbonyloxy)propyl, 1-(cyclohexyloxycarbonyloxy)ethyl, 1-(ethoxycarbonyloxy)ethyl, 1-(isopentyloxycarbonyl-oxy)propyl, 1-(isopropoxycarbonyloxy)ethyl, 1-(isopropoxycarbonyloxy)propyl, (4-methyl-2-oxo-1,3-dioxol-5-yl)methyl, pivaloxymethyl, 1-(pivaloyloxy)ethyl, or 1-(tert-butoxycarbonyloxy)ethyl, and

X is sulfur or sulfinyl.

5. An oral antibacterial preparation containing an antibacterially effective amount of a compound claimed in claim 1 and an inert carrier therefor.

4,731,363

THROMBOXANE SYNTHASE INHIBITORS AS INSULIN LOWERING AGENTS AND ANTIOBESITY AGENTS

James G. Hamilton, Nutley; Ann C. Sullivan, Cedar Grove; Lawrence D. Tobias, Glen Ridge, and Joseph Triscari, Bloomfield, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 680,706, Dec. 12, 1984, Pat. No. 4,591,594, which is a division of Ser. No. 387,721, Jun. 11, 1982, Pat. No. 4,500,540, which is a continuation of Ser. No. 107,484, Dec. 26, 1979, abandoned. This application Jan. 16, 1986, Ser. No. 819,319
Int. Cl.[4] A61K *31/38, 31/505*
U.S. Cl. 514—210 11 Claims

1. A method for the lowering of insulin levels in mammals which comprise administering to the mammal to be treated a therapeutically effective amount of a thromboxane synthase inhibitor selected from the group consisting of 4-phenylpyrimidine, alpha-oxo-4-pyrimidinepropanoic acid ethyl ester and [6R-(6α,7β)]-2-carboxy-8-oxo-3-[(4-pyrimidinylthio)methyl]5thia-1-azabicyclo-[4.2.0]oct-2-en-7-aminum hydroxide inner salt.

4,731,364

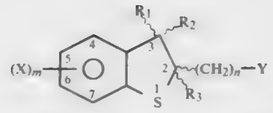
DIHYDROBENZO(B)THIOPHENES AND PHARMACEUTICAL COMPOSITIONS THEREOF USEFUL AS ANTIFUNGALS

Dinanath F. Rane, Sayreville, and Russell E. Pike, Stanhope, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 12, 1985, Ser. No. 764,289
Int. Cl.[4] A01N *43/84;* C07D *409/06*
U.S. Cl. 514—222 21 Claims

1. A compound represented by the formula I

VOL 1088 ISS 3 MR 15 1988 UMI

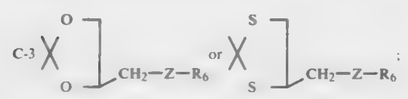


in racemic or optically active form, or a pharmaceutically acceptable salt thereof wherein

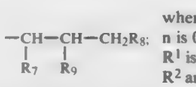
X is one or more groups selected independently from halogen, (lower)alkyl, halo(lower)alkyl, cyano, nitro, substituted and unsubstituted phenyl or substituted and unsubstituted phenyl(lower)alkyl, said phenyl and phenyl(lower)alkyl substituents being one to four of one or more groups independently selected from halogen, nitro, $-NR_4R_5$, (lower)alkanoyl, (lower)alkyl or halo(lower)alkyl;

Y is substituted or unsubstituted imidazolyl or 1,2,4-triazolyl, said substituents being one or more groups selected independently from (lower) alkyl, substituted and unsubstituted phenyl or substituted and unsubstituted phenyl(-lower)alkyl, said substituents being as described hereinabove;

R_1 and R_2 are independently hydrogen, $-CH_2NR_4R_5$, $-NR_4R_5$, $-OR_4$, $-SR_4$, (lower)alkyl (lower)alkenyl, halogen, substituted or unsubstituted phenyl or phenyl(-lower)alkyl, said phenyl and phenyl(lower)alkyl substituents being as described hereinabove, or R_1 or R_2 taken together with the carbon in the 3 position form carbonyl, $>C=N-R_4$,



R_3 is $-CH(R_7)-C\equiv CR_8$, $-CH(R_7)-C(R_9)=CHR_8$ or



and R_6, R_7, R_8 and R_9 are independently hydrogen, (lower)alkyl, substituted or unsubstituted phenyl or phenyl(-lower)alkyl, said phenyl or phenyl(lower)alkyl substituents being as described hereinabove, or substituted or unsubstituted five or six membered heterocyclyl ring systems containing carbon and one to four heterto atoms chosen from N, O and S, said heterocyclyl substituents being halogen, lower(alkyl), (lower)alkanoyl, substituted and unsubstituted phenyl or substituted and unsubstituted phenyl(lower alkyl), said phenyl and phenyl(lower)alkyl substituents being asd described hereinabove;

R_4 and R_5 are independently hydrogen, lower(alkyl), (lower)alkenyl, N,N-di(lower)alkylcarbamoyl, N,N-di(-lower)alkylthiocarbamoyl, substituted and unsubstituted phenylcarbonyl or substituted and unsubstituted phenyl(-lower)alkylcarbonyl, substituted or unsubstituted phenyl and phenyl(lower)alkyl, said phenyl and phenyl(lower)alkyl substituents being as described hereinabove, or R_4 and R_5 taken together with the nitrogen atom in NR_4R_5 and $-CH_2-NR_4R_5$ form substituted or unsubstituted five or six membered heterocyclyl ring systems containing carbon and one to four heteroatoms chosen from N, O and S, said heterocyclyl substituents being as described hereinabove;

Z is O, S or NR_5;

N=1 or 2; and

m=1, 2, 3 or 4.

18. A method of treating susceptible fungal infections which comprises administering to a host in need of such treatment an antifungally effective amount of a compound of claim **1** or a pharmaceutical composition comprising such a compound and a pharmaceutically acceptable carrier or diluent.

4,731,365

5-AMINOALKYL-BETA-CARBOLINE DERIVATIVES, PSYCHO TROPIC COMPOSITIONS AND USE

Helmut Biere; Andreas Huth; Dieter Rahtz; Ralph Schmiechen; Dieter Seidelmann, and David N. Stephens, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

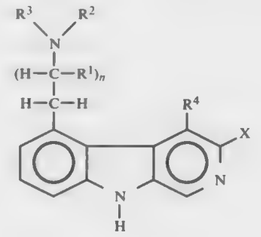
Filed Dec. 22, 1986, Ser. No. 944,165

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545776

Int. Cl.[4] **A61K** *31/435, 31/535;* **C07D** *471/04*

U.S. Cl. 514—222 **12 Claims**

1. A 5-Aminoalkyl-beta-carboline of the formula



wherein

n is 0 or 1,

R^1 is hydrogen or lower alkyl,

R^2 and R^3 each independently is hydrogen; alkyl; alkyl substituted by OH, lower alkoxy, mercapto, lower alkylthio, phenyl, amino, amino substituted by lower alkyl or a 5–6-member aliphatic N-containing heterocycle which can contain an additional O, N or S atom and can be substituted by 1 or 2 lower alkyl groups; alkanoyl; phenyl; or a 5–6-member aromatic heterocycle containing 1 or 2 O, N or S atoms; or together with the adjoining N-atom R^2 and R^3 form a 5–6-member aliphatic N-containing heterocycle which can contain an additional O, N or S atom and can be substituted by 1 or 2 lower alkyl groups,

R^4 is hydrogen, lower alkyl or lower alkoxy-lower-alkyl and

X is $COOR^6$, or $CO-NR^7R^8$

wherein

R^6 is H or lower alkyl,

R^7 and R^8 each independently is hydrogen; alkyl; alkyl substituted by OH, lower alkoxy, mercapto, lower alkylthio, phenyl, amino, amino substituted by lower alkyl or a 5–6-member aliphatic N-containing heterocycle which can contain an additional O, N or S atom and can be substituted by 1 or 2 lower alkyl groups; alkanoyl; phenyl; or a 5–6-member aromatic heterocycle containing 1 or 2 O, N or S atoms; or together with the adjoining N-atom R^2 and R^3 form a 5–6-member aliphatic N-containing heterocycle which can contain an additional O, N, or S atom and can be substituted by 1 or 2 lower alkyl groups,

and "lower" refers to 1–6 carbon atoms.

10. A composition of claim **9** wherein the amount of said compound is 0.05 to 100 mg.

4,731,366

DISCORHABDIN COMPOSITIONS AND THEIR METHODS OF USE

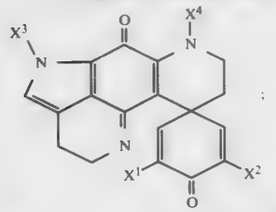
Murray H. G. Munro; Nigel B. Perry, and John W. Blunt, all of Christchurch, New Zealand, assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

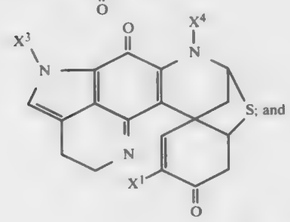
Filed Aug. 5, 1986, Ser. No. 893,409

Int. Cl.[4] **C07D** *513/22, 471/20;* **A61K** *31/38, 31/395*

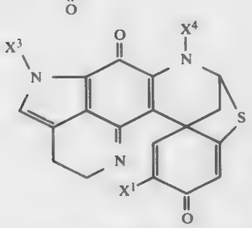
U.S. Cl. 514—278 **20 Claims**

1. A compound according to any one of the formulae:





; and



wherein X^1, X^2, X^3 and X^4 are the same or different and are a halogen, hydrogen or hydroxy.

6. An antitumor composition comprising, as active ingredient, an effective antitumor amount of one or more of the compounds of claim **1** and a non-toxic pharmaceutically acceptable carrier or diluent.

4,731,367

2-SUBSTITUTED ERGOLINES USEFUL AS NEUROLEPTICS AND ANTIDEPRESSANTS

Gerhard Sauer; Andreas Huth; Helmut Wachtel, and Herbert H. Schneider, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

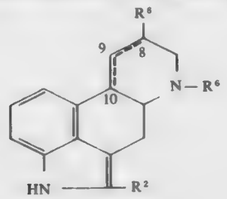
Filed Apr. 9, 1985, Ser. No. 721,522

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413657; Apr. 9, 1984, 3413658; Apr. 9, 1984, 3413659; Apr. 9, 1984, 3413660

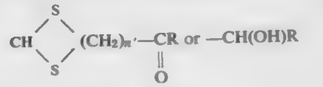
Int. Cl.[4] **A61K** *31/48;* **C07F** *7/02;* **C07D** *457/04*

U.S. Cl. 514—288 **14 Claims**

1. An ergoline substituted in the 2-position of the formula



wherein C_6=C_9 and C_9=C_{10} each independently is a CC-single or a C=C-bond, but not a cumulated double bond, and the substituent in the 8-position is in the α- or β-configuration where C_8=C_9 is a CC-single bond,

R^2 is SOR, 

wherein R is H or C_{1-4}-alkyl and n is 2 or 3;

COR′ or CSR′

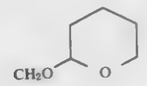
wherein R′=OH, OC_{1-4}-alkyl, benzyl, NH_2 or NHR″;

CH=CH—CO_2R″ or CH_2—CH_2—CO_2R″

wherein R″=C_{1-4} alkyl,

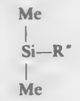
C=C—R′″ or HC=CH—R′″

wherein R′″=hydrogen C_{1-4}-alkyl, phenyl, CH_2OH, CR''_2OH,



CO_2R, $CH_2NR''_2$ or $SiMe_2$R″;

C_{1-3}-alkyl substituted by OH or phenyl; or



wherein R″ is C_{1-4}-alkyl,

R^6 is C_{1-4}-alkyl and

R^8 is methyl, NH—CO—NEt_2 or NH—CS—NEt_2 or a physiologically acceptable acid addition salt thereof.

4,731,368

THIENOPYRIDINE SULFONAMIDES AND THEIR OPHTHALMOLOGICAL FORMULATION

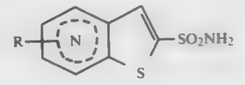
Jacob M. Hoffman, Jr., and Kenneth L. Shepard, both of North Wales, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 8, 1986, Ser. No. 939,389

Int. Cl.[4] **A61K** *31/44;* **C07D** *495/04*

U.S. Cl. 514—301 **9 Claims**

1. A compound of structural formula:



or N-oxide, or an ophthalmologically acceptable salt thereof wherein



is a pyrido, dihydropyrido or tetrahydropyrido group with the N at the 4-, 5-, 6- or 7-position; and

R is

(1) C_{1-5} alkyl, either straight chain, branched chain or cyclic,

(2) hydroxy-C_{1-5} alkyl,

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(3) —OR[1], wherein R[1] is hydrogen, C_{1-3} alkyl, cyclopropyl, amino-C_{1-3} alkyl, C_{1-3} alkylamino-C_{1-3} alkyl, di(C_{1-3} alkyl-)amino-C_{1-3} alkyl, hydroxy-C_{1-3} alkyl, or C_{2-4} alkanoyl,
(4)



alkyl, wherein n is 0, 1 or 2,
(5) —N(R[1])$_2$ wherein the R[1] groups can be the same or different,
(6) halo selected from the group consisting of chloro, bromo or fluoro,
(7) hydrogen,
(8) —NO_2, or
(9) oxo—; and if



is dihydro- or tetrahydropyrido, the N can be substituted with R[1] or $CONH_2$.

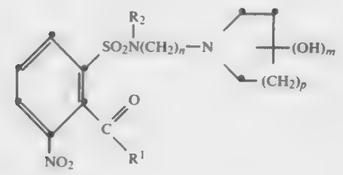
7. A method of treating elevated intraocular pressure which comprises the administration to a patient in need of such treatment of an effective intraocular pressure lowering amount of the compound of claim 1.

4,731,369
AMIDES AND ESTERS OF 2-(N-(HYDROXYPIPERIDINOALKYL) AND (HYDROXYPYRROLIDINOALKYL)-AMINOSULFONYL)-6-NITROBENZOIC ACIDS USEFUL AS ADJUNCTS TO RADIATION THERAPY

Edward L. Engelhardt, Gwynedd Valley, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation of Ser. No. 795,567, Nov. 6, 1985, abandoned. This application Jun. 26, 1987, Ser. No. 68,814
Int. Cl.[4] C07D *207/12, 211/40;* **A61K** *31/445, 31/40*
U.S. Cl. 514—327 **7 Claims**

1. A compound of the formula:



wherein:
R_1 is hydroxy(loweralkoxy), lower alkoxy, allyloxy, amino, alkylamino, di(loweralkyl)amino, (hydroxyalkyl)amino, di(hydroxy-alkyl)amino or allylamino;
R_2 is hydrogen, lower alkyl from 1–4 carbon atoms, hydroxyloweralkyl, allyl;
n is 2 or 3;
m is 0, 1 or 2;
p is 1 or 2 and pharmaceutically acceptable salts thereof.

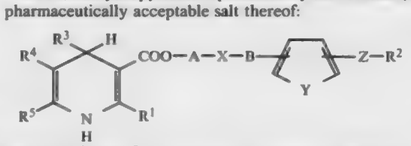
2. A method for enhancing the therapeutic effect of radiation which comprises administering to a patient in need of such radiation treatment an effective amount of a compound defined in claim 1.

4,731,370
PYRIDYL ESTER CONTAINING 1,4-DIHYDROPYRIDINE DERIVATIVES AND SALTS THEREOF AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Isao Watanabe, Toyama; Kaishu Momonoi, Shinminato; Toru Hiraiwa, Toyama; Satoshi Ono, Toyama; Joji Nakano, Toyama; Katsuyuki Nagumo, Kawasaki, and Hiroyasu Takagi, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 747,305, Jun. 21, 1985. This application Jun. 10, 1986, Ser. No. 872,408
Claims priority, application Japan, Jun. 25, 1984, 59-130645; Jan. 7, 1985, 60-497; Feb. 26, 1985, 60-37130; Dec. 20, 1985, 60-287000
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] C07D *401/12;* **A61K** *31/455*
U.S. Cl. 514—332 **6 Claims**

1. A 1,4-dihydropyridine represented by the formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein R^1 and R^5, which may be the same or different, represent lower alkyl groups, R^2 represents a pyridyl group; R^3 represents a phenyl group or a phenyl group substituted by at least one substituent selected from the group consisting of halogen atoms and nitro, cyano, azido, lower alkyl, lower alkoxy, trihalo-lower alkyl, lower alkanesulfonyl, benzyl. phenethyl, methylbenzyl, chlorobenzyl, methoxybenzyl, phenyl, naphthyl, benzyloxy, phenethyloxy, p-chlorobenzyloxy, p-methoxybenzyloxy, phenoxy, naphthoxy, p-methylphenoxy, lower alkythio, phenylthio, naphthylthio, p-methylphenylthio, benzylthio, phenethylthio, p-chlorobenzylthio, p-methoxybenzylthio and lower alkoxycarbonyl groups; R^4 represents a carboxyl group esterified with a group selected from the group consisting of lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, N,N-di(lower alkyl)amino-lower alkyl, N-benzyl-N-lower alkylamino-lower alkyl, N-(4-chlorobenzyl)-N-lower alkylamino-lower alkyl, N-phenyl-N-lower alkylamino-lower alkyl and N,N-dibenzylamino-lower alkyl; A represents an alkylene group; B represents an alkenylene group; X represents an oxygen atom; Y represents a vinylene group; and Z represents an alkylene group.

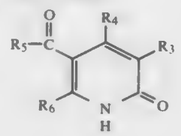
6. A vasodilator or platelet aggregation inhibitor which comprises an effective amount of a compound or its pharmaceutically acceptable salt as claimed in claim 1, in combination with a pharmaceutically acceptable excipient, carrier or diluent.

4,731,371
CERTAIN 5-ACYL-1,2-DIHYDRO-2-OXO-3-PYRIDINECARBONITRILES WHICH ARE USEFUL AS CARDIOTONIC AGENTS

Winton D. Jones; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

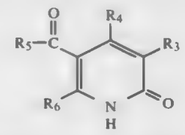
Division of Ser. No. 594,767, Mar. 29, 1984, abandoned. This application May 27, 1986, Ser. No. 867,825
Int. Cl.[4] C07D *213/57, 401/06, 405/06, 409/06;* **A61K** *31/44*
U.S. Cl. 514—336 **10 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein
R_3 is —C≡N,
R_4 is hydrogen or lower alkyl,
R_5 is phenyl, X-substituted phenyl, thienyl, furyl, pyrrolyl, and X is lower alkyl, lower alkoxy, lower alkyl thio, halogen, nitro, lower alkanoyl, alkoxy carbonyl, carboxy, cyano, NH_2 $CONH_2$, amindino, imidazol-2-yl, or CF_3, and
R_6 is hydrogen, methyl or ethyl.

10. A method of treating cardiac failure in a patient in need thereof which comprises administering to said patient a cardiotonically effective amount of a compound of the formula



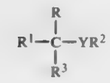
or a pharmaceutically acceptable salt thereof, wherein
R_3 is —C≡N,
R_4 is hydrogen or lower alkyl,
R_5 is pheny, X-substituted phenyl, thienyl, furyl, pyrrolyl, and X is lower alkyl, lower alkoxy, lower alkyl thio, halogen, nitro, lower alkanoyl, alkoxy carbonyl, carboxy, cyano, NH_2, $CONH_2$, amidino, imidazol-2-yl, or CF_3, and
R_6 is hydrogen, methyl or ethyl.

4,731,372
ARYL(ARYLOXY OR ARYLTHIO) AZOLOMETHANES, AND THEIR USE AS PESTICIDES

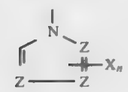
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,485
Int. Cl.[4] C07D *401/12;* **A61K** *31/345*
U.S. Cl. 514—340 **4 Claims**

1. A compound corresponding to the formula



wherein
R represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^1 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^2 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein
each Z independently represents —CH or N and at least one of Z is N;
X is C_1–C_4 alkyl, Br, Cl, F or I and
n represents an integer of from 0 to 3 and
Y is oxygen or sulfur.

4,731,373
GLYCERIN DERIVATIVES AND INHIBITION OF BLOOD PAF

Richard Barner, Witterswil; Kaspar Burri, Rheinfelden, both of Switzerland; Jean-Marie Cassal, Mulhouse, France; Paul Hadvary, Biel-Benken, Switzerland; Georges Hirth, Huningue, France, and Klaus Müller, Münchenstein, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Dec. 10, 1984, Ser. No. 679,734
Claims priority, application Switzerland, Dec. 30, 1983, 6985/83; Sep. 20, 1984, 4498/84
Int. Cl.[4] C07D *213/04, 277/30;* **A61K** *31/44, 31/425*
U.S. Cl. 514—365 **23 Claims**

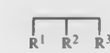
1. A compound of the formula



I

wherein one of the residues R^1, R^2 and R^3 is group U of the formula —X^1—C(O)—$(A^1)_n$—Z^1, another of the residues is group V of the formula —X^2—C(O)—A^2—Z^2 and the remaining residue is group W of the formula —X^3T—(C_{2-6}-alkylene)—N^+(Het)Q^- whereby one of —X^1, —X^2 and —X^3 is oxygen or NH and the other two are oxygen, A^1 and A^2, independently, are oxygen or NH, n is the integer 1 or 0, Z^1 is C_{9-25}-alkyl or C_{9-25}-alkenyl, Z^2 is C_{1-5}-alkyl, C_{2-5}-alkenyl, or phenyl-T is carbonyl, C(O)O or C(O)NH or, when X^3 is oxygen, T is also methylene, $-N^+$(Het) is selected from the group consisting of oxazolium, isoxazolium, pyridazinium, quinolinium, isoquinolinium, N-methylimidazolium, pyridinium and thiazolium, and —Q^- is the anion of a strong inorganic or organic acid, or its hydrate.

10. A pharmaceutical composition for inhibiting blood platelet activating factor comprising an effective amount of a compound of the formula



wherein one of the residues R^1, R^2 and R^3 is group U of the formula —OY^1 or —X^1—C(O)—$(A^1)_n$—Z^1,
another of the residues is group V of the formula —OY^2 or —X^2—C(O)—$(A^2)_p$—Z^2,
and the remaining residue is group W of the formula, —X^3-T—(C_{2-6}-alkylene)—N^+(Het)Q^-
wherein one of X^1, —X^2 and X^3 is oxygen or NH and the other two are oxygen,
Y^1 is C_{10-26}-alkyl or C_{10-26}-alkenyl,
Y^2 is C_{1-6}-alkyl, C_{2-6}-alkenyl,
C_{3-6}-cycloalkyl, C_{5-6}-cycloalkenyl, phenyl, benzyl or 2-tetrahydropyranyl,
A^1 and A^2, independently, are oxygen or NH,
n and p are the integer 1 or 0,
Z^1 is C_{9-25}-alkyl or C_{9-25}-alkenyl,
Z^2 is C_{1-5}-alkyl, C_{2-5}-alkenyl, phenyl or, when $(A^2)_p$ is not oxygen, Z^2 is also hydrogen,
T is carbonyl, C(O)O or C(O)NH or, when X^3 is oxygen, T is also methylene,
—N^+(Het) is selected from the group consisting of oxazolium, isoxazolium, pyridazinium, quinolinium, isoquinolinium, N-methylimidazolium, pyridinium and thiazolium, and
Q^- is the anion of a strong inorganic or organic acid, provided that when R^1 is a group of the formula —OY^1 or —OY^2, R^2 is a group V or OY^1, and X^3 is oxygen, then T is C(O)O or C(O)NH,
or its hydrate.

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4,731,374

TETRAHYDRO-BENZTHIAZOLES, THE PREPARATION THEREOF AND THEIR USE AS INTERMEDIATE PRODUCTS OR AS PHARMACEUTICALS

Gerhart Griss, deceased, late of Biberach (by Elisabeth Griss, legal representative); Rudolf Hurnaus, Biberach, all of Fed. Rep. of Germany; Walter Kobinger; Ludwig Pichler, both of Vienna, Austria; Rudolf Bauer, Wiesbaden, Fed. Rep. of Germany; Joachim Mieran, Mainz, Fed. Rep. of Germany; Dieter Hinzen, Zornheim, Fed. Rep. of Germany, and Gunter Schingnitz, Kreuznach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

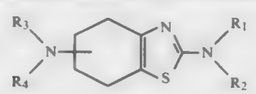
Filed Dec. 19, 1985, Ser. No. 810,947

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447075; Mar. 13, 1985, 3508947

Int. Cl.[4] A61K *31/425;* **C07D** *277/82*

U.S. Cl. 514—367 **9 Claims**

1. A tetrahydro-benzthiazole of the formula:



(I)

wherein

R_1 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group each having 3 to 6 carbon atoms, an alkanoyl group having 1 to 6 carbon atoms, a phenyl alkyl or phenyl alkanoyl group having 1 to 3 carbon atoms in the alkyl part, wherein the above mentioned phenyl nuclei may be substituted by 1 or 2 halogen atoms;

R_2 is a hydrogen atom or an alkyl group with 1 to 4 carbon atoms; and

R_3 and R_4 together with the nitrogen atom between them form a pyrrolidino group; or,

a pharmaceutically acceptable acid addition salt thereof.

4,731,375

COUMARIN DERIVATIVES AND ANTIALLERGIC AGENTS CONTAINING THE SAME

Jun Nakano, Moriyama; Toshikazu Awaji, Shiga; Kiyoshi Kuriyama, Takatsuki; Yoshiyuki Hiyama, Otsu, and Toshiaki Okuda, Kusatsu, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

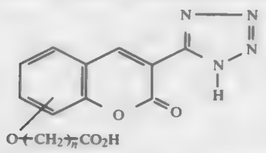
Filed Dec. 9, 1985, Ser. No. 806,917

Claims priority, application Japan, Dec. 10, 1984, 59-261039

Int. Cl.[4] A61K *31/41;* **C07D** *257/04*

U.S. Cl. 514—381 **16 Claims**

1. A chromene derivative having the general formula (I):

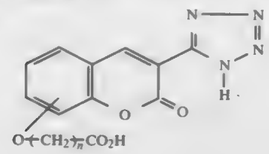


(I)

wherein n is 1 to 5 and the $—O—(CH_2)_n—CO_2H$ group is attached at 5-position, 6-position, 7-position or 8-position of the chromene ring, and pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition which comprises:

an antiallergic effective amount of a chromene derivative selected from the group consisting of compounds according to formula (I)



I

wherein n is 1 to 5 and the $—O—(CH_2)_n—CO_2H$ group is attached at the 5-position, 6-position, 7-position or 8-position of the chromene ring and the pharmaceutically acceptable salts thereof; and

a pharmaceutically acceptable carrier.

4,731,376

2-(-(2,2,5,5-TETRAMETHYL-3-PYRROLIN-3-CARBONYL))-AMINO DERIVATIVES

Kálmán Hideg; Olga H. Hankovszky, both of Pécs; László Frank, Tiszavasvári; Ilona Bódi, Tiszavasvári, and József Csák, Tiszavasvári, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar, Tiszavasvári, Hungary

PCT No. PCT/HU84/00004, § 371 Date Sep. 20, 1984, § 102(e) Date Sep. 20, 1984, PCT Pub. No. WO84/02906, PCT Pub. Date Aug. 2, 1984

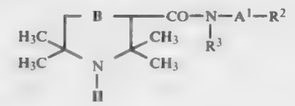
Continuation of Ser. No. 662,299, Sep. 20, 1984, abandoned. This PCT application Jan. 20, 1984, Ser. No. 898,723

Claims priority, application Hungary, Jan. 20, 1983, 178/83

Int. Cl.[4] A61K *31/40, 31/44;* **C07D** *207/09, 207/18*

U.S. Cl. 514—423 **18 Claims**

1. A compound of the Formula (IA)



wherein

A^1 is a C_1 to C_5 straight or branched chain alkylene group;

B is a valence bond or a double bond;

R^3 is hydrogen or C_1 to C_4 alkyl; and

R^2 is unsubstituted amino or is a phenyl or phenoxy group unsubstituted or substituted by one or two C_1 to C_4 alkyl groups, C_1 to C_4 alkoxy groups, or halo substituents;

or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating arrhythmia in an animal subject which comprises the step of administering to said animal subject a therapeutically effective antiarrhythmic amount of a compound of the Formula (IA) as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,731,377

ANTITUMOR CYCLIC PEROXIDES

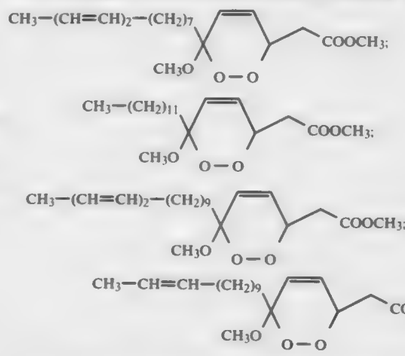
Tatsuo Higa, Okinawa, Japan; Carsten Christophersen, Copenhagen, Denmark, and Shinichi Sakemi, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institute, Inc., Ft. Pierce, Fla.

Filed Jan. 31, 1986, Ser. No. 825,061

Int. Cl.[4] A61K *31/35;* **C07D** *319/02*

U.S. Cl. 514—452 **7 Claims**

1. A compound selected from the group consisting of:



7. An antitumor composition comprising, as active ingredient, an effective antitumor amount of one or more of the compounds of claim 1 and a non-toxic pharmaceutically acceptable carrier or diluent.

4,731,378

PESTICIDAL FORMULATIONS

Arundev H. Naik, Leverkusen; Hans U. Sieveking, Cologne; Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 470,024, Feb. 25, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,703

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208333

Int. Cl.[4] A61K *31/215;* **A01N** *53/00*

U.S. Cl. 514—531 **7 Claims**

1. A pesticidal consisting essentially of 0.5 to 50 parts by weight of at least one pesticidal active pyrethroid compound selected from the group consisting of [α-cyano-4-fluoro-3-phenoxy)-benzyl 3-[2-(4-chlorophenyl)-2-chlorovinyl]-2,2-dimethylcyclopropanecarboxylate (flumethrin) and (α-cyano-3-phenoxybenzyl 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropanecarboxylate, 5 to 80 parts by weight of at least one surface active agent selected from the group consisting of alkylaryl polyglycol ether, polyoxyethylene alkylaryl ether, polyoxyethylene sorbitan monopalmitate, polyoxyethylene stearate, polyoxyethylene lauryl ether, polyoxyethylene oleyl ether, polyoxyethylene mannitan monolaurate and alkyl polyglycol ether, 5 to 90 parts by weight of water and optionally up to 40 parts by weight of a water-miscible solvent and up to 10 parts by weight of auxiliaries.

4,731,379

FLEA ERADICATOR

Jack S. Panzer, Detroit, Mich., assignor to H.S.C. Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 558,978, Dec. 7, 1983, abandoned. This application Jun. 5, 1985, Ser. No. 741,431

Int. Cl.[4] A01N *37/02, 65/00*

U.S. Cl. 514—547 **13 Claims**

1. A composition for the eradication of flea infestation of mammalian skin, adapted for topical application to said infested area of skin, said composition consisting essentially of about 1.7 per cent by weight dioctyl sodium sulfosuccinate and about 0.3 per cent by weight sodium benzoate in water.

4,731,380

TOLERSTAT AS AN AGENT FOR DIABETIC PERIODONTITIS

David D. Wood, Pennington, N.J., assignor to American Home Products Corporation (Del.), New York, N.Y.

Filed Aug. 26, 1986, Ser. No. 900,557

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—562 **5 Claims**

1. A method for treating periodontal disease in a diabetic human subject which comprises administering to the human a therapeutically effective amount of tolrestat or a therapeutically acceptable salt thereof.

4,731,381

METHOD OF TREATING A PERSON FOR SICKLE CELL ANEMIA

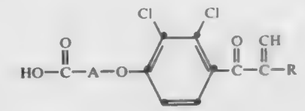
Donald J. Abraham, Murrysville; Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 4, 1986, Ser. No. 848,195

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—571 **17 Claims**

1. A method of treating a person for sickle cell anemia comprising administering to the person a therapeutically effective dosage of a compound of the general formula and pharmaceutically acceptable salts thereof:



wherein R is ethyl, propyl or isopropyl and

A is $—(CH_2)_n—$, $—C(CH_3)_2—$, $—C(CH_2)_3—$ and n=2–5.

4,731,382

LIPOXYGENASE INHIBITORY PHENYLALKANOHYDROXAMIC ACIDS

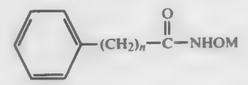
Fred C. Zusi; Suresh A. Marathe, both of Tonawanda, and Kenneth M. Tramposch, Williamsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,334

Int. Cl.[4] C07C *87/10;* **A61K** *31/185*

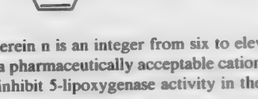
U.S. Cl. 514—575 **20 Claims**

1. A compound of the formula



wherein n is an integer from six to eleven and M is hydrogen or a pharmaceutically acceptable cation.

7. A method of inhibiting 5-lipoxygenase activity in a mammalian host in need of such treatment which comprises administering to said host an amount of a compound of the formula



wherein n is an integer from six to eleven and M is hydrogen or a pharmaceutically acceptable cation in an amount effective to inhibit 5-lipoxygenase activity in the host.

4,731,383

AMINOGUANIDINE COMPOUNDS, THEIR COMPOSITIONS AND PHARMACEUTICAL USES

Istvan Erczi; Jeno Marosfalvi; Gyorgy Rabloczky; Andras Varro; Maria Kuhar nee Kurthy; Istvan Elekes; Laszlo Szatmary, and Laszlo Jaszlits, all of Budapest, Hungary, assignors to Biogal Gyogyszergyar, Debrecen, Hungary

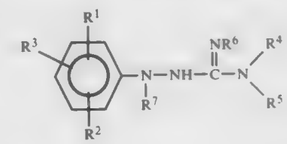
Continuation of Ser. No. 680,915, Dec. 12, 1984. This application Oct. 29, 1986, Ser. No. 925,489

Claims priority, application Hungary, Dec. 12, 1983, 4222/83

Int. Cl.[4] A61K *31/55;* **C07C** *133/10*

U.S. Cl. 514—634 **12 Claims**

1. An aminoguanidine derivative of the formula (I),



I

wherein

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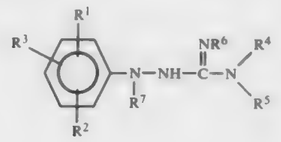
R^1, R^2 and R^3 each represent hydrogen, halogen, C_1–C_4 alkyl, nitro, trifluoromethyl or C_1–C_4 alkoxy,

R^4 and R^5 represent C_1–C_4 alkyl, or NR^4R^5, is an unsubstituted morpholino, piperidino, pyrrolidino, piperazino or hexahydroazepino radical or a mono- or dimethyl substituted morpholino, piperidino or pipperazino or hydroxymethyl or hydroxyethyl substituted piperazino radical,

R^6 and R^7 each represent hydrogen, normal or branched C_{1-4} alkyl or C_{2-4} alkenyl,

and the pharmaceutically acceptable acid addition salts thereof.

5. A pharmaceutical composition having antiarrhythmic activity containing as active ingredient an effective amount of at least one compound of the formula (I)



I

wherein

R^1, R^2 and R^3 each represent hydrogen, halogen, C_1–C_4 alkyl, nitro, trifluoromethyl or C_1–C_4 alkoxy,

R^4 and R^5 represent C_1–C_4 alkyl, or NR^4R^5 is an unsubstituted morpholino, piperidino, pyrrolidino, piperazino or hexahydroazepino radical or a mono- or dimethyl substituted morpholino, piperidino or piperazino or hydroxymethyl or hydroxyethyl substituted piperazino radical,

R^6 and R^7 each represent hydrogen, normal or branched C_{1-4} alkyl or C_{2-4} alkenyl,

and the pharmaceutically acceptable acid addition salts thereof, and a conventional inert, non-toxic, solid or liquid carrier and/or additive.

4,731,384

ETOFENAMATE FORMULATION

Hans-Dieter Dell, Bergisch-Gladbach; Reinhold Kraus, Cologne, and Detlef Schierstedt, St. Augustin, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co, KG, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 622,429, Jun. 20, 1984, abandoned, and a continuation-in-part of Ser. No. 622,424, Jun. 20, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,106

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323832; Jul. 1, 1983, 3323833

Int. Cl.⁴ A61K *31/135, 31/715, 31/695, 31/61*

U.S. Cl. 514—658 **19 Claims**

1. A cream or ointment formulation comprising (a) 2-(2-hydroxyethoxy)ethyl N-(α,α,α-trifluorom-tolyol)anthranilate, wherein for said cream (a) is contained in an amount of 2 to 30% by weight and for said ointment, (a) is contained in an amount of 5 to 40% by weight,

(b) an adjuvant selected from the group consisting of

(i) a triglyceride of a medium-chain carboxylic acid of C_6 to C_{14} chain length in saturated or unsaturated form and branched or straight-chain form,

(ii) an ester of a monohydric alcohol, a polyhydric alcohol and a mixture thereof, said ester being of a C_2 to C_{18} chain length with a carboxylic acid component of a C_6 to C_{18} chain length,

(iii) a C_8–C_{20} alcohol and

(iv) a mixture thereof of (i), (ii) and (iii), wherein for said cream, (b) is contained in an amount of 5 to 8% by weight and for said ointment, (b) is contained in an amount of 3 to 95% by weight, and for said cream, the formulation additionally comprises up to 85 weight % water.

4,731,385

INSECTICIDAL AND FUNGICIDAL COMPOSITION FOR AGRICULTURAL AND HORTICULTURAL USE

Shinichi Tsuboi; Shoko Sasaki, both of Hino; Yumi Hattori; Yoshio Kurahashi, both of Hachioji; Shinji Sakawa, Hino, and Toshihito Kondo, Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Oct. 21, 1986, Ser. No. 921,294

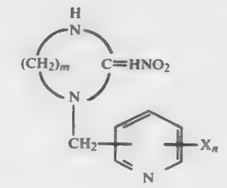
Claims priority, application Japan, Oct. 26, 1985, 60-240237; Oct. 26, 1985, 60-240238; Oct. 26, 1985, 60-240239; Oct. 26, 1985, 60-240240; Oct. 26, 1985, 60-240241

Int. Cl.⁴ A61K *31/00, 45/00*

U.S. Cl. 514—789 **7 Claims**

1. An insecticidally and fungicidal composition comprising

(A) (1) n insecticidally effective amount of a nitromethylbenzanilide derivative of the formula



(I)

in which

X is a lower alkyl group, a lower alkoxy group, or a halogen atom,

n is 0, 1 or 2, and

m is 2 or 3, and

(B) a fungicidally effective amount of at least one fungicide selected from the group consisting of

(2) O-ethyl S,S-diphenyl phosphorodithioate,

(3) 4,5,6,7-tetrachlorophthalide,

(4) 1-(4-chlorobenzyl)-1-cyclopentyl-3-phenylurea,

(5) Validamycin A, 3'-iso-propoxy-2-methylbenzenilide, o-trifluoromethyl-m'-isopropoxybenzoylanilide or 6-(3,5-dichloro-4-methylphenyl-3(2H)pyridazinone, and

(6) di-isopropyl-1,3-dithiolan-2-ylidenemalonate, 5-methyl-1,2,4-triazo[3,4-b]-benzothiazole, 3-allyloxy-1,2-benzisothiazole 1,1-dioxide, and 1,2,5,6-tetrahydro-4H-pyrrolo-]3,2,1-i,j]quinolin-4-one, (5-amino-2-methyl-6-(2,3,4,5,6-pentahydroxycyclohexyloxy)tetrahydropyran-3-yl]amino-α-iminoacetic acid or S-benzyl diisopropylphosphorothilate.

4,731,386

PROCESS FOR THE PREPARATION OF METHANOL IN LIQUID PHASE

Olav-T. Onsager, Trondheim, Norway, assignor to Sintef, Trondheim - NTH, Norway

PCT No. PCT/NO85/00067, § 371 Date Jul. 22, 1986, § 102(e) Date Jul. 22, 1986, PCT Pub. No. WO86/03190, PCT Pub. Date Jun. 5, 1986

PCT Filed Oct. 17, 1985, Ser. No. 891,184

Claims priority, application Norway, Nov. 23, 1984, 844675

Int. Cl.⁴ C07C *27/06*

U.S. Cl. 518—700 **7 Claims**

1. Process for preparing methanol in a liquid reaction medium by reaction of carbon monoxide and hydrogen in the presence of a catalyst system consisting of an alkali metal alcoholate and copper chromite, wherein the liquid reaction medium in the reactor, in addition to methanol and methyl formate, contains at least 50% by volume of a non-polar organic solvent having a dielectric constant which is lower than that of pure methanol at the same temperature.

4,731,387

PROCESS FOR CARRYING OUT A CHEMICAL EQUILIBRIUM REACTION

Klaas R. Westerterp, Enschede, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 15, 1986, Ser. No. 907,422

Claims priority, application United Kingdom, Sep. 30, 1985, 8524025

Int. Cl.⁴ C07C *27/06*

U.S. Cl. 518—706 **2 Claims**

1. Process for carrying out a chemical equilibrium reaction by introducing as reactants carbon monoxide and hydrogen in the gaseous phase into a reaction zone comprising at least two vertically aligned fixed beds of catalyst particles suitable for converting said reactants into methanol positioned in series on top of each other, said catalyst particles having interstices therebetween, and at least a portion of said catalyst particles comprising a catalyst for said chemical equilibrium reaction, which process comprises introducing said reactants at the bottom of the bottommost bed to flow upwardly through the beds, passing in a downward direction through said interstices relatively fine particles, adsorbing substantially all of the product compound or product compounds of said chemical equilibrium reaction onto said particles, and subsequently withdrawing said relatively fine particles from said reaction zone.

4,731,388

PROCESS FOR PRODUCING EXPANDABLE STYRENE-BASED POLYMER BEADS

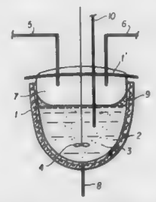
Hiroshi Matsui; Naoto Taga, and Shinya Ohgi, all of Mie, Japan, assignors to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Jan. 20, 1987, Ser. No. 4,487

Claims priority, application Japan, Jan. 23, 1986, 61-12470; Feb. 12, 1986, 61-26787

Int. Cl.⁴ C08J *9/20*

U.S. Cl. 521—56 **10 Claims**



1. A process for producing expandable styrene-based polymer beads, which comprises adding a low temperature polymerization initiator that is decomposable to the half at a temperature of from 50° to 80° C. for a period of 10 hours to an aqueous medium having suspended therein blowing agent-containing expandable styrene-based polymer small particles whose particle sizes have been adjusted so as to have a particle size distribution falling within a mean particle size ±20% in a proportion of at least ⅔ the amount required for polymerization of a styrene-based monomer to be added to the system, adding a blowing agent to the system in an amount of 5 to 15% by weight based on the small particles enough to inhibit expansion of said expandable styrene-based polymer small particles while the system is heated to a temperature for first stage polymerization, continuously or intermittently adding thereto a styrene-based monomer to which the rest, if any, of said low temperature polymerization initiator and a high temperature polymerization initiator that is decomposable to the half at a temperature of from 80° to 120° C. for a period of 10 hours have been added, adding a blowing agent to the polymerization system in an amount required for desired expansion of the resulting expandable styrene-based polymer beads, effecting first stage polymerization at a temperature ranging from a temperature 10° C. lower than the decomposition temperature of said low temperature polymerization initiator for obtaining a half-life of 10 hours to a temperature 20° C. higher than said decomposition temperature, and subsequently effecting second stage polymerization at an elevated temperature of from 100° to 150° C.

4,731,389

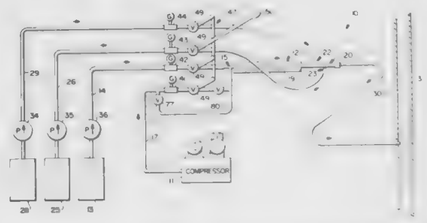
FOAM INSULATION AND PROCESS FOR PRODUCING THE SAME

R. Keene Christopher, Weedsport, N.Y., and Donald Thomson, Inverness, Fla., assignors to Air Krete, Inc., Weedsport, N.Y.

Continuation of Ser. No. 602,158, Apr. 19, 1984, abandoned and a continuation-in-part of PCT US/83/01335, Aug. 29, 1983, which is a continuation-in-part of Ser. No. 414,953, Sep. 3, 1982, abandoned, This application Nov. 14, 1985, Ser. No. 798,145

Int. Cl.⁴ C08J *9/30, 9/32;* **B29C** *39/10;* **E04B** *2/34*

U.S. Cl. 521—103 **45 Claims**



1. A process for producing a self-supporting insulating foam, comprising the steps of:

(a) mechanically foaming with air a foamable first component comprising polyvinyl alcohol and water;

(b) mixing a second cement component with said foamed first component, said second cement component comprising an aqueous solution or mixture of a cementitious material, a dispersant and a member selected from the group consisting of barium metaborate and sodium metaborate;

(c) shaping the resultant mixture; and

(d) allowing the shaped mixture to set thereby forming a self-supporting insulating foam.

11. A thermal insulation foam produced by the pocess of claim 1.

4,731,390

BIAXIALLY STRETCHED POLYPARAPHENYLENE SULFIDE FILM

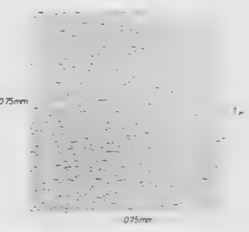
Toshiya Mizuno, Tsuchiura; Satoshi Hirose, Iwaki, and Yoshikichi Teramoto, Tsuchiura, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,571

Claims priority, application Japan, Apr. 2, 1986, 61-75827

Int. Cl.⁴ C08V *9/00*

U.S. Cl. 521—134 **5 Claims**



1. A biaxially stretched polyparaphenylene sulfide film comprising a resin composition consisting essentially of 100 parts by weight of a resin of polyparaphenylene sulfide and from 0.3 to 15 parts by weight of poly(4-methylpentene-1).

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4,731,391

PROCESS OF MAKING A SUPERABSORBENT POLYURETHANE FOAM

Chad E. Garvey, Ball Ground, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 18, 1986, Ser. No. 888,548

Int. Cl.[4] C08L *75/00;* **C08G** *18/10*

U.S. Cl. 521—137 **5 Claims**

1. A method of preparing a superabsorbent polyurethane foam which comprises mixing an isocyanate-terminated polyurethane prepolymer having an isocyanate functionality greater than two with (1) at least one compound having (a) at least one carbon-carbon double bond capable of undergoing addition polymerization with itself and other compounds which may be present and (b) at least one functional group selected from the group consisting of carbamoyl, substituted carbamoyl, and carboxy and the alkali metal and ammonium salts thereof; and (2) water, in the presence of at least one thermally activated free radical initiator, with the resulting polyurethane foam being essentially free of grafting of addition polymer to polyurethane.

4,731,392

PROCESS FOR THE PREPARATION OF POLYESTER POLYOLS, BASED ON 2-METHYL-1,4-BUTANEDIOL, WHICH ARE LIQUID AT ROOM TEMPERATURE, AND THEIR USE FOR THE PREPARATION OF PLASTIC MATERIALS

Joachim Streu, AM Huettenwingert, and Wolfgang Straehle, Hampenweg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 9, 1987, Ser. No. 36,298

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3614038

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—172 **17 Claims**

1. A process for making a polyester polyol which is liquid at room temperature and is useful for forming noncellular or cellular isocyanate addition polymer plastics, comprising:

polycondensing in the molten state at least one aliphatic polycarboxylic acid or a polycarboxylic acid anhydride, and 2-methyl-1,4-butanediol, or a mixture of 2-methyl-1,4-butanediol and a multivalent aliphatic alcohol selected from the group consisting of a linear or branched, aliphatic di-, tri- and tetravalent alcohol, and mixtures thereof,

whereby, the polyester polyol contains units having the structure $—OCH_2—CH(CH_3)—CH_2—CH_2O—$, an average functionality of from about 2 to 3, a hydroxyl number of from about 25 to 300, an acid number less than about 2 and a viscosity at 25° C. of about 200 to 10^5 mPas.

4,731,393

PROCESS FOR CHEMICALLY BONDING STABILIZERS TO POLYMERS

Friedrich Karrer, Zofingen, and Peter Hofmann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

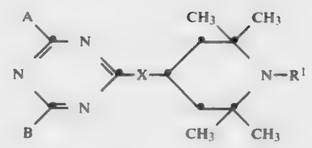
Continuation of Ser. No. 757,916, Jul. 22, 1985, abandoned, which is a continuation of Ser. No. 520,379, Aug. 4, 1983, abandoned. This application Jun. 11, 1986, Ser. No. 873,853

Claims priority, application Switzerland, Aug. 11, 1982, 4810/82

Int. Cl.[4] C08J *3/28;* **C08L** *23/36*

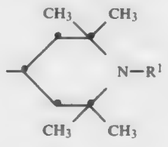
U.S. Cl. 522—117 **16 Claims**

1. A process for chemically bonding polyalkylpiperidine stabilizers to polyolefins or olefin copolymers by grafting ethylenically unsaturated polyalkylpiperidine derivatives, by the action of free radicals produced by chemical or physical means, onto the polyolefin or copolymer, said derivative being a compound of the formula I

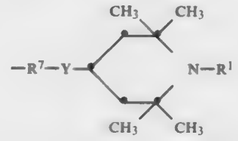


I

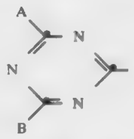
in which R^1 is hydrogen, oxyl oxygen, C_1–C_{12}-alkyl, C_3–C_7-alkenyl, C_7–C_{11}-phenylalkyl, cyanomethyl, C_2–C_{18}-alkanoyl or C_3–C_{18}-alkenoyl or a group $—CON(R^2)(R^3)$ or $—CH_2—CH(R^4)—OH$ in which R^2 is C_1–C_{12}-alkyl, allyl, cyclohexyl, benzyl, phenyl or C_7–C_{12}-alkylphenyl and R^3 is hydrogen, C_1–C_{12}-alkyl, allyl or benzyl or R^2 and R^3, together with the N atom to which they are attached, form a 5-membered or 6-membered heterocyclic ring and R^4 is hydrogen, C_1–C_{12}-alkyl, phenyl, C_2–C_{13}-alkoxymethyl or phenoxymethyl, X is a divalent group of the formula —O—, $—N(R^5)—$, $—NH—CH_2—CH_2—$, $—NH—(CH_2)_2—O—$, $—NH(CH_2)_3—O—$ or $—N(R^5)—R^7—N(R^6)—$ in which R^5 is hydrogen, C_1–C_{12}-alkyl, C_3–C_7-alkenyl, cyclohexyl, C_3–C_{12}-alkoxyalkyl, C_5–C_{12}-alkenoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, a group $—CH_2—CH(R^4)—OH$, benzyl or a group of the formula



or of the formula

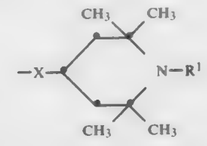


R^6 is hydrogen, C_1–C_{12}-alkyl, C_3–C_7-alkenyl, cyclohexyl, a group $—CH_2—CH(R^4)—OH$ are group of the formula



R^7 is C_2–C_{12}-alkylene which can be interrupted by 1, 2 or 3 of the groups —O— or $—N(R^6)—$, C_6–C_{14}-cycloalkylene or cycloalkylenedialkylene, Y is a divalent group of the formula —O— or $—N(R^6)—$ and A and B, independently of one another, (a) are a group of the formula $R^8O—$ or $(R^9)(R^{10})N—$ in which R^8 is C_1–C_{12}-alkyl, C_3–C_7-alkenyl, C_3–C_{12}-alkoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, cyclohexyl, benzyl, phenyl or C_7–C_{12}-alkylphenyl, R^9 is C_1–C_{12}-alkyl, C_3–C_7-alkenyl, C_5–C_8-cycloalkyl, C_3–C_{12}-alkoxyalkyl, C_5–C_{12}-alkenoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, a group $—CH_2—CH(R^4)—OH$, phenyl, C_7–C_{12}-alkylphenyl or C_7–C_{11}-phenylalkyl and R^{10} is hydrogen, C_1–C_{12}-alkyl, C_3–C_7-alkenyl, C_5–C_8-cycloalkyl, C_3–C_{12}-alkoxyalkyl, C_5–C_{12}-alkenoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, C_2–C_{12}-alkanoyl, C_3–C_{12}-alkenoyl, a group $—CH_2—CH(R^4)—OH$ or C_7–C_{11}-phenylalkyl, or R^9 and R^{10}, together with the N atom to which they are attached, form a

5-membered or 6-membered heterocyclic ring, or (b) are a group of the formula



in which at least three of the groups R^1, R^2, R^3, R^5, R^6, R^8, R^9 or R^{10} is an alkenyl or alkenoyl radical.

4,731,394

INORGANIC-ORGANIC COMPOUND SUBSTANCES FOR BIOMEDICAL PURPOSES

Werner Vogel; Guenther Heublein; Wolfram Hoeland; Manfred Boese; Karin Naumann; Gunter Carl; Juergen Vogel; Peter Wange, all of Jena; Jens Gummel, Berlin; Peter Zinner, Jena; Eggert Beleites, Maua, and Thomas Schubert, Dresden, all of German Democratic Rep., assignors to Friedrich-Schiller-Universitaet Jena, Jena, German Democratic Rep.

Filed Jun. 12, 1986, Ser. No. 873,566

Claims priority, application German Democratic Rep., Jun. 24, 1985, 2776665

Int. Cl.[4] C08K *3/40, 9/04, 9/06*

U.S. Cl. 523—115 **11 Claims**

1. Inorganic-organic compound substances useful for biomedical purposes, comprising 30 to 80 weight-% of an inorganic initial material chemically bonded with 20 to 70 weight-% of an organic initial material, wherein the inorganic initial material is selected from the group consisting of a biocompatable silicate glass, silicate glass ceramic or mixtures thereof having a composition by weight % of

SiO_2 =	34–60
Al_2O_3 =	21–36
MgO =	8–17
R_2O =	5–12
F^- =	1–7

wherein R_2O represents the sum of 0–8 weight-% Na_2O and 0–6 weight-% K_2O,

a bioactive phosphosilicate glass, a phosphosilicate glass ceramic (A) or mixtures thereof having a composition by weight % of

SiO_2 =	19–52
Al_2O_3 =	12–23
MgO	5–15
R_2O =	3–10
CaO =	9–30
P_2O_5	4–24
F^- =	0.5–7

wherein R_2O represents the sum of 0–8 weight-% Na_2O and 0–8 weight-% K_2O,

a bioactive phosphosilicate glass, a phosphosilicate glass ceramic (B) or mixtures thereof having a composition by weight % of

SiO_2 =	18–63
MgO =	10–35
K_2O =	3–10
F^- =	4–9
CaO =	1–30
P_2O_5 =	1–30

a bioactive phosphate glass, a phosphate glass ceramic or mixtures thereof having a composition by weight % of

P_2O_5 =	43–58
Al_2O_3 =	3–21
CaO =	8–26
R_2O =	10–25

wherein R_2O can contain up to 25 weight-% Na_2O and up to 18 weight-% K_2O,

a sintered ceramic comprising tricalcium phosphate apatite or mixtures thereof and mixtures thereof, and the organic initial material comprises a biocompatible, monomer-free, epoxidized polymeric hydrocarbon composed only of the elements C, H, O having an average molecular weight $\overline{Mn}$ of 2,000 to 6,000 and an epoxy equivalence EEW of 50 to 500 g, wherein the inorganic initial material has been pretreated with phosphoric acid to facilitate said chemical bonding between the organic and inorganic initial materials.

4,731,395

POLYDICYCLOPENTADIENE HAVING IMPROVED ODOR

Brian Byrne, Mahwah; Pierre I. Croquez, Montclair; Barbara C. Gebbia, Totowa, all of N.J., and Paul A. Silver, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed May 14, 1986, Ser. No. 863,214

Int. Cl.[4] A61L *9/01;* **C08F** *4/78, 132/08*

U.S. Cl. 523—102 **20 Claims**

1. In a two-part metathesis polymer catalyst system wherein part one comprises a catalyst activator and optionally a rate moderator, and part two comprises WCl_6 and $WOCl_4$ and optionally a phenolic compound and/or a chelating agent and/or t-butanol, and wherein at least one of said catalyst parts contains dicyclopentadiene monomer, the improvement comprising at least one of said catalyst parts containing from about 2 to about 500 ppm (based on the weight of dicyclopendadiene) of liquid deodorant selected from the group consisting of cyclacet, cyclaprop, β-damascenone, β-damascone, rose oxide, terpene C, citronellyl methyl ether, citronellyl ethyl ether, geranyl methyl ether, geranyl ethyl ether, 2,6-dimethyloctyl methyl ether, 2,6-dimethyloctyl ethyl ether, α-terpenyl methyl ether, α-terpenyl ethyl ether, methyl salicylate, methyl octin carbonate, and 1,3,5-undecatriene.

4,731,396

THERMAL STABILIZATION OF ACETAL POLYMERS

Andrew B. Auerbach, Livingston, and Thomas C. Yu, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 778,348, Sep. 20, 1985. This application Jan. 15, 1986, Ser. No. 819,092

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] C08K *5/34;* **C08F** *283/00*

U.S. Cl. 523—439 **18 Claims**

1. A method of preparing a stabilized acetal polymer composition comprising forming an intimate dispersion of an amidine stabilizer in a carrier resin comprising an ionomer at a temperature above the softening point of said resin and compounding said dispersion with said acetal polymer, said carrier resin having a melting or softening point no higher than the melting point of the acetal polymer.

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THERMAL STABILIZATION OF ACETAL POLYMERS

Andrew B. Auerbach, Livingston, and Tom C. Yu, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,348
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] C08K 5/34; C08F 283/00
U.S. Cl. 523—439 11 Claims

1. A method of preparing a stabilized acetal polymer composition comprising forming an intimate dispersion of a stabilizer selected from the group consisting of cyanoguanidine and melamine in a carrier resin at a temperature above the softening point of said resins and compounding said dispersion with said acetal polymer, said carrier resin melting or softening at or below about 160° C. and being inert to said acetal polymer as well as to the other additives present.

4,731,398

THERMOSETTING ADHESIVE AND SEALANT COMPOSITIONS

Hans Huber, Lohmar, and Norbert Vollkommer, Troisdorf-Kriegsdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 928,530
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539593
Int. Cl.[4] C08L 67/02, 67/06; C08G 63/46
U.S. Cl. 523—500 16 Claims

1. A thermosetting adhesive and sealant composition comprising:
(a) 20 to 60 wt.-% of carboxyl-group-terminated polyesters with a glass transition temperature below 20° C.;
(b) 2.0 to 12 wt.-% of polyoxazolines which contain at least 2 oxazoline groups per molecule, the polyoxazolines being suspended in the polyester;
(c) 2 to 40 wt.-% of acrylic or methacrylic esters, of monovalent or polyvalent alcohols or allyl esters of polyvalent carboxylic acids including carbonic acid, or mixtures of these compounds;
(d) 0 to 5 wt.-% of peroxides or aliphatic azo compounds as radical formers; and
(e) 0 to 4 wt.-% of paraffin.

4,731,399

LATEX MODIFIED ASPHALT FOAMS

Paul Fitzgerald, Hixson, and Jimmy D. Cross, Signal Mountain, both of Tenn., assignors to Polysar Financial Services S.A., Canton of Fribourg, Switzerland

Filed Dec. 12, 1985, Ser. No. 808,158
Int. Cl.[4] B32B 11/00; C08L 95/00
U.S. Cl. 524—60 8 Claims

1. A composition comprising from about 30 to about 70 percent by weight of solids comprising on a dry weight basis from about 60 to about 99 parts by dry weight of an emulsion of a polymer selected from the group:
(a) homo- or copolymer of one or more C_{4-6} conjugated diolefins which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom;
(b) a copolymer of: from about 25 to 80 weight percent of a C_{4-6} conjugated diolefin which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom; from about 20 to 75 weight percent of a mixture comprising 75 to 100 weight percent of a C_{8-12} vinyl aromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom and from 0 to 25 weight percent of one or more of a C_{3-6} alkenyl nitrile, and from 0 up to about 15 weight percent of one or more monomers selected from the group consisting of:
(i) C_{3-6} ethylenically unsaturated carboxylic acids;
(ii) amides of C_{3-6} ethylenically unsaturated carboxylic acids, which amides may be unsubstituted or substituted by up to two C_{1-4} alkyl or alkanol radicals;
(iii) C_{1-4} alkyl or alkanol esters of C_{3-6} ethylenically unsaturated carboxylic acids;
(iv) C_{3-6} ethylenically unsaturated aldehydes;
(v) and a mixture thereof;
(c) a copolymer of from about 0.5 to about 20 weight percent of a C_{2-4} olefin; and from about 99.5 to about 80 weight percent of a monomer selected from the group C_{1-8} alkyl or alkanol esters of C_{3-6} ethylenically unsaturated carboxylic acids; C_{2-8} alkenyl or alkanol esters of C_{1-8} ethylenically saturated carboxylic acids;
(d) a copolymer of from about 60 to about 99.5 weight percent of a C_{1-4} alkyl or alkanol ester of a C_{3-6} ethylenically unsaturated carboxylic acid; and from about 0.5 to 40 weight percent of one or more monomers selected from the group consisting of:
(i) C_{3-6} ethylenically unsaturated carboxylic acids;
(ii) amides of C_{3-6} ethylenically unsaturated carboxylic acids, which amides may be unsubstituted by up to two C_{1-4} alkyl or alkanol radicals;
(iii) C_{3-6} ethylenically unsaturated aldehydes,
(iv) or a mixture thereof;
from about 1 to about 40 parts by dry weight of an emulsion compatible with said emulsion of polymer, of a member selected from the group asphalt, bitumen, tar and a mixture thereof; per 100 parts by dry weight of said emulsion of up to 350 parts by dry weight of a particulate mineral filler and a stabilizer of from 0.5 to 1.5 parts by weight of a pyrophosphate and from 0.5 to 1.5 parts by weight of a salt of a long chain fatty acid.

4,731,400

THERMOPLASTIC RESIN COMPOSITION

Hiromi Shigemoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 808,952
Claims priority, application Japan, Dec. 18, 1984, 59-265443
Int. Cl.[4] C08K 5/34, 5/48; C08L 23/18
U.S. Cl. 524—88 26 Claims

1. A thermoplastic resin composition consisting essentially of
(A) a crystalline homopolymer of 4-methyl-1-pentene or a crystalline copolymer of 4-methyl-1-pentene and another alpha-olefin, and
(B) 1 to 100 ppm of a blue pigment.

4,731,401

POLYOLEFIN RESIN COMPOSITION CONTAINING ROSIN, ROSIN DERIVATIVE OR PETROLEUM RESIN

Tsutomu Moteki, Sodegaura; Kazuo Aoki, Chibashi, and Kazuhiro Kimura, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Oct. 3, 1986, Ser. No. 915,078
Claims priority, application Japan, Oct. 21, 1985, 60-234872
Int. Cl.[4] C08K 11/00; C08J 23/00; C08L 45/00
U.S. Cl. 524—271 9 Claims

1. A polyolefin resin composition suitable for forming a molded product with superior adhesion to a cast foamed polyurethane but with little molding shrinkage, which composition comprises a blend of
(1) a polyolefin resin selected from the group consisting of
(i) a propylene homopolymer,
(ii) a crystalline copolymer comprising propylene units as the main component and units of one or more alpha-olefins selected from the group consisting of ethylene, butene-1, 4-methylpentene-1, hexene-1, heptene-1, octene-1 and decene-1,
(iii) an ethylene homopolymer or a crystalline copolymer comprising ethylene units as the main component and units of one or more alpha-olefin selected from the group consisting of propylene, butene-1, 4-methylpentene-1 hexene-1, heptene-1, octene-1 and decene-1 or a mixture thereof,
(2) 10 to 40 wt. % of a styrene resin selected from the group consisting of
(i) a polystyrene,
(ii) an acrylonitrile-butadiene-styrene copolymer,
(iii) an acrylonitrile-styrene copolymer,
(iv) a styrene-methylmethacrylate copolymer,
(v) a styrene-maleic anhydride copolymer and a mixture thereof; and
(3) 0.5 to 5 wt. % of at least one member selected from the group consisting of rosin, derivatives of rosin and petroleum resin, said percentages being by weight of the polyolefin resin composition.

4,731,402

FLOOR COVERING ADHESIVE BASED ON AQUEOUS POLYMER DISPERSIONS

Erich Penzel, Ludwigshafen; Lothar Maempel, Bruehl; Hans J. Neumann, Wachenheim; Karl-Clemens Peters, Bad Duerkheim, and Oral Aydin, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,204
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538983
Int. Cl.[4] C08J 23/00, 31/00; C08L 39/00
U.S. Cl. 524—273 13 Claims

1. A floor covering adhesive consisting essentially of:
(a) an aqueous dispersion of a copolymer of:
(i) 20–60% by weight of vinylidene chloride,
(ii) 34–80% by weight of a mixture of 40–80 parts by weight of esters of acrylic acid with C_1–C_{18}-alkanols and 20–60 parts by weight of one or more vinyl esters, and
(iii) 0.5–6% by weight of α,β-monoolefinically unsaturated C_3–C_5-mono-or dicarboxylic acids or amides thereof or vinyl sulfonate, or a mixture thereof, and
(b) 30–150 parts by solid weight, based on 100 parts of a copolymer of a), of a tackifying resin which is a rosin or a derivative thereof.

4,731,403

LUBRICANTS FOR HALOGEN-CONTAINING THERMOPLASTIC RESINS AND COMPOSITIONS PREPARED THEREFROM

Karl R. Wursthorn, Cincinnati; Jeffrey R. Hyde, West Chester, and Miller H. Goose, Jr., Cincinnati, all of Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 919,111, Oct. 15, 1986, abandoned.
This application Jul. 13, 1987, Ser. No. 73,904
Int. Cl.[4] C08K 5/36; C08J 5/36, 5/16
U.S. Cl. 524—302 12 Claims

1. A thermoplastic resin composition comprising a halogen-containing thermoplastic resin and a lubricant compound which is an addition product of (1) an olefin and (2) a mercaptan, the —SH group of said mercaptan joining to a carbon-carbon double bond of said olefin, attaching the H of said —SH group to one of the double-bonded carbons and attaching the S of said —SH group to the other of the double-bonded carbons, the carbons to which said S is attached in said lubricant compound being saturated, said lubricant compound having at least one free carboxyl group or salt of a free carboxyl group, said lubricant compound being present at between about 0.05 and about 5 parts by weight per 100 parts of said resin.

4,731,404

POLYESTER COMPOSITION CONTAINING ESTER OF POLYFUNCTIONAL HIGH MOLECULAR WEIGHT ALCOHOL

John C. Haylock, Dennysville, Me.; Harold W. Tuller, Long Valley, N.J., and John A. Bander, Richmond, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 25, 1986, Ser. No. 899,701
Int. Cl.[4] C08L 67/02
U.S. Cl. 524—310 18 Claims

1. A composition comprising:
a linear saturated polyester; and from 0.5 to 30% by weight of the polyester of at least one ester of an alcohol and a carboxylic acid wherein the alcohol has the formula:

$$R^1[(OR^2)_nOH]_m$$

wherein R^1 is a hydrocarbon radical of from 3 to 10 carbon atoms, R^2 is a hydrocarbon radical of from 2 to 4 carbon atoms, n can be the same or different integer of from 2 to 15, m is an integer of from 3 to 6, the alcohol has greater than 20 carbon atoms; and
wherein the acid is a carboxylic acid of from 1 to 25 carbon atoms, and the molecular weight of the ester is from 900 to 1,500.

4,731,405

THERMOPLASTIC MOULDING MATERIALS WITH HIGH TRACKING RESISTANCE

Jürgen Kirsch, Cologne; Horst Peters, Leverkusen; Peter Baasch, Bergisch Gladbach; Hans-Jürgen Kress, Krefeld, and Christian Lindner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Nov. 28, 1986, Ser. No. 935,824
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544295
Int. Cl.[4] C08K 3/22
U.S. Cl. 524—408 14 Claims

1. A thermoplastic moulding material containing
(A) 60 to 85 parts by weight of a copolycarbonate containing 3 to 20% by weight of halogen, of a divalent phenol and a divalent halogenated phenol,
(B) 10 to 30 parts by weight of a graft polymer of
(1) 5 to 90 parts by weight, of a mixture of
(i) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methylmethacrylate or mixtures thereof, and
(ii)50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, on
(2) 95 to 10 parts by weight of an acrylate rubber having a glass transition temperature $T_G \leqq 10°$ C.
(C) 5 to 30 parts by weight of a thermoplastic copolymer from
(1) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof, and
(2) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-sustituted maleimide or mixture thereof,
wherein the percentages of A, B and C must add up to 100
(D) 0.05 to 2.0 parts by weight, relative to 100 parts by weight of A+B+C, of a tetrafluoroethylene polymer having a density of 2.0 to 2.3 g/cm^3 and a mean particle diameter of 100 to 1000 μm, and
(E) 1 to 5 parts by weight, relative to 100 parts by weight of A+B+C, of antimony trioxide, antimony carbonate, bismuth trioxide or bismuth carbonate and
(F) 4 to 12 parts by weight, relative to 100 parts by weight of A+B+C, of titanium dioxide and,
(G) 0 to 15 parts by weight, relative to 100 parts by weight of A+B+C, of a low-molecular weight, organic halogen compound, the halogen content resulting from components

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A+G, however, not exceeding 20% by weight, relative to the total weight of components A+G.

4,731,406

FLAME-RETARDANT LOW-SMOKING RUBBER COMPOSITION

Kunio Itoh; Tsutomu Nakamura, and Ken-ichi Takita, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,388

Claims priority, application Japan, Dec. 18, 1985, 60-284770

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—436 **2 Claims**

1. A flame-retardant and low-smoking rubber composition which comprises:

(a) 100 parts by weight of a rubbery copolymer of monomers comprising ethylene and propylene;

(b) from 10 to 150 parts by weight of a combination of

(b-1) from 20 to 80% by weight of a polymer of an acrylic acid ester and

(b-2) from 80 to 20% by weight of an organopolysiloxane, or from 10 to 150 parts by weight of (b-3) a copolymer essentially composed of from 20 to 80% by weight of a moiety of an acryclic acid ester and from 80 to 20% by weight of a moiety of an organopolysiloxane; and

(c) aluminum hydroxide, magnesium hydroxide or a combination thereof in an amount in the range from 30 to 150% by weight based on the total amount of the components (a) and (b).

4,731,407

POLYETHERESTER ELASTOMER COMPOSITION

Thomas E. Benim, Kinston, N.C., and Michael A. Hamilton, Kingston, Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1985, Ser. No. 792,072

Int. Cl.[1] C08L *67/02*

U.S. Cl. 524—451 **4 Claims**

1. An improved elastomeric composition formed from a melt blend of polyetherester elastomers, each elastomer being formed of hard and soft segments made from reactants consisting essentially of a poly(tetramethylene ether)glycol, 1,4-butane diol and a phenylene dicarboxylic acid or a derivative thereof, the improvement wherein

the phenylene dicarboxylic acid consists essentially of at least 70% terephthalic acid and no more than 30% isophthalic acid

a first elastomer amounts to 75 to 85% by weight of the blend and has hard segments amounting to 20 to 25% by weight of said elastomer and soft segments of 1800 to 3000 number average molecular weight,

a second elastomer amounts to 15 to 25% by weight of the blend and has hard segments amounting to 40 to 55% by weight of said second elastomer and soft segments of 850 to 2000 number average molecular weight, and

the blend exhibits a melting endotherm over a temperature range that extends from no lower than 120° C. to no higher than 215° C. with a melting peak in the range of 150° to 175° C.

4,731,408

PROCESSABLE CONDUCTIVE POLYMERS

Stanley J. Jasne, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1985, Ser. No. 811,281

Int. Cl.[4] C08F *39/04*

U.S. Cl. 524—458 **25 Claims**

1. A method for the production of a processable conductive polymer which comprises oxidatively polymerizing, in a polymerization reaction medium, an aromatic heterocyclic or aniline salt monomer oxidatively polymerizable to a cationic polymer, said reaction medium including a reaction medium-soluble chemical oxidizing agent for said oxidatively polymerizable monomer and, in a dispersed phase in said reaction medium during the polymerization and as a counteranion for said cationic polymer, a polymer having anionic surface character.

4,731,409

AQUEOUS COATING COMPOSITION CONTAINING FINE PARTICLES OF WATER INSOLUBLE RESIN SOLUTION

Hiroshi Miwa; Hideyoshi Noda, both of Hyogo, and Sakuichi Konishi, Nara, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Feb. 3, 1987, Ser. No. 11,211

Claims priority, application Japan, Feb. 5, 1986, 61-023330

Int. Cl.[4] C08L *63/00, 33/02*

U.S. Cl. 524—501 **5 Claims**

1. An aqueous coating composition comprising

(A) an aqueous medium,

(B) at least one water soluble or dilutable resin which has a water tolerance of 4 or more and whose 1% by weight aqueous solution shows a surface tension of 51 dynes/cm or less, and

(C) fine particles of resinous solution of water insoluble resin in a hydrophobic solvent, the particles being uniformly dispersed in the combination of said aqueous medium (A) and the water soluble or dilutable resin (B) and having a mean diameter of 1μ or less, which is characterized in that the absolute value of difference in solubility parameter ($|\Delta Sp|$) between said resinous solution and said water soluble or dilutable resin is within a range of $|\Delta Sp| < 2$.

4,731,410

POLYURETHANE ADHESIVE MIXTURES

Uwe Bueltjer, Ludwigshafen; Rainer Hummerich, Worms, and Michael Kerber, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 2, 1986, Ser. No. 881,244

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1985, 3524333

Int. Cl.[4] C08G *18/66, 18/76;* **C08L** *75/06*

U.S. Cl. 524—539 **10 Claims**

1. A polyurethane adhesive mixture comprising a polyurethane elastomer prepared by reacting at least one essentially linear polyester-polyols and at least one chain extender with a mixture of 4,4'- and 2,4'-diphenylmethane diisocyanate isomers in a weight ratio of from 60:40 to 40:60.

2. A polyurethane adhesive as claimed in claim 1 which further contains at least one organic solvent.

10. The polyurethane adhesive as claimed in claim 2 comprising from 5 to 40 parts by weight of a polyurethane elastomer and from 95 to 60 parts by weight of an organic solvent.

4,731,411

PROCESS FOR PRODUCING ALKOXY-TERMINATED POLYSILOXANES

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 446,233, Dec. 2, 1982, abandoned. This application Jun. 16, 1986, Ser. No. 874,891

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—860 **14 Claims**

1. A process for producing alkoxy-terminated polysiloxanes which can be used to produce RTV silicone rubber compositions, comprising, anhydrously reacting

(1) a silanol-terminated diorganopolysiloxane having a viscosity in the range of 100 to 1,000,000 centipoise at 25° C. where the organo groups are monovalent hydrocarbon radicals with

(2) a polyalkoxy cross-linking agent of the formula,

$$(R^1O)_{3-b}-\overset{(R^2)_b}{\overset{|}{Si}}-H$$

where R^1 is a $C_{(1-8)}$ monovalent hydrocarbon radical, R^2 is a $C_{(1-13)}$ monovalent hydrocarbon radical, b is 0, 1 or 2;

(3) in the presence of a platinum or platinum-containing catalyst.

4,731,412

PROCESS AND COMPOSITION FOR AMINO-TERMINAL, α-ASPARTYL AND α-GLUTAMYL DIPEPTIDE ESTERS

Emil T. Kaiser, New York, N.Y., and Gary F. Musso, San Diego, Calif., assignors to The Salk Institute Biotechnology/Industrial Associates, Inc., San Diego, Calif.

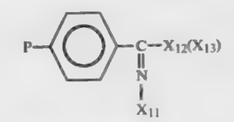
Division of Ser. No. 687,475, Dec. 28, 1984, Pat. No. 4,600,532. This application Apr. 14, 1986, Ser. No. 851,444

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—54.11 **6 Claims**

1. A ketoxime ester-derivatized resin wherein the ester-derivatized sites are represented by formula X

X



wherein P represents the polymer backbone of the resin; wherein the phenylene group is a repeating functional group in the corresponding underivatized polymer; wherein X_{11} is a strong acid salt of L- or D,L-aspartyl or a strong acid salt of L- or D,L-glutamyl, which is bonded to the ketoxime-nitrogen through the α or β carboxyl group, and is not covalently protected at either the amino group or the carboxyl group that is not bonded to the ketoxime-nitrogen, provided that the fraction of X_{11} groups in the resin bonded to the ketoxime-nitrogen through the α-carboxyl and with a configuration of L is greater than 0; wherein X_{12} is (i) phenyl, or phenyl substituted at any one position with chlorine; bromine; iodine; alkoxy, wherein the alkyl moiety is of 1 to 6 carbon atoms; sulfonyl; nitro; or trialkylamino, wherein the alkyl groups are the same or different and are each of 1 to 4 carbon; (iii) cycloakyl of 3 to 8 carbon atoms; or (iv) a heterocyclic moiety consisting of 3 or 4 carbon atoms in the ring, an atom or group selected from oxygen, nitrogen, sulfur and sulfonyl in the ring, and a CH group in the ring and bonded to the ketoxime carbon atom; and wherein X_{13} is a counterion to any positive charge that is present on X_{12} and is the conjugate base of a strong acid.

4,731,413

MOLDING COMPOSITIONS BASED ON LINEAR, HIGH-MOLECULAR WEIGHT POLYESTERS

Michael Dröscher, Dorsten; Christian Gerth, Haltern, and Harald Sturm, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,254

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3504986

Int. Cl.[4] C08L *67/02, 13/02, 21/02*

U.S. Cl. 525—64 **21 Claims**

1. A method of increasing the impact strength of a molding composition comprising admixing an aqueous latex of a synthetic resin having a solids content of 35% by weight or less with a linear high-molecular weight polyester in melt form under strong shear forces effective to form the mixture, wherein said synthetic resin is a copolymer having 0.1–20 mol-% of functional groups that are able to form ester or amide linkages, said copolymer being obtained by addition polymerization of unsaturated monomers, and said composition having a latex proportion, calculated as solid matter, of 1–400 parts by weight, based on 100 parts by weight of polyester.

4,731,414

BLENDS OF AN ASA TERPOLYMER, AN ACRYLIC POLYMER AND AN ACRYLATE BASED IMPACT MODIFIER

Sai-Pei Ting, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,614

Int. Cl.[4] C08L *33/08, 33/10, 33/12, 51/06*

U.S. Cl. 525—71 **8 Claims**

1. A weatherable impact resistant resin composition comprising:

(A) 5 to 95 parts of weight of an acrylate-styrene-acrylonitrile terpolymer resin;

(B) 95 to 5 parts by weight of an acrylic resin made by the polymerization of acrylic ester monomers; and

(C) 1 to 40 parts by weight per 100 parts of resins (A) and (B) taken together of an impact modifying component wherein said modifying component is comprised of a crosslinked alkyl acrylate-graft acrylate copolymer.

4,731,415

POLYISOCYANATES AND RESIN COMPOSITIONS THEREOF

Shoichi Fujita, Minoo, and Kohji Nasu, Nishinomiya, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 2, 1986, Ser. No. 847,392

Claims priority, application Japan, Apr. 10, 1985, 60-77457; Mar. 3, 1986, 61-45668

Int. Cl.[4] C08G *18/76*

U.S. Cl. 525—123 **10 Claims**

1. A polyisocyanate having a biuret structure obtained by allowing α,α, α',α'-tetramethyl-xylylene diisocyanate, a diisocyanate represented by the general formula:

$$OCN-CH_2-R-CH_2-NCO$$

wherein R is a divalent hydrocarbon residue having 1–12 carbon atoms and water to react.

4,731,416

POLYURETHANE-TYPE ADHESIVES CONTAINING NONAQUEOUS SOLUTIONS OF ACRYLATE POLYMERS

Frank L. Saunders, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 655,795, Oct. 1, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,736

Int. Cl.[4] C08L *75/04*

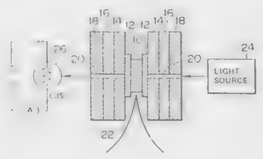
U.S. Cl. 525—131 **12 Claims**

1. An adhesive composition comprising the reaction product of (1) a true solution of (a) from about 10 to about 70 weight percent of a copolymer consisting essentially of (i) from about 45 to about 95 weight percent of an alkyl ester of an α,β-ethylenically unsaturated ccarboxylic acid and(ii) from about 5 to about 55 weight percent of a hydroxyalkyl ester of an α,β-ethylenically unsaturated carboxylic acid, in (b) from about 30 to about 88 weight percent of a polyahl having a molecular weight of at least 200, with (c) from about 2 to about 20 weight percent of a polyahl chain extender having a molecular weight less than 200, and (2) an organic polyisocyanate in an amount sufficient to react with essentially all of the active hydrogen moieties of the HMW polyahl and the LMW polyahl, said copolymer and polyahl chain extender being present in amounts effective to substantially increase the lap shear strength or impact strength over that of a comparable adhesive

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containing no copolymer, said copolymer having a number average molecular weight ($\overline{M}_n$) of at least 3500.

4,731,417
MULTICOMPONENT RESIN COMPOSITION VARIABLE IN LIGHT TRANSMITTANCE WITH TEMPERATURE
Seizo Miyata, and Satoru Kobayashi, both of Tokyo, Japan, assignors to Central Glass Company, Limited, Ube, Japan
Filed Mar. 7, 1986, Ser. No. 837,304
Claims priority, application Japan, Mar. 7, 1985, 60-43724
Int. Cl.[4] C08L *27/16, 31/04, 33/08*
U.S. Cl. 525—200 **13 Claims**

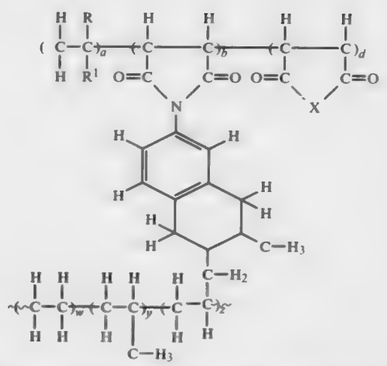


1. A blended multicomponent resin composition, comprising a combination of first and second polymers wherein said combination of first and second polymers is selected from the group consisting of combinations of a polyalkyl methacrylate and chlorinated polyethylene, combinations of a polyalkyl acrylate and a vinylidene fluoride base copolymer, combinations of a polyalkyl methacrylate and a vinylidene fluoride base copolymer, combinations of polyvinyl methyl ketone and a vinylidene fluoride base copolymer, combinations of polystryene and a polyalkyl vinyl ether, combinations of polycarbonate and polycaprolactone, combinations of an ethylenevinyl acetate copolymer and a chlorinated rubber and combinations of a polyalkyl acrylate and polyvinyl nitrate which have mutual solubility and a blend of lower critical solution temperature appears; and

a third polymer which has mutual solubility, at least partially, with at least one of said first and second polymers, said third polymer serves the function of controlling the phase separation temperature of the multicomponent resin composition.

4,731,418
DIELS-ALDER GRAFT POLYMERS
Barry D. Dean, Broomall, Pa., assignor to ARCO Chemical Company, Newtown Square, Pa.
Filed Sep. 2, 1986, Ser. No. 902,737
Int. Cl.[4] C08L *39/04*
U.S. Cl. 525—205 **15 Claims**

1. A graft polymer represented by formula (I):

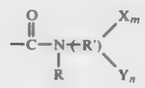


(I)

wherein R represents hydrogen or alkyl; R^1 represents phenyl, alkyl substituted phenyl, chloro or bromo substituted phenyl, CO_2H, CO_2CH_3, $CO_2CH_2CH_3$, or C≡N; X represents O, NH, NCH_3, NCH_2CH_3, $NC(CH_3)_3$, NC_6H_5, N-(p-Br)C_6H_4, N-(p-CH_3)C_6H_4, N-[p-$C(CH_3)_3$]C_6H_4, or N-(p-CH_3O)C_6H_4; the mole percent of the total recurring units designated by subscripts a+b+d equals 100 with a being a number from about 95 to about 99.5, b being a number from about 0.5 to about 5, and d being a number from 0 to about 45, with the proviso that if the recurring unit designated by subscript d is present, it is directly substituted for the recurring unit designated by the subscript a; the mole percent of the total recurring units designated by subscripts w+y+z equals 100, with w being a number from about 30 to about 55, y being a number from about 44.9 to about 55, and z being a number of from about 0.1 to about 15; and, wherein at least 1 percent of the recurring units designated by the subscript b and at least 1 percent of the recurring units designated by the subscript z have been reacted to form a graft structure.

4,731,419
ALKOXYLATED/CATIONICALLY MODIFIED AMIDE-CONTAINING POLYMERS
Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.
Filed Feb. 24, 1986, Ser. No. 831,963
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—328.2 **12 Claims**

1. A water-soluble pendant substituted amide containing vinylic polymer having a molecular weight of at least 500 which has at least one mole percent of its original pendant amide groups converted to pendant substituted amide structures represented by:



wherein:

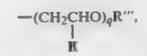
R′ is a multivalent hydrocarbonaceous bridging group having from 1–20 carbon atoms and which may be linear or branched alkyl; aryl; alkaryl, cyclic, and mixtures thereof;

X is represented by the formula:

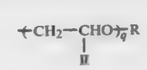


wherein

R″ is a hydrocarbonaceous group chosen, at each occurrence, from linear or branched alkyl, aryl, alkaryl, cyclic,, or two R″ groups taken together to form a ring, alkoxyl groups represented by



and mixtures thereof provided that when n is zero, at least one R″ is an alkoxyl group represented by



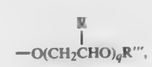
,

and wherein

p is from 0 to 1, provided that when p is one, an electroneutralizing gegenion is equivalently present;

R‴ is individually chosen, at each occurrence, from hydrocarbonaceous groups having from one to twenty carbon atoms and being linear or branched alkyl groups, aryl and alkaryl, and cyclic groups, and mixtures thereof;

Y is chosen, at each occurrence, from the group consisting of —OR‴,



and mixtures thereof;

and wherein

R is chosen, at each occurrence, from hydrogen or a lower alkyl (C_1–C_4) group, and

q ranges between 1–50; and

m is from 0–20

n is from 0–20, provided the sum, m+n, is at least one.

4,731,420
CO-OLIGOMERIZATION PRODUCT OF A MIXED CYANATE AND A POLYMALEIMIDE AND EPOXY RESIN THEREOF
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 831,947, Feb. 24, 1986, Pat. No. 4,663,398.
This application Dec. 8, 1986, Ser. No. 939,201
Int. Cl.[4] C08G *69/48*
U.S. Cl. 525—430 **6 Claims**

1. An epoxy resin composition prepared by reacting an epihalohydrin with a hydroxyaromatic oligomer resulting resulting from

(I) reacting at a temperature and time sufficient to essentially complete the reaction of

(A) at least one material having an average of more than one aromatic hydroxyl group per molecule with

(B) at least 0.01 but not more than 0.95 moles of at least one cyanogen halide per aromatic hydroxyl group; in the presence of

(C) from about 0.01 to about 1.1 mole of a suitable base per aromatic hydroxyl group contained in component (A); and thereafter recovering the resultant cyanate-containing mixture; and

(II) co-oligomerizing at a temperature and for a time sufficient to essentially complete the co-oligomerization reaction the cyanate-containing product from (I) with

(D) a polymaleimide in an amount which provides a mole ratio of maleimide groups to cyanate groups of from from about 0.01:1 to about 1:1; optionally in the presence of

(E) a suitable co-oligomerization catalyst

and subsequently dehydrohalogenating the resultant halohydrin ether and thereafter recovering the resultant glycidyl ether product.

4,731,421
TRANSPARENT COPOLYAMIDE FROM BIS(4-AMINO-3,5-DIETHYL CYCLOHEXYL) METHANE
Manfred Hoppe, Chur, and Hans D. Torre, Domat, both of Switzerland, assignors to Ems-Inventa AG, Switzerland
Filed Jan. 7, 1986, Ser. No. 816,805
Claims priority, application Switzerland, Jan. 7, 1985, 00039/85
Int. Cl.[4] C08G *69/26*
U.S. Cl. 525—432 **10 Claims**

1. A copolyamide from the polycondensation of

(a) bis-(4-amino-3,5-diethylcyclohexyl)methane or dicarboxylic acid salt thereof, and at least one member selected from the group of bis-(4-amino-cyclohexyl)-methane or another diamine, the molar ratio of said (diethylcyclohexyl)-methane to said bis-(4-aminocyclohexyl)-methane or said diamine being 95:5 to 5:95, with

(b) a substantially stoichiometric quantity, based on (a), of isophthalic acid or a diamine salt thereof, partially replaceable by 0–50% (by mole or weight) terephthalic acid or a diamine salt salts thereof, or by 5 to 95% by weight of at least one additional polyamide-forming aliphatic dicarboxylic acid or diamine salt thereof, and with

(c) 20 to 60% by weight, based on the total of (a), (b) and (c) of at least one polyamide forming component comprising:

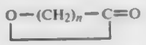
1. an ω-aminocarboxylic acid having 11 or 12 carbon atoms or the lactam thereof, or

2. a salt or stoichiometric mixture of an aliphatic dicarboxylic acid an an aliphatic diamine,

the average number of methylene groups in (c), based on each amide group or each pair of amide-forming groups, is at least seven, and the minimum number of methylene groups between the amide forming groups is at least 6 and, when part of said isophthalic acid is replaced by said aliphatic dicarboxylic acid, the total weight of said dicarboxylic acid and (c) is 20 to 60% by weight based on the total of (a), (b), and (c).

4,731,422
RESINOUS MODIFIED POLYESTER COMPOSITION FOR A TOP COAT
Hisaki Tanabe, Kyoto; Masahiko Togo, Kanagawa, and Hirotoshi Umemoto, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Filed Jul. 29, 1986, Ser. No. 890,484
Claims priority, application Japan, Jul. 31, 1985, 60-170196
Int. Cl.[4] C08G *63/76*
U.S. Cl. 525—437 **2 Claims**

1. A resinous composition for a top coat comprising a polyester resin modified with a lactone, said polyester resin being composed of alcohol and acid components, 10 to 80 mole % of the acid component being an alicyclic polycarboxylic acid or anhydride thereof and 10 to 100 mole % of the carboxyl groups capable of developing a resinous acid value being derived from a polycarboxylic acid showing a titration midpoint potential in a non-aqueous potentiometric titration, under the state being incorporated into the resin, of −350 mV or more, and said lactone being represented by the formula:



wherein n is an integer of 4 to 10, said lactone being included in an amount corresponding to 5 to 30% by weight of the total weight of the resin.

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4,731,423

META-HALO-PHENOLIC ALKYLATION PRODUCTS AND EPOXY SYSTEMS

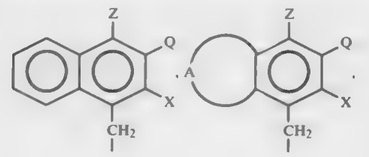
Abel Mendoza, Midland, Mich.; Chun S. Wang, Lake Jackson, Tex.; Eric E. Bancroft, Midland, Mich., and David B. Fritz, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

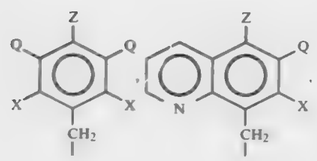
Filed Aug. 13, 1986, Ser. No. 896,480
Int. Cl.[4] C08G *59/06, 59/08;* **C07C** *39/12*
U.S. Cl. 525—480 **29 Claims**

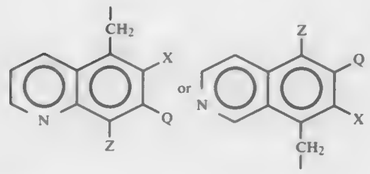
1. A coupled aromatic compound represented by the formula

Ar-Y

wherein Ar is an aromatic moiety different from Y and Y is an aromatic moiety represented by one of the formulae:







wherein

A is an aliphatic ring system bonded to the aromatic ring;

Q is separately at each occurrence hydrogen, alkyl or inertly-substituted alkyl provided that the carbon bonded to the aromatic ring is a primary or secondary carbon;

X is separately at each occurrence a halogen moiety; and

Z is a nitrogen- or chalcogen-containing moiety.

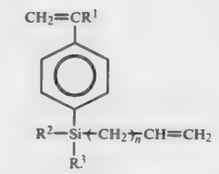
4,731,424

PROCESS FOR PRODUCING POLYMER COMPOUND CONTAINING ALKENYLSILYL GROUP

Teruo Fujimoto; Mikio Shiono; Osamu Watanabe, all of Nagaoka, and Koichi Ito, Higashikurume, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,640
Claims priority, application Japan, Mar. 14, 1986, 61-057960
Int. Cl.[4] C08F *4/46, 30/08*
U.S. Cl. 526—180 **9 Claims**

1. A process for producing an alkenylsilyl group-containing polymer compound, comprising polymerizing a vinyl monomer compound comprising an alkenylsilyl group-containing styrene compound represented by General Formula (I):



(I)

wherein R^1 represents hydrogen atom, methyl group or ethyl group; R^2 and R^3 may be the same or different and each represent an alkyl group having 1 to 3 carbon atoms or phenyl group; and n is an integer of 0 to 4, by using an organic metallic compound as an initiator, wherein the polymerization is carried out in the presence of N-methylpyrrolidine.

4,731,425

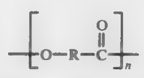
MONO AND BIS(METH)-ACRYLATES, AND USES THEREOF

Wolfgang Ritter, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 802,543, Nov. 27, 1985, Pat. No. 4,675,433, which is a continuation-in-part of Ser. No. 726,278, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 460,900, Jan. 25, 1983, abandoned. This application Apr. 3, 1987, Ser. No. 34,521
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204504; Aug. 9, 1982, 3229635
Int. Cl.[4] C08F *8/42, 4/52*
U.S. Cl. 526—196 **22 Claims**

1. A two component reactive adhesive comprising

(a) an adhesive component containing two terminal (meth)-acrylyl groups on a polyester-oligomer chain that contains hydroxy-carboxylic acid segments having the structural characteristic



wherein R is a straight or branched chain alkylene group, an unsubstituted or alkyl substituted cycloalkylene group, or an unsubstituted or alkyl substituted phenylene group and n is an integer chosen so that the mean molecular weight of the polyester-oligomer chain is in the range of from about 200 to about 600; and

(b) a hardener component, maintained separately from said adhesive component, which contains an initiator to initiate free radical polymerization.

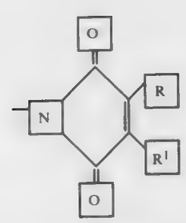
4,731,426

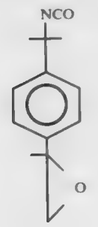
POLYMERIZATION PRODUCT FROM CYANATE FUNCTIONAL MALEIMIDE

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 782,644, Oct. 1, 1985, Pat. No. 4,683,276. This application Mar. 18, 1987, Ser. No. 27,774
Int. Cl.[4] C08F *22/40*
U.S. Cl. 526—262 **4 Claims**

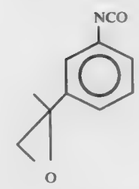
1. The product resulting from polymerizing a composition comprising at least one thermosettable compound which contains simultaneously in the same molecule only one maleimide or substituted maleimide group which groups are represented by the formula





(I)

or



(II)

wherein each R and R^1 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; and only one cyanate group.

or a mixture of (I) and (II).

4,731,427

METHOD FOR THE PREPARATION OF RIGID REACTION INJECTION MOLDED THERMOSET POLYURETHANE MODIFIED POLYISOCYANURATE COMPOSITIONS

Usama E. Younes, Newtown Square, Pa., assignor to Arco Chemical Company, Newtown Square, Pa.

Filed Apr. 1, 1987, Ser. No. 32,801
Int. Cl.[4] C08G *18/20*
U.S. Cl. 528—53 **12 Claims**

1. A method for the preparation of rigid reaction injection molded polyurethane modified polyisocyanurate thermoset polymer composition which comprises injecting at least two streams via a RIM machine into a mold cavity of the desired configuration to react at temperatures of from about ambient to about 140° C. a reaction mixture comprising at least one stream of an organic di-or polyisocyanate and a second stream of from about 2 to about 50 parts by weight of a cyclic alkylene carbonate and from about 2 to about 50 parts by weight of a polyether polyol, based on the 100 parts iso- cyanate-carbonate-polyol composition, and a soluble adduct of a tertiary amine and a cyclic alkylene carbonate as catalyst at a concentration of from about 0.01 to about 5.0 weight percent based on the total composition.

4,731,428

EPOXIDIZED ISOCYANATES AND PROCESS FOR THEIR PREPARATION

Paul S. Waterman, Shelton, Conn., assignor to American Cyanamid Co., Stamford, Conn.

Filed Nov. 3, 1986, Ser. No. 926,051
Int. Cl.[4] C08G *18/71*
U.S. Cl. 528—69 **2 Claims**

1. A curable composition comprising:

(a) a compound having at least two active hydrogen-containing functional groups; and

(b) an effective amount of an epoxy-pendant polyurethane curing agent for (a) which comprises a reaction product of:

(i) a polyol; and

(ii) an epoxidized isocyanate selected from those of the formulae:

4,731,429

NOVEL POLY(ARYL ETHER KETONES)

Lee P. McMaster, Brookfield, Conn., and Paul A. Winslow, West Millington, N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 17, 1985, Ser. No. 745,139
Int. Cl.[4] C08G *65/40*
U.S. Cl. 528—127 **19 Claims**

1. A process for preparing a poly(aryl ether ketone) which consists essentially of reacting 4,4'-bis(p-fluorobenzoyl)diphenyl ether with 1,4-bis(p-hydroxybenzoyl)benzene under nucleophilic polycondensation conditions.

4,731,430

MODIFIED PHENOL RESOLE ETHER RESINS AND THEIR PREPARATION

Fritz E. Kempter, Mannheim, and Juergen Nieberle, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,691
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525073
Int. Cl.[4] C08G *14/08, 8/36*
U.S. Cl. 528—139 **7 Claims**

1. A process for the preparation of a modified phenol resin which is based on phenol resol ethers which are bonded via, o,o'-methylene ether groups and are obtainable from phenol or an m-alkyl-substituted phenol, and formaldehyde or a formaldehyde donor, in the presence of divalent metal ions, and modification with monoalkyl or monoalkoxycarbamate or asymmetric dialkylurea, wherein

A. where the procedure begins with methylolation in an aqueous medium,

a_1. the methylolation is carried out in the presence of from 0.5 to 10% by weight, based on the phenol used, of divalent metal ions,

a_2. the divalent metal ions are then removed as sparingly soluble salt, and

a_3. the water present as a solvent in the reaction mixture is separated off in the presence of monoalkyl or monoalkoxycarbamate or asymmetric dialkylurea and in the presence or absence of an entraining agent at from 30° to 80° C., while the water of reaction formed by reaction of the phenol resol ethers (a_1) with monoalkyl or monoalkoxy

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carbamate or asymmetric dialkyllurea is separated off at from 40° to 120° C.,

and

B. where the procedure begins with methylolation in a non-polar organic solvent,

b_1. the methylolation is carried out in the presence of from 0.1 to 0.3% by weight, based on the phenol used, of divalent metal ions, and

b_1. the modification is effected at from 60° to 120° C. in the presence of one or more compounds of monoalkyl or monoalkoxy carbamate or asymmetric dialkylurea,

and, finally, the residual amounts of phenol from the preparation of the products according to A. or B. are removed by evaporation in a thin film evaporator, the phenol content being reduced to less than 1% by weight.

4,731,431

CO-OLIGOMERIZATION PRODUCT OF A MIXED CYANATE AND A POLYMALEIMIDE

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 831,947, Feb. 24, 1986, Pat. No. 4,663,398. This application Dec. 8, 1986, Ser. No. 939,202

Int. Cl.⁴ C08G *73/10*

U.S. Cl. 528—170 **3 Claims**

1. The hydroxyaromatic oligomer composition resulting from

(I) reacting at a temperature and time sufficient to essentially complete the reaction of

(A) at least one material having an average of more than one aromatic hydroxyl group per molecule with

(B) at least 0.01 but not more than 0.95 moles of at least one cyanogen halide per aromatic hydroxyl group; in the presence of

(C) from about 0.01 to about 1.1 moles of a suitable base per aromatic hydroxyl group contained in component (A); and thereafter recovering the resultant cyanate-containing mixture; and

(II) co-oligomerizing at a temperature and for a time sufficient to essentially complete the co-oligomerization reaction the cyanate-containing product from (I) with

(D) a polymaleimide in an amount which provides a mole ratio of maleimide groups to cyanate groups of from about 0.01:1 to about 1:1; in the absence of or in the presence of

(E) a suitable co-oligomerization catalyst.

4,731,432

COMPLETELY AROMATIC POLYESTERS AND THEIR PREPARATION

Michael Portugall, Wachenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,785

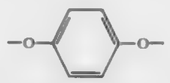
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338805

Int. Cl.⁴ C08G *63/60*

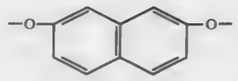
U.S. Cl. 528—190 **6 Claims**

1. A completely aromatic polyester which forms a liquid-crystalline filament forming melt at below 300° C. and consists essentially of

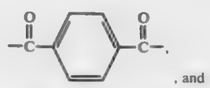
(a) from 3 to 15 mol% of units having the structural formula



(b) from 5 to 35 mol% of units having the structural formula



(c) molar amounts, equivalent to the sum of (a) and (b), of units having the structural formula



, and

(d) from 10 to 39.4 mol% of units having the structural formula



4,731,433

AROMATIC COPOLYESTER DERIVED FROM AROMATIC DICARBOXYLIC ACID COMPONENT AND AROMATIC DIOL COMPONENT

Tadao Yatsu, Iwakuni; Takayuki Nakano, Ohtake, and Toshiki Sotoyama, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,900

Claims priority, application Japan, Aug. 3, 1984, 59-162800; Aug. 7, 1984, 59-164223; Aug. 7, 1984, 59-164224; Aug. 7, 1984, 59-164225

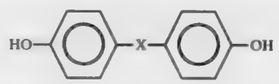
Int. Cl.⁴ C08G *63/12*

U.S. Cl. 528—193 **11 Claims**

1. An aromatic copolyester comprising substantially equimolar proportions of (A) units derived from an aromatic dicarboxylic acid having 8 to 16 carbon atoms, and (B) units derived from an aromatic diol mixture, wherein said units are derived by the reaction between said dicarboxylic acid or an ester-forming derivative thereof with said diol component or an ester-forming derivative thereof; characterized in that

(I) the diol mixture (B) is composed of 20 to 95 mole%, based on the total moles of compounds (a) and (b) below, of

(a) a bisphenol compound represented by the formula (I)

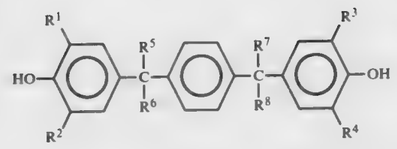


(I)

wherein X represents a divalent group selected from the class consisting of C_1–C_8 alkylidene groups, O, S, and SO_2, and

(b) 5 to 80 mole%, based on the total moles of the compounds (a) and (b), of a dihydric phenol compound selected from the group consisting of

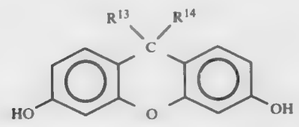
(b-1) a divalent phenolic compound represented by the formula (II)



(II)

wherein each of R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 represents a hydrogen atom or a lower alkyl group,

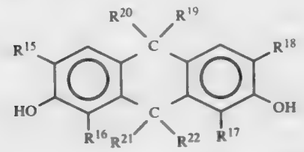
(b-3) a divalent phenol compound represented by the formula (III)



(III)

wherein each of R^{13} and R^{14} represents a hydrogen atom, a lower alkyl group or a phenyl group, and

(b-4) a dihydric phenol compound represented by the formula (IV)



(IV)

wherein each of R^{15}, R^{16}, R^{17} and R^{18} represents a lower alkyl group, and each of R^{19}, R^{20}, R^{21} and R^{22} represents a hydrogen atom, a lower alkyl group or a phenyl group, and

(II) the aromatic copolyesters has an intrinsic viscosity ( ), determined at 60° C. in pentafluorophenol, of at least 0.4 dl/g, a glass transition temperature of from 208° C. to 254° C., and a hydrolysis resistance of from 73% to 98%.

4,731,434

ALKYL ARYL KETONE/FORMALDEHYDE RESIN HAVING HIGH SOFTENING POINT

Jörg Dörffel, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,537

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324287

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ C08G *2/30*

U.S. Cl. 528—227 **26 Claims**

1. A C_{1-6}-alkyl C_{6-10}-aryl ketone/formaldehyde resin having a softening point of at least 90° C.

4,731,435

ELASTOMERS

Robin N. Greene, and Garret D. Figuly, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1986, Ser. No. 929,087

Int. Cl.⁴ C08G *69/44, 73/16*

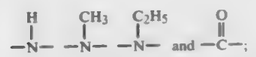
U.S. Cl. 528—289 **17 Claims**

1. An elastomer consisting essentially of

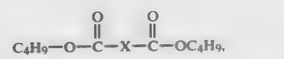
A. from about 5 to 25 wt. % of —X— units where —X— is part of a repeat unit having the structural formula

—Y—X—Z—

where —Y— and —Z— are independently selected from —O—,



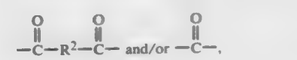
—X— is a divalent organic radical consisting of a chain of ring structures except for trans-amide, carbonyl, trans-vinylene, azo, and azomethine linkages which may be present and whose shortest length between centers of its terminal junctions measured from a Dreiding model laid flat is at least 11 Angstroms; and when —X— is in the compound:



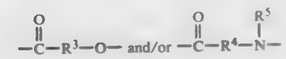
the compound exhibits a melting point that is at least about 225° C.; and

B. from about 75 to 95 wt. % of units selected from the following:

a. 

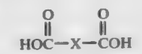
b. 

in which both free bonds are connected to oxygen and/or nitrogen, and/or

c. 

where R, R^1, R^2, R^3 and R^4 are each aliphatic divalent organic radicals, having from 2 to 15 carbon atoms within the chain, with each having a molecular weight of under 450 and R^5 is a hydrocarbon radical.

12. A process for preparing an elastomer of claim **1** which comprises heating a high molecular weight diacid of the formula



where —X— is as defined in claim **1** with one or more diols and diacids providing units a. and b. of claim **1**, said diols being in excess of stoichiometry at a temperature of about 220° to 300° C. and in the presence of an esterification catalyst to form prepolymer and carrying the resulting prepolymer to high molecular weight.

4,731,436

THERMOSETTING CROSSLINKED IMIDE RESIN FROM BIS-IMIDE AND POLYAMINE

Chi-Fei Ling, South Plainfield, N.J., assignor to BTL Specialty Resins Corporation, Warren, N.J.

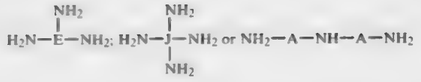
Filed Oct. 7, 1986, Ser. No. 916,283

Int. Cl.⁴ C08G *73/10*

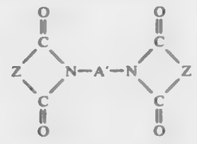
U.S. Cl. 528—322 **19 Claims**

1. A thermosetting cross-linked imide resin consisting of the polymeric reaction product formed from the non-catalytic reaction of a single aromatic polyamine selected from the group consisting of:

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wherein E and J are aromatic trivalent and tetravalent groups, respectively, and A is a divalent group with at least one aryl moiety; with an aromatic N,N'-bis-imide of an unsaturated dicarboxylic acid having the formula:



wherein Z is a divalent group containing a —C=C— bond, and A' is a divalent group with at least one aryl moiety.

4,731,437

PROCESS OF PREPARING ORGANOBORON NITRIDE POLYMER

Taniguchi, Isoji, 17-12, 2-chome, Takeshirodai,, Sakai-shi, Osaka-fu; Yoshiharu Kimura, 1126, Takakai-cho, Ohmihachiman-shi, Shiga-Ken, and Yamamoto, Kenji, Seisen-Ryo, 1820, Ohaza-Yoshida, Ohizumi-cho, Ohra-gun, Gunma-ken, all of Japan

Filed Aug. 6, 1985, Ser. No. 762,935
Claims priority, application Japan, Aug. 11, 1984, 59-168454
Int. Cl.[4] C08G *79/08*
U.S. Cl. 528—394 **8 Claims**

1. A process of producing an organoboron nitride polymer which comprises polymerizing an organoboron nitride compound having a cyclic structure of the formula $(XBNR)_3$ wherein R represents hydrogen, a saturated or unsaturated alkyl group, or an aryl group and X represents NH_2, NHR^3 or NR^3R^4 wherein R^3 and R^4 may be the same or different and each represents and alkyl group, an aryl group or a silyl group of $-SiR^5R^6R^7$ where R^5, and R^6 and R^7 may be the same or different and each represents an alkyl group or an aryl group, in the presence of at least one of an amine compound of the formula R^1NH_2 and an amine compound of the formula R^1NHR^2 in the range of from 0.003 to 0.3 mol of the organoboron nitride compound wherein R^1 and R^2 which may be the same or different individually represent a C_{12} alkyl, a C_{18} alkyl or an aryl group.

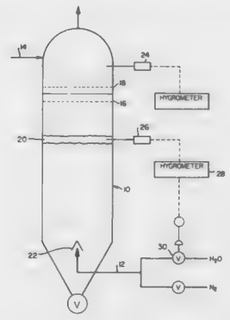
4,731,438

WATER TREATMENT METHOD FOR RESIN IN A PURGE VESSEL

Robert J. N. Bernier, Flemington, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1986, Ser. No. 947,875
Int. Cl.[4] C08F *6/02*
U.S. Cl. 528—483 **8 Claims**

1. A method for deactivating Ziegler-Natta catalysts and organometallic cocatalyst residues present in olefin polymer resins produced by the fluidized bed polymerization process which comprises conveying said olefinic polymer resins to a purge vessel in an inert gas stream to form a resin bed in said purge vessel, maintaining said resin bed substantially constant in said purge vessel, introducing an inert purge gas containing water into said purge vessel, said water and purge gas being regulated and calibrated so that said water present in said purge gas is in an amount sufficient to maintain a moisture front region in said resin bed whereby above said moisture front region purge gas is substantially free of water and below said moisture front region the amount of water present in said purge gas is substantially equal to the amount of water present in said purge gas introduced in said purge vessel and wherein



deactivation of said catalyst and cocatalyst residues are effected in said moisture front region.

4,731,439

SNAKE VENOM GROWTH ARRESTING PEPTIDE

Hans Marquardt, Mercer Island; George J. Todaro, Seattle, and Daniel R. Twardzik, Bainbridge Island, all of Wash., assignors to Oncogen, Seattle, Wash.

Filed Nov. 22, 1985, Ser. No. 801,019
Int. Cl.[4] A61K *37/02;* **C07G** *7/00*
U.S. Cl. 530—324 **8 Claims**

1. A toxic peptide conjugate comprising a toxic peptide of the formula:

$$pp^1QC_1aa^4aa^5aa^6GGaa^9C_2aa^{11}aa^{12}aa^{13}aa^{14}C_3aa^{16}aa^{17}$$

$$aa^{18}aa^{19}SDaa^{22}GKaa^{25}aa^{26}C_4aa^{28}aa^{29}aa^{30}$$

$$WKC_5C_6Kaa^{36}aa^{37}aa^{38}aa^{39}pp^2$$

wherein:

pp^1 is the N-terminus and is hydrogen, or an amino acid chain of from 1–20 amino acids;

pp^2 is the C-terminus and may be a hydroxyl, or an amino acid chain of from 1–20 amino acids;

the individual letters have their normal meaning as provided in the one-letter amino acid code;

up to five of the amino acids designated with numbers may serve as bonds;

when cysteine bridges are present, C_1 pairs with C_5, C_2 with C_4, and C_3 with C_6;

aa^4 is an aliphatic acidic or aromatic amino acid;

aa^5 is an aliphatic polar or basic amino acid;

aa^6 is an aliphatic charged amino acid;

aa^9 is an aromatic amino acid;

aa^{11} is an aliphatic basic amino acid;

aa^{12} is an aromatic amino acid or aliphatic polar or charged amino acid;

aa^{13} is an aliphatic non-polar or charged amino acid;

aa^{14} is an aliphatic non-polar amino acid;

aa^{16} is an aliphatic non-polar amino acid of from 4 to 6 carbon atoms;

aa^{17} is an aliphatic non-polar or polar amino acid of from 3 to 5 carbon atoms;

aa^{18} is an aliphatic non-polar or basic amino acid of from 3 to 6 carbon atoms;

aa^{19} is an aliphatic polar amino of from 3 to 4 carbon atoms;

aa^{22} is an aliphatic non-polar or aromatic amino acid;

aa^{25} is an aliphatic neutral amino acid of from 3 to 6 carbon atoms;

aa^{26} is an aliphatic charged or non-polar amino acid of from 2 to 5 carbon atoms;

aa^{28} is an aliphatic charged amino acid of from 4 to 6 carbon atoms;

aa^{29} is an aliphatic amino acid of from 3 to 5 carbon atoms or an aromatic amino acid;

aa^{30} is an aliphatic non-polar or basic amino acid of from 4 to 6 carbon atoms;

aa^{36} is an aliphatic basic amino acid;

aa^{37} is an aliphatic amino acid of from 2 to 3 carbon atoms or an aromatic amino acid;

aa^{38} is an aliphatic neutral amino acid of from 2 to 4 carbon atoms; and

aa^{38} is an aliphatic neutral amino acid of from 2 to 4 carbon atoms; and

aa^{39} is an aliphatic non-polar amino acid,

wherein the N-terminus may be blocked or unblocked, covalently bonded to a member of a specific binding pair.

4,731,440

METHOD OF SOMATOTROPIN SOLUBILIZATION USING DIMETHYLSULFONE AND NATURATION

Larry A. Bentle, St. Charles; James W. Mitchell, St. Louis; Stephen B. Storrs, Creve Coeur, and Grant T. Shimamoto, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 704,341, Feb. 22, 1985, and Ser. No. 704,677, Feb. 22, 1985, Pat. No. 4,652,630. This application Aug. 25, 1986, Ser. No. 900,018
Claims priority, application Spain, Feb. 20, 1986, 552233
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[4] C07K *3/02;* **A61K** *37/24, 37/36*
U.S. Cl. 530—399 **16 Claims**

1. A method for solubilization of somatotropin protein from refractile bodies of a host cell containing said protein which comprises contacting said bodies with an effective amount and concentration of dimethylsulfone or urea-dimethylsulfone at a pH effective to accomplish solubilization of said protein.

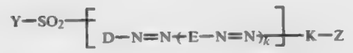
4,731,441

WATER-SOLUBLE AZO COMPOUNDS CONTAINING, AS FIBER-REACTIVE GROUPS, A (NITROPHENYLAMINO-PHENYLAMINO)-CHLORO-TRIAZINYLAMINO GROUP AND GROUPS OF THE VINYLSULFONE SERIES, SUITABLE AS DYESTUFFS

Marcos Segal, and Michael Kunze, both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,542
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510179
Int. Cl.[4] C09B *62/026, 62/507;* **D06P** *1/38, 3/10*
U.S. Cl. 534—637 **18 Claims**

1. A water-soluble azo compound conforming to the formula



in which

k is the number zero or 1;

D is phenyl which is unsubstituted or is substituted by 1, 2 or 3 substituents selected from the group of substituents consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy, alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, sulfo-benzoylamino, benzoylamino, phenylamino, sulfophenylamino, carbamoyl, carbamoyl which is monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, N-phenylsulfamoyl, N-phenyl-N-(C_1–C_4-alkyl)-sulfamoyl, cyano, nitro, chlorine, bromine, fluorine, trifluoromethyl, hydroxy and sulfo, or

D is a naphthyl which is unsubstituted or is substituted by 1, 2 or 3 substituents selected from the group of substituents consisting of sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, sulfobenzoylamino, benzoylamino, chlorine, hydroxy and nitro, or

D is phenyl which is substituted by the group —SO_2—Y shown and except as shown is otherwise unsubstituted or is further substituted by 1 or 2 substituents selected from the group of substituents consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy, alkanoylamino of 2 to 5 carbon atoms which is unsubstituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, sulfobenzoylamino, benzoylamino, phenylamino, sulfophenylamino, carbamoyl, carbamoyl which is monosubstituted or disubstituted by alkyl or 1 to 4 carbon atoms, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted with alkyl of 1 to 4 carbon atoms, N-phenylsulfamoyl, N-phenyl-N-(C_1–C_4-alkyl)sulfamoyl, cyano, nitro, chlorine, bromine, fluorine, trifluoromethyl, hydroxy and sulfo, or

D is a naphthyl which is substituted by the group —SO_2—Y shown and except as shown is otherwise unsubstituted or is further substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, methy, ethyl, methoxy, ethoxy, alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy, or hydroxy, sulfobenzoylamino, benzoylamino, chlorine, hydroxy and nitro;

E is phenylene which is unsubstituted or is substituted by 1 or 2 substituents which are selected from the group cosnisting of 2 alkyl of 1 to 4 carbon atoms, 2 alkoxy of 1 to 4 carbon atoms, 2 chlorine, 1 bromine, 1 alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, 1 benzoylamino, 2 sulfo, 1 carboxy, 1 N,N-dialkylamino having alkyl groups of 1 to 4 carbon atoms each, 1 ureido, 1 phenylureido and 1 alkylsulfonylamino of 1 to 4 carbon atoms, or is a naphthylene which is unsubstituted or is substituted by 1 or 2 sulfo or by 1 alkyl of 1 to 4 carbon atoms, 1 nitro, 1 alkanoylamino of 2 to 5 carbon atoms or 1 benzoylamino or by the group —SO_2—Y shown, or is substituted or unsubstituted by the group —SO_2—Y shown and by 1 or 2 sulfos and 1 alkyl of 1 to 4 carbon atoms, 1 nitro, 1 alkylamino of 2 to 5 carbon atoms or 1 benzoylamino, or represents a naphthylene which contains bonded in the ortho-position relative to the azo which is also linked with D, an amino, an alkylamino of 1 to 4 carbon atoms or phenylamino unsubstituted or substituted by substituents selected from the group of substituents consisting of chlorine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, sulfo and carboxy, or a hydroxy group, and which is further unsubstituted or additionally substituted by 1 or 2 sulfos or 1 alkyl of 1 to 4 carbon atoms, 1 nitro or 1 alkanoylamino of 2 to 5 C-atoms or additionally by 1 or 2 sulfos and 1 alkyl of 1 to 4 carbon atoms, 1 nitro or 1 alkanoylamino of 2 to 5 carbon atoms; the —SO_2—Y being mandatorily bonded to a carbon atom of an aromatic ring of D or of an aromatic ring of E or of a benzene ring of a substitutent of D;

K is a 1-hydroxynaphthylene which contains the azo bonded in the 2-position, or is a 2-hydroxynaphthylene which contains the azo bonded in the 1-position, both of which arc otherwise unsubstituted or are further substituted by 1 or 2 sulfos or by 1 alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy or 1 benzoylamino or

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by 1 or 2 sulfos and 1 substituted alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or is substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, or 1 benzoylamino, or

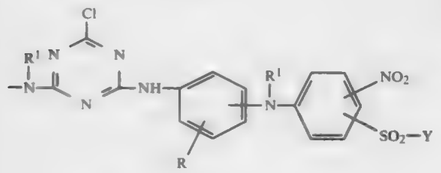
K is a naphthylene which is unsubstituted or substituted by 1 or 2 sulfos, or by 1 or 2 sulfos and 1 unsubstituted or monosubstituted or disubstituted amino group, the substituents of the amino groups being selected from the group of substituents consisting of alkyl of 1 to 4 carbon atoms, hydroxylalkyl of 1 to 4 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, sulfoalkyl of 1 to 4 carbon atoms, sulfatoalkyl of 1 to 4 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, carbalkoxyalkyl having alkyls of 1 to 4 carbon atoms each, phenylalkyl having an alkyl group of 1 to 4 carbon atoms; the phenyl of said phenylalkyl being unsubstituted or substituted by one or more of the following: methyl, ethyl, methoxy, ethoxy, chlorine, sulfo, and carboxy; phenyl and phenyl which is substituted by one or more of the following: alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, carboxy, 2nd sulfo; or

K is a 1-aminonaphthylene which contains the azo bonded to its 2-position or is a 2-aminonaphthylene which contains the azo bonded to its 1-position, said aminonaphthylene radicals being unsubstituted or substituted by 1 or 2 sulfos or by 1 hydroxy in the 5-, 6-, 7- or 8-position or by this hydroxy and 1 or 2 sulfos, or

K is a phenylene which is unsubstituted or is substituted by 1 or 2 substituents selected from the group of substituents consisting of 2 alkyls of 1 to 4 carbon atoms, 2 alkoxys of 1 to 4 carbon atoms, 2 chlorines, 1 bromine, 1 alkanoylamino of 2 to 5 carbon atoms which is unsubstituted or substituted by chloro, bromo, sulfo, sulfato, carboxy or hydroxy, 1 benzoylamino, 1 sulfo, 1 carboxy, 1 ureido, 1 phenylureido, 1 alkylsulfonylamino of 1 to 4 carbon atoms, 1 amino and 1 monosubstituted or disubstituted amino whose substituents are alkyl of 1 to 4 carbon atoms, hydroxylalkyl of 1 to 4 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, sulfoalkyl of 1 to 4 carbon atoms, sulfatoalkyl of 1 to 4 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, carbalkoxyalkyl having alkyls of 1 to 4 carbon atoms each, phenylalkyl having an alkyl group of 1 to 4 carbon atoms, the phenyl of said phenylalkyl being unsubstituted or substituted by methyl, ethyl, methoxy, ethoxy, chlorine, carboxy, sulfo or combinations thereof, phenyl and phenyl which is substituted by one or more of the more of the following: alkyl of 1 to 4 carbon atoms, chlorine, carboxy, and sulfo,

Y is vinyl or β-thiosulfatoethyl, β-phosphatoethyl, β-chloroethyl or β-sulfatoethyl;

Z is a radical of the formula



in which

R^1 stands for hydrogen or alkyl of 1 to 4 carbon atoms unsubstituted or substituted by one or two substituents selected from the group consising of acetylamino, hydroxy, sulfato, aikoxy of 1 to 4 carbon atoms, sulfo and carboxy, wherein the two R^1s are identical to or different from each other,

R denotes hydrogen or sulfo and

Y has the above-mentioned meaning, and the two Ys are identical to or different from each other.

4,731,442

HIGH TEMPERATURE SOLVENT RESISTANT AMORPHOUS THERMOPLASTIC PHENYLETHYNYL QUINOXALINE RESIN COMPOSITION

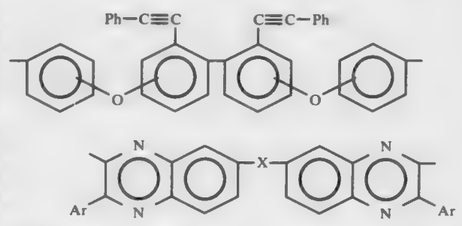
Patricia M. Lindley, Springfield, Va.; Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1986, Ser. No. 914,695

Int. Cl.[4] C08G *73/06*

U.S. Cl. 528—125 **8 Claims**

1. A quinoxaline polymer consisting essentially of repeating units of the general formula:



wherein X is a single bond, or X is —O—, —S— or $—SO_2—$, Ar is $—C_6H_5$, $—C_6H_4—C_6H_5$, $—C_6H_4Br$, $—C_6H_4CH_3$, or $—C_6H_4C_2H_5$, and Ph is $—C_6H_5$.

4,731,443

7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES

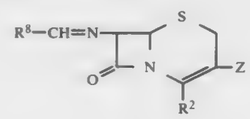
Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 653,041, Sep. 21, 1984, abandoned, which is a division of Ser. No. 341,621, Jan. 22, 1982, Pat. No. 4,487,927, which is a continuation-in-part of Ser. No. 261,618, May 7, 1981, Pat. No. 4,423,213, which is a continuation-in-part of Ser. No. 205,334, Nov. 10, 1980, Pat. No. 4,409,214. This application Jul. 24, 1986, Ser. No. 889,189

Int. Cl.[4] C07D *501/04*; A61K *31/545*

U.S. Cl. 540—215 **4 Claims**

1. A compound of the formula:



in which

R^2 is carboxy or a protected carboxy group,

R^8 is 2-hydroxyphenyl and

Z is a group of the formula: $—CH=CH_2$, $—CH_2—X^2$, $—CH_2p^+(R^7)_3.X^3—$, $—CH=P(R^7)_3$ or $—CH_2OH$,

wherein X^2 and X^3 are each halogen and R^7 is selected from the group consisting of phenyl, tolyl, xylyl and naphthyl, or a salt thereof.

4,731,444

BICYCLIC LACTAMS AS ANTIHYPERTENSIVES

William H. Parsons, Rahway, and Matthew J. Wyvratt, Jr., Mountainside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 3, 1984, Ser. No. 637,622

Int. Cl.[4] C07D *513/04*; A61K *31/35*

U.S. Cl. 540—521 **1 Claim**

1. A compound which is a member of the group:

6(S)-[1(S)-(benzyloxycarbonyl-3-phenylpropyl)amino]octahydro-5-oxo-9a(R)-thiazolo[3,2-a]azepine-3-(R)[2-diazo-1-oxoethane];

6(S)-[1(S)-(ethoxycarbonyl-3-phenylpropyl)amino]octahydro-5-oxo-9a(R)-thiazolo[3,2-a]azepine-3-(R)[2-diazo-1-oxoethane];

6(S)-[1(S)-(benzyloxycarbonyl-3-phenylpropyl)amino]octahydro-5-oxo-9a(R)-thiazolo[3,2-a]azepine-3-(R)[2-hydroxy-1-oxoethane];

6(S)-[1(S)-(ethoxycarbonyl-3-phenylpropyl)amino]octahydro-5-oxo-9a(R)-thiazolo[3,2-a]azepine-3-(R)[2-hydroxy-1-oxoethane]; and,

6(S)-[1(S)-(carboxy-3-phenylpropyl)amino]octahydro-5-oxo-9a(R)-thiazolo[3,2-a]azepine-3-(R)[2-hydroxy-1-oxoethane].

4,731,445

PREPARATION OF EPSILON-CAPROLACTAM

Hans-Martin Hutmacher, Ludwigshafen; Franz Merger, Frankenthal; Franz J. Broecker, Ludwigshafen; Rolf Fischer, Heidelberg; Uwe Vagt, Speyer; Wolfgang Harder, Weinheim, and Claus-Ulrich Priester, Meckenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,585

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602375

Int. Cl.[4] C07D *201/08*

U.S. Cl. 540—538 **10 Claims**

1. A process for the preparation of ϵ-caprolactam, wherein

(a) a C_1-C_4-alkyl 5-formylvalerate is reacted with excess ammonia and hydrogen in the presence of an alkanol as the solvent and in the presence of a hydrogenation catalyst under superatmospheric pressure in the liquid phase at from 40 to 130° C.,

(b) exesss ammonia and hydrogen are separated off from the reaction mixture,

(c) the resulting reaction mixture is reacted with water at elevated temperatures with simultaneous removal of alkanols, and

(d) the reaction mixture thus obtained is heated to 150°–370° C. and ϵ-caprolactam is obtained.

4,731,446

IMIDAZO[1,2-A]PYRIMIDINE SULFONIC ACIDS AND ACID HALIDES

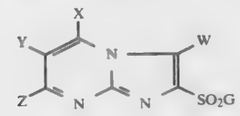
Norman R. Pearson, Walnut Creek; William A. Kleschick, Martinez, and Shannon L. Bartley, Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 1, 1987, Ser. No. 45,908

Int. Cl.[4] C07D *487/14*

U.S. Cl. 544—281 **13 Claims**

1. An imidazolo[1,2-a]pyrimidine-2-sulfonyl halide compound of the formula



wherein

X and Z each, independently represents R, OR^3, SR^3, NR^1R^2, F, Cl, Br, or CN;

Y represents R, OR^3, F, Cl, Br, or CN;

W represents R, OR, SO_nR^3, NR^1R^2, F, Cl, Br, NO_2, CN, C(O)E, or phenyl, phenoxy, or phenylthio, each phenyl optionally having 1 to 3 substituents selected from the group consisting of F, Cl, Br, CN, CF_3, NO_2, and CH_3;

G represents Cl or Br;

R represents H, C_1–C_4 alkyl or C_1–C_4 haloalkyl;

R^1 and R^2 each, independently represents H or C_1–C_4 alkyl;

R^3 represents C_1–C_4 alkyl or C_1–C_4 haloalkyl;

E represents R, OR, SR, NR^1R^2, or phenyl; and

n represents an integer of 0, 1, or 2.

4,731,447

PROCESS FOR PREPARING PIPERIDYLIDENE DIHYDRO-DIBENZO(A,D)-CYCLOHEPTENES OR AZA-DERIVATIVES THEREOF

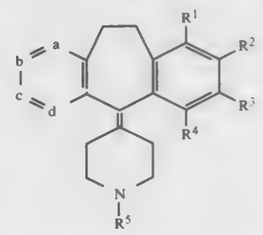
Doris P. Schumacher, Florham Park; Bruce L. Murphy, Elizabeth, and Jon E. Clark, Highland Park, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 733,428, May 13, 1985, abandoned. This application Mar. 12, 1986, Ser. No. 839,016

Int. Cl.[4] C07D *221/16*

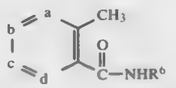
U.S. Cl. 546—93 **35 Claims**

1. A process for preparing a compound of formula I:



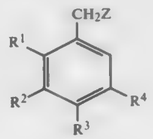
I

said process comprising the steps of reacting a compound of formula II



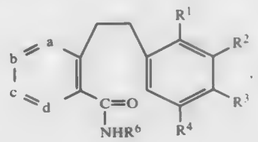
II

with a compound of formula III



III

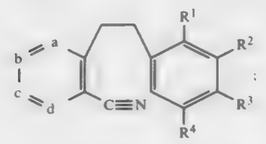
in the presence of base to produce a compound of formula IV



IV

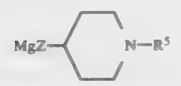
VOL 1088 ISS 3 MR 15 1988 UMI

reacting the compound of formula IV with a dehydrating agent to produce a compound of formula V



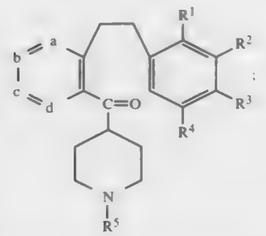
V

reacting the compound of formula V with a compound of formula VI



VI

and hydrolyzing the product thereof to produce a compound of formula VII



VII

and reacting the compound of formula VII with a super acid having a Hammett acidity function of less than minus 12 to produce the compound of formula I, wherein:

a, b, c and d represent CH or one of a, b, c and d represents N and the others represent CH;

R^1, R^2, R^3 and R^4 may be the same or different and each independently represents hydrogen, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms or trifluoromethyl;

R^5 represents an N-protecting group which does not prevent formation of the Grignard reagent of formula VI;

R^6 represents a protecting group that will protect the N of the group $CONHR^6$ in formula II from reaction with an alkylating agent; and

Z represents chloro, bromo or iodo.

4,731,448

PROCESS FOR THE PREPARATION OF 1-(2-HYDROXYETHYL)-2,2,6,6-TETRAMETHYL-4-PIPERIDINOL

Heinz Issler, Bensheim; Siegfried Kintopf, Bensheim/Bergstrasse; Lutz König, Worms, and Hans Stephan, Bensheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,600

Claims priority, application Switzerland, Dec. 6, 1985, 5226/85

Int. Cl.⁴ C07D *211/46*

U.S. Cl. 546—248 **15 Claims**

1. In the process for the preparation of 1-(2-hydroxyethyl)-2,2,6,6-tetramethyl-4-piperidinol by reducing triacetoneamine by catalytic hydrogenation in water or in a polar organic solvent, or in a mixture thereof, and subsequently reacting the resulting 2,2,6,6-tetramethyl-4-piperidinol with excess ethylene oxide, the improvements which comprise (i) adding, prior to the reaction with the ethylene oxide, a catalytic amount of an inorganic or organic acid to the solution of 2,2,6,6-tetramethyl-4-piperidinol or to said solution concentrated by distillation with the proviso that, if the solution is concentrated, the acid is added before or after distillation, (ii) adding the ethylene oxide in a molar excess of 1–35%, and (iii) maintaining the temperature of the reaction with the ethylene oxide in a range from 60° to 170° C.

4,731,449

MELTABLE, ELECTRICALLY CONDUCTING TCNQ COMPLEXES

Friedrich Jonas, Aachen, and Jürgen Hocker, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

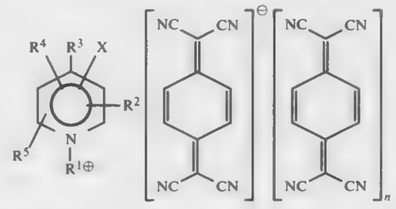
Filed Mar. 3, 1986, Ser. No. 835,337

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509070

Int. Cl.⁴ C07D *211/78, 211/90, 213/79, 211/70*

U.S. Cl. 546—286 **2 Claims**

1. TCNQ complex salts corresponding to the following general formula (I):

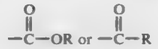


(I)

wherein

$2 \geqq n \geqq 0$;

R^1, R^2, R^3, R^4, R^5, which may be the same or different, represent hydrogen, a straight- or branched-chain alkyl radical having from 1 to 30 carbon atoms or a cycloalkyl radical having from 5 to 12 carbon atoms with the proviso that R^1 is not hydrogen; and X represents



wherein R is defined as for R^1.

4,731,450

PROCESS FOR PERFLUOROALKYLATION OF AROMATIC DERIVATIVES

Claude Wakselman, Paris, and Marc Tordeux, Sceaux, both of France, assignors to Rhone-Poulenc Specialites Chimiques, France

Filed May 21, 1986, Ser. No. 865,346

Claims priority, application France, May 22, 1985, 85 07695; Oct. 25, 1985, 85 15857

Int. Cl.⁴ C07D *213/26;* **C07C** *21/18, 43/02, 43/03, 69/76, 69/773*

U.S. Cl. 546—303 **20 Claims**

1. A process for the preparation of perfluoroalkylated aromatic derivatives comprising the steps of bringing an aromatic derivative, sulfur dioxide, and a metal selected from the group consisting of zinc, aluminum, manganese, cadmium, iron, magnesium, tin, nickel and cobalt into contact in a solvent; and then adding a perfluoroalkyl bromide or iodide to react with said aromatic derivative.

4,731,451

N-((2-OXO-3(2H)BENZOTHIAZOLYL)METHYL)-2-CHLOROACETANILIDES

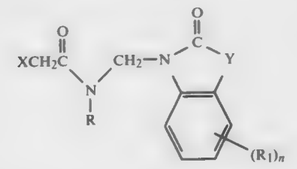
John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1980, Ser. No. 133,763

Int. Cl.⁴ C07D *263/58, 277/68*

U.S. Cl. 548—165 **6 Claims**

1. Compounds having the formula



wherein

X is chlorine, bromine or iodine;

R is a C_{5-7} cycloalkenyl or phenyl radical or such R radical independently substituted with C_{1-6} alkyl, thioalkyl or, alkoxy C_2-C_6, alkoxyalkyl, or polyalkoxy, C_{2-6} alkenyl or alkynyl, C_{6-10} aryl, halogen, NO_2, CF_3 or a C_{5-6} heterocyclic ring having only one O or S hetero atom;

Y is O or S;

R_1 is hydrogen, halogen, C_{1-6} alkyl, thioalkyl, alkoxy, allyl, or furfuryl; and n is an integer from 0–4 inclusive.

4,731,452

PREPARATION OF NOVEL AZOLYLMETHYL KETONES

Gerhard Jäger, Leverkusen; Manfred Jautelat, Burscheid, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 498,605

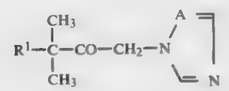
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1982, 3222220

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.⁴ C07D *249/04, 233/60*

U.S. Cl. 548—262 **4 Claims**

1. An azolylmethyl ketone of the formula



in which

A is a nitrogen atom or the CH group, and

R^1 is phenoxyethyl optionally substituted by fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, methoxy, ethoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro, dimethylamino, methoxycarbonyl, phenyl and/or chlorophenyl.

4,731,453

PROCESS FOR PRODUCING 1, 3-DIALKYL-2-IMIDAZOLIDINONE

Teruyuki Nagata; Nobuyuki Kajimoto; Masaru Wada; Hideki Mizuta, and Akihiro Tamaki, all of Fukuoka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

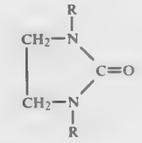
Filed Mar. 31, 1986, Ser. No. 846,564

Claims priority, application Japan, Apr. 3, 1985, 60-69044; Apr. 8, 1985, 60-72677; Apr. 12, 1985, 60-76657; Feb. 7, 1986, 60-23975

Int. Cl.⁴ C07D *233/32*

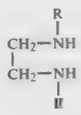
U.S. Cl. 548—317 **14 Claims**

1. In the procedure process of 1,3-dialkyl-2-imidazolidinone expressed by the formula (2)



(2)

wherein R represents —CH_3, —C_2H_5, —C_3H_7 or —C_4H_9, by reacting a N,N'-dialkylethylenediamine expressed by the formula (1)



(1)

wherein R is as defined above, with urea,

the improvement which comprises carrying out the reaction at a temperature of 180° C. or higher in the presence of a non-protonic polar solvent.

4,731,454

PROCESS FOR PRODUCING LACTAMS

Masayuki Otake, and Isamu Fukushima, both of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

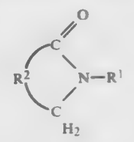
Filed May 29, 1987, Ser. No. 55,380

Claims priority, application Japan, Jun. 9, 1986, 51-133031; Jul. 18, 1986, 51-169493

Int. Cl.⁴ C07D *207/12*

U.S. Cl. 548—543 **7 Claims**

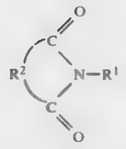
1. A method for producing a lactam having the formula:



(I)

wherein R^1 is a hydrogen atom, or a straight chain or branched chain alkyl group having from 1 to 5 carbon atoms, and R^2 is an organic group having at least 2 carbon atoms, and connected at both ends to the cyclic acid imide group, which comprises reducing a cyclic acid imide having the formula:

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(II)

wherein R^1 and R^2 are as defined above, or its precursor, with hydrogen by means of a cobalt-based catalyst comprising (a) cobalt and (b) at least one modifier component selected from the group consisting of molybdenum, tungsten and rhenium.

4,731,455

PROCESS FOR THE PREPARATION OF GAMMA-BUTYROLACTAMS

Wolfgang Hartwig, Chicago, Ill., assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Chinese Academy of Medical Sciences, Beijing, China

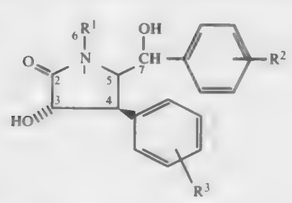
Filed Oct. 1, 1986, Ser. No. 914,210

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1985, 3537074; Sep. 25, 1986, 3632589

Int. Cl.[4] C07D *207/12*

U.S. Cl. 548—544 **13 Claims**

1. A process for the preparation of a C(3)–C(4)-transconfigurated γ-butyrolactam of the general formula (I)



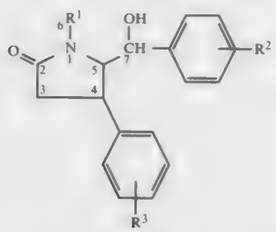
(I)

in which

R^1 represents hydrogen or alkyl, aryl or aralkyl with in each case up to 10 carbon atoms and

R^2 and R^3 are identical or different and represent hydrogen, alkyl, alkoxy, with in each case up to 10 carbon atoms, phenyl, benzyl, phenoxy, benzloxy, benzoyl, acetyl, trifluoromethyl, trifluoromethoxy, nitro, hydroxy, halogen, amino, carboxyl, sulpho, dialkylamino with up to 4 carbon atoms in the alkyl groups or acylamino with up to 18 carbon atoms,

and isomers, isomer mixtures, racemates or optical antipodes of said δ-butyrolactam, comprising reacting a starting compound of the formula (II)



(II)

in which

R^1, R^2 and R^3 have the above-mentioned meanings with an oxidizing agent selected from the group consisting of peroxoacetic acid, chloroperbenzoic acid, molybdenum peroxide/pyridine complex, oxygen, ozone and 2-sulphonyloxaziridine in an inert organic solvent in the presence of a base selected from the group consisting of an alkali metal alcoholate, an alkali metal amide, an alkali metal hydride, an organo-alkali metal compound, 1,5-diazabicyclo(4,3,0)non-5-ene and 1,8-diazabicyclo(5,4,0)undec-7-ene and further in the presence of a phosphite auxiliary, wherein the reaction is conducted at a temperature of −100° C. to +20° C., and wherein 1 to 5 moles of base are employed per mole of starting compound.

4,731,456

PROCESS FOR THE PREPARATION OF CLAUSENAMIDE

Wolfgang Hartwig, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Chinese Academy of Medical Sciences, Beijing, China

Filed Oct. 3, 1986, Ser. No. 915,309

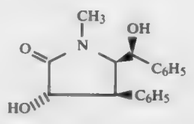
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1985, 3537075

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

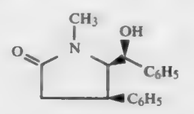
Int. Cl.[4] C07D *207/12*

U.S. Cl. 548—544 **4 Claims**

1. A process for the preparation of (±)3(5*),4(R*), 5(R*), 7(5*)-3-hydroxy-5α-hydroxybenzyl-1-methyl-4-phenyl-pyrrolidin-2-one of the formula



wherein (±)4(R*), 5(R*), 7(5*)-5-α-hydroxybenzyl-1-methyl 4-phenylpyrrolidin-2-one of the formula



is reacted with an oxidizing agent selected from the group consisting of peroxoacetic acid, chloroperbenzoic acid, molybdenum peroxide/pyridine complex, oxygen, ozone and sulphonyloxaziridine in an inert organic solvent in the presence of a base selected from the group consisting of an alkali metal alcoholate, an alkali metal amide, an alkali metal hydride, an organo-alkali metal compound, 1,5-diazabicyclo(4,3,0) non-5-ene and 1,8-diazabicyclo(5,4,0) undec-7-ene and further in the presence of a phosphite auxiliary, wherein the reaction is conducted at a temperature of −100° C. to 20° C., and wherein 1 to 5 moles of base are employed per mole of starting compound.

4,731,457

1-SUBSTITUTED, 2,3-DIPHENYL-3-HYDROXYMETHYL PYRROLIDINES, WHERE THE 2- AND/OR 3-PHENYL CAN BE SUBSTITUTED

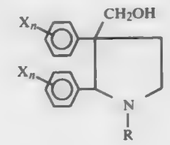
Bola V. Shetty, Stamford, Conn.; Arthur McFadden, East Brunswick, N.J., and Peter Hofer, Liestel, Switzerland, assignors to The Purdue Frederick Company, New York, N.Y.

Division of Ser. No. 620,680, Jun. 18, 1984, Pat. No. 4,639,529, which is a division of Ser. No. 349,992, Feb. 19, 1982, Pat. No. 4,476,311, which is a continuation of Ser. No. 129,578, Mar. 12, 1980, abandoned. This application May 27, 1986, Ser. No. 867,038

Int. Cl.[4] C07D *207/08*

U.S. Cl. 548—570 **4 Claims**

1. Compound of the formula

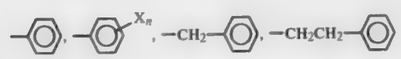


wherein

n=0–1,

X=Halo, Lower Alkoxy, HO—, Lower Alkyl, and

R=



4,731,458

SPIRO[BICYCLO[3.2.0]HEPTANE-6,2'-OXIRANE] DERIVATIVES

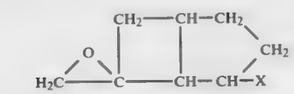
Walter J. Kasha, Los Angeles, Calif., assignor to CBD Corporation, Los Angeles, Calif.

Filed Apr. 25, 1986, Ser. No. 855,720

Int. Cl.[4] C07D *303/22, 303/16, 303/40, 407/08*; C07F *7/18*

U.S. Cl. 549—215 **9 Claims**

1. A compound of the formula



wherein X is a C^{2-11}-alkyl group substituted by a protected hydroxy, protected oxo or protected carboxy group.

4,731,459

NOVEL ANTI-ULCER AGENTS AND QUASSINOIDS

Haruhiko Tada; Masami Doteuchi, both of Osaka; Fumio Yasuda, Hyogo, and Koichi Otani, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

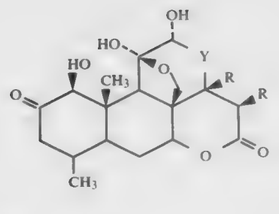
Filed May 27, 1986, Ser. No. 866,961

Claims priority, application Japan, Jun. 14, 1985, 60-130516

Int. Cl.[4] C07D *493/08*

U.S. Cl. 549—275 **2 Claims**

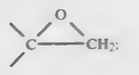
1. A compound of the following formula:



wherein

R is hydrogen or hydroxy;

Y is >CH—CH_3 or



and

the 3,4-dotted line indicates the presence or absence of a double bond provided that the case wherein R is hydrogen, Y is =CH—CH_3, and the dotted line indicates the presence of a double bond is excluded.

4.731,460

ACYLCYANAMIDE COMPOUNDS AND THEIR PRODUCTION

Christian Hase, Erkrath; Bernd Wegemund, Haan; Werner Erwied, Langenfeld, and Dieter Krampitz, Moenchengladbach, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

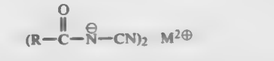
Filed Jun. 24, 1986, Ser. No. 878,085

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522532

Int. Cl.[4] C07F *11/00, 3/06, 7/24, 15/06*

U.S. Cl. 556—45 **26 Claims**

1. Acylcyanamide having the formula



in which the symbol R represents a straight-chain or branched chain alkyl or alkenyl group having from about 5 to about 21 carbon atoms, which group may be substituted by at least one OH—, O—CH_2—CH_2—OH— or O—R'— group, in which the symbol R' represents an alkyl group having from 1 to about 4 carbon atoms; and in which the symbol M represents a manganese, iron, cobalt, nickel, zinc, cadmium, copper, or lead cation.

4,731,461

PROCESS FOR PREPARING TIN ALKOXIDES

Carl C. Greco, Garnerville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 9, 1986, Ser. No. 872,329

Int. Cl.[4] C07F *7/22*

U.S. Cl. 556—81 **15 Claims**

1. A process for the preparation of tin tetraalkoxides which comprises the following steps:

(a) combining in a liquid reaction medium a tin tetrahalide reactant, a first step alcohol reactant, and an ammonia reactant, to yield a halogen containing tin alkoxide product represented on the average by the formula:

$(R_1O)_{4-m}Sn$

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wherein R_1 is an alkyl or alkoxyalkyl group, X is a halogen, and m is a number from about 0.1 to about 1.0,

(b) reacting the tin alkoxide reaction product of Step (a) with a metal amide reactant and a second-step alcohol reactant to yield a substantially halogen-free tin tetra-alkoxide reaction product represented by the formula:

$(R_1O)_4Sn$

wherein R_1 is as defined in Step (a).

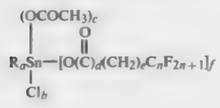
4,731,462

ORGANOTIN COMPOUNDS CONTAINING FLUORINE USEFUL FOR FORMING FLUORINE-DOPED TIN OXIDE COATING

David A. Russo, Edison, N.J., and Georg H. Lindner, Vlissingen, Netherlands, assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jul. 18, 1986, Ser. No. 888,298
Int. Cl.⁴ C07F *7/22*
U.S. Cl. 556—105 **8 Claims**

1. A compound having the formula:



where:
R is alkyl; aryl or carbalkoxyalkyl;
a=1
b=1, 2, 3
c=0, 1
d=0, 1
e=0–2
f=1, 2
n=1–6,
and
a+b+c+d=4.

4,731,463

PROCESS OF HYDROBORONIZING ALKENES AND ALKYNES

Heinrich Nöth, Grünwald, and Detlef Männig, Munich, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,292
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528320
Int. Cl.⁴ C07C *107/02*
U.S. Cl. 558—288 **7 Claims**

1. A process for hydroboronizing an alkene or alkyne which comprises reacting at a temperature of 0° to 40° C. the alkene or alkyne with catecholborane in an organic solvent selected from the group which consists of benzene, toluene, hexane, and slightly coordinating ethers, in the presence of a complex catalytically effective compound selected from the group consisting of:

(I) $RhCl(CO)_x[E(C_6H_5)_3]_{3-x}$ wherein E is arsenic or phosphorous and x is 0 or 1,

(II) $[RhCl(alkene)_2]_2$,

(III) $[(C_6H_5)_3P]_3Ru(CO)ClH$, and

(IV) $[(C_6H_5)_3P]_3RuCl_2$.

4,731,464

PROCESS FOR THE SYNTHESIS OF AN ALKYL NITRILE FROM AN ALKANOL

Roger J. Card, Stamford, and Joseph L. Schmitt, Jr., Bethel, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 173,781, Jul. 30, 1980, Pat. No. 4,654,440. This application Mar. 9, 1987, Ser. No. 23,428
Int. Cl.⁴ C07C *120/00*
U.S. Cl. 558—316 **3 Claims**

1. A process for synthesis of an alkyl nitrile from an alkanol having 2 to 20 carbon atoms which comprises contacting a gas-phase reaction mixture of alkanol, ammonia and hydrogen having an excess of ammonia and hydrogen reactants in said mixture at contact times in the range from about 0.1 to ten seconds at reaction temperature in the range from about 260° C. to about 340° C. with a solid catalyst consisting essentially of metal oxide selected from the group consisting of mixed copper and manganese oxides on a solid support of alumina, copper and zinc oxides on a solid support of alumina, and nickel oxide on a support of high-surface-area carbon, at pressure of about one to ten atmospheres, wherein at least 40% of the alkanol converted is selectively converted to the corresponding nitrile.

4,731,465

PROCESS FOR PRODUCING NITRILOTRIACETONITRILE

Chung Y. Shen, St. Louis, Mo., and Kent P. Lannert, Freeburg, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 413,058, Aug. 30, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 586,876
Int. Cl.⁴ C07C *120/00*
U.S. Cl. 558—346 **12 Claims**

1. A continuous process for producing nitrilotriacetonitrile, comprising:

a. combining reactants, (1) hexamethylenetetramine or equivalent amounts of formaldehyde and ammonia or an ammonium salt, (2) formaldehyde, and (3) hydrogen cyanide with a mineral acid to form a reaction mixture;

b. reacting said reaction mixture in a reactor in which the incoming reaction mixture is mixed with partially reacted reaction mixture, which reactor is maintained at about 90° C. to 120° C.;

c. further reacting said reaction mixture in a plug-flow tubular reactor maintained at about 95° C. to about 120° C.;

d. cooling said reaction mixture to form crystalline nitrilotriacetonitrile; and

e. separating said crystalline nitrilotriacetonitrile from the cooled reaction mixture.

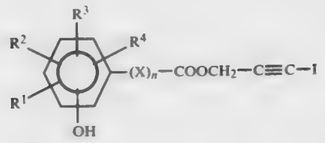
4,731,466

HYDROXYPHENYL- AND HYDROXYPHENOXYALKANOIC ACID IODOPROPARGYL ESTERS

Gerhard Staiger, Altoetting, and Peter Kinzel, Feldkirchen, both of Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 30, 1987, Ser. No. 44,164
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614836
Int. Cl.⁴ C07C *69/76*
U.S. Cl. 560—75 **8 Claims**

1. Compounds having the formula



wherein
R^1, R^2, R^3, R^4 may be identical or different radicals in any desired position on the benzene ring, namely fluoro, chloro, bromo, iodo, cyano, or nitro radicals, alkyl radicals having from 1 to 4 carbon atoms, cyclo alkyl radicals having from 3 to 7 carbon atoms, phenyl, phenyl sulfonyl and phenoxy radicals and hydrogen;
n can be a number with the value of 1 or 2 and
x can be CH_2 and, where n=1, O—CH_2 as well.

4,731,467

PROCESS FOR THE PREPARATION OF A DIESTER OF A 2-BUTENEDIOIC ACID

Eit Drent, and Antonius J. M. Breed, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 12, 1987, Ser. No. 2,489
Claims priority, application United Kingdom, Jan. 29, 1986, 8602178
Int. Cl.⁴ C07C *67/38*
U.S. Cl. 560—204 **30 Claims**

1. A process for the preparation of a diester of a 2-butenedioic acid which process comprises reacting at a temperature in the range of from 20° C. to 200° C. and a pressure in the range of from 1 bar to 200 bar an acetylenically unsaturated hydrocarbon having two carbon atoms per molecule less than said 2-butenedioic acid, carbon monoxide, an alcohol and a quinone in the presence of a noble metal selected from the group consisting of Group VIII of the Periodic Table of the Elements and compounds thereof.

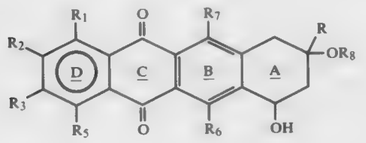
4,731,468

AGLYCONS

Jean-Pierre Gesson, Chasseneuil du Poitou; Martine Mondon, Poitiers, both of France; Abdallah A. Abdallah, Omdurman, , assignors to Laboratoires Hoechst S.A., France

Filed Aug. 29, 1984, Ser. No. 645,360
Claims priority, application France, Aug. 30, 1983, 83 13877
Int. Cl.⁴ C07C *57/02, 49/115*
U.S. Cl. 560—255 **7 Claims**

1. Aglycon compounds corresponding to the general formula IV below:



(IV)

in which:
R_1, R_2, R_3, and R_5, which can be identical or different, represent a hydrogen atom or a group OH, OMetal or OR_4, R_4 being a substituted or unsubstituted C_1 to C_6 alkyl group,
R represents a hydrogen atom or a group $COCH_2R'$, R' being hydrogen or an alkyl, hydroxyl, alkoxy or aryl group,
R_6 and R_7, which are always different, represent either a hydrogen atom or an OH group, and
R_8, which is located on the A ring in the compound of formula IV, represents a hydrogen atom or the group CH_3CO—, with the proviso that:
(a) R_1, R_2 and R_3 are never simultaneously hydrogen when R_7 and R_8 represent the hydrogen atom and R is the group $COCH_2R'$, and
(b) if R_1, R_2, R_3 and R_6 are hydrogen, R_5 is other than hydrogen and OCH_3.

4,731,469

PROCESS FOR RECOVERY AND PURIFICATION OF L-PHENYLALANINE

David L. Evans, Arvada; Roberta L. Thimmig, Brighton, and Robert C. Koltz, Lafayette, all of Colo., assignors to Synthetech, Inc., Boulder, Colo.

Filed Aug. 6, 1986, Ser. No. 894,239
Int. Cl.⁴ C07C *99/12*
U.S. Cl. 562—443 **18 Claims**

1. A process for the recovery and purification of L-phenylalanine from an aqueous mixture containing L-phenylalanine and at least one contaminant said process comprising evaporating water to provide a sludge having a solid phase and a liquid phase, adding sufficient lower alkyl alcohol to dissolve substantially all of the contaminant cooling said sludge to a final temperature to increase formation of solid L-phenylalanine at a pH of at least 7.0, and separating said solid L-phenylalanine from said liquid phase

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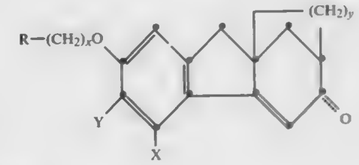
4,731,470

[(5,6-DICHLORO-3-OXO-2,9A-ALKANO-2,3,9,9A-TETRAHYDRO-1H-FLUOREN-7-YL)OXY]ALKANOIC ACIDS AND ALKANIMIDAMIDES

Adolph M. Pietruszkiewicz, North Wales; Otto W. Woltersdorf, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

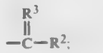
Filed Nov. 3, 1986, Ser. No. 926,161
Int. Cl.⁴ C07C *69/94*
U.S. Cl. 562—461 **19 Claims**

1. A compound of the formula:

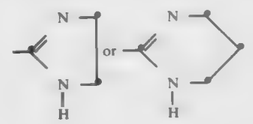


(I)

wherein:
R is —$COOR^1$,

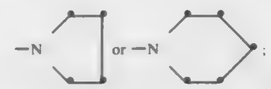


R^1 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkylcarboxy;
R^2 is NH_2, NHR^4 or NR^4R^5;
R^3 is NH or NR^4;
R^4, R^5 are each independently lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, or amino, provided that R^4 and R^5 are not both amino;
wherein R^2 and R^3 may be joined together via R^4 to form a heterocyclic ring of 5 or 6 atoms containing 2 nitrogen atoms and 3 or 4 carbon atoms,



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or wherein R^4 and R^5 may be joined together to form a 5- or 6-membered ring containing one nitrogen atom and 4 or 5 carbon atoms,



X and Y are halo or lower alkyl, such as methyl; and x is 1 to 4; y is 1 to 3

4,731,471

(5,6-DICHLORO-3-OXO-2,3,9,9A-TETRAHYDROFLUOR-EN-7-YL)-ALKANOIC ACIDS AND ALKANIMIDAMIDES BEARING NOVEL FUNCTIONAL 9A-SUBSTITUENTS

Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., Chalfont, and Adolph M. Pietruszkiewicz, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

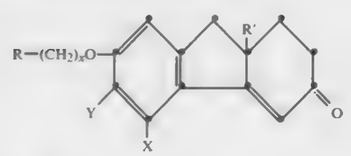
Filed Nov. 3, 1986, Ser. No. 926,170

Int. Cl.[4] C07C *69/94*

U.S. Cl. 562—461 **10 Claims**

1. A compound of the formula:

(I)



wherein:

R is —COOR[1],



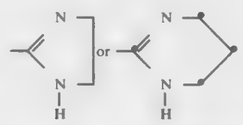
R^1 is hydrogen, C_1–C_6 alkyl, C_1–C_6 carboxyalkyl;

R^2 is NH_2, NHR^4 or NR^4R^5;

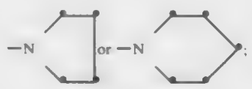
R^3 is NH or NR^4;

R^4, R^5 are each independently lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, or amino, provided that R^4 and R^5 are not both amino;

wherein R^2 and R^3 may be joined together via R^4 to form a heterocyclic ring of 5 or 6 atoms containing 2 nitrogen atoms and 3 or 4 carbon atoms,



or wherein R^4 or R^5 may be joined together to form a 5- or 6-membered ring containing one nitrogen atom and 4 or 5 carbon atoms,



R′ is C_1–C_6 hydroxyalkyl, C_1–C_6 haloalkyl, C_1–C_6 acyloxy-alkyl, and C_1–C_6 alkoxyalkyl;

X and Y are halo or lower alkyl; and

x is 1 to 4, or the pharmaceutically acceptable salts thereof.

4,731,472

(5,6-DICHLORO-3-OXO-9A-PROPYL-2,3,9,9A-TETRAHY-DROFLUOREN-7-YL)ALKANOIC ACIDS AND ALKANIMIDAMIDES

Adolph M. Pietruszkiewicz, North Wales; Otto W. Woltersdorf, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

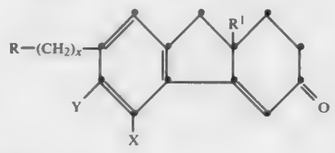
Filed Mar. 3, 1986, Ser. No. 835,598

Int. Cl.[4] C07C *59/86*

U.S. Cl. 562—461 **10 Claims**

1. A compound of the formula:

(I)



wherein:

R is —COOH;

R^1 is lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, phenyl, p-fluorophenyl, o-fluorophe-nyl, p-chlorophenyl, benzyl, cycloalkyl containing from 3 to 6 nuclear carbon atoms, or cycloalkyl-lower alkyl containing from 4 to 7 total carbon atoms;

X and Y are halo or lower alkyl; and

x is 1 to 4.

4,731,473

COMPOUNDS USEFUL IN TREATING SICKLE CELL ANEMIA

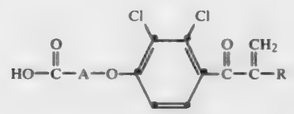
Donald J. Abraham, Murrysville; Otto W. Woltersdorf, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 4, 1986, Ser. No. 848,078

Int. Cl.[4] C07C *65/40*

U.S. Cl. 562—464 **14 Claims**

1. A compound of the general formula and pharmaceutically acceptable salts thereof:



wherein R is ethyl, propyl or isopropyl and A is $—(CH_2)_n—$ or $C(CH_2)_3$ and n=4 or 5.

4,731,474

NOVEL THERAPEUTIC COMPOUNDS USEFUL AS HYPOLIPIDEMIC AND HYPOCHOLESTEREMIC AGENTS

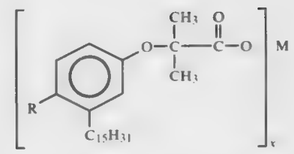
Thallapalli Ramalingam; Yadavalli V. D. Nageswar; Maddam-setty V. Rao; Pralhad B. Sattur, and Gopalakrishna Thyagara-jan, all of Andhra Pradesh, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Jan. 17, 1986, Ser. No. 820,410

Int. Cl.[4] C07C *59/48*

U.S. Cl. 562—471 **12 Claims**

2. A method for decreasing blood lipids comprising adminis-tering to a patient in need of a hypolipidemic, an effective amount of a composition comprising alkali metal salts of substi-tuted α-(3-pentadecylphenoxy)-isobutyric acid of the general formula:



wherein R is hydrogen or halogen, M is an alkali metal and x is 1 or 2, and a pharmaceutically acceptable vehicle.

4,731,475

METHOD FOR PREPARING SOLID P-DISODIUM HYDROXYBENZOATE

Fumio Tanimoto, Kyoto, and Hisao Kitano, Ohsaka, both of Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

Filed Apr. 28, 1987, Ser. No. 43,323

Claims priority, application Japan, Apr. 30, 1986, 61-99597

Int. Cl.[4] C07C *65/01*

U.S. Cl. 562—475 **11 Claims**

1. A method for preparing solid p-disodium hydroxybenzo-ate benzoate which is characterized by comprising the steps of reacting phenol, carbon tetrachloride in an amount of 0.9 to 1.2 moles per mole of phenol and sodium hydroxide in an amount of 7 to 20 moles per mole of phenol prior to the reaction in an aqueous liquid containing 10 to 40% by weight of p-disodium hydroxybenzoate and/or sodium chloride in the presence of a transition metal powder in an amount of 0.01 to 1.00% by weight based on the weight of a reaction system at a reaction temperature of 50° to 150° C.; cooling the resulting reaction mixture to a level of −20° to +20° C.; and separating said solid p-disodium hydroxybenzoate therefrom.

4,731,476

PROCESS FOR THE SEPARATION OF L-LEUCINE AND L-ISOLEUCINE

Kris Bart de Roos, Ar Hoevelaken, Netherlands, assignor to Polak's Frutal Works B.V., Amersfoort, Netherlands

Filed Mar. 31, 1987, Ser. No. 32,370

Claims priority, application United Kingdom, Apr. 3, 1986, 8608179

Int. Cl.[4] C07C *99/12*

U.S. Cl. 562—554 **19 Claims**

1. A method of separating L-leucine from a mixture of hy-drophobic amino acids, comprising:

(a) Providing an amino acid mixture, said mixture compris-ing L-leucine and L-isoleucine,

(b) esterifying said amino acid mixture with an alkanol, to form an ester mixture, said ester mixture comprising L-leucine ester and L-isoleucine ester,

(c) selectively hydrolyzing said L-leucine ester by treating said ester mixture with an enzymatic agent selected from the group consisting of enzyme and enzyme-complex having esterase activity to form hydrolysis mixture, said hydrolyzed mixture comprising L-leucine and L-isoleu-cine ester and separating said L-leucine from said hydroly-sis mixture to form purified L-leucine.

4,731,477

PROCESS FOR THE RING CLEAVAGE OF 2-ISOPROPYL-5,5-DIMETHYLTHIAZOLIDINES SUBSTITUTED IN THE 4-POSITION

Hans-Guenter Koban, Gelnhausen; Edgar Koberstein, and Juer-gen Martens, both of Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 18,304

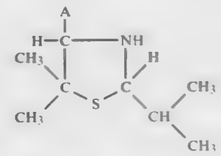
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607167

Int. Cl.[4] C07C *149/243*

U.S. Cl. 562—558 **7 Claims**

1. A process for the ring cleavage of a 2-isopropyl-5,5-dime-thylthiazolidine compound substituted in the 4-position or mineral acid salts thereof comprising hydrolyzing in an aque-ous acid medium, a compound represented by structural for-mula:

(I)



or a mineral acid salt therof,

wherein A represents COOH, or an N-mono- or N-disub-stituted carbonamide or thiocarboxylic acid amide group wherein the substituent is lower alkyl with 1 to 6 carbon atoms or phenyl,

at a temperature from 80° to 220° C. under autogenous pressure in an autoclave.

4,731,478

SULFAMOYL-SUBSTITUTED PHENETHYLAMINE DERIVATIVES, THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS, CONTAINING THEM

Kunihiro Niigata, and Takashi Fujikura, both of Saitama, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 756,790, Jul. 18, 1985, which is a continuation of Ser. No. 632,258, Jul. 18, 1984, Pat. No. 4,558,156, which is a continuation of Ser. No. 403,006, Jul. 29, 1982, abandoned, which is a division of Ser. No. 231,421, Feb. 4, 1981, Pat. No. 4,373,106. This application Nov. 27, 1985, Ser. No. 803,204

Claims priority, application Japan, Feb. 8, 1980, 55-14382

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] C07C *143/80*

U.S. Cl. 564—86 **4 Claims**

1. Optically active 5-{2-[2-(2-ethoxyphenoxy)ethyl-amino]-2-methylethyl}-2-methoxybenzenesulfonamide.

4,731,479

N-SULFAMYL-3-HALOPROPIONAMIDINES

Péter Bod, Gyömrö; Kálmán Harsányi, Budapest; Éva Ágai née Csongor, Budapest; Erik Bogsch, Budapest; Éva Fekecs, Budapest; Ferenc Trischler, Budapest; György Domány, Budapest; István Szabadkai, Budapest, and Béla Hegedüs, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sep. 10, 1986, Ser. No. 905,833

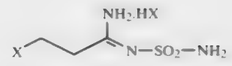
Claims priority, application Hungary, Sep. 11, 1985, 3423/85

Int. Cl.[4] C07C *143/72*

U.S. Cl. 564—79 **1 Claim**

1. Propionamidine derivatives of the formula (I)

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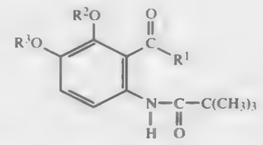


(I)

wherein X is halogen.

4,731,480
PROCESS FOR PREPARING 2-ACYL-3,4-DIALKOXYANILINES
Richard A. Conley, Annandale, and Donald L. Barton, Frenchtown, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.
Filed Jul. 29, 1985, Ser. No. 760,003
Int. Cl.[4] C07C *103/38*
U.S. Cl. 564—223 **2 Claims**

1. A compound of the formula



wherein R_1, R_2 and R_3 are lower alkyl.

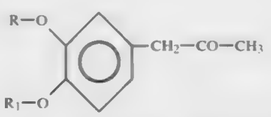
4,731,481
POLYALKANOLAMINES
Thomas J. Bellos, Kirkwood, and Eva G. Lovett, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.
Division of Ser. No. 264,506, May 18, 1981, Pat. No. 4,505,839.
This application Nov. 30, 1984, Ser. No. 676,693
Int. Cl.[4] C07B *6/06*
U.S. Cl. 564—503 **16 Claims**

1. Polyalkanolamines which have an osmometer molecular weight of from about 325 to 525, a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C nmr spectrum in D_2O.

9. The process of making polyalkanolamines which comprises heating alkanolamines in the presence of a catalytically effective amount of zinc chloride or aluminum sulfate catalysts at a temperature and for a time sufficient to yield polyalkanolamines having a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C nmr spectrum in D_2O.

4,731,482
PROCESS FOR THE PREPARATION OF PHENYLPROPANONES
Carlo Venturello; Rino D'Aloisio, and Marco Ricci, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy
Filed Oct. 17, 1986, Ser. No. 920,265
Claims priority, application Italy, Oct. 18, 1985, 22555 A/85
Int. Cl.[4] C07C *45/58*
U.S. Cl. 568—310 **11 Claims**

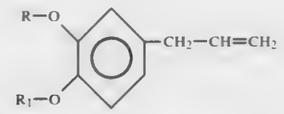
1. A process for the preparation of a phenyl-propanone having formula (I):



(I)

wherein R and R_1, which may be equal or different, are C_1–C_4 alkyl groups or are attached to the CH_2 group of a heterocyclic ring, characterized in that:

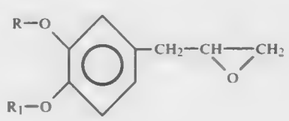
(a) the corresponding allylbenzene having formula (II):



(II)

is epoxidized with H_2O_2 under stirring, at 40°–90° C., in a bisphasic system consisting of an aqueous phase containing H_2O_2, and an organic phase consisting of at least one solvent immiscible in the aqueous phase selected from aromatic and chlorinated hydrocarbons, of said allylbenzene, and of a catalyst having the formula $Q_3XW_4O_{24}+$, wherein Q is a quaternary cation ($R_2R_3R_4R_5$ M), M being selected from the group consisting of N and P, and R_2, R_3, R_4 and R_5, which may be equal or different, are so selected from hydrogen and alkyl groups as to have from 1 to 4 alkyl groups containing, on the whole, from 20 to 70 C atoms, wherein X is P or As, and wherein the H_2O_2: allylbenzene molar ratio is from 1:1 to 1:2;

(b) said solvent and catalyst are removed from the organic phase and, optionally, the pure epoxide, having formula (III):



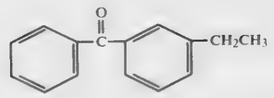
(III)

is isolated from the same organic phase; and

(c) said epoxide or said organic phase, after said removal of (b), are isomerized by heating, under stirring, in the presence of catalytic amounts of LiI, at 90°–150° C.

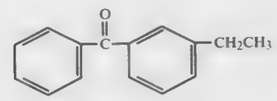
4,731,483
METHOD FOR PREPARING 3-ETHYLBENZOPHENONE
Isoo Shimizu; Yasuo Matsumura, both of Yokohama; Shigenobu Kawakami, Ichikawa, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan
Filed Sep. 8, 1986, Ser. No. 904,470
Claims priority, application Japan, Sep. 11, 1985, 60-200808
Int. Cl.[4] C07C *45/36*
U.S. Cl. 568—311 **11 Claims**

1. A method for preparing 3-ethylbenzophenone in a high purity which consists essentially of the steps of alkylating benzene with ethylene in the presence of an alkylating catalyst comprising aluminum chloride at a temperature within the range of about 0° to 175° C. to obtain an alkylated product composed mainly of unreacted benzene, ethylbenzene, polyethylbenzene and heavier substances; subjecting said alkylated product to distillation in order to recover therefrom a fraction which has a temperature range of boiling points within the range of 275° to 310° C. (in terms of atmospheric pressure); dehydrogenating said recovered fraction at a reaction temperature within the range of 200° to 700° C. in the presence of a dehydrogenation catalyst comprising an iron oxide; oxidizing said dehydrogenated fraction in a liquid phase with molecular oxygen at a temperature of 30° to 250° C.; and performing a distillation to recover therefrom 3-ethylbenzophenone represented by the formula (I):



(I)

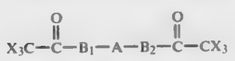
8. A method for preparing 3-ethylbenzophenone in a high purity which consists essentially of the steps of alkylating benzene with ethylene in the presence of an alkylating catalyst comprising aluminum chloride at a temperature within the range of about 0° to 175° C. to obtain an alkylated product composed mainly of unreacted benzene, ethylbenzene, polyethylbenzene and heavier substance; subjecting said alkylated product to distillation in order to recover therefrom a fraction which has a temperature range of boiling points within the range of 275° to 310° C. (in terms of atmospheric pressure); dehydrogenating said recovered fraction at a reaction temperature within the range of 200° to 700° C. in the presence of dehydrogenation catalyst comprising an iron oxide; oxidizing said dehydrogenated fraction in a liquid phase with an oxidizing agent comprising a peroxide at a reaction temperature of 0° to 100° C. in an inert solvent; and performing distillation to recover therefrom 3-ethylbenzophenone represented by the formula (I):



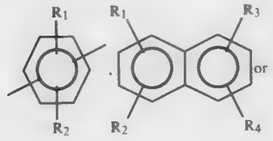
(I)

4,731,484
HALOACETYL DERIVATIVES OF AROMATIC COMPOUNDS
Marlin E. Walters, West Columbia, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 692,462, Jan. 18, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 858,133
Int. Cl.[4] C07C *49/213*
U.S. Cl. 568—331 **20 Claims**

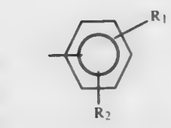
1. A compound having the formula:



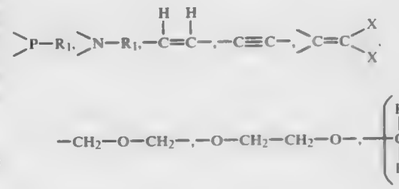
wherein B_1 and B_2 are independently selected from



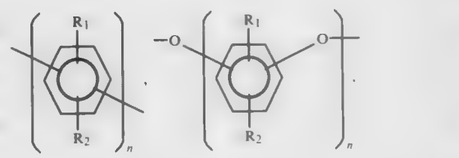
and which may be the same or different and wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, chlorine, bromine, an alkyl or an alkoxy group having from 1 to 4 carbon atoms, a phenyl group or



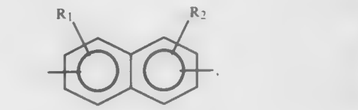
wherein R_1 and R_2 have the aforesaid meaning, X is chlorine or bromine and A is a single valence bond, oxygen, sulfur,

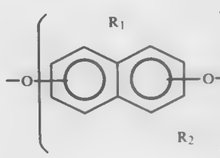


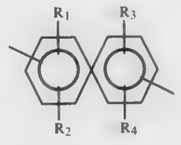
an aromatic group having the formula

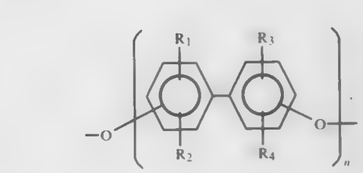












X, R_1, R_2, R_3 and R_4 having the aforesaid meanings and wherein n is an integer from 1 to 6.

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PROCESS FOR HYDROFORMYLATION WITH RHODIUM CATALYSTS AND THE SEPARATION OF RHODIUM THEREFROM

Boy Cornils, Dinslaken; Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln-Drunen; Hanswilhelm Bach; Ernest Wiebus, both of Oberhausen, and Wolfgang Lipps, Isny, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

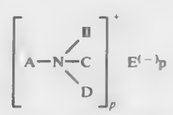
Division of Ser. No. 920,901, Oct. 10, 1986, which is a continuation of Ser. No. 714,960, Mar. 22, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 9,734

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412335

Int. Cl.[4] C07C *45/50*

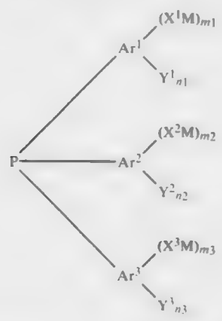
U.S. Cl. 568—454 **11 Claims**

1. In a process for the production of aldehydes by hydroformylation by reaction of an olefin, carbon monoxide and hydrogen in the presence of water, the improvement comprising effecting the reaction in the presence of a quaternary ammonium solubilizer of the formula



I

wherein A is a straight or branched alkyl, alkoxy, hydroxyalkyl, substituted or unsubstituted aryl having 6–25 carbon atoms, or $R^7CONHCH_2CH_2CH_2$— wherein R^7 is a straight or branched alkyl having 5–11 carbon atoms; B is alkyl or hydroxyalkyl of 1 to 4 carbon atoms C and D are each independently chosen from straight or branched alkyls or ω—hydroxyalkyl of 1 to 4 carbon atoms or C and D, together with the bridging N, form a 5 or 6 membered heterocyclic ring; and E is selected from chloride, bromide, iodide, sulfate, tetrafluoroborate, acetate, methosulfate, benzene sulfate, alkylbenzene sulfate, sulfonate, toluene sulfonate, lactate, and citrate and a water-soluble complex of rhodium and a trisulfonated and/or tricarboxylated triarylphosphine of the formula



wherein Ar^1, Ar^2 and Ar^3 are individually selected from the group consisting of phenyl and naphthyl, Y^1, Y^2 and Y^3 are individually selected from the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, halogen, hydroxy, cyano, nitro and



and R^1 and R^2 are individually alkyl of 1 to 4 carbon atoms, X^1, X^2 and X^3 are individually selected from the group consisting of carboxylate (COO—) and sulfonate (—SO_3—), m_1, m_2 and m_3 are individually an integer from 0 to 3 with the sum of m_1, m_2 and m_3 being at least one, n_1, n_2 and n_3 are individually integers from 0 to 5, M is selected from the group consisting of alkali-metal, alkaline earth metal, zinc, —NH_3, quaternary ammonium $N(R_3R_4R_5R_6)+$, R_3, R_4, R_5 and R_6 are individually alkyl of 1 to 4 carbon atoms.

4,731,486

HYDROFORMYLATION USING LOW VOLATILE PHOSPHINE LIGANDS

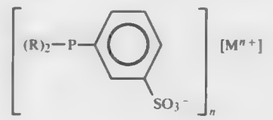
Anthony G. Abatjoglou, Charlestown, and David R. Bryant, So. Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 18, 1986, Ser. No. 932,002

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **45 Claims**

1. In a non-aqueous hydroformylation process for producing aldehydes which comprises reacting an olefinically unsaturated organic compound containing from 2 to 20 carbon atoms with carbon monoxide and hydrogen, in a non-aqueous hydroformylation reaction medium containing the olefinically unsaturated organic compound, aldehyde product, solubilized rhodium-phosphorus ligand complex catalyst and solubilized free phosphorus ligand, and wherein the hydroformylation reaction conditions comprise a reaction temperature of from about 45° C. to about 200° C., a total gas pressure of hydrogen, carbon monoxide and olefinically unsaturated compound of less than about 500 psia, a carbon monoxide partial pressure of from about 1 to 120 psia, a hydrogen partial pressure of from about 10 to 160 psia and wherein said reaction medium contains at least about 2 moles of total free phosphorus ligand per mole of rhodium in said medium, the improvement comprising employing as the phosphorus ligand of said complex catalyst and as said free phosphorus ligand, a monosulfonated tertiary phosphine metal salt the general formula



wherein each R group individually represents a radical containing from 1 to 30 carbon atoms selected from the class consisting of alkyl, aryl, alkaryl, aralkyl and cycloakyl radicals; wherein M represents a metal cation selected from the group consisting of alkali and alkaline earth metals, and wherein n has a value of 1 or 2 corresponding to the valence of the particular metal cation represented by M; and wherein said hydroformylation reaction medium also contains at least a sufficient amount of an added organic solubilizing agent capable of rendering the rhodium-monosulfonated tertiary phosphine metal salt ligand complex catalyst and free monosulfonated tertiary phosphine metal salt ligand employed, soluble in said hydroformylation reaction medium; and wherein said organic solubilizing agent is selected from the group consisting of an alkylene oxide oligomer having an average molecular weight of at least 150, an organic nonionic surfactant mon-ol having an average molecular weight of at least 300, a polar organic compound having a molecular weight of less than 150 and having a Hildebrand solubility value of at least 10, and mixtures thereof; provided that when present in the hydroformylation reaction medium, the amount of said alkylene oxide oligomer is not greater than about 35 weight percent of said medium, the amount of said organic nonionic surfactant mono-ol is not greater than about 60 weight percent of said medium, and the amount of said polar organic compound is not greater than about 60 weight percent of said medium, with the additional proviso that the total amount of added organic solubilizing agent present in said medium is not greater than about 60 weight percent of said medium.

4,731,487

PROCESS FOR THE PREPARATION OF ALDEHYDES

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 14, 1986, Ser. No. 918,243

Claims priority, application United Kingdom, Oct. 29, 1985, 8526613

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **16 Claims**

1. A process for the preparation of aldehydes by hydroformylation of an alkenically unsaturated compound having at least 5 carbon atoms per molecule, which comprises contacting the alkenically unsaturated compound with carbon monoxide, in a molar ratio of carbon monoxide to unsaturated compound in the range from 5:95 to 95:5, and hydrogen, in a molar ratio of hydrogen to carbon monoxide between about 12:1 and 1:12, at a temperature between about 20° and 200° C. and at a pressure between about 1 and 100 bar in the presence of an aprotic solvent and a catalytic system comprising

(a) one or more catalysts selected from the group consisting of palladium, palladium compounds, platinum and platinum compounds, in a quantity in the range from 10^{-8} to 10^{-1} mol of catalyst per mol of alkenically unsaturated compound,

(b) one or more anions of one or more carboxylic acids having a pKa<2, measured in aqueous solution at 18° C., in a quantity of at least 5 equivalents of carboxylic acid anions per gram atom of palladium and platinum, and

(c) one or more bidentate ligands of the formula



wherein M represents phosphorus, arsenic or antimony, R represents a divalent organic bridging group having at least three carbon atoms in the bridge, and R^1, R^2, R^3 and R^4 are the same or different hydrocarbon groups, in a quantity of 0.1 to 10 mols of bidentate ligand per mol of palladium, palladium compound, platinum and platinum compound.

4,731,488

VAPOR-PHASE HYDROGEN TRANSFER REACTION OF CARBONYL COMPOUND WITH ALCOHOL

Yuzji Shimasaki, Suita; Youichi Hino, Sakai, and Michio Ueshima, Takarazuka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 802,183, Nov. 25, 1985, abandoned. This application Jun. 6, 1986, Ser. No. 873,447

Claims priority, application Japan, Nov. 27, 1984, 59-248650; Apr. 8, 1985, 60-72698

Int. Cl.[4] C07C *29/136, 29/14, 33/03, 33/22*

U.S. Cl. 568—648 **8 Claims**

1. In a vapor-phase hydrogen transfer reaction for reacting in the vapor-phase a carbonyl compound having an alkenyl or aryl group and a primary or secondary alcohol in the presence of a vapor-phase hydrogen transfer catalyst, the improvement comprising carrying out said reaction in the presence of a catalyst having a composition represented by the following formula

$$Mg_aX_bY_cO_d$$

wherein X represents at least one element selected from the group consisting of boron, aluminum, silicon, phosphorus, titanium, vanadium, yttrium, zirconium, niobium, tin, antimony, lead, bismuth, lanthanum and cerium, Y represents at least one element selected from the group consisting of alkali metals and alkaline earth metals excepting magnesium, O represents oxygen, and a, b, c and d represent the atomic ratios of the individual elements, and when a is 1, b represents a number of 0.01 to 0.5, c represents a number of 0 to 0.5, and d is a number determined by the atomic valences and atomic ratios of the individual elements.

4,731,489

PROCESS FOR PRODUCTION OF GASOLINE BLENDING STOCK

David E. Whisenhunt; Gregg L. Byers, and Uday S. Hattiangadi, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 18, 1986, Ser. No. 886,850

Int. Cl.[4] C07C *41/06*

U.S. Cl. 568—697 **9 Claims**

1. A process for producing a gasoline blending stock comprising the steps of:

(a) reacting for etherification in a first catalytic reaction zone methanol and a C_4 mixture including isobutene, said methanol being in excess of stoichiometric with respect to said isobutene in step (a) but substoichiometric with respect to the combined isobutene in steps (a) and (b), to produce an etherification product comprising methyl tertiary butyl ether and unreacted methanol; and

(b) reacting for hydration and etherification in a second reaction zone, water, additional C_4 mixture including isobutene, and said etherification product including methanol, whereby an overall reaction product is produced comprising methyl tertiary butyl ether, tertiary butyl alcohol, and essentially no methanol.

4,731,490

PROCESS FOR METHYL, TERTIARY BUTYL ETHER PRODUCTION

Glenn E. Coughenour, Bryn Mawr, Pa., and Joseph P. Chan, Cherry Hill, N.J., assignors to Arco Chemical Company, Newtown Square, Pa.

Filed Jul. 23, 1986, Ser. No. 888,604

Int. Cl.[4] C07C *41/06*

U.S. Cl. 568—697 **7 Claims**

1. A process for the production of methyl, tertiary butyl ether comprising:

(a) dimerizing ethylene to produce a first butene-containing material which includes less than about 1% by weight butane;

(b) isomerizing said first butene-containing material to produce a second butene-containing material including an increased amount of isobutene relative to said first butene-containing material; and

(c) contacting at least a portion of said second butene-containing material with methanol at etherification conditions to produce an effluent enriched in methyl, tertiary butyl ether.

4,731,491

PROCESS FOR LIQUEFACTION OF LIGNIN

Peter Urban, Northbrook, and Dusan J. Engel, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 22, 1986, Ser. No. 821,190

Int. Cl.[4] C08H *15/02*; C07C *37/00*

U.S. Cl. 568—761 **21 Claims**

1. A method of liquefying lignin from the Kraft process comprising forming in situ a catalystic composition resulting from the addition of a sulfide source to an aqueous solution of divalent iron, and at least one promoter metal selected from the group consisting of copper, tin, silver, chromium, cobalt, nickel, zinc, molybdenum, gallium, and germanium, and reacting a mixture of an aqueous solution of said lignin, phenol, and a lower aliphatic alcohol in the presence of said catalytic composition in a hydrogen atmosphere at a temperature from about

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300° to about 450° C. and an initial pressure from about 50 to about 150 atmospheres.

13. A method of making cresols from lignin from the Kraft process comprising:

(a) reacting a mixture of an aqueous solution of the lignin, phenol, and a lower aliphatic alcohol in the presence of a catalytic composition prepared in situ of sulfides of divalent iron and at least one promoter metal selected from the group consisting of copper, tin, silver, chromium, cobalt, nickel, zinc, molybdenum, gallium, and germanium, in a hydrogen atmosphere at a temperature from about 300° to about 450° C. and an initial hydrogen pressure from about 50 to about 150 atmospheres to afford a first product mixture;

(b) recovering from the first product mixture substantially all material of boiling point less than about 235° C.;

(c) reacting the remainder fo the first product mixture with an aqueous solution of a lignin salt in the presence of said catalyst compositon in a hydrogen atmosphere at a temperature of 300° to about 450° C. and an initial hydrogen pressure of about 50 to 150 atmospheres to afford a second product mixture;

(d) recovering fromthe second product mixture substantially all material of boiling point less than about 235° C.; and

(e) recycling the material of step (d) to step (a) as replacement therein, in whole or in part, for phenol.

4,731,492

PHENOL ALKYLATION PROCESS

Steven L. Wiker, Orangeburg; S. Wendell Holmes, Jr., Columbia, both of S.C., and Dixie E. Goins, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 4, 1987, Ser. No. 21,754

Int. Cl.[4] C07C *37/14*

U.S. Cl. 568—794 **20 Claims**

1. A process for mono-orthoalkylating an arylhydroxide having an unsubstituted ring position ortho with respect to the hydroxy group, said process comprising continuously passing a moxture of said arylhydroxide and olefin in a mole ratio of 0.8–10 moles of olefin per mole of arylhydroxide and an inert hydrocarbon diluent in an amount such that the arylhydroxide:diluent ratio is about 10–90 weight percent arylhydroxide and 90–10 weight percent diluent in the liquid phase through an activated alumina bed at an elevated temperature of 120°–200° C. and under a pressure in the range of 50–2000 psig which is also sufficient to maintain said arylhydroxide, hydrocarbon diluent and olefin in the liquid phase.

4,731,493

PROCESS FOR PRODUCING CONDENSED BROMOACENAPHTHYLENE

Masashige Kubo; Mitsuaki Yoshimitsu, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

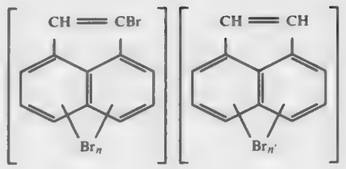
Continuation of Ser. No. 537,581, Sep. 30, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,269

Claims priority, application Japan, Sep. 30, 1982, 57-169835; Oct. 1, 1982, 57-171015

Int. Cl.[4] C07C *17/26, 17/34, 17/02*

U.S. Cl. 570—204 **19 Claims**

1. A process for producing condensed bromoacenaphthylene having the general (I) or (II)



(I) (II)

as elementary unit, wherein n and n′ are integers ranging from 1 to 5, the bonding being made intermolecularly between a benzylic carbon of one acenaphthylene and an arylic carbon of another acenaphthlene, comprising:

(A) brominating and condensing acenaphthene with from 1 to 5 moles of bromine per mole of acenaphthene in a halogenated hydrocarbon solvent in the presence of an iron or aluminum catalyst;

(B) removing said catalyst from the bromination medium and then continuing the bromination reaction with bromine in the presence of added radical initiator; and

(C) dehydrobrominating the product of step (B) to obtain said condensed bromoacenaphthylene product.

4,731,494

PROCESS FOR MAKING METHYL IODIDE FROM METHANE

Jawad H. Murib, Cincinnati, and John H. Kahn, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 30, 1987, Ser. No. 31,804

Int. Cl.[4] C07C *17/10*

U.S. Cl. 570—244 **27 Claims**

1. A process for making methyl iodide from methane comprising introducing methane and a source of oxygen into a molten salt, maintained at a temperature in the range of between about 500° C. and below about 675° C., comprising an iodide of a metal selected from the group consisting of alkali metals, alkaline earth metals and mixtures thereof and a catalyst comprising at least one metal selected from the group consisting of metals of Group IB and Group VIII of the Periodic Table of the Elements with the proviso that said methane and said source of oxygen not contact each other.

18. A process for making methyl iodide from methane comprising introducing methane, a source of oxygen, and steam into a molten salt, maintained at a temperature at or above about 675° C., said molten salt comprising an iodide of a metal selected from the group consisting of alkali metals, alkaline earth metals and mixtures thereof and a catalyst comprising at least one metal selected from the group consisting of metals of Group IB and Group VIII of the Periodic Table of the Elements with the proviso that said methane and said source of oxygen do not contact each other.

4,731,495

ELECTRICAL INSULATING OILS

Takao Katayama, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed May 19, 1986, Ser. No. 865,044

Claims priority, application Japan, May 29, 1985, 60-114255

Int. Cl.[4] H01B *3/22*

U.S. Cl. 585—6.6 **10 Claims**

1. An electrical insulating oil consisting essentially of an oil having a boiling point of not less than 150° C., a viscosity of 2 to 500 centistokes (at 40° C.), a pour point of not more than −35° C., a sulfur content of from more than 5 ppm to not more than 800 ppm and an aromatic hydrocarbon content ($\%C_A$) of more than 5%.

4,731,496

PROCESS FOR THE HYDROGENATION OF BENZENE TO CYCLOHEXANE

Shao-Chueh Hu; I-Kai Wang, and Jung-Chung Wu, all of Chia-Yi, Taiwan, assignors to Chinese Petroleum Corporation, Taipei, Taiwan

Filed Jul. 25, 1986, Ser. No. 889,280

Int. Cl.[4] C07C *5/10*

U.S. Cl. 585—270 **6 Claims**

1. A process for converting benzene to cyclohexane by hydrogenation over a supported nickel catalyst comprising the steps of:

mixing together and precipitating solutions of titanium compounds and zirconium compounds wherein said compounds are present in a atomic ratio of 25 Ti/75 Zr to 75 Ti/25 Zr;

calcining said mixture at a temperature between 450° C. and 750° C. to produce a support;

impregnating the surface of said support with a solution of nickel salt such that the nickel content is 2–18 weight percent based on the supported catalyst;

calcining the resulting support at a temperature below 150° C.;

reducing the supported catalyst at 250°–350° C.;

and

hydrogenating benzene to cyclohexane in a gas phase reaction by passing said benzene over said catalyst.

4,731,497

ALKYLATION OF AROMATICS WITH ALPHA-OLEFINS

Roger A. Grey, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1986, Ser. No. 947,120

Int. Cl.[4] C07C *2/64, 15/107*

U.S. Cl. 585—455 **6 Claims**

1. A process for the alkylation of monoalkyl-monosubstituted benzenes with long-chain alpha olefins comprising:

contacting, at a temperature of from 20° to 260° C., a monalkyl monosubstituted benzene with an alpha-olefin containing from about 10 to about 20 carbon atoms in the presence of a catalyst comprising the acid form of a three-dimensional crystalline zeolite molecular sieve having pore size of between 6.7 and 7.5Å and having a silica:alumina weight ratio of between about 30:1 and 2:1; said benzene and alpha-olefin being in mole ratio of between about 10:1 and 3:1 and said olefin to catalyst mole ratio being from about 20:1 to 2:1; whereby the alkylated benzene is alkylated to at least about 80% in the paraposition and the benzene ring is attached at least about 70% at position 2 of the alpha-olefin.

4,731,498

ENHANCING THE PRODUCTION OF HIGHER MOLECULAR WEIGHT HYDROCARBONS FROM LOWER MOLECULAR WEIGHT HYDROCARBONS BY THE ADDITIONS OF ALUMINUM VAPOR TO THE FEED

Louis Devries, Greenbrae, and P. R. Ryason, Santa Rosa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 27, 1986, Ser. No. 879,665

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—415 **22 Claims**

1. In a continuous catalyst process for the production of higher molecular weight hydrocarbons from lower molecular weight hydrocarbons in which a lower molecular weight hydrocarbon containing reaction gas is contacted in a reaction zone with a higher molecular weight hydrocarbon synthesis catalyst under C_2+ hydrocarbon synthesis conditions, the improvement comprising increasing production of higher molecular weight hydrocarbons by the addition of an effective amount of aluminum metal vapor to the reaction gas, said synthesis conditions including a temperature greater than 1000° C. and a gas hourly space velocity of greater than 3200 hr^{-1} and wherein said hydrocarbon synthesis catalyst contains a carbide, nitride, boride or oxide of a Group I-A, II-A, III-A, IV-B or actinide series metal.

4,731,499

HYBRID CORN PLANT AND SEED

Vladimir Puskaric, Woodstock, Canada, and Lori Carrigan, New London, Minn., assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Jan. 29, 1987, Ser. No. 8,179

Int. Cl.[4] A01H *1/02*

U.S. Cl. 800—1 **4 Claims**

1. Hybrid corn seed designated 3790.

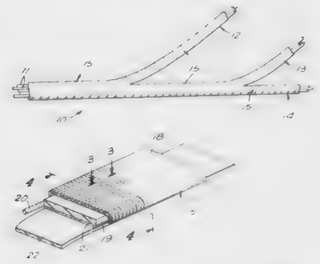
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4,731,500

ELECTRICAL SHIELDING TAPE AND METHOD OF MAKING SAME

Hiraaki Otsuka, Kobe, Japan, assignor to The Zippertubing Company, Los Angeles, Calif.

Filed Jan. 17, 1986, Ser. No. 819,619
Claims priority, application Japan, Feb. 14, 1985, 60-27799
Int. Cl.[4] H01B *7/08;* B32B *7/04*
U.S. Cl. 174—36 11 Claims



1. An article of manufacture for use in providing an electrical shield between an object and ambient electrical flux comprising:

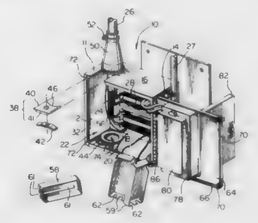
flattened tubular wire netting of conductive material having gaps between the wires and embracing a flat nonconductive strip extending therethrough; and a layer of tacky adhesive applied to the exterior of one side of said flattened netting and to the side of said strip adjacent to the one side of the netting and adapted to hold said netting firmly affixed to the surface of an object to shield the object from ambient electrical flux.

4,731,501

ENTRANCE TERMINALS FOR TELECOMMUNICATIONS CABLE

Gordon P. F. Clark, Beaconsfield; Richard Benoit, Longueuil, and Zbigniew T. Karwowski, Dollard Des Ormeaux, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 6, 1985, Ser. No. 795,558
Claims priority, application Canada, Jun. 19, 1985, 484543
Int. Cl.[4] H02G *3/22*
U.S. Cl. 174—65 R 10 Claims



1. An entrance terminal housing comprising: walls which define a chamber, the walls sealingly joined together and between them defining an opening to the chamber, at least one of the walls defining at least one aperture for passage of conductors of a cable through the wall; a cover for removably closing the opening and a sealing means to provide a seal between the walls and the cover when the opening is closed; and a plurality of positions each for holding a terminal connector to electrically connect terminals of an incoming cable with another cable, a plurality of individual covers provided for covering each of said positions or groups of said positions so as to isolate individual connectors or groups of connectors from one another.

4,731,502

LIMITED BEND-RADIUS TRANSMISSION CABLE ALSO HAVING CONTROLLED TWIST MOVEMENT

Domenico Finamore, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 21, 1986, Ser. No. 921,690
Int. Cl.[4] H01B *7/18*
U.S. Cl. 174—74 R 10 Claims



1. A crush resilient flexible transverse electromagnetic mode transmission cable having a controlled bend radius and controlled twist movement under torque, comprising:

(a) a microwave coaxial transmission line;

(b) a flexible crush-resilient helically-wound metallic armor sheath having interlocking edges and grooves between its joints, in which said microwave coaxial transmission line is sheathed;

(c) a metallic wire of a diameter selected to cooperate with the armor in the control on the bend of the cable spirally wound into the groove between the joints of the armor;

(d) a braided high tensile strength wrap surrounding the armor and the wire;

(e) an insulating jacket surrounding said braided wrap;

(f) a strain relief boot surrounding and affixed to the insulating jacket at each end of the cable; and

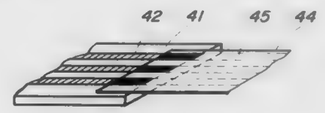
(g) a connector end for fixation of connectors for the microwave transmission line to said strain relief boot and the microwave transmission line at each end of the cable, for joining the transmission cable to a transmission receiving apparatus.

4,731,503

CONNECTOR WITH A FLEXIBLE CIRCUIT SUPPORT

Yoshitomo Kitanishi, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 501,975, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 234,870, Feb. 13, 1981, abandoned, which is a continuation of Ser. No. 926,088, Jul. 19, 1978, abandoned. This application Mar. 28, 1986, Ser. No. 845,341
Claims priority, application Japan, Jul. 21, 1977, 52-88083; Aug. 31, 1977, 52-117416[U]
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—88 R 4 Claims



1. An electrical connector configuration comprising:

a pair of circuit supports each having a plurality of limited electrical contact regions and a plurality of limited non-electrical contact regions;

an electrically conducting hot melt adhesive having electrically conductive particles dispersed therein interposed and solidified between said electrical contact regions of the supports, resulting in establishing circuit paths between said contact regions; and

an electrically nonconducting hot melt adhesive free of electrically conductive particles interposed and solidified between said non-electrical contact regions of the sup-

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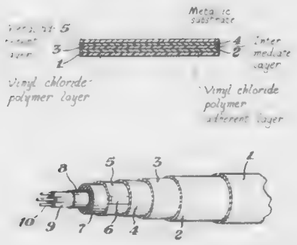
ports for ensuring the strength of said adhesively established circuit paths.

4,731,504

MULTI-LAYER FILM STRUCTURE AND ELECTRICAL CABLE INCORPORATING SAME

Felix Achille, Reynoldsburg; Daniel G. Pikula, Colombus, and Patricia B. Leng, Newark, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1986, Ser. No. 895,969
Int. Cl.[4] H01B *7/34;* **B32B** *7/04, 27/08*
U.S. Cl. 174—107 **7 Claims**



1. A multiple layer adhesive film suitably employed to provide adhesion between a metallic substrate and a vinyl chloride polymer resin, the multiple layer adhesive film comprising a metal adherent layer of a copolymer of ethylene and up to about 20 percent by weight of one or more copolymerizable carboxy containing comonomers; an intermediate layer of a copolymer of ethylene and vinyl acetate containing from about 10 percent to about 40 percent by weight polymerized vinyl acetate; and a vinyl chloride polymer adherent layer of a polymer of ethylene and carbon monoxide or a copolymer of ethylene, carbon monoxide and one or more copolymerizable ethylenically unsaturated carboxy substituted comonomers.

5. A communications cable having improved fire resistance comprising an outer jacket of a vinyl chloride polymer resin, a multi-layer adhesive film comprising a metal adherent layer of a copolymer of ethylene and up to about 20 percent by weight of one or more copolymerizable carboxy containing comonomers; an intermediate layer of a copolymer of ethylene and vinyl acetate containing from about 10 percent to about 40 percent by weight polymerized vinyl acetate; and a vinyl chloride polymer adherent layer of a polymer of ethylene and carbon monoxide or a copolymer of ethylene, carbon monoxide and one or more copolymerizable ethylenically unsaturdated carboxy substituted comonomers, a metallic shield and a conductor assembly, the metallic shield being wrapped circumferentially around the conductor assembly and adhered to the jacket by means of the multi-layer adhesive film.

4,731,505

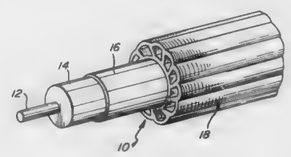
IMPACT ABSORBING JACKET FOR A CONCENTRIC INTERIOR MEMBER AND COAXIAL CABLE PROVIDED WITH SAME

Randall W. Crenshaw, and Michael K. Drum, both of Conover, N.C., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 31, 1987, Ser. No. 33,333
Int. Cl.[4] H01B *7/24, 17/58*
U.S. Cl. 174—107 **12 Claims**

1. A cable for use in transmitting electromagnetic signals comprising:
- an inner electrical conductor;
- an electrical insulating layer concentrically encompassing said inner electrical conductor;
- an outer electrical conductor concentrically encompassing said insulating layer; and
- an outer jacket encompassing said outer electrical conductor, said outer jacket formed from a deformable material having a plurality of spaced tubular elements arranged longitudinally about said outer electrical conductor, each of said tubular elements having a cross-section which is non-symmetrical about all radii of said inner electrical conductor, and having an arch-shaped outer layer portion with a radius of curvature less than the average distance between the outer layer portion and the longitudinal axis of said cable, the radial axis of each arch-shaped outer layer portion being non-radial of said cable.

12. A jacket for protecting an elongated member such as an electrical cable, said jacket comprising:



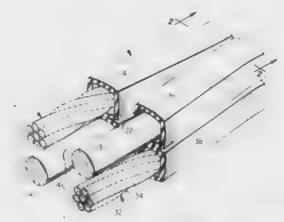
- an inner wall of generally circular cross-section to surround and closely conform to an elongated member;
- a deformable outer wall; and
- a plurality of deformable support walls spaced around said inner wall, between said inner and outer walls, to support said outer wall, said plurality of deformable support walls together with said inner and outer walls defining longitudinally extending tubular chambers, each portion of said outer wall spanning two adjacent support walls being arch-shaped and the radial axis of each of said arch-shaped portions being non-radial of said jacket.

4,731,506

SIGNAL CABLE ASSEMBLY

Noel Lee, 47 W. Park Dr., Daly City, Calif. 94015

Filed Oct. 29, 1986, Ser. No. 925,831
Int. Cl.[4] H01B *11/02*
U.S. Cl. 174—115 **6 Claims**



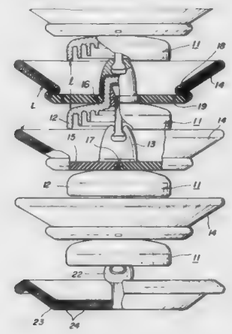
1. A signal cable assembly for transferring positive and negative signals between a source and a load, said cable assembly comprising:
- a first conductor comprising a plurality of bundles of wire strands twisted together and insulation means extending around said bundles of wire strands for a portion of the lengths thereof;
- a second conductor comprising a plurality of bundles of wire strands twisted together and insulation means extending around said bundles of wire strands for a portion of the lengths thereof;
- a third conductor comprising at least one solid wire of a diameter greater than the diameter of each of said wire strands, and insulation means extending around said solid wire for a portion of the length thereof;
- a fourth conductor comprising at least one solid wire of a diameter greater than the diameter of each of said wire strands, and insulation means extending around said solid wire for a portion of the length thereof;
- said first and third conductors extending in a juxtaposed relationship with their respective axes extending parallel and with their respective uninsulated portions being twisted together to provide a single conductive path for said positive signal;
- said second and fourth conductors extending in a juxtaposed relationship with their respective axes extending parallel and with their respective uninsulated portions being twisted together to provide a single conductive path for said negative signal; and
- said second and fourth conductors extending adjacent said first and third conductors.

4,731,507

ELECTRICAL INSULATOR STRING WITH BULLET-PROOF PROTECTIVE RINGS

Soichi Torimoto, Nagoya; Eiji Senda, Niwa; Morio Nishikawa, Nagoya, and Kenji Tanaka, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 21, 1986, Ser. No. 853,895
Claims priority, application Japan, Apr. 30, 1985, 60-64539[U]; Feb. 1, 1986, 61-13765[U]
Int. Cl.[4] H01B *17/04;* **F41H** *5/04;* **B32B** *15/08*
U.S. Cl. 174—139 **2 Claims**



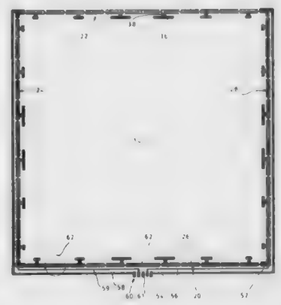
1. A bullet-proof insulator assembly comprising, an insulator string formed from a plurality of suspension insulators coupled to each other, each suspension insulator having a metal cap; bullet-proof rings, one of said bullet-proof rings being mounted on each of the suspension insulators, each bullet-proof ring having a shape representing a sidewall of a truncated-cone with a minimum inside diameter greater than an outside diameter of a shed portion of the suspension insulator, and holders mounting each of said bullet-proof rings to the suspension insulators such that each bullet-proof ring is insulated from each corresponding metal cap and each bullet-proof ring extends away from a longitudinal axis of the insulator string at an angle of 45–70 degrees relative to the longitudinal axis as the bullet-proof ring extends upwardly and that the minimum distance between adjacent bullet-proof rings (L) is longer than the minimum distance between adjacent suspension insulators (l).

4,731,508

ELECTROGRAPHIC TOUGH SENSOR HAVING REDUCED BOW OF EQUIPOTENTIAL FIELD LINE THEREIN

William A. Gibson, Knox County; John E. Talmage, Jr., and John W. T. Dabbs, both of Anderson County, all of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 685,348, Dec. 24, 1984, Pat. No. 4,661,655. This application Jun. 5, 1986, Ser. No. 870,848
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **23 Claims**



1. A position touch sensor having resistive electrodes which provides a linear output response over an enhanced proportion of the surface area of said sensor by reducing the bow of equipotential lines along edges of said sensor, which comprises:
- a resistive layer having a selected substantially uniform resistivity throughout said layer, said resistive layer defining perimeter edges;
- a resistance element positioned proximate each of said perimeter edges of said resistive layer for providing orthogonal electrical fields to said resistive layer, each of said resistance elements having opposite ends joined to proximate ends of adjoining resistance elements, each of said resistance elements comprising a plurality of substantially identical discontinuous units in electrical contact with said resistive layer, each of said units formed by at least one line of conductive material spaced from a line of conductive material of an adjacent unit to define a separation gap of a selected width and length whereby said width and length of said gap and said resisitivity of said resistive layer establish a unit resistance value for said units;
- a plurality of electrodes positioned on, and electrically connected to, said layer along a preselected symmetrical path proximate each perimeter edge of said layer, said electrodes each being electrically connected to selected positions along said resistance elements and having a selected center-to-center spacing and each electrode having an effective length along said path, said length and spacing of said electrodes, and said positions of connection of said resistance elements selected to produce a selected voltage gradient along said path of said electrodes to compensate for any voltage drop along said resistance element during operation of said sensor when said orthogonal fields are introduced into said resistive layer whereby said bow is reduced; and
- means for deriving output signals corresponding to coordinates of a selected point on said resistive layer.

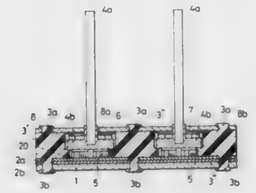
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4,731,509

ELECTRICAL ASSEMBLY HAVING MULTIPLE SLIDABLE ELEMENTS

Takahiro Miyamoto, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 24, 1986, Ser. No. 946,524
Claims priority, application Japan, Feb. 10, 1986, 61-16843[U]; Feb. 10, 1986, 61-16844[U]
Int. Cl.[4] H01H *11/00*
U.S. Cl. 200—16 R **4 Claims**



1. A multi-slider electrical assembly comprising:

a planar upper cover of rigid material having formed through its surface a plurality of parallel elongated grooves and a plurality of securing holes spaced around the periphery of said cover;

a planar lower base of rigid material having a plurality of securing holes spaced around the periphery thereof corresponding to said securing holes of said cover;

guide block means formed by a plurality of guide blocks disposed between said cover and said base arranged in parallel and spaced apart at predetermined intervals to provide slits therebetween aligned with the grooves of said cover, each of said guide blocks having an upper block portion abutting said cover, lower step portions framing said slits, and upper and lower pins on upper and lower sides of said guide blocks which are secured through said securing holes of said cover and said base, respectively to form an integral structure;

a substrate structure disposed between the lower side of said guide blocks and said base having a plurality of securing holes spaced around the periphery thereof through which the pins on the lower surface of the guide blocks are secured, said substrate structure including a first insulative film having conductive patterns printed on an upper surface and connection lands printed on a lower surface thereof, and a second insulative film having lead circuit patterns and connection lands on an upper surface thereof, said connection lands on the lower surface of said first insulative film being connected to said connection lands on the upper surface of said second insulative film by conductive sealing means;

a plurality of carriers each disposed between an adjacent pair of said guide blocks slidable on said step portions framing the slit formed therebetween and having a lever extending upwards therefrom through a respective groove of said cover for selective external operation; and

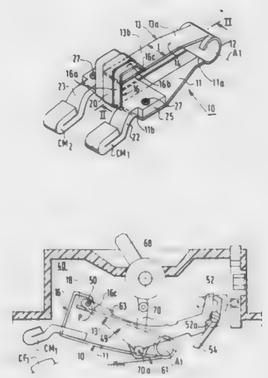
a plurality of sliders each secured to a lower surface of a respective one of said carriers so as to project through the respective slit in sliding contact with the conductive patterns on the upper surface of said first insulative film of said substrate structure.

4,731,510

CIRCUIT-BREAKER WITH TRIPPING LEVER COOPERATING WITH MOVABLE CONTACT SUPPORT MEMBER HAVING A RESILIENT BLADE WHICH EFFECTS CONTACT OPENING AND CLOSURE

Daniel Nourry, Dijon, France, assignor to La Telemecanique Electrique, France

Filed Jul. 3, 1986, Ser. No. 882,001
Claims priority, application France, Jul. 19, 1985, 85 11076
Int. Cl.[4] H01H *1/44, 1/50*
U.S. Cl. 200—275 **6 Claims**



1. A circuit-breaker operable under the effect of a current overload, said circuit-breaker including:

i. at least one stationary contact member and at least one movable contact member respectively having contact surface portions adapted for mutual engagement;

ii. a support member for the movable contact member, said support member having a rigid portion, said rigid portin having an outer face, a first end and a second end, and a resilient blade portion integrally conected together at a first end thereof through a cylindrical portion which is pivotally mounted about a stationary axis, the movable contact member being mounted at a second end of the rigid portion, the rigid portion further having at said second end an up-turned generally C-shaped tongue portion having a branch substantially parallel to said resilient blade portion and overlapping said blade portion whereby the support member forms a substantially closed loop defining an inner space, the contact surface portion of the movable contact member being located out of said inner space, said resilient blade portion being movable between a biased position and a released potion;

iii. tripping means for pivoting the support member about said stationary axis from said biased position of the resilient blade portion in which said contact surface portions are mutually engaged to said released position in which said contact surface portions are separated from each other and resetting means for pivoting the support member from the released position to the biased position;

iv. said tripping means comprising an elongate lever pivotally mounted about a displaceable axis, said axis being movable within said inner space from a first position to a second position, the first position being nearer from said rigid portion than the second position, said lever having at a first end thereof a pin adapted for engaging the resilient blade portion which projects between said resilient blade portion and said branch, said lever cooperating at a second end thereof with latching means releasable under the effect of said current overload, said latching means having a latch which has, relative to said lever, a released position

in which said second end of the lever is freed and a latching position in which said second end of the lever is latched, said latch then forming a further pivoting axis for said lever, said tripping means further comprising spring means engaging on a surface portion of said lever which is located out of said inner space between said pin and said displaceable axis for pivoting the lever in a first direction about said displaceable axis when said displaceable axis is in its first position and the latch passes to its released position whereby the pin is disengaged from the resilient blade portion which then returns to its released position, the pin then abutting against said tongue;

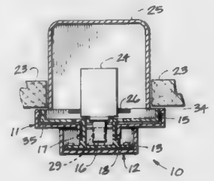
v. said resetting means, in the released position of said latch, being operable through manual action to move said displaceable axis from its second to its first position and automatically returning said displaceable axis to its second position when no manual action is exerted thereon, the pin then sliding over said branch, said latching means further comprising means for moving the latch to the latching position when the current overload has disappeared, said lever, when said manual action is exerted for resetting the support member to its biased position pivoting about said displaceable axis in said first direction until the latch has recaptured the second end fo the lever and then pivoting about said further axis in a second direction opposite the first direction, whereby the pin engages the resilient blade portion which then is biased to its biased position.

4,731,511

DECORATIVE WALL PLATES AND SLIDER CAPS FOR TOGGLE-TYPE ELECTRICAL SWITCHES

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Filed Oct. 1, 1986, Ser. No. 914,173
Int. Cl.[4] H01H *3/20*
U.S. Cl. 200—330 **10 Claims**



1. Decorative wall plate and slider caps for subsurface mounted, toggle-type electrical switches which comprise:

an adapter wall plate having a substantially rectangular front face and four edges extending perpendicular to, and rearwardly from, said adapter wall plate front face, said adapter wall plate having at least one elongate, rectangular opening therethrough for receiving a switch toggle and at least two apertures through said face for receiving a means to fasten said adapter wall plate to an electrical switch housing and wherein at least two ramped projection members are disposed on outside faces of said adapted wall plate edges, said adapter wall plate being raised from said mounting surface by said edges;

a decorative wall plate having a substantially rectangular decorative front face and four edges extending perpendicular to, and rearwardly from, said decorative wallplate front face, said decorative wall plate face having at least one elongate rectangular opening therethrough for receiving a switch toggle and said opening defined along its longitudinal edges by two rail members extending perpendicularly outward from said decorative wall plate face and wherein at least two ramped projection members are disposed on the inside faces of said decorative wall plate edges to mate with said adapter wall plate edge projection members whereby said decorative wall plate is removably fastened over said adapter wall plate to align said decorative wall plate switch toggle receiving opening with said adapter wall plate switch toggle receiving opening, said decorative wall plate switch toggle receiving opening being smaller than the adapter wall plate switch toggle receiving opening;

at least one slider member having a front face, at least two apertures therethrough and upper and lower fingers extending perpendicular to, and rearwardly from, said slider member face which fingers act as a cam to restrict movement of said switch toggle, said slider member also having two barbed spring clips extending perpendicular to, and rearwardly from, said slider member face for slidingly engaging said decorative wall plate rail members whereby said slider member fingers and barbed spring clips are received within said decorative wall plate switch toggle receiving opening and thereby contain movement of said switch toggle and said slider member face is permitted to move in a single plane parallel to said decorative wall plate face but is restricted in movement perpendicular to said decorative wall plate face; and,

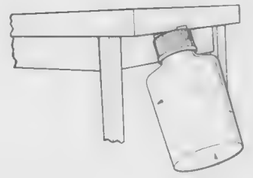
at least one decorative slider cap, larger than said slider member, having a decorative face and at least two prongs extending perpendicular to and rearwardly from, said decorative face whereby said prongs permanently mate with, and assemble to said slider member face apertures.

4,731,512

CHILD RESISTANT CLOSURE WITH EASY OPEN FEATURE FOR THE MANUALLY HANDICAPPED

Jacques J. Barriac, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Mar. 9, 1987, Ser. No. 23,742
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—220 **8 Claims**



1. A two-piece press-twist, child resistant closure for a container wherein an inner closure member threads onto the container neck and the outer closure member is free to rotate with respect thereto, the outer closure will drivingly engage the inner closure when it is axially depressed, the improvement in the outer member comprising, raised means mounted on top of the outer member, said raised means being engageable with a straight edge of a table or other stable surface wherein the closure may be removed by pressing the closure against the straight edge and rotating the container.

4,731,513

METHOD OF REHEATING PREFORMS FOR FORMING BLOW MOLDED HOT FILLABLE CONTAINERS

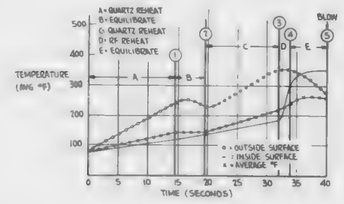
Wayne N. Collette, Merrimack, N.H., assignor to Continental PET Technologies, Inc., Stamford, Conn.

Filed Jun. 24, 1986, Ser. No. 878,044
Int. Cl.[4] H05B *6/60*
U.S. Cl. 219—10.43 **20 Claims**

1. A method of reheating a polyester preform for blow molding, said method comprising the steps of heating said polyester preform in a quartz infrared heater oven to a generally customary temperature for blow molding wherein the

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temperature of an outside surface of the preform is materially higher than the temperature of an inside surface of a like portion of the preform, transferring the reheated preform to a radio frequency heater and further heating the preform wherein the inside surface of the preform is heated at a greater rate than the outside surface of the preform until the temperature of the inside of the preform at least approaches the temperature of the outside, then transferring the thus heated preform to a blow mold for blow molding with the temperature of both the inside surface and the outside surface of the preform being above the temperature wherein crystallization would occur if the preform were heated to such temperature utilizing either quartz infrared heating or radio frequency heating independently.

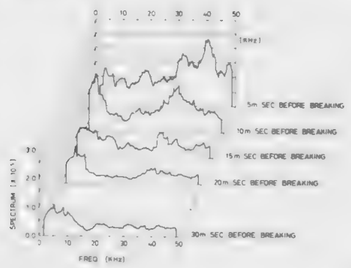


4,731,514

METHOD FOR PREDICTING BREAKING OF WIRE ELECTRODE IN WIRE ELECTRODE TYPE ELECTRIC DISCHARGE MACHINING OPERATION

Mohri Naotake, No. 3837-3, Shimadakuroishi, Tenpaku-cho, Tenpaku-ku, Nagoya-shi, Aichi, and Nagao Saito, Tokyo, both of Japan, assignors to Naotake Mohri, Aichi and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 27, 1986, Ser. No. 845,152
Claims priority, application Japan, Sep. 27, 1985, 60-214001
Int. Cl.[4] B23H *1/02*
U.S. Cl. 219—69 W **4 Claims**



1. In a wire electrode type electric discharge machining operation in which an electrically conductive wire is employed as an electrode and advanced under tension through a workpiece to be machined, and electric discharge between said wire electrode and the workpiece is utilized to machine said workpiece, a method of predicting an imminent breaking of the wire electrode, comprising the steps of:

detecting an electric discharge signal between said wire electrode and said workpiece during machining; and

monitoring an average value of high frequency components included in a spectrum of the detected electric discharge signal above 20 KHz which are independent from discharge induced vibration frequencies of said wire electrode, an increase in said average value of high frequency components beyond a predetermined level being indicative of a stationary electric discharge and attendantly the imminent breaking of said wire electrode;

wherein the steps of monitoring the high frequency components include:

applying said discharge signal to a high-pass filter, and

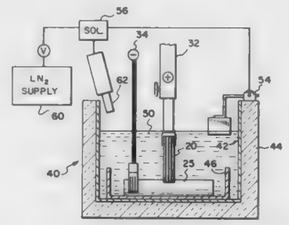
applying an output of said high-pass filter to an averaging circuit.

4,731,515

METHOD OF MAKING POWDERS BY ELECTRO-DISCHARGE MACHINING IN A CRYOGENIC DIELECTRIC

Steven J. Savage, Stockholm, Sweden, and C. Edward Harper, Jr., Fairborn, Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Oct. 22, 1986, Ser. No. 921,708
Int. Cl.[4] B23H *1/00, 1/08*
U.S. Cl. 219—69 M **7 Claims**



1. A method for producing powders comprising the steps of electro-discharge machining conductive electrodes composed of the materials from which the powder is to be derived in an inorganic cryogenic dielectric until sufficient powder has been produced, thereafter allowing the dielectric to evaporate, and recovering the powder formed during machining.

4,731,516

LASER POLISHING SEMICONDUCTOR WAFER

Takeshi Noguchi; Yoshihiro Hirata; Junichi Arima; Eisuke Tanaka; Reiji Tamaki, and Masanori Obata, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,124
Claims priority, application Japan, Oct. 11, 1985, 60-227191
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LF **5 Claims**



1. In the manufacture of semiconductor devices, a method for mirror-polishing the rear surface (**13***b*) of a semiconductor wafer (**11**) rough ground to a predetermined thickness (Tb) without damaging an electronic component (**12**) formed on the front surface of the wafer, said mirror-polishing method comprising the steps of:

(a) disposing the semiconductor wafer in an inert atmosphere,

(b) preheating the semiconductor wafer to a temperature of 200°–400° C.,

(c) locally irradiating the rear surface of said semiconductor wafer with an energy beam (**21**) to form a melt puddle (**22**) on said surface;

(d) moving said beam with respect to said wafer to attendantly move the irradiating area and thus the melt puddle over the rear surface of said wafer, and

(e) recrystallizing the melt puddle at the trailing edge (**24**) of a liquid-solid interface thereof to leave a smooth and mirror-polished rear wafer surface (**13***c*), wherein

(f) said semiconductor wafer is maintained preheated in said inert atmosphere during the irradiating, moving and recrystallizing steps.

4,731,517

POWDER ATOMIZING METHODS AND APPARATUS

Richard F. Cheney, 12 Sunset Hill Ave., Norwalk, Conn. 06851

Filed Mar. 13, 1986, Ser. No. 839,284
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PY **26 Claims**



1. Apparatus for atomizing of ceramics or metals comprising

A. a heat-resistant housing enclosing an impact chamber and having gasketed access door means formed therein,

B. cooling means installed in the housing and door means,

C. substrate-advancing means juxtaposed to an impact zone in the chamber and supported by the housing,

D. an impact substrate comprising a thin film of polytetrafluoroethylene polymer mounted on the advancing means for advancing edge-wise movement through the impact zone,

E. chilling gas nozzle means supported by the housing and aimed to deliver pressurized chilling gas through a quench gas chill zone adjacent to the impact zone,

F. a plasma torch supported in the chamber, connected to a source of electrical power and to a pressurized supply source of gas entraining pulverized feed material to be atomized, aimed to deliver the hot plasma jet carrying molten drops of feed material to impact on the advancing substrate in the impact zone, producing rebounding atomized droplets chilled and solidified to produce microatomized particles in the quench gas chill zone by the chilling gas,

G. substrate-cleaning means supported in the chamber juxtaposed to the advancing substrate near the impact zone,

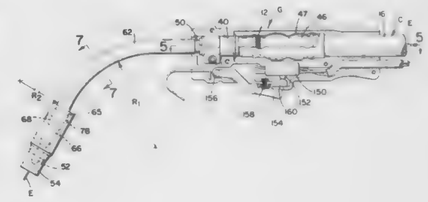
H. powder recovery means connected to receive and collect powder produced in the impact zone.

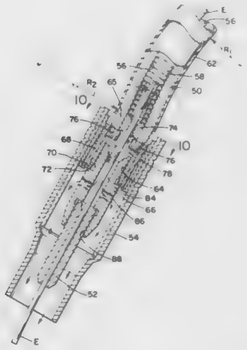
4,731,518

GUN AND CABLE FOR GAS METAL ARC WELDING

Donald R. Parmelee, Lyndhurst, and Joseph R. Nosse, Richmond Heights, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Dec. 12, 1986, Ser. No. 940,868
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—137.31 **10 Claims**





1. A welding gun for gas shielded metal arc welding, including: a handle; a nozzle tube extending arcuately from said handle on a predetermined radius and terminating in a portion having a reverse curvature, said tube having a polygonally shaped passage therethrough having an entrant and an exit end, a cylindrically shaped ceramic guide in the exit end of said passage, a gas diffuser tube on the exit end of said nozzle tube and having an axial passage communicating with said tube passage and radially extending passages, a contact tip extending on the exit end of said gas diffuser tube having a passage of a diameter to pass an electrode; and, a gas nozzle surrounding said gas diffuser tube for directing shielding gases coaxially about an electrode emerging from said electrode nozzle, the axis of said electrode nozzle being at a small angle relative to the axis of the passage of said nozzle tube at said ceramic guide whereby an electrode moving through said guide and tip is biased against a side of said tip.

4. A welding gun for gas shielded metal arc welding comprising a handle, a microswitch mounted on said handle having a control button, a trigger movably supported on said handle adjacent said button, said trigger having a trigger main body and a resilient cantilevered arm having a first end and a second end spaced from said first end, said resilient cantilever arm first end being connected to said trigger main body and said resilient cantilever arm second end being adapted to engage said button when said trigger is moved toward said handle.

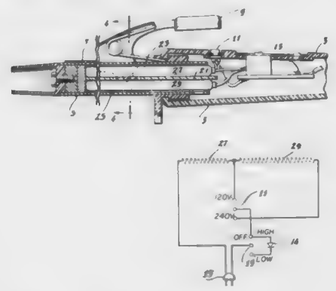
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4,731,519

CURLING IRON ADAPTED TO PROVIDE UNIFORM HEAT WHEN USED WITH EITHER DOMESTIC OR FOREIGN VOLTAGES

Wayne D. Dieterle, South Plainfield, and Harry A. Wansaw, Plainfield, both of N.J., assignors to Conair Corporation, Edison, N.J.

Filed Feb. 5, 1986, Ser. No. 826,380
Int. Cl.[4] H05B *1/02, 3/40;* **A45D** *1/04*
U.S. Cl. 219—225 **6 Claims**



1. A curling iron adapted to operate at both domestic and foreign voltages and yet provide comparable, uniform heat levels at either said voltage, said curling iron including

a generally cylindrical handle, a heatable barrel secured to said handle in axial alignment therewith, and means associated with said barrel to hold hair in contact therewith,

electrical heating means within said barrel and extending the length thereof, said heating means including a first and a second electrical resistance element, said elements being rope heaters positioned side by side within said barrel, being of the same configuration and being coextensive in length with each other and with the length of said barrel, said elements being separated by an electrical insulator, and having relative resistances such that the output wattage of said curling iron is substantially the same when said first element is energized alone with said domestic voltage as when both said elements are energized in series at said foreign voltage, and means to alternatively interconnect said first element alone with a source of said domestic voltage and both said elements in series with said foreign voltage,

whereby uniformity of barrel temperature may be obtained irrespective of which said voltage is used.

4,731,520

AROMA DIFFUSER APPARATUS

Dov Z. Glucksman, Winchester, Mass.; Eugene Puchalski, Jr., Jersey City, and Mark E. Hardy, Estontown, both of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Jun. 24, 1986, Ser. No. 878,096
Int. Cl.[4] A61L *9/03*
U.S. Cl. 219—271 **26 Claims**

1. An aroma cartridge for an aroma diffuser comprising:

a porous aroma block for holding a quantity of an aroma producing liquid;

a cartridge housing for holding said aroma block, said cartridge housing having a base for supporting said cartridge on said aroma diffuser and a wall portion extending upwardly from said base to surround said block, said base having an opening therein; and

a trough adjacent said wall portion where said wall portion meets said base, said trough disposed to collect said liquid which may condense on the interior surface of said wall portion, said block comprising a projecting portion which



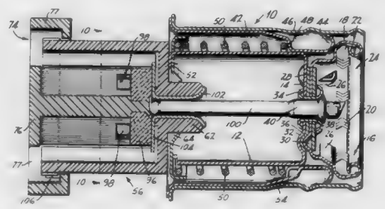
engages said trough to reabsorb said condensed liquid into said block.

4,731,521

ELECTRIC CIGAR LIGHTER HAVING AROMATIC EMITTING MEANS

Donald Spector, Union City, N.J.; Melvin Spat, Stamford; Dominic Pesapane, West Haven, both of Conn., and Craig M. Saunders, Sagamore Hills, Ohio, assignors to Casco Products Corporation, Bridgeport, Conn. and Scentronic Industries, Inc., New York City, N.Y.

Filed Apr. 10, 1987, Ser. No. 37,044
Int. Cl.[4] A61L *9/03*
U.S. Cl. 219—274 **25 Claims**



1. A scent-emitting electric cigar lighter comprising, in combination:

(a) an igniting unit having a plug body and having at one end of said body an electric heating element,

(b) a metal conductor stud connected to said heating element in heat-exchanging relation therewith, said stud extending through said body and having a terminus terminating at the other end thereof,

(c) a heat transfer flange attached to the terminus of said stud,

(d) a slab of fragrant substance disposed adjacent said heat-transfer flange in heat-exchanging relation therewith, and

(e) a knob attached to the other end of the igniting unit body and surrounding said fragrant slab.

4,731,522

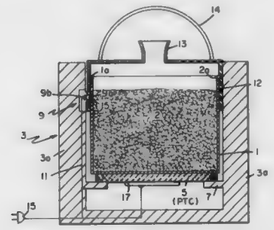
INSECTICIDE DISPENSER WITH A PTC HEATER

Steven T. Manchester, Limerick, Me., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 4, 1986, Ser. No. 892,613
Int. Cl.[4] H05B *3/14;* **A61L** *9/03*
U.S. Cl. 219—275 **9 Claims**

1. An insecticide dispenser including a housing, a PTC heater disposed therein, said PTC heater having an upper side and a lower side and an electrically conductive container for an insecticide disposed on the upper side of said PTC heater; and

one side of a power supply means being connected to said conductive container and, in turn, to the upper side of said PTC heater; and



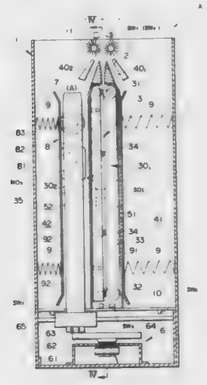
an other side of the power supply being connected to the lower side of said PTC heater, whereby when said electrically conductive container is disposed on said PTC heater, a circuit will be formed on both sides of said PTC heater through said container, and further whereby heat is provided to initiate an exothermic self-sustaining chemical reaction in said container to volatilize insecticide therein.

4,731,523

BILL RECEIVING DEVICE

Susuma Kozima, Sakado, Japan, assignor to Kabushiki Kaisha SG, Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 892,496
Claims priority, application Japan, Aug. 7, 1985, 60-172292; Sep. 25, 1985, 60-210043
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **8 Claims**



1. A bill receiving device comprising:

a bill passage;

conveying means for conveying a bill delivered to said bill passage to a predetermined position for receiving it;

first and second bill receiving chambers formed on both sides of said bill passage, at least said first bill receiving chamber having a bill outlet;

a bill pushing member being capable of moving in a reciprocating motion between said first and second bill receiving chambers across and bill passage and, when the bill located at the predetermined position in said bill passage is to be received in said first bill receiving chamber, effects receiving of the bill by pushing it with a first surface of said bill pushing member while moving from said second bill receiving chamber towards said first bill receiving chamber and, when the bill is to be received in said second bill receiving chamber, effects receiving of the bill by pushing it with a second surface of said bill pushing member with is opposite to said first surface while moving from said first bill receiving chamber towards said second bill receiving chamber; and

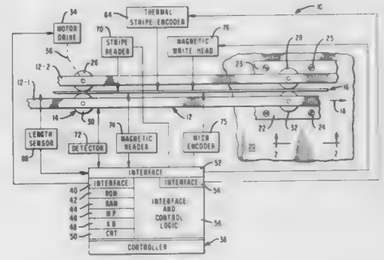
a bill payout mechanism provided in said bill pushing member and having a bill conveying member exposed on at least said first surface of said bill pushing member, a bill which is in contact with said bill conveying member being fed to said bill outlet by driving said bill conveying member.

4,731,524

REAL TIME ITEM PROCESSING APPARATUS USING A THERMAL ENCODER

Ralf M. Brooks, Waterloo, Canada, assignor to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Oct. 11, 1985, Ser. No. 786,887
Int. Cl.[4] G06F *15/12*
U.S. Cl. 235—432 **8 Claims**



1. An apparatus for processing documents comprising:

a document track and means for moving said documents sequentially along said document track; said documents having machine readable data thereon;

processing means for processing said documents to obtain data relative to said documents and also for controlling the operation of said apparatus;

reading means coupled to said processing means for determining whether or not each said document in said document track has a magnetic stripe thereon, and also for reading data on a said magnetic stripe when said magnetic stripe is present;

printing means coupled to said processing means for printing a magnetic stripe on those of said documents which do not have a magnetic stripe thereon as determined by said first reading means;

writing means coupled to said processing means for magnetically writing at least a portion of the data obtained from said processing means for a said document onto the associated said magnetic stripe while said document is in said document track;

said printing means also being capable of printing data received from said processing means in human readable form as said magnetic stripe is being printed on the associated said document.

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4,731,525

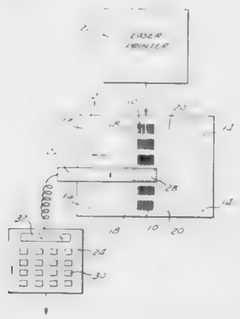
MODULAR MICROPROCESSOR-BASED SYSTEM FOR PRINTING AND READING SCHOOL ATTENDANCE RECORDKEEPING CODES ON FORMS

John R. Hice, Santa Paula, Calif., assignor to Data Information Management Systems, Inc., Ventura, Calif.

Continuation of Ser. No. 505,234, Jun. 17, 1983, Pat. No. 4,578,572. This application Feb. 7, 1986, Ser. No. 827,257

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 235—472 **10 Claims**



1. A modular microprocessor-based apparatus adapted to generate and print pring a unique identifier code assigned to each person on a school attendance roster, on a sheet of paper comprising a form adapted for use in a school-attendance recordkeeping proces, which code is adapted to enable the person's file to be addressible directly without correlation to a control file, and which apparatus is further adapted to enable the personal identifier code to be read from the sheet of paper, to generate data associated with each such person relating to the school-attendance recordkeeping process, for processing of such data for use in the school-attendance recordkeeping process, comprising:

(a) microprocessor-based means for generating and printing the directly-addressible personal identifier code on the sheet of school-attendance recordkeeping process form paper, including means for directing a laser beam therein, adapted to be operable responsive to control by a laser control program for printing the directly-addressible personal identifier code on the school-attendance recordkeeping process form; and

(b) microprocessor-based portable compact means for reading the directly-addressible personal-identifier code from the school-attendance recordkeeping process form, adapted to be operable responsive to control by the operator, and control by a reading control program, to generate data assocated with each such person relating to the school-attendance recordkeeping process, for processing thereof for use in the school-attendance recordkeeping process.

4,731,526

PROCESS FOR PICKING UP NAVIGATION DATA

Peter Knoll, Ettlingen; Winfried König, Pfinztal-Burghausen; Peter Rapps, Karlsruhe, and Thomas Walz, Pforzheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

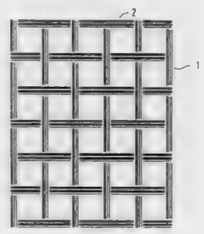
Filed Dec. 18, 1985, Ser. No. 821,560

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428847; PCT Int'l Appl., May 10, 1985, PCT/DE85/00154

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 235—472 **17 Claims**

1. Process for determining navigation data from a map, particularly for use in vehicles, comprising the steps of applying on the map a line code lattice including crossing line codes formed, respectively, by a sequence of at least two parallel



lines differing in width and/or in spacing; and scanning the line code lattice by a sensor.

4,731,527

AN ASTIGMATIC FOCUSING SYSTEM WITH OPTICAL ELEMENTS ORIENTED TO PRODUCE ASTIGMATISM IN A PREDETERMINED DIRECTION TO MAXIMIZE DETECTOR SENSITIVITY

Susumu Nomura, and Takanori Maeda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,396

Claims priority, application Japan, Jul. 8, 1985, 149833

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **7 Claims**



1. An optical pickup for determining a position of an object comprising:

a light source;

an optical detector for providing a focusing error signal;

a beam splitter receiving light from said source for reflecting at least part of said light to a first surface of an object whose position is being determined and for transmitting through first and second free surfaces of said beam splitter at least part of the light reflected from said first surface of said object to said optical detector, at least said first free surface being inclined to an optical axis of said reflected light;

converging means for causing said light reflected from said first surface of said object to converge toward said first free surface of said beam splitter; and

astigmatism means disposed between said beam splitter and said detector in a path of the transmitted converging light for producing astigmatism in said transmitted light in a predetermined direction relative to the astigmatism produced in said transmitted light by said beam splitter such that the combined astigmatism is arranged at such an angle as to provide the maximum sensitivity of said optical detector.

4,731,528

FAILSAFE LOGIC CIRCUIT WHEREIN THE PHOTOTRANSISTOR OF A PRECEDING OPTOCOUPLER IS CONNECTED IN SERIES WITH THE PHOTODIODE OF A SUCCEEDING OPTOCOUPLER

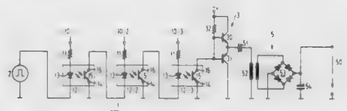
Hans-Jürgen Neumann, and Artur Meisberger, both of St. Wendel, Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 868,398

Claims priority, application Fed. Rep. of Germany, May 29, 1985, 3519252

Int. Cl.⁴ H01J *31/50, 40/14*

U.S. Cl. 250—213 A **6 Claims**



1. Failsaft AND or NOR logic circuit comprising:

a combinatorial logic circuit having at least one signal input and only one ultimate signal output, said combinatorial logic circuit including optocouplers as coupling elements by which said at least one signal input of said combinatorial logic circuit is connected with said ultimate signal output according to the implemented logic circuit;

an alternating voltage source connected to said combinatorial logic circuit to activate the combinatorial logic circuit according to said alternating voltage; and

an AC signal conductive component responsive to said alternating voltage and connected to the output of said combinatorial logic circuit for passing only alternating current signals;

wherein one optocoupler is provided per signal input whereat the signal inputs of said combinatorial logic circuit are applied to the cathodes or anodes of photodiodes of said optocouplers, each said optocoupler having a single transmitter and a single receiver and being unrestricted as to control frequency of timed input pulses;

wherein said optocouplers are arranged in a series circuit with the phototransistor of a preceding optocoupler being in a series connection with the photodiode of a succeeding optocoupler; and wherein

the photodiode of the first optocoupler is fed by the alternating voltage of said alternating voltage source and the phototransistor of the last optocoupler provides the ultimate signal output of the combinatorial logic.

4,731,529

LIGHT MEASURING CIRCUIT HAVING CIRCUITRY FOR BYPASSING A LOW FREQUENCY COMPONENT IN THE OUTPUT OF A PHOTOELECTRIC CONVERSION ELEMENT

Toshifumi Ohsawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Apr. 2, 1986, Ser. No. 847,204

Claims priority, application Japan, Apr. 3, 1985, 60-067904

Int. Cl.⁴ H01J *40/14*

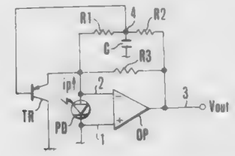
U.S. Cl. 250—214 A **5 Claims**

1. A DC signal suppression circuit for a photo-signal amplifying circuit using an operational amplifier, comprising:

(a) photoelectric conversion means;

(b) a parallel circuit consisting of an operational amplifier having an input terminal connected to said photoelectric conversion means, a T type low-pass filter disposed in a negative feedback loop of said operational amplifier, and a resistor; and

(c) bypass switching means connected to a contact point between a resistor and a capacitor of said T type low-pass filter, said bypass switching means turning on to bypass a photocurrent from the photoelectric conversion means



when a value of a current flowing through the contact point becomes higher than a predetermined value.

4,731,530

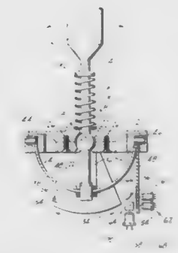
JOYSTICK CONTROL HAVING OPTICAL SENSORS

Peter J. Mikan, 15 Lakeside Dr., Milford, Conn. 06460

Filed Apr. 21, 1986, Ser. No. 853,980

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—229 **26 Claims**



25. A joystick control comprising, in combination:

(a) a lever,

(b) means mounting said lever for swivelling movement in the directions of x and y axes,

(c) a single energy source providing a beam of radiant energy,

(d) means dividing said beam into two parts,

(e) means responsive to movement of said lever in a direction of one of said axes, for varying the intensity of one of said beam parts between lower and higher values, and

(f) means responsive to movement of said lever in a direction of said one axis, for effecting from the other of said beam parts, a reduced-energy beam of predetermined constant value between said lower and higher values,

(g) said intensity-varying means being adapted to produce, when said lever is disposed at a given predetermined angle with respect to the said one axis, a resultant beam of intermediate intensity having solely one fixed relationship to the intensity of said reduced-energy beam.

4,731,531

METHOD OF LOGGING A WELL USING A NON-RADIOACTIVE MATERIAL IRRADIATED INTO AN ISOTOPE EXHIBITING A DETECTABLE CHARACTERISTIC

Wayne A. Handke, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 29, 1986, Ser. No. 823,891

Int. Cl.⁴ G01V *5/00*

U.S. Cl. 250—259 **10 Claims**

1. A method of logging a well, comprising:

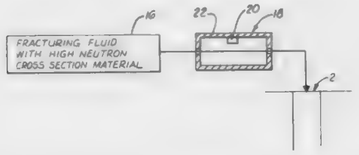
moving a tagging agent into a well so that the tagging agent is deposited in an earthen formation of the well, the tag-

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ging agent being non-radioactive until just prior to entering the well;

irradiating the tagging agent so that the tagging agent exhibits at least one tagging agent characteristic distinguishable from earthen formation characteristics, wherein irradiating the tagging agent includes passing the tagging agent through a source of neutrons before the tagging agent is moved into the well; and

detecting the at least one tagging agent characteristic after the tagging agent has been deposited in the earthen formation.



4,731,532

TIME OF FLIGHT MASS SPECTROMETER USING AN ION REFLECTOR

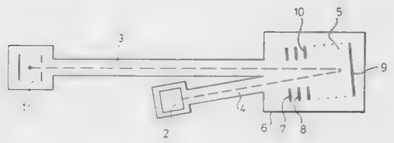
Rüdiger Frey, Weyhe, and Edward W. Schlag, Munich, both of Fed. Rep. of Germany, assignors to Bruker Analytische Mestechnik GmbH, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,476

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524536

Int. Cl.⁴ B01D *59/44*

U.S. Cl. 250—287 **8 Claims**



1. A time-of-flight mass spectrometer, comprising:

ion source means for generating accelerated ions along a flight path;

ion reflector means positioned along said flight path for receiving and reflecting said ions, said ion reflecting means including first and second decelerating electrodes sequentially spaced along said flight path substantially parallel to a reflector electrode displaced furthest along said flight path at a distance from said second deceleration electrode, each of said electrodes receiving voltage signals;

means for focusing said ions including a gridless diaphragm ring electrode receiving voltage signals positioned along said flight path between said reflector electrode and said second decelerating electrode; and

voltage source means for providing said voltage signals each at selected voltage magnitude increasing from said first decelerating electrode to said reflector electrode, generating between said back decelerating electrode and reflector electrode a voltage linearly proportional to the displacement therebetween, said linearly proportional voltage being modified by a focusing electrode voltage selected to have a magnitude greater than the corresponding linearly proportional voltage magnitude.

4,731,533

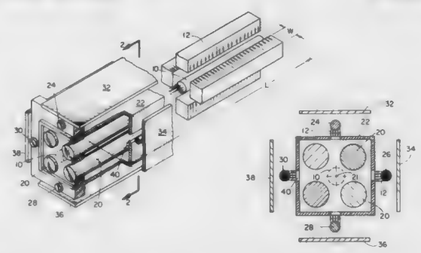
METHOD AND APPARATUS FOR DISSOCIATING IONS BY ELECTRON IMPACT

Marvin L. Vestal, Houston, Tex., assignor to Vestec Corporation, Houston, Tex.

Filed Oct. 15, 1986, Ser. No. 918,932

Int. Cl.⁴ B01D *59/44*; **H01J** *49/26*

U.S. Cl. 250—292 **20 Claims**



1. A mass spectrometer for the analysis of samples, including ionizing means for ionizing sample molecules of widely varying molecular weights to produce ions derived from the sample, fragmentation means for producing ionized fragments or products of the produced ions, mass analyzer means for scanning the ionized fragments or products and selecting ionized fragments or products of a particular weight over a wide range of atomic mass units, and detector means at the output of the mass analyzer means for receiving the selected ionized fragments or products and for producing a representation therefrom of a mass spectrum for identifying the sample or components thereof, the fragmentation means comprising:

a first plurality of electrically conducting rods for forming a multipole electrodynamic field having a central axis and for transmitting a substantially cylindrical-shaped elongate beam of the produced ions from the ionizing means to the mass analyzer means along substantially the central axis;

a second plurality of electrically conducting rods each spaced radially outwardly from the first plurality of electrically conducting rods with respect to the central axis for passing electrons from the second plurality of electrically conducting rods toward the central axis; and

shielding means spaced radially between the second plurality of electrically conducting rods and the first plurality of electrically conducting rods for prohibiting electrons passing from the second plurality of electrically conducting rods toward the central axis from engaging the first plurality of electrically conducting rods and transmitting radially inward past the first plurality of electrically conducting rods elongate sheets of electrons for intersecting the elongate beam of produced ions so as to excite at least some of the produced ions to electronic states above their dissociation limits and producing the ionized fragments or products.

4,731,534

X-RAY DETECTOR SYSTEM

Sigismund Klein, Nuremberg, and Wolfgang Ruehle, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,608

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524975

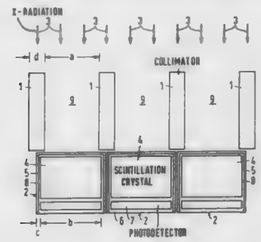
Int. Cl.⁴ G01T *1/20*

U.S. Cl. 250—366 **9 Claims**

1. An x-ray detector system comprising:

a collimator having a plurality of spaced plates defining a plurality of channels through which x-radiation travels, each channel terminating in a radiation exit end; and

a plurality of detector elements respectively disposed adjacent to the radiation exit ends of said collimator channels, each detector element including a transducer having a surface facing said exit ends effective for detecting x-radiation and further including a housing for said transducer, said housing having lateral walls on opposite sides of said transducer facing said collimator plates and forming a portion of said detector element substantially ineffective for detecting x-radiation at least partially surrounding said transducer surface, said transducer surface having a width substantially equal to the width of the collimator channel and said detector elements being disposed with the respective portions thereof ineffective for detecting radiation in the radiation shadow of said collimator plates.



4,731,535

APPARATUS FOR CHECKING PERSONS FOR RADIOACTIVE CONTAMINATION

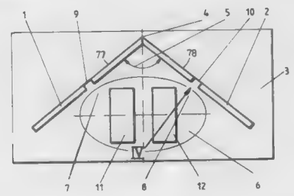
Uwe W. Rische, Bendestorf, and Rainer Gerlach, Wedel, both of Fed. Rep. of Germany, assignors to Firma Herfurth GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 828,054

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1985, 3505527; European Pat. Off., Jun. 22, 1985, 851077461

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—394 **13 Claims**



1. Apparatus for checking persons for radioactive contamination, comprising

two detector panels (**1**, **2**), which are provided each with detectors on one broadside, wherein

said two detector panels (**1**, **2**) extend at an angle to each other in such a manner that the apex of the angle defines a vertical axis and those broadsides of the detector panels which are provided with detectors face the space that is included by the detector panels,

each detector panel has on said broadside provided with detectors a vertical blank strip (**9**, **10**) between adjacent detectors, and

said blank strip is so arranged with reference to the contour of a reference figure (**6**) such that signals generated by the detector means which are separated by the blank strip (**9**, **10**) are processed to compensate the influence of the closest approximation of the reference figure to the detector panels on the generation of said signals.

4,731,536

APPARATUS FOR CHECKING PERSONS FOR RADIOACTIVE CONTAMINATION

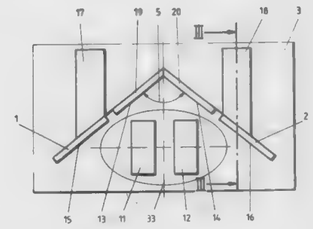
Uwe W. Rische, Bendestorf, and Rainer Gerlach, Wedel/Holst., both of Fed. Rep. of Germany, assignors to Firma Merfurth GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 828,065

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1985, 3505527; European Pat. Off., Jun. 22, 1985, 851077461

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—394 **12 Claims**



1. Apparatus for checking persons for radioactive contamination, wherein

at least two detector panels (**1**, **2**), which are provided each with detectors on at least one broadside and extend at an angle to each other and include a space for accommodating a person to be checked,

said detector panels (**1**, **2**) extending at an angle to each other are rigidly interconnected to constitute a rigid subassembly, which is mounted for rotation about a vertical axis of rotation (**35**, **36**, **46**), and

a resetting drive is connected to said rigid subassembly and comprises means for storing resetting energy as the rigid subassembly is rotated about said axis of rotation from an initial position in one sense and for expending said energy to reset the rigid subassembly to said initial position when said rigid subassembly has been released.

4,731,537

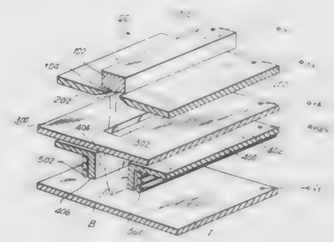
ELECTRON BEAM GUN

Kenneth E. Williams, Andover, and P. Michael Fletcher, North Reading, both of Mass., assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1985, Ser. No. 744,396

Int. Cl.⁴ G01K *1/08*; **G21K** *1/08*; **H01J** *3/14, 3/22*

U.S. Cl. 250—396 ML **4 Claims**



1. An electron beam gun for generating an electron beam directed at a target, the gun comprising:

electrode means for creating an electric field along the direction of beam travel;

focusing coils forming an electromagnet;

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means mounting said focusing coils downstream of said electrode means;
cathode menas for emitting electrons and having a substantially flat, rectangular emitting island;
drift region means for creating a region extending along the direction of beam travel having substantially no electric field therein and substantially coinciding with the location of said electromagnet;
a correcting coil mounted between said focusing coils and said cathode means;
means for establishing a direct current in said focusing coils having a first clock-direction polarity; and
means for establishing a direct current in said correcting coil having a clock-direction polarity opposite said first polarity;
wherein:
said electrode means includes a substantially planar grid electrode disposed proximate to said emitting island and a substantially planar anode electrode disposed substantially parallel to and spaced apart from said grid electrode in the direction of travel of the electron beam;
each of said electrodes has a rectangular beam-shaping aperture therein aligned with said emitting island for passage of a beam of rectangular cross section substantially without interception of the electrons in the beam;
said electrode means and said focusing coils are disposed of accelerating electrons in the beam in non-parallel paths through said beam-shaping apertures and for converging the electrons in the beam in at least one cross-sectional dimension of the beam to minimize that dimension at a target;
said electromagnet extends along the direction of beam travel spaced from said anode electrode;
said drift-region means includes an auxiliary electrode including a conductive tube of rectangular cross section disposed in alignment with said beam-shaping apertures and spaced in the direction of the beam travel from said anode electrode;
said tube of rectangular cross section has two longer sides and two shorter sides;
said auxiliary electrode includes a substantially planar portion which is integral with the end of said tube closer to said anode and which lies in a plane substantially normal to the direction of said electron beam;
said focusing coils extend around said tube of rectangular cross section and create a magnetic field extending generally parallel to the direction of beam travel; and
said correcting coil is substantially coaxial with said focusing coils and creates a magnetic field generally parallel to the direction of beam travel but directed oppositely to the magnetic field generated by said focusing coils;
whereby distortion of the intersection of said beam with said target caused by said focusing coils can to some extent be compensated for by said correcting coil.

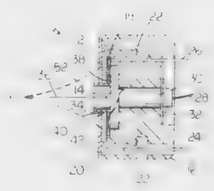
4,731,538

MICROCHANNEL PLATE ION DETECTOR

John W. Gray, Ware, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Jun. 20, 1986, Ser. No. 876,696
Int. Cl.[4] H01J *3/14, 40/00, 43/02*
U.S. Cl. 250—397 **10 Claims**

1. An ion detector comprising
a microchannel plate (MCP) made up of a plurality of microchannels for multiplying charged particles passing therethrough, said plate having a hole through it provided along an undeflected trajectory of an ion beam, said hole being substantially larger than said microchannels,
a voltage source connectable to said MCP to achieve amplification of ions directed to said microchannels,
a faraday cup in position to receive ions passing through said hole, and
a deflector selectively deflect ions from said undeflected trajectory to multiplying channels of said MCP, said deflector comprising switch means connectable to selectively connect said voltage source to the input of said MCP.

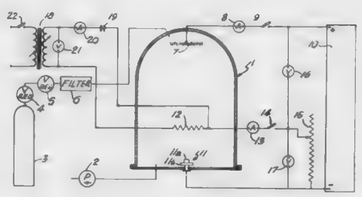


4,731,539

METHOD AND APPARATUS FOR INTRODUCING NORMALLY SOLID MATERIAL INTO SUBSTRATE SURFACES

Zhong Xu, Taiyuan, China, assignor to Plaur Corporation Columbia, S.C.

Continuation-in-part of Ser. No. 712,120, Mar. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 498,313, May 26, 1983, Pat. No. 4,520,628. This application Aug. 25, 1986, Ser. No. 900,250
The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.
Int. Cl.[4] G21K *5/00*
U.S. Cl. 250—492.1 **30 Claims**



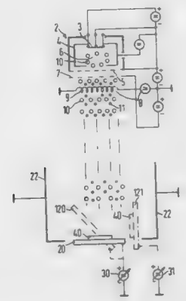
1. The method for introducing into an electrically conductive substrate at least one normally solid material selected from the group consisting of metals and metalloids, the method producing an alloy of the at least one normally solid material penetrating below the surface of the substrate, the method comprising the steps of:
providing a closed chamber in which the atmosphere and pressure can be controlled and which includes an anode;
positioning the substrate as a cathode with the surface of the substrate exposed to the interior of the chamber and spaced from the anode;
providing a source electrode comprising a body of the material to be introduced into the substrate,
said body being exposed within the chamber in a location spaced from the anode and the substrate;
evacuating the chamber and establishing therein an atmosphere of inert gas at a pressure not exceeding 10 torr;
establishing a direct current potential difference between the anode and the cathode and a direct current potential difference between the anode and the source electrode to cause a double glow discharge with one glow discharge occurring between the anode and cathode and the other between the anode and the source electrode and maintaining the double glow discharge for a time period of at least 1 minute; and
maintaining the surface portion of the substrate at an elevated temperature not exceeding the deformation point of the substrate and maintaining said body of material at a temperature below the boiling point of the material,
said temperatures being maintained throughout said time period;
the double glow discharge causing said body of material to be bombarded by ions of the inert gas of the atmosphere with resultant heating of the said body and ejection of positive ions of the material of said body from said body, the positive ions so ejected travelling to the substrate and vigorously bombarding the exposed surface of the substrate,
such bombardment causing the metal ions to penetrate the exposed surface of the substrate and permeate a portion of the heated substrate below said surface to thereby form said alloy penetrating below the surface of said substrate.

4,731,540

ION BEAM MATERIALS PROCESSING SYSTEM WITH NEUTRALIZATION MEANS AND METHOD

Guenther Schmidt, Freising, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 26, 1986, Ser. No. 844,303
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511141
Int. Cl.[4] H01J *37/30*
U.S. Cl. 250—492.2 **17 Claims**



1. In an improved ion beam material processing system having an acceleration system including an ion beam gun from which an ion beam emerges and a specimen mount toward which the ion beam is directed, the improvement comprising:
an ion beam neutralization means for emitting electrons into said ion beam in the space between said ion beam gun and said specimen mount;
means for applying an extraction voltage between said neutralization means and said specimen mount, said extraction voltage being of a polarity for conveying electrons from said neutralization means to said specimen mount.

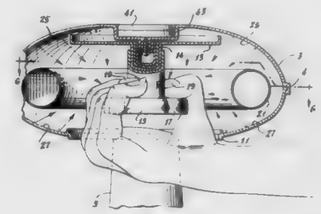
4,731,541

ULTRAVIOLET LIGHT FOR USE IN SETTING GELS FOR ARTIFICIAL FINGERNAILS

Richard E. Shoemaker, Milford, Conn., assignor to Conair Corporation, Edison, N.J.

Filed Jul. 25, 1986, Ser. No. 889,241
Int. Cl.[4] G21K *5/08*
U.S. Cl. 250—504 R **18 Claims**

1. A light source for curing gel on fingernails and providing uniform radiation levels thereto, said light source including
a housing having lamp means therein for treating said gel, said lamp means emitting ultraviolet rays, support means for said housing,
a closure member, said housing including an opening therein on the bottom of said housing to receive said closure member and to retain said closure member within said housing means for mounting said closure member for vertical movement within said housing and upwardly from said opening, and a handle secured to said closure member and positioned to be grasped by the user's hand and moved inwardly of said housing,



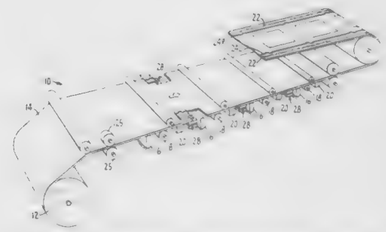
wherein grasping said handle and moving it inwardly serves to bring the user's fingernails into said housing and to allow them to be exposed to said rays from said lamp means.

4,731,542

SYSTEM AND METHOD FOR ACTIVATING AN OPERATING ELEMENT WITH RESPECT TO A MOVING SUBSTRATE

David E. Doggett, Sunnyvale, Calif., assignor to Synergy Computer Graphics, Sunnyvale, Calif.

Filed Sep. 11, 1986, Ser. No. 906,258
Int. Cl.[4] B65H *25/26*
U.S. Cl. 250—548 **13 Claims**



1. A system for activating an operating element with respect to a moving substrate, the system comprising:
a continuous tracking line formed on the substrate and having activation means formed therein which activation means reflects light of an intensity distinguishable from the intensity of light reflected from the remainder of the tracking line;
a photosensor mounted in relation to the continuous tracking line to sense the intensity of light reflected from the tracking line when the substrate is moving such that the photosensor generates an output signal indicative of the passage of the activation means with respect to the photosensor; and
means responsive to the output signal to activate the operating element.

4,731,543

ELECTRIC STARTING MOTOR CONTROL SYSTEM

Earl H. Buetemeister, Alexandria, and John R. Spears, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1987, Ser. No. 44,656
Int. Cl.[4] F02N *11/08*
U.S. Cl. 290—38 R **7 Claims**

1. An electric starting system for cranking an engine comprising, an electric starter comprising an electric cranking

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motor and a solenoid having pull-in and hold-in coils and a shiftable plunger, said cranking motor having first and second terminals, a pinion driven by said motor that is shifted by movement of said plunger that is adapted to mesh with the ring gear of an engine, switch means having first and second contacts that are at times electrically connected by a contactor that is shiftable by movement of said plunger, a manually operable start switch, at least one N-channel enhancement mode field effect transistor having a drain, a source and a gate, a source of direct voltage having positive and negative terminals, means connecting the positive terminal of said voltage source to said first terminal of said cranking motor, means connecting said pull-in coil between the said second terminal of said cranking motor and the drain of said transistor, means



connecting said source of said transistor to said negative terminal of said voltage source, means connecting said hold-in coil between the positive terminal of said voltage source and the drain of said transistor, means connecting one of the contacts of said switch means to said second terminal of said cranking motor, means connecting the other contact of said switch means to said negative terminal of said voltage source and means connecting said start switch between said positive terminal of said voltage source and the gate of said transistor whereby when said start switch is closed said transistor is biased conductive between its drain and source, said transistor when conductive causing said pull-in and hold-in coils to be energized to thereby cause said movable conductor to be shifted into engagement with said fixed contacts.

4,731,544

METHOD AND APPARATUS FOR EXTRACTING SURF AND WAVE ENERGY

Dedger Jones, 885 Freeway Dr. North, Columbus, Ohio 43229

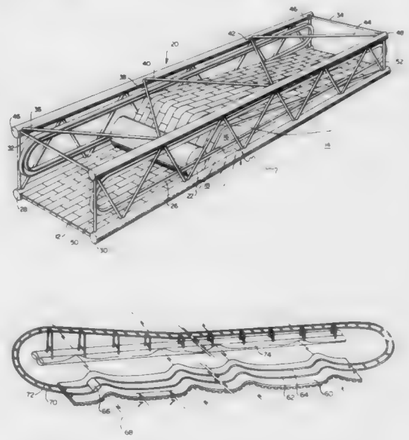
Filed May 27, 1986, Ser. No. 867,052
Int. Cl.[4] F03B *13/00;* **E02B** *9/08*
U.S. Cl. 290—53 **11 Claims**

1. A method for extracting energy from waves, wherein said waves have a height, crests, trough and a direction, comprising the steps of:

disposing upon the surface of the water a flexible floating belt having a width and a length;

orienting the length of said belt substantially parallel to the direction of said waves, said belt substantially conforming to the crests and troughs of said waves;

disposing upon said flexible floating belt an energy roller having a length and a diameter, the length of said roller being disposed parallel to the width of said belt;



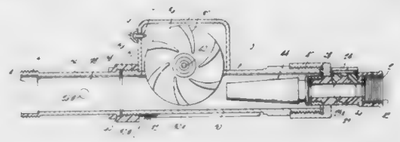
locating said roller on said belt where said belt conforms to a wave trough, said belt imparting momentum to said roller in response to wave action.

4,731,545

PORTABLE SELF-CONTAINED POWER CONVERSION UNIT

Hal Lerner; Bhikhabhai J. Desai, and Suresh B. Desai, all of Huntington Park, Calif., assignors to Desai & Lerner, Huntington Park, Calif.

Filed Mar. 14, 1986, Ser. No. 840,430
Int. Cl.[4] H02P *9/04;* **F03D** *9/00;* **F03B** *13/00*
U.S. Cl. 290—54 **17 Claims**



1. A portable, self-contained power-conversion unit, for attachment to a source of pressurized fluid, comprising:

(a) a body having a passage for transmission of fluid, an inlet end, and an outlet end, the passage joining the inlet end and the outlet end in order to permit flow of pressurized fluid from the inlet end to the outlet end, the inlet end being attachable to the source of pressurized fluid and the outlet end being at ambient atmospheric pressure;

(b) an impeller rotatably mounted in the body and protruding into the passage so that the impeller is rotated by the flow of pressurized fluid through the passage; and

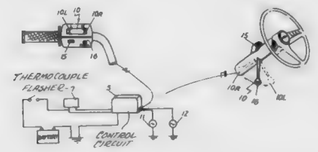
(c) a generator mounted on and supported by the body and attached to the impeller so that rotation of the impeller causes rotation of an armature in the generator in order to generate electric power.

4,731,546

AUTOMATIC ELECTRIC DIRECTION ALARMING CONTROL ADAPTED TO A CAR, A MOTORCYCLE OR OTHER LAND VEHICLE

Chung T. Hau, 21, Sublane 7, Lane 301, Li Jen Rd., Tainan, Taiwan

Continuation of Ser. No. 637,576, Aug. 3, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 937,469
Int. Cl.[4] B60Q *1/34*
U.S. Cl. 307—10 LS **8 Claims**



1. An automatic directional assembly circuit for use in a vehicle, comprising:

switching means for initiating a directional signal command;

means for sensing a speed of the vehicle and producing an output indicative thereof; and

control circuit means coupled to said switching means and to said sensing means, for electrically initiating a flashing sequence signal in response to said directional signal command, said flashing sequence signal persisting for a variable time which varies as a function of said speed of the vehicle,

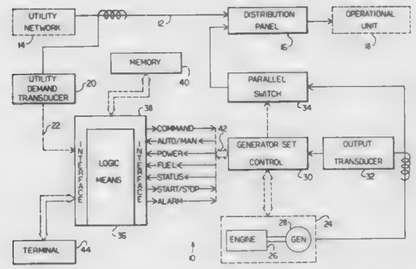
wherein the variable time that said flashing sequence signal persists is determined by a time constant circuit which includes: (a) at least one capacitor means for storing charge, (b) resistor means for allowing said stored charge to be discharged in a predetermined time, (c) second capacitor means for storing a charge when said vehicle is at rest and for discharging at a rate which is related to the speed of the vehicle when moving, and (d) switching means for allowing said first capacitor means to discharge only when said second capacitor means is discharged to a voltage level which is within a predetermined range of values.

4,731,547

PEAK POWER SHAVING APPARATUS AND METHOD

Phillip D. Alenduff; Gregory J. Porter, and Richard A. Crump, all of Lafayette, Ind., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 12, 1986, Ser. No. 941,245
Int. Cl.[4] H02J *1/00, 3/40;* **F02N** *11/06*
U.S. Cl. 307—85 **38 Claims**



1. Apparatus for reducing the peak electrical power demand of a predetermined operational unit from an electrical utility power distribution network by controllably operating at least one secondary electrical generator associated with said operational unit in parallel with said utility power distribution network, said secondary electrical generator including control means for operating said secondary electrical generator in response to receiving command signals, and switch means for connecting said secondary electrical generator in parallel with said utility power distribution network in response to receiving a transfer command signal, comprising:

transducer means for substantially continuously sensing the actual peak power demand of said operational unit from said utility power distribution network and producing a demand signal having a value responsive to said sensed actual peak power demand;

memory means for controllably storing a plurality of control parameters including a predetermined demand setpoint value and plurality of predetermined power percentage factors;

means for receiving said demand signal and controllably producing said transfer command signal and connecting said secondary electrical generator in parallel with said utility power distribution network in response to the value of said demand signal exceeding the value of said predetermined demand setpoint;

means for producing predetermined command signals and controlling said secondary electrical generator to produce only the amount of power necessary to maintain said demand signal value at or below said predetermined setpoint value; and

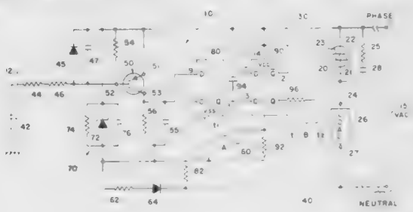
means for controllably variably limiting the maximum amount of power produced by said secondary electrical generator to a predetermined percentage of the secondary electrical generator maximum power capacity in accordance with a preselected one of said plurality of predetermined power percentage factors.

4,731,548

TOUCH CONTROL SWITCH CIRCUIT

Ronald D. Ingraham, Quincy, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Sep. 29, 1986, Ser. No. 913,084
Int. Cl.[4] H01H *35/00*
U.S. Cl. 307—116 **19 Claims**



1. A touch controlled electric switching circuit comprising:

a source of power for the actuation of a load to be selectively coupled to said source of power;

a controllable means for selectively coupling said source to a load; and

a control circuit including a series voltage divider input circuit including at least one capacitor having a first terminal connected to said source of power and an input touch terminal for coupling a person's body capacitance in series with said at least one capacitor such that the voltage across said one capacitor produced by said source of power is changed when said input touch terminal is touched and said control circuit provides a control output signal in response to the touching of said touch terminal which signal is applied to said controllable means for selectively coupling said source of power to said load.

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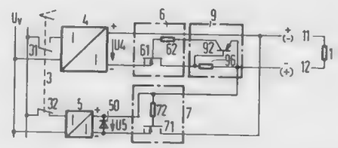
4,731,549
CURRENT SENSOR AND CONTROL DEVICE
Thomas V. Hiddleson, 1010 Morse Ave., Sunnyvale, Calif. 94089
Filed Oct. 15, 1984, Ser. No. 661,063
Int. Cl.⁴ H01H *47/00*
U.S. Cl. 307—125 **3 Claims**



1. A current sensing and control system for alternating current power supplied to a distribution circuit, comprising:
a source of alternating current power including a first power supply line and a second power supply line;
an electric power distribution circuit means including at least first and second distribution power lines;
sensor means including first and second sensor lines, said first sensor line being connected in series between said first power supply line and said first distribution power line and said second sensor line being connected to said second power supply line, and sensor load means connectable across said first an second sensor lines to cause alternating current to flow in said second sensor line;
control switch means openable and closable to disconnect and connect, respectively, said second power supply line to said second distribution power line;
control circuit means responsive to the flow of alternating current from said source to said sensor load means, said control circuit means including sensing means coupled to said second sensor line, and pulse circuit means connected between said sensing means and said control switch means to close said control switch means in response to current flow in said sensor load means to thereby connect said distribution circuit in parallel with said sensor load means across said source of alternating current power, said pulse circuit including a sense amplifier responsive to alternating current in said sensing coil means to deliver a signal at its output when its input signal crosses the zero voltage level, buffer meansn responsive to the output signal from said amplifier to produce a TTL level square wave having the frequency of said alternating current power source, a negative recovery monostable multivibrator connected to receive said square wave signal and to produce a timed output, and means for applying said timed output from the multivibrator to said switch means to connect said distribution circuit across said source of alternating current power.

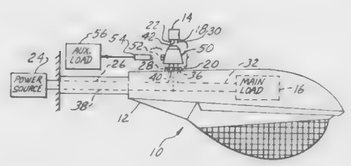
4,731,550
CIRCUIT HAVING A FEED CIRCUIT FOR SUPPLYING CURRENT TO A LOAD RESISTOR
Heinz Kraicar, Poecking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Aug. 20, 1985, Ser. No. 767,816
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1984, 3433142
Int. Cl.⁴ H01H *3/26;* **G05F** *1/40*
U.S. Cl. 307—140 **15 Claims**

1. A circuit for supplying a current to a load connected to a pair of output leads of said circuit comprising:
at least one feed circuit;
an electronic switch disposed between said feed circuit and said leads having a transistor with a control electrode and a controlled path;
control means for operating said electronic switch to disconnect said feed circuit from at least one of said leads when said feed circuit is de-energized and to connect said feed circuit to at least one of said leads when said feed circuit is energized, said control means having a further transistor with a controlled path connected in series with said control electrode of the transistor in said electronic switch and a control electrode connected at a node to said con-



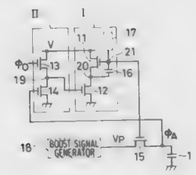
trolled path of said transistor in said electronic switch, and a resistor connected between said node and a terminal of said one of said leads;
a thyristor having an anode and a cathode connected in parallel with said controlled path of said transistor in said electronic switch and having a trigger electrode; and
a further resistor and a Zener diode connected in series in a branch in parallel with said thyristor anode and cathode, said Zener diode having a polarity opposite said thyristor and said trigger electrode being connected between said further resistor and said Zener diode.

4,731,551
TIMED AUXILIARY POWER ADAPTER
Thomas J. Gibbs, Pomona; Richard L. Finley, Placentia, and Michael G. Canavan, Highland, all of Calif., assignors to Southern California Edison, Inc., Rosemead, Calif.
Filed Nov. 7, 1986, Ser. No. 928,536
Int. Cl.⁴ H01H *7/00;* **H05B** *37/02;* **H01J** *5/02*
U.S. Cl. 307—141 **10 Claims**



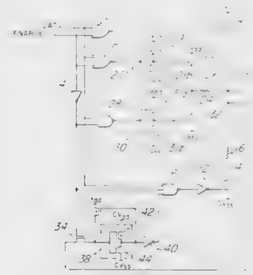
1. An apparatus for powering and controlling an auxiliary load from an automatic lighting fixture, the fixture having a support structure and a control module removably mounted thereto, the control module having an input connection for receiving electrical power from a source of power and an output connection for periodically delivering the power to a main load of the fixture in a drive cycle, the apparatus comprising:
(a) a housing for mounting between the support structure and the control module;
(b) means in the housing for extending the source of power to the input connection;
(c) means in the housing for returning the output connection to the main load;
(d) means for connecting the auxiliary load to the source of power; and
(e) means for interrupting the connecting means during a predetermined period of time in each cycle.

4,731,552
BOOST SIGNAL GENERATOR WITH BOOTSTRAP MEANS
Takayuki Miyamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1986, Ser. No. 849,249
Claims priority, application Japan, May 14, 1985, 60-104351
Int. Cl.⁴ H03K *17/10, 3/57*
U.S. Cl. 307—264 **5 Claims**



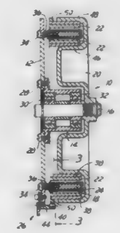
1. A semiconductor boost signal generator circuit, comprising: boost potential generating means for providing at an output node thereof an output voltage V_p higher than a source voltage; an MOS transistor for producing a signal to be boosted, said MOS transistor having a gate electrode, a first main electrode connected to said output node of said boost potential generating means, and a second main electrode connected to a load capacitor; bootstrap control means having at least one input node connected to said second main electrode of said MOS transistor and an output node whose potential varies from a first level to a second level when a potential of said second main electrode of said MOS transistor becomes equal to or greater than a predetermined level; and bootstrap means having an input node connected to said output node of said bootstrap control means and a bootstrap output node connected to said gate electrode for producing at said bootstrap output node an unboosted signal at a potential enabling said MOS transistor to be turned on, and for boosting the potential of said signal when said output node of said bootstrap control means assumes said second level.

4,731,553
CMOS OUTPUT BUFFER HAVING IMPROVED NOISE CHARACTERISTICS
David A. Van Lehn, and Edward H. Flaherty, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 30, 1986, Ser. No. 913,783
Int. Cl.⁴ H03K *19/094, 19/003*
U.S. Cl. 307—443 **13 Claims**



1. An MOS logic circuit, having an input and having an output, and adapted for driving its output to a logic state responsive to the logic state received by its input, comprising:
a first MOS transistor, having its source-to-drain path connected between a first power supply node and the output node of the logic circuit, and having its gate coupled to the input of the logic circuit so that its source-to-drain path is conductive responsive to said input of said logic circuit being at a first logic state;
a second MOS transistor, having its source-to-drain path connected between the output node of the logic circuit and a first reference supply node, and having its gate coupled to the input of the logic circuit so that its source-to-drain path is conductive responsive to said input of said logic circuit being at a second logic state;
a third MOS transistor, having its source-to-drain path connected between the output node of the logic circuit and a second power supply node;
a fourth MOS transistor, having its source-to-drain path connected between the output node of the logic circuit and a second reference supply node;
a first delay means, connected between said input to said logic circuit and the gate of said third MOS transistor, for communicating the state of said input to said gate of said third MOS transistor so that the source-to-drain path of said third MOS transistor is conductive at a predetermined time after said input of said logic circuit is at said first logic state, said third MOS transistor charging said output of said circuit to a voltage which turns off said first MOS transistor;
a second delay means, connected between said input to said logic circuit and the gate of said fourth MOS transistor, for communicating the state of said input to said fourth MOS transistor so that the source-to-drain path of said fourth MOS transistor is conductive a predetermined time after the said input of said logic circuit is at said second logic state; and
turn-off means, connected to the gate of said second MOS transistor, for turning off said second MOS transistor approximately as said source-to-drain path of said fourth MOS transistor becomes conductive responsive to said input of said logic circuit being at said second logic state;
wherein said first and second power supply nodes are at substantially the same voltage;
and wherein said first and second reference supply nodes are at substantially the same voltage, said voltage of said first and second reference supply nodes representative of a different logic state than that represented by the voltage of said first and second power supply nodes.

4,731,554
LOW PROFILE RING-SHAPED MOTOR
Robert D. Hall, Berkey, and Jeffrey T. Major, Cygnet, both of Ohio, assignors to Allied Corporation, Morris County, N.J.
Filed Nov. 14, 1985, Ser. No. 798,062
Int. Cl.⁴ H02K *1/06, 21/12*
U.S. Cl. 310—67 R **10 Claims**



1. A ring-shaped motor comprising, in combination:
a housing;
a rotatable shaft;

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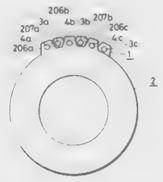
a bearing support secured to said housing for rotatably supporting said shaft;
a ring-shaped stator secured to said housing concentric with said bearing support, said stator including a laminated core with a plurality of helical windings thereon;
a rotor secured to said rotatable shaft and rotatable therewith, said rotor including a base and two substantially concentric rims extending from said base, both of said rims substantially concentric with and on opposite sides of said stator; and
control means for applying electrical power to said windings.

4,731,555

LEAD WIRE LAYOUT IN COIL UNITS FOR STEPPING MOTOR

Koichi Torimoto, and Hiroaki Takada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 931,779
Claims priority, application Japan, Nov. 22, 1985, 60-180020[U]
Int. Cl.[4] H02K *3/32*
U.S. Cl. 310—71 **4 Claims**



1. A motor comprising:
a rotor including a permanent magnet;
at least two stator sections comprising first and second annular coil units and yokes juxtaposed along an axial direction of and located around said rotor; and
at least two lead wires for each of said stator sections extending along said axial direction radially exterior to a respective one of said annular coil units wherein said one of said annual coil units comprises;
a bobbin;
a coil wound on said bobbin;
at least two terminals, each connected at one end to said coil and at another end to a respective one of said lead wires; and
a synthetic resin member encapsulating said coil, said terminals and the ends of the lead wires connected thereto and forming at least two projections extending radially outwardly from said coil and having a circumferential recess between said projections; and
wherein at least one of said lead wires from the other coil unit is disposed in an axial direction within said recess of said one coil unit.

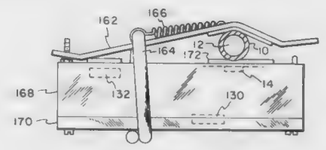
4,731,556

ELECTRONIC BUBBLE DETECTOR APPARATUS

Tello Adams, 8400 141st St. North, Seminole, Fla. 33542

Continuation-in-part of Ser. No. 1,901, Jan. 9, 1987. This application Mar. 23, 1987, Ser. No. 29,233
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—338 **10 Claims**

1. Electronic apparatus adapted for use with a conduit through which a fluid flows, the fluid having a first bubble free state and a second and alternative bubble containing state, said apparatus comprising:
an oscillator employing a single piezo-electric transducer as a frequency determining element, the transducer having different frequency modes of operation enabling the transducer to resonate at different frequencies, the oscillator having a positive feedback loop containing in series a high pass filter and a low pass filter which together determine one selected mode of operation and eliminate any other transducer frequency mode, the transducer, when unloaded and operating in the selected mode, having a resonant frequency which determines the oscillation frequency and having a predetermined maximum level of amplitude excursion, the transducer, when loaded by being moved into engagement with the conduit, exhibiting



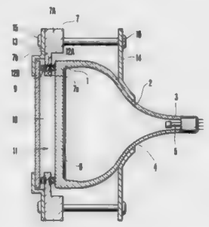
a change in resonant frequency and a change in the level of amplitude excursion while remaining in the selected mode, the amount of oscillator frequency change and the amount of change in excursion level having respective values when the fluid is in the first state which differ from the respective values when the fluid is in the second state;
first means responsive to the changing amplitude values to produce an output signal when a selected one of the states is detected; and
second means adjustable to different sizes of conduit to detachably clamp the transducer to the conduit.

4,731,557

LIQUID COOLING TYPE PROJECTION PICTURE TUBE

Tetsuo Asano, Mobara; Misao Ikeda, Unakamimachi; Katsuyoshi Tamura, Mobara, and Takumi Yamaguchi, Chiyodamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 879,138
Claims priority, application Japan, Jul. 5, 1985, 60-146501
Int. Cl.[4] H01J *29/86, 7/24*
U.S. Cl. 313—36 **10 Claims**



1. A projection picture tube comprising:
a bulb;
a sealing chamber disposed in contact with a front surface of a phosphor screen panel of said bulb and sealed with a liquid coolant; and
a holding mechanism for holding said sealing chamber by said bulb,
said sealing chamber being provided with a transparent member disposed in front of said phosphor screen panel to be spaced apart therefrom, a heat dissipation member which is disposed between said transparent member and said phosphor screen panel and part of which is in contact with the liquid coolant sealed in said sealing chamber, seal members respectively disposed between said heat dissipation member and said phosphor screen panel and between said heat dissipation member and said transparent member, and a holding piece for holding said transparent member on said heat dissipation member, said holding mechanism being coupled to said heat dissipation member.

4,731,558

METHOD OF REDUCING THE REFLECTANCE OF A TRANSPARENT VIEWING SCREEN AND VIEWING SCREEN WITH REDUCED REFLECTANCE

Jan Haisma; Johannes M. M. Pasmans; Pieter van der Werf, and Albertus J. M. Rombouts, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 628,708, Jul. 9, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 926,820
Claims priority, application Netherlands, Jul. 11, 1983, 8302460
Int. Cl.[4] H01J *29/89, 9/20*
U.S. Cl. 313—478 **17 Claims**



1. A method of reducing the reflectance of a transparent viewing screen comprising first mechanically roughening the outer surface of the screen until the roughness parameters of the resultant roughened outer surface satisfies the following requirements
$25\ nm < R_a < 200\ nm$
$50\ nm < R_q < 250\ nm$
$25\ nm < R_{tm} < 1500\ nm$
$25\ \mu m < S_m < 100\ \mu m$
wherein
R_a is the arithmetic average of the absolute difference between the surface profile and the average surface level measured along a line,
R_q is the square root of the average difference squared between the surface profile and the average surface level measured along a line,
R_{tm} is the peak-to-valley height difference of the surface profile averaged over a number of line intervals, and
S_m is the average distance between positive crossings of the surface profile and the average surface level measured along a line and
then providing an anti-reflective coating on the roughened outer surface in such a manner that the thickness of the resultant coating is constant.

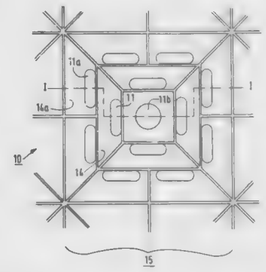
4,731,559

ELECTRON MULTIPLIER PLATE WITH CONTROLLED MULTIPLICATION

Gilbert Eschard, Brive La Gaillarde, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1986, Ser. No. 924,224
Claims priority, application France, Jun. 3, 1986, 86 07966
Int. Cl.[4] H01J *43/00*
U.S. Cl. 313—533 **10 Claims**

1. A secondary emission electron multiplier plate of the "apertured plate" type, comprising an elementary multiplier pattern having a plurality of multiplier apertures, said apertures lying in concentric arrays about the interior of said pattern, each aperture having an input side, an output side, and an efficacious multiplier partition having emissive power therebetween, the partitions of the apertures in the peripheral array being oriented so that electrons received at their input sides are



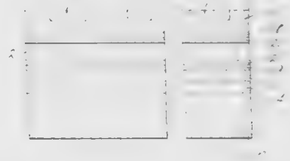
directed toward the interior of the pattern through the output side.

4,731,560

MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING IMPROVED OPERATING LIFE

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois Television Products, Inc., Teledo, Ohio

Continuation of Ser. No. 385,973, Aug. 6, 1973, which is a continuation of Ser. No. 61,842, Aug. 6, 1970, abandoned. This application Feb. 7, 1974, Ser. No. 440,532
Int. Cl.[4] H01J *17/49*
U.S. Cl. 313—587 **12 Claims**



1. A display device utilizing gas discharge, said display device comprising a pair of insulating substrates spaced from each other and in substantially parallel relation, each of said substrates having an inside surface facing that of the other and at least one of said substrates being transparent; a first group of electrodes positioned in rows on the inside surface of one of the substrates; a second group of electrodes positioned in columns on the inside surface of the other of the substrates, the first and second groups of electrodes being positioned transverse relative to each other; a first dielectric layer covering the first group of electrodes and a second dielectric layer covering the second group of electrodes; said first and second dielectric layers being of a material having heavy metallic elements therein; and a first protection layer formed on the first dielectric layer and a second protection layer formed on the second dielectric layer for preventing sputtering, said insulating substrates being positioned relative to each other in a manner whereby they are oppositely placed with a discharge gap between them, said discharge gap being filled with gas capable of ionization and each cross point of an electrode of the first group of electrodes and an electrode of the second group of electrodes being a discharge point for display.

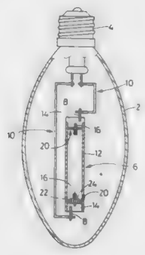
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,561

CERAMIC ENVELOPE DEVICE FOR HIGH-PRESSURE DISCHARGE LAMP

Hirotsugu Izumiya, Nagoya; Takehiro Kajihara, Komaki, and Senji Atsumi, Kakamigahara, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 20, 1985, Ser. No. 799,836
Claims priority, application Japan, Dec. 17, 1984, 59-191194[U]; May 20, 1985, 60-74771[U]
Int. Cl.[4] H01J *61/30, 61/36*
U.S. Cl. 313—624 12 Claims



1. A ceramic envelope device for a high-pressure metal vapor discharge lamp comprising:

a translucent ceramic tube having a first end and a second end and an inner peripheral surface and an outer peripheral surface;

a first electrically conducting cermet end cap having an inner surface and an outer surface, said first electrically conducting cermet end cap closing said first end of the ceramic tube;

a second electrically conducting cermet end cap having an inner surface and an outer surface, said second electrically conducting cermet end cap closing said second end of the ceramic tube;

a first discharge electrode having an inner end and an outer end and an outer peripheral surface, said outer end of the first discharge electrode being inserted into said inner surface of said first end cap such that said inner end of the first discharge electrode protrudes from the inner surface of the first end cap longitudinally into the ceramic tube;

a second discharge electrode having an inner end and an outer end and an outer surface, said outer end of the second discharge electrode being inserted into said inner surface of said second end cap such that said inner end of the second discharge electrode protrudes from the inner surface of the second end cap longitudinally into the ceramic tube;

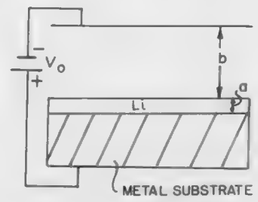
a pair of electrically insulating members, each electrically insulating member having an outer surface which contacts said inner surface of the first and second electrically conducting end caps, respectively, at least one of said pair of electrically insulating members having an inner protruding portion which protrudes longitudinally into the ceramic tube, said inner protruding portion creating a radial gap between said inner peripheral surface of the ceramic tube and said protruding portion and also creating a predetermined radial gap between said protruding portion and a corresponding outer surface of at least one of said first and second discharge electrodes, wherein a corresponding inner surface of at least one of said first and second end caps does not extend longitudinally into said ceramic tube beyond said outer surface of the corresponding electrically insulating member.

4,731,562

ELECTROHYDRODYNAMICALLY DRIVEN LARGE-AREA LIQUID ION SOURCES

Arian L. Pregenzer, Corrales, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 27, 1986, Ser. No. 867,175
Int. Cl.[4] H01J *27/02*
U.S. Cl. 315—111.81 17 Claims



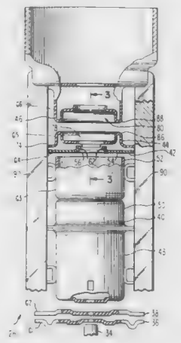
1. A liquid ion source comprising means for generating, over a large area of the surfae of a liquid capable of emitting ions, an electric field of a strength sufficient to induce emission of ions from said large area at a current density on the order of at least 5 kA/cm^2, wherein said large area is on the order of at least $10\lambda^2$ and λ is the wavelength of an unstable surface wave generated in said ion source by said electric field.

4,731,563

COLOR DISPLAY SYSTEM

Stanley Bloom, Bridgewater, and Eric F. Hockings, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 29, 1986, Ser. No. 912,632
Int. Cl.[4] H01J *29/58, 29/50, 29/46*
U.S. Cl. 315—382 18 Claims



1. In a color display system including a cathode-ray tube having an electron gun for generating and directing three electron beams along paths toward a screen of said tube, said gun including electrodes comprising a beam-forming region and electrodes for forming a main focusing lens, and said system including a self-converging yoke that produces an astigmatic magnetic deflection field, the improvement comprising

electrodes in said electron gun for forming a multipole lens between the beam-forming region and the main focusing lens in each of the electron beam paths wherein each multipole lens is oriented to provide a correction to an associated electron beam to at least partially compensate for the effect of the astigmatic magnetic deflection field on the associated beam, and wherein said electrodes for forming a multipole lens include a first multipole lens electrode and a second multipole lens electrode, said second multipole lens electrode being a portion of one of said electrodes for forming a main focusing lens, and said first multipole lens electrode being located between the second multipole lens electrode and the beam-forming region, adjacent to the second multipole lens electrode,

means for applying a fixed focus voltage to said second multipole lens electrode,

means for applying a dynamic voltage signal to said first multipole lens electrode, said dynamic voltage signal being related to deflection of the electron beams, and

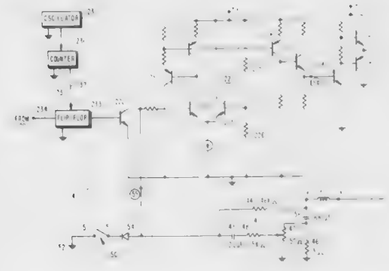
each multipole lens being located sufficiently close to the main focusing lens to cause the strength of the main focusing lens to vary as a function of voltage variation of said dynamic voltage signal.

4,731,564

SERVICE SWITCH FOR VIDEO DISPLAY APPARATUS

Harry Pan, and Ching L. Yu, both of Taipei, Taiwan, assignors to RCA Corporation, Princeton, N.J.

Filed May 12, 1986, Ser. No. 862,287
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—397 6 Claims



1. A field rate deflection circuit for a video display apparatus comprising:

means for providing a field rate deflection current;

means for sampling said deflection current and producing a feedback signal representative thereof;

means for applying said feedback signal to said deflection current providing means to control the operation of said deflection current providing means; and

a service connection means comprising means for preventing the application of said feedback signal to said deflection current providing means in order to disable said deflection current providing means.

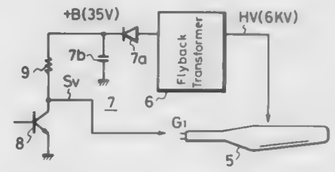
4,731,565

HIGH VOLTAGE GENERATOR FOR TELEVISION APPARATUS

Susumu Tagawa, Kanagawa, and Chihiro Miura, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,917
Claims priority, application Japan, Sep. 25, 1984, 59-199883
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—411 7 Claims

1. In a video display device, the combination of a cathode ray tube having a cathode, a video output circuit, a flyback transformer producing at respective secondaries a high voltage fed to said cathode ray tube and a low voltage fed to said video output circuit that also receives a video signal and provides a first current varying in response to variations in said video signal for driving said cathode of the cathode ray tube, and circuit balancing means connected between said flyback transformer and said video output circuit for changing the total current flowing in said video output circuit by supplying a second current to said video output circuit to be added to said first current, said total current changing in an inverse relationship relative to changes in the cathode current of the cathode ray tube caused by the video signal such that the high voltage



is maintained constant and is fed to said cathode ray tube in spite of variations in the cathode current of said cathode ray tube.

4,731,566

INTERMITTENT DRIVE CONTROLLER FOR WINDSHIELD WIPER MOTOR

Yukio Takaishi, Aichi, Japan, assignor to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Dec. 10, 1986, Ser. No. 940,096
Claims priority, application Japan, Dec. 12, 1985, 60-191526[U]
Int. Cl.[4] B60S *1/08;* H02P *3/12*
U.S. Cl. 318—444 5 Claims

1. An intermittent drive controller for a windshield wiper motor comprising:

a wiper switch for turning the drive controller on and off

a motor switch operated in a linked relationship with the rotation of said wiper motor so as to be changed over between first and second terminals, said motor switch completing a circuit when change over to the first terminal and producing an operation signal for the motor, and said motor switch completing a circuit when changed over to the second terminal and producing a pause signal for said motor;

a drive command circuit responsive to the wiper switch and the motor switch for producing a drive command signal when the wiper switch is turned on and after a certain period of time has passed from the moment at which said motor switch is changed from the first to the second terminal;

a windscreen washer motor for driving a pump adapted for ejecting windscreen washer fluid and a windscreen washer switch for turning the windscreen washer motor on and off;

a washer drive circuit for producing a drive command signal when said windscreen washer switch is turned on;

a drive circuit for driving said wiper motor in response to the drive command signal from said drive command circuit; and

a brake circuit for immediately hindering said drive command signal when said motor switch is changed over from said first to said second terminal, said brake ciruit simulta-

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neously forming a braking loop of said wiper motor for a short time.

4,731,567

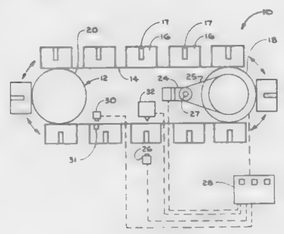
METHOD AND APPARATUS FOR AUTOMATED PARTS FOR STORAGE AND RETRIEVAL

George M. Dands, Columbia; Steven P. Downing, Perry Hall, and Edmund J. Smith, Jr., Hanover, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 649,445, Sep. 11, 1984. This application Feb. 10, 1986, Ser. No. 828,010

Int. Cl.[4] G05B *11/18*

U.S. Cl. 318—594 **12 Claims**



1. An automated system for accurate positioning of movable parts bins comprising:

(a) several movable parts bins

(b) a conveyor for movably supporting said parts bins,

(c) a drive mechanism for controllably moving said conveyor

(d) a coarse position sensor for determining bin position relative to a fixed location during movement of said conveyor said coarse position sensor having a shaft that undergoes numerous revolutions for each complete rotation of said conveyor;

(e) a final approach sensor for precise positioning of a predetermined bin relative to a fixed location, said final approach sensor active only during preselected revolutions of said coarse position sensor; and

(f) an interactive electronic controller connected to said coarse sensor, said final approach sensor and said drive mechanism, said controller for constantly monitoring said coarse position sensor and relating signals from said sensors to parts bin locations and for controlling part bin movement by controlling said drive mechanism.

4,731,568

ERROR SIGNAL GENERATOR

Jiroh Shimada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,682

Claims priority, application Japan, Sep. 25, 1985, 60-212829

Int. Cl.[4] G05B *19/29*

U.S. Cl. 318—603 **4 Claims**

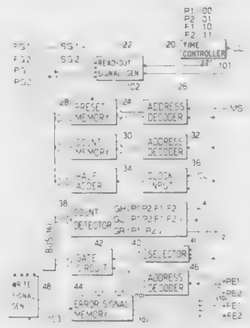
1. An error signal generator for generating a first error signal responsive to a first reference signal and a first detection signal and a second error signal responsive to a second reference signal and a second detection signal, comprising:

a time controller for periodically generating first and second status signals in response to a clock signal;

a preset memory storing first and second preset data and outputting to a bus line said first preset data when both of said first reference signal and said first status signal are present and said second preset data when both of said second reference signal and said second status signal are present;

a count memory having first and second memory areas and coupling to said bus line said first memory area in response to said first status signal and said second memory area in response to said second status signal;

means coupled to said bus line for subtracting a predetermined value from the data on said bus line and for returning the result of the subtraction to said bus line in response to each of said first and second status signals; and



an error signal memory having third and fourth memory areas and storing at least one portion of the data on said bus line into said third memory area when both of said second detection signal and said second status signal are present, the data stored in said third and fourth memory areas being generated as said first and second error signals, respectively.

4,731,569

APPARATUS FOR CONTROLLING A MAGNET IN A MAGNETICALLY SUSPENDED VEHICLE HAVING A LINEAR STATOR

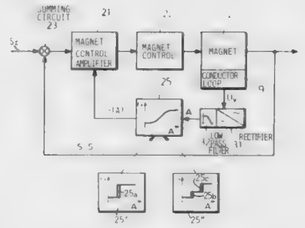
Gerhard Bohn, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 715,495, Mar. 25, 1985, Pat. No. 4,587,472. This application Apr. 18, 1986, Ser. No. 853,614

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515350

Int. Cl.[4] G05B *11/00*

U.S. Cl. 318—687 **5 Claims**



1. An apparatus for controlling the force of a levitation magnet in a magnetically levitated vehicle of the linear stator type, comprising a uniformly toothed rail track forming a linear stator with teeth each having a determined width in the travel direction, levitation magnet means (2) having pole pieces with surfaces facing said rail track teeth, a groove in said pole piece surface, induction conductor loop means (9) in said groove, said induction conductor loop means including output terminals, said conductor loop means having a loop width in the travel direction corresponding to said determined width of said track teeth for inducing in said conductor loop means an alternating signal having a value proportional to the vehicle speed on said track, levitation magnet control circuit means (21, 22) operatively connected to said levitation magnets for energizing said levitation magnets, signal rectifying circuit means (31) operatively connected to said output terminals of said conductor loop means (9) for rectifying said alternating signal to produce a control signal proportional to the vehicle speed, and feedback circuit means connecting an output of said signal rectifying circuit means to said magnet control circuit means for controlling the magnet force in response to said control signal.

4,731,570

ELECTRICAL DRIVE CIRCUIT FOR A VARIABLE-SPEED SWITCHED RELUCTANCE MOTOR

Peter W. Lee, Willingham, England, assignor to Caterpillar Inc., Peoria, Ill.

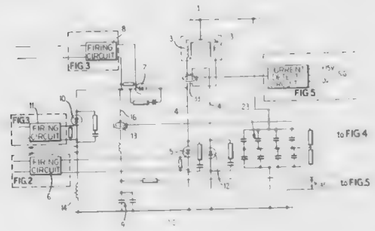
PCT No. PCT/US86/01846, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1986, PCT Pub. No. WO87/01530, PCT Pub. Date Mar. 12, 1987

PCT Filed Sep. 8, 1986, Ser. No. 943,213

Claims priority, application United Kingdom, Sep. 9, 1985, 8522323

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **6 Claims**



1. An electrical drive circuit for a variable-speed switched reluctance motor for connection to a DC power source, and said motor having a bifilar winding, said bifilar winding having a main winding (3) and an auxiliary winding (3'), comprising:

first and second voltage/current lines (1,2) connectable to said DC power source, one end of said main winding (3) being connected to said first voltage/current line (1);

first, second and third thyristor switches (5,7,10) each having a respective firing circuit (6,8,11) adapted to fire said respective thyristor switch (5,7,10) to conduction, said first thyristor switch (5) being connected between said second end of said main winding (3) and said second voltage/current line (2), said second and third thyristor switches (7,10) being connected in series between said second end of said main winding (3) and said second voltage/current line (2), in parallel with said first thyristor switch (5);

a commutation capacitor device (9), said commutation capacitor device (9) being connected in parallel with said third thyristor switch (10) between said second and third thyristor switches (7,10) and said second voltage/current line (2);

means (33) for sensing the direction of current flow through said commutation capacitor device (9); and

control means (20) for preventing said first and third thyristor switches (5,10) from conducting when said second thyristor switch (7) is conducting and to prevent said first and second thyristor switches (5,7) from conducting when said third thyristor switch (10) is conducting, said control means (20) being connected to said sensing means (33) and to said firing circuits (5,8,11).

4,731,571

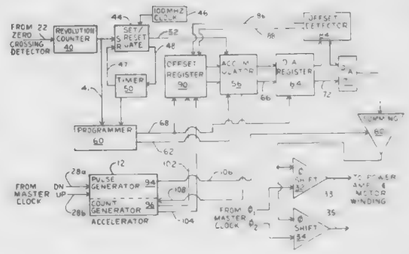
CONTROL FOR STABILIZING THE ALIGNMENT POSITION OF THE ROTOR OF A SYNCHRONOUS MOTOR

Lawrence I. Donley, Lemont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1985, Ser. No. 710,880

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—702 **8 Claims**



1. A method of stabilizing the rotational alignment of the rotating rotor of a synchronous motor driven with a period of rotation determined by a drive signal that is generally synchronized to a clock signal generated by a master clock, wherein the master clock includes means for permitting abrupt changes in the frequency of the drive signal, comprising the steps of:

magnetically sensing the rotor and generating a pulse in response to said rotor reaching a predetermined angular position;

generating an error signal by generating high frequency clock pulses, accumularing a count of said clock pulses on a plurality of successive periods of rotation of the rotor, the count to an analog count value, differentiating the analog count value, generating a change pulse of preselected duration in response to the abrupt change in frequency, said change pulse having a polarity determined by the direction of the abrupt change in frequency, and adding the change pulse to the result of differentiating the analog count value to produce the error signal;

phase shifting the drive signal in response to the error signal to compensate for a change in period.

4,731,572

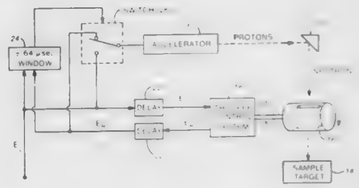
PRECISION ELECTRONIC SPEED CONTROLLER FOR AN ALTERNATING-CURRENT

Victor W. Bolie, Albuquerque, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 17, 1982, Ser. No. 450,841

Int. Cl.[4] H02P *1/46*

U.S. Cl. 318—721 **4 Claims**



1. A controller for controlling the speed of a multiphase induction motor so as to maintain the motor in phase with an

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alternating-current power supply signal that is subject to meandering in frequency about a nominal line frequency, said motor including a plurality of power amplifiers having outputs which drive the respective stator windings of the motor, comprising:

shaft revolution sensor means operable to provide a feedback pulse train siganl having a frequency representative of the speed of said motor;

phase error signal generator means for generating a phase error signal representative of the phase difference between said alternating-current power supply signal and said feedback pulse train signal;

speed error signal generator means for generating a speed error signal that is representative of the difference between the speed of said motor and a predetermined desired speed, said predetermined desired speed being a speed at which said motor is in phase with said power supply signal at said nominal line frequency, said speed error signal generator means including a digital clock which produces a timing signal pulse train having a predetermined substantially constant frequency which is substantially higher than the frequency of said feedback pulse train signal, first digital counter means connected to receive said timing signal pulse train and said feedback pulse train signal, said first digital counter means operating to count pulses of said timing signal pulse train during intervals between receipt of successive pulses of said feedback pulse train signal, and means for converting the digital count value of said first digital counter means after each counting interval to said speed error signal;

drift error signal generator means for generating a drift error signal representative of the integral of said phase error signal over time;

a summing amplifier for combining said speed, phase and drift error signals to produce a single motor control signal, means for selectively weighting the relative contributions of said signals to produce said motor control signal such that said speed error signal effectively stabilizes the operation of said phase error signal to maintain the motor in phase with said alternating-current power supply signal, a voltage controlled oscillator connected to receive said motor control signal and produce a variable frequency control signal, a plurality of programmable read-only memories connected respectively with said power amplifiers and said stator windings of said motor, said memories containing sequentially addressable digitized representations of trigonometric functions which bear the appropriate phase relationships of the respective stator windings of the motor, and digital-to-analog converter means connected respectively with said programmable read-only memories for converting the contents of said memories to analog signals suitable for controlling the outputs of the respective power amplifiers, whereby said variable frequency control signal sequentially advances the addresses of said programmamble read-only memories at a rate determined by the magnitude of said motor control signal, thereby maintaining said motor in phase with said alternating-current power supply signal.

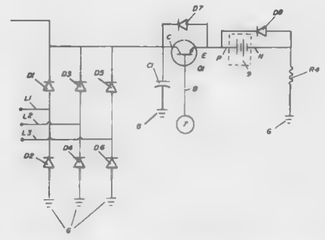
4,731,573

METHOD FOR CHARGING ELECTRICAL STORAGE BATTERIES

Daniel E. Sexton, and Jimmie N. Short, both of Lexington, Ky., assignors to Ralph J. Stolle Co., Cincinnati, Ohio

Filed May 22, 1986, Ser. No. 865,780
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—14 **2 Claims**

1. Apparatus for charging electrical storage battery means including electrical current generating means to supply a forward flow of charging current of selected value; a cyclical wave generating means for cycling flow of said charging current to said battery; switch means to control said charging current flow and periodically terminate forward flow of said charging current flow at selected intervals; reverse charging current flow path to allow current flow from the battery in a direction opposite to the direction of charging current flow for a period of time less than 25% of the period during which forward flow of charging current occured and wherein said electrical storage battery includes at least first and second terminal means where said first terminal means is connected to a reference voltage potential and said second means is connected to said switch means output to receive said forward flow of charging current and undirectional current flow means connected between said first and second terminals to allow current flow from said first to said second terminal whereby said current flow from said first to said second terminals occurs during periods when said forward flow of charging current is terminated.

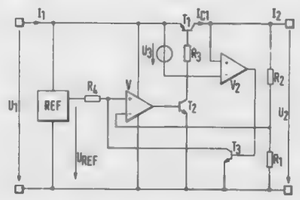


4,731,574

SERIES VOLTAGE REGULATOR WITH LIMITED CURRENT CONSUMPTION AT LOW INPUT VOLTAGES

Joachim G. Melbert, Steinhöring, Fed. Rep. of Germany, assignor to SGS-ATES Deutschland Halbleiter Bauelemente GmbH, Grafing, Fed. Rep. of Germany

Continuation of Ser. No. 669,737, Nov. 7, 1984, Pat. No. 4,704,572. This application May 20, 1987, Ser. No. 51,633
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341345
Int. Cl.[4] G05F *1/565*
U.S. Cl. 323—275 **21 Claims**



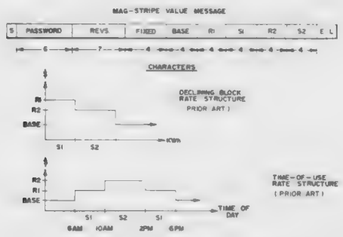
1. A series voltage regulator comprising a normally non-saturated regulating transistor with its emitter-to-collector path arranged in a series arm of the regulator, the base of said regulating transistor being controlled via a control transistor by a first differential amplifier having first and second input ports, the first differential amplifier comparing a reference voltage which is supplied to the first input port with a voltage which is supplied to the second input port and which is proportional to the output voltage of the regulator, wherein the reference voltage supplied to the first input port of the first differential amplifier is controlled as a function of the difference between the input voltage and the output voltage of the series voltage regulator.

4,731,575

PREPAYMENT METERING SYSTEM USING ENCODED PURCHASE CARDS

Joseph W. Sloan, 2537-140th Ave. NW., Andover, Minn. 55304

Filed Dec. 8, 1986, Ser. No. 939,175
Int. Cl.[4] G01R *11/02*
U.S. Cl. 324—113 **4 Claims**



1. A prepayment metering system for dispensing utilities using mag-stripe cards, comprising:

first control means for encrypting a value message;

mag-stripe card writer means electrically connected to said first control means for writing said encrypted value message onto the mag-stripe cards;

mag-stripe card reader means for reading said encrypted value message from the mag-stripe cards;

means for sensing utility usage;

utility disconnect means for connecting and disconnecting the utilities;

second control means electrically connected to said mag-stripe card reader means, said means for sensing utility usage and said utility disconnect means, said second control means operable for (1) decrypting said value message, (2) storing said value message into a memory, (3) monitoring utility usage, and (4) disconnecting and connecting the utilities in response to the utility usage and said value message; and

said encrypted value message comprising:

purchased value component having a monetary value;

rate component having a value corresponding to the cost of utilities purchased; and

password formed by a combination of a customer account number, a site identification number, and a sequential transaction number.

4,731,576

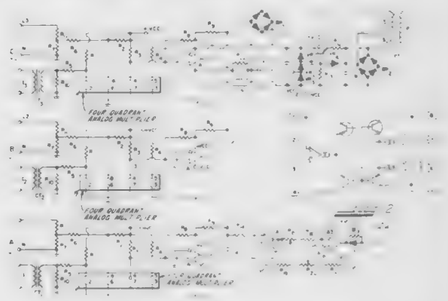
ALTERNATING CURRENT WATT TRANSDUCER

Raymond H. Legatti, Clearwater, Fla., assignor to Technology Research Corporation, Clearwater, Fla.

Filed Nov. 13, 1985, Ser. No. 797,619
Int. Cl.[4] G01R *21/06*
U.S. Cl. 324—142 **2 Claims**

1. A single phase AC watt transducer comprising:

an integrated circuit analog multiplier which provides four quadrant multiplication, said multiplier having at least two input terminals, to each of which is applied an AC input signal, said input AC signals having magnitudes which, with respect to each other have in-phase components, and at least one output terminal, upon the application of AC input signals to said at least two input terminals, an AC output signal being produced at said at least one output terminal, said AC output signal having a magnitude which is proportional to the product of the in phase components of the magnitudes of said at least two AC input signals, the magnitude of one of said AC input signals being proportional to an AC current, and the magnitude of the other of said AC input signals being proportional to an AC voltage across a load through which said AC current is flowing, such that the magnitude of said AC output signal is proportional to and a measurement of the power transfer to the load represented by the AC current and the AC voltage with respect to which said AC input signals are proportional, a first operational amplifier having at least one input terminal and at least one output terminal, said AC output signal being applied to said input termianl of said first operational amplifier, a DC output signal being produced at said output terminal of said first operational amplifier which is proportional to and a measurement of power transfer determined by the AC current and the AC voltage, a second operational amplifier having at least one



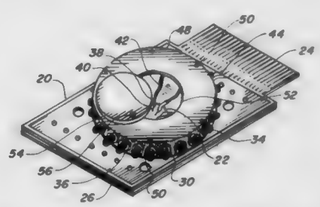
input terminal and at least one output terminal, a resistor connected in series with said at least one input terminal of said second operational amplifier, the DC output signal of said first operational amplifier being applied to said at least one input terminal of said second operational amplifier through said resistor, a constant-current being produced at said at least one output terminal of said second operational amplifier which is proportional to and a measurement of power transfer determined by the AC current and the AC voltage.

4,731,577

COAXIAL PROBE CARD

John K. Logan, 26527 Silver Spur Rd., Rancho Palos Verdes, Calif. 90274

Filed Mar. 5, 1987, Ser. No. 22,056
Int. Cl.[4] G01R *1/04;* **H01P** *5/22*
U.S. Cl. 324—158 F **9 Claims**



1. A multipoint microwave semi-conductor wafer node point and inspection point coaxial probe card comprising:

(a) a printed circuit board having a ground plane on both a bottom and top side, also a centrally located hole therein, further an electrically conductive edge connector on one end;

(b) stiffening means affixed to the bottom side of said printed circuit board increasing the structural integrity of the board allowing handling and application thereof;

(c) a connector mounting ring having an upstanding edge disposed upon the top of the printed circuit board encir-

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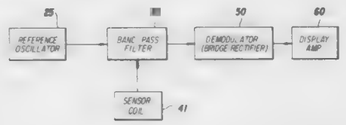
cling said hole providing a mounting surface and defining a mechanical barrier shield;
(d) a plurality of threaded coaxial microwave connectors attached through said mounting ring in spaced relationship with the centrally located hole in the board having the connector body penetrating through the ring and mechanically attached on the outside thereof, providing means for an isolated electrical signal to be conducted through the mounting ring;
(e) a plurality of angular ceramic stripline needle assemblies having a stripline on one side and a ground plane on the other and an offset needle, conductively bonded on the top ground plane side of the printed circuit board to the ground plane of the needle assemblies with the tips of the needles disposed within said hole in the board in such a position as to align with node points and test points on the semi-conductor wafer;
(f) means to connect a portion of said stripline needle assemblies to said coaxial microwave connectors defining an electrical conductive flowpath therebetween for high frequency probing;
(g) means to connect a portion of said stripline needle assemblies to said board edge connector defining an electrical conductive flowpath therebetween for signal frequencies below one megahertz; and,
(h) means to enclose said connector mounting ring on the side opposite the printed circuit board defining a radio frequency interference and electromagnetic interference shield for isolation of a low capacitance and low noise signal within the probe card apparatus.

4,731,578

ELECTRICAL SENSING SYSTEM FOR MEASURING FERROUS PARTICLES WITHIN A FLUID

Edward Tsaprazis, Havertown, Pa., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 2, 1985, Ser. No. 729,759
Int. Cl.[4] G01N *27/74*; G01R *33/12*
U.S. Cl. 324—204 **1 Claim**



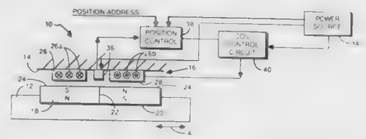
1. Article for sensing ferrous contamination in a fluid comprising:
(a) a generally cylindrical magnet;
(b) a first electrical coil located co-axially on one end of said magnet, said coil having a hole lengthwise through its center;
(c) a pole piece of said magnet occupying the hole in said first coil and concentric with said magnet disposed at one end of the magnet, said pole piece of the magnet being available to accumulate ferrous contamination present in a fluid whereby any ferrous accumulation changes the induction of the coil;
(d) a second coil, indentical in composition and inductance to said first coil, the axis of the second coil being concentric to the axis of said magnet and located on the opposite end of the generally cylindrical magnet from the said first coil, the inductance of said second coil being unaffected by said ferrous accumulation;
(e) frequency generation means for generating a fixed, known frequency sine wave signal of a known amplitude;
(f) an electrical bandpass filter including means connecting said first and second coils as the frequency determinative element of the filter, both of said coils being equally affected by variations in external operating conditions, whereby changes in the outputs of said coils due to such variations cancel each other in said filter, the input of the filter being operatively connected to said frequency generation means;
(g) amplification means operatively connected to the output of said filter.

4,731,579

MAGNETIC POSITION INDICATOR AND ACTUATOR USING SAME

Christian C. Petersen, Westwood, and Bernard C. Westgate, Jr., Bradford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 12, 1982, Ser. No. 433,468
Int. Cl.[4] G01B *7/14*; H01L *43/06*; G03B *9/08*
U.S. Cl. 324—207 **1 Claim**



1. An actuator apparatus for controlling the relative positions of a pair of members, one of which is movable relative to the other along a given path, said apparatus comprising:
magnetic means forming at least a portion of a first of said members for providing adjoining magnetic fields of opposite polarity and generally equal field strengths extending generally perpendicular to said given path for providing a substantially linear variation in field strength extending over an elongated path which traverses an abutment of said fields;
a field coil forming at least a portion of a second of said members, said field coil having conductive portions located in said fields, and said field coil portions being energizeable for effecting relative movement between said members along said given path;
means for sensing magnetic field strength fixedly coupled to said second member and generally centrally located within said field coil for movement along said elongated path responsive to relative movement of said members whereby said sensing means provides a substantially linear response during said relative movement, said sensing means providing an output signal representative of magnetic field strength; and,
means responsive to said output signal for controlling the energization of said field coil to provide closed loop control of the positioning of said members.

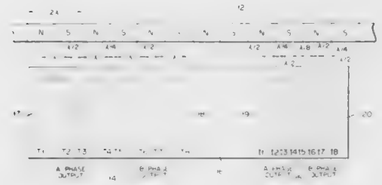
4,731,580

DISPLACEMENT SENSING DEVICE WITH TWO MAGNETORESISTANCE ELEMENT SECTIONS USED INDEPENDENTLY

Kenji Indo, Hadano, Japan, assignor to Sokkisha Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,273
Claims priority, application Japan, Aug. 30, 1984, 59-131558[U]
Int. Cl.[4] G01N *7/14*; G01R *33/02*; H01L *43/08*
U.S. Cl. 324—208 **2 Claims**

1. A displacement sensing device, comprising:
a magnetic scale with a magnetic pattern of a first pitch of (nλ) wherein n is a selected positive integer; and
a sensor located opposite to the magnetic scale and including two magnetoresistance element sections each comprised of a pair of magnetoresistance elements, wherein one of said element sections is formed at a pitch which operatively interacts with the first pitch so that an electric signal corresponding to a relative amount of movement between the magnetic scale and the sensor is generated by said one of said element sections according to a variation in a resistive value of each magnetoresistance element of said one of said element sections in response to the magnetic pattern on the magnetic scale;
the pair of magnetoresistance elements forming the remaining one of said element sections being arranged at a pitch



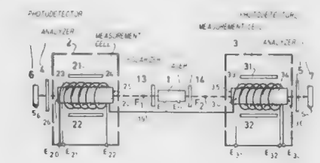
which operatively interacts with a magnetic pattern of a second pitch different from the first pitch;
said magnetoresistance element sections being arranged so that said one of said element sections which operatively interacts with the first pitch can be selected for use independently of the other element section.

4,731,581

MEASUREMENT HEAD FOR A MAGNETIC FIELD GRADIENT VECTOR MEASURING APPARATUS, AN APPARATUS COMPRISING SUCH A HEAD AND A MEASUREMENT PROCESS

Gérard Doriath, Palaiseau; Pierre Hartemann, Paris, and Joël Martin, Boussy St. Antoine, all of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 627,098, Jul. 2, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 73,331
Claims priority, application France, Jul. 4, 1983, 83 11073
Int. Cl.[4] G01R *33/022*, *33/032*; G02F *1/09*
U.S. Cl. 324—244 **22 Claims**



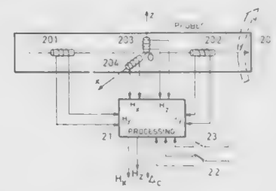
1. A measurement head for a magnetic field gradient vector measuring apparatus comprising an emission device for emitting respectively from opposite faces thereof a first and second linearly polarized light beam propagating along the same axis of propagation in opposite directions a first and second cell made from magnetic material spaced from said emission device on opposite sides thereof, each cell comprising an input face and an output face aligned along the axis of the light beam and allowing, therewithin, guided propagation of one of the beams as well as rotation of the polarization direction of the beam during its propagation as a function of the magnetic field at the cell; first and second means each associated with a respective cell for measuring the polarization rotation associated with each cell along the axis of the light beam, each of said means for measuring receiving the beam after it has passed through the associated cell; difference computing means receiving measurement signals from said first and second measuring means and supplying in exchange information representative of the difference between the two measurement signals indicating the gradient of the magnetic field between said two measurement points.

4,731,582

METHOD AND APPARATUS FOR CORRECTING ALIGNMENT ERRORS IN A MAGNETOMETER SYSTEM

Gilles Posseme, and Germain Guillemin, both of Brest, France, assignors to Thomson CSF, Paris, France

Filed Jan. 14, 1985, Ser. No. 691,138
Claims priority, application France, Jan. 24, 1984, 84 01051
Int. Cl.[4] G01R *33/022*, *33/025*
U.S. Cl. 324—245 **2 Claims**



1. A process for the automatic compensation of mechanical errors of a magnetic gradientmeter, comprising the steps of:
aligning a first measuring magnetometer along an axis, oy, and measuring a component, Hy, of a magnetic field F, having a given orientation along the axis oy;
subsequently aligning a second measuring magnetometer along an axis OY, which is an axis having a slight error of alignment with the axis oy, and measuring a component H'y of the magnetic field f along the axis OY;
subsequently substracting H'y from Hy so as to obtain a measured value Δm, of the gradient;
aligning two additional magnetometers respectively along two axes, ox and oz, which are perpendicular to each other and perpendicular to the axis oy, and measuring two components, Hxm and Hzm, of the field F, along these two axes, ox and oz;
orienting the axis oy of the gradient-meter in an east-west direction in the earth's magnetic field;
rotating the gradientmeter about its axis oy and measuring components Δ1 and Δ2 of said gradient m with said two additional magnetometers, said measurements 1 and 2 being measurements for which the first and second magnetometers, respectively give a zero measurement;
obtaining calibration coefficients as:

$$kx = \frac{\Delta 1}{F} \text{ and } kz = \frac{\Delta 2}{F} ;$$

using said calibration coefficients, kx and kz, to obtain two error terms kx·Hxm and kz·Hzm; and
subtracting said two error terms from said measured value m, to obtain the corrected value of the gradient, c.

4,731,583

METHOD FOR REDUCTION OF MR IMAGE ARTIFACTS DUE TO FLOWING NUCLEI BY GRADIENT MOMENT NULLING

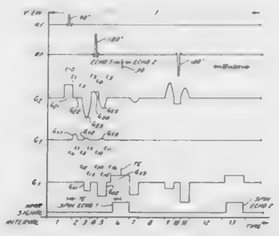
Gary H. Glover, Oconomowoc, Wis., and Matthew O'Donnell, Schenectady, N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 15, 1985, Ser. No. 798,544
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **9 Claims**

1. A method of compensating for random phase accumulations in magnetic resonance signals acquired from a region of an object having stationary and flowing nuclear spins, said method including the implementation of a plurality of views, each of which includes irradiation of said region by an RF excitation pulse at the Larmor frequency to produce a spin-echo signal at a time TE, and application of a pulsed magnetic field gradient having adjustable amplitude and duration parameters along at least one dimensional axis of said region, said

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random phase accumulations being due to fluctuations of flow velocity of said flowing spins from view to view, said method comprising the improvement:

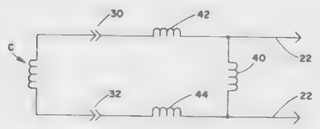


modifying at least one of said amplitude and duration parameters so as to make at least one of the higher moments of said magnetic field gradient equal zero by satisfying for said flowing nuclear spins the equation:

$$\gamma v_\alpha \int_0^{TE} G_\alpha(t')\, t'\, dt' = 0$$

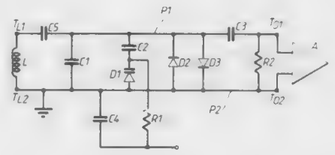
where $\alpha = x$, y, or z,
v is the velocity of nuclear spin flow in the direction of α,
TE is the time occurrence of the spin-echo signal,
G_α is the gradient in the direction, and
γ is the gyromagnetic ratio.

4,731,584
MAGNETIC RESONANCE PROBE FOR OPERATION AT FREQUENCIES ABOVE SELF RESONANCE
George J. Misic, Novelty, and John L. Patrick, Solon, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio
Continuation-in-part of Ser. No. 765,708, Aug. 14, 1985, and a continuation-in-part of Ser. No. 641,570, Aug. 16, 1984, Pat. No. 4,634,980. This application Aug. 14, 1986, Ser. No. 897,046
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **19 Claims**



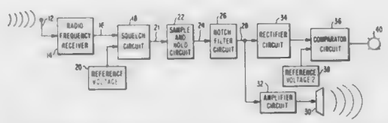
1. A magnetic resonance spectrometer comprising:
a probe for at least receiving radio frequency magnetic resonance signals from a sample, the probe having a self resonance frequency above which the probe is capacitively reactive and below which the probe is inductively reactive;
a magnetic field means for selectively generating a magnetic field adjacent the probe;
a radio frequency transmission line for conveying the magnetic resonance signals from the probe to a radio frequency receiver means; and,
an inductive matching network directly connecting the probe and the transmission line for matching reactive and resistive impedance of the probe with the resistive impedance of the transmission line, the matching network having a net inductive reactance at frequencies above the self resonance frequency, such that the probe is operable in a resonance mode at frequencies above the self resonance frequency.

4,731,585
ANTENNA COUPLING CIRCUIT FOR MAGNETIC RESONANCE IMAGING
Timothy R. Fox, Chicago, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 24, 1987, Ser. No. 18,161
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **10 Claims**



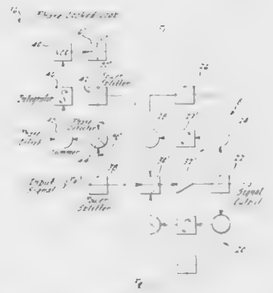
1. A coupling circuit for coupling an inductive coil antenna of a magnetic resonance imaging system to receiver circuitry, said coupling circuit comprising:
capacitive means, coupled in parallel with said antenna, for providing capacitive reactance in said coupling circuit;
resistive means, coupled in parallel with said antenna and with said capacitive means, for providing resistance R in said coupling circuit when the inductive reactance of said coupling circuit is equal to the capacitive reactance of said coupling circuit; and
capacitive transformer means, coupled between said antenna and said receiver circuitry in series with said antenna, for transforming said resistance value R of said resistive means into a transformed resistance value R', thereby increasing the apparent resistance of said coupling circuit in parallel with said antenna.

4,731,586
ELECTRICAL NOISE DETECTOR FOR DETECTING POWER LINE GAP DEFECTS
Mark D. Perkins, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 14, 1985, Ser. No. 798,255
Int. Cl.[4] G01R *31/08, 31/12*
U.S. Cl. 324—536 **6 Claims**



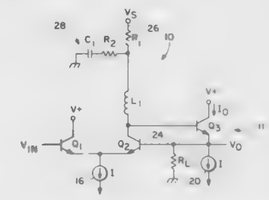
1. Apparatus for detecting a defect in power line equipment in response to broadband radio frequency electrical noise generated by such defect, comprising:
antenna for receiving radio frequency noise;
radio receiving means coupled to said antenna for producing first electrical signals of varying amplitudes representative of the received radio frequency noise;
means for generating second signals corresponding to time periods when the amplitude of the first signals are greater than a first predetermined level, said means for generating the second signals including a squelch circuit having first and second inputs, and a reference voltage, with the first signals being coupled to the first input and the reference voltage being coupled to the second input, said squelch circuit generating the second signals in response to the first signals, with the second signals corresponding to time periods when the first signals are greater than the reference voltage;
means for sampling said second signals and holding the levels of each of said second signals to their respective input values for a predetemined sampling time such that a third set of signals is produced thereby, said third set of signals being separate collections of groups of said second signals such that said third set of signals are essentially digitized, representations of said groups of second signals;
means for determining when said third set of signals have a predetermined periodic bandwidth associated with gap noise and for providing a fourth set signals in response to the recurrence of said third set of signals which have frequencies within said periodic bandwidth;
and, indicator means response to said fourth set of signals.

4,731,587
ENHANCED QUADRATURE NOTCH FILTER
Preben B. Jensen, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 10, 1985, Ser. No. 807,391
Int. Cl.[4] H03B *1/00;* **H03K** *5/00*
U.S. Cl. 328—167 **12 Claims**



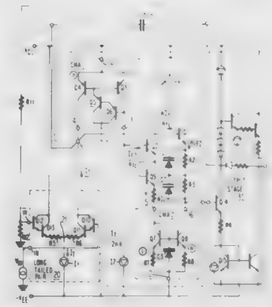
11. A quadrature notch filter for rejecting an undesired frequency component of an input signal, comprising:
an oscillator which generates an output signal that has substantially the same frequency as said undesired frequency component;
a quadrature hybrid circuit which splits said output signal into first and second reference signals, said first and second reference signals being 90° out of phase with each other;
an amplitude control loop circuit for each of said first and second reference signals which adds said first and second reference signals to said input signal in amplitudes which will cancel said undesired frequency component;
a hybrid circuit which produces a third reference signal having a phase which is between the phases of said first and second reference signals;
a phase detector circuit which compares the phase of said undesired frequency component with the phase of said third reference signal and produces a feedback signal that is related to the compared phase difference; and
an integrator circuit which controls said oscillator such that said oscillator will maintain a predetermined phase relationship between said undesired frequency component and said third reference signal.

4,731,588
GAIN SELECTABLE AMPLIFIER WITH RESONANCE COMPENSATION
John L. Addis, Beaverton; Clifford E. Baker, and Patrick A. Quinn, both of Aloha, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 14, 1986, Ser. No. 918,412
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—254 **12 Claims**



1. A resonance compensated feedback amplifier, comprising:
a differential input stage for receiving an input signal voltage;
an output stage coupled to the differential input stage to provide a voltage gain to the input signal voltage; and
a series resonance circuit coupled across the input and output stages for compensating for the resonance of the amplifier created by the feedback, the reactance of the series resonance circuit adjusted to counter gain peaking at the resonant frequency of the amplifier.

4,731,589
CONSTANT CURRENT LOAD AND LEVEL SHIFTER CIRCUITRY
Donald R. Preslar, Plainsboro, N.J., assignor to RCA Corporation, Somerville, N.J.
Filed Jul. 25, 1986, Ser. No. 889,209
Int. Cl.[4] H03F *3/26, 3/45*
U.S. Cl. 330—271 **9 Claims**



1. A level shifter comprising:
first and second terminals for receiving first and second operating potentials respectively;
a level-shifter input terminal;
a level-shifter output terminal;
first and second transistors of a first conductivity type, having respective collector electrodes each connected to said first terminal and having respective base and emitter electrodes between which current gains each equal to h_{fe} are exhibited;
first-transistor base-connection means for providing a direct-current-conductive path and a prescribed voltage between

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said level-shifter input terminal and the base electrode of said first transistor;

first-transistor emitter-connection means for providing a direct-current conductive path and a prescribed voltage between the emitter electrode of said first transistor and said level-shifter output terminal;

a first current mirror amplifier being of a second conductivity type complementary to said first conductivity type, having an input terminal, having an output terminal connected to said level-shifter input terminal, having a common terminal connected to said first terminal, and exhibiting a current gain of −n between its input and output terminals, n being a positive number;

second-transistor base-connection means for providing a direct-current-conductive path and a prescribed voltage between the input terminal of said first current mirror amplifier and the base electrode of said second transistor;

a second current mirror amplifier being of said first conductivity type, having an input terminal, having an output terminal connected to said level-shifter output terminal, having a common terminal connected to said second terminal, and exhibiting a current gain of −n between its input and output terminals; and

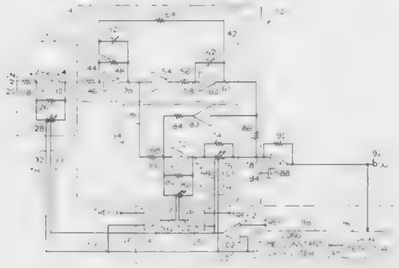
second-transistor emitter-connection means for providing a direct-current-conductive path and a prescribed voltage between the emitter electrode of said second transistor and the input terminal of said second current mirror amplifier.

4,731,590

CIRCUITS WITH MULTIPLE CONTROLLED GAIN ELEMENTS

Veikko R. Saari, Spring Lake Heights, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 3, 1986, Ser. No. 881,895
Int. Cl.⁴ H03G *3/10*
U.S. Cl. 330—278 **5 Claims**



1. Gain control apparatus having an input node adapted to be supplied with an input signal to be controlled and an output node for yielding an output signal representative of a gain controlled version of the input signal comprising:

a first gain control circuit including a first continuously controllable variable resistance network having control nodes for controlling the gain of said first gain control circuit;

a signal shaping section including a second continuously controllable resistance network having second control nodes for controllably varying the amplitude of an applied signal, said shaping section and said first gain control circuit being connected in tandem; and

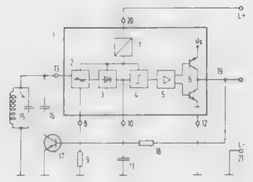
a single control-loop definition network means supplied with the output signal from the gain control apparatus output node for generating a first plurality of control signals which are monotonically related and are supplied to said first and second control nodes, said first and second continuously controllable resistance networks being responsive to said first plurality of control signals so that amplitude variation of said input signal is control said second continuously controllable resistance network for input signal amplitude values less than a predetermined value and by said first gain control circuit for input signal amplitude values greater than said predetermined value.

4,731,591

INDUCTIVE PROXIMITY SWITCH HAVING SWITCHED CAPACITOR FOR CONTROLLING HYSTERESIS

Reinhard Weigand, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,014
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543935
Int. Cl.⁴ G01V *3/11;* **H03B** *5/12*
U.S. Cl. 331—65 **2 Claims**



1. An inductive proximity switch comprising:

a resonator circuit having a resonator frequency and an output which changes in the proximity of an external object, said resonator circuit including a first capacitor;

an oscillator coupled to said resonator output and having an oscillator output coupled to means for generating an amplifier output;

a second capacitor; and

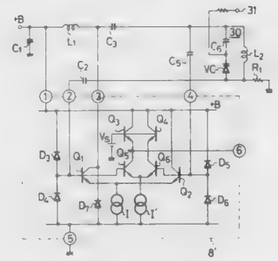
switching means responsive to said amplifier output for switching said second capacitor in parallel with said first capacitor for changing said resonator frequency.

4,731,592

VOLTAGE CONTROLLABLE OSCILLATOR

Akiro Sato; Jun Ono, both of Kanagawa; Kenichiro Kumamoto, and Koichi Ohya, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,355
Claims priority, application Japan, Dec. 16, 1985, 60-282326
Int. Cl.⁴ H03B *5/12*
U.S. Cl. 331—108 C **7 Claims**



1. An integrated voltage controllable oscillator comprising:

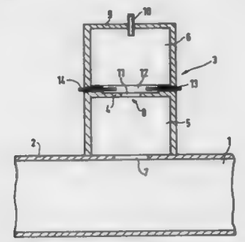
an integrated circuit including a transistor for oscillation having an emitter, a collector and a base connected to respective pins on said integrated circuit; a protective diode connected between said collector and ground; resonance circuit means externally connected to said collector and said base by way of said respective pins for oscillation; variable capacitance means for varying a resonance frequency of said resonance circuit means; and high impedance means connecting said resonance circuit means and said variable capacitance means to ground in a circuit for supplying a control voltage to said variable capacitance means, thereby reducing the influence of said protective diode on the operation of said resonance circuit means.

4,731,593

ATTENUATION AND TIME DELAY EQUALIZER FOR A WAVEGUIDE FILTER

Franz-Josef Görtz, Oppenweiler, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 8, 1986, Ser. No. 916,734
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536001
Int. Cl.⁴ H01P *9/00, 7/06, 1/20*
U.S. Cl. 333—28 R **13 Claims**



1. An arrangement for the equalization of attenuation and time delay in a microwave filter utilizing waveguide technology, the filter having time delay characteristics which vary as a function of frequency, comprising an equalizer composed of a multi-circuit cavity resonator coupled via a first coupling aperture to a waveguide which is connected to the filter, the multi-circuit cavity resonator having a longitudinal axis and including at least two individual waveguide sections coupled to each other via a second coupling aperture, the coupling apertures being dimensioned so that the individual waveguide sections and the waveguide are critically coupled with respect to time delay characteristics so that the time delay characteristics of the filter become substantially frequency-independent over a wide band of frequencies, the improvement wherein:

said multi-circuit cavity resonator includes power-absorbing tuning means for tuning all of said waveguide sections to substantially the same quality factor;

said second coupling aperture coupling said waveguide sections with each other presents a stepped cross section defining a first area and a second area having a larger cross section than said first area; and

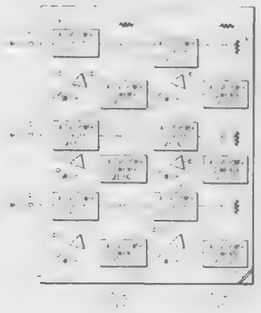
said multi-circuit cavity resonator includes at least two screws arranged symmetrically with respect to said longitudinal axis of said multi-circuit cavity and protruding laterally into said second coupling aperture in said second area of larger cross section, said screws influencing the time delay of said equalizer arrangement as a function of their depth of penetration into said second area.

4,731,594

PLANAR ACTIVE COMPONENT MICROWAVE SWITCH MATRIX AND AIR BRIDGE FOR USE THEREWITH

Mahesh Kumar, South Brunswick Township, Middlesex County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,101
Int. Cl.⁴ H04Q *1/00*
U.S. Cl. 333—103 **7 Claims**



2. A microwave planar switch matrix for connecting various ones of M inputs to various ones of N outputs, comprising in combination:

a semi-insulative substrate;

a ground plane disposed on one side of said substrate;

a plurality of conductors arranged as rows and columns positioned on the other side of said substrate, respective ones of the row conductors being coupled to respective ones of the M inputs, respective ones of the column conductors being coupled to respective ones of the N outputs, the intersections of the rows and columns forming the coordinates of the matrix, said row and column conductors not being electrically connected at said intersections;

a plurality M·N of two-way in phase power dividers, each located on said other side of said substrate, each having an input terminal and first and second output terminals, the dividers being positioned with their respective input terminals and respective first output terminals as part of the row conductors in proximity to respective ones of the M·N intersections;

a plurality M·N of two way in phase power combiners each located on said other side of said substrate, each having an output terminal and first and second input terminals, the combiners being positioned with their respective first input terminals and respective output terminals as part of the column conductors in proximity to respective ones of the M·N intersections;

a plurality M·N of swithes connected between respective second outputs of the power dividers and respective second inputs of the power combiners positioned in proximity to the M·N intersections;

an air bridge conductive assembly suitable for passing row and column signals along the row and column conductors at the row and column intersections, said air bridge comprising:

each of said row conductors being generally of width W but including at each of said M·N intersections a portion of uniform. reduced width less than W being of length at least W, each of said row conductors further including, at respective ends of each said uniform reduced width portion, a tapered conductor portion tapering from width W to the width of said uniform reduced width portion;

each of said column conductors having a gap at the intersection with each said row conductor, said gap being laterally centered about the reduced width portion of said first

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conductor and at least W in length centered about the center line of said row conductor; and

for each column conductor gap, a conductive ribbon bonded to the ends of the column conductor forming said gap, said ribbon passing over and being raised above the reduced width portion of said row conductor.

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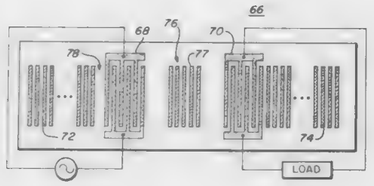
RESONATOR STRUCTURE

Peter V. Wright, Dallas, Tex., assignor to RF Monolithics, Inc., Dallas, Tex.

Filed Jan. 24, 1986, Ser. No. 822,233

Int. Cl.[4] H03H *9/15*

U.S. Cl. 333—195 **13 Claims**



1. A resonator structure comprising:

a. a piezoelectric substrate,

b. first and second spaced gratings of λ/4 electrodes attached to said substrate,

c. input and output spaced transducer structures having λ/4 electrodes and attached to said substrate between said first and second gratings for generating standing waves in said substrate, and

d. an aperiodic cavity formed on said substrate between only one of said gratings and one of said transducers.

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BAND-PASS FILTER FOR HYPERFREQUENCIES

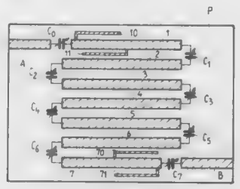
Jean-Claude Cruchon, Bouffemont; Gilbert Prost, Paris, and Jean-Pierre Marquet, St Leu La Foret, all of France, assignors to Alcatel Thomson Faisceaux Hertziens, Levallois-Perret Cedex, France

Filed Feb. 26, 1986, Ser. No. 832,783

Claims priority, application France, Feb. 27, 1985, 85 02850

Int. Cl.[4] H01P *1/20*

U.S. Cl. 333—204 **2 Claims**



1. Band-pass filter for hyperfrequency electromagnetic waves, comprising, in series from an electrical standpoint, n+2 elements (n being a positive integer) formed by an input line, n linear resonators open at both ends and all sustantially of a given length b/2, and an output line, the resonators being arranged in the order of the first to the n-th between respectively the input line and the output line, wherein a combination of n+1 capacitors are provided to respectively couple the input line to the first end of the first resonator, the second ends of the i-th resonators to the first ends of the (i+1)th resonators (i being an integer from 1 to n−1, inclusive) and the second end of the n-th resonator to the output line, and at least one pair of auxiliary linear resonators of length λs/4 λs being the wavelength to be rejected and less than λb) where b is the wavelength corresponding to the center frequency of the filter pass-band, the auxiliary λb/4 resonators of a pair, each pair having one end connected to one of the n+2 elements and being spaced an electrical distance (2 k+1) apart (k being an integer greater than −1), and wherein the linear resonators are half wave conductive strips open at both ends and situated in parallel and along at least a part of their length which are colinear to create a highly compact filter and permitting the auxiliary resonators to be located anywhere along the electrical path between the two filter leads as long as the distance therebetween is maintained at (2 K+1)λb/4.

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ELECTROMAGNETIC RELAY

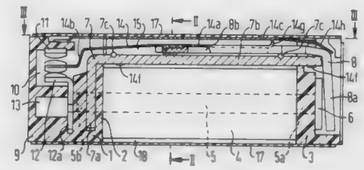
Fritz Hinrichs, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 917,972

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538636

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—128 **13 Claims**



1. An electromagnetic relay having a connecting plane, comprising:

a coil member having an axially extending core and a winding;

an angular yoke having a long leg extending parallel to the axis of said coil;

an angled armature seated at an end edge of said long leg of said yoke and having a long armature leg;

a contact spring extending substantially parallel to said long leg of said yoke and to said long armature leg and having a contact spring leg;

an end face shoulder formed as an extended portion at an end of said coil member;

at least one cooperating contact element anchored in said end face shoulder;

said contact spring interacting with said at least one cooperating contact element;

said angular yoke and said angled armature and said contact spring each having a principal plane next to said winding and substantially perpendicular to the relay connecting plane;

a connecting plate connected to said contact spring and forming a channel between said connecting plate and said long yoke leg for said long armature leg and for said contact spring leg, said connecting plate forming a lateral terminating wall of said relay;

a terminal pin connected to said connecting plate for electrical communication with said contact spring and extending from an underside of said relay;

said coil member and said connecting plate forming the contours of a cuboid housing;

foil applied over at least two sides of said cuboid housing covering openings in said housing; and

said underside of said relay being free of said foil.

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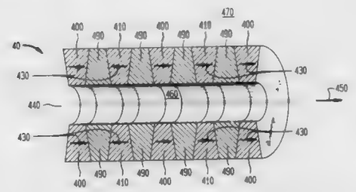
PERIODIC PERMANENT MAGNET STRUCTURE WITH INCREASED USEFUL FIELD

John P. Clarke, Cranford, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1987, Ser. No. 89,100

Int. Cl.[4] H01F *7/00*

U.S. Cl. 335—210 **19 Claims**



1. A device for manipulating a charged particle beam traveling along a beam path, said device comprising:

a pair of similar permanent magnets, one of said magnets having its magnetization aligned parallel to said beam path and in a direction opposite to the magnetization of the other said magnet;

an interstitial pole piece interposed between said magnets;

said magnets and interstitial pole piece aligned adjacent to and parallel to said beam path; and,

one said interstitial pole piece cross section, in a plane which contains said beam path, being tapered away from said beam path.

4,731,599

COMBINED HIGH-VOLTAGE CURRENT AND VOLTAGE TRANSFORMER

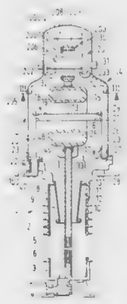
Norbert Preissinger, Litzendorf, Fed. Rep. of Germany, assignor to MWB Messwandler-Bau AG, Bamberg, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,682

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608388; Mar. 13, 1986, 3608389; Mar. 13, 1986, 3608390

Int. Cl.[4] H01F *15/04, 27/02, 40/08*

U.S. Cl. 336—84 C **27 Claims**



1. A combined high voltage current and voltage transformer of head-type construction, comprising top housing means, a column of insulating material carrying the top housing means, a current transformer means, a voltage transformer means, the active parts of the current transformer means and above the same the active parts of the voltage transformer means being arranged in the top housing means, the current transformer means including a secondary system and primary conductor means constructed U-shaped whose base extends at least approximately concentrically through the ring of the secondary system of the current transformer means and whose two leg portions project downwardly, the top housing means including a closure plate means and a hood means, the two legs of the U-shaped primary conductor means of the current transformer means being secured exclusively on said closure plate means from the inside thereof, at least one of the legs being electrically insulated from the metallic closure plate means and being adapted to be contacted through the closure plate means from the outside and from below, and the ring of the secondary system of the current transformer means being also secured exclusively on the closure plate means by way of support means.

4,731,600

FUSE

Philip Rosen, Bridgeford, England, assignor to Brush Fusegear Limited, Leicestershire, England

Filed Dec. 11, 1986, Ser. No. 940,616

Claims priority, application United Kingdom, Dec. 17, 1985, 8531026

Int. Cl.[4] H01H *85/04*

U.S. Cl. 337—159 **12 Claims**



1. A General-Purpose fuse having first and second fuse parts, said first fuse part serving as current limiting means at high fault currents and said second fuse part serving as current interrupting means at lower fault currents, each fuse part comprising at least one monolithic ribbon-like fuse element common to said fuse parts, said fuse element in said first fuse part having a plurality of longitudinally spaced constrictions of longitudinal extent therein, and said fuse element in said second fuse part having a longitudinally elongated constriction positioned intermediate a first and a second end of said second fuse part, the longitudinal extent of said constriciton in said second fuse part exceeding the longitudinal extent of at least one of said constrictions in said first fuse part, said fuse element being of a reduced cross section at said constrictions with the cross section of said constriction in said second fuse part being the same as or greater than the reduced cross section of said fuse element at at least one of said constrictions in said first fuse part.

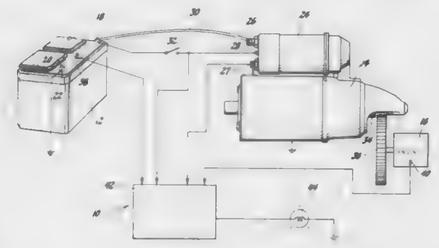
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,601

CRANKING SYSTEM PERFORMANCE INDICATOR

Robert J. Nowakowski, Indianapolis; Van V. Reisberg, Jr., Anderson, and Robert P. MacKenzie, Muncie, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,413
Int. Cl.[4] B60Q *1/00*; G01M *19/00*
U.S. Cl. 340—52 R **5 Claims**



1. In a cranking system including an internal combustion engine requiring a minimum cranking speed for starting, a storage battery having a capacity that decreases with decreasing battery temperature and increasing current load on the battery, and an electric cranking motor drivingly engaged with the engine when current is supplied from the battery to the cranking motor, the current required by the cranking motor to crank the engine increasing with decreasing temperature of the engine, and further including a predetermined low limit operating condition corresponding to a minimum battery and engine temperature at which it is desired that the cranking system be capable of achieving the minimum cranking speed, a method of testing the cranking system during engine cranking, comprising the steps of:

a. storing a schedule of minimum battery voltage values as a function of battery temperature and engine temperature values, the stored value at each combination of engine and battery temperature values representing the minimum capacity of the battery required to achieve the minimum cranking speed at the predetermined low limit operating condition;

b. measuring the temperature of the engine;

c. measuring the temperature of the battery;

d. measuring the voltage of the battery during cranking of the engine;

e. comparing the measured voltage of the battery with the voltage value in the stored schedule corresponding to the measured battery and engine temperatures; and

f. indicating the condition of the cranking system based upon the comparing step, whereby the indication represents a forewarning of an impending failure of the cranking system to achieve the minimum cranking speed at the predetermined low limit operating condition.

4,731,602

CONVERTER

Ikuro Hata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1986, Ser. No. 910,518
Claims priority, application Japan, Sep. 24, 1985, 60-210763
Int. Cl.[4] H03M *1/50*
U.S. Cl. 340—347 MT **8 Claims**

1. An analog-to-digital converter comprising:

a signal input terminal;

an integrator connected to said signal input terminal;

a plurality of constant current sources connected to said integrator so that said integrator is supplied with respective constant currents;

counter means including a first counter having a first predetermined number of bits for higher significant bits and a second counter having a second predetermined number of bits for lower significant bits; and

clock signal generating means for generating a first clock signal having a first clock frequency and being supplied to said first counter and a second clock signal having a second frequency higher than said first clock frequency and being supplied to said second counter;



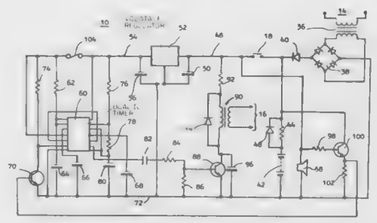
said plurality of constant current sources having respective currents which are determined according to said first and second predetermined numbers of bits and said first and second clock frequencies of said first and second clock signals, respectively.

4,731,603

TACTILE ALARM SYSTEM FOR GAINING THE ATTENTION OF AN INDIVIDUAL

Elizabeth McRae, and Cameron McKenzie, both of Glasgow, Scotland, assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 19, 1986, Ser. No. 864,534
Claims priority, application United Kingdom, Aug. 30, 1985, 8521675
Int. Cl.[4] G08B *5/22*
U.S. Cl. 340—407 **18 Claims**



1. A tactile alarm system comprising:

a transmitter unit, said transmitter unit including transmit means for generating and transmitting a predetermined transmitted signal.

said transmit means comprising monostable timer means and astable multivibrator means, alarm activator means coupled to said timer means for initiating upon activation a timeout mode in said timer means, said multivibrator means being responsive to said timeout mode for generating said predetermined transmitted signal for the period of operation of said timeout mode.

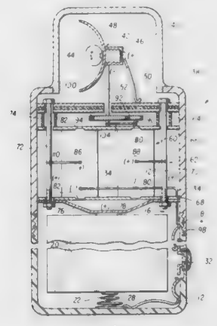
a source of electrical power coupled to a first power rail for supplying electrical energy to said transmit means, a fuze connecting said timer means to said first power rail for protecting said timer means from excess currents flowing therethrough as a result of a fault condition, the blowing of said fuze and resultant disconnection of said timer means from said first power rail causing said multivibrator means to initiate the continuous generation of said predetermined transmitted signal, thereby providing an indication of the occurrence of said fault condition.

4,731,604

PORTABLE DISTRESS SIGNAL DEVICE FOR INDICATING TROUBLED SITUATIONS AND METHOD FOR ITS MANUFACTURE

Thomas J. Pawlowski, Jr., 921 Jeremy La., Libertyville, Ill. 60048

Filed Aug. 7, 1986, Ser. No. 894,042
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—574 **15 Claims**



1. A portable distress sigal device comprising

casing means for receiving current storage means with positive and negative terminals and having an ON-OFF switch connected in series therewith,

dome member of generally transparent material having an end portion for receiving a signal means and an enlarged portion for receiving control means and an engaging portion distal to the end portion for connecting securably with a mating engaging portion of the casing means, the control means including frame means having respective current terminals for engaging with the terminals of the casing means,

buzzer and motor means in the control means connected in parallel circuit relation with the terminals of the frame means in the dome member,

a shaft of the motor means driving reduction gears one of which in turn is connected to a proximate end of a support metal shaft extending within the dome member and drives the shaft in rotation,

means supporting a reflector and bulb holder at a distal end of the support metal shaft and for supplying current thereto from one of the terminals of the frame means,

a metal disk having a central opening for passing the support metal shaft therethrough and the metal disk being mounted on the frame means connected to the other of the terminals of the frame means, and

means mounted on the reflector and bulb means extending in trolley contact with the metal disk for completing the circuit of the one terminal to the other terminal of the frame means.

4,731,605

REMOTE GARAGE DOOR OPENER CONVERSION

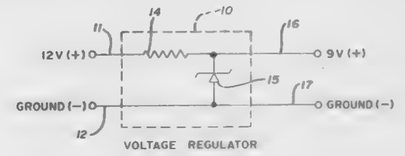
James E. Nixon, 2023 Belmont Ave., Youngstown, Ohio 44505

Filed Feb. 20, 1987, Ser. No. 17,132
Int. Cl.[4] H04Q *9/14*
U.S. Cl. 340—696 **4 Claims**

1. A process of converting a garage door opener transmitter having a battery within to be mounted in an automobile and powered by the automobile's electrical system comprising of the steps of:

a. Replacing the battery within the transmitter with a voltage regulator,

b. Permanently closing an activation switch on said transmitter,



c. Securing said transmitter in an engine compartment of said automobile,

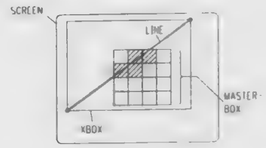
d. Interconnecting a switch within said automobile to the automobile's electrical system and to said voltage regulator.

4,731,606

METHOD FOR RAPID WINDOWING OF DISPLAY INFORMATION IN COMPUTER GRAPHICS

David F. Bantz, Chappaqua, and Carlo J. Evangelisti, Jefferson Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1985, Ser. No. 762,348
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—709 **7 Claims**



1. A method for facilitating rapid windowing of image data in computer graphics wherein the picture data stored in refresh memory is organized in a hierarchical tree structure made up of connected nodes such that the entire picture is represented by the top node and parts of the picture are represented in descending nodes from said top node so that at the most bottom nodes (leaves) of the tree, a graphic primitive, representing a vector, string of text, or image raster data, make up the displayable picture, including the steps of:

(a) dividing the displayable picture represented in a two-dimensional co-ordinate system into a number of boxes,

(b) defining a master box greater than or equal to one of said boxes,

(c) establishing a window of a preset number of said boxes less than or equal to the size of said master box such that said window represents the area of said picture which is to be displayed on the screen,

(d) locating said window in relationship to said master box such that said window is contained in said master box, then

(e) mapping bits of data called summaries into an NxN matrix, wherein NxN is equal to the number of boxes within the master box such that if a graphic primitive lies within a box within said master box then the summary has entered therein a one value and computing said summaries for branch nodes throughout said tree by ORing the summaries associated with the nodes of the tree and placing the result in an upper branch node and proceeding to OR

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the resulting summaries at the node branches of the tree in an ascending manner up the tree until the summary associated with the upper most node of the tree has been computed,

(f) traversing said data tree from the summary for the top node of the tree through the summaries for said sub-nodes of the tree using the one value of the bits in said summaries to determine which of the branches of the tree contain graphic primitives at their nodes

(g) identifying the location of the primitives within the grid of boxes,

(h) clipping the graphic primitive to the size of said window box

(i) displaying said clipped graphic primitives to render the image to the viewer.

4,731,607

DATA INPUT AND DISPLAY DEVICE FOR A NUMERICAL CONTROL GRINDING MACHINE

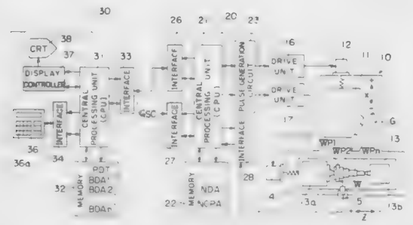
Takao Yoneda, Toyoake; Yasuji Sakakibara, Hekinan, and Norio Ohta, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 2, 1986, Ser. No. 815,507

Claims priority, application Japan, Feb. 15, 1985, 60-29001

Int. Cl.⁴ G09G *3/02*

U.S. Cl. 340—711 **3 Claims**



1. A data input and display device for a numerical control grinding machine, comprising:

a display unit having a screen capable of displaying a shape of a cylindrical workpiece on which a number of first portions to be ground and at least one second portion not to be ground are axially arranged;

shape data input means for inputting shape data defining the shape of each of said first portions;

memory means coupled to said shape data input means for storing said shape data input by said shape data input means;

main display control means coupled to said memory means and said display unit for controlling displaying on said screen of said display unit the shapes of said number of first portions based upon said shape data stored in said memory means; and

auxiliary display control means coupled to said memory means and said display unit for controlling displaying on said screen of said display unit the shape of said at least one second portion based upon said shape data which are stored in said memory means for said number of first portions;

wherein said at least one second portion is between one of said first portions and another of said first portions, and the shape data input by said shape data input means includes coordinate data defining an end point of said one of said first portions and a beginning point of said another of said first portions; and

said auxiliary control means comprising,

means for converting said coordinate data into corresponding coordinate values on the screen of the display unit, and

means for controlling the display on the screen such that the coordinate values on the screen are visually interconnected,

whereby said auxiliary display control means is operable to display on said screen of said display unit the shape of said at least one second portion in such a manner as to interconnect the shapes of said one first portion and said another first portion.

4,731,608

IMAGE CONTROL UNIT FOR A VIDEO DISPLAY UNIT

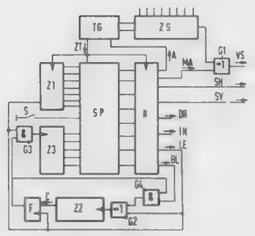
Roland Roth, Holzkirchen, and Ivan Furjanic, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,113

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427810

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—734 **11 Claims**



1. An image control unit for a video display for generating control signals serving to construct an image on a display unit, including, in combination, a storage device for storing a plurality of sequence control words corresponding to groups of one or more raster lines displayed on said display unit, each of said sequence of control words being associated with a block of identical raster lines to be displayed, a first counter having an output connected to address inputs of said storage device, means for incremeting said first counter for each character to be represented on said video display, whereby said storage device successively reads out control words corresponding to the characters to be represented on a raster line of said display device, a second counter, means connected to said second counter and to said storage device for setting said second counter to a predetermined block length, in accordance with said control words, said second counter being connected to receive an output from said storage device corresponding to a raster line-end signal stored therein to count the raster lines of a block, and a third counter having its output connected to address inputs of said storage device and its input connected to an output of said second counter, whereby said third counter is incremented after a given sequence of control words when said storage device has been accessed a number of times equal to the number of raster lines in its associated block.

4,731,609

FAST CORRELATION OF MARKERS WITH GRAPHIC ENTITIES

David C. Reynolds, Boulder, and Michael Wong, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1986, Ser. No. 926,928

Int. Cl.⁴ G06F *15/60*; G09G *1/16*

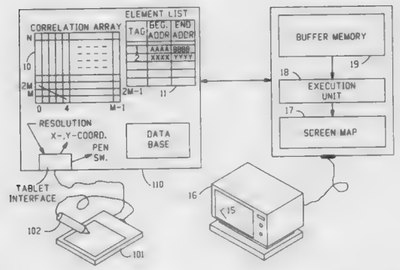
U.S. Cl. 340—747 **3 Claims**

1. In a graphics system wherein displayed entities are selected by a moveable cursor positioned by a device supplying x,y coordinates of said cursor, the method of correlating said cursor to a displayed entity comprising the steps of:

storing displayed entities as a bit map of pels at x,y coordinates corresponding to the pels' positions in a display of said bit map;

identifying each displayed entity with a uniquely assigned tag;

inserting in each cell of a correlation array the tag of a displayed entity occupying a location in said bit map corresponding to said cell;



convering said x,y coordinates of the cursor to a cell number in said correlation array corresponding to the same x,y coordinates in said bit map; and

identifying said correlated entity by the value inserted in the cell of the correlation array addressed by the converted coordinates.

4,731,610

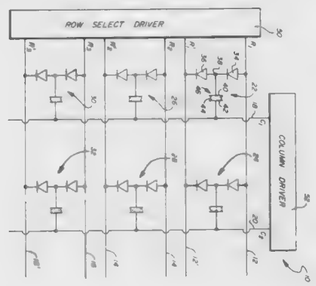
BALANCED DRIVE ELECTRONIC MATRIX SYSTEM AND METHOD OF OPERATING THE SAME

Yair Baron; Walter E. Chapelle, both of Southfield; Shui-Chih A. Lien, Troy, and Clive Catchpole, Birmingham, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Jan. 21, 1986, Ser. No. 821,023

Int. Cl.⁴ G09G *3/34*

U.S. Cl. 340—784 **20 Claims**



1. A method of operating an electronic matrix system to rapidly store and efficiently retain electric charge in selected ones of a plurality of storage elements of the matrix system, said method comprising the steps of:

providing a plurality of substantially parallel address line pairs;

providing a plurality of substantially parallel additional address lines crossing said address line pairs at an angle and being spaced from said address line pairs to form a plurality of crossover points therewith;

coupling a pair of threshold devices together at a common node and in nonopposing series relation between said address line pairs and associated with said crossover points, said threshold devices being of the type which provide a low impedance to current flow when forward biased into an on condition;

coupling each of said storage elements between a respective one of said common nodes and one of said additional address lines;

applying first operating potentials which are substantially equal in magnitude and opposite in polarity between said address line pairs to bias said threshold devices into said on condition to facilitate the storage of charge in the storage elements coupled thereto; and

applying charging potential to selected ones of said additional address lines during the application of said first operating potentials to said address line pairs to store electric charge in said selected storage elements.

4,731,611

STRIPLINE DOPPLER RADAR

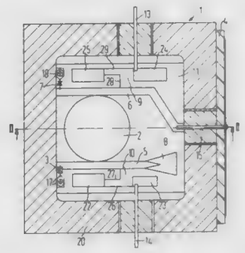
Jörg Müller, Buchholz, and Andreas Reppekus, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,674

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322304

Int. Cl.⁴ G01S *13/50*

U.S. Cl. 342—28 **26 Claims**



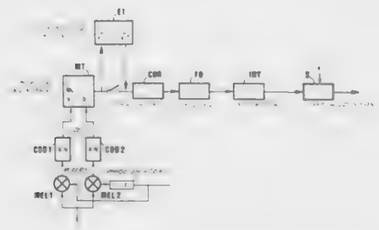
1. Stripline Doppler Radar, comprising at least one high-frequency oscillator, a first stripline conductor connected to said oscillator, a second stripline conductor spaced from said first stripline conductor, at least one receiving diode connected to said second stripline conductor, an antenna connected to said second stripline conductor, low frequency external electrical terminals, filters connected between said stripline conductors and said external electrical terminals for inhibiting leakage of high-frequency power through said external electrical terminals, and a dielectric resonator adjustable to an optimal position in a range from a location between said stripline conductors to a location partially covering one of said stripline conductors for conducting power delivered by said oscillator through said stripline conductor and said dielectric resonator to said receiving diode and said antenna, and wherein the ratio between the power received through the antenna and the power transmitted from said oscillator through said resonator directly to said receiving diode is such that optimal sensitivity of the doppler radar is attained.

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4,731,612
METHOD AND APPARATUS FOR ELIMINATING SHORT PULSES IN A DOPPLER RADAR

Claude A. Chalard, Montigay Le Bretonneux, and Christian F. H. Trilles, Velizy-Villacoublay, both of France, assignors to Laboratoire Central de Telecommunications, Velizy Villacoublay, France

Filed Jan. 27, 1984, Ser. No. 588,935
Claims priority, application France, Jan. 28, 1983, 83 01323
Int. Cl.[4] G01S 7/30, 7/44
U.S. Cl. 342—94 3 Claims



1. A method for eliminating short pulses in a pulse Doppler radar, the pulse repetition period of which is divided into N range gates, comprising the steps of:

delaying components a_{ij} and b_{ij} of a sample V_{ij} of the received signal vector by a time delay equal to the duration Tr of the repetition period, where i and j are sub-indices designating the ith repetition period and the jth range gate of the latter period;

determining the vector $\Delta V_{ij}=V_{ij}-V_{i-1\,j}$, which is the difference between the received signal vector and the signal vector received in the same range gate during the preceding repetition period, by calculating the square $\Delta\rho_{ij}^2$ of the modulus of said vector ΔV_{ij} from the components a_{ij} and b_{ij} and the preceding delayed components $a_{i-1\,j}$ and $b_{i-1\,j}$;

delaying the squared modulus $\Delta\rho_{ij}^2$ by the duration Tr of a repetition period;

comparing the squared modulus and the delayed squared modulus $\Delta\rho_{i-1\,j}^2$ corresponding to the preceding repetition period and determining whether they satisfy the inequalities

$$\Delta\rho_{i-1\,j}^2-K\leq\Delta\rho_{ij}^2\leq\Delta\rho_{i-1\,j}^2+K$$

where K is a measurement noise threshold;

storing information indicative of "No short pulse" if the inequalities are satisfied;

if the inequalities are not satisfied, storing information corresponding to "Short pulse detected" when the information corresponding to the $i-2^{th}$ repetition period is "No short pulse" and information corresponding to "No short pulse" when the information corresponding both to the $i-2^{th}$ and $i-1^{th}$ repetition periods is "Short pulse detected";

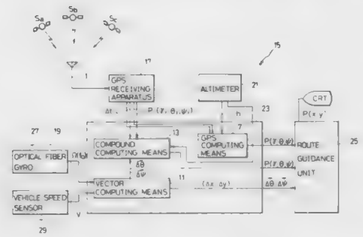
delaying the stored information by time delays respectively equal to the duration Tr of the repetition period and twice said duration 2Tr for making available at each moment information relative to the present i^{th} repetition period and said delayed information relative to the $i-1^{th}$ and to the $i-2^{th}$ repetition periods; and

transmitting, for the subsequent processing of the signal, the delayed components $a_{i-1\,j}$ and $b_{i-1\,j}$ instead of the components a_{ij} and b_{ij} when the information is "Short pulse detected" and the delayed information is "No short pulse" for both the $i-1^{th}$ and $i-2^{th}$ repetition periods and transmitting the components a_{ij} and b_{ij} in all the other cases.

4,731,613
POSITIONING SYSTEM FOR A VEHICLE

Hiroshi Endo; Hiroshige Fukuhara, both of Yokosuka, Japan, and Motoki Hirano, Mountain View, Calif., assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 4, 1985, Ser. No. 804,511
Claims priority, application Japan, Dec. 7, 1984, 59-257485
Int. Cl.[4] G01S 5/02, 3/02; G01C 21/00; H04B 7/185
U.S. Cl. 342—357 8 Claims



1. A system for measuring the position of an object comprising:

receiving means for receiving navigational data radiated from a plurality of satellites and calculating position data and propagating delay time data based on the navigational data received from the plurality of satellites;

computing means, coupled to said receiving means, for calculating the position of the object when said receiving means receives navigational data from at least three satellites, based on the position data and the propagating delay time data calculated by the receiving means;

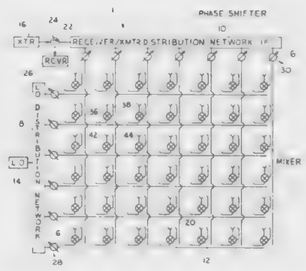
vector means for detecting the velocity and the angular velocity of the object and calculating a shifted vector amount caused by the displacement of the object during a predetermined time interval based on the detected velocity and the detected angular velocity of the object; and

compound computing means, coupled to said receiving means and said vector means, for calculating the position of the object when said receiving means receives data from at least one satellite but less than three satellites, based on the position data and the propagating delay time data calculated by the receiving means and the shifted vector amount calculated by the vector means.

4,731,614
PHASED ARRAY SCANNING SYSTEM

Patrick E. Crane, 13706 Chestersall Dr., Tampa, Fla. 33624

Filed Aug. 11, 1986, Ser. No. 895,421
Int. Cl.[4] H01Q 3/26, 3/00
U.S. Cl. 342—372 13 Claims

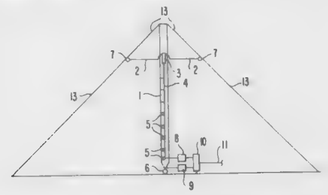


1. A phased array system having a circulator, a transmitter connected to the circulator, a receiver connected to the circulator, a receiver/transmitter IF distribution network connected to the circulator, M phase shifters connected to the receiver/transmitter IF distribution network, a local oscillator, a local oscillator distribution network connected to the local oscillator, N phase shifters connected to the local oscillator distribution network, an orthogonal array of M×N transmitting/receiving means, each of the receiving means comprising an IF mixing diode connected to one of the M phase shifters and to one of the N phase shifters.

4,731,615
METHOD AND APPARATUS FOR SEPARATELY CONTROLLING SKY WAVE AND GROUND WAVE RADIATION FROM A MEDIUM WAVE ANTENNA

Ogden L. Prestholdt, 8905 Maxwell Dr., Potomac, Md. 20854

Filed Sep. 18, 1985, Ser. No. 777,252
Int. Cl.[4] H01Q 21/00
U.S. Cl. 343—725 9 Claims



1. An antenna system for controlling the sky wave generated by a station in one or more azimuth directions psi and zenith directions theta comprising:

one or more vertical antenna configurations generating an electromagnetic field E, said field having a field component $E_{\theta V}$ determined with respect to the azimuth direction psi and the zenith direction theta;

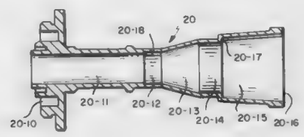
one or more horizontal antenna configurations generating another electromagnetic field, said another field having a further field component $E_{\theta H}$ determined with respect to the zenith direction theta and azimuth direction psi and having an additional field component $E_{\Psi H}$ oriented in the psi direction; and,

means for adjusting the magnitude of $E_{\theta H}$ and the phase of $E_{\theta H}$ generated by said horizontal antenna configuration for one or more angles of elevation of the station's ionospheric reflection corresponding to said azimuth directions psi such that $E_{\theta V}$ is substantially cancelled out by $E_{\theta H}$ at said angles of elevation and azimuth.

4,731,616
ANTENNA HORNS

David A. Fulton, 3 Pilgrim Rd., Watertown, Mass. 02172, and Christopher L. Slotta, 8 Daniel Dr., Bellingham, Mass. 02019

Filed Jun. 3, 1985, Ser. No. 740,876
Int. Cl.[4] H01Q 13/02
U.S. Cl. 343—786 8 Claims



7. An antenna horn comprising:

A. a first hollow waveguide section which is internally smoothly tapered and is of a circular cross section having a larger inside diameter of about 1.350 inches at one end which forms the aperature of the horn thereof and smoothly tapering down to an inside diameter of about 1.20 inches at the opposite end, said section having a length of about 1.250 inches and a step of a width of about 0.18 inches at the end opposite the aperature;

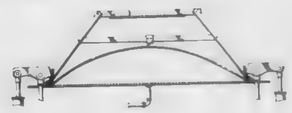
B. a second hollow waveguide section which has an inside diameter of about 1.020 inches throughout and is coupled to the end of the first section having the step, said second section having a length of about 0.450 inches; and

C. a third hollow waveguide section which is smoothly tapered and is of a circular cross section with a larger inside diameter of about 1.020 inches at the one end which is coupled to said second section and an inside diameter of about 0.645 inches at the other end, said third section having a length of about 0.750 inches.

4,731,617
APPARATUS AND METHOD FOR MAKING PARABOLOIDAL SURFACES

Robert E. Gray, Apt. #4, Pretoria Avenue, Ottawa, Ontario, K1S 1W9, Canada, and Donald F. Lahey, R.R. #2, Plantagenet, Ontario, Canada

Filed Aug. 19, 1986, Ser. No. 897,879
Int. Cl.[4] H01Q 15/14
U.S. Cl. 343—912 19 Claims



1. Apparatus for dishing a circular flat sheet of deformable material comprising:

(a) a base frame;

(b) a circular sheet-receiving table supported by the base frame;

(c) a plurality of clamping means supported by the base frame and spaced equally about the periphery of the table, the clamping means each having a clamping surface, each said clamping surface of each clamping means when in clamping position being oriented to direct clamping force downwardly towards the table surface;

(d) a rigid annular clamping ring having an upper surface to receive each of the clamping surfaces of the clamping means when in clamping position and a lower, clamping surface to bear against the upper surface of the sheet when in position on the table to evenly distribute the clamping forces from the clamping means about the lower clamping surface;

(e) an upstanding swaging means supported on the surface of the table to uniformly engage and upwardly turn the edge of the sheet when under clamping pressure from the clamping ring;

(f) fluid supply means communicating with the surface of the table to supply fluid between the sheet and table surface for deforming and thereby shaping the sheet;

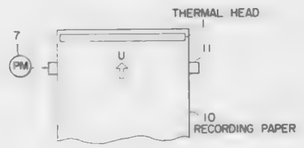
(g) control means associated with the fluid supply means for providing appropriate fluid for deforming and shaping the sheet; and

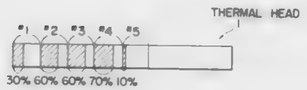
(h) gasket means on the table surface to extend between the table surface and the sheet to prevent fluid leaking during deformation of the sheet when the clamping means are in clamping position,

the clamping means to provide sufficient force on the clamping ring to hold the sheet in position, upwardly turn the edge of the sheet against the upstanding swaging means, prevent escape of fluid from between the sheet and table surface during the deforming operation and prevent inward slippage of the sheet.

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4,731,618
CONTROL METHOD FOR THERMAL RECORDING
Osamu Shimazaki, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan
Filed Mar. 6, 1987, Ser. No. 23,108
Claims priority, application Japan, Mar. 13, 1986, 61-55911
Int. Cl.[4] G01D *15/10;* **B41J** *3/20*
U.S. Cl. 346—1.1 **8 Claims**



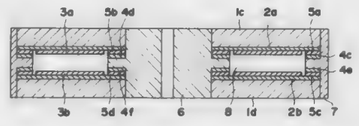


1. A recording control method for thermal recording which records image data on a recording medium with a line-type thermal head which comprises a plurality of heat resistor elements, which comprises the steps of:
dividing said heat resistor elements of said line-type thermal head into blocks in the number N;
counting the number of recording heat resistor elements in each block;
respectively summing the number of the recording heat resistor elements for each block in a predetermined direction;
sequentially recording data in a unit of one line by applying electric current to the recording heat resistor elements of each block simultaneously in a manner that the summed number is or less than a predetermined value; and
controlling amount of displacement of said recording medium with the number of groups of blocks which record simultaneously and said divisional number N.

4,731,619
THERMAL PRINTING HEAD
Kunihiko Miura, Hiratsuka, and Takashi Shimazaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 9, 1986, Ser. No. 883,715
Claims priority, application Japan, Jul. 18, 1985, 60-159129; Jul. 26, 1985, 60-165362; Sep. 12, 1985, 60-203176
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**

1. A thermal printing head, comprising:
a rod-like member having a cylindrical surface and a central axis;
a heating element array consisting of a plurality of heating elements arranged on said rod-like member along the axial direction thereof;
first electrodes arranged on said rod-like member, each of said first electrodes being connected to a corresponding one of said heating elements in said heating element array and extending in a first circumferential direction along said cylindrical surface of said rod-like member;
second electrodes arranged on said rod-like member, each of said second electrodes being connected to a corresponding one of said heating elements in said heating element array circumferentially opposite said first electrodes so that each of said heating elements is disposed circumferentially between one of said first electrodes and one of said second electrodes, each of said second electrodes extending in a second circumferential direction opposite said first circumferential direction along said cylindrical surface of said rod-like member; and
a common pattern commonly connecting said second electrodes and extending from said second electrodes in said second circumferential direction along said cylindrical surface of said rod-like member to a circumferentially distal edge proximate said first electrodes, said interconnected first electrodes, heating elements, second electrodes, and common pattern substantially encircling said rod-like member.

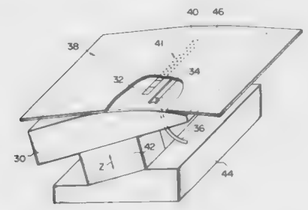
4,731,620
INFORMATION RECORDING MEDIUM
Masao Yabe, and Younosuke Takahashi, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Filed Feb. 12, 1987, Ser. No. 13,900
Claims priority, application Japan, Feb. 12, 1986, 61-28242
Int. Cl.[4] G01D *15/34*
U.S. Cl. 346—137 **11 Claims**



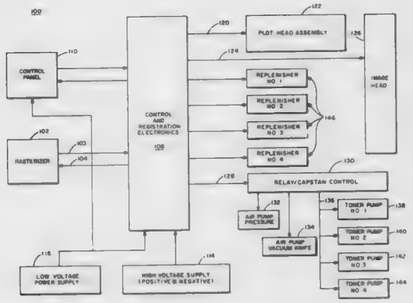
1. In an information recording medium comprising two disc-shaped substrates, said two substrates being combined with each other directly or via a ring-shaped inner spacer and a ring-shaped outer spacer by means of an adhesive, and a recording layer for writing or reading information with laser beam which is provided on the inner surface of at least one substrate,
the improvement wherein a layer of chlorinated polyolefin is provided between the substrate and the recording layer and further on the area where the substrate is combined with another substrate or the spacers, and said adhesive is an ultraviolet-curable epoxy adhesive which is arranged on the chlorinated polyolefin layer.

4,731,621
RECORDING APPARATUS HAVING PRINTING HEAD
Mamoru Hayamizu, Chiba; Ichiro Sano, Kawasaki, and Toshiaki Sakai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Soartec Corporation, Tokyo, both of, Japan
Filed Mar. 24, 1987, Ser. No. 29,775
Claims priority, application Japan, Mar. 25, 1986, 61-64819; Apr. 9, 1986, 61-80164; May 21, 1986, 61-114900; Nov. 14, 1986, 61-269791
Int. Cl.[4] G01D *15/16, 15/10*
U.S. Cl. 346—140 R **28 Claims**

1. A recording apparatus having a printing head, comprising:
a heating means support member having a plurality of heating means;
a film member which is in contact with said heating means support member to face said plurality of heating means and has a plurality of nozzle holes on a region facing said heating means;
an ink holding portion, arranged near said plurality of nozzle holes and on one of opposing surfaces of said film member and said heating means support member, for holding externally supplied ink; and
vibration generating means for vibrating said heating means support member to supply ink to said plurality of nozzle holes from said ink holding portion through a gap between the opposing surfaces of said film member and said heating means support member.

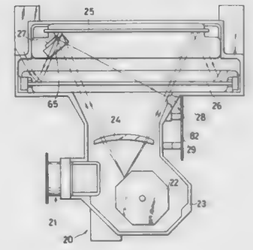


4,731,622
MULTIPLE INFORMATION ARRAY REGISTRATION APPARATUS AND METHOD
Anthony B. Hicks; Jerome L. Johnson, both of Irvine, and Charles H. Morris, II, Anaheim, all of Calif., assignors to Sanders Associates Inc., Nashua, N.H.
Filed Oct. 16, 1985, Ser. No. 787,874
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—157 **23 Claims**



1. In an imaging device including multiple recording means, haing first and second sets of pluralities of circuit means for imparting each pattern of indicia on a medium, for imparting at least first and second patterns of indicia on a medium and the recording means is moved in one direction with respect to the other in at least two passes, the improvement comprising: correction means, associated with and stationary with respect to the recording means, for selectively and substantially continuously imparting reference indicia to the medium and separating electrical signals corresponding to detected indicia position and recombining the signals of individual ones of the first and second sets of pluralities of circuit means for correcting for medium displacement in a direction generally perpendicular to the one direction of movement of the medium during at least one pass, whereby the first and second patterns are substantially continuously correctly registered with respect to each other on the medium during substantially all of each pass subsequent to the first pass.

4,731,623
IMAGE FORMATION DEVICE
Goro Oda, and Takashi Shiraishi, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 26, 1986, Ser. No. 911,990
Claims priority, application Japan, Sep. 30, 1985, 60-218406
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—160 **18 Claims**



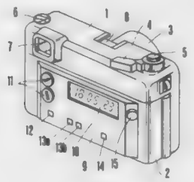
1. An image formation device for forming an electrostatic latent image on a photosensitive body by means of a laser beam comprising:
(a) a semiconductor laser for generating a laser beam to form an electrostatic latent image on the photosensitive body;
(b) a collimating lens for arranging the laser beam from said samiconductor laser into parallel beam;
(c) flattening means for flattening the laser beam from said collimating lens;
(d) scanning means for scanning by deflecting the laser beam from said flattening means in a main scanning direction, said laser beam being propogated along an optical path, said optical path having a mid-point between a surface of the photosensitive body and the scanning means;
(e) a first and second scanning lenses for cooperatively correcting the path of the laser beam so as to move the laser beam from said scanning means on the surface of said photosensitive body at a constant speed;
(f) said first scanning lens being arranged on the scanning means side of said mid-point;
(g) said second scanning lens being arranged on the photosensitive body side of said mid-point; and
(h) said second scanning lens having a power in the main scanning direction and a power in a sub-scanning direction which is at least several times stronger than the power in the main scanning direction.

4,731,624
DATA IMPRINTING DEVICE FOR A CAMERA
Toru Nagata; Chikara Aoshima, both of Kanagawa; Hiroshi Maeno, and Hideo Tamamura, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan
Continuation of Ser. No. 704,670, Feb. 25, 1985, abandoned.
This application Oct. 3, 1986, Ser. No. 915,915
Claims priority, application Japan, Feb. 25, 1984, 59-33344; Feb. 25, 1984, 59-33345; Feb. 25, 1984, 59-33347; Feb. 25, 1984, 59-33348; Feb. 25, 1984, 59-33349
Int. Cl.[4] G03B *17/08, 17/24;* **G06C** *7/02*
U.S. Cl. 354—64 **32 Claims**

1. A data imprinting device for a camera comprising:
(a) data imprinting means;
(b) data inputting means for inputting data to said data imprinting means, said date inputting means being arranged to input said data by a pressing force, from outside, of a first range;
(c) prohibition means for outputting a signal to prohibit the inputting of said data from said data inputting means, said prohibiting means being arranged to output the prohibition signal by a pressing force, exerted from outside, not

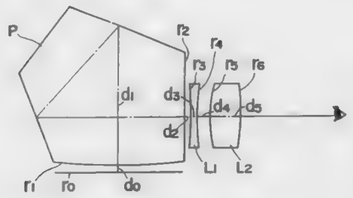
VOL 1088 ISS 3 MR 15 1988 UMI

weaker than a pressing force of a second range, but weaker than the pressing force of said first range; and



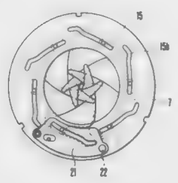
(d) altering means for altering a time required by said data inputting means for inputting said data, to a longer time in response to said prohibition signal of said prohibition means.

4,731,625
FINDER OPTICAL SYSTEM FOR A SINGLE-LENS REFLEX CAMERA
Toshihide Nozawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 15, 1987, Ser. No. 38,789
Claims priority, application Japan, Apr. 21, 1986, 61-91762
Int. Cl.⁴ G03B *13/06, 19/12*
U.S. Cl. 354—155 **6 Claims**



1. A finder optical system for a single-lens reflex camera comprising a pentagonal roof prism and an eyepiece comprising a negative lens and a positive lens and arranged on the light exiting side of said pnetagonal roof prism, the surface on the image side of said negative lens being arranged as an aspherical surface.

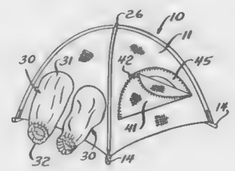
4,731,626
DIAPHRAGM DEVICE FOR CAMERA
Kenichi Kawamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 19, 1987, Ser. No. 51,327
Claims priority, application Japan, May 21, 1986, 61-076740[U]
Int. Cl.⁴ G03B *9/02*
U.S. Cl. 354—271.1 **5 Claims**



1. A diaphragm device, comprising,

(a) a plurality of diaphragm blades which cooperate to form a diaphragm opening;
(b) a diaphragm controlling member having a plurality of guide grooves connected to respective ones of the diaphragm blades and arranged to control movements of the respective diaphragm blades to vary the diaphragm opening within a range from its full open state to its reduced opening state having a predetermined opening value; and
(c) an adjusting member for movably adjusting at least one of said guide grooves, said adjusting member being arranged to displace said guide groove so that the position of the diaphragm blade in the reduced opening state having the predetermined opening value is moved for a larger amount than that of the position of the diaphragm blade in the full open state.

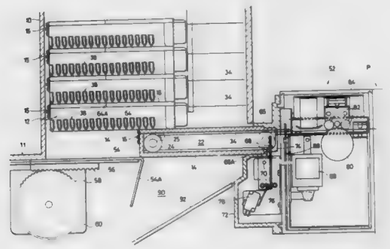
4,731,627
ENCLOSURE FOR LOADING FILM
Brian J. Chisholm, 517 Lee St., Apt. 3, Evanston, Ill. 60202
Filed Jan. 2, 1987, Ser. No. 150
Int. Cl.⁴ G03B *17/56*
U.S. Cl. 354—308 **15 Claims**



1. A collapsible film loader comprising inner and outer light-impervious fabric shells connected to a light-impervious fabric floor around the periphery thereof defining an enclosure, external support means removably connected to said outer shell constructed and arranged to expand and support said inner and outer shells into a tent-like construction, a pair of light-impervious fabric sleeves in communication with said enclosure extending from outside of said outer shell, and a door having a closure mechanism in one side of said outer shell at least in partial registry with a door having a closure mechanism in said inner shell with light imprevious fabric between the said inner shell and the closure mechanism of the door in said outer shell.

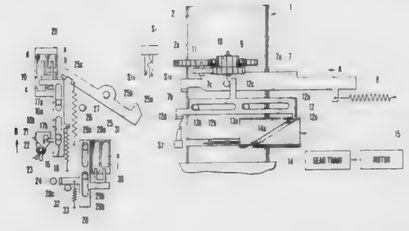
4,731,628
FILM FEEDING APPARATUS FOR A DEVELOPING MACHINE
Kazushige Uenaka, Tokyo; Haruo Takase, Kanagawa; Riuzi Otomo, and Masuo Akimoto, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 24, 1985, Ser. No. 813,320
Claims priority, application Japan, Dec. 26, 1984, 59-278989; Dec. 26, 1984, 59-278990; Dec. 26, 1984, 59-278991
Int. Cl.⁴ G03D *3/08*
U.S. Cl. 354—319 **13 Claims**

1. A film feeding apparatus for feeding exposed film to a developing machine, comprising:
a developing machine having a film receiving section;
a plurality of magazines, at least one film cassette being received within each of said magazines, each of said magazines having a rack formed on an outer side portion thereof;
a stand receiving a stack of said magazines;
a worm gear engaged with said rack of a lowermost magazine in said stack for moving said lowermost magazine towards said film receiving section of said developing machine for extraction of film from the at least one cassette received in said lowermost magazine and for retracting said lowermost magazine from said developing machine after said film has been extracted; and



means for supporting said lowermost magazine while moving said lowermost magazine between said stack and said developing machine and dropping said magazine into a discharge passage after said film has been extracted.

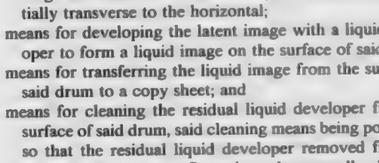
4,731,629
CONTROL DEVICE FOR EXPOSURE-WITH-ZOOMING PHOTOGRAPHY
Chikara Aoshima, Kanagawa, and Yasuhiko Shiomi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha
Filed Apr. 2, 1986, Ser. No. 847,205
Claims priority, application Japan, Apr. 2, 1985, 60-069740
Int. Cl.⁴ G03B *3/10*
U.S. Cl. 354—410 **20 Claims**



1. A control device for exposure-with-zooming photography, comprising:
(a) a focal length variable photographic optical system;
(b) drive means for varying the focal length of said photographic optical system;
(c) exposure means for performing an exposure operation; and
(d) operating means for rendering operative said drive means and said exposure means simultaneously.

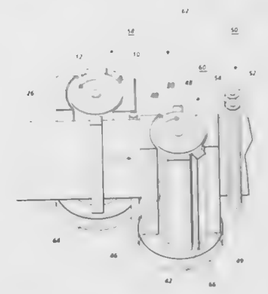
4,731,630
DISPLAY DEVICE
Kosuke Masuda, Kawaskai, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan
Filed Jun. 9, 1986, Ser. No. 871,929
Claims priority, application Japan, Jun. 17, 1985, 60-91412[U]
Int. Cl.⁴ G03B *17/18*
U.S. Cl. 354—475 **17 Claims**

1. An information display device comprising:
a display substrate;
scale display means including a plurality of scale segments linearly arranged on said substrate in spaced relationship with each other; and
character display means including at least one character display element arranged on said substrate, said display element substantially surrounding at least one of said scale



segments and having portions interposed between adjacent scale segments of said scale display means.

4,731,631
VERTICALLY ORIENTED PHOTOCONDUCTIVE DRUM
Edwin R. Monkelbaan, Fairport, and Joseph Fantuzzo, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 20, 1987, Ser. No. 40,424
Int. Cl.⁴ G03G *15/00, 15/10, 21/00, 15/06*
U.S. Cl. 355—3 DR **10 Claims**



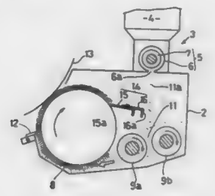
1. A printing machine, including:
a drum having a surface adapted to have a latent image recorded thereon, said drum being positioned with the longitudinal axis thereof extending in a direction substantially transverse to the horizontal;
means for developing the latent image with a liquid developer to form a liquid image on the surface of said drum;
means for transferring the liquid image from the surface of said drum to a copy sheet; and
means for cleaning the residual liquid developer from the surface of said drum, said cleaning means being positioned so that the residual liquid developer removed from the surface of said drum flows in a downwardly direction under the influence of gravity.

4,731,632
TONER DEVELOPMENT DEVICE WITH IMPROVED SCRAPER
Masao Fukushima; Yoshihiko Bessho; Masao Nishikawa, and Yasunari Yamaguchi, all of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed May 9, 1986, Ser. No. 861,255
Claims priority, application Japan, May 10, 1985, 60-69793[U]
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 355—3 DD **4 Claims**

1. A toner development device for an electrophotograhic copying machine comprising a toner supplying device mounted detachably to a developing box, a plurality of screw

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rollers arranged parallel so as to define a circulative passage for developers in said developing box, a magnet roller arranged adjacent to said screw rollers, a regulating device for regulating a supplied and retained quantity of developers supplied to said magnet roller and a scraping means for scraping off the



developers retained on said magnet roller and returning them to said circulative passage,

wherein said scraping means is composed of a primary scraper and a secondary scraper, and said secondary scraper is fixedly adjustable forward and rearward relative to said primary scraper.

4,731,633

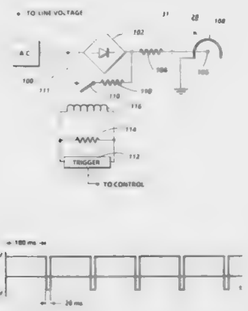
ELIMINATION OF STREAMER FORMATION IN POSITIVE CHARGING CORONA DEVICES

Geoffrey M. T. Foley; Roger W. LaForce, both of Fairport; Conrad J. Bell, Webster, and Thomas W. Cherry, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1987, Ser. No. 43,075

Int. Cl.[4] G03G *15/02*

U.S. Cl. 355—3 CH **16 Claims**



1. In an electrographic device wherein a corona charging device having a bare wire coronode is driven with a positive D.C. voltage signal to deposit a net positive charge on a charge retentive surface in a single charging step prior to exposure of said charge retentive surface to imaging radiation, a method for preventing pepper tracking is provided comprising:

periodically driving the corona charging device with a negative voltage signal, whereby defects in said bare wire coronode causing pepper tracking are healed.

4,731,634

APPARATUS FOR PRINTING BLACK AND PLURAL HIGHLIGHT COLOR IMAGES IN A SINGLE PASS

Howard M. Stark, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1986, Ser. No. 925,933

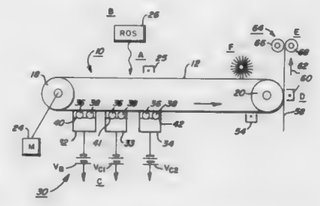
Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—3 TR **20 Claims**

1. Apparatus for forming latent electrostatic images on a charge retentive surface and rendering them visible with black and at least two highlight color toners in a single pass of the imaging surface through the processing area of a printing system, said apparatus comprising:

means for uniformly charging said charge retentive surface;

an exposure system for discharging said charge retentive surface to at least four voltage levels corresponding to image and background areas; and



means including a plurality of developer structures each including a developer housing containing a different color toner for rendering at least three image areas visible, each of two of said three image areas being rendered visible by the application of only one of said different color toners to said two image areas on said charge retentive surface and one of said image areas being rendered visible by the application of two of said different color toners to one image area on said charge retentive surface.

4,731,635

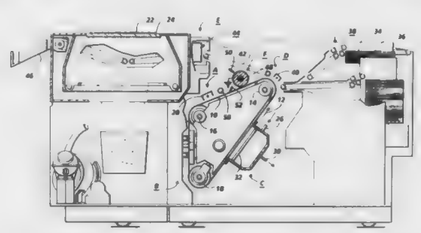
LIQUID INK FUSING AND CARRIER REMOVAL SYSTEM

Thomas F. Szlucha, Fairport; Dexter A. Dyer, Williamson, and Michael J. Langdon, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 12, 1987, Ser. No. 13,991

Int. Cl.[4] G03G *15/10, 15/20*

U.S. Cl. 355—10 **18 Claims**



1. A reproducing machine of the type having a latent image recorded on a member, wherein the improvement includes:

means for developing the latent image recorded on the member with a liquid developer material comprising at least a liquid carrier having pigmented particles dispersed therein;

means for transferring the developed image from the member to a sheet of support material;

a pair of rollers arranged to cooperate with one another to define a nip through which the sheet of support material having the developed image thereon passes, at least one of said pair of rollers being heated and said pair of rollers applying pressure to the sheet of support material having the developed image thereon so as to vaporize the liquid carrier therefrom and fuse the pigmented particles to the sheet of support material in image configuration; and

means for removing a substantial portion of the vaporized liquid carrier from the region of said pair of rollers.

4,731,636

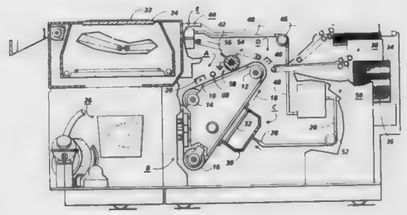
LIQUID CARRIER RECOVERY SYSTEM

William C. Howe, Walworth, N.Y., and Thomas C. Hsu, Reading, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1987, Ser. No. 23,315

Int. Cl.[4] G03G *15/10, 15/20*

U.S. Cl. 355—10 **11 Claims**



1. An apparatus for reclaiming a developing liquid, including:

a housing defining a chamber having inlet and outlet ports with a developing liquid vapor entering the chamber through the inlet port and developing liquid exiting the chamber through the outlet port thereof; and

a cooling fluid located in the chamber of said housing with the developer liquid being immiscible in said cooling fluid so that as the developer liquid vapor passes from the inlet port through said cooling fluid to the surface thereof it condenses to exit the chamber of said housing from the exit port.

4,731,637

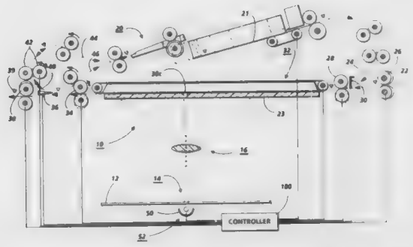
AUTOMATIC "TWO-UP" DOCUMENT REGISTRATION AND FEEDING FOR COPIERS

Thomas Acquaviva, Penfield, and Thomas R. Cross, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1987, Ser. No. 29,026

Int. Cl.[4] G03G *15/00;* **B65H** *7/02*

U.S. Cl. 355—14 SH **9 Claims**



1. In an automatic document handling system for a copier, with means for sequentially feeding and registering document sheets to the imaging station of the copier for their copying, including a retractable registration gate with means for retractably inserting said registration gate into the document sheet feeding path for engaging an edge of the document sheet fed thereagainst so as to register the document sheet; the improvement wherein:

said registration gate has first and second opposite registration sides spaced apart by a preset defined distance;

said means for feeding and registering document sheets includes means for registering the first edges of the document sheets against said first side of the registration gate while said registration gate is inserted into the document sheet feeding path;

said means for feeding and registering document sheets further including means for reversing the direction of motion of automatically preselected sequential document sheets to back the opposite edges of said preselected document sheets into registration with said second, opposite, side of said registration gate in coordination with reinserting of said registration gate into the document path and also registering a first edge of another document sheet against said first side of the registration gate;

and said means for feeding and registering document sheets further including means for feeding at least two said document sheets to the imaging station together, with one document sheet following the other, while said registration gate is retracted, for copying of these document sheets with a registered spacing between those document sheets which is determined by and corresponds to said preset defined distance between said first and second opposite sides of said registration gate.

4,731,638

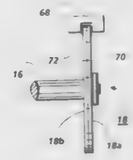
TIMING PULSE GENERATOR FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1986, Ser. No. 935,373

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **16 Claims**



1. An apparatus for generating timing pulses in an electrophotographic printing machine, including:

a flexible member having spaced marks formed photographically thereon;

means for mounting said member rotatably in the printing machine; and

means for detecting the spaced marks on said member and generating a timing pulse output in response thereto, said detecting means preventing said member from deflecting to control the axial motion of said member during rotation.

4,731,639

MICROFILM PICKUP CAMERA WITH MARKING MEANS FOR SCREENED ORIGINALS

Walter Gutmann, Sauerlach-Arget; Gerhard Schreiner, Munich; Wolfram Betzold, Hoehenkirchen; Wilfried Hofmann, Taufkirchen; Traugott Liermann, Unterhaching, and Klaus Schiessl, Wolfratshausen, all of Fed. Rep. of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,379

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1986, 3608912

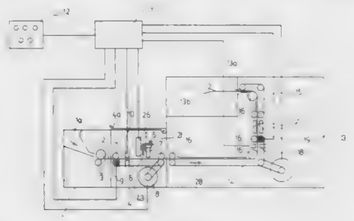
Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—64 **18 Claims**

1. A microfilm pickup camera, comprising transport means for transporting originals to be reduced inserted into the camera so that each original is continually horizontally moved within the camera; an exposure station for a reduced projection of the originals; and marking means for marking originals

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before they reach said exposure station, said marking means including an ink spraying head controlled by a computer and directed in a use position (I) approximately vertically downwardly relative to a horizontally movable original (2), said



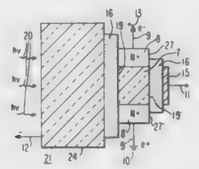
head having nozzles and being rotatable to a cleaning position (II), and a diaphragm cover (25), said head being also rotatable and displaceable relative to said diaphragm cover to an inoperative position (III) to protect said nozzles from dry ink residuals.

4,731,640

HIGH RESISTANCE PHOTOCONDUCTOR STRUCTURE FOR MULTI-ELEMENT INFRARED DETECTOR ARRAYS

Nathan Bluzer, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 20, 1986, Ser. No. 864,940
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **48 Claims**



1. A high resistance, thin film, photoconductive device, operable for use in high density multi-element photodetector arrays, comprising:

a photoconductive layer of n-doped semiconductor material having a predetermined band gap, a first and second lateral face, and two opposing ends, said photoconductive layer further comprising a first and second N+ dopant region so positioned at the extreme of said two opposing ends of said photoconductive layer, said first and said second N+ dopant regions operable to serve as contact regions for said photoconductive layer, said photoconductive layer further operable to facilitate the migration of electrons and holes within said photoconductive layer;

a first insulating layer positioned upon said first lateral face of said photoconductive layer, said first insulating layer operable to serve as a barrier for said electrons and said holes migrating within said photoconductive layer and said first insulating layer having a predetermined band gap;

a second insulating layer positioned upon said second lateral face of said photoconductive layer, said second insulating layer operable to contain said electrons and said holes within said photoconductive layer, and said second insulating layer having a predetermined band gap;

a ground means affixed to said first N+ dopant region operable to provide an electrical path to ground for said photoconductive device;

a positive bias means affixed to said second N+ dopant region operable to provide positive electrical potential to said second N+ dopant region, whereby said second N+ dopant region is the most electrically positive region of said photoconductive layer; and,

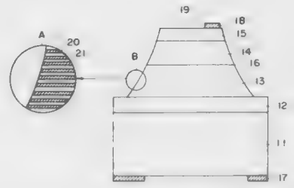
a metallic gate means layered upon said first and said second insulating layers, said electrical metallic gate means operable to place a negative electrical potential across said first insulating layer, said photoconductive layer and said second insulating layer whereby said electrons will migrate towards said positively biased second N+ dopant region, said electrons migrating within the bulk of said photoconductive layer and said holes migrating towards said ground means affixed to said first N+ dopant region along said first and said second lateral faces of said photoconductive layer, increasing said resistance of said photoconductive layer during photoconductive detector operation.

4,731,641

AVALANCHE PHOTO DIODE WITH QUANTUM WELL LAYER

Yuichi Matsushima, Tokorozawa; Kazuo Sakai, Tokyo; Yukitoshi Kushiro, Tokyo; Shigeyuki Akiba, Tokyo; Yukio Noda, Yokohama, and Katsuyuki Utaka, Musashino, all of, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 433,105, Oct. 6, 1982, abandoned. This application Aug. 5, 1986, Ser. No. 892,479
Claims priority, application Japan, Oct. 7, 1981, 56-159967
Int. Cl.[4] H01L *29/201, 31/08, 27/14*
U.S. Cl. 357—30 **4 Claims**



1. An avalanche photodiode with a quantum well layer, comprising a first semiconductor layer for absorbing light of wavelight of 1.0 to 1.6 mm to generate optically excited carriers; a quantum well layer formed by a thin film, periodic multilayer structure composed of second semiconductors of InP and third semiconductors of $In_xGa_{1-x}As$ for multiplying the optically excited carriers; and a pn junction interposed between the first semiconductor layer and the quantum well layer.

4,731,642

SEMICONDUCTOR MEMORY DEVICE WITH MEANS TO PREVENT WORD LINE BREAKAGE

Hisao Katto, Tokyo; June Sugiura, Musashino; Nozomi Horino, Higashiyamato; Akira Endo, Hachiouji; Yoshiharu Takeuchi, Koganei, and Yuji Arakawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan and Hitachi Device Eng. Co., Japan

Filed Feb. 22, 1985, Ser. No. 704,572
Claims priority, application Japan, Feb. 24, 1984, 59-32444
Int. Cl.[4] H01L *23/50, 23/54, 27/10, 29/44*
U.S. Cl. 357—45 **10 Claims**

1. A semiconductor memory device comprising:

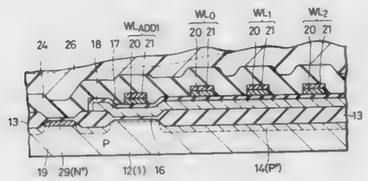
at least one memory cell array including a plurality of memory cells that are formed in rows and in columns on a semiconductor substrate;

a plurality of word lines formed in rows, said word lines being coupled to said memory cells that are arrayed in corresponding rows;

a plurality of data lines formed in columns, said data lines being coupled to said memory cells that are arrayed in corresponding columns;

contact holes formed by dry etching in an intermediate insulating film formed between said word lines and said data lines to couple said data lines and said memory cells together; and

a film which is formed between said plurality of word lines formed in rows and a first peripheral edge of said memory



cell array, said film being located on said semiconductor substrate at a location to prevent the thickness of a resist film for forming said contact holes from decreasing on the word lines which are located closest to said peripheral edge.

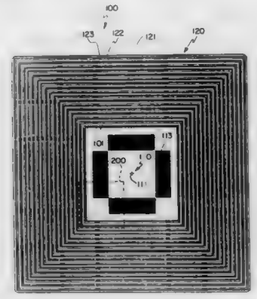
wherein said data lines are comprised of aluminum, and wherein said word lines and said film are each comprised of a first layer of polycrystalline silicon and a second layer of silicide formed over said first layer.

4,731,643

LOGIC-CIRCUIT LAYOUT FOR LARGE-SCALE INTEGRATED CIRCUITS

Bradford Dunham, White Plains, N.Y.; Joseph M. Fitzgerald, and Robert R. Williams, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1985, Ser. No. 789,594
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **15 Claims**



1. An integrated-circuit chip, comprising:

a substrate having a central point substantially in the center of the area of said chip;

multiple circuit rings disposed substantially concentrically about said central point and substantially conforming to the overall outline of said chip, each of said rings including multiple circuit cells;

multiple wiring bays disposed substantially cocnetrically about said central point and interspersed with said circuit rings, each of said bays including multiple interconnections between said circuit cells;

multiple input/output connections located within a central area substantially inside said rings, said connections comprising substantially all the external connections of said chip,

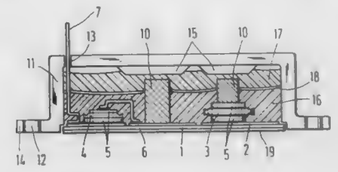
said wiring bays being formed in a first conductive layer on said chip and substantially all of said interconnections running parallel to the direction of said bays.

4,731,644

SEMICONDUCTOR POWER MODULE WITH CERAMIC SUBSTRATE

Arno Neidig, Plankstadt, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,572
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521572
Int. Cl.[4] H01L *23/30, 23/04, 23/10, 21/447*
U.S. Cl. 357—72 **16 Claims**



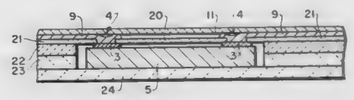
1. Semiconductor power module, comprising a cap-shaped plastic housing, a ceramic substrate with upper and lower surfaces being disposed in and forming a bottom surface of said housing, upper and lower metallizations respectively disposed on said upper and lower surfaces of said substrate, components disposed on said upper metallization, at least one support having upper and lower parts and being disposed on said substrate in said housing, a first elastomeric soft casting compound disposed in said housing covering said substrate and said lower part of said at least one support, said upper part of said at least one support protruding from said first casting compound, and a second thermo-setting hard casting compound covering said upper part of said at least one support and connecting said upper part to said housing.

4,731,645

CONNECTION OF A SEMICONDUCTOR TO ELEMENTS OF A SUPPORT, ESPECIALLY OF A PORTABLE CARD

Paul Parmentier, Cailly sur Eure, and Philippe Jourdan, Evreux, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 782,322, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 492,778, May 9, 1983, abandoned. This application Jun. 12, 1986, Ser. No. 873,875
Claims priority, application France, May 14, 1982, 82 08430
Int. Cl.[4] G06K *7/06*
U.S. Cl. 357—80 **1 Claim**



1. An identity card provided with flat conducting elements situated on an external surface of a wall of said card, which conducting elements are connected to metallized termination areas of a semiconductor wafer so that an electrical connection can be established with a member separate from said wall characterized in that:

said conducting elements are constituted by a polymerized conducting material;

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the semiconductor wafer is situated within said card and is positioned so that its metallized termination areas face said wall;

said wall is provided with holes opposite said metallized termination areas; and

parts of said flat conducting elements each penetrate into one of said holes while contacting the metallized terminal area positioned opposite said hole and covering at least in part said hole, thus providing electrical contact between said metalized termination area opposite said hole and said flat conducting element at least partially covering said hole.

4,731,646

MOVING-IMAGE CODER WITH SELF-IDENTIFICATION OF THE STUFFING CHARACTERS

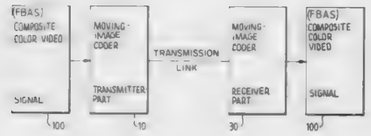
Helmut Kliem, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,542

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525567

Int. Cl.⁴ H04N *11/04*

U.S. Cl. 358—13 **13 Claims**



1. In a process for adjusting the pulse rate of a stream of evenly-time-spaced pulses of a digital moving-image signal representative of a composite color video signal to a higher clock rate used in a digital transmission link with a moving-image coder, the improvement comprising the steps of: generating stuffing digital characters for insertion into the moving-image pulse stream wherein the stuffing characters are identifiable by an additional bit; inserting the stuffing characters into the moving image pulse stream; transmitting the latter pulse stream with the inserted stuffing characters over the link; detecting the stuffing charactes at a receiver end of a moving-image coder by the additional bit; and removing the stuffing character at the receiving end of the link so as to reproduce the evenly-time-spaced image character stream.

4,731,647

METHOD AND APPARATUS FOR PRINTING INK BY DISSOLVING COLORANT WITH DEPOSITED SOLVENT

Tadao Kohashi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 4, 1984, Ser. No. 616,835

Claims priority, application Japan, Jun. 3, 1983, 58-99738; Mar. 23, 1984, 59-56655

Int. Cl.⁴ H04N *1/46*

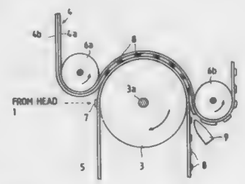
U.S. Cl. 358—75 **12 Claims**

1. A method for printing ink on a recording medium comprising:

(a) providing a transfer base and a fresh layer of colorant deposited thereon;

(b) selectively depositing a liquid solvent on a portion of said recording medium in response to an electrical signal representing the density of a picture element, said solvent comprising a material which dissolves at least one constituent of said colorant layer;

(c) contacting said portion of the recording medium with a portion of said colorant layer for a predetermined period to dissolve said portion of the colorant layer with the deposited solvent; and



(d) transferring the dissolved portion from said base to said recording medium.

4,731,648

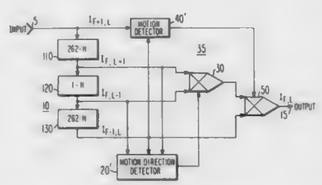
INTERSTITIAL SIGNAL GENERATING SYSTEM

Francis S. Bernard, Plainsboro, and Chandrakant B. Patel, Hopewell, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 29, 1986, Ser. No. 912,628

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—105 **17 Claims**



11. An interstitial signal generating system comprising:

an input terminal for receiving a signal representing successive pixels of at least one component of a composite video signal;

an output terminal for producing a signal including an interstitial pixel in an interstitial line;

first means coupled to said input terminal and responsive to pixels from fields adjacent that of said interstitial pixel for producing a signal representing a first estimate of said interstitial pixel;

second means coupled to said source and responsive to pixels within the same field as that of said interstitial pixel for producing a signal representing a second estimate of said interstitial pixel, and including:

means for producing a signal representing an estimated pixel from upper adjacent lines to that of said interstitial line,

means for producing a signal representing an estimated pixel from lower adjacent lines to that of said interstitial line,

means for detecting the relative direction of motion in the neighborhood of said interstitial pixel, and

means for selectively producing said signal representing said estimated pixel from upper adjacent lines as said second estimate when the direction of motion is relatively upward, and said signal representing said estimated pixel from lower adjacent lines as said second estimate when the direction of motion is relatively downward;

means coupled to said source for detecting motion in the neighborhood of said interstitial pixel; and

means for selectively coupling said second estimate to said output terminal when motion is detected, and said first estimate to said output terminal otherwise.

4,731,649

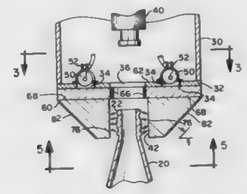
OBLIQUE ILLUMINATION FOR VIDEO RIM INSPECTION

Roger Chang, Ft. Lauderdale; Donald Darling, Palm Beach Gardens, and Dale Kline, Palm Beach, all of Fla., assignors to Vistech Corp., West Palm Beach, Fla.

Filed Sep. 11, 1986, Ser. No. 906,297

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—106 **9 Claims**



1. An inspection system for examining an end of transparent and translucent bodies, each of the bodies to be inspected while progressing along a conveying path, the system comprising:

a video analyzer directed axially toward the end and being operable to record an instantaneous image of the end and to discriminate between good and bad ends by detecting effects therein;

at least one light source for illuminating the end; and,

a block of light-transmitting material illuminated by the light source, the block defining sidewalls reaching over the end of the body to partly surround the end of the body as the body is moved along the conveying path, the block having a diffuse, light-transmissive surface, and light being directed inwardly from the block toward the end and obliquely toward said end and toward the video analyzer.

4,731,650

SPATIAL CHARACTERISTIC DETERMINATION

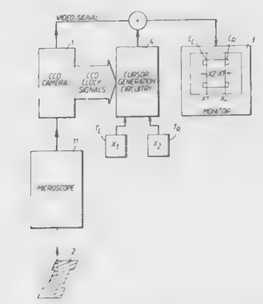
Kevin A. D. Hadfield, and Christopher J. Morcom, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Aug. 1, 1986, Ser. No. 891,953

Claims priority, application United Kingdom, Aug. 13, 1985, 8520278

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—107 **9 Claims**



1. Apparatus for the determination of a spatial characteristic of an object, which includes:

a video cameral employing an imaging element array sensor, by which the object may be suitably viewed to provide an object video image;

cursor generation means, by which at least one cursor may be generated for superimposition on the video image, the placing of the at least one cursor on the video image being determined by array sensor timing signals, and so corresponding to the position in the array of at least one particular imaging element; and

cursor positioning means, by which the at least one cursor may be positioned in the video image to be appropriately aligned with the object image as regards the relevant characteristic;

whereby, from the distance to the at least one cursor, known in terms of the array sensor timing signals and thus known in terms of the number and size of the array elements up to the relevant cursor position, there may be determined the required characteristic of the object.

4,731,651

APPARATUS FOR COMPENSATING A MOVEMENT OF A PICTURE OF TELEVISION SIGNAL

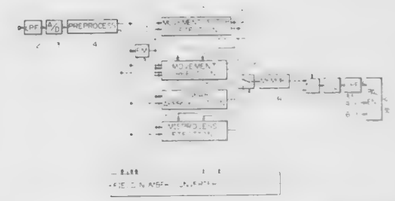
Kunio Matsumoto; Akira Furutani, both of Kanagawa; Yutaka Tanaka; Toshiro Ohmura, both of Tokyo; Taiichiro Kurita; Yoshimichi Ohtsuka, both of Kanagawa; Taiji Nishizawa, Tokyo, and Yuichi Ninomiya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 889,226

Claims priority, application Japan, Jul. 26, 1985, 60-165075

Int. Cl.⁴ H04N *7/01, 7/12*

U.S. Cl. 358—140 **14 Claims**



1. Apparatus for correcting movement of a television signal picture image in a vertical direction, comprising:

means for detecting movement of a picture image between successive fields of a television signal and producing a vector signal indicating a magnitude and a direction of said detected movement;

first memory means for storing a first field of the television signal therein;

second memory means for storing a second field of the television signal therein; and

switching means for selecting the stored first and second fields of the television signal from said respective first and second memory means in response to said vector signal;

in which said first memory means comprises a first field memory for delaying the television signal for an interval of at least one field to produce the television signal in the preceding first field and a first pair of memories for respectively storing the data in the same line of the current and preceding first fields.

4,731,652

SHADING CORRECTION SIGNAL GENERATING DEVICE FOR A TELEVISION CAMERA APPARATUS

Junichi Yamanaka, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1987, Ser. No. 29,953

Claims priority, application Japan, Mar. 25, 1986, 61-66283

Int. Cl.⁴ H04N *5/14*

U.S. Cl. 358—163 **11 Claims**

1. A shading correction signal generating device for a television camera apparatus, said device comprising:

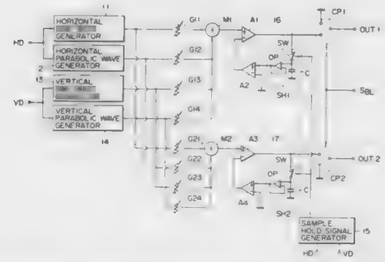
shading correction wave generating means for generating a predetermined shading correction waveform signal including AC signal components on the basis of a scanning

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drive signal with at least one of horizontal or vertical scanning frequencies for a TV screen;

area-designating signal generating means for generating an area-designating signal to designate a specific area on the TV screen on the basis of said scanning drive signal;

potential clamping means for receiving said predetermined shading correction waveform signal including AC signal components and said area-designating signal, and for



clamping said predetermined shading correction waveform including AC components to a specific potential in said specific area designated by said area-designating signal; and

output means for producing a shading correction signal which is said predetermined shading correction waveform signal including AC components as clamped to the specific potential in the specific area by said potential clamping means.

4,731,653

MULTI-CHANNEL, CONTROLLED AMPLIFICATION FACTOR ELECTRONIC AMPLIFIER CONSTRUCTION, PARTICULARLY FOR COLOR TV CONTRAST ADJUSTMENT

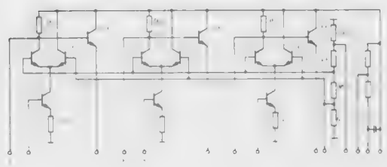
Gerald Gronau, Hildesheim, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,608

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540752

Int. Cl.⁴ H04N *5/57*

U.S. Cl. 358—169 **19 Claims**



1. A multi-channel, controlled-amplification-factor electronic amplifier construction, for adjusting contrast in a color television monitor having contrast setting means,

wherein each channel comprises

first and second transistors (**21**, **22**; **31**, **32**; **41**, **42**) forming, together, a pair, said first and second transistors being emitter-coupled, and a third transistor (**22**, **33**, **43**),

the collector of the respective third transistor being coupled to the emitters of the first and second transistors forming the pair,

the emitter of the third transistor being coupled, through an emitter-resistor (**25**, **35**, **45**), to a reference terminal (**5**) of a current supply source;

and wherein, in accordance with the invention,

channel input terminals (**3**, **8**, **13**) are provided, each connected to a respective base terminal of a respective one of said third transistors (**22**, **33**, **43**);

said first one (**21**, **31**, **41**) of the transistors of each pair (**21**, **22**; **31**, **32**; **41**, **42**) is coupled through a collector-resistor (**26**, **36**, **46**) to a second terminal (**17**) of said current supply source; and

a respective emitter-follower transistor (**24**, **34**, **44**) is connected to the collec.or of said first transistor (**21**, **31**, **41**) and to a respective output terminal (**2**, **7**, **12**) of a respective channel;

the transistors forming the pair of transistors and the third transistor (**22**, **33**, **43**) for each channel are formed on respective common substrates to provide a plurality of common substrates for each channel;

said common substrates are all derived from the same wafer or chip; and

wherein said amplifier comprises a hybrid circuit network including said common substrates for the respective channels and at least said emitter-resistors (**25**, **35**, **45**).

4,731,654

NONVOLATILE MEMORY SYSTEM FOR DIGITAL TELEVISION TUNER

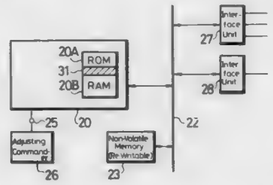
Takao Itabashi, Tokyo; Junya Saito, Saitama; Norihito Ichikawa, Tokyo, and Hisafumi Yamada, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,475

Claims priority, application Japan, Oct. 16, 1984, 59-217036

Int. Cl.⁴ H04N *5/44;* **H04B** *1/16*

U.S. Cl. 358—188 **6 Claims**



1. Apparatus for use with a television receiver that processes a television signal in digital form under control of digital data stored in at least one register of the receiver, the apparatus comprising:

first memory means operably connected to the television receiver for storing predetermined, display parameter, receiver initialization data an comprising a read only memory, in which a protion of said read only memory containing said predetermied, display parameter, receiver initialization data is non-volatile and non-rewritable;

manually operable means for producing adjusting data used in control of the television receiver;

second memory means connected to store said adjusting data from said manually operable mean, whereby processing of the television signal is also under control of the adjusted data and in which said second memory means comprises first and second non-volatile memories, said first non-volatile memory being arranged to store a predetermined standard value of data and said second non-volatile memory being arranged to store an offset value of data, said

adjusted data being comprised of a sum of said standard data and said offset data; and

control means connected to said first and second memory means and to said television receiver for controlling said first and second memory means and said at least one register to set said predetermined, display parameter, receiver initialization data stored in said first memory means into said at least one register, at a first time the television receiver is operated.

4,731,655

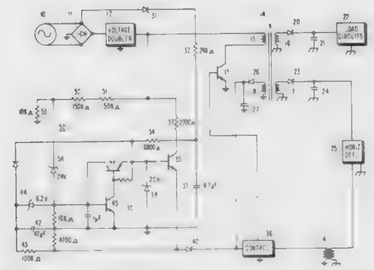
PROTECTION CIRCUIT FOR IMPROPER LINE VOLTAGE

Wayne Lee, Taipei, and Shin T. Tzuo, Taoyuan, both of Taiwan, assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1986, Ser. No. 900,867

Int. Cl.⁴ H04N *5/63*

U.S. Cl. 358—190 **4 Claims**



1. A video display apparatus comprising:

a source of unregulated voltage derived from and having a level representative of the level of an applied line voltage;

means responsive to an operating voltage for rendering said video display apparatus operative;

start-up means responsive to said unregulated voltage for producing said operating voltage; and

protection means responsive to said unregulated voltage for producing an output signal when the level of said unregulated voltage is above a predetermined level, said output signal disabling said start-up means such that said video display apparatus is rendered inoperative.

4,731,656

SOLID STATE IMAGER WITH TRANSFER SMEAR SUPPRESSION FOR MOVING AND STATIONARY IMAGES

Robert A. Dischert, Burlington Township, Burlington County, and Allen L. Limberg, Hopewell Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 30, 1986, Ser. No. 880,321

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213.25 **15 Claims**

1. A method for operating a field transfer imager, comprising:

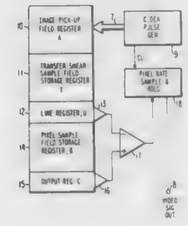
erasing an image field register;

accumulating one field of image-representative charge in said image field register during a non-blanking interval of a field period;

placing one field of null charge in said image field register during a field blanking interval of said field period;

transferring said field of image representative charge and said field of null charge to a two-field storage register, using time-division multiplexing, during said field blanking interval;

recovering said one field of image-representative charge and said one field of null charge of stored charge during a subsequent field period; and



combining said recovered two fields of stored charge during said subsequent field period to provide a video output signal.

4,731,657

CONTROL APPARATUS

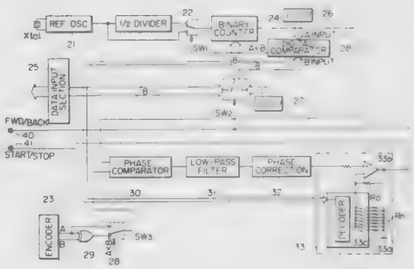
Ken Miyagi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

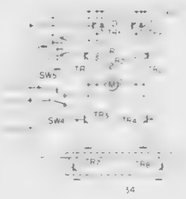
Filed Jul. 14, 1983, Ser. No. 513,810

Claims priority. application Japan, Jul. 20, 1982, 57-125055

Int. Cl.⁴ H04H *1/04*

U.S. Cl. 358—285 **17 Claims**





1. A control apparatus comprising:

drive means for driving a movable member;

setting means for setting the movable member at a predetermined speed;

detection means for detecting a driving state of said drive means and for generating a detection signal in accordance with the driving state of said drive means, wherein said detection means comprises an encoder and changes the

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number of pulses in the detection signal generated for each revolution of said encoder in accordance with the speed set by said setting means;

reference signal generating means for generating a plurality of reference signals having respective different frequencies, said reference signal generating means selecting one of the reference signals in accordance with the speed set by said setting means; and

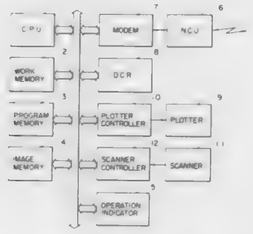
control means for controlling said drive means in accordance with the selected reference signal and the detection signal of said detection means so as to drive the movable member at the speed set by said setting means.

4,731,658

FACSIMILE MACHINE USING CUT SHEET OF PAPER

Yuji Koseki, Machida, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,224
Claims priority, application Japan, Apr. 19, 1985, 60-82658
Int. Cl.⁴ H04N *1/04*
U.S. Cl. 358—287 **6 Claims**



1. A facsimile machine comprising:

storing means for temporarily storing image data to be recorded;

recording means for recording said image data on a recording medium having a fixed size;

detecting means for detecting the size of said recording medium to be used in recording said image data; and

control means for controlling recording of said image data on said recording medium such that said image data is recorded on a single sheet of said recording medium as reduced in size with a reduction rate determined by the size of said recording medium and the detected size of said image data if the size of said image data is larger than the size of said recording medium but does not exceed a predetermined value, whereas said image data is recorded on two or more sheets of said recording medium as divided if the size of said image data exceeds said predetermined value.

4,731,659

SLOW MOTION REPRODUCING APPARATUS

Tetsuo Kani, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 791,108
Claims priority, application Japan, Oct. 26, 1984, 59-226274
Int. Cl.⁴ H04N *5/783*
U.S. Cl. 358—312 **9 Claims**

1. A slow motion reproducing apparatus employing a record medium having tracks for recording video signals, said apparatus comprising:

(a) dynamic tracking head repeatedly scanning said recording medium in a direction along said tracks for reproducing the video signals from said successive tracks of said medium;

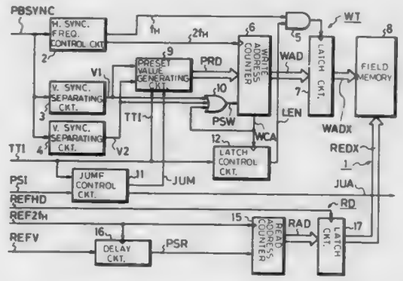
(b) head deflecting means responsive to drive signals for deflecting said dynamic tracking head in a direction transverse to the direction of said tracks;

(c) address generator to generating a write address signal indicative of the start address of each horizontal scanning line;

(d) video signal memory for storing the video data of one horizontal scanning line at its address which sequentially increments from the above write address signal;

(e) head position information generator for specifying the track that the dynamic tracking head now traces and for generating a head position information;

(f) record medium speed information generator for specifying the predetermined speed of said record medium and generating speed signals in response thereto;



(g) head displacement amount specifying means for specifying a dynamic tracking head displacement amount so as to make the dynamic tracking head trace the specified track on the basis of said head position information and record medium speed information to supply said drive signals to said head deflecting means;

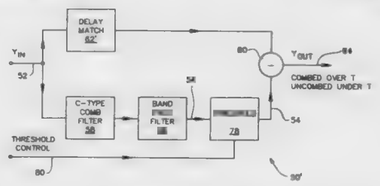
wherein said video signal memory storing the video signal data at its memory area corresponding to a corresponding track, which can be reproduced from the corresponding track and which is recorded on the track that said dynamic tracking head traces.

4,731,660

PROCESSING METHODS USING ADAPTIVE THRESHOLD FOR REMOVAL OF CHROMA/LUMINANCE CROSS-TALK IN QUADRATURE-MODULATED SUBCARRIER COLOR TELEVISION SYSTEMS

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022, and Jack J. Campbell, San Francisco, Calif., assignors to Yves C. Faroudja, Los Altos Hills, Calif., a part interest

Filed Feb. 20, 1987, Ser. No. 17,166
Int. Cl.⁴ H04N *11/14, 9/78*
U.S. Cl. 358—31 **8 Claims**



THRESHOLD IMPLEMENTATION

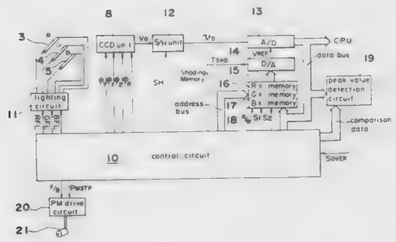
1. A comb filter for processing a luminance component of a quadrature modulated color subcarrier television signal in the vicinity of the color subcarrier pass band, the comb filter comprising an input and an output, and having a first path including a delay circuit for delaying the luminance component and a subtraction circuit connected between the input and the output, and a second path including a chrominance type comb filter, a band pass filter for passing a spectrum in the vicinity of the color subcarrier pass band followed by variable threshold circuit means connected to the subtraction circuit, the variable threshold circuit means for inhibiting the signal in the second path below a variable threshold being derived as a function of at least one of luminance diagonal transition level, chroma level and luminance activity in the spectrum in the vicinity of the color subcarrier.

4,731,661

COLOR DOCUMENT READER WITH WHITE BALANCE ADJUSTER FOR DETERMINING LIGHT EMISSION PERIODS FOR A PLURALITY OF DIFFERENT-COLORED LIGHT SOURCES AND CORRESPONDING INTEGRATION TIMES FOR A LIGHT SENSOR BY READING A WHITE REFERENCE AREA

Fumikazu Nagano, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1985, Ser. No. 797,892
Claims priority, application Japan, Nov. 16, 1984, 59-242745; Dec. 11, 1984, 59-261220
Int. Cl.⁴ H04N *1/46, 9/73;* **G03F** *3/08*
U.S. Cl. 358—75 **2 Claims**



1. In a color reader for reading a color document including a plurality of light sources for emitting light of respective different colors onto said document for respective light emission periods and a sensor for receiving light reflected from said document and for integrating the received light for an integration period, the improvement comprising:

means for successively directing light of the respective different colors from said plurality of light sources onto a white reference area so as to successively reflect light of each of the respective different colors from said white reference area;

means for directing the light so reflected from said white reference area onto said sensor;

means for determining a light emission period for each of said plurality of light sources and a corresponding integration period for said sensor such that the peak value of a signal produced by said sensor is substantially equal to a predetermined reference value when light of corresponding ones of the respective different colors is reflected from said white reference area and directed onto said sensor;

memory means for storing the light emission periods and the integration periods determined by said determining means; and

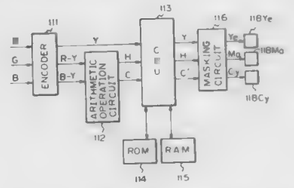
means for controlling said plurality of light sources and said sensor in accordance with the light emission periods and the integration periods stored by said memory means while said color reader reads said color document.

4,731,662

IMAGE PROCESSING METHOD FOR PROCESSING AN IMAGE SIGNAL DIFFERENTLY DEPENDING ON THE RANGE OF AN IMAGE CHARACTERISTIC THEREOF RELATIVE TO THE RANGE WITHIN WHICH AN OUTPUT DEVICE CAN REPRODUCE THE IMAGE CHARACTERISTIC

Yoshiro Udagawa, and Takashi Sasaki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,785
Claims priority, application Japan, Mar. 21, 1985, 60-56630; Mar. 21, 1985, 60-56631
Int. Cl.⁴ H04N *1/46, 1/40;* **G03F** *3/08*
U.S. Cl. 358—75 **28 Claims**



1. An image processing method applicable when an output device for reproducing an image represented by an input image signal having image characteristics cannot fully reproduce the range of one of the image characteristics of said input image signal, comprising the steps of:

detecting an input range of said one image characteristic of said input image signal corresponding to one image frame, and comparing said input range with an output range representing the range of said one image characteristic which can be reproduced by said output device;

judging whether or not said input range is within said output range; and

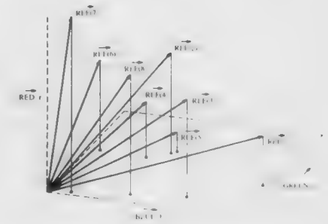
performing respectively different processings on said input image signal when said input range is within said output range and when said input range is not within said output range.

4,731,663

METHOD AND APPARATUS FOR COLOR IDENTIFICATION

Joseph S. Kovalchick, Middlesex; Theodore J. Sikorski, Trenton, and Ralph A. Treder, Ewing, all of N.J., assignors to American Telephone and Telegraph, New York, N.Y.

Filed May 20, 1987, Ser. No. 52,101
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—101 **12 Claims**



1. A method of fabricating an article comprising the steps of:

identifying the color of an object by illuminating the object, sensing the intensity of each of a plurality of spectral components in the light reflected from the object and comparing the intensity values to each of a standard set of

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intensity values associated with each of a plurality of known colors; and

completing the fabrication of said article in accordance with the color of said object, characterized in that said identifying step further includes the steps of:

placing the object proximate to a background which is of a color uniquely distinguishable from the possible colors of said object;

illuminating said background simultaneously with said object;

sensing each of said plurality of spectral components in the light reflected from said background, simultaneously with sensing the spectral components in the light reflected from the object;

computing the ratio of the intensity of each spectral component of the light reflected from said object to the corresponding spectral component of the light reflected from said background; and

comparing the computed intensity ratios to each of a set of intensity ratios established for each of a set of reference bodies of different known colors placed proximate to said background until a substantial match is found between each of the computed intensity ratios and each of the intensity ratios of a set associated with a reference body having a particular color.

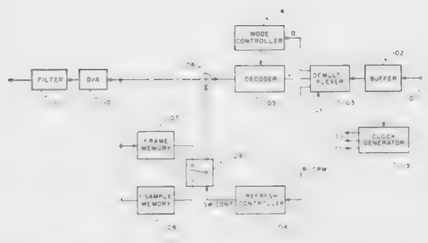
4,731,664

METHOD AND ARRANGEMENT FOR REFRESHING A FRAME MEMORY IN AN INTERFRAME ENCODING SYSTEM

Mitsuo Nishiwaki; Shuzo Tsugane, both of Tokyo; Naoki Mukawa, and Hideo Kuroda, both of Kanagawa, all of Japan, assignors to NEC Corporation, Japan

Filed Nov. 4, 1985, Ser. No. 794,667
Claims priority, application Japan, Nov. 8, 1984, 59-235906
Int. Cl.[4] H04N *7/12, 7/04*
U.S. Cl. 358—133 **12 Claims**





1. A method for refreshing a frame memory used in an encoding system for efficiently encoding video signals having cyclically recurring frames, said method comprising the steps of:

(a) dividing a video signal stored in said frame memory into n number of blocks consisting of m number of lines;

(b) dividing each of said blocks into l number of sub-blocks where l is an integer greater than one;

(c) refreshing one of said sub-blocks once for every one frame;

(d) repeating the step (c) for l number of times to complete a refreshing of one of said blocks; and

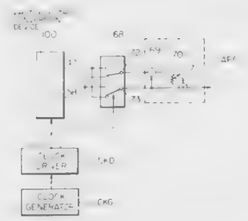
(e) repeating the step (d) for n number of times to refresh said frame memory.

4,731,665

IMAGE SENSING APPARATUS WITH READ-OUT OF SELECTED COMBINATIONS OF LINES

Seiji Hashimoto, and Akira Suga, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,240
Claims priority, application Japan, Dec. 28, 1984, 59-276978; Dec. 28, 1984, 59-276979; Dec. 28, 1984, 59-276980
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.27 **13 Claims**



1. An image sensing apparatus comprising:

a photoelectric conversion device consisting of a plurality of photoelectric conversion elements which are arranged in row and column directions and each of which capable of non-destructive read out,

means for generating a signal representing one image line using signals of a predetermined set of rows of said conversion element, and

control means for simultaneously reading out signals of said predetermined set of rows for one horizontal scanning, a respective such set of rows being selected for each image line, and said sets of rows belonging to consecutive image lines in one image field partially overlapping with each other.

4,731,666

KALEIDOSCOPE RECORDING APPARATUS

Charles F. Csesznegi, Hobbs, N. Mex., assignor to Csesznegi's Art World Unlimited, Inc., Hobbs, N. Mex.

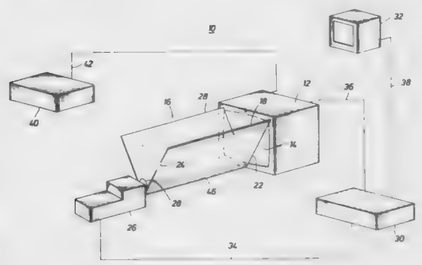
Filed May 13, 1985, Ser. No. 733,043
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—244 **11 Claims**

1. A kaleidoscope recording apparatus comprising:

a kaleidoscope mirror set comprising two planar mirrors in swingable contact along one edge forming an elongated open-end trough of predetermined interior angle, said kaleidoscope mirror set having a light-entry end and a light-egress end;

backlighted screen means for emitting a plurality of light rays in the form of imageable material, said screen means facing the interior of the trough formed by said mirror set and adjacent to said light-entry end;

means for recording said light rays egressing from said light-egress end; and



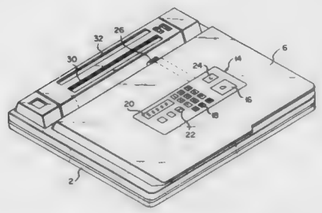
light collector means adjacent to said light-egress end and through which said light rays are projected to form a kaleidoscopic pattern on said recording means.

4,731,667

IMAGE FORMING APPARATUS

Junji Watanabe, and Ken Iseda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,722
Claims priority, application Japan, Jul. 15, 1985, 60-155533; Jul. 15, 1985, 60-155534; Jul. 15, 1985, 60-155537; Jul. 15, 1985, 60-155538; Jul. 15, 1985, 60-155539; Jul. 15, 1985, 60-155541; Jul. 25, 1985, 60-162852
Int. Cl.[4] H04N *1/00*
U.S. Cl. 358—256 **4 Claims**



1. An image forming apparatus comprising:

a document table for placing a document thereon;

image scanning means for scanning an image formed on the document placed on said document table and outputting the scanned data;

document cover means for covering the document placed on said document table;

data input means, provided in said document cover means, for inputting predetermined data; and

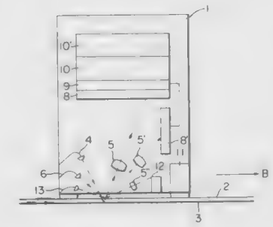
image forming means for forming an image on an image forming member in accordance with at least one of the input data from said data input means and the scanned data from said image scanning means.

4,731,668

IMAGE READING APPARATUS INCLUDING MEANS FOR ACCURATELY DETERMINING THE LOCATION OF READ IMAGE INFORMATION

Hiroshi Satomura, Hatogaya; Takeshi Honjo, Kawasaki; Takashi Saito, Ichikawa; Tatsuo Takeuchi; Tadashi Ishikawa, both of Tokyo; Masataka Naito, Kawasaki; Sachiko Naito, Kawasaki, and Masanori Yamada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 642,269, Aug. 20, 1984, abandoned.
This application Jun. 16, 1987, Ser. No. 63,725
Claims priority, application Japan, Aug. 26, 1983, 58-156689
Int. Cl.[4] H04N *1/00, 1/10*
U.S. Cl. 358—256 **20 Claims**



1. An image reading apparatus comprising:

reading means for reading an image of an original and for outputting an electrical signal corresponding thereto, said reading means being capable of starting its reading operation from any location on the original;

first detecting means for detecting absolute location information, in a first specified direction, of the original image read by said reading means; and

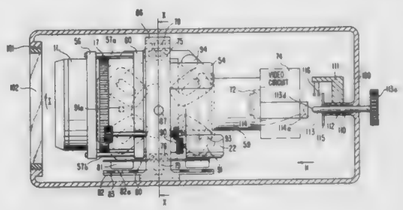
second detecting means for detecting relative location information, in a second specified direction, of the original image read by said reading means.

4,731,669

CAMERA APPARATUS WITH MOVABLY SUPPORTED LENS BARREL

Takayuki Hayashi, Hirakata, and Jirou Kajino, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1986, Ser. No. 870,963
Claims priority, application Japan, Jun. 18, 1985, 60-132294; Jun. 24, 1985, 60-137258; Jul. 18, 1985, 60-159023; Jul. 18, 1985, 60-159024; Oct. 16, 1985, 60-230149; Dec. 9, 1985, 60-276338
Int. Cl.[4] H04N *5/247, 5/225*
U.S. Cl. 358—229 **14 Claims**



1. A camera apparatus comprising:

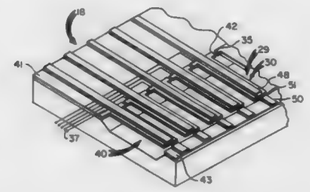
a lens system for receiving the optical image of an object;

a photoelectric conversion means for converting the optical image of said object which has passed through said lens system into electric signals;

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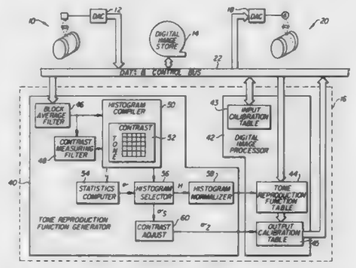
holding means for holding said lens system and said photoelectric conversion means;
a cabinet for encasing therein said holding means, a front part of said holding means being exposed out of said cabinet so that said lens system can receive the optical image of the object;
supporting means encased in said cabinet for rotatably supporting said holding means in at least one of panning and tilting directions with respect to said cabinet;
drive means for driving said holding means to move said holding means in at least one of said panning and tilting directions;
control means for controlling said drive means; and
lock means operable independently of said drive means for locking said holding means so as to prevent movement of said holding means relative to said cabinet.

4,731,670
IMAGING APPARATUS
James D. Allen, and Joel L. Seligson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 30, 1987, Ser. No. 79,383
Int. Cl.[4] H04N *1/10*
U.S. Cl. 358—298 **5 Claims**



1. Imaging apparatus for exposing a recording medium, said apparatus comprising:
a light source;
a light-valve array for receiving light from said source, said array comprising a plurality of light valves, each of said light valves including an electrostatically deflectable element having a transmitter waveguide thereon and a stationary element having a receptor waveguide thereon, said deflectable element having an initial position in which a beam of light can be transmitted from said transmitter waveguide to said receptor waveguide and said waveguides are axially aligned, said deflectable element being movable from the initial position through a series of positions in which progressively less light can be transmitted to the receptor waveguide and to a fully-deflected position in which no light can be transmitted, each of said elements being selectively deflectable in response to an information signal;
optical means for receiving beams from said elements and for imaging said beams on said recording medium; and
control means connected to said elements for controlling the deflection thereof in accordance with an information signal which contains gray-scale information.

4,731,671
CONTRAST ADJUSTMENT IN DIGITAL IMAGE PROCESSING METHOD EMPLOYING HISTOGRAM NORMALIZATION
James S. Alkofer, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 6, 1985, Ser. No. 730,629
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] H04N *1/40, 1/46;* G03F *3/08;* G03B *27/80*
U.S. Cl. 358—284 **15 Claims**



1. A digital image processing method employing a tone reproduction function generated by normalizing a histogram of a sample of tone values selected from informational portions of a digital image to produce a processed digital image having improved contrast characterized by the steps of computing the standard deviation of the sample of tone values, and of adjusting the contrast of the processed digital image as a function of the standard deviation.

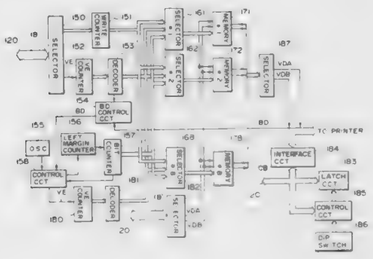
7. A digital image processing apparatus for processing tone values of a digital image to produce a processed digital image, comprising:
means for selecting a sample of tone values from informational portions of the digital image;
means for normalizing the sample of tone values to produce a tone reproduction function, the tone reproduction function relating tone values to values of a standard normal variate Z (Z values);
means for applying the tone reproduction function to tone values of the digital image to produce processed Z values;
means for computing the standard deviation of the sample of tone values; and
means for adjusting the contrast of the processed digital image comprising means for multiplying said processed Z values by a contrast adjusting constant which is a function of the standard deviation of the sample of tone values.

14. A digital image processing method of the type employing a tone reproduction function generated by normalizing a sample of tone values from informational portions of a digital image, characterized by: the tone reproduction function being applied to tone values in the digital image to produce values of a standard normal variate Z (Z values) in a processed digital image.

4,731,672
IMAGE PROCESSING SYSTEM
Kiyohisa Sugishima, Tokyo, and Masahiro Funada, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 21, 1984, Ser. No. 673,724
Claims priority, application Japan, Nov. 25, 1983, 58-222630; Dec. 8, 1983, 58-230567
Int. Cl.[4] H04N *1/21, 1/23, 1/40*
U.S. Cl. 358—296 **27 Claims**

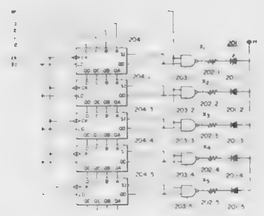
1. An image processing system comprising:
reading means for reading an original document and supplying image information;

memory means for storing at least one page of the image information supplied by said reading means and supplying stored image information, said memory means being adapted to directly supply without storing the image information generated by said reading means;
recording means for recording an image on a recording medium, based on image information supplied from said memory means; and



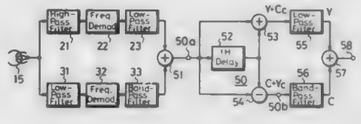
control means for causing said memory means to supply stored image information to said recording means in synchronism with the direct supply of image information from said reading means to said recording means, in order to record on the recording medium an image synthesized from an image represented by the image information stored in said memory means and from an image of the original document read by said reading means.

4,731,673
IMAGE OUTPUT DEVICE
Tadashi Yamakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 18, 1985, Ser. No. 712,896
Claims priority, application Japan, Mar. 22, 1984, 59-55401; Mar. 22, 1984, 59-55402
Int. Cl.[4] G01D *9/42;* H04N *1/24*
U.S. Cl. 358—300 **21 Claims**



1. An image output device comprising:
a plurality of memory means each capable of writing or reading image data transferred in parallel, wherein each of said memory means has parallel data input terminals, parallel data output terminals, a serial data output terminal and a control signal input terminal, said parallel data output terminals are capable of connecting to parallel data input terminals of another memory means, and said memory means has a load mode for writing image data input through said parallel data input terminals and shift mode for outputting written image data from said serial output terminal, said load mode or shift mode being selected in accordance with a control signal for controlling data read, said control signal being input through said control signal input terminal;
clock means for providing a clock signal, said clock signal being used for parallel transfer of image data between said plurality of memory means in said load mode and for serial output of image data in said plurality of memory means in said shift mode, wherein said clock signal has a first frequency in said load mode and a second frequency lower than the first frequency in said shift mode; and
a plurality of dot forming means for forming dots in accordance with image data serially read from said plurality of memory means.

4,731,674
COLOR VIDEO SIGNAL PROCESSING APPARATUS FOR CROSSTALK ELIMINATION
Tokuya Fukuda; Noriyuki Yamashita; Toshitaka Senuma, and Isao Masuda, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 15, 1985, Ser. No. 798,613
Claims priority, application Japan, Nov. 19, 1984, 59-244096
Int. Cl.[4] H04N *9/79, 5/782*
U.S. Cl. 358—328 **15 Claims**



1. Signal processing apparatus for a reproduced color video signal formed of a luminance signal and a color carrier signal and each including respective crosstalk components, in which the luminance and color carrier signals are in non-coextensive frequency bands and the respective crosstalk components are frequency-interleaved relative to the respective reproduced luminance and color carrier signals, the apparatus comprising:
first filter means receiving the reproduced color video signal for producing a frequency-band limited, reproduced color carrier signal and a frequency-band limited, reproduced luminance signal;
first signal combining means receiving said frequency-band limited, reproduced color carrier signal and said frequency-band limited, reproduced luminance signal for producing a summed output signal therefrom;
delay means receiving said summed output signal for producing a delayed output signal therefrom being time delayed by an integral multiple of a video horizontal scan time;
second signal combining means receiving at respective first and second inputs said summed output signal and said delayed output signal for producing a first output signal formed of the sum thereof and consisting of a luminance signal and a crosstalk component of said color carrier signal and a second output signal formed of the difference thereof and consisting of a color carrier signal and a crosstalk component of said luminance signal; and
second filter means receiving said first and second output signals from said second signal combining means for producing said luminance signal having said crosstalk component of said color carrier signal removed and said chrominance signal having said crosstalk component of said luminance signal removed.

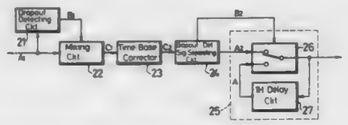
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4,731,675

DROPOUT CORRECTING APPARATUS WHEREIN DROPOUT DETECTING FLOG SIGNAL IS SUPERIMPOSED ON REPRODUCED VIDEO SIGNAL

Kaoru Tachibana, Kanagawa, and Ken Morita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,468
Claims priority, application Japan, Sep. 13, 1984, 59-190634
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—336 4 Claims



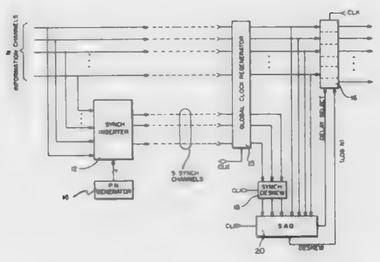
1. A dropout correcting apparatus comprising:
a dropout detecting circuit for detecting a dropout from a reproduced RF signal or a reproduced video signal and generating a dropout detecting flag signal in response thereto;
a mixing circuit for superimposing said dropout detecting flag signal upon said reproduced video signal to produce a mixed signal;
a time base fluctuation correcting circuit for removing a jitter component of said mixed signal to produce a time base corrected output signal;
a dropout detecting flag signal separating circuit for separating said dropout detecting flag signal from said time base corrected output signal; and
a dropout correcting circuit which corrects a dropout of said time base corrected output signal in response to said separated dropout detecting flag signal.

4,731,676

TRANSPARENT SYNCHRONIZATION OF MULTIPLE CHANNEL DATA

Elwyn R. Berlekamp, Berkeley, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Dec. 13, 1985, Ser. No. 808,861
Int. Cl.[4] G11B *20/20*
U.S. Cl. 360—26 5 Claims



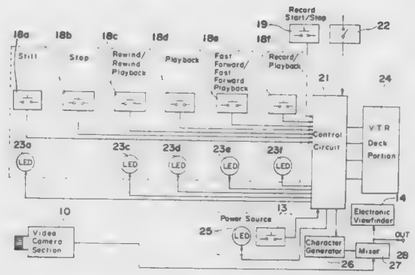
5. The method of establishing synchronization among a plurality N+s where N and s are integers information streams comprising N data streams and s synchronization streams, said information streams extant on N+s respective communication channels, comprising the steps of:
(a) associating s said channels for synchrony information and N said channels for data excluding synchrony information,
(b) writing each of said N information streams to respective ones of said N channels,
(c) writing to each of said s channels a unique p-bit pattern, then copying to each said of s channels an M-bit where p and M are integers subportion of the M×N bit portion of said respective data stream, whereby each of said s channels contain at least one synchronous information period comprising p+(Mk), where k is an integer bits,
(d) recovering from the aggregate of said N+s channels identifiable consecutive discrete time intervals,
(e) associating with each of said identifiable discrete time interval a counter to record the detection or non-detection of a condition consistent with one particular identifiable discrete time interval,
(f) extracting from each of said s channels the plurality of N M-bit subsequences, and comparing each said M-bit subsequence with the respective data stream from which said M-bit subsequence was originally derived in step (c) and incrementing or decrementing respective ones of said counters in accord with the comparison step resulting in a determination of identity or non-identity of said extracted M-bit sequence with the data stream from which said M-bit sequence was copied, each one of said counters being associated with a respective current bit time,
(g) changing said counters in consecutive order in response to said master clock,
(h) detecting the overflow condition first to occur for each of the N sets of said counters, and associating a skew value to each of said N channels from the position of respective overflowed ones of said counters, and
(i) delaying each of said N data streams by an amount consistent with the corresponding skew value.

4,731,677

INTEGRATED VIDEO CAMERA/RECORDER UNIT

Mineo Mino, Hirakata; Yoshikazu Kageyama, Neyagawa, and Yoshihiro Asahi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 18, 1985, Ser. No. 810,695
Claims priority, application Japan, Dec. 24, 1984, 59-277150
Int. Cl.[4] H04N *5/78*; G03B *1/60, 17/18*
U.S. Cl. 360—33.1 4 Claims



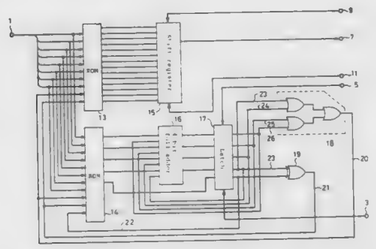
1. A video tape recorder comprising:
a detection means for detecting presence and absence of an erasure prevention tab of a video tape cassette loaded into said video tape recorder;
a display light emitting element;
a control means which is operatively associated with said detection means;
said control means, when a first video tape cassette which is provided with said erasure prevention tab has been loaded into said video tape recorder, automatically setting said video tape recorder to a recording standby state and turning on said display light emitting element; and
means for starting and pausing tape transportation during a recording mode after said video tape recorder has been set to said recording standby state,
said control means, when a second video tape cassette which is not provided with said erasure prevention tab has been loaded into said video tape recorder, setting said video tape recorder to a stop state and flashing said display light emitting element.

4,731,678

DIGITAL DATA RECORDING AND REPRODUCING METHOD

Kousou Takeuchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 25, 1986, Ser. No. 832,774
Claims priority, application Japan, Feb. 25, 1985, 60-35759; May 16, 1985, 60-104229
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—40 8 Claims



1. A digital data recording and reproducing method, comprising the steps of:
dividing a string of inputted digital data into successive 8-bit information words;
assigning to each 8-bit information word at least one 14-bit NRZI code word in which the number of "0" bits inserted between two successive "1" bits in each 14-bit NRZI code word is between one and eight, inclusive;
determining the digital sum variation of the preceding 14-bit NRZI code words forming an NRZI coded waveform representative of successive 8-bit information words in said string of inputted digital data; and
selecting one of said assigned 14-bit NRZI code words to represent the next 8-bit information word divided from said string of inputted digital data as a function of the polarity of an NRZI code word digital sum of said selected one 14-bit NRZI code word and the polarity of the determined digital sum variation sum that said selected one 14-bit NRZI code word tends to decrease the absolute value of the digital sum variation of the NRZI coded waveform.

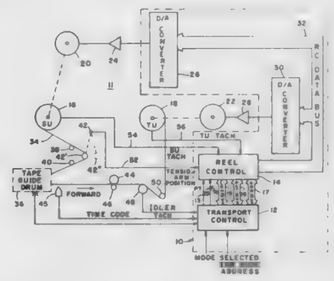
4,731,679

METHOD AND APPARATUS FOR TRANSPORTING A RECORDING MEDIUM WITH AN ADAPTIVE VELOCITY CHANGE PROFILE

David C. O'Gwynn, Colorado Springs, Colo., and Thomas L. Helmers, Millbrae, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 20, 1984, Ser. No. 653,972
Int. Cl.[4] G11B *15/46, 15/48*
U.S. Cl. 360—73 27 Claims

13. A control apparatus for controlling a transport mechanism for transporting a tape relative to a reference point along a path of said tape, in accordance with a velocity change profile which changes with a changing distance separating said reference point from a selected location on said tape, said velocity change profile being determined by a selected parameter of the tape transport mechanism, comprising;
means for providing and storing sets of velocity change profile values, each set pertaining to one velocity profile determined by a different value of said selected parameter;
means for monitoring an actual value of said selected parameter during the transport of said tape by said transport mechanism; and
means for controlling the speed of said transport mechanism



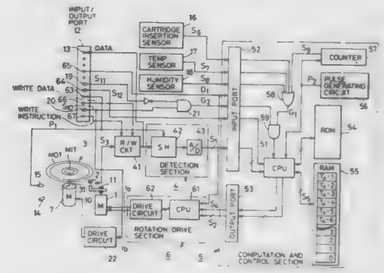
in accordance with a set of velocity change profile values corresponding to said monitored value of said selected parameter, for transporting the selected location on said tape to said reference point.

4,731,680

DISK DRIVE WITH STORED POSITIONING DATA RELATED TO DISK EXPANSION

Masakatsu Moriyama, and Keiichi Kaneko, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 19, 1986, Ser. No. 943,751
Claims priority, application Japan, Dec. 19, 1985, 60-284428
Int. Cl.[4] G11B *21/08, 21/10*
U.S. Cl. 360—78 12 Claims



12. A disk drive apparatus for reading data from a plurality of concentric tracks of a recording disk and for supplying said data to a host computer, said host computer functioning to detect the presence of errors in said data and to supply to said disk drive apparatus an error indication signal indicative of such errors, each of said tracks including a gap fixed data portion having fixed data written therein, said disk drive apparatus comprising:
a read and write head for read-out of said data from said tracks;
means for rotating said disk;
means for positioning said read and write head with respect to said tracks along a radius of said disk;
detection means for detecting a level of a read signal produced from said read and write head during read-out of said fixed data from said fixed data portion of a track and for producing a corresponding detection signal, and;
computation and control means including memory means, operable to execute a correction data acquisition operation by detecting an amount of off-track error of said read and write head with respect to at least one of said tracks

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based upon said detection signal, computing respective correction values for the remainder of said tracks based on said detected off-track error amount, and storing in said memory means said correction values;

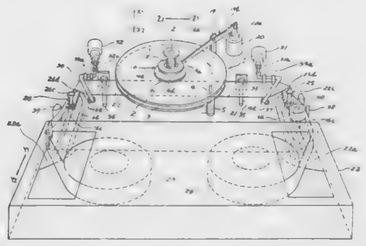
said computation and control means further functioning to control said read and write head positioning means prior to read-out of data from one of said tracks such as to accurately position said read and write head with respect to said track based upon a corresponding one of said stored correction values, and further functioning, in the event that said error indication signal is produced from said host computer during subsequent read-out of data from said track following said accurate positioning, to execute a single track correction data acquisition operation for said track and to store as an updated correction value for said track an off-track error which is derived by said single track correction data acquisition operation, and to control said read and write head positioning means to accurately position said read and write head in accordance with said updated correction value.

4,731,681

VERTICAL MAGNETIC RECORDING AND PLAYBACK APPARATUS

Haruki Ogata, Sagamihara, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 19, 1986, Ser. No. 841,484
Claims priority, application Japan, Mar. 23, 1985, 60-59099
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—85 **15 Claims**



1. A vertical magnetic recording and playback apparatus comprising:

head drive means supporting a vertical magnetic head which is made up of a main magnetic pole and an auxiliary magnetic pole positioned to face said main magnetic pole, said head drive means comprising at least a pair of flat rotary members which are positioned to face each other, said flat rotary members comprising a first rotary plate on which the main magnetic pole is mounted and a second rotary plate on which the auxiliary magnetic pole is mounted; and

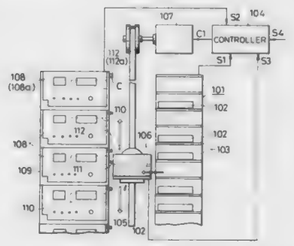
tape guide means for guiding a magnetic tape through a clearance between said main and said auxiliary magnetic poles while causing one of opposite surfaces of the tape to face said main magnetic pole and the other said auxiliary magnetic pole.

4,731,682

SIGNAL RECORDING AND/OR REPRODUCING SYSTEM HAVING A CASSETTE STORING AND TRANSPORTING ARRANGEMENT THEREIN

Hiraku Nishiyama; Hideki Hama, both of Kanagawa; Masashi Takehana, Tokyo, and Yoshiaki Suzuki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,327
Claims priority, application Japan, Nov. 9, 1983, 58-210384; Nov. 30, 1983, 58-226549; Nov. 30, 1983, 58-226548
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 **6 Claims**



1. A signal recording and/or reproducing system having a tape cassette storing and transporting arrangement therein, comprising:

cassette storing means comprising a plurality of receiving compartments each provided for receiving a tape cassette to store the same therein,

a plurality of recording and/or reproducing means for recording an information signal on or reproducing an information signal from the tape cassette taken out selectively from said cassette storing means, each of said recording and/or reproducing means comprising a housing which is provided with a control panel and with an opening through which the tape cassette is inserted therein and a cassette loading mechanism provided in said housing for placing the tape cassette inserted in the housing through said opening in a tape drive portion provided in said housing,

cassette transporting means cooperating with said cassette storing means and said recording and/or reproducing means for taking the tape cassette out of a selected one of the receiving compartments of said cassette storing means and transporting the tape cassette taken out from said cassette storing means in order to transfer the same to a selected one of said recording and/or reproducing means through said opening and to the receiving compartment of said cassette storing means from said selected one of said recording and/or reproducing means,

transportation driving means connected to said cassette transporting means for moving said cassette transporting means along the arrangement of said plurality of recording and/or reproducing means,

position detecting means associated with said cassette transporting means for detecting the position of said cassette transporting means in relation to positions where said cassette transporting means should stop to transfer the tape cassette to said selected one of said recording and/or reproducing means and producing an output signal representing the detected position, and

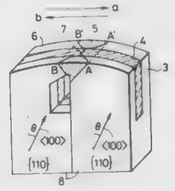
electronic controlling means connected to said transportation driving means for controlling said transportation driving means for cause said cassette transporting means initially to move towards a previously memorized stop position and then to move to and stop at to current appropriate stop position determined in accordance with the current output signal of said position detecting means, said electronic controlling means comprising means for memorizing said current appropriate stop position as a corrected preset stop position for subsequent use to control the initial movement of said cassette transporting means.

4,731,683

MAGNETIC RECORDING AND REPRODUCING SYSTEM WITH COMPOSITE MAGNETIC HEAD

Shigekazu Otomo, Sayama; Noriyuki Kumasaka, Ome; Takeo Yamashita, Hachioji; Juichi Morikawa, Katsuta; Takayuki Kobayashi, Inaki, and Mitsuhiro Kudo, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 724,688
Claims priority, application Japan, Apr. 20, 1984, 59-78587
Int. Cl.[4] G11B *5/127, 5/133*
U.S. Cl. 360—119 **4 Claims**



1. A magnetic recording and reproducing system with a composite magnetic head whose surface facing a magnetic recording medium is composed at least of a ferromagnetic metal and a high permeability ferrite single crystal, and at least whose region close to a gap is composed of said ferromagnetic metal, wherein said composite magnetic head is arranged in such a fashion that the {110} plane of said high permeability ferrite single crystal or a plane inclined from the {110} plane within such a range where the characteristics of the {110} plane are not lost is made to coincide with a plane forming a principal magnetic circuit of said composite head, that the <100> direction lying inside the {110} plane is inclined at an angle within the range of from 15° to 75° with respect to a direction perpendicular to the surface facing said magnetic recording medium, and that said magnetic recording medium travels in a direction which is relatively the same as, and parallel to, a vector formed by projecting a vector extending from the inside to the outside of said surface facing said magnetic recording medium in the <100> direction, on the surface said magnetic recording medium, whereby the difference between the rate of wear of said ferromagnetic metal and the rate of wear of said high permeability ferrite single crystal is reduced, thereby decreasing the level of a step resulting from the travel of said magnetic recording medium and preventing a reduction of output.

4,731,684

PIVOTABLE CHANGEOVER MECHANISM FOR LOADING AND EJECTING FUNCTIONS IN CASSETTE TAPE RECORDER

Shoji Suzuki, Iwaki, Japan, assignor to Alpine Electronic, Ltd., Japan

Filed Mar. 31, 1986, Ser. No. 846,573
Claims priority, application Japan, Mar. 30, 1985, 60-47176[U]
Int. Cl.[4] G11B *15/665, 15/675*
U.S. Cl. 360—96.5 **5 Claims**

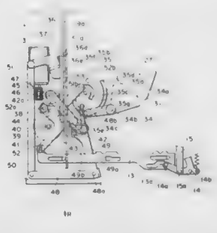
1. A pivotable changeover mechanism for performing the loading and ejecting functions in a cassette tape recorder having a chassis, a single reversible motor in the chassis providing a power output in a forward direction for moving a tape cassette inserted in the chassis to a loading position and loading a tape in the cassette around a recorder head by forwardly pivoting a pair of loading arms, and in a reverse direction for reversedly pivoting the loading arms to unload the tape from the recorder head and ejecting the tape cassette from the chassis, said pivotable changeover mechanism comprising:

a rotatable first gear (**41**) in mesh with a cassette moving mechanism for moving the inserted cassette to a loading position when said first gear is rotated in a forward direction, and for moving the cassette from the loading position to an ejection position when said first gear is rotated in a reverse direction;

a rotatable positive motion cam (**35**) having a spiral groove formed therein, extending between an outer (**35***d*) position and an inner (**35***c*) position, in which one end of a pivotable sector gear (**34**) is slidably retained for pivoting the sector gear correspondingly in response to rotation of the positive motion cam in forward and reverse directions, said sector gear being meshed with a tape moving mechanism for forwardly and reversedly pivoting said pair of loading arms to load and unload the tape around the recorder head, said inner position of said groove corresponding to pivoting of said pair of loading arms to a position in which the tape is fully unloaded from the recorder head;

a retaining lever (**51**) having a retaining end which is shiftable between a retaining position in which said retaining end locks the cassette moving mechanism from movement, and a release position in which the cassette moving mechanism is released for movement;

a reversing lever connected on one end to said retaining lever and having another end engageable with said one

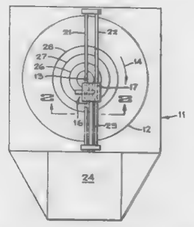


end of said sector gear (**34**) such that said reversing lever is shifted between a first position and a second position when said one end of said sector gear is slidably moved between said outer position and said inner position of said groove, respectively, by rotation of said positive motion cam, said reversing lever being shifted to said second position only when said one end of said sector gear has moved substantially completely to said inner position of said groove, said retaining lever being shifted from said retaining position to said release position to release said cassette moving mechanism for movement only when said reversing lever is shifted to said second position; and

a pivotable arm (**42**) having one end pivotally mounted to the chassis, a pinion (**43**) supported at an intermediate portion thereof and being driven in forward and reverse rotation by the reversible motor for performing the loading and ejecting functions, respectively, and a fore and biasedly connected to a part of said reversing lever for positively switching said pinion between a position in mesh with said positive motion cam and a position in mesh with said rotatable first gear, wherein said pinion is switched to mesh with said rotatable first gear for moving the cassette for ejection from the chassis only after said one end of said sector gear is moved to the inner position of said groove, wherein the tape is fully unloaded from the recorder head, said reversing lever is shifted to said second position, and said retaining lever is shifted to said release position to release said cassette moving mechanism.

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4,731,685
TRANSDUCING HEAD MOUNTING ON AN UNSUPPORTED LENGTH OF SPRING
Frederic K. Orcutt, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Oct. 16, 1985, Ser. No. 787,860
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **7 Claims**



1. A head stabilizing mounting structure for the magnetic transducing head of a magnetic disc memory machine of the type in which a head carriage is arranged for generally radial motion with respect to a set of data storage tracks on said disc, comprising:
- a generally U-shaped mouning block presenting two generally parallel arms and affixed to the head carriage with the arms extending toward the disc surface and aligned enerally transversely to the disc radius with one arm upstream and the other arm downstream with respect to the direction of disc motion;
- a spring leaf member arranged in a plane parallel to the disc surface and secured at one end to the upstream arm and beairng against a disc-facing portion of the downstream arm to define an unsupported length (L) of the leaf member between said arms;

said head being mounted on said unsupported length of said leaf member to define a recording gap between the head and the disc surface and being mounted at a point on the leaf member where the tangent to sid leaf member remains parallel to the disc when the leaf member is flexed into a curvilinear shaped as by movement of said head toward and away from the disc;

said head being urged springily toward said disc but permitted freedom of motion with respect to the head carriage in both directions normal to the disc surface, and maintained with the recording gap thereof in a stabilized plane orthogonal to the disc surface for greater accuracy of reproducing and recording.

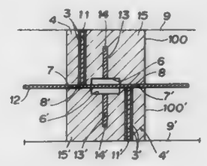
4,731,686
MAGNETIC HEAD
Minoru Kato; Nobuaki Kaneko; Masahiro Yamamoto, and Yutaka Hayashi, all of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan
Filed Mar. 19, 1985, Ser. No. 714,019
Claims priority, application Japan, Mar. 21, 1984, 59-52211; Jan. 22, 1985, 60-8532
Int. Cl.[4] G11B *5/187*
U.S. Cl. 360—122 **18 Claims**

1. A pair of magnetic heads for use with a recording medium having first and second opposing surfaces, comprising

first and second sliders each having a surface adapted for sliding on the first and second surfaces respectively of said recording medium, the surface of each of said sliders having first and second lands separated by a groove, the first and second lands of said first slider being opposite the second and first lands of said second slider, respectively;

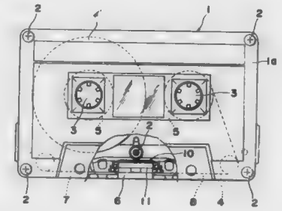
first and second magnetic cores embedded in the first lands respectively of each of said first and second sliders and being adapted to slide on the first and second surfaces of said recording medium, said first and second magnetic cores extending in a direction substantially perpendicular to the surfaces of said sliders and being spaced in a direction parallel to the surface of said sliders by a predetermined track displacement distance; and

first and second magnetic shielding members embedded in said first and second sliders respectively, said first and



second shielding members extending in a direction substantially parallel to said first and second magnetic cores, being positioned therebetween, and being substantially coextensive therewith whereby said shielding members magnetically shield said first and second magnetic cores from each other.

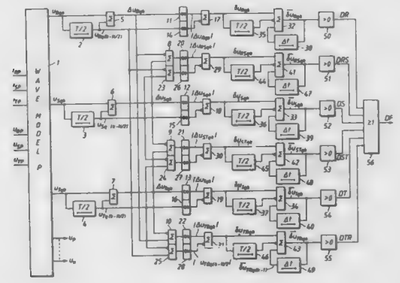
4,731,687
TAPE CARTRIDGE
Shinichi Kagano, Kyoto; Osamu Yamamoto, Takatsuki; Kazuaki Urano, Osaka, and Mutsunori Hamaoka, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Jan. 29, 1986, Ser. No. 823,806
Claims priority, application Japan, Jan. 30, 1985, 60-12572[U]
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—132 **5 Claims**



1. A tape cartridge comprising:
- a case body including a top half and a bottom half combined together forming a head insertion opening on a front portion of the case body;
- a magnetic tape wound around a pair of tape hubs and contained in the case body;
- a magnetic shielding plate of a definite thickness provided between said opening and the wound tape in the case body;
- a partition wall provided between said shielding plate and said wound tape for separating said wound tape from said shielding plate; and
- a pair of side ribs provided in front of said partition wall between said opening and said magnetic shielding plate forming a gap with respect to said partition wall, each side rib having a surface portion which contacts said shielding plate, said contact portions of said side ribs extending substantially the length of said partition wall along respective side ends of side plate;

said partition wall having a pair of lateral contact surface portions with a recess therebetween, said gap between said partition wall and said side ribs being substantially equal to said thickness of said shielding plate, thereby holding said shielding platc within said gap by said respective contact surface portions.

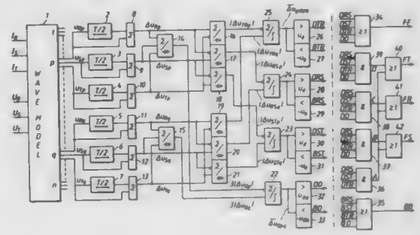
4,731,688
RANGE LIMITATION FOR A PROTECTION DEVICE IN A POWER SUPPLY NETWORK
Gunnar Nimmersjö, and Murari M. Saha, both of Västerås, Sweden, assignors to Asea AB, Sweden
Filed Mar. 27, 1987, Ser. No. 30,448
Claims priority, application Sweden, Apr. 8, 1986, 8601566
Int. Cl.[4] H02H *3/38*
U.S. Cl. 361—65 **3 Claims**



3. A device for range limitation and direct tripping in connection with the protection of a power line included in a multiphase electrical power transmission system, and for a control point Q, whereby the distance between P and Q constitutes the range of the device, the device comprises:
- a first summation member adapted to form a voltage difference Δu_{Rq} equal to the difference between an R-phase voltage, calculated with the travelling wave model, and the corresponding voltage one time period earlier,
- a second summation member adapted to form a voltage difference Δu_{Sq} equal to the difference between an S-phase voltage, calculated with the travelling wave model, and the corresponding voltage one time period earlier,
- a third summation member adapted to form a voltage difference Δu_{Tq} equal to the difference between a T-phase voltage, calculated with the travelling wave model, and the corresponding voltage one time period earlier,
- a fourth summation member adapted to form a voltage difference δu_{Rq} equal to the difference between the numerical value $|\Delta u_{Rq}|$ and the numerical value $|u_{Rq}|$ one time period eariler,
- a fifth summation member adapted to form a voltage differenee δu_{Sq} equal to the differfence between the numerical value $|\Delta u_{SQ}|$ and the numerical value $|u_{SQ}|$ one time period earlier,
- a sixth summation member adapted to form a voltage difference δu_{Tq} equal to the difference between the numerical value $|\Delta u_{Tq}|$ and the numerical value $|u_{Tq}|$ one time period earlier,
- a seventh summation member adapted to form a mean value $\bar{\delta}u_{Rq}$ of the voltage difference δu_{Rq},
- an eighth summation member adapted to form a mean value $\bar{\delta}u_{Sq}$ of the voltage difference δu_{Sq},
- a ninth summation member adapted to form a mean value $\bar{\delta}u_{Tq}$ of the voltage differ δu_{Tq},
- a tenth summation member adapted to form a voltage difference Δu_{RSq} equal to the difference between Δu_{Sq} and Δu_{Rq},
- an eleventh summation member adapted to form a voltage difference Δu_{STq} equal to the difference between Δu_{Tq} and Δu_{Sq},
- a twelfth summation member adapted to form a voltage difference Δu_{TRq} equal to the difference between Δu_{Rq} and Δu_{Tq},
- a thirteenth summation member adapted to form a voltage difference u_{RSq} equal to the difference between values of u_{Sq} and u_{Rq} one time period before the respective Δu-values,
- a fourteenth summation member adapted to form a voltage difference, u_{STq} equal to the difference between values of u_{Tq} and u_{Sq} one time period before the respective Δu-values,
- a fifteenth summation member adapted to form a voltage difference u_{TRq} equal to the difference between values of u_{Rq} and u_{Tq} one time period before the respective Δu-values,
- a sixteenth summation member adapted to form a voltage difference δu_{RSq} equal to the difference between the numerical value $|\delta u_{RSq}|$ and the numerical value $|u_{RSq}|$,
- a seventeenth summation member adapted to form a voltage difference δu_{STq} equal to the difference between the numerical value $|\Delta u_{STq}|$ and the numerical value $|u_{STq}|$,
- an eighteenth summation member adapted to form a voltage difference δu_{TRq} as the difference between the numerical value $|\Delta u_{TRq}|$ and the numerical value $|u_{TRq}|$,
- a nineteenth summation member adapted to form a mean value $\bar{\delta}u_{RSq}$ of the voltage difference δu_{RSq},
- a twentieth summation member adapted to form a mean value $\bar{\delta}u_{STq}$ of the voltage difference δu_{STq},
- a twenty-first summation member adapted to form a mean value $\bar{\delta}u_{TRq}$ of the voltage difference δu_{TRq},
- a respective comparison element to compare the produced mean values with the value zero,

and means to deliver a signal, via an "or"-element, indicating the occurrence of a fault within the range of the protection device when any of the mean value is greater than zero.

4,731,689
DIRECTIONAL DETECTION IN CONNECTION WITH FAULTS IN A POWER SUPPLY NETWORK
Gunnar Nimmersjö, and Murari M. Saha, both of Västerås, Sweden, assignors to ASEA AB, Sweden
Filed Mar. 27, 1987, Ser. No. 30,566
Claims priority, application Sweden, Apr. 8, 1986, 8601565
Int. Cl.[4] H01H *3/44*
U.S. Cl. 361—66 **5 Claims**



3. A device for the directional detection of a fault on an electrical power transmission line extending between two stations (P, Q) included in a multi-phase electrical power transmission system, which device, located in one of the stations, comprises a travelling wave model, comprising:
- a first summation member adapted to generate a difference voltage Δu_{Rp} equal to the difference between an R-phase voltage in station P, calculated by means of the travelling wave model, and the corresponding voltage one time period earlier,
- a second summation member adapted to generate a difference voltage Δu_{Sp} equal to the difference between an

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S-phase voltage in station P, calculated by means of the travelling wave model, and the corresponding voltage one time period earlier,

a third summation member adapted to generate a difference voltage Δu_{Tp} equal to the difference between a T-phase voltage in station P, calculated by means of the travelling wave model, and the corresponding voltage one time period earlier,

a fourth summation member adapted to generate a difference voltage Δu_{Rq} equal to the difference between an R-phase voltage in station Q, calculated by means of the travelling wave mode, and the corresponding voltage one time period earlier,

a fifth summation member adapted to generate a difference voltage Δu_{Sq} equal to the difference between an S-phase voltage in station Q, calculated by means of the travelling wave model, and the corresponding voltage one time period earlier,

a sixth summation member adapted to generate a difference voltage Δu_{Tq} equal to the difference between a T-phase voltage in station Q, calculated by means of the travelling wave model, and a corresponding voltage one time period earlier,

a seventh summation member adapted to generate a numerical value of the change in the zero sequence voltage, $3|\Delta u_{Op}| = = |\Delta u_{Rp} + \Delta u_{Sp} + \Delta u_{Tp}|$, in station P,

an eighth summation member adapted to generate a numerical value of the change in the zero sequence voltage, $3|\Delta u_{Oq}| = = |\Delta u_{Rq} + \Delta u_{Sq} + \Delta u_{Tq}|$ in station Q,

a ninth summation member adapted to generate a numerical value of the change in the principal voltage between phases T and R, $|\Delta u_{TRp}| = |\Delta u_{Rp} - \Delta u_{Tp}|$, in station P,

a tenth summation member adapted to generate a numerical value of the change in the principal voltage between phases R and S, $|\Delta u_{RSp}| = |\Delta u_{Sp} - \Delta u_{Rp}|$, in station P,

an eleventh summation member adapted to generate a numerical value of the change in the principal voltage between phases S and T, $|\Delta u_{STp}| = |\Delta u_{Tp} - \Delta u_{Sp}|$, in station P,

a twelfth summation member adapted to generate a numerical value of the change in the principal voltage between phases T and R, $|\Delta u_{TRq}| = |\Delta u_{Rq} - \Delta u_{Tq}|$, in station Q,

a thirteenth summation member adapted to generate a numerical value of the change in the principal voltage between phases R and S, $|\Delta u_{RSq}| = |\Delta u_{Sq} - \Delta u_{Rq}|$, in station Q,

a fourteenth summation member adapted to generate a numerical value of the change in the principal voltage between phases T and S, $|\Delta u_{STq}| = |\Delta u_{Tq} - \Delta u_{Sq}|$, in station Q,

a fifteenth summation member adapted to generate a mean value Δu_{Opq} of the change in the zero sequence voltage $\Delta u_{Opq} = = |\Delta u_{Oq}| - |\Delta u_{Op}|$ between stations P and Q,

a sixteenth summation member adapted to generate a mean value Δu_{STpq} of the change in the principal voltage between phases S and T, $\Delta u_{STpq} = |\Delta u_{STq}| - |\Delta u_{STp}|$, between stations P and Q,

a seventeenth summation member adapted to generate a mean value Δu_{RSpq} of the change in the principal voltage between phases R and S, $\Delta u_{RSpq} = |\Delta u_{RSq}| - |\Delta u_{RSp}|$, between stations P and Q,

an eighteenth summation member adapted to generate a mean value Δu_{TRpq} of the change in the principal voltage between phases T and R, $\Delta u_{TRpq} = |\Delta u_{TRq}| - |\Delta u_{TRp}|$,

a first comparison element adapted to compare Δu_{TRpq} with a selected voltage level u_d and, when Δu_{TRpq} is greater than said voltage level, to deliver a logical "1"-signal on its output DTR,

a second comparison element adapted to compare Δu_{TRpq} with a selected voltage level $-u_b$ and, when Δu_{TRpq} is lower than said voltage level, to deliver a logical "1"-signal on its output BTR,

a third comparison element adapted to compare Δu_{RSpq} with a selected voltage level u_d and, when Δu_{RSpq} is greater than said voltage level, to deliver a logical "1"-signal on its output DRS,

a fourth comparison element adapted to compare Δu_{RSpq} with a selected voltage level $-u_b$ and, when Δu_{RSpq} is smaller than said voltage level, to deliver a logical "1"-signal on its output BRS,

a fifth comparison element adapted to compare Δu_{STpq} with a selected voltage level u_d and, when Δu_{STpq} is greater than said voltage level, to deliver a logical "1"-signal on its output DST,

a sixth comparison element adapted to compare Δu_{STpq} with a selected voltage level $-u_b$ and, when Δu_{STpq} is smaller than said voltage level, to deliver a logical "1"-signal on its output BST,

a seventh comparison element adapted to compare Δu_{Opq} with a selected voltage level u_{Od} and, when Δu_{Opq} is greater than said voltage level, to deliver a logical "1"-signal on its output DO,

an eighth comparison element adapted to compare Δu_{Opq} with a selected voltage level $-u_{Ob}$ and, when Δu_{Opq} is smaller than said voltage level, to deliver a logical "1"-signal on its output BO,

a first or-element adapted to deliver on its output (FF) a logical "1"-signal indicating a fault lying ahead when any of DRS, DST, DTR or DO consists of a logical "1"-signal, and

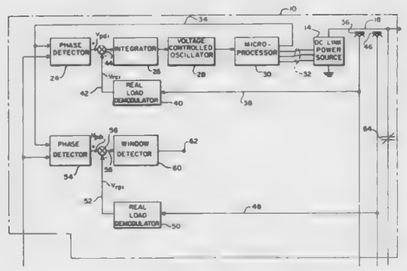
a second or-element adapted to deliver on its output (BB) a logical "1"-signal indicating a fault lying behind when any of BRS, BST, BTR or BO consists of a logical "1"-signal.

4,731,690

REAL LOAD UNBALANCE PROTECTION SYSTEM FOR PARALLEL VARIABLE SPEED CONSTANT FREQUENCY ELECTRICAL POWER SYSTEMS

Mirza A. Beg, Lima, and Donal E. Baker, American Township, Allen County, both of Ohio, assignors to Westinghouse Electrical Corp., Pittsburgh, Pa.

Filed Dec. 5, 1986, Ser. No. 938,702
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—78 5 Claims



1. A real load unbalance sensing and protection circuit for an electric power system in which at least two clock based power sources are connected for parallel operation, said circuit comprising:

means for producing a real load difference current signal proportional to the difference in real load currents of the power sources;

means for producing a phase angle signal proportional to the phase difference between an external clock signal and an internal clock signal of a first one of said power sources;

means for combining said real load difference current signal and said phase angle signal to produce an error signal; and

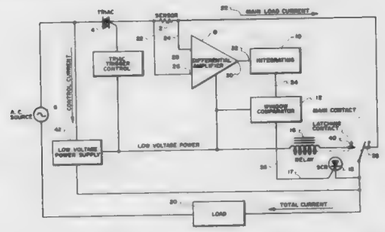
means for producing a trip signal when said error signal exceeds a preselected threshold level.

4,731,691

SAFETY CIRCUIT FOR DETECTING ASYMMETRY IN THYRISTOR LOAD CURRENTS

Ned Padwa, Tarzana, Calif., assignor to National Technical Systems, Calabasas, Calif.

Filed Jun. 6, 1986, Ser. No. 871,250
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—87 19 Claims



1. A symmetry sensing safety circuit means controlling an alternating electrical current flow through a bidirectional triode thyristor having its main terminals serially connected to an electrical device and to a source of electrical energy, the symmetry sensing safety circuit means having sensors connected in series and control logic connected in parallel with the thyristor, comprising:

a current sensing resistor device having a low resistance serially connected to thyristor and to the source of electrical energy sensing the alternating electrical current flow;

differential amplifier circuit means operatively associated with said resistor device generating a signal which is indicative of the direction and proportional to the amplitude of the sensed electrical current flow;

integrating circuit means operatively associated with said differential amplifier means generating a signal which is indicative of the direction and proportional to the amplitude of said signal generated by said differential amplifier circuit means integrated over a predetermined time interval, said time interval being variable by a user, said integrating circuit means having a time constant of at least 0.5 seconds;

window comparator circuit means operatively associated with said integrating circuit means generating a signal indicating when said signal generated by said integrating circuit means is outside of a predetermined range of values, said range of values being user adjustable;

relay control circuit means operatively associated with said window comparator circuit means generating a triggering signal whenever said window comparator circuit means generates said signal indicating said signal generated by said integrating circuit means is outside of said predetermined range of values;

electromechanical relay means operatively associated with said electromechanical relay means latching, in a selectively releasable manner, said electromechanical relay means in said latched state switching off the alternating current flow to the thyristor.

4,731,692

CIRCUIT BREAKER TRIP SOLENOID ASSEMBLY

Robert F. Dvorak, Mt. Vernon, and John M. Winter, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Oct. 24, 1986, Ser. No. 922,967
Int. Cl.[4] H03H *7/00*
U.S. Cl. 361—102 9 Claims

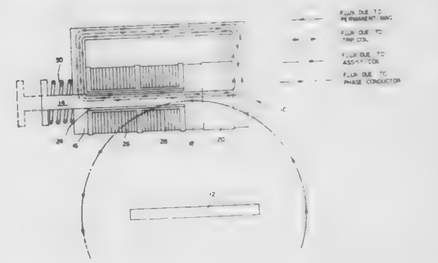
1. A circuit breaker comprising:

a pair of separable contacts having an open position and a closed position, said contacts being separated in the open position, said contacts being engaged in the closed position;

a conductor;

tripping means for moving said contacts to the open position upon activation;

a trip solenoid assembly positioned adjacent said conductor, said trip solenoid assembly including a ferrous metal plunger, a trip coil and an assist coil, the plunger moving within the trip coil and assist coil, the plunger having an



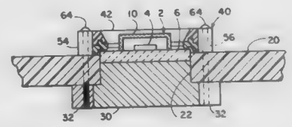
extended position and a non-extended position, the plunger generally being in the non-extended position when said contacts are in the closed position, upon the current through said conductor reaching a predetermined overcurrent level, said trip coil being enerized for a certain time period to move said plunger to the extended position activating said tripping means, said assist coil being energized upon the current through said conductor reaching a predetermined first level.

4,731,693

CONNECTION APPARATUS FOR INTEGRATED CIRCUIT

William E. Berg, Portland, and John L. Addis, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 29, 1986, Ser. No. 912,898
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 6 Claims



1. In combination,

a circuit board having first and second opposite main faces and formed with an aperture that extends therethrough between the opposite main faces, the circuit board comprising dielectric material and runs of conductive material that are supported by the dielectric material in mutually electrically isolated relationship, the runs of conductive material terminating in connection pads that are exposed at the first main face of the circuit board and are distributed about the periphery of the aperture in the circuit board,

a substrate of dielectric material having first and second opposite main faces, the substrate being fitted in the aperture of the circuit board,

conductor runs on the first main face of the substrate and terminating in respective connection pads that are distributed about a peripheral region of the first main face,

an integrated circuit chip mounted on the first main face of the substrate,

a first clamp member of thermally-conductive material, the first clamp member being homogeneous and having a

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perigheral portion that engages the second main face of the circuit board and a pedestal portion that enters the aperture of the circuit board and engages the second main face of the substrate, the height of the pedestal portion being less than the thickness of the circuit board,

a second clamp member,

a resilient member comprising dielectric material and portions of conductive material supported by the dielectric material in mutually electrically isolated relationship and exposed at a face of the resilient member, the resilient member being positioned in engagement with the second clamp member and having said face presented towards both the substrate and the circuit board, and

releasable fastening means which engage the clamp members and hold the first clamp member in pressure contact with the second main face of the substrate and the second main face of the circuit board and hold said face of the resilient member in contact with the substrate and the circuit board, whereby said portions of conductive material provide electrical connection between the connection pads of the substrate and the connection pads of the circuit board, and upon release of the fastening means the first clamp member can be removed from contact with the substrate and the circuit board.

4,731,694

TOUCH SELECTION PAD AND METHOD OF MANUFACTURE

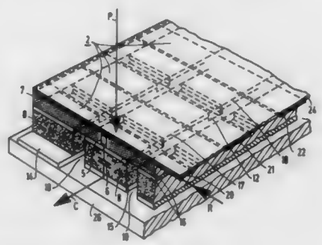
Günther Gräbner, Heroldsbach, and Dietrich Stephani, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 40,239

Claims priority, application Fed. Rep. of Germany, May 5, 1986, 3615204; Dec. 15, 1986, 3642780

Int. Cl.⁴ H01H *9/00, 13/02;* **H02P** *7/00*

U.S. Cl. 361—280 **24 Claims**



1. A touch selection pad comprising:

(a) a matrix of tactile sensors arranged into rows and columns, each tactile sensor comprising a series circuit of a variable resistance which is part of a layer of composite material which has a pressure dependent conductivity and a capacitor comprising a layer of dielectric material having a capacitance of at least fifty picofarads;

(b) a plurality of row electrodes coupled to the rows of the matrix of tactile sensors and

(c) a plurality of column electrodes coupled to the columns of the matrix of tactile sensors.

4,731,695

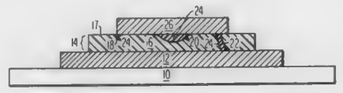
CAPACITOR AND METHOD FOR MAKING SAME WITH HIGH YIELD

Richard Brown, Berkeley Heights Township, Union County; Phillip C. Jozwiak, Plainsboro Township, Middlesex County, and Saligrama N. Subbarao, West Windsor Township, Mercer County, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 17, 1987, Ser. No. 15,478

Int. Cl.⁴ H01G *3/07, 4/08, 7/00*

U.S. Cl. 361—313 **18 Claims**



1. A capacitor comprising:

a first non-anodizable electrode;

an insulator overlying said first electrode, said insulator including a primary dielectric having an upper surface and at least one void communicating only with said upper surface, and a fill dielectric disposed in said void; and

a second electrode overlying said insulator.

4,731,696

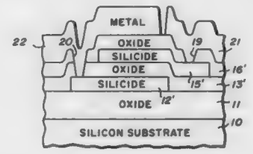
THREE PLATE INTEGRATED CIRCUIT CAPACITOR

Peter G. Himes, Fremont, and John A. Lippert, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1987, Ser. No. 53,764

Int. Cl.⁴ H01G *4/10, 7/00;* **H01L** *21/225*

U.S. Cl. 361—313 **7 Claims**



1. A capacitor suitable for fabrication on a monolithic silicon integrated circuit, said capacitor having a low voltage coefficient and comprising:

a first plate composed of a material selected from the group consisting of refractory metals and refractory metal silicides;

a first dielectric layer located on said first plate, said first dielectric being characterized as having a low incidence of interface trapping states where it contacts the first plate;

a second plate located on said first dielectric layer, said second plate composed of a material selected from the group consisting of refractory metals and refractory metal silicides;

a second dielectric layer located on said second plate, said second dielectric being characterized as having a low incidence of interface trapping states where it contacts the second plate;

a third plate composed of a conductive metal and located over said second dielectric layer; and

means for connecting said first and third plates together to form one capacitor electrode wherein said second plate forms the other capacitor electrode.

4,731,697

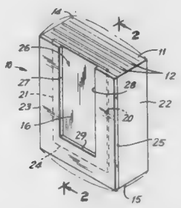
ARC RESISTANT TRIMABLE CERAMIC CAPACITOR

Joseph C. McLarney, Portville, N.Y., assignor to AVX Corporation, Great Neck, N.Y.

Filed May 5, 1987, Ser. No. 46,098

Int. Cl.⁴ H01G *4/10, 7/00*

U.S. Cl. 361—321 **5 Claims**



1. A constant value trimable monolithic arc-resistant ceramic capacitor comprising alternate layers of electrode and ceramic dielectric material, alternate said electrode layers being exposed at opposite ends of said monolith, said monolith including an outer dielectric layer, a surface electrode formed on said outer layer, said surface electrode covering less than all of said outer layer and having one margin co-terminus with one said end of said monolith, the margin of said surface electrode opposite said one margin being spaced from the other end of said monolith, first termination means at said other end connecting the electrodes exposed at said other end, and second termination means connecting the electrodes at said one end and said one margin of said surface electrode, and a further dielectric layer covering said surface electrode, said further layer including an aperture in registry with portions of said surface electrode, said aperture extending to said one end of said monolith, said further dielectric layer overlying margins of said surface electrode.

4,731,698

MECHANICAL AND ELECTRICAL ASSEMBLING DEVICE FOR HIGH-DENSITY ELECTRONIC CARDS WITH THERMAL CONDUCTION COOLING

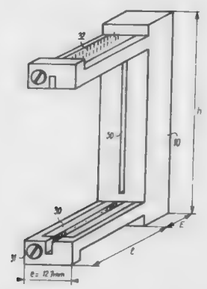
Francois Millot, Asnieres, and Jean C. Kran, Ygny, both of France, assignors to Sintra, Asnieres, France

Filed Jun. 11, 1985, Ser. No. 743,610

Claims priority, application France, Jun. 14, 1984, 84 09308

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **1 Claim**



1. A device for holding high-density electronic data cards comprising:

a U-shaped receptacle having two legs and a bottom portion, said receptacle having a means providing thermal conduction cooling path with a received electronic card on the bottom portion thereof;

zero insertion force receiving means on each of the legs of said U-shaped receptacle positioned such that said electronic card is inserted into said U-shaped receptacle when said zero insertion force receiving means are in a unlocked position.

4,731,699

MOUNTING STRUCTURE FOR A CHIP

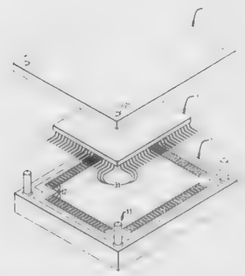
Mitsuru Nitta, and Tatsuo Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,361

Claims priority, application Japan, Oct. 8, 1985, 60-224488; Oct. 16, 1985, 60-228869

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **5 Claims**



1. A mounting structure for a chip comprising:

a substrate having a plurality of electrodes on an upper surface thereof, a plurality of terminals on a lower surface thereof, and wirings for electrically interconnecting said electrodes and said terminals thereinside;

a plurality of pins provided on said upper surface of said substrate;

an integrated circuit chip provided with a plurality of flexible lead terminals, which are interconnected to said electrodes, around a lower surface of said chip; and

a heat radiation plate having a plurality of openings in which said pins are received in one-to-one correspondence, making contact with an upper surface of said chip through a good heat-conductive material and being fixed to said pins by an adhesive.

4,731,700

SEMICONDUCTOR CONNECTION AND CROSSOVER APPARATUS

Gary K. Woodward, and Stephen R. Belcher, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 12, 1987, Ser. No. 13,959

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—388 **9 Claims**

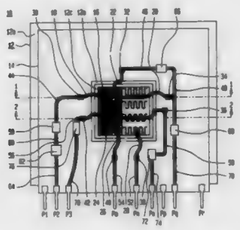
1. Interconnection apparatus comprising: an insulator member having an upper surface and portions thereof which define a recessed region which has an upper perimeter which intersects the upper surface and receives an integrated circuit therein; and a plurality of conductors;

a first of the conductors on the upper surface of the insulator member extends completely over the recessed region and passes over an integrated circuit placed in the recessed region without making electrical contact to the integrated circuit; and

a second of the conductors has a portion thereof on the upper surface of the insulator member and has another

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portion thereof which extends into a portion of the recessed region and is electrically coupled to the integrated



circuit placed in the recessed region with an upper major surface of the integrated circuit facing the perimeter of the recessed region.

4,731,701

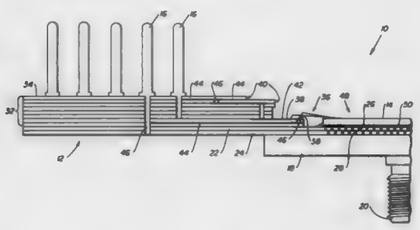
INTEGRATED CIRCUIT PACKAGE WITH THERMAL PATH LAYERS INCORPORATING STAGGERED THERMAL VIAS

Marco K. Kuo, San Mateo, and Nirmal K. Sharma, Sunnyvale, both of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed May 12, 1987, Ser. No. 49,725

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—388 **4 Claims**



1. A package for an integrated circuit comprising:

a plurality of cavity-defining layers of thermally and electrically insulating material with conductive strips and vias applied on and through at least some of said cavity-defining layers providing for the conduction of electrical signals, said layers including apertures so that each of said plurality of cavity-defining layers includes at least one aperture, said apertures collectively defining a die cavity;

a thermally and electrically conductive heat spreader for conducting heat from said die cavity; and

a thermally conductive electrical barrier between said plurality of layers and said heat spreader, said barrier including at least first and second layers primarily of electrically insulating material, said first and second layers being in contact, said first layer including a first pattern of thermally conductive vias extending therethrough, said second layer including a second pattern of thermally conductive vias extending therethrough, said first and second patterns being staggered so that the vias of said first and second layers define an electrically insulating thermal path between said die cavity and said heat spreader.

4,731,702

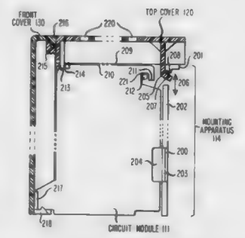
COMMUNICATION EQUIPMENT CABINET ARRANGEMENT

Jeffrey M. Hiatt, Monmouth Beach; William H. Martin, Jr., Holmdel, and Mark E. Millman, Keyport, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Oct. 30, 1986, Ser. No. 925,080

Int. Cl.[4] H05K *5/04*

U.S. Cl. 361—391 **7 Claims**



1. A communication equipment cabinet arrangement comprising

a mounting apparatus having a backplane including at least three parallel mounting slots, each slot arranged for mounting a circuit module therein;

two circuit modules, each module individually mounted in one of two end slots of said mounting apparatus and wherein one side surface of each of said two modules forms a side panel of said cabinet arrangement; and

cover means having multiple integral connection means (illustratively, **205, 213, 218**) thereon connecting to said two modules and said mounting apparatus, said cover means covering the top and front surfaces of and any intervening spaces between said two modules, thereby forming the top and front panel of said cabinet arrangement.

4,731,703

POWER SUPPLY STRUCTURE AND SYSTEM FOR MOUNTING THE SAME

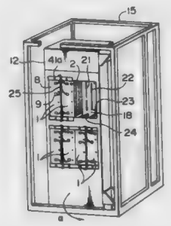
Tamotsu Tsukaguchi, Hiratsuka; Hiroshi Kozai; Toshio Mori, both of Hadano, and Fumiyuki Kobayashi, Sagamihara, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Oct. 20, 1986, Ser. No. 920,607

Claims priority, application Japan, Oct. 18, 1985, 60-231140; Oct. 23, 1985, 60-235124

Int. Cl.[4] H02J *3/00;* **H02B** *1/04*

U.S. Cl. 361—391 **11 Claims**



1. A power supply construction comprising:

a logic circuit section housed in a frame;

a power supply section mounted rotatably on said frame so as to rotate about a rotating axis in opposed relation to said logic circuit section for supplying power to said logic circuit section;

a plurality of relay bars having first ends thereof arranged along said rotating axis for supplying a plurality of required voltages to said logic circuit section;

a plurality of power supply bars for providing said required voltages from said power supply section, said power supply bars having first ends thereof arranged along said rotating axis; and

a plurality of flexible conductors electrically connecting said first ends of said relay bars to said first ends of said power supply bars, respectively, so as to conduct said required voltages from said power supply section to said logic circuit section.

4,731,704

ARRANGEMENT FOR MODIFYING ELECTRICAL PRINTED CIRCUIT BOARDS

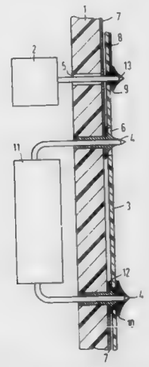
Anton Lochner, Moosburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 751,815, Jul. 5, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 940,227

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432360

Int. Cl.[4] H05K *7/06*

U.S. Cl. 361—400 **2 Claims**



1. An arrangement for modifying an electrical printed circuit board including a relatively thick support plate, components having component lead wires which extend through the thick support plate and conductors which are electrically connected to at least some of said component lead wires, comprising:

an additional conductor which is to be connected to at least one of said component lead wires, the additional conductor being in the form of a printed conductor formed on a relatively thin support plate which is adapted for placement on the thick support plate, said thin support plate including at least one soldering eyelet integral with said additional conductor which is to be positioned over at least one of said component lead wires and soldered thereto and the thin support plate including at least one clearance hole and one insulated soldering eyelet for positioning over respective ones of at least two other of said component lead wires, said insulated soldering eyelet being positioned on said thin support plate so as to be aligned with one of said at least two other of said component lead wires and soldered thereto, for providing mechanical connection of said thick support plate to said thin support plate, said clearance hole being positioned on said thin support plate so as to be aligned with and allow an other one of said at least two other of said component lead wires to pass through said thin support plate without obstruction.

4,731,705

CELL FOR ELECTRIC DOUBLE LAYER CAPACITORS AND PROCESS FOR MANUFACTURING SUCH A CELL

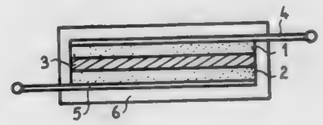
Gonzal Velasco, Paris; Philippe Adet, Fontenay les Brus; Philippe Colomban, Sevres, and Thi M. Pham, Savigny sur Orge, all of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jun. 24, 1986, Ser. No. 877,867

Claims priority, application France, Jun. 25, 1985, 85 09653

Int. Cl.[4] H01G *9/00;* **B01J** *17/00*

U.S. Cl. 361—433 **24 Claims**



1. A cell for an electric double layer capacitor, comprising:

a membrane formed of a solid protonic conducting electrolyte separating two electrodes; and

two electrodes each comprising a composite electrode including a mixture of predetermined proportions of at least one electronic conductor and at least one solid electrolyte, said solid electrolyte of said composite electrode comprising a protonic conductor chosen from a group consisting of uranyl phosphate $H_3OUO_2PO_4.3H_2O$, zirconium phosphate $Zr(HOP_4)_2nH_2O$, derivatives of these compounds and protonic conductors with high protonic conductivity having a low electronic conductivity.

4,731,706

METHOD OF MANUFACTURING AND OF ADJUSTING THE ORIENTATION OF A MOTOR VEHICLE HEADLAMP; AND A MOTOR VEHICLE HEADLAMP FOR PERFORMING SAID METHOD

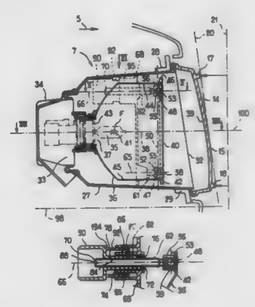
Jacques Ricard, Paris, France, assignor to Cibie Projecteurs, France

Division of Ser. No. 749,308, Jun. 27, 1985, Pat. No. 4,628,414. This application Jun. 19, 1986, Ser. No. 876,241

Claims priority, application France, Jul. 2, 1984, 84 10465

Int. Cl.[4] B60Q *1/06*

U.S. Cl. 362—61 **8 Claims**



1. A motor vehicle headlamp comprising:

a transparent glass:

means defining a plane which is fixed relative to said glass;

an optical assembly having an optical axis passing through said glass;

connection means for connecting said optical assembly to

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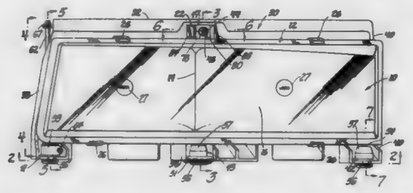
said glass, said connection means comprising both guide pivot means for guiding said optical assembly to pivot relative to said glass about a pivot axis, and graduated adjustment means for adjusting the position of said optical assembly relative to said glass by pivoting about said pivot axis, with reference to a reference plane at a predetermined orientation relative to the plane which is fixed relative to the glass and at least approximately parallel to said pivot axis, said graduated adjustment means including graduations and a zero point which remains in a fixed relationship corresponding to a known reference position of the optical assembly with respect to the glass.

4,731,707

VEHICLE HEADLAMP ASSEMBLY

David R. McMahan; Harry S. Murphy, Jr., and John D. Geddie, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 4, 1987, Ser. No. 45,300
Int. Cl.[4] B60Q *1/06*; F16C *11/00*
U.S. Cl. 362—66 **6 Claims**



1. A vehicle headlamp assembly comprising a support frame adapted to be fixedly secured to the front end of a motor vehicle, a lamp body located within said support frame for selective adjustable movement about a vertical axis and a horizontal axis, a first axially adjustable connector secured to the lamp body and located along the vertical axis between the lamp body and the support frame, a second axially adjustable connector secured to lamp body and located along the horizontal axis, and a third non-adjustable connector secured to the lamp body and located at the intersection of the vertical axis and the horizontal axis, said first, second and third connectors each having resilient means interposed between the lamp body and the support frame so as to cushion the head lamp from shock.

4,731,708

COMBINATION REAR WINDOW BRAKE LIGHT AND CONVENIENCE LIGHT

Albert J. Gonas, Grosse Point, Mich., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Sep. 22, 1986, Ser. No. 909,890
Int. Cl.[4] B60Q *11/00*
U.S. Cl. 362—80 **4 Claims**

1. A combination brake light and convenience light for an automotive vehicle, including:

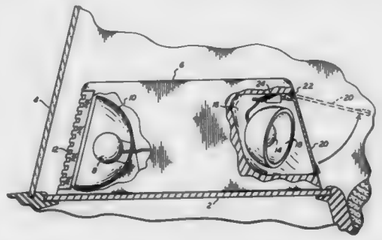
a. a housing arranged within said vehicle on a shelf between a rear seat of said vehicle and a rear window of said vehicle so that said housing is visible from behind said vehicle through said rear window;

b. a brake light disposed within said housing and responsive to the operation of the braking system of said vehicle to signal such operation through said rear window;

c. a convenience light disposed within said housing separate from said brake light and arranged for directing illumination generally forward and downward for use by rear seat occupants of said vehicle;

d. a hinged cover mounted on said housing over said convenience light;

e. a switch responsive to the opening of said cover to energize said convenience light, and responsive to the closing of said cover to deenergize said convenience light; and



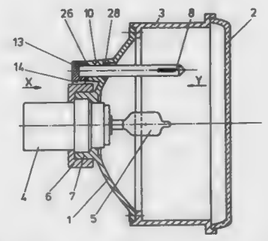
f. said cover in its open position preventing direct incidence of illumination from said convenience light upon the rear view mirror line of sight of the operator of said vehicle.

4,731,709

HEADLIGHT FOR AUTOMOBILES

Erwin Freudenreich, Lippstadt, and Werner Stuckstedte, Rheda-Wiedenbrück, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,820
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612987
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—80 **19 Claims**



1. A headlight for motor vehicles, comprising:

(a) a plastic reflector dish having an interior and a rear;

(b) a glass disc covering the interior of said reflector;

(c) a light bulb inserted into a first opening in the rear of said reflector;

(d) a rod-shaped tube filled with desiccative connecting the interior of said reflector with the external air environment;

(e) a collar surrounding said rod-shaped tube, said rod-shaped tube having an end segment guided into and locked onto a second opening in said reflector, said rod-shaped tube having a free end segment protruding into the interior of said headlight and being located in vicinity of said light bulb;

(f) a cover on the rear of said headlight and having a ventilation opening for protecting said tube filled with desiccative against contamination and flooding;

(g) said rod-shaped tube having a length so that said end segment of said tube inserted into said second opening protrudes out of said second opening at the rear of said reflector;

(h) said cover with said ventilation opening having a socket-shape and being pushed over and locked onto said end segment of said tube protruding out of said second opening;

(i) said socket-shaped cover contacting a facing rim of said second opening in said reflector;

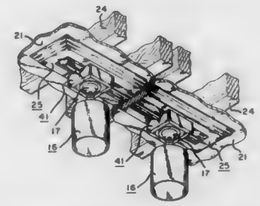
(j) screw lock means for reversibly arresting said rod-shaped tube in said second opening in said reflector.

4,731,710

DECORATIVE LIGHTING TRACK SYSTEM

Joseph Distasio, 10 Edelweiss La., Voorhees, N.J. 08043

Filed Apr. 30, 1987, Ser. No. 44,293
Int. Cl.[4] F21S *1/02, 1/14, 3/02*
U.S. Cl. 362—147 **4 Claims**



1. A track lighting system for decoratively supporting and concealing an elongate standard transversely adjustable lighting track and associated track clamp and lighting fixture upon a flat surface such as a common wall or ceiling comprising:

a decorative planar member having opposed flat surfaces and a predetermined perimetral configuration in excess of that of the lighting track and adapted to be secured upon the flat surface by one opposed flat surface and adapted to have secured upon the other opposed flat surface the lighting track; and

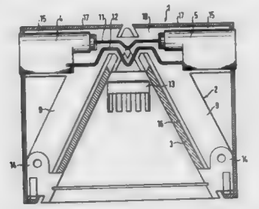
a decorative lighting track cover member of configuration adapted to fit over a portion of the lighting track within the perimetral bounds of the decorative planar member and be interposed between the lighting track and track clamp when secured in place and the lighting fixture to conceal the lighting track and track clamp.

4,731,711

LIGHTING SYSTEM

Hartmut S. Engel, Schloss Heutingsheim, 7141 Freiberg am Neckar, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,616
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521910
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—147 **17 Claims**



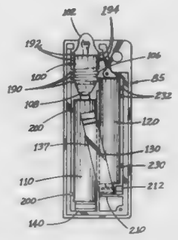
1. A modular lighting system including at least one spotlight unit and mechanical support means therefor, said mechanical support means including first and second power lines and having at least one end connectable to said spotlight unit and formed as a connection member, said spotlight unit comprising a carrier part, a lamp holder mounted on said carrier part, first and second diametrically oppositely disposed and substantially identically constructed mounts on said carrier part and adapted for connection to a said connection member of said mechanical support means, each said mount including first and second conductors, said first conductors of said first and second mounts and said second conductors of said first and second mounts being respectively electrically connected together and to said lamp holder, said connecting member being electrically and mechanically connectable with any one of said mounts, said connecting member and said mounts being constructed as respective elements of a plug and socket connector adapted in connected state to produce mechanical connection between said mechanical support means and said spotlight unit and electrical connection between said power lines and said first and second conductors.

4,731,712

SQUEEZABLE FLASHLIGHT

Helmut K. Amthor, Rocky River, Ohio, assignor to Eveready Battery Company, St. Louis, Mo.

Filed Dec. 10, 1986, Ser. No. 940,129
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—189 **18 Claims**



1. A flashlight comprising:

a flashlight housing;

a pair of batteries within the housing, each battery having a terminal disposed on an end thereof and a terminal defined by a battery casing;

a lamp including a body comprising a central contact terminal disposed at an end thereof and a generally cylindrical casing terminal;

first means for securing at least a portion of the lamp within the flashlight housing;

second means for retaining the batteries in an offset side-by-side relationship within the housing and in a relationship with respect to the lamp such that said central contact terminal of the lamp contacts a first said terminal of a first of the batteries and said cylindrical casing terminal of the lamp contacts a second said terminal of the second of the batteries, the second terminal having a polarity opposite to the first terminal;

third means for electrically insulating the casings of the batteries from each other; and

fourth means for electrically connecting the batteries so that current flows through the lamp, said fourth means being rendered operative when force is applied to a portion of said housing having at least limited flexibility.

4,731,713

FOG LAMP

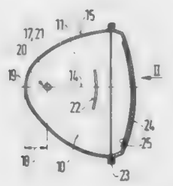
Peter Perthus, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,171
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527391
Int. Cl.[4] F21V *7/06, 7/08*
U.S. Cl. 362—302 **2 Claims**

1. A fog lamp for a motor vehicle, comprising a reflector, a transparent pane connected to said reflector, and an incandescent lamp accommodated in said reflector, said reflector hav-

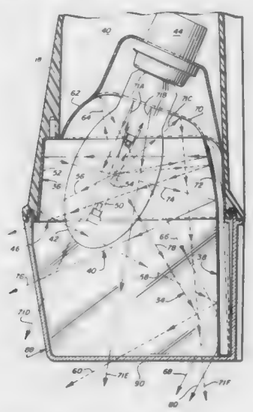
VOL 1088 ISS 3 MR 15 1988 UMI

ing an upper portion and a lower portion separated from each other by a horizontal central plane, said lower portion being formed by a portion of paraboloid, said upper portion constituting a reflection surface which has every vertical section formed by ellipse and every horizontal section formed by parabola, wherein focuses of the paraboloid, parabola and



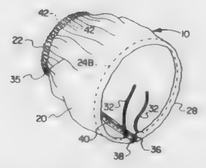
ellipse are identical and form a focus of said reflector, said incandescent lamp being positioned in the region of said focus and being cylindrical and having an axis which is horizontal and extends at right angles to an optical axis of the fog lamp, said focus lying within said incandescent lamp, whereby a rough light beam with a concentrated core for a required light-dark limit is obtained.

4,731,714
LUMINAIRE
James P. Kelly, Waterford, and James A. Wenman, Whitewater, both of Wis., assignors to Cooper Industries, Houston, Tex.
Continuation of Ser. No. 601,483, Apr. 18, 1984, abandoned.
This application Jan. 9, 1986, Ser. No. 817,771
Int. Cl.[4] F21V *15/04*
U.S. Cl. 362—310 **14 Claims**



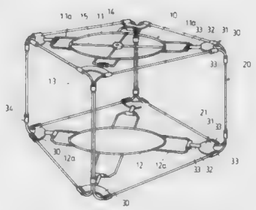
1. A luminaire adapted to a luminate a planar area with a sharp horizontal cutoff in a generally rectangular light pattern, comprising:
- a housing defining a cavity with a downwardly facing open end;
- a source of light located in an upper portion of said cavity;
- means for mounting said housing on a vertical surface;
- a reflector system, said reflector system including a first top reflector portion in said cavity;
- said reflector system further including a lower second reflector portion extending downwardly from said cavity;
- a lens assembly secured to said housing over said downwardly facing open end, said lens assembly including a lens of transparent, nonprismatic substantially smooth material;
- said second portion of said reflector system being removably mounted in said lens assembly;
- said first portion of said reflector system including a substantially concave reflector shaped to conform to the internal periphery of said cavity, said first portion of said reflector system further being constructed and arranged to reflect light from said source of light onto said second portion of said reflector system;
- said second portion of said reflector system including side edges, a central peak with curvilinear side sections curving downwardly from said central peak to said side edges and a forwardly extending portion;
- said first portion of said reflector system including a frontal surface configured to reflect light out of said downwardly facing open end of said housing and onto said second portion of said reflector system, said first portion of said reflector system including a rear surface configured to reflect light out of said downwardly facing open end of said housing through said lens assembly in a generally outward and downward direction.

4,731,715
LAMP SHADE COVER
Edwin G. Anderson, 2508 N. Locust, Denton, Tex. 76201
Filed Aug. 30, 1982, Ser. No. 412,495
Int. Cl.[4] H02B *1/02*
U.S. Cl. 362—352 **4 Claims**



1. A lamp shade cover comprising a conformable panel member having a top edge portion, a bottom edge portion, a flexible sidewall member disposed intermediate said top and bottom edge portions, an elongated elastic member coupled to said flexible sidewall member along substantially the entire length of said bottom edge portion and a draw string coupled to said flexible sidewall member along said top edge portion, said top edge portion including a casing pocket extending along said top edge portion, and said draw string being received in said top edge casing pocket.

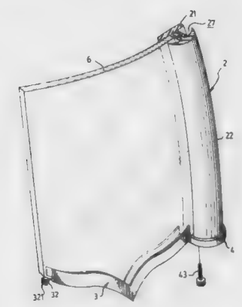
4,731,716
COLLAPSIBLE LAMP-SHADE STRUCTURE
Kuo-Hsiang Chang, 5th Floor, No. 4, Lane 281, Lung Chiang Road, Taipei, Taiwan
Filed Jan. 30, 1987, Ser. No. 8,761
Int. Cl.[4] F21V *1/06*
U.S. Cl. 362—352 **6 Claims**



1. A collapsible lamp-shade structure, comprising:

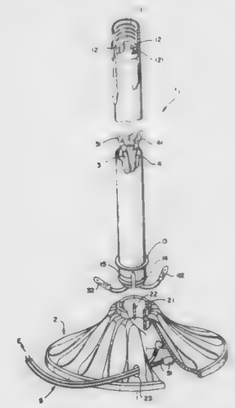
an inner lamp-shade having an upper member, a lower member and a flexible cloth stretched therebetween to confine a space for the light source; said upper and lower members each being provided with a plurality of lugs each being spaced equidistantly around the outer periphery and extending away from the center of respective said upper and lower members;
- an outer lamp-shade having a plurality of frame members each being located equidistantly away from said inner lamp-shade and abutted end-to-end with one after another to assume a polygonal shape, and a plurality of decorative pieces of transparent material, each being detachably provided on respective said frame member; each said frame member having top, bottom, left and right sides; and
- a plurality of connecting means provided between said lugs and top and bottom sides of said frame members for detachably connecting said inner and outer lamp-shades with each other.

4,731,717
SUPPORT STRUCTURE FOR PLATE GLASS LAMP SHADES
Kang Yu, and Jiann Yu, both of 2nd Fl., No. 24, Lane 295, Sec. 1, Fu Hsing S. Road, Taipei, Taiwan, assignors to Kang Yu; Jiann Yu and Judith Chyou, all of Taiwan, Taiwan
Filed Mar. 30, 1987, Ser. No. 31,362
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—352 **2 Claims**



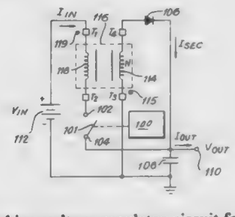
1. A support structure for plate glass lamp shades comprising:
- (A) a plurality of strip assemblies, each of said strip assembly further comprising a receiver strip with an abutment and an insert strip, said insert strip having a ridged insert which is securely engagable with a ridged receptacle projecting from said abutment on said receiver strip;
- (B) a plurality of lower supports which correspond to the shape of the lower edge of a glass plate, said lower supports having catches on either end thereof, a plate glass retainer forming the top surface of said lower support;
- (C) a plurality of injection plates which secure both said lower supports and said strip assemblies in place, each of said injection plates having a catch hole on either side thereof, each of said injection plates also having an insert strip cavity for receiving an insert strip; each injection plate being fixed to said insert strip by means of a screw; and
- (D) a lamp cover, said lamp cover having an abutment on said receiver strip slot to receive said abutment, said lamp cover also having a rim to receive the top end of said ridged receptacle and ridged insert.

4,731,718
CHRISTMAS LAMP
Rong-Fu Sheu, No. 15, Bair Sha, Hsin Chu, Taiwan
Filed Feb. 25, 1987, Ser. No. 18,711
Int. Cl.[4] F21V *35/00*
U.S. Cl. 362—392 **1 Claim**



1. An improved Christmas lamp comprising a candlelike cylinder, a stand and several electric wires, each electric wire being provided with a metal strip at both ends thereof, one of the metal strips being bent; said candlelike cylinder having an interrupted internal thread at the top, several curved projections under the thread to act as a support of the bulb, several small cylindrical projections on the curved projections to prevent the bent metal strip from being pressed down by the lower end of the bulb, a collar acting as an inserting stop of the candlelike cylinder, a double-slope flange to be retained by the lower ends of the projections of the stand as a means to removably fix the candlelike cylinder in the stand, and several grooves in the lower end under the collar to fit on the projections of the stand to prevent the candlelike cylinder from turning axially in the stand and to enable the lower end of the candlelike cylinder to reduce and to snap in the stand; said stand having two grooves and several projectons to retain the candlelike cylinder together with the collar and double-slope flange of the cylinder, and two grooves for the metal strips of the electric wires to fit in; said electric wires fitted with metal strips being connected to complete a circuit.

4,731,719
CURRENT BOOSTED SWITCHING REGULATOR
Carl T. Nelson, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.
Filed Nov. 19, 1986, Ser. No. 932,715
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—20 **5 Claims**



1. A switching voltage regulator circuit for connection to a power supply, the circuit generating at an output terminal an

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output voltage no greater in magnitude than the power supply voltage, comprising:

switching means for controlling on and off conduction of an input current from the power supply;

a diode;

a capacitor connected to said diode and to the output terminal; and

energy storage means connected to said diode, said capacitor and said switching means for providing input current to the output terminal and for storing energy when said switching means conducts input current, and for providing to the output terminal from the stored energy a current exceeding the input current when said switching means does not conduct input current, whereby the total current delivered to the output terminal exceeds the input current conducted by said switching means.

4,731,720

HIGH-VOLTAGE POWER SOURCE APPARATUS

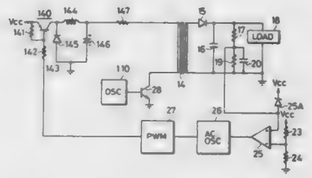
Kazuyoshi Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,254

Claims priority, application Japan, Nov. 2, 1984, 59-230092; Nov. 2, 1984, 59-230093; Nov. 2, 1984, 59-230094; Nov. 2, 1984, 59-230095; Dec. 26, 1984, 59-273455; Dec. 26, 1984, 59-273456; Dec. 26, 1984, 59-273457

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **11 Claims**



1. A high-voltage power source apparatus comprising:

a transformer for receiving an input at a primary side of said transformer and producing a high-voltage output at a secondary side of said transformer;

switching means for intermittently supplying electric power to the primary side of said transformer;

first signal output means for outputting a switching signal for turning said switching means on and off;

rectifying means for rectifying the high-voltage output at the secondary side of said transformer; and

control means, including second signal output means for outputting a signal oscillating at a predetermined frequency different from that of the switching signal, for oscillating an output from said rectifying means at a predetermined frequency by means of controlling the primary side of said transformer in accordance with the signal from said second signal output means.

4,731,721

REGULATED HIGH-VOLTAGE POWER SUPPLY WITH OUTPUT SHORTING PREVENTION

Kiyoteru Igashira, and Yukio Maeba, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 24, 1986, Ser. No. 832,146

Claims priority, application Japan, Mar. 20, 1985, 60-57894

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 363—56 **5 Claims**

1. A regulated high-voltage power supply comprising

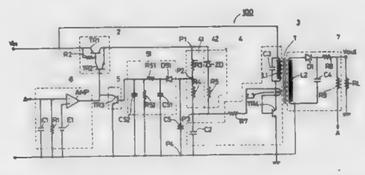
a tuned-collector type oscillation circuit having an oscillation transistor;

a control circuit for controlling the base current of said oscillation transistor;

a resistance circuit for supplying the base current to said oscillation transistor in response to the output from said control circuit;

a protection circuit having a protective transistor for receiving at least part of the output from said resistance circuit to attenuate the output from said control circuit, said resistance circuit being formed by a first resistance circuit part having high resistance value and a second resistance circuit part connected in parallel thereto and including a zener diode, said first resistance circuit part being formed by a plurality of series-connected resistor means, a first junction between said plurality of resistor means being connected to said protective transistor; and

a first delay capacitor connected between said first junction and a grounded potential point for delaying the rise time of voltage at said first junction with respect to the rise time of output voltage of said control circuit,



said regulated high-voltage power supply further including,

between said first junction between said plurality of resistor means forming said first resistance circuit part and said protective transistor,

a diode for supplying a forward current to the base of said protective transistor and

a time-constant circuit including a second delay capacitor for delaying the time at which said protective transistor enters a non-conductive state from a conductive state, the diode preventing the storage charge in the second delay capacitor from being discharged through the first resistance circuit part, and

discharge resistor means for discharging the storage charge of said second delay capacitor.

4,731,722

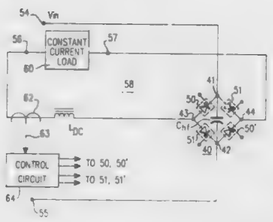
LOW AC HARMONIC DC POWER SUPPLY

Ernest F. Conroy, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1987, Ser. No. 55,569

Int. Cl.⁴ H02M *1/12*

U.S. Cl. 363—44 **7 Claims**



1. A low AC harmonic, DC power supply comprising:

(A) a bridge circuit having first and second opposed junction points and third and fourth opposed junction points and including high frequency power switching means in each of four legs thereof;

(B) a high frequency filter capacitor connected to said first and second opposed junction points;

(C) a source of AC power connected across said first and second opposed junction points;

(D) a DC loop connected to said third and fourth opposed junction points;

(E) said DC loop including an energy storage device;

(F) said DC loop including output terminals for connection to a DC load; and

(G) a control circuit responsive to a predetermined parameter of said DC loop and operable to control the high frequency switching of said power switching means to maintain said parameter at a relatively constant value when said DC load is connected to said output terminals.

4,731,723

POWER SUPPLY INSTALLATION FOR DC ELECTRIC RAILROAD

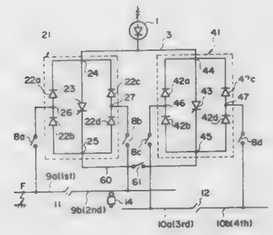
Teiji Nogi, Tokyo; Toyomi Gondo; Tuneo Tamura, both of Kanagawa, and Hiroyasu Sato, Miyagi, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 883,998

Claims priority, application Japan, Jul. 12, 1985, 60-153698; Jul. 18, 1985, 60-158699; Jul. 18, 1985, 60-158705

Int. Cl.⁴ H02M *7/155*

U.S. Cl. 363—70 **4 Claims**



3. An apparatus for use in an electric car power supply system including AC power sources, AC-DC converters connected to the AC power sources for converting an AC power to a DC power and applying the DC power to a bus bar, a regenerative bus bar and DC-AC converters connected to the regenerative bus bar for converting a DC power to an AC power, the apparatus being connected between the bus bar and first and second pairs of power supply lines for supplying the DC power to an electric car, the power supply lines of each of the first and second pairs being arranged in series and disconnected electrically with a dead section, comprising:

(a) a first diode bridge having first, second, third and fourth diodes each having an anode and a cathode, the anode of the first diode being connected at a first junction to the cathode of the second diode, the anode of the third diode being connected at a second junction to the cathode of the fourth diode, the cathode of the first diode being connected at a third junction to the cathode of the third diode, the anode of the second diode being connected at a fourth junction to the anode of the fourth diode, the third junction being connected to the bus bar;

(b) a first thyristor having an anode connected to the first junction and a cathode connected to the fourth junction, the first thyristor breaking the connection between the third and fourth junctions in response to occurrence of an accident in at least one of the power supply lines of the first pair;

(c) a first switch connected between the first junction and one of the power supply lines of the first pair;

(d) a second switch connected between the second junction and the other power supply line of the first pair;

(e) a first stopper diode having an anode connected to the fourth junction and a cathode connected to the regenerative bus bar;

(f) a third switch connected in parallel with the first stopper diode;

(g) a second diode bridge having fifth, sixth, seventh and eighth diodes each having an anode and a cathode, the anode of the fifth diode being connected at a fifth junction to the cathode of the sixth diode, the anode of the seventh diode being connected at a sixth junction to the cathode of the eighth diode, the cathode of the fifth diode being connected at a seventh junction to the cathode of the seventh diode, the anode of the sixth diode being connected at an eighth junction to the anode of the eighth diode, the seventh junction being connected to the bus bar;

(h) a second thyristor having an anode connected to the seventh junction and a cathode connected to the eighth junction, the second thyristor breaking the connection between the seventh and eighth junctions in response to occurrence of an accident in at least one of the power supply lines of the second pair;

(i) a fourth switch connected between the fifth junction and one of the power supply lines of the second pair;

(j) a fifth switch connected between the sixth junction and the other power supply line of the second pair;

(k) a sixth switch connected between the fourth junction and the eighth junction;

(l) a second stopper diode having an anode connected to the eighth junction and a cathode connected to the regenerative bus bar; and

(m) a sixth switch connected in parallel with the second stopper diode.

4,731,724

SYSTEM FOR SIMULTANEOUS TRANSMISSION OF DATA BLOCKS OR VECTORS BETWEEN A MEMORY AND ONE OR A NUMBER OF DATA-PROCESSING UNITS

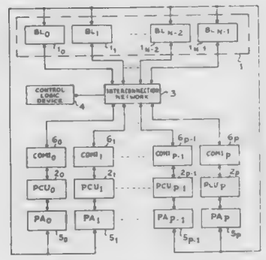
Claude Michel, Asnieres, and Noureddine M'Rabet, Pantin, both of France, assignors to Sintra, Asniere, France

Filed Nov. 20, 1985, Ser. No. 799,854

Claims priority, application France, Nov. 23, 1984, 84 17932

Int. Cl.⁴ G06F *13/00, 15/16*

U.S. Cl. 364—200 **6 Claims**



1. A system for simultaneous transmission of vectors of data blocks between plural memory cells and a plurality of data-processing units designed for asychronous operation with respect to each other, said system comprising:

a group of memory cells composed of a whole number N of storage logic arrays each comprising any whole number n of physical arrays each having q storage locations;

an interconnection network interposed between the group of memory cells and the data-processing units for simultaneously establishing connections between the memory arrays and said processing units;

a control device coupled to said interconnection network for controlling the connection paths within the interconnection network; a plurality of addressing logic devices each controlled respectively by one of the plurality data-processing unit for addressing the locations of the memory to which each unit requests access and performing transfer

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of the vectors or data blocks contained in the corresponding locations; wherein the N.n physical arrays of the memory being juxtaposed and numbered in order of natural integers 0, . . . to as to form an ordered matrix base of storage locations, each storage location in a physical array being located at the point of intersection of a line and a column of the matrix base and being also numbered on each line in the order of increasing magnitude of the matural integers from the start-of-line location contained in the first physical array denominated as the 0 array of the momory to the end-of-line location contained in the last physical array of the memory, all of the start-of-line locations of the memory being located within a first physical array; wherein each of said addressing logic device comprises:

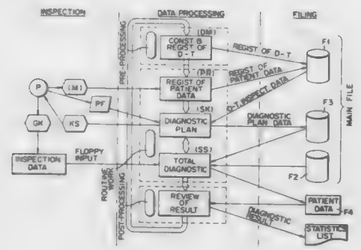
means for determining the address of each location in the physical array by computing the modulo address (N.n) of each location in the physical array from its sequence number in the memory to allow for the multiple data-processing units to access the same storage array on a simultaneous basis; wherein said control logic device comprises means for establishing a connection between a requesting data-processing unit and the storage logic array containing the computed modulo address of the start of the vector or of the data block to be transferred and switching means in said control logic device for successively switching the requesting unit to the following storage logic arrays at the end of each data transfer between a logic array of the memory and the data-processing unit without interruption until the transfer of the last data item of the block or of the vector.

4,731,725

DATA PROCESSING SYSTEM WHICH SUGGESTS A PATTERN OF MEDICAL TESTS TO REDUCE THE NUMBER OF TESTS NECESSARY TO CONFIRM OR DENY A DIAGNOSIS

Yasuzo Suto, Tochigi; Katsuyoshi Saito, Ootawara, and Kenichi Sato, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 719,647, Apr. 5, 1985, abandoned, which is a continuation of Ser. No. 391,435, Jun. 23, 1982, abandoned. This application Sep. 18, 1986, Ser. No. 908,955
Claims priority, application Japan, Jun. 24, 1981, 56-96781
Int. Cl.⁴ G06F *15/42*
U.S. Cl. 364—415 **6 Claims**



1. A data processing system for identifying a sequence of diagnostic procedural steps for using medical diagnostic apparatus to generate, for an operator, information to confirm or reject a diagnosis hypothesis, said sequence minimizing said procedural steps before said diagnosis hypothesis can be confirmed or rejected comprising:

means for storing data representing decision tree elements required to construct a decision tree indicating a predetermined combination and order of medical inspections, said medical inspections generating information which said operator uses to confirm or reject a diagnosis hypothesis corresponding to any of a plurality of diseases;

means, coupled to said storing means, for assembling said data to construct a decision tree of medical inspections, said medical inspections generating information to confirm or reject a particular diagnosis hypothesis;

means, coupled to said storing means and said assembling means, for allowing said operator to enter a degree to which each of said medical inspections in said constructed decision tree minimized said procedural steps in confirming or rejecting said particular diagnosis hypothesis and for generating statistical indications of said degree of minimizing said procedural steps for each of said medical inspections;

said assembling means also being for modifying said constructed decision tree, based on said statistical indications, to minimize the number of said medical inspections which said operator uses, to confirm or reject said particular diagnosis hypothesis; and

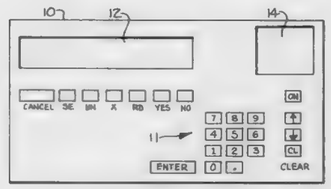
means, coupled to said assembling means for indicating visual information corresponding to data signals of said constructed decision tree of medical inspections supplied from said storing means and said assembling means.

4,731,726

PATIENT-OPERATED GLUCOSE MONITOR AND DIABETES MANAGEMENT SYSTEM

Lyle M. Allen, III, Durham, N.C., assignor to Healthware Corporation, Durham, N.C.

Filed May 19, 1986, Ser. No. 864,506
Int. Cl.⁴ G06F *15/42*
U.S. Cl. 364—416 **10 Claims**



5. A monitor system adapted for use by a patient afflicted with diabetes mellitus, comprising:

means for measuring blood glucose values and for generating blood glucose data in response to measuring said blood glucose values;

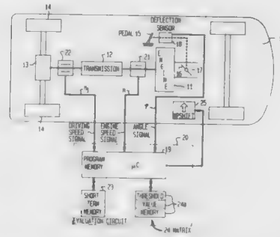
monitor means, connected to said measuring means and capable of receiving, storing and evaluating data, for (a) receiving and storing said blood glucose data, (b) receiving and storing physician-supplied data, (c) prompting and receiving patient input into the monitor means at periodic times of patient data relating to diet, exercise, emotional stress and symptoms of hypoglycemia and other illness experienced by the patient during a preceding time period, (d) receiving and storing the patient data supplied by the patient, and (e) generating recommendations relative to patient insulin dosage based at least in part upon the received blood glucose data, physician data and patient data.

4,731,727

INTELLIGENT OPTIMUM-GEAR INDICATION SYSTEM

Hans Rauch, Fürth, and Jürgen Wesemeyer, Nürnberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00170, § 371 Date May 8, 1985, § 102(e) Date May 8, 1985, PCT Pub. No. WO85/01256, PCT Pub. Date Mar. 28, 1985
PCT Filed Aug. 30, 1984, Ser. No. 734,264
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 334093
Int. Cl.⁴ B60K *41/18;* **B60Q** *9/00;* **G09B** *19/16*
U.S. Cl. 364—442 **10 Claims**



9. Intelligent optimum-gear indication circuit for a motor vehicle, comprising

a position transducer (18) measuring the gas pedal deflection angle (ϕ),

a speed transducer (21) measuring the engine speed (n),

a further speed transducer (22) measuring the driving speed (n_1),

an upshift indicator (25), and

an evaluation circuit device (20) connected to an input of said upshift indicator and to outputs of each of said transducers (18, 21, 22) and having

a short-term memory (23) storing a limited number of recent instantaneous transducer output values, said engine speed and deflection angle values together defining a working point pair (A),

and

an alterable threshold value memory (24), containing, for each gear step of the transmission (12), data classifying each working point pair (A) alternatively into a favorable fuel consumption zone (I) or an unfavorable fuel consumption zone (II),

said evaluation circuit device (20) detecting when each gear shift occurs, comparing power before and after each upshift, updating said alterable threshold value memory (24) each time an upshift is accomplished without loss of power, based upon values stored in said short-term memory (23), thereby learning where the boundary between said fuel consumption zones lies for each particular combination of driver, road conditions, and engine conditions, and actuating said upshift indicator (25) whenever said instantaneous value define a working point (A) falling within said unfavorable fuel consumption zone (II).

4,731,728

POSTAGE METER WITH MEANS FOR PREVENTING UNAUTHORIZED POSTAGE PRINTING

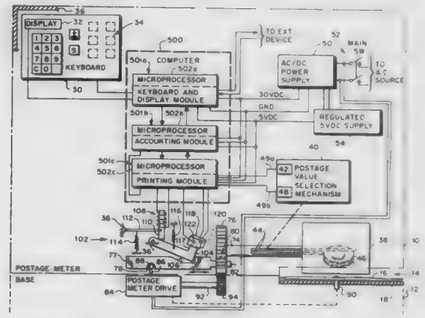
Arno Muller, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 10, 1985, Ser. No. 690,355
Int. Cl.⁴ G06F *15/20;* **H01H** *9/00*
U.S. Cl. 364—466 **13 Claims**

1. In an electronic postage meter having computer means and for printing a postage value, wherein the computer means includes means for authorizing printing the postage value, and said postage meter having shutter means operable for alternately preventing and permitting operation of said postage printing means, and having interposing means operable for alternately preventing and permitting operation of said shutter means, an improvement for controlling operation of said interposing means, said improvement comprising:

(a) said computer means including means for generating a first control signal for normally operating said interposing means to prevent operation of said shutter means;

(b) said computer means including means for generating a



second control signal when said authorizing means has authorized printing the postage value, said second control signal comprising a series of pulses during a cycle of printing of postage value for operating said interposing means to permit operation of said shutter means; and

(c) means for coupling said first and second control signals to said interposing means for controlling operation thereof.

4,731,729

ELECTRONIC DIGITAL DUAL SEQUENTIAL TIMING CONTROL APPARATUS FOR ENVIRONMENTAL SYSTEMS

Dale M. Uetrecht, Cincinatti, and Carlton J. Simmons, West Chester, both of Ohio, assignors to Baldwin Piano & Organ Company, Loveland, Ohio

Filed Oct. 27, 1986, Ser. No. 923,369
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—505 **1 Claim**

1. In an environmental control system a digital programmable timer for controlling at least two sequentially timed events, said timer comprising:

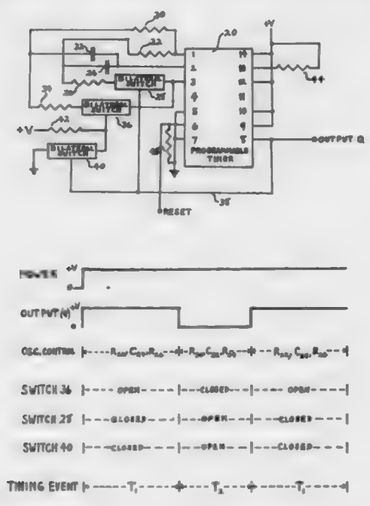
oscillator means for providing an output signal of variable frequency, said oscillator means having a selectable set of tuning components for each sequentially timed event, wherein the set of tuning components selected determines the frequency of said oscillator means;

binary counter means for counting the cycles of the output signal of said oscillator means and providing an output control signal having a different state for each set of tuning components, wherein said binary counter means changes the state of its output control signal when it has counted a predetermined number of cycles of the output signal from said oscillator means; and

switching means responsive to said output control signal for terminating the sequentially timed event corresponding to the set of tuning components currently selected, selecting

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the set of tuning components for determining the frequency of the output signal of said oscillator means corresponding to the next of the sequentially timed events, and initiating the next sequentially timed event.

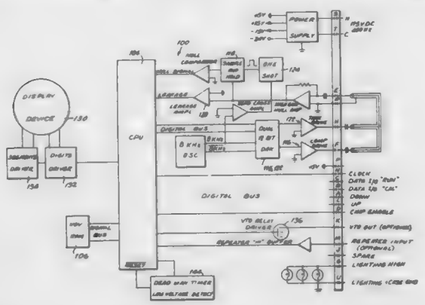


4,731,730

UNIVERSAL FUEL QUANTITY INDICATOR APPARATUS

Geoffrey S. Hedrick, Malvern, and Steven L. Tomlinson, Coatesville, both of Pa., assignors to Smiths Industries Aerospace & Defence Systems Inc., Malvern, Pa.

Filed Apr. 30, 1985, Ser. No. 728,150
Int. Cl.⁴ G01F *23/26*
U.S. Cl. 364—509 **41 Claims**



1. In a fuel quantity indicator apparatus for determining the fuel quantity present in a fuel tank based on calculations of capacitance of a tank capacitor array and a compensation capacitor wherein a plurality of different parameters specific to a given tank configuration determine the measurement factors for said calculated fuel quantity determination, said indicator comprising display means for displaying fuel quantity information with respect to said fuel tank based on said calculated fuel quantity determination and microprocessor control means for calculating said fuel quantity determination and for controlling said display based thereon, said microprocessor control means comprising a CPU and first static memory means for storing control program information for controlling the operation of said microprocessor control means and for storing information corresponding to said different parameters for enabling said microprocessor control means to provide said calculated fuel quantity determination on said display means for a given specific fuel tank; the improvement comprising:

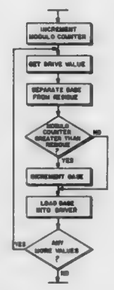
second alterable static memory means operably connected to said microprocessor control means for providing an alterable auxiliary data source of different groups of said different parameters for a plurality of different specific fuel tanks to said microprocessor control means, and up/down steering control means operably connected to said microprocessor control means CPU and said first and second static memory means for selecting a particular group of said different parameters dependent on the parameters associated with a particular specific fuel tank, said up/down steering control means comprising switch means for variably selecting the value of each of said parameters in said particular group and for storing each of said selected parameters in said group in said second alterable static memory means, said switch means further comprising means for loading the selected parameter content of said second alterable static memory means into said microprocessor control means first static memory means for configuring said fuel quantity indicator for a particular specific fuel tank, said fuel quantity indicator apparatus being reconfigurable for a different specific fuel tank by varying said selected fuel tank parameters by said up/down storing control means; whereby a universal fuel quantity indicator apparatus is provided.

4,731,731

DIALYSIS MACHINE HAVING ENHANCED D/A RESOLUTION

Michael J. Cochran, 16178 Greenwood Rd., Monte Sereno, Calif. 95030

Filed Feb. 21, 1985, Ser. No. 704,049
Int. Cl.⁴ G06G *7/57*; H03M *1/18*; B01D *13/00*
U.S. Cl. 364—510 **8 Claims**



1. In a dialysis machine comprising:

pump means for supplying dialysate to an artificial kidney at a rate proportional to an analog supply rate signal; and

flow rate control means for providing the analog supply rate signal to the pump means, the analog supply rate signal having a value proportional to the value of a digital flow rate signal, the digital flow rate signal having a first predetermined number of bits of resolution;

the improvement comprising:

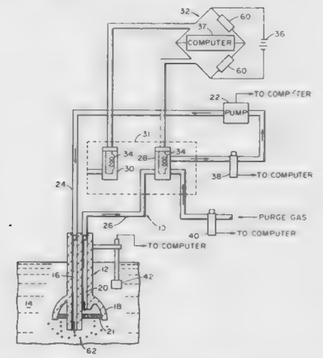
resolution enhancement means, responsive to a digital flow rate control signal having a second predetermined number of bits of resolution at least one bit greater than said first predetermined number of bits of resolution, for varying the value of the least significant bit of said digital flow rate signal during a selected resolution period in proportion to the value of the least significant bit of said digital flow rate control signal.

4,731,732

METHOD AND APPARATUS FOR DETERMINING SOLUBLE GAS CONTENT

Mark F. A. Warchol, New Kensington, and Ronald C. Wojnar, Upper Burrell Township, West Moreland County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 7, 1985, Ser. No. 763,290
Int. Cl.⁴ G01N *7/14*; G01K *1/12*
U.S. Cl. 364—510 **2 Claims**



1. A method of determining the amount of gas content dissolved in molten metal of a known alloy and temperature, the gas content having a known solubility in the known alloy, the method comprising the steps of:

(a) providing a body or flow of said metal,

(b) providing a flow of carrier gas,

(c) directing the carrier gas into and circulating the same in the molten metal to create therein free surfaces in the metal and thereby accumulate free molecules of the gas content dissolved in the metal in the flow of the carrier gas such that equilibrium pressure of the carrier and content gases occurs at a measurable magnitude,

(d) determining the occurrence and magnitude of the equilibrium pressure,

(e) measuring the temperature of the molten metal,

(f) developing and directing electrical signals representing respectively said temperature and equilibrium pressure to a computing device,

(g) informing the computing device of a number that represents the solubility of the gas content in the alloy of the molten metal, and

(h) said computing device thereafter calculating the gas content of said body of molten metal from said signals, solubility number and temperature measurement to provide a direct and accurate reading of said gas content.

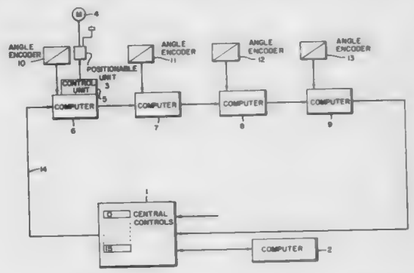
4,731,733

DEVICE FOR POSITIONING SEVERAL UNITS THAT CAN BE MOVED ADJACENT TO AND AT A CONSTANT DISTANCE FROM ONE ANOTHER

Heiko Knoll, Oleander, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 825,821
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3504013
Int. Cl.⁴ G05B *19/417*; B26D *5/30*
U.S. Cl. 364—167 **2 Claims**

1. In a device for positioning several units which are movable adjacent to and at a constant distance from one another, wherein the device has central controls for producing reference values for starting position of each unit and wherein each unit has a drive mechanism for moving the unit, and a distance-traveled detector associated with the drive mechanism for each unit, the improvement wherein: the controls include a main computer for producing a series of coded blocks of information for each unit relating to its starting position and each unit has a separate computer for controlling its drive mechanism, wherein the separate computers and the central controls are connected in series and the separate computers intercept, process, and forward the blocks of information along the serial connection to actualize the information pertaining to the position of its own unit.

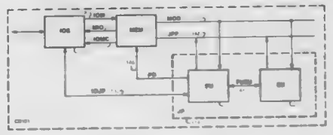


4,731,734

DIGITAL COMPUTER SYSTEM INCORPORATING OBJECT-BASED ADDRESSING AND ACCESS CONTROL AND TABLES DEFINING DERIVATION OF ADDRESSES OF DATA FROM OPERANDS IN INSTRUCTIONS

Ronald H. Gruner, Cary, N.C.; Gerald F. Clancy, Saratoga, Calif.; Craig J. Mundie, Cary; Stephen I. Schleimer, Chapel Hill, both of N.C.; Steven J. Wallach, Saratoga, Calif.; Richard G. Bratt, Wayland; Edward S. Gavrin, Lincoln, both of Mass.; Walter A. Wallach, Jr., Raleigh, N.C.; John K. Ahlstrom, Mountain View, Calif.; Michael S. Richmond, Pittsboro, N.C., and David H. Bernstein, Ashland, Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 542,088, Oct. 17, 1983, abandoned, which is a continuation of Ser. No. 266,410, May 22, 1981, abandoned. This application Feb. 14, 1986, Ser. No. 830,480
Int. Cl.⁴ G06F *9/30*
U.S. Cl. 364—200 **16 Claims**



1. A digital computer system comprising:

memory means for storing and providing data items, said data items including instructions,

memory organization means operative on said memory means for organizing said memory means into objects which provide for the location of said data items in said memory means, each object being identifiable by an object identifier;

access control means for identifying for each object a set of subjects which are permitted to access the data items in said object and for identifying for each subject a specified set of memory operations which each said subject is permitting to perform;

means responsive to said access control means and to a request from a current subject for access to a current data

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item in an object and for the performance of a current memory operation for determining whether said current subject is a subject which is permitted to access said current data item and whether said current memory operation is one which said current subject is permitted to perform;

memory oepration means responsive to a memory operation specifier which includes

a logical address specifying an object identifier and a location in the object identified by said object identifier, and

a memory command specifying a current memory operation,

and further responsive to a request from a current subject for performing a current memory operation specified by said memory command when said determining means determines that said current subject is one having permission to access the object specified by said logical address and to perform said current memory operation,

and further wherein said instructions include

operation codes specifying operations, including memory operations, of said digital computer system, certain instructions further including

a name representing a data item to be used in an operation specified by an operation code, and

said system further includes

means for storing a plurality of name table entries each name table entry corresponding to a data item and to the name representing said data item and each name table entry including information from which the logical address of the data item represented by the name corresponding to said name table entry can be derived, and

processor means connected to said memory means and including

means for providing instructions from said memory means,

instruction decoding means responsive to instructions from said instruction providing means for decoding a current instruction to provide one or more names therein,

logical address generation means responsive to the information in a name table entry corresponding to a name for deriving a logical address from said information, said logical address generating means including

name resolution means responsive to a name in said decoded instruction and to the information in the name table entry corresponding to said name for generating the logical address for the data item represented by said name, and

next instruction address generation means further responsive to said decoded instruction for providing a logical address of a next current instruction, and

control means responsive to a name from said instruction decoding means and to the logical address from said logical address generation means for providing a representation of a current subject and one or more memory operation specifiers to said memory operation means.

4,731,735

MULTILINGUAL PROCESSING FOR SCREEN IMAGE BUILD AND COMMAND DECODE IN A WORD PROCESSOR, WITH FULL COMMAND, MESSAGE AND HELP SUPPORT

Ken W. Borgendale, Gaithersburg; Paul S. Cheng, Potomac; Mike D. Flannery; Lisa K. Peters, both of Gaithersburg, and Kenneth A. Zaiken, Germantown, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,862

Int. Cl.[4] G06F *3/14, 15/38*

U.S. Cl. 364—200 **2 Claims**

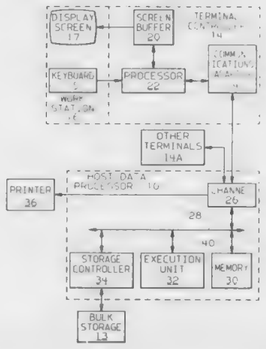
1. In an information processing system including an execution unit having a memory, a bulk storage and a workstation connected thereto operated by a user, said workstation including a keyboard connected to a display screen for inputting command and working text information to said display screen for display thereon, a multilingual processor for building screen images on said display screen and for decoding multilingual, user defined commands, comprising:

a document library stored in said bulk storage device including a plurality of language documents and at least one user document;

said language documents each characterizing a selected language and including an initialization records portion, a displayable components portion and an executable components portion including an sequence of elementary commands defined by the user;

a language document selector means, for accessing a selected one of said plurality of language documents in response to a user language selection input from said keyboard specifying that commands are to be input to said keyboard and messages are to be displayed on said display screen in a first one of said selected languages;

an initialization processor means, for accessing said initialization records portion from a first one of said language documents for storage in said memory, to provide a set of constant words to be continuously displayed on said display screen in said first language;



a message processor means, for accessing said displayable components portion from said first one of said language documents, for the real-time display of messages on said display screen in said first language;

a command processor means for accessing said sequence of elementary commands defined by the user in said executable components portion of said first one of said language documents in response to a user command input in said first selected language to said keyboard, for decoding said user command input in said first language;

said language document selector means accessing a second selected one of said plurality of language documents in response to a second user language selection input from said keyboard specifying that commands are to be input to said keyboard and messages are to be displayed on said display screen in a second one of said selected languages;

whereby multilingual processing is achieved for screen image build and decoding of user defined commands.

4,731,736

METHOD AND APPARATUS FOR COORDINATING EXECUTION OF AN INSTRUCTION BY A SELECTED COPROCESSOR

David Mothersole; Douglas B. MacGregor, and John Zolnowsky, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 485,673, Apr. 18, 1983, abandoned.

This application Sep. 18, 1986, Ser. No. 86,351

Int. Cl.[4] G06F *9/00*

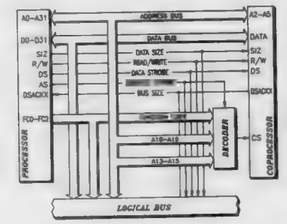
U.S. Cl. 364—900 **2 Claims**

1. A first data processor adapted for coordinating the execution of an instruction received for execution by said first processor with a second data processor responsive to a unique address comprised of a general address portion and a value unique to the second data processor contained in an address field of said instruction, the first data processor comprising:

first means for receiving said instruction;

second means for providing said unique address by combining said general address portion and the value contained in said address field of said received instruction; and

third means for coordinating the execution of said instruction by said second processor at the address provided by said second means.



PROCESSOR – COPROCESSOR SYSTEM BLOCK DIAGRAM

4,731,737

HIGH SPEED INTELLIGENT DISTRIBUTED CONTROL MEMORY SYSTEM

David B. Witt, and Brian D. McMinn, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 7, 1986, Ser. No. 860,608

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—200 **56 Claims**

1. A high speed distributed control memory system, coupled to a host system processor via a data bus, comprising:

(a) an array of modular/memory elements, connected in cascade with adjacent memory elements and further connected to said data bus, each being independently operative to store and process data, communicate with said host processor over said data bus, and directly communicate with other memory elements of said array;

(b) position reference means, coupled to the first and last memory elements of said array, for indicating to said first and last elements their physical position along said data bus in said array;

(c) host interface means, coupled between said host processor and said array of elements, to separate memory element to memory element communications over said data bus, from memory element to host processor communications over said data bus; and

(d) a system clock, coupled to said host processor and each of said memory array elements, for synchronizing the operations of said host processor and said memory array elements.

4,731,738

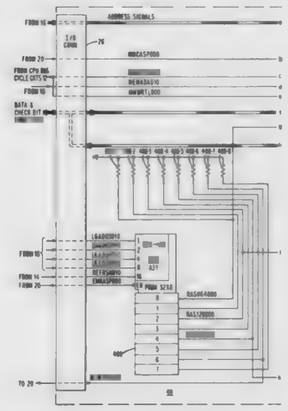
MEMORY TIMING AND CONTROL APPARATUS

Edwin P. Fisher, N. Abington, and Ralph G. Schuberth, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 14, 1983, Ser. No. 466,272

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **30 Claims**



1. A memory option board for use in a processing unit which is included as part of a basic logic board, said basic logic board having a main memory including a plurality of storage locations defining an initial memory capacity for said processing unit, said memory option board pluggable into said basic logic board for expanding said initial memory capacity of said processing unit, said main memory and option board storage locations being addressable by the same plurality of address signals, said memory option board comprising:

at least one row of memory chips, each row of chips providing a plurality of storage locations corresponding to a predetermined amount of expanded memory, and

each of said memory chips of said one row including a row address strobe (RAS) input terminal; and,

an addressable programmable array having a plurality of locations including information coded for specifying an amount of expanded memory for said processing unit being provided by said option board, said programmable array having;

a plurality of input terminals connected to receive a portion of said same plurality of address signals for accessing storage locations within said main memory unit and said option board during a memory cycle;

an enabling input terminal connected to receive a timing signal from said basic logic board; and

a number of output terminals, a predetermined one of said number of output terminals being connected to said RAS input terminal of each of said chips of said row, said programmable array in response to each portion of said plurality of address signals and said timing signal received from said logic board during said memory cycle generating an output signal at said predetermined one of said number of output terminals for an interval defined by the duration of said timing signal, the state of said output

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signal defining when access to storage locations within said one row of memory chips by said plurality of address signals is permitted.

4,731,739

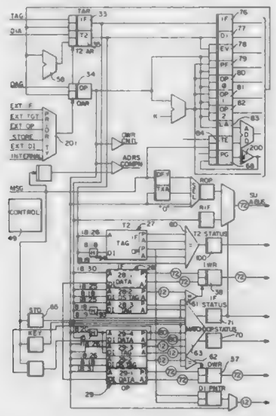
EVICTION CONTROL APPARATUS

Gary A. Woffinden, Scotts Valley, and Donald L. Hanson, Los Altos Hills, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 527,676, Aug. 29, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 789,035

Int. Cl.⁴ G06F *12/12*

U.S. Cl. 364—200 **16 Claims**



1. A memory apparatus for use in a data processing system, the data processing system generating logical addresses for accessing the memory apparatus, comprising:

a main store for storing system data including a plurality of main store locations addressed by system line addresses, the main store locations having a data field for storing a line of data identified by the corresponding system line address, a plurality of lines constituting a page and each page being identified by a subset of a system line address called a system page address;

an intermediate store for storing a subset of the system data, connected to receive the logical addresses, including a plurality of intermediate store locations addressed in response to logical addresses, the intermediate store locations having a data field for storing a line of data and a tag field for storing a tag associating the line of data in the data field with a system line address, a subset of the logical address being a logical page address;

a system address store for storing system page addresses of lines of data stored in the intermediate store, and connected to receive tags accessed from the intermediate store in response to logical addresses, including a plurality of system address store locations addressed in response to a tag, the system address store locations having at least one system address field for storing a system page address and a status field for storing control bits indicating the status of the at least one system address field as active, eviction pending or available;

means, in communication with the main store and the intermediate store, for transferring a line of data from a main store location to a data field in an intermediate store location and for writing a tag in the tag field associating the line of data in the data field with its system line address;

means, in communication with the intermediate store and the system address store and connected to receive the logical addresses, for assuring that the line of data in the intermediate store location addressed in response to a logical address is the line of data having the correct system address, including

means for translating logical page addresses to system page addresses for supply to the system page address store,

means, responsive to a translation in the means for translating and to control bits in the system address store locations, for selecting a system address field having an available status and transferring the system page address of the translation to the selected system address field, generating a pointer to the selected system address field and setting the status of the selected system address field to active, and

a translation buffer for storing translation entries including a plurality of translation buffer locations addressed in response to translation buffer addresses, a translation buffer address being generated as a function of and in response to a logical address, the translation buffer locations having a logical address field for storing data identifying the translated logical page address for the translation entry and a pointer field for storing the pointer associating the translated logical page address with the system address field in the system address store storing the system page address for the translation entry;

eviction means, in communication with the system address store, the intermediate store and the main store, for detecting system address fields having an eviction pending status and evicting lines of data associated with the detected system address fields from the intermediate store and, when eviction is complete for a given system address field, updating the control bits in the system address store location to change the status of the given system address field to available; and

means, in communication with the system address store, for changing control bits in status fields of system address store locations indicating active status to indicate eviction pending status.

4,731,740

TRANSLATION LOOKASIDE BUFFER CONTROL SYSTEM IN COMPUTER OR VIRTUAL MEMORY CONTROL SCHEME

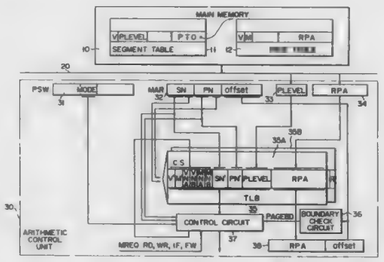
Kazutoshi Eguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1985, Ser. No. 749,866

Claims priority, application Japan, Jun. 30, 1984, 59-135906; Jun. 30, 1984, 59-135907

Int. Cl.⁴ G06F *12/08*

U.S. Cl. 364—200 **6 Claims**



1. A translation lookaside buffer (TLB) control system in a computer of virtual memory control scheme, comprising:

a translation lookaside buffer including, in each TLB entry, fields consisting of a bit V, representing validity of the entry, a bit VN_i($i=1, \ldots, n$; n is a integer of 1 or more) representing validity of a TLB entry corresponding to a page next to the page of the entry, and address translation data;

first detecting means, connected to said TLB, for detecting, for each memory access, if correct address translation data is stored in the TLB entry as well as if correct address translation data is detected in the TLB entry corresponding to the page next to the page of the TLB entry in accordance with an object virtual, address having an offset and predetermined fields of the bits V' and VN_i and the address translation data of the TLB entry which corresponds to the object virtual address;

second detecting means responsive to the offset of said object virtual address for detecting if a single access involves a page boundary;

replacing means, connected to said TLB, said first detecting means, and said second detecting means, for performing a replace of the entry of the TLB in accordance with detection results of said first and second detecting means;

means, connected to said TLB, for setting the bit V' and resetting the bit VN_i of a replace object TLB entry when said replacing means replaces the TLB entry; and

updating means, connected to said TLB, for updating a bit VN_i of a TLB entry corresponding to a page immediately preceding the replace object TLB entry.

4,731,741

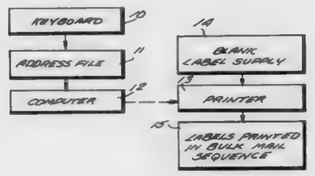
BULK MAIL LABEL PRINTING

Paul M. Allen, 2224 Main St., Little Rock, Ark. 72206

Filed Oct. 25, 1985, Ser. No. 791,449

Int. Cl.⁴ B07C *7/00*

U.S. Cl. 364—518 **18 Claims**



1. A method of automatically producing a bulk mail sorted list of address labels utilizing a computer and a printer, comprising the steps of:

(a) entering a random address file having at least L address entries into the computer memory, the address file having, for each address entry, city, state, and zipcode designations;

(b) automatically sorting all the address entries in the address file by zipcode, by partial zipcode, by multiple zipcode cities, and by state, designations;

(c) automatically separating out all address entries in the address file having X or more address entries with the same zipcode, and assigning a bundle number to each;

(d) automatically separating out any remaining address entries, after step (c), having Y or more address entries with the same multi-zip city designation, and assigning a bundle number to each;

(e) automatically separating out any remaining address entries, after step (d), having Z or more address entries with the partial zipcode, and assigning a bundle number to each;

(f) automatically separating out any remaining address entries, after step (e), having K or more address entries with the same state designation, and assigning a bundle number to each;

(g) automatically assigning a bundle number to any additional entries remaining after step (f); and

(h) automatically controlling the printer with the computer to print a sequence of labels wherein all labels in each bundle number are printed in sequence, and to print a separator between labels of different bundle number.

4,731,742

VIDEO DISPLAY CONTROL SYSTEM

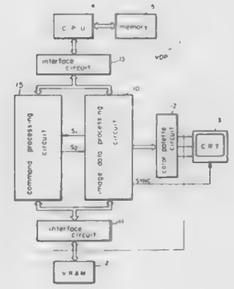
Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, Hamamatsu; Takatoshi Okumura, Hamamatsu, and Minoru Morimoto, Hamamatsu, all of Japan, assignors to Ascii Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Mar. 15, 1985, Ser. No. 712,253

Claims priority, application Japan, Mar. 16, 1984, 59-050253; Mar. 16, 1984, 59-050254; Mar. 16, 1984, 59-050251; Mar. 16, 1984, 59-050252; Apr. 11, 1984, 59-072542; Apr. 11, 1984, 59-072541

Int. Cl.⁴ G06F *3/153*

U.S. Cl. 364—521 **52 Claims**



1. A video display control system for displaying a video image on a screen of a video display unit which includes a plurality of display elements comprising:

(a) memory means, having a plurality of memory locations, each said memory location corresponding to respective display element group each said display element group including at least one of said plurality of display elements on the screen; and

(b) display control means having: (i) first register means for receiving area information identifying a display area that includes at least one of said display element groups, (ii) address generating means for generating first address data indicative of a first memory location among said plurality of memory locations in said memory means, in accordance with said area information, said first memory location corresponding to one of a display element group or groups in said display area, and (iii) memory accessing means for accessing said first memory location in accordance with said first address data.

4,731,743

METHOD AND APPARATUS FOR DISPLAYING HAIRSTYLES

Vito Biancato, Coral Springs, Fla., assignor to Combputer Images, Inc., Coral Springs, Fla.

Filed Nov. 12, 1985, Ser. No. 796,981

Int. Cl.⁴ G06F *15/66;* **H04N** *7/18;* **G09B** *19/10*

U.S. Cl. 364—521 **32 Claims**

1. A method of using a video camera with a computer system to create a hairstyle change on a subject, said computer system having a video display and data storage means, said method comprising the steps of:

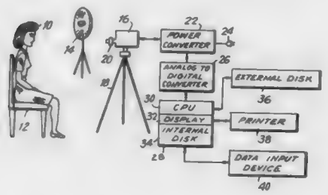
storing in said storage means data manifesting a proportioned selectable plurality of hairstyles;

displaying a correspondingly proportioned present image of said subject on a video display;

separating on the display the face and hairstyle of said present image;

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removing the separated hairstyle from said present image to create a remaining image of only the face; and



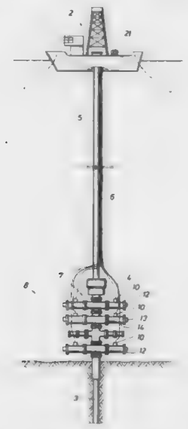
joining the remaining image and a selected hairstyle obtained from said storage means to create the hairstyle change on the subject.

4,731,744

POSITION SENSOR AND SYSTEM

John P. Harrell, Jr., and Douglas L. Michalsky, both of San Antonio, Tex., assignors to Neal Hare, Katy, Tex.

Filed Jul. 16, 1985, Ser. No. 755,489
Int. Cl.⁴ G08C *21/00*; G01B *11/00*
U.S. Cl. 364—560 **36 Claims**



1. An indicator system for remotely sensing the relative position of a moving member to that of a mechanical apparatus of which it is a part comprising,

scribing marks disposed on a portion of said moving member,

means for illuminating said scribing marks,

optical sensing means for generating a digital signal representation of at least a portion of said scribing marks on said moving member,

mounting means fastened to said mechanical apparatus for stationarily mounting said illuminating means and said optical sensing means to face said scribing marks of said moving member,

transmission means provided between said optical sensing means and said illuminating means and a location remote from said mechanical apparatus for transmitting said digital signal representation to said remote location,

digital computer means disposed at said remote location for generating and applying command signals via said transmission means to said illuminating means and to said optical sensing means and responsive to said digital signal representation via said transmission means for generating an output signal representation of said scribing marks, and

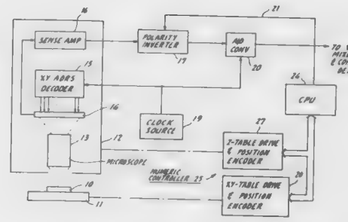
means responsive to said output signal representation for displaying a visual representation of at least a portion of said scribing marks, said visual representation of said scribing marks enabling a human being at said remote location to determine said relative position of said moving member with respect to said mechanical apparatus.

4,731,745

AUTOMATIC DIMENSION ANALYZER

Kiyoo Katagiri, Joetsu; Kozo Kasukawa, Ibaraki, and Shigensaga Manabe, Tokyo, all of Japan, assignors to Shin-Etsu Engineering Co., Ltd., Japan

Filed Dec. 3, 1984, Ser. No. 677,599
Int. Cl.⁴ G01B *11/14*; G06K *9/46*; H04N *7/18*
U.S. Cl. 364—560 **36 Claims**



15. An automatic dimension analyzer comprising:

a power driven table on which an object under measurement is placed, the table being movable in orthogonal directions in a field defined by a pair of coordinate axes;

an optical system for forming an optical image of said object in a sample point field;

means for scanning said sample point field in a rectangular raster format to produce sample point data bits each representing a sample point having a predetermined optical level;

means for detecting a coincidence between at least one sample point data bit and a cursor defined in said sample point field parallel with one of said coordinate axes, said cursor being movable in said sample point field;

a memory;

data entry means for storing measurement instruction in sequentially addressable locations of said memory; and

data processing means for addressing said memory locations to retrieve said instructions, causing one of said table and said cursor to move with respect to the other in accordance with the retrieved instructions and detecting the position of said table or said cursor relative to a reference position upon the detection of a coincidence by said coincidence detecting means,

wherein said coincidence detecting means comprises means for generating left, right, upper and bottom window cursors in said sample point field to define a rectangular window therein, the first-mentioned cursor being located in said rectangular window, and

means for detecting a coincidence between said sample point data bits and each one of said window cursors,

each of said window cursors being movable in said sample point field, said data processing means being programmed to perform the steps of:

(a) causing at least one pair of said window cursors to move relative to one another to opposite edges of the optical image of said object from predetermined positions which are defined by the area of said object;

(b) determining the positions of said opposite edges in response to the successive detection of a coincidence between a data bit and each of the cursors of the pair by said coincidence detector when said window cursors of said pair coincide with each of the opposite edges of said object; and

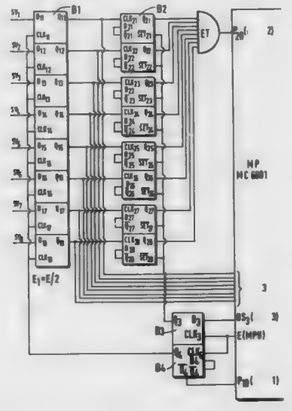
(c) deriving a distance between said opposite edges from the positions determined by the step (b).

4,731,746

ELECTRONIC DEVICE FOR THE ACQUISITION OF ASYNCHRONOUS PERIODIC SIGNALS

Jean-Marc Nozeran; Jean-Marc Villevielle, and Serge Nauleau, all of Toulouse, France, assignors to Bendix Electronics S.A., Toulouse, France

Filed Nov. 12, 1985, Ser. No. 797,059
Claims priority, application France, Nov. 27, 1984, 84 18043
Int. Cl.⁴ G01P *3/00*; G06G *7/70*
U.S. Cl. 364—565 **13 Claims**



1. Device for the acquisition and the processing of N asynchronous and periodic input signals, including a set of N synchronization flip-flops (B1) receiving said input signals and followed by a set of N storage flip-flops (B2) storing occurrences of said input signals coming from said synchronization flip-flops, said set of N storage flip-flops (B2) having an output connected to a single timer input of a microprocessor via an N-input AND gate means which is used for the combined acquisition by said microprocessor of all the occurrences of the input signals, the N synchronization flip-flops being clocked from an internal clock of the microprocessor by a flip-flop (B4) and wherein the N storage flip-flops are reset from said clock by an automatic flip-flop (B3).

4,731,747

HIGHLY PARALLEL COMPUTATION NETWORK WITH NORMALIZED SPEED OF RESPONSE

John S. Denker, Red Bank, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

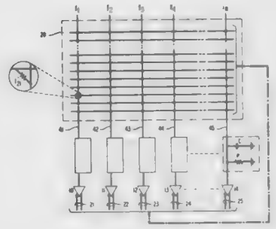
Filed Apr. 14, 1986, Ser. No. 851,239
Int. Cl.⁴ G06G *7/00, 7/02*
U.S. Cl. 364—807 **6 Claims**

1. A network comprising:

a plurality of amplifiers A_i each having an input node at which there is developed an input voltage U_i, and each developing a non-inverting output V_i and an inverting output $-V_i$, with both of said outputs being related to said input by a sigmoid function g_i;

means for applying input current I_i to said input of each of said amplifiers A_i;

a conductance network for connecting said positive and negative outputs to said inputs, said conductance network comprising conductance values selected for the nature of the decisional operation for which it is intended to minimize the energy function



$$E = -\frac{1}{2}\sum_i\sum_j T_{ij}V_iV_j + \sum_i (1/R_i)\int_0^{V_i} g_i^{-1}(V)dV - \sum_i I_iV_i$$

where V_i and V_j are output voltages of said amplifiers A_i and A_j, respectively, T_{ij} is a conductance that relates the amplified input voltage of amplifier A_i, $g(U_i)$ to the input node of amplifier A_j, R_i is the equivalent resistance at said input of said amplifier A_i and g_i^{-1} is the inverse of g_i; and means for equalizing the speed of response of said amplifiers.

4,731,748

POCKET COMPUTER WITH MEANS FOR CHECKING THE DETACHABLE MEMORY MODULE BEFORE AND AFTER POWER INTERRUPTION

Isamu Haneda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1985, Ser. No. 800,142
Claims priority, application Japan, Nov. 20, 1984, 59-246717
Int. Cl.⁴ G06F *7/04*
U.S. Cl. 364—900 **6 Claims**



1. An electronic apparatus having detachable memory module means, said memory module means including at least two memories, each capable of being connected to said apparatus, said apparatus having only one of said at least two memories connected thereto, said apparatus further comprising:

means for detecting a power failure to said apparatus and for generating a failure signal;

means for generating information which is unique at the time of said power failure, in response to said failure signal;

write means for receiving said information and writing said information into both a memory area of said apparatus and a memory area of said memory module means;

means for detecting power resumption to said apparatus and for generating a resumption signal in response to said power resumption detection;

comparison means for comparing contents of said memory area of said apparatus and said memory area of said mem-

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ory module means in response to said resumption signal, said means for comparing generating one of a coincidence signal and a noncoincidence signal, said coincidence signal indicating that said information stored in said memory area of said apparatus is identical to said information stored in said memory area of said memory module means connected to said apparatus, said noncoincidence signal indicating said information stored in said memory area of said apparatus is not identical to said information stored in said memory area of said memory module means connected to said apparatus; and

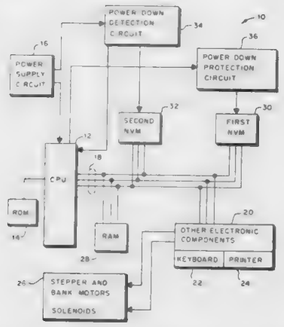
control means responsive to said signal generated by said comparison means for enabling operation of said apparatus if said signal generated by said comparison means is a coincidence signal and for disabling said apparatus if said signal generated by said comparison means is a noncoincidence signal, said control means thereby permitting operation of said apparatus only when said memory module means connected to said apparatus is the same before and after the power failure to said apparatus.

4,731,749

ELECTRONIC POSTAGE METER HAVING MULTIPLE NON-VOLATILE MEMORIES FOR STORING DIFFERENT HISTORICAL INFORMATION REFLECTING POSTAGE TRANSACTIONS

Wallace Kirschner, Trumbull, Conn.; Easwaran C. N. Nambudiri, East Meadow, N.Y., and Douglas H. Patterson, Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 22, 1984, Ser. No. 643,113
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—900 **9 Claims**



1. A method for storing different historical information reflecting the postage transactions of an electronic postage meter, comprising the steps of:

providing a first non-volatile memory;

providing a second non-volatile memory having a larger data storage capacity than the first non-volatile memory with individually addressable memory locations for storing information regarding each postage meter transaction on a real time basis;

writing cumulative historical information corresponding to the postage meter transactions into the first non-volatile memory during each power down cycle of the meter;

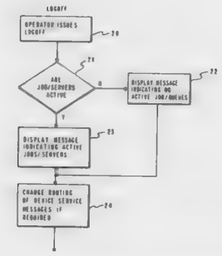
sequentially writing historical information corresponding to postage meter transactions in respective different memory locations in the second non-volatile memory in real time as each postage meter transaction occurs to provide a historical record of each postage transaction so that two different records of historical information regarding the postage transactions are provided in non-volatile memory with the first non-volatile memory providing a cumulative historical record reflecting the postage transactions prior to a power down cycle and the second non-volatile memory providing a sequential historical record of each individual postage transaction.

4,731,750

WORKSTATION RESOURCE SHARING

Martha A. Hoflich, Tokyo, Japan, and Jack E. Olson, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,007
Int. Cl.⁴ G06F *13/00, 15/16*
U.S. Cl. 364—900 **9 Claims**



1. In a data processing method employing more than one data processing workstation in which workstations communicate therebetween, the improvement for allowing an operator at a first workstation to cause the utilization of one or more resources of a second workstation, comprising:

determining at said first workstation a specification of resources at said second workstation which are authorized for utilization by said first workstation;

displaying at said second workstation, upon actual utilization of one or more of said resources at said second workstation by said first workstation, an indication of said utilization of one or more of said resources;

determining, in the event of an operator logging off said second workstation, if said one or more resources of said second workstation are being utilized by said first workstation; and then

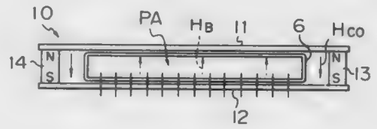
displaying an indication at said second workstation that the second workstation should be maintained in an on state because of utilization of said one or more resources of said second workstation by said first workstation.

4,731,751

MAGNETIC BUBBLE MEMORY DEVICE

Seiichi Iwasa, Sagamihara, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan

Filed Feb. 21, 1985, Ser. No. 703,984
Claims priority, application Japan, Feb. 28, 1984, 59-35133
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—28 **20 Claims**



1. A magnetic bubble memory device, comprising;

a magnetic bubble memory chip;

means for generating a bias field for maintenance of magnetic bubbles in said memory chip;

a magnetic shield disposed externally of said bias field-generating means for isolating an external magnetic field; and

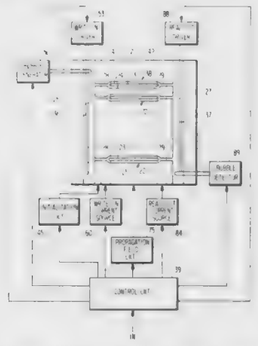
mean, disposed externally of said magnetic shield, for compensating said bias field in accordance with the temperature, and for generating a compensation field opposite in direction to said bias field.

4,731,752

BLOCH LINE MEMORY DEVICE WITH STRIPE DOMAIN STABILIZING MEANS

Yasuharu Hidaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,280
Claims priority, application Japan, Apr. 15, 1985, 60-79659; Apr. 25, 1985, 60-89321
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—29 **10 Claims**



1. In a Bloch-line memory device using a magnetic medium having a principal surface and an easy axis of magnetization orthogonal to said principal surface wherein at least one stripe-domain is generated in said magnetic medium and is surrounded by an outer domain wall in substantial parallel to said easy axis, a plurality of information signals being magnetically memorized in said domain wall as vertical Bloch line pairs, respectively, by write-in means, the memorized vertical Bloch line pairs being transferred in said domain wall by application of pulsed magnetic field in a direction orthogonal to said principal surface, and said memorized vertical Bloch line pairs being detected by detecting means to produce output signals representative of said information signals, respectively, the improvement which comprises:

at least one endless ring-like groove being formed in said principal surface of said magnetic medium to leave an island portion defined inside said endless groove so that said island portion is surrounded by an endless step portion formed at an inner boundary of said endless groove; and

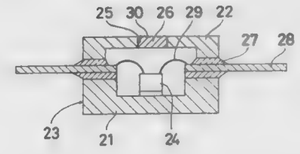
controllably generating means for controllably generating said stripe-domain in a form of an endless ring within said endless groove, said endless stripe-domain having an inner domain wall fixedly disposed under said endless step portion to thereby stabilize said endless stripe-domain, said endless stripe-domain being surrounded by an outer domain wall in which said vertical Bloch line pairs are written by said write-in means according to said information signals.

4,731,753

PACKAGE FOR SEMICONDUCTOR DEVICE

Hiroji Ikari, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Jun. 21, 1984, Ser. No. 623,158
Claims priority, application Japan, Jun. 24, 1983, 58-114854
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—52 **8 Claims**



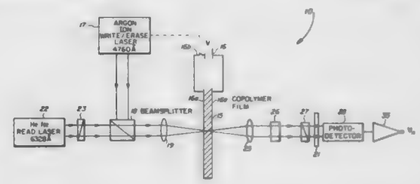
1. A package for a semiconductor device comprising an insulating base member and a lid to contain the semiconductor element therein, said lid being provided at a portion thereof opposite to at least a portion of said semiconductor element with ultraviolet transmission glass, at least one surface of which is rough, having jags of 0.5 to 3 μm in size.

4,731,754

ERASABLE OPTICAL MEMORY MATERIAL FROM A FERROELECTRIC POLYMER

T. Roger Ogden, and Debra M. Gookin, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 12, 1985, Ser. No. 775,541
Int. Cl.⁴ G11C *11/42, 11/22*
U.S. Cl. 365—121 **17 Claims**



1. An apparatus for optically writing, storing, reading and erasing digital information comprising:

a film of at least partially transparent poly(vinylidene-fluoride-trifluoroethylene) having a Curie temperature below its melting temperature;

means oriented to beam pulses of light onto the film for optically heating spots on the film;

means for impressing an electric field across the film having a magnitude less than the coercive field of the film at ambient temperature but of sufficient magnitude to rotate dipoles in the heated spots and thereby change the polarity of the heated spots to effect an optical writing therein;

means disposed for illuminating the polarity changed heated spots with polarized reading light, the illuminating means having a magnitude insufficient to heat the polarity changed spots above the film's Curie temperature, the polarized reading light having its polarization rotated where it passes through polarity changed heated spots;

means receiving the polarized reading light passing through the film for passing only the polarization rotated portions that traverse the polarity changed heated spots; and

means responsive to the passed polarization rotated portions for generating signals representative of digital information.

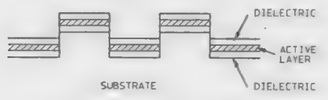
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,755

THERMAL DESIGN FOR REVERSIBLE PHASE CHANGE OPTICAL STORAGE MEDIA

Gary C. Bjorklund, Los Altos; Martin Y. Chen, and Victor B. Jipson, both of San Jose, all of Calif., assignors to International Business Machines Corporation, New York, N.Y.

Filed Apr. 10, 1986, Ser. No. 849,988
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—127 3 Claims



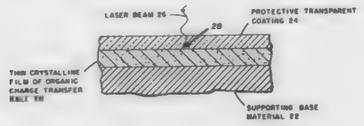
1. An optical storage medium comprising a substrate having lands and grooves, a reversible phase change active layer approximately 1,000 Angstroms thick above said substrate, and at least one thermally conductive dielectric layer, between 1,000 and 2,000 Angstroms thick either between said substrate and said active layer or on top of said active layer, with the grooves in the substrate being of at least 5,000 Angstroms in depth to provide thermal isolation between adjacent lands and grooves.

4,731,756

OPTICAL STORAGE AND SWITCHING DEVICES USING ORGANIC CHARGE TRANSFER SALTS

Richard S. Potember; Theodore O. Poehler, both of Baltimore, and Richard C. Benson, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 464,771, Feb. 7, 1983, Pat. No. 4,574,366. This application Aug. 29, 1985, Ser. No. 770,443
Int. Cl.[4] G11C *11/00*
U.S. Cl. 365—153 38 Claims



1. An optically sensitive medium comprising a film of organic charge transfer salt responsive to the application of optical energy for undergoing an electrochemical redox reaction effective when illuminated by said optical energy to switch between a first state having an associated optical spectrum and a second state having an associated detectably different optical spectrum from said first state, whereby said film stores data in accordance with the selective illumination thereof by said optical energy.

4,731,757

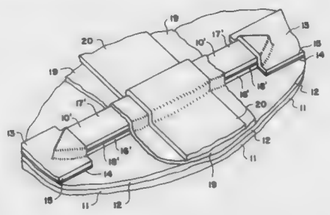
MAGNETORESISTIVE MEMORY INCLUDING THIN FILM STORAGE CELLS HAVING TAPERED ENDS

James M. Daughton, Edina, and Jack S. T. Huang, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1986, Ser. No. 879,679
Int. Cl.[4] G11C *11/15*
U.S. Cl. 365—173 14 Claims

1. A ferromagnetic thin film based digital memory, said memory comprising:

a first storage line structure having a first storage line pair of end terminals adapted to conduct electrical current in at least one direction, said storage line end terminals having electrically connected in series therebetween a plurality of bit structures with each bit structure electrically connected at a bit juncture to at least one other said bit structure, each said bit structure comprising an intermediate layer of a kind of separating material having two major surfaces on opposite sides thereof and a memory film on each of said intermediate layer major surfaces with said memory film being of a magnetoresistive, anisotropic magnetic material where said memory film is narrowed in extend near where said bit structure is electrically connected to a bit juncture, as aforesaid, with respect to its extent at centralized portions of said bit structure located farther from any said bit junctures, and



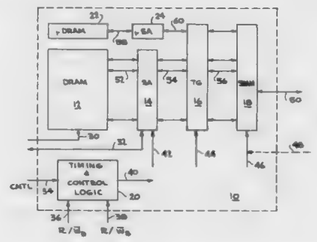
a plurality of word line structures each having a pair of word line end terminals adapted to conduct electrical current in at least one direction, each of said pairs of word line end terminals having an electrical conductor electrically connected therebetween which is located across an electrical insulating layer from said memory film on one of said major surfaces of said intermediate layer at said centralized regions of a selected one of said bit structures.

4,731,758

DUAL ARRAY MEMORY WITH INTER-ARRAY BI-DIRECTIONAL DATA TRANSFER

Heng-Mun Lam, and Paul D. Keswick, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 21, 1985, Ser. No. 747,475
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 16 Claims



1. A dual array memory for storing data subject to the externally addressable input/output transfer of data thereto, said memory comprising:

(a) first memory array means for dynamically storing data in a plurality of dynamic memory sub-arrays;

(b) plural array means, respectively coupled to said dynamic memory sub-arrays, for sensing and writing data at addressed locations of said first memory array means;

(c) second memory array means for statically storing data in a plurality of respective static memory sub-arrays generally corresponding to said plural array means;

(d) timing and control means for bi-directionally transferring data beween said plural array means and said second memory array means substantially independently of the externally addressable input/output transfer of data to said first memory array means;

(e) wherein each respective static memory sub-array includes,

(i) respective latching means for latching data, said latching means operable to latch data only when said latching means is enabled, and

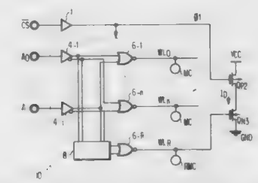
(ii) respective enabling means, responsive to said timing and control means, for selectably enabling said respective latching means by coupling said latching means to a pair of voltage potentials and for selectably disabling said latching means by substantially decoupling said latching means from the pair of voltage potentials.

4,731,759

INTEGRATED CIRCUIT WITH BUILT-IN INDICATOR OF INTERNAL REPAIR

Takayuki Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,826
Claims priority, application Japan, Mar. 18, 1985, 60-53651
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—200 12 Claims



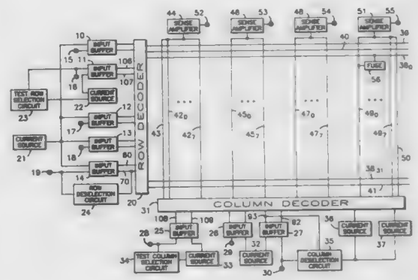
1. A semiconductor device comprising a first voltage terminal receiving a first potential, a second voltage terminal receiving a second potential, a control terminal for receiving a control signal having first and second logic levels, a functional section coupled to said first voltage terminal, said second voltage terminal and said control terminal, said functional section being enabled when said control signal is at said first logic level, said functional section including at least one normal circuit, a redundant circuit having the same function as said normal circuit and a control circuit, said control circuit being coupled to said normal circuit and said redundant circuit, said control circuit being programmed such that said control circuit operatively enables a normal circuit which is good and enables said redundant circuit when at least one normal circuit is defective to utilize said redundant circuit in place of the defective normal circuit, said control circuit enabling the normal circuit and/or the redundant circuit when said control signal is at said first logic level, a first and a second switching means coupled in series between said first and second voltage terminals, said first switching means being made conductive in response to the first logic level of said control signal and made non-conductive in response to the second logic level of said control signal, said second switching means being made one of conductive or non-conductive when said redundant circuit is enabled in place of said normal circuit and made non-conductive or conductive, being opposite the state representing enabling of said redundant circuit, when said redundant circuit is not utilized, whereby it is detectable through a conductivity between said first and second voltage terminals whether said redundant circuit is utilized or not.

4,731,760

ON-CHIP TEST CIRCUITRY FOR AN ECL PROM

Rajnish Maini, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 5, 1986, Ser. No. 859,581
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—201 29 Claims



1. A memory circuit comprising:

a first plurality of input pins including a first and a second input pin;

a second plurality of input pins including a third and a fourth input pin;

a plurality of word lines;

a plurality of bit lines;

a plurality of memory elements, wherein each of said memory elements are uniquely coupled between one of said plurality of word lines and one of said plurality of bit lines;

at least one test word line;

at least one test bit line;

a first plurality of test memory elements arranged in one or more rows, wherein each of said first plurality of test memory elements are uniquely coupled between one of said test word lines and one of either said bit lines or said test bit lines;

a second plurality of test memory elements arranged in one or more columns, wherein each of said second plurality of test memory elements are uniquely coupled between one of said test bit lines and one of either said word lines or said test word lines;

first means coupled to said plurality of word lines and said test word lines for selecting one of said word lines according to the digital states of a first plurality of input signals applied to said first plurality of input pins;

second means coupled to said plurality of bit lines and said test bit lines for selecting one of said bit lines according to the digital states of a second plurality of input signals applied to said second plurality of input pins;

third means coupled between said first plurality of input pins and said first means for selecting one of said word lines or said test word lines according to the digital states of the first plurality or input signals when an input signal applied to said first input pin exceeds a threshold voltage level; and

fourth means coupled between said second plurality of input pins and said second means for selecting one of said bit lines or said test bit lines according to the digital states of the second plurality of input signals when an input signal applied to said second input pin exceeds a threshold voltage level.

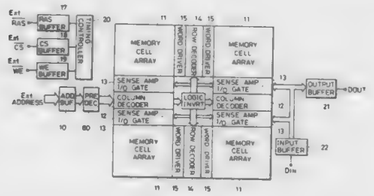
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4,731,761

SEMICONDUCTOR MEMORY

Toshifumi Kobayashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,679
Claims priority, application Japan, Oct. 4, 1985, 60-222103
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—230 **4 Claims**



1. A semiconductor memory having a memory cell array composed of a plurality of memory cells arranged in a matrix form of rows and columns, comprising

predecoder means for receiving address information which defines a row and a column of one memory cell included in said memory array and for performing a predetermined operation to output an intermediate signal,

row selection means for selecting one row defined by said address information responsive to the intermediate signal from said predecoder means,

column selection means for selecting one column defined by said address information in response to the intermediate signal from said predecoder means, and

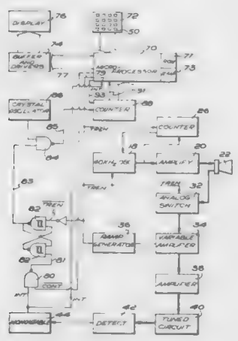
logic inversion means connected to said row selection means and said column selection means for inverting at least a part of the intermediate signal from said predecoder means in response to the operation of said predecoder means to be applied to said row selection means or to said column selection means.

4,731,762

DISTANCE SENSING APPARATUS

Paul Hanks, Malmesbury, England, assignor to Fisco Electronics, Rayleigh, England

Filed Jul. 12, 1985, Ser. No. 754,641
Claims priority, application United Kingdom, Jul. 17, 1984, 8418213
Int. Cl.⁴ G01S *9/68*
U.S. Cl. 367—108 **16 Claims**



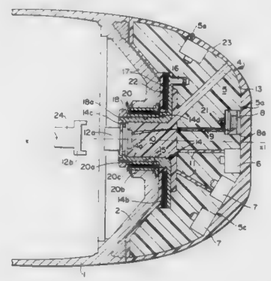
1. An apparatus for measuring distances in air, comprising transmitter means to transmit at least one ultrasonic or sonic signal, echo detecting means to detect receipt of an echo of said signal, time sensing means which generates a numerical value proportional to time from transmission to return of an echo, and display means to display a digital distance measurement derived from said numerical value and which is a measure of distance to the target returning the echo, the improvement comprising ability to detect any one of at least two echoes returning in succession from different distances and within a range, and for any one of said echoes to generate a said numerical value and display a said digital distance measurement obtained therefrom, irrespective of the distances within said range from which the echoes return, means for regularly and automatically repeating the transmitted signal at sufficient delay for return of an echo from a maximum range, control means selectively operable to choose between said echoes returning in succession and to cause said time sensing means and display means respectively to generate a said numerical value and display a said digital distance measurement obtained therefrom, said control means being user operable to choose any one of said echoes, irrespective of the distances within said range from which the echoes return.

4,731,763

SONAR ANTENNA FOR USE AS THE HEAD OF AN UNDERWATER DEVICE, AND METHOD FOR MANUFACTURING THE SAME

Jean-Marie L. Wagner, Cavalaire Sur Mer, France, assignor to Etat Francais, Paris, France

Continuation of Ser. No. 509,220, Jun. 22, 1983, abandoned. This application Mar. 26, 1987, Ser. No. 45,712
Claims priority, application France, Jun. 22, 1982, 82 10846
Int. Cl.⁴ H04R *1/02;* **F42B** *19/01*
U.S. Cl. 367—153 **10 Claims**



1. A method for manufacturing a sonar antenna, comprising:

casting a core block of syntactic foam sufficiently rigid to withstand submersion hydrostatic pressures, said block having an axial cavity, facets, and recessed housings formed in an outer surface thereof;

forming passages connecting each of said recessed housings to said axial cavity and at least one channel connecting said axial cavity to said outer surface of said block;

mounting at least one electro-acoustic transducer in each recessed housing such that an outer surface of each said transducer is flush with said outer surface of said block;

placing an electrical connector in said axial cavity for connection to a hull of an underwater device, and connecting each said electro-acoustic transducer to said electrical connector thereto by way of electrical conductors extending through said passages;

filling said axial cavity, passages and channel with a muffling material by injecting the muffling material through said channel;

attaching means to said block for fastening said block against a forward end of the hull of the underwater device; and

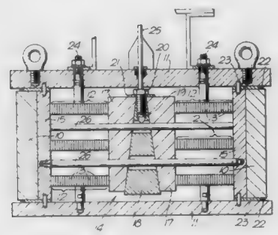
molding a sealed envelope of acoustically transparent material around said block and transducers, said envelope being formed substantially in a bullet shape to serve as the front end of an underwater device.

4,731,764

SONAR TRANSDUCERS

Kenneth J. Ponchaud, Weymouth, United Kingdom, assignor to British Aerospace plc, London, England

Filed Sep. 12, 1986, Ser. No. 906,449
Claims priority, application United Kingdom, Sep. 12, 1985, 8522652
Int. Cl.⁴ H04R *17/00, 31/00*
U.S. Cl. 367—158 **6 Claims**



1. Sonar transducer assembly for submerged operation in water comprising:

a hollow water-tight shell of generally elliptical cylinder form;

drive means located within said shell for engaging opposed portions thereof at the ends of the major axis of the ellipse so as, in use, to excite said shell, said drive means being held in compression and said shell being configured so that, in use, exterior water pressure tends to reduce the compressive force on said drive means; and

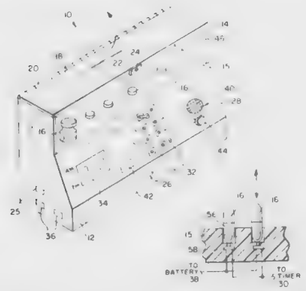
wedge means interposed in said drive means for exerting a compressive preload thereon.

4,731,765

MEDI MINDER

George W. Cole, 4819 Ridge Rd., N. Little Rock, Ark. 72118, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Aug. 25, 1986, Ser. No. 900,327
Int. Cl.⁴ G04B *47/00*
U.S. Cl. 368—10 **2 Claims**



1. A medication reminder device comprising:

(a) a housing having a compartment containing a plurality of individual medication units;

(b) a cover hinged to top of said compartment;

(c) a latch mechanism mounted on said compartment to lock and unlock said cover;

(d) an electric circuit having a timer system within said housing controlling said latch mechanism, to lock and unlock said cover at adjustable time intervals so that said medication units can be removed when needed;

(e) a signal emitter in said circuit activated by said timer system at said adjustable time intervals to notify a person when to remove a medication unit from said compartment wherein said timer system comprises:

(f) an electronic time in said circuit, having a plurality of alarm set buttons to set said adjustable time intervals;

(g) a digital time indicator in said circuit having a pair of time set buttons to set AM or PM time;

(h) a battery to supply electricity to said circuit;

(i) timer actuating means in said circuit responsive to removal of medication units from said compartment to actuate the timer system thereby indicating the time a medication unit is again required to be taken, wherein said timer actuation means comprises:

(j) a floor within said compartment of said housing having a plurality of spaced seats; and

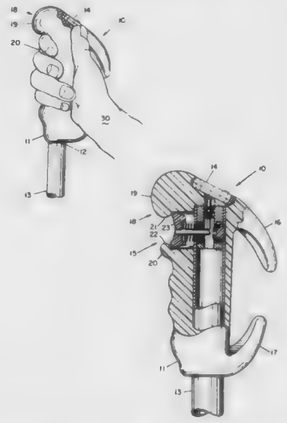
(k) a plurality of contacts in said circuit mounted under each of said seats, said contacts electrically connected between said seats to close one of said contacts so that said timer will operate till said next adjustable timer interval.

4,731,766

COMBINATION SKI POLE HANDLE WITH HAND-OPERATED WATCH OR TIMING DEVICE MOUNTED THEREIN

Jeffrey M. Bunyea, 7925 Modesto Dr., Riverside, Calif. 92503

Filed Jul. 7, 1986, Ser. No. 882,284
Int. Cl.⁴ G04B *47/00;* **A63C** *17/26*
U.S. Cl. 368—10 **15 Claims**



1. A combination ski pole with a molded hand grip for mounting on the top end of the ski pole with a finger-operable timing function therein, comprising:

(a) stop watch means incorporating a timing function with an external, manually-operable control means, said control means being operably disposed below said stop watch means, said stop watch means being operably disposed and protectively mounted in the uppermost portion of the molded hand grip and exposed for ready visual readout by the skier;

(b) a finger-operable trigger means operably disposed in the molded hand grip and protectively mounted therein; and

(c) mechanical means secured to the ski pole for operatively linking the watch to the trigger means,

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whereby when the trigger means is actuated by the skier's finger, the mechanical means is actuated for controlling the timing function of the stop-watch timing function as desired by the skier.

4,731,767

TIMEPIECE HAVING A STAR DISPLAY

Hideo Uehara, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,976

Claims priority, application Japan, Oct. 15, 1985, 60-229170; Oct. 15, 1985, 60-229169

Int. Cl.⁴ G04B *19/26*

U.S. Cl. 368—15 **14 Claims**



1. A timepiece comprising:

a case;

an hour hand operatively associated with hour wheel means, said hour wheel means being rotatably mounted in said case and including an hour wheel pinion;

a minute hand disposed coaxially with said hour hand and operatively associated with said hour wheel means;

a star map disk rotatably mounted in said case below said hands and disposed coaxially with said hour wheel means, said star map disk having a diameter substantially equal to the rotational diameter of said minute hand and said star map disk including a star map disk wheel operatively associated with said star map disk;

gear train means for transmitting rotation of said hour wheel means to said star map disk to rotate said star map disk one revolution per one sidereal day, said gear train means including a regulating wheel means having

a regulating wheel shaft rotatably mounted in said case,

a regulating wheel gear mounted on said regulating wheel shaft and engaged with said hour wheel pinion,

a regulating wheel pinion mounted on said regulating wheel shaft and engaged with said star map disk wheel, and friction engaging means for allowing said regulating wheel gear and

said regulating wheel pinion to slip so as to allow said star map disk to be set without rotating said hands;

a first star map provided on said star map disk, said first star map including stars of constellations in a part of the celestial sphere which are selected from stars visible at an observation point on the earth; and

celestial defining means provided on said first star map for defining a range in said first star map which is visible at an observation point on the earth.

4,731,768

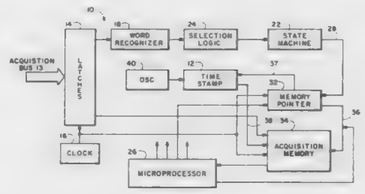
AUTORANGING TIME STAMP CIRCUIT

John L. Easterday, Portland, Oreg., assignor to Tektronix, Beaverton, Oreg.

Filed Sep. 15, 1986, Ser. No. 906,873

Int. Cl.⁴ G04F *8/00;* **G01R** *23/02*

U.S. Cl. 368—118 **15 Claims**



1. A circuit for associating time values with specified events stored in a memory, comprising:

means for generating a plurality of different known clock frequencies;

means for selecting in order of decreasing frequency the clock frequencies to provide a clock signal;

means for generating in response to the clock signal a binary code count to be associated as a time value with each specified event to be stored;

means for signaling the occurrence of a specified event; and

control means responsive to the signaling means to reset the clock frequency to its initial frequency in the predetermined order each time a specified event occurs.

4,731,769

CENTRAL SERVICING AND INFORMATION CONTROLLER FOR VEHICLE AUXILIARY EQUIPMENT

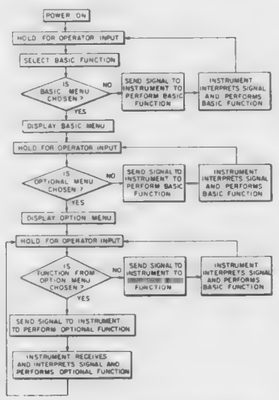
Peter Schaefer, Moensheim; Roland Ehniss, Karlsruhe, and Dieter Marx, Kernen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.f. Porsche Akiengesellshaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,568

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514438

Int. Cl.⁴ H04B *1/20;* **G05D** *23/00*

U.S. Cl. 369—6 **29 Claims**



1. A central operating input and information output system for the control of a plurality of optional instruments in a vehicle, said instruments having basic functions such as volume control and defrosting, having display means partitionable into fields for displaying information and function-selection menus, and first control input means assigned to elements of displayed menus, said elements of said menus indicating functions that are controllable by said first control input means, with individual menus for controlling at least one optional instrument being selectable from at least one basic menu that is indicated in said display means, further comprising:

second control input means for directly controlling said basic functions of said central operation input and information output system and at least two said optional instruments at any time and irrespective of a menu that has been currently selected.

4,731,770

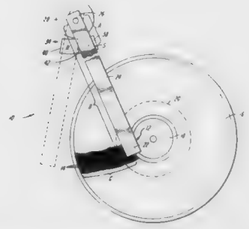
METHOD AND APPARATUS FOR CONTROLLING TRANSDUCER

Christian C. Petersen, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1986, Ser. No. 835,222

Int. Cl.⁴ G11B *17/06*

U.S. Cl. 369—41 **1 Claim**



1. Apparatus for controlling the position of a transducer mounted for movement across data tracks on a recording medium, said apparatus comprising:

a transducer mounting assembly including an elongated arm supporting a transducer near one end thereof and being mounted for rotation about an axis near the opposite end of said arm, said assembly being positioned so that said transducer is movable across the data tracks, in operative overlying relation thereto, in response to rotation of said arm;

drive means operable for rotatably driving said arm about said axis; and

control means for controlling the position of said transducer with respect to selected data tracks, said control means including;

(a) a pair of magnetic sensing probes mounted on said arm, near said other end, for rotation with said arm over a sensing path, said probes being spaced with respect to each other in leading and lagging relation in the direction of arm rotation;

(b) magnetic means for defining a magnetic field having a field strength that varies linearly over said sensing path in the path of travel of said probes so that said probes provide signals indicative of the relative positions of said probes along said sensing path;

(c) means for providing a track address signal indicative of a selected data track;

(d) signal processing means for receiving said track address signal and said probe signals and deriving therefrom a control signal for operating said drive means to effect arm rotation so said transducer is positioned over the selected track.

4,731,771

TRACKING SERVO SETTING METHOD AND APPARATUS

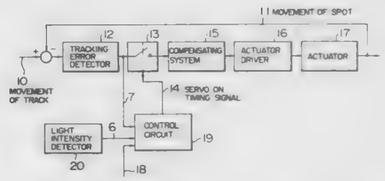
Takeshi Maeda, 21-19, Honcho-4-chome, Kokubunji-shi; Kazuo Shigematsu, 1-12 Takahisa, Yoshikawamachi, Kitakatsushika-gun, Saitama-ken; Shigeru Nakamura, 32, Koyasumachi-2-chome, Hachioji-shi; Yoshito Tsunoda, 24-12-310, Mure-6-chome, Mitaka-shi, and Masuo Kasai, 11-17, Motohongocho-1-chome, Hachioji-shi, all of Japan

Filed Feb. 13, 1986, Ser. No. 829,024

Claims priority, application Japan, Feb. 25, 1985, 60-34356

Int. Cl.⁴ G11B *7/085*

U.S. Cl. 369—44 **16 Claims**



1. A track setting method for a tracking servo system in which a light spot is projected onto a recording medium on which a guide groove of a plurality of tracks is formed in advance, a light flux coming from said recording medium is opto-electrically transformed, a tracking error signal representing deviations of the center of said light spot from a center line of said track is detected using the output obtained by the opto-electrically transformation, and the position of the projected light spot is controlled using said tracking error signal so that said light spot follows said track, comprising the steps of:

detecting a passage velocity at which said light spot moves across said track, based on said tracking error signal;

determining an intensity signal representing the light intensity of said light flux coming from said recording medium using said output obtained by said opto-electric transformation; and

determining a timing signal for beginning a setting operation for setting said light spot on said track by generating a pulse representing a moment in time at which said light spot moves across substantially said center line of said track using said tracking error signal, said timing signal being generated substantially in synchronism with said pulse only when said passage velocity is lower than a predetermined minimum velocity value.

4,731,772

OPTICAL HEAD USING HOLOGRAM LENS FOR BOTH BEAM SPLITTING AND FOCUS ERROR DETECTION FUNCTIONS

Wai-Hon Lee, 10332 Noel Ave., Cupertino, Calif. 95014

Filed May 6, 1986, Ser. No. 860,154

Int. Cl.⁴ G11B *7/12*

U.S. Cl. 369—45 **12 Claims**

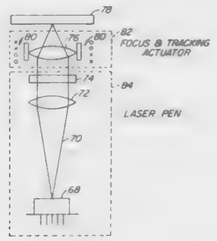
1. An optical head for reading information recorded on a reflective medium, comprising:

semiconductor laser means for radiating a laser beam;

a diffraction grating disposed between said laser means and said medium to produce a diffracted beam from a reflected beam of said laser beam off said medium, said diffracted beam having an optical axis inclined relative to an optical axis of said reflected beam, said diffractive grating being patterned to produce a spacial variation in said diffracted

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beam responsive to variations in the focus of said laser beam on said medium; and



photodetector means for detecting said spacial variations in said diffracted beam, said photodetector means being positioned to intercept said diffracted beam.

4,731,773

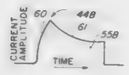
THERMALLY-INDUCED RECORDING WITH REDUCED HARMONIC DISTORTION

Julian Lewkowicz, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 749,021, Jun. 26, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 857,268

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 369—59 **11 Claims**



1. In a method of recording information-bearing signals onto a thermally-responsive record-bearing medium;

the steps of:

relatively moving the record-bearing medium and an energy-beam-emitting pulse source such that the source emits a pulsed energy beam to scan a track on the record-bearing medium;

supplying a plurality of heat-inducing pulses of diverse durations for recording the information-bearing signals along the track length as a series of lengths of recordings having lengths corresponding respectively to said diverse durations;

at a predetermined time after initiating each of said heat-inducing pulses, and independently of any portion of said each heat-inducing pulse being reflected from said record medium at said predetermined time, altering the amplitude of each of the heat-inducing pulses from an initial high recording-initiating value to a recording-sustaining value for maintaining the duration of said initial-recording-initiating value at a predetermined fixed duration irrespective of variations in recording lengths caused by said diverse durations, or the light reflected from said record-bearing medium such that the resultant recording in the track is uniformly wide along the length of the track being scanned whereby even-harmonic frequencies are reduced from a recording made at said recording-initiating value for the duration of the heat-inducing pulse.

4,731,774

DISC PLAYBACK APPARATUS

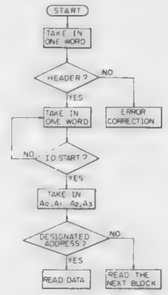
Shunsuke Furukawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 635,606, Jul. 30, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,845

Claims priority, application Japan, Jul. 30, 1983, 58-140749

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 369—59 **10 Claims**



1. A disc having recorded thereon

a plurality of FRAMEs of main digital data and subdigital data, said subdigital data being used in playback of said disc to locate said main digital data,

a predetermined number of said FRAMEs consituting one BLOCK,

a header signal being included in the beginning of said BLOCK,

an address signal following said header signal, and

a time indication code contained in said subdigital data for locating a desired FRAME within said BLOCK.

4,731,775

INFORMATION RECORDING REGENERATING APPARATUS

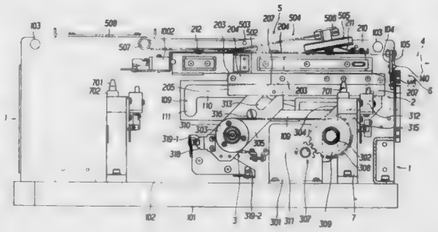
Toshihiko Katsuyama, and Takao Aihara, both of Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,722

Claims priority, application Japan, Dec. 3, 1984, 59-255373; Dec. 3, 1984, 59-255372; Dec. 6, 1984, 59-258287; Mar. 9, 1985, 60-47089; Mar. 11, 1985, 60-47662

Int. Cl.⁴ G11B *17/04*

U.S. Cl. 369—77.2 **14 Claims**



1. An information recording and reproducing apparatus comprising: a transfer body for supporting an information recording medium; a transfer body driver mechanism for driving the transfer body to a turn table; a clamp support arm rockably supported on the transfer body; a clamp head supported on one end of the clamp support arm for clamping the information recording medium on the turn table; and a clamp

actuation member disposed on the other end of the clamp support arm and mounted for movement along a guide member which prevents the clamp actuation member from upward movement, the clamp actuation member being actuatable directly by means of downward movement of the transfer body to the turn table by the drive mechanism for rocking the clamp support arm to enable the clamp head to clamp the information recording medium on the turn table.

4,731,776

CARTRIDGE LOADING APPARATUS

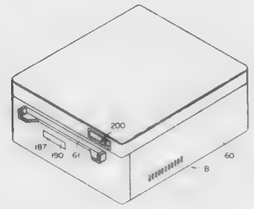
Masaru Ishii, Fujiwawa, and Kazuharu Odawara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1986, Ser. No. 833,181

Claims priority, application Japan, Feb. 28, 1985, 60-39285

Int. Cl.⁴ G11B *25/04;* **B65D** *85/02*

U.S. Cl. 369—77.2 **10 Claims**



1. An apparatus for loading a cartridge which encloses an information recording disk therein, wherein said cartridge includes first and second cases selectively movable in opposite directions by a sliding movement along a plane substantially coinciding with that of said disk, and is adapted to be in a closed state to completely enclose and seal said disk when said first and second cases are by said sliding movement brought into contact with each other and in an open state to expose an area of said disk between said first and second cases when said first and second cases are by said sliding movement separated from each other, said first case having lateral side faces extending in the movable direction of said first case, said side faces being provided with a recess, and fixing means for locking said cartridge in said closed state, said apparatus comprising:

a housing having a port at one side of said housing for receiving and discharging said cartridge therethrough;

cartridge handling means, disposed in said housing, for receiving said cartridge from said port in said closed state, for opening the cartridge by separating by said sliding movement the first and second cases from each other to expose the area of said information recording disk, for closing the cartridge by bringing by said sliding movement the first and second cases into contact with each other, and for ejecting at least part of said closed cartridge outside of said housing through said port;

locking means for locking said cartridge inserted in said housing in position, said locking means including a pair of locking devices arranged beside said lateral faces of said first case of said cartridge, and each locking device including a locking lever movable between a release position where said cartridge is set freely movable, and a locking position where the locking lever is inserted in said recess, thereby locking said cartridge in position; and for cooperating with said fixing means to lock said cartridge in a closed state when said cartridge is discharged from said housing.

4,731,777

OPTICAL DISK PLAYER

You Yoshitoshi; Tsutomu Toyoguchi, both of Tokyo; Ryoji Takamatsu, and Yoshiro Watanabe, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

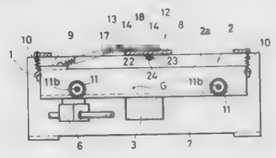
PCT No. PCT/JP85/00557, § 371 Date Jun. 19, 1986, § 102(e) Date Jun. 19, 1986, PCT Pub. No. WO86/02482, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 9, 1985, Ser. No. 879,129

Claims priority, application Japan, Oct. 11, 1984, 59-153438[U]

Int. Cl.⁴ G11B *25/04*

U.S. Cl. 369—263 **7 Claims**



1. An optical disk player in which a movable chassis member mounted with an optical pickup, a turntable and the like, is supported by a plurality of springs connected to respective positions on a frame member to hold the movable chassis in a floating state with respect to the frame, comprising at least one damper inserted between said frame member and said movable chassis member so as to absorb the energy of vibrations of said movable chassis, each said damper comprising a generally horizontal rod fixed to one of said members and a resilient vessel of viscous liquid secured to the other of said members with said rod secured centrally of said vessel, and correcting means between said member and said movable chassis member to adjust a resilient biasing force for biasing said movable chassis with respect to said frame by adjustment operation, wherein a positional deviation of said movable chassis causing movement of said rod away from centered condition in said vessel is corrected by adjusting the biasing force, so that said movable chassis is kept with said rod in centered condition in neutral equilibrium position regardless of the setting angle of said frame.

4,731,778

ELECTRO-MAGNETIC DRIVE UNIT COMPRISING A PIVOTABLE ARMATURE

Henricus M. van Hout, and Johannes T. A. van de Veerdonk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,976

Claims priority, application Netherlands, Oct. 22, 1985, 8502872

Int. Cl.⁴ G11B *3/10, 7/00*

U.S. Cl. 369—266 **15 Claims**

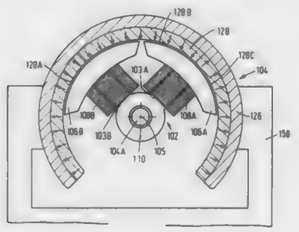
1. An electromagentic drive unit comprising a stator and an armature which is pivotable about a pivotal axis and which cooperates with a stator via an air gap, characterized in that

the stator comprises at least one pair of polepieces having respective centers which are interconnected by a magnetizable stator member carrying at least one coil, and

the armature comprises a cylindrical armature member which is arranged coaxially around the stator, which armature has a plurality of axially and tangentially extending radially magnetized poles which correspond in the number at least to the number of stator polepieces and which are juxtaposed and alternately have opposite polarities viewed in the circumferential direction of said armature member, said poles cooperating with said polepieces via said air gap, each pole of said armature having tangentially opposed bounding surfaces, at least one of said

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bounding surfaces of each pole being juxtaposed with a respective bounding surface of the juxtaposed pole, said



juxtaposed bounding surfaces being tangentially spaced at least substantially the same as the centers of the respective stator poles.

4,731,779

DISK INSTALLING DEVICE FOR A DISK PLAYER

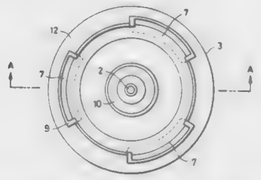
Tathuhisa Mathunaga, Fujisawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,866

Claims priority, application Japan, Aug. 21, 1985, 60-181798

Int. Cl.⁴ G11B *25/04, 17/02*

U.S. Cl. 369—270 **3 Claims**



1. A disk installing device for a disk player adapted to employ both a first disk and a second disk comprising:

a centering hub axially slidably mounted on the output shaft of a driving motor, and having a plurality of first taper centering parts positioned to fit the center hole of the first disk and formed in the circumference of a flange of said centering hub at regular angular intervals, and a second taper centering part dimensional to fit the center hole of the second disk and having an outside diameter smaller than that of a circle corresponding to the outer circumferences of the first taper centering parts;

a turn table with a supporting surface fixed to the output shaft of the driving motor and provided with cut-out parts corresponding in position to the first taper centering parts of the centering hub and formed so as to receive the first taper centering parts therein when the second disk is placed on the turn table;

means having a compression coil spring for axially biasing the centering hub toward the supporting surface of the turn table from one side thereof; and

a clamping member for pressing the first disk or the second disk toward the supporting surface of the turn table from th other side thereof so that the first disk or the second disk is held firmly by said clamping member and is centered on the turn table by said centering hub.

4,731,780

OPTICAL RECORDING ELEMENT

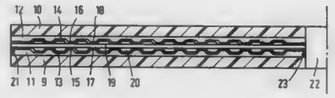
Petrus J. Kivits; Martinus M. Sens, and René Dufour, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 842,727, Mar. 20, 1986, which is a continuation of Ser. No. 662,652, Oct. 19, 1984, abandoned. This application Jan. 21, 1987, Ser. No. 4,320

Claims priority, application Netherlands, Jul. 11, 1984, 8402193

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—284 **3 Claims**



1. An optical recording element comprising an assembly of two parallel substrate plates, each of said plates being made of a transparent synthetic resin and each of said plates comprising on their mutually opposing surfaces a guide track provided with a spiral-like groove and ridges between the turns of said groove, and a recording layer, situated upon and following the contours of said guide track and a slot-shaped gap present between said recording layers, characterized in that a foil of a synthetic resin is present in said gap, is sandwiched between said recording layers and engages essentially only the portions of the recording layers present on said ridges, said foil, when adhering to said recording layers, adheres only at the areas of said recording layers not in contact with said guide tracks and that said recording element is capable of recording information by radiation of said recording layers with modulated laser light through said substrate plates thereby to form in the resultant exposed areas of said recording layers light detectable changes.

4,731,781

RECEIVER OF A DIGITAL COMMUNICATION APPARATUS

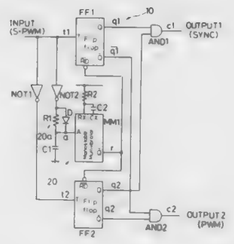
Aki Nakamura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,093

Claims priority, application Japan, Jul. 16, 1985, 60-157290

Int. Cl.⁴ H04J *15/00;* **H03K** *1/18*

U.S. Cl. 370—9 **4 Claims**



1. A receiver for a digital communication apparatus utilizing a time-division multiplexed signal in which a plurality of pulse signals of different types are time-division multiplexed, comprising:

signal separation means for separating said pulse signals into said different types, including,

first flip-flop means, responsive to leading edges of said plurality of pulse signals, for producing a first output waveform,

second flip-flop means, responsive to leading edges of a plurality of pulse signals of an inverted time-division multiplexed signal, for producing a second output waveform, and

logic gate means, responsive to the output waveforms of said first and second flip-flop means, for producing output signals corresponding to each different type of pulse signal at respective output terminals thereof; and

reset pulse generator means for providing reset pulses to said first and second flip-flop means, including means for producing said reset pulses at intervals corresponding to the period of said plurality of pulse signals, said reset pulses being produced between respective starting and falling edges of said plurality of pulse signals.

4,731,782

DIGITAL LOCAL SWITCHING SYSTEM FOR INTEGRATED SERVICE DIGITAL NETWORK

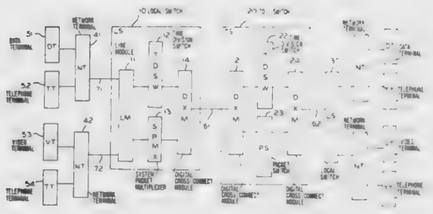
Tomoyoshi Shimizu; Yoshinori Yoshida; Masao Hashimoto, and Hideki Nakane, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 11, 1986, Ser. No. 872,810

Claims priority, application Japan, Jun. 12, 1985, 60-126263; Jun. 12, 1985, 60-126264; Jun. 12, 1985, 60-126265

Int. Cl.⁴ H04J *3/22*

U.S. Cl. 370—60 **1 Claim**



1. A digital local telephone exchange system for accommodating a plurality of digital access lines, each of said access lines being ascribed to a basic access interface having two B channels for circuit switching calls and packet switching calls and one D channel for packed signalling information or data, said system comprising:

a plurality of line module means for separating said circuit switching calls and packet switching calls from said digital access lines;

each of said line module means including:

a plurality of line circuit means for separating said B channel circuit switching calls and packet switching calls and said D channel packeted signalling information or data;

digital line switch means for multiplexing circuit switching calls separated by each of said line circuit means;

line module packet multiplexer means;

line module controller means connected to said each line circuits for identifying said packeted signalling information or data on said D channel, for controlling calls by using said signalling information and for outputting said packeted data to said line module packet multiplexer; and

said line module packet multplexer means multiplexing B channel packets from said line circuits and D channel packets from said line module controller;

system packet multiplexer means for multiplexing said B channel packets from each of said line module packet multiplexer;

time division switch means for connecting circuit switching calls from said line module means; and

digital cross-connect module means having a plurality of circuit-packet multiplexer means corresonding to a toll connecting trunk, each of circuit-packet multiplexer means receiving input circuit switching calls from said time division switch means and packet switching calls from said system packet multiplexer means for mutliplexing these calls to said toll connecting trunk.

4,731,783

METHOD AND SYSTEM FOR TIME DIVISION MULTIPLE ACCESS SATELLITE TELECOMMUNICATIONS

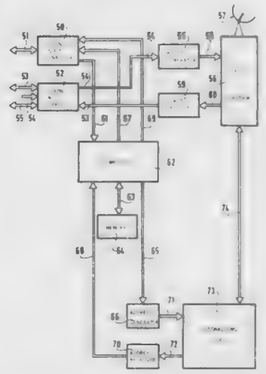
Sylvain Fontanes, Chatou, France, assignor to Alcatel Espace, Courbevoe, France

Filed May 19, 1986, Ser. No. 864,382

Claims priority, application France, May 20, 1985, 85 07550

Int. Cl.⁴ H04J *3/16*

U.S. Cl. 370—84 **5 Claims**



1. A TDMA satellite communications method in which plural orginating stations transmit data over respective channels in the form of bursts at different corresponding data rates, comprising the steps of:

establishing a common transmission frame for plural ones of said channels, said frame being divided into indentical time slots of fixed duration, said fixed duration corresponding to a length of a single burst of a lowest data rate plus guard gaps;

at each said station originating a new call, assigning to itself for said new call at least one time slot left available by other calls in progress without reassigning any of said time slots among said calls in progress, a number of said time slots assigned to each call being dependent upon the data rate of the call, no more than a single time slot being assigned to a call at said lowest data rate; and

terminating a call by interrupting transmission in said time slot assigned thereto.

4,731,784

COMMUNICATION SYSTEM COMPRISING OVERLAYED MULTIPLE-ACCESS TRANSMISSION NETWORKS

Heinz J. Keller, Ruschlikon; Johann R. Mueller, Albis; Ernst H. Rothauser, Reichenburg, and Erwin A. Zurflüh, Feldmeilen, all of Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 26, 1986, Ser. No. 833,639

Claims priority, application European Pat. Off., Feb. 28, 1985, #5102205

Int. Cl.⁴ H04J *3/00, 3/16*

U.S. Cl. 370—88 **16 Claims**

1. A communication system comprising:

a first transmission network (**11**);

a plurality of first station means (**17**) connected only to the said first transmission network for receiving and sending signals thereover,

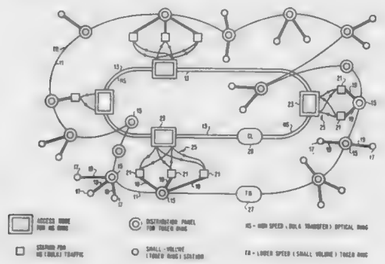
VOL 1088 ISS 3 MR 15 1988 UMI

each said first station means including first decoding means for decoding and detecting first network control messages received over said first transmission network, and

first data transmission means responsive to a said decoded and detected first network control message for transmitting data messages over said first transmission network whenever the station has a data message to send;

a second transmission network (13);

a plurality of second station means (21) connected to the said first and second transmission network for receiving and sending signals thereover,



each said second station means including second decoding means for decoding and detecting second network control messages received over said first transmission network, and

second data transmission means responsive to a said decoded and detected second network control message for transmitting data messages over said second transmission network whenever the station has a data message to send thereover.

4,731,785

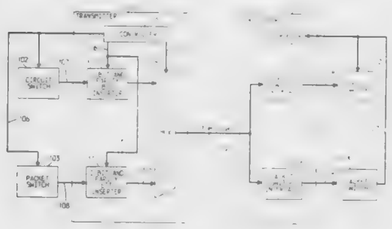
COMBINED CIRCUIT SWITCH AND PACKET SWITCHING SYSTEM

James J. Ferenc; Robert W. Gebhardt, both of Boulder; Gary J. Grimes, Thornton; Edward B. Morgan, Jr., Boulder, and Gabe A. Sellers, III, Northglenn, all of Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems Inc., both of Holmdel, N.J.

Filed Jun. 20, 1986, Ser. No. 876,613

Int. Cl.[4] H04Q *11/04*; H04J *3/02, 3/24*

U.S. Cl. 370—60 **25 Claims**



1. Apparatus for transmitting a first and a second type of information over a time multiplexed bus, said apparatus comprising:

a source of information of a first type for generating a signal comprising cyclically reoccurring frames with each of said frames having a plurality of time slots and with a first type of information being contained in certain ones of said time slots with the remainder of said time slots being idle,

means for storing information specifying which of said time slots currently contain said first type of information and which of said time slots are currently idle,

a source of information of a second type,

means controlled by said storing means for transmitting said first and second types of information over said bus by inserting currently extant information of said second type into any of said currently idle time slots so that all of said idle time slots are used to transmit any extant information of said second type, and

means for inserting an identity bit into each transmitted time slot specifying the type of information represented by other bits of the time slot.

4,731,786

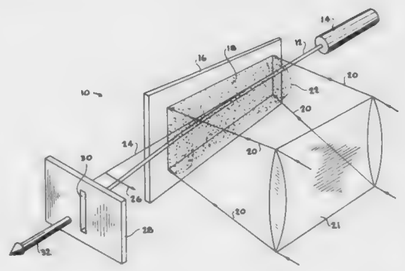
METHOD AND APPARATUS FOR PRODUCING DURATIONALLY SHORT ULTRAVIOLET OR X-RAY LASER PULSES

Brian J. MacGowan, Livermore; Dennis L. Matthews, El Granada, and James E. Trebes, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 5, 1987, Ser. No. 46,020

Int. Cl.[4] H01S *3/30*

U.S. Cl. 372—5 **8 Claims**



1. A method for shortening the duration of a nanosecond time scale, ultraviolet or X-ray laser pulse, the method comprising the steps of:

illuminating a flat surfaced portion of a target comprised of a solid structural material, the flat surfaced portion of the target having an areal density of 10^{-5} gm/cm^2 or greater, with a pulse of line focused, high power, laser radiation having a wavelength in the approximate range from 0.25 to 11 microns, having a full width at half maximum amplitude in the approximate range from 10 picoseconds to 1 nanosecond, and having a peak intensity of 10^{12} watts/cm^2 or greater, thereby producing a streaming plasma in a spatial region located generally along, but slightly removed outward from, the illuminated flat surfaced portion of the target, with the free electron density of the streaming plasma approximately exponentially decreasing in the direction perpendicularly proceeding away from the flat surfaced portion of the target, at first increasingly steeply and then gradually leveling, as the illuminating pulse of laser radiation at first increases and then diminishes in intensity;

directing the ultraviolet or X-ray laser pulse along a straight line passing axially through the spatial region within which the streaming plasma is produced, so that the ultraviolet or X-ray laser pulse is first increasingly refracted away from the flat surfaced portion of the target, as the free electron density profile of the streaming plasma increases in steepness, and is then decreasingly refracted back toward the straight line along which the ultraviolet or X-ray laser pulse is directed, as the free electron density profile of the streaming plasma gradually levels; and

positioning an opaque barrier having an aperture at a spatial location that permits a portion of the ultraviolet or X-ray laser pulse, after leaving the spatial region within which the streaming plasma is produced, to pass through the aperture in the barrier and become an ultraviolet or X-ray laser pulse of shortened duration.

4,731,787

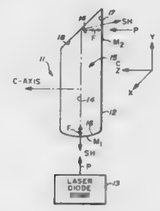
MONOLITHIC PHASEMATCHED LASER HARMONIC GENERATOR

Tso Y. Fan, and Robert L. Byer, both of Stanford, Calif., assignors to Board of Trustees, Stanford University, Stanford, Calif.

Continuation-in-part of Ser. No. 896,865, Aug. 15, 1986, which is a continuation-in-part of Ser. No. 674,948, Nov. 26, 1984, abandoned. This application Oct. 30, 1986, Ser. No. 924,746

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—22 **18 Claims**



1. In a method for harmonically generating coherent optical radiation, the steps of:

optically pumping an optically nonlinear lasant material to excite a lasant transition of said nonlinear lasant material;

reflecting lasant radiation between reflective faces of said lasant material to define a monolithic optical resonator for resonating lasant radiation emanating from said excited lasant transition within said lasant material;

interacting the resonated lasant radiation within said optically nonlinear lasant material to generate output radiation of a wavelength harmonically related to a wavelength of said resonated lasant radiation; and,

phasematching the generated harmonic output radiation and the resonated lasant radiation within said lasant material, such that the efficiency of the harmonic generation process is enhanced.

4,731,788

LOW DIVERGENCE LASER APPARATUS

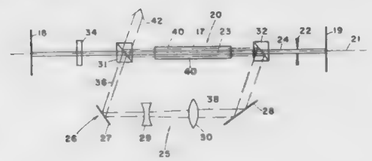
Itamar Shoshan, Ramat Gan, Israel, assignor to El-Op Electro-Optics Industries Limited, Rehovot, Israel

Filed Jul. 18, 1986, Ser. No. 888,106

Claims priority, application Israel, May 27, 1986, 78936

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—9 **28 Claims**



1. In a low divergence laser oscillator of the kind wherein an intra-cavity oscillator beam is propagated along resonator axis and within a portion of the volume of the active medium and wherein a part of said intra-cavity oscillator beam intensity is coupled out of the oscillator by a first out-coupling means as an extra cavity oscillator beam, the improvement comprising beam expanding and collimating means for subjecting one of said oscillator beams to expansion and collimation so as to produce an expanded and collimated extra-cavity beam having a cross-sectional area substantially greater than the cross-sectional area of said portion of the active medium; introducing means for introducing substantially the total intensity of the expanded collimated extra cavity beam into said active medium as a reintroduced beam so as to fill a volume of the said portion, thereby giving rise to amplification of said reintroduced beam so as to produce an amplified beam, said introducing means including a polarizing element located within the resonator and through which the intra-cavity beam is transmitted whilst the expanded extra-cavity beam is directed onto said polarizing element without passing through said first outcoupling means for reflection into said active medium; and a second outcoupling means for coupling out said amplified beam.

4,731,789

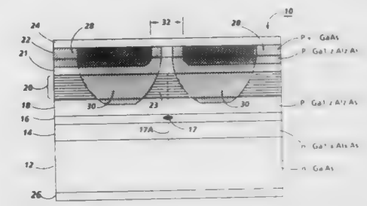
CLAD SUPERLATTICE SEMICONDUCTOR LASER

Robert L. Thornton, East Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 13, 1985, Ser. No. 733,357

Int. Cl.[4] H01S *3/19*; H01L *27/12*

U.S. Cl. 372—45 **20 Claims**



1. In a clad superlattice semiconductor laser comprising a plurality of planar semiconductor layers, one or more of said layers forming an active region for light wave generation and propagation under lasing conditions in a confined optical cavity which includes said active region, a cladding layer formed on opposite sides of said active region, a superlattice formed as part of at least one of said cladding layers and comprising alternating layers of wells and barriers, the improvement comprising

a pair of spatially separated disordered regions formed in said superlattice along adjacent sides of said optical cavity via impurity induced disordering, the depth of said regions not extending into said active region, the disordering of said regions providing said regions with a resultant lower refractive index compared to the refractive index of said optical cavity region to form a refractive index waveguide in said laser.

4,731,790

SEMICONDUCTOR LASER CHIP HAVING A LAYER STRUCTURE TO REDUCE THE PROBABILITY OF AN UNGROWN REGION

Masaaki Sawai, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,028

Claims priority, application Japan, Mar. 16, 1984, 59-49033; Mar. 19, 1984, 59-50929

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **13 Claims**

1. A semiconductor laser chip comprising:

(1) A semiconductor substrate of a first conductivity type having first and second major surfaces;

(2) a light emitting portion disposed on the the first major

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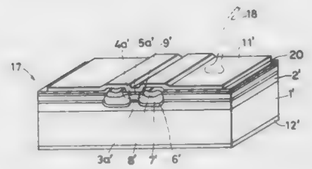
surface of said semiconductor substrate of the first conductivity type, and including:

(a) a first semiconductor layer of the first conductivity type coming into contact with said semiconductor substrate of the first conductivity type;

(b) an active layer serving as a light emitting region coming into contact with said first semiconductor layer of the first conductivity type;

(c) a second semiconductor layer of a second conductivity type opposite to said first conductivity type, coming into contact with said active layer;

(d) third semiconductor layers of the second conductivity type, formed on said first semiconductor layer of the first conductivity type, and interposing therebetween a part of said first semiconductor layer of the first conductivity type, said active layer and a part of said second semiconductor layer of the second conductivity type; and



(e) fourth semiconductor layers of the first conductivity type, formed on said third semiconductor layers of the second conductivity type, and interposing therebetween said second semiconductor layer of the second conductivity type, and

(3) a pair of electrodes for supplying a voltage to forward bias said semiconductor laser chip,

wherein said active layer, and said second, third and fourth semiconductor layers are disposed to all be located within an area which is only over a predetermined portion of the first major surface of the substrate which is less than the entire surface area of said first major surface.

4,731,791

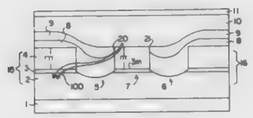
BURIED HETERO-STRUCTURE LASER DIODE

Randall B. Wilson, Maple Wood, N.J., assignor to Lytel Incorporated, Sommerville, N.J.

Filed May 30, 1986, Ser. No. 869,002

Int. Cl.[4] H01S *3/19*; H01L *33/00*

U.S. Cl. 372—48 **3 Claims**



1. In a buried hetero-structure laser diode comprising:

a substrate;

a plurality of layers on said substrates, said layers including an active layer capable of emitting radiation when a pumping current is applied thereto, a first cladding layer above said active layer, and a second cladding layer below said active layer;

first and second channels in said active layer and said cladding layers defining a mesa therebetween, the improvement comprises said mesa having a top in said first cladding layer and a height above said active layer less than the height of said first cladding above said active layer for portions of said first cladding layer outside said channels;

first blocking layer of one conductivity type on said first cladding layer;

second blocking layer of opposite conductivity type to said first blocking layer on said blocking layer and extending into said channels; and

electrodes for receiving said pumping current;

both of said first and second blocking layers extending into said channels and terminating at the top of said mesa.

4,731,792

SEMICONDUCTOR LASER DEVICE WITH DECREASED LIGHT INTENSITY NOISE

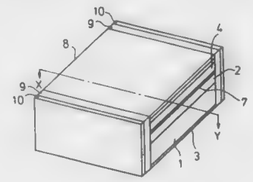
Hirokazu Shimizu, Suita; Masahiro Kume; Masuru Wada, both of Takatsuki; Kunio Itoh, Uji; Ken Hamada, Toyonaka, and Fumiko Tajiri, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

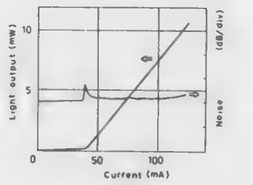
Continuation of Ser. No. 623,562, Jun. 22, 1984, abandoned. This application Dec. 30, 1986, Ser. No. 948,393

Claims priority, application Japan, Jun. 29, 1983, 58-117650; Jun. 29, 1983, 58-117651

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—49 **7 Claims**





1. In a semiconductor laser device, the improvement comprising:

a resonator having light reflectivities of first and second predetermined values at each of two facets in a range of 0.45 to 0.8 for the oscillation wavelength.

4,731,793

DYE LASER

Toshinao Ukai, and Hisashi Okada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

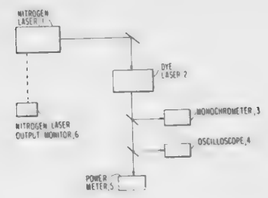
Filed Jul. 8, 1986, Ser. No. 883,398

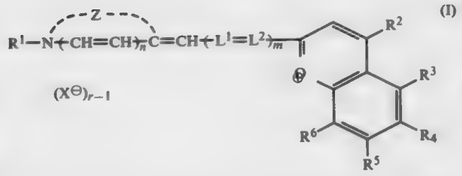
Claims priority, application Japan, Jul. 8, 1985, 60-149826; Nov. 19, 1985, 60-259551

Int. Cl.[4] H01S *3/20*

U.S. Cl. 372—53 **6 Claims**

1. A dye laser comprising a cell containing a laser dye solution and a pumping energy source connected to the cell, wherein the laser dye solution contains a compound represented by formula (I):





wherein n represents 0 or 1; m represents 0, 1, 2 or 3; L^1 and L^2 which may be the same or different each represents a methine or substituted methine group; R^1 is a substituted or unsubstituted alkyl group, an alkenyl group or an aralkyl group; R^2, R^3, R^4, R^5 and R^6 which may be the same or different each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, an alkenyl group, an aryl group, an aralkyl group, an alkoxy group, an aryloxy group, an alkoxycarbonyl group, an acyloxy group, an acyl group, a hydroxy group, a cyano group, or a substituted or unsubstituted amino group, with the proviso that when R^2 is an alkenyl group, the alkenyl group is selected from the group consisting of an allyl group and a 3-butenyl group; Z represents atoms necessary to form a 5- or 6-membered ring which may have a substituent or may be condensed to another ring, X^- represents an anion; and r represents 1 or 2, with the compound being an intramolecular salt when r is 1.

4,731,794

OPTICAL LASER PUMPING SYSTEM

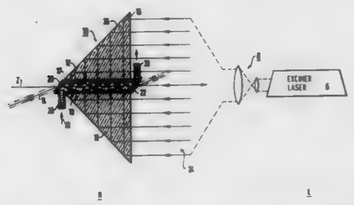
Fritz P. Schäfer, Göttingen-Nikolausberg, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 868,091

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519775

Int. Cl.[4] H01S *3/091*

U.S. Cl. 372—70 **12 Claims**



1. An optically pumped laser system comprising in combination

a pump radiation source comprising a pump radiation laser for generating a pump radiation laser beam, said beam being highly collimated and propagating along an axis,

a reflector comprising an essentially frustro-conical reflective surface positioned coaxially with respect to said axis and tapering in said propagation direction and located for impingement of said highly collimated beam directly thereon, and

an active laser medium bounded by an essentially cylindrical, elongated circumferential surface, said laser medium being positioned on said axis and extending completely through the cone frustrum defined by said reflective surface, whereby said reflected collimated rays produce an intensity distribution of said pump radiation both radially and axially of said laser medium.

4,731,795

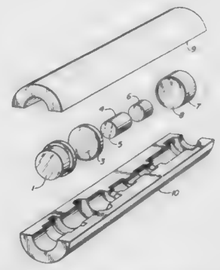
SOLID STATE LASER

John H. Clark, Wheaton, and Dennis L. Werth, Indian Head Park both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 26, 1986, Ser. No. 879,157

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **20 Claims**



1. An optically pumped laser comprising:

(a) solid-state component means for generating laser light along an optical path, said solid-state component means including solid-state optical pumping means for generating optical pumping radiation at a preselected wavelength, and a lasant member comprising a solid lasant material for receiving said radiation from said optical pumping means and emitting laser light; and

(b) at least one monolithic support for supporting said solid-state component means, said monolithic support comprising a pumping means-support portion for supporting said optical pumping means and a lasant member support portion for supporting said lasant member, said pumping means-support portion defining a pumping means-receiving indentation in said monolithic support for securely receiving said optical pumping means and said lasant member support portion defining a lasant member-receiving indentation in said monolithic support for securely receiving said lasant member.

4,731,796

MULTI-MODE RADIO TRANSCEIVER

John Masterton, Bishop's Stortford, and Peter A. Ramsdale, Saffron Walden, both of England, assignors to STC, plc, London, England

Continuation-in-part of Ser. No. 790,606, Oct. 23, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 64,240

Int. Cl.[4] H04B *1/38*

U.S. Cl. 375—9 **2 Claims**

2. A quadrature conversion module for use in a radio transceiver or receiver which responds to radio frequency signals received as I and Q quadrature analogue components, which said I and Q components may represent different modulation modes, wherein:

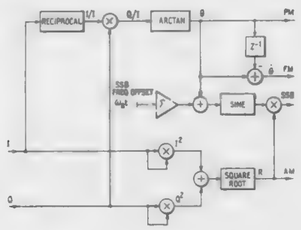
(a) said I and Q components are applied to circuit means which generate the function Q/I, which function is applied to an ARCTAN circuit whose output θ is a phase

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modulation version of the signal to which said I and Q components correspond;

(b) the ARCTAN output θ is applied directly to one input of a first adder to the other input of which θ is applied via a Z^{-1} circuit, so that the output of the subtractor is θ, which is a frequency modulation version of the signal to which said I and Q components correspond;

(c) said I and Q components are also applied respectively to two squarers whose outputs are all applied to a second adder the output of which is thus (I^2+Q^2), which output is applied to a square root circuit whose output R is an amplitude modulation version of the signal to which said I and Q components correspond;



(d) for SSB the mid-frequency of a sideband is applied to one input of a third adder via a summing circuit, the above-mentioned output θ being applied to the other input of the third adder, the output of the third adder being applied via a sine-generating circuit to one input of a multiplier to the other input of which is applied the above-mentioned output R, such that the output of the multiplier is an SSB modulation to which said I and Q components correspond; and

(e) wherein one of the above PM, FM, AM or SSB outputs is enabled dependent on which form of modulation is being received.

4,731,797

CIRCUIT FOR IMPLEMENTING A LOW ACCUMULATED DISPARITY CODE IN HIGH DATA RATE DIGITAL TRANSMISSION, AND A CODING METHOD USING SUCH A CIRCUIT

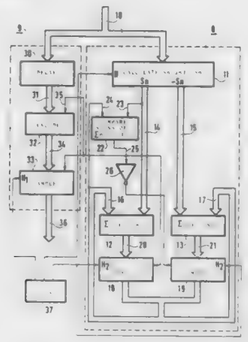
Pierre Jaffré, Lannion; Maurice Niquel, Perros Guirec, and Christian Tanguy, Lannion, all of France, assignors to Alcatel, Paris, France

Filed Nov. 5, 1986, Ser. No. 927,198

Claims priority, application France, Nov. 5, 1985, 85 16372

Int. Cl.⁴ H04L *25/34*

U.S. Cl. 375—19 **9 Claims**



1. A circuit for implementing a low accumulated disparity code for high data rate digital transmission of information grouped in the form of x-digit binary words, with an n-th word having a sum Sn equal to one half of the difference between the number of 1-bits and the number of 0-bits in said word, said circuit comprising:

a calculating circuit for calculating said sum Sn for a sequence of values of n;

a calculating unit for calculating the accumulated disparity for said sequence of values of n:

$$\Sigma_n = \sum_{k=0}^{n} Sk$$

a comparator circuit for comparing the signs of Σ_{n-1} and Sn; and

an encoding circuit for encoding the n-th word;

the overall coding circuit including the improvement whereby said unit for calculating the accumulated disparity comprises a first unit for calculating the sum $\Sigma_n=\Sigma_{n-1}+Sn$ and a second calculating unit for calculating the difference $\Sigma'_n=\Sigma_{n-1}-Sn$ disposed in parallel, with the sign comparator circuit having an output which is directly connected to a reset to zero input for the first calculating unit, to a control input of the encoding circuit, and to one of the inputs to said encoding circuit to form an (x+1)-th output bit from said encoding circuit, and indirectly via an inverter to a reset to zero input for the second calculating unit.

4,731,798

METHOD FOR TRANSMITTING INFORMATION, IN WHICH THE SIGNALS ARE CODED AS AMPLITUDES OF THE HALF-WAVES OR PERIODS OF A SINUSOIDAL ALTERNATING CURRENT

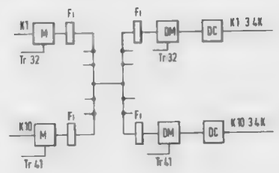
Josef Dirr, Neufahrner Strasse 5, 8000 München 80, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,772

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245237; Aug. 4, 1983, 3328249; Aug. 4, 1983, 3328268; Nov. 8, 1983, 3340378

Int. Cl.⁴ H04K *1/10;* **H04L** *27/28*

U.S. Cl. 375—38 **20 Claims**



1. A method for pulse amplitude modulation as a means for transmitting information, comprising the steps of:

generating unipolar analog values from a signal to be transmitted and sampling the unipolar analog values at a preset sampling frequency;

generating at least two code alternating currents in synchronism with subsets of said sampled unipolar analog values, and with a frequency equal to or half of said frequencies of said subsets;

phase shifting said code alternating currents by equal amounts;

modulating the amplitudes of each of said code alternating currents in time multiplex mode with the sampled unipolar analog values of the respective subset to provide an uninterrupted sequence of positive and negative half waves in the form of a continuous sinusoidal signal; and

transmitting said uninterrupted sequence of positive and negative half waves in the form of a continuous signusoidal signal as a means for transmitting information based on said generated unipolar analog values.

4,731,799

MEANS AND METHOD FOR BLOCK ENCODING DETECTION AND DECODING

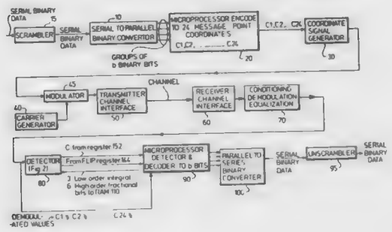
Fred M. Longstaff, Islington, and Gordon R. Lang, Bolton, both of Canada, assignors to Motorola Canada Limited, N. York, Canada

Continuation-in-part of Ser. No. 629,110, Jul. 9, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 819,709

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ H04L *23/02*

U.S. Cl. 375—39 **26 Claims**



1. Method of signalling on a communication channel comprising:

from a stream of numeric signals,

converting said signals in blocks of b signals into K message point coordinates C1, C2, . . . CK for $40 \leqq K > 4$,

modulating a carrier signals in accord with the values of said message point coordinates,

wherein said message point coordinates are determined as follows:

for each block of b signals determining a number N identifying the sequence of digits in said block,

where for suitable packing of defined points by said coordinates in K dimensional space said coordinates are expressible in permissible integral values and the sum of the K coordinates so expressed has a permissible modulo value,

providing a table of K dimensional shells where each shell comprises message points with permissible value coordinates and permissible modulo sum totals of the coordinates value which points at the same distance from a datum, said shells having a predetermined number of points with permissible value coordinates,

identifying N in terms of a predetermined shell S_K and a number D less than the number of said points thereon,

using S_K, D provide a set of values,

S_F, X_F and S_G X_G,

where S_F identifies a shell in F dimensions and X_F identifies a point having permissible value coordinates on said F dimensional shell and S_F, X_F, S_G X_G collectively identify S_K, D_K,

for each set S_F, X_F and each S_G X_G providing two sets of lower dimension S, X values, dimensions which summed equal F and G respectively and where each two sets of lower dimension S, X values identify the higher dimension S, X values from which they are developed,

continuing the process of substituting two parts of lower dimension S, X values for higher dimension S, X values which they identify until they are obtained K sets of S, X values in one dimension,

generating a coordinate of permissible value identifying each one dimensional S, X pair and identifying it.

4,731,800

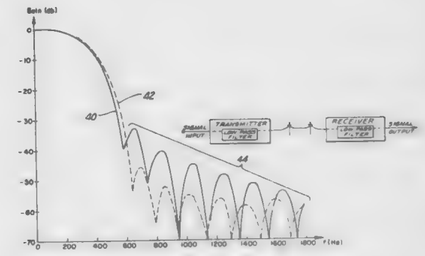
RAISED-COSINE FILTERING FOR MODEMS

David M. Motley, Santa Ana, and John F. Stockman, Costa Mesa, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Filed Oct. 3, 1986, Ser. No. 914,886

Int. Cl.⁴ H04B *15/00;* **H04L** *25/08*

U.S. Cl. 375—58 **1 Claim**



1. A digital modem including low-pass intersymbol interference suppression filter means required to have an overall response characteristic of the form

$$H(f)=\tau.$$

for $0 \leqq f \leqq \frac{1}{2}\tau(1-\alpha)$, and

$$H(f) = \frac{\tau}{2}\left[1 - \sin\left\{\frac{\tau\pi}{2\alpha}\left(2f - \frac{1}{\tau}\right)\right\}\right]$$

for

$$\frac{1}{2\tau}(1-\alpha) \leqq f \leqq \frac{1}{2\tau}(1+\alpha),$$

where

H(f)=filter response as a function of frequency

$$\tau = \frac{1}{\text{baud rate}};$$

and

α=percentage of RC filter characteristic expressed in decimals

the improvement comprising using, in both the transmitter and the receiver of said modem, separate low-pass filter means having a response characteristic of the form

$$H(f)=\tau$$

for $0 \leqq f \leqq \frac{1}{2}\tau(1-\alpha)$, and

$$H(f) = \frac{\tau}{2}\left[1 - \text{SIN}\left\{\frac{\tau\pi}{2\alpha}\left(2f - \frac{1}{\tau}\right)\right\}\right]$$

for

$$\frac{1}{2\tau}(1-\alpha) \leqq f \leqq \frac{1}{2\tau}(1+\alpha),$$

at a cutoff frequency which is related to the cutoff frequency of said overall response characteristic by substantially the formula

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$$f_f = f_o\left(\frac{(1.047\alpha)+\pi}{\pi}\right)$$

where

f_f=6 db cutoff frequency of said separate low-pass filter means, and

fo=6 db cutoff frequency of said overall response characteristic.

4,731,801

METHOD FOR THE RECEPTION AND DETECTION OF DIGITAL SIGNALS

Jukka Henriksson, Espoo, Finland, assignor to Oy Nokia Ab, Helsinki, Finland

Filed Nov. 5, 1985, Ser. No. 795,239
Claims priority, application Finland, Dec. 5, 1984, 844810
Int. Cl.⁴ H04B *1/10*
U.S. Cl. 375—100 **11 Claims**



11. A method for the reception and the detection of digital signals, comprising:

receiving at least two signals ($s_1, s_2, \ldots, s_M$) having at least approximately the same information content, by means of at least one antenna or equivalent,

generating out of each received signal s_i, by means of a phase shift, an amplitude shift, and a demodulation, one in-phase baseband signal (s_{iI}) and one quadrature baseband signal (s_{iQ}),

summing all in-phase baseband signals (s_{iI}) in a first summing point and all quadrature baseband signals (s_{iQ}) in a second summing point,

feeding both sum signals (Y_{IK} and Y_{Qk}) to a detector (**4**) for detection and generting two detected output signals (s_{Ik} and s_{Qk}), and

generating a reference carrier (ca) as a function of said two sum signals (Y_{Ik} and Y_{Qk}) for carrying out a coherent demodulation,

characterized by

generating a projection voltage (z_k) defined by the following equation

$$z_k = Y_{Qk}\, s_{Ik} - Y_{Ik}\, s_{Qk},$$

wherein

Y_{Ik} is a signal sample in the in-phase branch before threshold decision in the detector,

Y_{Qk} is the signal sample in the quadrature branch before decision,

s_{Ik} is the detected signal in the in-phase branch, and

s_{Qk} is the detected signal in the quadrature branch,

generating a product signal (b) by multiplying the projection voltage (z_k) with a signal (r) being a function of said sum signals (Y_{Ik} and Y_{Qk}),

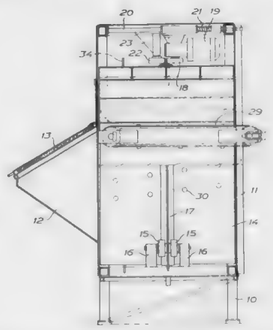
generating control voltages ($c_1, \ldots, c_M$) by correlating said product signal (b) with each received signal related to ($s_1, \ldots, s_M$) by means of correlators ($Cor_1, \ldots, Cor_M$), and controlling the phase shifts or the phase and amplitude shifts by means of said control voltages ($c_1, \ldots, c_M$).

4,731,802

APPARATUS FOR COUNTING SUBSTANTIALLY CYLINDRICAL ARTICLES

Leif Magnusson, Bäckavägen 5, Helsingborg S-254 84, and Ben Elwing, Drottgränd 14, Gislaved S-322 00, both of Sweden

Filed Mar. 31, 1986, Ser. No. 846,285
Int. Cl.⁴ B65G *47/14*; G06M *7/00*
U.S. Cl. 377—6 **2 Claims**



1. An apparatus for counting substantially cylindrical articles comprising a cylinder having a circumferential series of compartments each for receiving one article, on the inside surface of the cylindrical wall of the cylinder, each compartment extending axially and opening towards the interior of the cylinder, means mounting the cylinder for rotation about a substantially horizontal axis, means for supplying articles to the interior of the cylinder at the lower region thereof, means for delivering articles from the interior of the cylinder at the upper region thereof, means for sensing the presence of an article in each compartment when passing a predetermined position in the rotational path of the compartments, means for sensing the arrival of each compartment to said position, including a reflector type photocell sensor sensing a circumferential path on the outside surface of the cylindrical wall of the cylinder said wall forming an opening for each compartment in said path and a circumferential row of radially projecting pins on the outside surface of the cylinder, one pin for each opening, a second photocell sensor at one side of the row of pins, and a reflector at the other side of the row of pins opposite to said seconde photocell sensor, and means for making one count in dependence on the sensing of an article in said position.

4,731,803

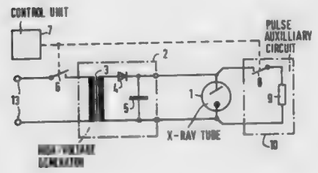
CIRCUIT FOR OPERATING AN X-RAY TUBE

Heinz-Erik Kranberg, Erlangen, and Horst Hallmann, Forchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,673
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1985, 3541612
Int. Cl.⁴ H05G *1/56*
U.S. Cl. 378—114 **5 Claims**

1. In an X-ray diagnostics system including an X-ray tube, a high-voltage generator feeding said X-ray tube, a first switch for energizing and de-energizing said X-ray tube operated by a control unit, the improvement of a circuit for rapidly dissipating energy stored in components of said high voltage generator comprising:

a circuit branch having a resistance connected in series with a second switch, said circuit branch connected in parallel across said X-ray tube, said second switch also operated by said control unit and being normally open and being closed by said control unit simultaneously with said first switch being operated to de-energized said X-ray tube.

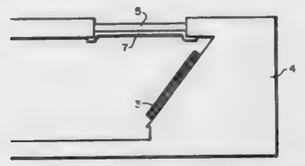


4,731,804

WINDOW CONFIGURATION OF AN X-RAY TUBE

Ronald Jenkins, Peekskill, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 688,098, Dec. 31, 1984, abandoned.
This application Jan. 14, 1987, Ser. No. 6,323
Int. Cl.⁴ H01J *35/18*
U.S. Cl. 378—140 **5 Claims**



1. In an X-ray tube comprising a cathode means for generating electrons, an anode means receiving said electrons for emitting X-rays, a beryllium window separated from said anode means for passing said X-rays, wherein said anode means is mounted on a copper anode block, the improvement comprises a coating layer disposed over the entire surface of said beryllium window for improving heat dissipation by said window upon receiving X-rays from said anode means, wherein said coating layer is a material the same as said anode means, and wherein said coating layer has a thickness ranging from about 500 to 1000 angstroms.

4,731,805

ROTARY ANODE FOR AN X-RAY TUBE AND AN X-RAY TUBE HAVING SUCH ANODE

Maiya F. Boyarina, ulitsa Trefoleva, 15, kv. 92; Vladimir G. Vildgrube, Svetlanovsky prospekt, 44, korpus 2, kv. 144; Jury S. Sergeev, prospekt Morisa Toreza, 30, kv. 24; Oleg V. Filatov, ulitsa Kuibysheva, 1/5, kv. 21; Lev G. Andruschenko, prospekt Stachek, 216, kv. 60; Jury N. Zelenov, bulvar Novatorov, 22, kv. 5; Valery N. Kupriyanov, Serebristy bulvar, 26, kv. 529, and Elena I. Taubkina, prospekt Morisa Toreza, 24, kv. 133, all of Leningrad, U.S.S.R.

PCT No. PCT/SU84/00030, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO86/00171, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 8, 1984, Ser. No. 829,650
Int. Cl.⁴ H01J *35/10, 35/08*
U.S. Cl. 378—144 **3 Claims**

1. A rotary anode for an X-ray tub comprising a disc and a blackening coating on at least a part of a surface of the disc, the blackening coating comprising a sintered porous composition of titanium grains having an essentially dendritic structure of a size from 0.5 to 150 μm, and at least one high melting point metal having a melting point greater than 2500° C., the amount of the high melting point metal in the coating being between about 5 and 60% by weight.

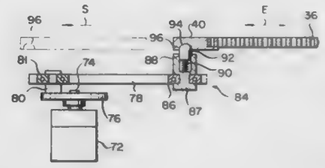


4,731,806

GRID MOVING APPARATUS FOR RADIOGRAPHY

Hideo Takahata, Kawachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1986, Ser. No. 842,555
Claims priority, application Japan, Mar. 26, 1985, 60-63106
Int. Cl.⁴ G21K *1/02, 1/00*
U.S. Cl. 378—155 **10 Claims**



1. A grid moving apparatus for an x-ray radiographing apparatus, comprising:

a grid for eliminating a scattered X-ray beam, said grid having X-ray transmitting regions and x-ray non-transmitting regions alternately arranged;

reciprocating means for reciprocating said grid at a constant frequency between imaging positions, said reciprocating means having a motor and a crank shaft for converting rotation of said motor into a linear motion;

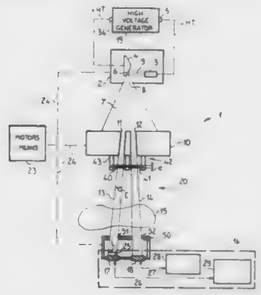
removing means for moving said grid between an imaging position and a non-imaging position; and

engaging means for detachably engaging said reciprocating means and said grid, said engaging means having an engaging member provided at the distal end portion of said crank shaft and a spring means for pressing said engaging member to be frictionally engaged with said grid.

wherein said grid and said reciprocating means are engaged with each other to reciprocate the grid, and said reciprocating means and said grid are disengaged from each other to move said grid between said imaging position and said non-imaging position.

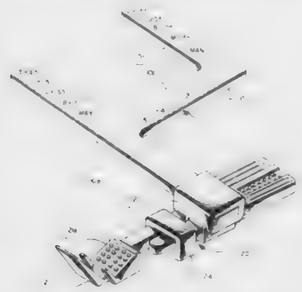
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4,731,807
X-RAY EXAMINATION APPARATUS
André Plessis, Clamart; Emile Gabbay, Paris, and Jacques Trotel, Palaiseau, all of France, assignors to Thomson-CGR, Paris, France
Filed Sep. 29, 1986, Ser. No. 913,126
Claims priority, application France, Oct. 8, 1985, 85 14885
Int. Cl.⁴ G21K *5/10, 3/00*
U.S. Cl. 378—156 **11 Claims**



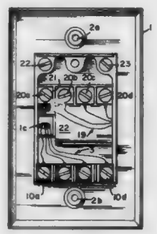
1. An X-ray examination apparatus comprising an X-ray tube producing X-rays, collimation means defining a first and a second separated fan-shaped flat beams of said X-rays, means for scanning an object by said first and second fan-shaped beams along a mean direction substantially perpendicular to the planes of said first and second fan-shaped flat beams, receiving means sensitive to the X-rays, means for conferring to each said first and second beams a different energy radiation spectra prior to their crossing through the object to be examined, and wherein the receiving means comprise a first and a second receiving assemblies each forming a shadow image of the object respectively from the first and the second fan-shaped flat beam in order to simultaneously obtain at least two images of the object.

4,731,808
GUIDES FOR INTRAORAL X-RAYS
Olatunde A. Ogunsunlade, 5804 Lamont Dr., New Carrollton, Md. 20784
Filed Jun. 13, 1986, Ser. No. 873,985
Int. Cl.⁴ A61B *6/14;* **G03B** *42/04;* **G03C** *5/16*
U.S. Cl. 378—170 **2 Claims**



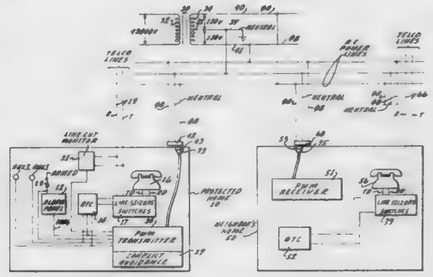
1. An h-shaped exterior guide for use in combination with a SNAP-A-RAY film holder for accurately aligning a beam from an X-ray cone with an X-ray film during the process of taking intraoral periapical dental X-rays of the maxillary and mandibular teeth, comprising:
a first guide arm laterally and detachably connectable through a housing means;
said housing means comprising an upper rectangular enclosed channel running in a first direction to slideabley engage and retain said first guide arm and a lower rectangular enclosed channel running in a second direction perpendicular to said first direction to slideably engage and retain an extended arm of the large jaw of a SNAP-A-RAY type film holder; said first guide arm pointing in a horizontal plane perpendicular to an X-ray film;
a traverse arm extending from the midpoint of said first guide arm and parallel to said X-ray film;
and a second guide arm extending perpendicularly from an end of said traverse arm toward a plane of said X-ray film and in parallel relation up to an end point of said first guide arm; said traverse arm having an index mark midway its length and calibrations for aiming an X-ray cone toward a film area; wherein said first guide arm and said second guide arm in parallel relation have maxillary angulation markings on said first guide arm and mandibular angulation markings on said second guide arm.

4,731,809
INDOOR TELEPHONE NETWORK INTERFACE DEVICE
Robert A. Crane, Windham, and David H. Dowler, Portland, both of Me., assignors to GTE Products Corporation, Stamford, Conn.
Filed Aug. 21, 1986, Ser. No. 898,567
Int. Cl.⁴ H04M *1/00*
U.S. Cl. 379—27 **16 Claims**



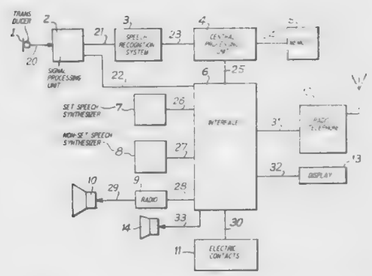
1. A telephone network interface device comprising:
a housing to be fixedly disposed in a standard electrical receptacle box to be fitted on the interior of a building; and
a decorative face plate arranged to be the surface viewed from the interior of the building and jack and plug means disposed on said housing, said housing being of smaller length and width than said face plate, whereby said housing will fit in said standard electrical receptacle box; and
a first array of terminal posts and a second array of terminal posts disposed on said housing; and
wire means connecting said first array of terminal posts to said jack and wire means connecting said second array of terminal posts to said plug; and
cover means detachably secured to said housing, said cover means enclosing the first array of terminal posts, but allowing access to said second array of terminal posts by a telephone subscriber.

4,731,810
NEIGHBORHOOD HOME SECURITY SYSTEM
Randy W. Watkins, 7343 Satsuma Ave., Sun Valley, Calif. 91352
Filed Feb. 25, 1986, Ser. No. 832,697
Int. Cl.⁴ H04M *11/04*
U.S. Cl. 379—33 **9 Claims**



1. A backup security system for the telephone company lines of a protected home located in a neighborhood of individual homes all having external a.c. supply lines connected to a common power transformer and each having individual external telephone company lines, said system comprising:
a line-cut monitor in the protected home for providing a signal when the external telephone company lines for the protected home have been cut;
a transmitter means in the protected home responsive to the signal from the line-cut monitor for providing high frequency electrical signals on the a.c. supply lines; and
a receiver means and an automatic telephone communicator located in one of the other homes in the neighborhood selected to serve as a backup home;
said receiver means responding to the high frequency electrical signals on the a.c. supply lines and providing a signal to said automatic telephone communicator to seize the telephone company lines for the backup home and send a message informing a central station that the telephone company lines for the protected home have been cut.

4,731,811
RADIOTELEPHONE SYSTEM, PARTICULARLY FOR MOTOR VEHICLES
Daniel Dubus, Mezieres sur Seine, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Oct. 2, 1985, Ser. No. 783,134
Claims priority, application France, Oct. 2, 1984, 84 15092
Int. Cl.⁴ H04M *1/65*
U.S. Cl. 379—58 **8 Claims**



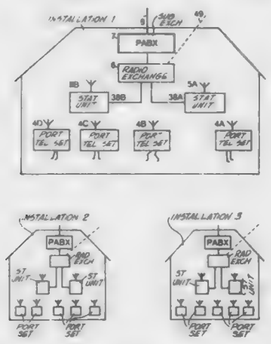
1. A speech recognition system for an automatic voice controlled radiotelephone system having a radiotelephone, comprising:
transducer means for remote pickup, processing and transmitting of speech of a user;
recognizing means for recognizing a user control vocabulary including numbers and key words associated with stored telephone numbers, said control vocabulary stored in a directory and derived from speech of a user of the speech recognition system;
a central processing unit connected to said recognizing means and including plural memories for controlling automatic dialing of telephone numbers on the radiotelephone in response to a recognition by said recognizing means of numbers and key words stored in said directory;
synthesis means for synthesizing of set speech signals suitable for generating, under the control of the central processing unit, permanently stored messages;
recording means including a scratchpad for recording of non-permanent voice messages from the transducer means or from the radiotelephone and for playback of the recorded messages;
selecting means for selecting predetermined modes of operation of said speech recognition system; and
interface means controlled by said central processing unit for controlling connections between said central processing unit, said means for synthesis, said transducer means, said recording means, and said recognizing means;
wherein said predetermined modes selected by said selecting means comprise;
a normal operation mode in which said recognizing means and said synthesis means are inhibited and a telephone communication between the user and another party is established upon said user receiving a call from said another party, and
a standby operation mode in which upon receiving a call from said another party, said another party can retrieve non-permanent voice messages stored in said scratchpad; and
means for detecting a confidential code sent by said another party to enable addressing of said scratchpad and retrieving by said another party of said non-permanent voice messages stored in said scratchpad only upon detection of said confidential code.

4,731,812
INSTALLATION WITH PORTABLE, WIRELESS TELEPHONE SETS
Dag E. Åkerberg, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
PCT No. PCT/SE86/00210, § 371 Date Dec. 19, 1986, § 102(e) Date Dec. 19, 1986, PCT Pub. No. WO86/06915, PCT Pub. Date Nov. 20, 1986
PCT Filed May 6, 1986, Ser. No. 12,126
Claims priority, application Sweden, May 9, 1985, 8502319
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—61 **10 Claims**

1. An installation comprising at least two stationary units (5) each including a radio transmitter and a radio receiver with a relatively short range, a plurality of portable, wireless telephone sets (4) including a radio transmitter and a radio receiver with relatively short range for respectively exchanging telephone messages with one of the stationary units, the stationary units (5) each being adapted for simultaneously exchanging telephone calls with more than one of said portable telephone sets (4) over radio speech channels, adaptively selected amongst a plurality of radio speech channels common to all of said radio transmitters, (9, 31) and radio receivers (10, 32) and a radio exchange (6), to which said stationary units are connected, adapted for switching a telephone call with decreasing

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intelligibility between one of said portable telephone sets (4B) and one of said stationary units (5) to a telephone call with



increasing intelligibility between the said one portable telephone set and another of said stationary units (5B).

4,731,813

ADDRESS ENCODING SYSTEM FOR PORTABLE BATTERY-OPERATED DEVICES

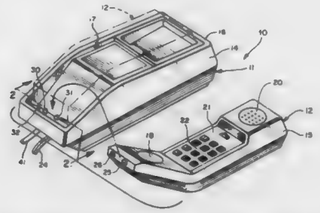
Daniel R. Schroeder, Glen Ellyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1983, Ser. No. 567,027

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—62 **26 Claims**



1. An encoding system for use in electronic message transmission systems of the type having a base station unit and one or more battery operated portable units in which the base station unit provides a charging current for charging the battery of the portable unit and in which a code stored in the base station unit is compared with an assigned code stored in the portable unit before a message transmission can be decoded, comprising:

means associated with the base station unit for modulating the charging current in accordance with the code stored in the base station unit; and

means associated with the portable unit for demodulating the modulated charging current to retrieve the code information contained thereon and for storing a code corresponding to the demodulated code information within the portable unit, said code stored in said portable unit thereby becoming the assigned code of said portable unit.

4,731,814

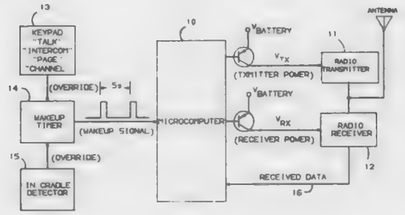
COMPUTER-CONTROLLED CORDLESS TELEPHONE

William R. Becker, Red Bank; James J. Boyd, III; William J. Clifford, both of Randolph, and Paul B. Newland, Red Bank, all of N.J., assignors to AT&T Information Systems Inc. American Telephone & Telegraph Company, Murray Hill, N.J.

Filed Feb. 21, 1986, Ser. No. 831,557

Int. Cl.[4] H04Q *7/04*

U.S. Cl. 379—62 **34 Claims**



1. A cordless telephone comprising:

a base unit for connection to a telephone line, the base unit including a first transmitter and a first receiver for respectively transmitting signals to and receiving signals from a handset unit associated with the base unit;

a handset unit with a second transmitter and a second receiver for respectively transmitting the signals to the first receiver and receiving the signals from the first transmitter in the base unit;

control means for deactivating the second transmitter and reducing the on-time state of the second receiver while the handset unit is located remote from the base unit and in a standby state wherein no user initiated communications exists between the base unit and the handset unit; and

coding means for storing in the base unit and the handset unit of the cordless telephone and for providing a common security code for establishing communications between the base unit and the handset unit, the coding means being transmitted as signals between the base unit and the handset unit in response to the presence of user initiated communications while the handset unit is located remote from the base unit, the handset unit being unresponsive to user initiated communication attempts by the base unit unaccompanied by the coding means and remaining in the reduced on-time state, and the base unit being unresponsive to user initiated communication attempts from the handset unit accompanied by the coding means.

4,731,815

RESET SYSTEM FOR TELEPHONE ANSWERING MACHINE IN THE EVENT OF A POWER FAILURE

Bradford E. Hanscom, Downey, and Gerald L. Mock, Corona, both of Calif., assignors to Fortel Corporation, Compton, Calif.

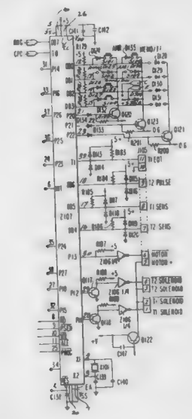
Filed May 28, 1986, Ser. No. 867,196

Int. Cl.[4] H04M *1/65*

U.S. Cl. 379—79 **4 Claims**

1. In a telephone answering machine which includes a magnetic tape mechanism for recording incoming messages received over a telephone line sequentially on a storage means comprising a magnetic tape, a microcomputer, and first circuit means connected to the microcomputer and to the magnetic tape mechanism for setting the magnetic tape mechanism to an origin position during a reset operation occurring when power is applied to the telephone answering machine, the combination of: second circuit means connected to said microcomputer and to said magnetic tape mechanism to cause said magnetic tape to move away from said origin position after the reset operation to enable particular data recorded on the magnetic

tape to be sensed; and third circuit means coupled to said magnetic tape and to said microcomputer and responsive to the particular data recorded on said magnetic tape to introduce a control signal to said microcomputer indicating the presence of incoming messages stored on said magnetic tape prior to said magnetic tape mechanism being set to said origin position, said microcomputer responding to said control signal to cause said



third circuit means to return said magnetic tape to a position displaced from its origin position and corresponding to the number of incoming messages recorded thereon; and fourth circuit means connecting said microcomputer to said magnetic tape mechanism for changing the particular data on said magnetic tape each time a new incoming message is recorded on said magnetic tape.

4,731,816

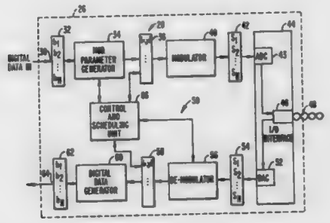
ENSEMBLE MODEM STRUCTURE FOR IMPERFECT TRANSMISSION MEDIA

Dirk Hughes-Hartogs, Morgan Hill, Calif., assignor to Telebit Corporation, Cupertino, Calif.

Division of Ser. No. 736,200, May 20, 1985, Pat. No. 4,679,227. This application Jan. 12, 1987, Ser. No. 2,096

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—98 **5 Claims**



1. In a high speed modem communication system including two modems (A and B) coupled by a transmission link, each modem having an input buffer for storing data to be transmitted, each modem for transmitting data over a telephone line and each modem of the type that encodes data elements on an ensemble of carrier frequencies, a method of operating said modems to efficiently allocate power and data to the carrier frequencies, to compensate for frequency dependent phase delay, where the maximum estimated magnitude of the phase delay is T_{PH}, to prevent intersymbol interference, to allocate control of the transmission link between modem A and modem B and for initiating a sampling interval having a given time sample offset equal to the reciprocal of the sampling frequency, said method comprising the steps of:

determining the equivalent noise component for every carrier frequency in the ensemble:

determining the marginal power requirement to increase the complexity of the data element on each carrier from n information units to n+1 information units, n being an integer between 0 and N;

ordering the marginal powers of all the carriers in the ensemble in order of increasing power;

assigning available power to the ordered marginal powers in order of increasing power;

determining the value, MP(max) at which point the available power is exhausted;

allocating power and data to each carrier frequency where the power allocated is equal to the sum of all the marginal powers less than or equal to MP(max) for that carrier and the number of data units allocated is equal to the number of marginal powers for that carrier less than or equal to MP(max);

transmitting a symbol encoded on one of said carrier frequencies where said symbol is a predetermined time duration, T_S;

retransmitting the first T_{PH} seconds of said symbol to form a transmitted waveform of duration T_E+T_{PH};

allocating control of the transmission link to modem A;

determining the volume of data stored in the input buffer of modem A;

determining the number, K, of packets of data required to transmit the volume of data stored in the input buffer of modem A;

transmitting L packets of data from modem A to modem B where L is equal to I_A if K is less than I_A, where L is equal to K if K is greater than or equal to I_A, and where L is equal to N_A if K is greater than N_A so that the minimum number of packets transmitted is I_A and the maximum is N_A;

allocating control of the transmission link to modem B;

determining the volume of data in the input buffer of modem B;

determining the number, J, of packets of data required to transmit the volume of data stored in the input buffer of modem B;

transmitting M packets of data from modem B to modem A where M is equal to I_B if J is less than I_B, where M is equal to J if J is greater than or equal to I_B, and where L is equal to N_B if J is greater than N_B so that the minimum number of packets transmitted is I_B and the maximum is N_B;

where allocation of control between modem A and B is dependent on the volume of data stored in the input buffers of modems A and B;

generating an analog waveform at modem A including first and second frequency components at f_1 and f_2;

transmitting said waveform from modem A to modem B at time T_A;

adjusting the phases of said first and and second frequency components so that their relative phase difference at time T_A is equal to about 0°;

detecting energy at frequency f_1 at modem B to determine the estimated time, T_{EST}, that said waveform arrives at modem B;

determining the relative phase difference at modem B between said first and second frequency components at time T_{EST};

calculating the number of sampling time offsets, N_I, required for the relative phase of said first and second carriers to change from 0 to said relative phase difference; and

changing the magnitude of T_{EST} by N_1 sampling intervals to obtain a precise timing reference, T_0.

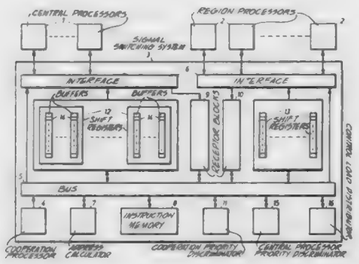
VOL 1088 ISS 3 MR 15 1988 UMI

4,731,817

MULTI-PROCESSING STORED PROGRAM CONTROLLED TELECOMMUNICATION ESTABLISHMENT

Björn E. R. Jonsson, Järfälla, and Oleg Avsan, Huddinge, both of Sweden, assignors to Telefonaktiebolget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE84/00301, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01598, PCT Pub. Date Apr. 11, 1985
PCT Filed Sep. 18, 1984, Ser. No. 734,965
Claims priority, application Sweden, Sep. 30, 1983, 8305364
Int. Cl.⁴ H04M *3/00*
U.S. Cl. 379—112 **6 Claims**



1. Stored program controlled telecommunication establishment, the controlled and controlling parts of which comprise a plurality of establishment function blocks (2) which perform telephony functions and computer functions with the aid of instruction memory units and data memory units for storing establishment control information, and a plurality of processors which include at least one central processor (1), said function blocks and processors controlling in real time and in mutual co-operation the telephony traffic processed by the establishment with the aid of the stored control information, the co-operation functions containing determination of the consecutive order in which the establishment functions blocks perform their assigned functions, characterized by an independent stored program controlled signal switching means (3), for executing said co-operative functions by switching co-operative signals between said establishment parts, and which includes a co-operation memory means (7–16) for storing co-operative control and one (4) of the processors, which exclusively controls in real time the signal switching system with the aid of the stored co-operative control information.

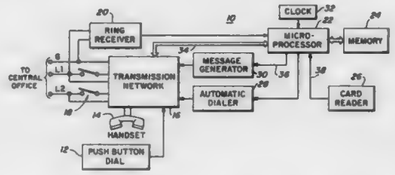
4,731,818

SELF-COMPUTING CREDIT CARD TELEPHONE PAYSTATION METHOD AND SYSTEM

Robert A. Clark, Jr., Lauderdale, and Jay D. Brussels, Lauderhill, both of Fla., assignors to Communication Equipment & Engineering Co., Plantation, Fla.

Filed Dec. 5, 1985, Ser. No. 804,880
Int. Cl.⁴ H04M *17/02*
U.S. Cl. 379—144 **3 Claims**

1. A method for processing a telephone call by a credit card telephone paystation, comprising the steps of:
reading a magnetic credit card to produce an identification signal;
comparing said identification signal with a plurality of predetermined stored signals within the credit card telephone paystation;
detecting a match of said compared signals;
identifying a valid identification signal responsive to said detected match;
enabling the teleophone call after a valid identification signal is identified;
detecting a number dialed;
detecting a call connection signal and a time of occurrence thereof;
detecting a call disconnection signal and a time of occurrence thereof;
determining a duration of the telephone call;
storing call data within the credit card telephone paystation, said call data including said detected number dialed, said time of occurrence of said detected call connection signal, said determined call duration and said identification signal;



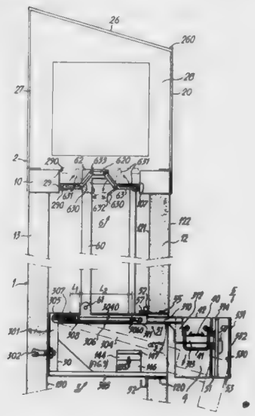
receiving an incoming predetermined signal from a central computer, said central computer generating and transmitting said predetermined signal at a selected time and being off-line until said selected time;
comparing said received incoming signal with a stored data request signal;
ignoring said incoming signal if said comparing signals do not match; and
transmitting said stored call data if said compared signals match.

4,731,819

PREPAYMENT PRODUCT OR SERVICE DISPENSER

Renë Kalfon, 816 rue de la Haie, 76230 Bois Guillaume, France

PCT No. PCT/FR85/00333, § 371 Date Jun. 21, 1986, § 102(e) Date Jun. 21, 1986
PCT Filed Nov. 25, 1985, Ser. No. 893,292
Claims priority, application France, Nov. 26, 1984, 84 17979
Int. Cl.⁴ H01M *17/00*
U.S. Cl. 379—145 **28 Claims**



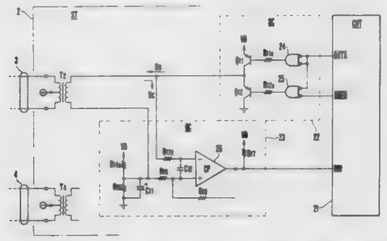
1. A prepayment product or service dispensing apparatus comprising a post anchored to the ground and including a closable compartment containing a removable coin box, and a container attachable to the post, characterized in that the post comprises means for concomitantly opening the compartment, extracting the coin box from the compartment and releasing the container from the post for access to internal means included in the post and the container.

4,731,820

DATA TRANSMISSION SYSTEM OF KEY TELEPHONE SYSTEM

Kenichi Kanno; Senji Okumura, and Hisami Ojima, all of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Mar. 23, 1987, Ser. No. 29,311
Claims priority, application Japan, Apr. 7, 1986, 61-78365
Int. Cl.⁴ H03M *7/00*
U.S. Cl. 379—165 **15 Claims**



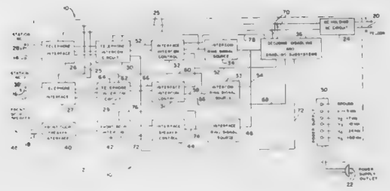
1. A system for transmitting data by a data pulse train, the data pulse train comprising a combination of data bit pulse signals each of which is characterized by either a first logic state or a second logic state, the data being transmitted through a pair of lines connected between a main unit and a key telephone set unit, comprising:
for a unit transmitting data,
counting means for sampling the data pulse train and counting data bit pulse signals of either said first or said second logic state;
comparing means for comparing a count of said counting means with a reference value, said reference value being related to the number of bit pulse signals of said data pulse train and a correction pulse train; and
correcting means for appending a plurality of correction bit pulse signals as said correction pulse train to said data pulse train such that the total number of bit pulse signals, of said data pulse train and of said correction pulse train, having said first logic state is made substantially equal to the total number of said bit pulse signals of said second logic state.

4,731,821

SINGLE WIRE TELEPHONE INTERCOMMUNICATION SYSTEM

Thomas H. Jackson, III, 604 Burnham Rd., Philadelphia, Pa. 19119

Filed Nov. 13, 1986, Ser. No. 929,779
Int. Cl.⁴ H04M *9/00, 9/08*
U.S. Cl. 379—172 **11 Claims**



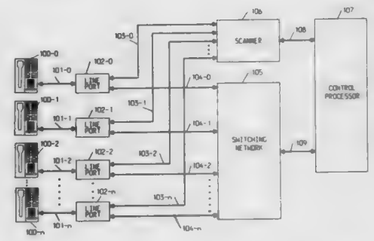
1. An improved telephone intercommunication system having a plurality of CMOS digital logic circuits providing two-way voice communication through the use of a single bidirectional conductor within said system, the improvement comprising:
a. at least two telephone interface circuit devices connected in parallel to a tip and ring conductor pair from a local telephone company for sending and receiving voice messages;
b. an inline hold circuit device connected in series with said telephone interface circuit devices;
c. at least two telephone intercommunication circuit devices each connected to said interface circuit devices to receive and send both voice and non-voice signals therebetween;
d. at least two interface intercommunication control circuit devices for receiving at least three types of input signals and generating at least three control output signals;
e. a plurality ring signal circuits for shaping and transmiting a plurality of ring signals to said telephone, intercommunications circuit devices and said control circuit devices;
f. a digital logic circuit for decoding digital input signals from said telephone intercommunication circuits and outputting coded digital signals;
g. a latch decoder device for receiving a plurality of digital input signals from said digital logic circuit and generating a corresponding plurality of output signals responsive to said digital input; and
h. a power supply source having an input and a plurality of voltage outputs for operation of said devices and circuits.

4,731,822

HELD PARTY NOTIFICATION FEATURE

Chester A. P. Berry, III, Thornton, Colo., and Anna M. Tolaini, Marina Di Massa, Italy, assignors to American Telephone and Telegraph Company and AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 4, 1985, Ser. No. 794,536
Int. Cl.⁴ H04M *1/00, 3/56*
U.S. Cl. 379—204 **14 Claims**



1. In a switching system in which a call connection has been established between a first station and a second station and wherein a party at said first station has placed said second station in a "hold" state; a method of providing notification to a party at said second station to indicate the termination of the "hold" state at said first station, said method comprising the steps of:
(1) generating a service request at said first station to request removal of said "hold" state;
(2) responding to the receipt of said generated service request to convert said first station from a "non-talk" state to a "talk" state, including
(i) identifying said first station on said connection to detect a current state of said first station,
(ii) responding to said detected current state to verify the existence of said "hold" state, and
(iii) responding to said verified "hold" state to change to an "unhold" state associated with the termination of said "hold" state; and
(3) responding to said conversion of said first station to said

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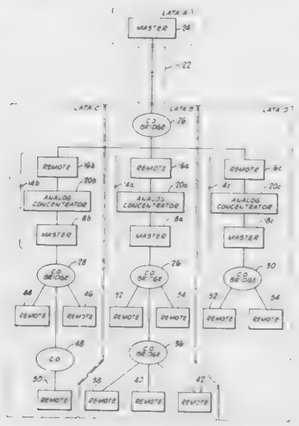
"talk" state to transmit to said second station an indication of the removal of the "hold" state at said first station.

4,731,823

APPARATUS AND METHOD RELATED TO COMMUNICATING ANALOG SIGNALS BETWEEN DIFFERENT LOCAL ACCESS TRANSPORT AREAS

Billy D. Warner, Midwest City, and Larry R. Leaf, Oklahoma City, both of Okla., assignors to COMAC Financial Services, Oklahoma City, Okla.

Filed Feb. 24, 1987, Ser. No. 17,973
Int. Cl.[4] H04M *3/42, 7/00*
U.S. Cl. 379—220 **20 Claims**



7. An apparatus for interfacing analog signals between a first four-wire private line and a second four-wire private line, said apparatus comprising:

first amplifier means for amplifying an analog signal;

first connector means for connecting an input of said first amplifier means to the first four-wire private line so that said first amplifier means receives an analog signal transmitted over two of the wires of the first four-wire private line;

second connector means for connecting an output of said first amplifier means to the second four-wire private line so that said first amplifier means provides an analog signal to two of the wires of the second four-wire private line;

second amplifier means for amplifying an analog signal;

third connector means for connecting an input of said second amplifier means to the second four-wire private line so that said second amplifier means receives an analog signal from the other two wires of the second four-wire private line; and

fourth connector means for connecting an output of said second amplifier means to the first four-wire private line so that said second amplifier means provides an analog signal to the other two wires of the first four-wire private line.

18. A method of communicating analog signals between a master station, located in a first local access transport area, and a plurality of remote drops, located in a second local access transport area having a central office, said method comprising the steps of:

(a) defining a remote demarcation point within the second local access transport area;

(b) defining a master station demarcation point within the second local access transport area;

(c) transmitting analog signals from the master station in the first local access transport area to the central office in the second local access transport area;

(d) communicating the analog signals from the central office to the remote demarcation point defined within the second local access transport area;

(e) coupling the analog signals from the remote demarcation point to the master station demarcation point defined within the second local access transport area; and

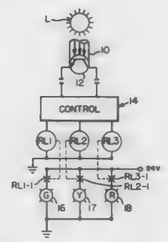
(f) communicating the coupled analog signals from the master station demaraction point to the plurality of remote drops in the second local access transport area.

4,731,824

CHIME PULSER FOR PHONE CALL BACKUP INTERPRETER

Eugene H. Kohlmeier, West Webster, N.Y., assignor to Rotelcom, Inc., Fairport, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,639
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—265 **13 Claims**



1. In combination with automatic telephone call distributing equipment, having a flashing indicator light intermittently energized at a frequency which increases in proportion with the increase in incoming telephone calls awaiting service.

a first plurality of relays connected to said equipment and responsive to the frequency of said flashing light to be energized one at a time and successively as said frequency increases,

audible signal generating means, and

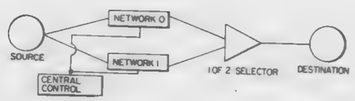
means interposed between said relays and said signal generating means and operative momentarily to energize said signal generating means to produce an audible signal each time one of said relays is energized and deenergized, respectively.

4,731,825

NONBLOCKING SWITCHING SYSTEM AND METHOD

Robert F. Wojcinski, Downers Grove, and John A. Cicero, Lisle, both of Ill., assignors to Tellabs, Inc., Lisle, Ill.

Filed Jan. 27, 1986, Ser. No. 822,389
Int. Cl.[4] H04Q *3/42*
U.S. Cl. 379—273 **16 Claims**



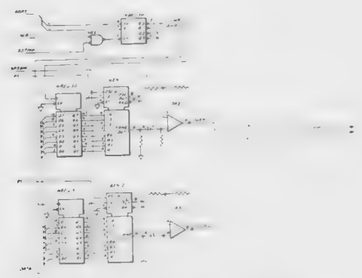
14. A method of operating a switching system for connecting individual ones of a plurality of sources to individual ones of a plurality of destinations through one or the other of first and second connecting networks that are nonblocking in the wide sense, comprising the steps of controlling paths through the first network to establish connections between the sources and destinations through the first network only; and, upon occurrence of a blocking state in the first network before its maximum capacity is reached, establishing paths through the second network, without a blocking state occurring in the network until its maximum capacity is reached, that will connect the sources and destinations in the manner attempted when the blocking state occurred in the first network, and then establishing connections between the sources and destinations through the second network only.

4,731,826

MIXED MODE DIALING SYSTEM

Hedayat Daie, Cary, N.C., assignor to U.S. Holding Company, Inc., New York, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,262
Int. Cl.[4] H04M *1/26*
U.S. Cl. 379—359 **7 Claims**



1. A communication system, comprising:

means for generating tone dialing signals,

means for generating pulse dialing signals, and

means, coupled to both of said generating means, to switch from said pulse means to said tone means, while transmitting said signals in stream, wherein said switching means comprises:

means for detecting a dial-mode switch over prompting signal; and

means, coupled to said detecting means, for transmitting said tone dialing signals in response to said detection, further comprising:

means, coupled to said detecting means, for providing said dial-mode switchover prompting signal, and

memory means, coupled to said prompting signal providing means, for storing said prompting signal together with signals representative of an auto dial number.

4,731,827

INTERSWITCH LINE CIRCUIT

Samuel F. Wood, Los Altos Hills, Calif., assignor to David Systems, Inc., Sunnyvale, Calif.

Filed Oct. 29, 1984, Ser. No. 665,681
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—377 **8 Claims**

1. A method for determining the direction of loop current flow in a telephone loop circuit comprising the steps of:

generating an input voltage with the polarity of said input voltage indicating the direction of said loop current;

providing a bias voltage having a magnitude less than the magnitude of said input voltage;

switching the polarity of said bias voltage according to a preselected time sequence;

comparing said input voltage to said bias voltage to generate an output signal indicating whether said input voltage is of opposite polarity from said bias voltage;

sampling said output signal at times t_1 and t_2 where the bias voltage is in a first polarity state at t_1 and a second polarity state at t_2; and

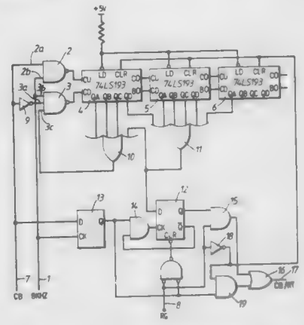
comparing the sampled output signal to the first and second bias voltage polarity states to determine whether the input voltage is of opposite polarity from said first or said second bias voltage polarity state.

4,731,828

RING TRIP DETECTION IN TELECOMMUNICATIONS EXCHANGES

Paul M. Basehore, Sanford, Fla., assignor to Plessey Overseas Limited, Ilford, England

Filed Jun. 7, 1985, Ser. No. 742,352
Int. Cl.[4] H04M *3/06*
U.S. Cl. 379—382 **3 Claims**



1. A ring trip detection circuit comprising:

a terminal for connection to a customer line;

limiting means to limit ringing signal voltage on the customer line to produce a substantially square wave output;

duty cycle monitoring means which compares consecutive opposite polarity cycles of the square wave output;

and means to provide an output signal when consecutive opposite polarity cycles of the square wave output are of substantially different durations,

said duty cycle monitoring means comprises a sampling circuit which samples the square wave output at periodic intervals and which increments a counter for each sample of one polarity and which decrements the counter for each sample of another polarity, the counter providing a ring trip output signal when a predetermined count is reached; and,

inhibit means is provided which prevents the counter from decrementing when the count therein is zero.

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4,731,829

CIRCUIT FOR DETECTING CURRENT VARIATIONS

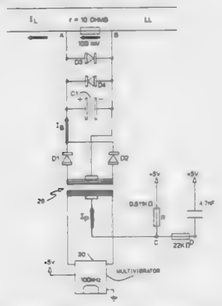
Yves A. Bonnet, Saint Laurent du Var, and Christian Jacquart, Gattieres, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 744,181, Jun. 13, 1985, abandoned. This application Mar. 24, 1987, Ser. No. 30,263

Claims priority, application European Pat. Off., Jun. 20, 1984, 84430019.4

Int. Cl.[4] H04M *3/22*

U.S. Cl. 379—382 **4 Claims**



1. A circuit for detecting current variations in a telephone line circuit produced when the telephone set connected to the line circuit goes off-hook comprising:

a first resitive load, connected in series with the telephone set, in the line circuit;

a high frequency (HF) generator for generating an HF wave signal;

a transformer having a centertapped primary winding connected to said HF generator and a secondary winding;

a rectifier connected to said secondary winding of said transformer;

a filter circuit connected to said rectifier and said first resistive load;

means for connecting the centertap of said primary winding to a source of reference voltage through a resistive load; and

means connected to said second resistive load for detecting any voltage variations across said second resistive load corresponding to any said varitions of current flowing through said telephone line circuit and said first resistive load connected therein.

4,731,830

NONSATURATING INTERFACE SUPPLY

Robert G. Thomson, Tempe, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Oct. 4, 1985, Ser. No. 784,085

Int. Cl.[4] H04M *19/00*

U.S. Cl. 379—387 **14 Claims**

1. A nonsaturating interface circuit for coupling both a relatively high-level voice circuitry and a relatively low-level dialer circuitry across the TIP and RING leads of a telephone line, the interface circuit comprising:

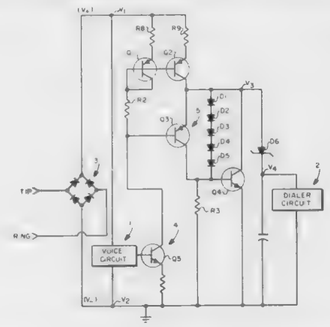
means for coupling the voice circuitry across the TIP and RING leads,

a first shunt transistor coupled at a first electrode through a resistor to the telephone line;

a current sink coupling a second electrode of the first transistor to the telephone line;

a second shunt transistor coupled to the first shunt transistor, said second shunt transistor for supplying current to the relatively low-level circuitry; and

a saturation prevention circuit coupled between the base and collector of the second shunt transistor for sensing the tendency of said second shunt transistor toward saturation and for increasing the current load on the second shunt



transistor so as to prevent saturation and therefore maintain the impedance between the TIP and RING leads.

4,731,831

TELEPHONE INSTRUMENT

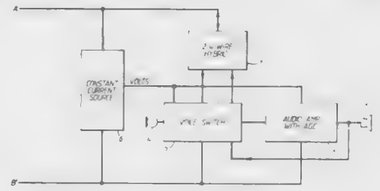
Ian T. Cosgrove, Chilwell, and Derrick Bent, Beeston, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 19, 1986, Ser. No. 909,396

Claims priority, application United Kingdom, Sep. 19, 1985, 8523181

Int. Cl.[4] H04M *1/60, 19/00*

U.S. Cl. 379—388 **3 Claims**



1. A telephone instrument comprising a constant current source arranged for connection across a line to a telephone exchange, the constant current source comprising a regulated voltage output, means to sense variation in current demand from said regulated voltage output and means to cause an increase or decrease in dissipation of power within the source circuit in dependence upon the sensed variation whereby variation in current demanded by one or more auxiliary circuits connected to the regulated voltage output is not reflected in the current demand from the connected line.

4,731,832

PROCESS AND APPARATUS FOR CONTROL OF A HANDS-FREE TELEPHONE SET OPERATING IN ALTERNATION BETWEEN SENDING AND RECEIVING

Serge Brossaud, St Romain, and Laurent Terrier, Blanzy, both of France, assignors to Jeumont-Schneider Corporation, Puteaux, France

Filed Feb. 24, 1986, Ser. No. 833,056

Claims priority, application France, Feb. 27, 1985, 85 02828

Int. Cl.[4] H04M *9/08*

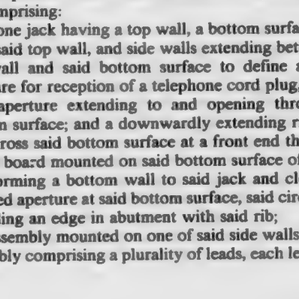
U.S. Cl. 379—389 **15 Claims**

1. In a hands-free telephone set having a sending line coupled to a microphone and a receiving line coupled to a speaker, the sending line and the receiving line being coupled to a common message transmission/reception line, apparatus for alternately switching said sending line and said receiving line to operate said telephone set alternately in a transmission mode and a receiving mode, said apparatus comprising:

inverter means having respective interrupter means connected in said sending line and in said receiving line, said inverter means being operable to switch said sending line and said receiving line in alternation,

a first integrator having an input connected to said receiving line at a received-signal output side of said inverter means and an output connected to a first input of a comparator and applying integrated received signals to said first input of said comparator, and

a second integrator having an input connected to said sending line at an emitted-signal input side of said inverter



means and an output connected to a second input of said comparator,

said comparator having an output connected to said inverter means and controlling switching of said inverter means to control switching of said telephone set from said transmission mode to said receiving mode and vice versa in accordance with the output state of said comparator,

said output of said first integrator also being connected to a gain control input of said second integrator and being used to lower the gain of said second integrator instantaneously upon receipt of a message signal on said receiving line in order to prevent said comparator from switching from a state corresponding to said receiving mode to a state corresponding to said transmission mode due to acoustic coupling between said speaker and said microphone.

4,731,833

LOW PROFILE CIRCUIT BOARD MOUNTED TELEPHONE JACK

Beverley W. Gumb; Eric Foster, and Laurence J. Retallack, all of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 12, 1985. Ser. No. 775,281

Int. Cl.[4] H04R *9/00;* **H01R** *9/00*

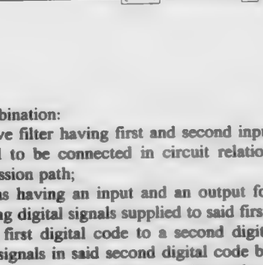
U.S. Cl. 379—399 **6 Claims**

1. A low profile circuit board mounted telephone jack assembly comprising:

a telephone jack having a top wall, a bottom surface spaced from said top wall, and side walls extending between said top wall and said bottom surface to define a profiled aperture for reception of a telephone cord plug, said profiled aperture extending to and opening through said bottom surface; and a downwardly extending rib extending across said bottom surface at a front end thereof;

a circuit board mounted on said bottom surface of said jack and forming a bottom wall to said jack and closing said profiled aperture at said bottom surface, said circuit board including an edge in abutment with said rib;

a lead assembly mounted on one of said side walls, said lead assembly comprising a plurality of leads, each lead having a cantilever front end extending into said aperture, for contact by a contact member on a plug, each lead further



including a rear end extending through said circuit board and connected to a circuit pattern on said circuit board.

4,731,834

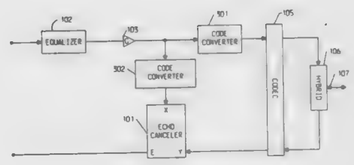
ADAPTIVE FILTER INCLUDING SIGNAL PATH COMPENSATION

Donald L. Duttweiler, Rumson, and John Hartung, Marlboro, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 656,535, Oct. 1, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,737

Int. Cl.[4] H04B *3/23*

U.S. Cl. 379—410 **8 Claims**



1. In combination:

an adaptive filter having first and second inputs and being adapted to be connected in circuit relationship with a transmission path;

first means having an input and an output for converting incoming digital signals supplied to said first means input from a first digital code to a second digital code, said digital signals in said second digital code being supplied from said output to said transmission path; and

second means having an input and an output for converting said incoming digital signals supplied to said second means input from said first code to said second code and from said second code to said first code and said second means output being connected in circuit relationship with said first input of said adaptive filt wherein a nonlinearity substantially identical to a nonlinearity introduced by said first means into signal being supplied by said transmission path to said second input of said adaptive filter is introduced by said second means into signals supplied to said first input of said adaptive filter.

VOL 1088 ISS 3 MR 15 1988 UMI

4,731,835

REVERBERATION TONE GENERATING APPARATUS

Tsuyoshi Futamase, and Mitsumi Kato, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 673,048, Nov. 19, 1984, abandoned, which is a continuation of Ser. No. 397,449, Jul. 9, 1982, abandoned. This application Mar. 10, 1987, Ser. No. 22,582

Int. Cl.[4] H03G 3/00

U.S. Cl. 381—63 12 Claims



1. A digital reverberation tone generating apparatus having musical tone signals input thereto, comprising:

memory means having a plurality of memory areas, each of which are used as delay elements, wherein said memory areas comprise a plurality of first memory areas of a first reverberation tone forming unit and a plurality of second memory areas of a second reverberation tone forming unit;

delay time information generating means for generating delay time information that determines delay times for each of said memory areas used as delay elements;

memory address generating means for generating write address information for identifying write addresses designating locations of said memory areas to store amplitude samples of musical tone signals respectively at a present time and read address information for identifying read addresses, equal to said write addresses, designating locations of said memory areas to read out said stored amplitude samples after the lapse of the time designated by said delay time information, said memory areas storing and outputting said stored amplitude samples in response to said write address information and read address information respectively;

coefficient generating means for generating coefficients corresponding to said memory areas respectively;

calculating means for modifying said stored amplitude samples outputted from said memory areas in accordance with corresponding ones of said coefficients generated from said coefficient generating means;

program control means including a first program which provides a sequence of generation of said delay time information, said write address information, and said read address information, said memory address generating means and said coefficient generating means generating said delay time information, said read address information, said write address information and said coefficients in accordance with said program, said program control means further including a second program for controlling the coupling of each of said first and second memory areas, wherein said second program couples said first memory areas in parallel and said second memory areas in series and wherein said second program also forms a feedback loop for each of said memory areas of said first and second memory areas; and

reverberation tone producing means for producing a reverberation tone in accordance with said stored amplitude samples of musical tone signals modified by said calculating means.

4,731,836

TELEPHONE SET FOR TABLE-TOP AND WALL OPERATION

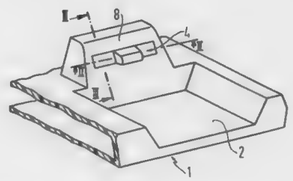
Erwin Awakowicz; Erwin Grassl, both of Munich, and Peter Kleine, Fischen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,484

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609513

Int. Cl.[4] H04M 1/02

U.S. Cl. 379—435 5 Claims



1. A telephone set for table-top and wall operation including at least one deposit trough for a handset provided in a stationary housing part at the outside surface thereof, whereby at least one freely accessible cutout is provided in the edge region of said deposit trough, an insert member being capable of being secured in said cutout in two use positions, and whereby said insert member terminates flush with said deposit trough when said telephone set is used as a table-top unit, whereas a nose connected to said insert member of one piece projects beyond the contours of said deposit trough when said telephone set is used as a wall unit and engages into a receptacle at said handset, comprising the improvement wherein said insert member is fashioned as an oblong, resilient, rectangular plate-like member and has ends reduced in step-like fashion, said ends engaging behind end regions of said cutout corresponding thereto in terms of contour in snap fashion, whereby said insert member seats against walls within said cutout.

4,731,837

METHOD AND DEVICE FOR SECURE TRANSMISSION AND OF TELEVISION PICTURES

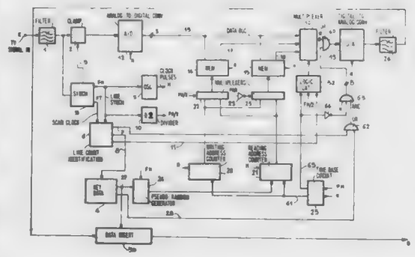
Christian J. F. Gautier, Acigne, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", France

Division of Ser. No. 590,708, Mar. 19, 1984, Pat. No. 4,633,310. This application Sep. 22, 1986, Ser. No. 909,617

Claims priority, application France, Mar. 21, 1983, 83 05076

Int. Cl.[4] H04N 7/167

U.S. Cl. 380—14 2 Claims



1. A process for scrambling and unscrambling the image part of a sampled MAC line video signal excluding the synchronization signal, said process comprising the steps of respectively dividing at two dividing points the MAC luminance signal and the chrominance signal to form two pairs of segments that are adjacent in each pair, each one of the segments comprising at least two samples, synchronously defining in a pseudo-random manner for both transmission and reception each one of two dividing points between the two segments, the two segments forming a pair slightly overlapping in the neighborhood of the pertinent dividing point, and processing the segments in each pair as a whole in order to scramble prior to transmission and again to unscramble upon reception so as to restore the initial video signal.

4,731,838

AGC CIRCUIT USED IN A CATV RECEIVER

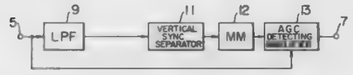
Yoshio Amemiya, Yokosuka, and Masanori Oguino, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,529

Claims priority, application Japan, Sep. 5, 1983, 58-161841

Int. Cl.[4] H04N 7/167

U.S. Cl. 380—15 13 Claims



1. An automatic gain control (AGC) circuit used in a subscriber's receiver of a cable television system comprising:

means including a reception amplifier circuit for receiving a television signal which is scramble-modulated except for the vertical blanking period and for amplifying the received signal;

a detector circuit for detecting the amplified video signal from said reception amplifier circuit;

a AGC signal generating circuit including means for extracting vertical sync pulses the vertical blanking period of the detected video signal from said detector circuit and for producing an AGC signal depending on the magnitude of of the extracted vertical sync pulses of the vertical blanking period; and

a circuit for controlling the gain of said reception amplifier circuit according to the AGC signal provided by said AGC signal generating circuit.

4,731,839

METHOD FOR CODING AND DE-CODING AUDIO AND VIDEO INFORMATION

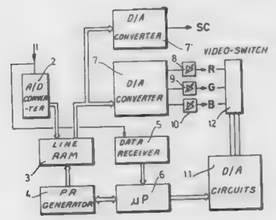
Eddy C. Goray; Pierre J. Joris, and Jean-Claude S. Nelen, all of Brussels, Belgium, assignors to Radio-Television Beige de la Communaute Francaise, Brussels, Belgium

Filed Jan. 6, 1986, Ser. No. 816,635

Claims priority, application Belgium, Jan. 9, 1985, 214310

Int. Cl.[4] H04N 7/167; H04L 9/00

U.S. Cl. 380—14 18 Claims



1. A method for coding and de-coding information comprised of video and audio information in an information-transmission system, particularly for pay-television, comprising the steps of:

for coding:

(a) converting an input analog signal which includes said information into a digital signal,

(b) treating said digital signal to produce a treated digital signal of a form which makes the information content thereof unintelligible to normal receiving circuits by: (1) defining a base time period according to which said audio information in the form of digital data is cut into identical slices, (2) transposing an order of the information in each slice, and (3) compressing the transposed information in each slice together with a fraction from the directly adjacent slices, and

(c) converting said treated digital signal to a transmit analog signal to transmit same; and

for receiving and de-coding:

(a) receiving an input analog coded signal and converting the input analog coded signal into a coded digital signal,

(b) treating said coded digital signal to form a treated digital signal of a form with an information content which is intelligible for normal receiving circuits, and

(c) finally converting the treated signal back to analog form for the use thereof.

4,731,840

METHOD FOR ENCRYPTION AND TRANSMISSION OF DIGITAL KEYING DATA

Susan M. Mniszewski; Edward A. Springer, both of Los Alamos, N. Mex., and David P. Brenner, North Collins, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

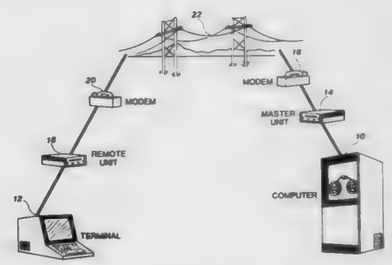
Filed May 6, 1985, Ser. No. 730,529

Int. Cl.[4] H04L 9/00

U.S. Cl. 380—21 24 Claims

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 108 Pages)



1. A cryptographic method for encrypting, transmitting and decrypting keying data between a master unit and at least one remote unit, comprising the steps of:

storing in said master unit and in said remote unit a plurality of key encryption keys, said key encryption keys being addressed by means of a common addressing system in each unit;

generating a first storage address effective to identify a master key encryption key from said plurality of key encryption keys;

indexing said first storage address by a first predetermined amount to define a second storage address effective to identify a first key encryption key from said plurality of key encryption keys;

indexing said first storage address by a second predetermined amount to define a third storage address effective to identify a second key encryption key from said plurality of key encryption keys;

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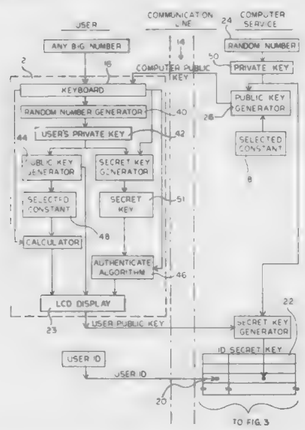
generating a data encryption key in said master unit, using said first key encryption key;
encrypting said data encryption key using said second key encryption key to produce an encrypted data encryption key;
downloading to said remote unit said encrypted data encryption key together with a designator value for identifying the address of said second key encryption key at said remote unit;
decrypting said encrypted data encryption key at said remote unit to reproduce said data encryption key at said remote unit;
whereby there is enabled subsequent transmission of data between said master unit and said remote unit, using said data encryption key to encrypt and decrypt said data.

4,731,841

FIELD INITIALIZED AUTHENTICATION SYSTEM FOR PROTECTIVE SECURITY OF ELECTRONIC INFORMATION NETWORKS

Richard D. Rosen; Robert B. McCown, and Matthew S. Fleming, all of Columbus, Ohio, assignors to Applied Information Technologies Research Center, Columbus, Ohio

Filed Jun. 16, 1986, Ser. No. 874,381
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **12 Claims**



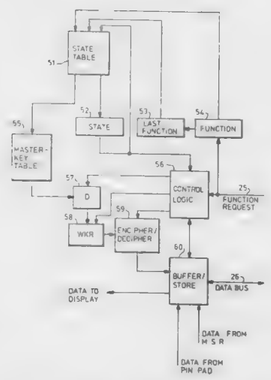
1. In combination a method for authenticating the authority of any of a plurality of remote users to access a host computer, the method comprising:
(a) storing in the host computer and in each of a plurality of substantially identical hand-held, portable, remote user computers the identical selected constant, instructions for using a first, non-invertible algorithm for raising a number to a power using modulo arithmetic, for performing a non-invertible authentication second algorithm which is a function of a secret key and for generating a random number;
(b) distributing the identical portable computers which use four bit microprocessors to the remote users;
(c) initializing the portable computers independently with the host computer and from a remote location selected by the remote user by:
(i) establishing communicating between the host computer and a remote user computer;
(ii)independently generating a random first number as a first key in the remote user's computer and in the host computer;
(iii) independently raising said selected constant in each of the communicating computers to that computer's first key using modulo arithmetic and said first non-invertible algorithm to generate a second key for each computer;
(iv) communicating the second key of each communicating computer to the other;
(v) generating and storing in each communicating computer the identical secret key by raising in each computer the second key of the other computer to the power of the computer's own first key using modulo arithmetic by the first non-invertible algorithm; and
(vi) disconnecting said communication;
(d) subsequently authenticating the authority of a remote user to access or continue to access the host computer by detecting whether a remote user communicating with and seeking access to the host computer has a remote user computer which has been subjected to steps (a), (b) and (c) by:
(i) generating a second number in the host computer;
(ii) communicating that second number to the remote user computer;
(iii) performing said stored, second non-invertible algorithm upon that second number in the remote user computer as a function of its stored secret key and in the host computer as a function of the same secret key;
(iv) communicating the result of said second algorithm in the remote user computer to the host computer; and
(v) comparing the transmitted result to the result obtained at the host computer; and
(e) permitting access to the host computer if the compared portions are identical and preventing access if they are not.

4,731,842

SECURITY MODULE FOR AN ELECTRONIC FUNDS TRANSFER SYSTEM

Peter R. Smith, Alresford, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1985, Ser. No. 807,396
Claims priority, application United Kingdom, Dec. 12, 1984, 8431381
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—24 **7 Claims**



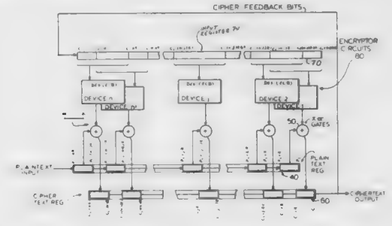
1. A security module, for authenticating messages having a plurality of different formats and cryptographic authenticators, contained in a tamper-resistant housing and including two data input devices, a display unit, at least one input/output port for connecting the module to an external processor and a security controller, characterised in that the security controller includes:
at least one read only memory which stores a state table and a module master encryption key;
a control logic unit including a microprocessor and a control store which stores a plurality of different control function routines invoked by different entries in the state table;
function key generation means to generate different encryption keys dependent upon a particular control function and a derivative of the module master key; and
means to perform encryption and decryption operations on messages transmitted to and from the module using keys transmitted to the module encrypted under one of a number of derivatives of the module master key to authenticate said messages; whereby data input to the module at the first of the two data input devices is used to determine the control function routine that the module is to perform and the encryption key used to encode data input at the second data input device.

4,731,843

METHOD AND DEVICE OF INCREASING THE EXECUTION SPEED OF CIPHER FEEDBACK MODE OF THE DES BY AN ARBITRARY MULTIPLIER

Kurt E. Holmquist, Largo, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Dec. 30, 1985, Ser. No. 814,677
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—29 **4 Claims**



1. A data encryption system for encrypting a stream of data bits, comprising:
a serial in, parallel out register for receiving a stream of plaintext bits;
a plurality of exclusive-or gates connected in parallel to outputs of said serial in, parallel out register and not in series with each other;
a cipher text register connected to parallel outputs of said exclusive-or gates and having an output which can be transmitted to a decryptor;
an input register connected to an output of said cipher text register and functioning to receive in series and store encrypted data blocks, each encrypted data block containing k bits;
a plurality of encryptor circuits connected in parallel to outputs of said input register and having parallel outputs to said exclusive-or gates and functioning to substantially simultaneously process and then output in parallel selected bits from said encrypted data blocks to said plurality of exclusive-or gates.

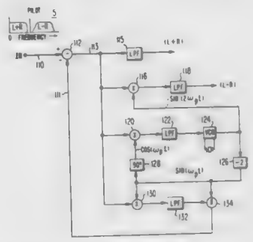
4,731,844

APPARATUS FOR CANCELLING A PILOT SIGNAL FROM A COMPOSITE SIGNAL

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 7, 1986, Ser. No. 882,384
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—13 **5 Claims**

1. Apparatus, for processing a composite signal including a pilot signal, comprising:
a signal input terminal for applying said composite signal;
signal combining means having a first input terminal coupled to said signal input terminal, having a second input terminal and an output terminal for providing a combined signal;
means including a phase-locked-loop having an input coupled to the output terminal of said signal combining means, for generating a synthesized pilot signal responsive



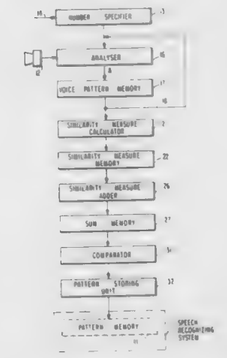
to residual pilot signal output from said signal combining means; and
means for coupling said synthesized pilot signal to the second input of said signal combining means in a sense to cancel the pilot signal included in said composite signal.

4,731,845

DEVICE FOR LOADING A PATTERN RECOGNIZER WITH A REFERENCE PATTERN SELECTED FROM SIMILAR PATTERNS

Tomoko Matsuki, and Hideo Tanaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,492
Claims priority, application Japan, Jul. 21, 1983, 58-133313
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **3 Claims**



1. A pattern storing device for storing a reference pattern in a pattern memory of a pattern recognizing system, said pattern storing device comprising:
pattern memory means for storing those at least three patterns as stored patterns from which said reference pattern should be selected, all of said at least three patterns representing the same speech sequence;
similarity measure calculating means for calculating similarity measures for each of said stored patterns relative to others thereof, respectively;
sum calculating means for calculating a sum of the similarity measures calculated for each of said stored patterns; and
selecting means responsive to the sums calculated for said stored patterns, respectively, for selecting that one of said stored patterns as said reference pattern for which the sum

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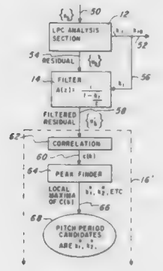
is an extremum of the sums calculated for said stored patterns, said reference pattern selected by said selecting means being the most representative pattern of said at least three patterns stored in said pattern memory means.

4,731,846

VOICE MESSAGING SYSTEM WITH PITCH TRACKING BASED ON ADAPTIVELY FILTERED LPC RESIDUAL SIGNAL

Bruce G. Secrest, and George R. Doddington, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1983, Ser. No. 484,711
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—49 **20 Claims**



1. A voice messaging system for encoding and regenerating human speech comprising:

LPC analysis means for analyzing an analog speech signal provided as an input thereto in accordance with an LPC (Linear Predictive Coding) model, said LPC analysis means providing LPC parameters and a residual signal as an output representative of the analog speech signal;

adaptive filter means operably coupled to the output of said LPC analysis means for receiving said residual signal and at least one LPC parameter from said LPC analysis means, said adaptive filter means filtering said residual signal in accordance with a time-varying filter characteristic defined by said at least one LPC parameter, wherein the time-varying filter characteristic provides for the removal of high frequency noise from the residual signal during periods of voiced speech and for the retention of high frequency energy in the residual signal during periods of unvoiced speech, to provide an adaptively filtered residual signal as an output therefrom;

means operably connected to the output of said adaptive filter means for extracting pitch and voicing information from said adaptively filtered residual signal; and

means operably connected to the outputs of said extracting means and said LPC analysis means for encoding said pitch and voicing information and said LPC parameters.

4,731,847

ELECTRONIC APPARATUS FOR SIMULATING SINGING OF SONG

Gilbert A. Lybrook; Kun-Shan Lin, and Gene A. Frantz, all of Lubbock, assignors to Texas Instruments Incorporated, Dallas, Tex.

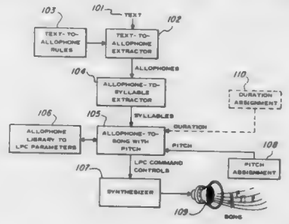
Filed Apr. 26, 1982, Ser. No. 372,257
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—51 **21 Claims**

1. An electronic sound synthesis apparatus for simulating the vocal singing of a song, said apparatus comprising:

operator input means for selectively introducing a sequence of textual information representative of human sounds and for establishing a sequence of pitch information;

memory means storing digital data therein representative of at least portions of words in a human language from which the lyrics of a song may be synthesized, said memory means further including a storage portion in which digital data representative of a plurality of pitches is stored from which the tune of a song may be synthesized;

control means operably coupled to said operator input means and said memory means for forming a sequence of synthesis control data in response to the accessing of digital data representative of at least portions of words and the accessing of digital data representative of a selected sequence of pitches defining a tune, said control means including correlation means for combining the



sequences of digital data from said memory means respectively representative of the lyrics and the tune of the song in a manner producing said sequence of synthesis control data;

synthesizer means operably associated with said memory means and said control means for receiving said sequence of synthesis control data as produced by said correlation means and providing an analog output signal representative of the song as produced by the lyrics and tune; and

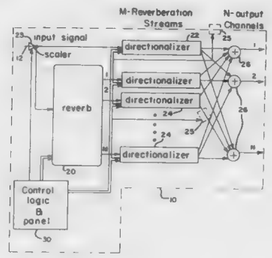
audio means coupled to said synthesizer means for converting said analog output signal into an audible song comprising the lyrics and the tune in a correlated relationship.

4,731,848

SPATIAL REVERBERATOR

Gary Kendall, and William Martens, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Oct. 22, 1984, Ser. No. 663,229
Int. Cl.[4] H03G 3/00
U.S. Cl. 381—63 **47 Claims**



1. Sound processing apparatus for creating illusory sound sources in three dimensional space comprising:

means for providing audio signals;

reverberation means for generating at least one reverberant stream of signals from the audio signals to simulate a desired configuration of reflected sound; and,

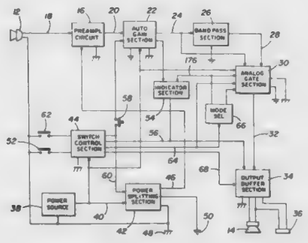
directionalizing means for applying to at least part of one reverberant stream a spectral directional cue to generate at least one output signal.

4,731,849

ELECTRONIC AUSCULSCOPE

John W. Bloomfield, III, P.O. Box 6427, Hilton Head Island, S.C. 29938

Filed Jul. 30, 1986, Ser. No. 890,502
Int. Cl.[4] A61B 7/04
U.S. Cl. 381—67 **27 Claims**



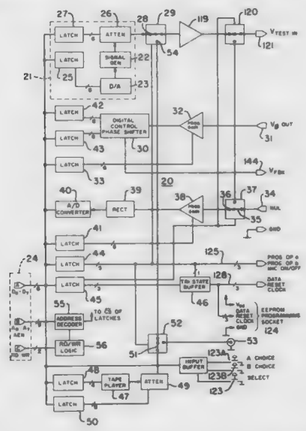
1. In an electronic ausculscope having a pick-up transducer, a preamplifier to the transducer, automatic gain control means connected to the preamplifier for variable amplification of audio signals transmitted from the transducer, speaker means for reproducing the audio signals amplified by the automatic gain control means, output buffer means operatively by connected to the automatic gain control means for driving the speaker means and bandpass means connected to the automatic gain control means for limiting transmission of the amplified audio signals to selected bandpass frequencies, the improvement comprising selectively controlled supply means for powering the preamplifier and the output buffer means in response to command signals and selectively controlled gate means connected to the output buffer means and the automatic gain control means for by-pass of the bandpass means.

4,731,850

PROGRAMMABLE DIGITAL HEARING AID SYSTEM

Harry Levitt, Livingston, N.J.; Richard S. Dugot, New York, N.Y., and Kenneth W. Kopper, River Edge, N.J., assignors to Audimax, Inc., Hackensack, N.J.

Filed Jun. 26, 1986, Ser. No. 879,214
Int. Cl.[4] H04B 15/00
U.S. Cl. 381—68.2 **19 Claims**



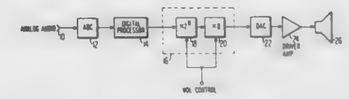
1. A hearing aid comprising at least one input microphone, an output receiver, and a signal transmission channel interposed between said microphone and said receiver in which the improvement comprises a programmable delay line filter and programmable signal limiter means interposed between the input and output of said transmission channel in a feedback path for said transmission channel, said filter being programmed to impart to the hearing aid at least one response characteristic effective to compensate for impaired hearing of the wearer of the aid.

4,731,851

DIGITAL SIGNAL GAIN CONTROL CIRCUITRY FOR VARYING DIGITAL SIGNALS IN SUBSTANTIALLY EQUAL DB STEPS

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 24, 1986, Ser. No. 910,993
Int. Cl.[4] H03G 3/00
U.S. Cl. 381—104 **17 Claims**



1. A digital signal amplitude control system for changing the amplitude value of a digital signal in substantially uniform dB steps, which steps are less than 6 dB, said system comprising:

a signal input terminal for applying said digital signal;

coarse control means, having a signal input terminal and having control signal input terminals and an output terminal, including means for altering the amplitude value of digital signals in multiples, including one, of 6 dB steps responsive to first control signals applied to said control signal input terminals;

fine control means, having a signal input terminal, an output terminal and control signal input terminals, including means for multiplying digital signals by a number of predetermined values responsive to second control signals applied to its control signal input terminals, wherein an ordered ascending/descending sequences of said predetermined values is substantially logarithmic;

means for coupling said coarse control means and said fine control means in a serial combination with said signal input terminal; and

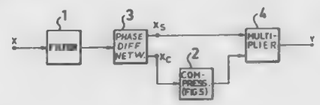
control signal generating means, for generating said first and second control signals, wherein successive changes of said first and second control signals effect amplitude changes, in signal processed by said serial combination of coarse and fine control means, in substantially uniform increments of dB, which increments are less than 6 dB.

4,731,852

METHOD TO ELECTRONICALLY CLARIFY SOUND OR PICTURE INFORMATION AND AN ARRANGEMENT TO CARRY OUT THE METHOD

Lars G. Liljeryd, 19 Vintervägen, S-171 34 Solna, Sweden

Filed Jun. 4, 1986, Ser. No. 870,540
Claims priority, application Sweden, Jun. 4, 1985, 8502762
Int. Cl.[4] H03G 7/00
U.S. Cl. 381—106 **12 Claims**



1. A method for electronically clarifying sound or picture

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information represented by an input signal X which contains at least two respective frequency components, comprising the steps of:

amplitude compressing said input signal X according to a first characteristic;

dividing the amplitude compressed signal into two orthogonal components X_s and X_c; and

multiplying the two orthogonal components X_s and X_c in a multiplier having a second characteristic inverse to said first characteristic to obtain an output signal Y which contains the harmonics of said respective frequency components as well as sum intermodulation products of said respective frequency components, difference intermodulation products of said respective frequency components being eliminated so that the harmonics of said output signal Y have a substantially equivalent dynamic amplitude ratio with respect to the input signal X.

4,731,853

THREE-DIMENSIONAL VISION SYSTEM

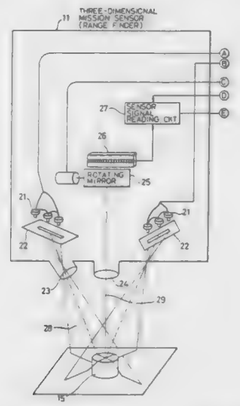
Seiji Hata, Fujisawa; Takushi Okada, Yokohama; Makoto Ariga, Yokohama, and Takafumi Okabe, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,455

Claims priority, application Japan, Mar. 26, 1984, 59-56199

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—1 **25 Claims**



1. A three-dimensional vision system, comprising:

three-dimensional vision means for projecting slit-like light onto an object to-be-handled over each of a plurality of scanning lines and for reading image signals representing both a resulting slit image of the object while the slit-like light is projected over one of said plurality of scanning lines and a background image of the object along the same one of said plurality of scanning lines while no slit-like light is projected,

an image input portion which controls illumination of the slit-like light to cause said vision means to sequentially project said slit-like light over each of said plurality of scanning lines, and also controls the reading of image signals representing both the slit-image and the background image along each of said scanning lines, and which performs extraction processing for each one of said plurality of scanning lines to obtain differential signals from the image signals representing a resulting slit image of the object along a scanning line and the image signals representing the background image of the object along the same scanning line to obtain said differential signals for each one of said scanning lines from the image signals read out, and

means including means for extracting a position corresponding to a maximum value among said differential signals occurring along each of said scanning lines, for extracting a light segmentation line from each one of said differential signals,

whereby an image processor can recognize a three-dimensional shape of the object on the basis of a plurality of said light segmentation lines extracted from said differential signals and the positions corresponding to the maximum value of each of one of said differential signals.

4,731,854

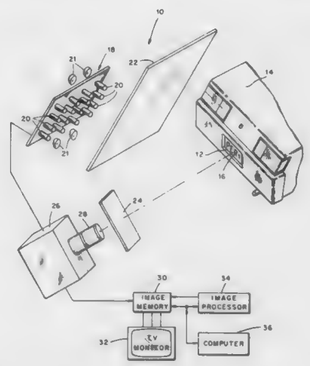
OPTICAL SYSTEM FOR PRODUCING AN IMAGE FOR A SET OF CHARACTERS

Rafael C. Gonzalez, Knoxville, Tenn., assignor to Perceptics Corporation, Knoxville, Tenn.

Filed Jul. 17, 1986, Ser. No. 887,545

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—1 **8 Claims**



1. An optical system for producing an image of a set of characters on a background in the presence of corrupting light, comprising:

a flash light source for directing light toward the set of characters for a predetermined flash time period;

a first polarizer for polarizing the illumination of said flash light source prior to the light impinging upon the set of characters, the illumination from said first polarizer impinging upon the set of characters having an intensity exceeding the intensity of the corrupting ambient light;

a second polarizer positioned to receive light reflected from said set of characters and background, said second polarizer being cross-polarized with respect to said first polarizer whereby said second polarizer is operable to filter out polarized light from said first polarizer that is specularly reflected by said set of characters and background;

an optical receiver for receiving light from said second polarizer and producing an image of said set of characters and said background; and

a shutter synchronized with said flash light source and optical receiver to open and close during said flash time period to admit light into said optical receiver, whereby the image produced by said optical receiver is dominantly produced by de-polarized light reflected by said set of characters and background from said flash light source.

4,731,855

PATTERN DEFECT INSPECTION APPARATUS

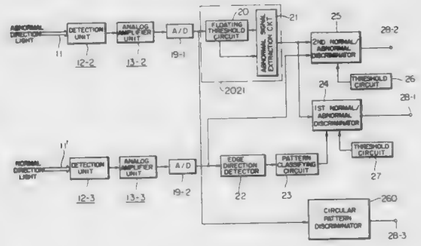
Kyo Suda, Hachioji; Shigeharu Kimura, Kokubunji; Shinobu Hase, Hachioji; Chusuke Munakata; Kanji Kinameri, both of Tokyo; Yoshitoshi Ito, Ome; Hiroto Nagatomo, Tokyo; Yuzo Taniguchi, Higashimurayama, and Mikihito Saito, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,730

Claims priority, application Japan, Apr. 6, 1984, 59-67640; May 1, 1984, 59-86260; Sep. 10, 1984, 59-187899

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—8 **13 Claims**



1. A pattern defect inspection apparatus for inspecting a pattern defect by detecting reflected diffraction lights generated by scanning a surface of a semiconductor wafer, having a substantially straight edge pattern of an integrated circuit formed thereon, by means of a coherent light beam haing a predetermined spot size directed normally to the surface of the semiconductor wafer, in which the directions of the edges of said pattern include directions of 0°, 45°, 90° and 135° with respect to a reference direction, and two straight edges crossing each other provide a rounded corner due to fabrication limitations, said corner generating weaker reflected diffraction light than that from said straight edge, comprising:

normal direction signal detection means including photo-detection means having wide light receiving areas arranged in a plurality of spatial areas in normal directions for converting the reflected diffraction lights generated from said pattern into electrical signals, said normal direction signal detection means providing a first group of normal direction signals when the photo-detector means receives reflected diffraction lights generated from said straight edge and a second group of normal direction signals when the photo-detector means receives reflected diffraction lights generated from said corner, said normal directions including directions of 0°, 45°, 90° and 135°;

abnormal direction signal detection means including photo-detection means having wide light receiving areas arranged in a plurality of spatial areas in abnormal directions for converting the reflected diffraction lights generated from said pattern into electrical signals, said abnormal direction signal representative of the received reflected diffraction lights, said abnormal directions including directions of 22.5°, 67.5°, 112.5° and 157.5°;

defect discrimination means for determining if the abnormal direction signal is due to a defect or not in accordance with the normal and abnormal direction signals from said abnormal direction signal detection means and said normal direction signal means, including means for classifying different patterns on the basis of said first and second groups of normal direction signals, as many normal/abnormal discriminators as the number of classes of the patterns for determining if the abnormal signals extracted by said abnormal signal detection means are due to a true defect or not, and activation means for selectively activating said normal/abnormal discriminators in accordance with the signal from the pattern classifying means.

4,731,856

AUTOMATIC ASSEMBLY APPARATUS

Philip R. Lloyd, South Nutfield; Barry M. Jones, Crawley; Peter Saraga, Wallington; David R. Humphreys, and Clive V. Newcomb, both of Horley, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

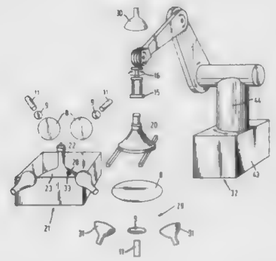
Continuation of Ser. No. 541,947, Oct. 14, 1983, abandoned.

This application Feb. 24, 1987, Ser. No. 18,869

Claims priority, application United Kingdom, Oct. 18, 1982, 8229671

Int. Cl.⁴ G06K 9/46

U.S. Cl. 382—8 **3 Claims**



1. Automatic apparatus for locating a first component present at a first initial position for assembly with a second component at an assembly position, said apparatus comprising: parallel projection means for imaging said first and second components as positioned, said parallel projection means comprising in order away from the respective component a field lens, an objective lens positioned at the principal focal plane of the field lens, and an electronic camera for receiving a real image of the component formed by the objective lens and for producing a spatially quantized picture signal, said apparatus comprising gripper control means for controlling a gripper to move the first component to the assembly position, said apparatus having furthermore data processing means for receiving said picture signal, for applying a threshold level to said signal to produce a binarized signal representing a component, and for measuring and storing any binarized component position and therefrom calculating movement commands for said gripper control means, characterized in that:

the first component comprises a succession of spatially separate illuminated features at predetermined locations and of predetermined dimensions in the component, a primary feature having a brightness which is either lower than or higher than the brightness of all other features in the succession, in that said data processing means comprise first thresholding means for thresholding said spatially quantized picture signal of the first component at a first threshold for binarizing the primary feature at one binary value and all other features at the other binary value for measuring the primary feature location and means for generating, from said primary feature location and from the predetermined locations of the features, a minimum second search area in which the next feature in the succession will be present, said data processing means comprising second thresholding means for thresholding said spatially quantized picture signal within said minimum secondary search area at a level between the brightness of the next feature and of its adjacent background for binarizing the next feature for measuring the next feature location, said data processing means comprising means for applying a corresponding sequence of thresholds and measuring means for each further feature in the succession, said data processing means being adapted to calculate from the succession of feature locations so obtained the orientation and position of said first component and to provide corresponding input signals to said gripper control means.

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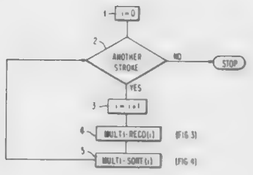
RECOGNITION SYSTEM FOR RUN-ON HANDWRITTEN CHARACTERS

Charles C. Tappert, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 626,254, Jun. 29, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 926,837

Int. Cl.⁴ G06K *9/62*

U.S. Cl. 382—9 **5 Claims**



1. A method of recognizing handwritten words, a word being formed by a plurality of characters that may touch or overlap each other, each character being formed by one or more strokes comprising the steps of:

(a) initializing an index of a current segmentation point of a character;

(b) considering a stroke of a handwritten character having a segmentation point and incrementing said index or terminating said method when no further strokes exist to be processed.

(c) examining recognitions on stroke sequences ending at the segmentation point corresponding to said index;

(d) grading the results of said examination of recognitions to rank potential character choices; and

(e) repeating steps (b) through (d) until all strokes for characters comprising a word have been processed.

4,731,858

ARRANGEMENT FOR THE SEGMENTATION OF LINES

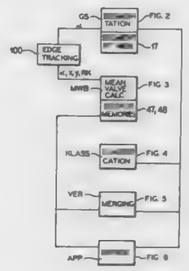
Hans Grasmueller, Mammendorf; Wilhelm Beutel, Munich; Karl Hohberger, Feldkirchen-Westerham; Paul Koellensperger; Anna Reischl, both of Munich, and Peter Rummel, Festenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,763

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417545

Int. Cl.⁴ G06K *9/34*

U.S. Cl. 382—9 **6 Claims**



1. A system for segmentation, classification, merging, and approximation of lines sought out and tracked by an edge tracking unit tracking an object, the lines being defined according to the edge tracking unit by a sequence of points wherein each point has associated with it a direction angle α, coordiantes x, y, and a direction code RK delivered by the edge tracking unit, comprising:

segmentation means for receiving the directional angles α from the edge tracking unit and for storing in a segment point memory means segments of a line with a determined boundary;

mean value calculation means connected to the segment point memory means and to the edge tracking unit for receiving from the segment point memory means said stored segments, for receiving from the edge tracking unit the direction angle α, coordinates x, y, and direction code RK, and for placing in an associated output memory means calculated values;

classification means connected to the output memory means and to the segment point memory means for classification of said stored line segments with a determined boundary obtained from the segment point memory means;

merging means connected to the segment point memory means and to the output memory means for merging of adjacent, classified segments which are sufficiently alike; and

approximation means connected to the segment point memory means and said output memory means for approximation of determined segments.

4,731,859

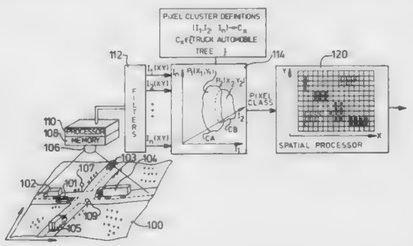
MULTISPECTRAL/SPATIAL PATTERN RECOGNITION SYSTEM

Marvin J. Holter; David Zuk, both of Ann Arbor; Vernon Larrowe, Ypsilanti, and Robert J. Maxwell, Ann Arbor, all of Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 20, 1985, Ser. No. 778,315

Int. Cl.⁴ G06K *9/00*

U.S. Cl. 382—36 **18 Claims**



1. A system for recognizing features in an image comprised of wavefronts of radiated energy, each point in the image being characterized by a plurality of radiated energy intensities at different predetermined wavelengths and a height, comprising:

sensor means operable to receive the radiated energy from preselected points in the two-dimensional image in a predetermined order, thereby defining picture elements, and to produce a plurality of signals measuring the radiated energy intensities and height within each picture element;

filter means for filtering the signals produced by the sensor means and adapted to produce a plurality of signals measuring the radiate energy intensity within each picture element at each of the predetermined wavelengths;

processing means adapted to receive the signals produced by the sensor means and to produce a signal measuring the height associated with each picture element;

first classification means adapted to receive at least some of the plurality of signals produced by the processing means and the filtering means, to partially classify each of the picture elements according to a first predetermined classification criterion selected from the set of classification criteria including the distribution of the plurality of radiated energy intensities within each picture element, and the distribution of the height associated with each picture element, the criterion selected being that which minimizes the number of picture elements partially classified and to produce a signal indicative of the resulting partial classification; and

second classification means adapted to receive the signal indicative of the resulting partial classification produced by the first classification means, operable to further classify, according to the remaining criterion of said set of classification criteria, the picture elements partially classified by the first classification means into classes containing the features to be recognized, and to produce signals indicative of which picture elements have been further classified.

4,731,860

METHOD FOR IDENTIFYING THREE-DIMENSIONAL OBJECTS USING TWO-DIMENSIONAL IMAGES

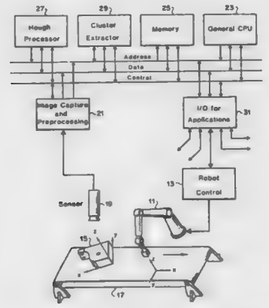
Friedrich M. Wahl, Langnau a. Albis, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1986, Ser. No. 874,313

Claims priority, application European Pat Off., Jun. 19, 1985, 85107445

Int. Cl.⁴ G06K *9/72*

U.S. Cl. 382—41 **18 Claims**



1. A machine method for recognizing or identifying a three-dimensional object from a two-dimensional image of the object, using a Hough space representation of said image comprising clusters each represented by its center point, comprising the steps of:

(a) determining in the Hough space representation of said object image, cluster configurations having specific properties;

(b) providing predetermined cluster configurations of Hough space representations which correspond to known object models identifying vertex points in three-dimensional space;

(c) relating cluster configurations determined in step (a) to said predetermined cluster configurations of Hough space representations, in order to identify said object by comparison of the vertex points of said object image represented by cluster configurations determined in step (a) to corresponding vertex points of said object model representations; and

(d) if further information is required for identification, fitting vertex points of the object image, the locations of which are given by the slope and intercept of respective cluster point colinearities in Hough space representation, to vertex points of at least one object model, on the basis of the relations determined in step (b).

4,731,861

METHOD OF OPTICAL CHARACTER RECOGNITION

Keith A. Blanton, Plano; Steven N. Petersen, Carrollton, and Ramon E. Helms, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

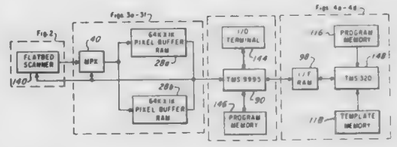
Filed Aug. 26, 1983, Ser. No. 527,155

Int. Cl.⁴ G06K *9/20*

U.S. Cl. 382—48 **15 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 170 Pages)



1. The method of isolating and reading character data for character recognition comprising:

(a) scanning a portion of a page having characters thereon with an imager to generate character data arranged in scan lines representative of said character and storing said character data,

(b) generating a first data set indicative of the amount of character data in each scan line,

(c) determining that a scan line contains significant character data only when corresponding data from said first set is above a scan line threshold value,

(d) reading character data only in scan lines which contain significant character information.

4,731,862

BINARIZING SYSTEM OF PICTURE IMAGE SIGNALS

Yukio Tsuda, Musashino, and Fumio Owada, Hachioji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

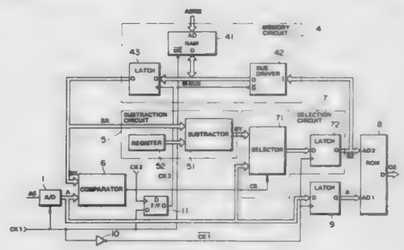
Filed Mar. 8, 1985, Ser. No. 709,662

Claims priority, application Japan, Apr. 28, 1984, 59-86332

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ G06K *9/38*

U.S. Cl. 382—50 **8 Claims**



1. A system for preprocessing an analog picture image signal representing a characteristic of a picture image obtained by scanning a document along successive main scanning lines, said system comprising:

quantizing means for sequentially quantizing said analog picture image signals to form a first number of picture element signals for each of the main scanning lines, each of the picture element signals representing a different position of said picture image along one of the main scanning lines;

a line memory for temporarily storing a plurality of storage signals corresponding to picture element signals for main

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scanning lines preceding the main scanning line whose picture element signals are currently being formed by said quantizing means;

output means coupled to said line memory for receiving from said line memory output signals corresponding to ones of the storage signals for positions of the picture elements currently being formed by said quantizing means;

comparator means, coupled to said quantizing means and said output means, for forming comparison signals representing a comparison of the picture element signals and the output signals;

first calculating means for adjusting values of the output signals toward a first level of the picture image characteristic thereby to produce adjusted picture element signals;

selection means, coupled to said first calculating means and said quantizing means and responsive to the comparison signals, for selecting the adjusted picture element signals as reference signals when the picture element signals have values closer to the first level than to values of the adjusted picture element signals, and otherwise for selecting the picture element signals as the reference signals;

writing means for writing the reference signals into said line memory; and

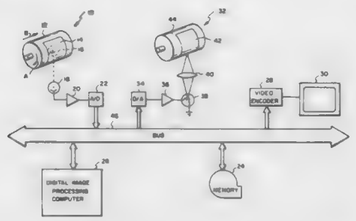
second calculating means coupled to said selection means and said quantizing means for modifying the picture element signals toward the first level when the picture element signals have values closer to the first level than do said reference signals.

4,731,863

DIGITAL IMAGE PROCESSING METHOD EMPLOYING HISTOGRAM PEAK DETECTION

Muhammed I. Sezan, Rochester, and Ralph Schaetzing, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,509
Int. Cl.[4] G06K *9/52*
U.S. Cl. 382—51 **6 Claims**



1. In a method of processing a digital image by computer, including the steps of forming a gray-level histogram of the digital image, forming a peak detection function from the gray-level histogram, employing the peak detection function to detect peaks in the histogram, and employing the location of detected peaks to process the image, the improvement wherein said step of forming a peak detection function comprises the steps of:

a. forming a cumulative distribution function from said gray-level histogram;

b. smoothing said cumulative distribution function with a sliding window average of size w to produce a smoothed cumulative distribution function; and

c. subtracting said smoothed cumulative distribution function from said cumulative distribution function to produce said peak detection function; and wherein said step of employing the peak detection function to locate peaks in the histogram includes the steps of:

a. identifying positive to negative zero crossings of the peak detection function as the start of a detected histogram peak, and

b. identifying a maximum following such a positive to negative zero crossing as the end of a detected histogram peak.

2. In a method of processing a digital image by computer, including the steps of forming a gray-level histogram of the digital image, forming a peak detection function from the gray-level histogram, employing the peak detection function to detect peaks in the histogram, and employing the location of detected peaks to process the image, the improvement wherein said step of forming a peak detection function comprises the step of: convolving the histogram with a function $q_w(n)$ of the form:

$$q_w(n) = d(n) * s_w(n)$$

where

$$d(n) = -1, \; n = -1$$

$$1, \; n = 0,$$

and

$$1/w, \; n = -[(w-1)/2] + 1$$

$$s_w(n) = [n + ((w-1)/2) + w s_w(n-1)]/w, \; n =$$

$$-[(w-1)/2] + 2, \ldots, 0 \; s_w(-n), \; n = 1,2 \ldots [(w-1)/2] - 1.$$

where w is an adjustable parameter representing the size of an averaging window, and wherein said step of employing the peak detection function to loacate peaks in the histogram includes the steps of:

a. identifying positive to negative zero crossings of the peak detection function is the start of a detected histogram peak, and

b. identifying a maximum following such a positive to negative zero crossing as the end of a detected histogram peak.

3. The digital image processing method claimed in claims 1 or 2, further including the steps of:

a. employing a relatively wide window size w to form a first peak detection function;

b. employing a relatively narrow window size w to form a second peak detection function; and

c. forming a set of detected peaks located from said first and second peak detection functions based upon the percentage of overlap between the peaks located by said first and second peak detection functions.

4,731,864

PHOTOGRAPHIC CAMERA SIMULATION SYSTEMS WORKING FROM COMPUTER MEMORY

Andrew A. Modla, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 21, 1986, Ser. No. 831,561
Int. Cl.[4] G06K *9/00;* **H04N** *1/387*
U.S. Cl. 382—54 **4 Claims**

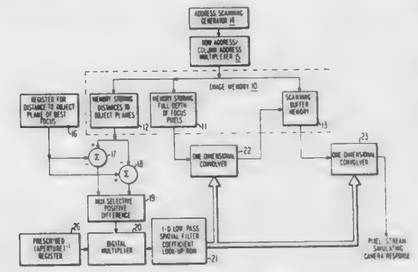
3. A method for electronically generating images of controlled focus and depth-of-focus, said method comprising the steps of:

mapping a camera field-of-view in memory, providing for each of selected points in image space a datum concerning the intensity of image at that point and a datum concerning the distance between the principal axis of the camera lens and the object plane of that point:

scanning said memory during reading thereof;

convolving an adjustable-bandwidth low-pass spatial filtering kernel and the data that scanning the memory during reading thereof supplies concerning the intensity of image, for generating samples of said images of controlled focus and depth-of-focus; and

adjusting the spatial bandwidth of said low-pass spatial filtering kernel responsive to the data that scanning the memory during reading thereof supplies concerning the distance between the principal axis of the camera lens and the object plane.

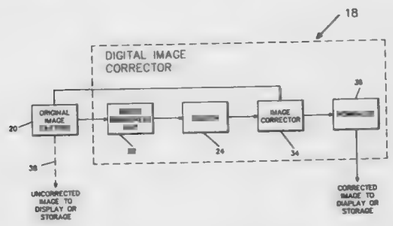


4,731,865

DIGITAL IMAGE CORRECTION

Crispian L. Sievenpiper, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Mar. 27, 1986, Ser. No. 844,842
Int. Cl.[4] G06K *9/56*
U.S. Cl. 382—54 **13 Claims**



1. Apparatus for correcting an image, wherein said image is an array of rows and columns of pixels each having a brightness represented by a digital value, comprising:

first means for estimating a gross brightness of each pixel in said image from a brightness of at least one of a first set of pixels surrounding said pixel to produce a gross brightness map of said image;

second means for estimating a smoothed brightness of each pixel in said gross brightness map from a weighted brightness of a second set of pixels surrounding said each pixel to produce a smoothed brightness map; and

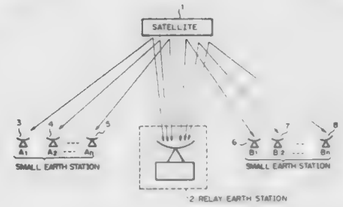
means for multiplying each pixel in said image by an inverse of its corresponding pixel in said smoothed brightness map to produce a corrected image from which artifacts of an imaging system are removed.

4,731,866

TRANSMISSION POWER CONTROL SYSTEM IN A SATELLITE COMMUNICATION

Takurou Muratani, Kanagawa; Tatsuo Watanabe, and Hideo Kobayashi, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,529
Claims priority, application Japan, Sep. 12, 1985, 60-200517
Int. Cl.[4] H04B *7/185*
U.S. Cl. 455—9 **5 Claims**



1. A transmission power control system in a satellite communication system comprising:

a plurality of small earth stations;

a satellite; and

a relay earth station which has larger antenna and a higher power transmitter than antennas and transmitters of said small earth stations, so that digital communication between said small earth stations is performed through said satellite and said relay earth station, said relay earth station regenerates received digital signals,

each of said small earth stations measures rain attenuation in a down link from the satellite to the small earth stations, and sends information about rain attenuation in an up link from each small earth station to the satellite based upon measured data in the down link,

said small earth station sending the information about rain attenuation in the up link to the relay earth station together with the transmission signal,

the relay earth station controls transmission power to said small earth station according to the rain attenuation information received from each said small earth station, so that resin attenuation at the small earth station is compensated

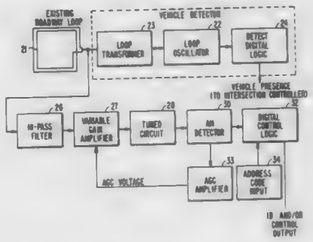
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4,731,867

VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS

Thomas W. Seabury, Diablo, and Thomas Potter, Los Alamitos, both of Calif., assignors to Detector Systems, Inc., Stanton, Calif.

Filed Apr. 21, 1986, Ser. No. 854,376
Int. Cl.[4] H04B *5/00*
U.S. Cl. 455—41 **14 Claims**



1. A communication system for enabling transfer of informa-

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tion between a vehicle and a stationary information location, said system comprising:

a vehicle mounted transmitter means for enabling transmission of preselected information signals over a relatively small range; and

stationary receiver means for receiving said information signals transmitted by said transmitter means when within said range,

said transmitter means including means for generating an encoded carrier frequency signal lying within a transmitting frequency range different from the frequency range of the vehicle detector system loop signals and containing said preselected information signals,

said receiver means including a vehicle detector system loop antenna and means for distinguishing said preselected information signals from conventional vehicle detector signals present in said vehicle detector system loop antenna.

4,731,868

CIRCUITRY IN A SCANNING RECEIVER FOR SPEEDING UP THE GENERATION OF A RECEPTION OR NON-RECEPTION CRITERION

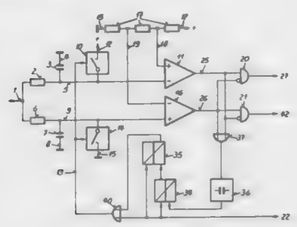
Ernst Dreier, Jegenstorf, Switzerland, assignor to Autophon AG, Solothurn, Switzerland

Filed Nov. 15, 1985, Ser. No. 798,399

Claims priority, application Switzerland, Nov. 15, 1984, 5459/84

Int. Cl.⁴ H04B *1/10*

U.S. Cl. 455—161 **4 Claims**



1. Circuitry in a wireless signal receiver for generating a receive criterion, i.e. for detecting the reception or non-reception of a signal, for receivers being alternating on reception on several channels and having facilities for seeking a free or an occupied channel, of the type having first circuit means for generating a DC signal as a noise criterion proportional to the strength of the noise at the receiver output, for generating a criterion for the reception or the non-reception of a wireless signal if the value of said noise criterion is below or above a certain limit potential, further having second circuit means dividing the time into measurement periods, a capacitance with a first and a second terminal, the first terminal being connected with any fixed potential, third circuit means, controlled by said second circuit means, for connecting said second terminal of said capacitance, before the beginning of a measurement period, to a base, potential having one of the possible extreme values of the noise criterion, and during the measurement period via a resistance to the potential of the noise criterion, the improvement comprising:

fourth circuit means, including a digital output, for comparing the potential at said second terminal with a threshold potential having a value between said base potential and said limit potential, the potential appearing at said digital output depending solely upon the polarity of the difference between the potentials to be compared, fifth circuit means with an input, connected to the output of the fourth circuit means determining the reception or non-reception of a signal based upon the moment at which a change of the potential at its input occurs within the respective one of said measuring periods.

4,731,869

TARGET TRACKING TRANSMITTER HAVING TWO LEVELS OF POWER OPERATION

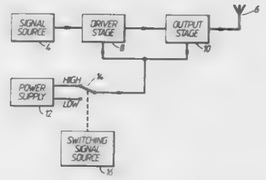
Alan R. K. Farrer, Chichester, Great Britain, assignor to Plessey Overseas Limited, Ilford, England

Filed Feb. 18, 1986, Ser. No. 830,771

Claims priority, application United Kingdom, Feb. 18, 1985, 8504135

Int. Cl.⁴ H03B *1/04*

U.S. Cl. 455—127 **5 Claims**



1. A target tracking transmitter comprising an internal voltage supply having a first operative level and a second reduced operative level, an output stage coupled to the voltage supply for supplying radio frequency signals for detection by a receiver remote from the target tracking transmitter, and switching means, coupled to the voltage supply, for cycling said supply between the first and second operative levels, said levels both arranged to provide sufficient power to the output stage for enabling continuous transmission of the radio frequency signals, wherein the switching means is arranged to control the time for which the transmitter is cycled at the first and second operative voltage levels whereby the operating life of said voltage supply is maximised whilst enabling continuous transmission of the radio frequency signals throughout the operating life of the voltage supply.

4,731,870

PLATFORM TRANSMITTER TERMINAL (PTT) FOR USE WITH AN ARGOS TYPE SATELLITE SYSTEM AND UTILIZING A SOLAR ARRAY/RECHARGEABLE BATTERY POWER SOURCE

Harold D. Black, Highland; John Daniels, Baltimore, both of Md.; Nadav Levanon, Ramat-Gan, Israel, and Thomas E. Strikwerda, Kensington, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 23, 1984, Ser. No. 674,128

Int. Cl.⁴ H04B *1/04*; H01Q *11/12*

U.S. Cl. 455—127 **15 Claims**

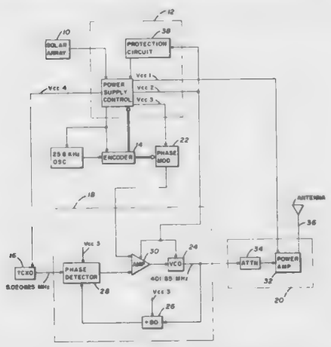
1. A portable transmitter for transmitting information to an earth satellite, comprising:

a rechargeable battery;

a solar array operably connected to said battery for charging said rechargeable battery;

a transmitter means for sending information to a satellite; and,

a load control means operably connected to said rechargeable battery and said transmitter means, for operably actuating said transmitter means when the voltage level of said rechargeable battery reaches a first threshold level and for deactivating said transmitter means when the voltage level of said rechargeable battery subsequently falls to a second lower threshold level, wherein said load control means further includes a controller means, for sequentially applying power to components of said transmitter means during each transmission cycle that said transmitter means is actuated.



4,731,871

TUNING DEVICE FOR LIQUID CRYSTAL TELEVISION

Ryo Ishikawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,811

Claims priority, application Japan, Nov. 18, 1985, 60-258415

Int. Cl.⁴ H04B *1/16*

U.S. Cl. 455—182 **6 Claims**

1. A tuning device for a liquid crystal television having a tuner for tuning according to a local oscillation frequency, a linear circuit for amplifying and detecting an intermediate frequency signal produced by the tuner, an A/D converter for converting a video signal detected by the linear circuit to a digital video signal, and a liquid crystal display unit for displaying video according to the digital video signal output from the A/D converter, comprising:

a power source;

a prescaler for dividing the local oscillation frequency of the tuner by a predetermined ratio when said power source is connected to the prescaler,

a programmable counter for dividing further the frequency signal divided by said predetermined ratio by said prescaler to a selected value when said power source is connected to said couter,

a phase comparator for comparing in phase the signal divided further by said counter with a reference frequency signal when said power source is connected to the phase comparator,

a low pass filter for generating a tuning voltage for controlling the local oscillation frequency of said tuner in response to a comparison signal output from said comparator,

mode deciding means for selecting one of a tuning mode and a receiving mode in response to operating conditions of the liquid crystal television, to output a decision signal,

switching means for interrupting said power source at least to said prescaler when the receiving mode is determined by said mode deciding means, and

holding means coupled to said mode deciding means for holding the tuning voltage of said tuner constant, including means for generating an AFT signal for drawing an S-curve characteristic with the intermediate frequency as a center, when in the receiving mode.

4,731,872

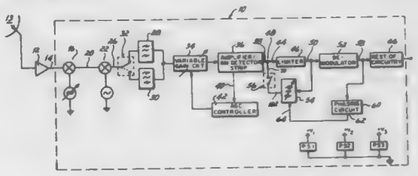
FM TVRO RECEIVER WITH IMPROVED OSCILLATING LIMITER

Clyde Washburn, Jr., Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 717,250, Mar. 25, 1985, Pat. No. 4,679,247. This application Feb. 7, 1986, Ser. No. 827,327

Int. Cl.⁴ H04B *1/16*; H03D *3/24*

U.S. Cl. 455—210 **27 Claims**



1. A circuit for reducing noise in an FM signal modulated by a plurality of baseband signal components, each at a respective frequency f_m, comprising:

a limiter having an input adapted to receive such an FM signal and an output, the limiter having a first time delay td_1;

feedback means coupling the limiter output to the limiter input and responsive to control signals for phase modulating signals fed back therethrough by the control signals and for providing regenerative feedback around the limiter, the feedback means having a second time delay td_2;

control means responsive to the limiter output for generating the control signals, the control means including first means having a third time delay td_3 for generating first signals corresponding to baseband signal components of a received FM signal, each at a respective frequency f_m, and second means advancing the phase of each of the first signals by a respective amount ϕ_n wherein

$$\phi_n \text{ approximately equals } 360° \cdot \frac{td_1 + td_2 + td_3}{1/f_n}$$

for generating the control signals.

4,731,873

SQUELCH TRIGGER CIRCUIT

Kenneth G. Voyce, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1986, Ser. No. 913,843

Int. Cl.⁴ H04B *1/10*

U.S. Cl. 455—219 **22 Claims**

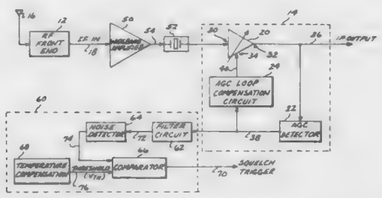
1. A circuit for receiving a modulated carrier signal having a predetermined information band and producing an output signal indicative of the level of the modulated carrier signal, the circuit comprising:

a bandpass filter connected to receive the modulated carrier signal and to produce a bandpass filtered signal, the bandpass filter having a passband that includes the information

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band, whereby substantially all frequency components within the information band of the modulated carrier signal pass through the bandpass filter, but noise components having frequencies outside the passband are substantially attenuated by the bandpass filter;

an AGC circuit connected to receive the bandpass filtered signal and to amplify the bandpass filtered signal to produce an IF output signal having a noise component that is outside of the band passed by the bandpass filter, the level of the noise component being directly proportional to the



gain of the AGC circuit and thus inversely proportional to the level of the modulated carrier signal, the AGC circuit including an AGC detector connected to receive the IF output signal and to produce a detection signal having a characteristic indicative of the level of the IF output signal; and

a trigger circuit including means for receiving the detection signal and means for producing the output signal when the level of the noise component in the IF output signal crosses a threshold.

4,731,874

RADIO RECEIVER HAVING SECOND RECEIVER PART FOR AVOIDING INTERFERENCE SIGNALS

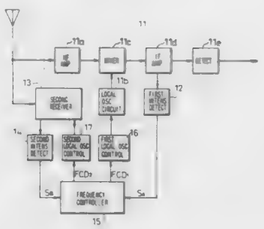
Nobuo Ichikawa, Iwaki, Japan, assignor to Alpine Electronic, Ltd., Japan

Filed Feb. 28, 1986, Ser. No. 834,748

Claims priority, application Japan, Feb. 28, 1985, 60-28640[U]

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—258 **2 Claims**



1. A radio receiver comprising:

a first radio receiving part having means for receiving a desired radio signal of a given frequency transmitted from a broadcasting station, means for generating a first local oscillation frequency, and means for mixing the received radio signal with the generated first local oscillation frequency to obtain an intermediate frequency (IF) signal corresponding to the desired signal;

a first detector connected to an output of the first radio receiving part for detecting a field intensity of the desired signal received by the first radio receiving part;

a second radio receiving part having means for receiving a disturbing radio signal having a frequency adjacent the frequency of the desired radio signal;

a second detector connected to an output of the second radio receiving part for detecting a field intensity of the disturbing signal received by the second radio receiving part;

a receiving frequency controller connected to the first and second detectors having means for comparing the field intensity of the desired signal with the field intensity of the disturbing signal, and for providing a first control signal for shifting the IF frequency of the desired signal in a direction away from the frequency of the disturbing signal based upon said comparing of field intensities; and

a first local oscillation frequency controller receiving the first control signal output of the receiving frequency controller and providing an output to the first radio receiving part for controlling said means for generating the first local oscillation frequency so as to shift the IF frequency of the desired signal in the direction away from the frequency of the disturbing signal.

4,731,875

FREQUENCY CONVERTER USED FOR A RECEIVER WHICH RECEIVES SIGNALS OF A UHF BAND OR A MICROWAVE BAND

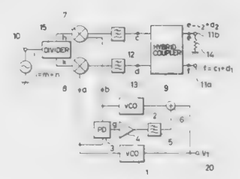
Hiroyuki Mizukami; Masaki Noda; Toshio Nagashima, and Keiro Shinkawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,626

Claims priority, application Japan, Feb. 8, 1985, 60-21646

Int. Cl.[4] H04B *1/10*

U.S. Cl. 455—302 **5 Claims**



1. A frequency converter comprising:

(a) a signal divider which has an input terminal to which will be input an input signal that contains a main signal and an image signal, and which divides the input signal supplied to said input terminal into a first divided input signal and a second divided input signal;

(b) a first local oscillation signal generator circuit which has a frequency control terminal that is served with a channel select voltage, and a first voltage-controlled oscillator which generates a first local oscillation signal whose oscillation frequency changes depending upon the channel select voltage supplied to said frequency control terminal;

(c) a second local oscillation signal generator circuit which generates a second local oscillation signal, the frequency of said second local oscillation signal being equal to the frequency of the first local oscillation signal generated by said first local oscillation signal generator circuit, and the phase of the second local oscillation signal being different by 90 degrees from the phase of the first local oscillation signal;

(d) a first mixer circuit which is connected to said signal divider and to said first local oscillation signal generator circuit, which is served with the first divided input signal from said signal divider and with the first local oscillation signal from said first local oscillation signal generator, and which generates a first intermediate-frequency signal of a wavelength λ that contains a first necessary signal obtained from the main signal and a first unnecessary signal obtained from the image signal, responsive to the first divided input signal and the first local oscillation signal;

(e) a second mixer circuit which is connected to said signal divider and to said second local oscillation signal generator circuit, which is served with the second divided input signal from said signal divider and with the second local oscillation signal from said second local oscillation signal generator, and which generates a second intermediate-frequency signal of a wavelength λ that contains a second necessary signal obtained from the main signal and a second unnecessary signal obtained from the image signal, responsive to the second divided input signal and the second local oscillation signal; and

(f) a hybrid coupler which is connected to said first and second mixer circuits, which is served with the first intermediate-frequency signal from said first mixer circuit and with the second intermediate-frequency signal from said second mixer circuit, which has at least one output terminal, which supplies the first intermediate-frequency signal to the output terminal thereof, and which supplies the said second intermediate-frequency signal to the output terminal thereof, the second intermediate-frequency signal being delayed by a quarter of the wavelength (¼λ) behind the first intermediate-frequency signal, such that the phase of the first unnecessary signal is different by 180 degrees from the phase of the second unnecessary signal, and that the first and second unnecessary signals are cancelled by each other;

wherein the hybrid coupler is constituted by a surface acoustic wave filter which consists of a first input electrode, a second input electrode, and an output electrode, and which propagates elastic waves, and wherein the first input electrode is connected to the first mixer circuit, the second input electrode is connected to the second mixer circuit, and the distance between the second input electrode and the output electrode is greater than the distance between the first input electrode and the output electrode by a quarter of the wavelength of the elastic wave.

4,731,876

VHF MIXER CIRCUIT WITH BAND DEPENDENT SWITCHING

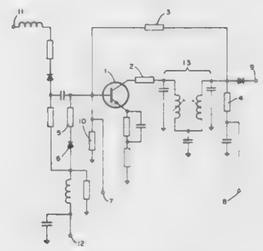
Gerhard Maier, Dauchingen; Bertram Fischer, Deisslingen, and Erich Kirschner, Göllsdorf, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH., Villingen-Schwenningen, Fed. Rep. of Germany

Continuation-in-part of PCT EP85/00013, Jan. 16, 1985, published as WO85/03393, Aug. 1, 1985. This application Sep. 20, 1985, Ser. No. 778,149

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401863

Int. Cl.[4] H04B *1/28*

U.S. Cl. 455—333 **17 Claims**



1. A mixer circuit for the VHF-television transmission bands I and III comprising

a mixer transistor having a base, an emitter and a collector, where emitter and collector represent intermediate frequency power connections of the mixer transistor and where the collector provides a collector voltage during operation;

an input terminal connected to the base of the mixer transistor for applying an oscillator voltage to the base;

a collector resistor having a first terminal connected to the collector of the mixer transistor;

a two pole intermediate frequency filter connected with a first terminal to a second terminal of the collector resistor;

an output terminal connected to a second terminal of the two pole intermediate frequency filter;

a current limiting resistor connected to the second terminal of the two pole intermediate frequency filter, where the collector voltage is fed to the transistor via the current limiting resistor, the two pole intermediate frequency filter and the collector resistor;

a base resistor having a first terminal connected to the base of the mixer transistor, where a second terminal of the base resistor is connected to ground;

a series circuit of a diode and a resistor having a first terminal connected to the base of the mixer transistor, where a second terminal of the series circuit is connected to ground; and

a resistor for operating point adjustment disposed between the base for the mixer transistor and the second terminal of the two pole intermediate frequency filter, where the resistor for operating point adjustment together with the base resistor form a voltage divider, which is dimensioned such that self-disturbances in the band I are suppressed while operating in the band I and that while operating in the region of band III the base voltage level of the same mixer transistor is modified by a switching of the voltage resulting for band III via the series circuit of the diode and the resistor such that the mixer current while operating in band III is substantially increased in comparison with the mixer current corresponding to operating in the region of band I.

4,731,877

TUNABLE LOWPASS-HIGHPASS SWITCHING FILTER

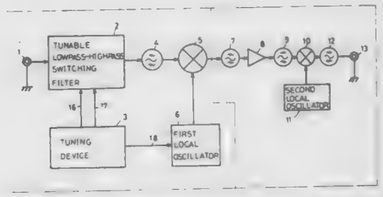
Fredrick H. Moon, Seoul, Rep. of Korea, assignor to Samsung Electronic Parts Co., Ltd., Suweon, Rep. of Korea

Filed May 29, 1986, Ser. No. 869,385

Claims priority, application Rep. of Korea, May 31, 1985, 85-3791

Int. Cl.[4] H04N *1/16*

U.S. Cl. 455—340 **2 Claims**



1. A tunable and switchable filter for reducing intermodulation distortion levels in a multichannel communications receiver comprising:

an input terminal for receiving signals broadcast over a plurality of communication channels;

an output terminal;

first and second series connected capacitors coupled between said input terminal and said output terminal;

first and second series connected inductors coupled between said input terminal and said output terminal;

third and fourth series connected inductors, a third capacitor and a first variable capacitance diode connected in series between the common junction of said first and second series connected inductors and the common junction of said first and second capacitors;

first and second diodes for selectively shunting one of the common junction of said first and second capacitors and the common junction of said third and fourth inductors directly to reference ground potential, wherein said selec-

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tive shunting establishes one of a lowpass and a highpass filter characteristic between said input terminal and said output terminal;

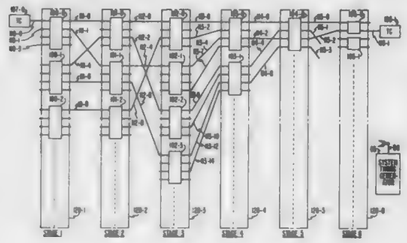
a third diode for selectively shunting said first and second inductors directly to reference ground potential for lowering the frequency of the trap in highpass filter mode.

4,731,878

SELF-ROUTING SWITCH NODE COMBINING ELECTRONIC AND PHOTONIC SWITCHING

Avinash K. Vaidya, Naperville, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 29, 1985, Ser. No. 803,088
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—600 **22 Claims**



1. A switch node for use in a switching network having a plurality of sequential stages each stage comprising a plurality of said switch nodes for the communication of information between network input and output ports, said switch node comprising:

means responsive to the receipt of electronic address signals for establishing an electronic path and photonic path from each stage to the next sequential stage; and

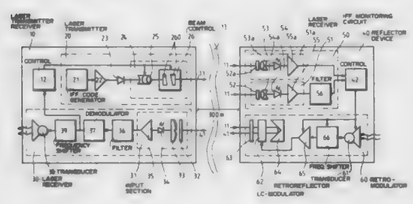
means responsive to photonic data information received via the photonic path for switching the latter information through said switch node.

4,731,879

REMOTE DATA MONITORING SYSTEM

Gunther Sepp, Ottobrunn, and Anton Harasim, Taufkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,411
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328335
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—605 **30 Claims**



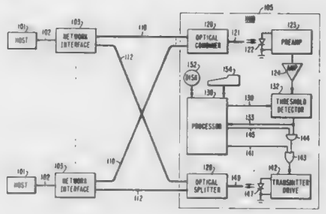
1. A remote data monitoring system for interrogating information from a remote interrogated location, comprising laser transmitter-receiver means (10) at an interrogating location, to transmit a laser beam (11) comprising upper and lower frequency bands, and retroreflector means (40) at said remote interrogated location, said laser transmitter-receiver means (10) comprising a laser transmitter section (20) including laser transmitter means (23, 24, 25, 26) including a semiconductor laser (23) and wavelength stabilizing means as part of said semiconductor laser (23) for stabilizing the wavelength of said semiconductor laser (23) and an IFF-code generator means (21) operatively connected to said laser transmitter means for modulating said upper frequency band onto said laser beam (11) transmitted by said laser transmitter means (23, 24, 25, 26), said laser transmitter-receiver means further comprising a laser receiver section (30) for receiving a reflected beam (41) comprising upper and lower frequency bands, said receiver section (30) including laser receiver means (31, 32, 33, 34, 35), an IFF-code demodulator (37) and first control means (12) connected to said IFF-code demodulator (37) and to said laser transmitter means for controlling the laser transmitter means in accordance with received information, said laser receiver section (30) further comprising transducer means (38) connected to said IFF-code demodulator (37) for providing an information output, said retroreflector means (40) comprising a retroreflector section and means including an IFF-monitoring circuit (50) for fully activating said retroreflector section only in response to a transmitted laser beam (11) modulated at said upper frequency band with an IFF-code and for fully deactivating said retroreflector section in response to a foe laser interrogation, information sensing means (61) for sensing information at said remote location, and a retroreflector (64), amplifier (65) and liquid crystal reflector modulator means (62) arranged for modulating said lower frequency band of said laser beam (11) in response to information sensed by said information sensing means (61) at said remote location to produce said reflected beam (41) simultaneously carrying information containing signals in said lower frequency band and IFF-code signals in said higher frequency band, said semiconductor laser (23) and said liquid crystal reflector modulator means (62) requiring a low voltage, low current power supply.

4,731,880

COMMUNICATION NETWORK

Cyrus F. Ault, and Clinton D. Gibler, both or Wheaton, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 494,101, May 12, 1983, abandoned.
This application Aug. 28, 1986, Ser. No. 902,102
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—607 **31 Claims**



31. A star configuration optical network for interconnecting a plurality of otherwise unconnected data handling stations comprising:

a plurality of network interface means each adapted to be connected to a data handling station;

a network hub for transferring a serial data stream from any one of said interface means to any other; and

transmission means comprising optical fibers connecting said hub to each of said interface means;

said hub comprising hub receiver means comprising an optical combiner for additively combining the optical signals received from said transmission means for receiving a serial data stream from any of said interface means and hub transmitting means for transmitting signals to any of said interface means, data transfer means coupled to said hub receiver means and hub transmitter means for generating a combined data stream from the output of said optical combiner and for transferring said combined data stream from said hub receiver means to said hub transmitter means, and controller means including stored program instructions coupled to said data transfer means operative under control of said program instructions for monitoring the data contents of said combined data stream as it is transferred by said data transfer means and responsive to said monitored data and said program instructions for selectively inhibiting the transfer of data by said data transfer means.

4,731,881

NARROW SPECTRAL BANDWIDTH, UV SOLAR BLIND DETECTOR

Myer Geller, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

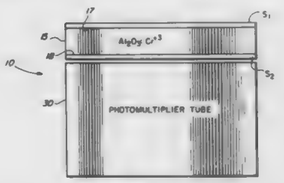
Filed Jun. 30, 1986, Ser. No. 880,513
Int. Cl.[4] H04B 9/00; G01J 1/42
U.S. Cl. 455—619 **3 Claims**

3. A method of improving the detection efficiency of an information signal within the solar blind UV spectrum comprising:

blocking out signals other than a passband including the information signal;

shifting the frequency of the information signal to a bandwidth outside of the solar blind UV spectrum;

blocking out signals other than the bandwidth outside of the solar blind UV spectrum and



amplifying the signals within the bandwidth, the shifting includes the transition of wavelengths to longer wavelengths and the transition includes locating a ruby block to receive the information signal passband to assure the transition to the longer wavelengths of fluorescent emission.

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294,650
SELF-ADHESIVE BREAST SUPPORTING ARTICLE
Marcel M. De Beys, Ohain, Belgium, assignor to Bust Cosmetics, Brussels, Belgium
Filed Nov. 1, 1984, Ser. No. 667,104
Claims priority, application Benelux, May 7, 1984, 12244
Term of patent 14 years
U.S. Cl. D2—1



294,652
EXPANDABLE HAT AND FAN
Michael Chang, 243-D Lakehurst, Waukegan, Ill. 60085
Filed Apr. 12, 1985, Ser. No. 722,594
Term of patent 14 years
U.S. Cl. D2—253





294,651
TWIN-SHARED POCKET FOR A GARMENT
Gianfranco Ferré, Milan, Italy, assignor to AB.AB. Abbigliamento Abruzzese S.p.A., Roseto Degli Abruzzi, Italy
Filed Jul. 18, 1985, Ser. No. 756,774
Claims priority, application Italy, Jan. 22, 1985, 20556/85[U]
Term of patent 14 years
U.S. Cl. D2—25





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294,653
SHOE
Tuan N. Le, Cohasett, Mass., assignor to Reebok International Ltd, Canton, Mass.
Filed Oct. 22, 1986, Ser. No. 922,100
Term of patent 14 years
U.S. Cl. D2—278



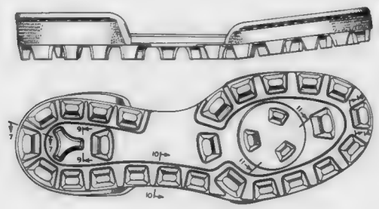


294,654
ATHLETIC SHOE UPPER
Steven Liggett, North Easton; Paul Brown, Hingham; Tuan Le, Cohasset; Andrea Kelly, West Roxbury, and Edward Lussier, Hingham, all of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed May 2, 1986, Ser. No. 859,871
Term of patent 14 years
U.S. Cl. D2—314

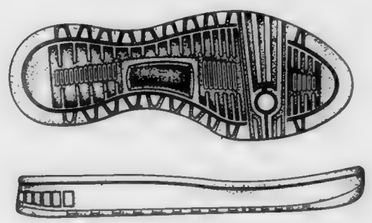




294,655
SOFTBALL SHOE SOLE
Keith R. Heyes, Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.
Filed Jan. 21, 1986, Ser. No. 820,642
Term of patent 14 years
U.S. Cl. D2—320



294,656
SHOE SOLE
Steven P. Liggett, North Easton, and Tuan N. Le, Cohasset, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 20, 1985, Ser. No. 805,942
Term of patent 14 years
U.S. Cl. D2—320



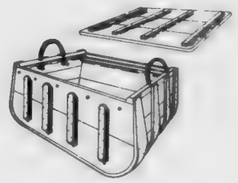
294,657
SUSPENDERS
Richard C. Weidman, and W. Jeffrey Weidman, both of 12020 Greywing Sq., Apt. A3, Reston, Va. 22091
Filed Jun. 17, 1985, Ser. No. 746,048
Term of patent 14 years
U.S. Cl. D2—626



294,658
BELT
Wesley L. Davenport, Sr., Rte. 1, Box 525-C, Hanover, Va. 23069
Filed Jul. 17, 1984, Ser. No. 631,725
Term of patent 14 years
U.S. Cl. D2—633



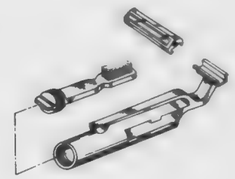
294,659
WANIGAN
James P. Hanna, and Lisa F. Hanna, both of HCR 71, Box 165, Machias, Me. 04654
Filed Jan. 18, 1985, Ser. No. 692,614
Term of patent 14 years
U.S. Cl. D3—30.1



294,660
PEN AND PENCIL HOLDER FOR AUTOMOBILE VISOR OR SIMILAR ARTICLE
Murray Strongwater, 326 Hewlett Neck Rd., Woodmere, N.Y. 11598
Filed Apr. 25, 1985, Ser. No. 727,109
Term of patent 14 years
U.S. Cl. D3—40

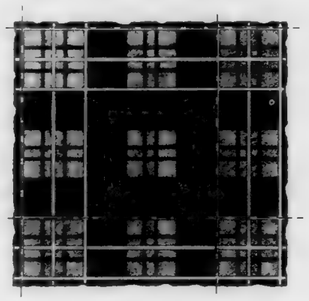


294,661
COMBINED TOOTHBRUSH AND RAZOR
Jin S. Kang, 2885 W. 7th St., Los Angeles, Calif. 90005
Filed Jul. 15, 1985, Ser. No. 754,948
Term of patent 14 years
U.S. Cl. D4—108

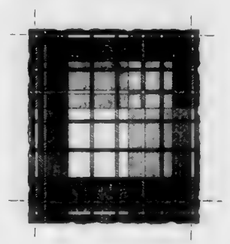


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294,662
TEXTILE FABRIC
T. Stuart Davidson, Stirling, Scotland, assignor to Neil Aylmer Hunter, West Kilbride, Scotland
Filed Apr. 29, 1985, Ser. No. 728,981
Claims priority, application United Kingdom, Oct. 30, 1984, 84314400
Term of patent 14 years
U.S. Cl. D5—46



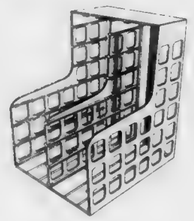
294,663
TEXTILE FABRIC
Elaine T. Gosling, London, England, assignor to James Buchanan and Co., Limited, London, England
Filed Jan. 9, 1985, Ser. No. 689,978
Claims priority, application United Kingdom, Jul. 9, 1984, 5143[illegible]
Term of patent 14 years
U.S. Cl. D5—46



294,664
SHOWER SEAT
Charles Clark, 341 Cottonwood, Longmont, Colo. 80501
Filed Mar. 15, 1988, Ser. No. 767,377
Term of patent 14 years
U.S. Cl. D6—380



294,665
STORAGE RACK
Jack Solomon, Long Beach, N.Y., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed May 1, 1985, Ser. No. 729,641
Term of patent 14 years
U.S. Cl. D6—462



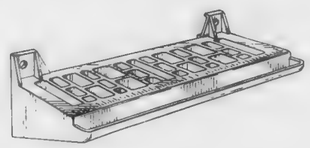
294,666
DESK
Paolo Favaretto, Padua, Italy, and James E. Hayward, Port Perry, Canada, assignors to Innovative Metal, Inc., Rexdale, Canada
Division of Ser. No. 594,178, Mar. 28, 1984. This application Jul. 29, 1986, Ser. No. 890,233
Claims priority, application Canada, Sep. 30, 1983, 30-09-83-1
Term of patent 14 years
U.S. Cl. D6—487



294,667
WALL-MOUNTED SMALL TOOL HOLDER
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Mar. 4, 1986, Ser. No. 841,700
Term of patent 14 years
U.S. Cl. D6—569



294,668
COMPACT TOOL HOLDER
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Mar. 4, 1986, Ser. No. 841,701
Term of patent 14 years
U.S. Cl. D6—570



294,669
WINDOW SHADE PULL OR SIMILAR ARTICLE
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533
Division of Ser. No. 685,158, Dec. 21, 1984, Pat. No. Des. 291,954. This application Jul. 2, 1987, Ser. No. 69,277
Term of patent 14 years
U.S. Cl. D6—581



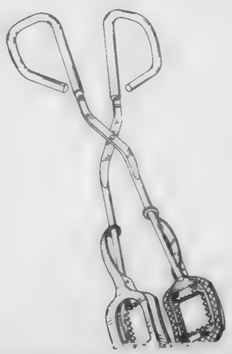
294,670
TACO HOLDER
Kenneth G. Kurtz, 2440 S. Belvoir Blvd., University Hts., Ohio 44118
Filed Jun. 3, 1985, Ser. No. 740,589
Term of patent 14 years
U.S. Cl. D7—27



294,671
NOVELTY STRAW
Stephan Koziol, 6120 Michelstadt/Odenwald, Fed. Rep. of Germany
Filed Aug. 17, 1984, Ser. No. 642,064
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, MR 796
Term of patent 14 years
U.S. Cl. D7—42

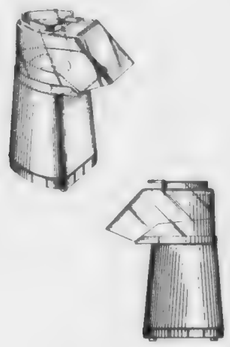


294,672
SELF-ADJUSTING TONGS
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Apr. 8, 1985, Ser. No. 720,578
Term of patent 14 years
U.S. Cl. D7—105

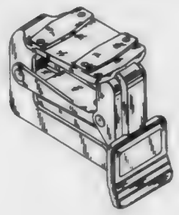


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294,673
CORN POPPER
Harry Solomon, Ville St-Laurent, Canada, assignor to Toastees, Inc., Point Claire, Canada
Filed Mar. 26, 1985, Ser. No. 716,114
Claims priority, application Canada, Mar. 1, 1985, 01-03-85-13
Term of patent 14 years
U.S. Cl. D7—325



294,674
CLOTHES HANGER CLAMP FOR LUGGAGE
Lawrence R. Mobley, Aurora; Richard E. Molesworth, Highlands Ranch, and Daniel R. Skewis, Westminster, all of Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Jul. 12, 1985, Ser. No. 754,473
The portion of the term of this patent subsequent to Feb. 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—330



294,675
POLY-V PULLEY
Masahiro Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-sho, Japan
Filed Nov. 21, 1984, Ser. No. 673,868
Term of patent 14 years
U.S. Cl. D8—360





294,676
CARRIER AND FASTENERS THEREFOR
Ronald J. Egner, Birmingham, and Thomas C. Ait, Grand Rapids, both of Mich., assignors to Textron Inc., Providence, R.I. and Agape, Inc., Grand Rapids, Mich.
Filed Mar. 28, 1985, Ser. No. 716,978
Term of patent 14 years
U.S. Cl. D8—387

294,677
CONTAINER
William C. Rogler, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,648
Term of patent 14 years
U.S. Cl. D9—349



294,678
CONTAINER
Michael Papa, Windsor Locks, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,517
Term of patent 14 years
U.S. Cl. D9—392



294,679
CONTAINER
John E. Griesing, East Granby, and Edward J. Temple, Wethersfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,653
Term of patent 14 years
U.S. Cl. D9—401



294,680
COVER FOR A CONTAINER
Alois Pappert, Nice, France, assignor to Tondeo-France Pappert Diffusion (S.A.), Nice, France
Filed Jan. 11, 1985, Ser. No. 690,749
Claims priority, application France, Jul. 11, 1984, 83 4092
Term of patent 14 years
U.S. Cl. D9—435



294,681
DISPENSING VALVE
John R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Jul. 8, 1985, Ser. No. 752,638
Term of patent 14 years
U.S. Cl. D9—448



294,682
DISPENSING VALVE
John R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Jul. 8, 1985, Ser. No. 752,639
Term of patent 14 years
U.S. Cl. D9—448



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294,683
WRISTWATCH
Alain-Dominique Perrin, Rueil Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Jul. 9, 1985, Ser. No. 753,580
Claims priority, application Hague, Jan. 9, 1985 DM/004617
Term of patent 14 years
U.S. Cl. D10—32

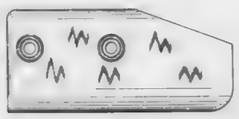


294,684
EARRING
Pepe Saraga, 13910 Old Harbor La., Marina del Rey, Calif. 90293
Filed Aug. 22, 1985, Ser. No. 768,822
Term of patent 14 years
U.S. Cl. D11—42





294,685
MOTORCYCLE MASTER CYLINDER COVER
Douglas G. Opitz, West Bend, Wis., assignor to Harley-Davidson, Inc., Milwaukee, Wis.
Filed Jun. 11, 1985, Ser. No. 743,359
Term of patent 14 years
U.S. Cl. D12—126

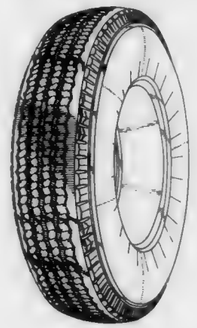




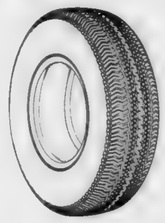
294,686
FOOT GUARD FOR THREE WHEELED VEHICLES
Leon M. Ableidinger, and George D. Pehl, both of Arena, N. Dak. 58412
Filed Apr. 3, 1985, Ser. No. 719,010
Term of patent 14 years
U.S. Cl. D12—126



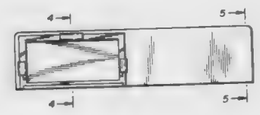
294,687
TIRE OR SIMILAR ARTICLE
Josef Stelzer, Vienna, Austria, assignor to Semperit Reifen AG, Vienna, Austria
Filed Aug. 12, 1985, Ser. No. 764,925
Claims priority, application Austria, Feb. 25, 1985, 535262
Term of patent 14 years
U.S. Cl. D12—142

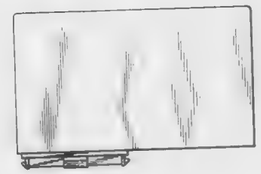


294,688
AUTOMOBILE TIRE
Toshiaki Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 5, 1985, Ser. No. 720,365
Claims priority, application Japan, Jan. 30, 1985, 60-3344
Term of patent 14 years
U.S. Cl. D12—147

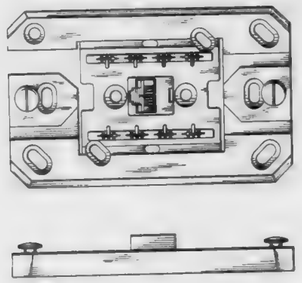


294,689
ADAPTOR FOR A WIRE CHANNEL
David W. Bramwell, Prestatyn, Wales, assignor to EGA Limited, United Kingdom
Filed Aug. 15, 1984, Ser. No. 641,493
Claims priority, application United Kingdom, Jun. 26, 1984, 1020642
Term of patent 14 years
U.S. Cl. D13—13

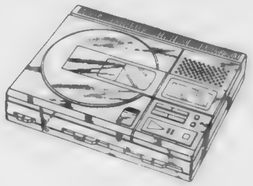




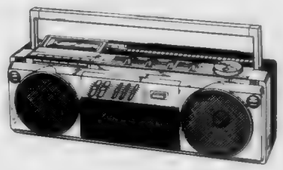
294,690
MULTI-PURPOSE MODULAR JACK CONNECTING BLOCK
Randy Below, Woodbury, Conn.; Howard Burke, Stone Mountain, Ga., and Stephen M. Thomas, Torrington, Conn., assignors to The Siemon Company, Watertown, Conn.
Filed Mar. 1, 1985, Ser. No. 707,442
Term of patent 14 years
U.S. Cl. D13—24



294,691
AUDIO DISK PLAYER
Nobutoshi Yoshida, Tokyo, and Takao Itoh, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 26, 1985, Ser. No. 813,630
Claims priority, application Japan, Aug. 21, 1985, 60-35155
Term of patent 14 years
U.S. Cl. D14—1

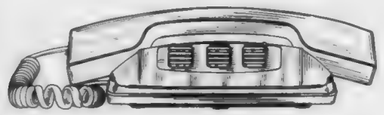


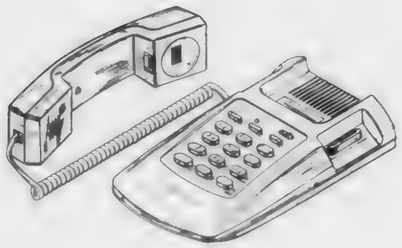
294,692
COMBINED PORTABLE CASSETTE RECORDER AND RADIO
Atsuhiko Urushihara, Kunitachi; Takao Ohsawa, Tokyo, and Moritaka Taniguchi, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 6, 1985, Ser. No. 773,300
Claims priority, application Japan, Jul. 15, 1985, 60-29906
Term of patent 14 years
U.S. Cl. D14—5



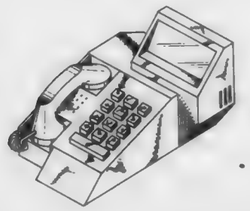
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294,693
TELEPHONE SET
Richard Wu, 12/F., No.126, Nan-Kin E. Rd., Sec. 4, Taipei, Taiwan
Filed Mar. 24, 1986, Ser. No. 845,793
Term of patent 14 years
U.S. Cl. D14—53





294,694
TELEPHONE SET
Esther L. Steward, 1601 Colfax St., P.O. Box 732, Benton Harbor, Mich. 49022-0732
Filed Nov. 27, 1985, Ser. No. 806,927
Term of patent 14 years
U.S. Cl. D14—53

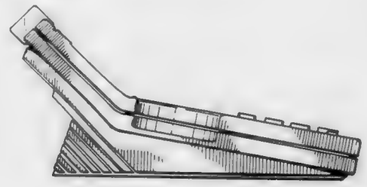


294,695
COMBINATION TELEPHONE HANDSET AND CONSOLE STAND ASSEMBLY
Evert Endt, Paris, France, assignor to Horlogerie Photographique Francaise, Bonneville, France
Filed Aug. 4, 1986, Ser. No. 893,369
Claims priority, application France, Feb. 26, 1986, 860932
Term of patent 14 years
U.S. Cl. D14—53





294,696
BASE FOR A TELEPHONE SET
Michael Brown, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Dec. 9, 1986, Ser. No. 939,940
Term of patent 14 years
U.S. Cl. D14—62





294,697
TELEPHONE
Randy Burkett, and Joann E. Burkett, both of 1029 Carla Pl., Norcross, Ga. 30093
Filed Apr. 28, 1986, Ser. No. 857,827
Term of patent 14 years
U.S. Cl. D14—64

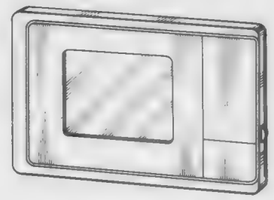




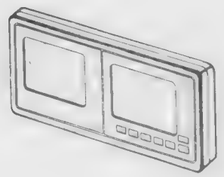
294,698
COMBINED RADIO, SPOTLIGHT, EMERGENCY BLINKING LIGHT AND SOFTLIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Continuation-in-part of Ser. No. 279,820, Jul. 23, 1985. This application May 28, 1985, Ser. No. 738,370
Claims priority, application United Kingdom, Dec. 4, 1984, 1023690
Term of patent 14 years
U.S. Cl. D14—70



294,699
PORTABLE TELEVISION SET
Itsumi Ohzu, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1985, Ser. No. 775,123
Claims priority, application Japan, Apr. 19, 1985, 60-16025
Term of patent 14 years
U.S. Cl. D14—77



294,700
PORTABLE TELEVISION SET
Kazuaki Sakuta, Koganei, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1985, Ser. No. 775,128
Claims priority, application Japan, Apr. 19, 1985, 60-16024
Term of patent 14 years
U.S. Cl. D14—77

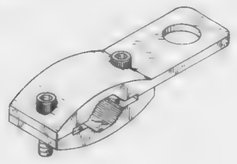


294,701
PORTABLE TELEVISION SET
Tsuyoshi Horii, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 18, 1985, Ser. No. 777,236
Claims priority, application Japan, Mar. 29, 1985, 60-12724
Term of patent 14 years
U.S. Cl. D14—77

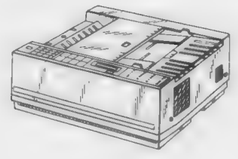


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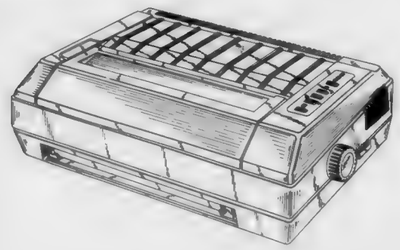
294,702
MOBILE ANTENNA MOUNT
Ronald L. Yoder, Topeka, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.
Filed Sep. 26, 1985, Ser. No. 780,251
Term of patent 14 years
U.S. Cl. D14—91



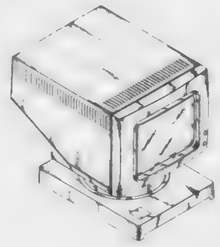
294,703
FACSIMILE
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1985, Ser. No. 717,164
Claims priority, application Japan, Sep. 11, 1984, 59-37835
Term of patent 14 years
U.S. Cl. D14—94



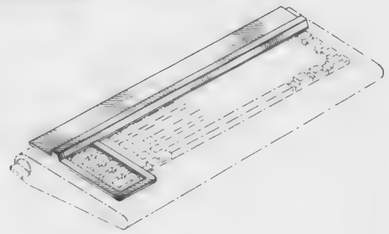
294,704
PRINTER
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Aug. 5, 1985, Ser. No. 762,777
Term of patent 14 years
U.S. Cl. D14—111



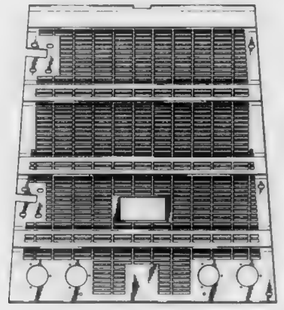
294,705
DISPLAY MONITOR
Roger C. Williams, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Sep. 18, 1985, Ser. No. 777,468
Term of patent 14 years
U.S. Cl. D14—113



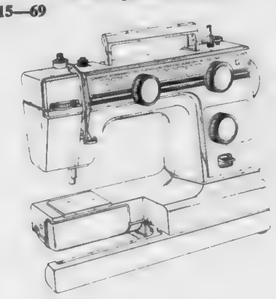
294,706
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to Talisman Development Associates, Inc., Redmond, Wash.
Filed Sep. 27, 1984, Ser. No. 654,915
The portion of the term of this patent subsequent to Sep. 22, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



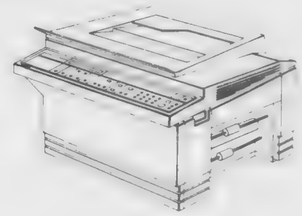
294,707
RADIATOR GUARD FOR A CONSTRUCTION VEHICLE
Thomas M. Cameron, Waukegan, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Jul. 18, 1985, Ser. No. 756,212
Term of patent 14 years
U.S. Cl. D15—31



294,708
SEWING MACHINE
Masatomo Amemiya, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Apr. 4, 1985, Ser. No. 720,145
Claims priority, application Japan, Dec. 17, 1984, 59-51489
Term of patent 14 years
U.S. Cl. D15—69



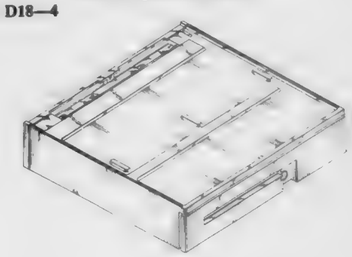
294,709
ELECTROPHOTOGRAPHIC COPYING MACHINE
Andrew T. Serbinski, Brooklyn, N.Y., assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Jul. 25, 1985, Ser. No. 759,128
Claims priority, application Japan, Jan. 25, 1985, 60-002346
Term of patent 14 years
U.S. Cl. D16—32



294,710
GOGGLE STRAP
Wayne Witzel, 978 E. 4555 South, Salt Lake City, Utah 84117
Filed Sep. 20, 1984, Ser. No. 652,130
Term of patent 14 years
U.S. Cl. D16—123

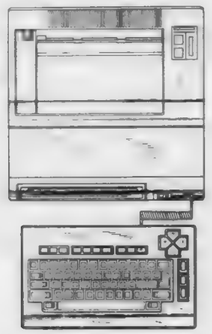


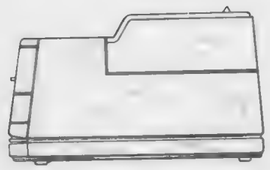
294,711
CASH DRAWER FOR AN ELECTRONIC CASH REGISTER
Roger C. Williams, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Sep. 18, 1985, Ser. No. 777,140
Term of patent 14 years
U.S. Cl. D18—4



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294,712
COMBINED WORD PROCESSOR-PRINTER AND KEYBOARD THEREFOR
Duncan P. Copland, Knoxville, Tenn., assignor to Philips Home Interactive Systems Inc., New York, N.Y.
Filed Jul. 17, 1985, Ser. No. 756,143
Term of patent 14 years
U.S. Cl. D18—13

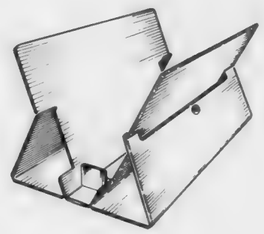




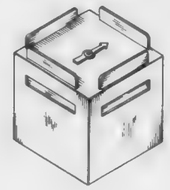


294,713
DOCUMENT HOLDER
Andrew K. Wadams, Wychbold, England, assignor to Kalamazoo plc, Northfield, England
Filed Feb. 12, 1985, Ser. No. 700,910
Claims priority, application United Kingdom, Nov. 24, 1984, 1023482
Term of patent 14 years
U.S. Cl. D19—26

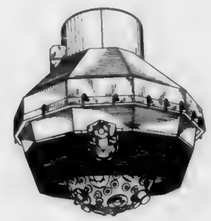




294,714
QUESTION AND ANSWER CUBE
David W. Johnson, 5860 Hanley Rd., Jamestown, Ohio 45335
Filed Aug. 5, 1985, Ser. No. 762,279
Term of patent 14 years
U.S. Cl. D19—59



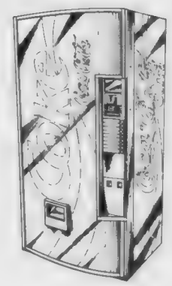
294,715
PLANETARIUM OR SIMILAR ARTICLE
Masamitsu Hattori, Toyokawa; Kenji Shiba, Toyohashi, and Takatsugu Yoshida, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sep. 27, 1985, Ser. No. 781,609
Claims priority, application Japan, Mar. 27, 1985, 60-12320
Term of patent 14 years
U.S. Cl. D19—62



294,716
VENDING MACHINE
Annis R. Morgan, Jr., Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 915,323, Oct. 3, 1986. This application Nov. 4, 1986, Ser. No. 926,774
Term of patent 14 years
U.S. Cl. D20—5



294,717
VENDING MACHINE
Annis R. Morgan, Jr., Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 3, 1986, Ser. No. 915,323
Term of patent 14 years
U.S. Cl. D20—5

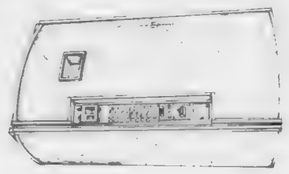


294,718
VENDING MACHINE
Annis R. Morgan, Jr., Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 3, 1986, Ser. No. 915,322
Term of patent 14 years
U.S. Cl. D20—5

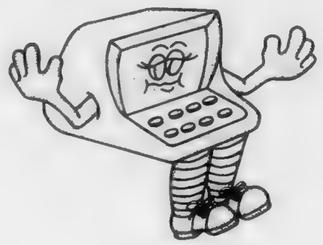


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294,719
VENDING MACHINE
Annis R. Morgan, Jr., Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 915,322, Oct. 3, 1986. This application Nov. 4, 1986, Ser. No. 926,773
Term of patent 14 years
U.S. Cl. D20—5



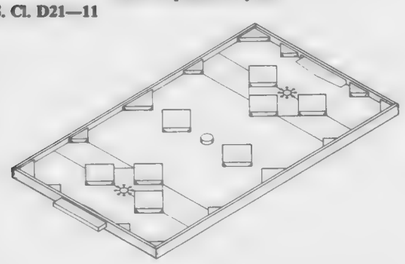
294,721
STUFFED TOY COMPUTER DOLL
Kathleen M. Cowling, P.O. Box 233, Wartburg, Tenn. 37887
Filed Oct. 28, 1985, Ser. No. 792,268
Term of patent 14 years
U.S. Cl. D21—155



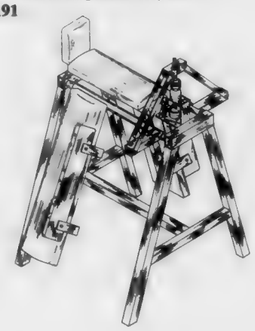
294,722
DOLL
Cheryl A. Barry, 138 Euclid Ave., Lynn, Mass. 01904
Filed Aug. 9, 1985, Ser. No. 764,090
Term of patent 14 years
U.S. Cl. D21—171



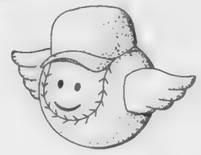
294,720
HOCKEY GAME BOARD
Robert P. MacDowell, Merrick, N.Y., assignor to APM Production Inc., Islandia, N.Y.
Filed Jan. 24, 1985, Ser. No. 694,419
Term of patent 14 years
U.S. Cl. D21—11



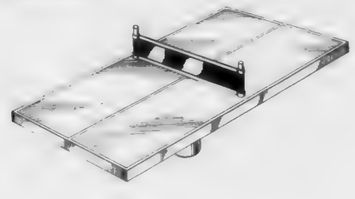
294,723
DYNAMIC STRETCHING MACHINE
Travis C. Fleming, 309 Longview St., Athens, Ala. 35611
Filed Sep. 16, 1985, Ser. No. 776,512
Term of patent 14 years
U.S. Cl. D21—191



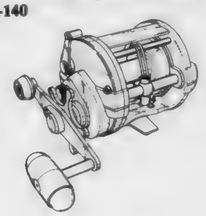
294,724
BASEBALL NOVELTY
Richard G. Lund, 7564 Major Ave. North, Brooklyn Park, Minn. 55443
Filed Dec. 30, 1985, Ser. No. 814,802
Term of patent 14 years
U.S. Cl. D21—204



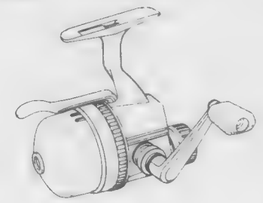
294,725
HAND-HELD GAME PADDLE
Rebecca J. Abbott, 238 Cajon St., Unit A, Laguna Beach, Calif. 92651
Filed Jul. 12, 1985, Ser. No. 754,154
Term of patent 14 years
U.S. Cl. D21—213



294,726
FISHING REEL
Hideo Nakamura, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 5, 1985, Ser. No. 762,532
Claims priority, application Japan, Feb. 25, 1985, 60-7059
Term of patent 14 years
U.S. Cl. D22—140



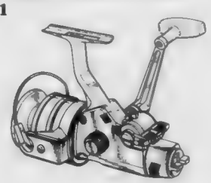
294,727
FISHING REEL
Masakazu Sakamoto, and Kiyoshi Hoshino, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 20, 1985, Ser. No. 805,167
Claims priority, application Japan, May 20, 1985, 60-20899
Term of patent 14 years
U.S. Cl. D22—141



294,728
FISHING REEL
Yasuhisa Kameda, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 8, 1985, Ser. No. 804,794
Claims priority, application Japan, May 9, 1985, 60-19045; Oct. 21, 1985, 60-44160
Term of patent 14 years
U.S. Cl. D22—141

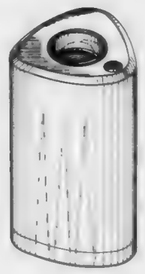


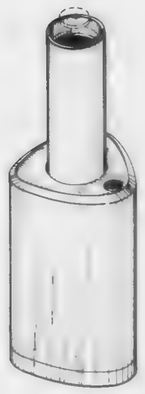
294,729
FISHING REEL
Kanji Iinuma, and Yasuhisa Kameda, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 8, 1985, Ser. No. 804,356
Claims priority, application Japan, May 9, 1985, 60-19044; Jul. 5, 1985, 60-28655
Term of patent 14 years
U.S. Cl. D22—141



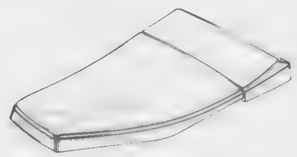
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294,730
POP-UP SPRINKLER
Richard S. Karbo, San Juan Capistrano, Calif., assignor to James Hardie Irrigation, Inc., Laguna Niguel, Calif.
Filed Sep. 29, 1986, Ser. No. 912,614
Term of patent 14 years
U.S. Cl. D23—218

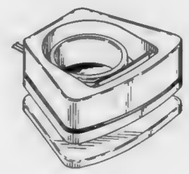




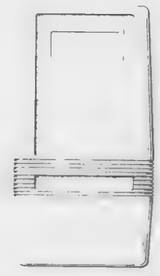
294,731
COVER FOR A PLUMBING FIXTURE OR THE LIKE
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jul. 31, 1985, Ser. No. 761,072
Term of patent 14 years
U.S. Cl. D23—311



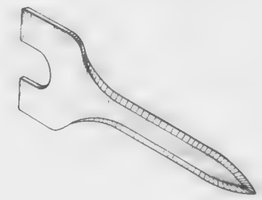
294,732
VAPORIZER BASE FOR A FACIAL SAUNA OR THE LIKE
Michael W. Young, Flushing, N.Y., assignor to Bernard Frank, Miami Beach, Fla.
Filed Aug. 11, 1986, Ser. No. 895,073
Term of patent 14 years
U.S. Cl. D23—360



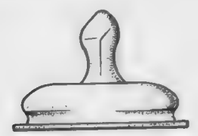
294,733
CASING FOR A DRUG DELIVERY SYSTEM
Lyle V. Peterson, Maple Grove, Minn., and Logan W. Johnson, Green Valley, Ariz., assignors to Pharmacia Deltec, Inc., St. Paul, Minn.
Filed Jan. 23, 1985, Ser. No. 694,104
Term of patent 14 years
U.S. Cl. D24—8



294,734
FORWARD CUTTING PORTION OF A DISPOSABLE SURGICAL SCALPEL BLADE OR THE LIKE
Steven G. Detsch, 4115 The Hill Rd., Bonita, Calif. 92002
Filed Nov. 19, 1985, Ser. No. 805,770
Term of patent 14 years
U.S. Cl. D24—28



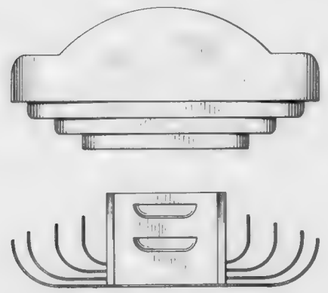
294,735
NIPPLE
Emanuel Morano, Totowa, and William J. Craven, Ridgewood, both of N.J., assignors to Playtex Family Products, Inc., Stamford, Conn.
Filed Jul. 24, 1985, Ser. No. 758,253
Term of patent 14 years
U.S. Cl. D24—46



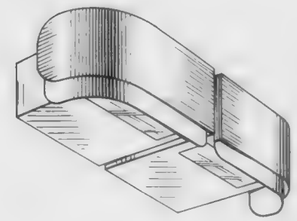
294,736
HAND BANDAGE PROTECTOR
Eskild G. Thygesen, Ikast, Denmark, assignor to A/S Tytex, Ikast, Denmark and Mölnlycke AB, Molnlycke, Sweden
Filed May 20, 1985, Ser. No. 735,490
Claims priority, application Denmark, Nov. 21, 1984, 1050/84
Term of patent 14 years
U.S. Cl. D24—49



294,737
WALL LAMP
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jul. 11, 1985, Ser. No. 753,904
Term of patent 14 years
U.S. Cl. D26—86



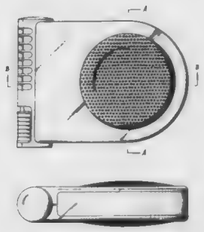
294,738
WALL LAMP
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jul. 16, 1985, Ser. No. 755,566
Term of patent 14 years
U.S. Cl. D26—86



294,739
WALL LAMP
Gerhard E. Joerger, Hans-Thoma-Strasse 89-99, 6800 Mannheim 25, Fed. Rep. of Germany
Filed Aug. 12, 1985, Ser. No. 764,899
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 1291
Term of patent 14 years
U.S. Cl. D26—87

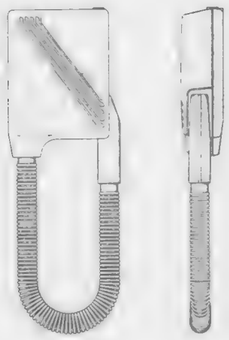


294,740
HAIR DRYER CASING
Kazuyoshi Yonezawa, Kadoma, Japan, and Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, assignors to Matsushita Electric Works, Ltd., Japan
Filed Feb. 20, 1986, Ser. No. 834,441
Claims priority, application Japan, Aug. 24, 1984, 60-35846
Term of patent 14 years
U.S. Cl. D28—12



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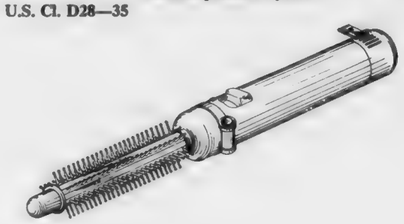
294,741
WALL-MOUNTED HAIR DRYER
Jean-Marie Froidevaux, Carouge, Switzerland, assignor to Aliseo Diffusion S.A., Saignelegier, Switzerland
Filed Dec. 12, 1985, Ser. No. 808,086
Term of patent 14 years
U.S. Cl. D28—12



294,742
CURLING IRON
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Sep. 19, 1985, Ser. No. 777,897
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 73 MR 9378
Term of patent 14 years
U.S. Cl. D28—35



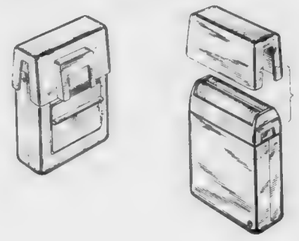
294,743
HAIR CURLING IRON
Yasusuke Seki, Tokyo; Masaru Komiya, Kodaira; Maki Fujisawa, and Misako Takahashi, both of Tokyo, all of Japan, assignors to Kyusyu Hitachi Maxell, Ltd., Tokyo, Japan
Filed Dec. 26, 1985, Ser. No. 813,625
Claims priority, application Japan, Jul. 25, 1985, 60-31940
Term of patent 14 years
U.S. Cl. D28—35



294,744
RAZOR
Pierre Paulin, Paris, France, assignor to Calor S.A., Lyons, France
Filed Oct. 11, 1985, Ser. No. 786,855
Claims priority, application France, Apr. 17, 1985, 851759
Term of patent 14 years
U.S. Cl. D28—49



294,745
ELECTRIC DRY SHAVER WITH COVER
Robert A. Mockovak, Newtown, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.
Filed Dec. 9, 1985, Ser. No. 806,630
Term of patent 14 years
U.S. Cl. D28—49

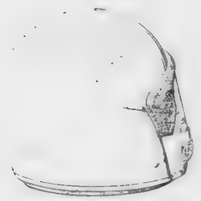


294,746
DENTAL FLOSS HOLDER AND APPLICATOR
Robert Ransom, P.O. Box 2191, Miami, Fla. 33055
Filed Jun. 17, 1985, Ser. No. 745,706
Term of patent 14 years
U.S. Cl. D28—64

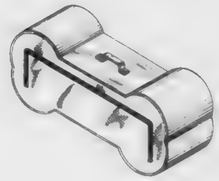


294,747
MOTORCYCLE HELMET
Klaus V. Gevert, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Jul. 19, 1985, Ser. No. 756,667
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, MR 16001
Term of patent 14 years
U.S. Cl. D29—15

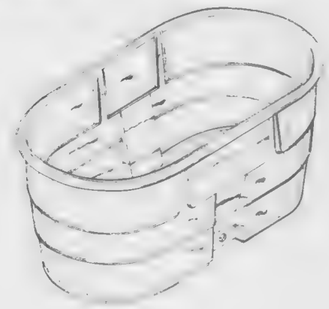




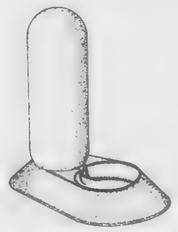
294,748
PET CARRYING CASE
Howard Dobelle, New City, N.Y., assignor to 501 Andoe Inc., New City, N.Y.
Filed Dec. 22, 1986, Ser. No. 945,449
Term of patent 14 years
U.S. Cl. D30—109



294,749
STOCK WATERING TANK
John M. Fuller, Winchester, Va., assignor to Rubbermaid Commercail Products, Inc., Winchester, Va.
Filed Apr. 3, 1986, Ser. No. 850,361
Term of patent 14 years
U.S. Cl. D30—132

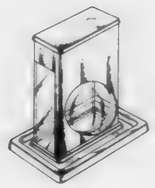


294,750
PET WATERER
Frank W. Atchley, 3006 Silverado Trail, Napa, Calif. 94558
Filed Feb. 24, 1986, Ser. No. 835,328
Term of patent 14 years
U.S. Cl. D30—132

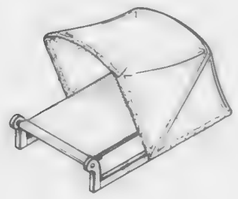


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294,751
AQUARIUM
Ming-Jin Shaiu, 229-A St. Francis St., San Gabriel, Calif. 91776
Filed Sep. 15, 1986, Ser. No. 907,619
Term of patent 14 years
U.S. Cl. D30—101



294,752
PET BED
David G. Palier, P.O. Box 334, Pulaski, Tenn. 38478
Filed Dec. 19, 1986, Ser. No. 943,632
Term of patent 14 years
U.S. Cl. D30—118



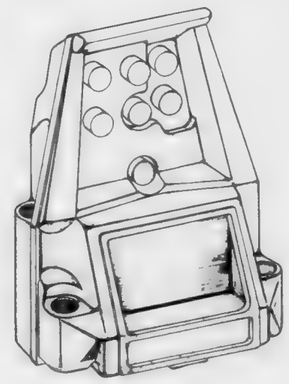
294,753
PORTABLE SADDLE RACK
Henry C. Otterbein, 653 Hidden Point La., Cincinnati, Ohio 45230
Filed Oct. 31, 1986, Ser. No. 925,750
Term of patent 14 years
U.S. Cl. D30—143



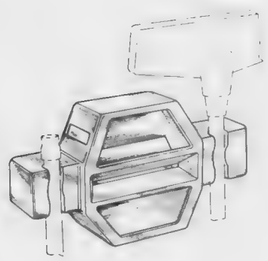
294,754
VETERINARY LEG WRAP
Donald J. Parashyniak, Pickering, Canada, assignor to Carolon Company, Winston-Salem, N.C.
Filed Aug. 6, 1986, Ser. No. 893,787
Claims priority, application Canada, Mar. 5, 1986, 05-03-86-6
Term of patent 14 years
U.S. Cl. D30—144



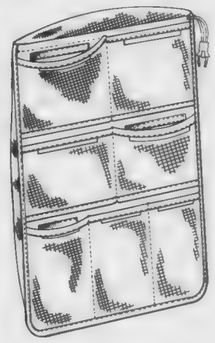
294,755
CONTAINER FOR VACUUM CLEANER ACCESSORIES
John R. Lackner, North Ridgeville, Ohio; Juergen Rathgeber, and J. Parks Newby, both of Raleigh, N.C., assignors to The Scott & Fetzer Company, Cleveland, Ohio
Filed Aug. 6, 1985, Ser. No. 763,131
Term of patent 14 years
U.S. Cl. D32—31



294,756
WALL MOUNTED HOLDER FOR VACUUM CLEANER ACCESSORIES
Frederick S. Fonville, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.
Filed Jun. 20, 1985, Ser. No. 747,100
Term of patent 14 years
U.S. Cl. D32—31



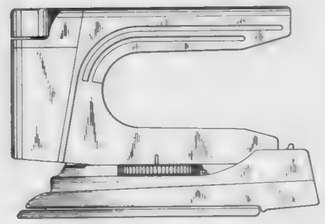
294,757
POCKETED LAUNDRY BAG FOR WASHING SELECTED CLOTHING
Robert D. Kahane, 170 Church St., Waltham, Mass. 02154; Rosalind Q. Kahane, and Ernest S. Kahane, both of 93 Sherman St., Belmont, Mass. 02178
Filed Mar. 28, 1985, Ser. No. 717,165
Term of patent 14 years
U.S. Cl. D32—36



294,758
UPPER SUPPORT COLLAR FOR ARMS OF A COLLAPSIBLE CLOTHES DRIER
Ronald G. Meade, Edwardstown, Australia, assignor to Hills Industries Limited, Edwardstown, Australia
Filed May 30, 1984, Ser. No. 615,206
Claims priority, application Australia, Nov. 30, 1983, 5848-83
Term of patent 14 years
U.S. Cl. D32—58

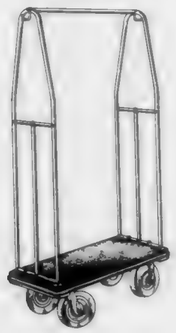


294,759
IRON
Bing Y. Chan, Kowloon, Hong Kong, assignor to Better Electrical Products Factory Limited, Cheung Sha Wan, Hong Kong
Filed Aug. 22, 1985, Ser. No. 768,250
Claims priority, application United Kingdom, Feb. 27, 1985, 1,025,273
Term of patent 14 years
U.S. Cl. D32—70



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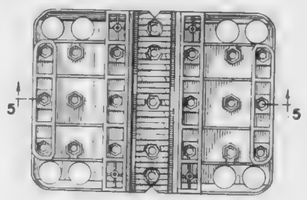
294,760
CART
Edward N. Vanderdoes, Sr., 3824 W. 184th Pl., Torrance, Calif. 90504
Filed Apr. 1, 1985, Ser. No. 718,533
Term of patent 14 years
U.S. Cl. D34—17



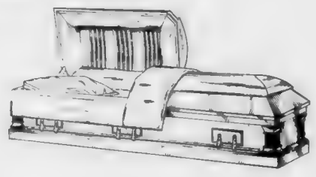
294,761
FOOD CART
Daniel J. Gallery, 2505 Pierce St., and Stanley A. Gallery, 812 E S. Vance, both of Lakewood, Colo. 80215
Filed Feb. 6, 1985, Ser. No. 698,844
Term of patent 14 years
U.S. Cl. D34—20



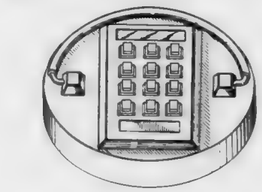
294,762
CONVEYOR PALLET
Goran Abbestam, Goteborg, and Leif Lachonius, Surte, both of Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden
Filed Mar. 15, 1985, Ser. No. 712,348
Claims priority, application Sweden, Sep. 25, 1984, 84-2545
Term of patent 14 years
U.S. Cl. D34—38



294,763
BURIAL CASKET
Michael L. Beardsley, Chittenango, N.Y., assignor to Marsellus Casket Co., Syracuse, N.Y.
Filed Nov. 29, 1985, Ser. No. 806,940
Term of patent 14 years
U.S. Cl. D99—7



294,764
LID FOR A COMPUTERIZED ELECTRONIC SAFE
Gerald B. Fincke, Daytona Beach, Fla., assignor to Compusafe, Inc., Daytona Beach, Fla.
Filed Apr. 15, 1985, Ser. No. 723,402
Term of patent 14 years
U.S. Cl. D99—43





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AB Film-Teknik: *See*—
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Abraham, Donald J.; Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Compounds useful in treating sickle cell anemia. 4,731,473, Cl. 562-464.000.
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Akao, Mutsuo; and Nishiyama, Yoshihiro, to Fuji Photo Film Co., Ltd. Container for roll of light-sensitive strip material. 4,730,778, Cl. 242-68.700.
Akatsuchi, Masahiro; and Itami, Tsugio, to Kabushiki Kaisha Toshiba. Rotary compressor with two discharge valves having different frequencies. 4,730,996, Cl. 418-15.000.
Akerberg, Dag E., to Telefonaktiebolaget LM Ericsson. Installation with portable, wireless telephone sets. 4,731,812, Cl. 379-61.000.
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Allard, Henri; Drummond, Robert; Villeneuve, Charles P.; and Ikezawa, Yukio, to Tokyo, Kogaku, Kikai, Kabushiki, Kaisha. Lens meter and method of measurement of progressive multifocal lens using the same. 4,730,924, Cl. 356-125.000.
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Allen, Edwin L. Universal implant for artificial eyes. 4,731,077, Cl. 623-4.000.
Allen, Jackie C., to Chevron Research Company. Hydraulic punch tool for heat exchangers. 4,730,392, Cl. 30-106.000.
Allen, James D.; and Seligson, Joel L., to Eastman Kodak Company. Imaging apparatus. 4,731,670, Cl. 358-298.000.
Allen, Lyle M., III, to Healthware Corporation. Patient-operated glucose monitor and diabetes management system. 4,731,726, Cl. 364-416.000.
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Lindquist, Dale C.; and Quale, Mark E., to Fountainhead Corporation, The. Hanger strip for art prints. 4,730,736, Cl. 211-46.000.

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Little, Roger H. Method for the recovery of precious metals from ores. 4,731,113, Cl. 75-101.00R.

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Lloyd, Philip R.; Jones, Barry M.; Saraga, Peter; Humphreys, David R.; and Newcomb, Clive V., to U.S. Philips Corporation. Automatic assembly apparatus. 4,731,856, Cl. 382-8.000.

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Lochner, Anton, to Siemens Aktiengesellschaft. Arrangement for modifying electrical printed circuit boards. 4,731,704, Cl. 361-400.000.

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Loctite Corporation: *See—*
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Logan, John K. Coaxial probe card. 4,731,577, Cl. 324-158.00F.

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Lotz, Helmut, to Bosch-Siemens Hausgerate GmbH. Refrigerator and freezer. 4,730,464, Cl. 62-401.000.

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Loy, Fernand; and Perrin, Jean-Claude, to Telecommunications Radioelectriques et Telephoniques. Distortionless sight utilizing holographic components. 4,730,912, Cl. 350-503.000.

Lucas, Gary M., to General Electric Company. Process for producing alkoxy-terminated polysiloxanes. 4,731,411, Cl. 524-860.000.

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Chiba, Koichi; Ono, Akihiro; Ohno, Takamasa; Okajima, Masaki; Yamane, Hiroshi; and Hayata, Minoru, 4,730,925, Cl. 356-311.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Niigata, Kunihiro; and Fujikura, Takashi, 4,731,478, Cl. 564-86.000.
Yamaoka, Shigemitsu: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,731,742, Cl. 364-521.000.
Yamashita, Hiroshi; Okada, Yoshiaki; and Suzuki, Hiroshi, to TDK Corporation. Radio-wave absorptive gasket. 4,731,286, Cl. 428-329.000.
Yamashita, Noriyuki: *See—*
Fukuda, Tokuya; Yamashita, Noriyuki; Senuma, Toshitaka; and Masuda, Isao, 4,731,674, Cl. 358-328.000.
Yamashita, Ryozo: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,731,742, Cl. 364-521.000.
Yamashita, Takashi; Kuze, Tetsuya; and Morikawa, Tuneo, to Yokohama Rubber Co., Ltd., The. Asymetric pneumatic radial tire tread for passenger car. 4,730,654, Cl. 152-209.00A.
Yamashita, Takeo: *See—*
Otomo, Shigekazu; Kumasaka, Noriyuki; Yamashita, Takeo; Morikawa, Juichi; Kobayashi, Takayuki; and Kudo, Mitsuhiro, 4,731,683, Cl. 360-119.000.
Yamasita, Hiroaki: *See—*
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Yamato, Yoshihiro: *See—*
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Yamaya, Susumu: *See—*
Hirano, Shin-ichi; and Yamaya, Susumu, 4,731,303, Cl. 428-700.000.
Yamazaki, Osamu: *See—*
Adachi, Hideaki; Higashino, Hidetaka; Mitsuyu, Tsuneo; and Yamazaki, Osamu, 4,731,172, Cl. 204-192.260.
Yamazaki, Shunpei; Inushima, Takashi; Mase, Akira; Konuma, Toshimitsu; and Sakama, Mitsunori, to Semiconductor Energy Laboratory Co., Ltd. Ferroelectric crystal display panel and manufacturing method thereof. 4,730,903, Cl. 350-334.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory, Co., Ltd. Printing member for electrostatic printing having a high crystallization region of an intrinsic semiconductor layer formed by irradiation with light and method of manufacturing thereof. 4,731,314, Cl. 430-49.000.
Yamin, Michael A.: *See—*
Cerami, Anthony; and Yamin, Michael A., 4,731,323, Cl. 435-4.000.
Yang, Ming F. Tire chain device for automobiles travelling on snow-covered terrain. 4,730,655, Cl. 152-213.00A.
Yankoff, Gerald K., to Ulticon Systems, Inc. Enclosure. 4,730,746, Cl 220-4.00F.
Yasuda, Ayumu: *See—*
Hirao, Shozo; Yasuda, Ayumu; Ohta, Yoshihiro; Nakai, Takashi; and Seto, Kazuo, 4,731,265, Cl. 427-440.000.
Yasuda, Fumio: *See—*
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Yasufuku, Yoshitaka: *See—*
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Yatsu, Tadao; Nakano, Takayuki; and Sotoyama, Toshiki, to Mitsui Petrochemical Industries, Ltd. Aromatic copolyester derived from aromatic dicarboxylic acid component and aromatic diol component. 4,731,433, Cl. 528-193.000.
Yokohama Rubber Co., Ltd., The: *See—*
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Yokota, Nobuo: *See—*
Matsuo, Tadao; Matsuoka, Fumio; Yokota, Nobuo; and Yamamoto, Masaaki, 4,731,199, Cl. 252-511.000.
Yokota, Takayoshi; Horiya, Shigekazu; and Tanaka, Kenjiroh, to Kabushiki Kaisha Kumagaigumi. Form for forming concrete. 4,730,805, Cl. 249-113.000.
Yoneda, Takao; Sakakibara, Yasuji; and Ohta, Norio, to Toyoda Koki Kabushiki Kaisha. Data input and display device for a numerical control grinding machine. 4,731,607, Cl. 340-711.000.
Yonker, John H.: *See—*
Pearce, Joseph L.; Sizer, Phillip S.; Gano, John C.; Yonker, John H.; Thurman, Robert L.; O'Sullivan, James F., Jr.; Simpson, Dayton M.; Roberts, Richard A.; Healey, Anthony J.; and Nooteboom, Urie G., 4,730,677, Cl. 166-345.000
Yontrarak, Bunlue. Wooden tile and a method of making the same. 4,731,140, Cl. 156-154.000.
Yoshida Kogyo K. K.: *See—*
Hasegawa, Akira, 4,731,212, Cl. 264-167.000
Yoshida, Tadashi: *See—*
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Yoshitoshi, You; Toyoguchi, Tsutomu; Takamatsu, Ryoji; and Watanabe, Yoshiro, to Sony Corporation. Optical disk player. 4,731,777, Cl. 369-263.000.
Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Webbing guide for use with seat belt apparatus. 4,730,875, Cl. 297-468.000.
Younes, Usama E., to Arco Chemical Company. Method for the preparation of rigid reaction injection molded thermoset polyurethane modified polyisocyanurate compositions. 4,731,427, Cl. 528-53.000.
Young, David A., to Young Rubber Company. Insulating non-removable type concrete wall forming structure and device and system for attaching wall coverings thereto. 4,730,422, Cl. 52-105.000.
Young, John N., to Charles C. Worth Corporation. Fishing reel with pad drag mechanism. 4,730,782, Cl. 242-84.50A.
Young, Robert H. Returned stair tread having moisture compensated joint and method for making same. 4,730,425, Cl. 52-182.000.
Young Rubber Company: *See*—
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Yu, Ching L.: *See*—
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Yu, Kang; and Yu, Jiann, 4,731,717, Cl. 362-352.000.
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Zamacola, Eduardo I., to Star Bonifacio Echeverria, S.A. Safety device for automatic firearms. 4,730,538, Cl. 89-154.000.
Zane, Ernest: *See*—
Zane, Peter L.; Zane, Michael S.; and Zane, Ernest, 4,730,470, Cl. 70-238.000.
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Zane, Peter L.; Zane, Michael S.; and Zane, Ernest, 4,730,470, Cl. 70-238.000.
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Zantek, Inc.: *See*—
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Zapata, Joseph V.: *See*—
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Boyarina, Maiya F.; Vildgrube, Vladimir G.; Sergeev, Jury S.; Filatov, Oleg V.; Andruschenko, Lev G.; Zelenov, Jury N.; Kupriyanov, Valery N.; and Taubkina, Elena I., 4,731,805, Cl. 378-144.000.
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Ziegler, Klaus; and Liebl, Reiner, to VDO Adolf Schindling AG. Device for determining the fluid level in a container and container having such a device. 4,730,650, Cl. 141-95.000.
Zingher, Arthur R.: *See*—
Flint, Ephraim B.; Grebe, Kurt R.; Gruber, Peter A.; and Zingher, Arthur R., 4,730,666, Cl. 165-80.400.
Zinner, Peter: *See*—
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Zinser Textilmaschinen GmbH: *See*—
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Zompolas, Thomas. Pressure relief valve exhaust gas heating means for aircraft backup pump. 4,730,486, Cl. 73-178.00R.
Zorner, Paul S.: *See*—
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Zusi, Fred C.; Marathe, Suresh A.; and Tramposch, Kenneth M., to Bristol-Myers Company. Lipoxygenase inhibitory phenylalkanohydroxamic acids. 4,731,382, Cl. 514-575.000.
Zydzik, George J.: *See*—
Ekholm, David T.; Grodkiewicz, William H.; Schwartz, Bertram; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,731,293, Cl. 428-426.000.
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501 Andersen Company, Inc.: *See*—
Andersen, Walter R., 4,731,275, Cl. 428-95.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arnold, Edgar, to Pantex-Stahl AG. Frame girder for underground drift and shaft construction. Re. 32,621, Cl. 52-655.000.
Arnold, Peter: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 32,623, Cl. 175-9.000.
Dunn, Francis P.: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 32,623, Cl. 175-9.000.
George Fischer Foundry Systems, Inc.: *See*—
Landolt, Christoph, Re. 32,622, Cl. 164-37.000.
Katz, Paul C.: *See*—
Myles, Sam A.; and Katz, Paul C., Re. 32,624, Cl. 362-390.000.
Landolt, Christoph, to George Fischer Foundry Systems, Inc. Method for the manufacture of molds using casting sand or another mixture of raw material particles. Re. 32,622, Cl. 164-37.000.
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., to Shell Oil Company. Curved offshore well conductors. Re. 32,623, Cl. 175-9.000.
Myles, Sam A.; and Katz, Paul C., to Triplex Manufacturing Co. Shock-reducing lamp assembly for vehicles. Re. 32,624, Cl. 362-390.000.
Pantex-Stahl AG: *See*—
Arnold, Edgar, Re. 32,621, Cl. 52-655.000.
Pasco, Robert W.: *See*—
Schwarz, James A.; and Pasco, Robert W., Re. 32,625, Cl. 374-57.000.
Schwarz, James A.; and Pasco, Robert W., to Syracuse University. Dynamic testing of electrical conductors. Re. 32,625, Cl. 374-57.000.
Shell Oil Company: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 32,623, Cl. 175-9.000.
Syracuse University: *See*—
Schwarz, James A.; and Pasco, Robert W., Re. 32,625, Cl. 374-57.000.
Triplex Manufacturing Co.: *See*—
Myles, Sam A.; and Katz, Paul C., Re. 32,624, Cl. 362-390.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Orlowski, David C. Sealing rings. B1 4,466,620, 3-15-88, Cl. 277-53.000.

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AB.AB. Abbigliamento Abruzzese S.p.A.: *See*—
Ferre, Gianfranco, 294,651, Cl. D2-25.000.
Abbestam, Goran; and Lachonius, Leif, to Aktiebolaget SKF. Conveyor pallet. 294,762, 3-15-88, Cl. D34-38.000.
Abbott, Rebecca J. Hand-held game paddle. 294,725, 3-15-88, Cl. D21-213.000.
Ableidinger, Leon M.; and Pehl, George D. Foot guard for three wheeled vehicles. 294,686, 3-15-88, Cl. D12-126.000.
Agape, Inc.: *See*—
Egner, Ronald J.; and Alt, Thomas C., 294,676, Cl. D8-387.000.
Aktiebolaget SKF: *See*—
Abbestam, Goran; and Lachonius, Leif, 294,762, Cl. D34-38.000.
Aliseo Diffusion S.A.: *See*—
Froidevaux, Jean-Marie, 294,741, Cl. D28-12.000.
Alt, Thomas C.: *See*—
Egner, Ronald J.; and Alt, Thomas C., 294,676, Cl. D8-387.000.
Amemiya, Masatomo, to Janome Sewing Machine Co. Ltd. Sewing machine. 294,708, 3-15-88, Cl. D15-69.000.
APM Production Inc.: *See*—
MacDowell, Robert P., 294,720, Cl. D21-11.000.
Atchley, Frank W. Pet waterer. 294,750, 3-15-88, Cl. D30-132.000.
Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 294,667, Cl. D6-569.000.
Barry, Cheryl A. Doll. 294,722, 3-15-88, Cl. D21-171.000.
Bayerische Motoren Werke A.G.: *See*—
Gevert, Klaus V., 294,747, Cl. D29-15.000.
Beardsley, Michael L., to Marsellus Casket Co. Burial casket. 294,763, 3-15-88, Cl. D99-7.000.
Below, Randy; Burke, Howard; and Thomas, Stephen M., to Siemon Company, The. Multi-purpose modular jack connecting block. 294,690, 3-15-88, Cl. D13-24.000.
Better Electrical Products Factory Limited: *See*—
Chan, Bing Y., 294,759, Cl. D32-70.000.
Bramwell, David W., to EGA Limited. Adaptor for a wire channel. 294,689, 3-15-88, Cl. D13-13.000.
Braun Aktiengesellschaft: *See*—
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Brown, Michael, to Northern Telecom Limited. Base for a telephone set. 294,696, 3-15-88, Cl. D14-60.000.
Brown, Paul: *See*—
Liggett, Steven; Brown, Paul; Le, Tuan; Kelly, Andrea; and Lussier, Edward, 294,654, Cl. D2-314.000.
Burke, Howard: *See*—
Below, Randy; Burke, Howard; and Thomas, Stephen M., 294,690, Cl. D13-24.000.
Burkett, Joann E.: *See*—
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Burkett, Randy; and Burkett, Joann E. Telephone. 294,697, 3-15-88, Cl. D14-64.000.
Bust Cosmetics: *See*—
De Beys, Marcel M., 294,650, Cl. D2-1.000.
Calor S.A.: *See*—
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Cameron, Thomas M., to Dresser Industries, Inc. Radiator guard for a construction vehicle. 294,707, 3-15-88, Cl. D15-31.000.
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Ohzu, Itsumi, 294,699, Cl. D14-77.000.
Sakuta, Kazuaki, 294,700, Cl. D14-77.000.
Chan, Bing Y., to Better Electrical Products Factory Limited. Iron 294,759, 3-15-88, Cl. D32-70.000.
Chang, Michael. Expandable hat and fan. 294,652, 3-15-88, Cl. D2-253.000.

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Clark, Charles. Shower seat. 294,664, 3-15-88, Cl. D6-380.000.
Coats & Clark, Inc.: *See—*
Chasen, Lee R., 294,672, Cl. D7-105.000.
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Morgan, Annis R., Jr., 294,717, Cl. D20-5.000.
Morgan, Annis R., Jr., 294,718, Cl. D20-5.000.
Morgan, Annis R., Jr., 294,719, Cl. D20-5.000.
Compusafe, Inc.: *See—*
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Davidson, T. Stuart, to Hunter, Neil Aylmer. Textile fabric. 294,662, 3-15-88, Cl. D5-46.000.
De Beys, Marcel M., to Bust Cosmetics. Self-adhesive breast supporting article. 294,650, 3-15-88, Cl. D2-1.000.
Detsch, Steven G. Forward cutting portion of a disposable surgical scalpel blade or the like. 294,734, 3-15-88, Cl. D24-28.000.
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Egner, Ronald J.; and Alt, Thomas C., to Textron Inc.; and Agape, Inc. Carrier and fasteners therefor. 294,676, 3-15-88, Cl. D8-387.000.
Endt, Evert, to Horlogerie Photographique Francaise. Combination telephone handset and console stand assembly. 294,695, 3-15-88, Cl. D14-53.000.
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Fleming, Travis C. Dynamic stretching machine. 294,723, 3-15-88, Cl. D21-191.000.
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203.1 4,730,449
261 4,730,453
274 4,730,454
4,730,455
602 4,730,456
609 4,730,457
CLASS 62
3 4,730,458
4,730,459
11 4,731,102
64 4,730,460
159 4,730,461
171 4,730,462
399 4,730,463
401 4,730,464
503 4,730,465
CLASS 65
312 4,731,103
CLASS 66
125 R 4,730,466
CLASS 70
25 4,730,467
34 4,730,468
81 4,730,469
238 4,730,470
277 4,730,471
CLASS 71
79 4,731,104
90 4,731,105
92 4,731,106
94 4,731,107
4,731,108
118 4,731,109
CLASS 72
8 4,730,472
16 4,730,473
61 4,730,474
234 4,730,475
407 4,730,476
424 4,730,477
CLASS 73
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4,730,479
23.1 4,730,480
38 4,730,481
49.3 4,730,482
87 4,730,483
119 R 4,730,484
170 R 4,730,485
178 R 4,730,486
182 4,730,487
189 4,730,488
304 C 4,730,489
304 R 4,730,490
308 4,730,491
597 4,730,492
599 4,730,493
606 4,730,494
620 4,730,495
724 4,730,496
803 4,730,497
852 4,730,498
861 4,730,499
861.22 4,730,500
861.38 4,730,501
866.1 4,730,502
CLASS 74
58 4,730,503
200 4,730,504
332 4,730,505
337.5 4,730,506
480 B 4,730,507
492 4,730,508
501 B 4,730,509
502 4,730,510
567 4,730,511
595 4,730,512
625 4,730,513
711 4,730,514
752 A 4,730,515
752 D 4,730,516
785 4,730,517
866 4,730,518
4,730,519
4,730,520
867 4,730,521
868 4,730,522
4,730,523
CLASS 75
0.5 A 4,731,110
0.5 AB 4,731,111
10.22 4,731,112
101 R 4,731,113
118 R 4,731,114
236 4,731,115
238 4,731,116
243 4,731,117
246 4,731,118
CLASS 81
367 4,730,524
CLASS 82
36 A 4,730,525
CLASS 83
71 4,730,526
100 4,730,527
123 4,730,528
425.4 4,730,529
CLASS 84
1.16 4,730,530
419 4,730,531
422 R 4,730,532
478 4,730,533
CLASS 86
20.12 4,730,534
CLASS 89
1.54 4,730,535
45 4,730,536
148 4,730,537
154 4,730,538
167 4,730,539
CLASS 91
25 4,730,540
362 4,730,541
368 4,730,542
448 4,730,543
467 4,730,544
480 4,730,545
498 4,730,546
CLASS 92
160 4,730,547
225 4,730,548
239 4,730,549
240 4,730,550
CLASS 98
37 4,730,552
115.2 4,730,553
315 4,730,551
CLASS 99
546 4,730,554
CLASS 100
37 4,730,555
CLASS 101
129 4,730,556
415.1 4,730,557
CLASS 102
218 4,730,558
254 4,730,559
275.3 4,730,560
517 4,730,561
CLASS 105
407 4,730,562
CLASS 106
2 4,731,119
97 4,731,120
181 4,731,121
198 4,731,122
286.5 4,731,123
CLASS 110
216 4,730,563
246 4,730,564
CLASS 112
67 4,730,565
121.12 4,730,566
324 4,730,567
CLASS 114
39.2 4,730,568
43 4,730,569
61 4,730,570
4,730,571
283 4,730,572
353 4,730,573
354 4,730,574
CLASS 118
47 4,730,575
CLASS 119
158 4,730,576
CLASS 122
33 4,730,577
49 4,730,578
CLASS 123
41.82 R 4,730,579
73 AD 4,730,580
90.6 4,730,581
169 MG 4,730,582
188 P 4,730,583
192 R 4,730,584
300 4,730,585
357 4,730,586
416 4,730,587
432 4,730,588
438 4,730,589
RE 4,730,590
510 4,730,591
516 4,730,592
561 4,730,593
589 4,730,594
CLASS 124
5 4,730,595
CLASS 125
11 CD 4,730,596
CLASS 126
2 4,730,597
80 4,730,598
91 A 4,730,599
108 4,730,600
263 4,730,601
425 4,730,602
CLASS 128
1 R 4,730,603
33 4,730,604
55 4,730,605
75 4,730,606
79 4,730,607
92 Z 4,730,608
132 D 4,730,609
149 4,730,610
156 4,730,611
201.24 4,730,612
305 4,730,613
328 4,730,614
335 4,730,615
348.1 4,730,616
352 4,730,617
419 PG 4,730,618
4,730,619
653 4,730,620
667 4,730,621
4,730,622
692 4,730,623
764 4,730,624
781 4,730,625
CLASS 131
196 4,730,626
305 4,730,627
364 4,730,628
369 4,730,629
CLASS 134
3 4,731,124
17 4,731,125
38 4,731,126
111 4,730,630
155 4,730,631
CLASS 135
76 4,730,632
93 4,730,633
CLASS 136
228 4,731,127
CLASS 137
1 4,730,634
4,730,635
15 4,730,636
62 4,730,637
202 4,730,638
413 4,730,639
625.17 4,730,640
CLASS 139
76 4,730,641
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116 4,730,643
188 R 4,730,644
435 4,730,645
CLASS 141
4 4,730,646
67 4,730,647
91 4,730,648
95 4,730,649
4,730,650
236 4,730,651
302 4,730,652
CLASS 144
193 C 4,730,653
CLASS 148
11.5 R 4,731,129
24 4,731,130
127 4,731,131
437 4,731,132
4,731,133
CLASS 152
209 A 4,730,654
213 A 4,730,655
417 4,730,656
CLASS 156
53 4,731,134
62.6 4,731,135
64 4,731,136
125 4,731,137
154 4,731,139
4,731,140
171 4,731,141
226 4,731,142
231 4,731,143
245 4,731,144
264 4,731,145
314 4,731,146
429 4,731,138
456 4,731,147
502 4,731,148
541 4,731,149
546 4,731,150
556 4,731,151
580 4,731,152
623 R 4,731,153
626 4,731,154
643 4,731,155
4,731,156
4,731,157
4,731,158
CLASS 159
6.1 4,731,159
CLASS 162
55 4,731,160
78 4,731,161
175 4,731,162
344 4,731,163
CLASS 164
23 4,730,657
37 Re.32,622
113 4,730,658
440 4,730,659
453 4,730,660
469 4,730,661
CLASS 165
25 4,730,662
32 4,730,663
41 4,730,664
80.4 4,730,665
4,730,666
84 4,730,667
137 4,730,668
151 4,730,669
CLASS 166
134 4,730,670
248 4,730,671
266 4,730,672
272 4,730,673
295 4,730,674
4,730,675
309 4,730,676
345 4,730,677
CLASS 172
265 4,730,678
375 4,730,679

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CLASS 174

36 4,731,500
65 R 4,731,501
74 R 4,731,502
88 R 4,731,503
107 4,731,504
4,731,505
115 4,731,506
139 4,731,507

CLASS 175

9 Re.32,623
39 4,730,681
397 4,730,682

CLASS 177

212 4,730,683

CLASS 178

18 4,731,508

CLASS 180

22 4,730,684
74 4,730,685
79.1 4,730,686
142 4,730,687
148 4,730,688
215 4,730,689
274 4,730,690
329 4,730,691

CLASS 181

114 4,730,692
145 4,730,693
153 4,730,694
252 4,730,695

CLASS 182

20 4,730,696
121 4,730,697
153 4,730,698
187 4,730,699
4,730,700
218 4,730,701
221 4,730,702
235 4,730,703

CLASS 184

6.4 4,730,704

CLASS 188

181 A 4,730,705
297 4,730,706
326 4,730,707

CLASS 192

0.033 4,730,708
0.052 4,730,711
0.076 4,730,712
3.31 4,730,709
18 R 4,730,710
85 AA 4,730,713
89 R 4,730,714

CLASS 194

351 4,730,715

CLASS 198

304 4,730,716
328 4,730,717
372 4,730,718
387 4,730,719
457 4,730,720
715 4,730,721
774 4,730,722
827 4,730,723
834 4,730,724

CLASS 200

16 R 4,731,509
275 4,731,510
330 4,731,511

CLASS 202

173 4,731,164

CLASS 203

29 4,731,165

CLASS 204

34 4,731,166
41 4,731,167
80 4,731,168
130 4,731,169
157.95 4,731,170
181.6 4,731,171
192.26 4,731,172
265 4,731,173

CLASS 206

63.3 4,730,725
204 4,730,726
311 4,730,727
315.9 4,730,728
370 4,730,729
497 4,730,730
540 4,730,731
597 4,730,732

CLASS 208

120 4,731,174
347 4,731,175

CLASS 209

166 4,731,176
538 4,730,733

CLASS 210

86 4,731,177
232 4,731,178
251 4,731,179
298 4,731,180
321.89 4,731,181
374 4,731,182
419 4,731,183
450 4,731,184
605 4,731,185
695 4,731,186
719 4,731,187
783 4,731,188

CLASS 211

8 4,730,734
41 4,730,735
46 4,730,736
59.3 4,730,741
90 4,730,738
113 4,730,737
189 4,730,739
4,730,740

CLASS 212

4,730,742
205 4,730,743

CLASS 215

11.5 4,730,744
220 4,731,512
230 4,730,745

CLASS 219

10.43 4,731,513
69 M 4,731,515
69 W 4,731,514
121 LF 4,731,516
121 PY 4,731,517
137.31 4,731,518
225 4,731,519
271 4,731,520
274 4,731,521
275 4,731,522

CLASS 220

4 F 4,730,746
288 4,730,747
400 4,730,748

CLASS 221

123 4,730,749
124 4,730,750

CLASS 222

189 4,730,751
394 4,730,752
481 4,730,753
594 4,730,754
595 4,730,755

CLASS 223

37 4,730,756
94 4,730,757

CLASS 224

36 4,730,758
158 4,730,759
273 4,730,760

CLASS 225

2 4,730,761
4 4,730,762
96 4,730,763

CLASS 228

1.1 4,730,764
124 4,730,765

CLASS 229

73 4,730,767
4,730,768
125.15 4,730,769
125.42 4,730,770
137 4,730,766

CLASS 235

379 4,731,523
432 4,731,524
472 4,731,525
4,731,526

CLASS 236

13 4,730,771
44 R 4,730,772

CLASS 239

1 4,730,773
14.2 4,730,774
120 4,730,775
416.4 4,730,784
453 4,730,785
590.3 4,730,786

CLASS 241

15 4,730,787
69 4,730,789
81 4,730,790
189 R 4,730,791
241 4,730,776

CLASS 242

4 R 4,730,777
68.7 4,730,778
72 R 4,730,779
75.45 4,730,780
78.8 4,730,781
84.5 A 4,730,782
84.8 4,730,783
204 4,730,792

CLASS 244

3.1 4,730,793
3.14 4,730,794
6 4,730,795
50 4,730,788
142 4,730,796
159 4,730,797
171 4,730,798

CLASS 248

51 4,730,799
62 4,730,800
118 4,730,801
238 4,730,802
297.2 4,730,803
429 4,730,804

CLASS 249

113 4,730,805

CLASS 250

201 4,731,527
213 A 4,731,528
214 A 4,731,529
229 4,731,530
259 4,731,531
287 4,731,532
292 4,731,533
366 4,731,534
394 4,731,535
4,731,536
396 ML 4,731,537
397 4,731,538
492.1 4,731,539
492.2 4,731,540
504 R 4,731,541
548 4,731,542

CLASS 251

62 4,730,806
84 4,730,807
326 4,730,808

CLASS 252

23 4,731,189
49.3 4,731,190
62.54 4,731,191
95 4,731,192
4,731,193
160 4,731,194
174.13 4,731,195
184 4,731,196
186.32 4,731,197
313.1 4,731,198
511 4,731,199
522 4,731,200
551 4,731,201

CLASS 256

1 4,730,809
12.5 4,730,810

CLASS 260

544 A 4,731,202
665 G 4,731,203

CLASS 261

30 4,731,204
94 4,731,205

CLASS 264

4.3 4,731,210
25 4,731,206
4,731,207
37 4,731,208
40.1 4,731,209
50 4,731,211
167 4,731,212
503 4,731,216
512 4,731,213
514 4,731,214
517 4,731,215
555 4,731,217
4,731,218

CLASS 266

81 4,730,811
236 4,730,812
266 4,730,813
4,730,814

CLASS 267

52 4,730,815
64.11 4,730,816
64.15 4,730,817

CLASS 269

75 4,730,818
221 4,730,819

CLASS 270

55 4,730,820
58 4,730,821
95 4,730,822

CLASS 271

31 4,730,823
227 4,730,824
268 4,730,825

CLASS 272

65 4,730,826
68 4,730,827
118 4,730,828
129 4,730,829

CLASS 273

171 4,730,830
243 4,730,831

CLASS 277

2 4,730,832
12 4,730,833
53 B1 4,466,620
212 FB 4,730,834
230 4,730,835
235 B 4,730,836

CLASS 279

5 4,730,837

CLASS 280

6 R 4,730,838
91 4,730,839
210 4,730,840
507 4,730,841
638 4,730,842
689 4,730,843
804 4,730,844
4,730,845

CLASS 281

45 4,730,846

CLASS 282

1 R 4,730,847
8 R 4,730,848

CLASS 283

70 4,730,849

CLASS 285

3 4,730,850
4 4,730,851
15 4,730,852
18 4,730,853
42 4,730,854
179 4,730,855
319 4,730,856
390 4,730,857

CLASS 290

38 R 4,731,543
53 4,731,544
54 4,731,545

CLASS 294

8.6 4,730,858
19.2 4,730,859
49 4,730,860
50.9 4,730,864
86.4 4,730,861
88 4,730,862
156 4,730,863

CLASS 296

95 C 4,730,865
100 4,730,866
153 4,730,867
197 4,730,870
216 4,730,868

CLASS 297

194 4,730,869
230 4,730,871
232 4,730,872
457 4,730,873
464 4,730,874
468 4,730,875

CLASS 300

2 4,730,876

CLASS 303

52 4,730,877
114 4,730,878
116 4,730,879

CLASS 307

10 LS 4,731,546
85 4,731,547
116 4,731,548
125 4,731,549
140 4,731,550
141 4,731,551
264 4,731,552
443 4,731,553

CLASS 310

67 R 4,731,554
71 4,731,555
338 4,731,556

CLASS 312

209 4,730,880

CLASS 313

36 4,731,557
478 4,731,558
533 4,731,559
587 4,731,560
624 4,731,561

CLASS 315

111.81 4,731,562
382 4,731,563
397 4,731,564
411 4,731,565

CLASS 318

444 4,731,566
594 4,731,567
603 4,731,568
687 4,731,569
696 4,731,570
702 4,731,571
721 4,731,572

CLASS 320

14 4,731,573

CLASS 323

275 4,731,574

CLASS 324

113 4,731,575
142 4,731,576
158 F 4,731,577
204 4,731,578
207 4,731,579
208 4,731,580
244 4,731,581
245 4,731,582
309 4,731,583
318 4,731,584
322 4,731,585
536 4,731,586

CLASS 328

167 4,731,587

CLASS 330

254 4,731,588
271 4,731,589
278 4,731,590

CLASS 331

65 4,731,591
108 C 4,731,592

CLASS 333

28 R 4,731,593
103 4,731,594
195 4,731,595
204 4,731,596

CLASS 335

128 4,731,597
210 4,731,598

CLASS 336

84 C 4,731,599

CLASS 337

159 4,731,600

CLASS 340

52 R 4,731,601
347 MT 4,731,602
407 4,731,603
574 4,731,604
696 4,731,605
709 4,731,606
711 4,731,607
734 4,731,608
747 4,731,609
784 4,731,610

CLASS 342

28 4,731,611
94 4,731,612
357 4,731,613
372 4,731,614

CLASS 343

725 4,731,615
786 4,731,616
912 4,731,617

CLASS 346

1.1 4,731,618
76 PH 4,731,619
137 4,731,620
140 R 4,731,621
157 4,731,622
160 4,731,623

CLASS 350

3.77 4,730,881
96.1 4,730,882
96.10 4,730,883
96.14 4,730,884
96.15 4,730,885
4,730,886
96.16 4,730,887
4,730,888
96.20 4,730,889
4,730,890
96.21 4,730,891
4,730,892
96.22 4,730,893
96.23 4,730,894
96.24 4,730,895
96.34 4,730,896
128 4,730,897
133 4,730,898
173 4,730,899
253 4,730,900
255 4,730,901
311 4,730,902
334 4,730,903
340 4,730,904
410 4,730,905
426 4,730,906
4,730,907
427 4,730,908
436 4,730,910
445 4,730,909
503 4,730,912
575 4,730,911
604 4,730,913
629 4,730,914

CLASS 351

47 4,730,915
117 4,730 916
211 4,730,917

CLASS 352

90 4,730,918

CLASS 353

79 4,730,919

CLASS 354

64 4,731,624
155 4,731,625
271.1 4,731,626
308 4,731,627
319 4,731,628
410 4,731,629
475 4,731,630

CLASS 355

3 CH 4,731,633
3 DD 4,731,632
3 DR 4,731,631
3 TR 4,731,634
10 4,731,635
4,731,636
14 R 4,731,638
14 SH 4,731,637
64 4,731,639

CLASS 356

4 4,730,920
39 4,730,921
73 4,730,922
121 4,730,923
125 4,730,924
138 4,730,926
311 4,730,925
371 4,730,927
373 4,730,928
4,730,929
407 4,730,930
429 4,730,931
432 4,730,932
440 4,730,933

CLASS 357

30 4,731,640
4,731,641
45 4,731,642
68 4,731,643
72 4,731,644
80 4,731,645

CLASS 358

13 4,731,646

31 4,731,660
75 4,731,647
4,731,661
4,731,662
101 4,731,663
105 4,731,648
106 4,731,649
107 4,731,650
133 4,731,664
140 4,731,651
163 4,731,652
169 4,731,653
188 4,731,654
190 4,731,655
213.25 4,731,656
213.27 4,731,665
229 4,731,669
244 4,731,666
256 4,731,667
4,731,668
284 4,731,671
285 4,731,657
287 4,731,658
296 4,731,672
298 4,731,670
300 4,731,673
312 4,731,659
328 4,731,674
336 4,731,675

CLASS 360

26 4,731,676
33.1 4,731,677
40 4,731,678
73 4,731,679
78 4,731,680
85 4,731,681
92 4,731,682
96.5 4,731,684
106 4,731,685
119 4,731,683
122 4,731,686
132 4,731,687

CLASS 361

65 4,731,688
66 4,731,689
78 4,731,690
87 4,731,691
102 4,731,692
280 4,731,694
313 4,731,695
4,731,696
321 4,731,697
386 4,731,693
4,731,698
4,731,699
388 4,731,700
4,731,701
391 4,731,702
4,731,703
400 4,731,704
433 4,731,705

CLASS 362

61 4,731,706
66 4,731,707
80 4,731,708
4,731,709
147 4,731,710
4,731,711
189 4,731,712
302 4,731,713
310 4,731,714
352 4,731,715
4,731,716
4,731,717
390 Re.32,624
392 4,731,718

CLASS 363

20 4,731,719
21 4,731,720
44 4,731,722
56 4,731,721
70 4,731,723

CLASS 364

167 4,731,733
200 4,731,724
4,731,734
4,731,735
4,731,737
4,731,738
4,731,739
4,731,740
415 4,731,725
416 4,731,726
442 4,731,727
466 4,731,728
505 4,731,729
509 4,731,730
510 4,731,731
4,731,732
518 4,731,741
521 4,731,742
4,731,743
560 4,731,744
4,731,745
565 4,731,746
807 4,731,747
900 4,731,736
4,731,748
4,731,749
4,731,750

CLASS 365

28 4,731,751
29 4,731,752
52 4,731,753
121 4,731,754
127 4,731,755
153 4,731,756
173 4,731,757
189 4,731,758
200 4,731,759
201 4,731,760
230 4,731,761

CLASS 366

4,730,934
82 4,730,935
101 4,730,936
146 4,730,937
282 4,730,938
342 4,730,939

CLASS 367

108 4,731,762
153 4,731,763
158 4,731,764

CLASS 368

10 4,731,765
4,731,766
15 4,731,767
118 4,731,768

CLASS 369

4,731,769
41 4,731,770
44 4,731,771
45 4,731,772
59 4,731,773
4,731,774
77.2 4,731,775
4,731,776
263 4,731,777
266 4,731,778
270 4,731,779
284 4,731,780

CLASS 370

9 4,731,781
60 4,731,782
4,731,785
84 4,731,783
88 4,731,784

CLASS 372

5 4,731,786
4,731,788
22 4,731,787
45 4,731,789
46 4,731,790
48 4,731,791
49 4,731,792
53 4,731,793
70 4,731,794
107 4,731,795

CLASS 374

57 Re.32,625
127 4,730,940
170 4,730,941

CLASS 375

9 4,731,796
19 4,731,797
38 4,731,798
39 4,731,799
58 4,731,800
100 4,731,801

CLASS 376

261 4,731,219
458 4,731,220

CLASS 377

6 4,731,802

CLASS 378

114 4,731,803
140 4,731,804
144 4,731,805
155 4,731,806
156 4,731,807
170 4,731,808

CLASS 379

27 4,731,809
33 4,731,810
58 4,731,811
61 4,731,812
62 4,731,813
4,731,814
79 4,731,815
98 4,731,816
112 4,731,817
144 4,731,818
145 4,731,819
165 4,731,820
172 4,731,821
204 4,731,822
220 .,731,823
265 4,731,824
273 4,731,825
359 4,731,826
377 4,731,827
382 4,731,828
4,731,829
387 4,731,830
388 4,731,831
389 4,731,832
399 4,731,833
410 4,731,834
435 4,731,836

CLASS 380

14 4,731,837
4,731,839
15 4,731,838
21 4,731,840
23 4,731,841
24 4,731,842
29 4,731,843

CLASS 381

13 4,731,844
43 4,731,845
49 4,731,846
51 4,731,847
63 4,731,835
4,731,848
67 4,731,849
68.2 4,731,850
104 4,731,851
106 4,731,852

CLASS 382

1 4,731,853
4,731,854
8 4,731,855
4,731,856
9 4,731,857
4,731,858
36 4,731,859
41 4,731,860
48 4,731,861
50 4,731,862
51 4,731,863
54 4,731,864
4,731,865

CLASS 383

7 4,730,942
8 4,730,943

CLASS 384

43 4,730,944
45 4,730,945
506 4,730,946

CLASS 400

61 4,730,947
120 4,730,948

CLASS 401

132 4,730,949

CLASS 402

48 4,730,950

CLASS 403

24 4,730,951
316 4,730,952

CLASS 405

45 4,730,953
240 4,730,954

CLASS 406

4,730,955
4,730,956
142 4,730,957

CLASS 408

54 4,730,958
115 R 4,730,959
127 4,730,960

CLASS 409

166 4,730,961
209 4,730,962
278 4,730,963

CLASS 410

23 4,730,964

CLASS 411

15 4,730,965
55 4,730,966
103 4,730,967
178 4,730,968
387 4,730,969
4,730,970
463 4,730,971

CLASS 412

7 4,730,972

CLASS 414

421 4,730,973
483 4,730,974
735 4,730,975
749 4,730,976

CLASS 415

4,730,977
115 4,730,978
118 4,730,979
143 4,730,980

CLASS 416

83 4,730,981
95 4,730,982
220 R 4,730,983
222 4,730,984
228 4,730,985

CLASS 417

44 4,730,999
222 4,730,986
270 4,730,987
313 4,730,988
357 4,730,989
381 4,730,990
397 4,730,991
465 4,730,992
477 4,730,993
572 4,730,994

CLASS 418

1 4,730,995
15 4,730,996
55 4,730,997
4,730,998
4,731,000

CLASS 420

445 4,731,221

CLASS 422

37 4,731,222
4,731,223
49 4,731,224
65 4,731,225
98 4,731,226
127 4,731,227
144 4,731,228
188 4,731,229

CLASS 423

77 4,731,230
231 4,731,233
235 4,731,231
236 4,731,232
280 4,731,234
327 4,731,236
344 4,731,235

CLASS 424

9 4,731,239
45 4,731,240
59 4,731,242
65 4,731,243
85 4,731,238
4,731,244
4,731,237
92 4,731,245
195.1 4,731,246

CLASS 425

7 4,731,001
133.1 4,731,002
133.5 4,731,003
4,731,004
185 4,731,005
190 4,731,006
238 4,731,007
335 4,731,008
406 4,731,009
461 4,731,010
529 4,731,011
540 4,731,012
542 4,731,013
556 4,731,014

CLASS 426

1 4,731,247
54 4,731,248
69 4,731,249
234 4,731,250
243 4,731,251
523 4,731,252

CLASS 427

34 4,731,253
53.1 4,731,254
54.1 4,731,255
109 4,731,256
122 4,731,257
140 4,731,258
155 4,731,259
236 4,731,260
376.5 4,731,261
379 4,731,262
385.5 4,731,263
387 4,731,264
440 4,731,265

CLASS 428

35 4,731,266
4,731,267
4,731,268
36 4,731,269
4,731,270
4,731,271
4,731,272
57 4,731,273
87 4,731,274
95 4,731,275
110 4,731,276
137 4,731,277
141 4,731,278
159 4,731,279
163 4,731,280
196 4,731,281
220 4,731,282
251 4,731,283
291 4,731,284
323 4,731,285
329 4,731,286
332 4,731,287
333 4,731,288
334 4,731,289
335 4,731,290
342 4,731,291
425.9 4,731,292
426 4,731,293
447 4,731,294
470 4,731,128
472 4,731,295
552 4,731,296
553 4,731,297
611 4,731,298
4,731,299
636 4,731,300
648 4,731,301
698 4,731,302
700 4,731,303

CLASS 429

62 4,731,304
94 4,731,305
98 4,731,306
112 4,731,307
121 4,731,308
188 4,731,309
194 4,731,310
213 4,731,311

CLASS 430

31 4,731,312
42 4,731,313
49 4,731,314
77 4,731,315
157 4,731,316
159 4,731,317
192 4,731,319
505 4,731,320
559 4,731,321
567 4,731,322

CLASS 431

154 4,731,015

CLASS 432

35 4,731,016
175 4,731,017

CLASS 433

20 4,731,018
119 4,731,019
180 4,731,020

CLASS 434

156 4,731,021
194 4,731,022
260 4,731,024
304 4,731,025
305 4,731,026
321 4,731,023
348 4,731,027
388 4,731,028

CLASS 435

4 4,731,323
5 4,731,324
6 4,731,325
7 4,731,326
162 4,731,329
172.3 4,731,327
253 4,731,328

CLASS 436

16 4,731,330
34 4,731,331
61 4,731,332
72 4,731,333
73 4,731,334
180 4,731,335
506 4,731,336
526 4,731,337

CLASS 437

22 4,731,338
29 4,731,339
31 4,731,340
4,731,341
41 4,731,318
48 4,731,342
63 4,731,343
129 4,731,344
4,731,345
240 4,731,346

CLASS 439

4,731,029
4,731,030
76 4,731,031
136 4,731,032
395 4,731,033
891 4,731,034

CLASS 440

61 4,731,035

CLASS 441

2 4,731,036
41 4,731,037
68 4,731,038
76 4,731,039

CLASS 445

45 4,731,040

CLASS 446

115 4,731,041
309 4,731,042

CLASS 453

6 4,731,043

CLASS 455

4,731,866
41 4,731,867
127 4,731,869
4,731,870
161 4,731,868
182 4,731,871
210 4,731,872
219 4,731,873
258 4,731,874
302 4,731,875
333 4,731,876
340 4,731,877
600 4,731,878
605 4,731,879
607 4,731,880
619 4,731,881

CLASS 474

8 4,731,044
78 4,731,045
80 4,731,046

CLASS 493

10 4,731,047
188 4,731,048

CLASS 501

21 4,731,347
4,731,348
87 4,731,349

CLASS 502

231 4,731,350
349 4,731,351
439 4,731,352

CLASS 503

209 4,731,354
210 4,731,353
227 4,731,355

CLASS 512

13 4,731,356

CLASS 514

10 4,731,357
81 4,731,358
169 4,731,359
201 4,731,360
202 4,731,361
4,731,362
210 4,731,363
222 4,731,364
4,731,365
227 4,731,241
278 4,731,366
288 4,731,367
301 4,731,368
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340 4,731,372

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367	4,731,374	271	4,731,401	170	4,731,431	570	4,731,457		CLASS 568	192	4,731,059
381	4,731,375	273	4,731,402	190	4,731,432		CLASS 549	310	4,731,482	250	4,731,069
423	4,731,376	302	4,731,403	193	4,731,433	215	4,731,458	311	4,731,483	254	4,731,060
452	4,731,377	310	4,731,404	227	4,731,434	275	4,731,459	331	4,731,484	263	4,731,061
531	4,731,378	408	4,731,405	239	4,731,435		CLASS 556	454	4,731,485	322	4,731,062
547	4,731,379	436	4,731,406	322	4,731,436	45	4,731,460		4,731,486	347	4,731,063
562	4,731,380	451	4,731,407	394	4,731,437	81	4,731,461	[illegible]	4,731,487	352	4,731,064
571	4,731,381	458	4,731,408	483	4,731,438	105	4,731,462	697	4,731,488	355	4,731,065
575	4,731,382	501	4,731,409		CLASS 530		CLASS 558		4,731,489	366	4,731,066
634	4,731,383	539	4,731,410	324	4,731,439	288	4,731,463	761	4,731,490	367	4,731,067
658	4,731,384	860	4,731,411	399	4,731,440	316	4,731,464	794	4,731,491	385 R	4,731,070
789	4,731,385		CLASS 525		CLASS 534	346	4,731,465		4,731,492	[illegible]	4,731,071
	CLASS 518	54.11	4,731,412	637	4,731,441		CLASS 560		CLASS 570	[illegible]	4,731,072
700	4,731,386	[illegible]	4,731,413		CLASS 540	75	4,731,466	204	4,731,493		CLASS 623
706	4,731,387	71	4,731,414	215	4,731,443	204	4,731,467	244	4,731,494	1	4,731,073
	CLASS 521	123	4,731,415	521	4,731,444	255	4,731,468		CLASS 585	2	4,731,074
56	4,731,388	131	4,731,416	538	4,731,445		CLASS 562	6.6	4,731,495		4,731,075
103	4,731,389	200	4,731,417		CLASS 544	443	4,731,469	270	4,731,496	3	4,731,076
134	4,731,390	205	4,731,418	281	4,731,446	461	4,731,470	415	4,731,498	4	4,731,077
137	4,731,391	328.2	4,731,419		CLASS 546		4,731,471	455	4,731,497	6	4,731,078
172	4,731,392	430	4,731,420	93	4,731,447		4,731,472		CLASS 604		4,731,079
	CLASS 522	432	4,731,421	248	4,731,448	[illegible]	4,731,473	20	4,731,049		4,731,080
117	4,731,393	437	4,731,422	286	4,731,449	471	4,731,474	24	4,731,050	8	4,731,081
	CLASS 523	480	4,731,423	303	4,731,450	475	4,731,475	51	4,731,052	10	4,731,082
102	4,731,395		CLASS 526		CLASS 548	554	4,731,476	67	4,731,051	13	4,731,084
115	4,731,394	180	4,731,424	165	4,731,451	558	4,731,477	89	4,731,053	14	4,731,083
439	4,731,396	196	4,731,425	262	4,731,452		CLASS 564	93	4,731,054	16	4,731,085
	4,731,397	262	4,731,426	317	4,731,453	79	4,731,479	100	4,731,055	20	4,731,086
500	4,731,398		CLASS 528	543	4,731,454	86	4,731,478	110	4,731,068	21	4,731,087
	CLASS 524	53	4,731,427	544	4,731,455	223	4,731,480	118	4,731,056	22	4,731,088
[illegible]	4,731,399	[illegible]	4,731,428					153	4,731,057		CLASS 800
		125	4,731,442							1	4,731,499
		127	4,731,429								

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D2—		294,650	D7—	27	294,670	D13—	13	294,689		69	294,708		141	294,727		64	294,746
	25	294,651		42	294,671		24	294,690	D16—	32	294,709			294,728	D29—	15	294,747
	253	294,652		105	294,672	D14—	1	294,691		123	294,710			294,729	D30—	101	294,751
	278	294,653		325	294,673		5	294,692	D18—	4	294,711	D23—	218	294,730		109	294,748
	314	294,654		349	294,677		53	294,693		13	294,712		311	294,731		118	294,752
	320	294,655	D8—	330	294,674			294,694	D19—	26	294,713		360	294,732		132	294,749
		294,656		360	294,675			294,695		59	294,714	D24—	8	294,733			294,750
	626	294,657		387	294,676		[illegible]	294,696		62	294,715		28	294,734		143	294,753
	633	294,658	D9—	392	294,678		64	294,697	D20—	[illegible]	294,716		46	294,735		144	294,754
D3—	30.1	294,659		401	294,679		70	294,698			294,717		49	294,736	D32—	31	294,755
	40	294,660		435	294,680		77	294,699			294,718	D26—	86	294,737			294,756
D4—	108	294,661		448	294,681			294,700			294,719			294,738		36	294,757
D5—	46	294,662			294,682			294,701	D21—	11	294,720		87	294,739		58	294,758
		294,663	D10—	32	294,683		91	294,702		155	294,721	D28—	12	294,740		70	294,759
D6—	380	294,664	D11—	42	294,684		94	294,703		171	294,722			294,741	D34—	17	294,760
	462	294,665	D12—	126	294,685		111	294,704		191	294,723		35	294,742		20	294,761
	487	294,666			294,686		113	294,705		204	294,724			294,743		38	294,762
	569	294,667			294,686		113	294,705		204	294,724			294,743		38	294,762
	570	294,668		142	294,687		114	294,706		213	294,725		49	294,744	D99—	7	294,763
	581	294,669		147	294,688	D15—	31	294,707	D22—	140	294,726			294,745		43	294,764

CLASSIFICATION OF PLANTS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,730,595		4,730,806		4,731,622		4,731,012		4,730,943		4,466,620
	4,731,084		4,730,832		4,731,660		4,731,023		4,730,960	18 :	4,730,531
04 :	4,730,444		4,730,854		4,731,676		4,731,142		4,731,104		4,730,572
	4,730,462		4,730,869		4,731,685		4,731,146		4,731,190		4,730,679
	4,730,468		4,730,910		4,731,691		4,731,184		4,731,275		4,730,951
	4,730,528		4,730,915		4,731,696		4,731,317		4,731,391		4,731,543
	4,730,601		4,730,946		4,731,701		4,731,428	15 :	4,730,354		4,731,547
	4,730,633		4,730,958		4,731,719		4,731,429		4,730,801		4,731,601
	4,730,665		4,730,967		4,731,731		4,731,457	16 :	4,731,270		4,731,700
	4,730,741		4,730,972		4,731,739		4,731,464	17 :	Re.32,624		4,731,707
	4,731,025		4,730,973		4,731,754		4,731,517		4,730,369		4,731,844
	4,731,760		4,730,980		4,731,755		4,731,530		4,730,422		4,731,851
	4,731,773		4,730,984		4,731,758		4,731,541		4,730,424	19 :	4,730,368
	4,731,830		4,730,989		4,731,766		4,731,728		4,730,437		4,730,380
05 :	4,730,423		4,731,029		4,731,772		4,731,749		4,730,583		4,730,800
	4,730,441		4,731,037		4,731,786	10 :	4,730,748		4,730,610		4,730,828
	4,731,741		4,731,056		4,731,787		4,730,922		4,730,668		4,731,077
	4,731,765		4,731,063		4,731,789		4,731,216		4,730,669		4,731,692
06 :	4,730,356		4,731,068		4,731,800		4,731,237		4,730,722	20 :	4,730,600
	4,730,363		4,731,069		4,731,810		4,731,435		4,730,728		4,730,926
	4,730,385		4,731,073		4,731,815		4,731,502		4,730,732		4,731,002
	4,730,386		4,731,081		4,731,816	11 :	4,731,227		4,730,766		4,731,360
	4,730,399		4,731,107		4,731,827	12 :	4,730,361		4,730,788	21 :	4,730,425
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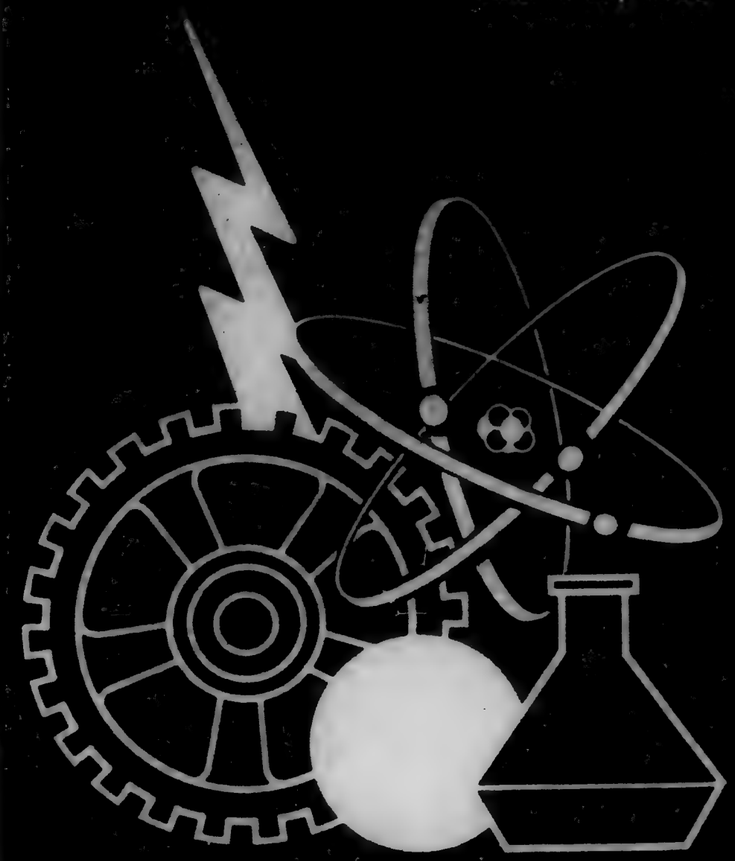
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Mar. 15, 1988, and was announced in the *Official Gazette* at 1087 O.G. 24 on Feb. 16, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected uner PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

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—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1300.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
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Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
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U.S. National Stage fees

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U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Jan. 21, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 19, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,504,977 through 4,506,388
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 3, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,423,536	06/255,750	1/3/84
4,423,541	06/319,723	1/3/84
4,423,542	06/217,790	1/3/84
4,423,548	06/280,190	1/3/84
4,423,554	06/254,742	1/3/84
4,423,556	06/272,501	1/3/84
4,423,562	06/406,205	1/3/84
4,423,563	06/431,339	1/3/84
4,423,567	06/302,489	1/3/84
4,423,569	06/307,852	1/3/84
4,423,582	06/285,343	1/3/84
4,423,585	06/294,551	1/3/84
4,423,591	06/372,081	1/3/84
4,423,597	06/237,674	1/3/84
4,423,602	06/338,183	1/3/84
4,423,610	06/275,895	1/3/84
4,423,622	06/325,425	1/3/84
4,423,624	06/351,662	1/3/84
4,423,626	06/248,312	1/3/84
4,423,628	06/317,557	1/3/84
4,423,630	06/275,334	1/3/84
4,423,634	06/280,355	1/3/84
4,423,636	06/328,772	1/3/84
4,423,638	06/383,791	1/3/84
4,423,639	06/324,101	1/3/84
4,423,646	06/249,039	1/3/84
4,423,668	06/310,622	1/3/84
4,423,670	06/393,249	1/3/84
4,423,677	06/353,230	1/3/84
4,423,683	06/334,753	1/3/84
4,423,689	06/361,527	1/3/84
4,423,691	06/438,064	1/3/84
4,423,694	06/437,120	1/3/84
4,423,698	06/316,565	1/3/84
4,423,716	06/321,820	1/3/84
4,423,722	06/308,094	1/3/84
4,423,729	06/307,841	1/3/84
4,423,735	06/219,737	1/3/84
4,423,745	06/445,252	1/3/84
4,423,757	06/371,678	1/3/84
4,423,761	06/356,764	1/3/84
4,423,773	06/285,220	1/3/84
4,423,774	06/270,020	1/3/84
4,423,776	06/277,137	1/3/84
4,423,780	06/265,336	1/3/84
4,423,783	06/371,170	1/3/84
4,423,784	06/261,262	1/3/84
4,423,787	06/291,483	1/3/84
4,423,790	06/329,667	1/3/84
4,423,792	06/274,557	1/3/84
4,423,793	06/314,310	1/3/84
4,423,798	06/283,190	1/3/84
4,423,811	06/431,206	1/3/84
4,423,814	06/270,730	1/3/84
4,423,825	06/441,150	1/3/84
4,423,826	06/343,593	1/3/84
4,423,832	06/288,080	1/3/84
4,423,833	06/337,273	1/3/84
4,423,839	06/351,022	1/3/84
4,423,847	06/306,085	1/3/84
4,423,850	06/293,580	1/3/84
4,423,851	06/292,289	1/3/84
4,423,852	06/317,652	1/3/84
4,423,853	06/290,016	1/3/84
4,423,860	06/376,406	1/3/84
4,423,861	06/283,641	1/3/84
4,423,862	06/271,248	1/3/84
4,423,863	06/377,323	1/3/84

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Patent Number	Serial Number	Issue Date	4,424,160	06/389,130	1/3/84
			4,424,167	06/315,314	1/3/84
4,423,868	06/326,827	1/3/84	4,424,168	06/417,766	1/3/84
4,423,869	06/325,197	1/3/84	4,424,185	06/244,605	1/3/84
4,423,870	06/350,977	1/3/84	4,424,194	06/336,693	1/3/84
4,423,876	06/342,483	1/3/84	4,424,202	06/387,637	1/3/84
4,423,880	06/236,846	1/3/84	4,424,220	06/421,595	1/3/84
4,423,881	06/390,358	1/3/84	4,424,225	06/462,379	1/3/84
4,423,883	06/218,970	1/3/84	4,424,227	06/375,144	1/3/84
4,423,884	06/337,864	1/3/84	4,424,228	06/380,664	1/3/84
4,423,886	06/360,359	1/3/84	4,424,229	06/356,643	1/3/84
4,423,892	06/201,711	1/3/84	4,424,232	06/379,737	1/3/84
4,423,895	06/256,388	1/3/84	4,424,237	06/360,472	1/3/84
4,423,901	06/305,322	1/3/84	4,424,268	06/443,787	1/3/84
4,423,903	06/258,892	1/3/84	4,424,269	06/356,215	1/3/84
4,423,909	06/316,844	1/3/84	4,424,276	06/327,756	1/3/84
4,423,911	06/317,502	1/3/84	4,424,277	06/324,369	1/3/84
4,423,912	06/377,722	1/3/84	4,424,308	06/329,790	1/3/84
4,423,913	06/317,923	1/3/84	4,424,312	06/243,747	1/3/84
4,423,916	06/282,656	1/3/84	4,424,315	06/422,310	1/3/84
4,423,927	06/304,504	1/3/84	4,424,333	06/306,845	1/3/84
4,423,933	06/361,201	1/3/84	4,424,336	06/418,875	1/3/84
4,423,944	06/302,825	1/3/84	4,424,347	06/387,178	1/3/84
4,423,957	06/300,353	1/3/84	4,424,350	06/248,636	1/3/84
4,423,965	06/431,350	1/3/84	4,424,361	06/224,954	1/3/84
4,423,968	06/266,639	1/3/84	4,424,368	06/389,731	1/3/84
4,423,969	06/337,240	1/3/84	4,424,372	06/419,655	1/3/84
4,423,970	06/407,841	1/3/84	4,424,374	06/243,567	1/3/84
4,423,972	06/369,213	1/3/84	4,424,378	06/396,485	1/3/84
4,423,973	06/327,944	1/3/84	4,424,379	06/398,953	1/3/84
4,423,980	06/256,900	1/3/84	4,424,384	06/378,531	1/3/84
4,423,994	06/314,749	1/3/84	4,424,400	06/243,418	1/3/84
4,424,000	06/336,793	1/3/84	4,424,407	06/325,736	1/3/84
4,424,007	06/311,986	1/3/84	4,424,416	06/269,347	1/3/84
4,424,011	06/218,354	1/3/84	4,424,421	06/314,212	1/3/84
4,424,012	06/310.102	1/3/84	4,424,427	06/396,384	1/3/84
4,424,018	06/301,954	1/3/84	4,424,438	06/318,400	1/3/84
4,424,021	06/335,906	1/3/84	4,424,453	06/250,871	1/3/84
4,424,025	06/368,627	1/3/84	4,424,454	06/326,932	1/3/84
4,424,039	06/428,355	1/3/84	4,424,462	06/372,876	1/3/84
4,424,041	06/296,326	1/3/84	4,424,465	06/434,713	1/3/84
4,424,047	06/319,051	1/3/84	4,424,470	06/352,230	1/3/84
4,424,054	06/268,381	1/3/84	4,424,478	06/223,048	1/3/84
4,424,067	06/402,869	1/3/84	4,424,499	06/320,656	1/3/84
4,424,078	06/406,092	1/3/84	4,424,502	06/438,119	1/3/84
4,424,085	06/300,649	1/3/84	4,424,509	06/269,508	1/3/84
4,424,103	06/481,553	1/3/84	4,424,535	06/360,021	1/3/84
4,424,110	06/345,340	1/3/84	4,424,537	06/336,985	1/3/84
4,424,111	06/383,916	1/3/84	4,424,538	06/346,568	1/3/84
4,424,127	06/317,901	1/3/84	4,424,542	06/264,121	1/3/84
4,424,152	06/281,615	1/3/84	4,424,548	06/285,990	1/3/84
4,424,159	06/345,309	1/3/84	4,424,558	06/284,211	1/3/84
			4,424,585	06/322,042	1/3/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,376,824	06/258,183	3/15/83	4/27/81	2/22/88

Recission of Notice of Patent Expiration

The Notice of Expiration due to failure to pay maintenance fees for the following patent was published in error and is hereby rescinded:

Patent Number	Serial Number	Issue Date
4,419,011	06/285,109	12/6/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,208,161, Re. S.N. 132,574, Filed Dec. 11, 1987, Cl. 414/401, DEVICE FOR RELEASABLY SECURING A VEHICLE TO AN ADJACENT SUPPORT, Steven J. Hipp, et al., Owner of Record: *Rite-Hite Corp., Cudahy, Wis.,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 317

4,539,542, Re. S.N. 140,660, Filed Jan. 4, 1988, Cl. 335/261, SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME, Bruce D. Clark, Owner of Record: *G. W. Lisk Co., Inc., Clifton Springs, N.Y.,* Attorney or Agent: Eugene S. Stephens, et al., Ex. Gp.: 216

4,604,600, Re. S.N. 140,661, Filed Jan. 4, 1988, Cl. 335/261, SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME, Bruce D. Clark, Owner of Record: *G. W. Lisk Co., Inc., Clifton Springs, N.Y.,* Attorney or Agent: Eugene S. Stephens, et al., Ex. Gp.: 216

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,760,149, Reexam. No. 90/001,432, Requested: Jan. 26, 1988, Cl. 219/247, CORDLESS ELECTRIC IRON AND CURRENT SUPPLYING MEANS THEREFOR, Eugen Harsanyi, Owner of Record: *Helwig Emmy Ulrichstrasse, Sindorf, Germany,* Attorney or Agent: Striker, Striker & Stenby, Ex. Gp.: 210, Requester: The West Bend Co., West Bend, Wis.

4,314,227, Reexam. No. 90/001,431, Requested: Feb. 2, 1988, Cl. 338/99, ELECTRONIC PRESSURE SENSITIVE TRANSDUCER APPARATUS, Franklin N. Eventoff, Owner of Record: *Inventor, Los Angeles, Calif.,* Attorney or Agent: Nilsson, Robbins, et al., Ex. Gp.: 210, Requester: Owner

4,421,643, Reexam. No. 90/001,429, Requested: Jan. 29, 1988, Cl. 210/138, SWIMMING POOL FILTERING SYSTEM, Stanley H. Frederick, Owner of Record: *ITT Corp., New York, N.Y.,* Attorney or Agent: Menotti J. Lombardi, Ex. Gp.: 130, Requester: Owner

4,545,906, Reexam. No. 90/001,430, Requested: Feb. 2, 1988, Cl. 210/138, SWIMMING POOL FILTERING SYSTEM, Stanley H. Frederick, Owner of Record: *ITT Corp., New York, N.Y.,* Attorney or Agent: Menotti J. Lombardi, Ex. Gp.: 130, Requester: Owner

4,656,790, Reexam. No. 90/001,433, Requested: Jan. 29, 1988, Cl. 51/141, BURNISHING METHOD AND APPARATUS FOR MAGNETIC DISK, Kazuo Mukai, et al., Owner of Record: *Fuji Photo Film Co., Tokyo, Japan,* Attorney or Agent: Brumbaugh, Graves, et al., Ex. Gp.: 320, Requester: Owner

Service of Court Papers on the Commissioner of Patents and Trademarks

The procedure set forth in M.P.E.P. §1216 (5th ed., revs. 1 to 6) under the heading "Service of Court Papers on Commissioner of Patents and Trademarks" was superceded by the procedure set forth in the Solicitor's Notice of June 8, 1987 [1079 OG 72], which remains in effect and which also describes the procedure for filing a notice of a appeal to the Federal Circuit. The portion of that notice concerning service of court papers on the Commissioner is repeated below, as modified to include additional guidelines about supplementation of the mail service address.

Court papers may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor, located in Crystal Plaza Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Floor, Room 5-C-15, Arlington, Va.

B. By *mail* in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office should not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Feb. 22, 1988 JOSEPH F. NAKAMURA, *Solicitor.*

Notice of Realignment and Move of Patent Examining Corps

The Patent Examining Corps is realigning and moving its staff to better meet the needs of the public, changing technology and workload requirements.

The realignment and move includes two major aspects. The first major aspect involves the continuation of the PTO's hiring program, whereby the hiring of a large number of new examiners is scheduled for Fiscal Year 1988. It also includes some balancing of the staff of the Patent Examining Corps to more accurately reflect anticipated workloads and better associate related arts. To this end, the four existing chemical groups will be rearranged into five chemical groups, namely existing Groups 110, 120, 130 and 150 and the new Biotechnology Group, Group 180. See attached Table 1 for Group art assignments for the Chemical Groups.

The second aspect involves the physical relocation of many persons and search files, part of which has already been accomplished, to both meet the increasing space needs of the Patent Corps in Bldgs. 3 and 4 of Crystal Plaza and to provide space for new Group 180 in Bldg. 2 of Crystal Plaza.

It is expected that the relocation and other changes will be completed by mid-April 1988. The Groups will then be located as shown in Table 2 at the end of this Notice.

The efforts described above will result in many examiners being moved to new rooms and some reassigned to different Groups and art units. Some pending applications will be assigned to new Groups and art units. The Office will do everything practical to minimize the adverse impact of all this change. However, problems and a certain amount of confusion, will undoubtedly occur. To help the public cope with these changes, the following guidance is offered:

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1. Examining Corps personnel can be reached on the telephone by calling their last known number (e.g. the number shown on the last office action). The answering receptionist will be provided with a directory of phone numbers which will be updated frequently. The caller will be informed or transferred, if possible, to the new number.
2. Persons who are not successful in reaching an Office employee by telephone should call our information number (703)357-3080 for the latest telephone number of the employee.
3. To determine the current Group or art unit assignment or other pertinent information concerning a patent application (for those entitled to such information), call any telephone associated with the Group to which the application was assigned. The answering receptionist - once assured of the caller's identity and/or entitlement - will provide the current art unit assignment or other pertinent information concerning the application.
4. Once the new art unit assignment of a reassigned application is known, all correspondence involving that application should identify the new art unit. However, all correspondence addressed to the art unit shown on the most recent communication from the Office will be routed to the correct destination.
5. A current directory will be posted periodically in or near the Public Search Room.
6. After the relocations and other changes are completed, new Group and art unit telephone and room numbers will be published in the Official Gazette.
7. Persons delivering papers, arriving for interviews or visiting the Examining Corps, should consult the directory posted near the Public Search Room for the current location of the organization and person they are visiting.

RENE D. TEGTMEYER,
Assistant Commissiner for Patents.

Feb. 25, 1988

TABLE - 1

Chemical Groups

Group	New Art Unit No.	New Art Unit Comprises Examiners Primarily from the Following Original Art Units No.(s)	New Art Unit Responsible for All or Part of the Following Classes
110	111	111	75, 148, 222, 266, 420, 428
	112	112	204, 252
	113	113, 134	23, 75, 106, 156, 252, 266, 422, 423
	114	114	29, 136, 148, 429
	115	157	8, 51, 106, 252
	116	116, 132, 136	44, 127, 134, 208, 252, 260, 502, 585
	118	118	44, 71, 106, 252, 501
120	121	121, 123	260, 534, 540, 544, 546, 548, 549, 558, 560
	122	122, 123	260, 540, 544, 546, 548, 560, 562, 568
	125	123, 125	260, 424, 514, 540
	126	123, 126	252, 260, 512, 518, 540, 549, 556, 558, 560, 562, 564, 568, 570
	129	123, 129	540, 544, 546, 548, 549, 564
130	131	131	152, 156
	132	132	426
	133	133, 134	48, 65, 156, 159, 162, 196, 201, 202, 203, 209, 252
	135	135	55, 249, 261, 425
	136	136	210
	137	137	264
	139	152	118, 148, 427
150	151	151	260, 521, 522, 523, 524, 525, 527, 528
	153	153	260, 521, 523, 524, 527, 528
	154	154	428
	155	155	260, 424, 520, 521, 523, 524, 525, 526, 528, 536
	156	156	430
	158	158	424, 428, 430, 503
180	181	128, 134, 136	210, 422, 436
	182	128	435, 436
	183	123, 153	424, 514, 530, 536
	184	124, 331, 333	Plants, 47, 119, 435, 935
	185	127	435

TABLE - 2

Group	Crystal Plaza Location
110	CP3-9
120	CP2-8
130	CP3-8
150	CP2-11
180	CP2-9
210	CP4-9
220	CP4-10
230	CP4-11
240	CP4-6
250	CP4-8
260	CP4-5
*290	CP6-11
310	CP3-5
320	CP3-6
330	CP4-4
340	CP4-3
350	CP3-3

*Group 290 is located at CP6-11. It remains under the direction of the Group 220 Director.

Establishment of a Special Box for Expedited Processing of Issue Fees

Effective immediately, the Patent and Trademark Office has established a special box designator for issue fees to allow expedited processing of the Issue Fee Transmittal (PTOL Form 85), and the order for advance copies.

In order to take advantage of this new service, the envelope should be addressed:

Box Issue Fees
Commissioner of Patents and Trademarks
Washington, DC 20231

Only the Issue Fee Transmittal (PTOL Form 85), advance copy orders and the fees associated with these two services are to be placed in the envelope. Including documents other than those specified will delay their reaching the area for which they were intended.

PLEASE USE THE NEW ISSUE FEE BOX.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Mar. 4, 1988.

Extension of Period for Comments on the Desirability of Permitting More Participation by Non-Patent Owner Requesters During Reexamination

The period for submitting written comments on the desirability of permitting more participation by non-patent owner requesters during reexamination in response to the notice published at 1086 OFFICIAL GAZETTE 445 (Jan. 5, 1988) is extended until May 16, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents.

Mar. 8, 1988.

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PATENTS WHICH EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEES (JAN.—DEC. 1987)

The following is a compilation of the NOTICE OF EXPIRATION OF PATENTS DUE TO FAILURE TO PAY MAINTENANCE FEES which have been published in the Official Gazette from Mar. 24, 1987 through Mar. 15, 1988.

The patents have issue dates in the range of Jan. 4, 1983 through Dec. 29, 1983.

Patent Number	Serial Number	Issue Date
4,366,580	06/242,642	1/4/83
4,366,584	06/232,275	1/4/83
4,366,590	06/220,178	1/4/83
4,366,593	06/255,645	1/4/83
4,366,594	06/248,492	1/4/83
4,366,605	06/230,668	1/4/83
4,366,628	06/251,386	1/4/83
4,366,632	06/231,740	1/4/83
4,366,638	06/238,918	1/4/83
4,366,642	06/230,296	1/4/83
4,366,646	06/292,393	1/4/83
4,366,647	06/214,224	1/4/83
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4,371,559	06/265,942	2/1/83
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4,371,608	06/275,816	2/1/83
4,371,633	06/258,903	2/1/83
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4,371,705	06/278,104	2/1/83
4,371,729	06/337,456	2/1/83
4,371,736	06/248,345	2/1/83
4,371,759	06/223,116	2/1/83
4,371,761	06/244,279	2/1/83

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4,371,811	06/230,904	2/1/83
4,371,814	06/300,498	2/1/83
4,371,820	06/293,347	2/1/83
4,371,834	06/264,396	2/1/83
4,371,896	06/296,823	2/1/83
4,371,968	06/279,394	2/1/83
4,371,978	06/256,170	2/1/83
4,371,984	06/258,411	2/8/83
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4,372,011	06/228,738	2/8/83
4,372,013	06/287,310	2/8/83
4,372,018	06/306,654	2/8/83
4,372,039	06/220,914	2/8/83
4,372,056	06/222,725	2/8/83
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4,372,082	06/235,593	2/8/83
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4,372,090	06/313,323	2/8/83
4,372,099	06/227,142	2/8/83
4,372,113	06/225,170	2/8/83
4,372,114	06/242,243	2/8/83
4,372,115	06/270,974	2/8/83
4,372,116	06/228,457	2/8/83
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4,372,129	06/265,183	2/8/83
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4,372,227	06/233,064	2/8/83
4,372,230	06/228,512	2/8/83
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4,372,238	06/224,275	2/8/83
4,372,243	06/284,342	2/8/83
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4,372,785	06/354,210	2/8/83
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4,373,284	06/236,336	2/15/83
4,373,308	06/257,298	2/15/83
4,373,321	06/246,002	2/15/83

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4,374,597	06/222,454	2/22/83
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4,374,968	06/292,563	2/22/83
4,374,973	06/283,330	2/22/83
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4,396,649	06/323,376	8/2/83
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4,396,675	06/421,150	8/2/83
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4,396,765	06/363,268	8/2/83
4,396,767	06/244,490	8/2/83
4,396,777	06/362,733	8/2/83

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4,396,842	06/310,110	8/2/83
4,396,843	06/280,080	8/2/83
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4,405,329	06/268,978	9/20/83
4,405,337	06/378,814	9/20/83

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4,413,947	06/300,743	11/8/83
4,413,952	06/398,564	11/8/83
4,413,965	06/382,610	11/8/83

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4,422,471	06/381,829	12/27/83
4,422,472	06/316,148	12/27/83
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Patent Number	Serial Number	Issue Date
4,422,486	06/227,120	12/27/83
4,422,489	06/436,015	12/27/83
4,422,490	06/233,090	12/27/83
4,422,491	06/282,008	12/27/83
4,422,493	06/331,257	12/27/83
4,422,495	06/238,342	12/27/83
4,422,502	06/397,216	12/27/83
4,422,509	06/375,960	12/27/83
4,422,511	06/391,457	12/27/83
4,422,513	06/280,346	12/27/83
4,422,514	06/305,915	12/27/83
4,422,516	06/218,332	12/27/83
4,422,526	06/256,709	12/27/83
4,422,533	06/282,080	12/27/83
4,422,544	06/264,632	12/27/83
4,422,549	06/246,731	12/27/83
4,422,563	06/282,624	12/27/83
4,422,580	06/272,023	12/27/83
4,422,583	06/330,265	12/27/83
4,422,589	06/306,566	12/27/83
4,422,598	06/271,764	12/27/83
4,422,606	06/277,353	12/27/83
4,422,610	06/262,312	12/27/83
4,422,614	06/296,797	12/27/83
4,422,625	06/351,557	12/27/83
4,422,640	06/395,138	12/27/83
4,422,641	06/359,430	12/27/83
4,422,643	06/374,435	12/27/83
4,422,644	06/318,336	12/27/83
4,422,645	06/308,860	12/27/83
4,422,647	06/350,529	12/27/83
4,422,655	06/295,772	12/27/83
4,422,656	06/376,539	12/27/83
4,422,658	06/306,227	12/27/83
4,422,660	06/361,239	12/27/83
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4,422,693	06/408,854	12/27/83
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4,422,708	06/251,203	12/27/83
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4,422,750	06/355,463	12/27/83
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4,422,761	06/305,974	12/27/83
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4,422,784	06/366,524	12/27/83
4,422,789	06/344,545	12/27/83
4,422,791	06/366,207	12/27/83
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4,422,797	06/348,877	12/27/83
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4,422,802	06/251,775	12/27/83
4,422,813	06/240,625	12/27/83
4,422,819	06/256,245	12/27/83
4,422,829	06/352,361	12/27/83
4,422,836	06/298,475	12/27/83
4,422,850	06/268,860	12/27/83
4,422,865	06/337,793	12/27/83
4,422,883	06/430,798	12/27/83
4,422,887	06/293,960	12/27/83
4,422,907	06/335,773	12/27/83
4,422,910	06/403,953	12/27/83
4,422,912	06/380,444	12/27/83
4,422,929	06/298,810	12/27/83
4,422,934	06/384,208	12/27/83
4,422,975	06/289,323	12/27/83
4,423,001	06/233,297	12/27/83
4,423,014	06/226,977	12/27/83
4,423,033	06/230,312	12/27/83
4,423,034	06/372,824	12/27/83
4,423,035	06/291,157	12/27/83
4,423,038	06/340,680	12/27/83
4,423,039	06/254,823	12/27/83
4,423,042	06/365,675	12/27/83
4,423,043	06/345,990	12/27/83
4,423,044	06/352,346	12/27/83
4,423,046	06/365,482	12/27/83
4,423,047	06/223,760	12/27/83
4,423,053	06/358,561	12/27/83
4,423,092	06/328,976	12/27/83
4,423,098	06/458,303	12/27/83
4,423,119	06/318,881	12/27/83
4,423,159	06/375,232	12/27/83
4,423,165	06/369,077	12/27/83
4,423,196	06/321,277	12/27/83
4,423,208	06/352,013	12/27/83
4,423,210	06/366,797	12/27/83
4,423,212	06/217,935	12/27/83
4,423,216	06/334,208	12/27/83
4,423,221	06/386,921	12/27/83
4,423,226	06/243,876	12/27/83
4,423,232	06/235,814	12/27/83
4,423,236	06/314,423	12/27/83
4,423,246	06/350,912	12/27/83
4,423,248	06/327,059	12/27/83
4,423,259	06/347,728	12/27/83
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4,423,270	06/451,482	12/27/83
4,423,285	06/347,290	12/27/83
4,423,291	06/231,452	12/27/83
4,423,306	06/400,595	12/27/83
4,423,317	06/305,116	12/27/83
4,423,342	06/449,806	12/27/83
4,423,347	06/328,618	12/27/83
4,423,360	06/370,528	12/27/83
4,423,402	06/371,674	12/27/83
4,423,413	06/276,021	12/27/83
4,423,417	06/318,856	12/27/83
4,423,420	06/261,286	12/27/83
4,423,445	06/259,745	12/27/83
4,423,457	06/343,966	12/27/83
4,423,473	06/428,112	12/27/83
4,423,499	06/291,121	12/27/83
4,423,500	06/300,120	12/27/83
4,423,501	06/257,943	12/27/83
4,423,522	06/273,547	12/27/83

The patents listed herebelow, appearing in the above (and/or previous) listed Compilation of Expired Patents, have been reinstated as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
Re. 31,795	06/553,051	1/8/85	11/18/83	2/20/87
(4,353,512)	(06/224,952)	(10/12/82)	(1/14/81)	
Re. 32,029	06/683,888	11/12/85	12/20/84	12/29/87
(4,365,046)	(06/223,973)	(12/21/82)	(1/12/81)	
Re. 32,073	06/654,190	1/28/86	9/24/84	7/28/87
(4,358,549)	(06/288,289)	(11/9/82)	(7/30/81)	
4,332,555	06/221,961	6/1/82	1/2/81	2/20/87
4,342,714	06/249,430	8/3/82	3/31/81	1/29/88

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,344,813	06/216,083	8/17/82	12/15/80	1/29/88
4,347,324	06/264,116	8/31/82	5/15/81	1/29/88
4,348,562	06/226,367	9/7/82	1/19/81	1/29/88
4,349,005	06/228,222	9/14/82	1/26/81	1/29/88
4,349,006	06/228,223	9/14/82	1/26/81	1/29/88
4,352,202	06/234,467	9/28/82	2/17/81	2/20/87
4,352,242	06/273,585	10/5/82	6/15/81	1/29/88
4,352,719	06/230,506	10/5/82	2/2/81	7/28/87
4,353,243	06/230,817	10/12/82	2/2/81	8/26/87
4,353,873	06/257,265	10/12/82	4/24/81	1/29/88
4,355,022	06/279,536	10/19/82	7/1/81	1/15/88
4,357,296	06/228,276	11/2/82	1/26/81	11/3/87
4,358,096	06/242,511	11/9/82	3/10/81	8/12/87
4,359,318	06/332,159	11/16/82	12/18/81	2/20/87
4,362,135	06/262,350	12/7/82	5/11/81	1/29/88
4,363,705	06/284,052	12/14/82	7/16/81	1/29/88
4,364,600	06/278,909	12/21/82	2/3/81	12/9/87
4,365,378	06/240,994	12/28/82	3/5/81	11/3/87
4,365,980	06/294,806	12/28/82	8/20/81	1/29/88
4,370,152	06/278,777	1/25/83	6/29/81	1/29/88
4,370,344	06/236,644	1/25/83	2/23/81	1/29/88
4,370,355	06/291,866	1/25/83	8/10/81	11/10/87
4,370,996	06/243,371	2/1/83	3/13/81	1/29/88
4,371,295	06/245,454	2/1/83	3/19/81	9/2/87
4,372,277	06/254,991	2/8/83	4/16/81	1/29/88
4,373,933	06/264,132	2/15/83	5/15/81	1/4/88
4,374,657	06/270,016	2/22/83	6/3/81	1/29/88
4,375,535	06/223,629	3/1/83	1/9/81	12/22/87
4,376,046	06/268,872	3/8/83	6/1/81	1/29/88
4,376,314	06/273,189	3/15/83	6/12/81	1/29/88
4,376,522	06/264,638	3/15/83	5/18/81	1/29/88
4,379,742	06/237,279	4/12/83	2/23/81	1/29/88
4,383,139	06/239,346	5/10/83	3/2/81	8/27/87
4,385,024	06/273,942	5/24/83	6/15/81	1/29/88
4,393,546	06/303,401	7/19/83	9/18/81	10/14/87
4,395,995	06/284,527	8/2/83	7/17/81	10/27/87
4,396,451	06/329,353	8/2/83	12/9/81	11/23/87
4,397,346	06/268,722	8/9/83	6/1/81	2/1/88
4,404,533	06/362,997	9/13/83	3/29/82	1/29/88
4,406,064	06/273,756	9/27/83	6/15/81	12/29/87
4,409,372	06/340,914	10/11/83	1/20/82	12/22/87

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PATENT NOTICES

Certificates of Correction for the Week of Mar. 22, 1988

Re. 32,418	4,661,567	4,687,755	4,696,990
D. 283,989	4,663,628	4,688,026	4,697,025
D. 291,412	4,664,161	4,688,179	4,697,222
4,474,893	4,665,009	4,688,368	4,697,372
4,484,282	4,665,066	4,688,474	4,697,800
4,488,740	4,665,538	4,688,568	4,697,827
4,492,501	4,666,505	4,688,573	4,697,892
4,517,742	4,667,018	4,688,664	4,698,115
4,527,056	4,667,271	4,688,801	4,698,236
4,534,113	4,668,406	4,689,706	4,698,371
4,568,978	4,668,886	4,689,760	4,698,410
4,577,109	4,670,250	4,690,453	4,698,758
4,595,721	4,670,318	4,690,598	4,698,788
4,606,644	4,670,942	4,691,456	4,698,938
4,607,224	4,671,018	4,691,697	4,699,492
4,608,851	4,671,842	4,692,362	4,699,499
4,613,398	4,672,101	4,692,497	4,699,841
4,616,093	4,673,639	4,692,628	4,699,863
4,616,856	4 676,293	4,692,877	4,700,038
4,622,919	4,676,496	4,693,176	4,700,103
4,624,956	4,677,758	4,693,595	4,700,227
4,637,021	4,679,188	4,693,618	4,700,461
4,637,929	4,680,072	4,693,819	4,700,802
4,638,475	4,681,212	4,693,827	4,701,497
4,642,179	4,681,216	4,693,973	4,701,986
4,645,765	4,682,190	4,694,564	4,702,777
4,648,215	4,682,208	4,694,616	4,702,793
4,650,900	4,683,091	4,694,739	4,703,068
4,651,340	4,683,554	4,694,919	4,703,472
4,651,714	4,683,783	4,695,622	4,703,727
4,653,574	4,684,553	4,695,717	4,703,855
4,656,535	4,684,849	4,695,832	4,703,938
4,656,710	4,685,346	4,695,917	4,704,010
4,658,402	4,685,464	4,696,155	4,704,753
4,658,859	4,686,209	4,696,421	4,707,056
4,660,729	4,686,968	4,696,433	
4,661,497	4,687,121	4,696,750	

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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 13, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	2-18-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-18-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	4-17-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-5-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	2-18-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-87

Expiration of patents: The patents within the range of numbers indicated below expire during February 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,559,209 to 3,566,408, inclusive

Plant Patents ..... Numbers 3,022 to 3,029 inclusive

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REEXAMINATIONS

MARCH 22, 1988

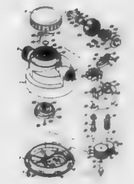
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,335,852 (822nd)
DEVICE FOR CONTROLLING THE FLOW OF FLUID
Ho Chow, River Edge, N.J., assignor to Jet Stream, Inc., Wilmington, Del.
Reexamination Request No. 90/001,310, Aug. 21, 1987.
Reexamination Certificate for Patent No. 4,335,852, issued Jun. 22, 1982, Ser. No. 145,798, May 1, 1980.
Int. Cl.[4] A01G *27/00*
U.S. Cl. 239—68

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. A device for controlling the flow of fluid, comprising:
(A) a housing, the walls of which define a chamber, said housing having a fluid flow inlet and a fluid flow outlet;
(B) means rotatably mounted to and at least partially within said chamber for measuring the volume of said flow through said chamber;
(C) a pawl movably mounted within said chamber actuated by said measuring means;
(D) a cam and ratchet wheel secured to said housing and rotatably disposed within said chamber adjacent said pawl for being driven by said pawl;
(E) a valve for controlling said flow through said chamber from said inlet to said outlet in response to the rotational disposition of said cam and ratchet wheel; and



(F) a means for manually rotating said cam and ratchet wheel.

B1 4,569,444 (823rd)
Patent Not Issued For This Number

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,626

MICROWAVE GENERATED PLASMA LIGHT SOURCE APPARATUS

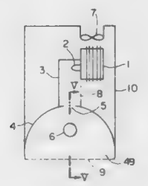
Kenji Yoshizawa, Hyogo; Hitoshi Kodama, Kanagawa; Yoshibumi Minowa, Hyogo; Hiroshi Ito, Kanagawa, and Hirotsugu Komura, Fukuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,498,029, dated Feb. 5, 1985, Ser. No. 625,565, Jul. 2, 1984. Continuation of Ser. No. 242,075, Mar. 9, 1981, abandoned. Application for reissue Nov. 20, 1986, Ser. No. 932,416

Claims priority, application Japan, Mar. 10, 1980, 55-29911

Int. Cl.[4] **H01J** *7/46, 17/80*

U.S. Cl. 315—39 **34 Claims**



1. A microwave generated plasma light source apparatus comprising: a microwave generator; a microwave cavity having a light reflecting member forming at least a portion of said cavity, said microwave generator being coupled through a feeding opening in said cavity to said cavity; a member transparent to light and opaque to microwaves disposed across an opening of said cavity opposite said feeding opening; a waveguide for guiding microwaves generated by said microwave generator to said feeding opening of said cavity; and an electrodeless discharge bulb disposed at a position in said cavity such that said cavity operates as a resonant cavity at least when said bulb is emitting light, said bulb encapsulating at least one discharge light emissive substance and having a shape and being sufficiently small that said bulb functions substantially as a point light source, said bulb being made of transparent quartz glass and having an inner diameter such that a ratio of an outer surface area of said bulb to the microwave input power is from 1.5 mm^2/W to 15 mm^2/W, the weight of said bulb with respect to the microwave input power being no more than 3.0×10^{-2} g/W, said microwave generator comprising means for generating microwaves intermittently with a rest interval of no more than 5 msec.

Re. 32,627

ELECTRICAL SURVEILLANCE APPARATUS WITH MOVEABLE ANTENNA ELEMENTS

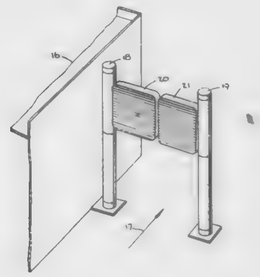
David R. Humble, Deerfield Beach; Jon N. Weaver, Boca Raton; David L. Gentzler, Boynton Beach; Ezra D. Eskandry, Pompano Beach, and Peter J. Lamanna, Boca Raton, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Original No. 4,394,645, dated Jul. 19, 1983, Ser. No. 337,990, Jan. 8, 1982. Continuation-in-part of Ser. No. 301,038, Sep. 10, 1981, abandoned. Application for reissue Jul. 19, 1985, Ser. No. 757,012

Int. Cl.[4] **G08B** *18/00, 22/00*

U.S. Cl. 340—572 **16 Claims**

1. Apparatus for detecting the presence within a surveillance zone of an electrical energy responsive marker wherein a transmitter is coupled to an electrical energy field radiator for establishing throughout said zone an AC energy field, and a receiver is coupled to an electrical energy field receptor for detecting a predetermined alteration of said AC energy field caused by the presence of said market within said AC energy field, characterized in that at least one of said radiator and



receptor is disposed in a gate-like structure that is mounted for rotation to and fro about a vertical axis with substantially all of said structure extending horizontally to one side of said axis, *at least one of said radiator and receptor being movable relative to the other thereof in said structure, said structure being constrained to assume a standby orientation in a vertical plane centrally of such to and fro rotation.*

Re. 32,628

CURABLE COMPOSITIONS BASED ON EPOXY RESINS

Helmut Tesch, Birkenheide; Manfred Heym, Weisenheim; Walter Doerflinger, Frankenthal; Herbert Stutz; Karlsruhe; Peter Neumann, Wiesloch; Dietmar Nissen, and Gerhard Schaefer, both of Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Original No. 4,607,069, dated Aug. 19, 1986, Ser. No. 751,389, Jul. 3, 1985. Application for reissue Nov. 24, 1986, Ser. No. 934,459

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424700

Int. Cl.[4] **C08G** *59/44*

U.S. Cl. 523—400 **3 Claims**

1. An essentially solvent-free curable composition which has a long shelf life and consists of

A 100 parts by weight of an epoxy resin and

B from 10 to 100 parts by weight of, *N,N'-bis-(para-aminobenzoyl)-piperazine* as a curing agent for the epoxy resin, [an aromatic diamine containing



groups,] with or without

C from 0.01 to 5 parts by weight of an accelerator, wherein the curing agent for the epoxy resin is finely dispersed in the latter.

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PLANT PATENTS

GRANTED MARCH 22, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,132

MINIATURE ROSE 'MADELINE SPEZZANO'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,361
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant name 'Madeline Spezzano' of hardy dwarf, vigorous growth, attractive appearance, substantially as illustrated and described, characterized by its abundance of blooms ranging in color from pale Carmine Rose to Porcelain Rose with hybrid tea-type form. The blooms and foliage are slightly larger than average size for a miniature rose; I have found this variety to be easily asexually reproduced from cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,133

RAPHIOLEPIS INDICA CV NEWPORT

Albert R. Di Florio, Irvine, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 3, 1985, Ser. No. 771,931
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Raphiolepis indica,* substantially as herein shown and described, characterized as to novelty by:

flower petals having a unique, dark, rich vivid red-purple color;

flowers that remain somewhat cupped, never fully expanding; and

a slow growing nature and tight, compact habit.

6,134

DWARF SCHEFFLERA NAMED COVETTE

Ernest A. Gorvel, 800 St. Lucie Cresent, Stuart, Fla. 33495

Filed Jan. 22, 1986, Ser. No. 820,809
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of *Schefflera arboricola* named Covette as herein shown and described, characterized particularly as to uniqueness by the combined characteristics of dark green foliage; oblanceolate-shaped leaves of approximately 13 centimeters in length; glossy leaf texture; good propagation by stem cuttings; and disease and pest resistance.

206-243 O.G.-88-3

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PATENTS

GRANTED MAR. 22, 1988

ERRATA

For CLASS	See PATENT NO.
049-334	4,731,886
070-488	4,731,944
156-094	4,731,982
134-084	4,732,185
134-123	4,732,186
134-135	4,732,187
137-073	4,732,188
137-220	4,732,189
137-460	4,732,190
137-565	4,732,191
137-614	4,732,192
137-624	4,732,193
439-586	4,732,437
437-228	4,732,658
437-228	4,732,761
380-025	4,733,345

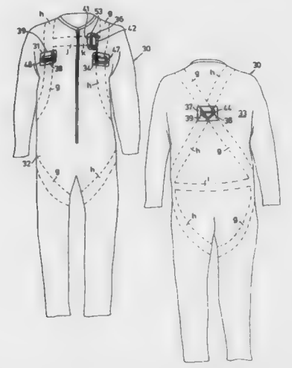
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GRANTED MARCH 22, 1988

GENERAL AND MECHANICAL

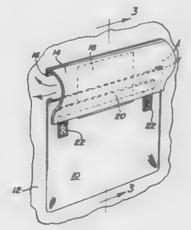
4,731,882
SAFETY GARMENT
Tommy Ekman, Krylbo, Sweden, assignor to Irvin Fallskarms AB, Avesta, Sweden
PCT No. PCT/SE85/00507, § 371 Date Jul. 28, 1986, § 102(e) Date Jul. 28, 1986, PCT Pub. No. WO86/03382, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 6, 1985, Ser. No. 890,149
Claims priority, application Sweden, Dec. 6, 1984, 8406210
Int. Cl.[4] A41D *13/00*; B64D *17/00*
U.S. Cl. 2—69 **14 Claims**



1. Garment, connectable to a safety line or the like by a connection point, and including at least one band of material, which is intended to take up the weight of a person wearing the garment and which is intended to glide in guide means mounted on the garment, said guide means being oriented such that a tensional force in the band applied at the connection point between said point and the safety line achieves tightening of the band, and thus the garment, around the person, characterized in that the garment (**1**; **30;30'**) comprises a front and a back each comprising outer and inner layers of material which are sewn together by seams to form the garment itself, as well as elongate channels (a–c; g,h; g',h') defined by the layers and the seams and constituting said guide means, and in that an opening (**13**; **37,37'**) is made in the back in the outer layer, through which the connection point is accessible, said connection point being formed as a ring (**21**; **44**; **66**) surrounding portions of the band (**15**; **38,39**; **65**) which overlappingly cross one another at said connection point.

4,731,883
GARMENT VENTILATION APERTURES WITH COVER FLAP
Ronald W. Foster, 35322 Deerpath Rd., Batavia, Ill. 60510
Filed Jan. 13, 1987, Ser. No. 2,943
Int. Cl.[4] A41D *27/28*
U.S. Cl. 2—69 **7 Claims**

1. A garment having a body panel, a flap on an outer surface of the body panel, ventilation means in the body panel under the flap, and attachment means for releasably and selectively securing the flap to the garment in a first position wherein the flap is substantially flat against the garment effectively blocking the ventilation means and a second position wherein the flap is arched over and concealing the ventilation means to provide a tunnel for promoting air circulation through the ventilation means.



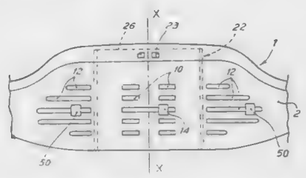
4,731,884
CLOTHING ARTICLE HAVING MODIFIABLE APPEARANCE
Sylvia M. Lawrence, 351 McDonald Ave., Mobile, Ala. 36604
Filed Jan. 29, 1987, Ser. No. 7,977
Int. Cl.[4] A41D *1/22*
U.S. Cl. 2—72 **6 Claims**



1. An article of feminine wearing apparel capable of being worn in a plurality of styles, comprising in combination:
a. A generally form fitting structure adapted for enclosing the waist and torso area of a wearer;
b. A full, flared, skirt section, seamlessly continuously depending downward from said torso section, extending to a hem point adjacent the foot of the wearer;
c. A continuous, substantially uniform width neck strap extending from a left front side of said torso section and connecting seamlessly to a right front side of said torso section, forming a continuous loop thereby;
d. Two restriction means slidably enclosing said neck strap section; and
e. The entire article being made of a fabric having uniform stretch characteristics along at least two substantially perpendicular directions.

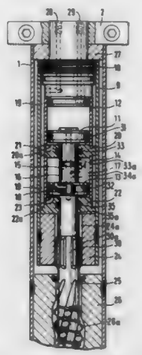
VOL 1088 ISS 4 MR 22 1988 UMI

4,731,885
DEVICE FOR DIVIDING THE AIR FLOW ENTERING IN A HELMET INTO A CENTRAL UPWARD FLOW AND TWO LATERAL FLOWS
Pier L. Nava, Bergamo, Italy, assignor to Nava & C. S.p.A., Italy
Filed Jun. 15, 1987, Ser. No. 61,462
Claims priority, application Italy, Jul. 1, 1986, 22424/86[U]
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—424 4 Claims



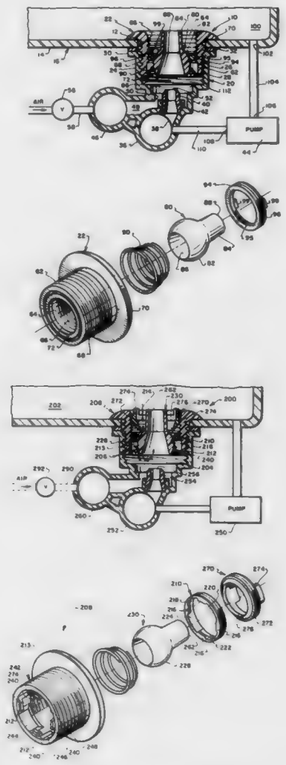
1. Device to ventilate helmets, in particular motorcyclists' helmets, the front of the helmet being provided in its lower part with a set of parallel slots communicating with the interior of the helmet characterized by a central box shaped body opened upwardly to deviate the air flow on the visor and provided by interception means to control air flow, and by two flapper valves fitted laterally with respect to said central body, each to deviate and to control an air flow sidewise of the helmet, said valves consisting of an elastic lamina made of flexible plastic material and being hinged on the lateral walls of said central box shaped body.

4,731,886
ROTATING POST ACTIVATOR FOR SWINGING VEHICLE DOOR
Siegfried Heinrich, Edermünde-Besse, and Manfred Horn, Kaufungen, both of Fed. Rep. of Germany, assignors to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany
Filed Sep. 10, 1986, Ser. No. 905,810
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532514
Int. Cl.[4] F16H *21/44;* E05F *11/54, 15/04*
U.S. Cl. 49—334 4 Claims



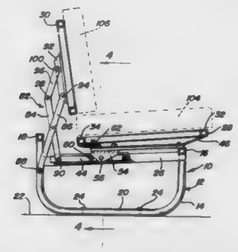
1. In a device for activating a rotating post for moving a swinging-door panel, the post comprising a hollow cylinder rotatably mounted in mounts at both ends and accommodating a worm gear driven by bi-directional pneumatic piston-and-cylinder drive means including a piston rod attached to the worm gear and positioned with a guide rigidly fastened to one of the mounts to permit only longitudinal movement of the piston rod relative to the guide, the improvement wherein the piston-and-cylinder drive means is completely accommodated inside the hollow cylindrical post and comprises a sleeve rigidly fastened to and coaxial with one of the mounts, at least two piston-and-cylinder units aligned in the sleeve and pneumatically connected in parallel, with each unit having a piston and cylinder and wherein the piston rod connects the pistons, means rigidly fastening the guide to an end of the sleeve facing the worm gear, first means receptive of a pressure medium to effect movement of the panel in one direction comprising an axial bore supplying pressure medium to one cylinder and an axial bore in the piston rod communicating with the insides of the cylinders in the vicinity of each piston face that faces the same direction, and second means receptive of a pressure medium to effect movement of the panel in the other direction comprising a supply channel with an essentially annular cross-section positioned between an outside surface of the cylinders and an inside surface of the sleeve and that communicates with the insides of the cylinders in the vicinity of each piston face opposite the piston faces of the first means.

4,731,887
WATER ENTRAINMENT HYDROTHERAPY JET ASSEMBLY
Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001
Filed Jun. 19, 1987, Ser. No. 64,138
Int. Cl.[4] A61H *33/02;* E03C *1/02*
U.S. Cl. 4—541 24 Claims



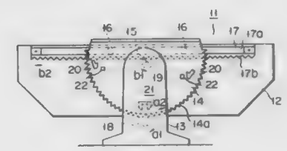
1. A hydrotherapy jet assembly suitable for mounting in an opening of a water tub peripheral wall for discharging a water stream into said tub for impacting against a user's body, said assembly including:
housing means defining a mixing chamber and including means for discharging a water jet along a defined axis into said chamber for creating a suction therein;
tubular flow director means having an inlet orifice and a discharge orifice;
means mounting said flow director means with said inlet orifice open to said mixing chamber and substantially aligned with said water jet axis whereby water supplied by said jet will flow through said flow director means to said discharge orifice; and
passageway means exteriorly of said flow director means for passing water into said chamber, drawn by said suction, from said tub for entrainment by said water jet.

4,731,888
CONVERTIBLE VAN SOFA
Bobby L. Bridges, Rte. 2, Box 3492, Nicholson, Ga. 30565
Filed Dec. 11, 1986, Ser. No. 940,336
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—37 R 11 Claims



1. A convertible seat-bed assembly including a base frame, a seat support and a seat back support, linkage means connected between said base frame and seat back support and seat support for movement of said supports between seat defining positions with the seat support in a generally horizontal position and the seat back support in a generally upright position and a bed defining position with said seat and seat back suports disposed horizontally in side-by-side relation, said seat support, when being shifted from said seat defining position toward said bed defining position being laterally horizontally shifted in a first direction away from said seat back support and the latter, when being shifted from said seat defining position to said bed defining position, being generally vertically lowered and angularly displaced in a manner to swing the lower portion of the seat back support in said direction and the upper portion of said seat back support in a second opposite direction, said linkage means including opposite side followers mounted from said base frame for guided generally horizontal back and forth movement relative thereto in said first and second directions, lazy tong means connected between said seat back support and said base frame and the followers, support portions rigidly supported by opposite sides of said seat support, depending downwardly therefrom and pivotally attached, below said seat support, to the corresponding opposite side followers for limited angular displacement relative to said followers about a horizontal pivot axis extending therebetween, and operating means for shifting said seat support and seat back support between said seat defining and bed defining positions, said operating means connected between said base frame and said seat support above said pivot axis, and being selectively operable to apply thrust forces to said seat support at a point thereon spaced above said pivot axis in said first and second directions, whereby a force applied to said seat support in said opposite direction will initially cause said seat support to rock rearwardly about said pivot axis and thereafter cause shifting of said followers rearwardly relative to said frame and rearward shifting of said seat support and upward displacement of said seat back support relative to said frame.

4,731,889
SAFETY LATCH FOR A TILTING BED
Naobumi Ishikawa, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 26, 1986, Ser. No. 832,877
Claims priority, application Japan, Feb. 27, 1985, 60-38061
Int. Cl.[4] A61B *6/04;* A61G *13/00*
U.S. Cl. 5—62 7 Claims



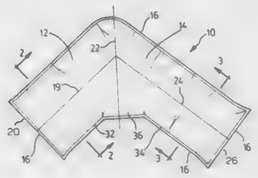
1. A tilting bed, comprising:
a. a support base having a mounting surface portion;
b. a sector gear rotatably supported on said support base and having a side surface facing said mounting surface portion of said support base;
c. a bed section supported on said sector gear and selectively tiltable to a desired diagnostic position by rotation of said sector gear to a desired rotation angle relative to said supoprt base, said desired rotation angle being within a preselected normal rotation angle range;
d. drive means for rotating said sector gear;
e. off-normal rotation control means for stopping operation of said drive means when said sector gear is rotated to a preselected off-normal angle, said off-normal rotation angle being beyond said normal rotation angle range by a preselected first marginal angle; and
f. safety stop means for holding said sector gear when said sector gear is rotated to a preselected limit angle, said limit angle being beyond said normal rotation angle range by a preselected second marginal angle greater than said first marginal angle, said safety stop means including:
a hook member mounted on said side surface of said sector gear and having a hook portion, and
hook holding means for engaging said hook member and holding said sector gear when said sector gear is rotated beyond said normal rotation angle range to said limit angle, said hook holding means including a pair of engaging hooks mounted on said mounting surface portion of said support base in a spaced-apart relation and rotatable only inwardly toward each other, whereby, when said sector gear is rotated beyond said normal rotation angle range and said off-normal rotation angle to said limit angle, said hook member pushes aside one of said engaging hooks to cause said one of said engaging hooks to be inwardly rotated toward the other of said engaging hooks, and then said hook member is positioned and held between said engaging hooks.

4,731,890
PILLOW
Frank L. Roberts, Willowdale, Canada, assignor to Bio-Support Industries Ltd., Toronto, Canada
Filed Dec. 22, 1986, Ser. No. 944,585
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—431 4 Claims

1. A pillow adapted to be used in nursing an infant by a seated adult, with an arm of the pillow sized to support a

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nursing infant, and the other arm of the pillow adapted to support the back of a seated adult, the pillow comprising a hollow flexible L shaped sheath including first and second arms, the first said arm having an aspect ratio of about twice that of the second said arm; and a stuffing material packed within said sheath, the packing density of said stuffing in said first arm being greater than that in said second arm, wherein the length of said arms is such that as said arms are inwardly



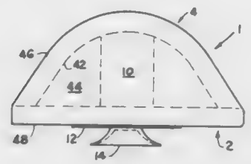
collapsed, opposed inwardly facing flank portions adjacent each distal end thereof are generally contiguous, wherein the ratio of the length of said first arm to second arm is in the ratio of about 4:3, the pillow including means for securing the inwardly facing flanks of said arms in close proximity, whereby when the arms are secured in close proximity, the pillow is adapted for conventional uses, and provides a softer and a harder portion.

4,731,891

APPARATUS AND METHOD FOR MANUFACTURING A WATERPROOF PILLOW

Robert S. Scheurer, and Stephen M. Scheurer, both of Wichita Falls, Tex., assignors to Texas Recreation Corporation, Wichita Falls, Tex.

Filed Jun. 28, 1985, Ser. No. 749,894
Int. Cl.[4] A47C *20/02*; A47K *3/022*
U.S. Cl. 5—434 **3 Claims**



1. A waterproof pillow for use in aqueous environments comprising, in combination:

a hollow pillow body constructed of closed cell foam material and enclosing an airtight interior chamber, said pillow body having a base sheet of closed cell foam material, first and second bell-shaped side members of closed cell foam material extending along opposite sides of the base sheet, the two side members each having a convex contour along a curved upper surface, the lower surface of each side member being bonded to the base sheet, and a covering sheet of closed cell foam material being bonded to the convex curved surfaces of the side members, and being bonded onto opposite edge portions of the base sheet to define a body having a planar base surface, a convex upper surface, and planar side surfaces extending transversely to the upper and lower surfaces; and

an insert block of open cell foam material disposed within the airtight chamber intermediate said base sheet and said covering sheet, said insert block being spaced from said curved covering sheet, thereby defining first and second air pockets on opposite sides of said insert block;

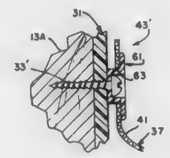
whereby external pressure exerted on the pillow body is absorbed by compression of air contained within the airtight interior chamber acting in cooperation with compression of said insert block.

4,731,892

WATERBED AND HOLDER ASSEMBLY FOR USE THEREWITH

Steve F. Bissel, 8 Robb Rd., Beverly, Mass. 01915

Division of Ser. No. 867,534, May 28, 1986, Pat. No. 4,683,602.
This application May 13, 1987, Ser. No. 49,214
Int. Cl.[4] A47C *27/08*; A47G *9/00*
U.S. Cl. 5—451 **10 Claims**



1. A holder assembly for releasably securing an article of bedclothing to a waterbed frame, said holder assembly comprising:

a base member for being secured to said frame, said base member of substantially U-shaped, elongated configuration and defining a channel therein;

an expandable, resilient member comprised of an elastic material and having a first portion for being secured to said article of bedclothing and a second portion for being releasably secured to said base member;

first retention means for releasably securing said second portion of said expandable, resilient member to said base member, said first retention means including at least one button member secured to or forming part of said base member; and

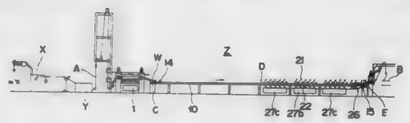
second retention means for engaging said expandable, resilient member to retain said expandable, resilient member against said base member, said second portion of said elastic material including a hole therein for having said button member inserted therein to provide said releasable securement.

4,731,893

METHOD OF CAUSTIC ALKALI TREATMENT FOR KNITTED WORK

Masaharu Tanaka, Kyoto, Japan, assignor to Masatoyo Tanaka; Setsuko Tanaka and Kazuko Tsukamoto, all of Kyoto, Japan

Filed Dec. 6, 1985, Ser. No. 805,603
Int. Cl.[4] D06B *7/10*
U.S. Cl. 8—151 **4 Claims**



1. A method for the caustic alkali treatment of knitted work, comprising the steps of, in succession:

(a) subjecting knitted work of cylindrical shape to a scouring and bleaching treatment, whereby it is expanded in the lengthwise direction and shrunk in the widthwise direction, whereby the knitted work is under a strain;

(b) subjecting said knitted work from step (a) to shrink-proofing by passing it through a shrink-proofing apparatus, to thereby restore said knitted work to its original dimensions prior to step (a) and whereby said strain is removed;

(c) cutting open the knitted work of cylindrical shape into the form of an unfolded cloth with end portions on two sides, by a cutting tool;

(d) passing the unfolded cloth of step (c) through a solution of caustic alkali in a tank under the guidance of rollers which contact each other so that the unfolded cloth is always kept in contact with the rollers while being processed by the caustic alkali;

(e) transferring the unfolded cloth of step (d) to a tenter which is provided in succession to said tank of step (d) and moving said unfolded cloth at the same speed as that at which the unfolded cloth is passed through the tank of caustic alkali solution so that the unfolded cloth is transferred by the tenter in the lengthwise direction under a condition whereby it is generally strained in the widthwise direction while keeping the end portions thereof freely detached from the tenter and supported by the tenter during transfer and

(f) washing the unfolded cloth being transferred on the tenter by shooting a jet of water from above and below the unfolded cloth in the widthwise direction thereof so as to remove the caustic alkali from the unfolded cloth by the jets of water,

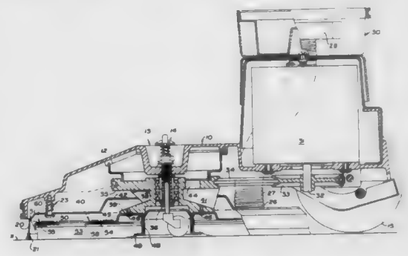
said caustic alkali treatment of step (d) and washing treatment of step (f) being performed in a such a manner that the size and configuration of the knitted work are maintained in the original state prior to step (a).

4,731,895

HIGH SPEED FLOOR BURNISHING MACHINE

Lawrence P. Zack, Minneapolis, Minn., and Gary E. Palmer, Roselle, Ill., assignors to Hako Minuteman, Inc., Addison, Ill.

Filed Oct. 21, 1986, Ser. No. 922,083
Int. Cl.[4] B24B *29/00*; A47L *11/20*
U.S. Cl. 15—98 **5 Claims**



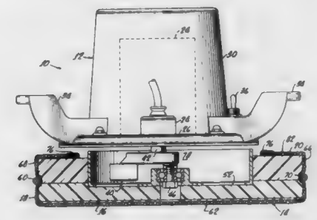
1. In a high speed floor burnishing machine, the combination of a pad driver assembly including a flexible backing member, gripping means on the under side of said backing member and a flexible, air-permeable pad coupled to said gripping means, and adapted to contact a surface to be polished; a motor for rotating said pad driver assembly at high angular velocity; shroud means surrounding said pad driver assembly including sealing means for contacting said surface about the periphery of said pad to prevent air and debris from being forced beneath said shroud means; characterized in that said backing member includes a plurality of apertures spaced radially therearound and intermediate the center and periphery thereof, whereby when said pad driver assembly is rotated at high speed, air is drawn down through said apertures and into said pad, and is accelerated radially outwardly of said pad to cause the peripheral portion of said backing member to flex downwardly and thereby to enhance the gripping of said pad about the periphery of said backing member and to generate a greater downward force about the periphery of said pad to increase the polishing effectiveness thereof.

4,731,894

ORBITAL POLISHING SYSTEM

Lewis A. Ashworth, Orange, Calif., assignor to BAF Industries, Santa Ana, Calif.

Filed May 13, 1986, Ser. No. 862,614
Int. Cl.[4] A47L *11/12*; B60S *3/06*; A46B *13/00*
U.S. Cl. 15—97 R **21 Claims**



1. An orbital polishing system comprising:

drive motor assembly means for orbitally rotating a buffing pad;

a buffing pad having a face and a periphery thereabout;

resilient means for tightly holding a buffing cloth against one side of the buffing pad periphery and releasing the buffing cloth from an opposite side of the buffing pad periphery in response to orbital rotation of the buffing pad, buffing cloth and resilient means by the drive motor assembly means causing the buffing cloth to achieve and maintain a taut configuration across the face of the buffing pad; and,

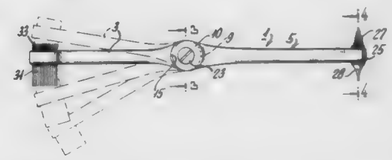
means for preventing said resilient means from moving in a direction perpendicular to the plane of orbital rotation of the buffing pad.

4,731,896

ADJUSTABLE TOOTHBRUSH

Odette de La Tour, 16 W. 82nd St., New York, N.Y. 10024

Filed Oct. 21, 1985, Ser. No. 789,495
Int. Cl.[4] A46B *7/00, 9/04*; A61C *15/00*
U.S. Cl. 15—106 **10 Claims**



1. An articulated toothbrush comprising

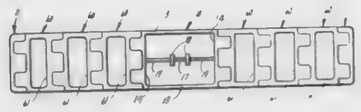
(a) a pair of elongated articulated members connected to each other at one of their extremities which includes circular tongue and groove tracking area means for permitting the members to rotate relative to each other along said track areas, the said groove means further including bifurcated sections stressed during the engagement thereof by the tongue of one of the articulated members,

(b) adjustable control means connected to said members at the said extremities for maintaining the said tongue and groove in a fixed relationship to permit the selective indexing of said members by the user in a plurality of rotational positions relative to each other, and

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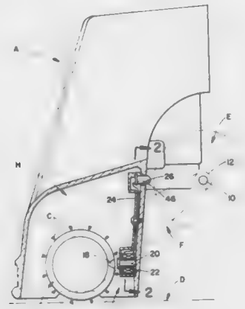
(c) dual cleansing means at each of the other extremities of the said members for performing hygienic cleansing of the teeth and gums in different locations of the mouth.

4,731,897
MODULAR MOP HOLDER
Dana K. Griffin, Van Wert, Ohio, assignor to Tu-Way Products Company, Troy, Mich.
Filed Mar. 31, 1987, Ser. No. 32,871
Int. Cl.[4] A47L *13/254*
U.S. Cl. 15—147 R 8 Claims



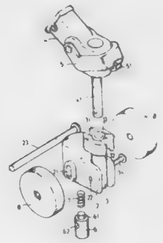
1. A mop holder, adapted to be attached to a mop handle, comprising:
(a) an elongated mop holder basic section provided with means for attaching the mop holder to a mop handle, and adapted to have a mop element attached thereto; and,
(b) said mop holder basic section being provided with a connection means on at least one of the lengthwise ends thereof, for selective connection to a connection means on at least one add-on mop holder section.

4,731,898
BRUSH SPEED INDICATOR
John F. Sovis, Richmond Heights; Michael F. Wright, Cuyahoga Falls; Scott B. Richards, Wadsworth, and Abe Zeewsy, Cleveland, all of Ohio, assignors to Royal Appliance Mfg. Co., Cleveland, Ohio
Filed Sep. 5, 1986, Ser. No. 908,352
Int. Cl.[4] A47L *9/28;* H02H *7/08*
U.S. Cl. 15—339 4 Claims



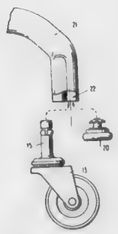
1. A vacuum cleaner comprising:
a housing enclosing a brush adapted for operative rotation therein;
a motor for rotatably driving said brush;
means for providing a first signal indicative of rotational movement of the brush, said first signal providing means including a metal element fixedly secured to said brush for rotation therewith and a magnet fixedly mounted to said housing whereby flux lines of said magnet are altered as said brush rotates; and,
means for receiving said first signal and for generating a second signal in response thereto.

4,731,899
ROTARY ROLLER SET DIRECTIONAL CONTROL DEVICE
Yung-Ho Huang, 140-58, Ch'e-Lu-Chien, Pao An Ts'un, Jen Te Hsiang, Tainan Hsien, Taiwan
Filed Jul. 18, 1986, Ser. No. 887,063
Int. Cl.[4] B60B *33/02*
U.S. Cl. 16—35 R 3 Claims



1. A rotary roller set directional control device comprising:
a roller seat having a front end and a rear end, said front end having a vertical slot therein;
a pivotal shaft socket, having a top end, said socket being disposed in said vertical slot, said socket having a T-shaped projection at said top end, said projection having a top surface and two opposite vertical slots therein;
a pair of rollers disposed on said rear end of said roller seat;
a pivotal supporting arm, having a front end, a middle portion and a rear end, said pivotal supporting arm having a revolving shaft extending vertically from said middle portion, said revolving shaft fitting within said pivotal shaft socket;
a U-shaped rocker having a base portion, and a front end with a lower edge, said rocker being disposed so that said base portion surrounds said front end of said pivotal supporting arm and said rocker is vertically movable with respect to said pivotal supporting arm, said rocker having an inward catch key on said lower edge of said front end of said rocker, said catch key being disposed to swing vertically downward and lock into either vertical slot of said T-shaped projection.

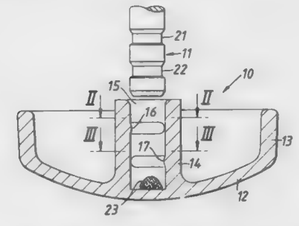
4,731,900
TUBULAR CHAIR LEG FORMED FOR DIRECT MOUNTING OF CASTER OR GLIDE
James W. Frobose, Haskins, Ohio, assignor to Ajusto Equipment Limited Partnership, Bowling Green, Ohio
Filed Apr. 29, 1986, Ser. No. 857,099
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—38 7 Claims



1. A metal tubular leg for a chair or the like having a normal or first outer diameter, said tubular leg formed at an end portion thereof to provide thereon integrally therewith a unitary

socket having a second outer diameter reduced from said first outer diameter for a glide or a caster, the socket including a unitary sleeve portion having a longitudinal axis and an inner diameter reduced from said second outer diameter by the wall thickness of said tubular leg to receive the shank of a glide or the pintle of a caster, and further including a pair of opposite side rearwardly divergent substantially flat webs whose outer edges are parallel with the axis of said sleeve portion and the distance between said outer edges being only slightly greater than said normal diameter of the metal tubular leg, said webs having double parallel walls produced by folding of the metal of said tubular leg and said sleeve portion having opposing arcuate side walls each being joined integrally with one wall of each web, one of said opposing arcuate side walls positioned forwardly of said pair of rearwardly divergent webs, and said one of said opposing arcuate side walls having a portion in longitudinal alignment with and an extension of said first outer diameter of said tubular leg.

4,731,901
CASTOR WHEEL WITH NON CONTINUOUS RIBS FOR LUBRICANT
Raymond R. J. Daniels, Norfolk, England, assignor to Guy-Raymond Engineering Company Limited, Norfolk, England
Filed Feb. 7, 1986, Ser. No. 827,241
Claims priority, application United Kingdom, Feb. 12, 1985, 8503511
Int. Cl.[4] A47B *91/06*
U.S. Cl. 16—42 R 10 Claims



1. A moulded plastics article having a closed bore for receiving a spindle, said bore being formed with at least one radially inwardly projecting annular rib, said rib being adapted to locate in a circumferential groove in the spindle, wherein the or each said rib is interrupted to form a gap for the passage of fluid from one side of said rib to the other when the spindle is inserted into said bore.

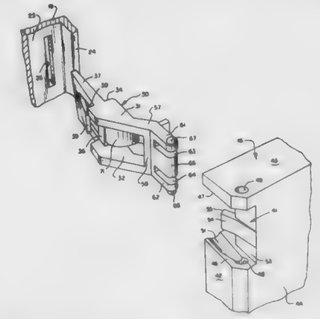
4,731,902
DOOR AND GATE SPRING
James R. Johnston, Sterling, Ill., assignor to National Manufacturing Co., Sterling, Ill.
Filed Aug. 9, 1982, Ser. No. 406,509
Int. Cl.[4] E05F *1/12*
U.S. Cl. 16—72 5 Claims

1. A spring assembly for use with a door gate comprising:
a first mounting bracket;
a first stud having an elongated shank portion having a non-circular shaped external surface in cross-section adapted to be attached to said first mounting bracket;
a second mounting bracket;
a second stud having an elongated shank portion having a non-rotatably affixed to said second bracket; and
a coil spring having a plurality of turns at one end having an interior shape and dimension which is complementary to said first stud exterior surface and being press fit onto said first stud, said spring further having a plurality of turns at a second end opposite said first end having an interior shape and dimension which is complementary to said



second stud exterior surface shape, and being press fit onto said second stud.

4,731,903
SELF-LATCHING HINGE
Robert W. Kennedy, Bridgewater, and Howard J. Tyler, Marlboro, both of N.J., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Oct. 27, 1986, Ser. No. 923,412
Int. Cl.[4] E05D *7/00, 5/00;* E05F *1/08*
U.S. Cl. 16—224 13 Claims



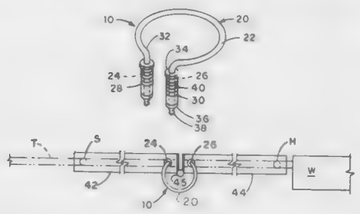
1. A hinge structure for pivotally mounting a door on a frame, comprising a hinge member, means fixedly mounting one end of said hinge member on said frame, said door having a notch receiving the other end of said hinge member, said notch having a pair of sides, pivot means on said other end of said hinge member and on the sides of said notch to allow rotation of said door about an axis, one position of said door and said frame defining a closed position, and cooperating means on said hinge member and said door to provide a biasing force operable to rotate said door to the closed position.

4,731,904
SPRING SYSTEM FOR STABILIZING BIFOLD DOOR HINGED POSITIONS
George W. Sprague, 1744 Ellingwood Rd., Baltimore, Md. 21237
Filed Jul. 13, 1987, Ser. No. 72,521
Int. Cl.[4] E05F *1/08;* F16F *1/00*
U.S. Cl. 16—286 7 Claims

1. A spring system for stabilizing at open and shut angular positions a pair of bifold doors hinged together at an edge of each said door about a vertical axis, comprising: tubular structure defining a respective hole and mountable in an edge of each said door substantially equidistant from and parallel to the vertical axis, a "C"-shape spring with first and second integral end portions in the form of a pair of parallel-spaced coextensive shanks extending at right angles from the plane of the

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"C"-shape, each of said shanks being located in the hole of a respective tubular structure, said spring being pre-loaded upon installation for exerting an over center force stabilizing the



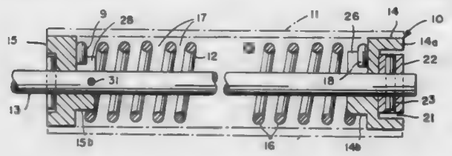
bifold doors by establishing the distance between the holes at any said angular position to be greater than said parallel spacing.

4,731,905

OVERHEAD DOOR TORSION SPRING ASSEMBLY AND METHOD

Richard J. Milano; Coy H. Burgess, and William F. Wadsworth, all of Dixon, Ill., assignors to Raynor Manufacturing Company, Dixon, Ill.

Filed May 1, 1986, Ser. No. 858,583
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—306 13 Claims



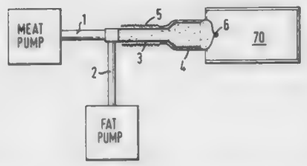
1. A torsion spring assembly for overhead doors, comprising an elongated helical torsion spring having a multiplicity of coils which are normally spaced apart when said spring is in an untensioned state; said spring having radially inwardly turned hook portions at opposite ends thereof; a shaft extending through the coils of said spring having end portions projecting beyond said spring; a first spring-mounting collar having a bore rotatably receiving one of said end portions of said shaft; said first collar having a neck portion extending into the coils at one end of said spring; said neck portion of said first collar having a generally axially-extending slot receiving one of said hook portions of said spring for anchoring said one end of said spring and said first collar against independent relative rotation; means secured to said shaft for preventing outward axial movement of said first collar upon said shaft; a second spring-mounting collar having a bore receiving the other end of said shaft; said second collar having a neck portion extending into the coils at the other end of said spring opposite from said one end; said neck portion of said second collar having a generally axially extending slot receiving the other of said hook portions of said spring for anchoring said other end of said spring and said second collar against independent relative rotation; and removable locking means securing said second collar against independent axial and rotational movement relative to said shaft; opposing ends of said neck portions of said first and second collars is such that the spring would be in a partially compressed state when said spring is fully untensioned.

4,731,906

APPARATUS FOR MAKING A SIMULATED NATURAL CUT OF MEAT

Bernard T. Matthews, Norwich; David J. Joll, Holt; Habeeb M. Ziauddin, and David N. Wilson, both of Norwich, all of England, assignors to Bernard Matthews plc, Norfolk, England

Division of Ser. No. 694,760, Jan. 25, 1985, Pat. No. 4,610,844.
This application Jun. 19, 1986, Ser. No. 875,989
Claims priority, application United Kingdom, Feb. 3, 1984, 8402948; Jan. 18, 1985, 8501291
Int. Cl.[4] A22C *7/00, 11/02*
U.S. Cl. 17—1 R 4 Claims



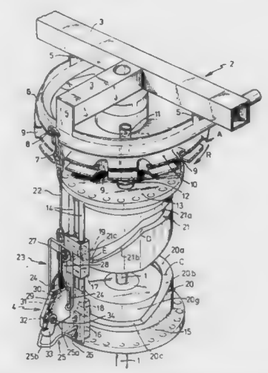
1. Apparatus for manufacturing a simulated natural cut of meat of substantially constant and non-cylindrical cross-section from large natural whole muscle means pieces and fat, said apparatus comprising an extrusion head having said non-cylindrical cross-section and comprising a meat region and a fat region, means for supplying said respective regions with meat and fat, means for encasing an extruded product in a flexible sleeve as said extruded product emerges from the head, conveyor means onto which said encased extruded product is deposited, forming means adjacent said conveyor means and said encasing means for maintaining a configuration of said encased extruded product formed by said extrusion head, and means for at least superficially freezing the encased extruded product.

4,731,907

DEVICE FOR CUTTING OPEN SLAUGHTERED POULTRY

Rudolf J. Tieleman, Aw Doesburg, Netherlands, assignor to Linco Holland Engineering B.V., Doesburg, Netherlands

Filed May 4, 1987, Ser. No. 46,228
Claims priority, application European Pat. Off., May 16, 1986, 86200850.5
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 9 Claims



1. A device for cutting open the bottom of a slaughtered bird (V) suspended with the legs from a hook (23) of a conveyor (7),

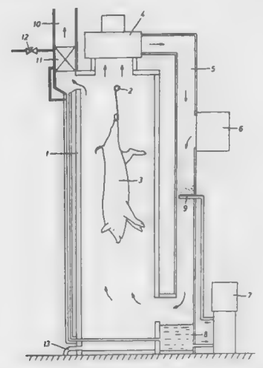
comprising a processing member (33) to be inserted into the bird and provided with a cutting edge (36), said cutting edge being movable along a portion of a circular arc and cooperating with a follower (19) which in its turn cooperates with a fixedly disposed curved path (21), which processing member (33) is mounted on a slide (16), which is movable up and down in the direction of the bird (V) along a slide guide (14) moving along with the conveyor (7) and which cooperates with a fixedly disposed curved path (20) for the control of the movement of the slide (16), which is provided with a bottom clip (25, 25') which can engage the bottom between the legs of the birds (V), characterized in that at least a portion (36*a*) of the cutting edge (36) of the processing member (33) from the foremost, outermost point (39) thereof is substantially vertical at the beginning of the operative stroke and is substantially horizontal at the end of the operative stroke, and that at least the said portion (36) of the processing member (33) in the operative direction of movement (B) of the processing member (33) is trailing with respect to the foremost, outermost point (39) of the cutting edge (36) in this direction.

4,731,908

APPARATUS FOR THE SCALDING OF CARCASSES

Olaf Thorsen, Olstykke, Denmark, assignor to Slagteriernes Forskningsinstitut, Roskilde, Denmark

PCT No. PCT/DK86/00038, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/05952, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 11, 1986, Ser. No. 7,966
Claims priority, application Denmark, Apr. 12, 1985, 1643/85
Int. Cl.[4] A22B *5/08*
U.S. Cl. 17—15 11 Claims



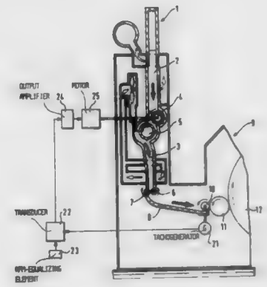
1. An apparatus for the scalding of carcasses comprising:
heat insulated cabin means for housing the carcasses;
fan means for moving hot humid air through said cabin means;
water atomizer means for providing atomized water to said cabin;
burner means for heating the atomized water and air; and
air discharge duct means for discharging air supplied to said cabin.

4,731,909

APPARATUS FOR CONTROLLING THE FEED ROLLER OF A FIBER TUFT FEEDER

Günter Duda, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 906,082, Sep. 11, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,219
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532410; Jul. 25, 1986, 3625311
Int. Cl.[4] D01G *23/02, 15/40*
U.S. Cl. 19—105 7 Claims



1. In a system including a fiber tuft feeder and a carding machine operatively coupled to the fiber tuft feeder or receiving a fiber lap therefrom; the tuft feeder having a feed chute and a first feed roller advancing fiber tufts into the feed chute, and the carding machine having a second feed roller arranged for advancing the fiber lap and a doffer situated downstream of said second feed roller; said second feed roller and said doffer constituting card rollers; an rpm-variable motor drivingly connected to said first feed roller and an output amplifier forming part of said rpm-variable motor; and control means for controlling the operation of said first feed roller; the improvement in said control means comprising
(a) an rpm measuring means connected to at least one of said card rollers for generating a first signal representing an operational magnitude of said at least one card roller;
(b) signal generating means connected to an output of said rpm measuring means and arranged for generating a second signal as a function of said first signal;
(c) pressure sensing means for sensing pressure in said feed chute and for generating a third signal representing said pressure;
(d) a regulator connected to an output of said pressure sensing means and arranged for generating a fourth signal as a function of said third signal; and
(e) an integrating device connected to an output of said signal generating means and an output of said regulator for receiving said second and fourth signals and being arranged for emitting a fifth signal as a function of said second and fourth signals; said integrating device being connected to said output amplifier for applying said fifth signal thereto.

4,731,910

HOOKING MECHANISM

Elmor G. Purcell, and Charlotte H. Purcell, both of 1208 Scott, Waterloo, Iowa 50701

Filed Jun. 22, 1987, Ser. No. 64,686
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—239 13 Claims

1. A hooking mechanism for quick, easy and reliable securing comprising:

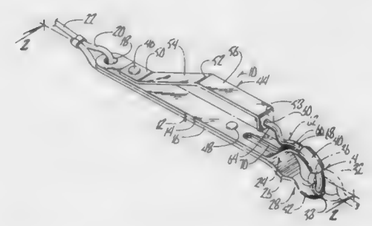
VOL 1088 ISS 4 MR 22 1988 UMI

a shank portion having a longitudinal axis, an anchor end, and a hooking end opposite of the anchor end;

first and second opposite generally curved yoke arms extending outwardly from the hooking end, said yoke arms generally defining an annular yoke but having a gap between the outermost ends of the yoke arms;

retaining means positioned along each of said first and second yoke arms;

a locking member having a rear portion and a forward portion, and being movable between an open and a locked position, the forward portion being slidably retained in the retaining means of the first yoke arm, being curved to generally conform to the outer circumference of the annular yoke formed by the first and second yoke arms, and being slidably retainable in the retaining means of the second yoke arm when moved from the open to the locked position, blocking the gap;



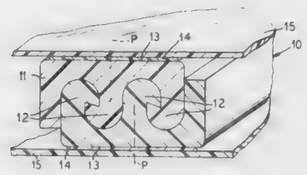
an actuator member having a rear end secured to the shank member, a middle section extending along the longitudinal axis of the shank member to a front end, the rear portion of the locking member being slidably insertable into the front end of the actuator member, the actuator member biasing the locking member to a locked position closing the gap and being retained in the retaining means of the first and second yoke arms, but being resiliently flexible so that when the middle section of the actuator member is depressed towards the shank member, the rear portion of the locking member is forced towards the shank member causing the forward portion to slidably move out of the retaining portion of the second yoke arm a distance sufficient to open at least a portion of the gap between the outermost ends of the yoke arms.

4,731,911

EXTRUDED CLOSURE STRIP CARRYING REACTIVATABLE ADHESIVE LAYER

Russell J. Gould, Mt. Prospect, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 8, 1986, Ser. No. 894,669
Int. Cl.[4] B65D *33/24*
U.S. Cl. 24—587 **3 Claims**



1. A closure strip adapted to be bonded to a substrate such as film in the manufacture of reclosable bags, the closure strip having a longitudinally extending base portion providing a longitudinally extending base furface, and a profile portion extending longitudinally along the base portion and having profile means projecting in the opposite direction from that in which the base surface faces, the base and profile portions comprising an extrusion in one piece from a polymeric material and being shaped cross-sectionally such that a plane projected normal to and bisecting said base surface longitudinally into two parts also bisects the profile portion into two corresponding parts, and comprising:

said base surface being directly back of said profile portion and of a width essentially no wider than said profile portion;

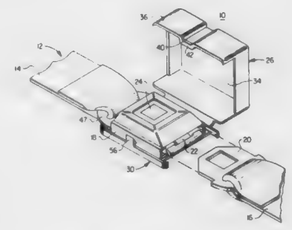
and a dormant but reactivatable adhesive layer adhering to and along said base surface on at least one side of said plane, so that the closure strip is adapted to be bonded to the substrate upon reactivation of the dormant adhesive.

4,731,912

SEAT BELT BUCKLE GUARD

Helen A. Boriskie, Dallas, Tex., and Louis Emmer, Oklahoma City, Okla., assignors to Ashlar Products, Incorporated, Dallas, Tex.

Filed Sep. 19, 1986, Ser. No. 909,253
Int. Cl.[4] A41F *1/00*
U.S. Cl. 24—633 **9 Claims**



1. A seat belt buckle guard for a seat belt buckle having an exposed release mechanism comprising:

in combination, a box like device having first and second housing portions;

the first and second housing portions each having a flat plate member and first and second pairs of opposing sides normal to the flat plate member, the flat plate members of the first and second housing portions forming front and back sides for the box like device, the first pair of opposing sides of the first and second housing portions having walls forming first and second opposing apertures therein, the second pair of opposing sides of the first and second housing portions each having corresponding first and second sides,

a strengthening means connected to at least one of said second sides for strengthening a portion thereof for a latching means:

a hinge means between the first sides for pivotally connecting the corresponding first sides of the second pair of opposing sides, said corresponding first sides and hinge forming a top for the box like device; and

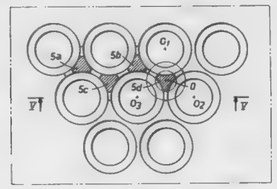
a latching means operatively connected to the strengthened portion of the at least one of the said second sides for latching together the first and second housing portions to form a bottom for the box like device with the latching means thereon, whereby when a buckle of a segmented seat belt having the buckle and buckle tongue attached to the ends is placed in the first and second housing portions with the buckle end of the seat belt passing through the first aperture and the first and second housing portions closed and latched together the buckle including its release button is sandwiched in the box like device, positioned to engage the tongue end of the segmented seat belt when inserted through the second aperture, and coacts with the strengthening means to rigidify the box like device, and the latching means being attached to the bottom of the box like device is rendered difficult for child opening, and a seat belt buckle release mechanism is shielded from access.

4,731,913

PROCESS FOR MAKING JEWELRY COMPRISING ONE OR MORE ROWS OF STONES AND JEWELRY OBTAINED BY THESE PROCESSES

Alain M. Plantureux, and Emile G. Magnien, both of Montpellier, France, assignors to Diamant Applications, Montpellier, France

Filed Mar. 12, 1986, Ser. No. 839,124
Claims priority, application France, Mar. 21, 1985, 85 04350
Int. Cl.[4] B23P *5/00*
U.S. Cl. 29—40 **10 Claims**



1. A process for making jewelry comprising one or more rows of stones set in a support made of precious metal, said process comprising the following steps:

machining said support to form one or more rows of cylindrical housings comprising an outer bore, a conical seating and a counter-bore the housing being separated by metal bridges of at least two thicknesses;

cutting, with a rotating mill the thinner part of the metal bridges which separate juxtaposed outer bores over a height equal to that of said outer bores with the result that each outer bore remains surrounded by islets of metal, uniformly distributed over its periphery;

placing a stone in each housing; said stone abutting on said conical seating;

and setting said stone by means of a concave-headed tool, which is applied axially on said islets to deform them permanently by buckling.

4,731,914

METHOD FOR MANUFACTURING AN ELECTROHYDRAULIC VALVE ASSEMBLY

Kenneth W. Zeuner, 43 Red Fox Dr., New Hope, Pa. 18938; Steven K. Zeuner, 39 Larch Cir., and Thomas A. Zeuner, 230 Woodlake Dr., both of Holland, Pa. 18966

Division of Ser. No. 568,599, Jan. 6, 1984, Pat. No. 4,638,974.
This application Dec. 1, 1986, Ser. No. 936,316
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157.1 R **4 Claims**

1. A method for manufacturing an electrohydraulic valve comprising the steps of

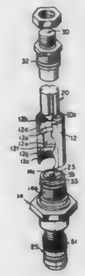
(a) forming an end stop section having high magnetically permeable material and having a lower threaded portion;

(b) forming a body section having high magnetically permeable material and having an upper threaded portion;

(c) forming a unitary sleeve section of low magnetically permeable material having an inner chamber with upper and lower portions which are internally threaded;

(d) completely finishing each of the end stop, body and sleeve sections so that substantially no further internal finishing operations are required;

(e) selecting predetermined ones of the sections to form a desired valve assembly for a particular application; and



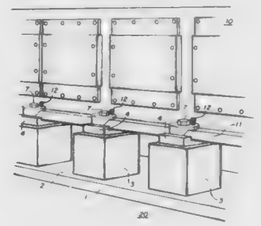
(f) threading and fluidly sealing the sleeve section to the end stop section and threading and fluidly sealing the sleeve section to the body section to form a valve assembly.

4,731,915

MACHINERY SUPPORT AND METHOD

Royce Z. Holder, 910 W. 62nd St., Odessa, Tex. 79764

Filed Feb. 26, 1987, Ser. No. 19,302
Int. Cl.[4] B23P *7/00*; F16M *1/00, 13/00*; E04B *1/16*
U.S. Cl. 29—402.03 **20 Claims**



1. In a machine support system, a method of repairing machine supports having a foundation including grouting material with anchor bolts for securing a machine to said support and leveling means to level and align the machine comprising releasing the tension and strain on the machine, removing existing machine support materials for a minimum depth necessary to expose the lowest portion of the machine and providing adequate space for new supports while supporting the machine on temporary supports, forming a layer of grouting material over the foundation, forming multiple columns extending upward from the layer over the concrete foundation under support members of the machine and surrounding, but not adhering to, the anchor bolts, leveling the machine with said leveling means, thereafter forming epoxy chocks upon the columns, surrounding, but not adhering to, the anchor bolts and extending between the columns and said support members for supporting said machine, and thereafter releasing the leveling screws and post-tensioning the anchor bolts to secure the machine upon said machine support.

7. The method of forming a permanent, non-corrosive level support for a heavy machine which comprises forming a foundation block having anchor bolts secured in and extending upward from said foundation block, forming multiple columns of a grouting material extending upward thereform and surrounding, but not adhering to, the anchor bolts, leveling and aligning the machine by suitable known means, and forming chocks of a grouting material seated on each of said columns

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and surrounding said anchor bolts, but not adhering thereto, said chocks supporting the heavy machine.

14. A support for a heavy machine which comprises a foundation block having anchor blots secured in and extending upward therefrom, a seal layer of a relatively impermeable surface upon said foundation block, multiple columns of a grouting material extending upward from the seal layer and surrounding, but not adhering to, the anchor bolts, chocks of a grouting material seated on each of said columns and surrounding said anchor bolts, but not adhering thereto, said chocks supporting the heavy machine from the columns.

4,731,916

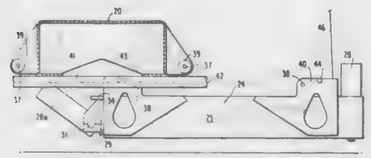
METHOD OF REMOVAL OF OUTRIGGER BOX ON CRANES

Robert L. Fix, Hagerstown, Md., assignor to Kidde, Inc., Saddle Brook, N.J.

Division of Ser. No. 535,411, Sep. 26, 1983, Pat. No. 4,664,411. This application Oct. 27, 1986, Ser. No. 923,605

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—426.3 **8 Claims**



1. A method of removing an outrigger assembly from its normal use position beneath a crane chassis frame transversely of the frame comprising unweighting opposite ends of the outrigger assembly to permit withdrawal of pins coupling the assembly to the chassis frame, lowering the released outrigger assembly onto transverse guide tracks secured to the bottom of the chassis frame, swinging one jack cylinder of the outrigger assembly downwardly, about a pivot axis on a support therefor on an end of the outrigger assembly substantially below the top of the outrigger assembly, to an inclined position below the level of the bottom of the chassis frame, shifting the outrigger assembly longitudinally on the guide tracks and transversely of the chassis frame toward the ends of the guide tracks which are downstream from the tilted jack cylinder and simultaneously supporting the downstream end of the outrigger assembly, and then lifting the outrigger assembly at both ends to remove it from the guide tracks and placing it on a supporting surface.

8. A method of removing an outrigger assembly from beneath a crane chassis frame to which it is attached through supporting pins, comprising unweighting the outrigger assembly and withdrawing said pins, lowering the outrigger assembly after the withdrawal of said pins onto support surfaces secured to the chassis frame at positions somewhat below the chassis frame, moving one upstream jack cylinder of the outrigger assembly to a position below the elevation of the bottom of the chassis frame downwardly, about a pivot axis on a support therefor on an end of the outrigger assembly substantially below the top of the outrigger assembly, shifting the outrigger assembly with the upstream jack cylinder in the downward position in one direction along said support surfaces transversely of the chassis frame until the outrigger assembly is substantially beyond the downstream side of the support frame with the upstream end of the outrigger assembly continuing to be supported on said surfaces, and then lifting the outrigger assembly bodily from the support surfaces, thereby completing separating the assembly from the chassis frame.

4,731,917

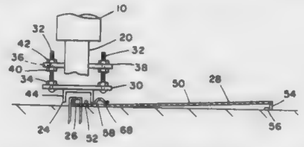
STAPLE GUN APPLICATION OF VINYL SIDING

Thomas R. Krowl, North Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Sep. 27, 1982, Ser. No. 423,702

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—432 **5 Claims**



1. The method of applying vinyl siding over relatively low density insulation board comprising the steps of placing an elongate strip of vinyl siding, having a plurality of longitudinally aligned, elongated nailing slots, over said insulation board forming the exterior flat subsurface of a building, placing a powered staple gun in position to fire a staple so that one staple leg will extend through one of said nailing slots in the siding top edge portion and the other staple leg will be disposed above the top edge of said siding, said staple gun having an adjustable shoe firmly held relative to said siding adjustably fixing the distance from the staple outlet to the vinyl siding between said nailing slot and said siding top edge, firing said staple gun so as to place a staple through said insulation board, and repeating as necessary.

4,731,918

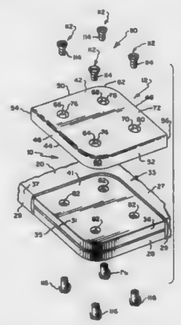
METHOD OF ATTACHING A CORNER PROTECTOR TO A TABLETOP OR THE LIKE

Donald J. Burghardt, Angell Rd., Silver Creek, N.Y. 14136

Filed Feb. 12, 1987, Ser. No. 13,963

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—526 R **5 Claims**



1. A method of installing a corner protector upon a tabletop or the like having two adjacent edges which meet at a corner, said method comprising the steps of:

providing a rigid protective body including a platen portion adapted to overlie a tabletop adjacent the corner thereof and a flange portion extending generally away from one side surface of said platen portion so that when said protective body is operatively positioned upon the tabletop, the flange portion extends generally downwardly from the platen portion so as to cover at least a portion of the tabletop edges at the tabletop corner, said platen portion defining a plurality of apertures disposed thereover;

forming a recess in the upper surface of the tabletop adjacent the corner thereof for receiving said platen portion when said protective body is operatively placed upon said tabletop, said recess being about equal in depth to the thickness of said platen portion of said protective body so that when said protective body is operatively placed upon said tabletop, the side surface of said platen portion opposite said one side surface is about even with the tabletop upper surface;

operatively positioning said protective body upon the tabletop and within said recess; and

securing the protective body to the tabletop with fasteners having shanks for extending through the platen portion apertures and heads for holding the platen portion against the tabletop.

4,731,919

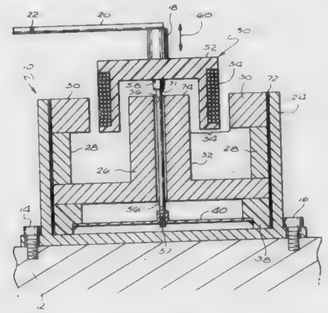
CENTERING MECHANISM FOR MOVING COIL FORCE MOTOR

Stephen J. Tranovich, Saugus, and James L. Coakley, Fillmore, both of Calif., assignors to HR Textron, Inc., Valencia, Calif.

Filed Oct. 28, 1986, Ser. No. 924,236

Int. Cl.[4] H02K *15/00, 15/14*

U.S. Cl. 29—596 **4 Claims**



1. A method of manufacturing a moving coil force motor having fixed permanent magnet pole pieces defining an air gap therebetween disposed within a motorcase and a movable coil mounted on a flexure spring member to precisely position the coil within the gap comprising the steps of:

aligning said flexure spring member centrally of said permanent magnet pole pieces;

rigidly securing said aligned spring and permanent magnet pole pieces within said motorcase;

affixing said movable coil to a driven member and centrally of said aligned spring;

relatively moving said motorcase with respect to said movable coil until movable coil is centered within said air gap; and

securing said motorcase against further movement.

4,731,920

METHOD FOR MOUNTING A MAGNETIC HEAD

Yasunori Nishijima; Daisuke Mitsuhashi; Takao Miyazaki, and Kenji Negishi, all of Minato, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 23, 1986, Ser. No. 877,411

Claims priority, application Japan, Jun. 26, 1985, 60-137897; Sep. 17, 1985, 60-205107; Sep. 17, 1985, 60-205108; May 21, 1986, 61-116917

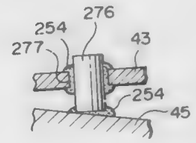
Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**

1. A method of attaching a head mount plate with a magnetic head previously attached thereto to a head carriage freely movable in the radial direction of a rotating magnetic disc so as to mount said magnetic head, said method comprising the steps of:

positioning said head mount plate at a predetermined position with respect to said head carriage by use of an adjusting jig;

inserting a rod-like connecting member through a through-bore formed in said head mount plate and bringing the top end of said connecting member into abutment with said head carriage; and,



applying adhesives to clearances between said top end of said connecting member and the abutment surface of said head carriage as well as between said connecting member and said through-bore in said head mount plate to fill them up.

4,731,921

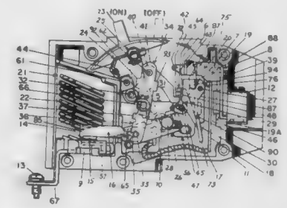
METHOD OF FABRICATING A MOLDED CASE CIRCUIT BREAKER

Ronald D. Ciarcia, Southington; Gregory T. DiVincenzo; Richard E. Bernier, both of Plainville, and Joseph G. Nagy, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 817,213, Jan. 8, 1986, Pat. No. 4,679,016. This application Apr. 17, 1987, Ser. No. 39,343

Int. Cl.[4] H01H *11/00*

U.S. Cl. 29—622 **1 Claim**



1. A method of fabricating a molded case circuit breaker comprising the steps of:

arranging a fixed contact and a line terminal strap within a molded plastic case;

arranging a trip mechanism electrically connected to a moving contact arm and a load terminal strap within said molded case opposite said fixed contact;

placing a contact carrier arrangement within slots formed within said molded plastic case and slidingly engaging a pin on said movable contact arm with a pair of slots on said contact carrier;

arranging a bottom link on said contact carrier by capturing said movable contact arm pin within a pair of slots formed on a bottom of said bottom link;

mounting a U-shaped operating handle yoke on a pair of side frames carrrying a latch assembly, a cradle and an upper link;

attaching said upper link to said lower link by engaging a pair of slots formed on said lower link with said movable contact arm pin; and

inserting said side frames within said molded plastic case and fastening said side frames to said molded plastic case.

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4,731,922

APPARATUS FOR CLOSING SLIDE FASTENER CHAINS HAVING SLIDERS

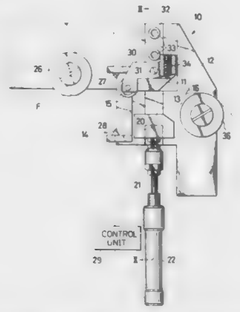
Ichiro Ikehara, Toyama; Shingo Hatagishi, Namerikawa, and Hiroshi Shirakawa, Uozu, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 11, 1987, Ser. No. 24,713

Claims priority, application Japan, Mar. 14, 1986, 61-37460[U]

Int. Cl.[4] B29D *5/00*

U.S. Cl. 29—766 9 Claims



1. An apparatus for closing a pair of slide fastener stringers including a plurality of longitudinally spaced chains of partly engaged coupling elements with sliders mounted respectively thereon, there being an element-free space between successive chains, each chain having a disengaged portion extending between a top end thereof and the slider mounted thereon, said apparatus comprising:

(a) a stationary element-engaging block disposed on one side of a path of movement of the coupling element chains and having a first guide groove facing toward the path;

(b) a movable element-engaging block disposed on the other side of the path and having a second guide groove facing toward said first guide groove, said movable element-engaging block being reciprocative toward and away from the stationary element-engaging block for causing said first and second guide grooves to selectively form a guide channel for constrictingly receiving therein the disengaged portion of each chain to close the same;

(c) a sensor disposed upstream of said stationary element-engaging block for detecting the element-free space and the slider mounted on the chain next following the element-space; and

(d) an actuator under the control of said sensor and operatively connected to said movable element-engaging block for reciprocating the latter.

4,731,923

APPARATUS AND METHOD FOR MOUNTING CIRCUIT ELEMENT ON PRINTED CIRCUIT BOARD

Hiroshi Yagi; Shuichi Tando; Yoshihito Oba, and Toshihisa Nakamura, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 23,117

Claims priority, application Japan, Mar. 15, 1986, 61-56062; Mar. 29, 1986, 61-69763; Apr. 17, 1986, 61-56868[U]; May 2, 1986, 61-66183[U]; May 27, 1986, 61-79664[U]; May 27, 1986, 61-79665[U]; May 29, 1986, 61-80320; Dec. 25, 1986, 61-310957; Dec. 25, 1986, 61-310958

Int. Cl.[4] H05K *3/30;* B23P *19/00*

U.S. Cl. 29—833 20 Claims

1. An apparatus for mounting a circuit element on a printed circuit board comprising:

a base;

a circuit element supply mechanism for supplying a circuit element to a predetermined position on said base;

a centering and optional turning mechanism for regulating a position and a posture of said circuit element;

a circuit element extracting head arranged so as to be movable between said supply mechanism and said centering and optional turning mechanism, said extracting head taking out said circuit element from said supply mechanism by suction and delivering said taken-out circuit element to said centering and optional turning mechanism;

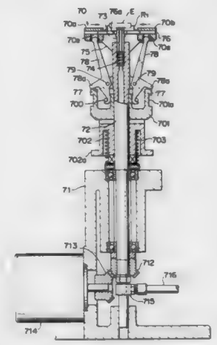
a mounting head arranged so as to be movable with respect a printed circuit board, said mounting head holding said circuit element of which the position and posture have been regulated by said centering and optional turning mechanism thereon by suction and carrying it to said printed circuit board;

a substrate support mechanism for supporting thereon said printed circuit board on which said circuit element is to be mounted;

a lead wire detection mechanism for detecting lead wires of said circuit element of which the position and posture have been regulated by said centering and optional turning mechanism; and

a substrate mark detection mechanism for detecting a mounting reference mark on said printed circuit board supported on said substrate support mechanism;

all of said mechanisms being mounted on said base;



whereby movement of said mounting head with respect to said printed circuit board is corrected depending on a result of detection by each of said detection mechanisms.

17. In a method for mounting a circuit element on a printed circuit board, including the steps of supplying a circuit element to a predetermined position of an automatic mounting apparatus; transferring said circuit element from said predetermined position to a centering and optional turning mechanism incorporated in said mounting apparatus to carry out the centering and turning of the circuit element by four claws, said four claws being mounted on said centering and optional turning mechanism and being arranged so as to be opposite to four sides of a circuit element; delivering said circuit element to a mounting head which is adapted to hold a circuit element thereon by suction; conveying a printed circuit board to a stop position; and mounting the circuit element on said printed circuit board when is at said stop position, the improvement resides in that:

said step of centering and optional turning of said circuit element by said four claws comprises holding two sides of said circuit element parallel to each other between one pair of claws of said four claws positioned oppositely to said two parallel sides of said circuit element through a tip end of each of lead wires projecting from said two parallel sides or a body of said circuit element and then separating said two claws from said lead wires of said body, and thereafter holding the remaining two sides of said circuit element between the other pair of claws through a tip end of each of lead wires projecting from said remaining two sides or said body.

4,731,924

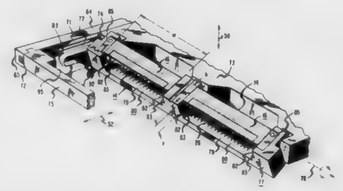
METHOD AND APPARATUS FOR INSERTING MULTI-LEADED ARTICLES INTO A SUBSTRATE

Willard E. Rapp, Franklin Township, Somerset County, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Aug. 4, 1986, Ser. No. 893,059

Int. Cl.[4] H05K *3/30;* B23P *19/00*

U.S. Cl. 29—837 18 Claims



1. A method for inserting a lead on an article into an aperture in a substrate comprising the steps of:

removably engaging the article in a rotatable member;

moving the member to position the article in registration with the substrate;

simultaneously rotating the member during the movement thereof so that the lead on the article is positioned for insertion in a predetermined aperture in the substrate; and

urging the article from the member and displacing said article towards the substrate to insert the lead on the article into the aperture.

12. Apparatus for inserting a lead on an article into a corresponding aperture in a substrate comprising:

a rotatable member adapted to engage at least one article therein;

means for moving the member so that the article engaged thereby is positioned in registration with the substrate;

means for simultaneously rotating the member during the movement thereof so that the lead on the article is positioned in alignment with a corresponding aperture in the substrate; and

means for disengaging the article engaged by the member and for displacing the article towards the substrate so that the lead is inserted in the corresponding aperture.

4,731,925

METHOD FOR PROVIDING A POWER CONNECTOR

Tokio Tanishi, Mie, and Hideki Yokoyama, Tsu, both of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Continuation-in-part of Ser. No. 654,134, Sep. 25, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 928,363

Claims priority, application Japan, Sep. 30, 1983, 58-184219

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—840 3 Claims

1. A method for providing a power connector on a panel of an electrical appliance by using at least one combination receptacle and a printed circuit board carrying electric components for the appliance; said combination receptacle comprising a connector body, a front cover separately formed therefrom and attachable thereto, said connector body having therein fixed contact terminals for contacting engagement with mating contacts of an electrical plug, each contact terminal projecting rearwardly of the connector body to define a terminal lug by which the connector body is to be supported on the printed circuit board, said front cover having mount means by which it is mounted to a mount opening in the panel of the electric appliance, said front cover having snap means by which it is snappedly attached to the connector body; and said printed circuit board being provided with a plurality of sections delimited by weakening lines and separable therealong from the rest of the printed circuit board;

said method using the above receptacle and the printed circuit board comprising the steps of:

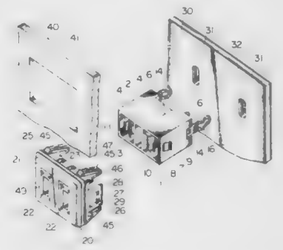
placing the connector body and the electrical components on complementary sections respectively of the printed circuit board;

soldering the connector body and the electrical components respectively to the circuits of the sections for simultaneous mounting thereof on the respective sections of the printed circuit board;

removing the connector body together with the section of the printed circuit board mounting the same as an integral unit from the rest of the printed circuit board;

attaching the connector body to the front cover mounted on the panel so as to complete the assembly of the electrical receptacle, and

utilizing the printed circuit board upon which the section mounting the connector body is located as the circuit board to be assembled into a housing of the electric appliance.



4,731,926

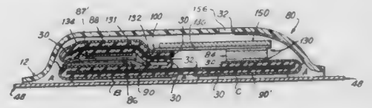
METHOD OF MANUFACTURING DISPOSABLE AND/OR REPLENISHABLE TRANSDERMAL DRUG APPLICATORS

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Continuation-in-part of Ser. No. 702,486, Feb. 19, 1985, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application Dec. 10, 1985, Ser. No. 807,234

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—877 32 Claims



1. A method of manufacturing a transdermal drug applicator which is adapted to be electrically activated, comprising the steps of:

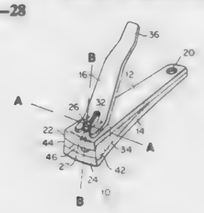
(a) applying conductive coated areas to the first surface of flexible, non-conductive substrate having first and second surfaces for use in said drug applicator, said coated areas and said substrate forming a one-piece member;

(b) folding by about 180 degree portions of said one-piece member with said conductive coated areas so as to form

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folded top side and bottom side portions and to provide electrical conductors leading between said top side and bottom side portions;
(c) applying at least one occlusive adhesive dam to the surface of another substrate containing thereon a coated release agent;
(d) adding at least one drug resrvoir to said surface of said another substrate adjacent to said dam;
(e) joining said at least one drug reservoir to a portion of at least one of said coated areas of said electrical conductors;
(f) joining together in registration said bottom side of said one-piece member and said another substrate to form a sandwiched construction in which said at least one drug reservoir and said occlusive dam are contained between bottom side of said one-piece member and said another substrate;
(g) applying a conformal cover having an adhesive coated surface over said second side of said flexible substrate of said folded one-piece member so as to enclose and protect said transdermal drug applicator.

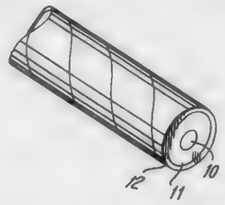
4,731,927
NAIL CLIPPER AND HOLDER
Douglas B. Wilson, 14 Castle Rd., Irvington, N.Y. 10533
Filed Sep. 11, 1986, Ser. No. 906,351
Int. Cl.[4] A45D *29/00*
U.S. Cl. 30—28 **6 Claims**



1. A nail clipper comprising:
first and second elongated members, each having first and second ends and first and second sides therebetween, said first and second elongated members being joined together at said first end such that said second ends oppose one another in spaced apart relationship, at least one of the second ends being movable toward the other,
first and second flexible members extending between the first sides and between the second sides, respectively, of the first and second elongated members, said flexible members being attached to said elongated members so that an enclosure is defined by only said first and second elongated members and said first and second flexible members, and
cutting means at said second end of at least one of said first and second elongated members for cutting a nail when the second ends of the first and second elongated members are brought into contact with the nail.

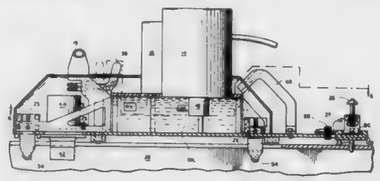
4,731,928
CUTTING TOOL FOR COAXIAL CABLE
Samuel H. Jackson, Ardsley, N.Y., assignor to Kings Electronics Co., Inc., Tuckahoe, N.Y.
Continuation-in-part of Ser. No. 525,581, Aug. 23, 1983, Pat. No. 4,481,327. This application Apr. 2, 1985, Ser. No. 718,908
Int. Cl.[4] B21F *13/00;* **B26B** *27/00*
U.S. Cl. 30—90.2 **3 Claims**

1. A cutting tool for preparing an end of a coaxial cable, of the type having a center conductor surrounded by an insulating material and a coaxial outer conductor, for connector attachment comprising: a piloting clamp having a bore for receiving the cable end, a coaxial shank portion from which the cable end is located to project a selected distance, said cable end having an end face, and clamping means for clamping the located cable end in the piloting clamp; the shank portion of the piloting clamp and projecting cable end slidably and coaxially advanced therein, a cutter blade mounted within the cutter head for cutting the insulating material and outer conductor away from the center conductor, said blade having an upper face and a lower face, there being an angle α between said end face and said lower face and an angle β between said



end face and said upper face, each of α and β being greater than 0° and less than 90°, α being less than β, and stop means for stopping the advance of the shank portion in the cutter head so as to leave a predetermined length of the center conductor exposed, said cutter head being provided with a handle having a chamfer cutter for the exposed end of the center conductor.

4,731,929
PORTABLE HYDRAULIC PUNCH
Richard R. McClure, Basehor, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.
Filed Aug. 14, 1986, Ser. No. 896,194
Int. Cl.[4] B26F *1/02;* **B26D** *5/12*
U.S. Cl. 30—361 **11 Claims**

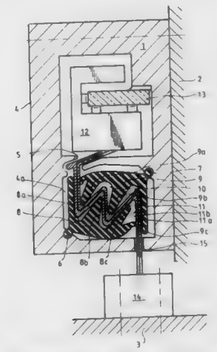


1. A self-contained apparatus for use in installing roof panels comprising:
a support housing;
guide means on said housing for temporarily affixing same on a building support beam;
adjustable gauge means on said housing;
a punch means on said housing for punching holes in said building roof support member;
said support housing comprising a rectangular body having an oil containing sump therewith, and means for pumping oil from said sump to said punch means; and
said means for pumping oil from said sump to said pump means including an oil pump together with an electric motor for operating said pump.

4,731,930
ENCLOSED MEASURING DEVICE
Walter Miller, Traunstein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Fed. Rep. of Germany
Filed Jul. 1, 1987, Ser. No. 68,666
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623353
Int. Cl.[4] G01B *11/02*
U.S. Cl. 33—125 R **5 Claims**

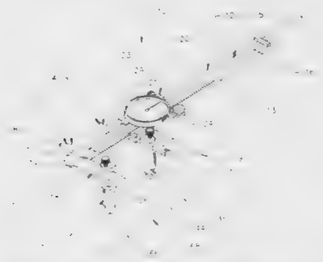
1. An enclosed measuring device for measuring the relative

position of two objects which are movable relative to each other, comprising a housing connected to one of the objects, the housing defining at least one slot extending in the direction of movement of the two objects relative to each other, a pair of flexible cover members attached to the housing so as to cover the slot and extending in the direction of the slot, the cover members being comb-shaped in transverse cross-section, the cover members being arranged in meshed contact with each



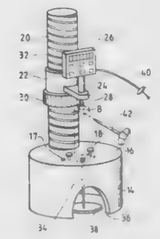
other, such that a labyrinth-type line of contact between the cover members is formed, a carrying member having first and second ends, the first end of the carrying member being attached to the other one of the objects, the second end of the carrying member being connected to a structural measuring unit located within the housing, the carrying member having a meander-like shape conforming to the labyrinth-type line of contact between the two cover members.

4,731,931
CALIPER SYSTEM
John D. Goodman, Grayson, and John M. Christopher, Conyers, both of Ga., assignors to Andromeda Technology, Inc., Lawrenceville, Ga.
Filed Mar. 16, 1987, Ser. No. 26,107
Int. Cl.[4] G01B *3/20, 5/14*
U.S. Cl. 33—143 M **5 Claims**



3. A reference off-setting device for displacing the effective reference edge of a caliper jaw, said off-setting device comprising:
a body portion for attachment to a caliper jaw;
gripping means for attaching said body portion to a caliper jaw;
a cone-shaped portion extending from said body portion, said gripping means and said cone-shaped portion cooperating such that the axis of symmetry of said cone-shaped portion lies in the plane defined by the reference edge of a caliper jaw to which said body portion is attached;
a bar member associated with said gripping means for protrusion from the caliper jaw;
a cavity formed in said body portion, said body portion slidably mounted on said bar member with said bar member received within said cavity;
a spring means for biasing said body portion to a position along said bar member displaced from said gripping means; and
retention means for retaining said body portion slidably mounted on said bar member.

4,731,932
METHOD AND MEASURING SYSTEM FOR PREPARING WORKING GAUGES
Gerhard Kristensen, Gylden 88, Fynshav, 6440 Augustenborg, Denmark
PCT No. PCT/DK85/00104, § 371 Date Jul. 7, 1986, § 102(e) Date Jul. 7, 1986, PCT Pub. No. WO86/02993, PCT Pub. Date May 22, 1986
PCT Filed Nov. 5, 1985, Ser. No. 890,771
Claims priority, application Denmark, Nov. 6, 1984, 5264/84
Int. Cl.[4] G01B *3/46*
U.S. Cl. 33—168 B **9 Claims**



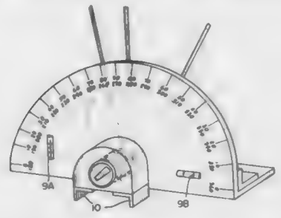
1. A method of preparing working gauges having a precision of 1 μm using at least one gauge unit and a measuring device for enabling a comparative measuring of said at least one gauge unit and said working gauge during said preparation thereof, the method comprising:
providing said working gauge including a longitudinally displaceable element;
displacing said displaceable element by said comparative measuring into a position projecting from said working gauge such that a distance measurement between one end of said working gauge and a free end of said projecting displaceable element corresponds to a predetermined desired master measure; and
fixing said displaceable elemet to said working gauge.

4,731,933
PROTRACTOR-CHALKLINE
Charles D. Cope, R.D. #1, Box 36, Willow Street, Pa. 17584
Filed Jul. 25, 1986, Ser. No. 889,197
Int. Cl.[4] B44D *3/38;* **G01C** *15/16*
U.S. Cl. 33—414 **6 Claims**

1. An angle marking device comprising:
a semi-circular protractor (2) having a first top side, a second bottom side, a front curved edge and a rear straight edge,
the first top side of said semi-circular protractor (2) having a compartment means (4) mounted thereon,
said compartment means (4) having a line and spool (5) contained therein and said compartment means being adapted to contain a powder chalk marking substance therein,
said compartment means (4) having an aperture means at the rear thereof for running said line therethrough,

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wherein said semi-circular protractor (2) has an edge (8B) extending at right angles from said rear straight edge and wherein a slot (6) is formed at substantially the middle



portion of said edge (8B) to provide means whereby said line may be extended under said semi-circular protractor (2) for use as an angle marking device.

4,731,934

WORKPIECE POSITION CONTROL

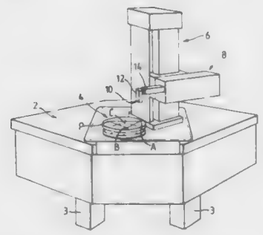
Anthony B. Barnaby, and Michael W. Mills, both of Leicester, United Kingdom, assignors to Rank Taylor Hobson Limited, England

Filed Mar. 2, 1987, Ser. No. 20,467

Claims priority, application United Kingdom, Mar. 4, 1986, 8605325; Oct. 10, 1986, 8624396

Int. Cl.[4] G01B *7/03, 7/28*

U.S. Cl. 33—504 **17 Claims**



1. Apparatus for performing an operation on a workpiece, comprising:

a support rotatable about a predetermined axis;

a workpiece receiving member mounted on said rotatable support for rotation therewith;

first means supporting said receiving member for tilting movement in any direction relative to said rotatable support, said first supporting means comprising three support elements supporting said receiving member at only three points, a first of said support elements being adjustable to tilt said member about a first tilt axis extending between the second and third said support elements, the second said support element being adjustable to tilt said member about a second tilt axis which is at an angle to said first tilt axis and extends between said first and third elements, said three points being at the apices of a triangle within which the centre of said workpiece receiving member is located;

first drive means for adjusting said first and second elements to effect said tilting movement;

second means supporting said receiving member for transverse movement relative to said rotatable support;

second drive means for effecting said transverse movement;

third drive means for rotating said rotatable support;

a surface sensor adapted to traverse and sense the workpiece surface during relative movement between the workpiece and the sensor;

means mounting said surface sensor for movement substantially parallel to and towards and away from said axis;

fourth drive means for effecting said movement of said sensor; and

computer means which is responsive to said sensor and includes program means for detecting centring and levelling errors and for controlling said first drive means dependent upon said angle between said tilt axes and a said levelling error and to control said second drive means dependent upon a said levelling error and a said centring error, to perform a centring and levelling correcting operation.

4,731,935

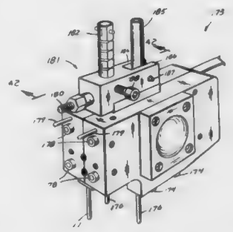
CONTOUR AND OUTLINE TRANSDUCER GAGE ASSEMBLY

James E. Struble, 81 W. Newman Rd., Williamston, Mich. 48895

Filed Oct. 15, 1986, Ser. No. 919,135

Int. Cl.[4] G01B *7/02, 7/28*

U.S. Cl. 33—561 **1 Claim**



1. In an adjustable contour check pin support assembly provided in operative engagement with a contour and outline transducer gage assembly comprising:

a transducer gage housing, said transducer gage housing provided with an external movable cover plate fixedly attached to a movable carrier arm provided within said gage housing;

a contour check pin support member provided on said movable cover plate, said contour check pin support member vertically adjustable along a vertical support pin extending upwardly from said cover plate through said contour check pin support member;

a vertically oriented angularity adjustment pin extending upwardly from said cover plate in operative adjustment engagement with said contour check pin support member, said angularity adjustment pin being in parallel spaced-apart relationship to said vertical support pin; and

adjustment means in association with said angularity adjustment pin and said contour check pin support member so as to selectively rotatably adjust said contour check pin support member about said vertical support pin.

4,731,936

GAUGING SYSTEM FOR VEHICLE ALIGNMENT EQUIPMENT

Roger B. Aldrich, and John R. Dahlstrom, both of Grand Island, Nebr., assignors to Chief Automotive Systems, Inc., Grand Island, Nebr.

Filed Oct. 16, 1985, Ser. No. 787,963

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—608 **7 Claims**

1. Improved apparatus for measuring the location of selected reference points on a vehicle relative to other selected reference points on a vehicle or reference planes associated with said vehicle, said vehicle of the type having a longitudinal axis extending from the front to the back of the vehicle, said apparatus comprising, in combination:

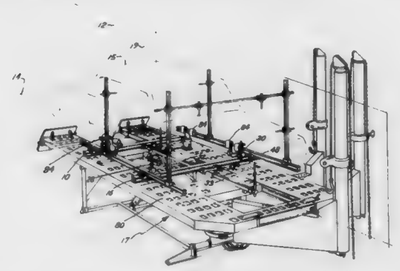
a first transverse bar member;

means for fixing the first bar member to the vehicle substantially transverse to the longitudinal axis of the vehicle;

a second transverse bar member;

means for fixing the second bar member to the vehicle substantially transverse to the longitudinal axis of the vehicle, parallel to and spaced generally horizontally from the first bar member in a common, generally horizontal plane;

a longitudinally extending measuring bar positioned to extend generally parallel to the longitudinal axis of the vehicle and perpendicular to the first and second transverse bar members, said measuring bar including a first longitudinal member telescopically and slidably receiving a second longitudinal member and including indicating means for measuring the telescoped position of the second longitudinal member relative to the first member;



mounting means for slidably mounting the measuring bar simultaneously on both transverse members, said mounting means including means for maintaining the measuring bar continuously movable and slidable as a unit toward and away from the longitudinal axis while remaining at all times substantially parallel to the longitudinal axis and generally perpendicular to the transverse members to define a rigid framework;

first means for measuring the position of the measuring bar in the transverse direction relative to a known point on both of the transverse bar members; and

said indicating means comprising a coiled tape measure with the end thereof extending from the first longitudinal member around a fixed point on the second longitudinal member and attached to the first member to form a loop which extends or retracts in response to telescopic extension or retraction of the second longitudinal member relative to the first member.

4,731,937

PROCESS AND APPARATUS FOR THE DRY SLUICING OF GRIT, SLAG OR SEDIMENTS FROM PRESSURIZED SYSTEMS

Ulrich Premel, Gummersbach; Ralf-Uwe Hartermann, Wiehl; Dietmar Deggim, Dortmund; Jürgen Poller, Holzwickede, and Klaus Weinzierl, Dortmund, all of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach and VEW Vereinigte Elektrizitatswerke Westfalen AG, Dortmund, both of, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,526

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446808

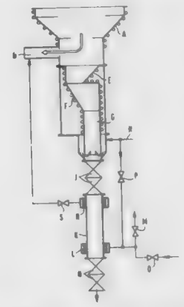
Int. Cl.[4] F26B *7/00, 17/14*

U.S. Cl. 34—20 **20 Claims**

1. A process for the dry sluicing of sediment from pressurized systems, whereby gravitationally conveyed sediments are cooled to below their fusing temperatures prior to removal; said process including the steps of:

in a first zone, cooling said sediment via indirect heat exchange to below its fusing temperature and effecting said indirect heat exchange by radiation cooling so that said sediment is no longer liquid;

in a subsequent second zone, slipping and sliding sediment as solid particles in a gravity fall as well as further cooling said sediment indirectly and directly, by means of cool countercurrent gas, to temperatures below 300° C.;



deflecting at least part of said sediment during said slipping and sliding of sediment as solid particles in a gravity fall in said second zone in order to lengthen the time said sediment is retained in said second zone also for said further cooling to temperatures below 300° C.; and

finally removing said sediment via a sluice.

4,731,938

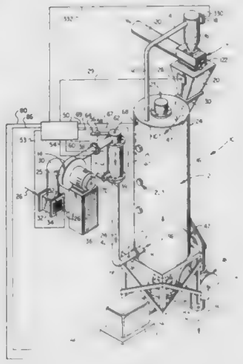
ANAEROBIC PASTEURIZING CONDITIONING SYSTEM

Richard L. White, Dallas, Tex., assignor to Ve Holding Corp., Arlington, Tex.

Continuation of Ser. No. 860,105, May 6, 1986, Pat. No. 4,667,418, which is a continuation-in-part of Ser. No. 799,014, Nov. 18, 1985, Pat. No. 4,686,779. This application May 20, 1987, Ser. No. 52,759

Int. Cl.[4] F26B *3/16, 17/14*

U.S. Cl. 34—33 **44 Claims**



1. An improved system for the conditioning of matter of the type wherein a vessel is adapted for the flow of matter therethrough and includes means for introducing a treatment fluid into said vessel, the improvement comprising:

a direct fired steam generator for producing an anaerobic treatment fluid comprising steam and oxygen deficient non-condensible gases in the products of combustion;

means for introducing the steam and oxygen deficient non-condensible gases from said generator into said vessel for

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counter-current flow relative to matter passing therethrough;

at least one air lock disposed in said vessel for permitting the egress of matter having passed therethrough while preventing the exhaust of steam and gases therefrom; and

means for controlling the operation of said direct fired steam generator to produce a sufficiently large volume of oxygen deficient gases and steam to purge the matter of other gases flowing therewith and create an anaerobic condition in said vessel.

4,731,939

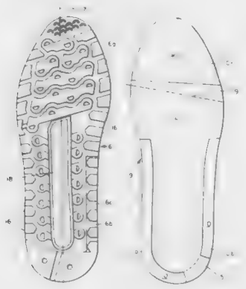
ATHLETIC SHOE WITH EXTERNAL COUNTER AND CUSHION ASSEMBLY

Rui M. Parracho, Peabody; Lloyd S. Smith, Newton Center; Richard P. Bunch, Reading, and Alexander L. Gross, Boston, all of Mass., assignors to Converse Inc., North Reading, Mass.

Division of Ser. No. 726,508, Apr. 24, 1985, Pat. No. 4,638,576. This application Jan. 23, 1987, Ser. No. 6,723

Int. Cl.[4] A43B *13/12, 13/18*

U.S. Cl. 36—31 **1 Claim**



1. An athletic shoe comprising:

an upper;

a midsole, including a low density central region and a higher density, substantially horseshoe-shaped perimeter around the middle and heel portions of the sole providing a frame around the central region and being interrupted in the lateral heel portion thereof by an indentation of the low density central region which extends therethrough to the periphery of the heel;

an outsole attached to the upper and the midsole, the outsole including a central longitudinal axis and defining a central aperture extending through the outsole from approximately the center of the heel region to a point just behind the front flex line of the foot and approximately centered along the central longitudinal axis such that the overlying midsole is visible through the aperture, the outsole further including peripheral cleats that elevate the main plane of the outsole above the plane of the ground surface.

4,731,940

ADJUSTING DEVICE FOR THE ARCH OF THE FOOT OF THE INSOLE OF SHOES, BOOTS AND THE LIKE

Giancarlo Zanatta, Nervesa della Battaglia, and Antonello Marega, Montebelluna, both of Italy, assignors to Calzaturificio Tecnica Spa, Treviso, Italy

Filed Nov. 3, 1986, Ser. No. 926,075

Claims priority, application Italy, Nov. 5, 1985, 23745 B/85[U]

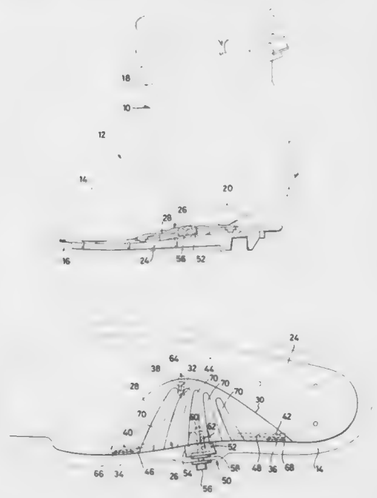
Int. Cl.[4] A43B *7/22, 13/38, 5/04*

U.S. Cl. 36—91 **6 Claims**

1. An adjustable foot arch for the insole of a shoe, said foot arch being of variable height and shape, comprising:

a flexible sheet member having an essentially unvariable extension, said flexible sheet member being shaped as a half-dome with an essentially parabolic base having a predetermined curvature, said parabolic base having an apex and an axis passing through said apex, said flexible sheet member being slideable relative to said insole;

restraining means for slidably connecting said flexible sheet member to said insole at at least three points on said insole, said restraining means limiting sliding movement between said flexible sheet member and said insole to sliding movement in a first direction and sliding movement in a second direction, said first and second directions being substantially perpendicular to each other, said first direction extending along a chord of said parabolic base and said



second direction extending along said axis passing through said apex;

height varying means, adjustably insertable between said half-dome and said insole, for varying the height of at least one point on said flexible sheet member relative to said insole so as to change said curvature of said flexible sheet member;

adjustment means, operably connected to said height varying means, for causing adjustable insertion of said height varying means between said half-dome and said insole, said adjustment means being accessible externally of said shoe and being operable by the wearer of said shoe, when the shoe is being worn.

4,731,941

DRAGLINE HOE, METHOD AND APPARATUS

Robert A. Beatty, Queensland, Australia, assignor to R. A. Beatty & Associates Pty., Limited, Queensland, Australia

Filed Sep. 30, 1986, Ser. No. 913,733

Claims priority, application Australia, Oct. 2, 1985, 02720

Int. Cl.[4] E02F *3/48, 3/60*

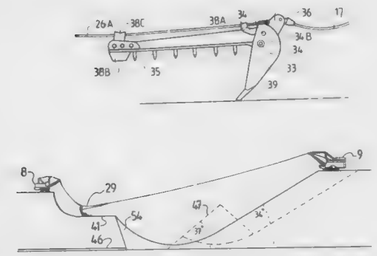
U.S. Cl. 37—115 **23 Claims**

1. A method of excavating overburden from a mineral or coal deposit seam using a low wall winch component, a high wall winch component and a hoe, the hoe including an upper body frame and a downwardly extending scraper blade attached to the rear end of the body frame, and the hoe being attached to the low wall winch component by one or more draglines and to the high wall winch component by a tail line, the method including the steps of:

(i) moving the hoe by tensioning of the dragline or draglines by the low wall winch component through overburden created by preliminary drilling and blasting to move the overburden away from the mineral or coal deposit seams in one or more traverses wherein overburden is scraped into the hoe, transported thereby and subsequently dumped onto a spoil bank; and

(ii) moving the hoe at the end of each traverse by untensioning of the dragline or draglines by the low wall winch component and tensioning of the tail line by the high wall winch component;

and wherein step (i) includes floatingly supporting the upper body frame of the hoe at a generally horizontally disposed bottom surface thereof on a load of scraped overburden being transported by the hoe and using plural spike-like elements extending downwardly from the bottom surface to retain the load of scraped overburden under the hoe, thereby to minimize working of the load of scraped overburden during transport.



18. A hoe for use in excavating overburden, comprising: an upper body frame, a scraper blade pivotally attached to a rear end of said body frame, means for connecting said hoe to one or more draglines for moving said hoe in a forward direction, and means for connecting the hoe to a tail line for moving the hoe in a rearward direction, said blade being pivoted to a material scraping position when said hoe is traversed in a forward direction by the dragline or draglines for scraping material and advancing a load of scraped material forwardly of said scraping blade, said blade being reversely pivoted to a forwardly extending return position when said hoe is traversed by the tail line in a rearward direction, and said body frame having generally horizontally disposed bottom surface means for floating said body on the load of scraped material advanced by said scraper blade and plural spike means extending downeardly from said bottom surface means for retaining scraped material under said hoe, whereby working of the load of scraped material is minimized.

4,731,942

DOZER BLADE

Ronald D. Eberle, 495 Oak St., Grainfield, Kans. 67737

Filed Jan. 7, 1987, Ser. No. 1,184

Int. Cl.[4] E01H *5/06*

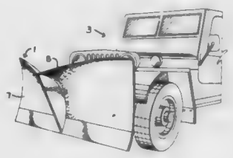
U.S. Cl. 37—272 **6 Claims**

2. A dozer blade apparatus movable in a forward direction for dozing snow and the like comprising:

(a) a first blade section having an inner end and an outer end;

(b) a second blade section having an inner end and an outer end; said first and second blade sections being mirror images of each other and having said respective inner ends attached at a central juncture to form a unitary blade; said first and second blade sections being curved upwardly from a bottom scraper section of said blade; said outer ends having substantially less curvature than said central juncture and being generally vertical when said blade is in an operative position with said bottom scraper section perpendicular to said forward direction;

(c) said first and second blade sections converging and being substantially curved near said inner ends thereof such that a top portion of said central juncture is positioned forwardly of a bottom portion of said central juncture when said blade is in said operative position; and



(d) said blade section bottom portion joining so as to form a substantially colinear lower scraping edge from end to end.

4,731,943

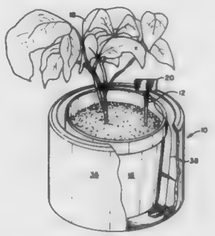
PLANT MAINTENANCE APPARATUS

Arnold J. Schlicter, 7213 W. Chester Pike, Upper Darby, Pa. 19082

Filed Jun. 16, 1986, Ser. No. 874,958

Int. Cl.[4] G09F *13/18*

U.S. Cl. 40—10 C **13 Claims**



1. An apparatus to assist in the proper maintenance of a plant which comprises:

a stake for insertion into a first container containing a plant, the first container being inserted into a second container;

a flexible connecting means having two ends, one end connected to the stake and the other end to an attachment means;

the attachment means for attaching the connecting means to the second container.

4,731,944

MOTOR DRIVEN SIGN WITH SLIDING PANELS

James J. Honse, 35 SW. Partridge La., Lake Oswego, Oreg. 97034

Filed Aug. 25, 1986, Ser. No. 899,675

Int. Cl.[4] G09F *7/00*

U.S. Cl. 40—488 **11 Claims**

1. A sign providing sequential displays, said sign comprising,

a base,

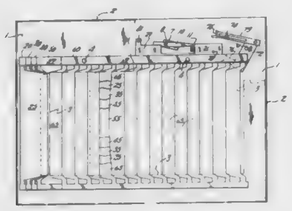
panel support means on said base,

panels each including a margin extending lengthwise of each panel and each panel including a multitude of strips having a composite image thereon, the strips of one panel being slidably interleaved with strips of the remaining panels in a predetermined order, carrier means on a margin of each panel and including an abutment,

a panel drive mechanism including power source, a crank

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driven by said power source, a panel drive arm carried by said crank and driven in a reciprocating manner thereby, said drive arm having a distal end for momentary sequential engagement with each carrier means abutment to shift each panel along said panel support means from a first



position to a second position to displace the image bearing strips of each panel into view, and

a panel return mechanism on said base serving to collectively return the shifted panels from said second position to said first position.

4,731,945

COMPACT ALTERNATIVE MESSAGE SIGN

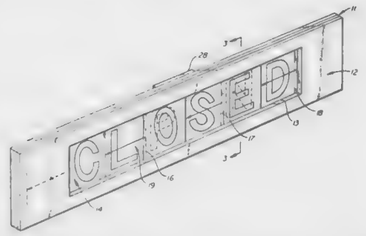
John Howard, 2230 Durant, #204, Berkeley, Calif. 94704

Continuation-in-part of Ser. No. 700,492, Feb. 11, 1985, Pat. No. 4,622,770. This application Sep. 12, 1986, Ser. No. 905,620

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.⁴ G09F *11/00*

U.S. Cl. 40—491 **10 Claims**



1. In a sign intended to convey one of two messages about the status of the location where the sign is placed in a compact form whereby specific information placed on spaces of the sign are used in both messages, the improvement comprising:

(a) a front panel having an aperture one space in one dimension and n spaces in the other dimension and a solid cover of one space in width on eitner side of the aperture of n spaces;

(b) a middle panel having at least n+1 spaces and apertures of the same size and shape and at least some of the spaces containing information viewable through the aperture of the front panel, said middle panel being slidable with respect to the front panel between a first position and a second position, said first position with one space at one end of the middle panel covered by the solid cover on one side of the aperture on the front panel and said second position with one space at the opposite end of the middle panel covered by the solid cover at the opposite end of the aperture of the front panel; and

(c) a back panel fixed with respect to the front panel, but capable of displaying different information in at least some of the spaces behind apertures in the middle panel in either the first or second position of the middle panel as the middle panel is moved from the first to the second position or vice versa.

4,731,946

BITE INDICATORS

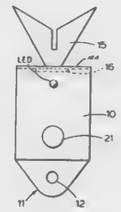
Donald J. Blythe, Canterbury, and Frank E. J. Sams, Margate, both of United Kingdom, assignors to Dellareed Limited, Kent, England

Filed Feb. 27, 1985, Ser. No. 706,044

Claims priority, application United Kingdom, Feb. 29, 1984, 8405209

Int. Cl.⁴ A01K *97/12*

U.S. Cl. 43—17 **6 Claims**



1. A bite indicator comprising a flexible fishing rod support fixedly mounted on a housing so that said support and said housing move as a unit; a strain sensing element responsive to the flexure of said rod support and electrically connected to indicating means, the arrangement being such that, in use, when a bite occurs, movement of a fishing rod supported by the rod support causes flexure of said rod support which is sensed by the sensing element and thereby actuates the indicating means.

4,731,947

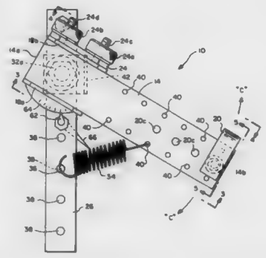
APPARATUS FOR HOLDING A FISHING ROD

Charles W. Hart, deceased, late of Nevada County, Calif.; by Margaret B. Hart, executor, 10300 Glenbrook Dr./P.O. Box 735, Grass Valley, Calif. 95945, and Harry Stewart, 220 Nihell St., Nevada City, Calif. 95959

Continuation-in-part of Ser. No. 509,959, Jun. 30, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,545

Int. Cl.⁴ A01K *97/10*

U.S. Cl. 43—21.2 **37 Claims**



2. An apparatus for holding a fishing rod, comprising:

a body member having a top surface for supporting the rod thereon;

at least one shoulder member formed at one end of said body member to define a first channel having an open side substantially parallel to said top surface and adapted to support a portion of the rod therein;

a clasp member mountable to said body member at an end opposite from said shoulder member and defining a second channel having one open side which is substantially perpendicular to said top surface, said clasp member being rotatably mountable to said body member so that the open end thereof may be rotated through an angle that approximates 180 degrees, and said second channel adapted to hold a portion of the rod therein to resist rearward and downward forces imposed on the tip of the rod; and

the rod positionable on said body member to extend between said first and second channels with the butt thereof projecting outwardly from said second channel, a portion of said top surface acting as a fulcrum about which the rod may be levered for removal therefrom.

4,731,948

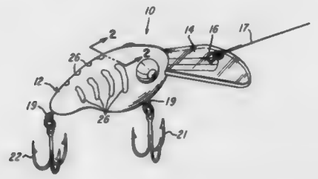
FISHING LURE WITH TEMPERATURE RESPONSIVE COLOR CHANGE

Doyle D. Helton, 448 Shepard Rd., Xenia, Ohio 45385

Filed Jul. 1, 1987, Ser. No. 68,578

Int. Cl.⁴ A01K *85/00*

U.S. Cl. 43—42.33 **16 Claims**



1. A fishing lure comprising a body having an outer surface forming a predetermined configuration, means for connecting a flexible fishing line to said body for pulling said body through the water, a plurality of hooks connected to said body, means associated with said body for maintaining said body below the water surface when the body is pulled through the water by the fishing line, a first coating of thermally responsive liquid crystal material covering at least a portion of said outer surface of said body, said liquid crystal material being effective to change in color in response to changes in temperature of the water which receives the fishing lure, means for bonding said coating of liquid crystal material to said outer surface of said body, and a second coating of substantially clear water-resistant material overlying said first coating of liquid crystal material.

4,731,949

STABILIZING POLYMERS AND POLYMER FILMS

William R. Poyner, Stourbridge, and Khirud B. Chakraborty, Birmingham, both of England, assignors to Robinson Brothers Limited, West Bromwich, United Kingdom

Continuation-in-part of Ser. No. 742,085, Jun. 6, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 910,372

Claims priority, application United Kingdom, Jun. 15, 1984, 8415305

Int. Cl.⁴ A01G *7/00*

U.S. Cl. 47—29 **26 Claims**

1. In a method of protecting flora at an agricultural or horticultural locus and maintaining an artificial environment more suited to growth of the flora than the natural environment by placing a polymeric film or sheet in the path of sunlight to the flora or to the locus of the flora, the improvement comprising placing in the said path a stabilised polymeric film or sheet rendered more resistant to weathering in the presence of fumigant and pesticidal chemicals adversely affecting its weather resistance wherein said polymeric film or sheet has been formed from a composition which comprises a polymer and an effective stabilising amount of a nickel dialkyldithiocarbamate of the formula $(R^1R^2NCSS)_2Ni$, wherein R^1 and R^2 are the same or different branched-chain alkyl groups of 5 to 18 carbon atoms.

4,731,950

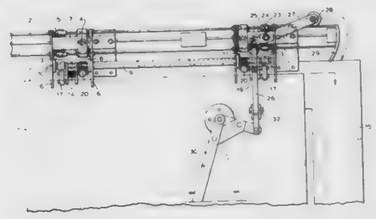
AIRTIGHT CLOSING SLIDING DOOR WITH CONTACT PRESSURE AND INTEGRATED ONE-HAND OPERATION

Friedrich Ullner, Zwickau, German Democratic Rep., assignor to Ing. Friedrich Ullner, Bautechnische Kuehlraumausstattung, Zwickau, German Democratic Rep.

Filed Jun. 30, 1986, Ser. No. 879,974

Int. Cl.⁴ E05D *15/10*

U.S. Cl. 49—221 **5 Claims**



1. An airtight closing sliding door having automatic sealing contact pressure and integrated one-hand operation and having a pair of suspension runners and a door leaf suspended from said pair of runners, each runner having a cam shaft and a cam plate and a carrying shaft on which said cam plate is rigidly mounted and which is turned about 90 degrees from an open position in which the cam plate is positioned horizontally downwards to a closed position in which the cam plate is positioned vertically by turning the carrying shaft, comprising

a carrying shaft which is rigidly connected to

a first cam plate which is pivotally connected to

a camshaft which is rigidly connected to a second cam plate;

holding up compression and holding down contact springs with a compression force of ⅓ to ½ of the door leaf weight respectively pivotally connected to said first and second cam plates

said door leaf is pivotally connected to said first cam plate via

a suspension hinge of an adjustable suspension stirrup

a first connecting rod pivotally connected to said first and second cam plates,

the distance between the axis of said cam shaft and the pivot connection of said first connecting rod on said second cam plate is about 1.5 to 2.00 times the distance between the axis of said carrying shaft and the pivot connection of said first connecting rod on said first cam plate, whereby, the axis of the suspension hinge of said door leaf is situated vertically under the axis of the carrying shaft when the door is in a closed position, and the suspension hinge is displaced by 90 degrees when in an open position, whereas the second cam plate is displaced by 45° away from the door leaf when it is in an open position,

a rocker arm is pivotally mounted on one of said pair of suspension runners

the load arm of the rocker arm is pivotally connected with the second cam plate; and

a lifting mechanism operatively connected to said rocker arm, and on whose power arm is arranged

a roller running on a guide rail.

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4,731,951

VEHICLE DOOR STRUCTURE

Hiroshige Ikuta, and Yuji Okamoto, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

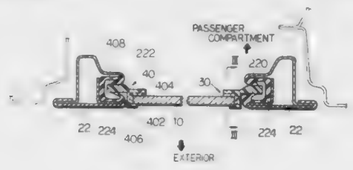
Continuation of Ser. No. 677,751, Dec. 3, 1984. This application Dec. 22, 1986, Ser. No. 943,868

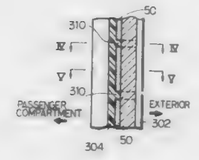
Claims priority, application Japan, Dec. 26, 1983, 58-203538[U]; Feb. 27, 1984, 59-27643[U]

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] E05F *11/38*

U.S. Cl. 49—374 3 Claims





1. A vehicle door structure, comprising:

a door frame swingably mounted to a vehicle, such that it opens and closes for a passenger to ingress or egress;

a door window having top and bottom edges, interior and exterior surfaces, and two substantially vertical edges, said door window provided in said door frame such that an exterior surface of said door window is substantially flush with an exterior surface of said door frame; and

a slider fixed to at least one of said substantially vertical edges of said door window for guiding said door window during an upward and downward displacement thereof, said slider comprising:

a first portion which extends in a substantially parallel relationship with said exterior surface of said door window;

a second portion which extends in a substantially parallel relationship with an interior surface of said door window;

a third portion which connects said first portion of said slider with said second portion of said slider;

an upper surface which contacts said first portion, said second portion and said third portion of said slider;

a lower surface which contacts said first portion, said second portion and said third portion of said slider; and

a plurality of ribs formed on the first and second portions and extending toward the door window and in contact therewith;

wherein said first and second portions of the slider have a groove formed therebetween, each of said first and second portions of the slider having an upper portion and a lower portion, there being a greater surface area of contact for equivalent vertical lengths of the slider between the door window and the lower portions of the slider than between the door window and the upper portions of the slider;

wherein said upper and lower surfaces of said slider function as caps which extend from said third portions for part of the distance between the substantially vertical window edges to maintain said at least one of said substantially vertical edges of the door window within said groove; and

further wherein said ribs partition said groove into a plurality of spaces created between adjacent ribs, the slider and the door window, whereby the ribs absorb at least a portion of stresses existing at an interface between the slider and the door window, said at least one of said substantially vertical edges of the door window being fixed within the groove of the slider by an adhesive placed between an inside portion of the groove in the slider and said at least one of said substantially vertical edges of the door window.

4,731,952

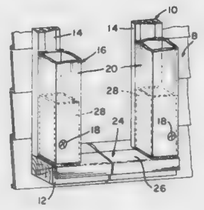
DOOR FRAME HAVING ADJUSTABLE THRESHOLD MEMBER

Lawrence L. Mascotte, 9106 SE. 82nd, Portland, Oreg. 97266

Filed Mar. 23, 1987, Ser. No. 28,863

Int. Cl.[4] E06B *1/70*

U.S. Cl. 49—380 5 Claims



1. A door frame for engagement with an existing door frame of a building and to be secured thereto, comprising:

top and side members for engagement with and to be secured to respective top and side sections of the existing door frame;

a threshold member mounted to the bottoms of said side members for extension along and for engagement with the threshold of the existing door frame; and

means provided by said side members and said threshold member enabling said threshold member to be adjusted relative to said side members so as to extend along and engage the threshold of the existing door frame subsequent to the side members being secured to the existing door frame.

4,731,953

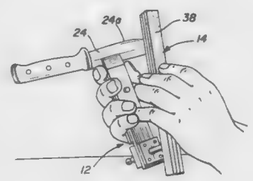
KNIFE SHARPENER

Joe L. Owen, Rte. 1, Box 428, Roland, Okla. 74956

Filed Feb. 4, 1986, Ser. No. 825,984

Int. Cl.[4] B24B *3/54*

U.S. Cl. 51—69 9 Claims



1. A sharpening device comprising an elongated blade holder and an elongated sharpening element, the blade holder having a blade clamping means for gripping a blade to be sharpened at one end of the holder with the blade extending substantially transversely with respect to the holder, and a post extending from the other end of the holder perpendicular to the plane in which the blade is gripped, the post terminating in a head formation, the sharpening element including a longitudinal sharpening surface extending over part of its length and a longitudinal guide slot extending over another part of its length for receipt of the head formation therein in a manner enabling the sharpening surface to be longitudinally and arcuately reciprocated across an edge of the blade to be sharpened while maintaining a preset angle, determined by the height of the post, between the sharpening surface and the blade, said head formation being a ball on the end of the post and the guide slot being of part-circular cross section for receipt of the ball.

4,731,954

METHOD AND APPARATUS FOR INITIATING AN OPERATION FOR DRESSING A GRINDING WHEEL IN CONFORMITY WITH ITS DEGREE OF BLUNTNESS

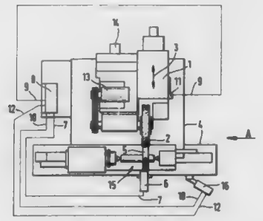
Ulrich Lilienfein, Stuttgart, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik Gesellschaft mit beschränkter Haftung, Stuttgart, Fed. Rep. of Germany

Filed Aug. 13, 1986, Ser. No. 896,386

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529427

Int. Cl.[4] B24B *49/16*

U.S. Cl. 51—165.71 4 Claims



3. An apparatus for initiating an operation for dressing a grinding wheel as a function of its degree of bluntness, with said grinding wheel being infed towards a workpiece that is to be machined thereby, said apparatus further comprising:

a feed carriage that supports said grinding wheel;

means for holding said workpiece;

a first measuring device for measuring material removed from said workpiece;

a second measuring device for measuring the infeed distance of said feed carriage;

respective signal lines leading from said first and second measuring devices;

a computer to which said signal lines feed, with said computer serving for comparison of actual and desired differential values based upon infeed distance and material removed from said workpiece; and

an output signal leading from said computer for indicating that it is actually necessary to dress said grinding wheel.

4,731,955

APPARATUS FOR RELEASABLY COUPLING GRINDING TOOLS TO ROTARY SPINDLES

Karl Henle, Reinbek, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

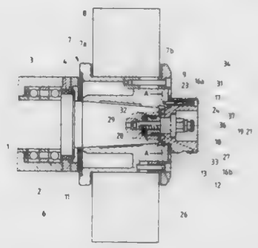
Filed Jul. 31, 1986, Ser. No. 891,539

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530351

Int. Cl.[4] B24B *41/04*

U.S. Cl. 51—168 12 Claims

1. Apparatus for releasably coupling a material removing tool, particularly a grinding wheel, to a rotary spindle, comprising means for centering the tool on the spindle including a hub connectable with the tool and having an elongated conical hole, and a complementary elongated cone provided on the spindle and extending into said hole; means for locating the tool in a predetermined axial position with reference to the spindle, including abutment means provided on said hub and on said cone; and means for transmitting torque from the spindle to the tool including complementary torque transmitting elements provided on said cone and on said hub at one axial end of said cone.



4,731,956

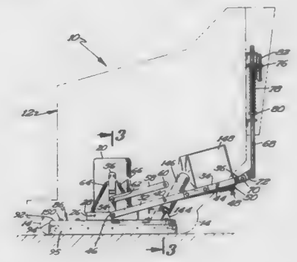
FLOOR POLISHING MACHINE

David W. Wood, Rockford, Minn., assignor to Advance Machine Company, Plymouth, Minn.

Filed Oct. 21, 1986, Ser. No. 922,084

Int. Cl.[4] B24B *7/18*

U.S. Cl. 51—177 24 Claims

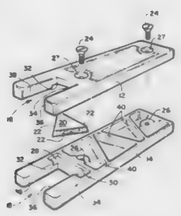


1. Machine for polishing floor surfaces comprising, in combination: a chassis adapted to be moved along the floor; a polishing member for rotation about a polishing axis for polishing the floor surface when the chassis is moved along the floor; a platform for rotatably mounting the polishing member; at least a first lift lever pivotally mounted to the chassis about a first pivot axis and having a free end pivotally mounted to the platform about a second pivot axis; a lift arm pivotally mounted to the platform about the second pivot axis; a parallelogram bar pivotally mounted to the chassis at a third pivot axis and having a free end pivotally mounted to the lift arm about a fourth pivot axis, with the first and third pivot axis lying along a vertical line and being spaced a distance, with the second and fourth pivot axis being spaced a distance equal to the spacing distance of the first and third pivot axis, with the first and second pivots axis being spaced a distance, with the third and fourth pivot axis being spaced a distance equal to the spacing distance between the first and second pivot axis, with the chassis, the lift lever, the lift arm, and the parallelogram bar forming a parallelogram for maintaining the lift arm in a vertical orientation; means for pivoting the lift lever about the first pivot axis moving the polishing member between an operating position engaging the floor surface and a transport position spaced from the floor surface, with the second pivot axis allowing the platform and the polishing member to follow the

VOL 1088 ISS 4 MR 22 1988 UMI

floor surface when the chassis is moved along the floor regardless of the unevenness of the floor surface.

4,731,957
KNIFE SHARPENER
Martin D. Weisinger, 6327 Mesita Dr., San Diego, Calif. 92115
Filed Jan. 12, 1987, Ser. No. 2,279
Int. Cl.[4] B24D *15/08*
U.S. Cl. 51—205 WG **6 Claims**



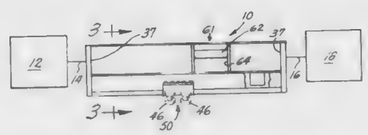
1. A blade sharpening device comprising:
a body member comprising two longitudinal body portions which are secured together by fastening means, said body member having a handle portion at one end and two parallel spaced apart extending arms on a second end thereof:
an equilateral triangular shaped blade extending from said body portion into an open area between said two parallel spaced apart extending arms with an apex of said cutter blade centrally positioned within said open area; and
locking means for locking said cutter blades in a fixed position relative to said body member, said locking means comprising an elongated rectangular opposing slot in each of said body portions, said elongated rectangular slot extending in a direction transverse to said parallel extending arms thereby forming an opening to said slot from said open area, said cutter blade being positioned in said slot so that the surface of said slot opposite said opening and the edges of said opening lock said cutter blade in position.

4,731,958
SUBSTRATE FOR THIN FILM ELECTROLUMINESCENT DISPLAY PANEL
Hiroshi Kishishita; Etsuo Mizukami; Yoshihiro Endo, all of Nara; Takaaki Horita, Tenri, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 535,312, Sep. 23, 1983, abandoned, which is a division of Ser. No. 296,537, Aug. 26, 1981, abandoned. This application Jan. 14, 1986, Ser. No. 819,004
Claims priority, application Japan, Aug. 29, 1980, 55-120914
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—283 R **1 Claim**



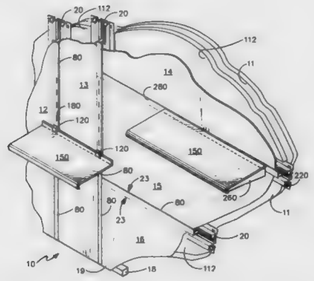
1. A method for preparing an electroluminescent (EL) display element comprising the steps of:
providing a glass substrate made of borosilicic acid;
subjecting at least one surface of said glass substrate to a first primary grinding;
subjecting said at least one surface of said primary ground glass substrate to a second grinding of a photo-mask grade,
cleaning said ground surface of said glass substrate with a non-acidic solution followed by drying with freon vapors such that said prepared surface of said glass substrate is free of hydrolytic products; and
providing in succession a transparent electrode formed on said cleaned surface of said glass substrate, first and second dielectric layers defining therebetween a EL thin film, and a counter electrode formed on said second dielectric layer so as to prepare said electroluminescent display element.

4,731,959
VIBRATORY CASTING CLEANING
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.
Continuation of Ser. No. 879,831, Jun. 26, 1986, abandoned, which is a continuation of Ser. No. 685,121, Dec. 21, 1984, abandoned. This application Jun. 16, 1987, Ser. No. 60,961
Int. Cl.[4] B24C *3/30*
U.S. Cl. 51—417 **8 Claims**



1. A vibratory apparatus for separating foreign matter from castings comprising:
a hopper having an inlet for admitting the castings to the hopper, an outlet through which castings are discharged from the hopper, a longitudinal axis and a bottom surface for supporting the castings,
said hopper inlet and hopper outlet being spaced from each other in a first direction,
means for supporting the hopper with the bottom surface inclined a few degrees downwardly from the inlet toward the outlet;
vibration imparting means comprising at least one motor having a shaft lying in a plane extending transverse to said first direction and carrying at least one eccentric weight thereon,
resilient means mounted between said vibration imparting means and said hopper for resiliently mounting said vibration imparting means to one quadrant of said hopper and for directing vibratory forces into one diametrically opposite quadrant and into one other quadrant on the same level as said opposite quadrant of said hopper for conveying castings in said first direction from the inlet to the outlet of the hopper as the castings are tumbled in a path transverse to said first direction, and
means on the hopper between the hopper inlet and hopper outlet for directing foreign matter separated from the castings in the hopper away from the hopper upstream from where the castings are discharged through the outlet,
whereby said castings can be continuously directed between the hopper inlet and outlet and foreign matter can be continuously separated from the castings and directed away from the hopper.

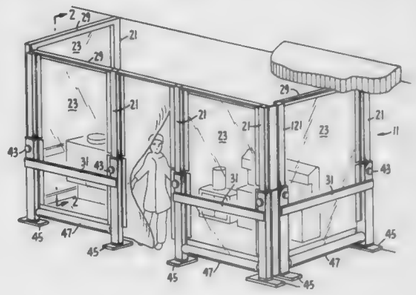
4,731,960
MOLDING STRIP ASSEMBLY WITH REVEAL AND SHELVING SYSTEM FOR USE IN CONSTRUCTING FLEXIBLE WALL COVERINGS
R. Gregg Sease, 6457 S. Heritage Pl., West, Englewood, Colo. 80111
Filed Sep. 4, 1986, Ser. No. 903,672
Int. Cl.[4] A47B *5/00*
U.S. Cl. 52—36 **28 Claims**



1. A molding strip assembly adapted to secure flexible sheets of material to a support surface to which the molding strip is attached, comprising:
a base wall adapted to be positioned against said support surface;
a first raised support wall operatively connected to said base wall so that said first support wall is laterally offset at a first side of said base wall and is supported in spaced relation above said support surface;
a second raised support wall operatively connected to said base wall so that said second support wall is laterally offset at a second side of said base wall and is supported in spaced relation above said support surface;
first material retaining means located between said first support wall and said first side along a first interior sidewall, said first material retaining means for receiving and retaining a marginal edge portion of a first sheet of flexible material whereby said first sheet may be secured in the first retaining means and may be trained across and be supported by said first support wall above said support surface; and
second material retaining means located between said second support wall and said second side along a second interior sidewall, said second material retaining means for receiving and retaining a marginal edge portion of a second sheet of flexible material whereby said second sheet may be secured in the second retaining means and may be trained across and be supported by said second support wall above said support surface said first and second interior sidewalls spaced apart from one another and forming an open U-shaped channel structure with said base wall defining a bottom wall of said channel structure.

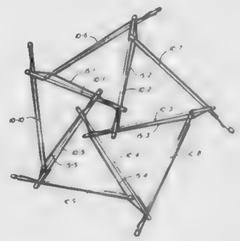
4,731,961
TEMPORARY ISOLATION STRUCTURE
Richard R. Bona, 506 Fairfax Ave., San Mateo, Calif. 94402
Filed Nov. 14, 1986, Ser. No. 930,780
Int. Cl.[4] E06B *9/00, 3/80;* **E04B** *1/347, 1/86*
U.S. Cl. 52—63 **19 Claims**

13. An adjustable stanchion for supporting flexible sidewalls of a temporary wall structure to environmentally isolate a selected area of a room from the remainder of the room comprises:
a tubular base member;
a telescopic member that is extendably received in the tubular base member;
a first set of flange members mounted to at least one side of the tubular base member to provide planar surfaces that extend parallel to the longitudinal axis of the base member; and



a second set of flange members hinged to at least one side of the telescopic member to provide planar surfaces that extend parallel to the longitudinal axis of the telescopic member in generally vertical alignment with the first set of flange members.

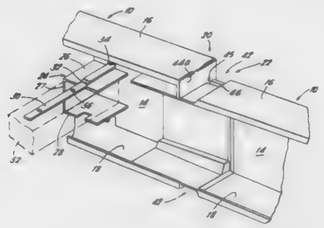
4,731,962
COMPRESSION-TENSION STRUT-CORD UNITS FOR TENSILE-INTEGRITY STRUCTURES
Cary Kittner, and Stuart R. Quimby, both of Barrytown, N.Y., assignors to Tensegrity Systems Corporation, Barrytown, N.Y.
Filed Dec. 24, 1986, Ser. No. 945,808
Int. Cl.[4] A63H *33/00;* **E04B** *1/32;* **E04H** *12/18*
U.S. Cl. 52—81 **12 Claims**



1. A compression tension unit for use in a tensile-integrity structure comprising
(a) an elongated rigid strut for bearing compression formed with
i. an end slot laterally through and longitudinally into each end of the strut, and
ii. at least one lateral hole extending into each strut end portion; and
(b) an elastic cord for bearing tension having substantially rigid tips sized for slip-fitting within and inserted into the lateral holes at the respective strut end portions with adjoining cord portions adjacent the tips fitted through the respective adjacent end slots and with a substantially stretched intermediate cord portion therebetween.

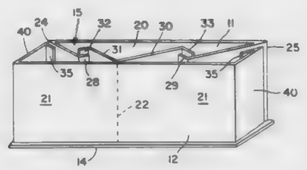
VOL 1088 ISS 4 MR 22 1988 UMI

4,731,963
VERGE UNIT WITH FRANGIBLE FEATURE
Michael A. Uden, Copthorne, and Mark L. Heaketh, Ourley, both of United Kingdom, assignors to Redland Roof Tiles Limited, Surrey, United Kingdom
Filed Nov. 7, 1986, Ser. No. 927,994
Claims priority, application United Kingdom, Jul. 11, 1985, 8527475
Int. Cl.[4] E04D *13/15*
U.S. Cl. 52—94 9 Claims



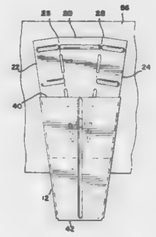
1. A verge unit, being a tapered channel element converging toward one end and comprising a side, upper and lower wall symmetrical about the longitudinal axis of the unit prior to use, and a pair of inwardly disposed break-out portions at a divergent end of the verge unit, wherein one of said break out portions must be removed before the unit is used to convert the symmetrical unit into a right hand verge unit, or the other of the pair of break-out portions removed to convert the symmetrical unit into a left hand verge unit.

4,731,964
STEEL SHELL BUILDING MODULES
Edward H. Phillips, 3601 Bay Shore Rd., Fort Collins, Colo. 80524
Continuation-in-part of Ser. No. 852,021, Apr. 14, 1986, Pat. No. 4,677,798. This application Jun. 30, 1987, Ser. No. 67,872
Int. Cl.[4] E04H *3/08*
U.S. Cl. 52—106 39 Claims



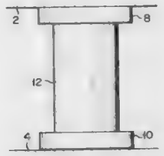
1. A building panel element for forming a part of a building wall surface, said element comprising;
(a) a generally rectangular metallic wall member having an inner wall surface and an outer wall surface, said wall member having a predetermined height and width and including longitudinally extending edges and laterally extending edges;
(b) a pair of laterally spaced baffle members each extending inwardly from respective ones of said longitudinal edges, at least one of said baffle members defining an acute angle with said inner wall surface; and
(c) end flanges carried along longitudinally extending innermost edges of each of said baffle members and extending inwardly toward the inner wall surface of the panel element.

4,731,965
ADJUSTABLE SHIM
Brian A. Jensen, P.O. Box 416, Rice Lake, Wis. 54868
Filed Feb. 19, 1987, Ser. No. 16,545
Int. Cl.[4] B66F *13/00*
U.S. Cl. 52—126.1 7 Claims



1. An adjustable, deformable, two-piece shim adapted to control the spacing between a fixed member and a movable member, said shim including a base member consisting of a substantially flat plate of deformable material with an upper surface, a lower surface, first and second end edges, said first end edge being narrower in width than said second end edge, a pair of side edges diverging linearly from each other from said first end edge toward said second end edge, and means defining at least one deformation line in said base member extedning between said first and second end edges, and a slide member consisting of a substantially flat plate with an upper surface, a lower surface, first and second end edges, said first end edge of said slide member being narrower in width than said second end edge of said slide member, said first end edge of said slide member being narrower in width than said first end edge of said base member, said second end edge of said slide member being greater in width than said first end edge of said base member, but narrower in width than said second end edge of said base member, such that at a predetermined point between said first end edge of said base member and said second end edge of said base member, the width of said base member is equal to the width of said second end edge of said slide member, the width of said base member increasing gradually between said predetermined point and said second edge member of said base member, a pair of side edges diverging linearly from each other from said first end edge toward said second end edge in a manner similar to the orientation of said side edges of said base member, and sleeve means defined at each side edges of said slide member adapted to engage said corresponding side edge of said base member and to be slidingly secured thereto, whereby when said second end edge of said slide member is positioned in overlying relationship to said first end edge of said base member and force is exerted on said first end edge of said slide member in a direction urging said second end edge of said slide member toward said second end edge of said base member, since the width of said second end edge of said slide member is narrower than the width of said base member between said predetermined point and said second end edge of said base member, said side edges of said base member are deformed along said deformation line such that said side edges are necessarily raised upwardly out of the plane of said base member thereby increasing the sapce between said lower surface of said base member and said upper surface of said slide member, said force being exerted until the distance between said bottom surface of said base member and said upper surface of said slide member has reached the predetermined spacing desired between said fixed member and said movable member.

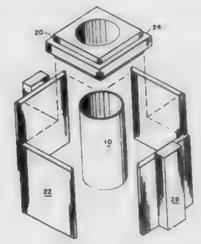
4,731,966
VIBRATION ENERGY ABSORBER DEVICE
Takafumi Fujita, 1-8-2-207, Saiwai-cho, Chiba-shi, Chiba-ken; Satoshi Fujita, Tokyo; Shigeru Fujimoto; Noboru Narikawa, both of Yokohama, and Chiaki Tsuruya, Tokyo, all of Japan, assignors to Takafumi Fujita, Chiba; Kabushiki Kaisha Toshiba, Kawasaki and Oiles Industry Co., Ltd., Tokyo, all of, Japan
Filed Jun. 10, 1986, Ser. No. 872,410
Claims priority, application Japan, Dec. 27, 1985, 60-294019; Dec. 27, 1985, 60-294020; Jun. 19, 1986, 60-133434
Int. Cl.[4] E04H *9/02*
U.S. Cl. 52—167 11 Claims



1. A vibration energy absorber device located between two construction members, having oppsite surfaces spaced apart from each other, for absorbing vibration energy causing a relative displacement of the construction members along a direction parallel thereto, comprising:
first and second fixing members, respectively mounted on the construction members such that at least a displacement of each fixing member relative to the corresponding construction member along the parallel direction is prevented;
an elastoplastic member which is located between the first and second fixing members, the elastoplastic member having two ends which are respectively coupled to the first and second fixing members and being subjected to plastic shear deformation; and
reinforcing means embedded in the elastoplastic member so as to allow plastic shear deformation of the elastoplaetic member, the reinforcing means including a plurality of first reinforcing members made of a material having a higher mechanical strength than that of the elastoplastic member, and the first reinforcing members extending from one end to the other end of the elastoplastic member, and being distributed along a peripheral portion of the elastoplastic member.

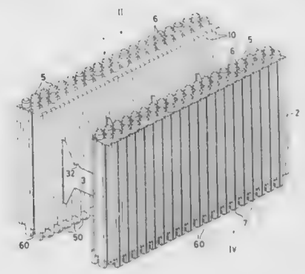
4,731,967
CHIMNEY CONSTRUCTION
Stephen D. McLaughlin, R.F.D. 1, Box 101, Lincolnville, Me. 04849
Filed Jul. 28, 1987, Ser. No. 78,831
Int. Cl.[4] E04H *12/28*
U.S. Cl. 52—218 22 Claims

1. A chimney structure comprising
a base member of fireproof material,
a hollow metallic core resting on said base member,
said core comprising a stacked series of individual hollow cylindrical metal sections joined together to define a vertical flue of the required length extending upwardly from said base member,
said core having at least one opening at a desired height above said base suitable for use as a clean-out and/or appliance connection,
a vertical enclosure surrounding and spaced from said core comprising vertically stacked box-like units formed of at least three side panels each and holding blocks separating said units from each other vertically, the lowermost of said units resting on said base member,
each of said holding blocks having a radially inwardly extending flange engaging said core and holding it centered within said enclosure and a radially outwardly extending flange for receiving and seating the top and bottom edges of successive box-like units respectively,



said panels and holding blocks being composed of high structural strength non-flammable thermal insulating material, and
lateral spacing blocks of similar material spacing the exterior surfaces of said panels from any flammable materials surrounding said chimney structure.

4,731,968
CONCRETE FORMWORK COMPONENT
Daniele Obino, Ed. - Huberstrasse, 6022 Groeswangen, Switzerland
Continuation of Ser. No. 486,218, Apr. 18, 1983, abandoned. This application Sep. 10, 1986, Ser. No. 906,621
Claims priority, application Switzerland, Apr. 23, 1982, 2470/82
Int. Cl.[4] E04C *1/14*
U.S. Cl. 52—309.12 11 Claims



1. A formwork component for use in concrete construction adapted to be connected to a plurality of corresponding formwork components for the formation of a shuttering, each component comprising:
a first and a second panel member made of foamed, hardened plastic material, being vertically arranged in a predetermined distance and extending parallel to each other,
a plurality of vertical cross members extending in right angles to said panel members and rigidly connecting said first panel member to said second panel member,
said first and second panel members being provided with substantially flat homogenous surfaces and having equal height and width; and
wherein said vertical cross members comprise on their two end regions a plurality of bracing members extending in right angles from the plane of said cross members and being provided on both sides of the cross members in a pressure zone of said first and second panel members, said

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vertical cross members further comprising a plurality of apertures adjacent to said bracing members, but situated closer to the center of said cross members at least partially in a tension zone of said first and second panel members, said pressure zone and said tension zone referring to a load situation of the formwork component when filled with fresh, not yet hardened concrete.

4,731,969

ROOF TILES

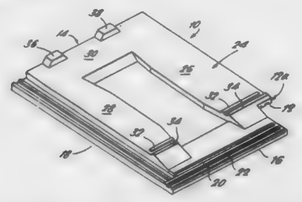
Robin M. Baker, Horsham; Paul R. Sargeant, Wisborough Green, and Ernest G. Papper, Crawley, all of England, assignors to Redland Roof Tiles Limited, Reigate, United Kingdom

Filed Sep. 12, 1985, Ser. No. 775,414

Claims priority, application United Kingdom, Sep. 12, 1984, 8423034

Int. Cl.⁴ E04D *1/00*

U.S. Cl. 52—536 **7 Claims**



1. An extruded concrete roof tile of a kind which is designed to be laid in broken bond, is generally rectangular in plan view and has underlying and overlying sidelock portions at opposed edges respectively, wherein an upper surface of the tile is generally flat, said tile having an upper end provided with an upwardly facing recessed portion adapted to received the sidelocks of two similar upper tiles laid in broken bond, said recessed portion being recessed beneath the flat upper surface of the tile, and the underlying sidelock portion is cut away at a lower end of the tile so as not to extend beyond the recessed portion of a tile positioned therebeneath when laid on a roof, said generally flat upper surface of the tile having a lower end portion which extends downwardly from the recessed portion and is positioned to lie over upper surfaces of a lower tile down the roof and positioned to extend beyond the said recessed portion of the lower tile.

4,731,970

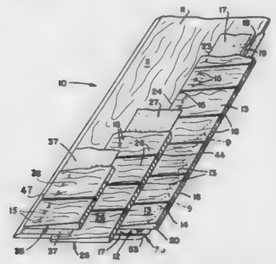
SHINGLED BUILDING PANEL

Thomas L. Marshall, Hollister, and Otis M. Martin, San Jose, both of Calif., assignors to Marshall Manufacturing, Inc., San Jose, Calif.

Filed Oct. 31, 1986, Ser. No. 925,328

Int. Cl.⁴ E04D *1/00*

U.S. Cl. 52—543 **21 Claims**



1. In a shingled building panel including a sheet-like base having at least one course of side-by-side shingles extending across and secured to said base, the improvement comprising:

said shingles in a lowermost course on said base having ends extending below a lower edge of said base to overlap an upper edge of a similarly formed panel mounted in vertically abutting relation to said panel;

said lowermost course having end shingles at opposite ends of said base which are mounted to protrude laterally beyond and to be laterally recessed with respect to opposite side edges of said base by a distance which is about equal; and

the laterally recessed end shingle having a thickness dimension over an upper portion thereof greater than the thickness dimension of the laterally protruding end shingle over the same upper portion whereby the thicker end shingle spaces any vertical adjacent course having an overlapping end shingle at a greater distance from said base than the thickness dimension of a protruding end shingle on a similarly formed panel placed in side-by-side abutting relation to said panel.

4,731,971

LARGE-PANEL COMPONENT FOR BUILDINGS

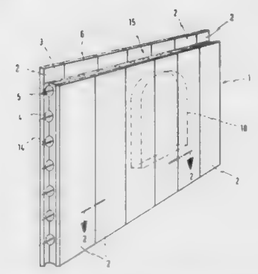
Hans-Ulrich Terkl, Edelackerstrasse 21, A-8642 St. Lorenzen i. Murztal, Austria

Division of Ser. No. 653,361, Sep. 24, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 28,792

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335370; Dec. 21, 1983, 3346277

Int. Cl.⁴ E04B *2/54*

U.S. Cl. 52—743 **7 Claims**



1. A method of constructing building walls and the like comprising the steps of:

(a) forming a plurality of lightweight rectangularly-shaped panels constructed using a mixture of polystyrene and concrete, one surface of said panels having a plurality of evenly spaced vertical semicircular cavities extending in parallel across the length dimension of said panel, the outermost cavities comprising quartercircular cavities; and further horizontal semicircular cavities extending along the same surface in a spaced and parallel relation across the width dimension of the panel,

(b) inserting reinforcing bars in a plurality of said semicircular cavities on said at least one of said panels,

(c) bonding a pair of said panels in facing alignment such that each panel's horizontal and vertical semicircular cavities are aligned to form a plurality of circular cavities,

(d) bonding a plurality of said pairs of panels in end-to-end alignment such that said horiontal cavities are in communicating relation with each other to form a large panel component,

(e) cutting an opening in said large panel component, said opening being of predetermined dimensions,

(f) covering on all lateral cut surfaces of said opening,

(g) transporting said large panel component to a construction site, and

(h) pouring concrete into said horizontal and vertical cavities at said construction site.

4,731,972

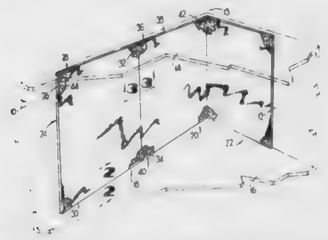
METHOD OF INSTALLING FABRIC WALL PANELS

Andy Anderson, Douglasville, Ga., assignor to Accutrack, Systems, Inc., Atlanta, Ga.

Filed Mar. 5, 1987, Ser. No. 22,177

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—745 **2 Claims**



1. A method for installing a fabric wall panel on an existing wall compriisng the steps of:

a. assembling a frame comprising linear frame members, each linear frame member comprising a flexible flat spine with a front side and a back side and having a raised channel of a preselected height on the front side forming a peripheral edge and an extending tongue on the front side forming an inner edge;

b. inlaying a flat filler insert within the frame on the front side of the spine;

c. bonding the filler insert to the tongue;

d. wrapping the frame with fabric and bonding the fabric to the raised channel along the peripheral edge and along the back of the spine; and

e. affixing the fabric panel to the wall by driving pin nails through the tongue in crossed fashion.

4,731,973

PROFILED MEMBER FOR CLAMPING PLATE-LIKE ELEMENTS, ESPECIALLY PLATES OF GLASS FOR DISPLAY CASES, SHOP COUNTERS, EXPOSITION FURNITURE, OR THE LIKE

Bruno Stenemann, Beckum, Fed. Rep. of Germany, assignor to Gebrüder Vieler GmbH, Iserlohn, Fed. Rep. of Germany

PCT No. PCT/EP85/00535, § 371 Date Jun. 19, 1986, § 102(e) Date Jun. 19, 1986, PCT Pub. No. WO86/02245, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 12, 1985, Ser. No. 890,770

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438365

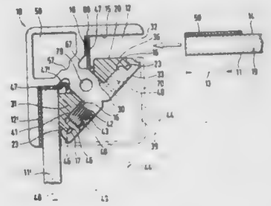
Int. Cl.⁴ A47F *3/12*; E06B *3/60*

U.S. Cl. 52—767 **18 Claims**

1. A profiled member for clamping plate-like elements, comprising:

at least one slot means that extends in the longitudinal direction of said profiled member, with each of said slot means being defined by a first and a second stationary planar wall, with said first and second walls being disposed at an angle relative to one another, and with said second wall being in the form of a guide surface, with each of said slot means being further defined by a third wall that proceeds from said second wall and, remote from the latter, has a free edge that defines an introduction opening, for a plate-like element, remote from a base portion of said slot means that interconnects said first and second walls, with said third wall and said second wall defining a triangular-shaped, enlarged portion of said slot means, with said third wall being provided with threaded through-holes for accommodating pressure-applying screws; and

respective profiled clamping strips that can be accommodated in respective ones of said enlarged slot portions and can be displaced by said pressure-applying screws, with each of said clamping strips having a fundamentally wedge-like cross-sectional shape which, when said clamping strip is installed in an enlarged slot portion, includes a wedge point region that faces said base portion of said slot means, a first wedge surface that is adjacent to said wedge point region and is displaceably supported on said guide surface, and a second wedge surface that is also adjacent to said wedge point region, extends parallel to said first wall, and defines wherein said slot means a parallel-walled slot of changeable width for accommodating and holding in place an edge portion of a plate-like element, with each of said clamping strips also including an abutment surface that interconnects said first and second wedge surfaces and is acted upon by said pressure-applying screws, with



the pressure-application direction of each of said pressure-applying screws extending parallel to said guide surface; each of said clamping strips is furthermore provided with integral parts that project from said wedge-like cross-sectional shape and are disposed in said slot means to secure the position of said clamping strip in said enlarged slot portion, with at least a portion of one of said integral parts extending parallel to said guide surface and being accommodated, for effective guidance, in a complementary aperture that is provided in said third wall and also extends parallel to said guide surface; each of said clamping strips being provided with zones of materials that differ from one another, including a core zone of relatively hard material, and at least one edge zone, the material of which is softer than that of said core zone; said integral parts for securing the position of said clamping strip in said slot means including a flexible flap that projects beyond said wedge-like cross-sectional shape and, in the installed state of said clamping strip, has at least one part that extends transverse to said parallel-walled slot.

4,731,974

MACHINES FOR PRODUCING INFUSION FILTER BAGS AND THEIR INDIVIDUAL PACKAGING IN AN OUTER ENVELOPE

Giorgio Billi, Bologna, Italy, assignor to I.M.A. - Industria Macchine Automatiche - S.p.A., Ozzano Emilia, Italy

Filed Jun. 25, 1986, Ser. No. 878,126

Claims priority, application Italy, Jun. 28, 1985, 3477 A/85

Int. Cl.⁴ B65B *61/14*

U.S. Cl. 53—134 **6 Claims**

1. In a machine for the production of filter bags for an infusion beverage, wherein a piece of filter paper is folded and filled with an infusion substance, closed to form a filter bag and the filter bag is provided with a string and a tag utilizing a rotary head provided with arms having respective pincers which carry said bag along a path, the improvement which comprises:

a supply of a strip of paper adapted to form envelopes for

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said bags, said strip being fed in a direction toward said head;

a fixed drawing device downstream of said supply and provided with a pair of juxtaposed vertical elements folding said strip into a V section with flanks of different lengths;

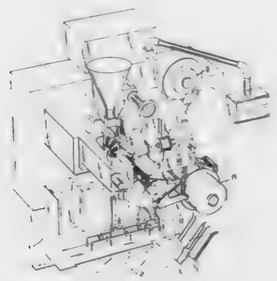
a pair of counter-rotating rollers between which said strip of V-section passes downstream of said elements and provided with means for impressing a longer one of said flanks adjacent to a longitudinal end of the shorter flank as a prefolding line;

braking means acting upon outer faces of said flanks for resisting displacement of said strip and located downstream of said counter-rotating rollers;

pulling means engaging said strip downstream of said braking means in said direction for intermittently advancing said strip between said elements, said rollers and said braking means;

cutting means downstream of said pulling means in said direction for severing from said strip successive wedges of paper folded in a V section and of a length sufficient to receive a respective one of said bags;

first pincer means swingable in a plane of said arms in one position of said arms on rotation of said head and receiving each wedge; and



second pincer means juxtaposed with the pincer of each arm at said position and including an inner pincer formed with fingers adapted to engage a filter bag on one of said arms in said position, and an outer pincer having fingers juxtaposed with the fingers of said inner pincer, said second pincer means being reciprocatable toward and away from said arm at said position whereby:

upon advance of said second pincer means toward an arm at said position, said fingers of said inner pincer engage a bag carried by said arm at said position;

upon movement of said inner pincer means away from said arm at said position, said first pincer means swings a respective wedge between said second pincer means and said arm at said position to receive a filter bag gripped between the fingers of said inner pincer,

said fingers of said outer pincer engage the respective flanks of the wedge receiving the filter bag in said inner pincer against the fingers of said pincer, and

upon swinging of said first pincer means from between said second pincer means and said arm at said position, said second pincer means advances toward said arm at said position to insert the wedge and the filter bag received therein in the pincer of the arm at said position.

4,731,975

MACHINE FOR AUTOMATICALLY POSITIONING PRODUCTS INTO RECEIVER ALVEOLI

Pierre Rossier, Chemin Neuf, Gironville, 91270 Maisse, France

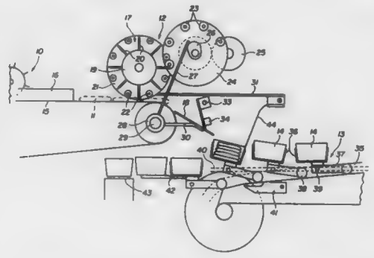
PCT No. PCT/FR86/00262, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00504, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 24, 1986, Ser. No. 43,555

Claims priority, application France, Jul. 26, 1985, 85/11579

Int. Cl.⁴ B65B *5/10, 19/34, 35/44, 35/56*

U.S. Cl. 53—148 **26 Claims**



1. A machine for automatically positioning randomly positioned products, in at least one layer in receptor alveoli, said machine comprising at least one endless conveyor belt having a surface for transporting said randomly positioned products in one direction, alignment means for aligning said products, means for transporting said alveoli, deposit means for depositing said products in said alveoli, said alignment means comprising at least one flexible endless element positioned parallel above said endless conveyor belt and driven in a direction of displacement reverse to said one direction, said flexible endless element being equipped with at least one series of pins having free ends aligned in said direction of displacement and mounted such that said free ends generally point towards the surface of said endless conveyor belt, said free ends of said pins being spaced from said surface of said endless conveyor belt by a distance less than a thickness of said transported products.

4,731,976

METHOD AND APPARATUS FOR APPLYING AN ELASTIC SLEEVE ON AN ARTICLE

Norman H. Nye, 1348 Highbridge Rd., Cuyahoga Falls, Ohio 44223

Continuation of Ser. No. 897,586, Aug. 18, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 36,129

Int. Cl.⁴ B65B *11/00*

U.S. Cl. 53—399 **13 Claims**

1. The method of applying an elastic sleeve to an article comprising the steps of:

causing an elastic sleeve to be pushed on an arbor that fits closely into the inside diameter of said sleeve; said arbor to extend lengthwise part way into the full length of the said elastic sleeve;

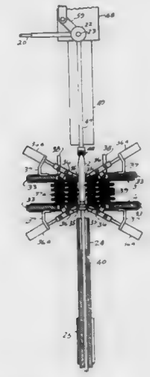
moving the said arbor with its said elastic sleeve into a location surrounded by a plurality of plates having holes of a size such as is required for expansion of the said elastic sleeve; said plates having their flat surfaces substantially perpendicular to the axis of the said arbor;

the said plates to be spaced apart in a direction of the axis of the said arbor;

causing the ends of the said elastic sleeve to be pinched to prevent leakage of fluid from the interior volume thereof;

providing fluid pressure to expand the said elastic sleeve large enough to contact the inner area of the said holes in said plates and to bulge into the spaces between the said plates;

reducing the spaces between the said plates to compress the bulges in the said elastic sleeve with enough force to provide frictional contact between the faces of said plates and the bulges of the said elastic sleeve so that there will be no loss of expansion of the said elastic sleeve when the said fluid pressure is released;



releasing the fluid pressure;

moving an article to which the said elastic sleeve is to be applied into position to receive the said elastic sleeve;

reducing the force applied to the said plates to allow the said elastic sleeve to collapse on the said article.

4,731,977

ROBOT SYSTEM FOR ENCASING CONICAL ARTICLES

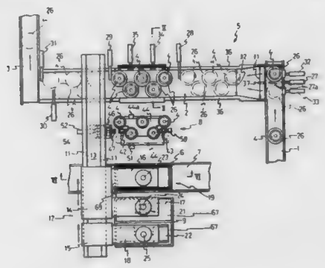
Hiroshi Maekawa, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 795,217, Nov. 5, 1985, abandoned. This application Aug. 19, 1987, Ser. No. 88,038

Claims priority, application Japan, Nov. 5, 1984, 59-233487

Int. Cl.⁴ B65B *35/30*

U.S. Cl. 53—443 **18 Claims**



18. A device for conveying articles from an arraying device to an enclosure comprising:

arrangement means for arranging a first plurality of articles and a second plurality of articles on said arraying device;

inverting means for inverting said first plurality of articles to thereby form an inverted first plurality of articles;

a first gripper for conveying said first plurality of articles from said arraying device to said inverting means and for conveying said second plurality of articles from said arraying device to said enclosure and for depositing said second plurality of articles in said enclosure; and

a second gripper for conveying said inverted first plurality of articles from said inverting means to said enclosure and for depositing said inverted first plurality of articles in said enclosure.

4,731,978

CLOSABLE BAG AND METHOD AND ARRANGEMENT FOR ASEPTIC FILLING THEREOF

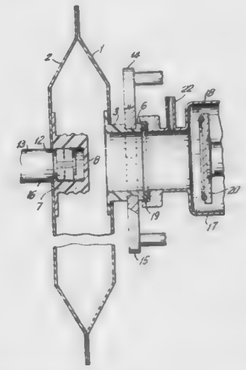
Karl Martensson, Lund, Sweden, assignor to Alfa-Laval Food & Dairy Engineering AB, Lund, Sweden

Filed Jun. 5, 1986, Ser. No. 870,904

Claims priority, application Sweden, Jul. 8, 1985, 8503389

Int. Cl.⁴ B65B *43/26*

U.S. Cl. 53—468 **9 Claims**



1. In a closable bag including a main part of flexible material, an inlet member separate from but connected to said main part and having an opening for filling the bag with a substance, such as a liquid, and a member separate from but connected to said main part for closing the filling opening from inside the bag, the improvement in which said inlet and closing members are of a rigid material substantially stiffer than said part and substantially more resistant to deformation than said part, said closing member being movable into sealing engagement with said inlet member to close the filling opening and also being releasable from said sealing engagement to allow partial discharge and reclosing of the filling opening, the improvement comprising engagement means on each of said inlet and closing members for engagement with operating equipment outside the bag for effecting relative movement of said members toward and away from each other to uncover and close the filling opening, the operating equipment engaging said engagement means when the filling opening is uncovered and also when the closing member is in sealing engagement with the inlet member to close said opening, the engagement means of each said member being positioned to be operable from one side of the member for both said closing and said uncovering of the filling opening, said closing member including a sleeve having an end wall, said engagement means of the closing member including a flange extending radially inward from the inside of the sleeve of the closing member.

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4,731,979

CAPSULE FILLING APPARATUS

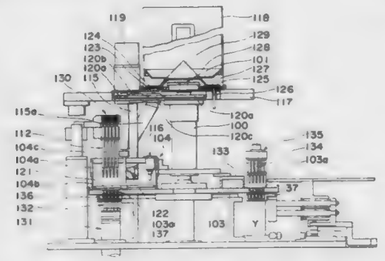
Taizo Yamamoto, Osaka, and Hirokazu Konishi, Sakurai, both of Japan, assignors to Nippon Elanco Kabushiki Kaisha, Osaka, Japan

Filed Feb. 26, 1986, Ser. No. 833,075

Claims priority, application Japan, Feb. 27, 1985, 60-40117; Mar. 15, 1985, 60-52971; Mar. 18, 1985, 60-55480; Jan. 30, 1986, 61-19261

Int. Cl.[4] B30B *11/00*; B65B *1/24, 1/38*

U.S. Cl. 53—529 11 Claims



1. A powder filling machine for filling a powdery material into a capsule, which comprises

a metering disc mounted on a vertical shaft,

a plurality of work stations situated around said metering disc,

means for intermittently rotating said metering disc about said vertical shaft past said work stations,

said metering disc having a plurality of groups of metering cavities,

the number of said cavity groups corresponding to the number of said work stations,

a first one of said work stations being a compressing station,

said compressing station including presser rods and means to move said presser rods up and down,

said presser rods each are engageable in a respective cavity of said metering cavities and have an outer diameter appropriate to the diameter of said respective cavity, so that the powdery material is compressed within said cavities to provide pellets by the up and down movement of said presser rods,

a second one of said work stations being a delivery station,

a delivery plunger for each of said cavities is located at said delivery station,

means for positioning a capsule cup body below said delivery plunger,

means for lowering each said delivery plunger to press the respective pellet to fall into said capsule cup body positioned therebelow,

means for subsequently delivering said capsule cup body to an associated apparatus,

a first auxiliary presser rod for each said cavity,

each said first auxiliary presser rod being located at a first stage of said compressing station, and having an outer diameter appropriate to the diameter of each said respective cavity,

each said respective cavity having a bottom opening therein,

means for inserting said first auxiliary presser rod from below into said respective cavity through said bottom opening, so as to occupy the entire space inside said respective cavity,

means for lowering said first auxiliary presser rod to allow a layer of the powdery material formed on said metering disc to be drawn into said respective cavity to fill up said respective cavity,

a third one of said work stations being a metering station located between a final stage of said compressing station and said delivery station,

a second auxiliary presser rod, for each said respective cavity, located at said metering station,

each said second auxiliary presser rod having an outer diameter appropriate to the diameter of each said respective cavity,

means for inserting each said second auxiliary presser rod into said respective cavity through said bottom opening of said cavity to push a respective pellet upwards to such an extent that in the event that said pellet is of a quantity exceeding a predetermined value, an excessive portion of said pellet will be exposed above said metering disc, and

means provided at said metering station for scraping off any excessive portion of the pellet.

4,731,980

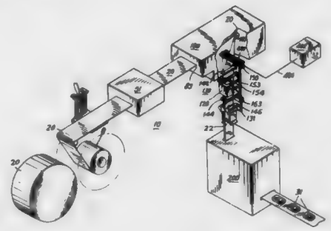
APPARATUS FOR FORMING A TUBE FROM POLYFOIL WEB FOR HIGH CAPACITY ASEPTIC FORM, FILL, AND SEAL MACHINES

Donald G. Worden, Sheboygan, and Kenneth Storm, Glendale, both of Wis., assignors to International Paper Company, Purchase, N.Y.

Filed Dec. 17, 1986, Ser. No. 942,849

Int. Cl.[4] B65B *9/08*

U.S. Cl. 53—551 13 Claims



1. Apparatus for forming a continuous web of polyfoil material into a tube that can be filled with a product and transversely clamped, sealed, and severed into packages, comprising:

means for advancing the polyfoil web;

a frame;

web guide means for bending the polyfoil web, the web guide means extending along a length so that the web bends as the longitudinal edges of the web are gradually brought close together into a superimposed and opposing relationship as the web is advanced along the web guide means;

a pair of first rollers, mounted on the frame a distance apart, one first roller being disposed on each side of the polyfoil web, the first rollers extending from the frame at an angle toward the polyfoil web and downwardly from the frame so as to contact the bent polyfoil web to flatten the portions of the web adjacent to the opposing longitudinal edges as the web advances;

groove means for receiving and aligning the longitudinal edges of the web disposed proximate to the longitudinal edges of the web as the web advances;

a pair of second rollers spaced a distance apart and adapted to receive the superimposed and opposing longitudinal edges and pinch them together, the second rollers having parallel axes of rotation that are at an angle to the longitudinal edge of the web so as to exert a component of force on the web edges perpendicular to the direction of advance of the web to urge the edges into the groove means and longitudinally into alignment;

a third roller mounted in the frame and disposed to contact the web portion between the two flattened web portions to urge the web edges into the groove means, longitudinally aligning the web edges, thereby providing the web with a substantially triangular cross sectional configuration;

means for heating the opposing longitudinal web edges; and

a pair of fourth rollers spaced a distance apart and adapted to receive the heated superimposed and contacting longitudinal edges and press them together so that they fuse together to form a homogeneous longitudinal seal.

4,731,981

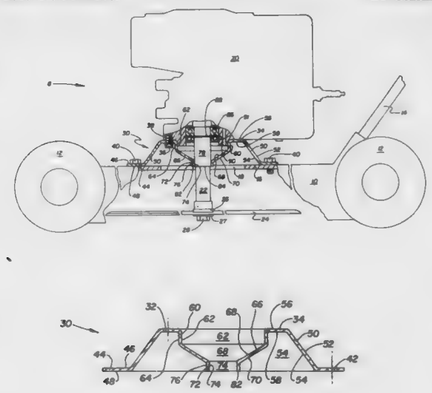
CRANKSHAFT IMPACT PROTECTOR

Miles S. Geringer, Milwaukee, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 14, 1986, Ser. No. 818,713

Int. Cl.[4] A01D *34/64*

U.S. Cl. 56—17.5 20 Claims



1. For use in a lawnmower having a generally planar mower deck, a crankshaft protector for protecting the crankshaft of a lawnmower engine from undue deflection, comprising:

a crankshaft bumper means adapted to receive therein and support said crankshaft of said lawnmower engine;

an engine mounting base portion connected to said bumper means by a first generally frusto-conical portion said mounting base portion having an upper surface for mounting a lawnmower engine thereupon, said first frusto-conical portion extending downwardly and inwardly from said mounting base surface; and

a flange connected to said mounting base portion for mounting said protector upon said generally planar mower deck.

4,731,982

GAS LINE SEALING METHOD UTILIZING PENETRATING FLEXIBLE SEALANT

Seamus M. Grant, Dublin, Ireland; Bernard Cooke, London, England, and Kieran Mulcahy, Kildare, Ireland, assignors to Loctite Ltd., Dublin, Ireland

Filed May 10, 1985, Ser. No. 732,659

Claims priority, application United Kingdom, May 15, 1984, 8412354

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 18 Claims

3. In a method comprising injecting a catalyzed acrylic monomer composition into a leaking pipe joint and curing the composition in the joint to seal the leaks, the improvement comprising that the composition when cured has a glass transition temperature (Tg) which is not more than 0° C. and is at least about 5° below the minumum operating temperature of the pipe joint, and the composition comprises:

(a) 20–80% of a long chain acrylic ester;

(b) 15–50% of a hydroxy functional acrylic ester;

(c) 0.5–5% of a acid monomer;

(d) 5–30% of a plasticizer;

(e) 0.1–5% of a polyfunctional acrylic ester.

4,731,983

LAWN MOWER

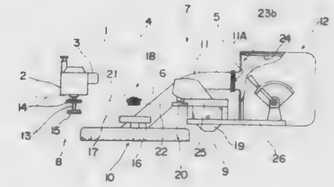
Mikio Yuki; Niro Bando; Kazuaki Kurohara; Hiroshi Itatani, all of Sakai; Fumihiro Ikeda, Osaka; Hiroyuki Ogasawara, Izumi; Nobuyuki Yamashita, Sakai, and Masaji Kure, Kishiwada, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,831

Claims priority, application Japan, Mar. 8, 1985, 60-33657[U]; Mar. 9, 1985, 60-47091; Sep. 13, 1985, 60-203787; Sept. 13, 1985, 60-203788

Int. Cl.[4] A01D *34/03*

U.S. Cl. 56—202 13 Claims



1. A lawn mower comprising:

a vehicle body,

a cutting unit supported by the vehicle body,

a grass catcher mounted rearwardly of the vehicle body and including an opening in one side thereof directed to the front of the vehicle body,

a discharge duct extending between the cutting unit and grass catcher and including an end defining a discharge opening for transmitting grass clippings from the cutting unit to the grass catcher,

a lid member removably attached to the opening of the grass catcher and including a socket opening engageable with the end of the discharge duct and an air vent defined at least around the socket opening, and

grass catcher posture switch means for switching the grass catcher between a sideways turned posture in which the end of the discharge duct is inserted into the grass catcher through the socket opening and an upright posture in which the socket opening is directed upwardly, said posture switch means displacing the grass catcher rearwardly prior to switching from the sideways turned posture to the upright posture, to position the end of the discharge duct outside of the grass catcher.

4,731,984

BALERS

Cornelis van der Lely, Zug, Switzerland, assignor to Texas Industries Inc., Willemstad, Curacao, Netherlands

Continuation of Ser. No. 676,307, Nov. 29, 1984, abandoned.

This application Aug. 14, 1986, Ser. No. 896,350

Claims priority, application Netherlands, Dec. 1, 1983, 8304136

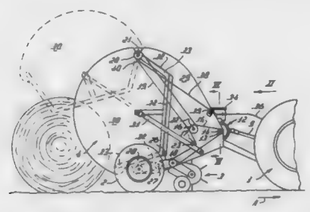
Int. Cl.[4] A01D *59/00*

U.S. Cl. 56—341 7 Claims

1. A baler for forming compact cylindrical rolls of substantial size of hay or the like which comprises a bale coiling space which is defined by a rear wall, a forwad wall and two parallel side walls which constitute the lateral boundaries of said bale coiling space; each said side wall comprising a small side part,

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which in concert with said foward wall forms a stationary front section, and a large side part, which in concert with said rear wall forms a pivotable rear section; pivot means for said rear section being disposed at the upper aspect of said bale coiling space which pivotally connects said rear section to said front section so that said rear section can be pivoted to a position where said rear section is disposed over ground located immediately to the rear of the baler, each said large side part having a forward edge which initially extends forward from said pivot means and then continues downward forward of a



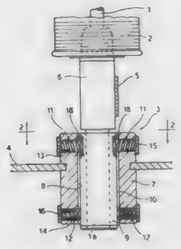
centerline of said bale coiling space and therefrom continues rearwardly to under said centerline and forward edges defining between them a bottom opening which extends under said centerline so that when a bale has been formed in said bale coiling space such bale is clamped between said large side parts of said rear section so as to be held thereby as said rear section is pivoted upwardly and rearwardly until the bale clamped between said large side parts has been moved to a position where the force of gravity overcomes the clamping resistance and the bale can drop through said bottom opening to the ground behind the baler.

4,731,985

SPINDLE SUPPORTING DEVICE

Carlo Menegatto, Via E. Spreafico No. 3, 20052 Monza, Milano, Italy

Filed Jan. 9, 1986, Ser. No. 817,532
Claims priority, application Italy, Jun. 11, 1985, 21100 A/85
Int. Cl.⁴ D01H *7/12;* **F16C** *35/08;* **F16F** *15/00*
U.S. Cl. 57—135 **17 Claims**



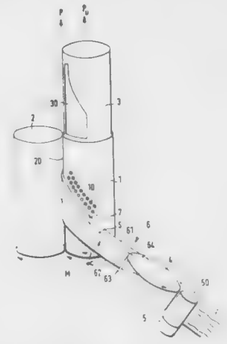
1. A spindle supporting device, in which a spindle is supported for rotation by means of bearings housed in a cylindrical spindle cartridge having an outer diameter, said device comprising an external support casing provided with means defining an open central hole open to both ends for housing said cartridge, said central hole means having an inner diameter greater than the outer diameter of the spindle cartridge thereby defining an annular air-gap therebetween; a first and a second set of independent elastically yielding thrust members disposed peripherally between said support casing and the cylindrical spindle cartridge, and retaining means for urging said thrust members radially towards and against the cylindrical spindle cartridge.

4,731,986

PROCESS AND DEVICE FOR OPEN-END FRICTION SPINNING

Werner Billner, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,555
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3521756
Int. Cl.⁴ D01H *7/898, 7/892, 1/135*
U.S. Cl. 57—401 **16 Claims**



1. A process for open-end friction spinning yarn where carded fibers are fed into the spinning wedge formed by two friction rollers, at least one of which is hollow and has a perforated surface and suction means to draw fibers onto said perforated surface and to hold said fibers on said perforated surface and to convey said fibers into the spinning wedge to form a yarn generating line, comprising the steps of:

(a) carding said fiber to separate and to orient said fibers along their longitudinal axis;

(b) conveying said separated and oriented fibers in an air current to the surface of said hollow roller;

(c) depositing said oriented and separated fibers in the direction of rotation and tangentially onto said perforated surface of said friction roller, with the longitudinal axes of said fibers generally extending at an acute oblique angle to the generating line of said hollow friction roller, said angle also being acute with said generating line adjacent the end of said hollow friction roller opposite one end of said roller from which the twisted yarn is withdrawn;

(d) conveying said deposited fibers into the spinning wedge while maintaining said fibers on said perforated surface at the angle at which they were deposited thereon;

(e) twisting said fibers into yarn; and

(f) withdrawing said yarn from said one end of said roller.

6. An open-end friction spinning apparatus for spinning yarn from fiber comprising:

(a) a pair of friction rollers, driven in the same direction about parallel longitudinal axes, forming a spinning wedge where the surfaces of said friction roller are adjacent to each other, at least one of said friction rollers being hollow with a perforated surface;

(b) means for creating a suction within said hollow roller thereby drawing air through said perforations into said hollow roller and forming a yarn generating line:

(c) means for supplying open fibers, oriented with their longitudinal axes substantially parallel to each other, in an air current, and means for withdrawing twisted yarn from one end of said hollow roller;

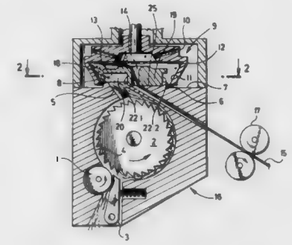
(d) a channel for guiding said air current and said fibers onto the perforated surface of said hollow roller, having an opening with first and second end walls which extend around a portion of the periphery of said hollow roller, a top wall which extends about said roller and towards said spinning wedge, and a bottom wall which terminates adjacent the surface of the hollow roller at a point remote from said spinning wedge, the center line of said channel extending at an acute oblique angle to the generating line of said hollow friction roller, said angle also being acute with said generating line adjacent the end of said hollow friction roller opposite said one end of said roller from which the twisted yarn is withdrawn, whereby said perforated surface of said hollow roller acts as a bottom wall after the bottom wall terminates and said open fibers are deposited onto said perforated surface with their longitudinal axes at an acute oblique angle to said generating line.

4,731,987

OPEN-END ROTOR SPINNING UNIT

Frantisek Jaros, Ústí nad Orlicí ; Miloslav Kubovy, Doiní Dobrouc; Kveta Hácová, Ústí nad Orlicí ; Zdenek Kotrba, Ústí nad Orlicí ; Pavel Bures, Ústí nad Orlicí ; Jirí Storek, Ústí nad Orlicí , and Frantisek Hortlik, Ústí nad Orlicí, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavinarsky, Usti Nad Orlici, Czechoslovakia

Filed Jun. 25, 1987, Ser. No. 67,060
Claims priority, application Czechoslovakia, Jun. 27, 1986, 4787-86
Int. Cl.⁴ D01H *7/892, 1/135, 7/882*
U.S. Cl. 57—415 **10 Claims**



1. An open-end spinning unit, comprising

a spinning rotor having an axis of rotation;

a cylindrical projection partially engaging into said spinning rotor;

a separator supported by said cylindrical projection;

a defining stud for defining a space between said separator and said cylindrical projection in a vertical direction, thereby defining a lower wall of said separator and a front wall of said cylindrical projection;

a fiber directing gap between the lower wall of said separator and the front wall of said cylindrical projection;

a fiber supply duct intersecting the front wall of said cylindrical projection at an acute angle; and

a fiber take-off duct passing through said separator, said cylindrical projection, and said defining stud;

said separator and said cylindrical projection being coaxial with each other and with the spinning rotor, the geometric center of cross-sectional area of said defining stud being situated eccentrically to the spinning rotor axis;

wherein the defining stud has a peripheral wall being divided into an inner section facing the supply duct, and an outer section situated at the opposite side of the cylindrical projection, said inner section being curved in a direction of natural fiber flow trajectory merging into a direction of the spinning rotor rotation and the outer section being in contact with or radially set back from the cylindrical wall of said projection at a distance of up to 4 millimeters;

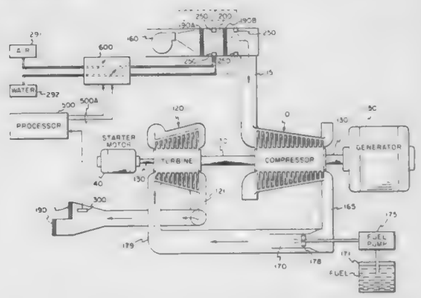
wherein the peripheral wall of the defining stud has a length which corresponds to at least one half of an average staple length of fibers supplied through the supply duct.

4,731,988

INTERNAL COMBUSTION ENGINE SYSTEM AND METHOD WITH REDUCED NOXIOUS EMISSIONS

Michael Munk, 28 Dorchester Dr., Rye Brook, N.Y. 10573

Division of Ser. No. 760,358, Jul. 30, 1985, Pat. No. 4,667,465.
This application Dec. 31, 1986, Ser. No. 948,250
Int. Cl.⁴ F02C *9/00*
U.S. Cl. 60—39.3 **15 Claims**



1. For use in conjunction with a combustion-based system including a combustion chamber having an exhaust, a source of input air and a source of fuel for providing input air and fuel to said combustion chamber, and means communicating with said combustion chamber for obtaining power from said combustion; the improvement comprising:

an ultrasonic fogging device communicating with said input air, said fogging device being adapted to receive a fogger air supply and a fogger water supply, and to generate a fog in said source of input air which has a droplet size of the order of ten microns or less, and evaporates to dryness in the input air;

means for sensing noxious emissions in exhaust gases from said combustion chamber; and

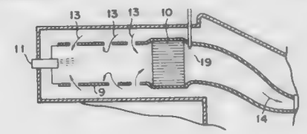
means for controlling said fogging device in accordance with the sensed noxious emissions.

4,731,989

NITROGEN OXIDES DECREASING COMBUSTION METHOD

Tomiaki Furuya; Susumu Yamanaka, both of Yokohama; Terunobu Hayata, Kawasaki, and Junji Koezuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 930,977, Nov. 13, 1986, abandoned, which is a continuation of Ser. No. 676,936, Nov. 30, 1984, abandoned. This application Apr. 23, 1987, Ser. No. 42,630
Claims priority, application Japan, Dec. 7, 1983, 58-229967; Feb. 23, 1984, 59-31363; Mar. 7, 1984, 59-41909; Mar. 27, 1984, 59-59431
Int. Cl.⁴ F02C *7/00, 7/26*
U.S. Cl. 60—39.05 **25 Claims**



1. A nitrogen oxides decreasing combustion method which comprises:

a first step of mixing a fuel and air with each other;

a second step of bringing the mixture obtained in the first step into contact with a packed catalyst such that only catalytic combustion occurs; and

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a third step of adding a fresh supply of the fuel to a stream obtained from the second step to form a mixed gas and causing the mixed gas to undergo non-catalytic thermal combustion, the temperature of said packed catalyst being lower than the ignition temperature of the mixture and the adiabatic flame temperature of said mixed gas being lower than a temperature at which the nitrogen oxides occur.

4,731,990

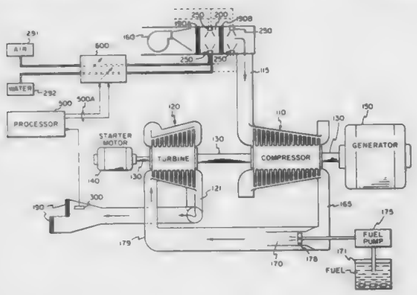
INTERNAL COMBUSTION ENGINE SYSTEM AND METHOD WITH REDUCED NOXIOUS EMISSIONS

Michael Munk, 28 Dorchester Dr., Rye Brook, N.Y. 10573

Division of Ser. No. 760,358, Jul. 30, 1985, Pat. No. 4,667,465. This application Dec. 31, 1986, Ser. No. 948,033

Int. Cl.⁴ F02C 9/00

U.S. Cl. 60—39.05 **8 Claims**



1. For use in conjunction with a combustion-based system including a combustion chamber having an exhaust, a source of input air and a source of fuel for providing input air and fuel to said combustion chamber, and means communicating with said combustion chamber for obtaining power from said combustion; a method for reducing noxious emissions from said system, comprising the steps of:

generating a fog having a droplet size of the order of ten microns or less, and injecting the fog into said input air, such that said fog evaporates to dryness in the input air;

sensing the concentration of emissions in the exhaust gases from said combustion chamber; and

controlling said fog in accordance with the sensed concentration of noxious emissions.

4,731,991

GAS TURBINE ENGINE THRUST REVERSER

Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

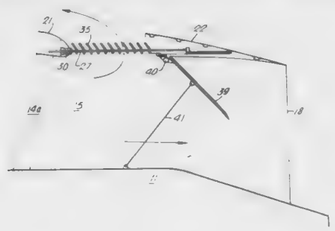
Filed Aug. 12, 1986, Ser. No. 895,619

Claims priority, application United Kingdom, Oct. 8, 1985, 8524801

Int. Cl.⁴ F02K 3/02

U.S. Cl. 60—226.2 **11 Claims**

1. A ducted fan gas turbine engine comprising a core engine having a fan propulsor and a cowling member surrounding and extending downstream of said fan propulsor, said cowling member being radially spaced apart from said core engine so that an annular gap is defined therebetween for the flow of air from said fan propulsor, said cowling member comprising a first static annular portion surrounding said fan propulsor and a second translatable annular portion downstream of said fan which is axially translatable from a first position in which it is contiguous with said first cowling portion and a second position in which a generally circumferential gap is defined between said cowling member portions, a plurality of generally axially extending support members interconnecting said second translatable cowling member portion with said first cowling member portion, a plurality of air flow deflecting members carried by said generally axially extending support members, said air flow deflecting members being translatable along said support members from a first position when said cowling members are contiguous in which said airflow deflecting members are stacked in a nested, axially abutting relationship to a second position when said circumferential gap is defined between said cowling member portions in which said air flow deflecting members are in axially spaced apart relationship and in which they occupy at least a major portion of the axial extent of said circumferential gap between said cowling member portions, and blocker means to at least partially obturate said annular fan air flow duct downstream of said air flow deflecting members when said cowling member portions are axially separated so that at least a portion of the flow of air operationally exhausted from said fan propulsor passes through said generally circumferential gap and is deflected by said air flow deflector means when in said axially spaced apart relationship, said air flow deflector members being so arranged when axially spaced apart to deflect said air flow in generally upstream direction.



4,731,992

FUEL SUPPLY DEVICE FOR ENGINES, MORE PARTICULARLY OF MODEL AIRCRAFT

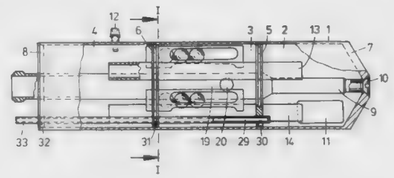
Günter Krumscheid, Halinger Dorfstrasse 83, D-5750 Menden 1, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,145

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517120

Int. Cl.⁴ F02B 37/02

U.S. Cl. 60—281 **8 Claims**



1. A fuel supply device for engines, more particularly for model aircraft, comprising: a fuel tank which is sealed off against atmosphere and is connected via a fuel outlet line to the engine and via a gas line to an excess pressure chamber in an exhaust constructed in the form of a silencer, the excess pressure chamber being connected on the inlet side to a combustion gas outlet of the engine and having an exhaust gas outlet extending to the atmosphere, characterized in that disposed in the exhaust gas outlet of the excess pressure chamber (**4**) is at least one valve arrangement (**16, 17, 18**) which throttles the exhaust gas outlet in dependence on the inclined position of the exhaust and the forces of inertia.

4,731,993

EXHAUST APPARATUS FOR A V-TYPE INTERNAL COMBUSTION ENGINE

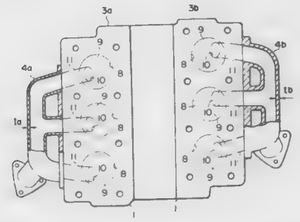
Yoshiaki Ito, Susono; Ryuichi Deguchi, Shimizu; Hiroki Matsuoka, and Toru Hanafusa, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1987, Ser. No. 8,534

Claims priority, application Japan, Jan. 29, 1986, 61-10259

Int. Cl.⁴ F01N 7/10, 3/28

U.S. Cl. 60—299 **7 Claims**



1. An exhaust apparatus adapted for connection to a V-type internal combustion engine in an automobile having a first cylinder bank away from the passenger compartment of said automobile and a second cylinder bank proximate the passenger compartment of said automobile, comprising:

a first exhaust manifold connected to said first cylinder bank;

a second exhaust manifold connected to said second cylinder bank;

said first exhaust manifold having a wall thickness which is thinner than the wall thickness of said second exhaust manifold;

a catalytic converter; and

means for connecting said first and second exhaust manifolds to said catalytic converter.

4,731,994

APPARATUS FOR BURNING SOLID PARTICLES IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

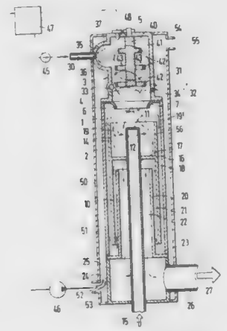
Hubert Dettling, Waiblingen; Rolf Leonhard, Schwieberdingen, and Ulrich Projahn, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 30,186

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621913

Int. Cl.⁴ F01N 3/26

U.S. Cl. 60—303 **20 Claims**



1. An apparatus for burning solid particles, in particular soot particles, in an exhaust gas of internal combustion engines, comprising an overflow opening (**6**), a cylindrical first combustion chamber (**1**) formed by a jacket (**2**), a fuel mixture preparation chamber (**4**) communicating with said combustion chamber (**1**) through said overflow opening (**6**), an ignition burner for generating a pilot flame in said preparation chamber, said pilot flame being oriented through said overflow opening into said combustion chamber (**1**), a plunger tube (**10**) protruding coaxially into said combustion chamber toward said overflow opening, said plunger tube (**10**) having at least one outlet (**12**) through which a flow of gas (**15**) laden with the solid particles (**14**) is directed into said combustion chamber, a combustion gas removal tube (**20**) partially surrounding the plunger tube (**10**) which carries a combustion gas (**27**) to an exhaust outlet (**26**), said at least one outlet (**12**) of said plunger tube (**10**) arranged to discharge radially, and a second combustion chamber (**19**) opening toward said overflow opening (**6**) and spaced apart radially from the wall of the first combustion chamber (**1**) is arranged to surround said plunger tube in the vicinity of said at least one outlet in such a manner that a combustion flame ignited by the pilot flame is retained within a limited volume having a hot core zone.

4,731,995

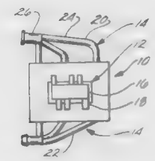
EXHAUST MANIFOLD AND AN IMPROVED EXHAUST MANIFOLD, INTAKE MANIFOLD AND ENGINE COMBINATION

James D. McFarland, Jr., Torrance, Calif., assignor to Edelbrock Corporation, El Segundo, Calif.

Filed Nov. 5, 1986, Ser. No. 927,342

Int. Cl.⁴ F02B 27/02, 75/20

U.S. Cl. 60—313 **21 Claims**



1. In combination with an internal combustion engine of the type having a plurality of cylinders, a reciprocating piston in each cylinder, at least one inlet port and valve into each cylinder, at least one exhaust port and valve from each cylinder, an inlet manifold for conducting combustion air into the cylinders through the inlet ports, and an exhaust manifold for exhausting products of combustion from the cylinders through the exhaust ports, an improvement comprising:

(a) at least two different sets of runners of the inlet manifold, each being tuned to a predetermined resonant frequency of air to effect resonance at a different engine speed from the other;

(b) at least two different sets of branches of the exhaust manifold, each being matched to a different one of the runner sets and tuned to a predetermined resonant frequency of the products of combustion of the engine to effect resonance at the same engine speed as its matched runner set.

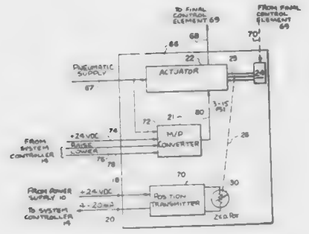
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4,731,996

POSITION TRANSMITTER FOR A PNEUMATIC-PNEUMATIC OR ELECTRO-PNEUMATIC CONVERTER

Jane E. Smith, Mentor, and Raymond J. Sampson, Cleveland, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 10, 1984, Ser. No. 649,246
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—390 **10 Claims**



1. A position transmitter for generating a signal corresponding to the position of a movable member of an actuator device, comprising:

a DC power supply having a pair of terminals;

an input line connected to one terminal of said power supply;

an output line connected to the other terminal of said power supply;

voltage divider means connected between said input and output lines and having a movable contact mechanically engageable with the movable member of the actuator device for carrying a voltage which varies with motion of the movable member;

a zero adjust amplifier having an input connected to said movable contact for receiving the voltage carried by said movable contact, and an output, said zero adjust amplifier being connected to influence a current on said output line and having an adjustable input, said movable contact being movable to a zero position corresponding to a zero position of the movable member and said adjustable input being adjusted to apply a low selected current signal to said output line which is indicative of a zero position of the movable member;

a span adjust amplifier having an input connected to said output of said zero adjust amplifier, said span adjust amplifier having an output and being connected to influence a current on said output line, said span adjust amplifier having an adjustable input, said movable contact being movable to a maximum position corresponding to a maximum position of the movable member and said adjustable input of said span adjust amplifier being adjusted to apply a high selected current signal to said output line which is indicative of the maximum position of the movable member; and

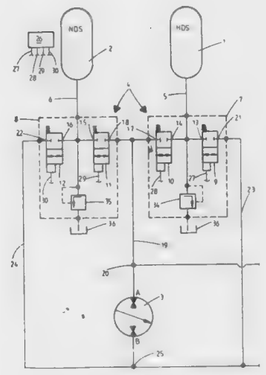
a voltage-to-current stage connected between said input and output lines and connected to said output of said span adjust amplifier for converting a voltage signal from said span adjust amplifier to a current signal on said output line.

4,731,997

DEVICE FOR STORING AND RELEASING ENERGY

Faust Hagin, Munich, Fed. Rep. of Germany, assignor to Man Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 53,100
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619639
Int. Cl.[4] F15B *1/04*
U.S. Cl. 60—416 **5 Claims**



1. A device for the storing and releasing of energy comprising:

a high pressure accumulator,

a low pressure accumulator,

a hydraulic transducer adapted for connection with a system intermittently

supplying and utilizing energy,

a switch over device for causing charging and discharging of the high pressure accumulator from and into the low pressure accumulator with the aid of said hydraulic transducer through a first circuit path in one direction and through a second circuit path in the opposite direction,

electrical means and shut off valves for shutting off one of the circuit paths and opening up the other and vice versa,

two first parallel-connected 2/1 way shut off valves associated with the high pressure accumulator,

two second parallel-connected 2/1 way shut off valves associated with the low pressure accumulator, first ports of said four 2/1 way shut off valves being connected with a feed line leading to the respective accumulator, second ports of two such 2/1 way shut off valves associated with each accumulator being connected with a power input of the hydraulic transducer, second ports of the respective other 2/1 way shut off valves being connected with the power output port of the hydraulic transducer,

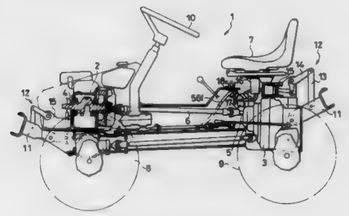
and means for paired switching of a respective one of the two 2/1 way shut off valves associated with one of such accumulators so that a selected one of the two accumulators is connected with the power input of the hydraulic transducer and the switching path is able to be built up from the power output of the hydraulic transducer to the other accumulator.

4,731,998

HYDRAULIC SYSTEM IN A WORKING VEHICLE

Kiyotomi Maesaka, Koshigaya, and Satoshi Matsuzawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 828,915
Claims priority, application Japan, Feb. 14, 1985, 60-27437; Feb. 14, 1985, 60-18302[U]
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—435 **4 Claims**



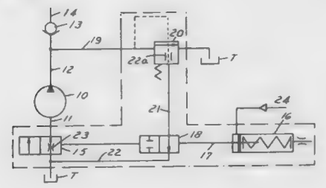
1. A hydraulic system in a working vehicle of the type that an engine and a transmission in a transmission housing are separately disposed on a vehicle body apart from each other adjacent the back and front of said vehicle and are drivably coupled to each other by a drive shaft connected at one of its ends to said engine and at its other end to the input shaft of said transmission; characterized in that the input shaft of said transmission is drivably coupled to said transmission through a clutch mounted on said housing and an oil pump is secured to said transmission housing, said oil pump being drivably coupled to said input transmission shaft.

4,731,999

POWER TRANSMISSION

Albin J. Niemiec, Sterling Heights, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Apr. 24, 1987, Ser. No. 42,286
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—468 **14 Claims**



10. A hydraulic system comprising

a pump having an inlet and an outlet,

a first line from the outlet of the pump,

a normally closed inlet valve having an inlet and outlet controlling flow from a source to the inlet of said pump,

a normally closed unloading valve having an inlet connected to the first line and having an outlet,

a second line connected to the outlet of said unloading valve,

said unloading valve having means forming a restricted passage permitting flow from the first line to the second line,

a normally open vent valve having an inlet connected to the second line and having an outlet,

a third line extending from said outlet to said vent valve to the inlet valve,

a motor for moving said vent valve and said inlet valve to open positions,

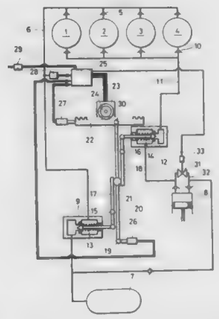
said inlet valve having means for directing a predetermined amount of fluid to the inlet of the pump when the inlet valve is closed such that when the inlet valve is normally closed only said predetermined flow will occur for cooling and lubricating the pump and when there is no load on the system and the motor is operated to open the inlet valve, the inlet valve is opened and the vent valve is closed, the inlet valve, unloading valve and vent valve being constructed and arranged such that when there is a load on the hydraulic system and the motor is operated to open the inlet valve, the vent valve remains open before the inlet valve is completely opened providing communication between the unloading valve and tank pressure through the second line and the vent valve and thereby causing a pressure differential across the first line, the unloading valve and second line to open the unloading valve to discharge the flow from the first line to tank pressure until the inlet valve is fully open and the vent valve is closed.

4,732,000

OUTPUT CONTROL APPARATUS FOR STIRLING ENGINES

Masahiko Hasegawa, Anjyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 26, 1987, Ser. No. 30,376
Claims priority, application Japan, Mar. 27, 1986, 61-67369
Int. Cl.[4] F02G *1/06*
U.S. Cl. 60—521 **2 Claims**



1. A stirling engine output control apparatus comprising:

a working gas compressor;

a maximum cycle pressure line connecting a working space to said working gas compressor via a first check valve;

a pressure reducing valve provided in said maximum cycle pressure line;

a minimum cycle pressure line connecting said working space to said working gas compressor via a second check valve;

a pressure boost valve provided in said minimum cycle pressure line;

an operating lever pivotable about a movable pivot point for controlling opening and closing of said pressure reducing valve and said pressure boost valve;

a motor for moving said movable pivot point;

electronic control means for driving said motor;

sensing means for supplying said electronic control means with signals indicative of engine rotating speed, displacement of said operating lever and working gas pressure; and

an unload valve provided in a line shorting intake and discharge sides of said compressor;

said electronic control means having means for moving said movable pivot point via said motor so as to control working gas pressure in accordance with a reference target pressure decided by engine rotating speed and amount of

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operating lever displacement in neutral and parking ranges, and in accordance with a practical target pressure obtained by adding a pressure increment to said reference target pressure in a drive range.

4,732,001

HYDRAULIC BOOSTER WITH BOOST-PRESSURE RESPONSIVE VALVE

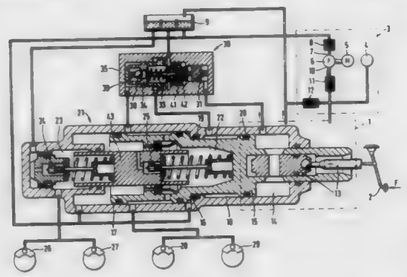
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,306

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428136

Int. Cl.[4] B60T *15/38*

U.S. Cl. 60—550 **12 Claims**



1. A braking pressure generator for a hydraulic brake system for automotive vehicles, wherein a booster piston is slidably arranged in a housing and is displaceable in the actuating direction by hydraulic auxiliary pressure, wherein the booster piston is provided as a stepped piston with a smaller - diameter portion close to one end of the housing adapted to be located adjacent a brake pedal, wherein the piston includes a blind-end bore remote from the one end of the housing, wherein a master cylinder piston is sealedly guided in the blind-end bore and forms a working chamber therewith, wherein the smaller - diameter portion of the booster piston confines an annular chamber diminishing upon brake application, wherein a valve which is located in the housing and which is controllable by the pressure in a pressure chamber of the hydraulic power booster is connected to the annular chamber, said valve being operable for closing a connection between the annular chamber and an unpressurized supply reservoir, wherein a direct connection is established between the annular chamber and the working chamber by way of the valve and by circumventing a sealing collar, and wherein a closing element normally sitting close to a valve seat of the valve in the connection between the working chamber and the annular chamber is switched into an operating position of the valve gate by the pressure prevailing in the pressure chamber and by pressure from the master cylinder.

4,732,002

SERVO-ASSISTED MASTER CYLINDER ASSEMBLIES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries public limited company, Birmingham, England

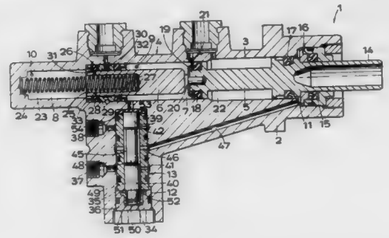
Continuation of Ser. No. 822,053, Jan. 23, 1986, abandoned. This application Jul. 21, 1987, Ser. No. 77,005 .

Claims priority, application United Kingdom, Jan. 29, 1985, 8502130

Int. Cl.[4] B60T *13/20*

U.S. Cl. 60—555 **6 Claims**

1. A servo-assisted master cylinder assembly for a vehicle braking system comprising a master cylinder having a housing provided with first and second bores, primary and secondary pistons working in said first bore, each said piston having a pressure-effective area, means defining primary and secondary pressure spaces in said first bore, said primary pressure space being pressurized by operation of said primary piston and having an outlet for connection to a primary brake circuit, and said secondary pressure space being pressurized by operation of said secondary piston and having an outlet for connection to a secondary brake circuit, and means defining a servo chamber in said first bore behind said primary piston, said assembly also having a control valve assembly comprising valve means operative in response to an input force applied to said master cylinder to control pressurization of said servo chamber by fluid from a source of pressure, pressurization of said servo chamber acting on said primary and secondary pistons to augment said



output force, said control valve means being operable solely in response to pressure in said primary pressure space and a bias force and comprising a spool working in said second bore, said primary pressure space and said spool being separated solely by an imperforate sealing diaphragm, on which pressure is said primary space acts directly on said spool, and said primary and secondary pistons being freely separable relative to each other for a maximum range of separation permitted by said bore, with said pressure-effective area of said secondary piston being less than said pressure-effective area of said primary piston, such that said primary and secondary pistons are substantially in abutment in their retracted positions.

4,732,003

METHOD OF CONTROLLING SUPERCHARGING PRESSURE IN TURBOCHARGER AND APPARATUS FOR SAME

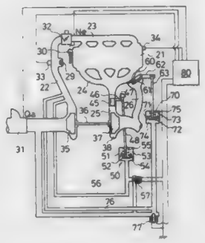
Takashi Ueno, Yokosuka; Toshimi Abo, Yokohama, and Katsunori Miyamura, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1985, Ser. No. 807,225

Claims priority, application Japan, Dec. 11, 1984, 59-261416; Dec. 11, 1984, 59-261417; Dec. 11, 1984, 59-261418

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **14 Claims**



1. An apparatus, comprising:

an exhaust turbine having an inlet for receiving exhaust gas from an operating system, said inlet having a cross sectional area,

a compressor powered by said exhaust turbine for supplying a supercharging pressure to said operating system,

a variable geometry means for adjusting the cross sectional area of said inlet to said exhaust turbine,

an exhaust bypass valve means for providing an exhaust path bypassing said exhaust turbine,

an operation detecting means which detects operating conditions of said operating system,

a supercharging pressure detecting means which detects said supercharging pressure,

a deviation calculating means which calculates a deviation between the detected supercharging pressure and a target supercharging pressure and provides an integrated value of said deviation,

a controlled variable determination means which determines a controlled variable for actuating at least one of said variable geometry means and said exhaust bypass valve means based on said operating conditions,

a feedback correction means which operates to perform feedback correction of said controlled variable in accordance with a previously determined learning amount and said integrated value of said deviation to produce a corrected controlled variable,

a control means which controls at least one of said variable geometry means and said exhaust bypass valve means in accordance with said corrected controlled variable,

an operating range discriminating means which determines an operating range in which feedback control of said at least one of said variable geometry means and said exhaust bypass valve means is to be performed, and

a learning amount calculating means which calculates a new learning amount in relation to at least one of said variable geometry means and said exhaust bypass valve means in accordance with the result of the operating range determining made by said operating range discrimination means and said integrated value of said deviation, so that the controlled variable is corrected in future operations of said feedback correction means based on said new learning amount used as said previously determined learning amount.

4,732,004

PROCESS FOR PURIFYING AND DEAERATING THE CONDENSATE/FEED WATER IN THE CIRCULATION SYSTEM OF A POWER-GENERATING PLANT

Andreas Brand, and Helmut Lang, both of Wettingen, Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 17, 1984, Ser. No. 631,767

Claims priority, application Switzerland, Jul. 19, 1983, 3943/83

Int. Cl.[4] F01K *13/02*

U.S. Cl. 60—646 **12 Claims**

1. A process for purifying and deaerating the condensate/-feed water in the circulation system of a power generating plant comprising:

(a) a main circuit comprising:

(i) a steam generator for producing saturated steam;

(ii) a turbine connected to said steam generator, in which turbine the saturated steam is expanded;

(iii) a main condenser connected to said turbine, in which main condenser the expanded steam is precipitated on water cooled tube bundles located in a condensation space of said main condenser, said condensation space further containing air coolers and being separated by an intermediate bottom from a condensate-collecting vessel, said condensation space and said condensate-collecting vessel being in fluid communication with one another via a syphon through which condensate flows downwardly from said condensation space to said condensate-collecting vessel and a steam equilization line through which steam flows upwardly from said condensate-collecting vessel to said condensation space;

(iv) a condensate pump conveying the condensate from said condensate-collecting vessel through a condensate purification apparatus to a low-pressure preheater;

(v) a feed pump conveying the condensate from said low-pressure preheater through a high-pressure preheater to said steam generator; and

(vi) a steam-generator isolating valve upstream of said steam generator and downstream of said high-pressure preheater;

(b) a secondary circuit fluidically connected to said main circuit downstream of said condensate purification apparatus and upstream of said low-pressure preheater, said secondary circuit comprising

a cold-condensate vessel; and

(c) a third circuit fluidically connected to said air coolers and to said condensation space, said third circuit comprising:

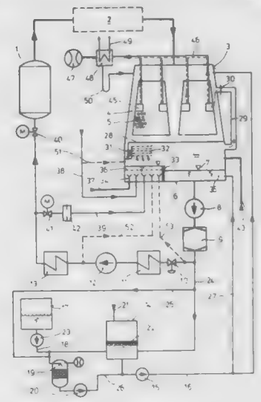
(i) a vacuum pump for drawing off the air/steam mixture from said air coolers;

(ii) a secondary condenser disposed in a venting line upstream of said vacuum pump; and

(iii) a second line for returning condensed fluid from said secondary condenser to said main condenser, said process comprising the steps of:

(d) closing said steam-generator isolating valve;

(e) filling said low-pressure preheater and said high-pressure



preheater with water extracted from said cold-condensate vessel and introduced into said low-pressure preheater and said high-pressure preheater via said condensate-collecting vessel;

(f) circulating the water in said low-pressure preheater and said high-pressure preheater several times through said condensate-collecting vessel and said condensate purification apparatus;

(g) introducing a deaerating medium into said condensate-collecting vessel below the water level therein and allowing the deaerating medium to rise through the water and to flow into a deaerating chamber in said condensate-collecting vessel, where the deaerating medium displaces the air located in said deaerating chamber and forms a cushion that is conducive to oxygen deaerating;

(h) conveying the steam and air displaced from said deaerating chamber into said condensation space;

(i) conveying steam and air from said air coolers through said venting line to said secondary condenser; and

(j), following the start of steam generation and during the initial low-load period, carrying out subsequent deaerating of condensate by means of steam flowing upwardly from said condensate-collecting vessel to said condensation space through said steam equilization line and condensate flowing downwardly from said condensation

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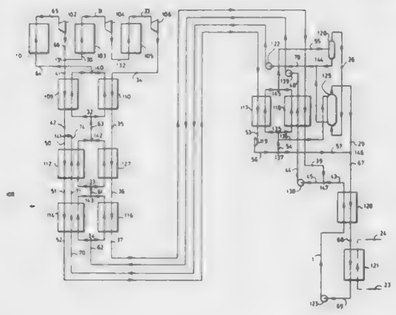
space to said condensate-collecting vessel through said syphon.

4,732,005

DIRECT FIRED POWER CYCLE

Alexander I. Kalina, 12214 Clear Fork, Houston, Tex. 77077

Filed Feb. 17, 1987, Ser. No. 15,102
Int. Cl.[4] F01K 25/06
U.S. Cl. 60—673 25 Claims



1. A method for implementing a thermodynamic cycle comprising the steps of:

expanding a gaseous working stream to transform its energy into usable form;

removing from the expanded gaseous working stream a withdrawal stream;

combining the withdrawal stream with a lean stream, having a higher content of a higher-boiling component than is contained in the withdrawal stream, to form a composite stream;

condensing the composite stream to provide heat;

separating the composite stream to form a liquid stream, said liquid stream forming a portion of said lean stream that is combined with the withdrawal stream, and a vapor stream;

forming an oncoming liquid working stream that evaporates at a temperature lower than the temperature at which said composite stream condenses; and

evaporating said oncoming liquid working stream, using said heat produced by condensing said composite stream, to form said gaseous working stream.

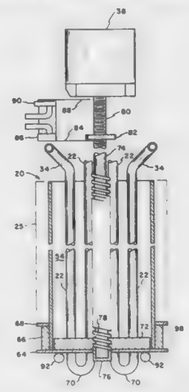
4,732,006

ICEMAKERS AND METHODS OF MAKING ICE

Harry C. Fischer, Maggie Valley, assignor to Remcor Products Company, Franklin Park, Ill.

Filed Feb. 9, 1987, Ser. No. 12,787
Int. Cl.[4] F25C 5/02
U.S. Cl. 62—71 24 Claims

11. An ice making apparatus, comprising a plurality of generally straight evaporator tubes; drive means located adjacent said evaporator tubes; means for supplying water to the exterior surfaces of said evaporator tubes; means for supplying refrigerant to the interiors of said evaporator tubes, so that evaporation takes place within said tubes to cause the freezing of tubes of ice on exterior surfaces of said evaporator tubes; means for heating said evaporator tubes above the freezing point of water to free the ice tubes from their bonds to said evaporator tubes following discontinuation of supply of refrigerant to and evaporation of refrigerant within said evaporator tubes; means for operating said drive means to move the ice tubes along and off of said evporator tubes; and means for fracturing the leading ends of the ice tubes into smaller ice pieces as the ice tubes move off of said evaporator tubes, wherein said evaporator tubes are in parallel relationship and said means for fracturing the ice tubes includes extensions at



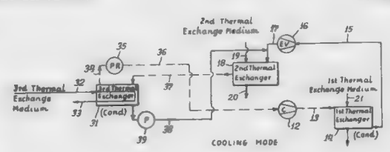
one each of each of said evaporator tubes that extend out of parallel relationship with said evaporator tubes.

4,732,007

AUXILIARY THERMAL INTERFACE TO COOLING/HEATING SYSTEMS

William H. Dolan, Mount Prospect, and William D. Ingle, III, Park Ridge, both of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Dec. 23, 1986, Ser. No. 946,429
Int. Cl.[4] F25B 7/00
U.S. Cl. 62—79 18 Claims



1. In an improved process for conditioning a second thermal exchange medium utilizing a compressor based refrigerant cycle wherein refrigerant vapor is compressed, the compressed refrigerant vapor is passed through a first thermal exchanger functioning as a condenser in thermal exchange relation to a first thermal exchange medium cooling and condensing said vapor to a liquid at relatively high temperature and pressure and warming said first thermal exchange medium, the liquid refrigerant is then passed through throttling means, and subsequently is passed through a second thermal exchanger functioning as an evaporator in thermal exchange relation to said second thermal exchange medium, said liquid refrigerant being warmed and vaporized at a relatively low temperature and pressure producing a cooling effect to said second thermal exchange medium, the improvement comprising:

passing said refrigerant vapor from said second thermal exchanger of said compressor based refrigerant cycle to a third thermal exchanger functioning as a condenser in thermal exchange relation to a third thermal exchange medium, said third thermal exchange medium supplied to said third thermal exchanger at a temperature to cause cooling and condensing at least a portion of said refrigerant vapor to refrigerant liquid; and

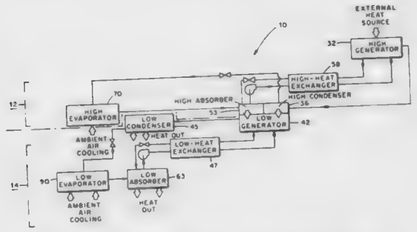
passing said condensed refrigerant liquid to said second thermal exchanger.

4,732,008

TRIPLE EFFECT ABSORPTION CHILLER UTILIZING TWO REFRIGERATION CIRCUITS

Robert C. DeVault, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1986, Ser. No. 933,943
Int. Cl.[4] F25B 7/00
U.S. Cl. 62—79 14 Claims



1. A heat absorption method for an absorption chiller comprising:

(a) providing a first absorption system circuit for operation within a first temperature range, said first circuit having generator means, condenser means, evaporator means, and absorber means operatively connected together;

(b) providing a second absorption system circuit for operation within a second temperature range which has a lower maximum temperature than said first temperature range, said second circuit having generator means, condenser means, evaporator means, and absorber means operatively connected together;

(c) heat exchanging refrigerant and absorber solution from said first circuit condenser and absorber with absorption solution from said generator of said second circuit; and

(d) said evaporator of said first circuit and said evaporator of said second circuit both being disposed in thermal communication with an external heat load to withdraw heat from said heat load.

2. A heat absorption apparatus for use as an absorption chiller comprising:

a first absorption system circuit for operation within a first temperature range;

a second absorption system circuit for operation within a second temperature range which has a lower maximum temperature relative to said first temperature range;

said first circuit having generator means, condenser means, evaporator means, and absorber means operatively connected together;

said second circuit having generator means condenser means, evaporator means, and absorber means operative connected together;

said first circuit condenser means and said first circuit absorber means being in heat exchange communication with said second circuit generator means; and

said first circuit and second circuit evaporator means both being in heat exchange communication with an external heat load.

4,732,009

REFRIGERATOR COMPARTMENT AND METHOD FOR ACCURATELY CONTROLLED TEMPERATURE

Edwin H. Frohbieter, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 26, 1986, Ser. No. 878,674
Int. Cl.[4] F25D 17/06
U.S. Cl. 62—89 22 Claims

1. In a combined refrigerator-freezer of the type including a compartmented cabinet including a freezer compartment and a refrigerator compartment, a controlled temperature compartment for extended storage of perishable items and formed as a separate compartment in said cabinet, comprising:

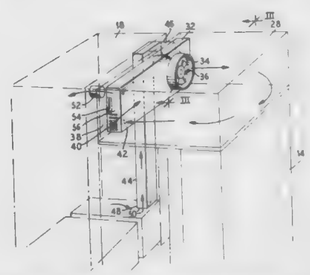
means for defining a plenum chamber within said separate compartment including first and second air openings providing communication between said separate compartment and said plenum chamber, said first air opening being spaced from said second air opening;

first and second air conduits extending between and in communication with said separate compartment and the freezer compartment,

said first air conduit having first and second opposite ends,

said first end of said first air conduit extending to a horizontal mid-portion of said freezer compartment and defining a third air inlet opening at said freezer compartment mid-portion,

said second opposite end of said first air conduit being in communication with said plenum chamber;



means for driving an air flow through said first air opening from said plenum chamber, said air flow driving means drawing air into said plenum chamber through said second air opening and through said first air conduit; and

means for controlling said air flow driving means depending on the air temperature within said separate compartment.

19. A method for cooling a separate compartment in a combination refrigerator-freezer unit to a predetermined temperature, comprising the steps of:

drawing a supply of cold air from a horizontal mid-portion of the freezer, said horizontal mid-portion being a horizontal region spaced from a top and botton of the freezer,

tempering the supply of cold freezer air with air drawn from the separate compartment;

directing the thus tempered air in the form of an air stream into the separate compartment; and

directing a flow of return air from the separate compartment to a different portion of the freezer.

4,732,010

POWER SWITCH AND BAFFLE ASSEMBLY HAVING UNIDIRECTIONAL DRIVE MOTOR FOR A REFRIGERATOR

William J. Linstromberg, Lincoln Township, Berrien County, and Donald E. Janke, Benton Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 870,328, Jun. 3, 1986, Pat. No. 4,688,393. This application Mar. 27, 1987, Ser. No. 30,998
Int. Cl.[4] F25D 17/04, 21/06
U.S. Cl. 62—187 16 Claims

1. In a refrigerator having a cabinet defining a frozen food compartment and a fresh food compartment separated from each other by a divider wall, a through opening formed in said wall to enable cold air from said frozen food compartment to flow into said fresh food compartment; a baffle selectively closing said opening; a compressor; an evaporator fan for circulating chilled air within said frozen food compartment and through said opening into said fresh food compartment; temperature sensor means for measuring the temperatures of

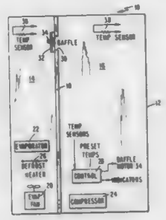
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said fresh food and frozen food compartments and control means responsive to said temperature sensor means for producing command signals indicative of the need to cool said compartments; a system for controlling said baffle, compressor and evaporator fan to maintain predetermined frozen food and fresh food compartment temperatures, comprising:

a cam having first and second control surfaces;

first electrical switch means operated by movement of said first control surface to apply electricity from an external electrical power source selectively to said compressor and said defrost heater;

means for coupling said cam to said baffle;



motor means responsive to said command signals for moving said cam;

second electrical switch means operated by movement of said second control surface to apply feedback signals to said control means to indicate the position of said cam;

the control surfaces of said cam being shaped and said coupling means interconnecting said cam and said baffle such that operation of said electrical switches and said baffle during movement of said cam are synchronized to each other to selectively cool said compartments and defrost the evaporator.

4,732,011

AIR CONDITIONER FOR VEHICLES

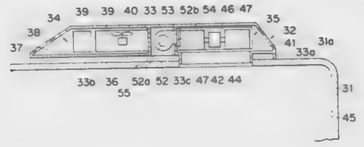
Sadao Haiya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 12, 1986, Ser. No. 862,484

Claims priority, application Japan, May 17, 1985, 60-73075[U]; Jul. 8, 1985, 60-103746[U]

Int. Cl.⁴ B60H *1/32*; F25D *23/12*

U.S. Cl. 62—244 **6 Claims**



1. An air conditioner for a vehicle having a roof, comprising:

a condensor unit including a condensor and a first blower for directing air toward said condensor;

a cooling unit including an evaporator and a second blower for directing air past said evaporator;

a casing means on the roof and in which said condensor unit and said cooling unit are disposed,

said casing means having a bottom wall overlying and spaced from the roof so as to define a space therebetween open to the exterior of the casing means, an outside air intake hole bordered by said bottom wall and open to said space, and a chamber open to said outside air intake hole; and

a third blower within said chamber for drawing air from the exterior of the casing means through said outside air intake hole and into the cooling unit.

4,732,012

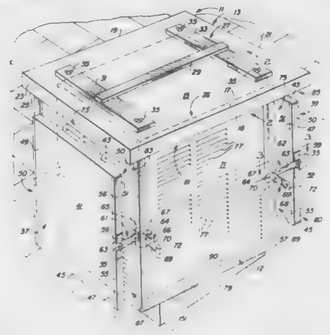
ENERGY EFFICIENT EVAPORATIVE COOLER COVER APPARATUS

W. Dean Thorpe, 1615 N. Delaward, Space #44, Apache Junction, Ariz. 85220

Filed Apr. 10, 1986, Ser. No. 850,258

Int. Cl.⁴ F28D *5/00*

U.S. Cl. 62—304 **21 Claims**



1. A cover for an evaporative cooler having a top, a bottom operably disposed on a base support means, and four generally rectangular dies having a plurality of vent means for communicating the interior of the evaporative cooler to the atmosphere, said cover comprising:

a top panel of insulating material dimensioned substantially greater than the top surface of said evaporative cooler for providing a substantial overhand about the four sides of the evaporative cooler for shading same;

menas for operatively coupling said top panel to the top of said evaporative cooler;

four generally rectangular insulating side panels;

a pair of bracket means operably dispoed on opposite ends of each side of said evaporative cooler for operatively mounting each of said side panels a predetermined distance away from a corresponding side of the evaporative cooler with the plane of the side panel being substantially parllel to the plane of corresponding side of evaporative cooler; and

manually operably means carried by said bracket means for repositioning each of said four insulating side panels flush against corresponding sides of the evaporative cooler for sealably covering at least a vented portion thereof for insulating the evaporative cooler during the heating season.

4,732,013

FREEZER WITH HELICAL SCRAPER BLADE

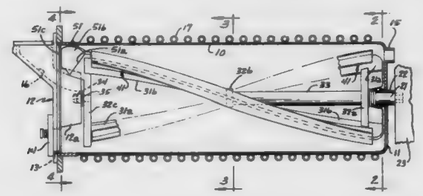
Norman L. Beck, Rockton, Ill., assignor to Taylor Freezer Company, Rockton, Ill.

Filed Aug. 26, 1983, Ser. No. 526,609

Int. Cl.⁴ A23G *9/12*

U.S. Cl. 62—343 **9 Claims**

1. In a comestible freezer of the type having a cylindrical freezing barrel with a discharge outlet adjacent one end, inlet means for supplying comestible to the barrel, refrigeration means surrounding the barrel for freezing comestible on the inner surface of the barrel, and rotor means in the barrel rotatable about the axis of the barrel and having at least one rigid flight bar extending in helical fashion along and spaced inwardly from the inner surface of the barrel for feeding comestible toward the outlet, the improvement comprising a scraper blade of a resilient synthetic resin material having a mounting portion defining a channel extending lengthwise of the blade for receiving at least a radially outer portion of the helical flight bar, the blade having first and second blade portions



extending in relatively opposite directions from the mounting portion adjacent the bottom of the channel, the scraper blade conforming to the helix of the flight bar when mounted thereon and the first and second blade portions resiliently engaging the inner surface of the barrel.

4,732,014

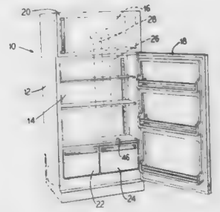
TEMPERATURE CONTROLLED COMPARTMENT FOR A REFRIGERATOR

Edwin H. Frohbieter, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 31, 1986, Ser. No. 948,124

Int. Cl.⁴ F25D *25/02*

U.S. Cl. 62—382 **27 Claims**



1. A refrigerator comprising:

a cabinet;

cooling means for providing a stream of temperature conditioned air within said cabinet;

a compartment within said cabinet defined by a pair of side walls, a top wall, a bottom wall and a rear wall;

a container within said compartment having side walls, rear wall, bottom wall and a front wall;

said container walls being spaced inwardly from said compartment walls to form an airspace therebetween;

said container being openable to provide access to the interior thereof for the placement and removal of articles to be preserved;

said container having apertures therethrough near each corner of said side walls and said front wall;

means to direct said stream of air forwardly along an outer surface of one of said side walls toward said apertures; and

means to direct said stream of air rearwardly along an outer surface of another of said side walls from said apertures;

whereby the stream of conditioned air will wash the outer surfaces of the container side walls and the inner surface of the container front wall to produce a minimal temperature gradient inside the container.

4,732,015

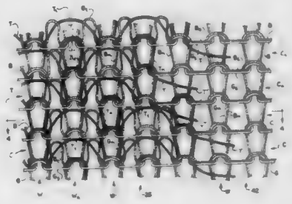
KNITTED ARTICLE

Walter W. Abrams, Conover, and Roger D. Good, Hickory, both of N.C., assignors to American Doubloon Corporation, Hickory, N.C.

Filed Oct. 23, 1985, Ser. No. 790,443

Int. Cl.⁴ D04B *9/46, 9/56*

U.S. Cl. 66—172 E **20 Claims**



1. In a circularly-knitted article formed of yarn knitted in circumferential courses and axial wales, the improvement comprising a cushion area occupying a plurality of successive courses and a plurality of successive wales therein, said cushion area having a first terry yarn knitted in substantially every said successive course in jersey stitches in substantially every said successive wale and in terry pile loops intermediate said successive wales, and a second terry yarn knitted in first selected ones of said successive courses in jersey stitches in selected spaced ones of said successive wales and in terry pile loops spanning the non-selected successive wales therebetween, said terry loops of said first and second terry yarns being staggered walewise with respect to one another to provide upstanding support for one another to maintain upstanding extension and inhibit flattening of said terry loops of said first and second yarns during use of said knitted article.

4,732,016

DEHYDRATING TANK STOPPING MECHANISM FOR SINGLE-TANK TYPE WASHING MACHINE

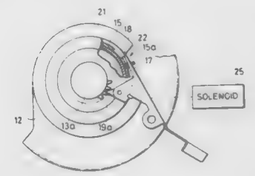
Hiroshi Hirooka; Takeshi Saito, and Hirobumi Urabe, all of Chiba, Japan, assignors to Mitsubishi Denki K.K. and Nihon Kenetetus Co., Ltd., both of Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,378

Claims priority, application Japan, Feb. 20, 1985, 60-31732

Int. Cl.⁴ D06F *37/40*

U.S. Cl. 68—23.7 **6 Claims**



1. A dehydrating tank stopping mechanism for a single-tank type washing machine, comprising:

a dehydrating tank for washing and dehydrating a washing load put therein;

an agitator arranged in said dehydrating tank;

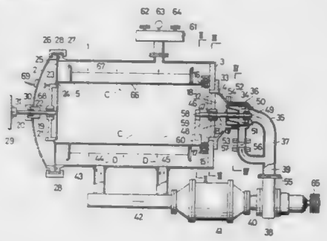
means for rotating said agitator alternately in forward and reverse directions to agitate the water and the washing load in said dehydrating tank, the angle of rotation thereof in each of said forward and reverse directions being no more than 360°;

first and second shafts arranged in the form of a coaxial dual

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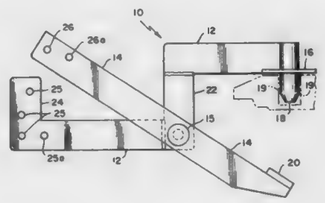
shaft structure and coupled respectively to said dehydrating tank and said agitator;
a clutch mechanism provided for said first and second shafts to selectively allow said first and second shafts to rotate in association with each other or allow only said second shaft coupled to said agitator to rotate; and
a brake device provided on said first shaft coupled to said dehydrating tank to stop rotation of said first shaft when said clutch mechanism operates to allow only said second shaft to rotate,
said brake device comprising:
a brake wheel mounted on said first shaft coupled to said dehydrating tank;
a brake band passed around said brake wheel; and
lever means operated in a braking operation for engaging said brake band to thereby prevent rotation of said brake band and including means for actuating said clutch mechanism to perform a switching operation,
said brake band having a collar extending radially of said brake band for regulating the engagement of said lever means with said brake band and said clutch mechanism, and having an opening formed therein, said brake band including lever engaging means protruding within said opening, said lever means being engaged with said lever engaging means of said brake band, and said actuating means being engaged with said clutch mechanism, when said lever extends into said opening, and
said lever means being operated when said first and second shafts are being rotated in one direction in association with each other.

4,732,017
APPARATUS FOR TREATMENT
Kiyoshi Nakayama, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Dec. 24, 1986, Ser. No. 945,890
Claims priority, application Japan, Dec. 26, 1985, 60-201260[U]
Int. Cl.[4] D06B *5/18*
U.S. Cl. 68—150 **5 Claims**



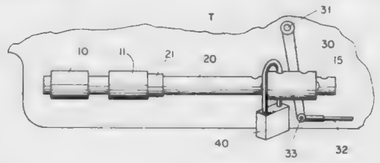
1. An apparatus for treatment of textile materials with treatment liquid, comprising:
(a) a horizontally extending cylindrical vessel for containing the treatment liquid;
(b) a perforated cylindrical beam rotatably supported within said vessel concentrically thereof for supporting on and around said beam the textile materials to be treated;
(c) a shaft positioned to rotate said perforated cylindrical beam;
(d) a pump for circulating the treatment liquid within said vessel through said beam;
(e) a flow passageway communicating with said pump and with the interior of said beam; and
(f) an impeller disposed in said flow passageway and drivingly connected to said shaft for rotation of said shaft by liquid flow pressure acting on said impeller in said flow passageway.

4,732,018
AIR COUPLING LOCKING DEVICE
Lyndon A. Crosby, 21 Pine St., East Millinocket, Me. 04430
Filed Nov. 6, 1986, Ser. No. 927,460
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—19 **13 Claims**



1. A safety and security locking device in combination with a pneumatic brake air coupling having an air coupling opening for applying air pressure to release an air brake, said locking device comprising:
a pair of first and second elongate arms pivotally joined at a pivot axis between the ends of the respective arms for pivoting motion of the ends of the arms toward and away from each other between an open position and a clamping locking position;
said first arm comprising at one end a flange means constructed and arranged for covering engagement over the air coupling opening and a locking guide projection within the perimeter of the flange means for guiding the flange means over the air coupling opening with the projection entering and extending into the opening and holding the locking device on the air coupling, said second arm comprising at the same end a brace means for clamping engagement with the air coupling on the opposite side from the opening in cooperation with the flange means holding the locking guide projection inside the air coupling opening and the flange means covering over the air coupling opening;
said first and second arms each comprising at the opposite end from the cooperating flange means and brace means at least one locking hole, said holes being positioned and arranged to coincide in a closed locking position for inserting a lock through the coincident locking holes whereby the locking device is locked and held in the locking position with the flange means covering the opening and the locking guide projection preventing lateral withdrawal of the locking device thereby preventing access to the air coupling opening.

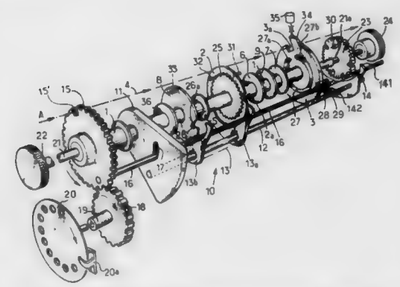
4,732,019
LOCKING APPARATUS
Glenn M. Tolar, 220 E. X St., Deer Park, Tex. 77536
Filed Jul. 27, 1987, Ser. No. 78,298
Int. Cl.[4] G05G *5/00*
U.S. Cl. 70—203 **10 Claims**



1. Locking apparatus for locking a movable object relative to a fixed object comprising:

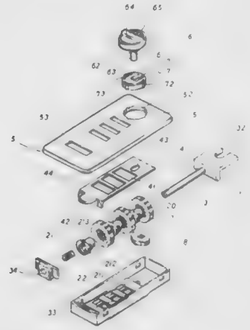
a sleeve member affixed to said fixed object;
a rod member one end of which is receivable within said sleeve member for rotating and axial movement therein, said axial movement being limited in one direction by a stop shoulder provided on said rod member for engagement with said sleeve member, the other end of said rod member being provided with a plurality of holes therethrough the axes of which are perpendicular to the axis of said rod member; and
a cylindrical member for placement on said other end of said rod member for rotating and axial movement thereon and having one or more holes therethrough the axes of which are perpendicular to the axis of said cylindrical member, said cylindrical member having a projecting portion engageable with said movable object to lock said movable object, relative to said fixed object, upon placement of a lock shackle or the like through one of said cylindrical member holes and a corresponding one of said rod member holes.

4,732,020
BOLT WITH INTERCHANGEABLE CODED INFORMATIONS
Georges R. Pieddeloup, 4, rue de Meautry, F 94500 Champigny/Marne, France
Continuation-in-part of Ser. No. 640,988, Aug. 15, 1984, abandoned. This application Jan. 2, 1987, Ser. No. 287
Claims priority, application France, Aug. 16, 1983, 83 13322
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—305 **10 Claims**



1. A combination lock having interchangeable coded combinations comprising:
a fixed shaft;
at least two locking members mounted for braked rotation on said shaft and preventing, in all their angular positions, free access of a tool for actuating a lock mechanism except one position obtained after having reproduced the coded combination;
a code disc removably mounted for braked rotation to said shaft and having a reference notch and code notches at predetermined locations in the periphery thereof;
an assembly oscillatable about said shaft; and
means for repeatedly oscillating said assembly from an initial position, with the angular amplitude of each oscillator corresponding to the numeric value of a digit of a code;
said assembly including:
a first pawl cooperating with teeth on a first of said members to rotate the latter in one direction from an initial locking position, on each oscillation of said assembly, a constant angular distance independent of the amplitude of each oscillation; and
a second pawl cooperating with both said second member and the notches in said code disc to rotate the latter in one direction from an initial position, on each oscillation of said assembly, an angular distance equal to the amplitude of each oscillation and to rotate said second member from an initial position if said second pawl is not engaged in a notch of said disc.

4,732,021
COMBINATION CHANGING MECHANISM FOR THE LOCK OF A LUGGAGE CASE
Shuhn C. Su, No. 29, Lu-Hsing Road, Lu-Kang Town, Chuang Hwa Hsieh, Taiwan
Filed Apr. 13, 1987, Ser. No. 37,691
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—312 **1 Claim**



1. A combination changing mechanism of a combination lock for a luggage case comprising:
a base which is substantially open at the top side thereof; a plurality of combination dials, wherein each dial being internally provided with a plurality of tooth-shaped grooves and being provided on its circumference with numerals; a plurality of sleeves which have the same number as the dials, each sleeve having a disc with a flat portion, a collar whose length is larger than the width of the corresponding dial, and a plurality of teeth provided on the circumference of the corresponding collar and adjacent to the corresponding disc, wherein each sleeve is mounted in the corresponding dial so that the teeth of the sleeve are meshed with the grooves of the corresponding dial, the sleeve being capable of disengaging from the dial when the sleeve is moved to the left; a compression spring; a shaft which passes through said combination dials, sleeves, and compression spring; a right side bracket which has a vertical portion and a horizontal portion, the vertical portion supporting said shaft at the right end thereof, and the horizontal portion being formed with an elongate notch; a left side bracket comprising a vertical portion in which is provided a circular aperture, wherein the left end of the shaft over which said compression spring is sleeved can be supportedly mounted in said circular aperture of the vertical portion; the combination dials, sleeves, compression spring, and shaft supported between said left side bracket and right side bracket are all mounted within said base; a displacement plate which is mounted above the combination dials, sleeves, and shaft, and has three rectangular apertures formed therein so that a part of each dial can protrude beyound the displacement plate from below through the corresponding rectangular aperture, the left end of said displacement plate being formed with a latch tongue extending to the left and formed with claws extending downward for holding the left side of said left bracket, the right portion of the displacement plate being formed an elongate aperture which is approximately in alignment with said elongate notch of said right bracket but is somewhat offset to the left thereof; a face plate to overlie the displacement plate for covering the base, and wherein the face plate has three

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rectangular apertures formed at the locations corresponding to those of the rectangular apertures in the displacement plate so that a portion of each dial can protrude therefrom, the face plate being also provided at its left portion with a rectangular aperture so that the latching hook of the luggage case can be inserted therein from outside and being provided at its right portion with a circular aperture in alignment with the elongate aperture of the displacement plate, the circular aperture being provided on its circumference with a plurality of small grooves; a circular rotation disc which is integrally formed from material of slight elasticity and is mounted within the circular aperture at the right portion of the face plate, the circular rotation disc being provided with a rectangular groove therein, having a plurality of small projections provided on its circumference, and being formed with an arcuate through groove inwardly adjacent each of said projection such that said small projections are suitable to rotate in the circular aperture of the face plate and can snap into engagement with the respective small grooves in the circular aperture; an operation disc on which is formed a raised portion for actuation by fingers, the operation disc being marked thereon with a direction-indicating arrow and having a rod extending downward from the center thereof, wherein the upper portion of the rod is formed into a rectangular block, the length of which is equal to the width of the rectangular groove in the rotation disc, and the lower portion of the rod is formed into a circular cylinder, wherein the rectangular block is positioned within the rectangular groove of the rotation disc, and the circular cylinder of the rod passes through said rectangular groove of the rotation disc, the circular aperture, the elongate aperture of the displacement disc, and the elongate notch of the horizontal portion of the right side bracket; a lower disc provided in the base below the horizontal portion of the right side bracket for fixing said rod of the operation disc the arrangement being such that;

when the combination dials are rotated into the on-combination position, the flat portion of each sleeve faces upwards, the look can be opened by rotating the operation disc such that the arrow directs to the right and then by pulling the operation disc to the right; when the operation disc is rotated such that the arrow directs to the left, the right side bracket can be pushed to the left by pushing the operation disc to the left, thereby, each collar protruding beyond the right side of the corresponding dial is pushed to the left, and each sleeve is pushed to the left and disengaged from the corresponding dial to achieve the combination-changeable state.

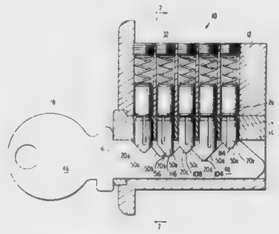
4,732,022

KEY FOR AN IMPROVED TWISTING TUMBLER CYLINDER LOCK

Roy N. Oliver, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Continuation of Ser. No. 756,791, Jul. 19, 1985, Pat. No. 4,635,455. This application Oct. 14, 1986, Ser. No. 918,015
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] E05B *19/04*
U.S. Cl. 70—406 **3 Claims**

1. A key for a pin tumbler lock in which longitudinal axes of all of the tumbler pins are equally spaced, the key having a key blade and a key bow, the blade extending longitudinally from the bow along a longitudinal plane of the key, the blade including means for complementarily engaging a row of equally spaced tumbler pins rotatable about respective equally spaced tumbler pin axes, the blade having a plurality of equally spaced parallel planes for coinciding with the axes of the equally spaced tumbler pins when the key is inserted into the lock, the equally spaced parallel planes being perpendicular to the longitudinal plane of the blade, the pin-engaging means being comprised of a plurality of key bits defined by generally V-shaped cuts in the blade for complementarily engaging each of said equally spaced rotatable tumbler pins, each V-shaped cut having an apex for engaging in actuating relationship a corresponding tumbler pin of said row, the apex of at least one V-shaped cut being offset in a direction axially of the blade



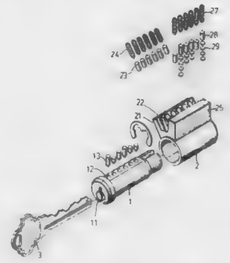
with respect to one side or the other of one of the equally spaced parallel planes by a predetermined distance less than the opening of the V-shaped cut, at least one of the V-shaped cuts being skew cut relative to the longitudinally extending blade.

4,732,023

MODIFIABLE CYLINDER

Chao C. Shen, No. 62, Ho Shan Street, Tainan, Taiwan

Filed Aug. 15, 1986, Ser. No. 896,803
Int. Cl.[4] E05B *25/00*
U.S. Cl. 70—383 **1 Claim**



1. A modifiable cylinder lock comprising

a cylindrical body having an axial bore formed therein,

a plug mounted in said axial bore for rotation,

said plug comprising a keyway and a plurality of axially-spaced, radially-extending inner pinholes communicating with said keyway, each pinhole opening onto an outer surface of said plug,

an inner pin disposed in each of said inner pinholes of said plug,

an elongated main chamber housing extending substantially radially outwardly from an outer cylindrical surface of said cylindrical body,

said main chamber housing having a plurality of axially-spaced, radially-extending outer pinholes which are alignable with said inner pinholes of said plug when said plug is rotated to a first position,

a first outer pin situated in each of said outer pinholes and first spring means for urging said first outer pins inwardly,

an elongated subchamber housing extending substantially radially outwardly from said outer cylindrical surface of said cylindrical body,

said subchamber housing having a plurality of axially-spaced, radially-extending storage slots which are alignable with said inner pinholes of said plug when said plug is rotated to a second position,

said main chamber housing and said subchamber housing being situated upon said outer surface of said cylindrical body to substantially form a V with one another in a radial plane of said cylindrical lock,

a second outer pin and a plurality of discs situated in each of said storage slots and second spring means for urging said second outer pins and discs inwardly,

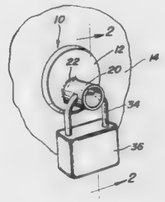
such that when a designated new key is inserted into said plug keyway when said plug is at said second position, a different number of discs from each said storage slot move into said respective inner pinholes, thereby modifying a tumbler combination of the lock to match notches in the new key.

4,732,024

LOCK WITH SECURITY CYLINDER AND EXTENDED KEY

David Nagy, 21 Maynard Avenue, Apt. 605, Toronto, Ontario, Canada M6K 2Z8

Filed Mar. 3, 1987, Ser. No. 21,321
Int. Cl.[4] E05B *17/14*
U.S. Cl. 70—427 **2 Claims**



1. A security lock comprising a relatively short, rigid tube adapted to be secured rigidly and stationarily to the face of a lock cylinder, said tube having an internal diameter only slightly larger than the diameter of a lock barrel and adapted to be disposed in enclosing relation to the end of the barrel and key slot in the barrel thereby requiring the use of a key having an extension incorporated into the balde thereof in order to insert the key blade into the key slot in the barrel, said tube including a pair of diametrically opposed apertures therein oriented adjacent the center of the tube for receiving the hasp of a padlock thereby requiring initial operation of the padlock and subsequent insertion of a key with extension for operating the lock cylinder, said tube and hasp of the padlock preventing direct access to the key slot in the barrel to prevent access of a key to the key slot and to prevent access thereto in order to reduce the capability of the lock being picked.

4,732,025

PRECISION BENDING APPARATUS AND PROCESS

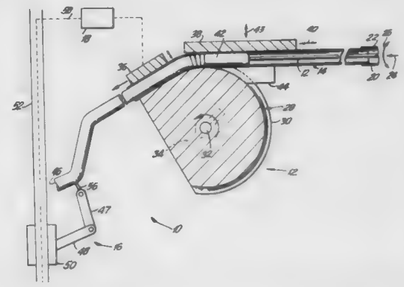
Terrance C. Marlinga, Kawkawlin; Gerald R. Trudell, Pinconning, both of Mich., and Jon W. Harwood, Toledo, Ohio, assignors to AP Industries, Inc., Toledo, Ohio

Filed May 22, 1987, Ser. No. 53,084
Int. Cl.[4] B21C *51/00*; B21D *7/12, 7/14, 9/05*
U.S. Cl. 72—15 **12 Claims**

1. An apparatus for precisely bending an elongated tube having opposed leading and trailing ends into a specified bent configuration, said apparatus comprising:

a preprogrammed bender comprising means for gripping the trailing end of the tube and moving said tube axially and rotationally preprogrammed amounts, and die means for sequentially bending said tube preprogrammed amounts to form a plurality of bends in said tube;

positioning sensing means for sensing the spatial position of at least one predetermined location between the leading end of the tube and one said bend, said position sensing means being operative to move to preprogrammed locations after the formation of each bend by the bender; and



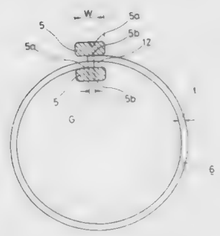
control means for altering the preprogrammed bending operations of the bender in response to the spatial positions of said tube sensed by said position sensing means such that the bender bends the tube precisely into the specified configuration.

4,732,026

METHOD OF LAP WELDING EVENTUAL CAN BLANK CONSISTING OF METAL SHEET OR THE LIKE

Kunikatsu Ban, Mie, Japan, assignor to N.P.W. Technical Laboratory, Co., Japan

Filed Mar. 11, 1986, Ser. No. 838,502
Claims priority, application Japan, Mar. 11, 1985, 60-48699
Int. Cl.[4] B21D *39/02, 51/28;* B23K *11/06*
U.S. Cl. 72—52 **4 Claims**



1. A method of lap welding a blank of metal sheet or a covered metal sheet to form a can comprising the steps of;

overlapping both edge portions of the blank to form a lap joint, simultaneously heating and applying a pressure to the lap joint by feeding the lap joint between upper and lower wire electrodes held by upper and lower roller electrodes, respectively, thereby welding the lap joint, said lap joint is electrically heated during applying pressure to said lap joint between upper and lower wire electrodes, each of said upper and lower electrodes has a contact width more than three times that of said lap joint, wherein sequences of thermal press bond sections are formed without the formation of a melting zone, each of which has a Vickers hardness in a range of 170 to 210, the center-to-center distance between adjacent thermal press bond sections being set to be in a range of 0.8±0.2 mm.

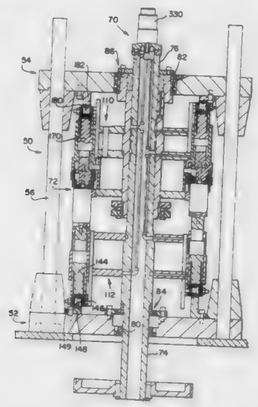
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,027

METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINERS

Edward S. Traczyk, Lockport, and Michael M. Shulski, Northfield, both of Ill., assignors to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 696,322, Jan. 30, 1985, abandoned, which is a division of Ser. No. 453,232, Dec. 27, 1982, Pat. No. 4,519,232. This application Oct. 3, 1986, Ser. No. 915,143
Int. Cl.[4] B21D *31/00, 41/00, 51/26*
U.S. Cl. 72—133 9 Claims



1. A modular system for necking openended containers comprising a plurality of substantially identical modules, each including a turret rotated on a support and having a plurality of necking stations with each station having upper and lower necking elements moved relative to each other by cam followers and a stationary upper and lower cam associated with each module for moving said cam followers, said stationary cams being supported on said support and extending around the peripheral surface of said turret, said stationary cams having exposed face cam surfaces directed toward each other and towards respective cam followers for engagement therewith, at least said lower stationary cam having a removable cam-forming segment and releasable fastener means securing said cam-forming segment to said support so that a container necking configuration can be changed by replacement of said cam-forming segment without removal of said necking stations, and pressurized fluid means acting on said cam followers for maintaining continuous engagement between said cam followers and said exposed face cam surfaces during an entire cycle of revolution of said turret.

4,732,028

ROTARY APPARATUS

Ernest R. Bodnar, 53 Pheasant Lane, Islington, Ontario, Canada

Continuation-in-part of Ser. No. 811,442, Dec. 20, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 938,406
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—190 21 Claims

1. A rotary cutting and forming apparatus for forming strip material for use in association with material forming dies comprising:

a rotatable upper roll unit and a corresponding rotatable lower roll unit, said units being connected for synchronous rotation, each of said units comprising a corner member defining a central axis, said member having at least one recess extending along said member parallel to the central axis, said recess having bearing surface means of generally semi-circular shape, and at least one die support block, rotatably received within said recess, said block defining two ends and a platan surface to which at least one of said forming dies may be affixed;

leading control pin means extending from a leading portion of a said end along a first axis;

trailing control pin means extending from a trailing portion of a said end, along a second axis spaced from said first axis of said leading control pin means;

said upper and lower roll units being spaced apart whereby said material may pass therebetween for formation by said dies;



leading cam surface means positioned to engage said leading pin means, and having a predetermined leading cam profile;

trailing cam surface means positioned to avoid said leading pin means, and to engage only said trailing pin means, and having a predetermined trailing cam profile different from said leading cam profile, whereby to support said die support blocks during a portion of the rotary cycle whereby a die affixed to said block on said lower unit may register with each other and cooperate together for the deformation of the material; and,

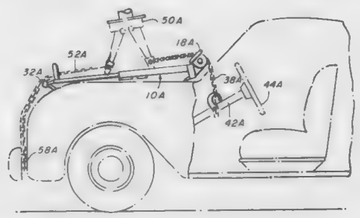
bearing means for supporting said units.

4,732,029

ACCIDENT RESCUE TOOL

Joseph E. Bertino, 298 Blue Bell Rd., R.D. #1, Vineland, N.J. 08360

Filed Sep. 17, 1985, Ser. No. 777,015
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—301 8 Claims



1. An accident rescue tool adapted for aiding removal of an occupant from a wrecked vehicle which has been badly damaged, or is in a position rendering use of known rescue tools difficult, said tool including a first bar member and a second bar member telescopically interactive and providing a rigid variable length overall bar arm, one free end of one said bar member having a hook-shaped member affixed thereto and a rotatably mounted roller, a first chain passing about said roller and being affixed to a vehicle component, the other of said bar members having a fixed roll at the free end thereof and a terminating serrated end thereon for attachment to a vehicle component, a chain passing around said fixed roller and having its free end attached to a rigid vehicle component, the respective inner end of said chains being attachable to operating means for drawing the respective chains toward one another in a manner to telescope said bar and in conjunction with said chains to move a component of the vehicle with respect thereto and to an occupant therof.

4,732,030

METHOD OF MANUFACTURING GEAR-SHIFT LEVER AND THE LEVER CONSTITUTION

Takeru Tanaka, 1-3-18, Minami-shimizu-cho, Sakai, Japan

Filed Jun. 17, 1986, Ser. No. 875,270
Int. Cl.[4] B21D *53/88*
U.S. Cl. 72—356 2 Claims



1. A method of manufacturing a transmission gear shifting lever, comprising the steps of

A. preparing a dice comprising a hollow cylindrical hole of a depth the same as a hollow cylindrical blank, and of a diameter the same as the outside diameter of said blank, and a mouth portion having a larger diameter than said outside diameter of said blank and tapered from the larger diameter to the hole diameter;

B. placing said blank into said hole;

C. inserting a punch having the same shape as said mouth portion of said dice and of a diameter smaller than the outside dimensions of said mouth portion by an amount equal to the walls of said blank, and applying pressure to said punch thereby to form said blank into the shape of said mouth portion;

D. repeating steps A, B and C hereinabove, but in each subsequent step increasing the dimensions of the mouth portion and increasing the dimensions of the punch accordingly;

E. placing said blank having the formed mouth portion into a pair of molds having the shape of a hollow cylinder to fit the unshaped portion of the blank, and an ellipse portion toward one end thereof, and applying pressure to said molds to cause the mouth portion to form an ellise;

F. placing said blank having the formed ellipse into a pair of molds having the shape of a hollow cylinder to fit the unshaped portion of said blank, and a sphere portion toward one end thereof, and applying pressure to said molds to cause the ellipse portion to form into a spherical portion having a cylindrical connecting portion at said one end thereof; and

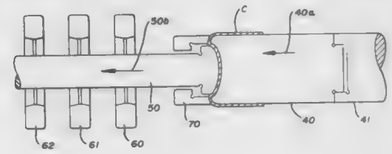
G. placing said blank having the formed spherical portion into a pair of molds having a tapered shape for the unshaped portion of said blank and said sphere portion toward said one end thereof, and applying pressure to said molds to cause the unshaped portion to form into a single tapered portion and enlarging the wall thickness of said connecting portion.

4,732,031

METHOD OF FORMING A DEEP-DRAWN AND IRONED CONTAINER

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Apr. 20, 1987, Ser. No. 40,247
Int. Cl.[4] B21D *22/21, 22/24*
U.S. Cl. 72—363 8 Claims



1. A method of forming a deep drawn and ironed container having a profiled bottom, comprising the steps of:

(a) blanking a generally circular blank;

(b) wiping the peripheral edge of the blank about a die core ring to form an inverted cup;

(c) reverse drawing the inverted cup and forming a profiled bottom by advancing a punch having a contoured central portion against a movable die core having a complementally contoured central portion;

(d) removing the profiled cup to a body maker;

(e) engaging the profiled cup between an ironing punch and a profiling post; and

(f) passing said cup through one or more ironing rings while supporting the profiled area thereof.

6. A system for forming a deep-drawn and ironed container having a bottom profile from a blank of material, comprising:

(A) a draw-redraw station including

(1) a movable platen carrying

(a) a punch shell;

(b) a profiled punch core; and

(c) a first, fluidly actuated pressure sleeve; and

(2) a fixed base carrying

(a) a pressure pad;

(b) a die core ring;

(c) a lift out ring and draw pad; and

(d) a profiled die core; and

(3) said punch shell being movable toward said die core ring to wipe the blank over said die core ring to form an inverted cup;

(4) said punch core being movable toward said die core to reverse draw the inverted cup and profile the bottom thereof in cooperation with said die core; and

(5) said lift out ring and draw pad engaging the material against said punch core during the reverse draw to control metal thickness; and

(B) an ironing station including

(1) a punch engagable with the interior of the cup;

(2) a post reciprocally disposed with respect to said punch and engagable with the exterior of the bottom of the cup;

(3) a pressure sleeve engagable with at least a portion of the exterior of the bottom of the cup;

(4) at least one ironing ring; and

(5) said punch, said post and said pressure sleeve being movable through said ironing ring.

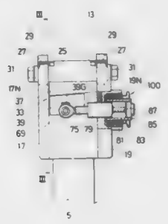
VOL 1088 ISS 4 MR 22 1988 UMI

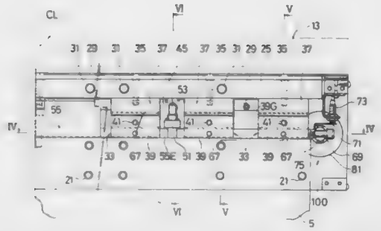
4,732,032

DIE CROWNING APPARATUS FOR PRESS BRAKE

Tsuneo Kogure, Hatano, Japan, assignor to Amada Company, Limited, Japan

Filed Mar. 24, 1987, Ser. No. 29,664
Claims priority, application Japan, Mar. 25, 1986, 61-064837
Int. Cl.[4] B21D *5/02*
U.S. Cl. 72—389 5 Claims





1. A die crowning apparatus for a press brake having an upper die (15) attached to an upper table (7) and a lower die (13) mounted on a lower table (5), which comprises:

(a) a plurality of sets of upper wedge member (37) and lower wedge member (39) arranged between the lower die and the lower table at intervals along a longitudinal direction of the press brake, the lower wedge members being slidable in a lateral direction of the press brake to adjust a height of the engaged upper wedge member;

(b) an elastic member (55) extending in the longitudinal direction and deformable in the lateral direction of the press brake, said elastic member being fixed to the lower table at the middle thereof and engaged with each groove (39G) formed in a bottom surface of each of said lower wedge members near both free ends of said elastic member positioned on both longitudinal ends of the press brake; and

(c) means (100) for adjusting a curvature of said elastic member by bending both the free ends of said elastic member in symmetrical cantilever fashion to adjust the height of said upper wedge members in contact with the lower die so that the lower die mounted on the lower table is deformable into a convex state in parallel to the upper die attached to the upper table all over the length of the press brake when the two dies are engaged with each other.

2. A die crowning apparatus for a press brake having an upper die (15) attached to an upper table (7) and a lower die (13) mounted on a lower table (5), which comprises;

(a) a plurality of sets of upper wedge members (37) and lower wedge member (39) arranged between the upper die and the upper table at intervals along a longitudinal direction of the press brake, the upper wedge member being slidable in a lateral direction of the press brake to adjust a height of the engaged lower wedge member;

(b) an elastic member (55) extending in the longitudinal direction and deformable in the lateral direction of the press brake, said elastic member being fixed to the upper table at the middle thereof and engaged with each groove formed in a top surface of each of said upper wedge members near both free ends of said elastic member positioned on both longitudinal ends of the press brake; and

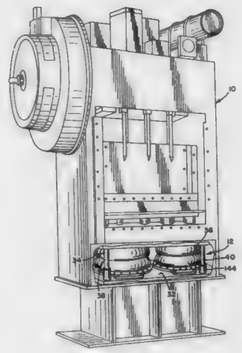
(c) means (100) for adjusting a curvature of said elastic member of bending both the free ends of said elastic member in symmetrical cantilever fashion to adjust the height of said lower wedge members in contact with said upper die so that the upper die mounted on the upper table is deformable into a convex state in parallel to the lower die attached to the lower table all over the length of the press brake when the two dies are engaged with each other.

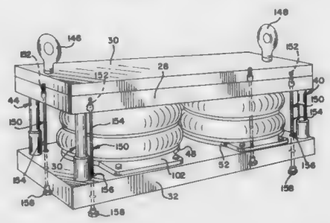
4,732,033

PNEUMATIC DIE CUSHION

Kenneth L. Smedberg, 5 Oak Hill Dr., Crete, Ill. 60417; Robert J. Kotynski, South Holland, and George J. Bozich, Chicago, both of Ill., assignors to Kenneth L. Smedberg, Crete, Ill.

Filed Sep. 26, 1986, Ser. No. 912,332
Int. Cl.[4] B21D *24/02*
U.S. Cl. 72—453.13 18 Claims





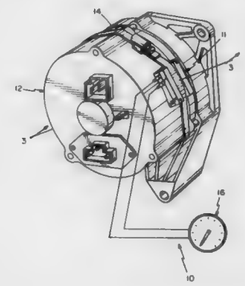
1. A pneumatic die cushion for use in a power press comprising, in combination, a pair of substantially parallel spaced plates, a resilient pneumatic bellows mounted between the plates resiliently holding the plates spaced apart, a plurality of limiter pins releasably secured to one of said spaced plates, each of said limiter pins having a threaded end threadedly mounted in one of said plates, each of said limiter pins having turning means on the end having the threaded end adapted for releasably threadedly mounting the limiter pins in the one plate, each of said limiter pins being movable relative to the other of said plates, stop means mounted on the other end of each limiter pin adjacent to the other of said plates limiting movement in one direction the movement of the first mentioned plate relative to the other plate, and a limit sleeve mounted on each of the limiter pins to control the minimum spacing between the plates.

4,732,034

TACHOMETER KIT WITH ALTERNATOR PICK UP

Thomas E. Bjorn, Northbrook, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Feb. 29, 1984, Ser. No. 584,931
Int. Cl.[4] G01P *3/42*
U.S. Cl. 73—2 14 Claims



1. An electrically driven uncalibrated vehicular tachometer that may be calibrated by the user to accommodate a variety of standard alternators from which a tachometer input signal is derived, comprising: a pick up coil transducer adapted to be fixed to the exterior of the alternator and sense the rotating field of the alternator rotor and provide an input signal representing engine rpm, a tachometer instrument having an input adapted to receive the input signal, a visual display, a visual display driving circuit for deriving drive signals for the visual display, a calibration circuit between the input and the display driving circuit adjustable from the exterior of the tachometer for varying the response of the display driving circuit to signals at the input, a reference signal generator in and part of the tachometer for deriving a fixed reference signal representing a predetermined input signal and corresponding engine rpm, switch means accessible from the exterior of the tachometer for selectively connecting the reference signal to the input, means for determining a plurality of specific visual display calibration rpm's for the engine rpm represented by the same reference signal for a variety of alternator derived input signal to engine rpm ratios, and means for varying the calibration circuit with the same reference signal connected to the input to produce more than one of the display rpm's from the determining means for the corresponding input signal to engine rpm ratio desired, said switch means being operable to disconnect the reference signal from the input and connect the input signal thereto after calibration is complete.

4,732,035

METHOD AND APPARATUS FOR STORAGE TANK LEAK DETECTION HAVING TEMPERATURE COMPENSATION

Peter J. Lagergren, Arlington, and C. Cameron Allen, Jr., Richardson, both of Tex., assignors to Pandel Instruments, Inc., Grand Prairie, Tex.

Filed Feb. 6, 1987, Ser. No. 11,922
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—49.2 26 Claims

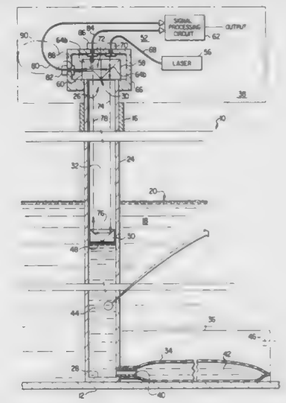
1. A leak detection system for a storage tank having a fluid product stored therein, comprising:

an elongated tube having first and second ends, an inlet adjacent to the first end, and a substantially hollow core for supporting a medium having a temperature coefficient substantially lower than the temperature coefficent of the fluid product;

means for supporting the elongated tube in a substantially vertical manner in the storage tank such that the second end of the tube is located adjacent the base of the storage tank;

a bladder connected to the tube adjacent the second and thereof for supporting a first portion of the medium in static equilibrium with respect to a second portion of the medium supported in the tube, wherein the large disparity between the temperature coefficients of the medium and the fluid product insures that temperature-induced volumetric changes in the fluid product do not vary the level of the medium in the tube; and

means for sensing variations in the level of the medium in the tube to thereby detect leakage into and from the storage tank.

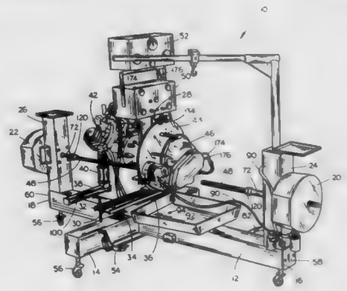


4,732,036

AUTOMATIC TRANSMISSION TEST APPARATUS

Allen F. Weeder, 4618 30th Ave., Columbus, Nebr. 68601

Filed May 10, 1985, Ser. No. 732,678
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 12 Claims



1. A transmission test unit, comprising,

an elongated main frame having opposite ends,

an inertia wheel,

means for supporting said inertia wheel on said main frame for rotational movement about a longitudinal axis,

an upstanding headstock frame on said main frame in longitudinally spaced relation from said inertia wheel,

means for supporting an automotive engine on said headstock frame,

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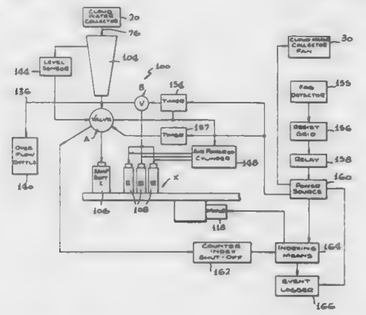
means for supporting an automatic transmission on headstock frame in driven relation with an engine supported thereon, said transmission having a rotary input and output,
means on said headstock frame for providing for transverse movement of an engine and transmission supported thereon to selected transverse positions relative to said main frame,
means on said headstock frame for providing for vertical movement of an engine and transmission supported thereon to selected vertical positions relative to said main frame,
disengageable coupling means for drivingly connecting a transmission rotary output to said inertia wheel,
said headstock frame, upon mounting an automotive transmission thereon, being transversely and vertically adjustable to a position wherein the transmission output is in longitudinal alignment with the inertia wheel axis,
a second inertia wheel,
means for supporting said second inertia wheel on said main frame in longitudinally spaced relation from the aforementioned inertia wheel with the headstock frame disposed therebetween,
and means, independent of a transmission supported on said headstock frame, for disengageably coupling said inertia wheels for rotation in unison.

4,732,037

AUTOMATED RAINWATER COLLECTOR

Bruce C. Daube, Jr., and Richard C. Flagan, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 867,820, May 27, 1986, Pat. No. 4,697,462. This application Mar. 20, 1987, Ser. No. 28,555
Int. Cl.[4] G01W *1/14*
U.S. Cl. 73—171 **9 Claims**



1. A rainwater collector for automating the collection of succesive rainwater samples which comprises
rainwater collecting means,
a reservoir in fluid comnmranicating with said rainwater collecting means,
a carousel,
means supporting said carousel for limited rotation,
a rack on said carousel adapted to support a plurality of first sample bottles in a circle adjacent the outer periphery of said carousel and a plurality of second smaller sample bottles in concentric circles adjacent said circle of first containers,
a fill station on said carousel wherein one of said first bottles and a plurality of said second bottles in said concentric circles are in a row,
a discharge line from said reservoir,
a first valve in said discharge line adapted to discharge liquid from said reservoir into one of said first bottles at said fill station,
a second valve in said discharge line adapted to discharge liquid from said reservoir into the second bottles in said row at said fill station,
a liquid level sensor to monitor collection of a predetermined volume of rainwater in said reservoir,
means associated with said liquid level sensor to actuate said first valve means when said predetermined volume of rainwater has been collected in said reservoir to open and fill a first bottle at said fill station,
timer means for actuating said second valve when said first valve has been actuated, to open and fill the second bottles in said row at said fill station, said timer means closing said second valve after a pre-set time interval, and said means for actuating said first valve closing same after a longer pre-set time interval,
driving means to actuate the carousel to index a successive row of a first bottle and a plurality of second bottles at said fill station,
means for sensing the closing of said first valve to actuate said driving means to index a successive row of bottles at said fill station, said last-mentioned means including a counter for deactivating said driving and indexing means when all of the bottles on said carousel have been filled at said fill station,
an overflow tubing connected to the discharge line from said reservoir, and
an overflow bottle connected to said overflow tube, for receiving liquid from said reservoir after deactivation of said driving and indexing means by said counter.

4,732,038

MUSCLE TESTING METHOD

Daniel DelGiorno, 56 Meadow Glen Rd., Fort Salonga, N.Y. 11768, and Mystical DelGiorno, 242 E. 72nd St. Apt. 1E, New York, N.Y. 10021

Filed Jul. 11, 1986, Ser. No. 884,718
Int. Cl.[4] A61B *5/22*
U.S. Cl. 73—379 **64 Claims**



5. A method of testing the strength of a selected muscle or muscle group of a human subject, comprises the steps of:
(a) stabilizing the subject's body and determining the range of motion of a body area moved by a selected muscle or muscle group,
(b) locating a force sensing means within the range of movement of the body area by moving the sensing means along a guide means to a selected position, and pivoting the sensing means about a rotational axis to a selected angular orientation,
(c) contacting the body area with a force sensing means to isolate the selected muscle or muscle group for testing,
(d) flexing the muscle or muscle group so that substantially all of the force applied to the sensing means by the body area is due to the flexing of the selected muscle or muscle group,
(e) measuring the force applied against the sensing means for a selected test period,
(f) recording the force applied, the selected position, the angular orientation of the sensing means and the location of the subject as stabilized.

4,732,039

ACOUSTIC IMPEDANCE MEASUREMENT

Asif A. Syed, Loveland, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 26, 1985, Ser. No. 813,358
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—589 **4 Claims**



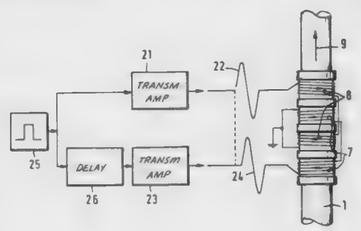
1. Apparatus for measuring the acoustic impedance of a curved material, comprising:
(a) a flexible, generally U-shaped channel having at least one acoustically hard wall for defininin an end thereof, for abutting against the material and for forming an acoustic waveguide with the material, said waveguide having a generally rectangular cross section;
(b) a plurality of acoustic transducers for measuring pressure at a respective plurality of locations within the waveguide; and
(c) speaker means for injecting planar sound waves into the waveguide having a direction of propagation generally parallel with the surface of the material to establish a standing wave in said waveguide.

4,732,040

ELECTRODYNAMICALLY PRODUCING ULTRASONIC WAVES

Wolfgang Boettger, Duesseldorf; Friedhelm Schlawne, Kerpen; Willi Weingarten, Krefeld, and Heinz Schneider, Duesseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,863
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—643 **2 Claims**



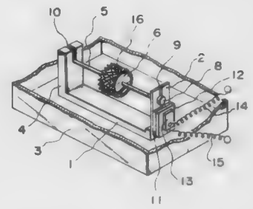
1. Electrodynamic transducing device including two staggerdly coils with a distance of staggering equal to a quarter of a wavelength of ultrasonic waves, the improvement of assuring unidirectional transmission characteristics of said transducer comprising:
means for feeding said two coils separately with discrete HF current pulses and at a particular time difference of feeding of the respective two pulse signals, the time difference being equal to a quarter of the wavelength such that a reinforcing ultrasonic signal is produced in a direction away from the coil receiving said signal earlier in time the coil being displaced in that and complete cancelation of acoustic waves obtains in the opposite direction, whereby in case of equal pitch of said coils the HF signals are of equal contour but of opposite polarity while in case of opposite winding pitch the signals not only have equal signal contour but also the same polarity.

4,732,041

AUTOMOBILE THEFT SENSOR

Keisuke Iwata, Tokyo, Japan, assignor to Kabushiki Kaisha Iwata Electric, Tokyo, Japan

Filed Jan. 8, 1987, Ser. No. 1,348
Claims priority, application Japan, Nov. 21, 1986, 61-179398[U]
Int. Cl.[4] B60R *25/00*; G01H *11/08*
U.S. Cl. 73—654 **2 Claims**



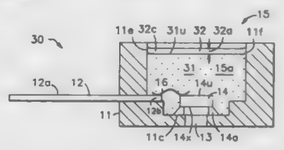
1. A theft for an automobile characterized in that a thin plate is fixed at one end to a base, an elastic string is stretched between the other end of the thin plate and a supporting plate provided from the above mentioned base, a weight is provided in the middle of the string and a sheet-shaped buffer material, conductive thin plate and piezoelectric element are successively pasted to the above mentioned thin plate.

4,732,042

CAST MEMBRANE PROTECTED PRESSURE SENSOR

Victor J. Adams, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Apr. 22, 1986, Ser. No. 855,055
Int. Cl.[4] G01L *7/08*
U.S. Cl. 73—706 **3 Claims**



1. An environmentally protected pressure sensor, comprising:
a body;
a cavity formed in an opening in said body, having a first surface for receiving a pressure sensing element and a substantially rigid second surface extending from said first surface to said opening;
a pressure sensing element sealably mounted on said first surface and having a pressure sensing region facing said cavity;
lead means in said body for providing electrical connections to said sensing element, wherein said lead means have first ends external to said body and second ends in said cavity;
a non-gaseous pressure transfer medium in contact with said pressure sensing region and partially filling said cavity and in contact with said second surface and having an exposed surface; and
a homogeneous thin flexible membrane means sealed to said second surface and said exposed surface of said pressure transfer medium and responsive to an external pressure, for preventing materials from the environment from

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reaching said sensor element, wherein said membrane means has a first thickness over said exposed surface and a second thickness less than said first thickness where it seals to said second surface.

4,732,043

SYSTEM AND METHOD FOR OBTAINING DIGITAL OUTPUTS FROM MULTIPLE TRANSDUCERS

Robert L. Bell, Agoura Hills, and Herman L. Renger, Calabasa, both of Calif., assignors to Bell Microsensors, Inc., Newbury Park, Calif.

Filed Aug. 11, 1986, Ser. No. 895,904
Int. Cl.[4] G01L *9/12, 19/04*
U.S. Cl. 73—708 **12 Claims**



1. A system for determining the value of readings taken by a capacitive transducer device, comprising:
- at least two capacitive sensing means responsive to different readings in the transducer device for providing analog variations;
- at least two oscillator means coupled individually to the different ones of said sensing means for producing varying frequency signals having frequencies proportional to the analog value represented by the sensing means, each of the oscillator means being externally enabled;
- processor means for providing enable signals to the oscillator means in succession and receiving digital counts;
- first counter means coupled to said oscillator means for counting a predetermined number of cycles produced by said oscillator means and producing an indication thereof;
- clock source means having a frequency substantially higher than the frequency of the oscillator means;
- second counter means coupled to the clock source means and responsive to the interval of operation of the first counter means for counting cycles of the clock source means during said interval, said second counter means being coupled to said data processor means, and said data processor means using the readings from said oscillator means to derive an output value for the transducer.

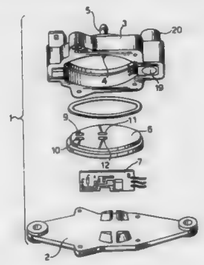
4,732,044

PRESSURE MEASURING DEVICE

Roberto Dell'Acqua, Pavia; Giuseppe Dell'Orto, Milan; Giuseppina Rossi, Pavia, and Gilberto Dendi, Milan, all of Italy, assignors to Marelli Autronica S.p.A., Pavia, Italy

Filed Sep. 17, 1986, Ser. No. 908,480
Claims priority, application Italy, Sep. 17, 1985, 53805/85[U]
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—727 **7 Claims**

1. A pressure measuring device comprising
- a support casing having an aperture,
- a substrate mounted in the casing and deformable through the effect of a pressure to be measured introduced into the casing through the aperture,
- at least one electrical deformation sensor, comprised of a thick-film resistor, applied to the substrate,
- circuit means housed in the casing and connected to the at least one electrical deformation sensor for outputting electrical signals indicative, according to a predetermined response curve, of the deformations of the substrate and hence of the pressure acting thereon, and
- manually-operable electrical adjustment means mounted in the casing and connected to the circuit means, for modifying predetermined characteristics of the response curve;
- said adjustment means including first means for causing a



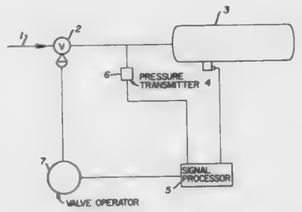
constant-magnitude increase or decrease in the intensity of the signal output by the circuit means and
- second means for multiplying the intensity of the signal output by the circuit means by a constant factor wherein said casing is provided with the access means to enable adjustment of said first and second means from the exterior of said casing.

4,732,045

METHOD FOR RAPID ACOUSTIC EMISSION TESTING OF PRESSURE VESSELS

Philip R. Blackburn, Niagara Falls, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 18, 1987, Ser. No. 15,984
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—801 **24 Claims**



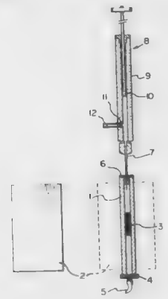
1. A method for carrying out acoustic emission testing of a pressure vessel comprising pressurizing the vessel to a target pressure by introducing pressurization fluid into the vessel while substantially continually increasing the pressurization fluid flowrate into the vessel and maintaining the pressurization fluid velocity within plus or minus 25 percent, so as to generate acoustic emission capable of being read by at least one acoustic emission sensor on the vessel.

4,732,046

METHOD AND APPARATUS FOR THE INTRODUCTION OF A VAPORIZABLE SAMPLE INTO AN ANALYTICAL TEST APPARATUS

André H. Lawrence, Gloucester, and Lorne Elias, Nepean, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 824,248, Jan. 30, 1986, abandoned. This application Mar. 12, 1987, Ser. No. 25,060
Claims priority, application Canada, Feb. 8, 1985, 473884
Int. Cl.[4] G01N *35/06*
U.S. Cl. 73—864.21 **5 Claims**



1. An apparatus for the introduction of a vaporizable sample into an analytical test apparatus, comprising:
- a sample tube having an interior for the collection of the vaporizable sample and from which, when the sample tube is heated, the sample may be vaporized and eluted therefrom;
- means at an upstream end of the sample tube for passing a carrier gas to the sample tube interior;
- a hypodermic syringe having a heat dissipating metal walled, hollow needle for the condensation of the vaporized, eluted sample, from the sample tube on an inner surface of the needle, and transfer of the sample from the inner surface in a revaporized, concentrated form to the analytical test apparatus;
- a valve attached to the hypodermic syringe, at a location adjacent the needle, for venting carrier gas therefrom from which vaporized sample has been condensed in the needle; and
- a plug closing the downstream end of the sample tube and, in operation, sealing said needle in a perforation in said plug for the transfer of the eluted sample from the sample tube to the hypodermic syringe.

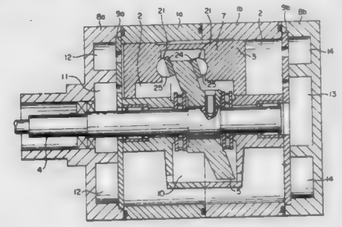
4,732,047

STRUCTURE OF A SHOE FOR A SWASH PLATE TYPE COMPRESSOR

Masafumi Kato; Kouichi Shimomura; Masayuki Nagura, and Katumi Asai, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Aug. 15, 1986, Ser. No. 897,550
Claims priority, application Japan, Aug. 16, 1985, 60-180321; Aug. 16, 1985, 60-180322
Int. Cl.[4] F04B *1/16;* **F16C** *17/06, 33/24*
U.S. Cl. 74—60 **4 Claims**

1. A shoe incorporated into a swash plate type compressor for transmitting an axial force from a rotating swash plate secured to a drive shaft to a piston of the compressor which applies an axially reciprocal compression effect to a refrigerant within a cylinder bore of the compressor, comprising:
- a first member made of a seizure-resistant material and having a first flattened contact face in slidable contact with said swash plate while said swash plate rotates with said drive shaft and a second face opposite to said first flattened contact face, said seizure-resistant material comprising a ceramic material having a void occupation ratio of less than 4%;
- a second member made of a material having less resistance to seizure but more easily machined than said seizure-resistant material of said first member, said second member



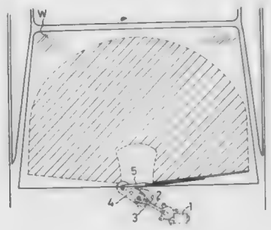
having a first spherical face slidably engaged with said piston and a second face opposite to said first spherical face, said material of said second member comprising a ferrous metal; and
- means for joining said first and second members together to form a unitary element.

4,732,048

WIPER DEVICE FOR VEHICLE

Kazuo Sakakibara, Toyokawa; Toshiaki Shimogawa, Okazaki; Satosi Kuwakado, Nukata, and Akira Hoshino, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Sep. 19, 1986, Ser. No. 909,291
Claims priority, application Japan, Sep. 19, 1985, 60-207308; May 20, 1986, 61-115956
Int. Cl.[4] A47L *1/00;* **B60S** *1/02*
U.S. Cl. 74—98 **10 Claims**



1. A wiper device for wiping a window of a vehicle, comprising:
- a wiper arm;
- a sub-arm, one end of said sub-arm being provided with a supporting shaft turnably supported by a body of the vehicle; the other end of said sub-arm being provided with a turnable arm shaft to which a base end of said wiper arm is fixed;
- an arm shaft driving means for reciprocally turning said arm shaft; and
- a supporting shaft driving means for reciprocally turning said supporting shaft and for stopping the turning of said supporting shaft when said sub-arm extends upward of the window glass and when said arm shaft is positioned within a predetermined turning angle range of said arm shaft during each of a forward movement and reciprocating return movement of said arm shaft.

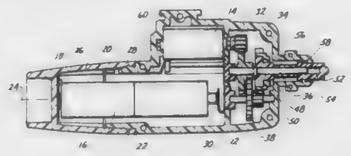
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,049

REMOVABLE TOY MOTOR MODULE

Janos Beny, Vista; Keith Megga, Torrance; Miva Filoseta, Los Angeles, and Edwin Faris, Simi Valley, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jun. 9, 1986, Ser. No. 872,361
Int. Cl.[4] F16H *1/12*
U.S. Cl. 74—421 A 6 Claims



1. A removable toy motor module for use with a figure toy and toy accessories, comprising:
a hollow housing;
a cover removably engaged to said housing;
an output gear extending through an aperture in said housing;
a shaft rotatably mounted within said housing and slidably engaged to said output gear;
motor means located within said housing for driving said output gear;
seal means disposed about said output gear for providing a seal between said output gear and said housing;
gear means located within said housing for operably engaging said output gear to said motor means; and
spring means disposed around said shaft for biasing said output gear generally in a direction along the longitudinal axis of said shaft away from said gear means and through said aperture in said housing, said gear means including:
(a) a pinion gear attached to said motor;
(b) a first spur gear cluster rotatably coupled to said shaft, said first spur gear cluster engaging said pinion gear;
(c) a second spur gear cluster rotatably mounted within said housing, said second spur gear cluster engaging said first spur gear cluster;
(d) a gear clutch drum disposed around said shaft, said gear clutch drum engaging said second gear spur cluster; and
(e) a clutch ratchet attached to said shaft, said clutch ratchet operably engaging said gear clutch drum.

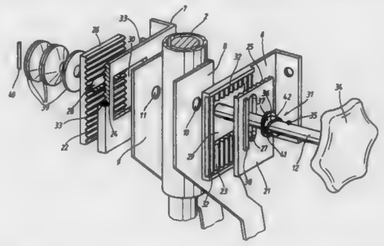
4,732,050

RECEIVING ARRANGEMENT FOR A STEERING COLUMN OF A MOTOR VEHICLE

Meinrad Vollmer, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 56,888
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619125
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 4 Claims

1. A receiving arrangement for a steering column of a motor vehicle that carries the steering column by means of a bearing shaft at two receiving plates fixed at the vehicle at opposite lateral sides of the steering column, said steering column being adjustable in its inclination and height by movement of the bearing shaft along oblong holes and being lockable in different positions by means of a clamping arrangement, wherein
a locking plate is assigned to each receiving plate, said locking plate having a respective oblong hole,
each receiving plate containing a square cutout, the dimensions of which correspond to the maximum sliding path of the adjustment of the height and inclination,
the receiving plates and the locking plates, at their surfaces facing one another, are equipped with toothings that engage with one another, the tooth profiles of said toothings each extending in the direction of the longitudinal course of the oblong hole of the adjacent locking plate.

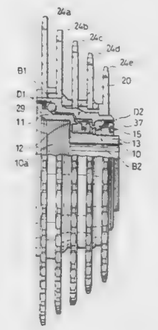


4,732,051

DUST PROTECTIVE MEMBER FOR BICYCLE FREEWHEEL ASSEMBLY

Nobuo Ozaki, and Mamoru Nakai, both of Osaka, Japan, assignors to Aeda Industries, Ltd., Osaka, Japan

Filed Feb. 26, 1986, Ser. No. 832,886
Claims priority, application Japan, Feb. 26, 1985, 60-27781[U]; Feb. 27, 1985, 60-28712[U]
Int. Cl.[4] G05G *1/08, 1/14*
U.S. Cl. 74—594.1 4 Claims



1. A bicycle freewheel assembly comprising:
a hollow external body rotatable relative to and radially spaced apart from a hollow internal body;
said external body having one end section formed with an internal cylindrical face;
said internal body having one end section formed with an external cylindrical face opposed to said internal cylindrical face, and with an axially inwardly directed, annular vertical face extending radially inwardly from said external cylindrical face;
said annular vertical face being formed with a cylindrical groove;
a dust protective member having a horizontal tubular body secured to said internal cylindrical face in parallel thereto, an annular vertical flange extending radially inwardly from said tubular body in opposed relation to said annular vertical face, and a tubular extension extending axially outwardly from said annular vertical flange into said cylindrical groove; and
said dust protective member being spaced in its entirety from said internal body to form therebetween a labyrinth clearance extending along said external cylindrical face, said annular vertical face and said cylindrical groove.

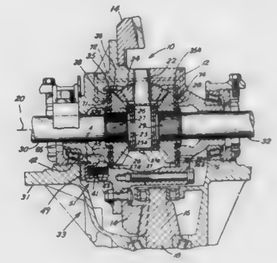
2. A bicycle freewheel assembly comprising:
a hollow external body rotatable relative to and radially spaced apart from a hollow internal body;
said external body having one end section formed with an internal cylindrical face;
a lock nut mounted on one end section of said internal body;
said lock nut having an external cylindrical face opposed to said internal cylindrical face, and with an axially inwardly directed, annular vertical face extending radially inwardly from said external cylindrical face;
said annular vertical face being formed with a cylindrical groove;
a dust protective member having a horizontal tubular body secured to said internal cylindrical face in parallel thereto, an annular vertical flange extending radially inwardly from said tubular body in opposed relation to said annular vertical face, and a tubular extension extending axially outwardly from said annular vertical flange into said cylindrical groove; and
said dust protective member being spaced in its entirety from said lock nut to form therebetween a labyrinth clearance extending along said external cylindrical face, said annular vertical face and said cylindrical groove.
3. A bicycle freewheel assembly comprising:
a hollow external body rotatable relative to and radially spaced apart from a hollow internal body;
said internal body having one end section formed with an external cylindrical face;
said external body having one end section formed with an internal cylindrical face opposed to said external cylindrical face, and with an annular vertical end face extending radially outwardly from said internal cylindrical face;
said annular vertical end face being formed with a cylindrical groove;
a dust protective member having a horizontal tubular body secured to said external cylindrical face in parallel thereto, an annular vertical flange extending radially outwardly from said tubular body in opposed relation to said annular vertical end face, and a tubular extension extending axially inwardly from said annular vertical flange into said cylindrical groove; and
said dust protective member being spaced in its entirety from said external body to form therebetween a labyrinth clearance extending along said internal cylindrical face, said annular vertical end face and said cylindrical groove.
4. A bicycle freewheel assembly comprising:
a hollow external body rotatable relative to and radially spaced apart from a hollow internal body;
a lock nut mounted on one end section of said internal body and having an external cylindrical face;
said external body having one end section formed with an internal cylindrical face opposed to said external cylindrical face, and with an annular vertical end face extending radially outwardly from said internal cylindrical face;
said annular vertical end face being formed with a cylindrical groove;
a dust protective member having a horizontal tubular body secured to said external cylindrical face in parallel thereto, an annular vertical flange extending radially outwardly from said tubular body in opposed relation to said annular vertical end face, and a tubular extension extending axially inwardly from said annular vertical flange into said cylindrical groove; and
said dust protective member being spaced in its entirety from said external body to form therebetween a labyrinth clearance extending along said internal cylindrical face, said annular vertical face and said cylindrical groove.

4,732,052

LIMITED SLIP DIFFERENTIAL

Gregory T. Dewald, South Bend, Ind., assignor to Clark Equipment Company, South Bend, Ind.

Filed Mar. 9, 1987, Ser. No. 23,584
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 18 Claims



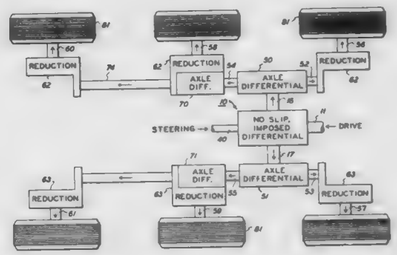
1. A limited slip differential having a case rotatable about an axis, a ring gear on the case for rotating the case, the case having an internal cross-shaft, a bevel pinion gear rotatable about the cross-shaft, a pair of coaxial shafts extending inwardly into the opposite ends of the case respectively, and each shaft carrying a bevel side gear which is in mesh with the pinion gear, the differential comprising
a friction clutch for clutching together one side gear and said case for limiting differential action between said axle shafts,
a hydraulic pump operated by rotation of the differential case,
said pump receiving hydraulic fluid through an antifriction bearing, and
a conduit connecting said pump and said clutch for forcing fluid through the clutch thereby gradually releasing the clutch as the speed of said case increases.

4,732,053

MULTI-AXLE VEHICLE STEER DRIVE SYSTEM

Vernon E. Gleasman, 11 Pondview Dr., Pittsford, N.Y. 14534, and Keith E. Gleasman, 11 McCord Woods Dr., Fairport, N.Y. 14450

Continuation-in-part of Ser. No. 544,390, Oct. 21, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,313
Int. Cl.[4] B62D *11/02;* F16H *37/10;* B60G *11/18*
U.S. Cl. 74—665 L 14 Claims



1. A steer drive system for a vehicle having a hull and a plurality of axle shafts extending outward from each side of said hull, said steer drive system comprising:
a. a drive differential and a steering control differential arranged within said hull so that said drive differential receives drive torque divided between right and left drive

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shafts and said steering control differential receives independently generated steering control torque via a worm and worm wheel reduction drive and applies said steering control torque additively and subtractively to said right and left drive shafts to provide steer driving torque;

b. a worm differential arranged in a right side of said hull for receiving steer driving torque from said right drive shaft and dividing said steer driving torque between a pair of said drive axles on said right side of said hull;

c. a worm differential arranged in a left side of said hull for receiving steer driving torque from said left drive shaft and dividing said steer driving torque between a pair of said drive axles on said left side of said hull;

d. torsion bar suspensions arranged within said hull and extending through said hull for springing wheels driven by said drive axles; and

e. a hydraulic system arranged within said hull for rotating said torsion bars to raise and lower said wheels.

4,732,054

STEPLESS SPEED CHANGE DEVICE

Kikuzo Takamiya, Kitamoto; Masakazu Inaba, Kumagaya; Kunitoshi Kozakae, Ageo, and Mitsuo Tanaka, Kuki, all of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,216

Claims priority, application Japan, Jun. 27, 1985, 60-138886; Oct. 3, 1985, 60-219196; Oct. 3, 1985, 60-219197; Oct. 3, 1985, 60-219198

Int. Cl.⁴ F16H *3/44*

U.S. Cl. 74—750 B **16 Claims**



1. A stepless speed change device comprising internally toothed ratchet rings arranged in plural rows side by side in an axial direction on an inner circumference of a driving rotary member with a one-way clutches interposed between said ratchet rings and said driving rotary member, a stationary ring fixed to a frame of a machine such as a bicycle and encircling the driving rotary member, a plurality of planet rollers rotatably fitted in said driving rotary member at plural locations so that when the drivng rotary member is being rotated said planet rollers are revolved together with the driving rotary member and at the same time are rotated about their axes with the aid of frictional transmission between said stationary ring and said planet rollers and said internally toothed ratchet rings are rotated by the planet rollers with the aid of frictional transmission between said planet rollers and the internally toothed ratchet rings, and pawls in plural rows to engage ratchets of the internally toothed ratchet rings and having bottoms pivotally connected to an eccentric cam whose eccentricity relative to a center shaft is adjustable.

4,732,055

SHIFT CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION SYSTEM

Toshiaki Tateno; Shigeki Fukushima, both of Yokohama, and Tomoyuki Iwamoto, Kawasaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

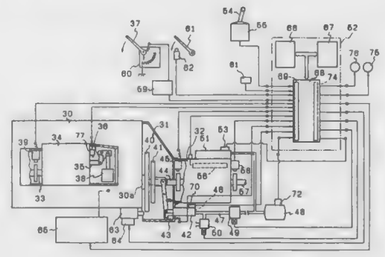
PCT No. PCT/JP86/00072, § 371 Date Dec. 2, 1986, § 102(e) Date Dec. 2, 1986, PCT Pub. No. WO86/04866, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 17, 1986, Ser. No. 923,831

Claims priority, application Japan, Feb. 16, 1985, 60-28748; Feb. 16, 1985, 60-28749; Feb. 16, 1985, 60-28750; Mar. 26, 1985, 60-59435; Mar. 27, 1985, 60-60809; Mar. 27, 1985, 60-60810; Apr. 12, 1985, 60-76639; Jul. 19, 1985, 60-159937

Int. Cl.⁴ B60K *41/18*

U.S. Cl. 74—866 **16 Claims**



1. A shift control apparatus for an automatic transmission system comprising:

a clutch coupled to an output shaft of an engine;

a parallel-shaft type gear transmission coupled at its input shaft to said clutch;

a clutch actuator actuating engagement and disengagement of said clutch;

actuator control means for controlling the operation of said actuator;

clutch position detecting means for detecting engagement and disengagement of said clutch;

shift position detecting means for generating a signal indicative of the shift position of said parallel-shaft type gear transmission;

shift position change-over means for changing the meshing state of said parallel-shaft type gear transmission;

memory means for storing a plurality of maps representing optimum speed ratios determined on the basis of signals indicative of at least the speed of the vehicle and the position of an accelerator pedal, said maps including at least a map I and a map II in which a vehicle speed to be changed over to a higher speed ratio is set at a higher vehicle speed than said map I;

operating condition detecting means for detecting the operating condition of the vehicle; and

automatic shift control means including map selecting means for selecting one of said maps according to information supplied from said operating condition detecting means, said map selecting means selecting said map I when said operating condition detecting means detects that a brake device is in its non-operating state, but selecting said map II when said operating condition detecting means detects that said brake device is in its operating state,

optimum speed ratio determining means for determining an optimum speed ratio on the basis of the map selected by said map selecting means and according to the signals indicative of at least the vehicle speed and accelerator position applied from said operating condition detecting means, coincidence judging for judging as to whether or not the shift position detected by said shift position detecting means coincides with the optimum speed ratio determined by said optimum speed ratio determining means, and shift position selecting means for applying a shift signal to said shift position change-over means so as to shift said parallel-shaft type gear transmission to the optimum shift position when non-coincidence is judged by said coincidence judging means.

4,732,056

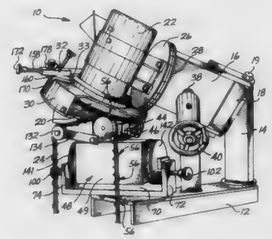
SAW CHAIN GRINDING MACHINE

Thomas S. Foster, 1016 Coolidge Rd., Aberdeen, Wash. 98520

Filed Oct. 2, 1986, Ser. No. 914,764

Int. Cl.⁴ B23D *63/16*

U.S. Cl. 76—25 A **9 Claims**



1. A carriage device for use in connection with a saw chain grinding machine, for moving a cutter link of a saw chain into engagement with a rotating grinding wheel that is mounted to said machine, said carriage device comprising:

a base mounted to said machine and having a pair of spaced supports;

a guide bar supported at each end by said supports and spanning the distance between said supports;

a housing having means, mounted to said housing, for holding a cutter link of said chain;

roller means for interconnecting said housing and said guide bar in a manner so that said housing may freely roll along the length of said guide bar;

a spring interconnecting said housing and said guide bar, said spring being biased to pull said housing and said cutter link away from said grinding wheel; and

means operable to pull said housing against the bias of said spring, so that said cutter link may be moved into engagement with said grinding wheel.

4,732,057

BOTTLE OPENING MACHINE

Kunio Tamura, and Takayuki Horiai, both of Yokohama, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 544,878, Oct. 24, 1983, Pat. No. 4,597,314.

This application Feb. 13, 1986, Ser. No. 829,276

Claims priority, application Japan, Oct. 28, 1982, 57-189674; Nov. 11, 1982, 57-198057

Int. Cl.⁴ B67B *7/08*

U.S. Cl. 81—3.2 **4 Claims**

1. A bottle opening machine for removing crown caps from the mouths of empty bottles contained in bottle cases which are being conveyed on a conveyancee system successively in a single file, said bottle opening machine comprising

at least one drum rotatably mounted on a frame structure;

a plurality of rotary discs fixedly mounted on said drum, the number of said rotary discs corresponding to that of file rows of the bottles in each bottle case;

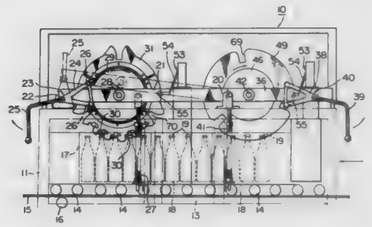
a plurality of cap removing sections distributed around the periphery of each of said rotary discs in an equally spaced relation in the peripheral direction, said cap removing sections being so positioned as to correctly register with the positions assumed by the bottle mouths of the bottles in the bottle case, each cap removing section having pawl means adapted to engage the crown caps to be removed;

synchronizing means for ensuring that the respective cap removing sections are correctly brought into engagement with the bottle mouths of the bottles in the bottle cases as the latter are conveyed on the conveyancee system;

cap releasing mechanisms for releasing the crown caps held in the cap removing sections after they have been removed from the bottle mouths;

at least a pair of arms on which the drum is rotatably supported, said arms being adapted to swing about pivotal pins positioned at one end part thereof, said pivotal pins being supported on brackets fixedly disposed on the frame structure,

the cap removing operation comprising engagement of said pawl means with the crown caps in an area where the linear movement path of the bottle mouths and the circular movement path of the pawl means are united with one



another in the tangential direction, subsequent removal of the crown caps from the bottle mouths, and final release of the same from the cap removing sections, said removal and release being effected by a moment which is produced by the increased distance by which the circular movement path is separated from the linear movement path past the aforesaid area as the bottle case is conveyed further on the conveyancee system; and

said synchronizing means comprises a star wheel adapted to engage the barrels of the bottles, and an auxiliary synchronizing roller adapted to come in contact with the wall surface of the side frame is provided in addition to said star wheel, said auxiliary synchronizing roller being in operative association with the star wheel,

said synchronizing means is adapted to engage the barrels of the bottles as the bottle cases are conveyed on the conveyancee system, said synchronizing means being positioned upstream of the drum in the proximity of side frame of the frame structure.

4,732,058

MEASURING HAMMER

Soon W. Chung, 804 Lanarkway, Silver Spring, Md. 20901

Filed Feb. 13, 1987, Ser. No. 14,550

Int. Cl.⁴ B25D *9/00*

U.S. Cl. 81—20 **15 Claims**

1. A measuring hammer comprising:

a head member, a neck member and a handle member, said head member having a striking head and claw members with an intermediate plate member disposed therebetween having a precise dimension along the top surface thereof,

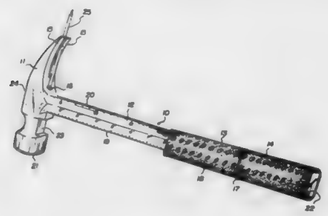
a slot disposed between the striking head and the neck member, said slot having a precise dimension,

said neck member having a front edge and a rear edge, one of said edges having a measuring scale in inches and the other of said edges having a corresponding measuring scale in the metric system, said measuring scales having precise dimensions which extend from the top of the handle member to the top of the intermediate plate, and

said handle member being subdivided by an indicator into

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equal sections of precise dimension, thereby also establishing a precise measuring dimension between the indicator



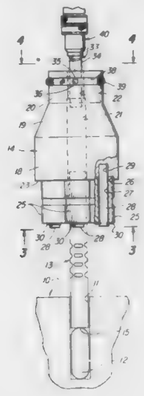
and the top of the intermediate plate, in one direction, and between the indicator and the end of the handle, in the other direction.

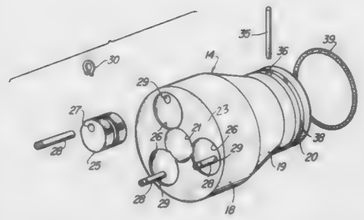
4,732,059

DRIVER FOR REINFORCEMENT BAR CHEMICAL ANCHOR

Ben V. Bonner, Bloomfield Hills, Mich., assignor to A.T. & G. Company, Farmington Hills, Mich.

Filed Dec. 30, 1986, Ser. No. 947,841
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—53.2 **3 Claims**





1. A driver for a construction reinforcement bar that is to be rotatably driven into a hole in concrete, masonry, rock or the like, and into engagement with a breakable capsule disposed in said hole and carrying a chemical adhesive, comprising:

(a) a body having a top end cylindrical portion, and a lower end cylindrical portion provided with a transverse bottom end surface;

(b) a plurality of cam rollers eccentrically mounted on pivot pins disposed in equally spaced apart annular positions on the bottom end surface of the body lower end portion, and the cam rollers having knurled peripheries;

(c) said body having an axial bore formed therein and extending axially inward from the bottom end surface of the lower end portion thereof, for the slidable reception of one end of a reinforcement bar;

(d) attachment means for releasably securing the driver to a power drive means for rotating the driver, whereby when the driver is rotated in a clockwise direction, viewed from the top of the driver, the eccentrically mounted cam rollers are pivoted by centrifugal force from respective retracted positions toward a reinforcement bar received in the body axial bore, and the cam rollers are advanced into gripping and driving engagement positions therewith, and when the driver is rotated in a counter-clockwise direction the eccentrically mounted cam rollers are pivoted by centrifugal force away from the reinforcement bar and back to their retracted positions to release the gripping and driving engagement of the cam rollers with the bar, and,

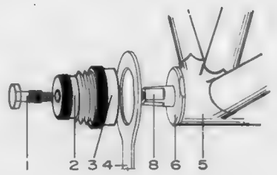
(e) means for stopping the cam rollers in their retracted positions comprising a plurality of counter bores, formed in said transverse bottom end surface, and which counter bores each has an axially disposed peripheral wall, and each of said cam rollers is pivotally mounted in one of said counter bores and is stopped during its pivotal movement away from the reinforcement bar in a retracted position by engagement with the peripheral wall in its respective counter bore.

4,732,060

CLAMP FOR BICYCLE CRANK BEARING WRENCH

James A. Stein, 711½ Miller Valley Rd., Prescott, Ariz. 86301

Filed Feb. 3, 1986, Ser. No. 825,468
Int. Cl.[4] B25B *29/00*
U.S. Cl. 81—57.4 **1 Claim**



1. A clamp for a bicycle bearing wrench comprising; a body externally threaded to provide adjustment and clamping force and internally threaded to fasten to spindles provided with an externally threaded stud or to a bolt having two coaxial threads of different diameters;

an outer ring having threads to match the external of the body to provide adjustment to different length spindles and to provide a clamping force against the outer surface of a spanner wrench;

a bolt provided with coaxial threads of two different diameters; one of said bolt threads sized to fit the internal threads of the body and the other of said bolt threads sized to fit the internal threads of the spindle when the spindle is provided with each internal threads;

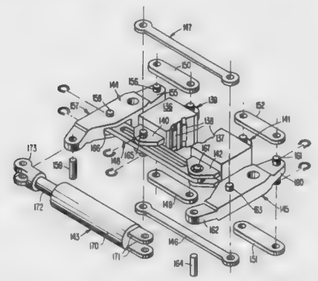
whereby the spanner wrench can be clamped to the spindle by the outer ring for assembly and disassembly of a bicycle crank assembly.

4,732,061

POWER TONGS AND CLAMPING UNITS THEREFOR

Michael C. Dinsdale, Dallas, Tex., assignor to National-Oilwell, Houston, Tex.

Filed Mar. 9, 1987, Ser. No. 23,384
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—57.34 **14 Claims**



1. In a clamping unit for power tongs to be used for making and breaking threaded pipe connections, the combination of rigid support means having a front, a back and two sides,

the support means having an opening to accommodate a pipe or a threaded connector member, the opening extending through the front of the support means so that relative lateral movement between the support means and a pipe or connector member can cause the pipe or connector member to be situated in a predetermined position in the opening,

the support means being adapted to be so mounted in a power tongs as to be rotatable about the longitudinal axis of the pipe connection to be made or broken;

two opposed jaw members each disposed between the opening and a different side of the support means,

the jaw members being supported for rectilinear movement toward and away from the opening so as to be capable of being engaged with and disengaged from a pipe or connector member disposed in the opening;

two jaw actuating levers each disposed between a different one of the sides of the support member and the one of the jaw members nearer such side, each of the jaw actuating levers being mounted on the support means for pivotal movement about an axis parallel to the axis of rotation of the support means, each of the levers having

a front portion projecting forwardly from the axis of pivotal movement of the lever, and a back portion projecting rearwardly from the axis of pivotal movement of the lever;

remotely operable double acting linear power device connected between the ends of the back portions of the jaws actuating levers and operative to pivot the levers in a first direction when the power device operates in one direction and a second direction when the power device operates in the opposite direction; and

linkage means interconnecting the jaw members and the jaw actuating levers to move the jaw members toward each other, to clamp the pipe or connector member, when the power device is operated in said one direction, and away from each other, to release the pipe or connector member, when the power device is operated in said opposite direction, the linkage means comprising

first means interconnecting the front portions of the levers and the respective jaw members but leaving the opening free for entry of the pipe or connector member, and

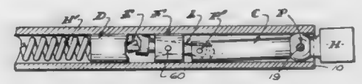
second means interconnecting the back portions of the levers and the respective jaw members and being located between the power device and the opening.

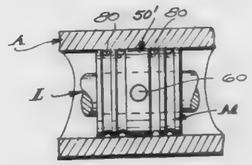
4,732,062

FLOATING FULCRUM FOR TORQUE WRENCHES

Bosko Grabovac, Arcadia; Milan Krunic, Azusa, and Zlatko Kurtovic, Walnut, all of Calif., assignors to Consolidated Devices, Inc., City of Industry, Calif.

Filed Jan. 16, 1987, Ser. No. 3,861
Int. Cl.[4] B25B *23/159*
U.S. Cl. 81—483 **11 Claims**

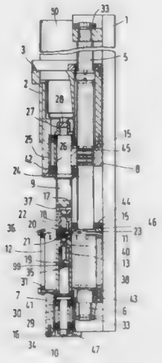




1. A torque wrench comprising an elongate manually-engagable lever arm with a cylindrical interior bearing surface and front and rear ends, an elongate work-engaging head at the front end of the arm on an axis normal to the axis of the arm, an elongate lever projecting rearwardly from the head and freely into the arm, a first pivot pin pivotally connecting the front end portion of the lever to the front end portion of the arm on an axis spaced rearward from and parallel with the axis of the head, an elongate link with front and rear ends positioned freely within the arm rearward of the lever, a second pivot pin pivotally connecting the front end of the link to the rear end of the lever on an axis spaced rearward from and parallel with the first pivot pin, a rearwardly-disposed front cam seat at the rear end of the link, an elongate fulcrum block with a cylindrical exterior bearing surface and a central longitudinal opening, said fulcrum block is engaged freely about the link between the ends thereof and is positioned in the arm rearward of the lever with its exterior bearing surface in sliding bearing engagement with said interior bearing surface of the arm, an elongate fulcrum pin carried by the fulcrum block between the ends thereof and engaged through and pivotally coupling the link with the block on an axis spaced rearward from and parallel with the axis of said second pivot pin, an elongate plunger with front and rear ends slidably engaged in the arm rearward of the link, a forwardly disposed rear cam seat at the front end of the plunger a cam block with forwardly- and rearwardly-disposed cam faces normally establishing flat bearing engagement with front and rear cam seats on the link and the plunger, a radially outwardly opening channel in the fulcrum block and a deposit of lubricant in the channel and in contact with said interior bearing surface, a spring means in the arm rearward of and yieldingly urging the plunger forward and holding the plunger, cam block and link in pressure engagement with each other, said plunger, link, fulcrum block and lever are normally axially aligned within the arm, said lever and link pivot about said first pivot pin and fulcrum pin and said plunger and fulcrum block move longitudinally in the arm when the wrench is operated.

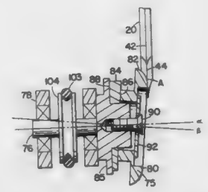
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4,732,063
APPARATUS FOR CHANGING A POSITION OF A CUTTING EDGE OF A LATHE TOOL
Reinhard Buchholz, Tamm, Fed. Rep. of Germany, assignor to Huller Hille GmbH, Fed. Rep. of Germany
Filed May 9, 1986, Ser. No. 861,403
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529876
Int. Cl.[4] B23B *19/00*
U.S. Cl. 82—1.4 3 Claims



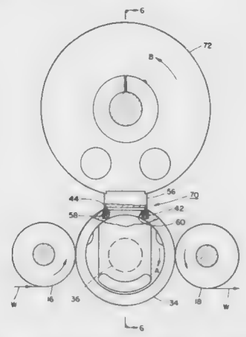
1. A machine tool comprising a lathe tool means, a dynamically controlled motor means for driving the lathe tool means, tool holder fixture means for accommodating the lathe tool means, a boring bar means interposed between the motor means and the lathe tool means for enabling a driving of the lathe tool means by the motor means, wherein, for an internal working between the boring bar means and the lathe tool means, at least a spring resilient coupling means is provided which supports said tool holder fixture means and said lathe tool means accommodated thereby on said boring bar means for movement along a large convolution circle in dependence upon a rotational frequency and centrifugal force and wherein the boring bar means includes diametrically opposed slot-like recess means, the coupling means includes at least two spring members arranged in the diametrically opposite recess means of the boring bar means, means are provided for connecting the respective spring members to the boring bar means in such a manner that first ends of the respective spring members are fixedly connected to the boring bar means and opposite ends thereof are free ends which hold the tool holding fixture means and lathe tool means so that the lathe tool means extends across a longitudinal axis of the boring bar means and projects at one end thereof from the tool holding fixture means through a side surface of one of the spring members, coaxially disposed openings are provided in the spring members for accommodating the tool holding fixture means, a distance sleeve means is arranged in a holding sleeve means provided along an axial direction of the boring bar means, at least one double-arm adjusting lever means is provided which includes a long and short arm, and means are provided for mounting said adjusting lever means so that the long arm thereof extends into a central recess of the boring bar means and the short arm is disposed so as to arcuate at least one of the spring members.

4,732,064
APPARATUS AND METHOD FOR SHARPENING EDGES OF RECIPROCATING BLADE
David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.
Filed Mar. 5, 1987, Ser. No. 21,994
Int. Cl.[4] B26D *7/12*
U.S. Cl. 83—13 9 Claims



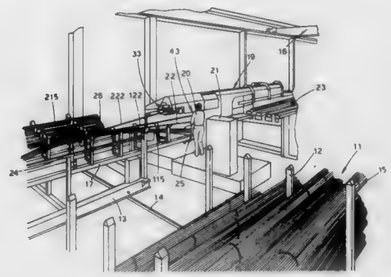
1. In a cutting machine with a blade supported from a blade support for generally vertical reciprocating movement along an axis perpendicular to a work supporting planar surface and having a cutting edge, a blade sharpener comprising:
at least one sharpening wheel suspended from the blade support and mounted on a shaft adjacent the cutting edge of the blade for rotation about the shaft axis and for sharpening when the sharpening wheel is engaged with the cutting edge of the blade, the sharpening wheel having an abrasive surface coaxially disposed about an axis of symmetry arranged in angular relation to the shaft axis; and
drive means for rotating the sharpening wheel on the shaft when engaged with the blade for sharpening the cutting edge of the blade as the blade reciprocates during a sharpening operation.

4,732,065
ROTARY SERRATED TUBE PUNCH WITH INTERNAL BACK-UP FOR A FILM WEB AND METHOD OF PUNCHING HOLES THEREWITH
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 8, 1986, Ser. No. 905,090
Int. Cl.[4] B26F *1/08*
U.S. Cl. 83—18 26 Claims



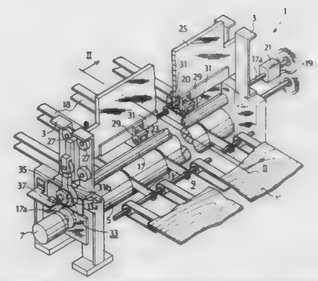
14. A method for punching holes into a continuously advancing thermoplastic film web, comprising:
(a) advancing said film web over a rotatable anvil roll with said film web extending in surface contact with at least a portion of the circumference of said roll; at least one opening of predetermined size being formed in the circumferential surface of said anvil roll, and a groove in the circumferential surface of said anvil roll surrounding said hole and forming an annular land between said groove and said opening;
(b) causing a rotary punch having a serrated cutting edge at the radially outer end thereof to pierce said film web and to enter said groove in said anvil roll at predetermined intervals;
(c) rotating said rotary punch; and concurrently rotating said anvil roll;
(d) and synchronizing the rotational movements of said anvil roll and said rotary punch with said film web advancing over said opening on the anvil roll facing said punch whereby said serrated cutting edge punches a hole into said web upon entering said groove in said anvil roll, while said film web is supported on said land and the surface of the anvil roll about the groove.

4,732,066
DEVICE TO FEED BARS
Marcello Del Fabro, Udine, and Giorgio Del Fabro, Montegnacco, both of Italy, assignors to S.A.E. Srl Societa Automatismi Elettronici, Tavagnacco, Italy
Filed Jan. 21, 1986, Ser. No. 821,057
Claims priority, application Italy, Jan. 21, 1985, 83317 A/85
Int. Cl.[4] B26D *5/20*
U.S. Cl. 83—277 14 Claims



1. A device to feed and shear bars, the device comprising:
a machine to shear bars to size from a bundle to be sheared,
at least one support frame located upstream of said machine for holding the bundle of bars to be sheared,
advancement means connected to said support frame to advance the support frame along a feed path and thereby advance all of the bars in said bundle simultaneously in a lengthwise direction, and
means disposed along said path to align and butt the bundle of bars so as to prepare them for shearing, said means to align and butt the bundle of bars including a gripper means operable between an open and closed position, an abutment plate movable along said feed path between forward and rearward positions, and means to laterally move said gripper means along said feed path between a first and second position; movement of said gripper means from said open to said closed position constraining the bundle of bars therein, movement of the gripper means from said first position to said second position bringing the bundle of constrained bars into contact with the abutment plate and thereby moving the abutment plate from its forward to its rearward position, movement of said gripper means from said closed position to said open position releasing said bundle of bars, and movement of said abutment plate from said rearward position to said forward position aligning the bundle of bars for shearing.

4,732,067
VENEER CLIPPER
Yoshiaki Yamada, Obu, Japan, assignor to Meinan Machinery Works, Inc., Obu, Japan
Filed Feb. 5, 1987, Ser. No. 11,109
Claims priority, application Japan, Feb. 13, 1986, 61-29950
Int. Cl.[4] B23D *25/12*; B26D *1/56*
U.S. Cl. 83—346 7 Claims



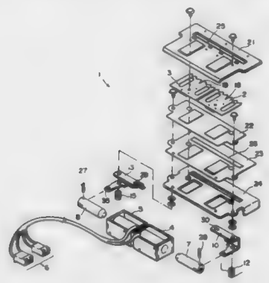
1. A rotary type veneer clipper for cutting a sheet of wood veneer comprising:
conveyor means for advancing veneer sheets successively into said clipper;
anvil member disposed extending transversely of the direction in which the veneer sheets are conveyed, each veneer sheet being cut on said anvil member while being supported thereby;
an intermittently rotatable knife carriage roll member spaced above and in parallel to said anvil member and carrying at least one elongated straight cutting knife extending axially of its carriage roll member and projecting from the periphery thereof to such an extent that the knife when rotated with its carriage roll member may cut through the veneer sheet then fed into the clipper and moving past the cutting position on the anvil member just beneath the knife carriage roll member;
said knife carriage roll member having a circumferential surface formed at least partially along its length;
a rotatable back-up roll disposed substantially above said knife carriage roll member and movable reciprocally toward and away from said circumferential surface for bracing the carriage roll member by pressing the same toward the anvil member;
means for reciprocating said back-up roll in conjunction with the intermittent rotation of said knife carriage roll member.

4,732,068
CUTTING DEVICE
Ryoichi Yasuda, and Kazutoshi Yamada, both of Takatsuki, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Feb. 12, 1986, Ser. No. 828,680
Claims priority, application Japan, Aug. 9, 1985, 60-123298[U]
Int. Cl.[4] B41J *11/70*; B26D *1/09*
U.S. Cl. 83—575 9 Claims

1. A cutting device, comprising:
a plurality of movable blades for cutting paper placed in said device along a cutting direction transverse to a longitudinal dimension of said paper, said movable blades being aligned in side-by-side relationship along said cutting direction;
a plurality of solenoid members, corresponding to each of said movable blades, for driving said movable blades linearly;

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a stationary blade for cutting the paper in cooperation with said movable blades, said stationary blade being aligned



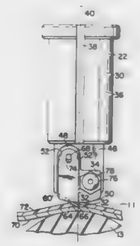
with said movable blades in spaced side-by-side relationship along said longitudinal dimension of said paper; and actuating means for actuating said solenoid members.

4,732,069

KNIFE AND KNIFE HOLDER ASSEMBLY

Kenneth O. Wood, Ellington, and William A. Loos, Broad Brook, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed May 8, 1987, Ser. No. 47,660
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—881 **7 Claims**



1. A knife and knife holder assembly for use in a machine for cutting sheet material, said assembly comprising:

a knife holder having a lower end with a downwardly facing lower end face and a flat vertical side face intersecting said end face and extending upwardly therefrom,

said knife holder having a vertically extending slot in said side face,

a knife positioned in said slot and having a lower portion extending downwardly beyond said end face of said holder, said lower portion of said knife having a generally downwardly facing cutting edge including a tip point constituting the lowermost extremity of said knife,

a guard and clamp member laterally overlying said knife and said vertical side face of said holder and having a generally downwardly facing shoe surface located vertically between said tip point of said knife and said downwardly facing lower end face of said holder for engaging the top surface of sheet material to be cut,

adjustment means for adjusting the vertical position of said guard and clamp member relative to said holder to adjust the vertical amount by which said tip point is vertically spaced from said shoe surface, and

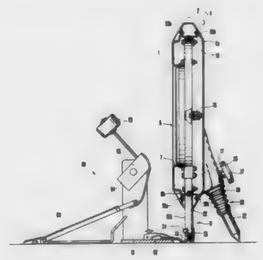
connecting means for connecting said guard and clamp member to said holder and which connecting means is movable between a loosened condition, at which said member is free for vertical adjustment relative to said holder by said adjustment means and said knife is free for vertical sliding movement relative to said holder for removal from and replacement into said holder, and a tightened condition, at which said member is fixed to said holder and said knife is also fixed to said holder by being clamped between said guard and clamp member and said holder.

4,732,070

ELECTRONIC BASS DRUM WITH INTEGRAL SUPPORTS

Toshinori Yamashita, Hamamatsu, Japan, assignor to Nippon Gakki, Seizo, Kabushiki, Kaisha, Hamamatsu, Japan

Filed Oct. 9, 1986, Ser. No. 916,834
Claims priority, application Japan, Oct. 16, 1985, 60-157067[U]
Int. Cl.[4] F16M *11/26;* G10D *13/02;* G10H *3/12*
U.S. Cl. 84—1.04 **8 Claims**



1. An electronic bass drum comprising:

supporting means for supporting said drum including a substantially vertical front supporter and a rear supporter having one end connected to said front supporter and another end extending obliquely downward;

pad means for producing a mechanical vibration, a back surface of which is attached to said front supporter and a front surface of which is to be struck by a player, said front supporter extending downward further than a lower edge of said pad means;

detecting means attached to said back surface of said pad means for detecting a mechanical vibration caused by a player's strike of said front surface of said pad means and for outputting a detection signal electrically representing said mechanical vibration; and

an instrument housing attached to said supporting means that encloses at least a part of said supporting means and said pad means except for at least a part of said front surface.

4,732,071

TUNING INDICATOR FOR MUSICAL INSTRUMENTS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd, Hamamatsu, Japan

Filed Feb. 13, 1987, Ser. No. 14,758
Int. Cl.[4] G10G *7/02*
U.S. Cl. 84—454 **13 Claims**

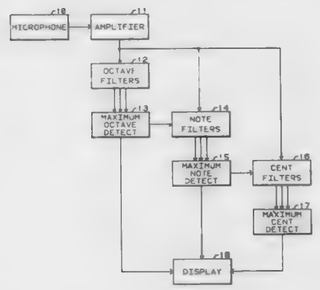
1. Apparatus for indicating the tuning error of a tone produced by a musical instrument comprising;

a conversion means for converting said tone into a waveshape signal,

an octave detection means whereby an octave signal is generated in response to said waveshape signal,

a note detection means whereby a note signal is generated in response to said waveshape signal and in response to said octave signal,

a cent detection means whereby a cent signal is generated in response to said waveshape signal and in response to said note signal, and



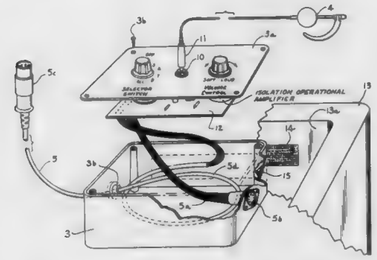
a tuning display means whereby said tuning error is indicated in response to said octave signal, said note signal, and said cent signal.

4,732,072

AUDIO TEACHING SYSTEM FOR USE IN CHORAL INSTRUCTION

Frank W. Garlock, P.O. Box 6524, Greenville, S.C. 29606

Continuation-in-part of Ser. No. 695,435, Jan. 28, 1985. This application Apr. 6, 1987, Ser. No. 34,739
Int. Cl.[4] G09B *15/00*
U.S. Cl. 84—470 R **3 Claims**



1. For use in choral instruction, an audio teaching system comprising:

a recorder/player having at least four channels;

a low noise, amplifier for said four channels;

a mixer and equalizer for said four channels having the capability to record or play said four channels simultaneously with said channels being in the same direction and syncronized;

a plurality of earphone amplifier control boxes connected in series; each of said control boxes having

a selector switch for choosing any of the said four channels or a mix-down of all four channels;

an isolation operational amplifier which provides additional gain to drive said earphones while isolating said earphones from the main amplifier;

a volume control for said isolation operational amplifier permitting the listener autonomy over the level of the chosen signal;

a single earphone; and

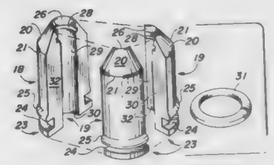
an earphone connection to accommodate said earphone.

4,732,073

PRIMER POCKET SWAGING DEVICE

Douglas C. Semon, 10330 Goldsberry Rd., Shreveport, La. 71106

Filed Dec. 8, 1986, Ser. No. 939,069
Int. Cl.[4] C06B *21/00;* F42B *33/10;* B67B *7/00;* F16L *45/00*
U.S. Cl. 86—1.1 **46 Claims**



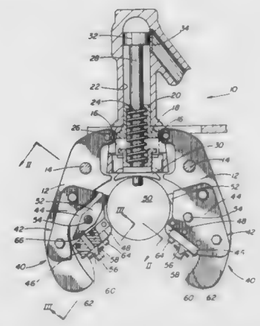
1. A primer pocket swaging device for use with a loading press having a frame, a plunger reciprocating in the frame and means carried by the frame for reciprocating the plunger, said primer pocket swaging device comprising collet cover means adapted for mounting in the frame of the loading press, said collet cover means provided with an opening in one end for receiving a shell casing base having a base flange and an empty primer pocket; expandable collet means located in said collet cover means for selectively engaging and securing the shell casing base inside the collet cover means; and rod means having one end slidably engaging said collet means, with the opposite end of said rod means adapted for attachment to the plunger in the loading press, for selectively contracting and expanding said collet means to grip the shell casing base, swage the primer pocket and release the shell casing base, in sequence, responsive to reciprocation of the plunger in the loading press.

4,732,074

BOMB RETAINING ADAPTOR

Marcel Normand, 6161 Fossambault Boul., Fossambault Sur-Le-Lac, Quebec G0A 3M0, Canada

Filed May 5, 1987, Ser. No. 46,120
Claims priority, application Canada, Jun. 26, 1986, 512816
Int. Cl.[4] F41F *5/02*
U.S. Cl. 89—1.51 **2 Claims**



1. An adaptor for use with a bomb dispenser having a pair of pivoting bomb-retaining arms, the adapter comprising:

a bracket adapted to be secured to one of the arms of the dispenser;

an elongate support bar carried by the bracket for engagement along the underside of a bomb engaged in the dispenser;

a stabilizing lever mounted on the bracket for pivoting movement toward and away from the support bar, for

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engagement with the upper side of a bomb engaged in the dispenser; and

adjustment means for adjusting the position of the lever relative to the support.

4,732,075

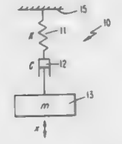
ELASTOMERIC BUFFER UNIT FOR A WEAPON RECOIL SYSTEM

Bruce W. Hurd, 734 Navesink River Rd., Red Bank, N.J. 07701

Filed Aug. 14, 1986, Ser. No. 898,152

Int. Cl.⁴ F41F *19/06*

U.S. Cl. 89—44.02 **8 Claims**



1. An elastomeric buffer unit for a weapon recoil system, comprising:

a plurality of paired elastomeric elements, disposed successively as pairs such that a first element of each pair is aligned with a first reference axis and a second element of each pair is aligned with a second reference axis;

said first and second members of said paired elastomeric elements are comprised of first and second elastomeric materials, respectively;

a plurality of separator elements, of which individual separator elements are disposed alternating between and in simultaneous contact with adjacent pairs of said plurality of aligned paired elastomeric elements; and

first and second end elements, disposed outwardly of and in contact with a first and a last pair, respectively, of said plurality of successively aligned paired elastomeric elements, said first and second end elements being subjected during use to an initial compressive preload and a time-varying load such that both said preload and a time-varying load are transmitted between said first and second end elements through said plurality of paired elastomeric elements and said separator elements therebetween.

4,732,076

APPARATUS FOR THE CONTROL OF A HYDROMOTOR

Roland Ewald, Lohr/Main, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Continuation of Ser. No. 134,052, Mar. 26, 1980, abandoned. This application Feb. 10, 1982, Ser. No. 347,723

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911891

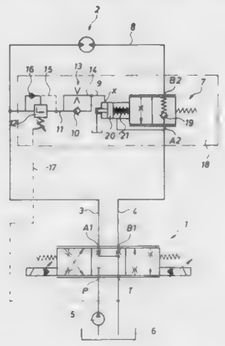
Int. Cl.⁴ F15B *11/04*

U.S. Cl. 91—420 **4 Claims**

1. In an apparatus for controlling the application of fluid under pressure to a hydraulic load device, the apparatus including a source of fluid under pressure, a throttling direction control valve for selectively permitting the pressure fluid to flow to the load device, first conduit means for interconnecting the load device at a first port thereof and the direction control valve, and second and third conduit means for interconnecting the direction control valve and the load device at a second port thereof;

compensating valve means, connected between said second and third conduit means such that said second conduit means connects said compensating valve means and the direction control valve and said third conduit means connects the load device and the compensating valve means, for preventing sudden driving of the load device for maintaining constant load device speed in the case of load changes thereon indepedently of direction, and for closing without leaking pressure fluid, said compensating valve means having a control input and a control piston with means for connecting said control piston with said control input; the improvement comprising

a pressure reducing valve having input and output flow connections, a control connection, means for connecting said input flow connection with the first conduit means and means for connecting said output flow connection with said control input of said compensating valve means, said control connection being on the side of said pressure reducing valve and having means for connecting said



control connection to said control input of said compensating valve means, whereby the pressure of fluid supplied to said control input of the compensating valve means, the pressure gradient across the direction control valve and the flow through the direction control valve are maintained substantially constant when the source of fluid under pressure is connected to the first conduit means;

fourth conduit means connecting the side of the control piston opposite the control input with the second conduit means; and

spring means for biasing the control piston toward the control input.

4,732,077

AIR SPRING

Willi Schweikert, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,812

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434659

Int. Cl.⁴ F15B *11/10*

U.S. Cl. 91—433 **6 Claims**

1. An air spring and pressure controller for the air spring comprising, in combination:

an air spring comprising an interior space which is variable in response to relatively-vibratable bodies between which the air spring is used for spring action when filled with a gas; and

a pressure controller comprising:

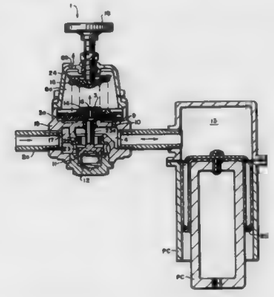
a housing;

an actuating piston movably sealed in the housing and having a face for bounding one side of a control chamber in the housing, the face of the actuating piston having an outlet valve seat and vent means for venting gas to the atmosphere from the outlet valve seat through the actuating piston;

gas line means for gas connecting the control chamber and, thereby, the outlet valve seat to the gas in the variable interior space of the air spring and, through an intake valve seat in the housing, for gas connecting the variable interior space of the air spring to a compressed-gas reservoir;

a compression spring in the housing for spring force on the face of the actuating piston opposite that bounding the control chamber and having the outlet valve seat, thereby to move the actuating piston in response to the relative spring force and gas pressure in the control chamber; and

an outlet valve stem and an intake valve stem, the outlet valve stem being seatable in the outlet valve seat on the actuating piston for outlet valve action on the vent means



therethrough in response to the movement of the actuating piston, and the intake valve stem being seatable in the intake valve seat for intake valve action on the gas line means for connecting the variable interior space of the air spring to the compressed-gas reservoir, the intake and outlet valve stems being movable in the housing by the actuating piston and interconnected for opposite valve action thereupon, the movement of said intake and outlet valve stems having a natural frequency which is higher than the frequency of the variation of the interior space of said air spring.

4,732,078

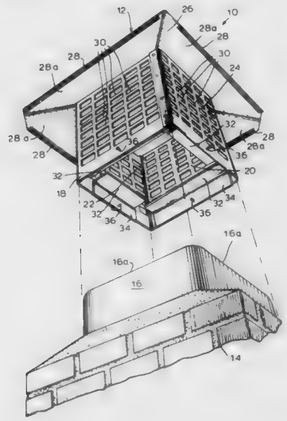
CHIMNEY CAP

Frank Giumenta, and Frederic Giumenta, both of 11 Thomas Rd., Rockville Centre, N.Y. 11570

Filed Apr. 24, 1987, Ser. No. 42,043

Int. Cl.⁴ F23J *13/08*

U.S. Cl. 98—67 **7 Claims**



1. A chimney cap for protecting the upper open end of a chimney flue for ingress of undesirable elements, said cap comprising a housing having four perforated sides which are integral in succession with one another, said four sides being formed from a flat metal blank the longitudinal span of which is greater than the transverse span thereof, said blank including along one longitudinal edge thereof four flanges integral with an extending transversely outwardly of said blank, said flanges being spaced in longitudinal succession from one another, said longitudinal edge of said blank and said flanges extending therefrom forming a base of said housing for nesting on the upper open end of a chimney, said flanges each being bent into two integral flange portions of substantially the same transverse dimension, one of said integral flange portions of each of said flanges which is most proximate to said longitudinal edge of said blank being bent back over and beyond said longitudinal edge and extending parallel to the plane of said blank, the other one of said integral flange portions of each of said flanges being bent to extend perpendicular to the plane of said blank.

4,732,079

COFFEE PERCOLATOR

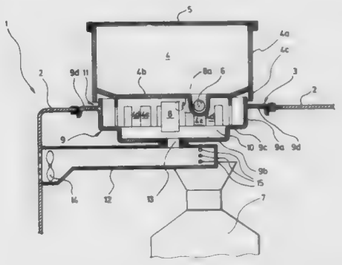
Erwin Princz; Hans Motsch, both of Geislingen/Steige, and Peter Pulvermüller, Bad Ditzenbach, all of Fed. Rep. of Germany, assignors to Wurttembergische Metallwarenfabrik AG., Baden-Wurttemberg, Fed. Rep. of Germany

Filed Feb. 25, 1986, Ser. No. 833,105

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509233

Int. Cl.⁴ A47J *31/00*

U.S. Cl. 99—289 R **19 Claims**



1. A coffee percolator having a supply container mounted at its upper portion for containing a supply of coffee, coffee meal metering means at the bottom portion of said supply container, a driving motor for driving said metering means, a cooling system adjacent the bottom portion of said supply container for reducing the thermal load on the coffee supply, said cooling system including a fan and at least one air flow path extending along at least one of the exterior of the bottom of said supply container and said driving motor, and an air circulation chamber accomodating said driving motor, wherein said air circulation chamber has an air inlet and further wherein the portion of said air flow path adjacent the air inlet is formed as a labyrinth the cross-sectional air inlet area of which is dimensioned in proportion to the aspiration capacity of said fan so as to avoid the aspiration of coffee meal from the outside.

4,732,080

APPARATUS FOR PREPARING HOT FOOD

Lawrence M. Vita, 323 Mola Ave., Fort Lauderdale, Fla. 33301

Filed Jul. 10, 1986, Ser. No. 883,986

Int. Cl.⁴ A47J *31/00, 37/12*

U.S. Cl. 99—330 **12 Claims**

1. Apparatus for heating a product comprising:

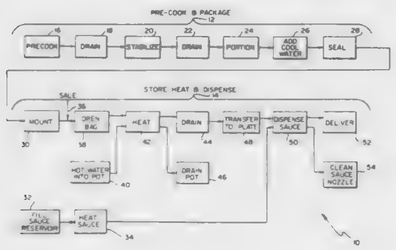
a pot;

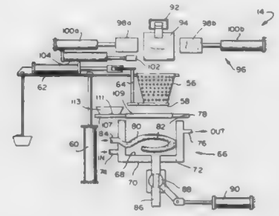
a strainer for containing said product;

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means for lowering said strainer into said pot;
a water-delivery ring in said pot;
said water-delivery ring being positioned a substantial distance above a bottom of said pot and having an opening sufficient to permit said strainer to pass at least part-way therethrough; and
said water-delivery ring including means for producing inward-directed water jets of hot water for impingement upon and into said strainer whereby said product in said strainer is contacted by said hot water.

9. Apparatus for heating a product, said product being contained in a single-serving film bag, comprising:
a strainer;
a pot disposed below said strainer;
a conveyor;
said conveyor including means for positioning said film bag above said strainer;

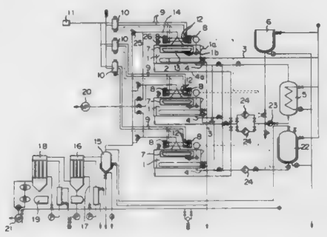




means for immobilizing said film bag above said strainer;
means for opening said film bag whereby said product falls into said strainer;
means for lowering said strainer into said pot;
means for injecting hot water into said pot;
said means for injecting including a ring having means for producing a plurality of inward-directed jets of hot water;
means for sealing a bottom of said pot whereby said hot water is retained in said pot;
means for raising said strainer from said pot after a predetermined heating period;
means for releasing said product from said strainer onto a container; and
means for draining said pot after said predetermined heating period.

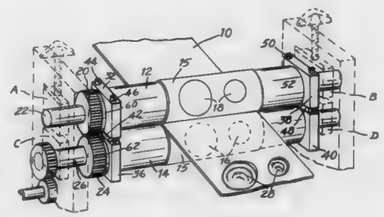
4,732,081
DEVICE FOR PRODUCING FRIED FOOD
Ken Sakuma, Matsudo, Japan, assignor to Kenji Sakuma, Chiba, Japan
Filed Aug. 6, 1986, Ser. No. 894,237
Claims priority, application Japan, Aug. 19, 1985, 60-180583
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—407 **5 Claims**

1. A device for producing fried food, comprising:
(a) a fryer vessel equipped with a vacuum tight sealing lid for sealing said vessel at an open upper portion thereof;
(b) means for providing said fryer vessel with heated oil from an oil heater, and means for draining said oil therefrom;
(c) a waggle frame housed within the fryer vessel, the waggle frame being vertically movable to repeatedly dip into heated oil within the vessel and to withdraw above the oil surface while said fryer vessel is sealed;



(d) a fryer case for containing material to be fried fitable into said waggle frame and dischargeable therefrom through said open upper portion of said vessel when said lid is open; and
(e) a vacuum generating means connected to said fryer vessel operable to produce a vacuum therein when said sealing lid is closed.

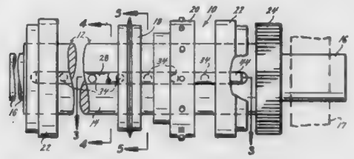
4,732,082
APPARATUS AND METHOD FOR MOUNTING EMBOSSING ROLLERS IN A PRESS LINE
Carl Ireton, 3189 Sunny Crest La., Kettering, Ohio 45419
Filed Jun. 25, 1986, Ser. No. 878,433
Int. Cl.[4] B31F *1/07*
U.S. Cl. 101—23 **2 Claims**



1. A removable and replaceable assembly for supporting a matched pair of embossing rolls for rotation in the embossing station of a printing press comprising:
said rolls;
two pair of harness means, each pair including two blocks, each block supporting a roll bearing therein, threaded fasteners interconnecting said blocks parallel to the plane of said bearings and resilient means between said blocks biassing them away from each other;
a pair of matching gears engaged with each other and keyed to adjacent ends of said rolls for rotating said rolls in synchronism with each other when one or the other of said gears is driven, said gears being positioned axially outwardly of one of said pairs of harness means;
means for holding said bearing elements in each harness pair, in adjustable spaced relation to support said rolls in proper embossing relation to each other; and
means for adjusting the longitudinal relation of said rolls with respect to each other;

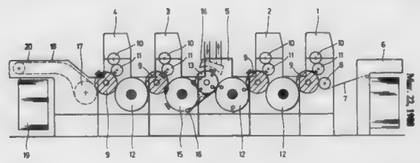
whereby said assembly may be totally prealigned remote from the press and then placed in the press and coupled to the press drive.

4,732,083
ROTARY DIE CYLINDER ASSEMBLY
James B. Arter, Breese, Ill., and Thomas M. Serra, High Ridge, Mo., assignors to Allied Gear and Machine Co., St. Louis, Mo.
Filed Nov. 7, 1986, Ser. No. 928,924
Int. Cl.[4] B41F *13/10, 13/56*
U.S. Cl. 101—28 **12 Claims**



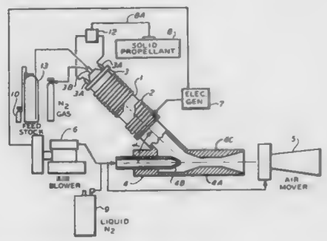
1. A rotary die cylinder assembly comprising:
(a) a cylinder including an outer surface, an elongate slot extending lengthwise of said outer surface and a plurality of transverse threaded bores each including opposed ends, one of said ends communicating with the slot and the other of said ends communicating with the outer surface of the cylinder in circumferentially spaced relation to said slot,
(b) an elongate pressure bar received within the slot and extendable outwardly of said slot,
(c) a plurality of threaded elements each received within an associated bore and each including a remote end engageable with the pressure bar tending to move said bar outwardly of said slot, and
(d) a plurality of annular members, each having an inner surface receiving the outer surface of the cylinder in sliding relation, said inner surface including a bearing portion receiving a portion of the bar in pressure relation when the bar moves outwardly.

4,732,084
SHEET-FED ROTARY PRINTING MACHINE FOR SINGLE-SIDE MULTICOLOR PRINTING AND PERFECTOR PRINTING
Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Continuation of Ser. No. 720,637, Apr. 8, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,968
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413159
Int. Cl.[4] B41F *5/16*
U.S. Cl. 101—177 **3 Claims**



1. Sheet-fed rotary printing machine which is capable of both single-side multicolor printing and perfector printing, said machine having an in-line type of construction with at least one sheet-turning device as well as devices for processing both papers and cardboard, said machine including respective printing units each having, in addition to a plate cylinder and a blanket cylinder of equal given diameter, an impression cylinder having a diameter at least double the given diameter and a sheet transfer drum, each of the printing units being formed of respective upper and lower parts, the lower parts of each of the printing units, except for a first printing unit thereof, being identical and including its respective impression cylinder, said machine also included an additional lower part identical with the identical lower printing-unit parts except that it includes a part of the turning device in the form of a storage drum in place of the respective impression cylinder, said additional lower part being located between an adjacent pair of the printing units, said storage drum being formed with at least two sheet-carrying surfaces, said additional lower part also including a sheet transfer drum with a diameter at least double the given diameter, said sheet transfer drum of said additional lower part being positioned on said additional lower part at a location which is identical to the position occupied by the sheet transfer drums on the lower parts of said printing units, the printing unit of said adjacent pair of printing units immediately following said additional lower part, in travel direction of a sheet through the printing machine, having, as another part of the turning device, a sheet transfer drum formed as a turning cylinder following said storage drum, said turning cylinder carrying at least two systems of pincer-type grippers.

4,732,085
SMOKE GENERATION APPARATUS AND PROCESS USING MAGNETIC FIELD
Moshe Gershenson, Bronx, N.Y., and Mark L. Moskowitz, Wayne, N.J., assignors to GAF Corporation, Wayne, N.J.
Filed May 11, 1987, Ser. No. 48,381
Int. Cl.[4] F42B *13/44*
U.S. Cl. 102—334 **32 Claims**



1. A method for generating smoke for use in military camouflage purposes which comprises injecting a feedstock through an atomizing nozzle into a substantially inert carrier gas stream, said inert carrier gas being the combustion product of a solid propellant fuel, passing the gas stream containing the automized feedstock into a reaction chamber, said reaction chamber being within a magnetic field having flux lines parallel to the flow of the gas stream, said gas stream remaining in the magnetic field for a time sufficient to cause growth of filaments of smoke particles, introducing the gas stream into an ejector wherein the gas stream is mixed with air and exits through a venturi type nozzle into the atmosphere.

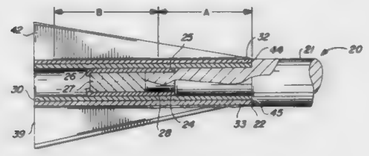
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,086

FIN STABILIZED ARMOR-PENETRATING TRACER PROJECTILE AND METHOD OF MANUFACTURING SAME

Randall L. Schieutl, Brooklyn Park, and Paul D. Ruffle, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 27, 1987, Ser. No. 6,859
Int. Cl.[4] F42B *11/16*
U.S. Cl. 102—513 4 Claims



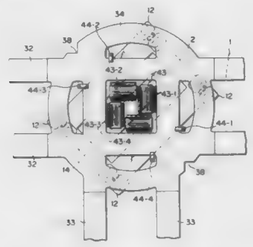
1. An armor-penetrating projectile **20** comprising:
a penetrator **21** including a cylindrical body having a trailing edge **22**, a first cylindrical boss **23** projecting rearwardly from said trailing edge **22**, and a second cylindrical boss **24** projecting rearwardly from said first boss **23**;
a cylindrical tracer cup **26** containing a pyrotechnic tracer mix **27**, said tracer cup **26** having an annular mounting flange **28** defining a blind bore **29** fitting on said second boss **24** of said penetrator **20**;
a sleeve **30** fitting over said first boss **23** and said tracer cup **26** to position the tracer cup **26** on the second boss **24** and within sleeve **30**; and
a pair of fin segments **32, 33**, each fin segment having a pair of fins **38, 39, 41, 42** projecting radially outwardly from an interconnecting arcuate web **35, 36**, the webs **35, 36** of said fin segments **32, 33** being welded to the sleeve **30**, and only the first boss of penetrator **21** being welded to the sleeve **30**, and only the mounting flange **28** of the tracer cup **26** being welded to the sleeve **30**.

4,732,087

TRANSPORTATION SYSTEM OF A FLOATED-CARRIER TYPE

Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1987, Ser. No. 31,284
Claims priority, application Japan, Mar. 27, 1986, 61-69208
Int. Cl.[4] B60L *13/06*
U.S. Cl. 104—130.1 10 Claims



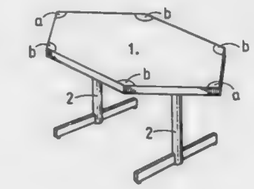
1. A transportation system of a floated-carrier type for transporting a cargo between predetermined positions, comprising:
a guide rail formed of a ferromagnetic material and including at least one first rail section and at least one second rail section intersecting the first rail section;
a coupling section connecting the first and second rail sections;
a carrier for carrying the cargo, said carrier being capable of running along the guide rail;
at least one magnetic unit, having an electromagnet provided on the carrier, so as to face the guide rail, said carrier being adapted to suspend from the guide rail, in a non-contact manner, by means of an electromagnetic attractive force acting between the magnetic unit and the guide rail, so that a gap of a predetermined size is maintained between the magnetic unit and the guide rail; and
transfer means provided at the coupling section, and adapted so that, at the coupling section, the carrier, having so far been running along the first rail section, is stopped, then rotated, then stopped from rotating when the carrier faces the second rail section, and then transferred from the coupling section to the second rail section, all in a non-contact manner.

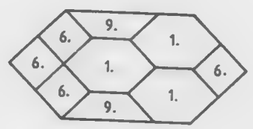
4,732,088

SET OF MODULAR ELEMENTS FOR FORMING OFFICE FURNITURES

René Koechlin, and Marc Mozer, both of 114, route de Florissant, 1206 Geneve, Switzerland

Filed Oct. 24, 1986, Ser. No. 927,224
Claims priority, application Switzerland, Nov. 20, 1985, 04945/85
Int. Cl.[4] A47B *57/00*
U.S. Cl. 108—64 5 Claims





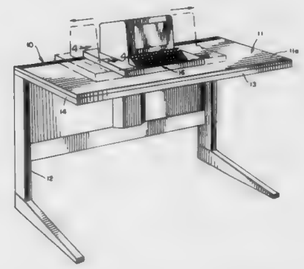
1. A set of modular elements for the construction of office furniture, comprising at least one first element comprising a hexagonal plate two opposite angles of which are 90° and four angles of which are 135°, all the sides of the first element being of equal length, at least a second element comprising a square plate the length of the sides of which is equal to the length of one of the sides of the hexagonal plate, and at least a third element having the same size and shape as half the hexagonal plate on one side of an imaginary line interconnecting said two opposite angles, said elements being separate from each other and being assemblable with at least one said third element having its edges juxtaposed to those of three other said elements of which at least one is a said first element and at least one is a said second element and with each of said three elements having an edge juxtaposed to an edge of one other of said three elements.

4,732,089

GUIDED TABLETOP PLATFORM

Lee G. Mueller, Kewaunee, Wis., assignor to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Sep. 22, 1986, Ser. No. 910,449
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—102 13 Claims



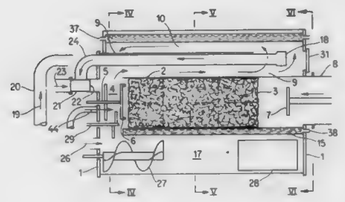
1. A platform assembly for tabletop use, comprising a platform having an enlarged planar top wall and front, side, and rear flanges depending from the periphery of said top wall and together defining a shallow, downwardly-facing cavity; a plurality of axially-elongated cylindrical rollers mounted within said cavity adjacent said front and rear flanges with their rotational axes disposed in spaced parallel relation and their lower portions projecting beneath said side and front flanges; said rear flange extending along a vertical plane normal to the axes of said rollers and including an extension projecting substantially below said rollers; and track means substantially longer than the width of said platform and adapted to be affixed to a vertical rear surface of a tabletop; said track means defining an elongated upwardly-facing guide channel for receiving said rear flange extension and for guiding movement of said platform therealong.

4,732,090

HEATING FURNACE FOR RECOVERY OF ENERGY FROM COMPACTED PAPER, STRAW AND LIKE FUELS

Heinrich Bollmann, Sr., and Heinrich Bollmann, Jr., both of Woltwiescher Strasse 17, D-3201 Söhlde, Fed. Rep. of Germany

PCT No. PCT/DE85/00220, § 371 Date May 1, 1986, § 102(e) Date May 1, 1986, PCT Pub. No. WO86/00390, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 28, 1985, Ser. No. 852,959
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424193
Int. Cl.[4] F23B *1/28, 1/38*
U.S. Cl. 110—196 24 Claims



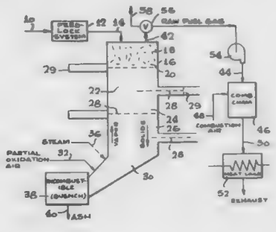
1. A furnace for combustion of bales of compressed paper, straw and like combustible materials, comprising walls defining an elongated channel having a first end for admission of bales and a second end; a combustion chamber adjacent to said second end; means for advancing the bales in said channel toward and into said chamber; and means for heating said walls from the outside so as to heat the bales in said channel on their way into said chamber, said heating means comprising a duct which conveys flames and combustion products and extends from said combustion chamber, above said channel and toward said first end, a first flue arranged to receive combustion products from said duct and extending above said channel from the first toward the second end thereof, and additional flues receiving combustion products from said first flue and extending along the sides of said channel.

4,732,091

PYROLYSIS AND COMBUSTION PROCESS AND SYSTEM

Orval E. Gould, Mission Viejo, Calif., assignor to G.G.C., Inc., Santa Ana, Calif.

Filed Sep. 30, 1985, Ser. No. 781,465
Int. Cl.[4] F23G *5/027, 5/16*
U.S. Cl. 110—229 24 Claims



1. A process for pyrolysis and combustion of combustible solid material which comprises:
introducing combustible solid feed material containing volatile matter into an upper section of a pyrolysis chamber having a lower section and a bottom,
moving said material downwardly at a controlled rate through multiple stage zones in said pyrolysis chamber, said multiple stage zones being provided by a series of spaced vertically disposed horizontally moveable grates in said pyrolysis chamber,
depositing carbon char in the lower section of the pyrolysis chamber,
introducing air into the lower section of said pyrolysis chamber and partially oxidizing said char to form hot gaseous products,
passing said hot gaseous products of the partial oxidation of said carbon char upwardly countercurrent to the movement of said solid material in said pyrolysis chamber, and driving off said volatile matter in said solid material in a multistage equilibrium process, wherein substantial reaction equilibrium is achieved in each of said stage zones in the pyrolysis chamber between the solid combustible feed material and said upwardly passing hot gaseous products,
removing ash and other non-combustible material from the bottom of said chamber,
removing a hot overhead fuel gas comprised of said volatile matter from the solid material and the hot gaseous products of the partial oxidation of the carbon char,
passing said overhead fuel gas to a combustion chamber for combustion thereof with air,
subjecting said overhead fuel gas to combustion in said combustion chamber, and
applying the resulting hot combustion gases exiting the combustion chamber to a heat load.

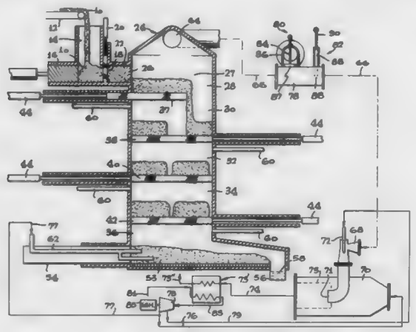
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,092

PYROLYSIS AND COMBUSTION APPARATUS

Orval E. Gould, Mission Viejo, Calif., assignor to G.G.C., Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 781,465, Sep. 30, 1985. This application Dec. 30, 1986, Ser. No. 947,866
Int. Cl.[4] F23G 5/12
U.S. Cl. 110—229 13 Claims



1. A system for pyrolysis and combustion of combustible solid material which comprises

a pyrolysis chamber having an upper section and a lower section,

a feed-lock apparatus for feeding combustible solid feed material into the upper section of said pyrolysis chamber, said feed-lock apparatus including a hopper for receiving particulate feed material, means for compressing the particulate feed material into a compacted block, and means for introducing the compacted block into said upper section of the pyrolysis chamber,

a series of spaced, vertically disposed, horizontally movable grates in said pyrolysis chamber, forming a plurality of stages in said pyrolysis chamber and permitting downward movement of the solid material at a controlled rate through said stages counter current to the upward flow of hot gaseous products of the partial oxidation of carbon char, and driving off volatile matter in the solid material,

means for introducing air into each of said stages,

means for introducing additional air into the lower section of said pyrolysis chamber into contact with carbon char deposited therein from the solid material, for partially oxidizing the carbon char, and forming hot gaseous products,

means for removing ash and other non-combustible material and carbon, from the bottom of said chamber, and

means for removing a hot overhead fuel gas from said pyrolysis chamber.

4,732,093

ANNULAR NOZZLE BURNER AND METHOD OF OPERATION

Eric Hansen, Shawnee, Kans., and James R. Tucker, Richmond, Va., assignors to J. R. Tucker and Associates, Richmond, Va.

Filed Feb. 11, 1986, Ser. No. 828,401
Int. Cl.[4] F23D 1/04
U.S. Cl. 110—347 27 Claims

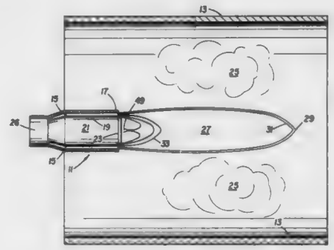
1. a method of burning fuel in a burner having an annular-nozzle for injecting primary air and fuel into secondary air of a combustion chamber, said method comprising the steps of:

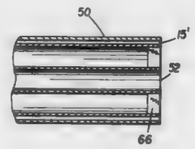
directing said fuel into said secondary air through said annular nozzle so that said fuel is delivered essentially only therethrough;

generating a compact flame by inhibiting dispersion of fuel particles and concentrating said fuel particles in a primary combustion area of said flame; and,

maintaining a sufficient velocity of said fuel particles relative to said secondary air to thereby obtain a high rate of radiant heat transfer between said fuel particles.

15. A method of burning fuel in a burner of the type including a source of fuel particles; an inner core area; and, means for





delivering said fuel into a combustion chamber, said method comprising the steps of:

ejecting said fuel into said combustion chamber only through a fuel feed area substantially surrounding said inner core area; and,

inhibiting radial dispersion of said fuel particles and concentrating said fuel particles in a primary combustion area.

4,732,094

MECHANISM FOR STORING, SINGULATING AND PLANTING WOODY CUTTINGS

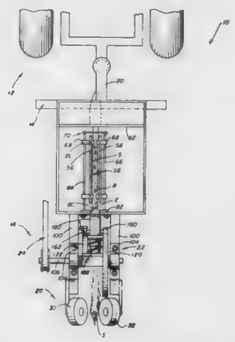
Roy J. Kangas, Dodgeville, and Edsel D. Matson, Hancock, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 25, 1986, Ser. No. 878,151
Int. Cl.[4] A01C 11/00
U.S. Cl. 111—3 15 Claims

1. A method of planting woody cuttings comprising:

storing the cutings in a liquid during a planting process;

automatically singulating those cuttings while maintaining them moist by submerging the cuttings in the liquid, permitting the cuttings to float to the surface of the liquid, and vertically spacing the cuttings from each other as they float to the surface of the liquid; and,



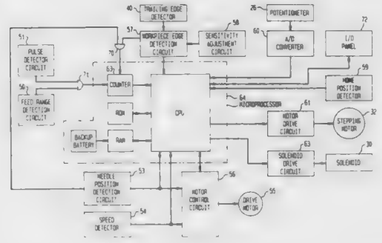
automatically removing the topmost cutting of the vertically spaced cuttings and planting that removed cutting.

4,732,095

SEWING MACHINE FOR AUTOMATICALLY SEWING NEAT SEAM ENDS

Kazuo Saito, Hachioji; Sumio Goto, Tokyo; Jiro Ishibashi, Tokyo, and Masakazu Nemoto, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,954
Claims priority, application Japan, Apr. 27, 1985, 60-91724
Int. Cl.[4] D05B 19/00, 27/22
U.S. Cl. 112—121.11 4 Claims



2. A sewing machine stitch control apparatus, comprising:

a feed dog for feeding a workpiece in a forward direction in synchronism with rotation of a main drive shaft of a sewing machine;

regulator means for incrementally regulating the feed of the feed dog in response to motion of a connecting means,

manual adjustment means for establishing an initial feed pitch, said manual adjustment means being connected to said regulator means;

connecting means for providing said motion to the regulator means, the connecting means being movable along a path within a predetermined range and in a predetermined direction;

detecting means for detecting a trailing edge of a workpiece, said detecting means being located forwardly of a reciprocating needle of the sewing machine;

first means for generating pulses in synchronism with the rotation of said main drive shaft and for counting said pulses while said feed dog is feeding the workpiece;

second means for determining, from the number of pulses counted by said first means, an amount of feed remaining after a stitch point on the workpiece, upon detection of said trailing edge by said detecting means;

third means for determining a reduced feed pitch which is less than said initial feed pitch, and corresponds to a total feed amount between said stitch point and a predetermined point;

fourth means for computing, from said initial feed pitch and said reduced feed pitch, an average feed pitch;

first driving means for moving the connecting means in said predetermined direction;

setting means being engagable with the connecting means along said path and being displacable along said predetermined direction when so engaged to vary the feed of the feed dog;

second driving means for displacing the setting means and thereby varying said feed of the feed dog;

fifth means for determining, upon detection of said trailing edge by said detecting means, a time at which said first driving means should be operated;

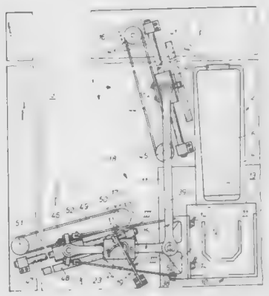
control means for driving the second driving means to displace the setting means to the position corresponding to that feed pitch computed by the fourth means and subsequently driving the first driving means at said time determined by said fifth circuit means.

4,732,096

DEVICE FOR CONTROLLING THE POSITIONING OF A WORKPIECE IN A SEWING MACHINE

Gunther Mall, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff AG, Fed. Rep. of Germany

Filed Aug. 7, 1987, Ser. No. 83,702
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626761
Int. Cl.[4] D05B 21/00, 69/36
U.S. Cl. 112—121.12 11 Claims



1. A sewing station for a sewing machine having a feed device, comprising a holder for the workpiece being stitched connected to said feed device being driven thereby to execute a predeterminable motion, a monitor movable as a function of the motion of said holder having a marking corresponding to a predetermined motion, a sensor scanning said marking, a control circuit connected to said sensor and to said feed device and emitting switching signals to said feed device when said holder for the product being stitched deviates from a predetermined motion.

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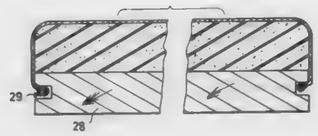
4,732,097

PROCESS FOR SEWING AND FOLDING A FLEXIBLE WORK PIECE

Christian Guilhem, Route Nationale 20, 82350 Albias, France

Filed Nov. 18, 1986, Ser. No. 932,178
Claims priority, application France, Nov. 20, 1985, 85 17743
Int. Cl.[4] D05B 97/00
U.S. Cl. 112—269.1 13 Claims





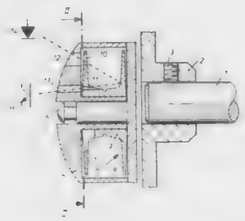
1. A process of covering an object with a flexible cover, said object having a front side to be covered and comprising in combination cutting out a flexible piece (25) having a shape corresponding to that of the front side of the object and an additional border (25*a*) along its contour, stitching into said border (25*a*) at the edge of the piece at least one auxiliary thread (4) in such a manner as to form an overcast at the edge of the piece for providing an overcast passage extending along said border and placing a tensioning thread (5) in said overcast passage between a stitching line (Pq) of the auxiliary threads in the material and an outer line (Pa) hooking up the threads to each other in such a manner that the tensioning thread can slide within and along said passage with thread lengths projecting at both ends (5*a*, 5*b*), covering the front face of the object with the piece in such a manner that the border provided with the tensioning thread extends beyond the object contour, folding back said border at the edge of the object and applying tension to the two ends (5*a*, 5*b*) of the tensioning thread to shorten the length of the tensioning thread within said passage and to tighten and fold said border, and locking the ends of the tensioning thread after tension is applied.

4,732,098

THREAD MONITOR FOR THE BOTTOM THREAD IN THE BOBBIN OF A SEWING MACHINE

Bernhard Mertel, and Erich Willenbacher, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinenen GmbH, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,077
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 8516211[U]
Int. Cl.[4] D05B 51/00, 69/36
U.S. Cl. 112—278 2 Claims



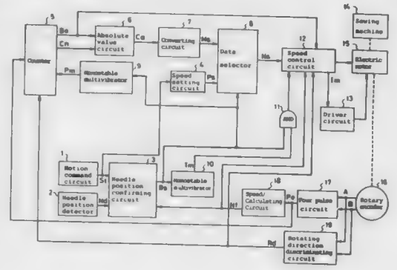
1. A thread monitor for a sewing machine having a lockstitch rotary hook comprising a bobbin capsule connected to the rotary hook and defining an inner space with an axis, a bobbin mounted for rotation in the space around the axis, said bobbin having a hub with an outer truncated cone-shaped region and a pair of flanges connected at space locations to said hub, said capsule having an inlet opening communicating with said space and an outlet opening spaced from said inlet opening and communicating with said space, at least one flange having an inlet opening alignable with said inlet opening of said capsule and an outlet opening alignable with said outlet opening of said capsule and extending substantially parallel to said axis through a portion of said truncated cone-shaped hub, a radiation source positioned to shed radiation on said inlet opening of said capsule and a radiation detector positioned to receive light from said outlet of said capsule which is reflected from said bobbin.

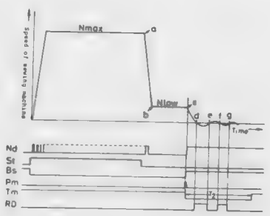
4,732,099

MOTOR CONTROLLER FOR A SEWING MACHINE

Shigeo Neki, Osaka; Kenichi Ohara, Hirakata; Nobuho Shibata, Katano, and Takashi Dohi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 4, 1986, Ser. No. 926,532
Claims priority, application Japan, Nov. 6, 1985, 60-248215
Int. Cl.[4] D05B 69/26
U.S. Cl. 112—275 6 Claims





1. A motor controller for a sewing machine, comprising:
pulse generating means for generating plural pulse signals for each rotation of a motor shaft,
speed measuring means for measuring rotational speed of said motor shaft and for generating a signal representative of a measured rotational speed of said motor shaft,
needle position detecting means for detecting the position of a needle and for generating a needle position signal,
motion command means for commanding the starting or stopping of rotation of said motor shaft,
speed setting means for setting the rotational speed of said motor shaft and for generating a lower speed setting signal when a stop signal is generated by said motion command means,
speed control means for controlling the rotational speed of said motor shaft,

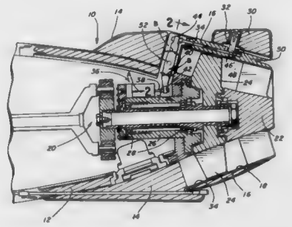
needle position confirming means for confirming the position of said needle and for generating a position control command signal when said signal representative of a measured rotational speed reaches a lower speed set by said lower speed setting signal, and said needle position signal is detected,
counter means for counting the number of said pulse signals by receiving said position control command signal from said needle position confirming means and for generating a first speed setting signal which is reduced to zero when the counted number of pulse signals reaches a predetermined value,
converter means for converting an output of said counter means into a second speed setting signal, and
switching means for disabling said lower speed setting signal from said speed setting means and for enabling said second speed setting signal from said converter means in response to said position control command signal.

4,732,100

ACTUATION SYSTEM FOR TORPEDO CONTROL SURFACES

Daniel R. Dobbs, Sunnyvale, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1986, Ser. No. 944,927
Int. Cl.[4] F42B 19/01
U.S. Cl. 114—23 17 Claims



10. An interior actuation system for controlling an exterior control surface of a torpedo or the like which has an afterbody with radial inlet vanes defining inlet liquid passages to the propellers of the torpedo, comprising
actuation means in the afterbody;
crank means connected at one end to the actuation means and extending radially outwardly therefrom through at least one of said inlet vanes; and
means operatively connecting the opposite end of the crank means to the exterior control surface.

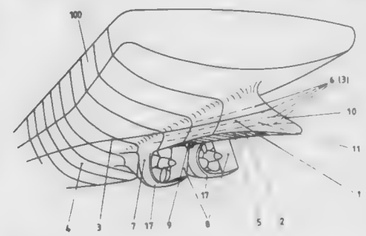
4,732,101

STERN APRON FOR ICE BREAKERS

Günter Varges, Emden, Fed. Rep. of Germany, assignor to Thyssen Nordseewerke GmbH

Filed Jun. 26, 1986, Ser. No. 878,802
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523763
Int. Cl.[4] B63B 35/08
U.S. Cl. 114—41 9 Claims

1. A stern apron above propellers and rudders on an ice breaker, said ice breaker including a hull having a bow, a stern and an afterbody extending from the stern toward the bow, said stern apron comprises a volumetric body extending downwardly from said afterbody and rearwardly of said propellers and rudders and tapering in a streamlined manner to a sharp end toward the stern, said volumetric body having lower outer edges extending in the bow-stern direction and spaced below said afterbody and said lower outer edges being wider than said volumetric body in the region between said afterbody and said lower outer edges, said volumetric body being integrated into the shape of said afterbody, said hull having a median plane extending upwardly and in the bow-stern direction and upwardly extending frame planes extending transversely of the median plane, and said volumetric body having water lines



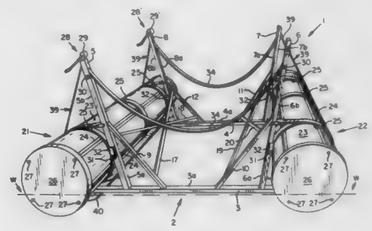
including an ice breaking line extending generally in the bow-stern direction and forming an angle of less than 20° with respect to the median plane.

4,732,102

PORTABLE, SELF-CONTAINED, SELF-ADJUSTABLE CRAFT LIFT AND WET/DRY STORAGE SYSTEM

Clifford W. Holman, 27700 NE. 132nd Ave., and Ralph V. Peabody, 21101 NE. 267th St., both of Battle Ground, Wash. 98604

Continuation of Ser. No. 837,675, Mar. 10, 1986, abandoned.
This application Jun. 5, 1987, Ser. No. 59,148
Int. Cl.[4] B63B 35/34
U.S. Cl. 114—45 21 Claims



1. A portable, self-contained, self-adjusting craft lift and storage system, designed for both wet and dry craft storage, which comprises:
(a) longitudinally-extending frame means for supporting a craft during the raising, lowering and said wet and dry storage of said craft;
(b) a pair of longitudinally-extending, spaced-apart pontoon means connected to said structural frame means for buoyantly supporting in water said frame means during the raising, lowering and wet storing of said craft; and
(c) a plurality of lift means each of which is secured to the underside of both of said pontoon means, said pontoon means coacting with said frame means to provide self-adjustability to said system, said craft being raised by said lift means pulling said pontoon means in a downward direction with respect to said frame means which in turn moves said frame in a upward direction, and said craft being lowered by said lift means by moving said pontoon means in an upward direction with respect to said frame means which in turn moves said frame means in a downward direction.

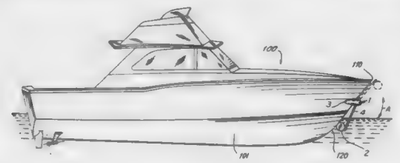
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,103
METHOD OF CONVERTING AN OCEAN CARGO BARGE INTO AN OFFSHORE MANNED SERVICE BARGE
John C. Culbertson, Houston, Tex., assignor to Martech International, Inc., Houston, Tex.
Filed Oct. 25, 1985, Ser. No. 791,573
Int. Cl.[4] B63B *9/00*
U.S. Cl. 114—65 R 7 Claims



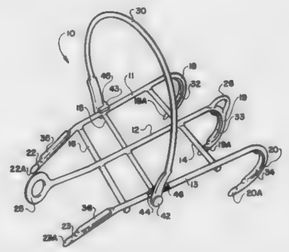
1. A method of rapidly and economically converting an unmanned ocean cargo barge to a manned service and construction barge comprising the steps of:
a. mounting to the deck of the cargo barge a central services module having electrical controls, water systems and other manned utilities for distributing power and utilities therethrough;
b. affixing to the deck of the barge a plurality of living quarters modules thereby providing the crew with complete sleeping and bathroom facilities;
c. attaching to the deck of the barge a kitchen module to provide the barge with a food preparation and storage area; and
d. installing interconnecting piping and wiring from said central services module to said living quarters and kitchen modules.

4,732,104
BOW THRUSTER
Frank Roestenberg, 47 Park Ave., Port Washington, N.Y. 11050
Continuation-in-part of Ser. No. 785,587, Oct. 8, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 909,189
Int. Cl.[4] B63H *25/46*
U.S. Cl. 114—151 22 Claims



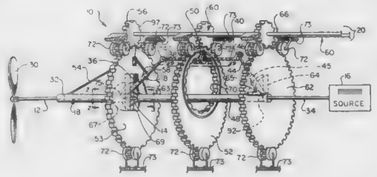
1. A pivotal bow thruster, adapted to be adjustably situated with respect to a stem of a boat, comprising
means for thrusting the bow substantially to port or to starboard, comprising
tow propellers,
means for actuating spinning of said propellers, and
a support for said propellers, and
means for pivoting said thruster about the stem of the boat, comprising
a pivoting arm engaged with said propeller support,
means for actuating pivoting of said pivoting arm,
a gear train engaged with said pivoting arm and with said pivoting actuating means, and
a support adapted to be mounted on the stem of the boat and supporting said pivoting actuating means,
wherein said support for said pivoting actuating means comprises a substantially V-shaped seat adapted to snugly seat against the stem of the boat and having laterally adjustable seat portions for varying of an angle therebetween.

4,732,105
BOAT ANCHOR
Roger Fisher, Rte. 2, Box 108, Stanley, N.C. 28164
Filed Nov. 28, 1986, Ser. No. 935,757
Int. Cl.[4] B63B *21/34*
U.S. Cl. 114—301 11 Claims



1. A boat anchor for holding in bottom material such as sand and mud, and comprising:
(a) first and second elongate, longitudinally extending runners, a one end of each of said runners defining a rear spike and the other one of each of said runners defining a front spike whereby substantially translational movement of the runners relative to the bottom drives the front and rear spikes into the bottom material, said rear spikes defining an acute angle and said front spikes defining an obtuse angle relative to the runner intermediate said rear and front spikes;
(b) at least one transversely extending tie bar to which said first and second runners are secured in spaced-apart registration with each other;
(c) means for attaching the anchor to a line.

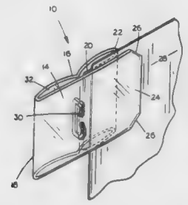
4,732,106
STEERING CONTROL FOR SUBMARINES AND THE LIKE
Anis I. Milad, 2938 Yorkway, Baltimore, Md. 21222
Filed Jul. 22, 1986, Ser. No. 887,921
Int. Cl.[4] B63G *8/16*; B63H *5/12*
U.S. Cl. 114—338 13 Claims



1. A steering apparatus for steering an article or material, said steering apparatus, comprising:
means for changing direction of the steered article or material;
means for both tilting and rotating said direction changing means;
means for tilting said means for both tilting and rotating said direction changing means; and
means for rotating said means for both tilting and rotating said direction changing means, wherein said tilting means is comprised of first varying length strut means connected to an angled projecting means, threaded bar means, first joint means for connecting said threaded bar means to said first varying length strut means, second varying length strut means, second joint means for connecting said threaded bar means to said

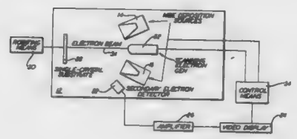
second varying length strut means, receiving sleeve means which telescopically receives said second varying length strut means, second sleeve means connected to said receiving sleeve means, internally threaded and externally toothed first tilt gear means mounted on said threaded bar means by threaded engagement, eccentric second tilt gear means engaging said first tilt gear means for rotating said first gear means along said threaded bar means and for raising and lowering said threaded bar means which raises and lowers said angled projecting means, thereby tilting said direction changing means.

4,732,107
REMOVABLE PAGE MARKER
Edwin W. Jacobsen, 1928 S. 62nd St., Omaha, Nebr. 68106
Filed Apr. 13, 1987, Ser. No. 37,934
Int. Cl.[4] B42D *9/00*; B42F *21/00*
U.S. Cl. 116—237 10 Claims



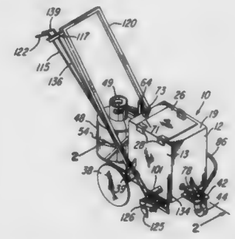
1. A removable page marker, comprising a generally rectangular sheet material folded upon itself to form an upper and lower leg extending from the fold thereof and generally parallel to each other, said upper leg having a portion of its free end bent back upon itself and extended between said upper and lower leg so as to be yieldably biased against said lower leg, said page marker adapted to receive the edge of a sheet of paper between the bent back end portion of said upper leg and said lower leg.

4,732,108
APPARATUS FOR MONITORING EPITAXIAL GROWTH
L. Peter Erickson, Minneapolis, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 26, 1986, Ser. No. 900,568
Int. Cl.[4] H01L *21/203*
U.S. Cl. 118—713 10 Claims



1. Apparatus for monitoring epitaxial crystalline growth comprising, in combination:
first means for mounting a single crystal substrate surface;
second means for applying epitaxial material to said substrate surface;
third means for impinging an electron beam upon said substrate surface to emit secondary electrons therefrom, said third means comprising a scanning electron gun disposed about normal to said substrate; and fourth means for detecting said secondary electrons emitted and for outputting a corresponding signal;
said first means, second means, third means and fourth means being mounted in a vacuum chamber.

4,732,109
MOBILE SEALANT APPLICATOR FOR ROAD JOINTS AND CRACKS
Russell D. Selby, Houston, Ohio, assignor to Schess Equipment Co., Inc., Piqua, Ohio
Filed Mar. 30, 1987, Ser. No. 31,423
Int. Cl.[4] B05C *11/04, 5/02*
U.S. Cl. 118—713 16 Claims



1. Mobile applicator apparatus for applying a fluid sealant to cracks and joints in a road surface, comprising a container for receiving a supply of the sealant, a set of wheels supporting said container for movement along the surface, a push-type handle member projecting rearwardly fromm said container, an elongated burner tube extending through a portion of said container, a heater tube surrounding said burner tube, means for connecting said burner and heater tubes to define a chamber therebetween, means for supplying a heat exchange liquid to said chamber, a fuel burner nozzle for directing a flame axially into said burner tube to heat the heat exchange liquid and the fluid sealant within said container, a discharge tube extending laterally from a lower portion of said container and having an outlet for discharging the heated sealant from said container, a valve member mounted on said discharge tube and movable between open and closed positions adjacent said outlet, control means extending from said handle member for manually moving said valve member to control the flow of heated sealant from said outlet, means mounted on said container for supporting a propane fuel tank, a line connecting said propane fuel tank to said nozzle, and a squeegee member disposed rearwardly of said outlet adjacent the road surface for spreading the sealant discharged from said outlet onto the surface when said valve member is in said open position.

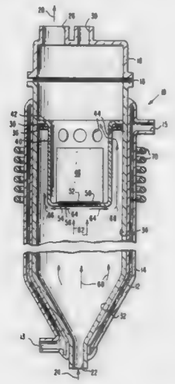
4,732,110
INVERTED POSITIVE VERTICAL FLOW CHEMICAL VAPOR DEPOSITION REACTOR CHAMBER
James D. Parsons, Newbury Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 489,919, Apr. 29, 1983, abandoned. This application Apr. 20, 1987, Ser. No. 45,258
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—719 16 Claims

1. A chemical vapor deposition (CVD) reactor system comprising a vertical reactor chamber, a source of a reactant gas compound having a deposition component as a fraction thereof, means for introducing said reactant gas compound into said reactor chamber, and a substrate having a major surface suitable for receiving said deposition component, wherein said reactor chamber comprises:
(a) a pedestal having
means for securing said substrate to said pedestal such that

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said major surface is exposed facing downward and having means above said substrate for removing any residual amounts of said reactant gas components and any residual decomposition reactant products;

(b) means for heating said substrate to a temperature sufficient to induce the decomposition of said compound when provided in close proximity with the exposed surface of said substrate;



(c) said reactor chamber being constructured so as to induce a vertical upward plug flow of said compound introduced into said reactor chamber to be positively directed into close proximity with the exposed surface of said substrate, so that said decomposition component is positively directed onto the exposed major surface of said substrate.

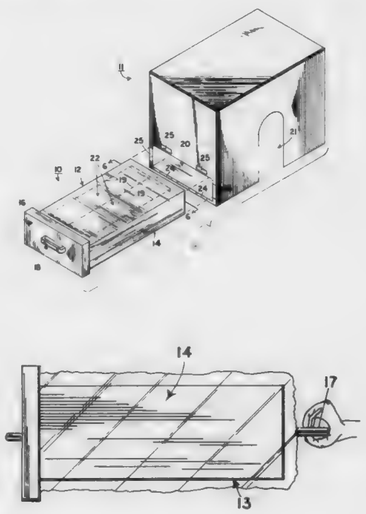
4,732,111
DISPOSABLE LITTER BOX
William J. Runion, 202 Crews St., Winston-Salem, N.C. 27101
Filed Jan. 12, 1987, Ser. No. 2,613
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **14 Claims**

1. A litter box comprising a tray, said tray forming a storage compartment along one end, a flexible cover member, said cover member attached to said tray, said cover member positionable from within said compartment to an extended position whereby said cover member in the extended position covers said tray.

12. A litter box and housing in combination comprising:

(a) a disposable tray, an enlarged end, said end attached to said tray, said end forming a storage compartment around said tray, a flexible sleeve, said sleeve attached to said enlarged end around said tray, a sleeve handle, and handle affixed to said sleeve, said handle having fastening means positioned thereon,

(b) the housing defining a first opening for receiving said disposable tray and defining a second opening for entry by a pet, said first opening having housing fastening means attached proximate thereto on the outer surface of the housing, said housing fastening means being complementary to said handle fastening means for connection therewith.



4,732,112
BIRD FEEDER
Ronald C. Fenner, Ithaca, and Brian A. Fenner, Groton, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Aug. 8, 1986, Ser. No. 894,533
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—52 R **9 Claims**



1. A bird feeder which comprises:

a container for holding a supply of feed, said container including a neck portion having external closure-engaging means;

an annular connecting member having an upper end and a lower end, and having internal engaging means cooperating with said external closure-engaging means on said container, to secure and hold said connecting member on said container neck;

tubular conduit means having an upper end attached to said annular connecting member and having a lower end;

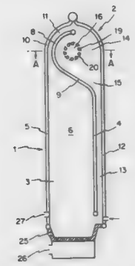
a feed-receiving cup attached to said lower end of said conduit means;

dispensing ports in said conduit means proximal to said lower end of said conduit means to permit feed to flow through said conduit from said container into said cup;

cover means connected to the lower end of said connecting member and flaring outwardly and downwardly therefrom to shield said cup from contaminants; and

a perch secured to said cup.

4,732,113
PARTICLE SEPARATOR
Folke Engström, San Diego, Calif., assignor to A. Ahlstrom Corporation, Karhula, Finland
Filed Mar. 9, 1987, Ser. No. 23,570
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **21 Claims**



1. A particle separator for separating solids and gases in a hot gas stream having solids entrained therein comprising:

a cyclone chamber having an axis and means for guiding the hot gas stream with entrained solids about an axis;

an inlet duct in communcation with said cyclone chamber for introducing the stream into said cyclone chamber;

at least one outlet for said cyclone chamber for removing solids separated from the stream in the cyclone chamber; and

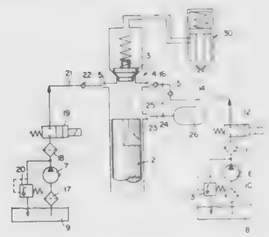
a conduit disposed in said cyclone chamber extending generally in an axial direction and having a gas outlet, said conduit being formed by a plurality of tubes extending generally in said axial direction with said tubes adapted to receive a coolant, said tubes defining a plurality of slots therebetween providing for passage of the gas from the cyclone chamber into said conduit and through said gas outlet.

4,732,114
PROCESS FOR PRODUCING A DIESEL-FUEL/WATER EMULSION FOR A DIESEL ENGINE
Klaus Binder, Deizisau, and Gerd Seidel, Aichwald, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Jul. 3, 1986, Ser. No. 881,925
Int. Cl.[4] F02M *25/02*
U.S. Cl. 123—25 E **15 Claims**

1. Process for producing a diesel-fuel/water emulsion for a diesel engine comprising:

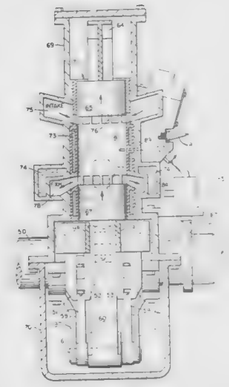
supplying different quantitative proportions of water and diesel fuel as a function of the operating condition of the engine, said supplying including leading said water and diesel fuel quantities separately to an intake side of an injection pump;

mixing said quantitative proportions in a pump cylinder; storing temporarily a non-injected highly pressurized excess quantity of mixture in a constant volume accumulator; and



providing said excess quantity to the injection pump during a subsequent intake stroke.

4,732,115
INTERVAL SPARK IGNITION COMBUSTION ENGINE
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.
Continuation-in-part of Ser. No. 446,702, Dec. 3, 1982, Pat. No. 4,543,917, and a continuation-in-part of Ser. No. 237,667, Feb. 24, 1981, Pat. No. 4,566,408, which is a continuation of Ser. No. 97,955, Nov. 28, 1979, abandoned, which is a continuation of Ser. No. 890,980, Mar. 28, 1978, abandoned. This application Nov. 21, 1985, Ser. No. 782,795
The portion of the term of this patent subsequent to Nov. 1, 2002, has been disclaimed.
Int. Cl.[4] F02B *25/08*
U.S. Cl. 123—51 B **10 Claims**



1. A two cycle internal combustion spark ignition engine comprising in combination:

(a) minimum of two side by side spaced apart axially parallel cylinders,

(b) a hollow guideway parallel to and positioned between said cylinders,

(c) one variable volume combustion chamber,

(d) air intake porting located in each cylinder wall at a first end of said combustion chamber, having an upstream end and a downstream end,

(e) exhaust porting located in each cylinder wall at a second end of said combustion chamber,

(f) means for delivering fuel into said cylinders approximately midway of the length of said combustion chamber, and when said combustion chamber is at its approximate

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minimum volume, said means including a precombustion chamber common to and in communication with said combustion chamber of each of said cylinders, said precombustion chamber being positioned outside of the plane of the axes of said cylinders,

(g) at least one spark plug for igniting a mixture of fuel and air in said combustion chamber,

(h) one cylindrical single headed pressure sealing valveless air intake controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing the combustion chamber and its connector end facing a first non-combustion end of said cylinder, said piston opening and closing said downstream end of said air intake porting as it slides past said air intake porting,

(i) a rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said air intake controlling pistons,

(j) dual rigid and operationally non-pivotal piston connector means extending from said piston bridging means, said piston connector means being adapted to link said piston bridging means with said air intake controlling pistons at said pistons' connector ends,

(k) bridge guide means extending from said piston bridging means into said hollow guideway for opening and closing said upstream end of said air intake porting as it slides past said air intake porting, said bridge guide means terminating in a connecting rod pivot means,

(l) one cylindrical single headed pressure sealing valveless exhaust controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing said combustion chamber and its connector end facing a second non-combustion end of said cylinders, said piston being adapted to open and close said exhaust porting as it slides past said exhaust porting,

(m) a second rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said exhaust controlling pistons,

(n) second dual rigid and operationally non-pivotal connector means extending from said second piston bridging means, said second piston connector means being adapted to link said second piston bridging means with said exhaust controlling pistons at said pistons' connector ends,

(o) a single crankshaft located between said parallel axes of said cylinders and between the two piston bridging means, the axis of said crankshaft being at right angles to the plane of said cylinders' parallel axis,

(p) at least two connecting rods between said two piston bridging means, one of said connecting rods being connected to pivot means of said bridge guide means and to said crankshaft and a second connecting rod connected to said second piston bridging means and to said crankshaft,

(q) said connections to said crankshaft being made to angularly spaced cranks carried by said single crankshaft, said angular spacing of said cranks being such that as the crankshaft rotates through 360°, said two piston bridging means and their respectively connected pistons are forced to move in opposite directions, the two air intake controlling pistons being reciprocated in unison and the two exhaust controlling pistons likewise being reciprocated in unison and wherein said air intake controlling pistons are forced to lag behind said exhaust controlling pistons in such a manner that said exhaust porting is forced to open prior to the opening of said air intake porting and said exhaust porting is forced to close prior to the closing of said air intake porting.

4,732,116

TWO-CYCLE INTERNAL COMBUSTION ENGINE

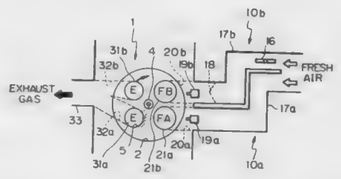
Toshio Tanahashi, Susono; Norihiko Nakamura; Michiaki Ujihashi, both of Mishima; Hiroshi Noguchi, Gotenba; Toshio Ito, Susono; Toyokazu Baika, Susono; Katsuhiko Hirose, Susono, and Kingo Horii, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 15, 1987, Ser. No. 61,976

Claims priority, application Japan, Jul. 2, 1986, 61-154231

Int. Cl.⁴ F02B *75/02*

U.S. Cl. 123—65 BA **4 Claims**



1. A two-cycle internal combustion engine comprising: a cylinder head having first and second intake ports for introducing fresh air into a combustion chamber and at least one exhaust port for discharging exhaust gas from said combustion chamber; an air charging means for supplying compressed fresh air to said intake ports; first and second intake valves and at least one exhaust valve for opening and closing said first and second intake ports and said exhaust port, respectively; and a valve operating means operated in response to a crank angle; characterized in that said engine further comprises:

an inlet air control valve for substantially closing said second intake port during an idling or light load running condition of the engine;

said valve operating means including a means for opening said exhaust valve earlier than said second intake valve and opening said first intake valve later than said second intake valve, while a speed of the downward movement of the piston is relatively high, so that a part of exhaust gas in said exhaust port flows back to said combustion chamber; and,

means for forming an exhaust gas swirl rotating around a cylinder axis of the combustion chamber when the exhaust gas flows from said exhaust port back to the combustion chamber, so that fresh air is slowly introduced onto said exhaust gas swirl in the combustion chamber during the idling or light load running condition.

4,732,117

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Toshio Tanahashi, Susono; Norihiko Nakamura; Michiaki Uzihashi, both of Mishima; Hiroshi Noguchi, Gotenba; Toshio Ito; Toyokazu Baika, both of Susono; Katsuhiko Hirose, and Kingo Horii, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 11, 1987, Ser. No. 60,611

Claims priority, application Japan, Jul. 2, 1986, 61-154229; Jul. 2, 1986, 61-154230

Int. Cl.⁴ F02B *75/02*

U.S. Cl. 123—65 PE **8 Claims**

1. A two-cycle internal combustion engine comprising: a cylinder head having at least one intake port for introducing fresh air into a combustion chamber and at least one exhaust port for discharging exhaust gas from said combustion chamber; an air charging means for supplying compressed fresh air to said intake port; intake and exhaust valves for opening and closing said intake and exhaust ports, respectively; and a valve operating means operated in response to a crank angle; characterized in that said engine further comprises:

a piston having a concavity on the top face thereof;

said valve operating means including a means for opening said exhaust valve earlier than said intake valve, when a speed of the downward movement of the piston is relatively high, so that a part of exhaust gas in said exhaust port flows back to said combustion chamber; and,

means for forming an exhaust gas swirl rotating around a cylinder axis of the combustion chamber when the exhaust gas flows from said exhaust port back to the combustion chamber;

said valve operating means further including a means for opening said intake valve so as to slowly introduce fresh air onto said exhaust gas swirl in the combustion chamber in the idling or light load condition.

4,732,118

TWO-CYCLE INTERNAL COMBUSTION ENGINE

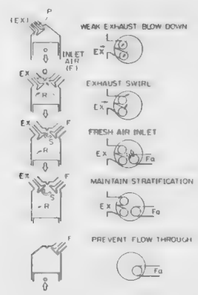
Toshio Tanahashi, Susono; Norihiko Nakamura; Michiaki Uzihashi, both of Mishima; Hiroshi Noguchi, Gotenba; Toshio Ito, Susono; Toyokazu Baika, Susono; Katsuhiko Hirose, Susono, and Kingo Horii, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 8, 1987, Ser. No. 59,603

Claims priority, application Japan, Jul. 4, 1986, 61-156284

Int. Cl.⁴ F02B *75/02*

U.S. Cl. 123—65 VD **3 Claims**



1. A two-cycle internal combustion engine comprising: a cylinder head having at least one intake port for introducing fresh air into a combustion chamber and first and second exhaust ports for discharging exhaust gas from said combustion chamber; an air charging means for supplying compressed fresh air to said intake port; an intake valve and first and second exhaust valves for opening and closing said intake port and said first and second exhaust ports, respectively; and a valve operating means operated in response to a crank angle; characterized in that said engine further comprises:

said valve operating means including a means for opening said first exhaust valve earlier than said second exhaust valve and said intake valve when a speed of the downward movement of the piston is relatively high, such that a part of exhaust gas in said first exhaust port flows back to said combustion chamber;

means for forming an exhaust gas swirl rotating around a cylinder axis of the combustion chamber when the exhaust gas flows from said first exhaust port back to the combustion chamber; and,

said valve operating means further including a means for opening said intake valve so as to slowly introduce fresh air onto said exhaust gas swirl during at least an idling or light load running condition of the engine.

4,732,119

INTERNAL COMBUSTION ENGINE

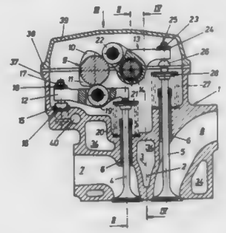
Helmut Melde-Tuczai; Skatsche Othmar, and Mario Sucher, all of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed May 19, 1986, Ser. No. 864,205

Claims priority, application Austria, May 22, 1985, 1548/85

Int. Cl.⁴ F01L *1/26*

U.S. Cl. 123—90.4 **3 Claims**



1. In an internal combustion engine which includes at least one cylinder, each cylinder defining a separate cylinder axis which extends in a common center plane; a crankshaft which defines a crankshaft axis that extends in said common center plane; a cylinder head; at least one pair of intake and exhaust ports which communicate with each cylinder, each intake port and each exhaust port of a pair of intake and exhaust ports being positioned opposite one another relative to said center plane; a movable valve associated with each intake port and each exhaust port; a common crankshaft that is located on one side of said center plane and extends in parallel therewith, said camshaft including at least one cam; a separate one-armed lever which is operated by a cam of said camshaft to move one of the valves associated with each pair of intake and exhaust ports; and a separate rocker lever which is operated by a cam of said camshaft to move a second of the valves associated with each pair of intake and exhaust ports,

the improvement wherein said camshaft is positioned above said cylinder head and includes a pair of cams associated with each cylinder, a first cam of each pair of cams contacting and operating an associated one-armed lever and a second cam of each pair of cams contacting and operating an associated rocker lever, each said second cam being axially displaced from each said first cam along said camshaft, wherein each said rocker lever is mounted on an axle which is positioned above said cylinder head the same distance that said camshaft is positioned above said cylinder head, and wherein each said rocker lever has a portion which extends in parallel with said camshaft.

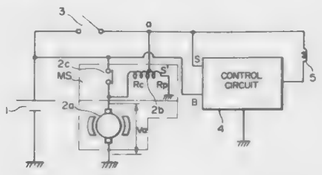
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,120

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE PROVIDED WITH PERMANENT MAGNET TYPE STARTING MOTOR

Shotaro Naito, Katsuta, and Taiji Hasegawa, Nakaminato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,716
Claims priority, application Japan, Feb. 20, 1985, 60-30448
Int. Cl.⁴ F02N *11/08*
U.S. Cl. 123—179 B **6 Claims**



1. An apparatus for controlling an internal combustion engine provided with a permanent magnet-type starting motor comprising:

a magnet switch having a switch contact connected between a power source and said starting motor and coil means including series and shunt coils for actuating said contact,

a first electric circuit for supplying an electric current from said power source to said starting motor through a key switch and said series coil,

a second electric circuit connecting a junction between said key switch and said series coil to said shunt coil for supplying an electric current from said power source through said key switch to said shunt coil,

start controlling means for controlling a given operation of said engine when said starting motor is actuated to rotate for starting the engine,

comparator means for comparing a voltage at said junction with a predetermined reference voltage thereby determining whether said starting motor is in a predetermined operating condition or not, said predetermined reference voltage being a voltage lower than a source voltage of said power source and higher than any voltage appearing at said junction between said key switch and said series coil when said starting motor rotates by inertia as said key switch is opened, and

means for actuating said starting controlling means upon detecting that said motor is in the predetermined operating condition.

4,732,121

RECOIL STARTER

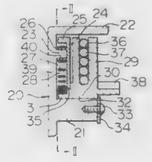
Hiromasa Miyata; Toshio Taomo, both of Tokyo, and Akira Nagashima, Kawasaki, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,726
Claims priority, application Japan, Mar. 24, 1986, 61-42737[U]
Int. Cl.⁴ F02N *3/02*
U.S. Cl. 123—185 BA **2 Claims**

1. A recoil starter comprising:

a cup-shaped casing having a circumferential wall portion and a bottom portion integrally having a drum mounting boss portion and an engagement projection which are directed axially inwardly;

a side plate integrally having an annular projection disposed in opposition to an inside of said bottom portion of said casing and an engagement hole to be engaged with said engagement projection of said bottom portion, said side plate integrally having a circumferential wall along its circumference and a boss portion insertion hole at its central portion; and



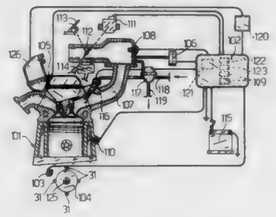
a spiral spring retained at one end to said annular projection of said side plate and kept in place in a spiral form within said circumferential wall of said side plate.

4,732,122

STARTING FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE, COMPRISING AN ELECTRONIC INJECTION SYSTEM

Michele Scarnera, Monzuno, and Carlo Conticelli, Bologna, both of Italy, assignors to Weber S.p.A., Turin, Italy

Filed Jun. 4, 1986, Ser. No. 870,430
Claims priority, application Italy, Jun. 4, 1985, 67511 A/85
Int. Cl.⁴ F02M *51/00*
U.S. Cl. 123—179 L **9 Claims**



2. A starting fuel supply system for an internal combustion engine (**101**), comprising an electronic injection system, characterized by the fact that said system comprises processing means (**102**) which, prior to stroke identification in said engine (**101**), cause fuel to be supplied to more than one injector (**116**), including the injector relative to that cylinder first reaching the ignition point subsequent to such identification, and which has already completed the induction stroke, thus enabling a substantially total intake of the fuel injected into said cylinder; further characterized by the fact that said processing means comprise means (**140, 141, 148, 149, 145, 151**) for detecting signals (S, C) from first sensor means (**103**) adapted to detect given angles of a drive shaft (**125**), and from second sensor means (**105**) adapted to detect given angles of a distributor (**126**) shaft, said detecting means (**140, 141, 148, 145, 151, 149**) controlling, as a function of said incoming signals (S, C), fuel supply to a given combination of said injectors (**116**).

4,732,123

SAFETY AIR SUPPLY FOR DIESEL ENGINE SHUTDOWN SYSTEMS

William H. Flora, New Caney, Tex., assignor to Stephen C. Ohm and Glen P. Johnson, both of Crosby, Tex., a part interest

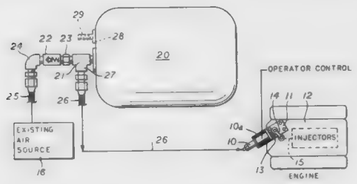
Filed Nov. 4, 1986, Ser. No. 926,546
Int. Cl.⁴ F02B *77/08*
U.S. Cl. 123—198 DB **12 Claims**

6. A pneumatic shutdown system for use on Diesel engines for moving the fuel injectors between an operative position and an inoperative position comprising;

an air cylinder having a movable piston operatively connected to the fuel injectors of the engine whereby movement of the piston causes movement of the fuel injectors between an operative firing position and an inoperative nonfiring position,

an enclosed air reservoir tank capable of being pressurized to contain a supply of pressurized air,

air control means on said reservoir tank including one-way valve means operative to allow air to enter said tank up to a predetermined pressure and thereafter maintaining a pressurized supply of air contained within said tank, and outlet means connected to the inlet of the air cylinder for moving the piston.



operator control means for selectively moving said valve means to an open position allowing the contained pressurized air in said tank to be directed through said outlet means to the inlet of the air cylinder of the existing pneumatic shutdown system thereby supplying sufficient air pressure to move the piston,

said operator control means comprising a solenoid valve cooperative with said air control means and controlled remote from the engine compartment for selectively releasing the contained pressurized air in said tank to the inlet of the air cylinder, and

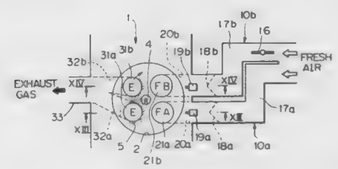
the movement of said piston causing movement of the fuel injectors between an operative firing position and an inoperative nonfiring position.

4,732,124

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Norihiko Nakamura, Mishima; Toshio Tanahashi, Susono; Michiaki Ujihashi, Mishima; Hiroshi Noguchi, Gotenba; Toshio Itoh, Susono; Katsuhiko Hirose, Susono; Kingo Horii, Susono, and Toyokazu Baika, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 21, 1987, Ser. No. 52,418
Claims priority, application Japan, Jun. 12, 1986, 61-135054; Jun. 27, 1986, 61-149705; Jun. 27, 1986, 61-149706; Jun. 27, 1986, 61-149707
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 123—302 **8 Claims**



1. A two-cycle internal combustion engine comprising: a cylinder head having at least one intake port for introducing fresh air into a combustion chamber and at least one exhaust port for discharging exhaust gas from said combustion chamber; an air charging means for supplying compressed fresh air to said intake port; intake and exhaust valves for opening and closing said intake and exhaust ports, respectively; and a valve operating means operated in response to a crank angle; characterized in that said engine further comprises:

an exhaust system having a means for substantially restraining a pulsation pressure of exhaust gas in said exhaust port during at least an idling or light load running condition of the engine;

said valve operating means including a means for opening said exhaust valve earlier than said intake valve when a speed of a downward movement of a piston is relatively high, such that a part of exhaust gas in said exhaust port flows back to said combustion chamber in the idling or light load conditions; and,

means for forming an exhaust gas swirl rotating around a cylinder axis of the combustion chamber when the exhaust gas flows back to the combustion chamber;

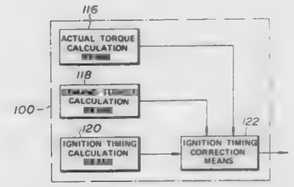
said valve operating means further including a means for opening said intake valve so as to slowly introduce fresh air onto said exhaust gas swirl in the idling or light load condition.

4,732,125

INTERNAL COMBUSTION ENGINE OUTPUT TORQUE CONTROL SYSTEM

Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

PCT No. PCT/JP84/00631, § 371 Date Aug. 29, 1985, § 102(e) Date Aug. 29, 1985
PCT Filed Dec. 28, 1984, Ser. No. 773,003
Claims priority, application Japan, Dec. 29, 1983, 58-245993; Dec. 29, 1983, 58-245994; Dec. 29, 1983, 58-245997
Int. Cl.⁴ F02P *5/15*
U.S. Cl. 123—422 **8 Claims**



1. An internal combustion engine output torque control system comprising:

first means for determining a basic spark advance angle based upon predetermined control parameters including an intake air flow rate, the first means being operable to determine an ignition timing in accordance with the relationship between said spark advance angle and the reference position of the engine crankshaft;

second means for calculating a difference between the torque demanded for the engine and the actual torque actually produced by the engine based on engine operating parameters including engine revolution speed, the second means being operable to determine said engine demand torque based upon said engine revolution speed and said intake air flow rate and said actual torque based upon the demand torque and the actual torque measured during the last cycle of the engine, and to determine a correction value used in correcting the ignition timing in a manner to reduce the difference between the actual torque and the demand torque; and

third means for correcting the ignition timing determined by the first means for the correction value determined by the second means to determine a corrected ignition timing, the third means being operable to generate an ignition signal at a predetermined timing corresponding to the corrected ignition timing.

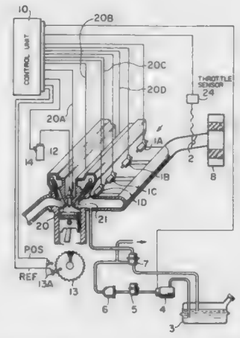
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,126

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kenji Ikeura, Zushi; Yoshihisa Kawamura, Yokosuka; Takeshi Atago, and Yasunori Mouri, both of Katsuta, all of Japan, assignors to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of, Japan

Filed May 6, 1987, Ser. No. 46,401
Claims priority, application Japan, May 10, 1986, 61-105843
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—435 1 Claim



1. A fuel control system for an internal combustion engine having at least one cylinder with an injector, comprising:
first means for inputting a throttle opening θ_{th} and an engine speed N_e to generate a basic injection pulse width T_p;
second means for detecting a peak value θ_{pmax} of pressures in said cylinder of said engine during each cycle thereof to calculate an average value θ_{pmax} of said peak values and determine whether a difference $(\theta_{pmax}-\theta_{pmax})$ between said average value θ_{pmax} and a peak value θ_{pmax} during each cycle is within a tolerance ϵ whereby when said difference is greater than said tolerance a correction factor α is established in a direction tending to decrease said difference;
third means for calculating an injection time T_i of said injector in accordance with said basic injection pulse width T_p from said first means and said correction factor α; and
fourth means for energizing said injector for the duration of said injection time T_i from said third means.

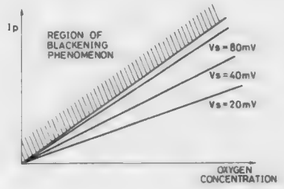
4,732,127

AIR/FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A FUNCTION FOR PREVENTING THE BLACKENING PHENOMENON OF OXYGEN CONCENTRATION SENSOR

Tomohiko Kawanabe; Masahiko Asakura; Katsuhiko Kimura, and Minoru Muroya, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1986, Ser. No. 905,434
Claims priority, application Japan, Sep. 21, 1985, 60-209841
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—440 2 Claims

1. An air/fuel ratio control system for an internal combustion engine, comprising:
an air supply passage connected to an air intake system of said internal combustion engine, for varying the air/fuel ratio of the mixture to be supplied to the engine;
an open/close valve disposed in said air supply passage for controlling the air flow in said air supply passage;
an oxygen concentration sensing unit disposed in an exhaust gas of the internal combustion engine, said sensing unit including an oxygen pump element and a sensor cell element which define a diffusion restricted region therebetween, each of said elements including a solid electrolyte member having oxygen ion permeability and a pair of electrodes sandwiching said electrolyte member therebetween;
current supply means for supplying a pump current across the electrodes of said oxygen pump element so as to keep constant voltage generated across the electrodes of said sensor cell element thereby causing said sensing unit to monitor a magnitude of said pump current which is substantially in proportion to the oxygen concentration in the exhaust gas;
valve open time period control circuit means connected to said oxygen concentration detection device, for determining the oxygen concentration of the mixture supplied to the engine by means of the magnitude of said pump current and calculating the open time period of said open/-close valve in each of a plurality of cyclic periods in response to the result of said determination every cyclic period;



valve drive means connected to said valve open time period control circuit means for opening said open/close valve for said calculated valve open time period in each of said cycles; and
control means responsive to output signals of said current supply means and said valve open time period control circuit means for stopping the supply of said pump current across the electrodes of said oxygen pump element when the valve open time period calculated by said valve open time period control circuit means exceeds a predetermined upper limit of valve open time period.

4,732,128

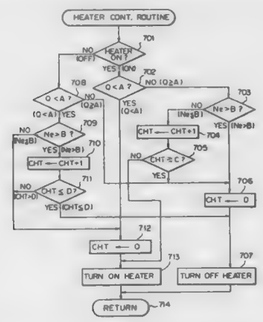
METHOD AND APPARATUS FOR CONTROLLING HEATER FOR HEATNG AIR-FUEL RATIO SENSOR

Mamoru Yoshioka; Kenichi Nomura; Kouichi Hoshi, and Takahide Izutani, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 2, 1987, Ser. No. 10,005
Claims priority, application Japan, Feb. 1, 1986, 61-19193
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—440 10 Claims

1. A method for controlling a heater for heating an air-fuel ratio sensor provided in an exhaust gas flow passage of an internal combustion engine comprising the steps of:
detecting a load parameter of said engine;
determining whether or not said load parameter is larger than a predetermined value;
detecting a rotational speed of said engine;
determining whether or not said rotational speed of said engine is larger than a predetermined value;
turning ON said heater when said load parameter is not larger than said predetermined value;
turning OFF said heater when said load parameter is larger than said predetermined value;
delaying the turning OFF of said heater with a predetermined delay time when said load parameter is larger than said predetermined value and said engine rotational speed is lower than said predetermined value; and

delaying the turning ON of said heater with a predetermined delay time when said load parameter is not larger than said predetermined value and said engine rotational speed is higher than said predetermined value.

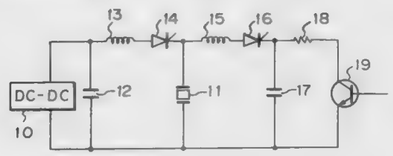


4,732,129

CONTROL APPARATUS FOR ELECTROEXPANSIVE ACTUATOR ENABLING VARIATION OF STROKE

Masahiro Takigawa, Nukata; Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio, and Kazuhide Watanabe, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 11, 1986, Ser. No. 850,696
Claims priority, application Japan, Apr. 15, 1985, 60-78529; Apr. 18, 1985, 60-81432; May 27, 1985, 60-112036
Int. Cl.[4] H01L *41/08*; B05B *3/14*
U.S. Cl. 123—478 34 Claims



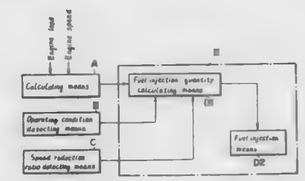
1. A control appartus for an electroexpansive actuator, comprising:
an electroexpansive actuator which has a stroke that is controlled in accordance with an amount of potential discharged therefrom;
means for supplying a potential to said electroexpansive actuator; and
means for controlling an amount of potential discharged from said electroexpansive actuator, comprising
(a) a capacitor, coupled to said electroexpansive actuator, for receiving a storing said potential discharged from said electroexpansive actuator as a stored potential, and
(b) means for controlling said stored potential of said capacitor before the charge is discharged from said actuator.

4,732,130

APPARATUS FOR CONTROLLING AIR-FUEL RATIO FOR INTERNAL COMBUSTION ENGINE

Michio Suzuki, Hekinan, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 17, 1986, Ser. No. 931,621
Claims priority, application Japan, Dec. 19, 1985, 60-286388
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—480 12 Claims



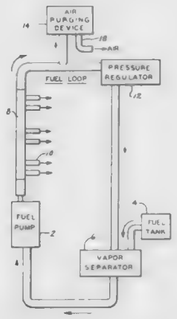
1. An apparatus for controlling an air-fuel ratio for an internal combustion engine, comprising:
calculating means for calculating a basic fuel injection quantity on the basis of an engine load and a rotational speed of said engine;
operating condition detecting means for detecting an operating condition of said engine;
speed reduction ratio detecting means for detecting a speed reduction ratio set in a transmission; and
control means which controls, when a predetermined operating condition is detected, the air-fuel ratio so as to be leaner than a stoichiometric air-fuel ratio on the basis of said basic fuel unjection quantity in such a manner that the air-fuel ratio is made progressively leaner than the stoichiometric air-fuel as the speed reduction ratio becomes smaller.

4,732,131

FUEL LINE PURGING DEVICE

Robert J. Hensel, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 26, 1986, Ser. No. 900,594
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—516 11 Claims



1. In a fuel injection system for an internal combustion engine having a fuel pump communicating with a fuel tank and delivering pressurized fuel through a pressure line to a fuel injector, the improvement comprising purging means for purging gas, including air and vapor, from said system, comprising:
a housing having an inlet communicating with said pressure line, and having an outlet;
pressure responsive valve means in said housing movable between an open position permitting flow from said inlet

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to said outlet, and a closed position blocking flow from said inlet to said outlet;

a first branch passage in said housing communicating between said inlet and one side of said valve means;

a second branch passage in said housing communicating between said inlet and the other side of said valve means;

restriction means in said second branch passage selected to provide a fuel pressure drop thereacross but not substantially dropping gas pressure thereacross, such that pressurized fuel in said inlet is transmitted through said first and second branch passages to respective said one and other sides of said valve means and causes a higher pressure on said one side of said valve means than on said other side of said valve means to close said valve means to said closed position, and such that gas in said inlet is transmitted through said first and second branch passages to respective said one and other sides of said valve means but does not cause sufficient pressure differential across said valve means to close same such that said valve means is in said open position.

4,732,132

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE USING A LINEAR-TYPE SOLENOID VALVE

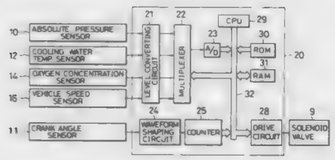
Hideo Kobayashi, Kawagoe; Kazuhito Kakimoto, Asaka; Yutaka Otobe, Shiki; Hitoshi Yamabe, Saitama; Hiroshi Hasebe, Hatogaya, and Norio Tomobe, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,794

Claims priority, application Japan, Jun. 28, 1985, 60-142706

Int. Cl.⁴ F02M *23/06, 23/08*

U.S. Cl. 123—587 **5 Claims**



1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and a throttle valve and an exhaust gas passage, comprising:

an air intake side secondary air supply passage leading to said intake air passage downstream from the throttle valve;

a solenoid valve disposed in said air intake side secondary air supply passage, the opening degree of said solenoid valve being varied continuously in response to the magnitude of a drive current supplied to a solenoid thereof so that a flow area of said air intake side secondary air supply passage is varied continuously;

first sensor means disposed in said exhaust gas passage for sensing the concentration of an exhaust gas component of the engine and producing a sensor output signal indicative of said concentration;

further sensor means for monitoring a plurality of parameters indicative of the operating state of said engine and operative to produce output signals indicative of the magnitude of said parameters; and

control means connected to each of said sensor means for effecting feedback control of the air-fuel ratio of the mixture to be supplied to said engine, said control means including means responsive to selected ones of said plurality of parameters representing the load on said engine for setting a base value, other than zero, of said drive current to be used in effecting such feedback control, and means responsive to said sensor output signal from said first sensor means for modifying the set base value of said drive current to determine a supply current value to be used in effecting such feedback control;

said control means also including current supply means connected to said solenoid of said solenoid valve for supplying said solenoid with drive current having the supply current value determined by said control means.

4,732,133

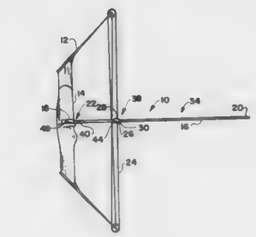
BOW SLIDER BLOCK

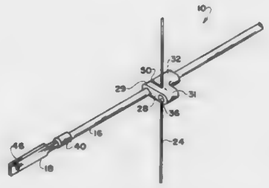
Edgar J. Chattin, 10819 Magnolia St., Riverview, Fla. 33569

Filed Sep. 8, 1986, Ser. No. 904,633

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—24 R **17 Claims**





1. An apparatus for propelling a projectile by the use of an archer's bow including a handle and a bowstring comprising:

an elongate bar means having an external configuration and a first and a second end;

said first end of said elongate bar means being securely positioned proximate the handle of the bow;

a slider block having a first and a second end;

an axial channel formed in said slider block and extending from said first end to said second end of said slider block to enable said slider block to be slidably received about said external configuration of said bar means in a tight fitting manner to enable wobble free and substantially friction free longitudinal movement along said bar means;

an attachment means for connecting the bowstring to said slider block;

said attachment means being positioned apart from said axial channel formed in said slider block;

a bore formed in said slider block and disposed at said first end of said slider block adjacent to said axial channel for holding the projectile;

a stop means for stopping said slider block;

said slider block being slidably moved along said elongate bar means proximate said second end of said elongate bar means when the bowstring is positioned in a drawn position and upon release of the bowstring, the force of the bow is transferred to the bowstring and said slider block to propel said slider block along said elongate bar means; and

said stop means releasing the projectile upon said slider block striking said stop means to enable the projectile to be releasably and forcibly propelled from said bore.

4,732,134

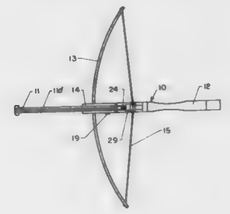
PROJECTILE SLIDE-PUSHERS FOR CROSS BOWS

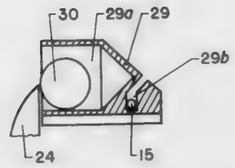
Shimon Waiser, P.O. Box 360 Midwood Station, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 536,545, Sep. 28, 1983, Pat. No. 4,593,675. This application Feb. 28, 1986, Ser. No. 834,552

Int. Cl.⁴ F41B *5/00;* **F41D** *10/00*

U.S. Cl. 124—25 **25 Claims**





23. In a cross bow comprising a stock having an external upper surface, a bow, a bow string, a pellet holder containing and pushing a pellet during a shot, said pellet holder having an external bottom surface, holding and releasing means for holding said pellet holder in a cocked position and for releasing said pellet holder from the cocked position, said external upper surface of said stock having a longitudinally extended guide surface conforming to the shape of said external bottom surface of said pellet holder for guiding of said holder during its movement on said external upper surface of the stock, the improvement including said pellet holder being made of rigid material as a one piece integral part and having connecting means for connecting with said bow string, said pellet holder having an original shape and keeping sid original shape during shooting, loading and during inactivity, said pellet holder having a forward facing part and a pellet recess in said forward facing part for containing pellets of different sizes during shooting, said recess having a rear part with a centering surface which centres a ball shaped pellet during a shot, said centering surface pushing said pellet on a line parallel to said longitudinally extended guide surface of the stock during a shot.

4,732,135

LATERALLY ADJUSTABLE ARROW REST

Niroslav A. Simo, 370 N. Delaplaine Rd., Riverside, Ill. 60546

Continuation-in-part of Ser. No. 482,186, Apr. 5, 1983, Pat. No. 4,548,188. This application Oct. 17, 1985, Ser. No. 788,486

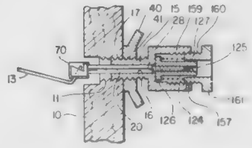
Int. Cl.⁴ F41D *10/00*

U.S. Cl. 124—41 A **16 Claims**

1. An arrow rest laterally adjustable with respect to a bow upon which it is mounted and having a pivotable arrow support arm which pivots forwardly upon release of an arrow and automatically returns to its initial position after discharge of an arrow comprising:

a receiving sleeve having a first portion fixedly attachable within a transverse through hole in a bow handle and an outer second portion sized to extend outwardly from said bow handle on the side away from said arrow when fixedly attached in said through hole, said sleeve having a through opening, said receiving sleeve first portion having external threads engageable with mating threads in a holding not which engages said receiving sleeve external threads and abuts said bow handle to secure said receiving sleeve in position in said through hole;

an elongated mounting means adapted to fit longitudinally movable within said sleeve through said opening and having a first end extending from said receiving sleeve first portion and receiving said support arm, and having an opposite second end extending from said receiving sleeve second portion through said opening;



said arrow support arm being pivotally attached to said mounting means first end, and being in communication with a first spring means capable of returning said arrow support arm to said initial position;

first adjustment means engaging said second end of said mounting means and engaging said second portion of said receiving sleeve, movement of said first adjustment means moving said mounting means longitudinally within said receiving sleeve, said first adjustment means comprising a holding sleeve retainable in stationary axial relation with respect to said mounting means; and

second adjustment means movable with respect to and along the axis of said mounting means adjusting the biased return force of a second spring means for return of said mounting means to its initial position following depression by the force of an arrow on its first end.

4,732,136

TOY-ARM IMITATING A FIRE-ARM

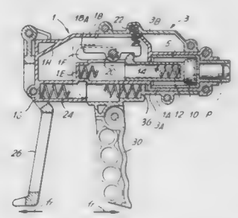
Giampiero Ferri, Via Vecchia Fiesolana n.74 S. Domenico (fraz. Com. Fiesole), Firenze, Italy

Filed Apr. 7, 1986, Ser. No. 849,193

Claims priority, application Italy, Apr. 12, 1985, 11616/85[U]; Apr. 12, 1985, 11617/85[U]; Jan. 3, 1986, 11502/86[U]

Int. Cl.⁴ F41B *11/00*

U.S. Cl. 124—67 **17 Claims**



1. A toy-arm configurated to imitate a portable fire arm which comprises:

a pair of first and second reciprocally movable carriers cooperatively and slidably assembled to provide a fire-arm having a first stroke of operation one with respect to the

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other which provides a bullet loading position in a barrel thereof and a second stroke in the opposite direction which provides a bullet-firing position from said barrel,

a handle located at one end of said first carrier, said first carrier having upper and bottom wall portions which are movably and slidably disposed within said second carrier, said second carrier having a handle for the manual use thereof with the handle of said first carrier during an operation stroke,

a fixed cylinder located in said first carrier coaxially aligned with a movably mounted cylinder in said second carrier which movable cylinder is capable of entering said fixed cylinder during a stroke operation, the aligned cylinders together having confined therein a reaction spring, said second carrier having retention means therein,

said movably mounted cylinder in said second carrier having coupling means thereon for coacting with said retention means in said second carrier for spring loading said movable cylinder during an operation stroke, and

means on said first carrier for coacting with said second carrier for releasing spring loading of said movable cylinder following an operation stroke.

4,732,137

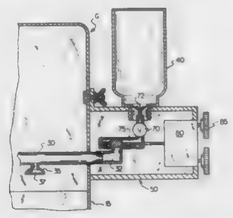
BASTING APPARATUS FOR BARBECUE GRILLS

Lee R. Parsons, 74 582 Candlewood, Palm Desert, Calif. 92260

Filed Dec. 4, 1986, Ser. No. 937,837

Int. Cl.[4] A47J *37/04*

U.S. Cl. 126—25 R **8 Claims**



1. A basting apparatus for applying a liquid basting sauce during the cooking of foods on a barbecue grill or smoking device; said basting apparatus comprising:

(a) a dispensing means having at least one spray head and being mounted in the barbecue grill for delivering the basting sauce to a prescribed area of said barbecue grill;

(b) a means for adjustably supporting said dispensing means in a prescribed portion of said barbecue grill;

(c) a an interchangeable liquid supply container for holding a selected basting sauce, operatively connected to said dispensing means;

(d) a pressurized means for injecting liquid sauce from said supply container into said dispensing means; and

(e) means for activating said pressurized means to inject liquid sauce at prescribed intervals of time;

whereby liquid sauce is injected into said barbecue grill or oven at prescribed times to improve the flavor and quality of foods being cooked.

4,732,138

CAMPFIRE COOKER

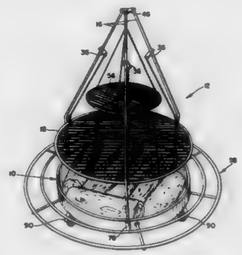
Robert B. Vos, 8066 Carriage La., Unit 1, Cordova, Tenn. 38018

Filed Feb. 27, 1987, Ser. No. 20,020

Int. Cl.[4] F24B *3/00*

U.S. Cl. 126—25 A **38 Claims**

1. Cooking apparatus comprising a tripod structure means including at least three legs joined at the top thereof; a grill; and means for adjustably suspending said grill from each leg of said tripod stucture; each of said tripod legs including a lower, generally vertical segment and an inturned, upper segment; each of said adjustably suspending means including a flexible support member having an upper and a lower end, a capture and guide ring mounted at the junction of the vertical and inturned segments, said flexible support member being threaded through said capture and guide ring, means for attaching the flexible member lower end to the grill and slidable



locking bracket means for attaching the flexible support member upper end to the inturned member and being pivotal to a first position to slide along the inturned member, thus to adjust the heighth of the grill, and to a second position locked onto the inturned member thus to suspend and maintain the grill at a selected heighth.

4,732,139

ENDOSCOPE WITH INSERTION HAVING A PLURALITY OF INSERTION HOLES

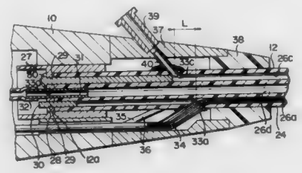
Masahiro Kawashima; Kunio Ohno; Koji Kambara; Nobuaki Akui, and Yoshio Tashiro, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Aug. 29, 1986, Ser. No. 902,432

Claims priority, application Japan, Sep. 3, 1985, 60-194362; Sep. 19, 1985, 60-207009; Sep. 19, 1985, 60-207010; Oct. 28, 1985, 60-239581; Oct. 30, 1985, 60-243378

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—6 **16 Claims**



1. An endoscope comprising:

an operation section;

a flexible insertion section extending from said operation section and adapted to be inserted in a body cavity, said insertion section having a plurality of insertion holes extending along its axial direction, each of said insertion holes having an outlet opening open to a distal end portion of said insertion section and an inlet opening open to a proximal end portion of said insertion section, and at least one of said inlet openings being formed to be separated from other inlet openings; and a plurality of components inserted in said insertion holes and extending from said inlet openings toward the outside of said insertion section, said components including an optical fiber which is inserted in the insertion hole having said one inlet opening.

4,732,140

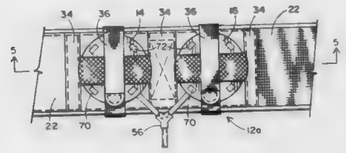
VIBRATORY MASSAGER RETAINED AGAINST BODY WITH BELT HAVING ELASTIC STRAP

Robert T. Stoffregen, 23 Woodrush Dr., Irvine, Calif. 92714

Filed Aug. 18, 1986, Ser. No. 897,613

Int. Cl.[4] A61H *11/00, 1/00, 23/02*

U.S. Cl. 128—36 **15 Claims**



1. A vibrating massage device, comprising:

(a) vibrator means for producing vibrations for purposes of massaging a human body part, said vibrator means including a casing having a top portion to be directed toward said human body part and a base portion against which to apply a force to hold said top portion against said human body part;

(b) belt means, including a substantially flexible, inelastic web adapted to be releasably attached around a particular human body part, for supporting said vibrator means with said top portion of said casing against said particular human body part, said web having thereon at least one vibrator location for the releasable attachment of said vibrator means thereto;

(c) an elastic band having a pair of longitudinal ends anchored to said web on longitudinally spaced apart opposite sides of the vibrator location for use in attaching said vibrator means to said web with the top portion of said casing disposed toward said web and the base disposed toward said elastic band;

(d) said elastic band having a size such that when said vibrator means is placed between said elastic band and said web with the web disposed generally flat, said elastic band stretches slightly over said base portion of the casing, and such that when said web is then placed around said particular human body part, said elastic band stretches more to press said top portion of said casing toward said particular human body part; and

(e) retaining strap means associated with said belt means for releasably retaining said vibrator means against movement transversely of said belt means.

4,732,141

CHIROPRACTIC TABLE WITH SWINGABLE SECTION

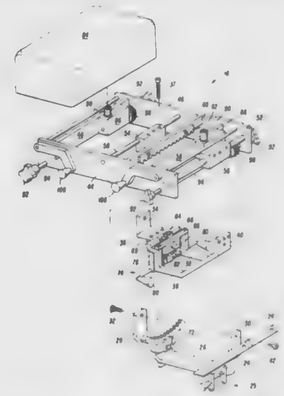
Lloyd A. Steffensmeier, 102-122 West Main St., Lisbon, Iowa 52253

Filed Sep. 25, 1986, Ser. No. 912,008

Int. Cl.[4] A61F *5/00, 5/04*

U.S. Cl. 128—74 **6 Claims**

1. In a chiropractic table having a base and framework for supporting multiple independent sections that include a chest-lumbar section, a pelvic section and head and foot sections spaced longitudinally along the table, a supporting structure for one of the sections comprising a main frame connectable to the supporting framework of the table and providing first and second pivots spaced longitudinally of the table which pivots provide for pivotal connection along a horizontal longitudinal axis, a cradle assembly pivotally mounted on said first and second pivots, patient supporting means including a framework operatively connected to the cradle assembly so as to provide for limited movement of the patient supporting means relative to the cradle assembly and transversely of the table, said patient supporting means also including a patient engaging member controllably moveable vertically within a limited distance relative to the framework for the patient supporting



means, and locking means to maintain the patient supporting means and cradle assembly in a selected stationery position.

4,732,142

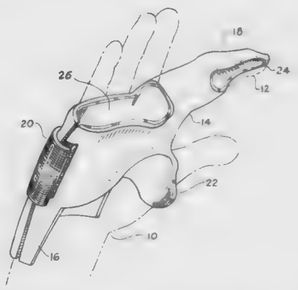
DEEP FRICTION MASSAGE ORTHOSIS

David Hurlburt, 15 Allen Pl., New Haven, Conn. 06512; Russell Woodman, 3 Tamarac Swamp Rd., Wallingford, Conn. 06492; Barbara M. Steward, 24 Nash St., New Haven, Conn. 06511, and R. Kevin Shea, 308 Williams St., Harrison, N.J. 07029

Filed Nov. 3, 1986, Ser. No. 926,460

Int. Cl.[4] A61F *5/10, 5/04;* **A61H** *7/00*

U.S. Cl. 128—77 **16 Claims**



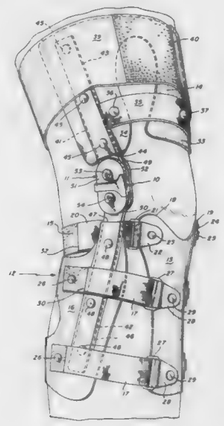
1. A deep friction orthosis having a means to apply three pressure points to the hand of a user giving deep friction massage therapy, said three pressure points consisting of a first pressure point applied proximal to the joint of the wrist of the user on the posterior aspect thereof, a second pressure point applied distal to the joint on the posterior aspect thereof, and a third pressure point applied such that it counterbalances said first and second pressure points,

said means to apply comprising a rigid partial enclosure forming a finger support means to rigidly engage, support and direct at least on finger of the user along substantially the entire length of said finger, and including a sufficient opening to permit at least the tip of the supported finger to touch the skin of the patient, said partial enclosure also comprising wrist support means and palmar support means,

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said finger support means providing said second pressure point,
said wrist support means providing said first pressure point, and
said palmar support means providing said third pressure point.

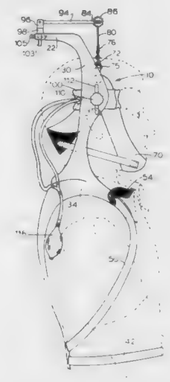
4,732,143
SELECTABLE EXTENSION STOP FOR A POLYCENTRIC HINGE
James Kausek, Swampscott, and Al Klugman, Waban, both of Mass., assignors to Spectrum Orthopedics, Ltd., Boston, Mass.
Filed Feb. 13, 1987, Ser. No. 14,357
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 C **9 Claims**



9. A removable extension stop for limiting the forward pivotal movement of a pair of arms connected by a polycentric hinge, said polycentric hinge being of the type including a pair of parallel spaced-apart face plates wherein the arms are pivotally secured at mating ends between the face plates at spaced-apart pivotal connections, said hinge having opposing front and rear edges, said mating ends of the arms having intermeshing gear teeth so as to cause simultaneous pivotal movement of the arms about their pivotal connections with the plates, said rotating ends of the arms having flanges to limit the forward pivotal movement of the arms when the flanges engage the extension stop, said extension stop comprising:
means for removably attaching the extension stop to the polycentric hinge; and
extension block means positionable between the mating ends of the arms to engage the flanges and to limit the forward pivotal movement of the arms, wherein said block means is disposed adjacent the front edge of the hinge and includes a pair of top and bottom edges which diverge outwardly going from the front toward the rear of the hinge so that the flanges exert a rearward pressure on the block means.

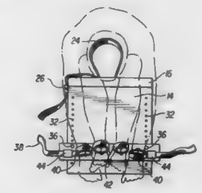
4,732,144
MULTI-SECTION EMERGENCY TRANSPORT NECK IMMOBILIZER
Oscar S. Cunanan, 102 Dunedin Ct., Cary, N.C. 27511
Filed Dec. 10, 1986, Ser. No. 940,911
Int. Cl.[4] A61F *5/01*
U.S. Cl. 128—878 **10 Claims**

1. An emergency transport neck immobilizing brace, comprising:
(a) an integral rigid frame structure including:
(i) a pair of laterally-spaced curved shoulder support frame portions formed to fit, be supported on, and be secured to the shoulders of a person's body;
(ii) back frame portions extending from said shoulder support frame portions and forming open frame structure mountable behind and extending from the shoulders toward the pelvic region of said person's body; and
(iii) support frame structure extending outwardly from said shoulder support frame portions opposite to the direction of extension of said back frame portions and including side frame structure formed to reside on opposite sides of and spaced outwardly from the head of said person's body;
(iv) and a U-shaped frame member joined to said side frame structure at the extremity of said side frame structure opposite to said shoulder support frame portions, said U-shaped frame member extending generally perpendicular to and outwardly from said side frame structure a substantial distance rearwardly therefrom for providing a platform support proximate the rear of the head of said person's body for supporting a traction mechanism rearwardly of said side frame structure



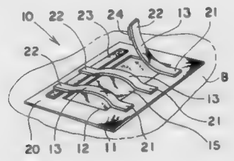
(b) strap and connector means on said frame structure providing straps of adjustable length and associated connectors mounted in a manner enabling said frame structure to be stably secured to the shoulders and other selected portions of said person's body with said shoulder support frame portions engaged with the shoulders of the person's body and said back frame portions engaged with the back of said person's body;
(c) a head halter assembly mounted on said support frame structure and said U-shaped frame member including:
(i) a chin-engaging head halter;
(ii) a pair of laterally spaced straps secured to opposite sides of said halter; and
(iii) a traction mechanism supported on rear portion of said U-shaped frame member rearwardly of said side frame structure and operatively associated with said pair of halter straps for placing in traction the head of the person's body employing said brace; and
(d) a head-bracing assembly mounted on said side frame structure and adjustably engagable with opposite sides of the head of the person's body employing said brace in a manner effective to embrace opposite sides of the head for restraining lateral, forward and backward movement of the said person's head.

4,732,145
RESTRAINING DEVICE FOR SPINAL TAPS
Philip B. Latham, 384 Oldham Ave., Lexington, Ky.
Continuation of Ser. No. 650,535, Sep. 14, 1984, Pat. No. 4,660,552. This application Oct. 8, 1986, Ser. No. 916,702
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—134 **1 Claim**



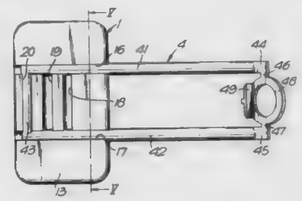
1. A restraining device for a patient undergoing medical treatment comprising:
a bar extending in a direction perpendicular to the legs of said patient;
a wrist and ankle belt mounted on said bar for holding the wrists and ankles of said patient adjacent each other on said bar, causing said patient to assume a position of spinal flexure;
connecting means including a frame having the shape of an inverted V connected to said bar and having a leg of said frame extending in a direction perpendicular to said bar and parallel to the legs of said patient; and
a neck belt connected to said connecting means at the apex of the frame so as to restrain the neck of the patient and assure the position of spinal flexure;
said connecting means being adjustable so that the distance between said bar and the neck of the patient may be varied to accommodate patients of different heights;
wherein the neck of the said patient is held by said neck belt and the wrists and ankles of said patient are held by said wrist and ankle belt so that said patient may not move during said medical treatment.

4,732,146
WOUND DRESSING RETENTION APPARATUS
Ronald J. Fasline, 2110 Arms Dr., Girard, Ohio 44420, and Randall J. Hartwig, 4133 Euclid Blvd., Youngstown, Ohio 44512
Filed Aug. 14, 1987, Ser. No. 85,191
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—155 **15 Claims**



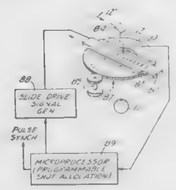
1. Apparatus for retaining wound dressing to a wound on a patient's body, comprising:
resilient frame means positionable proximate to the wound, said frame means having a body engaging surface for selective engagement with the patient's body and a top surface opposite said body engaging surface, said frame means presenting a dressing receiving region continually accessible from said top surface when said body engaging surface is engaged with the patient's body;
means for retaining the wound dressing, said means for retaining bridging a portion of said dressing receiving region; and
means for removably securing said means for retaining to a portion of said frame means.

4,732,147
SUPPORT FRAME
David Fuller, Dimchurch, England, assignor to Smiths Industries Public Limited Company, London, England
Filed Feb. 19, 1987, Ser. No. 16,607
Claims priority, application United Kingdom, Feb. 22, 1986, 8604433
Int. Cl.[4] A61M *25/02*
U.S. Cl. 128—207.18 **9 Claims**



1. A frame for supporting on a patient a tracheal tube having a connector connected therewith, said frame comprising: a generally planar pad member, said pad member having two parallel channels and at least one lateral channel each of which opens on a planar surface of the pad member; and a support arm member, said support arm member having two ends, one of said ends being adapted to support said connector, said support arm member comprising two parallel limbs that extend along the arm member and a lateral cross piece that extends between said limbs close to the other of said ends of the arm member, said two limbs being removably inserted in a press fit into said two parallel channels respectively and said lateral cross piece being inserted into said lateral channel, the length of said arm member projecting from the pad member being selectively adjustable.

4,732,148
METHOD FOR PERFORMING OPHTHALMIC LASER SURGERY
Francis A. L'Esperance, Jr., Englewood, N.J., assignor to LRI L.P., New York, N.Y.
Continuation-in-part of Ser. No. 778,801, Sep. 23, 1985, abandoned, said Ser. No. 778,801, is a continuation-in-part of Ser. No. 742,225, Jun. 6, 1985, abandoned, said Ser. No. 742,225, is a continuation-in-part of Ser. No. 552,983, Nov. 17, 1983. This application Jul. 31, 1986, Ser. No. 891,285
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—303.1 **34 Claims**



1. The method of using an ultraviolet laser beam to change optical properties of an eye by selectively ablating the anterior surface of the cornea with penetration into the stroma to achieve a volumetric removal of corneal tissue, which method comprises confining the laser beam to a maximum-area circular section producing a spot which is centered on and equal to the

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area of the cornea to be subjected to ablation, adjusting the intensity of laser-beam projection to a limited level at which resultant corneal-tissue ablation per unit time is to an ascertained elemental depth which is but a fraction of a predetermined maximum ablation depth into the stroma, directing the adjusted beam to the cornea in the context of reflection to define a central circular region within the confined beam, said directing step being by reflection to the anterior surface and for that period of time which will accomplish at least some ablative penetration to the predetermined maximum ablation depth, whereby laser-beam impingement upon the cornea is a circle having an outer diameter determined by the central circular region; and, in the course of said period of time, varying the diameter of said central circular region to thereby vary the outer diameter of the spot at corneal impact, said diameter variation proceeding in a range within said maximum-area circular spot; whereby the cornea is impacted with greatest cumulative ablating penetration per unit area at the central region of the ablated area and with ablative penetration decreasing with increasing radius to the outer portion of the ablated area, whereby a myopia-correcting change in the anterior surface may be effected by volumetric removal of corneal tissue.

4,732,149

BIPOLAR MEDICAL COAGULATION INSTRUMENT

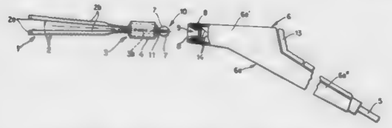
Hermann Sutter, Steinmatten 28, D-7803 Gundelfingen, Fed. Rep. of Germany

Continuation of Ser. No. 820,958, Jan. 21, 1986, abandoned. This application Jan. 21, 1987, Ser. No. 8,043

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501861

Int. Cl.[4] A61B *17/39*

U.S. Cl. 128—303.17 23 Claims



1. A bipolar medical instrument, comprising a forceps having two elongated legs each of which constitutes a coagulation electrode having a jaw and a first terminal remote from the jaw, said jaws being movable toward and away from each other and said forceps further comprising a first insulating carrier which insulates said terminals from each other; and a coupling device for connecting said first terminals with a source of electrical energy, including a pair of conductors having second terminals and a second insulating carrier which insulates said second terminals from one another, said device being movable with reference to said forceps by hand to and from at least one position in which each of said second terminals abuts one of said first terminals as long as said device continues to be held by hand in said at least one position so that the forceps can be used as a bipolar coagulation instrument only as long as said second terminals abut the respective first terminals because said device is held by hand in said at least one position, one of said insulating carriers defining a socket for the respective terminals and the terminals which are insulated from each other by the other of said carriers extending into said socket in said at least one position of said device, said one carrier having a surface surrounding said socket and having an at least substantially circular cross-sectional outline.

4,732,150

PROCESS FOR CATARACT EXTRACTION

Gerald T. Keener Jr., 5455 N. Pennsylvania St., Indiana, Ind. 46220

Division of Ser. No. 620,508, Jun. 14, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,635

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—320 4 Claims



1. In a process for removing a cataract including the steps of:
(a) peeling the conjunctival layer of the eye from the incision site at the junction of the cornea and sclera;
(b) making a puncture wound into the anterior chamber of the eye;
(c) enlarging the puncture wound to provide a larger incision;
(d) removing the anterior capsule from the cataract; and,
(e) displacing the nucleus into the anterior chamber;
the improvement which comprises the steps of:
suspending the nucleus by means of a liquid in such a position that it is separated from internal eye surfaces; and
cutting the nucleus in multiple sections by placing a loop of wire around the nucleus and constricting it and then removing the individual sections through the incision.

4,732,151

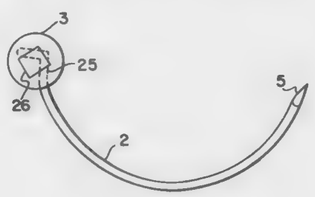
LOW TRAUMA SUTURING

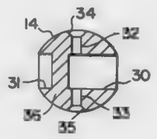
J. Paul Jones, Chester Springs, Pa., assignor to Patent Research & Development Corp., Exton, Pa.

Filed Oct. 8, 1986, Ser. No. 916,896

Int. Cl.[4] A61B *17/08, 17/06;* A44B *9/00*

U.S. Cl. 128—339 5 Claims





1. An anchor to be disposed on the portion of a steel needle suture exiting from the human body adjacent a wound on the body for holding the needle in place, the anchor comprising:
a body molded from medical grade plastic;
the body being formed with first and second cavities each extending into the body from the surface thereof with the axes of the cavities being coaxial, the cavities extending into the body respectively to a depth whereby the cavities are internally separated by a barrier formed by the body;

the body being formed with a pair of apertures each extending into the body from the surface thereof with the axes of the apertures being coaxial and being adjacent said barrier and open to said first cavity; and
the aperture being for use in receiving a steel suture needle and the first and second cavities being for use in receiving projections on a manipulating tool.

4,732,152

DEVICE FOR IMPLANTATION AND A METHOD OF IMPLANTATION IN A VESSEL USING SUCH DEVICE

Hans I. Wallstén, Denens, and Christian Imbert, Mézières, both of Switzerland, assignors to Medinvent S.A., Lausanne, Switzerland

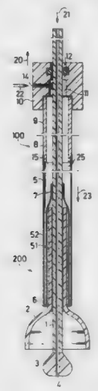
PCT No. PCT/SE85/00503, § 371 Date Aug. 4, 1986, § 102(e) Date Aug. 4, 1986, PCT Pub. No. WO86/03398, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 5, 1985, Ser. No. 893,320

Claims priority, application Sweden, Dec. 5, 1984, 8406169; May 8, 1985, 8502283

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—343 20 Claims



1. A device for implantation by insertion in a difficultly accessible location of a substantially tubular, radially expandable prosthesis, including in combination said radially expandable prosthesis surrounding and concentric with a flexible probe and means for maintaining said prosthesis in a radially contracted state and for releasing said expandable prosthesis in the difficultly accessible location, wherein said means for maintaining and releasing the prosthesis comprises a hose concentrically surrounding said probe with one end of said hose being connected to the probe, the hose being folded inside itself, a double-walled section of said hose formed by said hose being folded inside itself, said double-walled section radially surrounding the prosthesis, a fluid-tight chamber provided between and defined by said probe and said hose, means for introducing and pressurizing a fluid in said chamber to reduce contact pressure and friction between said double-walled section of the hose, the prosthesis being released from the hose by axial relative movement of said one end of the hose with respect to an opposite end of said hose, said opposite end of said hose connected to an element of said device.

4,732,153

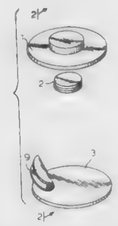
TRANSDERMAL DOSIMETER

Michael Phillips, 1740 Hinman Ave., Apt. 3B, Evanston, Ill. 60201

Continuation of Ser. No. 632,127, Jul. 18, 1984, Pat. No. 4,595,011. This application Apr. 4, 1986, Ser. No. 848,261

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—636 30 Claims



1. A transdermal dosimeter for use in a diagnostic test which comprises:
(a) a sealed container constructed of chemically inert, flexible, fluid-tight, adhesive material;
(b) a dermal contact bridge in the container which comprises a fluid component and a support means component for supporting the fluid component within the container;
(c) a collecting component means in the container and in contact with the dermal contact bridge, for providing storage for fluid substances collected from the dermal contact bridge; and
(d) a process component in the container made of fluid absorbent material containing a chemical reagent which reacts with the stored substances, said process component being in contact with the collecting component.

4,732,154

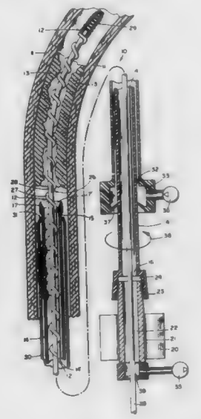
ROTARY CATHETER SYSTEM

Samuel Shiber, Mundelein, Ill., assignor to Surgical Systems & Instruments, Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,546

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 9 Claims



1. A rotary catheter system insertable into a patient's artery

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for remotely cutting and removing an obstruction therein, comprising in combination:

a flexible guide-wire insertable into a patient's artery, at least a portion of said flexible guide-wire being shaped as an auger,

a rotary flexible-catheter with front and rear ends, said flexible-catheter being rotatably disposed and slidable over said flexible guide-wire, a tubular-blade mounted to said front end, said tubular-blade having a through hole communicating with said flexible-catheter for passing obstruction material through said hole and into said flexible-catheter,

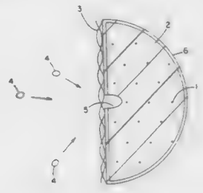
means connected to said rear end for rotating said flexible-catheter and said tubular-blade around said flexible guide-wire.

4,732,155

IMPLANTABLE CHEMOATTRACTANT SYSTEM

Bruce R. Zetter, Cambridge, and Robert S. Langer, Somerville, both of Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.

Filed Aug. 27, 1985, Ser. No. 769,946
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—630 **16 Claims**



1. A device for providing sustained, prolonged release of a chemoattractant to cells in a surrounding biological medium and for trapping cells attracted by said chemoattractant, said device comprising:

(a) a biocompatible non-inflammatory body comprising said chemoattractant sequestered therein, said body providing sustained prolonged release of said chemoattractant from at least a portion thereof, and

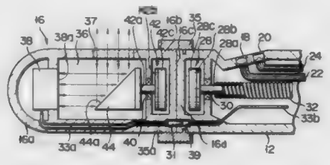
(b) a cell trap comprising a non-inflammatory wettable material attached to said body, chemoattractant released from said body being transmitted through said trap, and cells attracted by said chemoattractant released from said body being trapped by and retained within said trap.

4,732,156

ULTRASONIC ENDOSCOPE

Takeaki Nakamura, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 6, 1986, Ser. No. 871,470
Claims priority, application Japan, Jun. 21, 1985, 60-135318
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660 **5 Claims**



1. An ultrasonic endoscope comprising:

an operation section;

an insertion section having a longitudinal axis and extending from the operation section, said insertion section being adapted to be inserted into a body cavity;

a driving member mounted in a distal end portion of the insertion section to be rotatable with respect to said insertion section around an axis parallel to the longitudinal axis of the insertion section, said insertion section being closed by a distal end wall located adjacent to said driving member so that said driving member can be enclosed in said insertion section;

drive means for rotating the driving member; and

an ultrasonic scanning unit attached to the distal end of the insertion section, said unit including a casing having an ultrasonic radiation window and a scanning chamber filled with a liquid ultrasonic transmission medium, said scanning chamber including a scanning chamber wall adapted to be located adjacent to said insertion section end wall, an ultrasonic generator disposed in the scanning chamber and generating ultrasonic waves, and a rotary scanning means for radiating the ultrasonic waves generated by the generator through the window and repeatedly deflecting the waves by a predetermined angle, said scanning means including a driven member enclosed within said scanning chamber and mounted to be rotatable with respect to said casing, said driven member being fluidically isolated from said driving member by said scanning chamber wall and said insertion section distal end wall and being coupled to said driving member by a magnetic coupling, said driven member being disposed in the scanning chamber to be opposite to said driving member so as to be rotatable around the same axis as the driving member while being rotatable with respect thereto, the magnetic coupling between said driven member and said driving member causing said driven member to rotate as the driving member rotates; and

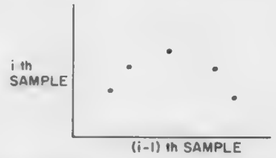
connecting means for detachably connecting said scanning unit to said insertion section with said insertion section end wall in abutting contact with said scanning chamber wall, whereby said scanning chamber and said insertion section are fluidically isolated from each other when said scanning unit is attached to said insertion section and said scanning chamber can remain fluidically closed when said scanning unit is detached from said insertion section.

4,732,157

METHOD AND APPARATUS FOR QUANTIFYING BEAT-TO-BEAT VARIABILITY IN PHYSIOLOGIC WAVEFORMS

Daniel T. Kaplan, Cambridge, and Richard J. Cohen, Newton Highlands, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 18, 1986, Ser. No. 897,602
Int. Cl.⁴ G01R *23/02*
U.S. Cl. 128—696 **19 Claims**



1. Method for determining cycle-to-cycle alternation in a physiologic waveform comprising:

sampling the waveform at corresponding fiducial locations for a plurality of cycles;

creating a scatter plot of the ith sample versus the (i−1)th sample; and

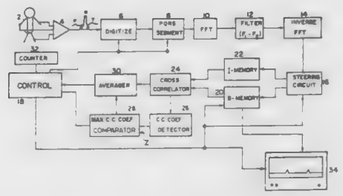
determining a parameter λ which optimizes the fit of the scatter plot to an equation $x(i)=4\lambda x(i-1)[1-x(i-1)]$, the value of λ quantifying the degree of alternation.

4,732,158

METHOD AND APPARATUS FOR MONITORING ELECTROCARDIOGRAM (ECG) SIGNALS

Dror Sadeh, Ramat Hasharon, Israel, assignor to Ramot University Authority for Applied Research & Industrial Development Ltd., Tel Aviv, Israel

Filed Oct. 28, 1981, Ser. No. 316,065
Claims priority, application Israel, Nov. 12, 1980, 61465
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—702 **15 Claims**



1. A method of monitoring ECG signals, characterized in:

detecting a first ECG signal wave, filtering same to pass only a frequency band within a range of about 25–300 Hz, and storing the filtered signal wave in a first storage device;

detecting each successive ECG signal wave, similarly filtering same to pass only a frequency band within the range of about 25–300 Hz, and storing the filtered signal wave in a second storage device;

cross-correlating each of said successive signal waves, when stored in said second storage device, with the signal wave stored in said first storage device, and determining whether the maximum cross-correlation coefficient exceeds a predetermined value;

averaging, with said signal waves stored in said first storage device, each of said successive signal waves having a maximum cross-correlation coefficient exceeding said predetermined value, and storing the averaged signal wave in said first storage device in place of the signal wave previously stored therein;

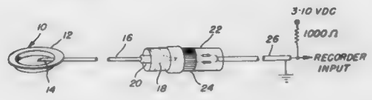
and displaying the average signal wave stored in said first storage device.

4,732,159

SIMPLE CAPSULE PNEUMOGRAPH

Steve S. Kraman, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed May 2, 1986, Ser. No. 858,694
Int. Cl.⁴ A61B *5/08*
U.S. Cl. 128—721 **9 Claims**



1. A capsule pneumograph for detecting respiratory movement of a patient comprising:

(a) capsule means adapted to be interfaced with the skin of the patient at a selected position on the patient's body which entraps a quantity of air between said capsule means and said patient's skin, said quantity of air expanding or contracting in response to respiratory movements which cause expansion and contraction of the interfaced skin;

(b) a hermetically sealed microphone housing;

(c) tube means coupling the capsule means and hermetically sealed microphone housing into fluid communication with each other so that air pressure changes associated with the expansion and contraction of said entrapped air are transmitted as pressure signals from said capsule means to said microphone housing, the length and diameter of said tube means being selected to cause said tube means to pass pressure signals in a low frequency range associated with the frequency range of said respiratory movements and to block high frequency noise signals above said low frequency range; and

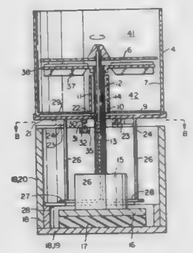
(d) electric microphone means disposed in said microphone housing for sensing the pressure signals in the low frequency range and generating output signals indicative thereof.

4,732,160

METHOD OF FLOW MEASUREMENT AND FLOW METER

Per Ask, Konsistoriegatan 17 A, S-582 34 Linköping; Anders Engberg, Heidenstamsgatan 104, S-582 49 Linköping; Anders Spångberg, Heidenstamsgatan 24, S-582 49 Linköping, and Åke Öberg, Uggleboväigen 79, S-590 60 Ljungsbro, all of Sweden

PCT No. PCT/SE84/00106, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/03824, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 23, 1984, Ser. No. 680,251
Claims priority, application Sweden, Mar. 30, 1983, 8301766
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—760 **15 Claims**



6. An apparatus for measuring the rate at which urine is emitted without interference from the impulse force of the urine stream comprising:

a collecting vessel for receiving urine in the form of a free-falling stream, said vessel having a base and generally cylindrical vertical walls;

mounting means to support the weight of the vessel and urine collected therein;

a rotatable device positioned within the vessel such that after entering the collecting vessel, the free-falling stream of urine will strike the rotatable device, said rotatable device having an outer edge substantially adjacent to but not touching the interior of said vertical walls of the vessel, and said rotatable device dividing the vessel into an upper urine receiving chamber and a lower urine measuring chamber;

means for rotating the rotatable device at a rate sufficient to cause the free-falling stream of urine striking the rotatable device to be deflected toward the vertical walls such that the vertical velocity of the urine stream is converted to horizontal velocity; and

means for measuring the weight of the vessel and the urine collected in the urine measuring chamber, and determining therefrom the rate of urine emission, wherein the rotatable device is mounted separately from the collecting vessel such that neither the rate of rotation of the device nor the impulse force of the free-falling stream of urine contributes to the measured weight of the urine collected.

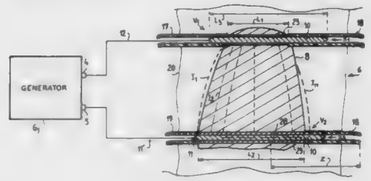
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,161

DEVICE FOR TREATMENT THROUGH HYPERTHERMIA

Guy Azam, La Celle St. Cloud; Guy Convert, Vincennes; Jean M. Cosset, Villejuif; Jacques Dufour, Orsay, and Jean P. Mabire, Gif sur Yvette, all of France, assignors to C.G.R. MeV, Buc, France

Filed Jun. 6, 1986, Ser. No. 871,287
Claims priority, application France, Jun. 7, 1985, 85 08641
Int. Cl.[4] A61N *1/05, 1/32*
U.S. Cl. 128—784 10 Claims



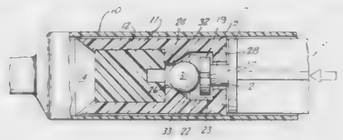
1. A device for treatment through hyperthermia comprising:
at least one generator;
at least two unipolar electrodes connected to said generator, said generator supplying an alternating electric energy, the said electric energy being applied, according to an electric field, to an area to be treated of a patient by means of said unipolar electrodes connected to the said generator, at least one of the said unipolar electrodes being an implantable unipolar probe, said device further comprising at least one vector tube adapted to be implanted permanently in the area to be treated by crossing through the patient's skin and to contain one of the said unipolar probes during a hyperthermia session the said vector tube comprising at least one tubular end formed of an insulating material and extended by a metallic tube, the said metallic tube being adapted to contain at least partially the said unipolar probe and to be in contact with the said area to be treated, and the said tubular end being adapted to be situated at the level of the skin, the said unipolar probe being introduced through the said tubular end into the said metallic tube with which the said unipolar probe is in electrical contact.

4,732,162

AUTOMATIC AND POSITION-SENSITIVE SYRINGE AND METHOD FOR NONASPIRATING OR ASPIRATING OBTAINING OF BLOOD SAMPLES

Michael D. Martell, Riverside, Calif., assignor to Martell Medical Products, Inc., Riverside, Calif.

Continuation of Ser. No. 789,233, Oct. 18, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 73,361
Int. Cl.[4] A61B *5/14;* A61M *5/00*
U.S. Cl. 128—765 15 Claims



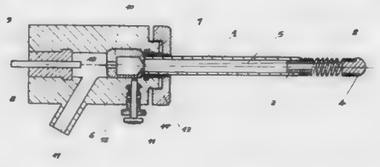
4. A syringe comprising:
a tubular body open at one end thereof and adapted to receive a hypodermic needle at the other end thereof,
a plunger having a longitudinal passageway therethrough, said plunger being slidably mounted in said tubular body,
an air-permeable and blood-impermeable filter extending across said passageway adjacent one end of said plunger, said one end of said plunger being relatively adjacent said other end of said tubular body,
handle means for retracting said plunger for taking a blood sample by aspiration,
a valve chamber formed in the passageway at the other end of said plunger,
a valve seat formed in an end of said chamber remote from said other end of said plunger,
said valve seat having a diverging guide surface that diverges toward said other end of said plunger, and
a ball, of high specific gravity, loosely confined within said valve chamber,
said ball being seated and held by gravity upon said valve seat and blocking flow of air through said plunger from said valve chamber to said filter when the syringe is held at a small angle to the vertical and said plunger is retracted to take a blood sample by aspiration,
said ball having a weight less than the force exerted thereon by flow of air through said filter to said valve chamber when said syringe is used for taking a sample of blood of normal arterial pressure, whereby said ball is displaced from said valve seat when said syringe is used for taking a sample of blood of normal arterial pressure.

4,732,163

REMOTE CONTROLLED GUIDE FOR A CATHETER

Philippe Bonello, Grand-Saconnex, and Maurice Jeanmonod, Meyrin, both of Switzerland, assignors to Sarcem S.A., Meyrin, Switzerland

Filed Nov. 10, 1986, Ser. No. 929,081
Claims priority, application Switzerland, Nov. 21, 1985, 04962/85
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 5 Claims



1. A remote controlled guide for a catheter, comprising a tube terminating at one end in a hollow flexible finger formed in part by a coil spring, a flexible pulling element that is secured to the finger eccentrically of the coil spring and that extends through the tube, the other end of the tube being removably secured to a frame element containing a control device for pulling the flexible member thereby to bend the finger relative to the tube, and a cutter carried by the frame element for selectively cutting the flexible pulling member thereby to permit separation of the frame element from the tube.

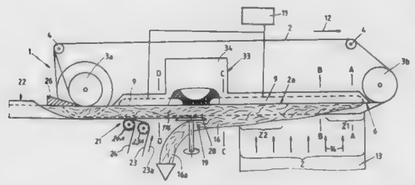
4,732,164

METHOD OF AND APPARATUS FOR MAKING A CONTINUOUS FILLER OF TOBACCO OR THE LIKE

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,349
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530022
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.3 26 Claims

1. A method of making a continuous filler of fibrous material, particularly a tobacco filler, comprising the steps of feeding fibrous material into a stream-growing portion of an elongated path to build a continuous stream; advancing the stream longitudinally along said path including attracting the fibrous material to one side of an-air permeable endless conveyor and establishing a pressure differential between the one side and the other side of the conveyor so that the fibrous material of the growing and fully grown stream is attracted to and advances with the one side of the conveyor; shaping the stream in the course of at least one of said feeding and advancing steps so as to provide the stream with a predetermined cross-sectional outline, including imparting to the one side of the conveyor the shape of an elongated channel having a longitudinally extending central section and two longitudinally extending lateral sections flanking the central section, said feeding step including attracting fibrous material primarily or exclusively to the central section in a first region of said stream-growing portion of said path and attracting fibrous material to all of the sections in a second region of said stream-growing portion; and preserving at least a portion of the predetermined cross-sectional outline of the stream at least until after completion of said advancing step.

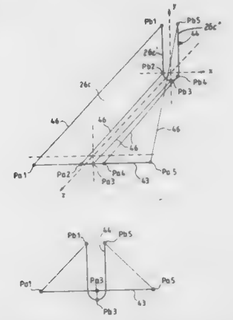


4,732,165

WRAPPING MECHANISM FOR CIGARETTE ROD MAKING AND LIKE MACHINES

Gerhard Hakansson; Günter Böttcher, and Klaus-Dieter Mallon, all of Hamburg, Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 892,137
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527837
Int. Cl.[4] A24C *5/18, 5/52*
U.S. Cl. 131—105 9 Claims



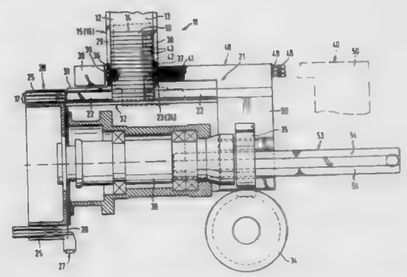
1. In a wrapping mechanism for use in a rod making machine of the tobacco processing industry, a sizing part including a channel-shaped member having a first edge with a first outline, a second edge remote from said first edge and having a second outline which differs in shape from said first outline, wherein one of said edges is a substantially straight edge, and a guide surface extending between said edges and having a configuration such that each of an infinite number of straight lines forming said surface extends from one of an infinite number of portions of said first edge to one of an infinite number of portions of said second edge.

4,732,166

APPARATUS FOR TESTING CIGARETTES IN A CIGARETTE PACKAGING MACHINE AND FOR REMOVING DEFECTIVE CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,415
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419738
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—283 12 Claims



1. In a cigarette packaging machine having a cigarette magazine (11) containing shafts (12) for feeding and forming cigarette groups (17), each of said shafts having a front wall (29) and a rear wall (30), said apparatus comprising:
a plurality of test plungers (39) for engaging first ends of cigarettes in said cigarette group and for testing the tobacco content of the cigarettes said plungers (39) passing through bores (36) formed in said front wall;
a plurality of grab members (41) for grabbing defective cigarettes and withdrawing them from the feed flow, said grab members passing through a recess (37) formed in said rear wall (30);
a common holder (40), mounted on said packaging machine, for holding said grab members;
a plurality of channel-shaped guides (44), mounted on said packaging machine, each guide containing one of said grab members;
actuating means (48) for selectively actuating said grab members (41) to grab selected cigarettes of said cigarette group (17); and
drive means, coupled to said common holder, for retracting said common holder (40) to withdraw the grabbed cigarettes from said cigarette group.

4,732,167

SMOKING AID FOR REDUCING CONCENTRATIONS OF POISONOUS SUBSTANCES CONTAINED IN TOBACCO SMOKE

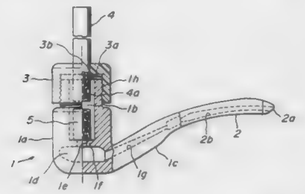
Hideo Nagano, 13-5, Shimomeguro 5-Chome, Meguro-Ku, Tokyo, Japan

Filed Jul. 29, 1986, Ser. No. 890,465
Claims priority, application Japan, Apr. 8, 1986, 61-52262
Int. Cl.[4] A24D *5/00, 7/02*
U.S. Cl. 131—198.2 3 Claims

1. A smoking aid for reducing concentrations of poisonous substances contained in tobacco smoke comprising:
a main portion for defining a smoke retaining cavity;
a stem portion having a conduit communicated with said smoke retaining cavity;
a mouthpiece portion communicated with said conduit of said stem portion; and
a cap-like member movably secured to said main portion such that a space communicated with said smoke retaining

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cavity is formed between said main portion and cap-like member, and having a hole through which a root portion of a cigarette is protruded into said smoke retaining cavity; whereby an amount of clean air introduced into said smoke retaining cavity through said space is adjustable by moving the cap-like member relative to said main portion, and a filter detachably inserted in said smoke retaining



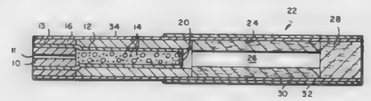
cavity, said main portion comprising a screw and said cap-like member comprises a screw which is engaged with said screw of the main portion, whereby said space is formed between said screws, said main portion comprising a pipe bowl and a sleeve inserted into said pipe bowl, and said screw of the main portion is formed in an outer surface of the sleeve.

4,732,168

SMOKING ARTICLE EMPLOYING HEAT CONDUCTIVE FINGERS

James L. Resce, Yadkinville, and Thomas L. Gentry, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 15, 1986, Ser. No. 864,647
Int. Cl.[4] A24B *15/00*; A24D *1/18*
U.S. Cl. 131—359 **12 Claims**



1. A cigarette-type smoking article comprising:
(a) a combustible fuel element;
(b) a physically separate aerosol generating means including an aerosol forming material; and
(c) a heat conductive member which is contiguous to both the fuel element and the aerosol generating means, said member having at least two spaced heat conductive projections which extend toward the lighting end of said fuel element.

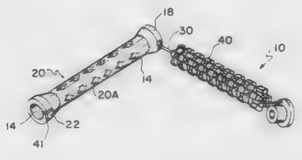
4,732,169

WAFFLE SPONGE PERM ROD

Jean Van Sickle, Vienna, W. Va., assignor to Perm-Ez Inc., Orlando, Fla.

Filed Nov. 14, 1986, Ser. No. 930,260
Int. Cl.[4] A45D *2/00*
U.S. Cl. 132—42 R **13 Claims**

1. A permanent wave roller for use in providing a permanent wave to hair comprising:
a rod having a predetermined length and an outer surface upon which an individual's hair is to be rolled to form a curl;
an elongated pressure element extending along said rod for applying pressure toward the outer surface of said rod for maintaining hair in a curl upon said rod; and
a pad positioned between said elongated pressure element and hair positioned on the outer surface of said rod, said pad having a length extending substantially along the length of said rod and having a waffle-like shape with a plurality of rows of projecting pad portions spaced apart



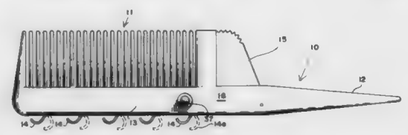
by a plurality of indentations extending along the length of said pad for enhancing the passage of a permanent solution to a curl and to prevent damage to an individual's hair.

4,732,170

COMBINATION HAIR STRAND SEPARATING IMPLEMENT AND COMB

Louis N. Thomas, 990 NE. 156 Ter., North Miami Beach, Fla. 33162

Filed Oct. 8, 1986, Ser. No. 916,804
Int. Cl.[4] A45D *24/00*
U.S. Cl. 132—151 **6 Claims**



1. A combination hair strand separating implement and comb for use in the withdrawal of spaced groups of hair strands from the scalp for separate treatment comprising, in combination, a hair comb, said hair comb having a back portion, said comb back portion extending into and joining a pick-type handle at one end, a plurality of hook members journalled in spaced relation along one side of said comb back portion, said hook members each being integrally formed with arcuate hook portions moveable between withdrawn and outwardly extended positions with respect to the outer edge of said comb back portion, said arcuate hook portions terminating in end portions which, when said hook portions are in withdrawn position are moved into closely spaced, opposed relation with respect to said outer edge of said comb back portion and means for simultaneously rotating said hook members for moving said arcuate hook portions between said withdrawn and outwardly extended positions, said hook members being integrally formed of bent wire and said hook member rotating means comprising an operating slide bar supported for longitudinally sliding movement within said comb back portion between forwardmost and rearwardmost positions with respect thereto, and crank means on said hook members extending through slots in said slide bar for cooperative movements therebetween.

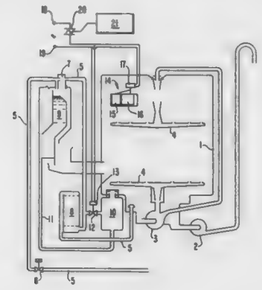
4,732,171

DISHWASHING MACHINE WITH SINGLE CONTROL OF ADDITIVE DISTRIBUTION AND WATER SOFTENER REGENERATION

Claudio Milocco, Pordenone, Italy, assignor to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Apr. 8, 1987, Ser. No. 35,724
Claims priority, application Italy, Apr. 17, 1986, 45720 A/86
Int. Cl.[4] B08B *3/02, 13/00*
U.S. Cl. 134—57 D **2 Claims**

1. In a dishwashing machine including at least one additive distributor for dispensing at least one dishwashing additive into a wash tub, a first electrically controlled actuator for operating said distributor, a water softener for softening water supplied to the wash tub, regeneration means for regenerating said water softener, a second electrically controlled actuator for operating said regeneration means, and programmer means for controlling the operation of said machine including said first and second actuators, the improvement comprising:
said first and second actuators being electrically connected in parallel to each other;



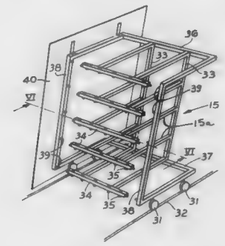
single switch means, controlled by said programmer means, for connecting the parallelly connected first and second actuators to a power source for at least one first time period and at least one second time period longer than said first time period; and
said first and second actuators having response times respectively shorter and longer than said first time period, such that operation of said single switch means by said programmer means for said first time period will operate said first actuator to dispense said at least one additive but will not operate said second actuator to regenerate said water softener.

4,732,172

APPARATUS FOR WASHING TRANSFER CARTS

Gerald D. Pedersen, Cannon Falls, Minn., assignor to Cannon Equipment Company, Cannon Falls, Minn.

Filed Oct. 4, 1985, Ser. No. 784,928
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—62 **13 Claims**



1. An apparatus for cleaning a transfer cart comprising:
(a) a discrete soak station having means for spraying a soaking solution upon a cart therein;
(b) a discrete washing station following said soak station;
(c) means for automatically advancing the cart from the soaking station to the washing station;
(d) means for securing the cart in a fixed position in the washing station;

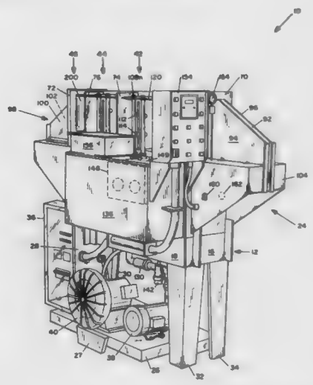
(e) a washer chassis fixed in and with respect to said washing station;
(f) cart washing means for washing the cart, said washing means having a plurality of discrete shelf washing means for cleaning individual shelves of the cart, said cart washing means being movably mounted on said washer chassis and having a discrete shelf washing means for the top surface and the bottom surface of each cart shelf;
(g) automatic advance means connected to said cart washing means and said washer chassis for automatic advancing said cart washing means into said cart and for advancing said shelf washing means across the extent of each respective shelf, said advance means having means for retracting said cart washing means from said cart after said shelf washing means having been advanced across the respective shelves;
(h) a discrete rinse station following said washing station;
(i) said cart advancing means including means for automatically advancing a washed cart from the washing station to the rinse station; and
(j) means for preventing wash solution migration to the rinse station during washing.

4,732,173

VERTICAL PHOTORESIST DEVELOPER

James J. Czaja, and John J. Herrmann, both of Maple Plain, Minn., assignors to Circuit Chemistry Corporation, Maple Plain, Minn.

Filed Dec. 20, 1985, Ser. No. 796,933
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—72 **10 Claims**



1. Printed circuit board chemical processing system comprising:
a. inlet chamber;
b. main chamber including a liquid sump;
c. rinse chamber;
d. drying chamber;
e. outlet chamber;
f. an endless chain extending through said chambers, and housing means supporting said chambers and for carrying at least one processing cassette;
g. substantially horizontally positioned fluid dispensing nozzles in said main, rinse, and drying chambers and means for electromechanically controlling the flow of fluid therethrough;
h. abutting pairs of vertically disposed flexible seal means between said main, rinse, and drying chambers to allow passage of said processing cassette with said board and prevent comingling of fluids used in respective chambers of said system; and,
i. at least one cassette having a plurality of teeth disposed

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along a lower side thereof for engagement with said driving chain and having a vertical pocket therein for accepting printed circuit boards of variable size and positioning said boards substantially parallel to the path of movement of said chain for movement between said nozzles and processing through each of said chambers, said pocket in said cassette defined by interior opposing edges of an exterior wall of said cassette, and a plurality of cord means extending between exterior walls of said cassette for retaining said board whereby the fluid from said nozzles flows substantially horizontally to impinge against the planar surfaces of said boards.

4,732,174

SPOOL-TYPE FLOW ADJUSTING VALVE

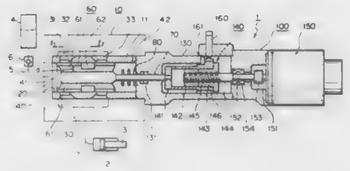
Toyoaki Ueno, Yamaguchi, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 16, 1985, Ser. No. 766,631

Claims priority, application Japan, Aug. 28, 1984, 59-177566

Int. Cl.⁴ F16K *31/04*

U.S. Cl. 137—625.38 **15 Claims**



1. In a spool-type adjusting valve comprising:

a valve body having a flow inlet and a flow outlet for transferring a pressurized fluid within said valve:

a valve bore formed within said valve body to communicate with said flow inlet and said flow outlet and having a first and a second chamber at opposite ends of said valve bore, said flow inlet being connected to said first chamber:

a valve spool slidably positioned within said valve bore and maintaining frictional engagement therewith, said valve spool having a cylindrical rod for slidably positioning said valve spool along the axis of said rod between said first and said second chambers, the surface area of said valve spool facing said first chamber being greater than the surface area of said valve spool facing said second chamber, the opening and closing of said flow outlet being dependent upon the reciprocating movement of said valve spool within said valve bore;

at least one flow passage formed within said valve spool for interconnecting said first and second chambers, said flow passage being defined by an axial through-hole formed along the length of said valve spool, wherein the flow of the fluid passing between said flow inlet and said flow outlet increases as said valve spool moves in the direction of said second chamber and opens said flow outlet;

a circumferential groove between the outer surface of said valve spool adjacent said valve bore and said flow passage for allowing the fluid to flow from said flow passage and into said flow outlet when said groove is aligned with said flow outlet, and wherein said flow outlet includes first and second channels extending substantially perpendicular to the axis of the valve spool, said first channel being in fluid communication with said first chamber and said second channel for fluid communication with said flow outlet when said groove is aligned with said second channel; and

means for slidably positioning said cylindrical rod includes:

a housing mounted adjacent said second chamber of said valve bore, the adjacent surfaces of second chamber and said housing having shaft receiving means coaxially aligned with said cylindrical rod;

a connecting shaft slidably supported within said shaft receiving means and having a rod portion and a cylindrical portion, said rod portion being connected to said valve spool via said cylindrical rod;

motor means including a pulse motor and having a driving member and a driven member mounted within said housing for imparting rotational movement within said housing;

conversion means connecting said cylindrical portion of the connecting shaft to said driven member for transforming rotational movement into reciprocating movement, said conversion means including a nut attached to said cylindrical portion, a drive screw shaft connected to said driven member for rotation within said nut, balls rotatably positioned between said nut and said screw shaft, and means for preventing said nut from rotating relative to said housing,

the improvement in that the ratio of cross-sectional areas of said flow passages in total at the end of said valve spool facing said first chamber to the cross-sectional area of said valve spool is set to a special value large enough to have a thrust acting upon said valve spool in the direction of valve opening decreased as the degree of valve opening is increased from zero and have a direction of the thrust changed at a specific degree from the valve opening direction to the valve closing direction, wherein, when said valve spool is free from control for positioning said valve spool at a degree of valve opening over the specific degree in operation, said valve spool is forced to return to the specific degree by the resultant thrust in the valve closing direction.

4,732,175

SURGE SUPPRESSOR

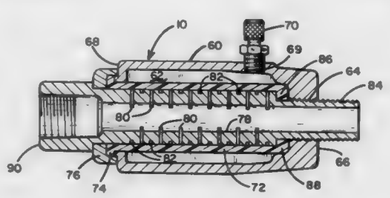
Ramon Pareja, Edina, Minn., assignor to Hypro Corp., St. Paul, Minn.

Division of Ser. No. 939,010, Dec. 8, 1986, Pat. No. 4,782,584.

This application Jul. 2, 1987, Ser. No. 69,194

Int. Cl.⁴ F16L *55/04*

U.S. Cl. 138—30 **6 Claims**



1. A surge suppressor for suppressing undesired pressure surges in a fluid handling system, comprising:

(a) a unitary tubular housing having a generally open end and a generally closed end, said closed end having an internally threaded bore extending through it, said housing defining a tubular cavity;

(b) a rigid, generally tubular baffle member coaxially disposed in said cavity and having a tubular wall portion longitudinally aligned with said generally open end and said generally closed end of said tubular housing said tubular baffle extending through said tubular housing at each end of said housing and of a length greater than the length of said housing, said tubular wall portion including a plurality of longitudinally spaced, radially extending slots formed through said wall portion and having a one-piece integrally formed, externally threaded tubular stub at one end thereof mating with said internally threaded bore;

(c) a tubular bladder member formed from an elastomeric material coaxially disposed about said baffle member and clamped at each end between said baffle member and said

housing to form a fluid tight seal proximate each end of said tubular bladder member when said externally threaded stub is mated with said internally threaded bore to effectively divide said cavity into two chambers, one chamber being exposed to said fluid subject to said undesired pressure surges; and

(d) means for pressurizing the other chamber with a compressible fluid to a predetermined pressure.

4,732,176

ISOLATING MEMBER IN AN IN-LINE TYPE ACCUMULATOR

Nobuyuki Sugimura, 308, Mabuse, Shimizu-shi, Shizuoka-ken, Japan

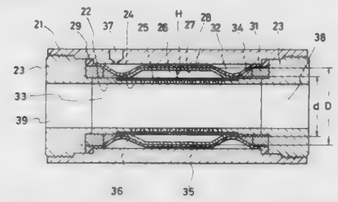
Continuation of Ser. No. 857,500, Apr. 30, 1986, abandoned.

This application Mar. 3, 1987, Ser. No. 22,544

Claims priority, application Japan, Aug. 6, 1985, 60-120345[U]; Aug. 29, 1985, 60-131935[U]

Int. Cl.⁴ F16L *55/04*

U.S. Cl. 138—30 **4 Claims**



1. An isolating member in an in-line type accumulator of the type which comprises a pressure vessel containing a cylindrical non-pleated isolating member concentric with an inner tube having communication holes and a plurality of circumferentially spaced guide frames outstanding from the central portion of said inner tube and an isolating member cap to retain the isolating member at each end, said isolating member cap including slanted circumferential surfaces wherein said isolating member has a single central portion and opposite flanged end portions on both sides of said central portion, said central portion and flanged portions being of substantially equal diameter, said central portion being preformed to a diameter larger than said inner tube, portions of said isolating member between said flanges and central portion being formed smoothly to a constricted size substantially to lay against said inner tube and the slanted surface when said isolating member is in its natural state to minimize deformation strain during operation adjacent the flanged ends of the isolating member.

4,732,177

HOT GAS CONTAINER WITH INSULATION FORMED OF OVERLAPPING CERAMIC BODIES

Wolfgang Maus, Bergisch-Gladbach; Rolf Miebach, Overath-Volkerath, and Helmut Swars, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,053

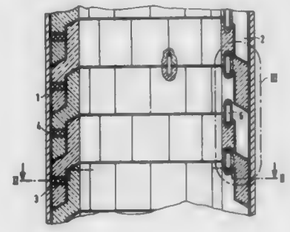
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346230

Int. Cl.⁴ F16L *9/14*

U.S. Cl. 138—147 **8 Claims**

1. Hot gas container, comprising a pressure-proof metallic outer shell having an inner surface, thermal insulation covering said inner surface in the form of ceramic bodies each having given radially inner and outer surfaces, each of said given surfaces being covered over at least the larger part of said given surface by another adjacent ceramic body, and anchors fastening said bodies to said outer shell, said anchors being welded to said outer shell, engaged in recesses formed in said bodies and covered by said outer shell and said bodies, said outer shell being rotation-symmetrical, and said ceramic bodies being in the shape of a sector of at least two hollow cylinders having different diameters and at least one truncated hollow cone interconnecting said hollow cylinders.

6. Hot gas container, comprising a pressure-proof metallic outer shell having an inner surface, thermal insulation covering said inner surface in the form of ceramic bodies each having given radially inner and outer surfaces, each of said given surfaces being covered over at least the larger part of said



given surface by another adjacent ceramic body, and anchors fastening said bodies to said outer shell, said anchors being welded to said outer shell, engaged in recesses formed in said bodies and covered by said outer shell and said bodies, said outer shell being rotation-symmetrical, and said, ceramic bodies being in the shape of a sector of a truncated hollow cone having larger and smaller ends, and an inwardly conically-bevelled cylinder adjacent said larger end of said hollow cone.

4,732,178

LOOM

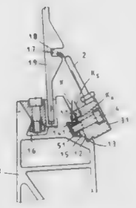
Erwin Schwarz, Hindwil, Switzerland, assignor to Sulzer Brothers Limited, Switzerland

Filed Dec. 8, 1986, Ser. No. 939,133

Claims priority, application Switzerland, Dec. 17, 1985, 05368/85

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **7 Claims**



1. A loom comprising a sley having a groove therein provided with an open mouth, an inner end opposite said mouth, and a wall portion inwardly of said mouth facing toward said inner end; a part adapted to be disposed on said sley outwardly of said mouth of said groove in position to bear on said sley; a rotatable screw operably connected to said part and extending into said groove; and a clamping element connected to said screw and adapted to be inserted through said mouth into said groove and having its only clamping surface portions located on only one side of a plane which extends through the screw axis parallel to the length of the sley, said clamping surface bearing outwardly on said wall portion of said groove upon rotation of said screw to draw said clamping element toward said part.

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4,732,179

AUTOMATIC PICKING CONDITIONS REGULATING METHOD AND A DEVICE FOR CARRYING OUT THE SAME

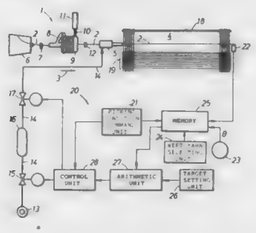
Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Corp., Kanazawa, Japan

Filed Dec. 8, 1986, Ser. No. 939,319

Claims priority, application Japan, Feb. 24, 1986, 61-39653; Sep. 18, 1986, 61-221225

Int. Cl.⁴ D03D *47/36*

U.S. Cl. 139—435 **13 Claims**



4. An apparatus which automatically regulates a picking condition of a loom which has a crankshaft and which picks a weft yarn into a shed using a jet of picking fluid from a picking nozzle, comprising:

command means for sequentially providing a plurality of predetermined values of the picking condition;

control means for varying the supply of the picking fluid from a fluid source to the picking nozzle according to the different predetermined values of the picking condition provided by the command means;

weft yarn arrival detector means for detecting the crankshaft angle at which a picked weft yarn arrives at a predetermined location in the shed;

memory means for storing the predetermined values of the picking condition provided by the command means and the corresponding weft yarn arrival crankshaft angles detected by the weft yarn arrival detector means;

target setting means for specifiying a target weft yarn arrival crankshaft angle appropriate for a normal weaving operation; and

arithmetic means for calculating an appropriate value of the picking condition corresponding to the target weft yarn arrival crankshaft angle specified by the target setting means on the basis of the correlation between the detected weft yarn arrival crankshaft angles stored in the memory means and the predetermined values of the picking condition stored in the memory means, and for providing the calculated value of the picking condition to the control means, the control means thereafter controlling the supply of the picking fluid to the picking nozzle in accord with the calculated value of the picking condition.

4,732,180

WIRE TIE APPARATUS

Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021

Filed Jun. 23, 1986, Ser. No. 877,131

Int. Cl.⁴ B21F *15/04*

U.S. Cl. 140—119 **7 Claims**

1. Wire tie apparatus adapted to wire wrap an object or to wire wrap objects to be tied together comprising

a first cylindrical member having a first end abutting said object or objects to be tied

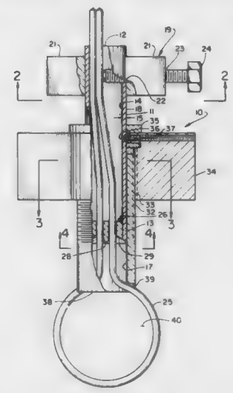
a second cylindrical member positioned within said first cylindrical member and extending out from a second end thereof

said first and second cylindrical members being arranged for relative axial movement therebetween

a pair of spaced side-by-side substantially coextending openings at the end of said second cylindrical member within said first member adapted to respectively receive ends of a loop of said wire

means for securing the ends of said wire to said second member at a location axially spaced from an entrance of said spaced apart openings

means for rotating said inner member, and said wire secured thereto, relative to said outer member whereby said wire is twisted between the entrance end of said spaced apart



openings and said first end of said outer member and whereby said twisted wire breaks therebetween when the wire wrapping of the object or objects is complete, and

means for adjusting the axial position of said first end of the outer cylindrical member relative to the end of said inner member within the outer member and having said spaced apart openings whereby the length of twisted wire remaining after said twisted wire breaks is adjustable.

4,732,181

VEHICLE CARRIED SYSTEM FOR CAMOUFLAGE WITH FOAM

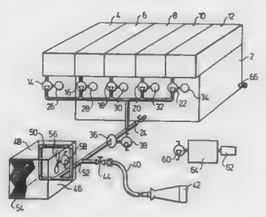
Stefan Sollander, 1892 Berge, S-834 00 Brunflo; Rainer Trübenbach, Schiringe Gard, S-642 00 Flen, and Per Wigren, Pl 3386A, S-635 90 Eskilstuna, all of Sweden

Filed Feb. 21, 1986, Ser. No. 831,985

Claims priority, application Sweden, Feb. 22, 1985, 8500875

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—98 **5 Claims**



1. A vehicle carried system for camouflage with foam comprising:

a foam generating plant;

a foaming agent and water;

foam generators, and pumps associated with said foam generators;

containers formed of bags, preferably of cotton, colored to give a visual camouflage when moist and containing

threads connected to the walls of said bags for modifying shape of said bags; wherein said containers are attached to and carried by said foam generators, said containers having a shape which can be adapted by the adjustment of said threads in said bags to a particular position on a vehicle, said containers being filled with said foam by said pumps from said generators thereby moistening said bags to produce said visual camouflage.

4,732,182

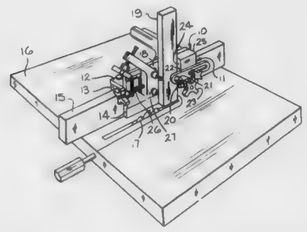
WORK SUPPORT

Russel P. Gorsha, 5-4269-1, Swanton, Ohio 43558

Filed Jul. 18, 1986, Ser. No. 886,965

Int. Cl.⁴ B23Q *3/00*

U.S. Cl. 144—198 A **2 Claims**



1. A work support comprising a channel having a web and side walls operable to straddle a fence of a saw and for steady sliding movement on a saw table, the fence, when operably associated with a saw, being effective to prevent sliding movement of said channel on the saw table in all directions except back and forth along a given straight line, means having a first substantially planar positioning surface, means comprising a block which is physically separable from the rest of the support, and having a second substantially planar positioning surface, said two last named means being carried by said channel so that the second positioning surface extends at substantially 90° to the first positioning surface and, when said channel is on the working surface of the saw table and the fence is operably associated with the saw, the first positioning surface is substantially parallel to a plane perpendicular to the working surface of the saw table which intersects the given straight line, means for keying said block to the support to prevent sliding movement between said block and the support, a threaded member operable, when said block is keyed to the support, to prevent movement of said block out of keyed engagement with the support, means for urging a work piece against the first positioning surface, and means for urging a work piece against the second positioning surface.

4,732,183

METHOD AND APPARATUS FOR PEELING VENEER

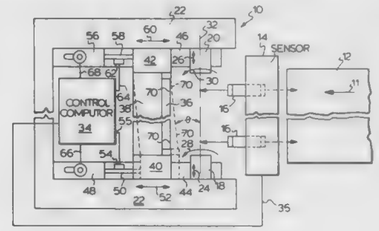
Derek Barnes, Vancouver, Canada, assignor to MacMillan Bloedel Limited

Filed Apr. 20, 1987, Ser. No. 40,331

Int. Cl.⁴ B27L *5/00*

U.S. Cl. 144—357 **9 Claims**

1. A method of peeling veneer from a tapered wood block having a larger diameter end and a smaller diameter end comprising sensing the shape of said block, mounting said block to rotate about a rotational axis in a veneer lathe for peeling by a cutting edge to form a veneer, independently moving one axial end of said cutting edge relative to the other in accordance with said sensed shape to adjust said cutting edge to a cutting angle that it is not parallel to said axis of rotation at the commencement of said peeling to produce veneer with the axial end of said cutting edge adjacent the larger diameter end of



said block spaced farther from said axis of rotation of said block then the opposite end of said cutting edge.

4,732,184

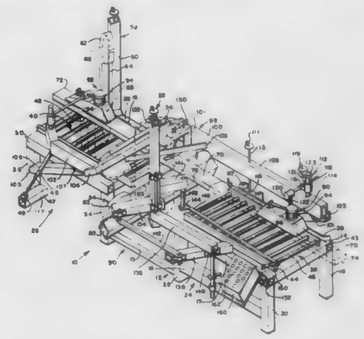
LUMBER SAW-SIZING MACHINE

Russell E. Albright, 28852 Modjeska Canyon Rd., Orange, Calif. 92667

Filed Jul. 18, 1986, Ser. No. 886,722

Int. Cl.⁴ B27C *1/08*

U.S. Cl. 144—361 **14 Claims**



1. A method for rough surface dressing of opposite surfaces of lumber without significantly altering its dimensions which comprises:

a. placing said lumber on a bandsaw cutting fixture having a longitudinal fence and at least two bandsaws each having a cutting edge and a non-cutting back edge, each having its respective saw blade oriented to a respective surface of said lumber at an angle between 10° and 75° thereto and passing said lumber through said fixture from the back edges of said saw blades;

b. guiding said lumber through said cutting fixture by biasing it against said longitudinal fence and thereby moving one of said surfaces against the first of said bandsaws; and

c. resiliently biasing the second of said bandsaws against the other of said opposite surfaces of said lumber, thereby rough surface dressing both opposite surfaces of said lumber.

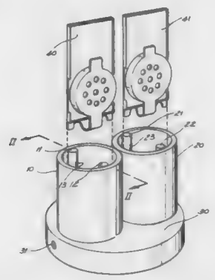
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,185

ELECTROPHORETIC CLEANER AND STERILIZER

Anthony J. Cowle; Paul J. Cowle; Gregory J. Cowle, and Joffre B. Cowle, all of Chatswood, Australia, assignors to Baremek Pty. Limited., Willoughby, Australia

Filed Jul. 16, 1985, Ser. No. 755,610
Claims priority, application Australia, May 21, 1985, 42730/85
Int. Cl.[4] B08B 3/10
U.S. Cl. 134—84 15 Claims



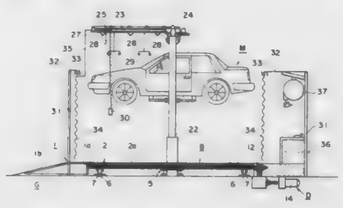
9. Apparatus for decontaminating and sterilizing a contact lens, the apparatus comprising:
a container for holding a buffer solution;
a pair of electrodes spaced from each other within the container for connection across a DC power supply, whereby to form a unidirectional electric field through the buffer solution between the electrodes; and
a lens holder in the container between the electrodes, the lens holder having a perforated compartment for housing a contact lens in the buffer solution in the unidirectional electric field therethrough between the electrodes, whereby to decontaminate and sterilize the contact lens by electrophoresis.

4,732,186

UNIT-TYPE AUTOMOBILE SERVICING APPARATUS

Koichi Nishikawa, 58, Komatsu-cho, Toyohashi-shi, Aichi-ken, Japan

Filed May 15, 1985, Ser. No. 734,283
Claims priority, application Japan, May 24, 1984, 59-103754
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—123 14 Claims



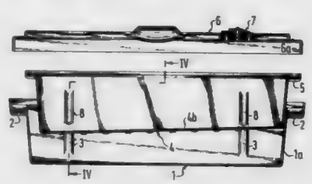
1. An automobile servicing apparatus comprising:
at least one turntable having a diameter suitable for placing thereon an automobile to be serviced such that all wheels of said automobile ride on said turntable;
lifting means mounted on said turntable for lifting said automobile above said turntable such that said automobile rotates on its own rotating axis, said lifting means including a pair of columns fixedly mounted on said turntable as spaced apart over a predetermined distance sufficient to locate said automobile between said pair of columns and as standing upright, a horizontal beam extending between said pair of columns at a predetermined height above said turntable to provide room for said automobile to be lifed above said turntable, and a pair of lift levers each provided to be vertically movable along the corresponding one of said pair of columns and engagable with the bottom of said automobile thereby causing said automobile to be lifted above said turntable;
supporting means for supporting said turntable to be rotatable around a predetermined spin axis whose extension defines said rotating axis; and
driving means for driving to rotate said turntable around said spin axis.

4,732,187

DEVICE FOR DISINFECTING MEDICAL INSTRUMENTS

Harry Mönch, Schwabstrasse 4, 7134 Knittlingen, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,542
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—135 6 Claims



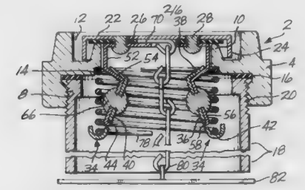
1. A device for disinfecting medical instruments comprising: a tub with a rectangular bottom, a pair of longitudinal sidewalls and a pair of end walls shorter than the sidewalls, said tub receiving a disinfecting fluid and having a perpheral flange with an upwardly extending edge; a perforated basket having a rectangular bottom, a pair of longitudinal sidewalls and a pair of end walls shorter than the sidewalls said basket having a peripheral flange with an upturned edge, said basket being dimensioned to fit within said tub and to receive said instruments therein; a lid having a peripheral rim; and means for supporting the perforated basket in said tub above a fluid level therein, said means for supporting comprising at least four coacting pairs of projections with each pair including an inwardly directed projection on an inner surface of the sidewall of said tub and an external projection on an outer surface of the sidewall of the basket, said tub having an internal length greater than the external length of said basket by at least the width of said projection, said basket being movable in said tub from a first position with one end wall of the basket engaging one end wall of the tub and the projections of each pair being aligned and arranged with each other to hold the basket above a fluid level in the tub to allow the instruments to be drained and a second position with the other end wall of the basket engaging the opposite end wall of the tub and the projections of each pair being out of alignment and engagement with each other to allow the basket with the instruments to be immersed in the fluid of the tub with the flange of the basket resting on the flange of the tub, said lid closing said tub with the rim received on the flange of the tub and surrounding the upturned edge of the flange of the basket.

4,732,188

FUEL TANK CAP WITH PRESSURE/THERMAL RELIEF

Zdenek Gabrlik, Brier; John M. Morris, Auburn; Nelson O. Phillips, Vashon, and Timothy L. Oliphant, Federal Way, all of Wash., assignors to GT Development Corporation, Tukwila, Wash.

Filed Jun. 15, 1987, Ser. No. 62,554
Int. Cl.[4] F16K 13/04
U.S. Cl. 137—73 31 Claims



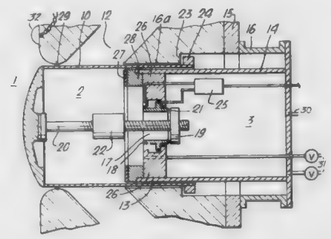
1. A pressure relief valve for a tank comprising:
a valve plug positioned outwardly of an opening in the tank;
a stem having an outer portion attached to the valve plug, and an inner portion; and
biasing means for exerting an axial, inward force on the inner portion of the stem to put the stem in tension and bias the valve plug into a position in which it closes the opening;
said inner and outer portions of the stem having means forming a mechanical interlock to transmit axial forces directly to each other, and said stem including fusible material positioned to maintain said inner and outer portions in a mechanically interlocking position; said biasing means being resilient to allow the stem and the valve plug to move outwardly in response to increased pressure in the tank to relieve pressure in the tank; and said fusible material being meltable at elevated temperatures exceeding a predetermined level, to allow said inner and outer portions to separate from each other and the valve plug and said outer portion to move away from the opening.

4,732,189

FAST OPENING VALVE

Terence V. Jones, Oxford, England, and Peter J. Loftus, College Park, Md., assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 6, 1986, Ser. No. 860,172
Int. Cl.[4] F16K 31/124
U.S. Cl. 137—220 8 Claims



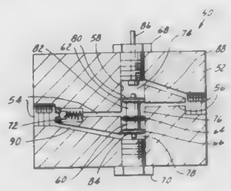
1. A fast opening valve having an opening movement driven by inlet pressure, comprising an inlet port, an outlet port, a valve passage linking said ports, a plug, a plug mounting which permits movement of the plug to and fro between a forward position thereof in which the plug closes the valve passage and a rearward position in which the plug lies clear of the valve passage on the outlet port side thereof, a wall member which is fixed in relation to the plug mounting, a chamber with the plg which defines in combination with the wall member a pressurizable compartment having an enclosed volume which increases as the plug moves from the rearward to the forward position, a discharge passage leading from the pressurizable compartment, a closure means operable to seal the discharge passage and thereby the pressurizable compartment, a pressurization means operable to introduce fluid into the pressurizable compartment under pressure and thereby to cause forward movement of the plug to its forward position in the absence of valve inlet pressure said closure means being opeably linked to movement of the plug to the extent that movement of the plug from the forward position opens the discharge passage to allow exit of said fluid from the pressurizable compartment, a receiving chamber at the outlet of the discharge passage rearward motion of the plug under the impetus of valve inlet pressure causing said fluid to exit from the pressurizable compartment through the discharge passage to the receiving chamber, and a choke means operable to restrict exit of fluid from the pressurizable compartment through the discharge passage as the plug nears the rearward position thereby to decelerate the plug.

4,732,190

SHUT-OFF VALVE AND METHOD FOR USING SAME

James V. Polselli, 39899 Baroque, Mount Clemens, Mich. 48044

Filed Feb. 26, 1986, Ser. No. 833,827
Int. Cl.[4] F16K 17/24
U.S. Cl. 137—460 18 Claims



1. Automatic shut-off valve for controlling the pulsating flow of fluid in a line, comprising:
(a) a body having a formed therein:
a valve cavity having a first end, a second end, and central region;
a fluid input port having a fluid inlet coupled to a source of intermittingly pulsating fluid and a fluid output port having a fluid outlet coupled to the line, both fluid input and fluid output ports communicating with the valve cavity central region;
an outlet pressure port connecting the valve cavity first end to the fluid outlet; and
an inlet pressure port connecting the valve cavity second end to the fluid inlet;
(b) valve means for controlling flow between the fluid input and output ports, said valve means sealingly cooperating with the valve cavity and shiftable relative thereto from an open position in which the input and output ports are coupled to a closed position where said flow is shut-off; and
(c) a normally closed check valve placed between the fluid inlet and the fluid outlet, downstream of the inlet pressure port and upstream of the outlet pressure port, said check valve opening in response to the incoming pulsating fluid flow, and closing thereafter to prevent backflow through said valve;
whereby the shut-off valve will normally transmit liquid from the fluid inlet to the fluid outlet passing through the check valve, input port, valve cavity central region and output port, resulting in a pulsating pressure in both the first and second ends of the valve cavity such that the valve means is maintained in the open position, said valve

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means shifting to the closed position in the event of a broken link resulting in a reduction in the fluid pressure causing the valve means to shift to the closed position due to the increase pressure in the valve cavity second end from the check valve restriction.

4,732,191

THERMAL PUMPING SYSTEM FOR LIQUID PRODUCTS

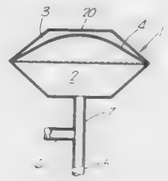
Adam P. Visser, Veldhoven, and Jan Blom, Wijk bij Duurstede, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,251

Claims priority, application Netherlands, Oct. 29, 1984, 8403270

Int. Cl.⁴ G05D *11/00*

U.S. Cl. 137—565 **7 Claims**



1. An automatic washing machine comprising a wash chamber, one or more spray lines and a thermal pumping system, said thermal pumping system comprising:

(a) a liquid-product supply container;

(b) a dosing chamber divided into two complementary compartments by an elastic membrane, the first compartment being a pumping space filled with said liquid-product and having product inlets and outlets, the second compartment filled with a temperature-sensitive evaporating-condensing expansion liquid;

(c) a product supply line connecting the supply container to the inlet of the first compartment and having a non-return mechanism; and

(d) a product discharge line connected to the outlet of the first compartment and having a non-return mechanism, said discharge line having an aeration point above the maximal liquid level of the liquid-product supply container, said discharge line having an opening above said dosing chamber for discharging said liquid-product downwardly in a direction toward said dosing chamber;

and wherein said one or more spraying lines are located above said dosing chamber, said second compartment of the dosing chamer being heated by water sprayed from said spraying lines, but said liquid-product supply container not being heated by said water.

4,732,192

MECHANISM FOR WATER SUPPLY DEVICE

Chung-Shan Shen, No. 34, Ho-Ping Road, Hu Wei, Yunlin Hsien, Taiwan

Filed Dec. 2, 1985, Ser. No. 803,647

Int. Cl.⁴ F16L *37/28*

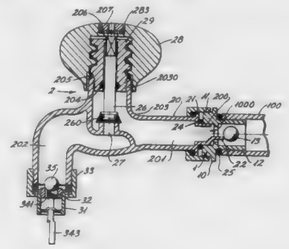
U.S. Cl. 137—614.19 **1 Claim**

1. An apparatus for controlling the flow of water comprising:

a faucet having an inlet path and an outlet path below the inlet path, a leading hole being disposed between the two paths, a cylindrical valve rod with the lower end thereof connecting to a water stopper being used to seal the leading hole, the upper end of the valve rod being connected to a knob, a shaft tube having the lower part thereof screwed into the upper section of the faucet body being disposed between the knob and the valve rod, and a horizontal push rod being disposed at the inlet of the faucet;

a connector for connecting a water supply tube and the inlet of the faucet and comprising two sections having threads on the exterior surface thereof, the interior of the two sections being separated by a hole to define a valve seat, a ball being provided to seal the hole, the ball being pushed away from the hole in the connector by the push rod in the faucet when the connector is connected to the faucet;

a quick-opening stopper connected to the outlet of the faucet comprising an outlet pipe with a flange on the top surface and a plurality of holes at the bottom thereof, an outlet cover with a central hole being provided on the upper surface of the outlet pipe, an operating lever being installed inside and through the central hole of the outlet pipe and the outlet cover, the outlet pipe and the outlet



cover being held by a holder connected to the end of the outlet of the faucet and a ball for removably blocking the central hole being disposed inside the outlet of the faucet;

wherein the operating lever comprises a pushrod comprising a cylindrical rod having an oblique surface at the top portion thereof, parallel and longitudinally extending grooves being provided on the wall of the top portion, a flange being provided at the intermediate section of the rod, the rod being slightly bent below the flange, a barb being provided on one side of the rod so that when the rod is pushed up, the barb engages a surface on the outlet of the stopper to maintain the rod in an elevated position so that the ball is pushed away from the central hole in the stopper by the oblique top of the rod and when the rod is pushed horizontally, the barb is disengaged, thus permitting the rod to fall and the ball to seal the central hole.

4,732,193

FLUID DRIVEN DEVICE CONNECTED INTO A FLUID SUPPLY SYSTEM

Alan H. Gibbs, 20125 S. Dixie Hwy., Miami, Fla. 33189

Continuation of Ser. No. 294,763, Aug. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,101, Feb. 13, 1980, abandoned. This application May 9, 1984, Ser. No. 590,841

Int. Cl.⁴ F16K *31/122*

U.S. Cl. 137 **4 Claims**

1. A device for producing pressure pulses of liquid comprising:

(a) a housing having a liquid inlet, a liquid outlet, and a chamber therebetween;

(b) said chamber includes an inline valve device in said housing comprising a body means having a piston chamber portion and a valve seat portion,

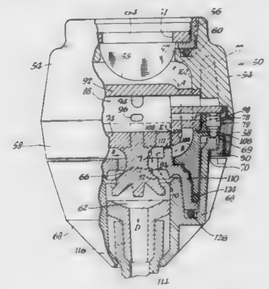
said inline valve device with an inlet connected to the liquid inlet, an outlet connected to the liquid outlet and said valve seat portion therebetween;

a valve device having a valve head cooperating with the outlet side of said valve seat portion for controlling flow between said inlet and said outlet and a piston portion on the inlet side of said valve seat portion connected to said valve head reciprocating in said piston chamber portion;

said piston portion having a larger area than said valve head so that inlet pressure on the side of said piston portion facing said valve seat portion acts in a direction to close said inline valve device;

restricted passage means communicating inlet pressure from one side to the other side of said piston portion so as to aid in operation of said inline valve device;

restriction means communicating said piston chamber por-



tion on said other side of said piston portion with atmosphere; and

a closed air chamber communicating with said piston chamber portion on said other side of the piston;

said air chamber, said restricted passage means, said restriction means and said valve device so dimensioned as to cause oscillation of said valve device and thus a pulsating flow of liquid at said liquid outlet in response to connection to a source of pressurized liquid at said liquid inlet.

4,732,194

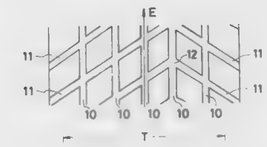
ASYMMETRIC TIRE AND TREAD

Kazuyoshi Saneto, Hadano, and Mitsutoshi Saeki, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,879

Int. Cl.⁴ B60C *11/04*

U.S. Cl. 152—209 R **3 Claims**



1. In right and let pneumatic tires that are fitted to a car on the opposite end of the same axis, characterized in that:

(1) a cord inclination direction of the upper belt layer of the tire on the right side with respect to a tire forward running direction is arranged in such a manner as to be inclined leftwardly and rearwardly with respect to the tire forward running direction and a cord inclination direction of the upper belt layer of the tire on the left side with respect to the tire forward running direction is arranged in such a manner as to be inclined rightwardly and rearwardly with respect to the tire forward running direction; and

(2) a tread pattern consisting of a plurality of parallel ring-like main grooves in a tire circumferential direction and parallel angled lug grooves connecting said main grooves to one another on a tire grounding surface, said lug grooves being angled to project rearwardly with respect to the tire forward rotating direction from the opposite sides of a main groove disposed outside of the center of the tread width in the tire running direction.

4,732,195

RADIAL TIRE TREAD FOR TRUCK OR BUS

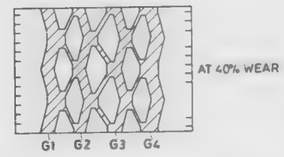
Akihiro Takeuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed May 16, 1986, Ser. No. 864,155

Claims priority, application Japan, May 21, 1985, 60-75658[U]

Int. Cl.⁴ B60C *11/04*

U.S. Cl. 152—209 R **6 Claims**



1. A radial tire with a tread reinforcing belt for trucks or buses, comprising:

at least four longitudinal grooves extending circumferentially to divide said tread into at least five parts;

auxiliary grooves extending across said at least five parts of the tread to form at least five rows of circumferentially separated blocks; and

the depth of the auxiliary grooves decreasing gradually toward the axially outside of the tread so that said rows of separated blocks change into continuous ribs from the axially outside to the inside of the tread in sequence as the tread wears.

4,732,196

ELASTOMER ARTICLE WITH AMINE CURABLE LAYER OF POLYMER

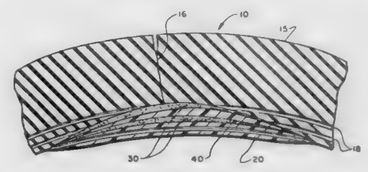
Russell W. Koch, Hartville, Ohio, and Douglas D. Snyder, Tempe, Ariz., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 767,998, Aug. 21, 1985, abandoned, which is a continuation of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Sep. 30, 1986, Ser. No. 913,421

The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.

Int. Cl.⁴ B60C *21/00*

U.S. Cl. 152—367 **9 Claims**



1. A repaired elastomer article, comprising:

the elastomer article, said elastomer article having an interior substrate, said interior substrate having cords therein, said article having a crack-cut extending therethrough, said elastomer article having an interior prepared area created by removal of one or more of said cords in the vicinity of said crack/cut;

a treating agent, said treating agent applied to said interior prepared area of said article and surrounding said crack-cut; said treating agent selected from a group consisting of

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N-halohydrantoins, N-haloamides, N-haloimides, and combinations thereof;

an amine curable polymer or prepolymer, said amine curable polymer or prepolymer residing on said interior treated surface, said exterior crack/cut being free of said amine curable polymer or prepolymer; and

a cured elastomer patch, said patch residing over said amine curable polymer or prepolymer, said amine curable polymer or prepolymer bonded to said patch and said elastomer article at ambient temperature.

4,732,197

PNEUMATIC TIRE

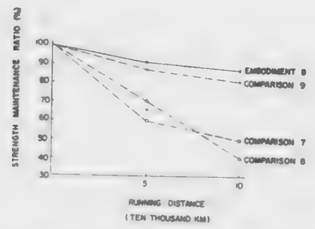
Seiichiro Heishi, Kyoto, and Koji Takahira, Nara, both of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Continuation of Ser. No. 461,976, Jan. 26, 1983, abandoned. This application May 23, 1985, Ser. No. 736,986

Claims priority, application Japan, Jan. 28, 1982, 57-12103

Int. Cl.⁴ B60C *9/18*

U.S. Cl. 152—451 **5 Claims**



1. A pneumatic tire at least partially reinforced with steel cords comprising steel filaments SWRS 82 A, as specified by JIS G 3502, containing 0.80 to 0.85 wt. % C, 0.12 to 0.32 wt. % Si, 0.30 to 0.60% Mn, 0.025 wt. % max. P, 0.025 wt. % max. S and 0.20 wt. % max. Cu, most of said steel filaments of said steel cords comprising iron materials having non-metallic inclusions of 10μ or less for any given inclusion cross-section, said steel cords having the tensile strength calculated from the following formula:

$$\frac{(A + 345)W}{7.86} < TS < \frac{(A + 395)W}{7.86} \quad 1$$

$$A = -177D - 1.84N + 0.02N^2$$

wherein D is the diameter (mm) of the steel filament, N is the number of steel filaments of a steel cord, W is the weight (g/m) of a steel cord, TS is the tensile strength (kg) and the denominator 7.86 is the specific gravity of iron, and the maintenance ratio of the knot strength of said steel cords is more than 60%.

4,732,198

VEHICLE WHEEL

Udo Frerichs, Langenhagen, and Heinz-Dieter Rach, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

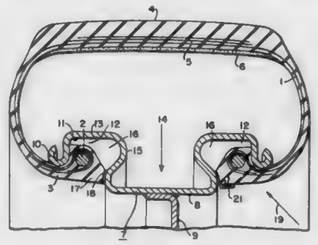
Filed Aug. 13, 1986, Ser. No. 896,384

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529512

Int. Cl.⁴ B60C *15/024*

U.S. Cl. 152—544 **12 Claims**

1. In a wheel and tire assembly for a vehicle, whereby the wheel has a rigid rim with a rim ring that, starting from the center, first extends axially outwardly in both directions, then extends radially outwardly first perpendicularly and then at an acute angle as to said first axially outwardly extending rim ring portion to form side walls of a central drop base, then extends axially outwardly in both directions, and then extends essentially radially inwardly to form respective rim flanges, with respective mounting spaces being formed on each side of said drop base and located axially inwardly of respective rim flanges and radially inwardly of said rim ring between a respective drop base side wall and rim flange, each mounting space provided with a deep mounting bed, and whereby on said rim is mounted a pneumatic tire that is made of rubber or rubber-like synthetic material and has a carcass which is secured in the beads of said tire by being looped around inextensible and pressure-resistant bead cores respectively embedded in the beads of said tire, with each of said beads having a cross-sectional form such that during mounting, said beads can extend into said mounting spaces and said deep mounting beds, and when said tire is in the operational state, said beads cover access to said mounting spaces and said deep mounting beds,



each said deep mounting bed having a radial height and forming that portion of each said mounting space which extends further radially outwardly than a radially outer edge of said bead when said tire is in said operational state,

the improvement wherein each of said deep mounting beds respectively extends integrally to one of said rim flanges respectively, and wherein, in the operational state of said tire, on the one hand said radially outer edge of each of said tire beads respectively is spaced radially inwardly from a radial inner side of said axially extending portion of said rim ring that is adjacent each respective rim flange, and on the other hand an axially inner portion of each of said tire beads extends axially inwardly to butt against a portion of said rim ring.

4,732,199

RADIAL TIRE FOR HIGH INTERNAL PRESSURE

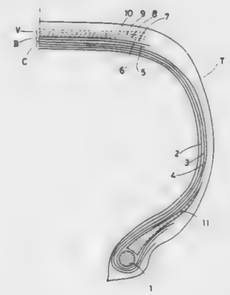
Shinzou Kajiwara, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed May 21, 1986, Ser. No. 865,277

Claims priority, application Japan, May 21, 1985, 60-108686

Int. Cl.⁴ B60C *9/13, 9/08*

U.S. Cl. 152—557 **6 Claims**



1. A radial tire for high internal pressure, comprising:

a carcass formed of a plurality of plies fastened in place by opposite ends thereof folded axially outwardly around a pair of laterally opposed bead cores; and

a belt disposed outside the crown part of said carcass, said carcass having a radial innermost reinforcement ply of nylon fiber and at least one ply of aramid fiber cords positioned radially outside said innermost ply.

4,732,200

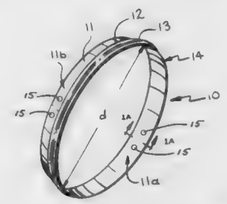
TIRE INFLATION DEVICE

Donald R. Price, 210 Elvin Ct., Lansing, Mich. 48912

Filed Jul. 11, 1983, Ser. No. 512,610

Int. Cl.⁴ B60C *25/00*

U.S. Cl. 157—1.1 **14 Claims**



1. A device for inflating a tubeless tire (**200**) having two spaced apart sidewalls supporting a tread and beads (**205, 206**) on the sidewalls for mounting the tire on a wheel rim (**100**) having a longitudinal axis upon which the wheel rim and mounted tire rotate, wherein the wheel rim has two spaced apart flanges (**101, 102**) which engage the beads of the tire at a radial periphery of the rim from the axis and wherein the bead has a heel portion (**201, 203**) on the bead which is outside of the tire and a toe portion (**202, 204**) on the bead which is inside of the tire which comprises:

(a) an annular body portion (**11, 21**) with two opposing wide sides (**11***a*, **11***b*, **21***a*, **21***b*) such that the body portion has an elongate cross-section, wherein one side (**11***a*, **21***a*) is inside the annulus and has a diameter (d) so as to frictionally engage the flange of the wheel rim and wherein the other side (**11***b*, **21***b*) is on the outside of the annulus; and

(b) an annular tapered portion (**13, 26**) formed by the wide sides of the body portion having an annular edge (**14, 24**) which can engage the rim, wherein in use the device is mounted around one of the flanges of the wheel rim in contact with the heel of the bead such that (1) prior to inflation of the tire, the tapered portion of the device fits between the bead and tire rim with the outside side resting on the heel portion of the bead and so that the device simultaneously frictionally engages the flange of the wheel rim and the heel of the bead with the edge on the rim so as to allow inflation of the tire, (2) during inflation of the tire, the heel of the bead on the outside side moves the device towards the flange upon which the device is mounted and (3) upon inflation as the heel and toe of the bead seats on the flange the device is expelled from between the bead and the rim and separated from the wheel rim.

4,732,201

ROLLER BLINDS

Manfred Dillitzer, Valeppweg 7, D-8038 Grobenzell, Fed. Rep. of Germany

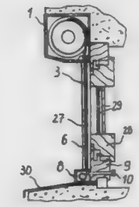
PCT No. PCT/EP86/00351, § 371 Date Mar. 17, 1987, § 102(e) Date Mar. 17, 1987, PCT Pub. No. WO86/07407, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 12, 1986, Ser. No. 27,202

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3521084

Int. Cl.⁴ E06B *9/08*

U.S. Cl. 160—25 **13 Claims**



1. Roller blind having two sections a first of which comprises an adjustable length armor having a series of lamellae, may be moved in guiding rails (**5**) at the side over a deployment length and which can be rolled on or off a take-up roll (**2**) disposed in a roller-blind housing (**1**), the free end of a material or coarse-screen (**7**) that in turn is accommodated in a blind housing (**8**), being fastened to the last lamella (**4'**) at the free end of the armor (**3**) and the blind housing (**8**) being disposed below the last lamella (**4'**) of the armor (**3**), wherein the blind housing (**8**) can be moved over the deployment length (L) of the armor (**3**), can be locked in position at any height within the deployment length (L) by means of a locking mechanism (**10, 11**) and, when not in the locked position, is pressed by the tension of a spring in set contact with the last lamella (**4'**) of the armor (**3**) said armor being adapted for movement in lateral, spaced apart, guide rails over a deployment length, a first roller-blind housing spanning one end of said lateral guide rails, a first take-up roll disposed in said housing in a position enabling rolling of said lamellae on or off said first roll for shortening or increasing the length of said armor, a second section of said roller blind comprising a continuous blind section normally rolled up under spring tension on a second roll accommodated in a second housing and having a free end fastened to a free end of that lamella most distant from said first housing, said second housing, by virtue of rolling up of said second section on said second roll under spring tension being disposed below said most distant lamella of said armor for movement with said armor over its deployment length, and means for locking said second housing against movement with said armor enabling rolling of said second section off said second roll during rolling of said lamellae on said first roll.

4,732,202

VERTICAL LOUVRE BLIND TRAVELLER

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc.

Filed Apr. 18, 1986, Ser. No. 853,818

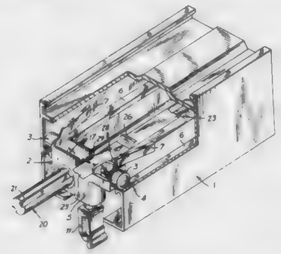
Int. Cl.⁴ E06B *9/36*

U.S. Cl. 160—168.1 **15 Claims**

1. A spacer for use with travellers of a vertically louvred blind assembly of the type having a plurality of travellers for holding the vertical louvres, said spacer permitting two adjacent travellers to move apart until said travellers reach a predetermined separation and preventing further separation of said travellers beyond said predetermined distance but permitting said travellers to move toward each other unrestrained, comprising:

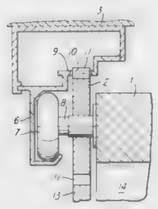
VOL 1088 ISS 4 MR 22 1988 UMI

(a) a first elongated strip extending from a first of said travellers in a direction parallel to said headrail to slidably overlay a second elongated strip extending in the same direction from an adjacent traveller;
(b) a slot formed in said second strip and having an elongated dimension parallel to the elongated dimension of said second strip;



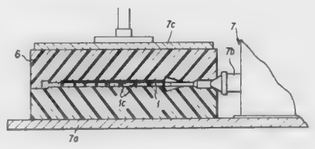
(c) hook means extending downward from said first strip to side along the surface of said second strip and engage an edge of said slot when said first and second travellers are moved to a predetermined separation distance to prevent further relative movement of said first and second strips and thereby preventing further separation of said first and second travellers beyond said predetermined distance;
(d) resilient spring means for biasing said first elongated strip into contact with said second strip.

4,732,203
SECTIONAL DOOR WITH OPERATOR
Kurt Altea, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany
Filed Oct. 31, 1986, Ser. No. 925,160
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538947
Int. Cl.[4] E05F *15/00*
U.S. Cl. 160—188 **6 Claims**



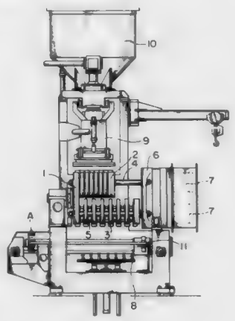
1. In a sectional door having a plurality of articulated closure elements that are guided at the sides via guide means, and that are provided with drive means, whereby these closure elements can be moved from an essentially vertical operative position where they close a building opening, into an approximately horizontal rest position above said building opening, and vice versa, the improvement wherein:
said drive means comprises: at least one motor secured directly to an uppermost one of said closure elements; gear wheel means driven by said at least one motor; stationary track means including individual tracks having openings with which the teeth of said gear wheel means mesh; said guide means including horizontal guide means sections, with said individual tracks being disposed integrally therewith; said guide means further including rollers that are freely rotatably supported by said closure elements and cooperate with said horizontal guide means sections to effect guidance of said closure elements; said gear wheel means including gear wheels supported by said uppermost closure element, and at least one of said gear wheels being mounted in coaxial relationship with said guide rollers.

4,732,204
PROCESS FOR THE PREPARATION OF CERAMIC CORES
Jacky P. Tabardin, Villiers le Bel, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A." , Paris, France
Filed Feb. 26, 1987, Ser. No. 19,334
Claims priority, application France, Feb. 27, 1986, 86 02700
Int. Cl.[4] B22C *9/04*
U.S. Cl. 164—35 **4 Claims**



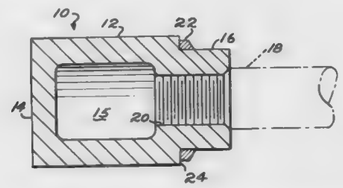
1. A process for the production of ceramic cores intended for the casting of high precision parts by the lost wax method, the process comprising the steps of:
(a) providing a core having cavities therein,
(b) providing a flexible mould,
(c) filling by means of an injection moulding machine, the cavities of the core with modelling wax while the core is enclosed within the flexible mould, and
(d) enrobing the core with modelling wax.

4,732,205
MOULDING MACHINE EQUIPPED WITH LONGITUDINAL LAMINATING CORE BOXES
Kazuo Kawai, Toyonaka, and Sumikazu Kawai, Amagasaki, both of Japan, assignors to Naniwa Products Co., Ltd., Osaka, Japan
Filed Mar. 18, 1986, Ser. No. 840,764
Int. Cl.[4] B22C *13/12, 15/24*
U.S. Cl. 164—228 **11 Claims**



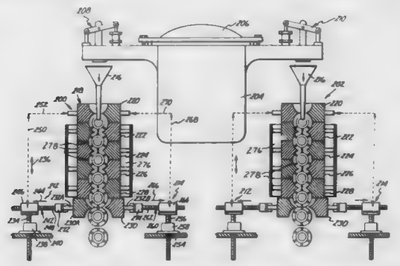
1. A moulding machine comprising:
a fixed die plate;
a main movable die plate;
a plurality of sub-movable die plates arranged between said fixed die plate and said main movable die plate along a longitudinal axis;
a plurality of core boxes adapted to form a longitudinal laminate of adjacent said core boxes for moulding a mold between each pair of adjacent said core boxes, a respective said core box being disposed in a respective said die plate; and
a connecting means for interlockingly connecting said main movable plate and said sub-movable plates.

4,732,206
PLUNGER TIP HAVING A SAFETY INDICATOR SURFACE
Ray L. Hildreth, and Leonard Furman, both of Marion, Ohio, assignors to Semco, Inc., Marion, Ohio
Filed Dec. 19, 1980, Ser. No. 218,441
Int. Cl.[4] B22D *17/08*
U.S. Cl. 164—312 **7 Claims**



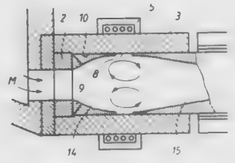
1. A metal plunger tip for use in aluminum die casting operations comprising a cylindrical body closed at one end and having an axially extending cavity therein whereby the body has a wall thickness determined by the distances of the interior and exterior surfaces of the body from the axis of the plunger tip, and a shank extending axially from the other end of the body, the body forming a shoulder at the junction between the body and the shank and the shank having a transverse dimension less than the outside diameter of the body; and at least one outwardly facing safety indicator surface located at a point intermediate the interior and exterior surfaces of the body for indicating the extent to which the outside diameter of the body can be reduced by machining without reducing the wall thickness of the body to an unsafe dimension, said safety indicator surface being the outwardly facing surface of a projection on the shank, the projection being located immediately adjacent the shoulder.

4,732,207
APPARATUS WITH SCREW ARMS FOR CONTINUOUSLY SIZING, PREFORMING OR CASTING
Oscar Trendov, 509 Strasbourg Rd., Monroe, Mich. 48161
Continuation-in-part of Ser. No. 827,279, Feb. 7, 1986, Pat. No. 4,662,428. This application Apr. 28, 1987, Ser. No. 43,563
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—459 **5 Claims**



1. An apparatus for continuously casting metal objects, the apparatus comprising:
a plurality of molds arranged in a substantially vertical column defining a mold cavity, each mold having at least two mold sections separable from each other and the column having a top mold and a bottom mold;
means for retaining the molds in the substantially vertical column; and
means for separating mold sections of the bottom mold and for removing the bottom mold sections and for positioning the bottom mold sections on the top mold of the column forming a new top mold, said means for separating mold sections including first and second screw arm assemblies, each screw arm assembly including first screw arm means for moving a mold half in a substantially vertical direction and second screw arm means for moving a mold half in a substantially horizontal direction such that a bottom mold section is moved horizontally from a bottom position in the mold column when the screw arm means is in a lowermost position and is moved in an upward direction to an uppermost position and is then moved horizontally to a top position on the mold column for forming an upper mold.

4,732,208
METHOD AND APPLICATION FOR HORIZONTAL CONTINUOUS CASTING
Hans-Gunnar Larsson, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden
Filed Nov. 18, 1986, Ser. No. 932,031
Claims priority, application Sweden, Nov. 21, 1985, 8505505
Int. Cl.[4] B22D *11/00, 27/02*
U.S. Cl. 164—468 **3 Claims**



1. A method for horizontal continuous casting comprising a succession of steps each comprising filling a horizontal continuous casting mold with a melt and allowing time for the mold to form in it a length of strand having a solid skin containing melt, and thereafter pulling the length forwardly partially from the mold while flowing additional melt into the mold so as to form a following length of said strand having its skin welded to the trailing end of the skin of the first length, and successively repeating said steps and forming additional lengths until step-by-step a desired length of casting is obtained; wherein the improvement comprises step of inductively stirring the melt longitudinally in the mold at a location between the ends of the mold so that the skin thins at that location and breaks apart during the pulling of the lengths of strand from the mold.

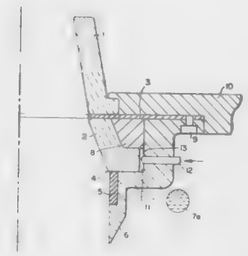
4,732,209
PROCESS AND APPARATUS FOR TOP-FEED CASTING OF METALS
Georges Apostolou, Saint Nicolas, and Sotiris Armaos, Saint-Nicolas, both of Greece, assignors to Aluminium Pechiney, Paris, France
Filed Jul. 28, 1986, Ser. No. 889,628
Claims priority, application France, Jul. 30, 1985, 85 12054; Jun. 6, 1986, 86 08427
Int. Cl.[4] B22D *11/04, 11/124*
U.S. Cl. 164—475 **4 Claims**

1. A process for the continuous casting of molten metal in an ingot mould having a movable bottom, which is internally provided with a graphite ring, which is externally cooled and having a wall in contact with the metal which is initially lubricated, comprising the steps of:

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storing the molten metal in a feeder head comprising an upper portion (1) and a lower portion (2) which is disposed in adjacent relationship above the ingot mould (6), said feeder head having an overhang (4) with repsect to the inside wall of the ingot mould,
feeding the ingot mould with molten metal from the feeder head, and
maintaining a mass of metal on the ingot mould so as to cause, by a flow of cooling fluid on the outside of the ingot mould and on the metal, solidification of the mass which is sufficient to permit metal to be extracted by way of the bottom, in a form corresponding to that of the ingot mould,
and further comprising applying an inert gas pressure to the periphery of the lower portion of the feeder head throughout the duration of the casting operation.

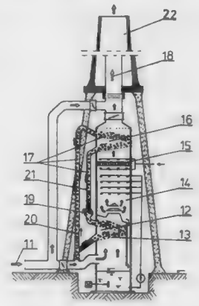
3. Metal casting apparatus comprising:



an ingot mould (6) having a movable bottom and provided on the outside with means (7) for a feed of a cooling fluid, and on the inside with a graphite ring (5),
a feeder head disposed in adjacent and overhanging relationship above the ingot mould and clamped against the upper face of said ingot mould, wherein
the feeder head comprises an upper portion (1) and a lower portion (2) which are connected together by way of a seal,
the lower portion (2) being surrounded over its entire periphery by a clamping ring (8) and by ring (13) which isolates the lower portion from the atmosphere, the diameter of said isolating ring being greater than the largest outside diameter of said lower portion, so as to form an annular chamber (11) around said lower portion, over at least a fraction of the height thereof, and wherein
said chamber is in communication with a source of inert gas under pressure by way of a feed conduit (12).

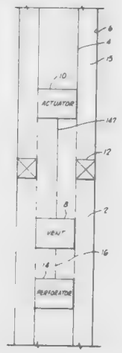
4,732,210
COLUMN-TYPE REGENERATIVE GAS-GAS HEAT EXCHANGER WITH HEAT-TRANSFERRING ELEMENTS
Stanislaw Michalak, Ratingen, and Bernd Hermanns, Gummersbach-Rebbelroth, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany
Division of Ser. No. 421,485, Sep. 22, 1982, Pat. No. 4,596,766. This application Jul. 7, 1986, Ser. No. 882,543
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214958
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.[4] F28D *19/02;* **F28C** *3/16;* **B01D** *51/10*
U.S. Cl. 165—104.18 **5 Claims**

1. A column-type regenerative gas-gas heat exchanger which usable for reheating gases after a wet washing or scrubbing of exhaust gas via a scrubber and which is provided with heat-transferring elements which absorb heat from hot gas, and give off heat to cold gas, said heat exchanger in combination comprising:
a first column part;
a second column part, each of said column parts being integrated in the scrubber for heating up purified cleaned gas as well as for absorbing heat from untreated gas and being provided with at least one gas-permeable plate; said second column part being located above said first column part when viewed in the direction of gas flow, which flows in an upward direction through said gas-permeable plates of said column parts; said heat-transferring elements forming a fluidized bed in said first and second column



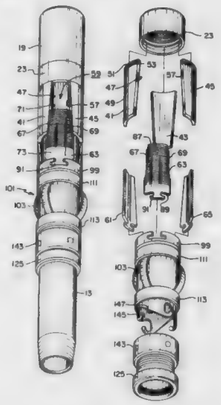
parts during operation, and being cyclically conveyed from said second column part to said first column part; said fluidized bed moving counter-cross current to said gas flow an over said gas-permeable plates of said column parts; and
at least one sluice/charging valve means arranged operatively with said first and second column parts to control and regulate time of engagement of hot gas relative to said first and second column parts via adjustment of speed of rotation of said valve means.

4,732,211
ANNULUS PRESSURE OPERATED VENT ASSEMBLY
David M. Haugen, Houston; David S. Wesson, Katy; Robert R. Luke, Houston, and Kevin R. George, Columbus, all of Tex., assignors to Halliburton Company, Duncan, Okla.
Filed Aug. 7, 1986, Ser. No. 894,101
Int. Cl.[4] E21B *43/116, 34/10*
U.S. Cl. 166—55.1 **24 Claims**



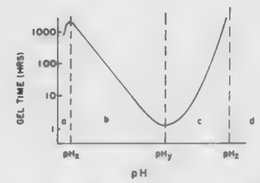
1. An apparatus for perforating a casing containing fluid therein in a well and for controlling the flow of fluids into said apparatus from said casing containing fluid therein and from a formation of the earth behind said casing in said well, said apparatus comprising:
a tubing string disposed in said well in spaced relation to said casing so that an annulus is defined therebetween, said tubing string adapted to conduct a fluid therethrough and containing a fluid therein and said tubing string including:
tubing sections extending from the top of said well thereinto;
packer means connected to said tubing sections and set in said casing in said well for dividing said annulus into an upper annular portion located above said packer means and a lower annular portion located below said packer means; and
perforating means, connected to said tubing sections below said packer means, for perforating said casing;
vent means, connected to said tubing string and located below said packer means, for preventing the flow of fluid between said lower annular portion and said tubing string through said vent means when said vent means is closed and for permitting the flow of fluid between said lower annular portion and said tubing string through said vent means when said vent means is open;
actuating means, connected to said tubing string and located above said packer means, for actuating said vent means in response to the differential in fluid pressure of said fluid within said casing in said upper annular portion and the fluid pressure of the fluid within said tubing string; and
coupling means, coupling said perforating means and said vent means, for initiating the operation of said perforating means in response to said actuating means actuating said vent means.

4,732,212
ATTACHMENT DEVICE FOR A SLIP GRIPPING MECHANISM WITH FLOATING CONE SEGMENTS
James M. Fraser, III, Woodlands, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Jul. 24, 1987, Ser. No. 77,255
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—216 **9 Claims**



1. A slip gripping mechanism for supporting a cylindrical conduit within the interior bore of a circumscribing conduit in a well bore, the cylindrical conduit being made up of a plurality of joints of pipe, at least one of the joints having a cylindrical external diameter which defines a length between a threaded connecting end at one extent and an opposite threaded connecting end at one another extent, the slip gripping mechanism comprising:
a cone retaining body having an internal bore which defines an interior surface, the bore being sized to slidingly receive the cylindrical external diameter of one of the joints of the cylindrical conduit which is to be supported from the circumscribing conduit whereby the cone retaining body is received directly on the cylindrical external diameter of the cylindrical conduit between the threaded connecting ends thereof;
a plurality of individual cone segments, each cone segment having side edges and an engagement end, the engagement end being adapted to be engaged by the cone retaining body for supporting each of the cone segments in spaced circumferential locations on the cylindrical conduit, the side edges of adjacent cone segments defining a plurality of circumferentially spaced, longitudinally disposed slots;
a plurality of circumferentially spaced, vertically shiftable slips carried on the cylindrical conduit in the longitudinally disposed slots, each slip having side edges which engage mating profiles formed in the longitudinally disposed slots whereby the slots form guideways for the slips for shifting the slips upwardly and outwardly between a set position engaging the circumscribing conduit and an unset position;
setting means for effecting opposite relative motion between the cone segments and the slips; and
wherein the interior surface of the cone retaining body is threaded and wherein the external diameter of the cylindrical conduit is provided with mating threads at one extent thereof for engaging the cone retaining body whereby the cone segments are fixed against axial movement with respect to the cylindrical conduit.

4,732,213
COLLOIDAL SILICA-BASED FLUID DIVERSION
Karl E. Bennett, Hockessin; John L. Fitzjohn, Wilmington, both of Del.; Richard A. Harmon, Ponca City, Okla., and Paul C. Yates, Jr., Wilmington, Del., assignors to Conoco Inc., Ponca City, Okla. and E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 15, 1986, Ser. No. 907,693
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—292 **23 Claims**



1. A process for selectively plugging permeable zones in subterranean formations or for plugging subterranean leaks which comprises injecting into the permeable zone or the site of the subterranean leak an aqueous solution containing 1 to 70 weight percent of a non-aggregated colloidal silica sol having a particle diameter in the range between 4 and 100 nm and a PH in the range between about 1 and 10, said solution as injected having a desired gel time in said zone or at said site without the necessity of being contacted by a separately injected material.

4,732,214
SUBSEA PRODUCTION TEST VALVE ASSEMBLY
Peter D. Yates, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.
Filed Jan. 12, 1987, Ser. No. 2,457
Int. Cl.[4] E21B *34/04, 34/10*
U.S. Cl. 166—336 **20 Claims**

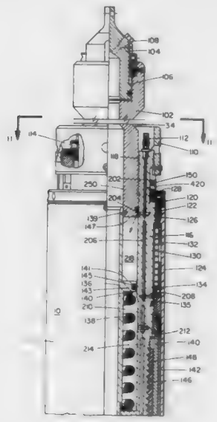
1. In a subsea test assembly securable within a blowout preventer stack above a subterranean well and positionable

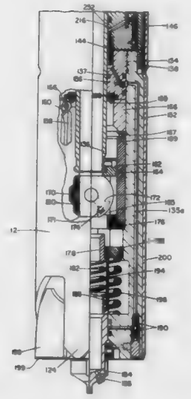
VOL 1088 ISS 4 MR 22 1988 UMI

between upper and lower portions of a tubular conduit in fluid communication with a production zone within the well, the test assembly including an upper subassembly carriable with the upper conduit portion, a lower subassembly carriable with the lower conduit portion, and valve means in the lower subassembly manipulatable between opened and closed positions to control fluid flow within the conduit, the improvement comprising:

the upper subassembly including an upper housing and first rigid dog means fixedly secured to the upper housing;

the lower subassembly including a lower housing and second rigid dog means fixedly secured to the lower housing;





the first rigid dog means positionable between a latch position for latching the upper and lower subassemblies and an unlatch position for unlatching the upper and lower subassemblies upon rotational movement of the first dog means with respect to the second dog means; and

lock means axially movable relative to the first and second dog means from a lock position for limiting rotational movement of the first dog means with respect to the second dog means to an unlock position for allowing the first dog means to rotate relative to the second dog means and unlatch the upper subassembly from the lower subassembly.

4,732,215

SUBSEA OIL PRODUCTION SYSTEM

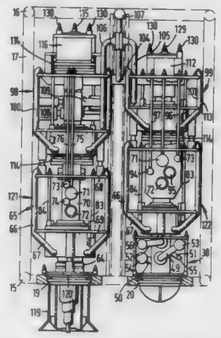
Hans P. Hopper, Whiterashes, Scotland, assignor to British Petroleum Company PLC, Middlesex, England

Filed May 2, 1986, Ser. No. 858,754

Claims priority, application United Kingdom, May 4, 1985, 8511440; May 4, 1985, 8511441; May 4, 1985, 8511442; May 4, 1985, 8511443; May 4, 1985, 8511446; May 4, 1985, 8511448; May 4, 1985, 8511449

Int. Cl.⁴ E21B *43/017*

U.S. Cl. 166—366 **11 Claims**



1. A template for a subsea oil production system having a three-dimensional framework of vertical and horizontal members enclosing one or more rectangular production bays, each bay having a well slot and a manifold slot, said vertical and horizontal members of the framework defining, within each production bay, space above each well slot for a tree module, space above each manifold slot for a manifold module, and space above the modules for a production bridge module linking the other modules.

4,732,216

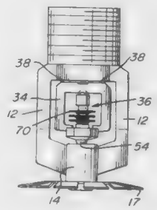
QUICK RELEASE MECHANISM FOR SPRINKLER HEAD

George S. Polan, North Wales, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Apr. 21, 1986, Ser. No. 854,369

Int. Cl.⁴ A62C *37/08*

U.S. Cl. 169—38 **12 Claims**



1. Quick release mechanism for a sprinkler head having an outlet orifice, a pair of arms projecting from body portion adjacent said orifice and a collar integral with said arms containing a preload mechanism, comprising:

a seal cap disposed in sealing engagement with the =sprinkler head over said outlet orifice;

an end collar pivotally mounted on the preload mechanism;

latch means interposed between said end collar and seal cap for holding said seal cap in sealing engagement over said outlet orifice including a structural element on one end of which is pivotally mounted on said seal cap and an opposite end of which is pivotally mounted on said end collar in lateral offsetting relation with respect to the pivot axis of said end collar, and a thermal responsive element one end of which is supported by said end collar and the other end of which supports said structural element such that forces acting on said structural element and thermal responsive element produce counteracting balanced moments about said end collar; and

said thermal responsive element including means for releasing said thermal responsive and structural elements from engagement upon exposure to a predetermined temperature thereby to cause said latch means to release said seal cap from sealing engagement with said outlet orifice.

4,732,217

HAMMER DRILL

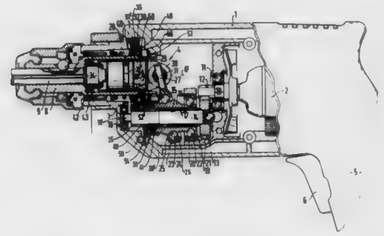
Manfred Bleicher, Leinfelden-Echterdingen; Ulrich Bohne, Kohlberg, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,445

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1985, 3504650

Int. Cl.⁴ B23B *45/16*

U.S. Cl. 173—104 **10 Claims**



1. A hammer drill having a housing and within the housing means for guiding a work tool, a percussive mechanism including an electric motor coupled via a gear train and a rotary motion convertor to a reciprocating driving member, the driving member acting via an air cushion on an axially movable striking member whose energy is transferred to a work tool inserted in said guiding means, a clutch having an axially movable part in mesh with said gear train and an axially fixed part provided on said motion convertor, comprising means for transferring relative axial movement between the work tool and the housing to said movable clutch part to control the connection between said gear train and said motion converter in response to a contact pressure of the work tool against a workpiece, said transferring means including power transforming means for amplifying the effects of said contact pressure on said clutch, said guiding means being displaceable relative to said housing in response to a control pressure of the work tool against a workpiece, and said power transforming means including a lever system arranged between said housing, said guiding means and said movable clutch part so as to amplify pressure transmission from said guiding means against said clutch part.

4,732,218

HAMMER DRILL WITH SEPARATE AND INTERCONNECTABLE DRIVE MEANS

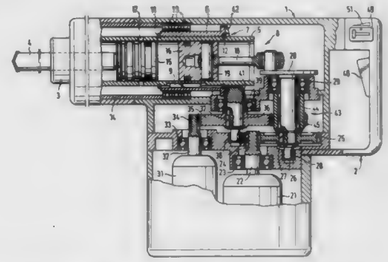
Anton Neumaier, Fürstenfeldbruck, and Hans-Jürgen Hoereth, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed May 5, 1986, Ser. No. 859,647

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516494

Int. Cl.⁴ B23B *45/16*

U.S. Cl. 173—105 **5 Claims**



1. Hammer drill for selectively providing rotational force, impact force or rotational and impact forces to a tool inserted into a hammer drill, comprising a housing, means within said housing for applying impact forces to the tool, means within said housing for applying rotational forces to the tool, a first drive motor arranged to drive said impact force means, a second drive motor arranged to drive said rotational force means, said first and second drive motors being controllable independently of one another, wherein the improvement comprises a first drive train interconnecting said first drive motor and said impact force means, a second drive train separate from said first drive train and interconnecting said second drive motor and said rotational force a coupling device, and means for interconnecting said first and second drive trains so that at least one of said impact force means and said rotational force means can be selectively driven by both said first and second drive motors.

4,732,219

HAMMER DRILL WITH PNEUMATICALLY DRIVEN PERCUSSION PISTON

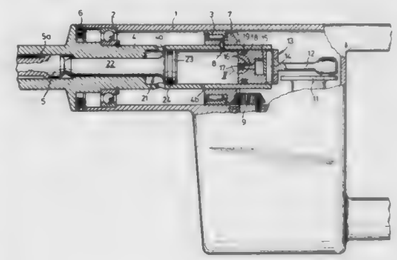
Franz Chromy, Feldkirch, Austria, assignor to Hilti Aktiengesellschaft, Fürstfentum, Liechtenstein

Filed Nov. 3, 1986, Ser. No. 926,712

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3539030

Int. Cl.⁴ B25D *17/00*

U.S. Cl. 173—116 **7 Claims**



1. Hammer drill comprising a housing having a front end and

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a rear end, an axially elongated hollow cylinder insertable into said housing through the front end thereof and located within and extending axially in the front end-rear end direction of the housing, said cylinder forming an axially extending piston chamber within said housing, a drive piston displaceably mounted within said piston chamber for movement in the front end-rear end direction of said housing, means for reciprocating said drive piston within said piston chamber, an axially extending percussion piston displaceably mounted within said cylinder and extending into said piston chamber and spaced from said drive piston in the direction toward the front end of said housing, an air cushion space located within said piston chamber between said drive piston and percussion piston, wherein the improvement comprises that at least one of said drive piston and percussion piston comprises a conduit having a first end opening into said air cushion space and a second end opening to the exterior of said cylinder remote from said air cushion space, and a closure plug formed of a material with a selected melting point and located within and closes said conduit, the melting point of the closure plug being lower than the melting point of material forming said drive piston and percussion piston and higher than the normal operating temperature within said air cushion space so that at an increase in temperature above the operating temperature within said air cushion space, said closure plug melts rendering the air cushion space ineffective whereby further reciprocation of said drive piston fails to reciprocate said percussion piston and said drive and percussion pistons cannot strike one another.

4,732,220

APPARATUS FOR BRIEFLY AND IMPULSIVELY RELEASING MECHANICAL ENERGY

Bo E. G. Johnsson, Järna, Sweden, assignor to Marcus Komponenter AB, Järna, Sweden

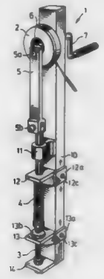
PCT No. PCT/SE84/00187, § 371 Date Jan. 8, 1985, § 102(e) Date Jan. 8, 1985, PCT Pub. No. WO84/04571, PCT Pub. Date Nov. 22, 1984

Continuation of Ser. No. 688,448, Jan. 8, 1985, abandoned. This PCT application May 16, 1984, Ser. No. 908,967

Claims priority, application Sweden, May 19, 1983, 83028530

Int. Cl.⁴ F16H *33/00*; B25D *1/00*

U.S. Cl. 173—119 **4 Claims**



1. A high speed punch press apparatus for briefly storing and impulsively delivering mechanical energy, comprising:

(a) a circular rotatable member (2),

(b) means (7) for rotatably driving the rotatable member,

(c) a relatively light weight, linearly reciprocable power delivering device (3),

(d) an elastically compressible energy absorbing member (4) operatively coupled to the power delivering device for compressively storing energy during movement of the power delivering device in one direction and for expansively releasing such stored energy to rapidly move said device in an opposite direction at a rate of acceleration substantially exceeding that of gravity upon the rotatable member passing a limit position, such that the resulting impulsive energy delivery rate exceeds 750 strokes per minute,

(e) a first coupling member (2) defined by the rotatable member, and

(f) a second coupling member (5*a*) connected to the power delivering device by a crank (5) and operatively disposed for engagement with the first coupling member, wherein:

(1) the first coupling member comprises a closed curve within the circular rotatable member successively defining, in a direction of rotation thereof, a single, inwardly extending, tooth-like dogging projection (2*a*), a single adjacent, outwardly extending recess (2*b*) radially spaced from a center of the rotatable member, and a circular arc (2*c*) having a constant radius substantially equal to a radius at a greatest depth of the recess, wherein said closed curve thus approximates the shape of a central vertical section through an apple, and

(2) the second coupling member comprises a follower pin configured to mate with and nestingly engage within the recess and the dogging projection for movement in a constant radius path from a lower released position to an upper, diametrically opposite position whereat the rotatable member is at its limit position such that the follower pin movement repetitively approximates that of a semi-circular path in engagement with the recess closed by a diametrical path free of any engagement with the first coupling member.

4,732,221

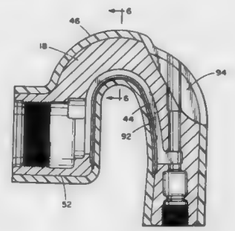
PNEUMATIC CHIPPING HAMMER AND METHOD OF MANUFACTURE

Edmund C. Dudek, Johnson City, Tenn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 21, 1987, Ser. No. 5,599

Int. Cl.⁴ B23B *45/04*

U.S. Cl. 173—170 **16 Claims**



1. A fluid operated power tool comprising: a tool body adapted to receive a fluid motor for driving a tool carried by the tool body, a handle portion connected to the tool body having an inlet adapted to be connected to a source of fluid under pressure, a passageway in the handle portion and the tool body adapted to carry fluid under pressure from the inlet to the fluid motor in the tool body, at least a portion of the passageway being formed by a groove in the exterior of the handle portion, high temperature tape covering the groove, and an elastomeric material insert molded around the handle portion and covering the tape and groove.

4,732,222

RAM BORING MACHINE WITH IMPACT BLADE PISTON

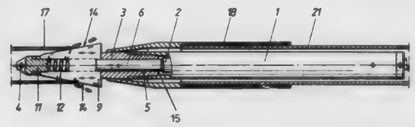
Paul Schmidt, Leanestadt, Fed. Rep. of Germany, assignor to Tracto-Technik Paul Schmidt Maschinenfabrik GmbH

Filed Sep. 23, 1986, Ser. No. 910,488

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533995

Int. Cl.⁴ E21B *11/02*; F16L *55/18*

U.S. Cl. 175—22 **11 Claims**



1. A ram boring machine for laying pipelines without trenching, comprising a housing having a front end, the housing defining a longitudinal axis, a striker piston guided in the housing of the machine and an impact tip fixed to the front end of the housing, the impact tip provided with impact blades, wherein the impact blades are movable in axial direction relative to the impact tip, the impact blades being acted upon by the striker piston.

4,732,223

CONTROLLABLE DOWNHOLE DIRECTIONAL DRILLING TOOL

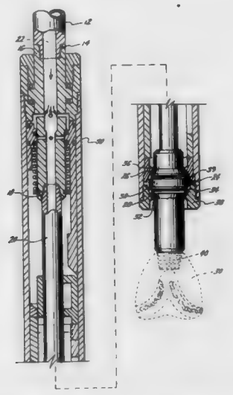
Schoeffler, William N., Lafayette, and Jerry J. Dugas, Breaux Bridge, both of La., assignors to Universal Downhole Controls, Ltd., Breaux Bridge, La.

PCT No. PCT/US85/01116, § 371 Date Oct. 28, 1985, § 102(e) Date Oct. 28, 1985, PCT Pub. No. WO86/00111, PCT Pub. Date Jan. 2, 1986

Continuation-in-part of Ser. No. 619,866, Jun. 12, 1984, Pat. No. 4,597,454. This PCT application Jun. 12, 1985, Ser. No. 798,694

Int. Cl.⁴ E21B *7/04*

U.S. Cl. 175—73 **6 Claims**



1. A directional drilling tool, for controllable drilling in a deep oil well having a bore, the tool comprising:

a. an elongate, outer, orientable casing member aligned in the bore;

b. an inner, bendable, torque passing member adapted for rotation of a drill bit, journaled within the outer casing member;

c. first collar means for maintaining the bendable torque passing member in a first aligned position in the casing member;

d. second collar means encircling the inner bendable member for shifting the inner bendable torque passing member to a second deflected position, with respect to the outer casing member; and

e. means for shifting the first collar means to a position for allowing the inner bendable torque passing member to move to the second deflected position, with respect to the outer casing member.

4,732,224

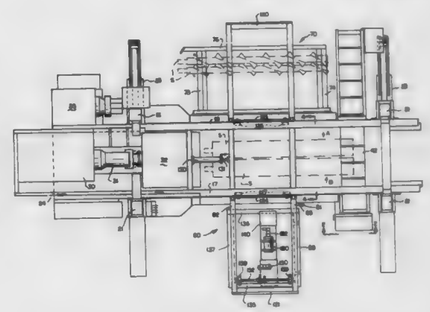
AUGER APPARATUS

Ronald C. Deeter, Malvern, and Robert J. Fisher, Columbiana, both of Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Jul. 28, 1986, Ser. No. 891,508

Int. Cl.⁴ E21B *19/14*; E21C *1/10*

U.S. Cl. 175—85 **11 Claims**



1. Auger apparatus comprising a frame, means associated with said frame for rotating at least one auger in said apparatus made up of a plurality of elongated auger sections connected end-to-end along a longitudinal axis, storage means on said apparatus spaced laterally from an auger in said apparatus for storing a plurality of auger sections in parallel relationship to said longitudinal axis, hoist means associated with said frame for lifting and lowering an auger section and moving same between said storage means and an auger in said apparatus, said hoist means comprising a laterally movable member, means for supporting said laterally movable member for lateral movement between a location above an auger in said apparatus and a location above said storage means, lift, said hoist means comprising a means carried by said laterally movable member and including carriage means having auger section holding means thereon, said carriage means having spaced-apart opposite side rails extending parallel to said longitudinal axis, collapsible and expandable guide means connected between said laterally movable member and each said side rail on said carriage means to guide said carriage means in an upwardly extending path of movement when lifted by said lift means and for stabilizing said carriage means during movement of said laterally movable member, said frame including overhead frame means for supporting said hoist means, said hoist means being suspended beneath said overhead frame means with no components of said hoist means extending above said overhead frame means in any position of said hoist means.

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4,732,225

DEEP-BOREHOLE DRILLING DEVICE WITH MAGNETIC COUPLING

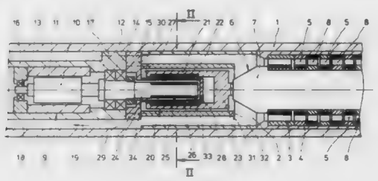
Rainer Jurgens, Osterloh, and Ulrich Hense, Hambuhren, both of Fed. Rep. of Germany, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Feb. 4, 1987, Ser. No. 10,750

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604270

Int. Cl.[4] E21B *4/02, 4/04*

U.S. Cl. 175—92 8 Claims



1. In a deep-borehole drilling device including a casing, at least one driven unit and a drive unit supported inside said casing to drive said at least one driven unit, and wherein mud flows through said casing to drive said driven unit, the improvement comprising:

a drive transmission coupling for effecting a driving relation between said at least one driven unit and said drive unit,

said drive transmission being a contact-free magnetic coupling supported within said casing and including first magnetic means rotatingly driven by said drive unit and second magnetic means spaced from said first magnetic means and rotatingly driven thereby,

said at least one driven unit being supported in said casing in sealed relation with respect to entrance of said mud into said at least one driven unit,

said second magnetic means being sealingly connected to drive said at least one driven means,

non-rotating means supported in said casing in spaced relation to said said first magnetic means, and

seal means cooperating with said non-rotating means to prevent flow of mud into the space between said first and said second magnetic means.

4,732,226

DRILLING MACHINE

Wolfgang Ebeling, Hanover, and Helmut Kolditz, Wolfenbüttel, both of Fed. Rep. of Germany, assignors to Turmag Turbo-Maschinen AG and Gesellschaft Fuer Strahlen- und Umweltforschung Muenchen MBH, Sprockhoevel, Fed. Rep. of Germany

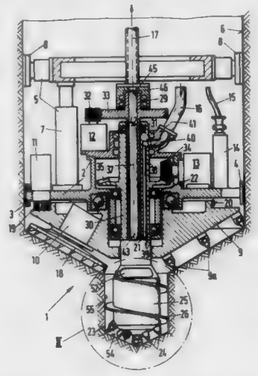
Filed Mar. 16, 1987, Ser. No. 26,525

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609111

Int. Cl.[4] E21B *4/18;* E21C *1/00;* E21D *1/06*

U.S. Cl. 175—94 22 Claims

1. A shaft drilling machine, comprising a drill head carrying drill tools thereon; means for guiding said drill head in a shaft; means for advancing said drill head in the shaft; drive means which are lowered into the shaft together with said drill head and driving the latter; a sluice and rinsing means for providing a rinsing fluid; a rinsing conduit connected to said rinsing means to lead said fluid to said drill head in the vicinity of which said fluid is mixed with a drilled material; an ascending conduit to convey a generated drilled material fluid mixture to a shaft mouth; a pilot drill (23) connected to said drill head; said sluice being formed as a bucket wheel sluice (27) and positioned in said pilot drill, said bucket wheel sluice being



connected to said rinsing conduit (16) and said ascending conduit (17).

4,732,227

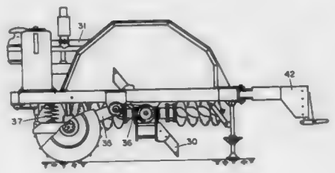
EQUIPMENT FOR CONTINUOUS HOLE DRILLING IN SOIL

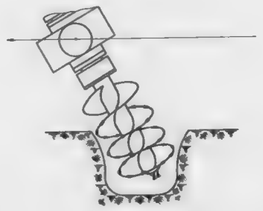
Dan Wolf, Haifa; Avraham Steif, Kiriat-Bialik; Arie Wolk, and Gedalia Manor, both of Haifa, all of Israel, assignors to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Dec. 23, 1986, Ser. No. 946,191

Int. Cl.[4] E21B *3/02*

U.S. Cl. 175—170 18 Claims





1. Equipment for drilling a row of substantially equidistant holes in soil, comprising:

a carriage attached to a traction vehicle for moving said traction vehicle along a predetermined path, said carriage being supported by at least one road wheel,

at least one earth auger compriising a shaft and helical blades wound around said shaft, and cutting lips extending from an outer end of said shaft, said shaft being power-rotated about its central axis and fastened to said carriage by means of a substantially horizontal, revolvable axle, said axle being positioned substantially perpendicular to the direction of travel of said equipment at a predetermined height above ground level and being coupled to revolve said auger in a substantially vertical plane sustantially parallel to said direction of travel, the depth of said drilled holes being defined by the distance of the outer end of said shaft of said auger from the axis of said axle,

at least one cultivator-shaped blade mounted on said substantially horizontal rotatable axle, forward of said at least one auger, for loosening the soil before entry of said cutting lips of said auger into the soil,

a power source and transmission coupled to rotate said auger about its central axis, and

means for revolving said at least one auger about said substantially horizontal axle so that the rotational speed of said auger is a function of the travel speed of said equipment.

4,732,228

PRECISION BALANCE

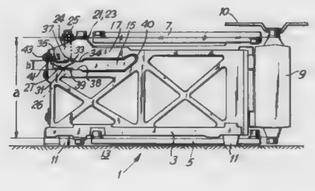
Horst Danhamer, Schwerzenbach, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

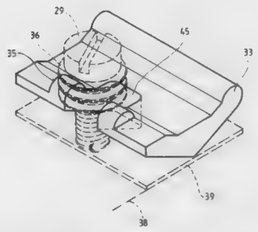
Filed May 4, 1987, Ser. No. 46,409

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3395

Int. Cl.[4] G01G *23/14, 3/08*

U.S. Cl. 177—164 7 Claims





1. A precision balance, comprising a balance frame, a support member, a weighing dish attached to the support member, the support member mounted in the balance so as to perform essentially exclusively a vertical movement during weighing, guide arms attached to the support member, an adjusting device for adjusting the vertical spacing between two guide arm ends, the balance frame defining a slot such that the portion of the frame adjacent the top side of the slot forms an elastically bendable arm, while the bottom side of the slot is rigid, the width of the slot being adjustable by the adjusting device, and an insert placed in the slot, the insert having linear contact with the top side and the bottom side of the slot, wherein the lines of contact of the insert with the top side and the bottom side of the slot extend parallel.

4,732,229

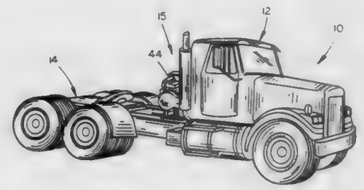
MEANS FOR HEATING AND COOLING A TRUCK CAB

James P. Lucht, 834 Hidden Hills Dr., Bellevue, Nebr. 68005

Filed Feb. 17, 1987, Ser. No. 15,085

Int. Cl.[4] B60H *1/32*

U.S. Cl. 180—69.6 6 Claims



1. In combination,

a truck including a cab, a water-cooled primary engine, an air-conditioning system including a first compressor driven by said engine, an evaporator and a condensor, and a heating system operatively connected to the coolant of the engine,

an auxiliary engine mounted on said truck and including a second air-conditioner compressor driven thereby, a second condensor operatively connected to said second compressor,

an alternator mounted on and driven by said auxiliery engine, said alternator being selectively operatively connected to the truck electrical system to selectively supply electrically thereto when said primary engine is not running.

means operatively connecting the downstream side of said second condensor to the inlet of said evaporator,

means connecting the outlet of said evaporator to the inlet of said second air-conditioner compressor,

and control means for selectively supplying refrigerant from either said second compressor or said first compressor to said evaporator whereby the interior of said cab may be cooled without operating the engine of said truck.

4,732,230

CENTER BEARING AND SUPPORT MECHANISM FOR TWO-PIECE PROPELLER SHAFT

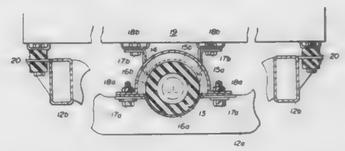
Tetsushin Sakata, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 14, 1986, Ser. No. 851,100

Claims priority, application Japan, Apr. 23, 1985, 60-87252

Int. Cl.[4] B60K *23/00*

U.S. Cl. 180—75.2 6 Claims



6. A center bearing and support mechanism for a vehicle having a cab and a rear body, comprising:

a propeller shaft having a center bearing;

a frame constituting a vehicle chassis, said cab and said rear body both resiliently and independently mounted on said frame;

a first mount for resiliently supporting said center bearing on said frame; and

a second mount for resiliently supporting said center bearing

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on said rear body such that the transfer of vibrations from said propeller shaft to said cab is prevented.

4,732,231

VEHICLE FOUR WHEEL STEERING SYSTEM

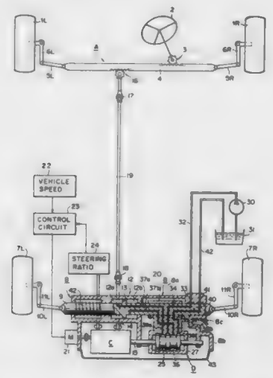
Hirotaka Kanazawa; Teruhiko Takatani; Shigeki Furutani, all of Hiroshima; Isamu Chikuma, Gunma; Satoru Shimada, Gunma, and Hiroshi Eda, Gunma, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Nippon Seiko Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 11, 1986, Ser. No. 895,227

Claims priority, application Japan, Aug. 13, 1985, 60-176962

Int. Cl.⁴ B62D *5/06*

U.S. Cl. 180—140 **13 Claims**



1. A vehicle four-wheel steering system comprising a manually operated steering member, front wheel steering means coupled with said steering member for producing steering movements in vehicle front wheels in accordance with movements in the steering member, rear wheel steering means coupled with said steering member for producing steering movements in vehicle rear wheels in accordance with the movements in the steering member, said rear wheel steering means including rear wheel steering rod means adapted for movements substantially transversely of the vehicle and connected with said vehicle rear wheels for producing steering movements therein, power assist piston-and-cylinder means connected with said steering rod means and including cylinder means and piston means in said cylinder means for defining hydraulic chamber means, control valve means for controlling supply of hydraulic pressure to said hydraulic chamber means to assist movement of the steering rod means in producing the steering movements in the vehicle rear wheels, said control valve means including valve casing means connected with said piston-and-cylinder means through interconnecting means, control rod means carried by said valve casing means for a sliding movement in response to the movement of the steering member and connected with said control valve means to transmit the movement of the steering member to said control valve means so that the control valve means is operated in accordance with the movement of the steering member to thereby control the hydraulic pressure to the hydraulic chamber means, hydraulic passage means formed in said interconnecting means and said steering rod means, said hydraulic passage means including valve passage means connecting said control valve means with said hydraulic chamber means, pressure supply passage means connecting hydraulic pressure source means with said control valve means and return passage means for exhausting the hydraulic pressure from said control valve means.

4,732,232

TILTABLE SHIFT LEVER ASSEMBLY FOR AUTOMOTIVE VEHICLE TRANSMISSION

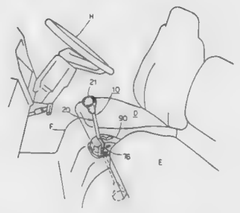
Junichi Miyagi, Zenichi Nobata, Anjo; Motoharu Akiyama, Chiryu, and Yoshitaka Sekiya, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Mannoh Kogyo Co., Ltd., both of Aichi, Japan

Filed Apr. 10, 1987, Ser. No. 37,385

Claims priority, application Japan, Apr. 14, 1986, 61-85656; Apr. 18, 1986, 61-90254; Apr. 18, 1986, 61-90255; Apr. 18, 1986, 61-90256; Apr. 18, 1986, 61-90257; Apr. 18, 1986, 61-90258; Apr. 18, 1986, 61-90259; Apr. 18, 1986, 61-90260

Int. Cl.⁴ B60K *19/12*

U.S. Cl. 180—336 **18 Claims**



1. A tiltable shift lever assembly for operating a transmission of an automotive vehicle which has a floor, a driver's seat, and a front passenger's seat, said tiltable shift lever assembly, comprising:

a shift lever disposed between said driver's seat and said front passenger's seat, so as to extend generally upward above said floor when placed in an operative position thereof, said shift lever having a shift knob at an upper end thereof and being supported pivotally about a first pivot axis which is substantially parallel to a transverse direction of the vehicle;

said shift lever including an upper portion having said shift knob, a lower portion operatively connected to said transmission, and a coupling connecting said upper and lower portions such that said upper portion is pivotable relative to said lower portion, about a second pivot axis which is substantially parallel to a longitudinal direction of the vehicle;

a guide member fixedly disposed above said coupling of the shift lever, and having a guide slot formed therethrough in a direction substantially parallel to said longitudinal direction, said upper portion of the shift lever extending through said guide slot, and being guided by the guide slot during a pivotal movement of said shift lever about said first pivot axis;

said guide member further having a lateral slot formed therethrough so as to extend in said transverse direction from one longitudinal position of said guide slot, said lateral slot permitting said upper portion of the shift lever to be pivoted about said second pivot axis until said upper portion is placed in a substantially horizontal position thereof.

4,732,233

APPARATUS FOR REDUCED TEAR PROPAGATION

Clarence S. Melander, West Covina, and Ralph Lewis, Jr., Cypress, both of Calif., assignors to The B. F. Goodrich Company, Akron, Ohio

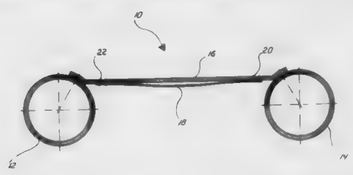
Filed Nov. 28, 1986, Ser. No. 935,864

Int. Cl.⁴ A62B *1/20*

U.S. Cl. 182—48 **8 Claims**

1. In a device wherein a flexible sliding ply bridges between a pair of supports for the sliding ply to establish a sliding structure for effecting a pathway for the sliding movement of objects between a pair of points, and wherein the sliding ply is subject to failure by reason of tears or rips, the improvement comprising:

a second ply of an elevated tear propagation resistance fabric positioned closely adjacent a surface of the sliding ply obverse to a surface upon which objects are slid, the second ply being attached at edges thereof to one of the



sliding ply and the supports but being otherwise substantially unaffixed to the sliding ply between the edge attachment; the sliding ply being formed of a coated fabric; the second ply being formed of a fabric having a tear propagation resistance greater than the tear propagation resistance of the sliding ply.

4,732,234

PERIMETER SAFETY NET SYSTEM FOR MULTI-STORY BUILDINGS UNDER CONSTRUCTION

Morley Brickman, 5240 Galitz, Skokie, Ill. 60077

Filed Sep. 8, 1987, Ser. No. 93,959

Int. Cl.⁴ E04G *21/32*

U.S. Cl. 182—138 **8 Claims**

1. A safety net system for multi-story buildings under construction comprising:

at least two parallel, vertical, stationary guide channels secured to a side of the building;

a vertically moveable slide rail slidably mounted on each of said guide channels;

a cantilever strut extending diagonally upwardly and outwardly from a connection with each slide rail;

outer anchor means mounted at the outer end of each strut;

inner anchor means mounted on each slide rail above said connection;

a safety net supported between said inner and outer anchor means; and

hoist means attached to each of said slide rails to simultaneously lift said slide rails and raise said net while in an extended condition to a new working position.

4,732,235

SCAFFOLDING

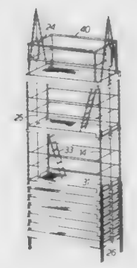
Henry T. Reed, 1 Otterburn Villas South, Jesmond, Newcastle-upon-Tyne, NE2 3AQ, Great Britain

PCT No. PCT/GB84/00388, § 371 Date Aug. 20, 1985, § 102(e) Date Aug. 20, 1985, PCT Pub. No. WO85/02219, PCT Pub. Date May 23, 1985

PCT Filed Nov. 9, 1984, Ser. No. 758,674

Int. Cl.⁴ E04G *3/10, 7/04*

U.S. Cl. 182—142 **8 Claims**



1. Scaffolding comprising: an assembly of platforms; a number of horizontally-spaced flexible suspension means secured at spaced positions along their length to the platforms for suspending the platforms in vertical array, one spaced from another while allowing them to be collapsed on one another in a stack; hoisting means secured to the lowest platform and capable of sliding in relation to the other platforms; winch means for winching in the hoisting means to lift and stack the lowest platform against a platform above it and then to raise all the lower platforms up to the top platform; and guides mounted on each platform with each guide having an end which can be guided into a lead-in portion of an adjacent guide so that as platforms are stacked together they are laterally located in relation to each other by the guides.

4,732,236

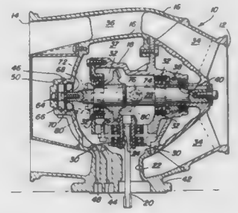
DUAL IMPELLER PUMP

David L. Jacques, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 16, 1986, Ser. No. 852,773

Int. Cl.⁴ F01M *11/06*

U.S. Cl. 184—6.2 **12 Claims**



1. A liquid scavenging pump system for scavenging oil or the like from a blower, an engine or the like, comprising:

a casing for housing the blower and defining an oil receiving cavity;

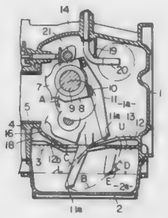
a dual pump having first and second pump means mounted in communication with the casing cavity for conjoint rotation;

first inlet means from the casing cavity to the first pump means;

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first outlet means from the first pump means for delivering oil from the cavity;
second inlet means from the casing cavity, remote from the first inlet means, to the second pump means; and
second outlet means from second pump means in communication with the first inlet to the first pump means to facilitate operating the pump at various attitudes.

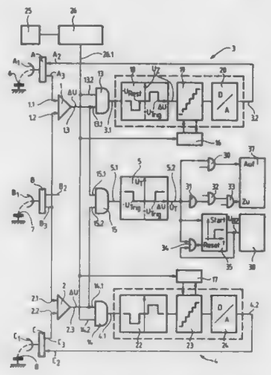
4,732,237
SPLASH LUBRICATING DEVICE FOR A HORIZONTAL OR INCLINED ENGINE
Keiichi Nakano, Sakaishi, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Apr. 28, 1986, Ser. No. 856,281
Claims priority, application Japan, Sep. 4, 1985, 60-135217[U]
Int. Cl.⁴ F01M *1/04*; F16N *7/16*
U.S. Cl. 184—6.5 **9 Claims**



1. A splash-type lubricating device for a horizontal or inclined engine having a revolving crankshaft, comprising:
an oil pan for containing oil, the oil filling said oil pan above a lower level;
an oil spoon fixedly connected to the crankshaft for movement therewith, said oil spoon being adapted to move into, through and out of the oil as the crankshaft revolves, whereby said oil spoon spashes oil onto parts of the engine as it moves out of the oil;
an oil splash portion connected to said oil spoon for movement therewith, said oil splash portion being provided with a surface having an edge, said edge being adapted to enter the oil first as said oil spoon moves downward into the oil; and
means for orienting said surface so that said surface is oriented substantially parallel to the direction of movement of said oil spoon during movement of said oil spoon into the oil, whereby resistance to the movement of said oil spoon through the oil is reduced.

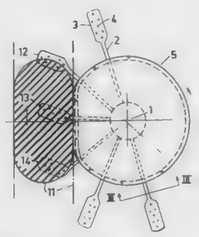
4,732,238
OBSTACLE DETECTION SYSTEM FOR AUTOMATICALLY CONTROLLED ELEVATOR DOORS
Max Baumgartner, Lucerne, Switzerland, assignor to Inventio AG, Switzerland
Filed Aug. 11, 1986, Ser. No. 895,245
Claims priority, application Canada, Aug. 22, 1985, 3612/85
Int. Cl.⁴ B66B *13/26*
U.S. Cl. 187—104 **21 Claims**

1. An automatic elevator door system for the recognition of obstacles having a plurality of antennas distributed across a closing edge of an elevator door, a plurality of capacitive sensors each coupled to an associated one of the antennas for generating a sensor signal representing the capacitance between the antenna and circuit ground, a plurality of differential amplifiers each coupled to a pair of the sensors for the reception and comparison of two of the sensor signals and for the generation of an error signal representing the difference between the received sensor signals, a compensator circuit coupled to the differential amplifiers for the compensation of each error signal, and an evaluating circuit coupled to the amplifiers and responsive to the error signals for the generation of a door control signal further comprising:
a door travel detector for sensing the entire range of movement of the elevator door and controlling the compensa-



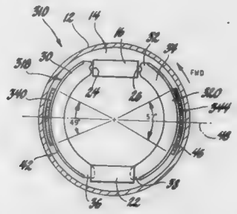
tor circuit during incremental motions of the door to compensate only during the closing movement of the door rapidly variable ones of the error signals, the evaluating circuit being responsive to said rapidly variable error signals for generating a door control signal.

4,732,239
ANTI-SKID DEVICE
Ragnar M. Härdmark, and Göte Törnebäck, both of Linköping, Sweden, assignors to Onspot AB, Linkoping, Sweden
Continuation of Ser. No. 711,950, Mar. 15, 1985, abandoned.
This application Oct. 29, 1986, Ser. No. 925,492
Claims priority, application Sweden, Mar. 15, 1984, 8401456
Int. Cl.⁴ B60T *1/04*
U.S. Cl. 188—4 B **16 Claims**



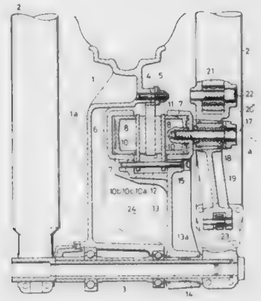
1. A device for increasing the friction or grip between the tires of an automobile and the ground comprising a rotatable, substantially disc-shaped member to which are attached arms, which arms are fed successively and continuously between the tire and the ground, characterized in that said arms are made of unreinforced rubber allowing a radial stretching of said arms in use of 50–100%.

4,732,240
DRUM BRAKE ASSEMBLY, BRAKE SHOES FOR SAME, AND METHOD
Thomas A. Flaim, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 10, 1987, Ser. No. 36,709
Int. Cl.⁴ F16D *51/00, 69/00*
U.S. Cl. 188—78 **17 Claims**



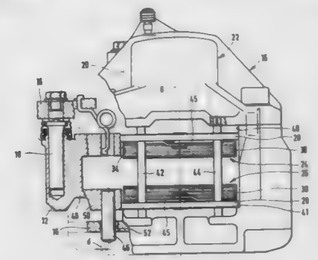
1. For use in a drum brake, a brake shoe assembly comprising a shoe and a friction brake lining secured to said shoe, said brake shoe having a heel end and a toe ends the improvement comprising:
said lining having a friction surface adapted to engage a brake drum for braking action which subtends over a total arc between said shoe heel and toe ends of not more than 60° and is arcuately spaced from said shoe heel and toe ends, said lining being secured to said shoe so that the transverse midpoint of said friction surface is located at the transverse midpoint of said shoe between said shoe heel and toe ends and therefore on the horizontal center line of the drum brake when said brake shoe assembly is installed in and becomes a part of the drum brake;
said brake shoe assembly having a brake effectiveness factor which varies over a range of about one-fourth the range of variation of the brake effectiveness factor of a similar brake shoe assembly whose shoe lining of any one shoe thereof extends through a total arc about 97° to 117° over the useful life of said lining independently of the friction braking material of which said brake lining is made.

4,732,241
DISC BRAKE APPARATUS
Takao Yoshida, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 13, 1986, Ser. No. 873,968
Claims priority, application Japan, Jun. 14, 1985, 60-128007; Jul. 26, 1985, 60-163813; Jul. 26, 1985, 60-163814
Int. Cl.⁴ F16D *55/228*
U.S. Cl. 188—73.34 **6 Claims**



1. A disc brake apparatus for a vehicle having a front fork, a front axle mounted to the front fork, a front wheel mounted about the axle and a brake disc mounted to rotate with the front wheel, comprising:
a caliper body disposed intermediate said front fork and said front wheel and having opposed, generally hollow cylindrical body portions in spaced relation to said brake disc;
operating pistons in each of said body portions and extending into the space between said brake disc and said body portions;
friction pads for engaging said brake disc operably disposed in said space between said operating pistons and said brake disc;
a hanger pin releasably connected to said caliper body slidably engaging said friction pads;
a bracket fixed at one end to said caliper body and pivotally mounted at its other end to said front axle; and
a releasable coupling pin securing said caliper body to said front fork, whereby release of said coupling pin permits rotation of said bracket and said caliper body to an access space and release of said hanger pin permits release of said friction pads from said caliper body into said access space.

4,732,242
SPOT-TYPE DISC BRAKE FOR VEHICLES
Helmut Heibel, Moschheim, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England
PCT No. PCT/EP85/00493, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/01865, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 24, 1985, Ser. No. 874,166
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 8428099[U]
Int. Cl.⁴ F16D *65/14, 65/38*
U.S. Cl. 188—73.45 **6 Claims**



1. A spot-type disc brake for vehicles, comprising
a brake carrier (12) which straddles the ege of a brake disc (10),
a pair of brake pads (24,26) arranged at one side each of the brake disc (10) and guided at the brake carrier (12),
an actuator (22) having an actuating axis (B) defining a radial center plane (C) together with the axis (A) of the brake disc,
a pair of guide bolts (18,20) arranged at the brake carrier (12) at least approximately parallel to the axis (A) of the brake disc at that side of the center plane (C) which is the trailing side based on the direction of rotation (D) of the brake disc (10) during forward travelling,
a caliper (16) guided for displacement by the guide bolts (18,20),
the actuator (22) acting directly on the one brake pad (24) and by way of the caliper (16) on the other brake pad (26) and the brake carrier (12) comprising effective guide faces (34,36) for the brake pads (24,26) upon braking during forward travelling at the trailing side only, while the caliper (16) comprises support faces (40,41) for the brake pads (24,26) effective upon braking during backward

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travelling, characterized in that the brake carrier (12) and the caliper (16) are interconnected by an additional sliding connection (46,52) at the side opposite the brake actuator (22), said connection comprising two members which are out of effective load sharing engagement with each other upon braking during forward travelling but which are moved into effective load sharing engagement with each other upon braking during backward travelling to relieve the guide bolts (18,20) at least in part of moments of the caliper (16) in respect of an axis which is normal to the axis (A) of the brake disc and the actuating axis (B).

4,732,243

AUTOMATIC ADJUSTER FOR A VEHICLE BRAKE ACTUATOR

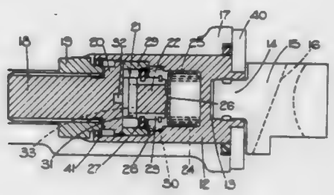
Brian Ingram, Gloucestershire; Hugh G. Margetts, Herefordshire, and John R. Ross, West Midlands, all of England, assignors to Lucas Industries, Public Limited Company, Birmingham, England

Continuation of Ser. No. 620,810, Jun. 15, 1984, abandoned. This application Nov. 6, 1986, Ser. No. 928,638

Claims priority, application United Kingdom, Jun. 16, 1983, 8316290

Int. Cl.⁴ F16D *65/56*

U.S. Cl. 188—196 D **13 Claims**



1. An automatic adjuster for a vehicle brake actuator comprising a housing, a tappet movable in the housing and disposed for engagement, in use, with a braking element, an adjuster member having a non-reversible threaded connection with a means separate from the tappet rotationally and axially fixed relative to the housing, so that rotation of the adjuster member in one direction causes axial adjusting movement thereof, the adjuster member acting as a backstop to set the inwardly retracted position of the tappet, resilient means acting to separate the tappet and adjuster member, a clutch ring urged towards a normally non-rotatable clutch surface and operable to control rotation of said adjuster member by means of a reversible threaded connection having a predetermined clearance formed between the clutch ring and co-operating means, said clutch ring having limited radial movement with respect to said clutch surface and adjuster member to provide self-centering of said clutch ring, and an intermediate member separate from said adjuster member and having limited radial movement with respect to said adjuster member and clutch surface to facilitate said self-centering of said clutch ring, the resilient means acting between the tappet and the intermediate member so as to transmit force thereby to the adjuster member, the arrangement being such that as the tappet moves in a shoe-applying direction, the predetermined clearance in the reversible thread is taken up and a force then generated at the reversible thread causes the clutch ring to be held against rotation by the clutch surface, whereby the reversible threads of said connection co-operate to cause rotation of the adjuster member in said one direction to move said adjuster means axially to a new position relative to said fixed means and therby set an outwardly adjusted retracted position of the tappet.

4,732,244

HYDRAULIC SHOCK DAMPER ASSEMBLY FOR USE IN VEHICLES

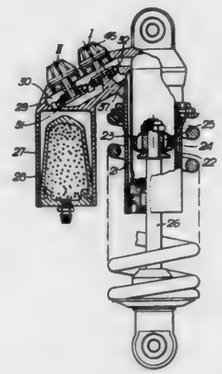
Adrianus H. I. Verkuylen, Malden, Netherlands, assignor to White Power Production B.V., Netherlands

Filed Jan. 27, 1987, Ser. No. 7,376

Claims priority, application Netherlands, Jan. 30, 1986, 8600211

Int. Cl.⁴ F16F *9/03, 9/34, 9/48;* F16K *5/10*

U.S. Cl. 188—318 **4 Claims**



1. A hydraulic shock-damper assembly for use in vehicles and particularly for the rear wheel of a motorcycle such as a rally-cross motorcycle, the shock-damper assembly comprising a hydraulic cylinder accomodating a hydraulic damping fluid and a piston provided with one or more apertures and dividing the cylinder internally to provide upper and lower chambers, and a dashpot closed at one end and a displaceable partitioning element accomodated in the dashpot and in which a first space enclosed between the partitioning element and the closed end of the dashpot is filled with a fluid under pressure and a second space located on the other side of the partitioning element is connected to the upper chamber of the hydraulic cylinder via a transmission channel for the damping fluid, characterised in that there is provided a second cylinder being spaced concentrically around the said hydraulic cylinder, an open connection close to the lower end of the hydraulic cylinder and running between the lower chamber of the cylinder and the intermediate space between both cylinders, two branch lines connected to the transmission channel for the damping fluid flow and emerging into a single line which again emerges into the said intermediate space, an externally controllable closure means and a non-return valve being arranged in each one of the said branch lines, both of which non-return valves open in opposing flow directions of the hydraulic fluid.

4,732,245

CONTROL APPARATUS FOR CLUTCH TORQUE IN HYDRODYNAMIC POWER TRANSMITTING DEVICE

Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo K.K., Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,997

Claims priority, application Japan, Jun. 11, 1985, 60-126833

Int. Cl.⁴ F16H *45/02;* F16D *43/28;* B60K *41/02*

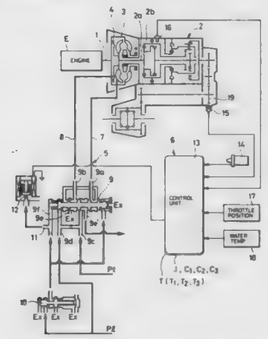
U.S. Cl. 192—0.032 **4 Claims**

1. An apparatus for controlling a variable-capacity clutch in a hydrodynamic power transmitting system comprising: a hydrodynamic power transmitting device interposed between an output shaft on an engine and an input shaft of a transmission; and a clutch transmitting power in parallel with said hydrodynamic power transmitting device from said output shaft to said input shaft, said controlling apparatus comprising;

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an operating condition detection means for detecting operating conditions of said engine including its torque;

judgment means which receives a signal from said operating condition detection means for judging whether the operating condition of the engine is in a domain in which the clutch should be disengaged; trigger means which receives a signal from said judgment means for commanding the disengagement of said clutch; and



first control means which receives a disengagement command signal from said trigger means and receives a signal indicating that the torque of said engine is higher than a first predetermined level from said operating condition detection means, for gradually decreasing the torque transmission capacity of said clutch upon disengaging said clutch

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4,732,246

AUTOMATIC TRANSMISSION APPARATUS FOR VEHICLE

Toshiaki Tateno; Shigeki Fukushima; Osamu Ihara, all of Yokohama, and Tomoyuki Iwamoto, Kawasaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

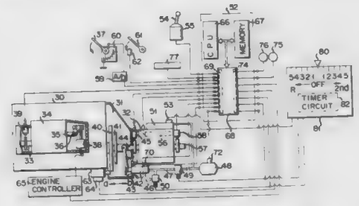
PCT No. PCT/JP85/00130, § 371 Date Nov. 15, 1985, § 102(e) Date Nov. 15, 1985, PCT Pub. No. WO85/04225, PCT Pub. Date Sep. 26, 1986

PCT Filed Mar. 15, 1985, Ser. No. 807,897

Claims priority, application Japan, Mar. 16, 1984, 59-50747; Apr. 19, 1984, 59-57514; Apr. 19, 1984, 59-57516; Apr. 19, 1984, 59-57517; Jun. 30, 1984, 59-99588; Sep. 27, 1984, 59-145992; Sep. 27, 1984, 59-145997; Oct. 12, 1984, 59-153129; Oct. 12, 1984, 59-153130; Oct. 12, 1984, 59-153133; Oct. 15, 1984, 59-155375

Int. Cl.⁴ B60K *41/28, 41/02, 41/08*

U.S. Cl. 192—0.052 **14 Claims**



1. An automatic transmission apparatus for a vehicle comprising:

a parallel shaft type gear automatic transmission connected through a clutch to an engine mounted on a vehicle;

an actuator for engaging/disengaging said clutch;

actuator control means for controlling an operation of said actuator;

clutch position detecting means for detecting engaging-/disengaging of said clutch;

gear ratio detecting means for generating a signal corresponding to a gear ratio of said parallel shaft type gear automatic transmission;

change speed means for changing the meshing state of said parallel shaft type gear automatic transmission;

operating condition detecting means for detecting operating conditions of at least one of said vehicle, said engine and said parallel shaft type gear automatic transmission;

gear ratio selecting means for supplying a change signal to said change speed means so as to change for a desired gear ratio in said parallel shaft type gear automatic transmission in accordance with an operation by a driver; and

automatic transmission control means having;

load detecting means for detecting a load of said engine in accordance with a changing rate of the engine speed;

first clutch control means for operating said actuator control means so as to actuate said clutch from a disengaged state to a half engaged state in accordance with an accelerator position signal from said operating condition detecting means;

second clutch control means including a first control function for operating said actuator control means so as to gradually engage said clutch in correspondence to the accelerator position signal from said operating condition detecting means when the changing rate of the engine speed detected by the load detecting means is a first preset value or less and stop engaging said clutch when the changing rate equals or exceeds a second preset value, and a second control function for operating said actuator control means so as to hold said clutch when the changing rate exceeds the first preset value and is less than a third preset value, and to move said clutch in a disengaging direction when the changing rate exceeds the first preset value and equals or exceeds the third preset value and stop moving said clutch when the changing rate is a fourth preset value or less when said clutch moves in the disengaging direction; and

third clutch control means for operating said actuator control means so as to fully engage said clutch when the difference between an engine speed and an output shaft speed of said clutch, becomes lower than a predetermined value after operation of said second clutch control means.

10. An automatic transmission apparatus for a vehicle comprising:

a parallel shaft type gear automatic transmission connected through a clutch to an engine mounted on a vehicle;

an actuator for engaging/disengaging said clutch;

actuator control means for controlling an operation of said actuator;

clutch position detecting means for detecting engagement-/disengagement of said clutch;

gear ratio detecting means for generating a signal corresponding to a gear ratio of said parallel shaft type gear automatic transmission;

change speed means for changing the meshing state of said parallel shaft type gear automatic transmission;

operating condition detecting means for detecting operating conditions of at least one of said vehicle, said engine and said parallel shaft type gear automatic transmission;

a change speed operating level for selecting an automatic change speed position for automatically changing a desired gear ratio in said parallel shaft type gear automatic transmission according to an accelerator pedal position, a vehicle speed and an engine speed detected by said operating condition detecting means, and a designated change speed position for changing a designated gear ratio in said parallel shaft type gear automatic transmission; and

automatic transmission control means including:

gear ratio selecting means for supplying a change speed signal to said change speed means so as to change to a

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desired gear ratio in said parallel shaft type gear automatic transmission in accordance with an operating signal generated by said change speed operating lever, and for operating said actuator control means to move said clutch to a disengaged position, and for holding an engine speed, and for supplying to said change speed means a signal for changing a gear ratio down, one by one, when the operating signal produced by said change speed operating lever is changed from the automatic change speed position to the designated change speed position; and

coincidence control means for supplying a pseudo accelerator signal to said engine to cause the engine speed to substantially coincidence with an output shaft speed of said clutch when the gear ratio selecting means indicates that the gear ratio has been changed down by one to a new gear ratio and for supplying a signal to said actuator control means to fully engage said clutch when an allowable speed difference exists between said engine and said clutch output shaft, said allowable speed difference being determined according to the new gear ratio.

12. An automatic transmission apparatus for a vehicle comprising:

a parallel shaft type gear automatic transmission connected through a clutch to an engine mounted on a vehicle;

an actuator for engaging/disengaging said clutch;

actuator control means for controlling an operation of said actuator;

clutch position detecting means for detecting engagement-/disengagement of said clutch;

gear ratio detecting means for generating a signal corresponding to a gear ratio of said parallel shaft type gear automatic transmission;

change speed means for changing the meshing state of said parallel shaft type gear automatic transmission;

operating condition detecting means for detecting operating conditions of at least one of said vehicle, said engine and said parallel shaft type gear automatic transmission;

a change speed operating lever for selecting an automatic change speed position for automatically changing a desired gear ratio in said parallel shaft type gear automatic transmission according to an accelerator pedal position, a vehicle speed and an engine speed detected by said operating condition detecting means, and a designated change speed position for changing said parallel shaft type gear automatic transmission to a designated gear ratio;

automatic transmission control means having gear ratio selecting means for supplying a change speed signal to said change speed means so as to change for a desired gear ratio in said parallel shaft type gear automatic transmission in accordance with an operation signal generated by said change speed operating lever, and clutch control means for supplying a signal to said actuator control means so as to disengage said clutch, by the change speed signal, and to fully engage said clutch when said gear ratio detecting means detects that the transmission operation is completed; and

emergency operation means distinct from said automatic transmission control means, manually operated when said automatic transmission control means malfunctions, for changing said parallel shaft type gear automatic transmission to a desired low speed gear ratio via a neutral gear position by directly actuating said changed speed means, after the clutch is disengaged, and for fully engaging said clutch by means of said actuator control means.

4,732,247

TRIPLE CONE SYNCHRONIZER WITH SERVO ACTION

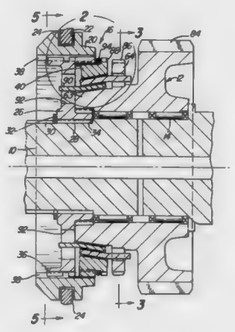
Barry L. Frost, DeWitt, N.Y., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 21, 1987, Ser. No. 5,719

Int. Cl.[4] F16D *23/06*

U.S. Cl. 192—53 F **4 Claims**

1. In a synchronizer and gear assembly comprising; a longitudinally extending drive shaft with at least one ratio gear journally mounted on said shaft, said ratio gear formed with an external cone surface, an externally splined hub fixed on said shaft and a sleeve having internal splines slidably coupled to said hub external splines and slidable forwardly thereon to an operative position for engaging said ratio gear coupling the ratio gear in rotation with said shaft, a blocker ring having an internal cone surface disposed in a radially outward manner defining a clearance with said ratio gear external cone surface for reciprocal movement relative thereto, an annular spring between said sleeve and said blocker ring, the improvement wherein an outer cone ring is concentrically disposed in said clearance adjacent said blocker ring internal cone surface, said outer cone ring defining an external blocking surface adapted to frictionally engage said blocker ring internal cone surface, said outer cone ring defining an internal cone surface, an inner cone ring concentrically disposed in said clearance adjacent said ratio gear external cone surface, said inner cone ring defining an external blocking surface adapted to frictionally engage said outer cone ring internal cone surface, said inner cone ring defining an internal blocking surface adapted to frictionally engage said ratio gear external cone surface, said outer cone ring having a plurality of forwardly projecting drive tangs, each said drive tang projecting in an associated



window in said ratio gear, each said drive tang symmetrically disposed about its longitudinal centerline defining a pair of back-angled cam edges, each said cam edge diverging outwardly from said centerline at a predetermined acute angle, each said window having a pair of symmetrically disposed side walls diverging outwardly at an acute angle equal to said predetermined acute angle each said window side wall located in spaced parallel relation to its associated opposed drive tang back-angled cam edge with said synchronizer in its neutral mode, said inner cone ring having a plurality of rearwardly projecting locking fingers, each said locking finger projecting in an associated aligned opening in said hub, whereby upon said sleeve being initially moved forwardly said annular spring presses said blocking ring internal cone surface against said outer cone ring external blocking surface, such that said outer cone ring is drawn toward said ratio gear and rotated relative thereto, wherein one of each said pair of drive tang back-angled cam edges slidably engages its opposed ratio gear window side wall, such that said ratio gear external cone surface and said outer cone ring internal cone surface are drawn into tighter engagement with said inner cone ring internal blocking surface and said inner cone ring external blocking surface respectively, whereby the synchronizing torque of said assembly is increased for a given synchronizer axial force.

4,732,248

METHOD OF AND APPARATUS FOR CONTROLLING AUTOMATIC CLUTCH

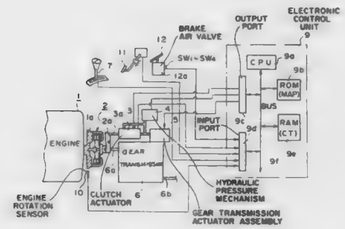
Hiroshi Yoshimura, and Akira Ohkawa, both of Yokohama, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 870,874

Claims priority, application Japan, Jun. 10, 1985, 60-125815; Jun. 11, 1985, 60-126876

Int. Cl.[4] B60K *41/24, 41/28;* **F16D** *67/00*

U.S. Cl. 192—0.055 **16 Claims**



1. An apparatus for controlling an automatic clutch on a motor vehicle having wheels and a brake, to disengage the automatic clutch when the brake is operated, comprising:

an engine for generating rotative power to move the motor vehicle;

a gear transmission for transmitting the rotative power from said engine at a selected gear ratio to the wheels of the motor vehicle;

a clutch, disposed between said engine and said gear transmission, for controlling the transfer of the rotative power from said engine to said gear transmission;

means for detecting a braking force applied to the brake;

means for detecting the speed of rotation of said engine;

means for ascertaining whether the speed of rotation of the engine, corresponding to the detected braking force, is less than a preset value; and

means for abruptly disengaging said clutch when said ascertaining means determines that the speed of rotation of the engine corresponding to the detected braking force is less than the preset value.

7. an apparatus for controlling an automatic clutch on a motor vehicle having a brake and wheels, to disengage the clutch when the brake is operated, said apparatus comprising:

an engine for generating rotative power to move the motor vehicle;

a gear transmission for transmitting the rotative power from said engine at a selected gear ratio to the wheels of the motor vehicle;

a clutch, disposed between said engine and said gear transmission, for controlling the transfer of the rotative power from said engine to said gear transmission;

means for detecting a braking force applied to the brake;

means for detecting the rate of increase of the braking force;

means for ascertaining whether the rate of increase of the braking force exceeds a preset value; and

means for abruptly disengaging said clutch if said ascertaining means determines that the rate of increase of the braking force exceeds a preset value.

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FLUID FRICTION CLUTCH

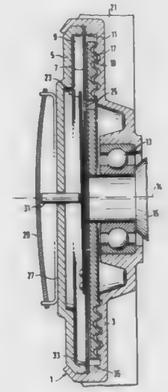
Gerd Brunken, Dittelbrunn, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG

Filed Jul. 21, 1986, Ser. No. 887,322

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526287

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **5 Claims**



1. A fluid friction clutch, such as for a cooling fan of an internal combustion engine, comprising:

(a) a housing rotatable about an axis of rotation and enclosing a reservoir for shear fluid and a working chamber,

(b) a rotor arranged in the working chamber rotatably about the axis of rotation in relation to the housing,

(c) at least one shear gap formed by facing surfaces of the rotor and of the housing spaced from one another, each of the surfaces forming the shear gap comprises a plurality of annular ribs arranged concentrically one within another around the axis of rotation, said ribs are separated from one another by circular concentric grooves and extend in the axis of rotation direction into the grooves of the other surface, wherein both the ribs and the grooves have annular flanks extending in the axis of rotation direction conically towards one another,

(d) pump means in the radially outer region of the shear gap, for delivering the shear fluid from the working chamber to the reservoir,

(e) temperature-dependently controllable valve means conducting the shear fluid from the reservoir into the working chamber,

(f) the ribs and the grooves have a flank angle in a range of 20° to 40° with respect to the axis of rotation,

(g) the grooves have a concave groove bottom curved in arcuate form, and

(h) the ribs have trapezoid-shaped cross section, viewed in the axis of rotation direction, the ribs have a flat annular end face extending in a plane perpendicular to the rotation axis, and said end faces on said surfaces are located opposite and spaced from the groove bottoms on the opposite said surfaces.

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4,732,250

TORQUE TRANSMITTING AND TORSION DAMPING ASSEMBLY

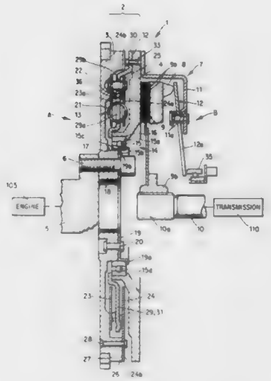
Paul Maucher, Sasbach; Oswald Friedmann, Lichtenau, and Wolfgang Reik, Bühl, all of Fed. Rep. of Germany, assignors to Lak Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 670,485, Nov. 13, 1984, and Ser. No. 672,581, Nov. 16, 1984. This application Apr. 15, 1986, Ser. No. 852,299

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340703; Nov. 15, 1983, 3341443; Dec. 2, 1983, 3343668; Mar. 5, 1984, 3410953; Mar. 5, 1984, 3410365; Mar. 5, 1984, 3413323

Int. Cl.[4] F16F *15/12*; F16D *3/14*

U.S. Cl. 192—70.17 43 Claims



1. A torque transmitting and torsion damping assembly, particularly for the transmission of torque between an internal combustion engine and an input element of a change-speed transmission in a motor vehicle, comprising a first rotary unit normally receiving torque from the engine and a second rotary unit coaxial with said first unit and arranged to normally transmit torque to the transmission, said first and second units respectively comprising first and second flywheels and said second unit further comprising a clutch interposed between said second flywheel and the transmission; actuating means operable to change the condition of said clutch between an engaged condition in which said clutch transmits torque between said second flywheel and the transmission and a disengaged condition; antifriction bearing means interposed between said flywheels, at least one of said flywheels being movable within predetermined limits axially relative to the other of said flywheels, said flywheels being angular movable relative to each other and said bearing means including first and second races respectively rotatable with said first and second flywheels and rolling elements between said races; damper means disposed between said units to yieldably oppose angular movements of said flywheels relative to each other; and resilient means including a resilient element which reacts axially against one of said units and bears axially against the other of said units so as to act against axial movements of said races relative to each other in one direction in engaged condition of said clutch by urging said races axially against said rolling elements.

4,732,251

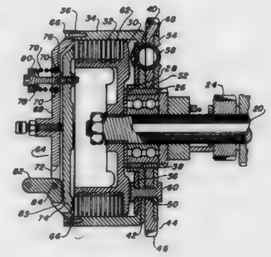
MOTORCYCLE ADJUSTABLE SLIDER CLUTCH

Keaneth L. Tipton, 1031 Fairlawn Dr., Rockledge, Fla. 32955

Filed Sep. 22, 1986, Ser. No. 909,574

Int. Cl.[4] F16D *43/10*, *13/75*

U.S. Cl. 192—70.24 6 Claims



1. A motorcycle adjustable slider clutch utilizing the original equipment manufacturers transmission output shaft, front bearing, transmission gear cluster, main bearing assembly, center hub and plurality of alternately nested clutch friction disks and clutch pressure plates comprising:

(a) a slider basket member having a cylindrical body with an open end and a closed end;

(b) a spring loaded housing gear assembly resiliently attached to the closed end of said slider basket in such a way as to transmit torque from the housing gear assembly to the basket in a flexible manner;

(c) said main bearing assembly slippingly joined into said spring loaded housing gear assembly which forms a rotational bearing receptacle;

(d) said transmission output shaft being received with said main bearing assembly and having said front bearing and transmission gear cluster on one end and said center hub and plurality of alternately nested clutch friction disks and clutch pressure plates on the other, said friction disks engaging said slider basket and said pressure plates engaging said center hub; and,

(e) an outside slider plate assembly attached to the open end of the basket having an adjustable connected spring loaded inside pressure plate and a plurality of rotatable offset fingers extending therethrough, each having a cam shaped spatial extension urgingly forcing the inside pressure plate into contact with said nested clutch friction disks and clutch pressure plates by the inward camming of the fingers induced by rotational centrifugal force causing the clutch disks and plates to compress together unitedly joining the slider basket clutch friction disks and pressure plates with the center hub making a union between the housing gear assembly and the transmission gear cluster at an adjustable predetermined speed of the housing gear assembly.

4,732,252

THRUST PLATE UNIT FOR A FRICTION CLUTCH

Friedrich Kittel, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt

Filed May 30, 1986, Ser. No. 869,100

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520145

Int. Cl.[4] F16D *13/50*

U.S. Cl. 192—70.27 4 Claims

1. A thrust plate unit for a friction clutch having a rotation axis comprising:

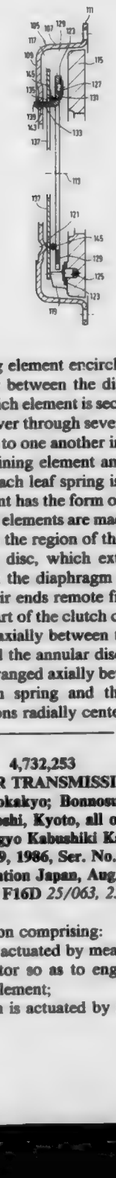
(a) a clutch cover of unitary annular pot from which comprises an annular face wall part extending transversely of the rotation axis and having a circumferentially extending inner edge and a circumferentially extending outer edge

and a side wall part extending from the outer edge of said face wall part generally parallel to the rotation axis away from the face wall part with the side wall part being free of open spaces,

(b) an annular presser plate arranged within and spaced radially inwardly from the side wall part of the clutch cover and encircling the rotation axis,

(c) a diaphragm spring arranged in the rotation axis direction between the face wall part and the presser plate, which spring abuts on a circle with a first diameter on the face wall part and on a circle with a second diameter on the presser plate,

(d) several separate leaf springs staggered in relation to one another in the circumferential direction of the presser plate each having a first and a second end, with each first end connected to the presser plate for guiding the presser plate non-rotatably but axially movably relative to the rotation axis on the clutch cover,



(e) an annular retaining element encircling the rotation axis and arranged axially between the diaphragm spring and the presser plate, which element is secured to the face wall part of the clutch cover through several distance elements staggered in relation to one another in the circumferential direction of the retaining element and on which element said second end of each leaf spring is secured,

(f) said retaining element has the form of an annular disc and wherein the distance elements are made as axial extensions of and are located in the region of the internal circumference of the annular disc, which extensions pass axially through openings in the diaphragm spring and are connected firmly by their ends remote from the annular disc with the face wall part of the clutch cover, the diaphragm spring is supported axially between the face wall part of the clutch cover and the annular disc, and

(g) a support ring is arranged axially between and in contact with the diaphragm spring and the annular disc and wherein the extensions radially center the support ring.

4,732,253

POWER TRANSMISSION

Takeo Hiramatsu, Nagaokakyo; Bonnosuke Takamiya, Joyo, and Yoshimasa Nagayoshi, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,673

Claims priority, application Japan, Aug. 31, 1985, 60-192282

Int. Cl.[4] F16D *25/063*, *25/10*

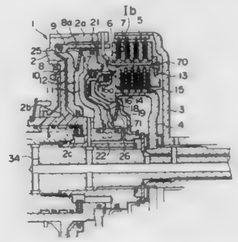
U.S. Cl. 192—87.11 5 Claims

1. A power transmission comprising:

a first clutch which is actuated by means of a hydraulically operated first actuator so as to engage a drive element with a first driven element;

a second clutch which is actuated by means of a hydraulically operated second actuator so as to engage said drive element with a second driven element;

said first actuator being constructed of a first piston for actuating said first clutch, a first cylinder in which said first piston is slideably disposed, a first working fluid chamber formed upon one side of said first piston between said first piston and said first cylinder and adapted to receive a supply of pressurized hydraulic fluid so as to move said first piston in a direction such that said first clutch is actuated by said first piston, and a first centrifugal hydraulic pressure chamber formed upon the other side of said first piston between said first piston and one side of a first partition fixed upon an end portion of said first cylinder and adapted to receive a supply of fluid the



pressure of which is substantially the same as atmospheric pressure; and

said second actuator being constructed of a second piston for actuating said second clutch, a second cylinder, formed within said first partition, in which said second piston is slideably disposed, a second working fluid chamber formed upon one side of said second piston between said second piston and the other side of said first partition and adapted to receive a supply of pressurized hydraulic fluid so as to move said second piston in a direction such that said second clutch is actuated by said second piston, and a second centrifugal hydraulic pressure chamber formed upon the other side of said second piston and adapted to receive a supply of fluid the pressure of which is substantially the same as atmospheric pressure.

4,732,254

ELECTRONIC COMPONENT FEEDER

Genichi Nishizaki, Iruma, and Keizo Shinano, Kodaira, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

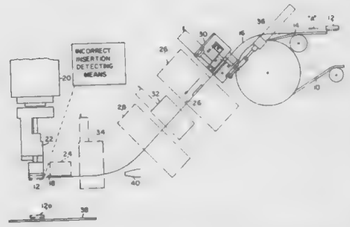
PCT No. PCT/JP85/00503, § 371 Date Apr. 24, 1986, § 102(e) Date Apr. 24, 1986, PCT Pub. No. WO86/01970, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 9, 1985, Ser. No. 859,086

Claims priority, application Japan, Sep. 10, 1984, 59-188190

Int. Cl.[4] B65G *11/00*

U.S. Cl. 193—38 3 Claims



1. In an electronic component feeder for carrying electronic components to be inserted into holes in a printed-circuit board

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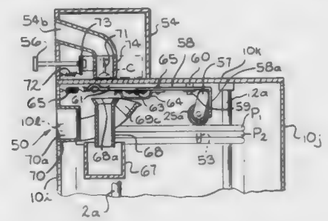
froma a component taking-out device to an insertion head in a predetermined sequence in an automatic electronic component insertion machine, said automatic electronic component insertion machine having said electronic component feeder; and an incorrect insertion detecting means for detecting any incorrect insertion caused when the electronic component is inserted into one of the holes in the printed-circuit board by the insertion head, characterized in that said electronic component insertion feeder is provided with at least one standby receptacle means for the electronic components which at least one standby receptacle means is provided before or after a working station equipped in a carrying path extended between said component taking-out device and said insertion head; and at least one laterally moving means for moving laterally said at least one standby receptacle means between two positions, a passing position located within said carrying path and a waiting position located outside said carrying path, said passing position permitting the passage of the components along a first path, said waiting position being only for holding the components and not permitting the passage of the components and its carrying path being formed by a second path; each of said at least one laterally moving means moving all the standby receptacle means simultaneously to the waiting positions when any incorrect insertion has been detected by said incorrect insertion detectirg means, whereby a new component can pass the arranged components being carried without changing said arrangement.

4,732,255

DISPENSING APPARATUS

Wade A. Bullard, 20254 Detente Rd., Sturgis, Mich. 49091

Continuation of Ser. No. 830,628, Feb. 18, 1986, abandoned. This application Apr. 23, 1987, Ser. No. 41,631
Int. Cl.[4] G07F *11/24, 5/00*
U.S. Cl. 194—248 **10 Claims**



1. A dispensing apparatus for a pile of identical elongate flat articles having horizontally oriented sides and front and rear edges between the sides which comprises:

(a) a housing with spaced apart side walls with an opening on a front wall for dispensing the articles one at a time such that the front edge of the article projects out of the opening for manual removal;

(b) support plate means horizontally mounted in the housing below the opening for supporting the pile of articles with the front edges towards the front end of the housing wherein the support plate means is vertically moveable in the housing;

(c) resilient means for urging the support plate means vertically so as to align articles with the opening in the housing for dispensing;

(d) ejector means including a circular cross-sectioned roll means having opposing ends rotationally mounted on a shaft inside the housing above the support plate including spaced apart rings of an elastic material mounted on the roll means so that the rings on the roll means are continuously in contact with an uppermost article on the pile of articles for dispensing the uppermost article, wherein the shaft is journaled for rotation on a longitudinal axis between the opposed ends of the roller means;

(e) rachet means mounted on the shaft on at least one of the ends of the roll means such that the end of the roll means is engaged by the rachet means and such that the roll means rotates on the shaft in only one direction when the roll means is rotated away from the opening and prevents rotation of the roll on the shaft when the roll means is rotated towards the opening;

(f) handle means mounted on the shaft which can move the shaft and roll means together with the rachet means preventing rotation of the roll means on the shaft so as to dispense the article; and

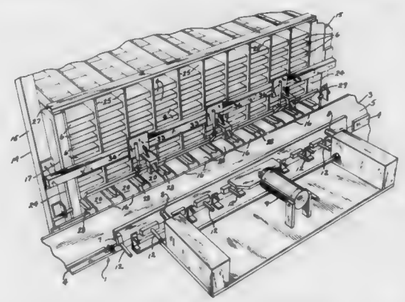
(g) a coin box mounted in the housing containing a coin mechanism which moves a coin over a cam surface on a moveable extension from an adapter plate to move the extension relative to the adapter plate and release a pin engaging the extension plate and wherein the ejector means rotates the shaft to turn an arm mounted on the shaft which moves the adapter plate and the extension to move the coin over the cam surface and drop the coin into a coin box and wherein the ejector means dispenses the article.

4,732,256

STORAGE UNIT FOR A CONVEYOR SYSTEM

Wolfgang C. Dorner, Oconomowoc, Wis., assignor to Dorner Mfg. Corp., Hartland, Wis.

Filed Feb. 18, 1986, Ser. No. 830,442
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—347 **8 Claims**



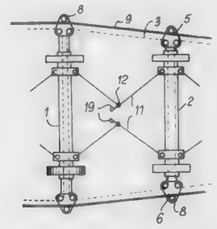
1. In a conveyor system, a supporting structure, a main conveyor mounted on the supporting structure, means for stopping a row of articles on the main conveyor, a plurality of parallel second conveyors extending laterally from a first side edge of the main conveyor, transfer means for transferring a row of articles from the main conveyor to the secondary conveyors, reversible drive means operably connected to the secondary conveyors for operating said secondary conveyors in a first direction away from said main conveyor to convey said row of articles in said first direction and for operating said secondary conveyors in a second direction towards said main conveyor to return said row of articles to the main conveyor, an elongated member disposed adjacent said first side edge of the main conveyor and movable between a first guiding position where said elongated member serves to guide said articles moving along said main conveyor and a second elevated position above said secondary conveyors where said elongated member will not interfere with transfer of said row of articles between said main conveyor and said secondary conveyors, and actuating means for moving the elongated member between said first and second positions, said elongated member being constructed and arranged so that movement of said elongated member from the second elevated position toward said first guiding position will engage a trailing surface of the articles in said row and urge said articles back onto the main conveyor.

4,732,257

CONTINUOUS VARIABLE-SPEED TRANSPORT APPARATUS

Daniel Mathis, Sautron, and Pierre Patin, Paris, both of France, assignors to Regie Autonome des Transports Parisiens, France

Filed Oct. 21, 1986, Ser. No. 921,096
Claims priority, application France, Oct. 21, 1985, 85 15591
Int. Cl.[4] B65G *21/12*
U.S. Cl. 198—334 **11 Claims**



1. A transport device, comprising:

a track which extends across a transport path;

a plurality of support members spaced along said track;

a plurality of load-bearing members supported on said support members;

connection means comprising a plurality of flexible, substantially inextensible first link means which connect each pair of adjacent support members, angle-changing means mounted on each of said support members for bending said first link means, and guide means disposed along the track for varying and controlling the positoning of said angle-changing means relative to its respective support member, said guide means being adapted to move the angle-changing means of each support member between a high-speed position, where the distance between adjacent support members is a maximum, and a low-speed position, where the distance between adjacent support members is a minimum;

wherein said connection means further comprises a second link means for connecting adjacent pairs of support members, said second link means comprising first and second rigid arms which are connected at one end to respective adjacent support members and hingedly connectd to each other so that the first and second arms pivot with respect to each other when the distance between adjacent support members is varied, wherein said second link means defines the maximum distance between adjacent support members so as to at least partially slacken the first link means when the angle-changing means is in said high-speed position.

4,732,258

VIBRATORY FEEDING WORK STATION MODULE AND SYSTEM

Warren C. Burgess, Jr., 3685 E. Lake Rd., Sheffield Lake, Ohio 44054

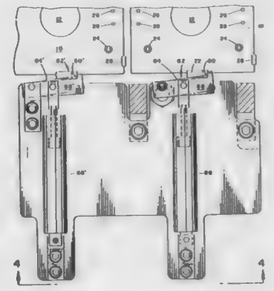
Continuation of Ser. No. 581,581, Feb. 21, 1984, Pat. No. 4,611,704, which is a continuation-in-part of Ser. No. 310,083, Oct. 9, 1981, Pat. No. 4,444,303. This application Apr. 21, 1986, Ser. No. 854,095
Int. Cl.[4] B65G *47/00*
U.S. Cl. 198—345 **11 Claims**

1. In a vibratory conveying apparatus which includes a buffer storage area for transitory storage of a plurality of carriers which are received at non-specific intervals, said buffer storage area including a conveying surface along which the carriers are moved from an upstream end toward a module downstream end, the conveying surface including a multiplicity of resilient fibers projecting outward therefrom to engage and support the carriers; vibrating means for continuously vibrating the conveying surface to move such that the carriers move along the conveying surface from the upstream end toward the downstream end, the improvement comprising:

a deceleration and stop means disposed adjacent the downstream end of the buffer storage area for decelerating, stopping, and selectively passing a downstream-most carrier from the buffer storage area, the deceleration and stop means including:

a first toggle member having a first friction surface which slidingly engages each carrier without lifting it to decelerate the carrier;

a first pivot means for pivotally mounting the first toggle member adjacent the conveying surface such that the first friction surface is selectively pivoted into and out of engagement with conveyed carriers;



the toggle member having a first stop surface disposed at a downstream end of the first friction surface for engaging and stopping the conveyed carriers;

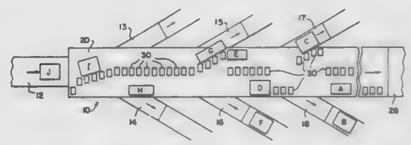
a biasing means for (1) selectively withdrawing the first toggle member to move the first friction and stop surfaces out of engagement with the conveyed carriers and (2) yieldingly biasing the first toggle member about the first pivot means toward the conveyed carriers such that the first friction surface is yieldingly biased into sliding engagement with each conveyed carrier without removing the carrier from the resilient fiber conveying surface and such that the first stop surface engages and blocks downstream movement of the conveyed carrier, the first toggle member being pivoted about the first pivot means by each conveyed carrier against the yielding bias.

4,732,259

SORTING CONVEYOR WITH CROSS-OVER

Thomas C. Yu, and Robert K. Vogt, both of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio

Filed Jul. 9, 1986, Ser. No. 883,893
Int. Cl.[4] B65G *47/68, 47/46*
U.S. Cl. 198—365 **6 Claims**



1. A sortation conveyor system for cartons and the like including a frame defining a main line and a plurality of branch lines leading from opposite sides of said main line, comprising:

(a) an endless apron supported for movement on said frame to define a top conveying run and a bottom return run,

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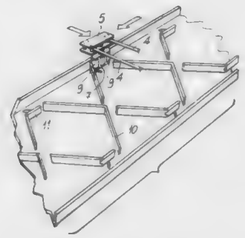
(b) means for driving said apron,
(c) a plurality of pusher elements mounted for sliding movement on said apron from one side thereof to the other to push a carton laterally aligned therewith to said other side,
(d) means for causing said pusher elements to enter the upstream end of said top run of said apron in preselected groups with each such group on the opposite side of said apron from the branch line to which the carton laterally aligned therewith is to be delivered,
(e) guide means adjacent each side of the upstream end of said frame positioned to direct each such group of pusher elements to the center of said apron and thereby to cause said pusher elements to move said aligned carton to the opposite side of center of said apron,
(f) selectively operable switch means associated with and mounted centrally of said frame upstream from each said branch line for movement between a centered guiding position and a guiding position aligned with said associated branch line wherein said switching means diverts successive said pusher elements toward said branch line, and
(g) means defining a guide track extending from said switch means to each of said branch lines associated therewith for guiding said diverted pusher elements across the remainder of said apron to said associated branch line.

4,732,260

APPARATUS FOR THE SELECTION AND SORTING OF OBJECTS

Francesco Canziani, Via Contardo Ferrini 21, S. Macario (Varese), Italy

Filed Dec. 28, 1979, Ser. No. 107,769
Claims priority, application Italy, Aug. 30, 1979, 25367 A/79
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **11 Claims**



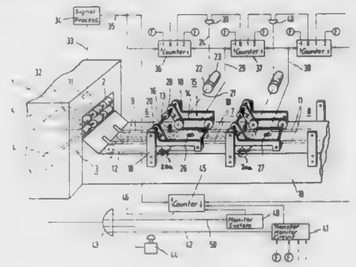
1. An apparatus for selectively sorting objects comprising:
a fixed conveyor table;
an endless conveyor member mounted on said table for movement thereon in a conveyor path, said conveyor member made of a plurality of connected plates, a pushing element slidably mounted on each plate for movement in a transverse direction to said conveying path for discharging an object from said conveyor member;
a plurality of object reception stations disposed along said table in said conveying path;
transverse drive means connected to said table in the vicinity of each station for sliding at least ne of said pushing elements in said transverse direction; and
multi-positioned hopper means at each of said stations for directing an object discharged from said conveyor member toward one of a plurality of spaced locations, spaced transversely to said conveying path; said transverse drive means comprising guide rail means connected to said table in the vicinity of each station having selectively openable and closeable interruptions therein, and a throttle planet wheel connected to each pusher element below its respective plate and engageable with at least one of said guide rail means, said throttle planetwheels comprising a frame rotatably mounted to said pusher element, at least two spaced rollers on said frame and biasing means connected to said frame for aligning the spacing between said rollers with said conveyor path, said frame alignable with at least one interruption to pass through said one interruption with said one interruption open and to move along said one interruption with said one interruption closed to move said pushing element in said transverse direction.

4,732,261

METHOD AND APPARATUS FOR ASSEMBLING AND FORWARDING SETS OF SHEETS

Gerd Mattern, Linden, and Franz-Georg Immerschitt, Hüttenberg, both of Fed. Rep. of Germany, assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 26, 1985, Ser. No. 769,047
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1985, 3526136
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—422 **8 Claims**



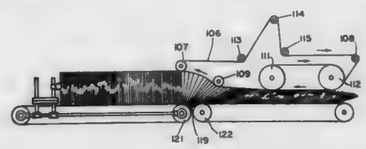
1. An apparatus for assembling sets of sheets and for forwarding assembled sets of sheets to a processing station at a predetermined cycle frequency, said apparatus comprising:
an entrance station including a receiving station which serves to receive individual form sheets;
at least three storage devices serially arranged in a direction of travel of said sets between said entrance station and said processing station;
means for feeding individual form sheets from said receiving station of said entrance station to a first of said storage devices, related ones of said form sheets being collectable in a set of form sheets at said first storage device;
means for determining when all related form sheets belonging to a set of sheets has been fed from said entrance station into said first storage device;
a plurality of first transfer means provided at least partially between adjacent ones of said storage devices for transferring sets of sheets in said direction of travel between said adjacent storage devices;
second transfer means provided between said processing station and a storage device which precedes said processing station for transferring sets of sheets to said processing station;
each of said first transfer means being independently and intermittently operable whereby a given one of said first transfer means is operated only when (1) the storage device which precedes said given transfer means in said direction of travel is occupied by a set of sheets, and (2) the storage device which succeeds said given transfer means in said direction of travel can receive a set of sheets; and,
said second transfer means being independently operable whereby said second transfer means is operated when (1) the storage device which precedes said processing station is occupied by a set of sheets, and (2) said processing station can receive a set of sheets.

4,732,262

APPARATUS FOR SEGREGATING COUNTED SLUGS OF FLATS

Raymond A. Labombarde, Nashua, N.H., assignor to International Paper Box Machine Co., Inc., Nashua, N.H.

Division of Ser. No. 911,304, Sep. 25, 1986. This application Feb. 2, 1987, Ser. No. 9,913
Int. Cl.[4] B65G *47/31*
U.S. Cl. 198—462 **4 Claims**



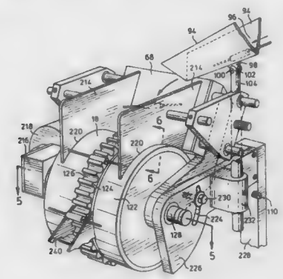
1. Count divider apparatus for segregating a counted slug of flats from a plurality of such flats being advanced in a path on the apron of a stacker at a predetermined speed in shingled formation, said apparatus comprising:
an endless elongated, alignment belt, trained around sheaves mounted above said apron, said belt having a lower stretch advancing in the direction of advance of said shingled flats with a first portion extending longitudinally at a spaced uniform distance above said apron and a second portion inclining upwardly and forwardly to a level substantially equal to the height of an erected flat, said lower stretch advancing at greater speed than the speed of said apron and riding on the upper edges of said flats to raise them from shingled to erect position, and
a movable wheeled carriage mounted to roll alongside said path, said carriage having a segregation rod mounted to move horizontally in and out of the path of the leading slug of said flats to maintain its erect position and having a one way clutch on a wheel thereof to allow the carriage to advance as fast as the apron but permit free reverse rolling thereof.

4,732,263

BULK FEEDER FOR ELECTRONIC COMPONENTS

Storimans Franciscus J. A., Vandorf, Canada, assignor to GPD Canada Inc., Gormley, Canada

Filed Jul. 31, 1986, Ser. No. 890,954
Int. Cl.[4] B65G *47/12*
U.S. Cl. 198—550.13 **8 Claims**



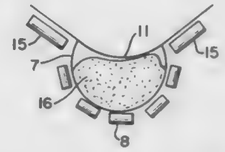
8. A bulk feeder for feeding electronic components one at a time into a lead forming machine, each component having a body portion and axially aligned lead wire extending one from each end of the body portion, said feeder comprising:
(a) a hopper including:
i. a pair of oppositely disposed side walls which are spaced from one another a distance which is slightly greater than the length of the electronic components which are to be fed to the forming machine, each of said side walls having upper and lower edges,
ii. a back wall extending between the side walls and being downwardly and forwardly inclined, said back wall having a lower end,
iii. a cylindrical drum mounted adjacent said lower edges of said side walls and below said lower end of said back wall so as to extend between the side walls, at least a portion of the periphery of said drum forming a bottom wall for said hopper, a circular disc carried by said drum and extending outwardly of said periphery thereof, said disc having a plurality of notches formed therein, said notches being arranged and proportional to receive and seat by gravity the transversely extending body portions of the components located adjacent the lower end of said back wall of the hopper,
iv. means for rotatably driving said disc to convey the components which are seated on the disc from the hopper.

4,732,264

BELT CONVEYER SYSTEM

Wilhelm Engst, Garbsen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,652
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540160
Int. Cl.[4] B65G *15/14*
U.S. Cl. 198—605 **3 Claims**



1. A belt conveyer system that includes an endless conveyer belt which is intended for transporting material and which, over a majority of its transporting stretch, can be closed off by overlapping its longitudinal edges to form a hose belt that is supported all the way around by first rollers, with said conveyer belt having zones where it is spread open, these zones being guided over second guide rollers; said system further comprising:
an endless cover belt that has an upper run and a lower run, and that runs over at least three third guide rollers; in the transition region of said conveyer belt from the hose shape to the spread-open shape, said lower run of said cover belt extends into the opening cross-sectional area of said conveyer belt, with a central portion of said lower run of said cover belt resting directly on transported material, and with edge portions of said lower run of said cover belt resting on longitudinal edges of said conveyer belt;
said cover belt in a discharge location of said conveyer belt, with said cover belt being in contact with a flat, spread-open state of said conveyer belt, where said cover belt is guided, through a limited curve angle, about an end one of said second guide rollers, with said cover belt then being guided about a lower one of said third guide rollers that is disposed below said end second guide roller and ahead of the latter as viewed in the direction of discharge of material from said conveyer belt at least in said transition region, said edge portions of said lower run of said cover belt project laterally beyond said conveyor belt on both

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sides and are supported by fourth support rollers that are oriented at an angle relative to a horizontal plane so that said cover belt forms a convex shape projecting into said opening cross-sectional area of said conveyor belt.

4,732,265

APPARATUS FOR THE ACCUMULATING CONVEYING OF GOODS

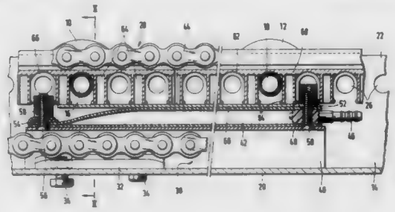
Hans vom Stein, Wermelskirchen, Fed. Rep. of Germany, assignor to Interroll Fordertechnik GmbH & Co KG, Wermelskirchen, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 846,267

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 8511014[U]

Int. Cl.⁴ B65G *15/22*

U.S. Cl. 198—721 **15 Claims**



1. Apparatus for the accumulating conveying of goods comprising: a roller conveyor and a chain adapted to be brought into engagement with the goods to be conveyed via inflatable hose sections; between the chain and each hose section a support and guide profile being disposed; and the chain, the support and guide profiles, and the hose sections being arranged in an upwardly open U-shaped profile having a pair of side legs and a base, characterized in that rollers (**10, 12**) are disposed on continuous pins (**16, 18**) with shaft journal (**89, 90**) mounted to the U-shaped profile, and that the support and guide profile (**62**) is constructed as comb profile having teeth (**64**) directed downwardly to the hose section (**42**), said continuous pins (**16, 18**) being disposed intermediate adjacent teeth, such that space between the teeth permit the support and guide profile (**62**) to move relative to the pins (**16, 18**) in response to inflation or deflation of said hose sections.

4,732,266

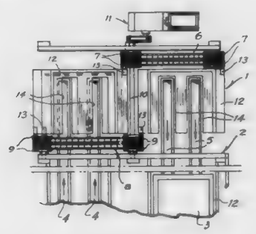
BEARING CONSTRUCTION FOR MOUNTING CARRIERS ON AN ENDLESS CHAIN ELEVATOR

Wolfgang C. Dorner, Oconomowoc, Wis., assignor to Dorner Mfg. Corp., Oconomowoc, Wis.

Filed Feb. 10, 1987, Ser. No. 12,956

Int. Cl.⁴ B65G *17/16*

U.S. Cl. 198—799 **9 Claims**



1. In an elevator for a conveyor system, said elevator having a first endless chain disposed to travel in a first generally rectangular path of travel, a second chain disposed to travel in a second generally rectangular path of travel, said second path of travel lying in a plane parallel to said first path of travel and offset from said first path of travel, a plurality of carriers adapted to support articles to be conveyed, bearing assemblies disposed at only two opposed corner portions of each carrier for pivotably connecting each carrier to the respective endless chains, drive means to drive the chains in synchronization, each bearing assembly including a housing having an axial opening, a sleeve disposed within the opening, shaft means connected to one of said chains and journalled with the opening, and means for permitting relative horizontal movement between said sleeve and said housing to thereby accommodate any misalignment between said chains.

4,732,267

TRANSPORT INTALLATION

Johann Schober, Gleisdorf, Austria, assignor to Binder & Co. Aktiengesellschaft, Gleisdorf, Austria

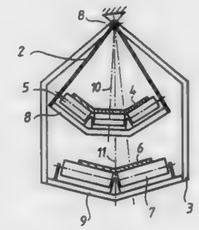
PCT No. PCT/AT86/00017, § 371 Date Nov. 3, 1986, § 102(e) Date Nov. 3, 1986, PCT Pub. No. WO86/05165, PCT Pub. Date Sep. 12, 1986

PCT Filed Feb. 27, 1986, Ser. No. 932,736

Claims priority, application Austria, Mar. 1, 1985, 622/85

Int. Cl.⁴ B65G *21/10*

U.S. Cl. 198—830 **6 Claims**



1. A transport installation comprising

(a) a conveyor belt having an upper and a lower strand, the conveyor belt extending along a track in a substantially horizontal plane for transporting goods in a conveying direction and the track being curved about a center point of curvature,

(b) a support frame means for the conveyor belt, the support frame means including

(1) separate upper and lower vertically aligned conveyor belt support stations for the upper and the lower strands of the conveyor belt, the separate upper and lower vertically aligned conveyor belt support stations being spaced along the curved track and each of said stations having at least one conveyor belt strand support roller rotatable about an axis extending transversely to the conveying direction, and

(2) each of the upper and lower conveyor belt support stations being independently freely pivotal in a pivoting path in response to forces applied to the conveyor belt strands about an axis extending above the conveyor track and substantially parallel to the conveying direction, the pivoting path extending transversely to the conveying direction and rising towards the center point of the curvature of the track.

4,732,268

ARRANGEMENT ON CONVEYORS

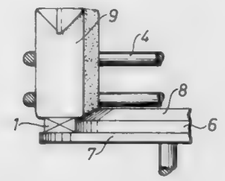
Uno Sjöstrand, Flyinge, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Apr. 29, 1986, Ser. No. 857,139

Claims priority, application Sweden, May 7, 1985, 8502231

Int. Cl.⁴ B65G *15/02*

U.S. Cl. 198—831 **10 Claims**



1. Conveyor apparatus comprising:

means for conveying packages along a predetermined path including a curved portion, said conveying means being formed by a flexible conveying element having an upper conveyor surface;

track means for supporting said flexible conveying element for movement along said predetermined path with a curved portion of said path;

guide means extending along and adjacent an outer circumference of said curved portion of said path and above said upper conveyor surface for guiding packages through said curved portion of said path; said track means including urging means for urging packages toward said guide means while said flexible conveying element conveys the packages along said curved portion of said path, said urging means including a rotatable curve disc having a steering surface which is sloped with respect to said upper conveyor surface and which extends from a first level at least as low as said upper conveyor surface to a second level above said upper conveyor surface such that packages conveyed around said curved portion of said path are urged toward said guide means by said sloped steering surface while said flexible conveying element conveys the packages.

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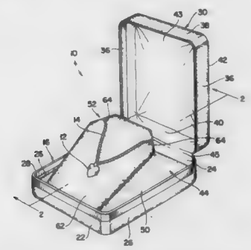
JEWELRY DISPLAY BOX

Armand W. Roy, Plainville, Mass., assignor to Royal Hinge & Die Co., Inc., Plainville, Mass.

Continuation of Ser. No. 835,810, Mar. 3, 1986. This application Mar. 3, 1985, Ser. No. 22,573

Int. Cl.⁴ B65D *79/00*

U.S. Cl. 206—45.13 **2 Claims**



1. A display box for packaging and displaying an article therein, comprising a bottom member having a bottom wall to which upstanding side walls, a front wall and a rear wall are joined, a top member hingedly connected to said bottom member and including a top wall to which side walls and front and rear walls are joined, and a display member located in said bottom member for receiving an article to be displayed thereon, said display member including an insert panel that is received on the bottom wall of said bottom member between the side and front and rear walls thereof, and a display panel that is hingedly connected to said insert panel for pivotal movement relative thereto and adapted for receiving the article for display thereon, the pivotal connection of said display panel to said insert panel being located adjacent to and extending in parallel relation with respect to the front wall of said bottom member, said insert panel including a substantially rigid base that is dimensioned to be received on the bottom wall of said bottom member so that said base extends between the side, front and rear walls of said bottom member, and a padding layer on said base covering substantially the entire upper surface thereof, said padding layer including a resilient foam pad received on said base and substantially covering the entire upper surface thereof and a fabric layer secured to said base and substantially covering said foam pad, said padding layer imparting a padded appearance to said insert panel and engaging said display panel adjacent to the pivotal connection between said display panel and said insert panel to normally urge said display panel to an upwardly inclined display position to locate said article in an inclined display position, said display panel being pivotally movable to a closed position between said top and bottom members upon contact thereof by the top wall of said top member when the top member is moved from the open to the closed position on said bottom member, the portion of said padding layer which is adjacent to the pivotal connection between said display panel and said insert panel being resiliently compressed by said display panel when said display panel is moved to the closed position thereof.

4,732,270

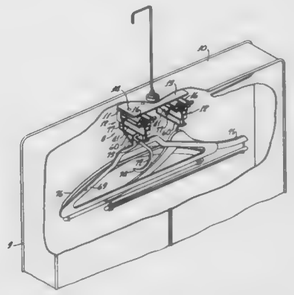
GARMENT BAG HANGER SUPPORT

Jay E. Myers, Laguna Beach, Calif., and M. Todd Myers, New York, N.Y., assignors to Andiamo, Inc., Fountain Valley, Calif.

Continuation of Ser. No. 805,437, Dec. 5, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 944,364

Int. Cl.⁴ A45C *3/00;* **A44B** *21/00;* **B65D** *85/18*

U.S. Cl. 206—289 **24 Claims**



14. In combination with a garment bag, an ordinary coat hanger having a hook and a locking luggage-type hanger having a pivotal locking element, a device for supporting both of said hangers in said garment bag comprising

a first jaw element including a substantially rigid member and a resilient member supported thereby, said resilient member having an exposed outer surface,

a second jaw element including a substantially rigid member,

means connecting one of said jaw elements to said garment bag,

said jaw elements being in a first relative position in which

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said exposed outer surface of said resilient member is in juxtaposition with said second jaw element, and said hook of said ordinary coat hanger is between said exposed outer surface of said resilient member and said second jaw element, so that said hook is retained by said jaw elements and carried by one of said jaw elements,

means interconnecting said first and second jaw elements so as to permit said first and second jaw elements to be selectively moved relatively to a second relative position in which they are spaced apart for permitting said hook of said ordinary coat hanger to be placed therebetween or removed therefrom, stop means for limiting movement of said first and second jaw elements from said first relative position to said second relative position,

means for selectively and releasably holding said jaw elements in said first relative position,

an elongated rail,

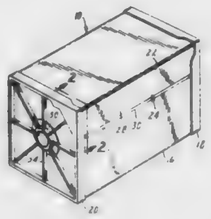
and means at opposite end portions of said rail for connecting said rail to one of said jaw elements so that said rail is spaced from said one jaw element and is unobstructed and exposed between said end portions thereof, said locking element of said locking luggage-type hanger being extended over said rail intermediate said end portions thereof for securing said locking luggage-type hanger to said rail, whereby said device retains and supports said locking luggage-type hanger as well as said ordinary coat hanger.

4,732,271

CANISTER AND LIGHT SEALING, ANTI-BLOOMING TAB

Alan J. Solyntjes, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1985, Ser. No. 811,815
Int. Cl.⁴ B65D *85/38*
U.S. Cl. 206—316 **3 Claims**



1. A light-tight, self-contained canister for a roll of core wound photosensitive media, said canister being constructed to restrict said media from being damaged or exposed to actinic light during shipping, storing and dispensing, said canister comprising:

a tubular sleeve having two outer edges and a media exit slot extending the length of said sleeve parallel to the central axis of said roll of core wound photosensitive media, said sleeve having inner walls closely adjacent the outer wrap of said roll of core wound media;

two opposed end caps engageable with the outer edges of said sleeve and each having a peripheral edge and a central hub portion, said central hub portion being engageable with the core of said core wound media for permitting free rotation of said core wound media within said sleeve during dispensing;

each of said hub portions extending longitudinally from said end cap toward the opposed end cap along the central axis of said core wound media;

fastening means for light sealably fastening said end caps to said outer edges of said sleeve; and

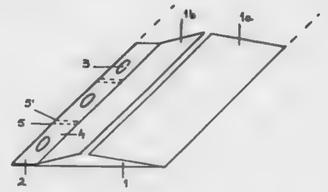
removable tab means positioned in said sleeve exit slot and extending into said sleeve to wedge between said sleeve and said roll of core wound media and in pressure engagement with said roll of core wound media and said sleeve for light sealing said exit slot and for preventing undesired rotation of said core wound media.

4,732,272

PACKAGING FILM PRODUCT

Veijo Heikkinen, Mäntti , Finland, assignor to G. A. Serlachius Oy

PCT No. PCT/FI85/00043, § 371 Date Jan. 9, 1986, § 102(e) Date Jan. 9, 1986, PCT Pub. No. WO85/05086, PCT Pub. Date Nov. 21, 1985
PCT Filed May 3, 1985, Ser. No. 830,582
Claims priority, application Finland, May 9, 1984, 841854
Int. Cl.⁴ B65D *71/00*
U.S. Cl. 206—391 **5 Claims**



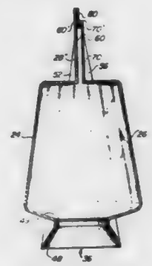
1. Packaging film product for forming package units for the packaging of paper rolls or corresponding products, wherein each package unit contains a product unit, comprising a film web having a middle area and edge border areas adjacent the middle area (1) and folded substantially over equal distances towards each other onto the middle area so that the edge border areas (*1a, 1b*) cover at least a substantial part of the middle area of the web, a longitudinal handle strip (2) formed by joining a portion of one of the edge border areas with the opposing portion of the film web, and grasping openings (3) in the handle strip, the grasping openings being spaced apart corresponding to the spacing of the package units.

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PROTECTIVE CONTAINER FOR CARAMEL APPLES

Daniel J. DeMarco, 7923 N. Kilbourn, Skokie, Ill. 60076

Filed Jun. 2, 1987, Ser. No. 56,815
Int. Cl.⁴ B65D *85/34*
U.S. Cl. 206—470 **15 Claims**



1. A container for shipping, storing and displaying a caramel apple, taffy apple, and the like, comprising:

a base section having a substantially flat surface portion, said flat surface portion having a pair of oppositely-disposed longitudinal edges;

a first pivotal section having a lower lateral edge-surface pivotally connected to one of said longitudinal edges of said flat surface portion of said base section;

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a second pivotal section having a lower lateral edge-surface pivotally connected to the other of said longitudinal edges of said flat surface portion of said base section;

each of said first and second pivotal sections further comprises a lower canted flat section extending outwardly from the lower edge-surface of the respective planar surface area thereof;

each of said first and second pivotal sections comprising a substantially planar surface area, and a half-shell portion projecting outwardly beyond said planar surface area, said half-shell portion defining a hollow interior in which may be stored part of a caramel apple, or the like;

said first and second pivotal sections being pivotal toward each other into abutting relationship in order to store a caramel apple therein, with the caramel apple being positioned within the enclosure formed by juxtapositioned said half-shells;

each of said first and second pivotal sections having cooperating means for removably interconnecting said first and second pivotal sections together to thereby hold said first and second pivotal sections together in a closed, upright state to thereby transport, store and display a caramel apple therein;

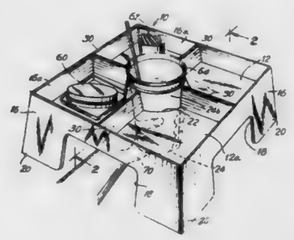
said base section further comprising an upwardly-extending centrally-disposed support member, said support member extending upwardly from the upper surface of said base section, each said canted surface section of each of said first and second pivotal sections comprising a centrally-disposed arcuate recess for receiving therein surface portions of said upstanding support member when said first and second pivotal sections are pivoted to their abutting, closed position.

4,732,274

PORTABLE TRAY TABLE

James A. Bouton, 6 Myron Ct., Teaneck, N.J. 07666

Continuation of Ser. No. 753,520, Jul. 10, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 930,084
Int. Cl.⁴ B65D *73/00*
U.S. Cl. 206—561 **11 Claims**



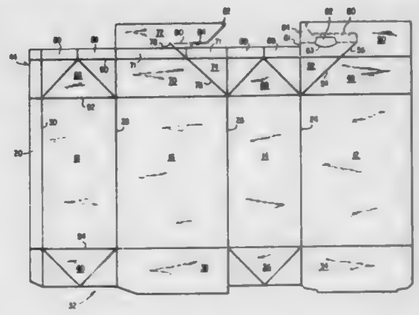
1. A portable tray table formed from a rigid material comprising a panel having an upper food bearing surface extending in a substantially horizontal direction and including a peripheral edge, a skirt coupled to said peripheral edge of said panel and extending downwardly therefrom, said skirt having a lower edge forming a support for supporting said panel above a horizontal surface when said portable tray table is resting on said horizontal surface, said panel having an opening in said food bearing surface located in a central portion thereof, a cup holder supported on said panel and extending downwardly through said opening, said cup holder having a sufficient length forming a gripable surface to be gripped by the fingers and palm of the hand of a user, said skirt including at least one cut-out portion whereby said gripable surface of said cup holder is accessible through said cut-out portion when said portable tray table is supported on said horizontal surface, said cut-out portion being sized to form a substantial opening in said skirt between said support formed on the lower edge of said skirt and said peripheral edge of said panel, said cut-out portion permitting the hand of a user to be inserted through said cut-out portion to grasp said gripable surface of said cup holder when said portable tray table is supported on said horizontal surface.

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OPENABLE AND RECLOSABLE CARTON

Thomas P. Hambleton, Thompson Ridge, N.Y.; Benjamin J. Cassidy, Waldwick, N.J., and James L. Sosier, Florida, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jun. 26, 1987, Ser. No. 66,585
Int. Cl.⁴ B65D *5/74*
U.S. Cl. 206—611 **2 Claims**



1. A one piece blank of stiff, foldable and resilient sheet material, said blank being cut and scored and adapted to be folded to define an openable and reclosable carton of rectangular parallelepiped shape, the blank including serially arranged main panels defined by score lines, said main panels being generally rectangular and each having a top forming and a bottom forming closure panel integrally carried thereby to define a plurality of bottom closure panels and a plurality of top closure panels, two of said main panels being sidewall forming and the remaining two main panels being endwall forming, at least one of the top closure forming panels carried by a respective endwall forming panel scored to define a reclosable pour spout, the top closure forming panel carried by each sidewall forming panel foldably carrying a fin panel, one fin panel being recessed at one end thereof to form a tuck edge spaced from an outer edge of said top closure forming panel associated therewith, the other said fin panel being partially cut to define a tear strip and tuck tab, whereby tearing the tear strip away exposes and defines the tuck tab.

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HINGED-LID PACKAGE

Siegfried Knecht, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Continuation of Ser. No. 867,781, May 27, 1986. This application Aug. 28, 1987, Ser. No. 93,107
Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519485
Int. Cl.⁴ B65D *85/10*
U.S. Cl. 206—624 **15 Claims**

1. In a box having a generally cuboid shape and a hinged lid, being articulated to the rear side of the box and having a wall which covers a first end of the box in the closed condition of the lid, said covering wall being adhesively secured to a pair of underlying and oppositely disposed lateral end tabs, said lid further having a pair of oppositely disposed side walls which are connected to said end tabs, said lid also including a front wall and a rear wall, the lid front wall being connected to said covering wall and the lid rear wall being connected to the rear

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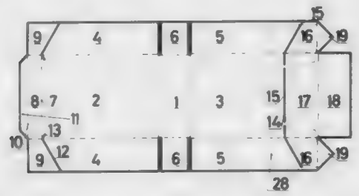
VOL 1088 ISS 4 MR 22 1988 UMI

side of the box, the box further including an inner wrapper received in the box and folded about the contents of the box, the inner wrapper generally conforming to the shape of the box interior and having a pair of oppositely disposed lateral side edge portions which are folded inwardly toward one another, the improvement comprising:

a tab extending from said lid rear wall, said tab extension having three exposed edges and extending generally transversely with respect to said lid rear wall in the direction of said lid front wall;

said lateral end tabs generally having a triangular shape;

said lid front and side walls being respectively connected to the box front and side walls by narrow strips of material which bridge shear lines between adjacent edges of said connected walls;



said inner wrapper having a first end flap which is folded over said lateral side edge portions and a second end flap which is folded inwardly toward and over said inner wrapper first end flap, said second end flap having a width in the direction of the fold line of the first end flap which is less than the width of the box between the front and rear sides thereof, said tab extension of said lid rear wall extending toward the fold line of the inner wrapper second end flap and in part overlapping the inner wrapper first end flap, the width of said tab extension being selected such that said inner wrapper second end flap does not overlie said tab extension;

whereby the inner wrapper when completely folded is free relative to the box lid.

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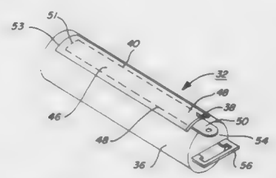
TONER CARTRIDGE WITH REMOVABLE SLEEVE CLOSURE

Wayne R. Smith, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 20, 1987, Ser. No. 4,936

Int. Cl.[4] B65D *83/06*

U.S. Cl. 206—633 **1 Claim**



1. An apparatus for storing a supply of marking particles therein, including:

a container defining a chamber for storing the marking particles therein and having an elongated opening in the wall thereof extending substantially the length of said container for the discharge of the marking particles therefrom;

a flexible sealing strip removably secured to said container sealing said opening to prevent the discharge of the marking particles therefrom, said sealing strip having a flat sleeve extending across said opening and beyond the edges thereof, a layer of adhesive material applied between those portions of the container adjacent the edges of said opening and the adjacent surface of said sleeve, and an elongated pulling member within said sleeve and being connected at one end to one end of said sleeve so that a gradual pulling motion at the other end of the member will effect the gradual stripping of said sleeve from said container and the turning inside out of said sleeve.

4,732,278

APPARATUS FOR TRANSPORTING CARTRIDGE FOR EXPOSED ROLL FILM

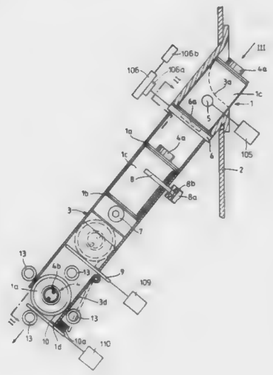
Helmut Zangenfeind, Puchheim; Günther Dömges, Deisenhofen, and Reinhart Würfel, Munich, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

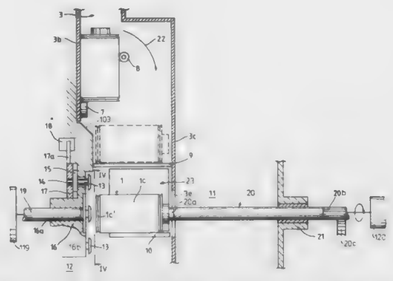
Filed Sep. 20, 1985, Ser. No. 778,612

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437046

Int. Cl.[4] B65G *11/20*

U.S. Cl. 209—546 **29 Claims**





1. Apparatus for transporting a series of successive containers for exposed photographic roll films to an opening station, each container consisting essentially of a single substantially cylindrical shell having a substantially tangentially extending mouth and apertured first and second end walls in sealing engagement with the end portions of the shell, and each container confining a reel which includes a pair of spaced-apart flanges flanking a roll of convoluted exposed roll film and a core having a pair of end portions which are accessible via the respective apertured end walls, said apparatus comprising a downwardly sloping duct having an upper end portion provided with an inlet configurated to admit only containers having a single substantially cylindrical shell; means for permitting the introduction of successive containers into the inlet of said duct when the axes of the respective shells are substantially parallel to the axis of the duct and in a predetermined angular position of the mouths of the respective shells and while said first end wall is located at a level below said second end wall of the respective shell; and means for tilting successive containers in said duct ahead of said opening station.

4,732,279

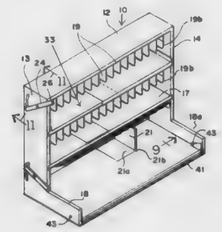
CONVERTIBLE LETTER/FLAT MAIL SORTING CASE

David E. Gurkin, 3035 "B" Guildford, Boca Raton, Fla. 33434

Filed Oct. 8, 1986, Ser. No. 916,803

Int. Cl.[4] B07C *7/04*

U.S. Cl. 209—702 **8 Claims**



1. A convertible letter/flat mail sorting case comprising, in combination, a rectangular box-like case member, open at the front, said box-like case member having a top wall, a bottom wall, sidewalls and a back panel, a plurality of flat letter separators hingingly connected in spaced, parallel relation against and along the inside of said top wall and normally depending vertically downwardly therefrom to define a plurality of compartments, open at the front of said box-like case member for the selective reception of letter mail during the sorting thereof, means for simultaneously swinging said letter separator members between said downwardly-depending positions and upwardly retracted, withdrawn positions against the top wall of said rectangular box-like case member, a "flats" separator member hingingly connected to said bottom wall intermediate the length of said bottom wall and moveable, selectively, between substantially horizontal abutting position against the top surface of said bottom wall and perpendicular position between said top and bottom walls for dividing the front opening of said box-like member into compartments, open to the front of said box-like case member, for the selective reception of "flats" mail to be sorted when said letter mail sorting separators are in their upwardly retracted, withdrawn positions.

4,732,280

REEL DISPLAY DEVICE

Randal J. Nieders, 14821 Pheasant Hill Ct., Chesterfield, Mo. 63017

Filed Jan. 21, 1987, Ser. No. 5,618

Int. Cl.[4] A47F *7/00*

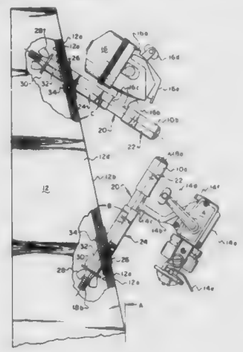
U.S. Cl. 211—13 **15 Claims**

1. In a device for attaching a reel to a flat panel having wall surfaces connected by an aperture, the improvement comprising:

an elongated member adapted to have its longitudinal axis penetrate said aperture with a portion of said member extending beyond each of said wall surfaces;

reel holding means attached to one extending portion;

actuating means for said reel holding means attached to the other extending portion; and,



said reel holding means and said actuating means providing coacting means for securing said member to said panel.

4,732,281

MOUNTING BRACKET ASSEMBLY FOR ELECTRONIC INSTRUMENT MOUNTING, HEAT DISSIPATION AND ENVIRONMENTAL PROTECTION

George R. Hall, II, Wickliffe, and Lonnie J. Richman, Eastlake, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 31, 1986, Ser. No. 846,391

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—26 **3 Claims**



1. A mounting bracket assembly, locatable along a side of a housing module having openings to permit heat dissipation therethrough that is mountable into an opening in a control panel having a front and a rear face, comprising:

a mounting bracket, having

(a) a first trapezoidal-shaped side having a narrow edge, a wide edge and two equal edges:

(b) second and third substantially rectangular-shaped sides, each attached at one edge thereof to one of the two equal edges of the first side and being substantially perpendicular to the first side, each having a plurality of regularly spaced, rectangular side slots located on the edge opposite the edge attached to the first side, and each having a beveled edge located near the wide edge of the first side: and

(c) a fourth rectangular-shaped side, attached at one edge to the narrow edge of the first side and substantially perpendicular thereto, having a first centrally disposed hole therethrough, and which bears upon an edge of each of the second and third sides opposite the beveled edge thereof for support:

such that the mounting bracket has a beveled front portion

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for engaging the rear face of the control panel and causing the mounting bracket to bow towards the side of the housing module when the beveled front portion is pressed against the rear face of the control panel; and

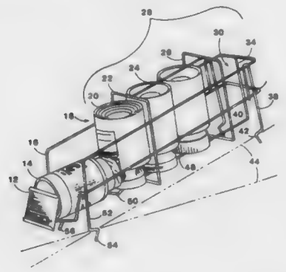
means for mounting said mounting bracket to said housing module so that an outwardly projecting lip of the housing module is pressed against the front face of the control panel when the beveled front portion is pressed against the rear face of the control panel.

4,732,282

GRAVITY FEED DISPENSER AND METHOD

John D. Lockwood, 1431 Westgate Ave., Los Angeles, Calif. 90025

Filed Jul. 23, 1987, Ser. No. 76,780
Int. Cl.[4] A47F *1/00*
U.S. Cl. 211—59.2 **12 Claims**



1. A gravity-feed dispensing apparatus comprising: a housing for supporting a row of items to be dispensed in an upright standing position, with an additional front item of the row being supported in a lateral lying position, and said housing including retaining means at the forward end thereof for holding the front item in the housing with the front item serving as a stop for the remaining items of the row, and said housing having an opening over the front item through which the front item is visible and enabling the front item to be removed; and a tripper mounted in said housing adjacent to the first upright standing item in the row to cause the first upright standing item to tip over and assume the lateral lying position of the first-named front item when the first-named front item is removed.

4,732,283

SKI RACK

Edmund W. Schmidt, 413 Forest Ave., Willow Springs, Ill. 60480

Filed Jun. 3, 1986, Ser. No. 869,993
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—70.5 **5 Claims**

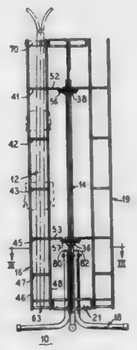
1. A ski rack comprising:

a stationary center post;

rotatable vertically spaced mounting means carried by said post;

a plurality of retaining means modules for supporting at least one pair of skis in an upright position in each module and each said retaining means module comprising elongated wire form members including a bottom member forming ski supporting dual baskets and further including a top member forming corresponding dual retainer bars and each having straps for selectively securing an upright ski in said module parallel to said center post; and

interfitting male and female parts between each said mounting means and each said module for selectively connecting



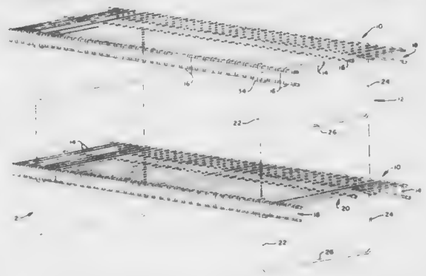
and disconnecting said modules to said center post in relatively rotatable assembly.

4,732,284

FREE STANDING STACKING SHELF SYSTEM

Lee Remmers, Ocala, Fla., assignor to Clairson Corporation, Ocala, Fla.

Filed Nov. 13, 1986, Ser. No. 929,776
Int. Cl.[4] A47B *47/00*
U.S. Cl. 211—188 **20 Claims**



1. A free-standing stacking shelf system comprising:

at least two shelf members;

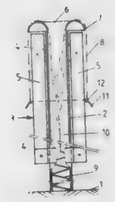
at least two stacking elements removably coupled to each of said at least two shelf members and extending downwardly therefrom, each of said stacking elements being substantially U-shaped, having first and second upwardly extending arm members and a base member coupled to and disposed between a lowermost portion of said first and second arm members, at least one of said arm members including means for removably coupling the stacking element to the shelf member comprising a generally hooked-shaped uppermost end portion of said arm member, at least one of said arm members including means for maintaining said stacking element and said shelf member in a predetermined angular orientation, each of said arm members including means for preventing relative vertical movement between the stacking element and the shelf to which it is attached, and each of said arm members further including means at said lowermost portion thereof for engaging a next adjacent shelf member.

4,732,285

COLLAPSIBLE STRUCTURE

Heinrich Wüster, Anwerk 18, A-6460 Imst/Tirol, Austria

Filed Sep. 2, 1986, Ser. No. 903,034
Claims priority, application Austria, Sep. 4, 1985, 2583/85
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—197 **18 Claims**



1. In a collapsible structure comprising

a rising central tube,

a spiderlike folding frame, which is carried by said tube and is adapted to be moved relative to said tube radially outwardly and upwardly to an unfolded position and radially inwardly and downwardly to a collapsed position, in which said folding frame surrounds said tube, and

flexible means carried by said folding frame,

the improvement residing in that

an open-topped tubular structure is provided, which is parallel to said central tube,

a flexible sheath is provided, which is longitudinally movable between a retracted position, in which a major portion of said sheath is contained in said tubular structure, and an extended position, in which said sheath surrounds said folding frame when the latter is in said collapsed position, said sheath having first and second ends, which are at the top and bottom, respectively, of said sheath when the latter is in said extended position, and

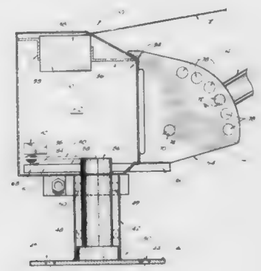
tensile means are secured to said one end of said sheath and adapted to pull said sheath from said extended position to said retracted position.

4,732,286

CRANE WITH OVERLOAD SENSOR

Richard F. Koenig, Houston, Tex., assignor to Rawson-Koenig, Inc., Houston, Tex.

Filed Mar. 1, 1985, Ser. No. 707,487
Int. Cl.[4] B66C *13/18*
U.S. Cl. 212—149 **15 Claims**



1. An improved crane comprising:

a base;

a support member connected to and extending from said base;

a deformable member fixedly attached to said support member, said deformable member comprising a flange plate, said flange plate being a load bearing member;

switching means fastened to said support member and interactive with said flange plate so as to sense the relative deformation of said flange plate with respect to said support member said switching means comprising;

a bar rigidly affixed at one end to said support member:

a switch fastened to the other end of said bar, said switch having a movement sensor extending therefrom and responsive to movements of said flange plate; and

control means electrically connected to said switch and responsive to said movement sensor; and

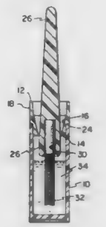
lifting means fastened to said deformable member, said lifting means for moving objects.

4,732,287

CONTAINER AND APPLICATOR FOR FLUIDS

Robert A. Bennett, Easton, Conn., assignor to R.J.S. Industries, Inc., Marlboro, N.J.

Continuation-in-part of Ser. No. 931,543, Nov. 17, 1986. This application Oct. 13, 1987, Ser. No. 107,158
Int. Cl.[4] B65D *17/32*
U.S. Cl. 215—32 **4 Claims**



1. A container and applicator for fluids comprising:

a vertical plastic cylinder having a first outer diameter and a hollow interior chamber adapted to store fluid, the cylinder having upper and lower ends, the lower end being sealed;

a vertical hollow plastic member having upper and lower open ends and as viewed in a horizontal plane having a circular cross section, the upper end of the member having a second outer diameter, the lower end of the member having a third outer diameter, the second diameter being equal to the first diameter and being larger than the third diameter, said member having an exposed inner surface having the general shape of a cup and extending downwardly and inwardly from the upper end of the member to the lower end of the member, the outer surface of the member defining a first upper vertical section having the second diameter and a second lower vertical section having the third diameter, the first and second sections being interconnected by a horizontal shoulder, the second section being disposed within the upper end of the cylinder with the outer surface of the second section being flush with the inner surface of the cylinder, the upper end of the cylinder engaging and being sealed to the shoulder;

a vertically elongated plastic element having an upper end disposed above the member and extending downwardly through the member into the cylinder, the element having a lower end disposed below the second section, the element having a vertical bore which extends upwardly from the lower end of the element to a point intermediate the ends of the element;

vertical bristles secured in said bore and extending out of the lower end of the element into the cylinder; and

horizontal annular sealing means disposed between the element and the inner surface of the lower end of the member

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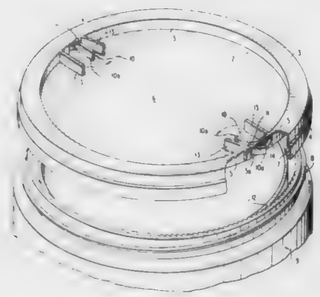
to seal the element to the member, said means being adapted to be broken by manual pressure to enable the element with its bristles to be removed from the member and the cylinder so that, when the cylinder contains fluid, the element can be used as a handle to repeatedly dip the bristles in the fluid to charge the bristles with fluid for repeated application as desired by a user.

4,732,288

CHILD-RESISTANT MOLDED PLASTIC CONTAINER LID FOR OPEN HEAD CONTAINERS

Glenn H. Morris, Sr., 1192 Cumberland Rd., Chattanooga, Tenn. 37419

Filed Aug. 6, 1987, Ser. No. 82,230
Int. Cl.[4] B65D *55/02, 41/04*
U.S. Cl. 215—214 **14 Claims**



1. In combination; a child-resistant molded plastic container lid and an open head container, said lid having an annular inverted U-shaped rim containing threaded portions and configured to fit over and receive the upper peripheral edge of said container, said container having threaded portions about its outer upper periphery for mating with said threaded portions of said lid, the improvement comprising,

locking teeth provided on the inner peripheral surface of the upper end portion of the container, and

resiliently biased locking means mounted on said lid engaging said teeth when said lid is threaded down upon said container to a closed position, to thereby prevent rotation of the lid in the opposite direction to an open position by a child, whereby the container and lid are child-resistant when closed.

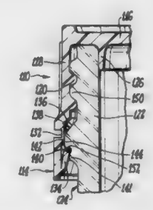
4,732,289

TAMPER INDICATING CLOSURE MEMBER FOR CONTAINER

Rodney J. Granat, Caulfield, and Roger W. Clark, Hampton Park, both of Australia, assignors to ACI Australia Limited, Australia

Filed Jul. 31, 1986, Ser. No. 891,756
Claims priority, application Australia, Jul. 31, 1985, PH01726; May 14, 1986, PH05893
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **16 Claims**

1. A closure member for a container, the closure member having a cap member defining a top wall and a depending peripheral skirt integral with the top wall; and axially spaced, separable band portion interconnected by at least one frangible bridge element to an edge of the skirt remote from the top wall and integrally formed on said band portion a locating member adapted to be received behind a shoulder defined by the container neck; the band portion having a centeralizing means provided on its inner surface, at circumferentially spaced locations around that surface; the centralizing means being dimensioned radially of said inner surface, relative to a peripheral face defined by a circumferential bead provided on the neck of the container such that, notwithstanding variations in neck diameter within normal tolerances, the closure member once fully applied to the container is centrally located on the container neck with the centalizing means contacting or being closely adjacent said peripheral face of the bead and thereby substantially preventing transverse movement of the closure band portion relative to the container neck; said locating member comprising an annular flap hingedly connected to the inner surface of the bank portion and, in an operative orientation thereof, extending radially inwardly and axially toward said top wall; said annular flap being connected to said inner surface around a hinge line, the width of said flap from said hinge line being less than the spacing between said hinge line and said centralizing means such that the centralizing means does not impede pivoting of said flap.

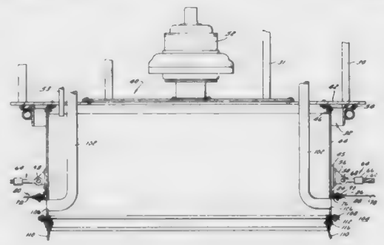


4,732,290

LOAD ISOLATING GAS WELL

Walter R. Hallen, Oconomowoc, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed May 7, 1986, Ser. No. 860,599
Int. Cl.[4] B65D *87/08*
U.S. Cl. 220—5 A **7 Claims**



1. In a pressurized gas storage tank having a floor and an outer wall, a gas well support structure mounted over said tank and having an access aperture, a floating gas well housed in the access aperture and movably supported therein for movement with respect to the gas well support structure in response to changes in gas pressure in the gas storage tank, and the gas storage tank including an inner gas storage membrane and an outer air sealing membrane, each of said membranes being attached at said outer peripheries to said wall and at said inner peripheries to the floating gas well, said gas well comprising:

a frame having a top plate with an access port and a vertically depending portion with a peripheral configuration approximating said inner periphery of said membranes;

a plurality of flexible cables, each of the cables having a well end and a base end, said well end being pivotally connected to said vertically depending portion of said frame, and said base end being pivotally fixed to said tank wall;

means for attaching the inner periphery of the outer air sealing membrane to the vertically depending portion of the frame in sealed relation, the means for attaching being below the well ends of the cables;

means for attaching the inner periphery of the inner gas storage membrane to the vertically depending portion of the frame in sealed relation and below the means for attaching the inner periphery of the outer air sealing membrane; and

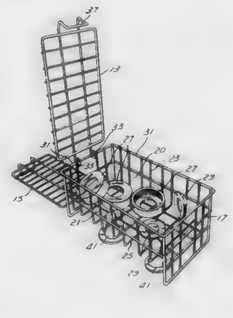
wherein said membranes are attached to said vertically depending portion of said frame in relation to the connections of said flexible cables such that when said tank becomes inflated with either pressurized air or gas, the outwardly-directed stress loads created thereby are accommodated by said flexible cables and transferred to said tank wall.

4,732,291

BABY BOTTLE NIPPLE, COLLAR, CAP RING AND PACIFIER DISHWASHER ENCLOSURE

Thomas E. McConnell, 6 Liveoak, Irvine, Calif. 92714

Filed Nov. 26, 1986, Ser. No. 934,951
Int. Cl.[4] B65D *6/08, 1/36*
U.S. Cl. 220—19 **15 Claims**



1. An assembly for holding and facilitating the washing of baby bottle nipples, collars, cap rings and pacifiers, the assembly comprising:

a first storage area for holding baby bottle collars, cap rings and pacifiers, said first storage area being defined by a pair of side walls, a pair of end walls, a bottom portion having a plurality of apertures therethrough and a retractable upper lid; and

a second storage area for holding baby bottle nipples, said second storage area being defined by a retractable lower lid detachably connected to and extending between said end walls beneath said bottom portion, said retractable lower lid being positionable in open and closed positions and being formed such that, when in said closed position, said lower lid will urge at least a portion of each nipple through at least one of said apertures thereby frictionally retaining said nipple(s) within said second storage area.

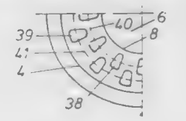
4,732,292

FLEXIBLE BOTTOM PROFILE FOR DRAWN AND IRONED BEVERAGE CAN

Helmuth Supik, Sorstedt, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca GmbH, Braunschweig, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 49,249, Jun. 18, 1979, abandoned. This application May 5, 1981, Ser. No. 260,558
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826422
Int. Cl.[4] B65D *1/16, 1/42*
U.S. Cl. 220—70 **5 Claims**

1. A can for pressurized packaged products, said can comprising a cylincrical body and an integral bottom comprising a tapered peripheral portion of truncated cone-shape extending downwardly from said body, a calotte-shaped central portion projecting into the can interior, and an intermediate ring-shaped portion between said peripheral and central portions, said ring-shaped portion having a plurality of equidistantly



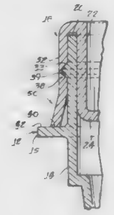
circumferentially spaced cup-shaped dimples being defined in two circumferential directions by two walls connected in a radial outward direction by a steep wall and in a radial inward direction by a relatively shallower wall, said dimples having centers located in staggered arrangement on two concentric circles.

4,732,293

TEAR STRIP CLOSURE FOR A CONTAINER WITH A SECURITY RING

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics, Inc., Chicago Ridge, Ill.

Filed Nov. 5, 1986, Ser. No. 927,337
Int. Cl.[4] B65D *17/40*
U.S. Cl. 220—276 **16 Claims**



1. A closure for a container having a retention bead comprising:

a top panel,

a depending skirt extending about periphery of the top panel and extending downwardly and outwardly from said top panel, said skirt having an inner wall and outer wall,

a locking recess means on the inner wall of said skirt having a lower shoulder for engaging the lower side of the retention bead on the container to hold the closure on the container,

a removable tear strip on the lower portion of the skirt having a line of weakness connection adjacent said locking recess means connecting an upper portion of the skirt to a lower portion of the skirt, said lower shoulder being on said removable tear strip and removed therewith,

a pull tab for the removable tear strip molded integrally with the tear strip to be pulled to tear the tear strip at said line of weakness, leaving a lower skirt edge adjacent the container retention bead, and

a lift tab connected to the skirt and available with removal of the tear strip and projecting outwardly from the skirt to be used to lift the closure from the container.

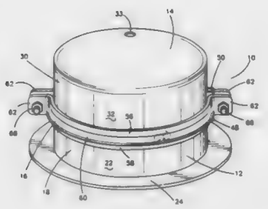
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4,732,294

SAFETY LATCH MEANS FOR FILTER ASSEMBLY

James R. Bohler, Danville; Jerry E. Stephenson, Lebanon, and Thomas E. Drawbaugh, Fillmore, all of Ind., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Mar. 12, 1987, Ser. No. 24,946
Int. Cl.[4] B65D *45/32*
U.S. Cl. 220—320 14 Claims



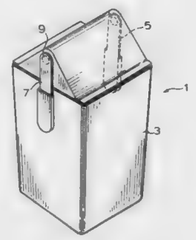
1. Safety latch means for a pressure vessel housing comprising a shell member, a separable cover member adapted to be associated with said shell member, and a locking clamp, said shell member being defined by a hollow shell body having an exterior surface, an interior surface and an open upper end, said upper end terminating in an upper peripheral edge, a first external bracket member provided on said exterior surface of said shell body and projecting outwardly therefrom, a plurality of projecting pin members provided on the interior surface of said shell body, said cover member being defined by a hollow cover body having an exterior surface, an interior surface, a closed upper end and an open lower end, said lower end terminating in a lower peripheral edge, an interior depending flange extending downwardly from said interior surface of said cover body beyond said lower peripheral edge, said interior flange being adapted to fit within said shell body when said cover member is associated with said shell member, said lower peripheral edge of said cover body being adapted to abut and be supported by the upper peripheral edge of said shell body when said cover member is associated with said shell member, a second external bracket member provided on said exterior surface of said cover body and projecting outwardly therefrom, a plurality of open slots formed in said interior depending flange, each of said slots being defined by a vertical portion and a horizontal portion, said slots being located on said interior depending flange such that each of said vertical portions is adapted to receive one of said pin members when said cover member is associated with said shell member, said pin members being adapted for engagement within said horizontal portions of said slots when said cover member is associated with said shell member by rotating said cover member with respect to said shell member, said first and second external brackets being adapted to be in alignment when said pin members are fully engaged within said horizontal portions, said locking clamp having at least two terminal ends, said locking clamp being adapted to be assembled around the point of abutment of said lower peripheral edge and said upper peripheral edge by aligning the respective terminal ends, means for securing together said aligned terminal ends of said locking clamp, said aligned external brackets being adapted to be located between said secured terminal ends of said locking clamp, said locking clamp being capable of being assembled around said point of abutment only when said external brackets are aligned.

4,732,295

RECEPTACLE WITH SWINGING COVER

Yutaka Horinchi, Kitchener, Canada, assignor to Twin-Cee Limited, Georgetown, Canada

Filed Jan. 14, 1987, Ser. No. 3,261
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—331 3 Claims



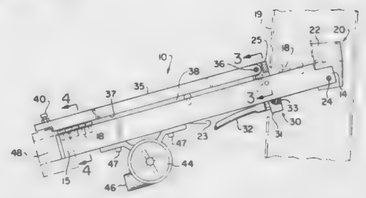
1. A waste receptacle comprising a bin and an upper swinging cover mounted by a pair of support arms to said bin, said support arms being movable from an upright position supporting said cover over said bin to a sideways extending position with said cover located to either side of said bin and including locking means for holding said support arms in said upright position, said support arms being slideable to clear away from said locking means for moving to the sideways extending position and being provided with elongated slots and mounted to said bin by a mounting structure comprising upper and lower pins fitted into said elongated slots, each support arm having a recessed lower end for fitting on the lower pin and being liftable to clear said recess from said lower pin and pivoting said support arms about said upper pins.

4,732,296

TRACK FEED ARRANGEMENT FOR AN AUTOMATIC SCREW FEEDING MACHINE

Michael Heck, 302 NE. 36th St., Boca Raton, Fla. 33432, and Nathan Singer, 5710 NW. 54th Way, Tamarac, Fla. 33319

Filed Jun. 14, 1985, Ser. No. 744,630
Int. Cl.[4] B23Q *7/12*
U.S. Cl. 221—172 8 Claims



1. A gravity assisted track arrangement for an automatic screw feeding machine adapted for use with a plurality of fasteners, comprising a pair of spaced tracks, the shanks of said fasteners being positioned within the space between said tracks with the bottom of the heads of said fasteners fitting against said tracks, said tracks being inclined at an angle to the horizontal, means attached to said tracks for stabilizing the alignment of said fasteners within and on said tracks, comprising an elongated bar member mounted for pivotal rotation relative to said tracks, said bar member being aligned substantially parallel to the longitudinal axis of said tracks and spaced above said tracks whereby the lower surface of said elongated bar rests upon the upper surface of at least one or more of the lead fasteners within said tracks and the underside surfaces of said fasteners rest substantially flat against the upper surfaces of said tracks and means for causing alternating, periodic bearing and lift off of said stabilizing means on said fasteners within said track.

4,732,297

LIQUID LEVEL DETECTOR APPARATUS FOR A CONCENTRATE DISPENSER TANK

Alfred A. Schroeder, Jr., San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Continuation of Ser. No. 545,655, Oct. 26, 1983, abandoned.
This application Sep. 12, 1985, Ser. No. 778,271
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—64 10 Claims



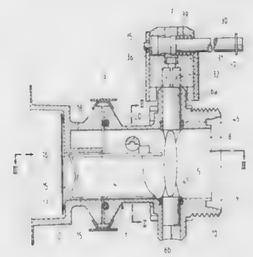
1. A liquid level detector for a concentrate tank comprising:
an electrically conductive housing mounted flush with the inside wall of the tank;
an electrically conductive engaging means mounted within said housing; and
means biasing said engaging means toward an electrical contact of a liquid concentrate dispensing apparatus when said tank is in communication with said apparatus, said bias means being in electrical connection with said engaging means.

4,732,298

WITHDRAWAL APPARATUS

Wilfried Dinslage, Muhlenstrasse 16, 5161 Merzenich, Fed. Rep. of Germany

Filed Jun. 24, 1986, Ser. No. 877,853
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522521
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—83 12 Claims



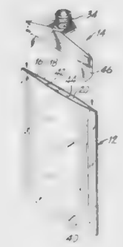
4. Apparatus for withdrawing a flowable product from a container having an outlet plug and a frangible sealing plate, the apparatus being positionable on the outlet plug connected to the container and being provided with a tube-shaped withdrawal channel which can be closed by a closure element, said apparatus comprising:
a plate-shaped closure flap defining the closure element, said flap being rotatable on an axis diametric to the withdrawal channel, said closure flap being sealed with respect to the withdrawal channel by a surrounding elastic seal; and,
a pipe-shaped knife shell in said withdrawal channel, said shell having a knife edge directed toward the outlet plug and characterized in that a space is provided at the end facing toward the closure flap (5) in such a way that the closure flap (5) can be partially opened without moving the knife shell (15) toward the frangible sealing plate (17).

4,732,299

COLLAPSIBLE CONTAINER

Earl E. Hoyt, 210 Chickasaw Trail, Franklin Lakes, N.J. 07417

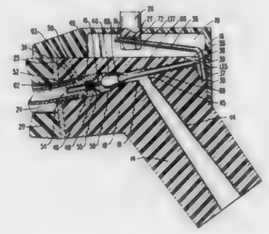
Filed Feb. 10, 1986, Ser. No. 827,627
Int. Cl.[4] B65D *35/22*
U.S. Cl. 222—94 6 Claims



1. A collapsible container comprising:
a first, pliable member and
a second, non-pliable member, wherein said first pliable member includes a first pliable sheet and a second pliable sheet, said first pliable sheet and said second pliable sheet having a respective left edge joint portions, right edge joint portions and bottom edge joint portions which are respectively joined together to form a pouch with a variable volume cavity therebetween for containing dispensible material, said caivty having an open end for connecting to said second, non-pliable member, said second non-pliable member including a base portion having opposite surfaces including a near side surface and a far side surface, said first pliable sheet and said second pliable sheet having respective, inwardly facing, near and far top edge joint portions,
said near and far side surfaces having continuous respective contours feathering down to meet at the two ends of said base portion to form a film thick endings, said respective contours without angular discontinuities, said near and far side surfaces, including the film thick endings, disposed between and sealingly connected to the inwardly facing, near and far top edge joint portions of said first and second pliable sheets, whereby the connection thereto of said first pliable sheet and said second pliable sheet is substantially leak free, said second, non-pliable member further including a tapered portion connecting to the base portion, and a stem portion connecting to the tapered portion, and wherein said stem portion has an opening for dispensing the contents of the container, and said base portion has an opening for receiving the contents from the cavity, and
said second non-pliable member has a passageway connecting the stem opening to the base opening for dispensing the contents, and wherein said near side surface of the second non-pliable member and the surface of said first pliable sheet sealingly connected thereto are substantially disposed in a common plane, whereby two containers can be nested together in a flat-to-flat arrangement for simultaneously dispensing two different container contents.

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4,732,300
PREMIXED BEVERAGE DISPENSER
Mojtaba Valiyee, Moraga; William A. Martindale, and Richard A. Martindale, both of Vacaville, all of Calif., assignors to Automatic Bar Controls, Inc., Vacaville, Calif.
Filed Mar. 10, 1987, Ser. No. 24,227
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—144.5 **1 Claim**



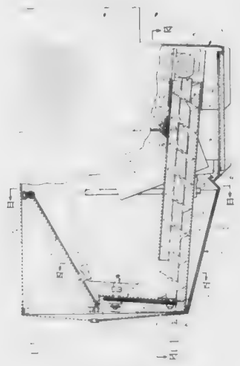
1. A beverage dispenser for dispensing premixed beverages from a premixed beverage supply having a conduit connected to the beverage supply comprising:

a dispenser head having a handle portion with an upper surface and a spigot portion having a plurality of spigots disposed at an obtuse angle with respect to the upper surface, said dispenser head having a plurality of channels therethrough generally parallel to said upper surface and adapted at one end to be connected to the conduit and at the other end to discharge the premixed beverage through the respective spigots, each said channel having a tapered portion having a wide end adapted to be coupled to the conduit and a valve stem bore axially extending beyond the narrow end generally parallel to said upper surface, said dispenser head further including a lever seat proximate to each said valve stem bore;

a plurality of valve means each received within said tapered portion of the respective channels, each of said valve means including a poppet having a stem at one end received within said valve stem bore and a biasing means urging said poppet towards the narrow end of the tapered portion of said channel so as to normally seal said channel, each said poppet including a poppet assembly for supporting an o-ring seal, said poppet assembly having first and second members, said first member having a cylindrical protrusion adapted to receive the o-ring and an annular axially directed concavity circumscribing the cylindrical protrusion and adapted to be flush with the o-ring, said second member having a cylindrical cavity adapted to mate with the cylindrical protrusion of the first member, the second member having an axially directed concavity facing the concavity of the first member so that an o-ring secured therebetween provides a continuous surface with the first and second members to minimize turbulence in the premixed beverage flow over the poppet; and

a plurality of valve actuating means each including a lever having a first portion and a second portion disposed at an obtuse angle with respect to each other, said first lever portion being generally parallel to said first surface of said dispenser head, said second lever portion being generally perpendicular to the associated poppet stem and operatively coupled thereto, said second portion being further pivotally connected at the respective lever seat to said dispenser head, said valve actuating means also including a plurality of pushbuttons disposed proximate to said first surface and operatively coupled to the first lever portions of the respective levers so that depression of a pushbutton causes the second lever portion of the associated lever to operatively engage the associated poppet stem thereby urging said poppet toward the wide end of said first portion of the associated channel to dispense the desired beverage.

4,732,301
ICE DISPENSER
Lamar K. Tobias, Richland; Hugh J. Chapman, Kalamazoo; Daniel R. Herzog, Delton, and Harold W. Williams, Paw Paw, all of Mich., assignors to Tobias Enterprises, Inc., Kalamazoo, Mich.
Filed Jan. 27, 1987, Ser. No. 7,228
Int. Cl.[4] F25C *5/18*
U.S. Cl. 222—203 **13 Claims**



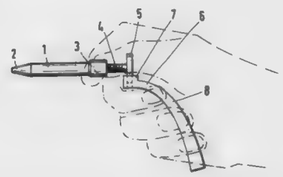
1. An arrangement for preventing the development of a frozen bond between individual pieces of cubed or crushed ice collected in a storage bin, comprising:

upstanding flexible wall means lining a majority of the inwardly facing wall surface of said storage bin, said upstanding flexible wall means being adapted to flex toward and away from said inwardly facing walls of said storage bin;

agitator means for moving said cubed or crushed ice about within the confines defined by said flexible wall means, said agitator means including a rotatable shaft, an arm secured to said rotatable shaft and extending radialy thereof and a drive means for drivingly rotating said shaft; and

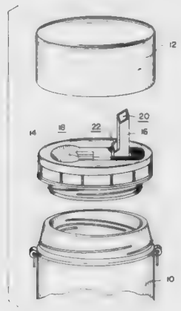
means for effecting a flexing of said flexible wall means toward and away from said inwardly facing walls of said storage bin, said agitator means and said means effecting a flexing of said flexible wall means causing a movement of said cubed or crushed ice to prevent the development of any frozen bond between the individual pieces of ice, said arm having means on an end thereof remote from said rotatable shaft for engaging at least a portion of each of said wall surfaces on each pass therepast, said means effecting a pushing of said wall surface and an elastic yielding thereof outwardly away from a central region of a bottom wall of said storage bin so that said cubed or crushed ice will move under the effect of gravity to occupy the expanded space created by said elastic yielding of said wall surface, said wall surface returning to its original position following a disengagement of said arm therewith to again cause movement of said cube or crushed ice and a breaking of any frozen bond that may exist between said pieces of ice.

4,732,302
DEVICE FOR THE METERED DISCHARGE OF DENTAL MATERIAL
Ernst Mühlbauer, Fangdieckstrasse 61, 2000 Hamburg 53, Fed. Rep. of Germany
Filed Jun. 2, 1986, Ser. No. 869,219
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 8521514[U]
Int. Cl.[4] A61C *5/04*
U.S. Cl. 222—390 **7 Claims**



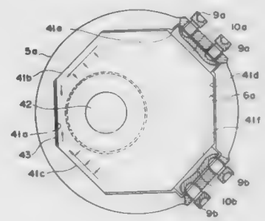
1. A device for the metered and aimed discharge of dental material comprising: a cartridge for containing the dental material and which at one end has a discharge nozzle and at the other end is connected fixedly in terms of rotation to a nut having an internal thread, the discharge nozzle being arranged coaxially relative to the internal thread of the nut; a plunger in the cartridge for ejecting the dental material from the nozzle; a threaded spindle interacting with the nut to advance the plunger as a result of the rotation of the cartridge around the spindle; a handle connected solely to the spindle, the handle having a grip part projecting laterally relative to the cartridge in the manner of a pistol grip; wherein the handle, the connection of the handle to the spindle and the nut are arranged to be grasped simultaneously in one hand such that the index finger and thumb can rotate the nut and cartridge while the handle and spindle remain stationary, thereby advancing the cartridge axially relative to the plunger to discharge the dental material through the nozzle.

4,732,303
BOTTLE COVER WITH DISPENSING SPOUT
Paul S. Wang, 16033 Villa Flores Dr., Hacienda Heights, Calif. 91745
Filed Nov. 24, 1986, Ser. No. 934,494
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—484 **2 Claims**



1. A dispensing cover assembly for a bottle, or the like, having an open top, comprising: a cover adapted to be mounted on the bottle to enclose the open top, said cover having a dispensing opening extending therethrough; a dispensing spout rotatably mounted on said cover to be turned to an open upright position and to a closed down position parallel to the plane of said cover, said spout having an opening extending therethrough which is aligned with said dispensing opening in said cover when said dispensing spout is turned to its upright position, and said dispensing spout closing the dispensing opening in said cover when the spout is turned down to its closed position; a snap-acting leaf spring element mounted on said cover and engaging said spout to hold said spout in its open and in its closed positions, said leaf spring element having a bifurcated shape with first and second spaced and parallel resilient arms extending along each side of said spout, a pair of trunions attached to said spout and extending outwardly from each side of said spout under respective ones of said arms, and said spout having a rectangular configuration of force said trunions upwardly against said resilient arms when the spout is turned from its closed to its open position until the spout reaches an upright position at which the arms move downwardly in an off-center action causing the spout to be held in its open position, and to force the trunions upwardly against said arms when the spout is turned down from its open position until the spout reaches a particular angular position at which the arms move downwardly in an off-center action biasing the spout with a snap action to its closed position.

4,732,304
ROTARY NOZZLE SYSTEM
Tetsuya Yoshihara, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo; Nippon Rotary Nozzle Co., Ltd.; Kokan Kikai Kogyo Kabushiki Kaisha, both of Kawasaki and Tokyo Yogyo Kabushiki Kaisha, Tokyo, all of, Japan
Filed Nov. 6, 1986, Ser. No. 927,451
Claims priority, application Japan, Nov. 18, 1985, 60-256703; Dec. 27, 1985, 60-293234
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—598 **9 Claims**



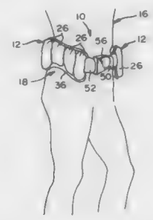
1. In a rotary nozzle system of the type in which a slide plate brick and bottom plate brick, each thereof having at least one nozzle bore, are relatively rotated in a surface-to-surface contact condition to adjust a degree of communication opening of said nozzle bores to control a rate of pouring of molten metal, each of said plate bricks being formed on an outer peripheral surface thereof with a flat portion at each of four locations arranged at angular intervals of 90° for receiving a driving force for said relative rotation and a reaction force.

4,732,305
WEIGHT BELT FOR UNDERWATER DIVING
William L. Courtney, San Francisco; Philip W. Ford, San Rafael; Jay L. Kahn, Sausalito; John M. Patty, Berkeley, and Daniel R. Rodarte, San Francisco, all of Calif., assignors to Diver Designed Equipment, San Francisco, Calif.
Filed Feb. 24, 1986, Ser. No. 832,826
Int. Cl.[4] A45F *3/00;* **B63C** *11/02*
U.S. Cl. 224—224 **10 Claims**

1. A weight belt for underwater divers, comprising two similar flexible elongated panels forming a plurality of generally contiguous pockets for receiving and containing diving weights, said panels comprising an inner flexible liner adapted for arrangement next to the diver and an outer liner, seams being formed between the inner and outer liners to form the

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respective pockets and for allowing expansion of the pockets when they are filled with diving weights so that the pockets tend to expand outwardly upon being filled to further enhance the comfort of the diver, the lower edge of each elongated panel being formed with an arcuate configuration to conform to the hips of the diver, and belt means comprising releasable



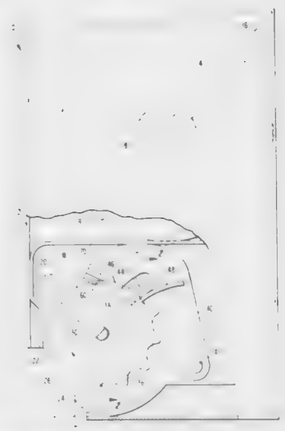
means and adjustable means for securing the panels about the diver's waist and selectively positioning the panels relative to the belt means, whereby the weight belt can be adjusted to accommodate different waist sizes with the arcuate lower edge of each elongated panel being respectively centered on the diver's hips.

4,732,306

ONE-REVOLUTION STOP MECHANISM AND DISPENSING METHOD FOR ROLLED WEB DISPENSERS

Paul W. Jesperson, Herlev, Denmark, assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Mar. 12, 1986, Ser. No. 838,799
Int. Cl.⁴ B26F *3/02*; A47K *10/36*
U.S. Cl. 225—2 **12 Claims**



1. A method of dispensing rolled web material comprising the steps of:

transversely perforating the web material within a dispenser cabinet to define individual sheets along the web with a row of perforations formed between one sheet and the next succeeding sheet;

freeing the web for it to be pulled out of said cabinet by an intending user until said row of perforations existing between succeeding sheets is exposed exteriorly of said cabinet;

abruptly stopping the freedom for said web material to be pulled out of said cabinet to provide a stopping action,

effecting said stopping action by raising a pivotted stop member against the force of gravity at least 1.2 inches beyond the point necessary to insure said stopping action to provide a predetermined time delay due to the time interval required for the stop member to drop by the force of gravity to the point where said stopping action is released;

maintaining said web stopped after said one sheet has been pulled from said cabinet by applying continuous pulling tension to said web;

pulling said one sheet to separate it from said web along said row of perforations thereby relieving tension on said web;

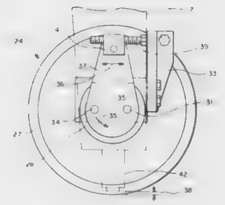
utilizing relief of tension on said web to again free said web to be pulled out of said cabinet by an intending user.

4,732,307

NAILING APPARATUS

Sidney C. Hubbard, 25228 La Loma Dr., Los Altos Hills, Calif. 94022; Gary M. Lass, and Harold M. Lass, both of San Jose, Calif., assignors to Sidney C. Hubbard, Redwood City, Calif.

Filed Oct. 3, 1986, Ser. No. 915,077
Int. Cl.⁴ B25C *3/00*
U.S. Cl. 227—7 **21 Claims**



1. A method for nailing a nailing surface comprised of panel members to an underlying joist or support structure using a nailing apparatus having a carriage with a nailing device mounted thereon, and a means for triggering the nailing device the method comprising the steps of:

passing the carriage along a seam to be nailed;

selecting a fixed carriage travel distance at which the nailing device will be automatically actuated in response to movement of the carriage along the nailing surface;

selecting a fixed height for the nailing device above the surface being nailed; and

altering the selected nailing device height to control penetration of the nails into the panel members while operating the nailing apparatus.

5. A nailing apparatus including a carriage having a plurality of support wheels for supporting said carriage for movement on a surface,

a nailing device having a nailing head,

means for mounting said nailing device on said carriage,

means for supporting the nailing device on said carriage for relative vertical movement with respect to the carriage so that the height of the nailing head of said device above the surface can be maintained,

means mounted on said nailing device for engaging the surface for maintaining a constant height of said nailing device head from said surface, said constant height maintaining means including adjustment means for allowing the user to selectively adjust the height of said nailing device head above said surface, and

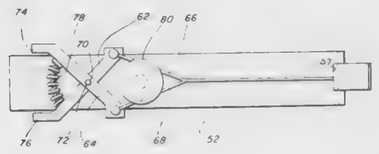
means for selectively controlling actuation of said nailing device in response to movement of the carriage along the surface to provide a selected nail spacing.

4,732,308

VETERINARY STAPLING IMPLEMENT

Terry L. Grieshaber, 820 Ogeden Ave., Lisle, Ill. 60532

Filed Feb. 17, 1987, Ser. No. 15,783
Int. Cl.⁴ A01B *17/00*
U.S. Cl. 227—19 **9 Claims**



1. A veterinary stapling implement for use with a two-pronged staple comprising:

a pair of implement members, each having an elongated handle portion, a pivot portion, and an elongated stapling portion extending forwardly of said pivot portion, each stapling portion having a jaw, said pivot portion of each member being contiguous with said handle and jaw portions thereof, and said jaw portions being opposed to one another;

a pivot member pivotally joining said pivot portions and thus said implement members;

a stapling means in one of said jaw portions comprising a staple feeding and driving means;

a staple crimping means opposite said staple feeding and driving means in the other jaw portion, said crimping means comprising a crimping plate and a pair of crimping anvils movable toward one another and positioned to each engage a prong of a driven staple and bend said prongs toward one another about said crimping plate; and

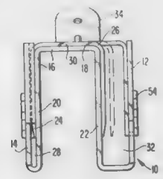
means to move said crimping anvils toward one another to bend and crimp said staple independently of any pivoting movement of said implement members.

4,732,309

STAPLE MAGAZINE

Alfred H. Judge, Raleigh, N.C., assignor to Black & Decker, Inc., Towson, Md.

Continuation of Ser. No. 639,425, Aug. 10, 1984, Pat. No. 4,667,865. This application Mar. 27, 1987, Ser. No. 30,578
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.⁴ B25G *5/16*
U.S. Cl. 227—109 **5 Claims**



1. In a stapler having a housing supporting means for selectively, downwardly ejecting U-shaped staples into a workpiece, the improvement comprising:

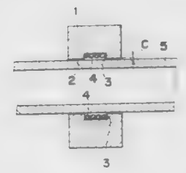
an elongated staple magazine for supporting and transversely confining independently of said housing a plurality of said staples, said magazine including a pair of transversely-spaced, parallel sidewalls defining the maximum transverse width of said staples and a pair of transversely-spaced, parallel inner walls disposed between and in fixed parallel relation to said sidewalls, said inner walls defining the minimum transverse width of said staples and slidably supporting said staples for longitudinal movement in said magazine, said side and inner walls defining two parallel, upwardly-open channels disposed to receive the legs of said staples, one said channel having a transverse width only slightly greater than the transverse width of said legs for closely confining one leg of each said staple and the other channel having a transverse width substantially greater than said one channel for receiving the other leg of each said staple thereby permitting said magazine to selectively contain staples of different transverse widths between said minimum and said maximum.

4,732,310

COMPOSITE CAMSHAFT AND METHOD OF MAKING THE SAME

Genkichi Umeha, Tokyo; Takasi Uda, Urawa, and Shunsuke Takeguchi, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00127, § 371 Date May 17, 1985, § 102(e) Date May 17, 1985, PCT Pub. No. WO85/01556, PCT Pub. Date Apr. 11, 1985
PCT Filed Mar. 23, 1984, Ser. No. 740,845
Claims priority, application Japan, Sep. 28, 1983, 58-179761
Int. Cl.⁴ B23K *9/225*
U.S. Cl. 228—135 **6 Claims**



1. A composite camshaft comprising a fitting member provided with a shaft-receiving bore and mounted on a shaft with a clearance therebetween and bonded to said shaft by a brazing material, wherein said fitting member is formed with an annular groove disposed in the central portion of the inner surface of said shaft-receiving bore, said annular groove containing said brazing material, which upon heating, melts to fill the clearance and bond the fitting member with the shaft as a unitary body, said brazing material being larger in diameter than said annular groove so as to extend along the bottom of said annular groove.

4,732,311

PROCESS OF PRODUCING LIGHTWEIGHT AND CORROSION-RESISTANT HEAT EXCHANGER

Yoshiharu Hasegawa, Ohbu; Yutaka Murakami, Nishio, and Toshio Ohara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Furukawa Aluminum Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 739,475, May 30, 1985, abandoned. This application Jan. 21, 1987, Ser. No. 8,041
Claims priority, application Japan, May 31, 1984, 59-112232; May 31, 1984, 59-112233
Int. Cl.⁴ B23K *9/225*
U.S. Cl. 228—138 **21 Claims**

1. A method of producing a lightweight and corrosion-resistant heat exchanger, comprising the steps of:

forming a tube having a plurality of passage bores by extrusion form one of aluminum and an aluminum alloy;

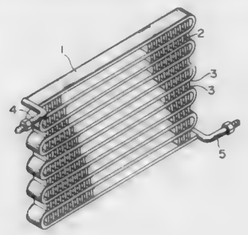
coating at least a part of the outer periphery of said tube, as viewed in cross-section, with a layer of a brazing material with the aid of a non-corrosive flux applied to one of said tube and said layer such that said layer of brazing material extends over the entire length of said tube, said brazing

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material comprising an aluminum alloy including zinc silicon and having an electrode potential value lower than that of the material of said tube;

bending said tube into a substantially zigzag winding form such that the bent tube has a plurality of substantially parallel runs and a plurality of bent portions each interconnecting an adjacent pair of said runs;

placing corrugated fin members of one of aluminum and an



aluminum alloy between adjacent runs of said tube, respectively, such that said fin members are not in contact with said bent portions of said tube, said fin members being uncoated with any layer of brazing material and each having a thickness of less than 0.12 mm; and

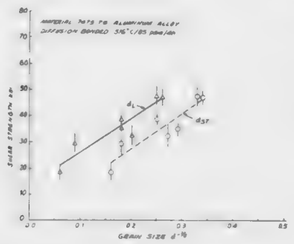
heating said tube and said corrugated fin members at least to the melting point of said brazing material to bond said corrugated fin members to said tube by said brazing material.

4,732,312

METHOD FOR DIFFUSION BONDING OF ALLOYS HAVING LOW SOLUBILITY OXIDES

James R. Kennedy, Huntington, and Edmund Y. Ting, Oyster Bay, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 10, 1986, Ser. No. 928,898
Int. Cl.[4] B23K *20/22, 20/24*
U.S. Cl. 228—157 **27 Claims**



1. A method for diffusion bonding surface layers of an alloy having surface oxide coatings of low solubility in the alloy, comprising the steps of:

treating said alloy so that at least the surface layers to be bonded have a fine grain structure;

removing existing surface oxide coatings from the surface layers to be bonded;

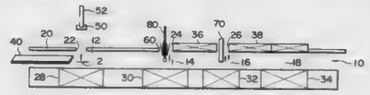
diffusion bonding the surface layers to one another by placing the alloy to be bonded under a pressure sufficient to cause disruption of the oxide coatings and insufficient to cause macroscopic deformation of the alloy while heating the alloy in a non-oxidizing atmosphere for a time sufficient for diffusion bonding to occur.

4,732,313

APPARATUS AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Mituo Kobayashi, Aioi; Osamu Usuda, Tatsuno; Yoshihiko Sano, Hyogo, and Koichiro Atsumi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1985, Ser. No. 759,273
Claims priority, application Japan, Jul. 27, 1984, 59-155591; Oct. 19, 1984, 59-219902; Oct. 19, 1984, 59-219903
Int. Cl.[4] H01L *21/60*
U.S. Cl. 228—179 **19 Claims**



18. A bonding method comprising the steps of:

preparing a bonding wire made of copper or a copper alloy;

conveying a lead frame in a convey direction along a convey path, the convey path being provided with a wire bonding portion and postbonding portion which are separated from each other along the convey direction;

heating one end of the bonding wire to form a ball at the end of the bonding wire by using a double-structure burner having an inner tube and outer tube outside the inner tube, said heating step including a blowing a first gas mixture of an H_2 gas and an O_2 gas in a mixing ratio of 2:1 O_2 to N_2 from the inner tube to form an oxyhydrogen torch and blowing a second gas mixture of O_2 gas and N_2 gas from a space between the outer tube and the inner tube to form an air curtain around the oxyhydrogen torch;

feeding the bonding wire so that the ball of the bonding wire contacts the electrode pad;

compressing the ball of the bonding wire onto the electrode pad; and

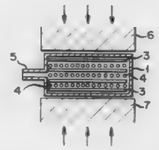
supplying a reducing or inert gas to the ball of the bonding wire at the wire bonding and post bonding portions to surround the bonding wire by the reducing gas, thereby preventing the ball from being oxidized.

4,732,314

METHOD OF MANUFACTURING A METAL-BASED COMPOSITE MATERIAL

Akira Sakamoto, Toyoake, Japan, assignor to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan PCT No. PCT/JP85/00629, § 371 Date Jul. 8, 1986, § 102(e) Date Jul. 8, 1986

PCT filed Nov. 12, 1985, Ser. No. 885,596
Claims priority, application Japan, Nov. 12, 1984, 59-236769
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—190 **6 Claims**



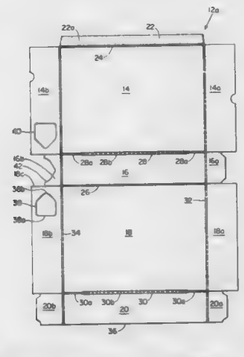
1. A method of manufacturing a metal-based composite material, characterized in that a preform laminate consisting of a fibrous inorganic reinforcing material and a matrix metal which is aluminum, an aluminum alloy, magnesium or a magnesium alloy, or a sandwiched body of the fibrous inorganic reinforcing material and metal sheets of foil layers of said matrix metal is packed in a sealing metal container, the container is rapidly heated to a temperature higher than the solidus of the matrix metal while its interior is maintained in a vacuum, and immediately thereafter the container is compressed by a platen heated to and kept at a temperature lower than the solidus of the matrix metal, thereby preparing a composite material of the reinforcing material and the matrix metal, and separating the composite material from the container.

4,732,315

DISPENSING PACKAGE

Charles L. Gunn, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 10, 1987, Ser. No. 24,182
Int. Cl.[4] B65D *5/72*
U.S. Cl. 229—125.09 **10 Claims**



1. A reclosable dispensing package comprising:

A. a carton of rectangular cross section having alternating face and side panels interconnected along corner folds, said carton being provided with a top closure comprising closure flaps attached to the upper edges of said panels, said closure flaps being secured in inwardly folded overlapped condition and having an opening extending therethrough adjacent the upper edge of one of said panels,

B. a granular detergent composition within said carton,

C. a fitment constructed of thin sheet plastic material and having:

(a) a base which is generally planar in configuration with a dispensing aperture extending therethrough, the planar base being affixed to the outer surface of the top closure with such dispensing aperture in registry with said opening;

(b) an overlying cover having a dependent plug formed therein which is sized to enter and seal said dispensing aperture;

(c) the cover and base provided with a line of articulation therebetween to permit said cover to be selectively swung arcuately outwardly relative to the base to a dispensing position and inwardly to a closed position wherein said plug is telescoped within said dispensing aperture, and

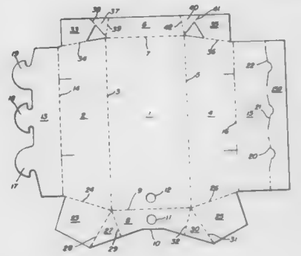
D. means integral with said carton to increase the thickness of the carton in areas spaced from said fitment when the package is in flattened tubular form to enhance stackability and machineability.

4,732,316

SUSPENDIBLE CARTON WITH END CLOSURE STRUCTURE

James R. Oliff, Austell, and Gary W. Baugus, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 30, 1987, Ser. No. 68,241
Int. Cl.[4] B65D *25/30*
U.S. Cl. 229—40 **5 Claims**



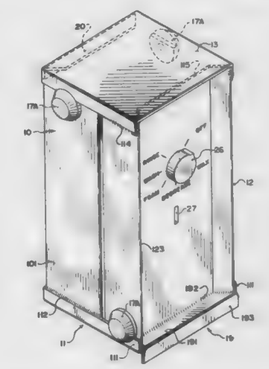
1. A carton for packaging articles and formed from a unitary blank comprises a top wall, a pair of side walls and a composite bottom wall foldably joined along their side edges to form a tubular structure and is provided with an end panel foldably joined to an end edge of said top wall at one end of the carton and folded inwardly toward the other end of the carton and into flat face contacting relation with the inner surface of the top wall, said end panel having an inner edge remote from said end edge of said top wall and having an aperture which is in coincidence with a corresponding aperture in said top wall for receiving a carton suspending hanger, a pair of end closing doors foldably joined respectively to the end edges of said side walls at said one end of the carton and arranged to expose said apertures when closed, and a web panel disposed in flat face contacting relation to said end panel and foldably joined to each end edge of said end panel and to the adjacent end edge of each of said end closing doors.

4,732,317

SECURE CONTAINER PARTICULARLY FOR HOUSING COIN FREED MECHANISM

Jacob R. Wiebe, 60 Heaton Ave., Winnipeg, Manitoba, Canada (R3B 3E3)

Filed Dec. 22, 1986, Ser. No. 944,746
Int. Cl.[4] G07B *15/00*
U.S. Cl. 232—7 **22 Claims**



1. A secure container comprising a first channel member and

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a second channel member each being shaped to define a base panel and side panels extending outwardly from the base panel generally at right angles thereto, said channel members being dimensioned so that they are substantially of the same length and such that they can be arranged in face to face relationship with longitudinal edges remote from the respective base panel of the side panels of the first channel member substantially abutting longitudinal edges remote from the base panel of the side panels of the second channel member with the base panels spaced so as to define an enclosure within the channel members, means provided on said longitudinal edges for interlocking the edges in such a manner that the channel members can be engaged to form said enclosure only by movement of one channel member relative to the other in a longitudinal direction, actuable locking means for locking said channel members against said longitudinal movement, and two end cap plate members each arranged to close a respective end of the enclosure, one of said end cap members being secured solely to said first channel member and the other of said end cap members being secured solely to said second channel member.

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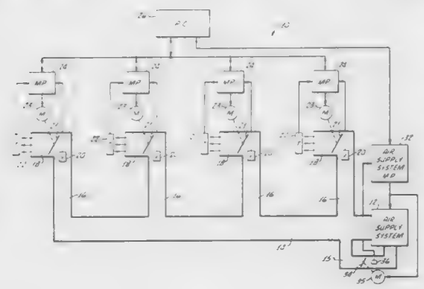
VELOCITY CONTROLLED FORCED AIR TEMPERATURE CONTROL SYSTEM

Gene W. Osheroff, 3932 Montego Dr., Huntington Beach, Calif. 92649

Continuation-in-part of Ser. No. 820,514, Jan. 17, 1986, abandoned. This application Dec. 22, 1986, Ser. No. 944,975

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 236—49 **21 Claims**



1. A temperature control system for regulating air flow of heated or cooled air into temperature control zones within a building, wherein each zone has associated therewith an air flow duct and a damper within the air flow duct to regulate the amount of air flow into the zone, said system comprising for each zone:

temperature selecting means for selecting a set temperature within the zone;

temperature sensing means for sensing actual temperature within the zone;

control signal generating means for generating a control signal in response to the difference between the set temperature and the sensed temperature, such control signal representing a selected velocity of air flow through the duct into the zone;

velocity sensing means for sensing the air flow velocity through the duct controlled by the damper;

comparator means for comparing the sensed velocity to the selected velocity and generating a damper control signal,

damper positioning means for positioning the damper in response to the damper control signal; and said system further comprising

an air supply system for supplying flow of heated or cooled air into all of said zones, said air supply system having an output capacity, means responsive to the velocity sensing means of all of said zones for generating a demand air signal indicative of the total quantity of air flowing into all of said zones, and means responsive to said demand air signal for diverting from said zones a quantity of air from said air supply system based upon the difference between said output capacity and said total quantity.

4,732,319

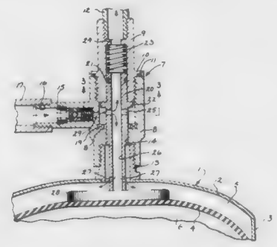
FILL VALVE FOR A WATER HEATING SYSTEM

Robert M. Schurter, Elm Grove, and Patrick J. Bourke, West Bend, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 19, 1987, Ser. No. 63,821

Int. Cl.⁴ F24D *3/00*

U.S. Cl. 237—65 **8 Claims**



1. A liquid control mechanism for a liquid heating system, comprising an expansion tank having a flexible pressure member dividing the tank into a liquid chamber and an enclosed gas chamber, a fill valve assembly mounted on the tank and including a body having an axial passage and having a second passage communicating between the axial passage and a source of makeup liquid, one end of said axial passage communicating with said liquid chamber and the opposite end of said axial passage defining an outlet and communicating with a water heating system, a portion of said axial passage defining a valve set, a hollow valve member mounted for sliding movement in said axial passage and having an inner end projecting through said opening into said tank and positioned to be contacted by said pressure member, said valve member having a valve disposed to engage said seat, and port means extending laterally in said valve member and providing communication between said second passage and the interior of said valve member, said port means being constructed and arranged so that when said valve is engaged with said seat, said port means is out of communication with said second passage and when said valve is disposed out of engagement with said seat said port means communicates with said second passage to permit water from said second passage to pass into the interior of said valve member and then to said outlet.

4,732,320

RAILROAD GRADE CROSSING WITH TRANSVERSE SECURING SPLINES

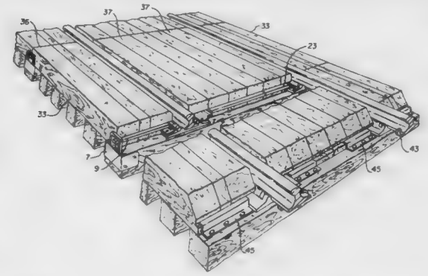
S. Hudson Owen, Marshfield, Wis., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,416

Int. Cl.⁴ E01B *21/04*

U.S. Cl. 238—8 **11 Claims**

1. A railroad crossing comprising rails supported by ties on a ballast and a deck of gage, transverse end and outer field panels supported by said ties adjacent to said rails, said panels being substantially level with the top of said rails so as to allow motor vehicle traffic to cross over said rails, the improvement which comprises joining panels by means of transverse splines fitted into indentations on end surfaces of said gage, transverse end and outer field panels whereby pairs of panels are joined together with one of said splines fitting partly into each end of adjoining panels; and lateral anchor means for engaging the transverse splines and thereby fixing the gage panels adjacent to said rails, transverse end panels and outer field panels



whereby the need is obviated for affixing the panels to the ties by means of surface spikes.

4,732,321

PASSIVE AIR FRESHENER

John E. Dolan, 15 New Main St., Haverstraw, N.Y. 10927

Filed Jul. 17, 1986, Ser. No. 886,415

Int. Cl.⁴ A61L *9/04*

U.S. Cl. 239—45 **9 Claims**



1. A room deodorizer adapted to continuously dispense a deodorant into a room over an extended time period of the order of 60 days comprising:

a container for holding a quantity of a first liquid that is not miscible with a second liquid;

a first matrix element partly immersed in said first liquid, and a second matrix element impregnated with said second liquid, said second matrix element being disposed above said first matrix element and communicating therewith such that the first liquid moves upward in the first matrix element by capillary action and contacts said second liquid impregnated in said second matrix element whereby the second liquid is forced to the surface by molecular displacement and evaporates into the atmosphere;

further including a cover assembly fitted to the top of said container, said cover assembly including a tube for accommodating said first matrix element and a hollow sleeve formed adjacent said tube;

said cover assembly including a cover member having a recess therein for receiving said second matrix element; a cap fitting over said cover member, said cap being provided with a rod adapted to extend into said hollow sleeve formed adjacent said tube, thereby to block an opening formed at the bottom of said sleeve such that water cannot reach said first matrix element.

4,732,322

LIQUID FUEL ULTRASONIC ATOMIZER CONSTRUCTION FOR A HEATER

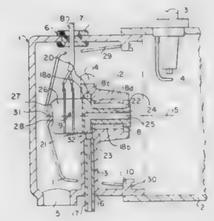
Gerhard Gaysert, Esslingen; Jakob Hilber, Leonberg, and Dieter Götz, Kirchheim/Teck, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Fed. Rep. of Germany

Filed Jun. 23, 1986, Ser. No. 877,290

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522697

Int. Cl.⁴ B05B *3/14*

U.S. Cl. 239—102.2 **5 Claims**



1. In a liquid fueled heater including a housing defining a combustion chamber with a heat exchanger contiguous thereto and with an ignition zone in the combustion chamber having igniting means extending therein, the improvement comprising a burner head having radially extending web portions supported peripherally in the housing and having a central seating body portion with a longitudinally extending bore therethrough and havng a rear bearing surface, and including an annular grove defined in the longitudinally extending bore, a fuel conduit defined in the said web portion communicating with said annular groove, an ultrasonic atomizer having a peizoelectric part with a metallic portion forming a horn-shaped emitter having an atomizer disk with a central longitudinally extending emitter bore, said front metallic portion having a face bearing against said seating body rear bearing surface and having a radial bore providing communication between said fuel conduit and the emitter bore, said ultrasonic atomizer being disposed in said seating body bore, and a resilient clasp having a central part bearing against the rear of said ultrasonic atomizer and urgin said ultrasonic atomizer into bearing engagement with said seating body portion, said resilient clasp includes radially and axially extending portions, said burner head having lug portions defined in the interior thereof with which the axially extending portions of said clasp are engaged.

4,732,323

LOWER SPRAY ARM SYSTEM FOR DISHWASHER

Wilbur W. Jarvis, St. Joseph Township, Berrien County, and John I. Smith, Coloma Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 27, 1986, Ser. No. 901,045

Int. Cl.⁴ B05B *5/06;* **F16J** *15/16*

U.S. Cl. 239—259 **15 Claims**

10. Structure for delivering a washing liquid into a wash chamber of a dishwasher, said structure comprising:

a spray arm support in said wash chamber and having a vertically extending annular sleeve with an inside annular surface and an upwardly facing, annular sealing surface;

a spray arm having at least one liquid discharge opening and a depending annular skirt with an annular outer surface;

means mounting the spray arm so that the annular sleeve and the skirt are in axially overlapping relationship;

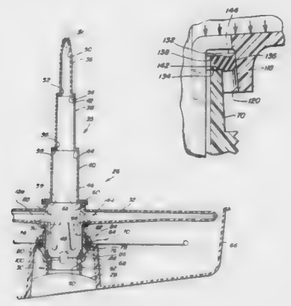
an annular flange on the spray arm and having a radially inwardly facing annular surface;

there being a downwardly facing surface on the spray arm which in conjunction with the inwardly facing surface of

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the flange and at least a portion of the outer surface of the spray arm skirt defines a U-shaped chamber opening downwardly towards said sealing surface on the spray arm support and being in communication with the liquid passageway;

a sealing member mounted in the U-shaped chamber and movable axially between the downwardly facing surface on the spray arm and the sealing surface on the spray arm support; and



pump means for forcibly delivering a washing liquid from a source of washing liquid supply to said spray arm for delivery of washing liquid into said wash chamber through said discharge opening, said washing liquid delivered from the pump means delivered through said passageway further passing into said U-shaped chamber and building up pressure therein so as to urge the sealing member downwardly against the sealing surface on the spray arm support.

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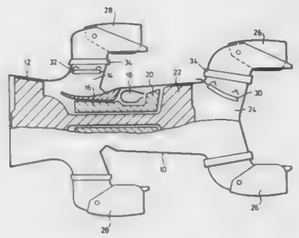
VARIABLE FLOW AREA NOZZLE

Douglas J. Nightingale, Jonesboro, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,675

Int. Cl.[4] B63H *11/00*

U.S. Cl. 239—265.29 **6 Claims**



1. A variable flow area nozzle comprising:

a first duct;

a second, pivotably mounted, duct positioned downstream of the first duct and thereby defining a fluid flow path through the first and second ducts, the upstream end of the second duct being of similar internal section to the downstream end of the first duct, the first duct including a lip which extends downstream through the second duct, the lip being of width corresponding to the internal width of the second duct thereby defining an exit orifice the flow area of which is controlled by the position of the second duct with respect to the lip;

a first pressurisable chamber located on a side of the lip remote from the fluid flow path, the chamber being defined at least in part by the lip and a portion of the second duct;

and a means for admitting fluid into the chamber, said means comprising at least one vent hole in the lip through which fluid from the first duct passes into the chamber.

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APPARATUS FOR CLEANING SURFACES

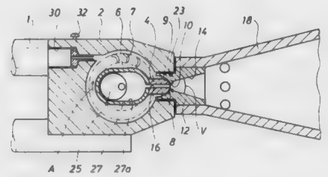
Erik Jensen, Randers, and Oluf Kjår, Rodkjärsbro, both of Denmark, assignors to Gerni A/S, Randers, Denmark

Filed Oct. 17, 1986, Ser. No. 920,088

Claims priority, application Denmark, Aug. 19, 1986, 3948/86

Int. Cl.[4] B05B *1/28*

U.S. Cl. 239—288 **13 Claims**



1. An apparatus for cleaning surfaces by means of a jet of cleaning liquid, the apparatus comprising a sluicing pipe (1) connected with a housing (2) provided with a tiltably arranged nozzle assembly (4) therein, the nozzle assembly (4) adapted to perform oscillations by means of a hydraulic motor (6) in the housing driven by the cleaning liquid prior to the cleaning liquid flowing to the nozzle assembly (4), the improvement characterized in that the tiltable nozzle assembly (4) has an oscillation coupling (27) integral therewith, is located within the housing (2) and has a front end including a contact surface (8) which bears against bearing surface (9) located downstream of the nozzle assembly (4) and provided with a discharge opening (10), the nozzle assembly (4) having an outlet (16) aligned with the discharge opening (10) and the nozzle assembly (4) being tiltable on the bearing surface (8); said bearing surface being located on a discharge member (12) at the outlet of the housing (2), the discharge member having a central flow channel (14) for the cleaning liquid, and said central flow channel (14) having a cross sectional area greater than the outlet (16) of the nozzle assembly (4).

4,732,326

APPARATUS FOR PRODUCING AEROSOLS FROM LIQUIDS

Harro A. W. Bessling, and Horst E. R. Wandert, both of Brunswick, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Fed. Rep. of Germany

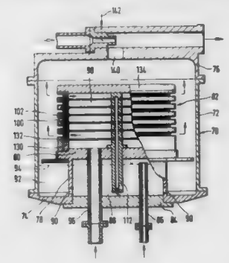
Filed Jun. 24, 1986, Ser. No. 877,843

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523157

Int. Cl.[4] A61M *11/02*

U.S. Cl. 239—338 **3 Claims**

1. A generator for producing an aerosol from a liquid comprising a substantially closed housing having an aerosol outlet, a liquid storage area in said housing for containing a supply of liquid therein, a substantially closed atomizer in said housing above said storage area operative for producing an aerosol from said liquid, and a gas driven ejector operative for withdrawing aerosol from said housing, said atomizer comprising a plurality of pairs of inner and outer rings, said inner and outer rings each having upper and lower surfaces, said pairs of inner and outer rings being placed in closely spaced substantially aligned relation one above another, the inner and outer rings of each pair cooperating to define an annular channel therebetween and an annular slot above the channel thereof, the annular channel of each pair having a substantially closed lower end, the annular slot of each pair communicating with the respective annular channel thereof and having a substantially open upper end which is adjacent the upper surface of the respective outer ring thereof, each of said inner rings having a substantially radially extending bore therein which communicates with the respective channel thereof, the opposed upper and lower surfaces of adjacent inner rings defining slot-like



discharge openings therebetween which open outwardly adjacent the upper ends of the respective adjacent annular slots, gas supply means connectable to a supply of pressurized gas for supplying compressed gas to said atomizer so that it passes outwardly through said discharge openings and across the upper ends of said annular slots, and liquid supply means connecting said bores to said liquid storage area so that the passage of gas through said discharge openings and across the upper ends of said annular slots causes said liquid to be drawn upwardly through said liquid supply means into said bores, said annular channels, and said annular slots and to be atomized adjacent the upper ends of said slots.

4,732,327

INJECTION VALVE

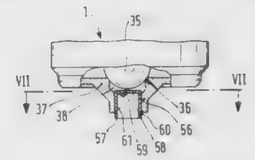
Karl Aichele, Stuttgart; Wolfgang Kramer, Strullendorf; Ernst Lang, Gerlingen; Mathias Linssen, Litzendorf; Alois Stemmer, Vaihingen, and Michael Wissmann, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 725,522, Apr. 23, 1985, which is a division of Ser. No. 438,824, Nov. 3, 1982, abandoned. This application Dec. 30, 1986, Ser. No. 947,795

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121572

Int. Cl.[4] B05B *1/34*

U.S. Cl. 239—463 **2 Claims**



1. An injection valve for fuel injection systems of internal combustion engines, comprising a nozzle body, a fixed valve seat provided on one end of said nozzle body, a movable valve element arranged to cooperate with said fixed valve seat provided on said nozzle body, said nozzle body comprises a guide bore of uniform diameter downstream of said valve seat, a cup-shaped swirl insert disposed downstream of said fixed valve seat and compressed in said guide bore, said valve seat is adjoined in a direction of fuel flow by a fuel collecting chamber (38) and said fuel collecting chamber is adjoined by said guide bore and said swirl insert, said swirl insert including a bottom (58) facing said valve seat (36), said bottom having a surface juxtaposed said valve element, a cylindrical outer wall (60) extending from said bottom in a fuel flow direction, a preparation bore (61) which opens in a direction remote from said valve seat and surrounded by said cylindrical wall, an oblique portion (63) extending from an outer surface of said bottom of said swirl insert adjacent to said valve element to an outer surface of said cylindrical wall (60) of said swirl insert, said swirl insert is provided with swirl channels (59) which originate along said oblique portion at the collection chamber (38) and are inclined downwardly relative to the longitudinal axis of the injection valve away from said wall (60) of said swirl insert into said preparation bore (61), whereby said swirl channels (59) meter an ejected quantity of fuel and discharge into the preparation bore (61).

4,732,328

INLET NOZZLE IN PARTICULAR FOR SWIMMING POOLS

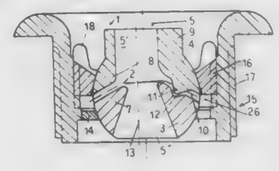
Martin T. Schydlo, Am Obersthof 25, D-4030 Ratingen 6, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 902,198

Claims priority, application Switzerland, Sep. 10, 1985, 03913/85

Int. Cl.[4] B05B *1/32, 1/30, 15/08;* **F16K** *5/10*

U.S. Cl. 239—538 **11 Claims**



1. An inlet nozzle for swimming pools or the like, comprising a generally spherical body including first and second parts, the second part being rotatable with respect to the first part about a first axis, and the first and second parts having respective first and second bores which are arranged eccentrically with respect to the first axis in such a way that upon rotation of the second part about the first axis the axis of the second bore rotates about the first axis, the spherical body being mounted in an insert member in such a way that the position of the body with respect to the insert member may be adjusted.

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IRRIGATION DRIPPER

Thomas A. Martin, P.O. Box 359, Bothas Hill, 3600, Natal, South Africa

Filed Nov. 10, 1986, Ser. No. 929,051

Claims priority, application South Africa, Jan. 24, 1986, 85/5587

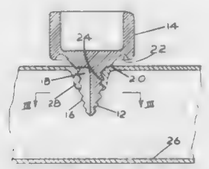
Int. Cl.[4] B05B *15/00*

U.S. Cl. 239—542 **2 Claims**

1. An irrigation drippper including a head integrally formed with a shank which is tapered from the end of the shank adjacent the head and towards the free end of the shank, the shank having helical screw threads and an open slit which extends throughout the length of the shank, and the head having a conical formation on its undersurface in which the apex of the cone has a diameter which is no less than the diameter of the

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end of the shank adjacent the head and merges with the end of the shank at the head, the base of the conical formation being



connected to a concentric depending peripheral skirt formed around the undersurface of the head.

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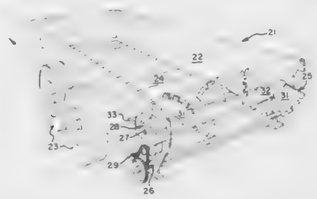
DRIVE GEARBOX AND SPREADER IMPLEMENT

Wilbur E. Groeneveld, Celina, and David M. Rieke, Galion, both of Ohio, assignors to New Idea Corporation, Coldwater, Ohio

Continuation of Ser. No. 770,148, Aug. 27, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,431

Int. Cl.[4] A01L *19/00*

U.S. Cl. 239—670 **16 Claims**



11. A gearbox assembly for a spreader implement and the like having a plurality of main drive shafts disposed generally parallel to each other, the gearbox assembly comprising:

an input shaft projecting partially within a unitary, compact housing of said gearbox means and that receives rotational power from an external mobile power source;

a direct drive assembly disposed generally parallel to said input shafts including a first gear assembly directly driving one of the main drive shafts, a first gear of said first gear assembly being secured onto said input shaft, a second gear intermeshing with said first gear and secured to said one of the main drive shafts, said first gear transmitting drive to said second gear and said one of the main drive shafts being angularly offset from said first gear assembly said first gear assembly including biased first clutch means disposed in said single gearbox housing, said first clutch means having a control rod projecting into said single gearbox housing; and

a drive train including a second gear assembly within said gearbox means housing, said drive train being disposed in said gearbox means housing generally parallel to said input shaft, said second gear assembly driving the other of said main drive shafts, said second gear assembly including a first spur gear secured onto said input shaft and in operative, driving engagement with a second spur gear secured to a driven shaft, said drive train further including a worm gear secured to said driven shaft and a worm wheel driven by said worm gear, said worm wheel being in operative interengagement with said other main drive shaft and transmitting driven from said input shaft to said other main drive shaft, said other main drive shaft being angularly offset from said direct drive assembly and said input shaft said second gear assembly further including second clutch means angularly offset from said first clutch means and operatively interengaged with said input shaft for selectively transmitting rotational movement of said input shaft to said other main drive shaft.

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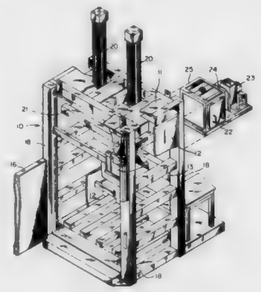
SONIC COMPACTOR

Joel Hughes, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Mar. 30, 1987, Ser. No. 31,359

Int. Cl.[4] B02C *19/18*

U.S. Cl. 241—1 **18 Claims**



1. An apparatus for disintegrating, leveling and compacting waste material within a waste container, comprising,

(a) a cabinet providing internal access through a lockable door for the reception of a waste container,

(b) a movable waste compression member within said cabinet and movable in contact with the waste material within the waste container, positioned within said cabinet,

(c) means moving said compressing member through reciprocal directions within said cabinet,

(d) a platform within said cabinet for supporting the waste container,

(e) means creating vibrational forces upon the waste within the waste container during compaction threof by said compressing member,

(f) means resiliently mounting said platform within said cabinet so as to prevent vibrational forces from being transmitted from said platform to said cabinet, and

(g) means resiliently connecting said compressing member to said moving means so as to prevent vibrational forces from being transmitted from said waste material within the container through the compressing member onto said moving means.

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PICK-UP AND DELIVERY VEHICLE

Johannes Schitemaker, Rijssen, Netherlands, assignor to Schuitemaker Machines, B.V., Netherlands

PCT No. PCT/NL85/00043, § 371 Date Jul. 1, 1986, § 102(e) Date Jul. 1, 1986, PCT Pub. No. WO86/02802, PCT Pub. Date May 22, 1986

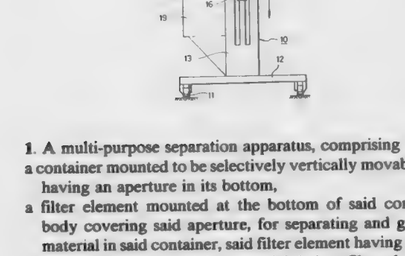
PCT Filed Oct. 31, 1985, Ser. No. 887,106

Claims priority, application Netherlands, Nov. 6, 1984, 8403377

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—32 **11 Claims**

1. In a pick-up and delivery vehicle of the type used for fodder material, and having a body at the front of which is disposed a pick-up mechanism linking up with a conveyor duct terminating in said body, into which duct there extend cooperating prongs of a pusher wheel and cutting knives, a cross-beam carrying two or more rotatable rings interconnected by a cross-bar upon which cross-bar said cutting knives are mounted for movement away from said prongs and between different positions in relation to said conveyor duct so that said



knives are accessible from above said cross-bar for maintenance or replacement.

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MULTI-PURPOSE SEPARATION APPARATUS

Koichi Aria, Kanagawa, Japan, assignor to Arai Corporation, Kanagawa, Japan

Filed Oct. 27, 1986, Ser. No. 923,283

Int. Cl.[4] B02C *18/10*

U.S. Cl. 241—46.17 **6 Claims**

1. A multi-purpose separation apparatus, comprising

a container mounted to be selectively vertically movable and having an aperture in its bottom,

a filter element mounted at the bottom of said container body covering said aperture, for separating and grading material in said container, said filter element having a filter surface through which matrerial being filtered passes through from said container,

a driving source mounted to said container,

a rotary blade device mounted in said container and connected to be driven by said driving source,

a support structure for holding said container while enabling vertical movement thereof, and

a discharge valve device coupled to said aperture for passing materials that have passed through said filter element,

said rotary blade device comprising blade means arranged to inhibit clogging of said filter means at said surface upon rotation of said rotary blade device and to mix materials in said container upon rotation of said rotary blade device.

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APPARATUS FOR CRUSHING BRITTLE MATERIAL FOR COMMINUTION

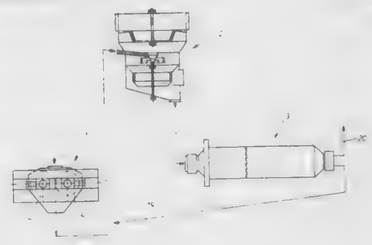
Manfred Müller, Ennigerloh, and Gerhard Gudat, Oelde, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,528

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609229

Int. Cl.[4] B02C *4/32*

U.S. Cl. 241—79.1 **10 Claims**



1. Apparatus for crushing brittle material comprising a roll crusher in which such material is subjected to individual grain crushing and material bed crushing at high pressure causing the formation of agglomerates; means for supplying said crusher with said material; a sifter downstream from said crusher; means for delivering crushed and agglomerated material from said crusher to said sifter; a rotary distributor mounted in said sifter in a position to receive material delivered thereto from said crusher; means for rotating said distributor at a speed to cause material thereon to move along a path radially outwardly of said distributor for discharge therefrom; impact means mounted in the path of movement of said material for engagement thereby to disagglomerate said material; means for establishing an airstream moving upwardly past said distributor at a velocity to entrain and carry upwardly relative fine disagglomerated material; means for receiving relatively coarse material that is incapable of being entrained in said air stream; rotary sifting means mounted above said distributor and through which said entrained material may pass; and means for rotating said sifting means independently of said distributor.

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APPARATUS FOR TREATING CELLULOSE PULP WITH INTERMESHING DISKS AND ASSYMETRICAL PULP MOVING MEANS

Erik F. Eriksson, Johanneshov, Sweden, assignor to Aktiebolaget Frotator, Johanneshov, Sweden

Continuation of Ser. No. 675,219, Nov. 27, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,967

Claims priority, application Sweden, Nov. 30, 1983, 83066166

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

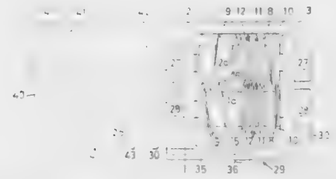
Int. Cl.[4] D21D *1/34;* **B02C** *19/00*

U.S. Cl. 241—261 **19 Claims**

1. Apparatus for treating high concentration cellulose pulp having a consistency above the flowage limit, comprising two spaced shafts rotatable in the same axial plane, each shaft carrying a plurality of radially directed axially spaced disks located in mutually cooperative positions to define respective cylinders of rotation which are in mutually intermeshing engagement and form a working zone located between opposed surfaces of said disks in said mutually cooperative positions, the thickness of said disks diminishing towards the periphery thereof, said disks being located within a housing which closely conforms to the common cylinder of rotation space of said disks, said disks being positioned between a pulp inlet at

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one longitudinal end of said shafts and a pulp outlet at the other longitudinal end of said shafts, said inlet and outlet communicates with said working zone, said disks having inlet facing surfaces and outlet facing surfaces, means for rotating said shafts, means positioned asymmetrically in relation to said opposed surfaces for causing pulp enclosed between said opposed surfaces to move in a direction towards said pulp outlet, said pulp-moving means comprising a plurality of projections on said outlet-facing surfaces increasing the friction in relation to the treated material to a greater extent than any structure on said opposed inlet-facing surfaces, a first feeding screw thread carried by one of said shafts and being adjacent said inlet and extending from said inlet to said disks carried by said one shaft, and a second feeding screw thread carried by said other of said shafts and being adjacent said inlet and extending from said inlet to said disks carried by said other shaft, said first and second threads being oriented relative to each other for urging said pulp from said inlet towards said disks.



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APPARATUS FOR TREATING CELLULOSE PULP WITH INTERMESHING DISKS AND ASYMMETRICALLY PULP MOVING MEANS

Erik F. Eriksson, Johanneshov, Sweden, assignor to Aktiebolaget Frotator, Johanneshov, Sweden

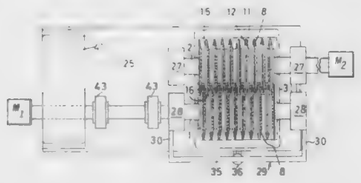
Continuation of Ser. No. 675,220, Nov. 27, 1984, Pat. No. 4,655,406. This application Jul. 7, 1986, Ser. No. 882,341

Claims priority, application Sweden, Nov. 30, 1983, 8306615

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.⁴ D21D *1/34;* **B02C** *19/00*

U.S. Cl. 241—261 **21 Claims**



1. Apparatus for treating cellulose pulp having a consistency above the flowage limit, comprising two spaced shafts rotatable in the same axial plane, each shaft carrying means for working said pulp in a working zone, said working means defining respective cylinders of rotation which are in mutually intermeshing engagement to form said working zone and which are driven with a housing enclosing in substantial conformity the space occupied by the intermeshing cylinders of rotation of said working means, a pulp inlet at one longitudinal end of said shafts and a pulp outlet at the other longitudinal end of said shafts, said inlet and outlet communicating with said working zone, said working means comprising a plurality of radially directed axially spaced disks in mutually cooperative positions between said pulp inlet and said pulp outlet for compressive and kneading working of said pulp in said working zone between opposed inlet facing surfaces and outlet facing surfaces of mutually intermeshing of said disks, the thickness of said disks diminishing towards the periphery thereof, means for rotating said shafts, and means positioned asymmetrically in relation to said opposed surfaces for causing pulp enclosed between said opposed surfaces to move in a direction towards said pulp outlet, said pulp-moving means comprising a plurality of projections of said outlet-facing surfaces increasing the friction in relation to the treated material to a greater extent than any structure on said opposed inlet-facing surfaces.

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MEAT CHOPPER BLADE HEAD

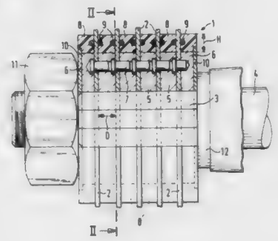
Manfred Knecht, Bergatreute, Fed. Rep. of Germany, assignor to Knecht Maschinenbau GmbH, Bergatreute, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 53,894

Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617349

Int. Cl.⁴ B02C *18/20*

U.S. Cl. 241—292.1 **4 Claims**



1. In a blade assembly for a meat cutter, which assembly includes a drive shaft having an axis a plurality of driving discs mounted on the drive shaft, a plurality of cutting blades alternating with the driving discs along the shaft to form a stack with the driving discs, and two end pieces mounted on the shaft and each disposed at a respective end of the stack, the driving discs being connected in a form locking manner with the shaft and the blades being axially clamped between the driving discs in a force transmitting manner, the improvement wherein said driving discs are entirely of a light metal and said assembly comprises: a plurality of outer rings of chemically resistant plastic material each disposed around a respective one of said driving discs and end pieces, each said ring having two axial end faces and an axial dimension, between said end faces and parallel to the shaft axis, such that said ring is substantially coextensive, parallel to the shaft axis, with the associated driving disc or end piece, and each said ring having a radial dimension, perpendicular to the shaft axis, substantially equal to the axial dimension, parallel to the shaft axis, of each said driving disc; and a plurality of sealing rings of a chemically resistant plastic elastomeric material each pressed into a respective outer ring via an associated axial end face of the respective outer ring such that each sealing ring protrudes for a distance into the respective outer ring via the associated axial end face, with each outer ring which is disposed around a respective driving disc having a respective sealing ring at each axial end face and each outer ring which is disposed around a respective end piece having a respective sealing ring at that axial end face which faces inwardly of the stack, and with said sealing rings being concentric to the axis of said shaft.

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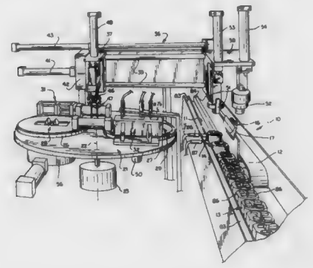
AUTOMATIC IN-SLOT COIL WINDER

Robert J. Eminger; Donald L. Van Gilder, and Vincent R. Williamson, Jr., all of Fort Wayne, Ind., assignors to Windamatic Systems, Inc., Fort Wayne, Ind.

Filed Mar. 3, 1986, Ser. No. 835,655

Int. Cl.⁴ H02K *15/02, 15/085*

U.S. Cl. 242—1.1 R **15 Claims**



1. A coil winding system comprising a conveyor means operating to deliver unwound dynamoelectric components on which coils are to be wound to a pick-up position and removing wound components from a discharge position, said conveyor means including positioning means operating to accurately position said unwound components at said pick-up position, indexing means providing at least two nests sequentially moving between a loading-unloading position and a winding position, separate loading and unloading gripper heads, said loading head operating through a cycle to grip an unwound component at said pick-up position and transferring said unwound component to said nest at said loading-unloading position, said unloading head operating through a cycle to grip a wound component at said loading-unloading position and transfer said wound component to said discharge position, a shroud gripper head operating through a cycle to position a shroud in an unwound component in said loading-unloading position and subsequently remove said shroud from a wound component at said loading-unloading position, and a coil winder operating through a cycle to wind a coil or coils on said component while said gripper heads operate to remove a wound component from said loading-unloading position and load an unwound component therein.

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APPARATUS FOR WINDING A FILAMENT ONTO A FORMER, HAVING GUIDE STRUCTURE FOR REDUCING FILAMENT BENDING

Stuart A. Bridges, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed May 23, 1986, Ser. No. 866,365

Claims priority, application United Kingdom, Jun. 6, 1985, 8514336

Int. Cl.⁴ B65H *81/02;* **H01E** *41/08*

U.S. Cl. 242—4 BE **4 Claims**

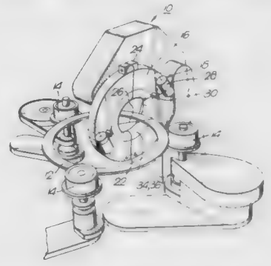
1. An apparatus for winding a filament onto a former, the apparatus comprising:

an annular carrier rotatable about a first axis of rotation;

filament supply means comprising at least one rotatable bobbin for receiving a plurality of windings of a length of the filament and being mounted on the annular carrier for rotation therewith about said first axis of rotation, said at least one bobbin being further rotatable about a second axis of rotation which is tangential to the first axis of rotation of the carrier;

translation means for moving the former relative to the carrier along a path which passes through the carrier; and

first and second filament guide members, said first guide member acting to guide the filament from said at least one bobbin to the second guide member, and said second guide member acting to guide the filament to the former, said first guide member comprising a pair of pinch rollers between which the filament passes and said second guide member comprising an annular ring having an arcuate surface over which the filament passes.



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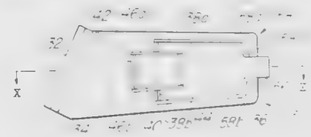
ARTICLE HOLDER

Takeshi Toya, Tokyo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1986, Ser. No. 940,881

Int. Cl.⁴ B65H *16/06*

U.S. Cl. 242—55.2 **7 Claims**



1. An apparatus comprising:

(a) a unitary member including a frame portion and a flap portion, said frame portion circumscribing said flap portion,

(b) said flap portion hingedly connected to said frame portion across split first hinged lines which extend laterally of the unitary member,

(c) an intermediate joint section intervening between the frame portion and the flap portion and having a portion extending into the frame portion and a portion extending into the flap portion, the joint section being defined by a second hinge line intervening between the frame portion and joint section, a third hinge line intervening between the flap portion and joint section, and a pair of cut lines extending between the second and third hinge lines.

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WINDING MACHINE FOR WINDING A WEB SLIT LENGTHWISE

Hans-Albrecht Ruff, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 13, 1986, Ser. No. 930,293

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541906

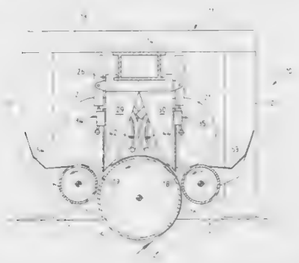
Int. Cl.⁴ B65H *19/30*

U.S. Cl. 242—56.4 **7 Claims**

7. A winding machine for simultaneously winding the strips of a web slit lengthwise into at least two wound rolls, each of said wound rolls having a first edge and a second edge, said winding machine comprising:

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a machine frame;
a middle support roller, a first outer support roller and a second outer support roller, each roller defining a longitudinal axis and mounted on the machine frame adjacent one another with their longitudinal axes parallel, each of said middle and outer rollers defining a periphery,
said middle support roller cooperating with each of said first and second outer support rollers, respectively, to define between their respective peripheries a first upper wedge space and a second upper wedge space, respectively, which have first and second winding beds therein to alternately receive said web strips;
said web strips defining a separating plane at each edge of said wound rolls;
adjustable winding frames mounted on said machine frame above said winding beds along each of said separating planes, said winding frames guiding the wound rolls at both edges thereof;



ejection apparatus for said wound rolls generally positioned above said middle support roller and including operable rocking levers in proximity to each of each wound roll, each rocking lever defining a lower end with support pressure bars at said lower ends which pressure bars are parallel to the axes of said middle, first outer and second outer support rollers,
said ejection apparatus characterized in that each of said winding frames comprises at least one rocking lever having a pressure bar with a length less than one half the width of the narrowest wound roll, said at least one rocking lever positioned on the wound roll side of each of said separating planes, each of said rocking levers mounted on said winding frame at a point just above the maximum diameter of a wound roll producible in the winding machine and said rocking lever having a curvature following the maximum circumference of the maximum diameter wound roll but at a distance therefrom.

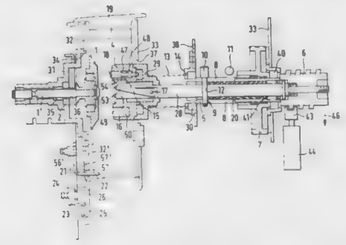
4,732,342

DRIVE ASSEMBLY FOR MICROFILM CARTRIDGES

Heinz G. Möbius, Düseldorf, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 28, 1987, Ser. No. 43,356
Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615495
Int. Cl.[4] B65H *18/08;* **G03B** *21/11, 1/04*
U.S. Cl. 242—68.1 **15 Claims**

1. In combination, a drive assembly for cartridges, particularly for microfilm cartridges adapted to be introduced into a microfilm cartridge receiving channel of a microfilm apparatus, said drive assembly comprising a drive head and a back-support wheel positioned on opposite sides of the cartridge receiving channel and aligned with each other in a direction perpendicular to the direction of introduction of the cartridge into the cartridge receiving channel, entrainment means for coupling for joint rotation and for releasing from such joint rotation said drive head and a main shaft driven by drive means, said main shaft has an end portion concentrically engaging said drive head, said entrainment means and drive head being engaged to drive a cartridge of a first predetermined type, and releasing of said entrainment means being adapted to automatically disengage said drive head from said main shaft for driving a cartridge of a second predetermined type, said drive head being resiliently biased by first energy storage means towards said cartridge receiving channel, said main shaft being resiliently biased by second energy storage means toward said cartridge receiving channel, said drive head having entrainment pins projecting from its end face and adapted to engage corresponding openings in a reel core of a cartridge of the first type when said drive head engages a receiving opening in the reel core of a cartridge of the first type, said



main shaft having in one end portion said entrainment means for engaging a slit terminating in a side wall of a receiving opening provided in a reel core of a cartridge of said second type as said end portion of said main shaft enters said receiving opening in the reel core of the second-type cartridge, said back-support wheel being secured automatically by lock means against axial displacement from the cartridge receiving channel by the introduction of a cartridge of the second type so that said back support wheel engages the opposing side of a cartridge of the second type which has been introduced in said channel, said drive assembly further comprising moving means provided to axially withdraw said main shaft and drive head from said cartridge receiving channel against the force exerted by said second and first energy storage means, respectively.

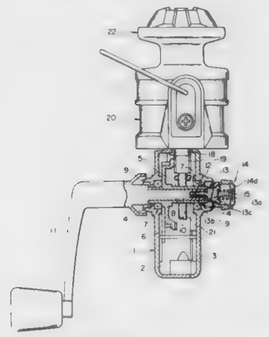
4,732,343

HANDLE ATTACHING SCREW ASSEMBLY FOR A FISHING REEL

Kenji Maruyama, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed May 28, 1987, Ser. No. 54,952
Claims priority, application Japan, May 30, 1986, 61-82890[U]
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.2 R **5 Claims**

1. A screw assembly for mounting a removable handle in a drive shaft provided in a body of a fishing reel wherein the drive shaft includes a central bore extending therethrough for receiving a handle shaft attached to the handle and wherein the handle shaft has a tapped, axial hole at one end opposite to the other end that is attached to the handle, the assembly comprising:
a rotatable screw having an enlarged head portion, a central body portion, and a threaded end portion adapted to be screwed into the threaded axial bore to retain the handle shaft in the drive shaft;
a rotatable knob having a central aperture for receiving said screw and being slidable along said screw between a fixing position wherein said knob and said screw rotate together and an operating position wherein said screw is rotatable with respect to said knob;
a spring interposed between said knob and said screw for biasing said knob to said fixing position; and
means for retaining said knob in said operating position, wherein during mounting of the handle in the drive shaft said knob is biased into said fixing position by said spring to enable rotation of said knob to rotate said screw such that said threaded end portion mates with the tapped axial



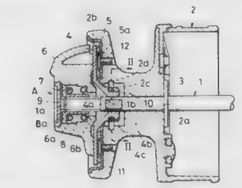
bore and during operation of the reel the knob is slid to said operating position and retained thereat by said retaining means to permit rotation of said screw relative to said knob.

4,732,344

DEVICE FOR PREVENTING THE DROPPING-OFF OF THE DRAG WASHER OF A FISHING REEL

Kenji Maruyama, and Toshiaki Yorikane, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 24, 1986, Ser. No. 878,041
Claims priority, application Japan, Jun. 28, 1985, 60-99998[U]
Int. Cl.[4] A01K *89/00*
U.S. Cl. 242—84.5 A **5 Claims**



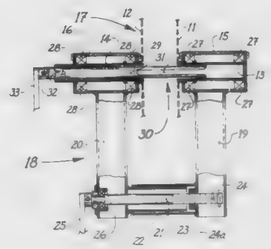
1. A drag device for a spinning reel comprising:
a spool shaft;
a spool rotatably fitted on said spool shaft, said spool having a recess formed therein;
a plurality of drag washers arranged within said recess and including an outermost drag washer removably mounted on said spool shaft, said plurality of drag washers each having a friction surface;
a drag knob removably mounted on an end of said spool shaft adjustably forcing said friction surface of said plurality of drag washers into engagement to provide a drag force therebetween;
a first groove extending along an inner peripheral surface of said recess;
a second groove annularly disposed along an outer peripheral surface of said outermost drag washer and radially aligned with said first groove; and
a flexible spring frictionally engaged with said spool along said first groove and extending within said second groove of said outermost drag washer to retain said plurality of drag washers within said recess, said flexible spring being resiliently mounted within said first and second grooves for removing said outermost drag washer by urging said outermost drag washer against said flexible spring.

4,732,345

HOSE REEL

Sammy L. Golden, 306 S. Fig, Sweeny, Tex. 77480

Filed Oct. 30, 1986, Ser. No. 925,742
Int. Cl.[4] B65H *75/38*
U.S. Cl. 242—86 **6 Claims**



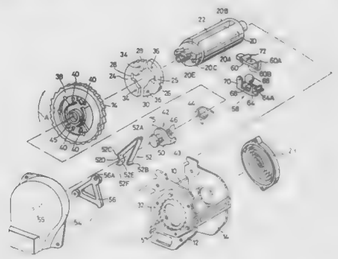
4. A hose reel comprised of
a U-shaped frame member consisting of a pair of L-shaped elements slidably matingly adjustably engagable one into the other forming the cross bar of the U-shaped member;
a pair of bearing housing members secured to the open end of the U, each housing containing friction reducing bearing members within;
a pair of sleeve members rotatably mounted within and axially supported by said bearings one in each housing;
each said sleeve having secured thereto at the end which is internal of said U, a hose guide member of a radius of about the depth of said internal dimension of said U, said guides each having an indent axially radially positioned from the axis of said member to receive ears or lugs of said coupling;
a means associated with the cross bar of said U to adjust the width of said U;
a means upon which said reel is mounted above the ground.

4,732,346

LOCK MECHANISM FOR WEBBING RETRACTOR

Keiichi Tamura, and Toshio Saitow, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jul. 9, 1986, Ser. No. 883,646
Claims priority, application Japan, Jul. 12, 1985, 60-106661[U]
Int. Cl.[4] B65H *75/48*
U.S. Cl. 242—107.4 B **18 Claims**

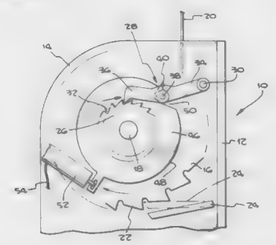


1. A lock mechanism for a webbing retractor designed to prevent an occupant restraining webbing for a vehicle from unwinding during a vehicular emergency which comprises:

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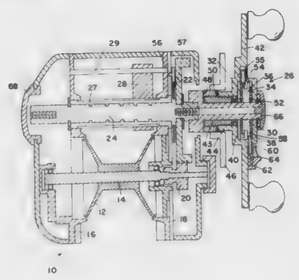
(a) a take-up shaft for winding up said webbing;
(b) a rotatable lock wheel connected to the take-up shaft by a biasing means, wherein said lock wheel rotates substantially in unison with said take-up shaft in a direction in which said webbing is unwound;
(c) a pawl lever activated by the action of an acceleration sensor to stop the rotation of said lock wheel, thereby causing the rotation of said lock wheel to be delayed with respect to the rotation of said take-up shaft;
(d) lock means for locking said take-up shaft from rotating in a direction in which said webbing is unwound when the rotation of said lock wheel is delayed with respect to the rotation of said take-up shaft;
(e) a rotary wheel secured to one end portion of said take-up shaft to rotate together with said take-up shaft; and
(f) follower means including a spring member having a substantially V-shaped portion and an extended portion defined by one end of said V-shaped portion which is bent to extend toward the other end of said V-shaped portion, and an arm means connected to the distal end of said extended portion of said spring member, said spring member frictionally engaging the take-up shaft at three discrete points to rotate therewith, said three points including one point at both sides of said V-shaped portion and said extended portion, respectively, and wherein said spring member pushes said arm means against said pawl lever in a direction to make said pawl lever inoperative when the take-up shaft rotates in a direction to wind up the webbing,
whereby, when the vehicle is running on a rough road, said webbing is prevented from being gradually wound up onto said take-up shaft.

4,732,347
EASY RELEASE TENSION RELIEVER
Nazareth Stamboulian, Los Angeles, and William Hollowell, Pacific Palisades, both of Calif., assignors to American Safety Equipment Corporation, Troy, Mich.
Filed Aug. 30, 1982, Ser. No. 412,880
Int. Cl.[4] B60R *22/44*
U.S. Cl. 242—107.6 **4 Claims**



1. In a seat belt retractor mechanism having a spring biased spool journal-mounted to a housing for holding seat belt webbing for protraction and retraction wherein the spool has a ratchet wheel connected thereto and a pawl is pivotally mounted to the housing for releasably engaging the teeth of the ratchet wheel to prohibit retraction rotation of the spool, the improvement comprising:
(a) the pawl being in two parts hingeably joined together for movement between a locked position wherein the hinged joint between said two parts is stopped in the over-the-center state, wherein said hinged joint lies below a line through a first point where said pawl is pivotally mounted to the housing and a second point where said pawl engages the teeth of the ratchet wheel, to hold the pawl rigid and a released position, wherein said hinged joint lies above said line, wherein the pawl is free to flex; and,
(b) pressure release means operably connected to the pawl for moving the pawl between said two positions.

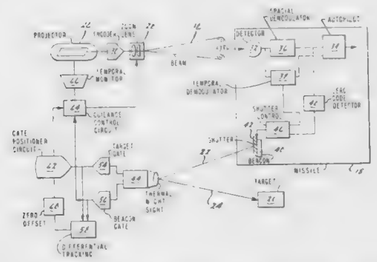
4,732,348
HANDLE ASSEMBLY WITH ADJUSTABLE DRAG FOR FISHING REEL
John N. Young, Fairfax, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.
Filed Sep. 29, 1986, Ser. No. 912,114
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—217 **5 Claims**



1. A fishing reel comprising:
a reel body;
a drive shaft rotatable on said reel body;
an input shaft;
a handle freely rotatable on one end of said input shaft;
a drag disc slidable but not rotatable on said input shaft;
ratchet teeth around said drag disc;
a first anti-reverse pawl on said handle and engageable with said drag disc ratchet teeth, normally to cause said drag disc and said handle to rotate together in a reverse, unwinding direction and to enable free forward rotation of said handle;
a second anti-reverse ratchet fixed on said drive shaft;
a second anti-reverse pawl on said body engaging said second anti-reverse ratchet to prevent reverse rotation of said drive shaft;
a drag mechanism interposed between said handle and said drag disc operative to impart forward rotation of said handle to said drag disc; and
complementary releasable coupling means on each end of said drive shaft and on the other end of said input shaft to enable rotation of said shafts together, with said input shaft and handle on either end of said drive shaft.

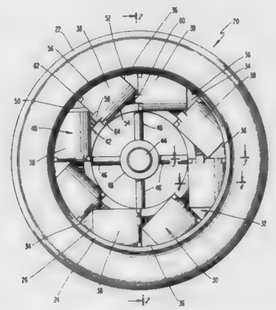
4,732,349
BEAMRIDER GUIDANCE SYSTEM
Hans A. Maurer, Tarzana, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 8, 1986, Ser. No. 916,595
Int. Cl.[4] F41G *7/24*
U.S. Cl. 244—3.13 **17 Claims**

1. A guidance apparatus for guiding a missile along a flight path to a target by a beam comprising:
means for projecting said beam, said flight path of said missile being determined by the orientation of said beam;
means for generating a signal when said missile is in a predetermined spatial relationship with respect to said beam; and



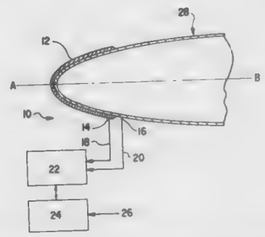
means for adjusting the orientation of said beam in response to said signal.

4,732,350
AIRCRAFT WHEEL ROTATION APPARATUS
John S. Lamont, 3-333 Broadway, Winnipeg, Manitoba, Canada (R3C 0T1)
Filed Nov. 7, 1985, Ser. No. 795,890
Int. Cl.[4] B64C *25/40*
U.S. Cl. 244—103 S **5 Claims**



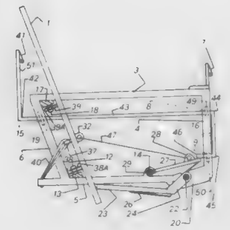
1. Apparatus for causing an aircraft wheel assembly to rotate in response to air passing by comprising:
attachment means for securing the apparatus to an aircraft wheel;
vane means for imparting rotational force on the attachment means in response to a fluid current, the vane means being carried by the attachment means and including a plurality of equiangularly disposed vanes positioned around the attachment means, being moveable between a first position and a second position, and being operable to exert a circumferentially directed force component through an angle of more than 180 degrees; and
synchronous actuation means carried by the attachment means and engaging the vane means for moving the vane means between the first position and the second position and for maintaining the vane means at any intermediate position between the first position and the second position;
wherein the synchronous actuation means includes a ring gear mounted on the attachment means so as to be circumferentially moveable; and
wherein each vane includes an arcuate gear arranged to mesh with the ring gear so that circumferential movement of the ring gear simultaneously moves each vane between the first position and the second position.

4,732,351
ANTI-ICING AND DEICING DEVICE
Larry Bird, 1715 Capital of Texas Hwy., Austin, Tex. 78746
Continuation-in-part of Ser. No. 601,070, Mar. 21, 1985, abandoned. This application Sep. 23, 1985, Ser. No. 778,878
Int. Cl.[4] B64D *15/00*
U.S. Cl. 244—134 D **10 Claims**



1. An anti/deicing analyzing apparatus comprising:
(a) an electrical power supply means;
(b) a microprocessing means connected to said electrical power supply means;
(c) a piezoelectric covering material, with an electrode grid located therein, connected to said microprocessing means; and
a conversion device to convert electrical power into the alternating voltage and wave form needed to generate the desired movement and deformation of said piezoelectric material and to receive information in the form of voltage from said piezoelectric material.

4,732,352
KITE STRING SLIDER
Jacob K. The, 323-810 W. Broadway, Vancouver, B.C., Canada (V5Z 1J8)
Filed Oct. 21, 1986, Ser. No. 921,244
Claims priority, application Canada, Oct. 24, 1985, 493794
Int. Cl.[4] B64C *31/06*; A63H *27/08*
U.S. Cl. 244—155 R **24 Claims**



1. A slider for ascending and descending the string of an airborne kite or the like, comprising: a frame; two wings pivotally connected to the frame for movement between an operative position in which they are mutually spread apart on opposite sides of the frame, and an inoperative folded position; wing-biasing means to resiliently bias the wings towards their inoperative folded position; support means for supporting a parachute or other article to be released from the slider, the support means being connected to the frame and movable between an operative article-support position and an inoperative, article-release position; and latch means operable effectively simultaneously to release the wings and support means, to permit them to move towards their inoperative positions, said latch means including an element of wire or the like con-

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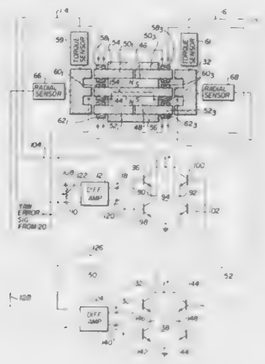
nected to the frame for displacement between a latching condition in which the wings and support means are retained in their operative positions, and an unlatching condition in which the wings and support means are released to move to their inoperative positions, the wire element being provided with a trigger member including a loop forming suspension means for slidably suspending the slider from a kite string, and being provided with a latch member, the wire element being displaceable from its latching to its unlatching condition when the suspension loop engages an obstruction associated with the string of an airborne kite, whilst slidably suspending the slider from the string, as the slider ascends the string, means being provided to resist inadvertent displacement of the wire element from its latching to its unlatching condition, said latch means further including a control lever pivotally connected to the frame and connected to the wings, the latch member, in the latching condition of the wire element, being cooperable with the control lever to latch it in a first pivoted position in which it retains the wings in their operative spread position, the latch member, in the unlatching condition of the wire element, releasing the control lever for pivotal movement permitting the wings to move to their inoperative folded condition under the influence of the wing-biasing means, the control lever, when in its first pivoted position, being cooperable with the support means to retain the latter in its operative, article-support position, and, when released, freeing the support means for movement to its inoperative, article-release position.

4,732,353

THREE AXIS ATTITUDE CONTROL SYSTEM

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 7, 1985, Ser. No. 795,805
Int. Cl.[4] B64G *1/28*
U.S. Cl. 244—165 **20 Claims**



1. An attitude control system for a body stabilized vehicle such as a spacecraft, comprising:

a motor driven flywheel centered about one of three mutually perpendicular axes and being coupled to a relatively high speed electrical motor whose rotary speed and acceleration is controlled to produce a bi-directional controllable torque about said one axis;

motor control circuit means coupled between a power source and said motor and being operable to accelerate or decelerate said flywheel to produce a reaction torque about one of said axes;

circuit means coupled to said motor for feeding power back to said power source during motor deceleration; and

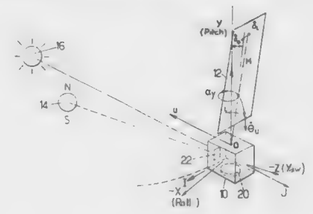
an active magnetic bearing, centered about said one axis, radially suspending said flywheel orthogonally along the other two of said three mutually perpendicular axes, said bearing further including electromagnetic circuit means for producing bi-directional controlled cross-axis torques of said flywheel about said two other axes, whereby a stabilized attitude of said vehicle in space is provided.

4,732,354

ACTIVE DAMPING OF SATELLITE NUTATION

Jérôme Lievre, Bagneux, France, assignor to MATRA, Paris, France

Filed Apr. 10, 1986, Ser. No. 850,018
Claims priority, application France, Apr. 19, 1985, 85 06013
Int. Cl.[4] B64G *1/38*
U.S. Cl. 244—170 **7 Claims**



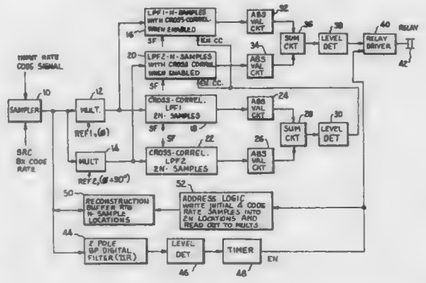
1. A process for controlling nutation of a three axis stabilized momentum biased geostationary satellite, comprising the steps of: locating at least one solar array on said satellite for rotation about a North-South axis with the center of gravity of said solar array being out of said North-South rotation axis by a predetermined amount; measuring the amplitude and phase of satellite nutation; and controlling the rotation speed of said solar array for temporarily and selectively modifying said rotation speed with respect to a constant predetermined average value with such a phase with respect to the nutation motion as to reduce the amplitude of nutation by varying the product of inertia represented by said solar array.

4,732,355

RATE CODE DECODING SYSTEM

John W. Parker, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 9, 1986, Ser. No. 817,309
Int. Cl.[4] B60L *15/06*; H01H *47/20*
U.S. Cl. 246—34 R **6 Claims**



4. A phase insensitive filter system for input signals within a certain frequency band which comprises means for obtaining separate correlation outputs of said input signals with reference signals of like frequency which are in quadrature phase relationship with each other and with a step function, means for summing the correlation outputs to provide an output representing said input signal when it is within said frequency band regardless of phase shift therein, means operable upon said correlation outputs to provide the absolute values thereof, and said summing means being operable to sum the absolute values of said correlation outputs to provide said filter output signal.

4,732,356

OUTLET BOX BRACKET WITH ADJUSTABLE STABILIZER

Lewis B. Medlin, Sr., P.O. Box 237, Blue Ridge, Va. 24064

Filed Oct. 23, 1986, Ser. No. 922,894
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.1 **9 Claims**



1. An outlet box mounting assembly comprising:

(a) a mounting bracket formed from a unitary section of stiff sheet material including:

(i) a flat plate body portion having at least one relatively large central opening of a size and shape to register substantially with the interior chamber of an outlet box and end portions on opposite ends of said body portion forming extensions thereof, said flat plate body portion and end portions residing in offset substantially parallel planes separated by at least one defined offset formed in said bracket between said body portion and an end portion;

(ii) at least a pair of screw shank receiving slots formed through said flat plate body portion and disposed on a diagonal axis across said relatively large central opening; and

(iii) at least one right angular stabilizing rectangular plate extension disposed on one side of one of said end portions and extending outwardly therefrom, said plate extension terminating with at least one section of reduced width forming at least one leg portion having an outermost edge adapted to engage an opposing wall surface during use and being bendable without breaking to reside in a plane substantially parallel to said flat plate body portion and spaced a selected distance therefrom enabling the size of said plate extension to be reduced.

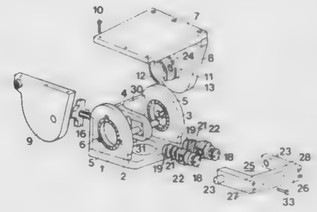
4,732,357

LIGHTWEIGHT TILT MOUNTING HEADS

Richard A. Lindsay, Eye, England, assignor to W. Vinten Limited, England

Filed Apr. 14, 1986, Ser. No. 851,492
Claims priority, application United Kingdom, Apr. 1, 1986, 8607991
Int. Cl.[4] F16M *11/10*
U.S. Cl. 248—185 **3 Claims**

1. A tiltable mounting comprising a base, a tiltable support member pivoted thereto and reactionary moment producing means, located between and operated from said base and tiltable support member for producing a reaction equal to the out of balance moment generated by the weight of an article mounted on said tiltable support member as the center of gravity of the article moves about the vertical, said reactionary moment producing means comprising mounting means on said base for pivotably locating a slide means, mounting means on said tiltable support member for crankedly locating a pivotable spring guide means having a spring compression means thereon, and a spring located on said spring guide means compressible between said slide means and said spring compression means wherein the reactionary moment at the tiltable support member produced by the action of the pivotable slide means and spring combined is equal to the out of balance moments



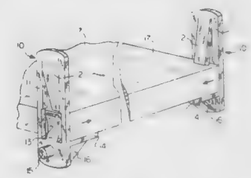
produced as the center of gravity of an article mounted on said tiltable support member rotates about the vertical.

4,732,358

SHELF BRACKET

Robert T. Hughes, Thomasville, and Timothy K. Crooks, Winston-Salem, both of N.C., assignors to Hughes Supply Co. of Thomasville, Inc., Thomasville, N.C.

Continuation of Ser. No. 832,019, Feb. 24, 1986, abandoned. This application Jul. 22, 1987, Ser. No. 76,532
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—243 **8 Claims**



8. A shelf bracket comprising: a substantially planar body portion, said body portion defining an opening therein, vertical shelf retaining means, said vertical retaining means integrally formed and joined to said body portion along the inside top of said opening and extending across said opening, horizontal supporting means, said horizontal support means integrally formed and attached to said body portion below said opening, lateral shelf retaining means, hinge means integrally joining said lateral retaining means to said body portion along the inside bottom of said opening, wherein said lateral retaining means extends across said opening, said vertical and said lateral retaining means spaced from each other, a brace, said brace mounted below said horizontal support means and joined thereto and to said body portion.

4,732,359

SEAT SUPPORT FOR A PUBLIC TRANSPORT VEHICLE AND SEAT EQUIPPED WITH THIS SUPPORT

Jean L. Danton, Boulogne, France, assignor to Societe Anonyme dite Etablissements Compin, Paris, France

Filed Sep. 29, 1986, Ser. No. 913,114
Claims priority, application France, Oct. 1, 1985, 85 14526
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—629 **14 Claims**

1. A seat support for a public transport vehicle, intended to be mounted overhung on a side wall of this vehicle, wherein the seat support comprises a framework and, as seen in section through a vertical plane perpendicular to the said wall, the framework of this support has a generally C-shaped cross section, including

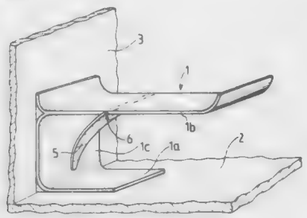
an upper branch to serve as a base for a seat,

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a lower branch to rest on the floor of the vehicle and to be fixed to the latter, and

a vertical part joining the upper and lower branches together, and being designed to bear against the side wall of the vehicle and to be fixed to the latter;

each of the upper and lower branches having a generally flat planar shape, the upper and lower branches being parallel to each other;



the framework being adapted to be positioned adjacent the side wall of the vehicle, with the vertical part of the framework extending along said side wall, and with the upper and lower branches longitudinally extending away from the sidewalk of the vehicle and transversely extending in a direction parallel to said side wall; and

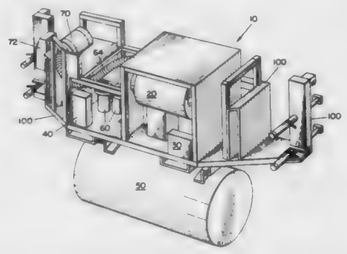
the upper branch having a first, generally uniform transversely extending width, the lower branch having a second, generally uniform transversely extending width, and said second width being at least as great as said first width.

4,732,360

COMBINATION UNDERSLUNG AND FRONT WALL MOUNTED ELECTRIC GENERATOR UNIT HOUSING FOR USE WITH REFRIGERATED FREIGHT CONTAINERS

Bert A. Bodenheimer, Stamford, Conn., assignor to B. A. Bodenheimer & Co., Inc., Stamford, Conn.

Filed Feb. 4, 1987, Ser. No. 11,297
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—645 **21 Claims**



1. A housing for an electric generator unit for a container, wherein said housing is subject to both vertical and horizontal forces when hung from said container, said housing comprising:

(a) a substantially rigid frame;

(b) mounting means supported by said substantially rigid frame for mounting said housing on said container so as to substantially remove both horizontal and vertical forces from said housing; and

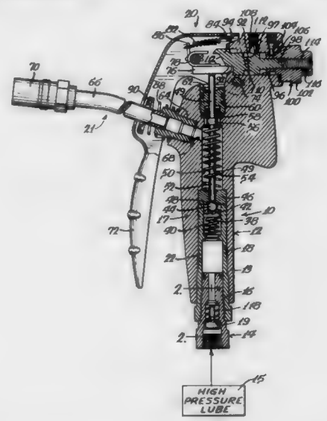
(c) retractable means supported by said substantially rigid frame for mounting said housing on a chassis which supports said container, said retractable means being extended when said housing is mounted on said chassis, and said retractable means being retracted when said housing is mounted on said container.

4,732,361

HIGH PRESSURE LUBRICANT CONTROL VALVE WITH SELF-CLEANING RESTRICTOR

Myron J. Johnson, Arlington Heights, and Mark C. C. Kao, Elmhurst, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 424,085
Int. Cl.[4] F16K *21/00*
U.S. Cl. 251—120 **17 Claims**



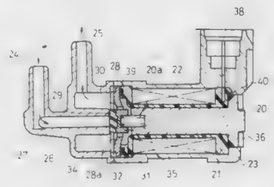
1. A high pressure lubricant control valve, comprising; a valve body having an inlet, an outlet extension with a coupler at the end thereof adapted to releasably fit against a lubrication fitting on the part to be lubricated, a fluid passage extending through and between the inlet, the valve body and the extension, a control valve in the valve body controlling fluid flow between the inlet and the outlet extension, and restrictor means including a restrictor in the fluid passage for reducing the outlet flow from the extension coupler under no load conditions when the coupler is not fitted against a lubrication fitting, said restrictor means including means for periodically and automatically passing foreign material around the restrictor.

4,732,362

SOLENOID VALVE ASSEBLY

Hiroaki Morioka, Okazaki, and Mamoru Nakamura, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Nov. 13, 1986, Ser. No. 929,883
Claims priority, application Japan, Nov. 13, 1985, 60-254215
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.17 **12 Claims**



1. A solenoid valve assembly including a casing, a core of magnetizable material secured to the casing, an electrical coil

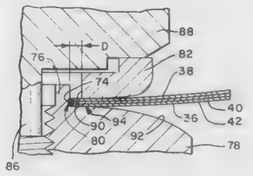
for passing a magnetic flux through the core, flexible support means in the form of a circular diaphragm having an outer periphery secured to the casing, a valve element supported by the flexible support means and disposed in opposing relationship with an end of the core for movement toward and away from the core and a rigid guide member disposed adjacent said diaphragm having a guide surface formed thereon including a region disposed for engagement by the flexible support means to shift the fulcrum of the flexible support means in accordance with the displacement of the valve element toward the core.

4,732,363

DIAPHRAGM VALVE

Terrence J. Kolenc, Mentor, and Gary W. Scheffel, Streetsboro, both of Ohio, assignors to Nupro Company, Willoughby, Ohio

Continuation of Ser. No. 863,714, May 16, 1986, Pat. No. 4,671,490. This application Jan. 8, 1987, Ser. No. 1,360
Int. Cl.[4] F16K *31/50*
U.S. Cl. 251—335.2 **6 Claims**



1. A fluid control device comprising:

a body defining a generally cylindrical chamber which opens to the exterior of said body;

an operating stem extending axially into said chamber from the exterior of said body;

a diaphragm comprising a plurality of generally annular shaped thin metal disk members positioned in juxtaposed relationship to extend across said chamber with said stem member extending outwardly therethrough;

a first circumferentially continuous weld joining outer peripheral portions of said disk members to each other and to said body;

a second circumferentially continuous weld joining inner peripheral portions of said disk members to each other and to said stem; and,

first and second radially spaced clamp means respectively clamping said diaphragm to said body and to said stem at locations radially between said first and second welds.

4,732,364

WEAR RESISTANT DIAMOND CLADDING

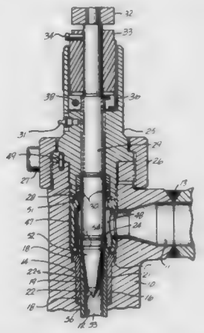
Fritz O. Seger, Mission Viejo, Calif., and David R. Hall, Provo, Utah, assignors to Ameron Iron Works USA, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 682,757, Dec. 17, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 797,601
Int. Cl.[4] F16K *47/00;* **E21B** *10/00*
U.S. Cl. 251—368 **30 Claims**

1. A wear resistant article comprising:

a rigid substrate; and

a plurality of separate tiles in sufficiently close side by side relation for forming an approximately continuous layer secured to at least one surface of the substrate, each of the tiles comprising at least a surface layer of polycrystalline material selected from the group consisting of diamond and cubic boron nitride, the surface layers of adjacent tiles being parallel to the surface of the substrate to which they are secured to form an approximately continuous wear resistant surface on the article and the side edges of adjacent tiles being sufficiently close to each other to prevent significant erosion of the substrate between the tiles.

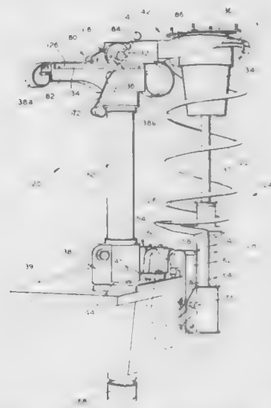


4,732,365

BENCH MOUNTED SPRING COMPRESSOR

Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Filed Jan. 23, 1987, Ser. No. 6,146
Int. Cl.[4] B23P *19/04*
U.S. Cl. 254—10.5 **10 Claims**



1. An apparatus for supporting and compressing a coil spring of a vehicle suspension strut assembly of the type including a coil spring having an upper end retained by an upper spring platform and having a lower end supported by a lower spring platform mounted on a shock absorber unit surrounded by the spring, with the shock absorber unit provided with at least one lower mounting flange for securing the strut assembly to a vehicle frame member, said apparatus comprising:

a fixed support;

adapter means for secure attachment to the lower mounting flange of the shock absorber unit for securely supporting the shock absorber unit relative to said fixed support said adapter means including means for rotating the shock absorber unit about an axis generally perpendicular to the longitudinal axis of the shock absorber unit;

upper force applying means for applying a force to an upper portion of the spring;

means for mounting said upper force applying means for movement along a second axis generally perpendicular to

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a first axis, the first axis being in a direction to compress the coil spring toward the lower platform;

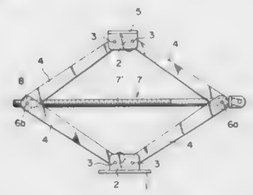
means coupled to said fixed support and said upper force applying means for moving said upper force applying means in a direction to compress the coil spring against the lower spring platform.

4,732,366

ARM UNIT FOR USE IN PANTOGRAPH TYPE JACK

Hiroko Saga, Kawagoe, Japan, assignor to Riken Kaki Kogyo Co., Ltd., Saitama, Japan

Filed Nov. 25, 1986, Ser. No. 934,962
Int. Cl.[4] B66F *3/12*
U.S. Cl. 254—126 3 Claims



1. An arm unit for use in a pantograph type jack having a rhombic link structure constituted by pivoting the upper and lower ends of respective right and left paired swingeable links to a pair of shaft holes that are formed while being spaced apart by a predetermined distance from each other to a pair of upper and lower shaft bearing members respectively, in which each of said right and left paired swingable links comprises upper and lower support arms pivoted respectively to each other at their opposed ends, wherein the end of each arm is formed with a mounting hole aligned with the shaft hole of the bearing member and is shaped into a U-cross sectioned frame opening toward the inside of said rhombic link thereby providing side plates, a main driving cam that has an effective cam face constituted by an arc of a circle with a radius r and having a center thereof at a point P situated above an axial line x in parallel with the bottom side of said arm passing through the center of the mounting hole is formed on top of one of the side plates of the U-cross sectioned frame, with the effective cam face being protruded forwardly and upwardly from the mounting hole and a driven cam is formed on the other side plate which driven cam has an effective cam face of a shape constituted by a curve that defines a region inside of a plurality of continuously moving traces of the arc-shaped cam face of said main driving cam plate from a region outside thereof when the pair of opposed arms attached to a pair of the shaft holes in said shaft bearing member are rotated at an equal angular velocity in the opposing directions.

4,732,367

INSTALLATION FOR THE CONTINUOUS HEAT TREATMENT OF WIRE ROD

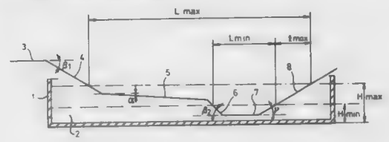
Paul Bercy, La Louviere, Belgium, assignor to Usines Gustave Boel Societe Anonyme, La Louviere, Belgium

Filed Jan. 21, 1987, Ser. No. 5,804
Claims priority, application Belgium, Jan. 21, 1986, 6/48182
Int. Cl.[4] C21D *1/62*
U.S. Cl. 266—102 17 Claims

1. An apparatus for the continuous heat treatment of wire rod including a tank containing a water bath maintained at a temperature of at least 75° C. and means for varying the level of the water bath in said tank between a maximum upper level and a lower level comprising:

at least one inlet conveyor for conveying wire rod into the water bath having an emergent part above said water bath and a part which is immersed in said water bath;

a plurality of steps on said inlet conveyor so that said inlet conveyor is stepped at least inside said tank and the steps inside said tank are lower than the maximum upper level of said water bath; and



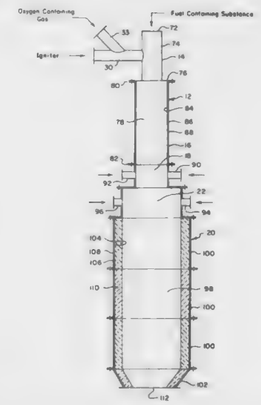
at least one outlet conveyor for conveying wire rod out of the water bath having a part which is immersed in said water bath and an emergent part above said water bath.

4,732,368

APPARATUS FOR THE PYROMETALLURGICAL TREATMENT OF FINELY DIVIDED MATERIALS

John F. Pusateri, Beaver, Pa., and Thomas E. Kidd, Tullahoma, Tenn., assignors to St. Joe Minerals Corporation, Monaca, Pa.

Division of Ser. No. 799,538, Nov. 19, 1985. This application Nov. 12, 1986, Ser. No. 929,957
Int. Cl.[4] C22B *1/10*; C21B *7/00*
U.S. Cl. 266—172 6 Claims



1. Reactor apparatus for use in the pyrometallurgical treatment of finely divided material, said apparatus comprising:

a vertically-extending cylindrical structure having first and second stages in series, said first stage having a turbulent mixing section feeding a dump section, the output from said dump section feeding said second stage, with the latter having an output for treated material, said first and second stages being dimensioned to create dump flow therebetween;

means coupled to said first stage for introducing therein a fuel-containing substance and an oxidizing gas to produce substantially within said first stage a hot fuel-rich reaction mixture for treating said material; and

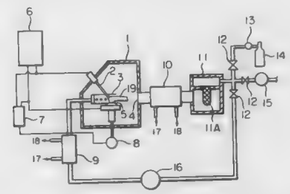
means for introducing said material to be treated into said second stage for reaction with said hot fuel-rich reaction mixture to yield treated material that exits from the output of said second stage.

4,732,369

ARC APPARATUS FOR PRODUCING ULTRAFINE PARTICLES

Takeshi Araya, Higashikurume; Yoshiro Ibaraki, Ibaraki; Yoshishige Endo, Ibaraki; Susumu Hioki, Kashiwa, and Masatoshi Kanamaru, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,600
Claims priority, application Japan, Oct. 30, 1985, 60-241408; Oct. 30, 1985, 60-241409; Mar. 10, 1986, 61-50393; Mar. 10, 1986, 61-50394; Mar. 10, 1986, 61-50395
Int. Cl.[4] B22F *9/14*
U.S. Cl. 266—207 14 Claims



1. An apparatus for producing ultrafine particles of metals, alloys or ceramics by using arc energy comprising a generating chamber for generating ultrafine particles of metals, alloys or ceramics, an electrode positioned opposite to a base material for producing ultrafine particles so as to generate an electric arc, a suction opening for sucking the ultrafine particles generated in the generating chamber, a trap for collecting the ultrafine particles sucked from the suction opening, and a cooler positioned between the suction opening and the trap for cooling the sucked ultrafine particles, characterized in that

the electrode is disposed inclinedly as to the base material so as to produce magnetic blow to the arc,

the suction opening is positioned at the direction of the arc blown, and

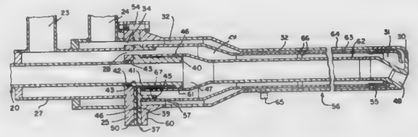
a cooling-gas feeder is positioned near the arc.

4,732,370

SELF CONTAINED DOUBLE O'RING SLIP JOINT AND QUICK DISCONNECT LANCE

William W. Berry, 8092 Regency Dr., Pittsburgh, Pa. 15237, and Nicholas M. Rymarchyk, P.O. Box 284, Zelienople, Pa. 16063

Filed Jul. 17, 1986, Ser. No. 886,398
Int. Cl.[4] C21C *5/32*
U.S. Cl. 266—270 26 Claims



1. A steelmaking lance assembly comprising a top support member having an upper connector plate including an upper oxygen pipe, an upper inlet water pipe, and an upper outlet water pipe disposed in concentric relation,

an intermediate member including a top intermediate plate being connected with the top support member and having an upper surface and a lower surface, said upper surface engaging the upper connector plate;

a lower support member having a lower connector plate including a lower oxygen pipe, a lower inlet water pipe, and a lower outlet water pipe;

a lance connected with said lower connector plate and providing communication between said lower inlet water pipe and said lower outlet water pipe, said lance including a nozzle having an oxygen outlet in communication with said lower oxygen pipe,

said intermediate plate having a central opening communicating with said upper and lower oxygen pipes, a water inlet passage communicating with said upper and lower inlet water upper and lower outlet water pipes;

said intermediate member having first and second first recesses therein spaced from each other; and

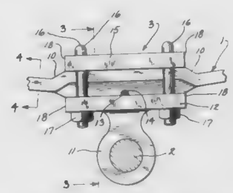
first and second seal members each supported in a respective recess and engaging the lower connector plate for sealing the engagement of the intermediate plate with the lower connector plate by providing a double seal structure usable with a replacement lower support member without being transferred between parts of the lance assembly when the lower support member is replaced.

4,732,371

AXLE MOUNT CONSTRUCTION FOR A FIBER REINFORCED RESIN LEAF SPRING

Fred R. Pflederer, Milwaukee, Wis., assignor to A. D. Smith Corporation, Milwaukee, Wis.

Continuation of Ser. No. 771,835, Sep. 3, 1985, abandoned. This application Jul. 17, 1987, Ser. No. 75,233
Int. Cl.[4] B60G *11/02*; F16F *1/36*
U.S. Cl. 267—52 8 Claims



8. A mounting construction for a fiber reinforced resin leaf spring, comprising a leaf spring composed of a fiber reinforced thermosetting resin and having a mounting section disposed to be secured to a vehicle and having a pair of ends spaced from said mounting section, said mounting section having alternate longitudinally extending ridges and grooves to provide increased section stiffness for said mounting section, the outer extremities of said ridges defining lands, and clamping means engaged with said lands for clamping the spring to said vehicle, said ridges and grooves terminating substantially immediately adjacent opposite sides of said clamping means and portions of said spring extending longitudinally outward from the respective sides of said clamping means to the respective ends being generally rectangular in cross section, said spring having a substantially uniform cross sectional area throughout its length including said mounting section.

4,732,372

DAMPERS FOR MECHANICAL RAILWAY SPRINGS

William W. Dickhart, III, Fort Washington, and James M. Herring, Jr., Merion Station, both of Pa., assignors to Budd Company, Troy, Mich.

Continuation of Ser. No. 642,004, Aug. 20, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 885,505
Int. Cl.[4] F16F *1/12*
U.S. Cl. 267—204 2 Claims

1. In combination with a railway car body and a truck.

(a) a first inner vertically disposed mechanical coil spring connected between said car body and said truck;

(b) a second outer vertically disposed mechanical coil spring spaced from and surrounding said first spring connected between said car body and said truck;

(c) a pair of integral cap members composed of damping material;

(d) each of said cap members including a flat circular base

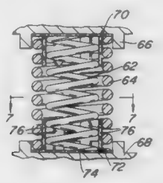
VOL 1088 ISS 4 MR 22 1988 UMI

portion having a plurality of projecting sections extending therefrom;

(e) said projecting sections including interconnecting convoluted portions spaced from said base portion;

(f) said projecting sections of said cap members being vertically disposed and dimensioned to fit into the space between said first and second springs at opposite ends thereof with said convoluted interconnecting portions being vertically disposed and physically engaging coil windings at one of the ends of said first and second springs at areas between said projecting sections, and

(g) said projecting sections being circumferentially spaced and parallel to each other.



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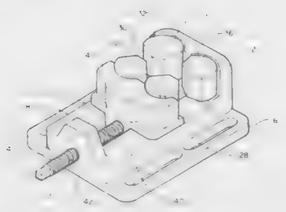
SERVO-CLAMPING DEVICE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation-in-part of Ser. No. 564,319, Dec. 22, 1983, Pat. No. 4,632,375. This application Jun. 12, 1985, Ser. No. 743,981

Int. Cl.[4] B25B *1/24*

U.S. Cl. 269—241 **5 Claims**



1. A clamping apparatus, comprising:

a pair of vise jaws supported on a common base, at least one of said vise jaws being movable and at least one of which being fixed, each of the vise jaws having a pair of concave recesses formed therein laterally of each other,

a clamping member in each of the recesses and having a convex surface substantially complementary to the respective concave recesses, the concave recesses and convex surfaces being formed about a vertical axis, wherein, in a cross-sectional plane substantially at right angles to the respective axes, each axis forms the center of a circle substantially defining the respective concave recesses and convex surfaces,

means for supporting each clamping member for pivotable movement about its respective vertical axis, and each of the clamping members having a plurality of substantially-flat chordal faces intersecting one another and disposed oppositely of the convex surface on the respective clamping member, the chordal faces on one pair of clamping members on a respective vise jaw confronting the chordal faces on the other pair of clamping members on the other respective vise jaw, thereby engaging and securely retaining a workpiece between the respective vise jaws,

threaded rod means for moving said vise jaws towards and away from one another, said threaded rod means having a first portion threaded in a first direction and a second portion threaded in a second direction,

internally threaded nut means threaded in a first direction, said nut means receiving said first portion of said threaded rod means,

either said movable jaw or said fixed jaw having internal threads threaded in a second direction for receiving said second portion of said threaded rod means and for advancing said threaded rod means through said jaw,

resilient friction ring means in frictional contact with said internally threaded nut means, said friction ring means for permitting said first portion of said threaded rod means to rotate within and advance through said internally threaded nut means when said movable jaw advances toward said fixed jaw prior to contacting the workpiece, and said friction ring means for permitting said first portion of said threaded rod means to cause said nut means to rotate with said threaded rod means when said movable jaw is in contact with the workpiece.

4,732,374

APPARATUS FOR COLLATING FOLDED PRINTED PRODUCTS, ESPECIALLY SIGNATURES OR SHEETS

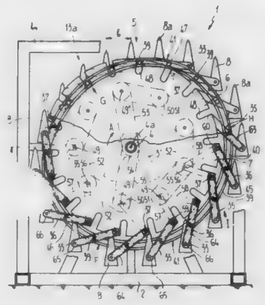
Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jul. 25, 1986, Ser. No. 889,221

Claims priority, application Switzerland, Jul. 31, 1985, 3311/85

Int. Cl.[4] B65H *5/30*

U.S. Cl. 270—55 **26 Claims**



1. An apparatus for collating folded printed products, especially signatures, comprising:

a plurality of movable collating conveyors for conveying the folded printed products in straddling relationship along respective substantially straight conveyor paths defined by said plurality of movable collating conveyors;

each of said movable collating conveyors having a predetermined direction of extent and being movable in said predetermined direction of extent for collating infed folded printed products;

each movable collating conveyor of said plurality of movable collating conveyors extending in spaced substantially parallel relationship to a common axis of revolution;

drive means for driving said plurality of movable collating conveyors in revolution about said common axis of revolution;

each said movable collating conveyor being spaced from each adjacent collating conveyor of said plurality of movable collating conveyors by a controllable separation distance; and

control means for altering said controllable separation distance between said adjacent movable collating conveyors during revolution of said plurality of movable collating conveyors about said common axis of revolution.

4,732,375

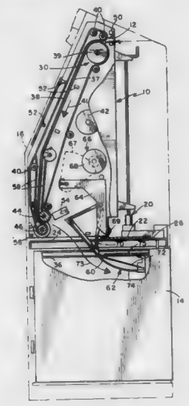
APPARATUS FOR HANDLING STRIP-LIKE MEDIA

Cyril F. Tetherton, Poway, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Jul. 24, 1986, Ser. No. 889,675

Int. Cl.[4] B65H *29/70*

U.S. Cl. 271—176 **18 Claims**



1. A handling apparatus for transferring strip like elements into a storage area for stacking one on top of the other, comprising:

first guide means for guiding the central longitudinal area of a strip-like element in a first curved path;

drive means for driving the central area of the element along the first curved path;

second guide means opposing the first guide means for guiding the outer area of the element on opposite sides of the central area to follow curved paths different from the first path and for deforming the outer areas of the element out of the plane of the central area;

the first and second guide means defining an exit opening through which the element is released;

storage means having an entry opening for receiving strip-like elements from the exit opening of the first and second guide means;

a guide member moveable between a first position extending from the entry opening of the storage means towards the guide means exit opening for guiding elements from the exit opening into the storage area in a generally downwardly inclined path and a second position within the storage area to urge elements into a stacked condition within the storage area.

4,732,376

BLANK CONVEYING APPARATUS

Fumiaki Umezawa, Kanagawa, Japan, assignor to Aida Engineering Limited, Sagamihara, Japan

Filed Feb. 6, 1987, Ser. No. 11,631

Claims priority, application Japan, Apr. 30, 1986, 61-101789

Int. Cl.[4] B65H *5/04*

U.S. Cl. 271—267 **8 Claims**

1. A blank conveying apparatus comprising:

a frame;

a movable member supported by said frame and provided in a manner to be freely reciprocated with a predetermined pitch of a conveying stroke in a direction parallel to the direction of conveying said blank;

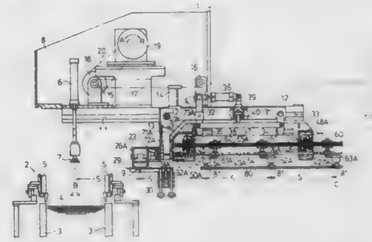
a vertically movable member which is supported by said movable member in a manner to be movable in the vertical direction;

driving means for reciprocating said movable member;

a plurality of screw shafts provided on said vertically movable member in parallel to one another in a direction of moving of said movable member;

a plurality of attracter holding members threadably coupled to said screw shafts at every pitches of the conveying stroke and each having an attracter;

a plurality of guide shafts disposed in parallel to said screw shafts, for supporting said plurality of attracter holding members in a manner to be movable in the axial direction of said screw shafts and unrotatable;



widthwise adjusting means for moving said guide shafts and said screw shafts, which are opposed to each other, respectively, in parallel to a plane of conveying said blank and in a direction perpendicular to the axial lines of said guide shafts and said screw shafts, independently of other guide shafts and screw shafts; and

equalizer means for synchronizing the movements of opposite ends of said guide shafts.

4,732,377

DEVICE FOR CONTROLLING GUIDING TONGUES OF A PRODUCT DIVERTER

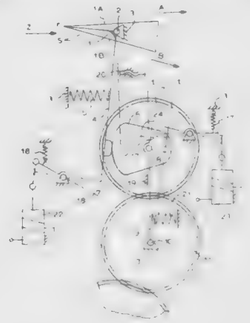
Horst Fenske, Leipzig, and Rudolf Störr, Karl-Marx-Stadt, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,381

Claims priority, application German Democratic Rep., Mar. 10, 1986, 287715

Int. Cl.[4] B65H *29/58*

U.S. Cl. 271—303 **5 Claims**



1. A device for diverting a stream of sheet-shaped products supplied in a feeding direction at a rate synchronized with the cycles of a sheet product processing machine into different directions according to a selected mode of operation, comprising a guiding tongue pivotably supported on a machine frame to engage and guide the incoming sheet-shaped products; a cam disk driven for rotation in synchronism with the machine cycles; a cam follower lever connected to said guiding tongue

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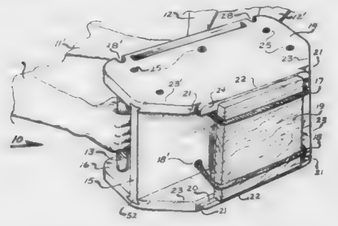
and being biased by a first pressure spring to engage said cam disk and to pivot the guiding tongue into different diverting positions; a rocking arm pivotably supported at one end thereof on the machine frame and supporting for rotation said cam disk; and control means for tilting said rocking arm together with the driven cam disk to different fixed angular positions.

4,732,378

PORTABLE KARATE BREAKING-BOARD HOLDER

Arthur G. LeFebvre, 1100 Industrial Blvd. L-5, Chula Vista, Calif. 92011, and Michael R. Lamb, 6367 Cleo St., San Diego, Calif. 92104

Filed Sep. 8, 1986, Ser. No. 904,893
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 9 Claims



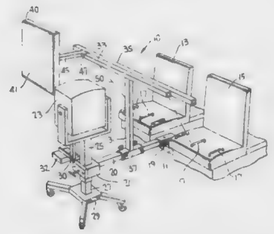
1. A portable karate breaking-board holder, comprising:
an elongated I-shaped frame having an elongated top plate, an elongated bottom plate spaced beneath said top plate and an elongated fence plate perpendicularly disposed between and attached to both the top and bottom plates, said fence plate defining distal and proximal recesses between the top and bottom plates;
breaking-board seating means disposed along the distal edges of said top and bottom plates for seating at least one breaking-board in a plane at an angle to a plane perpendicular to one of the top and bottom plates;
breaking board attaching means coupled to said I-shaped frame for securing at least one breaking-board to said distal edges of said top and bottom plates; and
handle means coupled to said I-shaped frame within said proximal recess for holding said frame.

4,732,379

TRUCK, STABILIZATION DEVICE FOR EXERCISING/TESTING HIP ABDUCTION, ADDUCTION, FLEXION AND EXTENSION

Peggy Bodine-Reese, and John W. Reese, both of 8 Brighton Ct., Gaithersburg, Md. 20877

Filed Feb. 14, 1986, Ser. No. 829,192
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—125 20 Claims



1. Apparatus for stabilizing the trunk of a standing user/subject while permitting exercise and testing of the user's hip abduction, adduction, flexion and extension by means of a machine for exercising/testing muscles and joints, said machine being of the type which includes a support frame, a torque transducer having an actuator and means for controllably resisting torque applied to the transducer via the actuator about a horizontally-extending torque axis, and transducer stabilizing means for positionally stabilizing the torque transducer relative to said support frame, said torque transducer including height adjustment means permitting selective raising and lowering of the torque axis, said apparatus comprising:
trunk stabilization means having a trunk supporting surface against which the front and back of the trunk of the user are to be alternatively braced when the apparatus is in use;
adaptor means for mounting said trunk stabilization means in first and second mutually perpendicular orientations of said trunk supporting surface; and
connector means for positionally securing said adaptor means to the torque transducer such that the trunk supporting surface is substantially vertical in both first and second orientations, said trunk supporting surface in said first orientation being substantially parallel to said torque axis and disposed such that, with the user's trunk braced against the trunk supporting surface, the user's hip joint is coaxially alignable with said torque axis by adjustment of the height of said torque axis, and the user's thigh is positioned in proximity to the actuator to permit application of torque to the torque transducer by flexion and extension of the user's hip; said trunk supporting surface in said second orientation being substantially perpendicular to said torque axis and disposed such that, with the user's trunk braced against said trunk supporting surface, the user's hip joint is perpendicularly alignable with said torque axis by adjusting the height of said torque axis, and the user's thigh is positioned in proximity to the actuator to permit application of torque to the torque transducer by abduction and adduction of the user's hip.

4,732,380

THIGH HOLDDOWN CLAMP

Henry Maag, 15722 Taft La., Apt. 4, Huntington Beach, Calif. 92649

Filed Feb. 7, 1986, Ser. No. 827,248
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—132 1 Claim



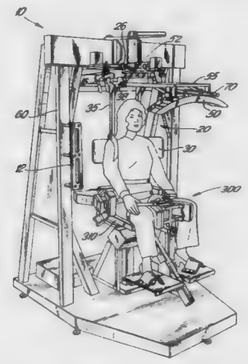
1. On a leg exercising machine which utilizes a pivotally mounted rotating effort arm to apply resistive force to an operator's legs while performing leg extensions or leg curls, and a thigh holddown bar which keeps the operator's thighs secured to the exercise machine during exercises, the improvement comprising:
said thigh holddown bar being pivotally attached to said exercise machine so as to pivot about the same axis as said rotating effort arm;
a pawl pivotally attached to said machine to engage and secure said thigh holddown bar at different angular positions about said axis;
an elongated handle attached to said pawl which the user of said machine can position to engage or release the pawl from said thigh holddown bar.

4,732,381

UPPER BODY ROTATION ASSEMBLY FOR A BACK TEST, REHABILITATION AND EXERCISE MACHIN

Richard E. Skowronski, West Sayville, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,716
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—134 17 Claims



1. An upper body rotation assembly for a back test, rehabilitation and exercise machine designed for the isolated testing, rehabilitation and exercise of the lower back musculature of a person comprising:
a front support structure having a top end attached to a top support structure of the frame of the machine;
a rear support structure having a top end attached to the top support structure of the frame of the machine;
a chest pad bearing against the chest of the person, said chest pad attached to a bottom end of the front support structure;
a scapula pad bearing against the scapula of the person, said scapula pad attached to a bottom end of the rear support structure;
means for securing the chest pad to the scapula pad;
means for attaching the top support structure to the frame of the machine wherein when the person exerts a rotational force against the chest pad and the scapula pad, the rotation assembly rotates relative to a vertical axis of the machine; and
means for rotating the chest pad upwardly away from the scapula pad so that the person may easily enter or exit from the rotation assembly, said means for rotating comprising a hinged connection between the top end of the front support structure and the top support structure.

4,732,382

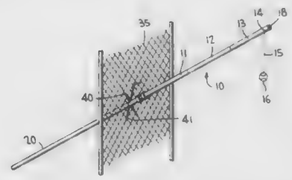
TENNIS TRAINING DEVICE

Harvey Ratner, 2905 Red Lion La., Silver Spring, Md. 20904

Filed Jan. 24, 1985, Ser. No. 694,527
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—29 A 7 Claims

1. A tennis training apparatus comprising:
a standard tennis net of the type having interwoven members and multiple interstices between said interwoven members, said net being tautly supported at its ends to extend across a playing area;
an elongated rod having first and second ends, said rod being inserted through plural vertically aligned interstices of said net with said first end abutting the ground to support the rod by means of the net and the ground in a vertical orientation, said rod having an upper length portion extending entirely above said net and terminating at said second end;





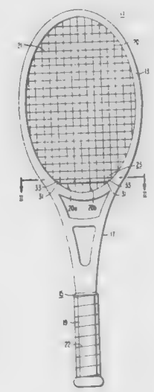
wherein said upper length portion is subdivided into a plurality of successive length segments, each length segment having a different color.

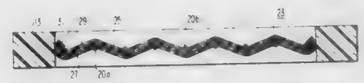
4,732,383

SHOCK AND VIBRATION ABSORBER FOR RACQUETS AND METHOD FOR ITS USE

Harry Ferrari; Raymond P. Harrington, and Harry W. Ingram, all of Pittsburgh, Pa., assignors to Ferrari Importing Company, Royal Oak, Mich.

Filed Apr. 21, 1986, Ser. No. 853,983
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 D 3 Claims



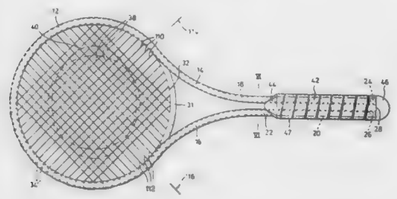


1. An elongated bar of shock-and-vibration absorbing material for suppressing shock and vibration in the use in play of a racquet, said racquet having a frame, vertical strings strung to the frame, and a hitting area, said bar to be weaved over and under the vertical strings of the racquet at a position located only in an edge area of said hitting area at which position said bar would not normally be impacted by a properly struck ball, said bar being composed of stacked layers of elongated strips of different materials, at least one strip, constituting an inside

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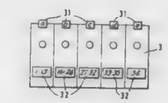
layer of said bar, predominantly suppressing shock and other strips, constituting layers outwardly of said at-least-one strip in said bar, predominantly suppressing vibration, the material of said outward layers being such that its predominant absorption of vibration is in a first range of frequencies, the material of said inner layer being such that its predominant absorption of vibration is in a second range of frequencies, said second range of frequencies being substantially higher than said first range of frequencies.

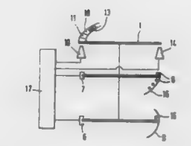
4,732,384
RACQUET HAVING CENTRALIZED SWEET SPOT
Robert J. Seymour, 27, Meadow Walk, Ewell Village, Surrey, England
Filed Jul. 27, 1984, Ser. No. 635,589
Claims priority, application United Kingdom, Jul. 28, 1983, 8320407; Oct. 13, 1983, 8327461; Oct. 27, 1983, 8328689
Int. Cl.[4] A63B *49/02*
U.S. Cl. 273—73 C **1 Claim**



1. A racquet comprising:
(a) an elongate member having a substantially uniform linear density;
(b) a first straight portion of said elongate member at one end thereof;
(c) a first arcuate portion of said elongate member extending from said first straight portion and turning in an anticlockwise sense as the line of the member is followed in a direction away from said one end;
(d) a loop portion of said elongate member extending from said first arcuate portion, having the shape of the greater part of a geometric circle, lying in the same plane as said first arcuate portion, and turning in a clockwise sense, the curve of said arcuate portion extending substantially the whole of the distance from said first straight portion to said loop portion;
(e) a second arcuate portion of said elongate member extending from said loop portion, said second arcuate portion having the same shape as said first arcuate portion but being a lateral inversion thereof and lying symmetrically adjacent thereto;
(f) a second straight portion of said elongate member at the other end thereof extending from said second arcuate portion, and lying parallel with and adjacent to said first straight portion;
(g) a bridging portion having substantially the same linear density as said elongate member and completing the geometric circle of which said loop portion forms the greater part, to define a head of said racquet;
(h) a first set of strings of said head;
(i) a second set of strings which extend transversely of the first set, in which the longitudinal centre line of each set substantially bisects each and every string of the other set, in which both sets have a mirror symmetry about their longitudinal centre lines, in which for each and every string for one set there is a string of substantially equal length in the other set, and in which the centre lines of the two sets intersect substantially centrally in relation to the geometric centre of the racquet head;
(j) a hand grip which surrounds said two straight parallel portions of said elongate member; and
(k) an open throat of said racquet defined by said first and second arcuate portions and said bridging portion;
said racquet including means for locating the sweet spot of the racquet at the geometric centre of the circular racquet head, said means comprising: a combination of said open throat, said bridge portion having substantially the same linear density as said elongate member and the weight of the racquet half located closest to said grip being substantially the same as the weight of the racquet half located farthest from said grip.

4,732,385
ROULETTE FOR GAMING
Rodolfo B. Castellanos, Escalmendi, 11, Vitoria, Spain
Continuation-in-part of Ser. No. 726,348, Apr. 23, 1985, abandoned. This application Sep. 3, 1986, Ser. No. 903,499
Int. Cl.[4] A63F *5/02*
U.S. Cl. 273—142 B **7 Claims**





1. An apparatus for playing roulette comprising:
(a) a roulette wheel provided with slots capable of accommodating a ball,
(b) motor means for providing the roulette wheel with a spinning speed whose magnitude and/or direction are capable of being altered in such a manner that the ball is ejected from its slot and enters another one at random,
(c) game selectors to select a slot upon which a player stakes,
(d) a joker character display for each selector, with means to make the joker character appear or disappear at random on the joker character displays,
(e) means to enable the joker shown in the display to be held at will,
(f) a first plate which is attached to the roulette wheel so as to spin integrally therewith, said first plate having an indicator to show when said roulette wheel passes by zero,
(g) a first signal transmitter/detector which is associated with said first plate and which is capable of detecting said indicator and transmitting a signal concerning detection of said indicator,
(h) a second plate which is attached to the roulette wheel so as to spin integrally therewith, said second plate capable of providing a signal for each said slot around the roulette wheel,
(i) a second signal transmitter/detector which is associated with said second plate and which is capable of detecting said signals from said second plate and transmitting a signal concerning said signal from said second plate,
(j) a third transmitter/detector to detect the presence of the ball in a slot,
(k) a processor equipped with means to receive the signal from the first transmitter/detector to denote passage by zero, and also to receive the signals from the second transmitter/detector and identify them with the relevant slot, and moreover to receive data from the third transmitter/detector to detect presence of the ball, and to award a prize if the position of the ball coincides with the slot upon

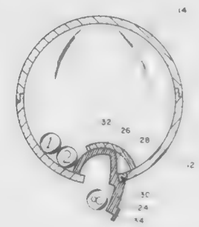
which the player's stake has been placed by means of preselection on the game selector.

4,732,386
VISIBLE RANDOMLY INTERMESHING, MULTI-WHEEL CHANCE GAME APPARATUS
Howard Rayfiel, R.D. 2 - Box 118-B, Corinth, N.Y. 12822
Filed Feb. 19, 1986, Ser. No. 831,470
Int. Cl.[4] A63B *71/04*
U.S. Cl. 273—142 H **17 Claims**



1. A chance game apparatus, comprising:
a primary element having a primary sequence of primary winning indices and primary losing indices, the primary element being so positioned in the apparatus to enable all players to view all of the primary winning indices and the primary losing indices at all times during a play of the game;
a plurality of secondary elements each having a secondary sequence of secondary winning indices and secondary losing indices, the secondary sequences being different from each other and from the primary sequence and further providing a statistically calculable chance of providing a win situation, the secondary elements being so positioned in the apparatus as to enable all players to concurrently pick at least one secondary element for a play of the game and to view all of the secondary winning indices and the secondary losing indices at all times during a play of the game, the secondary elements being further positioned as to operatively place the primary winning and primary losing indices adjacent the secondary winning and secondary loosing indices;
means for randomly selecting a plurality of indices in the primary sequence on the primary element while preventing a player from interceding and affecting the randomness of the selection;
means for randomly selecting one index in each of the secondary sequences on the secondary elements while preventing a player from interceding and affecting the randomness of the selection, such selection on the secondary sequences occurring during the selection on the primary sequence, whereby a win situation is indicated only if adjacent selected indices on the primary element and on a secondary element both happen to be winning indices.

4,732,387
DISPENSING CONTAINER
Joseph C. Elinski, 3304 S. Keswick Plz., Philadelphia, Pa. 19114
Filed Sep. 16, 1987, Ser. No. 97,152
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—144 A **8 Claims**



8. A new and improved dispensing container for selecting lottery numbers, comprising:
a generally spherical hollow transparent container of a size to be held in the palm of a user's hand;
said container being formed from two hemispherical shells connected by interfitting joint portions;
a plurality of numbered elements in said container;
an aperture for randomly dispensing said numbered elements from said container;
means for randomly dispensing only one of said numbered elements at a time;
said random dispensing means comprising a rod mounted adjacent said aperture for rotary movement about a longitudinal axis;
an outer door having one end rigidly connected to said rod and an opposite end having a lip for engaging an outer wall of said spherical container;
an inner door having one end rigidly connected to said rod and forming an acute angle with said outer door and having an opposite end for engaging an inner wall of said spherical container;
a counterweight rigidly connected to said rod;
a hemispherical shroud on an inner surface of said spherical container surrounding said aperture, said rod, said counterweight, said inner door and said outer door; and
said shroud having a slot and an arcuate hole for alternatively dispensing either circular numbered disks or spherical numbered balls through said aperture.

4,732,388
PUZZLE GAME
Narendrakumar M. Patel, 59 Deerfield Rd., Parsippany, N.J. 07054
Filed Nov. 4, 1986, Ser. No. 926,964
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S **5 Claims**



1. A puzzle comprising:
a frame comprising opposed first and second major sides and opposed first and second minor sides extending between and connected to the major sides so as to define a generally rectangular opening in said frame, said rectangular

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opening having a major dimension measured parallel to said major sides and substantially equal to four times a selected unit of measurement, and a minor dimension measured parallel to said minor sides and being substantially equal to three times the selected unit of measurement such that a line connecting the midpoints of said major sides defines first and second halves of said opening adjacent the first and second minor sides respectively;

four substantially identical square puzzle pieces having side edges equal in length to the selected unit of measurement said square puzzle pieces being movable within the rectangular opening of said frame and being initially disposed in the first half of the rectangular opening; and

three substantially identical rectangular puzzle pieces each said rectangular puzzle piece having a minor side dimension substantially equal to the selected unit of measurement and a major side dimension substantially equal to twice the selected unit of measurement, said rectangular puzzle pieces being movably disposed within said rectangular frame, two of said rectangular puzzle pieces having their major sides parallel to the minor sides of the frame and being initially disposed entirely within the second half of the opening therein, the remaining rectangular puzzle piece having its major side parallel to and adjacent one of said major sides of said frame and being initially disposed within the second half of the opening, whereby said square and rectangular puzzle pieces can be moved relative to said frame to achieve a selected distribution of said square and rectangular puzzle pieces such that said square puzzle pieces are entirely within the second half of said opening and said rectangular puzzle pieces are entirely within the first half of the opening.

4,732,389

GOLF CLUB HEAD

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 934,593
Claims priority, application Japan, Nov. 29, 1985, 60-182908[U]
Int. Cl.⁴ A63B *53/04*
U.S. Cl. 273—169 **6 Claims**



1. A golf club head for a wood type club, comprising:

a head body having a front surface inclined upward and backward;

a face plate having a face for hitting a golf ball provided in said front surface of said head body;

a sole plate provided at the bottom of said head body;

a bar-shaped weight provided in said head body and having a longitudinal axis extending from a central portion of the backside of said face plate toward a backside of said head body, said longitudinal axis of said bar-shaped weight being substantially perpendicular to a central portion of said face of said face plate; and

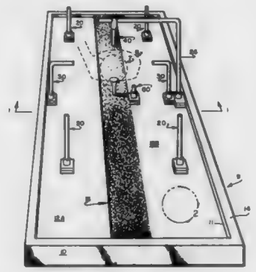
a back weight provided in said backside of said head body to establish a center of gravity of said golf club head in a position such that a line connecting said center of gravity of said golf club head an a sweet spot thereof coincides with said longitudinal axis of said bar-shaped weight.

4,732,390

GOLF CLUB SWING TRAINING DEVICE

Thomas H. McCollum, 5608 Spring Flat Rd., Albany, Ga. 31705

Filed Nov. 12, 1986, Ser. No. 929,760
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—186 R **5 Claims**



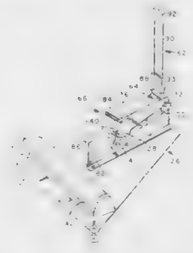
5. A golf training device comprising a structure of ferromagnetic material and a plurality of indicators held on the structure by magnetic forces, the indicators outlining the correct path of the golf club before, during and after ball contact, each indicator being held at any one of a wide variety of positions which are determinable by the user, each indicator being capable of signalling it has been struck while part of the indicator remains fixed in position.

4,732,391

GOLF BALL STORAGE AND DISPENSING APPARATUS

Robert J. Karr, Wyandotte, Mich., assignor to Tee-Wizz Co., Inc., Wyandotte, Mich.

Filed Sep. 23, 1985, Ser. No. 779,166
Int. Cl.⁴ A63B *57/00*
U.S. Cl. 273—201 **32 Claims**



1. A golf ball storage and a dispensing apparatus comprising:

a dispenser unit;

a golf ball storage unit connected to the dispenser unit, the storage unit being adapted for storing a plurality of golf balls and for delivering successively to the dispenser unit a single golf ball;

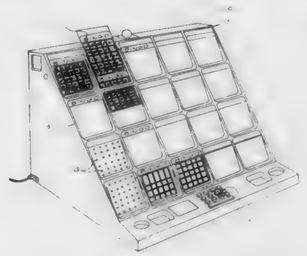
an actuator mechanism mounted in the dispenser unit so that the balls delivered to the dispenser unit are directed to the actuator mechanism, the actuator mechanism comprising: a motor including a direction switch; an arm mechanism pivotable about a support shaft between a substantially vertical position and a substantially horizontal position; a gear train assembly having a series of interacting toothed gear wheels and a rotor with a rotor arm, the gear train assembly being intermediate the motor and the arm mechanism, the rotor arm striking the direction switch when the arm mechanism is in a substantially horizontal position thereby raising the arm mechanism to the substantially vertical position; a reciprocating rod between the gear train assembly and the arm mechanism, the rod being axially moved at its one end by the gear train assembly and having its other end connected to the support shaft of the arm mechanism whereby reciprocation of the reciprocating rod causes the arm mechanism to move between the vertical and horizontal positions; and delay means for retaining the arm mechanism in the horizontal position for a sufficiently long period to enable the golf ball to roll down the entire length of the arm mechanism and be deposited adjacent the dispenser unit.

4,732,392

BINGO CARD DISPLAY FOR PLAYERS WITH MICROPROCESSOR CONTROLLED INDICATION OF CALLED NUMBERS

Robert G. Kerr, Las Vegas, Nev., and David C. Nelson, Santa Ana, Calif., assignors to Robert Edwards, Kansas City, Mo., Trustee for Ruby Oler Trust

Filed Aug. 28, 1985, Ser. No. 770,399
Int. Cl.⁴ A63F *3/06*
U.S. Cl. 273—237 **8 Claims**



1. In a bingo game which is played with bingo cards, each having a set of 24 numbers between 1 and 75 under their B, I, N, G, and O columns, plus a free space under their N columns, and where each individual number on the bingo card is covered when it is called from a random number source during a bingo game and including machine readable coding along a length of card in addition to visual readable numbers thereon, an apparatus for electronically assisting a player by displaying the called numbers on each of a plurality of bingo cards with a single manual input of such called numbers comprising:

a microprocessor/storage means for storing and accessing all called numbers and each set of 24 numbers on each of a plurality of bingo cards and their position thereon;

an inputting means for the player interconnected to the microprocessor/storage means for manually inputting into storage each called number;

card holding and displaying means for holding a plurality of cards, each in a discrete position for simultaneous viewing by the player during play;

a plurality of reader means at said card holding and displaying means, each reader means interconnected to the microprocessor/storage means, for automatically reading each set of 24 numbers on at least one bingo card and inputting each set of 24 numbers into storage as each card is introduced by the player into said cardholding and displaying means for viewing by the player;

a means interconnected to the microprocessor/storage means for indicating the inputted called numbers as they exist on each of the plurality of bingo cards, and,

said indicating means including visual means associated with each card positioning means and coupled to said microprocessor to visually identify on each card each number called as manually inputted by the player;

a means for manually enabling the erasing from storage of all called numbers after the end of each bingo game;

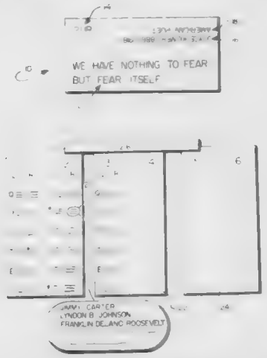
thus, the apparatus electronically assists the player by displaying the called numbers as they exist on each of the plurality of bingo cards with a single manual input of each of said called numbers.

4,732,393

EDUCATIONAL GAME

William J. Rita, Springfield, Va., assignor to Summer Afternoon, Inc., Springfield, Va.

Continuation-in-part of Ser. No. 715,245, Mar. 25, 1985, Pat. No. 4,606,546. This application Aug. 15, 1986, Ser. No. 897,024
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.⁴ A63F *3/00*
U.S. Cl. 273—269 **10 Claims**



1. A game for entertaining a number of players comprising:

a plurality of cards, the cards are divided into at least two card groups, each card is provided with at least one question and at least one answer, corresponding to the question, the card is also provided with a location code for the question on the side of the card on which the question is provided;

a random group selection generating means for selecting from which group of cards a single card is to be selected;

a plurality of answer boards which are divided into at least two answer board groups, each answer board is provided with a series of answer sets comprising a plurality of answers, each answer set can be identified by the location code, whereby during play a player is provided with at least two answer boards that corresponds to at least two groups of cards being selected for play, when a card is selected from one of the groups of cards, as determined by the random group selection generating means, the location code determines the location of an answer set on the answer board for the selected group of cards, a player can then make the correct answer selection for the question from the answers in the located answer set.

4,732,394

TARGET RAISING DEVICE

C. Francis Stein, R.R. 3, Box 313, and Leon E. Winslow, R.R. 3, Box 199, both of Waldoboro, Me. 04572

Filed Jan. 16, 1987, Ser. No. 3,724
Int. Cl.⁴ F41J *7/04*
U.S. Cl. 273—391 **13 Claims**

1. An automated device for raising shooting range targets of the type which are arranged to fall over backwards from the impact of a bullet which comprises

a base having a raised portion adapted to face the firing line when the device is installed on the range and another portion extending rearwardly therefrom,

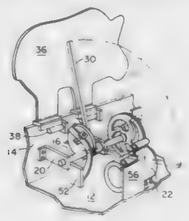
at least one target hinged to said raised portion and adapted

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to swing backwardly therefrom to a generally horizontal rest position concealed from the view of the shooter and upwardly and forwardly from said rest position to an upright position facing the firing line,

a main shaft revolvably mounted behind said raised portion,

a target raising arm pivotally mounted and having a first rest position beneath said target when the latter is in its rest position and adapted when swung upwardly about its pivot to engage and raise said target to its upright position,



means for rotating said shaft,

clutch mechanism for transmitting rotary motion from said shaft to said arm to swing said arm from its rest position to raise said target, and

means for releasing said clutch mechanism from said arm when said target has reached its upright position to permit said arm to swing backwards to its rest position.

4,732,395

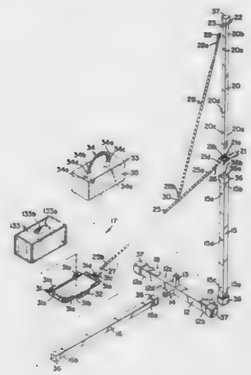
FREE STANDING SPORT NET STAND

James E. Halverson, Box 80, Hillsdale, Wis. 54744

Filed Jun. 10, 1987, Ser. No. 61,120

Int. Cl.[4] A63B *61/02*

U.S. Cl. 273—411 **22 Claims**



1. A free standing sport net stand for supporting a net comprising:

(a) a foot member having first and second stub members cooperatively connected thereto, said stub members generally perpendicular to said foot member and said first stub member generally perpendicular to said second stub member, wherein when in a first position said first stub member extends generally upward and said second stub member extends generally outward and when in a second position said first stub member extends generally outward and said second stub member extends generally upward;

(b) a generally upwardly extending riser having first and second ends, said first end cooperatively connected to one of said stub members, said riser having holes formed therein, whereby the net may be secured to said riser for playing a first sport;

(c) a leg member having first and second ends, said first end cooperatively connected to said other of said stub members;

(d) a weight assembly cooperatively connected to said second end of said leg member; and

(e) said foot member having claw members attached thereto, said claw members extending generally downward when said foot member is in the second position, thereby stabilizing said stand when outside and when said foot member is in the first position said claws extend inward for inside use.

4,732,396

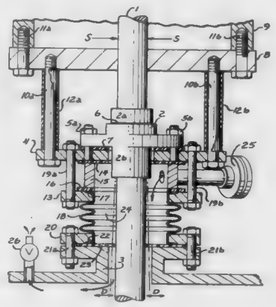
APPARATUS AND METHOD FOR SEALING A ROTATING SHAFT

Robert W. Brigham, West Lafayette, Ind.; Stephen Cirelli, El Dorado, Ark.; Nick T. Macchiarolo, El Dorado, Ark., and Paul D. Schiefelbein, El Dorado, Ark., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Oct. 8, 1985, Ser. No. 785,836

Int. Cl.[4] F16J *15/40, 15/52;* **F16L** *27/00*

U.S. Cl. 277—3 **17 Claims**



1. An apparatus for forming a seal at an aperture where a rotatable shaft means passes through a barrier means into a barred fluid, and where the rotatable shaft means is rotatable by a shaft drive means contained within a stationary shaft drive means housing, comprising:

mechanical seal means located between said stationary shaft drive means housing and said barrier mean, said mechanical seal means having at least one stationary portion sealingly positioned adjacent to at least one rotatable portion, the rotatable portion being attached to the rotatable shaft means for rotation therewith, and

elastomeric joint means joining the stationary portion of the mechanical seal means to the barrier means thereby forming a substantially fluid-tight chamber bounded by the mechanical seal means, the elastomeric joint means and the barrier means, whereby the elastomeric joint means is adapted to absorb relative radial and axial motion between the barrier means and the rotatable shaft means, and

means for rigidly anchoring the stationary portion to the stationary shaft drive means housing.

4,732,397

CAST IN PLACE COMBINATION APERTURE CLOSURE MEMBER AND PIPE SEAL FOR FLUID DISTRIBUTION BOX

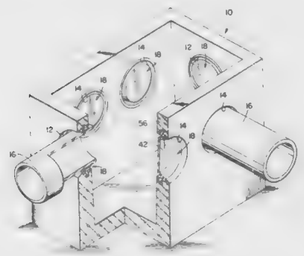
Norman Gavin, 2545 Ridge Rd., North Haven, Conn. 06473

Filed May 1, 1986, Ser. No. 858,341

Int. Cl.[4] F16J *15/10*

U.S. Cl. 277—207 A **9 Claims**

1. A combination aperture closure and low pressure seal for an exterior surface of a pipe adapted to be mounted in a cylindrical aperture and to receive an end portion of a pipe in a monolithically cast fluid distribution box or the like of the cementitious material; said seal being composed of molded elastomeric material and comprising an annular body portion having generally cylindrical inner and outer surfaces, the former defining a central cylindrical pipe receiving opening which extends axially through the body portion and the latter engagable with the aperture wall, an integral annular flange on said body portion extending generally radially outwardly and adapted to be embedded in the cast cementious material about the aperture during casting of said box whereby to secure the seal in position in the aperture, and a hollow generally frusto-conical sealing skirt formed integrally at its larger diameter end portion with the seal body portion and projecting inwardly at an angle between radial and axial planes, the smaller diameter end portion of said sealing skirt being slightly smaller in diameter than the pipe to be received and being disposed radially inwardly from said inner cylindrical body surface and free to expand diametrically, and frusto-conical sealing skirt being adapted to receive and guide an end portion of a pipe introduced at its said larger diameter end portion and urged toward and axially through its said free smaller diameter end portion whereby to slightly diametrically expand said free end portion and thus to establish firm frictional engagement and effective sealing thereof with the exterior peripheral surface of the pipe, said seal further including a knock-out web which takes a substantially circular disc configuration and which extends radially across the smaller diameter free end portion of the frusto-conical sealing skirt, said web being molded integrally with the skirt and having an integrally molded weakened narrow annular portion adjacent the skirt free end portion to facilitate web knock-out so that said seal can serve a dual purpose selectively as a closure for an associated aperture and a seal for a pipe entered in the aperture.



4,732,398

BELLOWS-TYPE BEARING SEAL AND METHOD OF USE

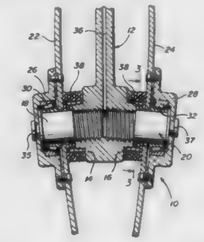
Elmer H. Biss, R.R. 1, Elbow Lake, Minn. 56531

Filed Jun. 4, 1985, Ser. No. 741,272

Int. Cl.[4] F16J *15/36, 3/04;* **A01C** *5/06*

U.S. Cl. 277—212 FB **2 Claims**

1. In combination with an assembly comprising a rotary disc-like ground engaging element generally supported on a shaft by a bearing means subject to engagement by dirt, the shaft extending from a stationary hub-like means, means for excluding dirt from the bearing means and retaining grease therein comprising a generally cylindrical accordian-like seal member of resilient material, said body having a constant thickness and configuration from end-to-end and formed as a plurality of identical axially interconnected pocket-like rings defined by interconnected generally radially extending and oppositely inclined walls, the seal member embracing the shaft and being axially compressed between the rotary disc-like element and the stationary hub-like means, said cylindrical seal member including inwardly opening V-shaped pockets and outwardly opening V-shaped pockets of substantially the same size to enable equal expansion and contraction throughout the length of the seal, said seal terminating in walls that incline inwardly and longitudinally outwardly into edge portions engaged with the disc-like element and hub-like means.



4,732,399

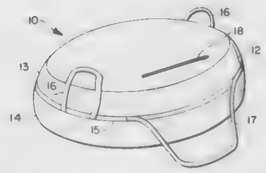
CUSHION SLIDER TOY

Daniel T. Reilly, Rte. 1, Box 369, and Joseph Eckenfels, P.O. Box 1036, both of Riverton, Wyo. 82501

Filed Mar. 10, 1986, Ser. No. 838,306

Int. Cl.[4] B62B *15/00*

U.S. Cl. 280—12 B **16 Claims**



1. A cushion slider toy comprising:

(a) an inflatable tube in the form of an annular ring;

(b) a flexible, durable, water-resistant, one-piece outer covering member which is adapted to completely surround and enclose said inflatable tube in a manner such that said covering member provides a flat top surface over said tube and a flat bottom surface below said tube; wherein said covering member includes an aperture which is adapted to allow said inflatable tube to be inserted into or removed from the interior of said covering member when said tube is deflated; and wherein said covering member includes closure means adapted to close said apperture; wherein said closure means comprises interlocking fastener portions disposed on opposing sides of said aperture; and;

(c) handle means secured to said outer covering; wherein said flat top surface of said cushion slider toy is adapted to form a seat for a person to sit on while riding said cushion slider toy.

4,732,400

SCOOTER BOARD

Luis A. Santini, Condominio Las Torres Sur-3F, Bayamon, P.R. 00619

Filed May 27, 1986, Ser. No. 867,160

Int. Cl.[4] A63C *17/02*

U.S. Cl. 280—87.04 A **10 Claims**

1. A skateboard-type vehicle having a platform, a frictional top surface, two sets of wheel pairs, an axle joining each wheel pair, each wheel cast with rounded sides of material offering low rolling resistance, each wheel pair attached for forwardly rolling near an end of an underside of the platform through an

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inclined pivotal and resilient coupling structure capable of turning the wheel pair into the direction of the platform's tilt comprising:

a reinforcement means for said platform;

a weight supporting vertical upright;

attachment means to rigidly attach said vertical upright through the center of the platform;



a transversely extending T-shaped handle assembly adjustably secured to the top of the vertical upright;

the platform's width accommodating a user's feet placed together upon the platform with a foot placed on each side of the vertical upright, said upright further comprising a means to adjust and lock the height of said upright.

4,732,401

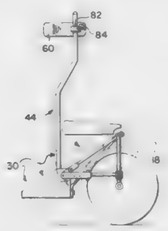
JOG CART TRAINING ATTACHMENT

Drew A. Siemon, 120 Old Mill Rd., Springfield, Ohio 45506

Filed Apr. 23, 1986, Ser. No. 855,229

Int. Cl.[4] B60R *3/00*

U.S. Cl. 280—163 **9 Claims**



1. A training attachment for a jog cart comprising:

a footrest having a non-slip surface extending downwardly and forwardly and adapted to support a trainer in a standing position thereon,

a pair of sockets projecting upwardly from said footrest on opposite sides thereof,

a stabilizing assembly including:

a pair of spaced parallel uprights each having a lower, substantially vertically extending portion received in said sockets, a medial, forwardly and upwardly angled portion, and an upper,

substantially vertically extending portion, a cross piece interconnecting said medial portions of said uprights, and

an upper support member extending between and vertically adjustable along said upper portions of said uprights,

said support member being padded and having outwardly projecting wings adapted to be engaged between the upper arms and torso of a trainer supported on said footrest,

a main support bar,

means mounting said footrest on said main support bar for pivotal movement with respect thereto,

an outer strut, adjustable in length and secured to each end of said main support bar and projecting forwardly therefrom,

an intermediate strut, adjustable in length and secured to said main support bar adjacent said footrest and projecting forwardly and upwardly therefrom,

a median strut adjustable in length and secured to said footrest adjacent the center thereof and projecting forwardly and upwardly therefrom, and

means for attaching outer ends of said struts to structural portions of a jog cart.

4,732,402

WHEELCHAIR FOR A DISABLED PERSON, PARTICULARLY A CHILD

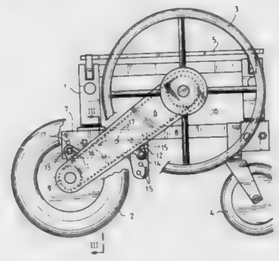
Jean-Pierre Lambert, Saint-Cyr-sur-Loire, France, assignor to Etablissements POIRIER, Luynes, France

Filed Sep. 11, 1986, Ser. No. 905,660

Claims priority, application France, Sep. 13, 1985, 85 13586

Int. Cl.[4] A61G *5/02*

U.S. Cl. 280—242 WC **11 Claims**



1. A wheelchair for a disabled person, particularly a child, comprising:

a frame having opposite sides;

an independent propelling assembly on each of said sides, each said propelling assembly being formed as a unit and including

an elongated arm pivotally mounted on a support on one of said sides of said frame and rotatably supporting a driving wheel at one end thereof engaging ground and a hand wheel at an opposite end thereof,

transmission means coupling said driving wheel to said hand wheel for simultaneous rotation,

adjustment means, coupled to said hand wheel, for varying height of said hand wheel relative to said frame, said driving wheel and the ground, and

locking means, on each said support and each said arm, for securing each said arm in a plurality of predetermined positions; and

coupling means for easily attaching each said propelling assembly to and removing each said propelling assembly from said sides of said frame.

4,732,403

FOLDING MOPED WITH A COLLAPSIBLE SUPPORT FOR THE SADDLE

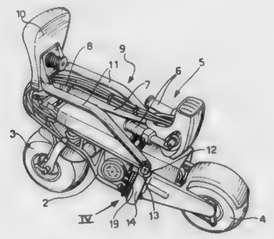
Renzo Grattapaglia, San Carlo Canavese, Italy, assignor to ALGAT S.p.A., Turin, Italy

Filed Jan. 14, 1987, Ser. No. 3,339

Claims priority, application Italy, Jan. 14, 1986, 52855/86[U]

Int. Cl.[4] B62K *15/00*

U.S. Cl. 280—278 **2 Claims**



1. A folding moped including a frame, a steering column which can be collapsed rearwardly, handlebars with folding arms carried by the steering column, a pair of footrests pivotally mounted on said frame and a saddle support constituted by two spaced-apart pillars connected to the frame with said pillars being pivotable between an erect condition of use and a collapsed rest condition in which these pillars extend substantially horizontally and forwardly, wherein each pillar of the support includes a lower hollow part rigidly fixed to the frame in a position corresponding to the erect condition of the support, and an upper part which is movable relative to the lower hollow part and has a jointed end portion inserted in the lower hollow part for sliding between an inserted position, in which the joint is inserted in the lower hollow part and the upper part of the pillar is held erect, and a withdrawn position in which the joint projects above the lower hollow part to allow the upper part of the pillar pivotally to collapse,

wherein a respective disengageable locking member is associated with each pillar for retaining the respective jointed end portion within the corresponding lower hollow part in the inserted position, said locking members being formed by appendages on said footrests and corresponding lateral holes are formed in the lower hollow parts and in the jointed end portions of the two pillars, the appendages being insertable into the holes under the action of respective thrust springs and,

wherein said footrests are pivotable about a pair of pins between a lowered position of use and a raised rest position, said pins passing transversely through the lower hollow parts to act as lower stops for supporting the jointed end portions of the two pillars.

4,732,404

BICYCLE

Abel O. Coetzee, Plot 117 Witfontein 0116, Pretoria North, Johannesburg, Transvaal Province, South Africa

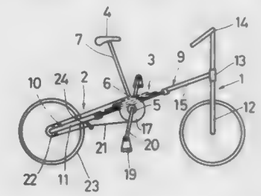
Filed Mar. 5, 1986, Ser. No. 836,311

Claims priority, application South Africa, Mar. 7, 1985, 85/1708

Int. Cl.[4] B62K *19/04*

U.S. Cl. 280—283 **6 Claims**

1. A bicycle frame comprising a single leaf spring set which is substantially rectilinear in an unloaded condition, a rear wheel mounting connected to said leaf spring set and including rear fork means extending rearward from a rear end of said leaf spring set in rectilinear configuration with said leaf spring set for mounting an axle of a rear wheel, a front wheel mounted connected to said leaf spring set and including a front frame member extending forward from a front end of said leaf spring set in rectilinear configuration with said leaf spring set and front fork means pivotally mounted to said front frame member on a steering axis transverse to said front frame member for mounting an axle of a front wheel, said leaf spring set being the sole framing element through which said front and rear wheel mountings are connected, and a seat mounting and a pedal



drive mechanism both fixed to said leaf spring set substantially centrally of both said leaf spring set and respective axle locations for the front wheel and the rear wheel, whereby said front and rear wheel mountings pivot about a single pivotal position when a load is placed on said seat mounting.

4,732,405

SAFETY SKI BINDING

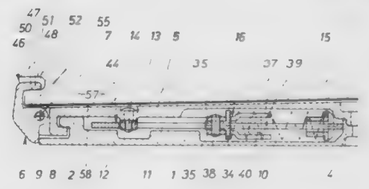
Henry Freisinger, Vienna; Franz Luschnig, Traiskirchen; Karl Stritzl, and Johann Zotter, both of Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed May 24, 1985, Ser. No. 738,159

Claims priority, application Austria, May 25, 1984, 1750/84

Int. Cl.[4] A63C *9/081*

U.S. Cl. 280—634 **15 Claims**

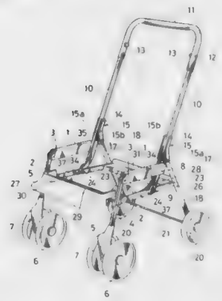


1. In a safety ski binding having connecting means for downhill or cross-country ski shoes having gripping soles made of rubber, said connecting means including at least one rear and one front holding member which have a constant distance from each other for all shoe sizes and thus provide a torque transmission from the ski shoe to the ski which is moment-balanced for all shoe sizes about a vertical axle arranged on the ski in the tibia area, said vertical axle pivotally supporting a cover plate swivelled against the force of a spring provided on said ski, and at least one initial-tensioning means for adjusting the force of said spring, the improvement comprising wherein said front holding member includes a holding jaw and a snap-off means for holding said holding jaw in engagement with the ski shoe, said holding jaw being movable between a ski shoe holding position and a ski shoe releasing position and a controlling means for controlling the swivelling moment of said cover plate against the force of said spring, wherein said initial-tensioning means has an operating member operable laterally of the ski, wherein said rear holding member is a heel holder having means for allowing said rear holding member to react only to vertical forces, wherein said controlling means includes a slide member having a recess therein, wherein guide means is provided for guiding said slide member for movement relative to said ski, wherein a roller means is provided on said cover plate and engages an edge surface of said recess so that a pivotal movement of said cover plate will cause said roller

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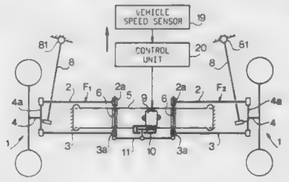
means to effect a movement of said slide member and, consequently, said cover plate against the urging of said spring.

4,732,406
PUSHCART
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Dec. 5, 1986, Ser. No. 938,427
Claims priority, application Japan, Dec. 9, 1985, 60-277739
Int. Cl.⁴ B62B *7/08*
U.S. Cl. 280—642 **12 Claims**



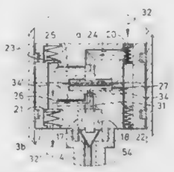
1. A push cart comprising a pair of longitudinally extending upper rods, a pair of lower rods disposed below said upper rods and extending substantially parallel to said upper rods, a pair of front legs turnably connected to the respective front ends of said upper rods and the respective front ends of said lower rods and extending further downwardly from said lower rods, said front legs each having a front wheel, a pair of push rods turnably connected to the respective rear ends of said upper rods and the respective rear ends of said lower rods and extending upwardly from said upper rods, a grip rod connecting said pair of upper rods, a pair of rear leg connecting members turnably connected at one of their respective ends to said push rods, a pair of rear legs turnably connected to the other ends of said rear leg connecting members and adapted to abut at their upper end surfaces against the back surfaces of said push rods when the other ends of the rear leg connecting members are positioned relatively low with respect to their connecting portions associated with the push rods, said rear legs each having a rear wheel, a pair of rear leg connecting rods turnably connected at their front ends to portions in the vicinity of the connecting portions between said lower rods and said push rods and turnably connected at their rear ends to said rear legs, front and rear support blocks connecting said pair of front legs and said pair of rear legs in a plane defined between said pair of lower rods and said pair of rear leg connecting rods, and stop means for defining the terminal ends of the lower rods positioned forwardly of the upper rods so that the lower ends of the front legs are positioned forwardly of their upper ends and so that the lower ends of the push rods are positioned forwardly of their upper ends to form a link mechanism as a parallelogram defined by said upper rods, said front legs, said lower rods and said push rods.

4,732,407
SUSPENSION SYSTEM FOR A MOTOR VEHICLE
Fusami Oyama, Ohrs; Shingo Ohbayashi; Akira Takahashi, both of Ohta; Hiroshi Mori, Ohizumi, and Takeo Inoue, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1987, Ser. No. 56,872
Claims priority, application Japan, Jun. 10, 1986, 61-134425; Jun. 10, 1986, 61-134426; Jun. 10, 1986, 61-134428; Jun. 10, 1986, 61-134429; Jun. 10, 1986, 61-134430; Jun. 10, 1986, 61-134431
Int. Cl.⁴ B60G *17/04*
U.S. Cl. 280—673 **5 Claims**



1. A suspension system for a motor vehicle having at least one swing member for pivotaly connecting one of wheels of the motor vehicle to a body of the vehicle, comprising:
a shaft rotatably supported on the body;
an annular elastic bush secured to the shaft,
the annular elastic bush having spring constants which are different in value at angular positions;
the swing member being rotatably engaged with the elastic bush; and
means for rotating the shaft in accordance with driving conditions of the motor vehicle so as to change the spring constants with respect to the swing member.

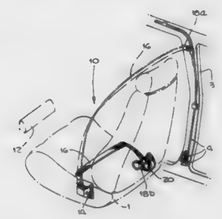
4,732,408
MEANS FOR A SHOCK-ABSORBER
Kenth Öhlin, P.O. Box 722, S-194 27 Upplands Väsby, Sweden
PCT No. PCT/SE85/00120, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04698, PCT Pub. Date Oct. 24, 1985
PCT Filed Mar. 14, 1985, Ser. No. 821,730
Claims priority, application Sweden, Apr. 4, 1984, 8401874
Int. Cl.⁴ F16F *9/34*
U.S. Cl. 280—707 **8 Claims**



1. A device for controlling the shock-absorbing capacity of the shock-absorber by means of control signals from an external control unit, said shock-absorber being of the type including a cylinder operating with a fluid and a piston arranged in the cylinder, said piston being provided with at least one passageway through which fluid is capable of being transferred from one side to the other side of said piston and vice versa comprising: a controllable means capable of being controlled by control signals from said control unit and in response to said signals varying the cross-sectional area of said passagewy thereby causing a variation in the shock-absorbing capacity, wherein each of the directions of the fluid flow is capable of being conducted through two parallel channels and wherein

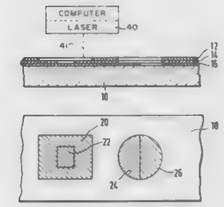
said control means includes a valve for determining the flow of a control fluid in the first channel for determining the position of a membrane, and another valve connected to the membrane for determining the flow of a master fluid in the other channel.

4,732,409
DUAL MODE PASSENGER RESTRAINT SYSTEM
Arduino Colasanti, East Detroit, Mich., assignor to American Safety Equipment Corporation, Troy, Mich.
Filed Dec. 12, 1986, Ser. No. 941,089
Int. Cl.⁴ B65H *75/48*; A62B *35/02*
U.S. Cl. 280—808 **10 Claims**



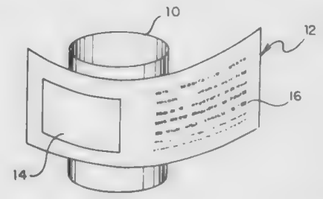
2. In a vehicle equipped with a passenger restraint system of the type having a knee bolster in front of a seat for restraining the lower torso of the passenger in the seat during emergency conditions and a chest belt having one end wound on an acceleration-sensitive retractor located at the lower, inward side of the seat and a second end passing across the chest of the passenger and engaging with a first quick-release means attached to an adjacent door or door frame for restraining the upper torso of the passenger during emergency conditions, a conversion kit for retrofitting said system to a dual mode operation capable of operating as an automatically-locking lap belt for restraining children or an infant seat, comprising:
a replacement retractor adapted for replacing said acceleration-sensitive retractor, said replacement retractor including:
a safety belt having one end wound thereon for extractive and retractive movement;
an acceleration-sensitive mode in which said retractor detects acceleration of said vehicle or said belt, or both, of a predetermined level and locks said belt against further extractive movement in response thereto; and
an automatic-locking mode in which said retractor operates to detect consecutive extractive and retractive movements of said belt of a predetermined amount to lock said belt against further extractive movement in response thereto, said automatic-locking mode being switchable between an operative state and an inoperative state; and
second quick-release means mounted at a lower, outward side of said seat for alternatively releasably-attaching said second end of said belt thereat when it is released from said first quick-release means such that said belt passes across the lap of said passenger or said infant seat, said second quick-release means further incuding switch means for switching said automatic-locking mode to said operative state when said second end of said belt is engaged therewith.

4,732,410
IDENTIFICATION CARD AND A METHOD OF PRODUCING SAME
Hans J. Holbein, and Thomas Maurer, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Fed. Rep. of Germany
Continuation of Ser. No. 330,890, Dec. 14, 1981, Pat. No. 4,523,777. This application May 1, 1985, Ser. No. 729,195
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048733
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.⁴ B42D *15/00*
U.S. Cl. 283—67 **12 Claims**



1. A method of producing an identification card having visually detectable information, comprising:
applying a plurality of color layers over each other on a synthetic carrier; and
forming the information by contacting the color layers with a controlled laser beam and selecting the energy of the laser beam and the color layer characteristics in such a way that a new color is formed restricted to a certain area, said new color being formed by an interaction between the color layers produced by at least partially melting micro-capsules which have a reactant of colorant and are embedded in the superjacent color layers with the laser beam.

4,732,411
MEDICATION DISPENSING IDENTIFIER SYSTEM
Harold B. Siegel, Clearwater, Fla., assignor to Siegel Family Revocable Trust, Clearwater, Fla.
Filed Feb. 5, 1987, Ser. No. 11,017
Int. Cl.⁴ G09C *5/00*; B42D *15/00*; G06F *15/42*; G09G *3/20*
U.S. Cl. 283—75 **4 Claims**



1. A medication dispensing system for maintaining a close surveillance over a patient for whom the medication is solely intended and prescribed medication to be dispensed to the patient, comprising:
means initially recording and storing a photograph of the patient for whom the medication is solely intended;
means initially recording and storing vital patient information concerning the prescribed patient medication and the dosage thereof;
label means;

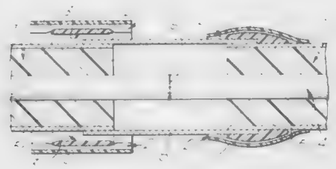
VOL 1088 ISS 4 MR 22 1988 UMI

means creating and imprinting on the label:
(a) a visual record of the stored photograph, for comparison with the patient to whom the medication is to be dispensed, before any medication is dispensed; and
(b) a visibly readable printout of the stored vital patient information;
a container for transporting to the patient, the prescribed medication as described in the printout;
the imprinted label affixed to the container;
the means for recording and storing the photograph and vital patient information comprises a computer system having both the patient photograph and the patient vital information recorded and stored therein for subsequent retrieval;
the computer system generating a uniquely distinctive, machine readable code number, which code number corresponds to the previously stored patient photograph and vital information;
means for printing either the machine readable code number or the patient photograph and visibly readable vital patient information on the label;
an identifier band fixable around a limb of the patient;
the band having the uniquely distinctive, machine readable code number and a photograph of the patient imprinted thereon;
the code number corresponding to the stored computer photograph and vital patient information; and
means for reading the code number on the identifier band, to recreate the photograph and information stored in the computer system.

4,732,412
COATED RECOVERABLE ARTICLES

Roger D. A. van der Linden, Antwerp, and Lucien G. Meeus, Heist-op-den-berg, both of Belgium, assignors to NV Raychem S.A., Kessel-lo, Belgium

Continuation of Ser. No. 435,168, Oct. 19, 1982, abandoned. This application Dec. 19, 1986, Ser. No. 942,937
Claims priority, application United Kingdom, Oct. 27, 1981, 8132997
Int. Cl.[4] F16L *11/12*
U.S. Cl. 285—47 **24 Claims**

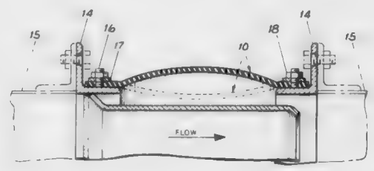


1. An assembly for sealing an end of a joint between two insulated pipes from which the insulation has been removed at the ends thereof exposing uninsulated end portions, said assembly comprising:
(a) a hollow casing arranged to surround the uninsulated portions of pipe, overlapping the pipe insulation at each side of the joint; and
(b) a sleeve comprising a heat-recoverable polymeric sheet having;
(i) a layer of a heat-activatable adhesive at two first regions of a principle surface thereof, arranged so as in use to provide substantially annular bonds between the polymeric sheet and the casing and between the polymeric sheet and the insulation of one of said pipes, so as to interconnect the casing and the pipe insulation, and
(ii) a layer of a sealant at a second region of the said principle surface, said second region being between the two said first regions, said sealant being distinct from said heat-activatable adhesive and being arranged in use to overlap the casing and the pipe insulation so as to provide substantially annular, flexible seals between the polymeric sleeve and the casing, and the polymeric sleeve and the insulation, thereby providing a flexible seal between the casing and the insulation which can accommodate relative movement between the casing and the insulation.

4,732,413
EXPANSION JOINTS

Lothar Bachmann, Auburn, and William F. Koch, Lewiston, both of Me., assignors to Bachmann Industries, Inc., Lewiston, Me.

Continuation-in-part of Ser. No. 773,608, Sep. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 584,246, Feb. 27, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 897,330
Int. Cl.[4] F16L *11/12*
U.S. Cl. 285—49 **13 Claims**



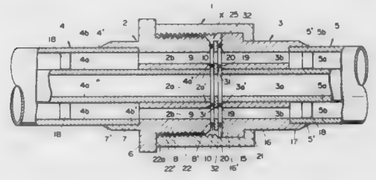
1. An expansion joint for use in interconnecting two fluid media containing members to permit relative movement between them in response to thermal, pressure related or vibrational changes, said joint consisting of a flexible, media resistant, sheet material disposed as a sleeve and means attachable to the ends of the sections to which the margins of the sleeve are sealed, at least when said means are so attached, said sleeve then surrounding and isolating the flow path in the area between said sections, said material including at least one reinforcing fabric substrate including two series of parallel strands the orientations of which present a criss-cross pattern and with all the strands of both series diagonal with respect to the flow path, and surface layers of a flexible media resisting material having a degree of elasticity whereby said changes on the joint, urging perimetric changes of the material are accommodated by the reorientation of the substrate strands thereby allowing the material substantially throughout the length of said sleeve to stretch and recover in directions substantially normal to said flow axis.

4,732,414
JOINT FOR COAXIAL PIPE

Junio Inaba, 9-49, Ohnodai 1-chome, Sagamihara-shi, Kanagawa, Japan

Filed Feb. 17, 1987, Ser. No. 15,414
Claims priority, application Japan, Nov. 18, 1986, 61-274887
Int. Cl.[4] F16L *47/00*
U.S. Cl. 285—133.1 **3 Claims**

1. A joint for connecting first and second co-axial pipes each having inner and outer pipes comprising:
a male joint portion having an inner portion for receiving an inner pipe of one of said co-axial pipes and having an internal bore communicating with said inner pipe, an outer cylindrical portion for receiving the outer pipe of said one co-axial pipe, a bored body integrally extending from said outer portion, said body defining a plurality of longitudinal bores between said body and said inner portion for communicating with said outer pipe;
a female joint portion having an inner portion for receiving the inner pipe of the other of said co-axial pipes and having an internal bore communicating with said inner pipe of the other of said co-axial pipes, an outer cylindrical portion for receiving the outer pipe of the other of said co-axial pipes, and a bored body integrally extending from said female joint bored body, said female joint bored body defining a plurality of longitudinal bores between said body and said female joint bored body for communicating with said outer pipe of the other of said co-axial pipes;
said inner portions of each said male and female joint portions having on an end surface opposing protrusions and said outer portions of each said male and female joint portions having opposing protrusions on the end surface remote from said outer cylindrical surface;

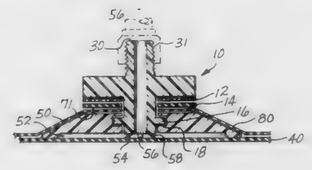


the bored body of one of said portions having a screw thread on the outer peripheral surface thereof and the bored body of the other portion having an external flange on its peripheral surface;
a flat metallic packing between said portions and having an inner passage communicating said internal bores of said inner portions and outer passages communicating said longitudinal bores; and
means engaging said screw thread and said flange for locking said male and female portions together with said packing therebetween so that said opposing protrusions are urged toward each other with said packing therebetween so that said protrusions are pressed and sealed to said packing and said internal bores and longitudinal bores are sealed from each other and the atmosphere.

4,732,415
NON-METALLIC VACUUM PROBE

Barry D. Matin, Kent, and George E. Trepus, Jr., Enumclaw, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 29, 1986, Ser. No. 901,855
Int. Cl.[4] F16L *37/24*
U.S. Cl. 285—169 **6 Claims**

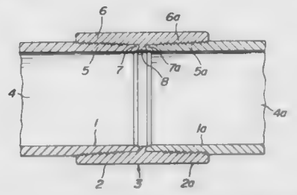


1. A non-metallic vacuum probe having a central axis and comprising in combination:
a cylindrically shaped probe body portion having a cylindrically shaped coaxially disposed protuberance, said cylindrically shaped coaxially disposed protuberance having a threaded outer surface portion adapted for attachment to a vacuum source;
a probe flange portion having a major surface portion disposed in a plane perpendicular with respect to the central axis of said non-metallic vacuum probe;
a washer shaped rubber gasket coaxially disposed about the central axis of said non-metallic vacuum probe, said cylindrically shaped rubber gasket disposed between said cylindrically shaped probe body portion and said probe flange portion;
a washer shaped bearing member disposed between said cylindrically shaped probe body portion and said washer shaped rubber gasket;
an air flow passage coaxially disposed along said central axis of said non-metallic vacuum probe, said air flow passage extending through said cylindrically shaped probe body portion, said washer shaped bearing member, said washer shaped rubber gasket and said probe flange portion; and,
lug and ramp means for interconnecting said cylindrically shaped probe body portion and said probe flange portion together.

4,732,416
PIPE CONNECTORS

Geoffrey C. Dearden, Bedford, England; Donald N. Jones, Aberdeenshire, Scotland, and Katsuo Ueno, Hertfordshire, England, assignors to Hunting Oilfield Services (UK) Limited, Aberdeen, Scotland and Kawasaki Steel Corporation, Kobe, Japan, part interest to each

Continuation of Ser. No. 740,185, May 31, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 21,547
Claims priority, application United Kingdom, Jun. 4, 1984, 8414203
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—333 **4 Claims**



1. A pipe connector comprising a female member having an internal circumferential surface provided with a thread and a male member having an external circumferential surface corresponding to the internal circumferential surface of the female member, to be received within the female member and provided with a thread for engagement with the thread of the female member, one of said members being provided at the free end with a first generally radially directed annular surface and a second generally axially directed annular surface, and the other of said members being provided with a first annular surface and a second annular surface which make abutting sealing contact with said first and second annular surfaces of the one member, respectively, when the members are fully engaged together, wherein said members are provided with third annular surfaces, respectively, which are located between said first and second annular surfaces and smoothly connect these first and second annular surfaces, radii of curvature of the first and second annular surfaces of the other of the members being larger than radii of curvature of the first and second annular surfaces of the one of the members, diameters of the first and second annular surfaces of the other of the members being smaller than diameters of the first and second annular surfaces of the one of the members, and a radius of curvature of the third annular surface of the other of the members being smaller than a radius of curvature of the third annular surface of the one of the members, whereby a relationship between the radii of curvature of the first, second, and third annular surfaces of the one and the other of the members, respectively, is expressed as follows:

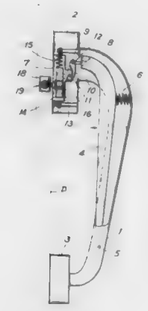
$$FR2>MR2>FR1>MR1>MR3>FR3$$

where MR1, MR2, and MR3 are the radii of curvature of the

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annular surfaces of the one of the members, and FR1, FR2, and FR3 are the radii of curvature of the annular surfaces of the other of the members.

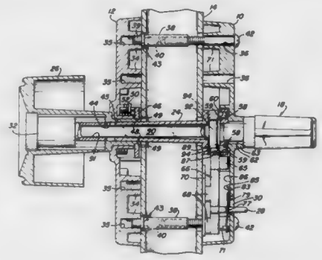
4,732,417
DOOR HANDLE
Anthony L. Yang, 1639 E. Harmon Ave., #3, Las Vegas, Nev. 89119
Continuation-in-part of Ser. No. 744,770, Jun. 14, 1985, abandoned. This application Nov. 6, 1986, Ser. No. 927,360
Int. Cl.[4] E05C *1/14*
U.S. Cl. 292—142 **1 Claim**



1. A door handle comprising
a C-shaped handle having upper and lower ends,
a first mounting member comprising a hollow casing located at one end of the C-shaped handle having a planar mounting surface adapted to abut and engage a flat vertical surface of a door,
a grip lever pivotally mounted with the C-shaped handle and biased outwardly from said handle,
a rotatable shaft extending forwardly from the planar mounting surface of the first mounting member and being adapted to engage an actuation mechanism of a conventional door latch, and
actuating means housed within the first mounting member operably connection the grip lever and the rotatable shaft such that movement of the grip lever toward the C-shaped handle rotates the shaft, said actuating means including a lever arm activated by the grip lever and a rack and pinion mechanism operatively connected to the lever arm.

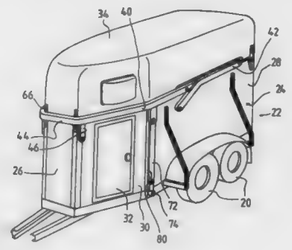
4,732,418
KNOB LATCH
Marlin D. Crown, Sycamore, and James A. Edeus, Rock Falls, both of Ill., assignors to National Manufacturing, Sterling, Ill.
Continuation of Ser. No. 533,554, Sep. 19, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,259
Int. Cl.[4] E05C *3/04*
U.S. Cl. 292—207 **8 Claims**

1. A door latch, comprising in combination:
a first case adapted to be mounted to one side of a door,
a second case adapted to be mounted to the other side of said door at a location opposite to said first case,
a first latch handle rotatably mounted in said first case and having a strike engagable latch surface thereon,
a second latch handle rotatably mounted in said second case,
an operating shaft having a first end non-rotatably connected to said second handle and having a second end,
locking means slidably mounted to one of said cases for movement between a locking position which prevents rotation of said shaft and an unlocking position which permits rotation of said shaft,
said locking means having a cam surface thereon,
a keylock spindle concentric with said operating shaft,
said spindle having an integrally-formed T-shaped end portion,
a cam operator surface means on said end portion for moving said locking means from said locking position to said unlocking position in response to rotation of said spindle,
key operated means rotatably carried by said second latch handle and non-rotatably connected to said spindle for rotating said spindle to unlock said latch,
a locking ring within said first case non-rotatably connected to said first handle, said locking ring having a pair of diametrically opposed holes provided therein,



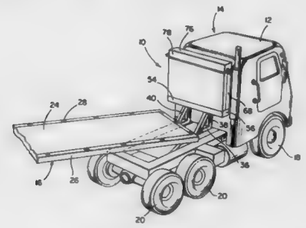
said T-shaped end portion of said spindle disposed between said second end of said operating shaft and said locking ring,
a pair of pins integral with said operating shaft in mutual parallel relationship therewith and extending into said holes of said locking ring, and
said cam operator surface means being disposed radially outward from the circle defined by the path of rotation of said pins,
whereby when said latch is assembled to a door said pins and holes cooperate to prevent relative rotation between said second handle and said first handle.

4,732,419
CARRIER FOR CONVEYING HORSES, PARTICULARLY A TRAILER
Michael Ketterer, 7500 Karlsruhe 21, and Erwin Meroth, Cologne, both of Fed. Rep. of Germany, assignors to Michael Ketterer, Fed. Rep. of Germany
Filed Oct. 24, 1986, Ser. No. 922,854
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538196
Int. Cl.[4] B62D *33/08*
U.S. Cl. 296—26 **15 Claims**



1. Carrier for conveying horses, comprising:
a tub-like substructure (22) mounted on a chassis (20), a door for entry and exit of the horses being provided at a rear end of the substructure;
a roof (34) supported by the substructure (22); and,
a lift device located between the substructure (22) and the roof (34), the lift device being operable for lifting the roof (34) in relation to the substructure (22), whereby the roof (34) can be moved between a normal closed position on the substructure (22), to a raised position in which a free space is defined between the roof (34) and the substructure (22), the lift device having on each side of the carrier a front moving arm (40) and a rear moving arm (42), each said moving arm being connected on one hand with the substructure (22) by means of lower linkages (48, 60), and on the other hand with the roof (34) by means of upper linkages (54, 58), the front moving arms on each side of the carrier being rigidly interconnected, said front moving arms being legs of a U-shaped hoop of which a base (44) of the hoop is disposed substantially parallel to a front wall (26) of the carrier.

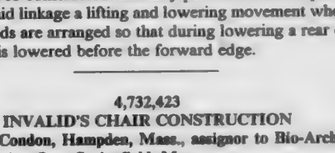
4,732,420
COMBINED HEADACHE RACK AND STORAGE COMPARTMENT FOR TRUCKS
Lorraine B. O'Neil, R.R. 1, Box 72, and Jeffery M. Miller, R.R. 1, Box 73, both of Williston, N. Dak. 58801
Filed Mar. 31, 1987, Ser. No. 32,239
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—43 **9 Claims**



1. A combined trailer headache rack and side kit component storage compartment adapted to be mounted rearwardly of a truck cab and forwardly of a trailer connected with the truck for towing comprising a pair of supporting stands adapted to be rigidly attached to the truck frame rails rearwardly of the cab and extending upwardly therefrom, a bottom pan supported rigidly between the upper ends of said stands, said bottom pan including spaced stake sockets along the front and rear edge thereof for receiving the stakes on a front headboard and tailgate removed from a flat bed trailer for storing the front headboard and tailgate on the bottom pan in spaced relation to form a space for receiving the side boards and stakes removed from a flat bed trailer when converting the side kit trailer to flat bed use and means rigidly securing the removed flat bed components to the bottom pan to form a headache rack to protect the driver of the truck from forwardly shifting loads when the flat bed trailer does not include a headboard mounted thereon and providing a convenient storage area for the side kit components to enable them to be more easily stored and more easily assembled onto the flat bed trailer.

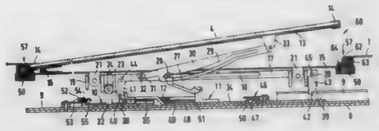
4,732,421
SELF-STORING, RETRACTABLE AUTOMOBILE COVER
Richard E. Ross, 1026 Oak Grove Rd., Concord, Calif. 94518, and Donald R. Harvey, P.O. Box 399, Benicia, Calif. 94510
Filed Oct. 30, 1986, Ser. No. 924,754
Int. Cl.[4] B60J *7/20*
U.S. Cl. 296—136 **10 Claims**

1. A self-storing, retractable automobile cover apparatus, including; a pair of end members; a plurality of rigid tubes, extending between said end members and rigidly joined thereto to maintain said end members disposed in spaced apart disposition; a tubular reel assembly rotatably secured between said end members; a pair of cylindrical housings, each secured to one of said end members; a pair of constant force spiral springs, each received within one of said housings and connected between the respective end member and the adjacent end of said tubular reel assembly; a fabric auto cover adapted



to be wound about said tubular reel assembly, two of said rigid tubes disposed in closely adjacent, parallel opposition, said fabric auto cover having a free end extending between said two rigid tubes as fixed roller guides, means for connecting said springs so that unwinding said cover from said tubular reel assembly drives said tubular reel assembly to wind said pair of spiral springs; and means for removably securing said apparatus to one bumper of the auto.

4,732,422
SLIDING-LIFTING ROOF FOR AUTOMOBILES
Albert Schlapp, Dreieich, and Rudolf Roos, Maintal, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany
Filed Jul. 23, 1986, Ser. No. 888,617
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 35269545
Int. Cl.[4] B60J *7/05*
U.S. Cl. 296—221 **7 Claims**



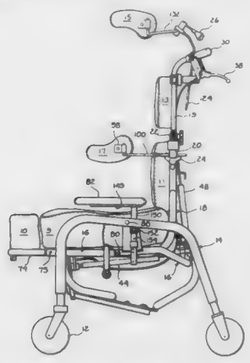
1. A sliding-lifting roof for an automobile, the roof comprising a lid which is pivotally mounted on an intermediate frame in the vicinity of its forward edge; forward sliding elements provided for slidably guiding the lid on lateral guide rails; driven rear sliding elements for driving the lid; a guide carriage coupled to each of the rear sliding elements, guided on said guide rails and connected to said intermediate frame by link rods and pins which substantially form with said intermediate frame a parallelogram linkage; said guide carriage and said link rods being so constructed that they permit said lid to perform through said linkage a lifting and lowering movement wherein the link rods are arranged so that during lowering a rear edge of the lid is lowered before the forward edge.

4,732,423
INVALID'S CHAIR CONSTRUCTION
James R. Condon, Hampden, Mass., assignor to Bio-Architectural Design, Inc., Springfield, Mass.
Filed Oct. 27, 1986, Ser. No. 923,586
Int. Cl.[4] A47C *1/032, 7/36*
U.S. Cl. 297—284 **6 Claims**

1. Invalid's chair comprising a wheel supported frame including a pivotable seat support section and a pivotable back support section, the seat support section having a seat cushion disposed thereon, said cushion having outer, inner and side

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edge portions, said seat support section and back support section being tiltable about discrete pivot means disposed at a distance from the inner edge of the seat cushion of about one-third of the depth of said seat cushion measured from its inner to outer edge so that a patient's torso and chair back will essentially be tilted together, a pair of rod supported, trunk engaging support pads disposed on the back section of said



frame by mounting means whereby the trunk pads remain in essentially fixed relation to the patient's torso when tilted with said chair back, said mounting means being horizontally rotatable and vertically pivotable and also linearly adjustable, said mounting means each including a means for clamping said rod in fixed position and simultaneously locking the rod in a fixed horizontal and vertical angular positions.

4,732,424

SITTING FURNITURE, IN PARTICULAR SWIVEL CHAIR

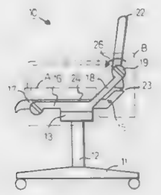
Angela Uredat-Neuhoff, Vosseberge 18, 4592 Linder/Oldenburg, Fed. Rep. of Germany

Continuation of Ser. No. 763,697, Aug. 8, 1985, abandoned. This application May 1, 1987, Ser. No. 52,136

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429186

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—317 15 Claims



1. Sitting furniture, in particular a swivel chair (10;70) with a frame (15; 71), a seat having a front section and a rear section, (24; 79) and a back (22; 77) pivotably connected by a hinge (23) with the rear section of the seat, the back being pivotably mounted at two mounting positions, above the hinge (23), at a section of the frame extending rearwardly of the front section of the seat (19; 76), the seat being supported on the frame (15;71) by means of a seat-guide, provided at the front section of the seat, and being movable in forward and rearward directions corresponding to a rest position and a second working position respectively, and spring means (40; 96) for forcing the seat and back into the working position, the spring means (40; 96) in the area of at least one mounting position (19; 76) on said frame (15; 71), said at least one mounting position being positioned between the back (22; 77) and a section of the frame extending rearwardly of the front section of the seat (15; 71) above said hinge (23), an arcuate rotary spring at least partially surrounding said mounting position (19; 76), the rear section of the seat (24; 79) being rearwardly and upwardly inclined at an essentially fixed angle with respect to the front section of the seat, a guide means for the front section of the seat (24; 79) for the automatic adjustment of the slope of the seat, which corresponds to the slope of the back, the guide means including a longitudinal hole (31;83) for slidably receiving a cross bar (25) essentially transverse to a plane defined by the longitudinal hole (31; 83), the longitudinal hole (31; 83) being inclined upwardly and forwardly with respect to a plane tangential to a top surface of the front section of the seat (24; 79), whereby rearward rotation of the portion of the back above said at least one mounting position (19; 76) about said hinge (23) increases the angle between said seat (24; 79) and said back (22; 77) and causes said hinge (23) and said front and rear sections of said seat (24; 79) to move forward and upward, and forwardly and upwardly inclines said seat (24;79) so that a forwardmost portion of said front section of said seat (24; 79) is raised higher than a rearwardmost portion of the front section of said seat (24;79).

4,732,425

SEAT RECLINING MECHANISM FOR VEHICLES

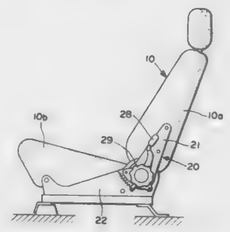
Takami Terada, and Yukifumi Yamada, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Continuation of Ser. No. 739,846, May 31, 1985. This application May 26, 1987, Ser. No. 53,549

Claims priority, application Japan, May 31, 1984, 59-81299[U]; Sep. 28, 1984, 59-148165[U]

Int. Cl.[4] B60N *1/06*

U.S. Cl. 297—362 5 Claims



1. An adjustment mechanism for reclining a vehicle seat comprising:

a first bracket supporting a seat back portion of a seat assembly and having a pivotal slot;

a second bracket supporting a seat cushion portion of the seat assembly, said first bracket being pivotally mounted adjacent to said second bracket;

internal gear means formed on said first bracket and having inwardly directed gear teeth eccentrically dispoesd about said pivotal slot;

a disc plate adjacent said first bracket and having external gear means disposed in meshed engagement with said internal gear means, said disc plate having an axial aperture and said external gear means having outwardly directed gear teeth circumferentially disposed relative to said axial aperture, the number of said internal gear teeth of said internal gear being more than the number of said external gear teeth;

shaft means for pivoting said first bracket relative to said second bracket, said shaft means having a pair of coaxial portions and an eccentric portion extending therebetween, said eccentric portion extending through said pivotal slot for rotatably supporting said internal gear means and said first bracket, one of said pair of coaxial portions extending through said axial aperture and the remaining one of said pair of coaxial portions being pivotally attached to said second bracket;

bearing means mounted on said pair of axial portions of said shaft means for reducing resistance on the periphery of said shaft means, said bearing means including a first bearing member mounted between said first bracket and said second bracket, said first bearing member having a portion extending radially outward relative to said eccentric shaft means to engage and space said first and second brackets and for reducing also radial resistance between said first and second brackets when said first bracket is pivoted relative to said bracket;

said external gear means including an outer peripheral portion having a plurality of teeth;

a pawl member adapted to be pivotally mounted on said second bracket for engagement with said plurality of teeth to lock said first bracket relative to said second bracket; and

an operating lever rotatably supported on said shaft means for controlling the engagement and disengagement between said pawl member and said plurality of teeth.

4,732,426

SEATING-SYSTEM FOR FOLDING WHEELCHAIRS

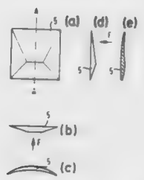
Uwe Brudermann, Heikendorf; Ruth Kruse, Laboe, and Peter Mackert, Bellin, all of Fed. Rep. of Germany, assignors to Ortopedia GmbH, Kiel, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,995

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440671

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 11 Claims



1. A seat structure comprising a portion useful as a seat portion, a back portion, or both for collapsible invalid chairs having flexible seat or back coverings of an upholstery material (3) and a covering material (4) at least partially enclosing the upholstery material, characterized in that the upholstery material (3) comprises a spring-back resilient and steam permeable material and is shaped as a molded part providing for favorable seating pressure distribution; that the covering material (4) is provided with ultrafine perforations (7) rendering the covering material permeable to steam; that the seat structure allows for the collapsibility of the collapsible invalid chair owing to the flexibility of the materials used and the configuration of the molded part; that the development of the surface of the molded part for seat, back, or both portions corresponds approximately to the conventional blank of seat or back coverings of collapsible invalid chairs provided with a flexible seat, back, or both covering, and that the molded parts, in their unloaded state, are shaped to be convex in the direction of the load.

4,732,427

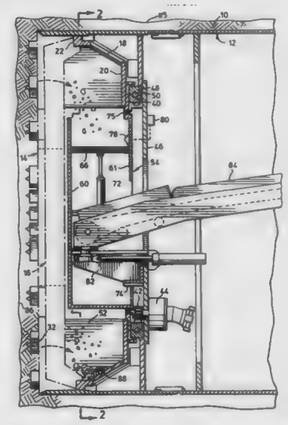
HEAD INTAKE FOR TUNNELLING MACHINE

Richard Lovat, 42 Grovetree Rd., Rexdale, Ontario, Canada (M9W 2Y2)

Filed Sep. 17, 1986, Ser. No. 908,167

Int. Cl.[4] E21D *9/08*

U.S. Cl. 299—33 12 Claims



1. Apparatus for tunnelling through soil, comprising:

a housing;

a cutting head rotatably mounted on one end of the housing and closing said one end, the head being sealed from the housing,

a muck ring fixed to the housing and projecting from the housing into the cutting head, the muck ring defining a chamber opening into the cutting head to receive loose soil collected within the cutting head; and

closure means operable in response to earth pressure change within the cutting head to open and close the opening in the muck ring whereby a predetermined earth pressure is maintained in the cutting head.

4,732,428

STREAMLINED WHEEL FOR BICYCLE

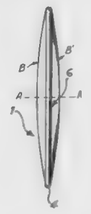
Antonio D. Monte, Rome, Italy, assignor to Also Laboratori S.a.s. di Dr. P. Sorbini & C., Milan, Italy

Filed Jan. 2, 1985, Ser. No. 688,133

Claims priority, application Italy, May 4, 1984, 21700/84

Int. Cl.[4] B60B *3/08, 5/02*

U.S. Cl. 301—63 DD 5 Claims



1. A streamlined wheel upon which a tire of a bicycle is mounted, the wheel comprising:

first and second half-shells which when joined form a hollow wheel; each half-shell being made of reinforced composite plastic material, being circular about an axis and having a thin cross section; the half-shells each having

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identical, continuously convex curved outer surfaces terminating in rim portions extending inward of the convex outer surfaces, each rim portion being formed by a radial flange extending radially inwardly toward the axis and joined to the continuously convex outer surface by a peripheral portion and by an axial flange extending in the axial direction from the radial flange; means for joining the axial flanges of the half-shells to one another at a location on each axial flange spaced from the radial flange of the other half-shell to form a groove around the periphery of the wheel for receiving the tire, which tire forms a substantially continuous curve with the continuously convex outer surfaces.

4,732,429

HYDRAULIC BRAKE SYSTEM WITH SLIP CONTROL

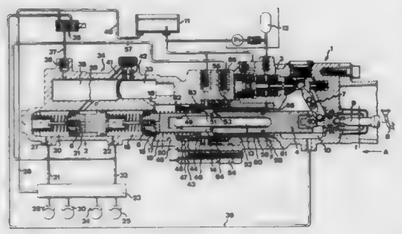
Juan Belart, Wuldorf, Spain; Wolfram Seibert, Pfungstadt; Norbert Ocvirk, Offenbach, both of Fed. Rep. of Germany; Juergen Schonlau, Niedernhausen, and Guenter Trach, Offenbach, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 904,922

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531782

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—114 **5 Claims**



1. A hydraulic brake system with slip control for automotive vehicles, comprising a master cylinder (2) pressurizable by means of a hydraulic power booster (1), wherein valve means (23, 38) are provided between the master cylinder (2) and wheel brakes (24, 25, 29, 30) connected to the master cylinder, through the intermediary of said valve means a pressure medium is drawn from the wheel brakes (24, 25, 29, 30), the pressure medium drawn from the wheel brakes being replenishable from a pressure chamber (10) of the hydraulic power booster (1), and wherein a limitation of the lift of a brake pedal (8) occurs during the slip control, wherein a booster sleeve (52) is provided which annularly encloses a booster piston (4) of said booster (1) and whose end face directed towards the pressure chamber (10) of the booster (1) is acted upon by the pressure in the pressure chamber (10), the booster sleeve (52) being coupled to the booster piston (4) by way of a stop in the form of a circlip (53), and whereupon movement of the booster piston (4) in the direction of brake release, the booster sleeve (52) is entrained by the booster piston (4), and on displacement of the booster piston (4) exclusively by way of a push rod (9) articulated at the brake pedal (8) in the direction of a brake actuation, the booster sleeve (52) will remain in its initial position.

4,732,430

BLOW MOLDED DRAWER FRONT

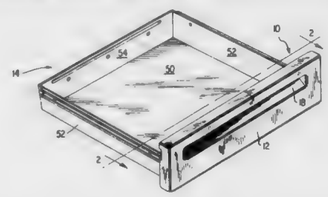
James E. Byrns, 1027 2nd Ave., South, Clinton, Iowa 52732

Filed Feb. 26, 1987, Ser. No. 19,377

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—330 R **4 Claims**

1. A drawer construction including a generally rectangular, elongated drawer front having a forward portion and a rear portion, a sheet metal drawer frame including a bottom wall, a rear wall and two side walls, means for positioning the drawer frame to the drawer front, at least one of said bottom wall and side walls having a bend adjacent the rear portion of said drawer front, said bend having a free edge, the rear portion of said drawer front rigidly carrying at least one tab which overhangs and engages said bend free edge, whereby when the drawer front is pulled forwardly, the drawer frame will move with it, said means for positioning the drawer frame to the drawer front defined by a fastener extending from said bend and extending through and anchored to the rear portion of said



drawer front, said drawer front being of a one-piece, blow molded thermoplastic construction having a generally hollow interior, the rear portion of said drawer front having a strengthening rib from which said tab integrally extends, said free edge of said bend snugly engaged between said tab and an associated portion of the rear portion of the drawer front, whereby pulling forces of the fastener on the walls of the drawer front are reduced to a minimum, with the pulling force mainly being taken by the tab, with the result that tearing or rupturing of the plastic from which the drawer front is formed is inhibited.

4,732,431

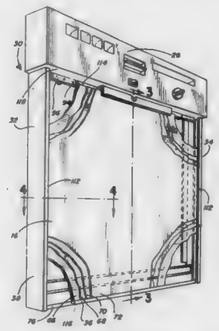
INTERCHANGEABLE DOOR PANELS FOR DISHWASHER

Anthony Mason, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 21, 1986, Ser. No. 865,514

Int. Cl.[4] E06B *00/00*

U.S. Cl. 312—109 **16 Claims**



1. A door for use with an electrically operated appliance, said door comprising:

a frame having a front side, and defining first and second spaced, panel-receiving channels opening towards each other, and a third channel,

said first and second channels each having a first end adjacent to the third channel and a second end remote from the third channel,

said first, second and third channels cooperatively defining a U-shaped channel,

said frame further having a fixed wall with a surface adjacent to the second ends of said first and second channels and facing said third channel;

a first, flexible, decorative panel,

said panel being substantially flat and defining a first decorative surface to be exposed at the front of the door, said panel having peripheral, rectilinear edge portions, a first and a second of said edge portions being noncontiguous to each other and spaced sufficiently that the panel must be bowed to bring said first and second edge portions towards each other to permit entry of the first and second edge portions into said first and second channels of the frame while the panel is urged toward said front side of the frame and permit the first and second edge portions of the panel when aligned with said first and second channels to be released to permit the panel to return to a flattened state so that said first and second edge portions are retained in said first and second channels,

said panel further defining third and fourth edge portions,

said fixed wall preventing assembly of the panel onto the frame by introduction of the first and second panel edges adjacent said third panel edge into the first and second channels at the second end of the first and second channels,

said third channel being arranged so that the panel must be moved parallel to the plane of the flat decorative surface to seat the third panel edge portion in the third channel; and

means for removably retaining the fourth panel edge portion in association with the frame,

whereby the panel is removably mounted to said frame by installation from the front side of the frame, and said retaining means is releasable to permit said panel to be separated from the frame as desired.

4,732,432

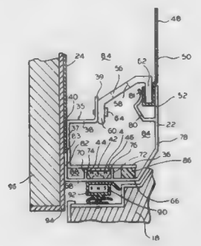
BREAKER STRIP FOR A REFRIGERATOR CABINET

John P. Keil, Ohio Township, Warrick County; George W. Sisk, Center Township, Vanderburgh County; Glenn E. Katterhenry, Knight Township, Vanderburgh County, and Walter H. Schentrup, Perry Township, Vanderburgh County, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 29, 1986, Ser. No. 946,931

Int. Cl.[4] B65D *25/18*

U.S. Cl. 312—214 **18 Claims**



1. A refrigeration apparatus cabinet defining a front opening, said cabinet comprising:

an outer wall defining a front edge portion;

a liner within and spaced inwardly from said outer wall;

a body of in-situ formed insulation disposed in an insulation space between said outer wall and said liner;

a frame having a first surface portion secured to said front edge portion of said outer wall;

first securing means for securing said liner to a second surface portion of said frame to maintain said liner in spaced relation with said outer wall; and

a resinous plastic breaker strip disposed between said front edge portion of said outer wall and said liner, said breaker strip comprising a generally U-section element including

(a) a front portion defining a front face of said cabinet and spaced outwardly from a third surface portion of said frame, said front portion having an outer rearwardly extending portion aligned with and disposed forwardly of said front edge portion of said outer wall,

(b) a rearwardly extending inner turned portion,

(c) second securing means for securing said inner turned portion to said liner, and

(d) third securing means for securing said breaker strip front portion to said frame in forwardly spaced relationship thereto, thereby defining a space between said front face of the breaker strip and said frame to prevent moisture condensation on the frame, said front face of said breaker strip defining a seamless front face for said cabinet.

4,732,433

DEVICE PREVENTING THE SIMULTANEOUS OPENING OF A PLURALITY OF SUPERPOSED DRAWERS IN A COMMON PIECE OF FURNITURE

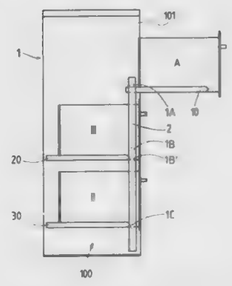
Alain Bruneau, Montferrand le Chateau, France, assignor to Alpia S.A., Besancon, France

Filed Jul. 24, 1986, Ser. No. 889,817

Claims priority, application France, Jul. 30, 1985, 85 12055

Int. Cl.[4] E05B *65/46*

U.S. Cl. 312—221 **5 Claims**



1. For use in a cabinet having a plurality of drawers movable from a closed position to a front of the cabinet for opening thereof and toward a rear of the cabinet for closing thereof, a semiautomatic safety mechanism for enabling any one of the drawers to be opened when all the drawers are closed and for enabling only one closed drawer to be opened at a time comprising, a single vertical guide mountable in use vertically inside of a side of the cabinet adjacent to the front of the cabinet, a single rigid safety bar freely slidable vertically in said vertical guide to a terminal raised position and to a terminal lowered position as individual drawers are opened and closed, said safety bar having a plurality of rollers rotatably mounted thereon spaced longitudinally on the safety bar, each drawer having a rigid rail mounted along a side thereof, each drawer other than a lowermost drawer having said rail thereof disposed for coaction with a corresponding roller on said safety bar for activating the safety bar individually to move the safety bar longitudinally upwardly only as individual closed drawers other than said lowermost drawer are opened and for effectively allowing the safety bar to move downwardly under control of the individual rails of said drawers when restored to a closed condition, said rollers being disposed on said safety bar at fixed points of rotation thereon to move upwardly and downwardly with the safety bar to operative positions for

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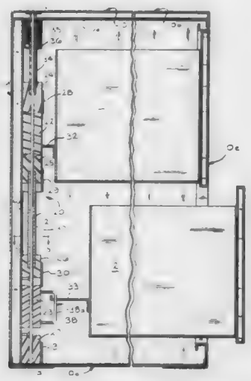
effecting cooperation with the corresponding individual rails on the individual drawers for enabling individually the corresponding individual rails to ride on a corresponding roller only one at a time for enabling opening of only one drawer at a time and at said operative positions effectively disenabling the opening of closed drawers other than the drawer corresponding to the enabled individual rail, each rail having a leading end for cooperating with the corresponding roller and configured for lifting of the safety bar progressively as the corresponding drawer is opened and for allowing the safety bar to move downwardly progressively, as the corresponding drawer is closed, said safety bar being disposed at said terminal lowered position when all said drawers are closed and the rollers thereon being disposed effectively enabling any one of all the closed drawers to be opened only one at a time, and the rigid rail of the lowermost drawer being disposed for bearing on a lowermost roller on said safety bar to preclude moving the safety bar upwardly when said lowermost drawer is opened with said safety bar disposed at said terminal lowered position whereby when the lowermost drawer is opened no other drawer can be opened until the lowermost drawer is closed.

4,732,434

HORIZONTAL FILE DRAWER INTERLOCK ASSEMBLY

Laude E. Hartrum, Pentwater, Mich., assignor to Metalworks, Inc., Ludington, Mich.

Filed Sep. 29, 1986, Ser. No. 912,543
Int. Cl.⁴ E05C *7/06*
U.S. Cl. 312—221 **24 Claims**



1. In a cabinet apparatus including a housing having a top wall and opposed bottom wall, two opposed side walls, a front wall and a back wall, at least two drawers mounted inside the housing through the front wall so as to slide horizontally away from the front wall to open the drawer and towards the back to close the drawer and an interlock assembly mounted inside and on the housing which engages an extension means from the drawer to prevent both drawers from being opened simultaneously the improvement in the interlock assembly which comprises:

(a) a rod having a longitudinal axis between two ends rigidly mounted in a parallel spaced relationship to a rear portion of each of the drawers;

(b) cam means rotatably and slideably mounted around the axis of the rod adjacent the rear portion of each of the drawers, wherein at least one end of the cam means around the axis of the rod has a sinusoidal surface such that there are lobes of the sinusoidal surface and valleys between the lobes on the surface on each cam means;

(c) block means slideably mounted on the rod at the one end of each of the cam means having the sinusoidal surface and having mating ends with second sinusoidal surfaces with lobes and valleys offset around the end of the block means when the drawers are closed so that the lobes and the valleys of the cam means and blocks means mate together;

(d) pivot means mounted on a side between the ends of each cam means which engages the extension means from each drawer; and

(e) guide means mounted inside the housing supporting the block means for linear movement along the axis of the rod without rotational movement perpendicular to the axis of the rod upon rotation of the cam means by the pivot means and the extension means, wherein the guide means support the interlock assembly to prevent movement of the rod, cam means and block means perpendicular to the longitudinal axis of the rod and

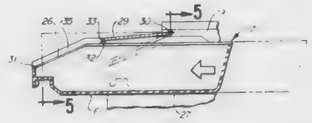
wherein when one of the cam means is rotated by the pivot means and extension means of a first of the drawers, the lobes of the cam means and the block means are engaged and the block means between the cam means and housing moves along the axis of the rod to engage the housing, thereby preventing a second cam means from being rotated by the pivot means and extension means of a second of the drawers.

4,732,435

REFRIGERATOR CRISPER DRAWER STRUCTURE

Curtis J. Bailey; Richard A. Heck, both of Birmingham, and Richard Waisanen, Warren, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 7, 1986, Ser. No. 928,167
Int. Cl.⁴ A47B *88/04*
U.S. Cl. 312—311 **15 Claims**



1. In a refrigerator having a cabinet defining a compartment having a front access opening, a door selectively movable to a closed position closing said opening, said door having a horizontal shelf extending rearwardly into a forward portion of said compartment for storing articles thereon, a drawer defining an upwardly opening cavity including a front portion, and means for movably mounting the drawer in said compartment for selective disposition in a rearward storage position wherein said front portion of the cavity is disposed in said forward portion of said compartment and underlies the door shelf when the door is in said closed position, the improvement comprising:

a cover member;

mounting means for movably mounting said cover member in said cabinet to overlie said upwardly open cavity front portion when said drawer is in said storage position and to be moved to a different position as a result of the drawer being moved from said storage position; and

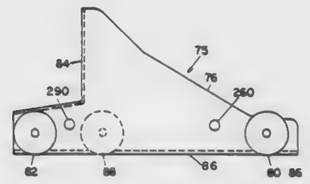
means for effectively rejecting retention of any one of a plurality of different articles on said cover member when covering said cavity front portion in said storage position and permit free movement of said shelf to overlie said cover member overlying said cavity front portion in said storage position upon movement of the door to said closed position.

4,732,436

CANTILEVERED DRAWER SLIDE ARRANGEMENT

Gary W. Nelson, 22933 Hatteras St., Woodland Hills, Calif. 91367

Continuation of Ser. No. 533,996, Sep. 20, 1983, Pat. No. 4,615,572. This application Jul. 7, 1986, Ser. No. 882,826
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.⁴ A47B *88/04*
U.S. Cl. 312—341 R **5 Claims**



5. A simplified drawer guide system in combination with a drawer and a cabinet comprising

a pair of metal tracks, respectively mounted rigidly to the cabinet at opposite sides of the drawer and extending forwardly and rearwardly, the drawer having upright front, rear and left and right side walls defining a storage space,

left and right metal brackets attached to the outermost surfaces of the left and right side walls of the drawer, each bracket having a plate carrying anti-friction means independently of said drawer side walls, with the anti-friction means spaced in cantilevered and sidewardly offset relation to the plate and to the drawer,

the anti-friction means associated with each bracket mounted onto one of the tracks for supporting the drawer rearward extent for forward and rearward drawer travel relative to the cabinet, the anti-friction means, brackets and tracks being everywhere confined rearwardly of an upright plane defined by the front of the cabinet when the bulk of the drawer is pulled forwardly to project at the front side of said plane,

each bracket including a first and vertically upright flange integral with an upwardly projecting portion of the plate and extending at right angles thereto and engaging the rear end of the drawer and attached thereto, said first flange extending above the levels of the anti-friction means,

there being only two anti-friction means carried by each plate to extend proximate opposite ends respectively, of the plate, the anti-friction means spaced forwardly and rearwardly, the track being channel shaped and receiving the two anti-friction means within said track channel, the anti-friction means having point-surface contact with the track,

and including adjustable means carried by the tracks to adjustably move relatively toward opposite outer sides of the drawer, for engagement with said sides to limit and reduce drawer side-to-side wobble during drawer in and out movement,

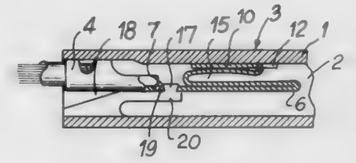
and wherein said brackets, anti-friction means and tracks are entirely confined adjacent about the rearwardmost one-third of the drawer when the drawer is pulled fully forwardly to project at the front side of the cabinet.

4,732,437

ELECTRICAL CONNECTOR

Bertrand Vandame, Villepreux, France, assignor to Precision Mecanique Labinal, Bois d'Arcy, France

Filed Jul. 7, 1986, Ser. No. 882,471
Claims priority, application France, Jul. 4, 1985, 85 10220
Int. Cl.⁴ H01R *13/40*
U.S. Cl. 339—586 **36 Claims**



1. An electrical connector having at least one compartment adapted to house an electrical contact device wherein said at least one compartment has an aperture therein adapted to permit said electrical contact device to extend therethrough, said at least one compartment comprising:

(a) a locking device including a lug having a wall for locking said electrical contact device having a portion complementary to said locking device in said at least one compartment in response to inserting said electrical contact device in said at least one compartment through said aperture and positioning said electrical contact device and said at least one compartment in a first position with respect to each other, said locking device including means for engaging said portion complementary to said locking device when said electrical contact device is in said first position;

(b) means for preventing said locking device from locking said electrical contact device in said at least one compartment when said at least one compartment and said electrical contact device are rotated relative to each other along the longitudinal axis of said connector, said means for preventing comprising a ramp for preventing said locking device from engaging said portion complementary to said locking device said wall of said lug being at least as tall as said ramp and being adapted to abut said ramp, said ramp including:

(i) means for guiding said electrical contact device over said ramp and said lug in response to to relative displacement of said electrical contact device and said connector along the longitudinal axis of said at least one compartment when said electrical contact device is in said first position, and

(ii) means for guiding that portion of said electrical contact device in front of said complementary portion to abut said wall of said lug in response to relative displacement of said electrical contact device and said connector along the longitudinal axis of said connector when said electrical contact device is in said position other than said first position.

4,732,438

SPLIT-IMAGE OPTICAL VIEWING INSTRUMENT

Zvi Orbach; Lea Ziph, both of Haifa, and Shlomo Idan, Rehovot, all of Israel, assignors to Elbit Computers Ltd., Haifa, Israel

Filed May 8, 1986, Ser. No. 860,882
Claims priority, application Israel, May 16, 1985, 75213
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 350—1.1 **20 Claims**

1. An optical viewing instrument, comprising:

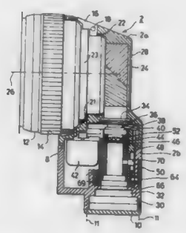
a housing including an eyepiece for viewing a field;

a beam splitter within said housing and splitting the field viewed via said eyepiece into a first image for direct

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viewing by a first observer, and a second image for viewing by a second observer;

a solid state image converter within said housing and located to receive said second image and to convert same to electrical signals for reproducing said second image at a remote location;



a focusing lens within said housing between said beam splitter and said image converter and movable towards and away from said image converter;

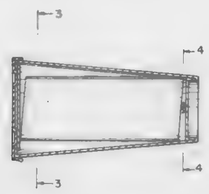
and a manipulatable member on the outer face of said housing coupled to said focusing lens for moving same towards and away from said image converter.

4,732,439

KIT ASSEMBLY FOR TRANSFORMING A CONTAINER INTO A KALEIDOSCOPE

Joseph J. Chioffe, 811 Beckman Dr., North Bellmore, N.Y. 11710

Filed Feb. 27, 1987, Ser. No. 19,964
Int. Cl.[4] G02B *23/00*
U.S. Cl. 350—4.1 **10 Claims**



1. A kit assembly for transforming a container into a kaleidoscope comprising:

(a) a hand supportable container having an open first end and a second end with a viewing hole;

(b) a reflecting means located lengthwise in said container between said first end and said second end for producing varying images at said viewing hole, said reflection means comprising a rectangularly shaped sheet having a reflecting material adhered to one side of said sheet, and said sheet folded along a lenghtwise axis and having one side of the reflecting surface facing a second side of the reflecting surface; and

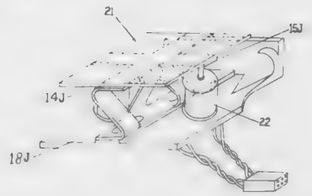
(c) a rotatable means for holding at least one picture adjacent to said first end of said container in front of said reflecting means.

4,732,440

SELF RESONANT SCANNING DEVICE

Jagmohan S. Gadhok, 1520 Belmont South, Arlington Heights, Ill. 60005

Filed Oct. 22, 1985, Ser. No. 790,134
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—6.6 **15 Claims**



1. A scanning deflector consisting of a mirror and deflecting means connected by top attaching means to one end of opposed curved springs that jointly provide torsional cross flex members which are in turn attached at the other end to a base by bottom attaching means.

4,732,441

ORIENTED-REFLECTION REFLECTIVE MIRROR SCREEN

Teh-Yao Cheng, No. 136, Li Hsing Road, Kaohsiung City, Taiwan

Filed May 14, 1987, Ser. No. 49,506
Int. Cl.[4] G03B *21/56, 21/60*
U.S. Cl. 350—125 **12 Claims**



1. An oriented-reflection reflective mirror screen for reflecting visual images projected from preset images to a specific observing area, comprising a reflective surface provided with a plurality of vertical or horizontal abutted strips having conic surfaces which are formed so as to reflect visual images projected thereon to said specific observing area which is located substantially frontward from the reflective mirror screen.

4,732,442

PHOTORADIATOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,236
Int. Cl.[4] G02B *6/00*; F21V *7/04*
U.S. Cl. 350—96.10 **9 Claims**

1. A photoradiator for diffusing light introduced from a light source comprising, in combination:

a cylindrical light conducting member having one end and an other end, said light being introduced into said one end and propagating through the light conducting member in a direction toward said other end;

a casing coaxially and hermetically surrounding said light conducting member to define an annular space in cooperation with the light conducting member, said casing being made of a light transmitting material; and

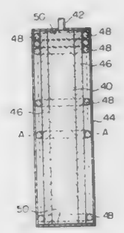
a plurality of transparent members arranged in said annular space to engage with the outer periphery of the light conducting member and the inner periphery of the casing;

said transparent members comprising transparent bars each having a substantially triangular cross-section, one side of said triangular cross-section being formed arcuate and engaged with the outer periphery of the light conducting member, said arcuate side having a length which progressively increases along the direction of light propagation through the light conducting member, said bars having a ridge formed at the junction of two of the side walls of said triangular cross-section;

said casing being formed with channels in the inner periphery thereof for receiving said ridges of the bars;

whereby the light propagating through the photoradiator is discharged radially outwardly from the photoradiator through the transparent members and the casing.

2. A photoradiator for diffusing light introduced from a light source comprising, in combination:



a cylindrical light conducting member having one end and an other end, said light being introduced into said one end and propagating through the light conducting member;

a casing coaxially and hermetically surrounding said light conducting member to define an annular space in cooperation with the light conducting member, said casing being made of a light transmitting material; and

a plurality of elongated trasparent rods disposed in said annular space and extending parallel to the light conducting member, said rods being in contact with one another and being in contact with the outer periphery of the light conducting member and the inner periphery of the casing, and a plurality of transparent rings in said annular space, surrounding said transparent rods, said rings being engaged with the rods at an inner periphery of said rings, the casing being engaged with the outer periphery of each of the rings at the inner periphery of said casing;

whereby the light propagating through the photoradiator is discharged radially outwardly from the photoradiator through the transparent members and the casing with the light emanating in the form of spots with the number of spots being the number of times said transparent rods engage the inner periphery of the rings.

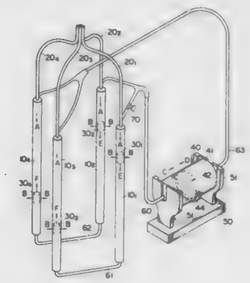
4,732,443

LIGHT RADIATOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,703
Claims priority, application Japan, Aug. 10, 1984, 59-168536
Int. Cl.[4] G02B *6/36, 6/00*; F21V *7/04*; A01G *9/02*
U.S. Cl. 350—96.10 **14 Claims**

1. A light radiator comprising a hollow transparent cylinder means, an optical conductor means for guiding light rays into said transparent cylinder means through one end of said transparent cylinder means, an optical means movably accommodated in said transparent cylinder means for reflecting said light rays guided into said transparent cylinder means from said optical conductor means and radiating said light rays outside of said transparent cylinder means, a pump means, said pump means comprising a pump cylinder means and a piston plate means partitioning said pump cylinder means and axially movable in said pump cylinder means, a first pipe means connected with one longitudinal end portion of said pump cylinder means and with one longitudinal end portion of said transparent cylinder means, a second pipe means connected with another longitudinal end portion of said pump cylinder means and with another longitudinal end portion of said transparent cylinder means, optical oil in said pump cylinder means, in said first and second pipe means and in said transparent cylinder



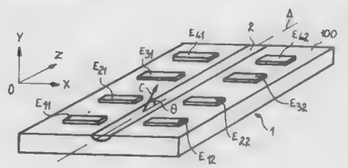
means, said pump means further comprising magnetic means for moving said piston plate means in one axial direction in said pump cylinder means to move optical oil in said first pipe means in one direction and optical oil in said second pipe means in one direction to thereby move said optical means in said transparent cylinder means in one direction, said piston plate means being axially movable in said pump cylinder means in a second direction opposite to said one direction to move optical oil in said first pipe means in a second direction opposite to said one direction and to move optical oil in said second pipe means in a second direction opposite to said one direction to thereby move said optical means in said transparent cylinder means in a second direction opposite to said one direction.

4,732,444

INTEGRATED OPTICS DEVICE FOR OPTICAL POLARIZATION CONVERSION

Michel Papuchon, Issy les Moulineaux, and Catherine Mariller, Gif sur Yvette, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 24, 1986, Ser. No. 843,265
Claims priority, application France, Mar. 26, 1985, 85 04490
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.14 **6 Claims**



1. An integrated optics polarization conversion device comprising a flat substrate made from a uniaxial crystalline material having electro-optical properties and a guide structure with given optical axis formed by doping the material of the substrate and in which at least two separate modes may propagate,

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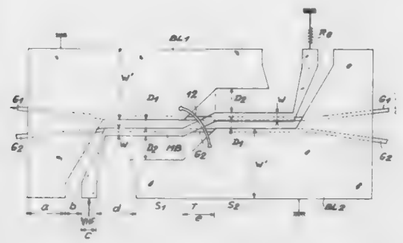
wherein said crystalline material has an optical axis contained in a plane perpendicular to the substrate and parallel to the axis of one guide, and forming an angle with the plane of the substrate less than ($\pi/2$) radians.

4,732,445

ELECTROOPTICAL DIRECTIONAL COUPLER WITH TRAVELING WAVE AND ALTERNATING PHASE SHIFT

Christian Sabatier, Nice, and Alain Carenco, Bourg La Reine, both of France, assignors to Centre National d'Etudes des Telecommunications, Issy Les Moulineaux, France

Filed Jan. 16, 1987, Ser. No. 3,935
Claims priority, application France, Jan. 16, 1986, 86 00561
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **1 Claim**



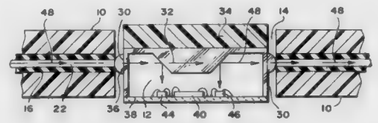
1. Electrooptical directional coupler with traveling wave and alternating phase shift of the type of those which comprise a light propagation structure consisting of a substrate containing a first optical guide (G1) and a second optical guide (G2), this structure being covered by a set of electrodes comprising three conductive strips deposited on the substrate, a central strip (MB) framed by a first and second lateral strip (BL1, BL2), this coupler comprising at least two sections (S1, S2) separated by a transition zone (T), a first section (S1) in which central strip (MB) covers second optical guide (G2), first lateral strip (BL1) covers first optical guide (G1) and second lateral strip (BL2) is very far from the central strip, and a second section (S2) in which central strip (MB) covers first optical guide (G1), second lateral strip (BL2) covers second optical guide (G2), and first lateral strip (BL1) is very far from central strip (MB), and a transition zone (T) in which central strip (MB) is inclined in relation to the direction of optical guides (G1 and G2) and goes progressively from the second to the first guide in which the edges of the lateral strips are also inclined so that first lateral strip (BL1), which covered first optical guide (G1) in first section (S1) moves away from the latter and then remains very far from central strip (MB) in a second section (S2), while the second lateral strip, which was very far from central strip (MB) in first section (S1) comes close to the latter and comes to cover second optical guide (G2) in second section (S2), the central strip having, in the two sections, a width (W) and being far away from first lateral strip (BL1) by an interval D1 and from second lateral strip (BL2) by an interval D2, in the first section, and respectively separated by intervals D2 and D1 in the second section, the amounts of W, D1 and D2 being selected so that the characteristic impedance of the propagation line formed by these electrodes is equal to a given matching value, this matching being maintained in transition T, this coupler being characterized by the fact that first and second strips (BL1, BL2) have a very great width (W') in comparison with the width (W) of the central strip and are connected together by a conductive element, the propagation line, which is formed essentially by the central strip and that of the two lateral strips which is closest, thus being asymmetrical.

4,732,446

ELECTRICAL CIRCUIT AND OPTICAL DATA BUSS

Lamar Gipson, 11510 SW. 181 St., Miami, Fla. 33157, and William P. Batina, 9310 Fontainebleu Blvd., Apt. 404, Miami, Fla. 33172

Filed Oct. 2, 1985, Ser. No. 782,940
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **68 Claims**



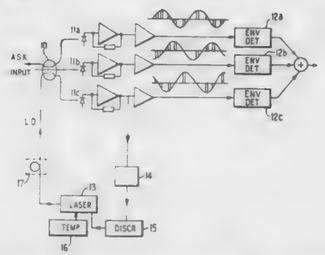
1. An electrical circuit and optical data buss comprising:
an electrical circuit board having electrically conductive circuitry;
optical signal conducting circuitry mounted on the electrical circuit board, for transmission of optical signals therethrough, said optical signal conducting circuitry including electronic chip carriers having interfaces with said circuitry and also having electrically conductive connections with the electrical circuit board;
means for interception of optical signals transmitted by the optical signal conducting circuitry;
means for converting intercepted optical signals to electrically conductive signals, and conductors for transmitting the electrically conductive signals to the electrical circuitry mounted on the electrical circuit board; and
means for converting electrically conductive signals to optical signals, including means for introducing the optical signals into the optical signal conducting circuitry.

4,732,447

HOMODYNE OPTICAL COHERENT RECEIVER FOR DIGITAL OPTICAL SIGNALS

Stephen Wright, London, and Anthony W. Davis, Harlow, both of United Kingdom, assignors to STC PLC, London, England

Filed Mar. 20, 1986, Ser. No. 842,105
Claims priority, application United Kingdom, Mar. 21, 1985, 8507342
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **4 Claims**



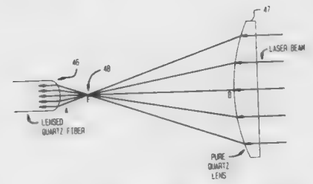
1. A homodyne optical coherent receiver for modulated optical signals including a multiport optical fibre coupler device having 3 input ports and 3 output ports with energy being coupled from each input port to all the output ports equally, means for applying to one input port a modulated optical signal, means for applying to another input port a local oscillator optical signal of substantially the same optical frequency as the modulated optical signal whereby the output ports of the coupler give separate output signals that are differentially related to the optical phase difference between the modulated input signal and the local oscillator signal, means for individually demodulating the output signals and means for combining the demodulated output signals.

4,732,448

DELIVERY SYSTEM FOR HIGH-ENERGY PULSED ULTRAVIOLET LASER LIGHT

Tsvi Goldenberg, Allentown, Pa., assignor to Advanced Interventional Systems, Inc., Costa Mesa, Calif.

Continuation-in-part of Ser. No. 679,538, Dec. 7, 1984, Pat. No. 4,641,912. This application Sep. 25, 1985, Ser. No. 779,844
Int. Cl.[4] A61N *5/06*; G02B *23/26*
U.S. Cl. 350—96.18 **23 Claims**



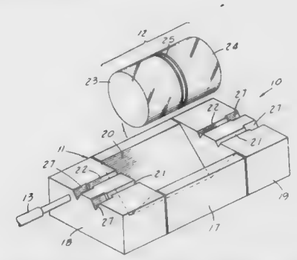
1. A system for the delivery of high energy pulsed laser light utilizing an optical waveguide, wherein said waveguide comprises an optical fiber having an energy-conducting core made of substantially pure synthetic silica; and
an energy coupler at one end of said fiber for enabling energy pulses to be coupled into said fiber while maintaining their energy level without damage to said fiber, said energy coupler comprising a surface which is substantially free of scratches at said one end of said fiber, and a lens which focusses a laser beam to a focal point, said focussing lens being located at a distance from said one end of said fiber that is greater than the focal length of said focussing lens so that laser light impinging on said fiber appears to be emanating from a point source.

4,732,449

BEAM SPLITTER

Robert J. Fan, Reseda, Calif., assignor to G & H Technology, Santa Monica, Calif.

Filed Oct. 25, 1985, Ser. No. 791,457
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **6 Claims**



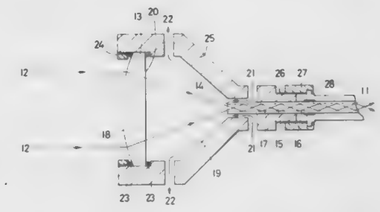
1. An optical signal beam splitter receiving an optical signal from a first fiber waveguide and passing signals to second and third fiber waveguides of predetermined character comprising:
a support base having a generally V-shaped in cross-section centrally located first groove in a surface thereof, second and third grooves in said surface communicating with said first groove and of smaller cross-section, and a fourth groove in said surface communication with said first groove and of smaller cross-section than said first groove;
first and second cylindrical lenses located in said first groove with their cylindrical axes colinear and parallel to the internal edge of said first groove;
a semi-reflecting film located between said first and second lenses;
said first, second and third fiber waveguides being received respectively within the second, third and fourth grooves with an outer end of each fiber waveguide being located slightly spaced from a surface of said first and second lenses;
a separate quantity of index matching liquid contacting the end of each fiber waveguide and a lens surface immediately opposite thereto; and
an encapsulant unitarily relating the lenses, fiber waveguides and support base.

4,732,450

INPUT/OUTPUT COUPLING DEVICE FOR OPTICAL FIBER USED IN HIGH POWER LASER BEAM DELIVERY

Chun-Sheu Lee, Torrance, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Feb. 27, 1985, Ser. No. 706,189
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **5 Claims**



1. An input/output fiber coupling device for a longitudinally extending optical fiber defining a longitudinal axis and a coupling end face substantially normal to said longitudinal axis and a side surface running parallel to said longitudinal axis comprising:
a chamber wall defining a generally longitudinally shaped chamber having oppositely disposed first and second sides, said chamber wall forming a cavity therein;
said first side of said chamber wall having an opening adapted to receive a lens, said second side of said chamber wall having a bore adapted to receive the end of the optical fiber with the end face of the optical fiber facing the interior of said cavity;
a fluid input port provided near said bore in said second side of said chamber wall for the introduction of fluid into said cavity along the end of the said side surface of the optical fiber;
a fluid output port in said chamber wall for the withdrawal of fluid from said cavity;
a focussing lens fitted within the opening of the first side of said chamber wall;
said focussing lens having input and output laser beam paths aligned along the longitudinal axis of the optical fiber for focussing a laser beam onto the end face of the fiber; and
an index-matching fluid circulating within the cavity between the focussing lens and the optical fiber end face;
wherein said index-matching fluid is introduced into said cavity through said input port, and withdrawn from said cavity through said output port thereby cooling said optical fiber end at least while said laser beam is focussed on the end face of the optical fiber;
said second side of said chamber wall is formed with an outer axial bore having a diameter substantially the same as that of the optical fiber, an inner axial bore having a

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diameter larger than that of the outer axial bore and adjoining the outer axial bore, and a radial bore communicating said inner axial bore with the outside of the cavity in an axially symmetric manner;

the optical fiber is inserted into the cavity through said outer axial bore and inner axial bore;

said fluid output port is formed on the first side of said chamber wall in an axially symmetric manner; and

the fluid is introduced into the cavity through the radial bore and an annulus formed between a wall of the inner axial bore and the surface of the fiber so that fluid flowing between said fluid input port and said fluid output port through said chamber past said lens flows in an axially symmetric manner.

4,732,451

STRUCTURE FOR MOUNTING AN OPTICAL ELEMENT

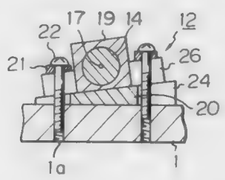
Hirosuke Furuta, Kawasaki; Kazushi Asanuma, Yokohama; Akira Okamoto, Higashikurume, and Hideki Noda, Inagi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 579,120, Feb. 10, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,784

Claims priority, application Japan, Feb. 17, 1983, 58-23821

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **9 Claims**



1. A structure for mounting on a base plate an optical element having a cylindrical portion and an optical axis, comprising:

a holder member, having a flat bottom surface and an opening, formed by a cylindrical inner surface, through which the cylindrical portion of the optical element penetrates, said holder member rotatably holding the cylindrical portion of the optical element; and

a support member, adjustably securable to said holder member, having an inclined upper surface and a bottom surface, the flat bottom surface of said holder member contacting the inclined upper surface of said support member in a face-to-face manner, said support member capable of being secured to the base plate, the optical element being mounted on the base plate at an optimum position by aligning the optical axis of the optical element in a predetermined direction while adjusting the position of said support member under said freely rotatable holder member until the inclined upper surface of said support member is in face-to-face contact with the flat bottom surface of said holder member and the bottom surface of said support member is in face-to-face contact with the base plate, and then securing said support member to said holder member and the base plate, substantially all of the cylindrical inner surface of said holder member remaining in contact with the cylindrical portion of the optical element while adjusting the position of said support member.

4,732,452

OPTICAL CONNECTORS

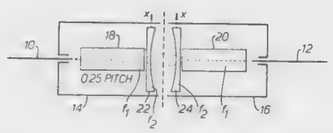
Andrew C. Carter, Blisworth, United Kingdom, assignor to Plessey Overseas Limited, Ilford, England

Filed May 3, 1984, Ser. No. 606,501

Claims priority, application United Kingdom, May 7, 1983, 8312650

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **7 Claims**



1. An optical connector arranged to be coupled with a complementary connector to form an optical connection between optical fibres, said connector including:

support means for supporting an end of a first of said optical fibres;

an optical axis, said support mean supporting said end of said first optical fibre nominally on said optical axis;

a first light displacement means mounted on said optical axis, said first light displacement means having a first light displacement power;

a second light displacement means mounted on said optical axis, said second light displacement means having a second light displacement power;

mounting means for said second light displacement means, said mounting means permitting adjustment of said second light displacement means orthogonally of said optical axis;

and joining means permitting the optical connector to be coupled to said complementary connector to form an optical connection between an optical fibre supported thereby and said first of said optical fibres.

4,732,453

INTEGRAL PHOTOGRAPHY APPARATUS AND METHOD OF FORMING SAME

Roger L. de Montebello; Ronald P. Globus, and Howard S. Buck, all of New York, N.Y., assignors to Integrated Images, Inc., New York, N.Y.

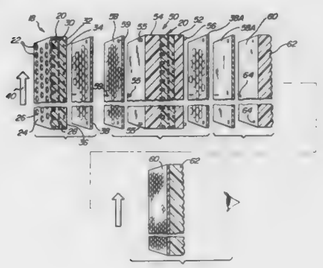
Filed Dec. 10, 1984, Ser. No. 680,342

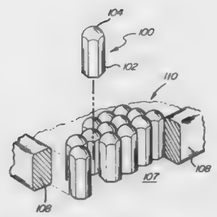
Int. Cl.[4] G02B *27/22, 27/00;* **B29D** *11/00;* **G03B** *35/08*

U.S. Cl. 350—130 **4 Claims**

4. A master array for use in forming an integral photography camera which includes a transparent screen having an array of lenslets formed on one surface, as well as an integral photography viewing screen comprising a transparent sheet having a similar array of lenslets formed on one surface, comprising:

a plurality of identical, elongated elements each element comprising a first domed end, a second, opposite socketed end, the domes and the sockets being formed along the central axes of the elements, and a polygonal configuration, symmetric about the central axis of the element, formed between the domed and socketed ends, whereby a plurality of the elements may be stacked with their polygonal surfaces in abutment to one another so that the domed ends form an arrayed surface and the socketed ends form a second arrayed surface on the same axes as the domed array surface, whereby a plurality of elements may





be fabricated each employing an array based on the centers of the surfaces.

4,732,454

LIGHT-TRANSMISSIBLE PLATE SHIELDING ELECTROMAGNETIC WAVES

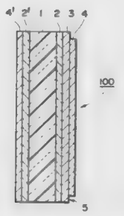
Takeshi Saito, Otsu; Kazuo Okamoto, Jyoyo; Masaki Tsuchida, Kusatsu, and Satoshi Nagai, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,035

Claims priority, application Japan, Apr. 22, 1985, 60-84662; Apr. 23, 1985, 60-87167; Dec. 23, 1985, 60-287827

Int. Cl.[4] G02B *1/10*

U.S. Cl. 350—164 **22 Claims**



1. A light-transmissible plate for shielding electromagnetic waves comprising:

a transparent plastic base plate;

a hard coating layer provided on a surface of said base plate, said hard coating layer having scratch resistance;

an electroconductive layer provided on the surface of said hard coating layer, said electroconductive layer being formed in an atmosphere of oxygen and at a temperature of less than 150° C.; and

a layer provided on the surface of said electroconductive layer, said layer having a lower refractive index than the refractive index of said electroconductive layer.

4,732,455

LENS SUPPORT

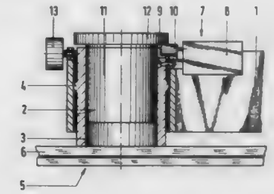
Peter Dziemba, Wieselsheim, and Dieter Immerheiser, Bad Nauheim, both of Fed. Rep. of Germany, assignors to MAP Mikrofilm Apparatebau Dr. Poehler GmbH & Co KG, Ober-Morlen, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,431

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439254

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—255 **7 Claims**



1. A lens support, comprising a lens holder, a lens sleeve adapted to float in the lens holder and to rest on a film holder, a lens mount axially slidably disposed within the lens sleeve, focussing means comprising a servomotor fixed at the lens sleeve, and a counterweight fixed at the lens sleeve at a side of the lens sleeve opposite the servomotor.

4,732,456

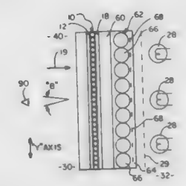
SCATTERING DISPLAY FOR CONTRAST ENHANCEMENT INCLUDING TARGET

James L. Fergason, Atherton, and Robert Parker, Alamo, both of Calif., assignors to Taliq Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 645,457, Aug. 28, 1984, abandoned. This application May 18, 1987, Ser. No. 53,583

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—334 **24 Claims**



1. A display comprising means having two states, one state for scattering incident light and a second state for transmitting incident light as a response to a prescribed input independent of the incident light, and focusing means for directing unscattered light transmitted through said scattering or transmitting means onto a light absorbing target means external to and on a non-viewing side of said scattering or transmitting means for enhancing the contrast of the display.

4,732,457

AUTONOMOUS POWER SUPPLY FOR OBSERVATION DEVICE, IN PARTICULAR WITH STEREOSCOPIC EFFECT

Fernande F. Lafonta, and Paul A. Lafonta, both of Paris, France, assignors to L'Etat Francais represente par le Delegue Ministeriel pour l'Armement

Filed Jul. 31, 1985, Ser. No. 760,812

Claims priority, application France, Aug. 16, 1984, 84 12832

Int. Cl.[4] G02F *1/03;* **G02B** *27/22;* **H03K** *3/86*

U.S. Cl. 350—356 **10 Claims**

1. An autonomous power supply for a steroscopic observa-

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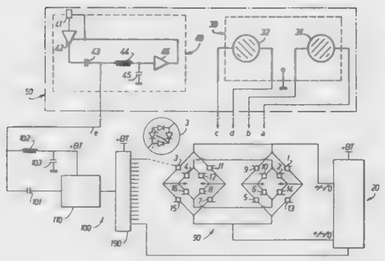
tion device including first and second capacitive-effect electro-optical cells, each cell containing an electro-optical material and each cell being controlled by a system of control electrodes which receive high-amplitude electrical signals, and including a clock system for generating clock signals to control periodic application of electrical control signals to said control electrodes, said power supply comprising:

a low-voltage power source;

circuit means for generating intermittent high voltage from said low-voltage power source, including an inductance coil having first and second coil terminals, said first coil terminal being connected to a first terminal of said low-voltage power source, and said second coil terminal being connected to a second terminal of said low-voltage power source through a controllable switching component, and a capacitor in connected parallel with said switching component;

a set of switches connected between said circuit means for generating intermittent high voltage, and said system of control electrodes of said electro-optical cells;

means for processing said clock signals, including means for processing said synchronization signals received by said means for receiving, and for controlling said switching components and said set of switches;



means for receiving a carrier wave modulated by synchronization signals to control synchronized periodic application of said high-amplitude electric control signals to the electrode systems of said first and second electro-optical cells; and

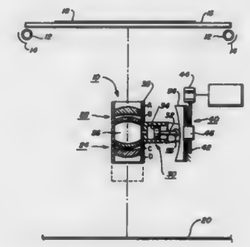
said set of switches comprising first and second controllable switches, each having first terminals connected intermediate said inductance coil and switching component and each having second terminals connected to respective electrodes of said first and second electro-optical cells, and third and fourth switches, each having first terminals connected to said first terminal of said inductance coil and each having second terminals respectively connected to said second terminals of said first and second switches, said first and fourth switches being controlled by said means for processing said clock signals to periodically close substantially simultaneously with the opening of said switching component every odd period of the control signal applied to the switching component, and said second and third switches being controlled to periodically close substantially simultaneously with the opening of said switching component during each even period of the control signal of the switching component, said first, second, third and fourth switches being closed for a time less than the time the switching component is open.

4,732,458

GAS ZOOM LENS ASSEMBLY

Robert G. Zambelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1986, Ser. No. 902,736
Int. Cl.[4] G02B *1/06, 7/10*
U.S. Cl. 350—419 **3 Claims**



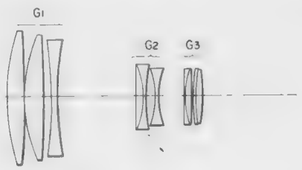
1. A gas zoom lens assembly for projecting an image of an object on an object plane onto an image plane at various magnifications comprising, in combination, a group of opposed, symmetrical lens elements defining at least a central cavity therebetween, said central cavity filled with a gas having a characteristic index of refraction, means for moving the lens towards and away from the image plane in response to a magnification selection, a piston/cylinder assembly (and means) linked to said lens movement means to simultaneously vary the pressure of the gas within said cavity so as to change the focal length of the gas in response to changes in magnification ratio (.) and a cam surface extending between said object and image planes and a cam follower attached to said piston, said piston movement within said cylinder governed by the cam motion between the cam follower and the cam surface.

4,732,459

FAST TELEPHOTO LENS

Kiyoshi Hayashi, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 633,297, Jul. 23, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 6,279
Claims priority, application Japan, Jul. 27, 1983, 58-137379
Int. Cl.[4] G02B *9/00*
U.S. Cl. 350—454 **15 Claims**



1. A fast telephoto lens, which has an F-number of approximately 2.0 to 2.8, consisting of:

a first converging lens group;

a diverging lens group; and

a second converging lens group;

said first converging lens group, said diverging lens group and said second converging lens group being arranged in succession from the object side, said first converging lens group and said diverging lens group being arranged to constitute an afocal system with respect to an object at infinity, said diverging lens group being shifted toward an image so as to focus said fast telephoto lens on a close distance object, said first converging lens group including at least two positive lens components and one negative lens component which are sequentially arranged from the object side, said diverging lens group including two negative lens components at least one of which consists of an achromatic lens component constituted by a positive lens and a negative lens, said second converging lens group including at least one achromatic lens component constituted by a negative lens and a positive lens, and said fast telephoto lens satisfying conditions below:

$$0.7f \leqq f_1 < f$$

$$-0.5 < (rd+rc)/(rd-rc) < 0$$

where

f: overall focal length of said fast telephoto lens

f_1: focal length of said first converging lens group

rc: radius of curvature of a surface of the negative lens component of said diverging lens group that is located nearer the image, the surface being that closest to the object

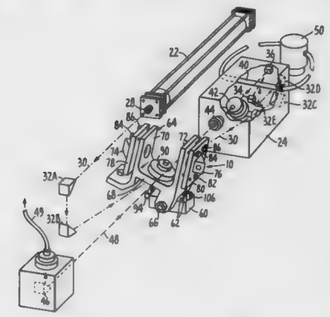
rd: radius of curvature of a surface of the negative lens component of said diverging lens group that is located nearer the image, the surface being that closest to the image.

4,732,460

BEAM SELECTOR FOR A PHOTOCOAGULATOR

Kalman Kele, Scotts Valley, and Nubar Manoukian, Cupertino, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Jul. 1, 1986, Ser. No. 881,135
Int. Cl.[4] G02B *27/00, 7/18;* B23K *26/00*
U.S. Cl. 350—486 **36 Claims**



1. An apparatus for selectively intercepting and redirecting the beam from a laser comprising:

support means;

frame means pivotally mounted to said support means and movable between a first and a second position;

means for moving said frame means between said first and second positions; and

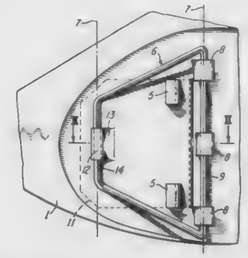
a pair of spaced apart mirrors mounted to said frame means, said mirrors being independently adjustable to facilitate the aiming of the beam from the laser, said mirrors being mounted at a location such that when said frame means is in said first position, said mirros are positioned out of the path of the beam from said laser and when said frame means is in said second position, said mirrors intercept and redirect the beam from said laser along a different path.

4,732,461

EXTERNAL REARVIEW MIRROR WITH RELEASABLE CATCH MECHANISM FOR MOTOR VEHICLES

Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,708
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 8530611[U]
Int. Cl.[4] B60R *1/06;* G02B *7/18, 5/08*
U.S. Cl. 350—631 **10 Claims**



1. An external rearview mirror for a motor vehicle, wherein a support serves for the fastening of said mirror to said vehicle, with a mirror housing, in which is disposed a mirror body, being pivotably connected to said support, via a closed bracket, so that said mirror housing can tilt in the longitudinal direction of said vehicle; said support is also provided with releasable catch mechanism means for holding said mirror housing in a fixed position, with said catch mechanism means also being disengageable; said mirror further comprises:

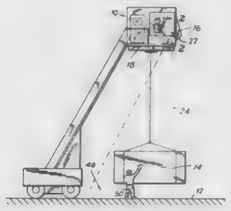
respective pivot connections disposed on said support and on said mirror housing for pivotably supporting said closed bracket to thereby effect said pivotable connection of said mirror housing to said support, at least one of said pivot connections being formed by sections that come together during assembly of said mirror, and said pivot connection on said support comprises a first section, in the form of a flexible tongue that has a free end, and a second section in the form of a rigid, bent tongue having an opening for receiving a portion of said bracket, with said free end of said flexible tongue being disposed in front of said bent tongue opening, and being adapted to be deflected upon introduction of said portion of said bracket into said bent tongue opening.

4,732,462

SAFETY VIEWING APPARATUS FOR CRANE CAR

Ronald Bel, 85 Roff St., Staten Island, N.Y. 10304

Filed Apr. 27, 1987, Ser. No. 42,862
Int. Cl.[4] G02B *7/18;* B60R *1/08*
U.S. Cl. 350—632 **18 Claims**



1. Safety apparatus enabling a crane operator in a crane cab

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to see the area below and behind the crane cab without leaving his seat, said apparatus comprising

a window formed in the floor of said crane under the operator's seat,

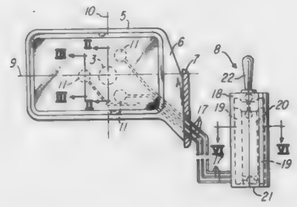
a mirrow located in front of said operator being positioned to permit the operator to view the area below and behind the cab of the crane while the operator is in his seat.

4,732,463

MIRROR WITH ADJUSTMENT ELEMENTS INCLUDING BELLOWS FOR A MOTOR VEHICLE

Bernhard Mittelhäuser, No. 57 D-3002, Wedemark 2, Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,672
Int. Cl.[4] G02B *7/18*; B60R *1/06*
U.S. Cl. 350—632 **12 Claims**



1. An adjustable mirror for a motor vehicle, comprising:

a housing;

a mirror element adjustably supported in said housing;

at least two adjustment elements disposed in said housing for effecting adjustment of said mirror element; and

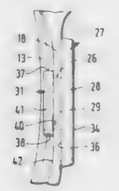
a control element that is operatively connected, via connection means, with said adjustment elements to form a closed hydraulic system, whereby said adjustment elements can be respectively selectively actuated by said control element, said control element including a displacement element that is movable in all directions; said displacement element being surrounded by deformable bellows that are operatively connected to said adjustment elements via said connection means.

4,732,464

NOSEPADS FOR EYEGLASSES

Walter H. Bononi, Zeppelinstrasse 9, 7012 Fellbach-Schmiden, Fed. Rep. of Germany

Continuation of Ser. No. 616,315, Jun. 1, 1984, abandoned. This application Dec. 18, 1986, Ser. No. 945,172
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319827
Int. Cl.[4] G02C *1/00, 5/12*
U.S. Cl. 351—88 **11 Claims**



1. A pair of eyeglasses comprising:

two eye rims and a bridge with a lens groove in the inner periphery of each eye rim,

two hard support plates, having an outer edge and inner and outer surfaces, starting at said eye rims below said bridge and shaped outwards to the rear to support, at said inner surfaces, the eyeglasses on the flanks of the wearer's nose,

said support plates having through-holes which open to the rear of said lens grooves,

two pads of a material of Shore-D hardness in the range of 10–30, retained removably against said support plates,

said pads having the shape of cuff-link studs with a main plate having inner and outer surfaces and an outer edge that is smaller than said outer edge of said support plate, said main plate being arranged and adapted to rest with its entire inner surface supported against said inner surface of said support plate and within said outer edge of said support plate, at the flanks of the wearer's nose, a stem on the back of said main plate, said stem being slightly shorter than the depth of said through-holes on said support plate, and a fastening member secured to said stem arranged and adapted to be pressed removably through said through-hole in said support plate to rest against said outer surface of said support plate to the rear of said lens groove,

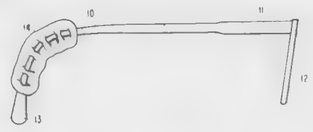
said support plates having recesses on said inner surfaces of said support plates, which contact said main plates to inhibit rotation thereof relative to said support plates.

4,732,465

EYEGLASS HOLDER

Albertus B. Field, 320 Harbour View Ct., Noblesville, Ind. 46060

Filed Nov. 5, 1986, Ser. No. 927,094
Int. Cl.[4] G02C *5/14*
U.S. Cl. 351—123 **6 Claims**



1. The combination:

eye glasses including a frame and a pair of lenses mounted to said frame and further including first and second side bars pivotally mounted to said frame and extendable aft of the ears of the person's head;

a first flexible sheet of material including a plurality of first apertures through which the first side bar is extendable in zigzag fashion relative to said sheet to alternately position said sheet on a side of said first side bar to contact the person's head and then on a side of said first side bar away from the person's head and back; and,

a second flexible sheet of material including a plurality of second apertures through which the second side bar is extendable in zigzag fashion relative to said second sheet to alternately position said second sheet on a side of said second side bar to contact the person's head and then on a side of said second side bar away from the person's head and back.

4,732,466

FUNDUS CAMERA

William E. Humphrey, Oakland, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Apr. 4, 1985, Ser. No. 719,779
Int. Cl.[4] A61B *3/14, 3/10*
U.S. Cl. 351—206 **16 Claims**

1. An improvement in a fundus camera for forming an image of a fundus of the eye through the cornea of the eye, comprising: a transmission path for guiding and focusing an illumination beam onto an illuminated region of the fundus; a receiving path for viewing the illuminated region of the fundus where the transmission path and the receiving path are substantially separate so that the transmission path of light to the fundus is

substantially excluded from the receiving path of light from the fundus thereby preventing light scattered by the illuminated region of the eye to the fundus from obfuscating the image of the fundus,

a cylindrical drum formed about a drum axis having a transmission slit and a receiving slit parallel to the axis of said drum slit, the transmission slit being formed in a first cylindrical segment of said drum and the receiving slit being formed in a second cylindrical segment of said drum;

means for routing the transmission path to the first cylindrical segment of the cylindrical drum having the transmission slit;

a transmission aperture between the cylindrical drum and the eye;

means for relaying a conjugate image of the transmission aperture to the cornea of the eye in at least one first discrete zone;



means for routing the receiving path to the second cylindrical segment of the cylindrical drum having the receiving slit;

a receiving aperture between the drum and the eye;

means for relaying a conjugate image of the receiving aperture to the cornea of the eye in at least a second discrete zone separate from the first discrete zone;

means for focusing the image of the transmission slit and the receiving slit on the fundus of the eye as the transmission and receiving slits move into and through said respective transmission path and the receiving path;

means for rotating the cylindrical drum about the drum axis to scan across the fundus whereby focused images of the transmission slit and the receiving slit pass across the fundus of the eye from the first discrete zone and second discrete zone without substantial overlap of the transmission path and the receiving path.

4,732,467

AUTOMATED PHOTOGRAPH SLIDE STORAGE AND RETRIEVAL SYSTEM

Thomas P. Sweeney, Plymouth, Minn., assignor to Modec Corporation, New Hope, Minn.

Filed Jul. 8, 1986, Ser. No. 883,358
Int. Cl.[4] G03B *23/00*
U.S. Cl. 353—25 **31 Claims**

1. An automated photograph slide storage and retrieval system for use with photograph slides of the type having electronically readable information encoded thereon, including:

a plurality of movable magazines for storing a plurality of photograph slides at indexed locations;

magazine drive means for driving the magazines;

pick means for picking selected photograph slides from the magazines;

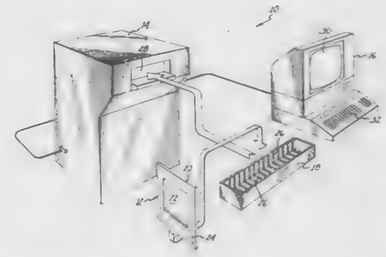
first pick drive means for driving the pick means with respect to the plurality of magazines, and for positioning the pick means adjacent selected magazines;

second pick drive means for driving the pick means with respect to selected magazines, and for positioning the pick means adjacent selected photograph slides;

memory means for storing data representative of the indexed locations at which the photograph slides are stored;

operator interface means for receiving information representative of photograph slides to be retrieved;

read head means for reading information from the photograph slides; and



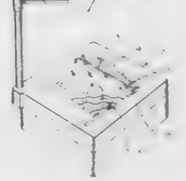
control means coupled to the memory means, pick means, read head means, operator interface means, magazine drive means and the first and second pick drive means, for controlling the magazine drive means, pick means and first and second pick drive means and causing selected photograph slides to be retrieved from the magazines.

4,732,468

REGISTRY DEVICE FOR TRANSPARENCIES FOR OVERHEAD PROJECTOR

John S. Wright, 6115 N. Lake Drive Ct., Milwaukee, Wis. 53217

Filed Jul. 1, 1986, Ser. No. 880,723
Int. Cl.[4] G03B *21/54*
U.S. Cl. 353—120 **2 Claims**



1. A registry device for properly aligning one or more transparencies on the glass stage of an overhead projector, which transparencies have spaced apart openings along one side so the transparencies can be stored in a ring binder, said device comprising a relatively rigid backbone having registering means for entering at least two of the spaced-apart openings of such a transparency and holding said transparency in a desired position on the stage; an adhesive-free, lightweight, anchoring means attached to the backbone for securing the registry device on the glass stage, said anchoring means serving as the sole means of securing the device to the glass stage and comprising a plastic sheet which when pressed flat upon the glass stage will securely cling to the glass stage and prevent the registry device from being moved until the sheet is lifted from the glass stage; and framing means comprising a second plastic sheet which is attached at one end to the backbone and which extends in an opposite direction from the first sheet, said second sheet having at least a portion thereof which is transparent; said registering means comprising pins which extend through aligned openings in the rigid backbone, anchoring

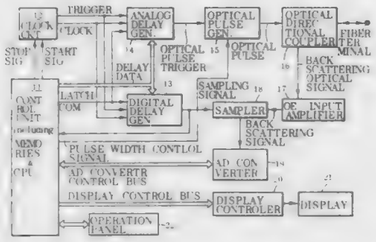
means and framing means and which serve to unite them into a unitary device.

4,732,469

LOW NOISE OPTICAL TIME DOMAIN REFLECTOMETER

Masafumi Souma, Oume, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 731,383, May 7, 1985, abandoned. This application Jul. 29, 1987, Ser. No. 80,226
Claims priority, application Japan, Aug. 18, 1984, 59-172158
Int. Cl.[4] G01N *21/88*; G01M *11/00*
U.S. Cl. 356—731 **6 Claims**



1. A low noise optical time domain reflectometer comprising:

clock means for generating clock edges at a predetermined frequency;

digital delay means for generating a sampling signal upon receipt a predetermined number of the clock edges according to delay data;

analog delay means for generating a pulse trigger at the end of a predetermined period according to the delay data after receipt of the first clock edge;

pulse genesating means for generating a pulse upon receipt of said pulse trigger;

coupling means for sending said pulse to an object under test and taking out a reflection signal from the object;

sampling means for sampling said reflection signal upon the instant of receipt of said sampling signal without being affected by noise which comes from said analog delay means;

analog to digital converting means for converting an analog output of said sampling means to a digital value; and

control means which includes,

memory means for memorizing output data of said analog to digital converting means, and

processing means for processing the delay data being sent out to said digital delay menas and said analog delay means, and for processing the output data memorized in said memory means,

whereby data of said object under test are obtained.

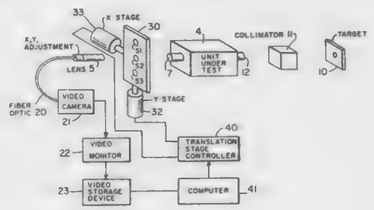
4,732,470

PARALLAX ERROR MEASUREMENT DEVICE

Randolph W. Priddy, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1986, Ser. No. 865,995
Int. Cl.[4] G01B *9/00*
U.S. Cl. 356—124 **6 Claims**

1. A parallax error measurement device for measuring the parallax error in a lens of a center spot generated through said lens comprising a flat aperture plate having at least one orifice therein, a receiving optical means for recording optical information, a mounting means connected to said optical means and said lens for boresight alignment, translation means connected to said aperture plate, said translation means causing said aperture plate to move such that the orfice will transverse one edge of the lens to the other edge of the lens, and a video storage



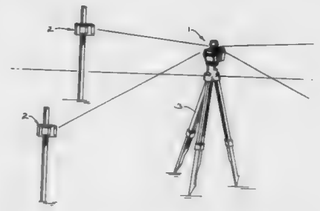
device connected to said optical means for evaluation of the parallax of said test lens.

4,732,471

LASER ALIGNMENT SYSTEM WITH MODULATED FIELD

Gary L. Cain, Springfield, and Sidney B. Goren, Troy, both of Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.

Continuation of Ser. No. 788,764, Oct. 18, 1985, Pat. No. 4,674,870. This application Jan. 20, 1987, Ser. No. 4,463
Int. Cl.[4] G01B *11/26*; G01C *3/08*
U.S. Cl. 356—152 **2 Claims**



1. In a laser alignment system having a transmitter for producing an alignment field in the form of energy directed from a laser and a remotely located receiver for detecting the presence of the alignment field and producing an electrical signal proportional to the magnitude of the laser energy, the improvement therein comprising:

modulation means at the transmitter for turning the laser on and off at a modulation frequency, the modulation means including means for selecting one of a plurality of modulation frequencies such that the transmitter may be operated in the same region as another similar transmitter but at a different one of said plurality of modulation frequencies than said other similar transmitter;

a band pass filter at the receiver for suppressing components in said electrical signal at frequencies other than said modulation frequency;

level detector means for receiving the filtered electrical signal and producing a level signal indicative of the magnitude of the modulation frequency signal component therein; and

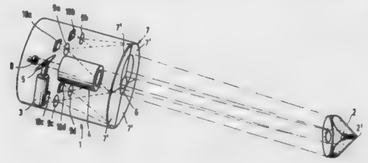
indicator means coupled to the level detector means for providing an indication to a user when the magnitude of the level signal reaches a present value.

4,732,472

METHODS OF, AND SYSTEMS FOR, DETERMINING THE POSITION OF AN OBJECT

Johannes König; Wilhelm Kurfürst, both of Munich; Hans-Günther Willers, Karlsfeld, and Martin Reuter, Munich, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunon, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,880
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404495
Int. Cl.[4] G01B *1/26*; G01C *1/00, 3/08, 3/00*
U.S. Cl. 356—152 **26 Claims**



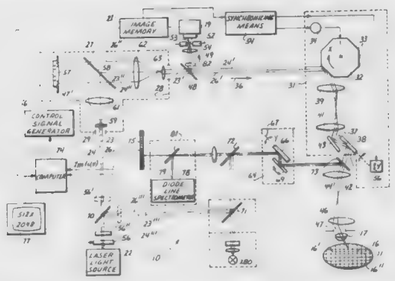
1. A unit for use in a positional determination system; said unit comprising a laser, an optical system, a beam splitter orientated to re-direct a beam from the laser through the optical system, a lens system with a central window on the axis of the optical system through which the laser beam is emitted and a symmetrical array of lenses around the window with optical axes parallel to that of the optical system and sensing means for receiving reflected light from the array of lenses to indicate whether a reflected beam entering the array is parallel to the emitted beam.

4,732,473

APPARATUS FOR, AND METHODS OF, DETERMINING THE CHARACTERISTICS OF SEMI-CONDUCTOR WAFERS

Josef Bille, AM Pferchelhang 2/4, and Siegfried Hunklinger, AM Buchsenackerhang 68, both of 6900 Heidelberg, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,531
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422143
Int. Cl.[4] G01N *21/88*
U.S. Cl. 356—237 **24 Claims**



1. A method of determining the characteristics of electrical circuitry on a semi-conductor wafer, including the steps of:

providing a light beam,

focussing the light beam at an entrance pupil,

positioning the semi-conductor wafer at a particular focal distance from the entrance pupil for reflection of the light beam by the semi-conductor wafer,

passing the reflected light beam through a pinhole,

focussing the reflected light beam at the pinhole, and

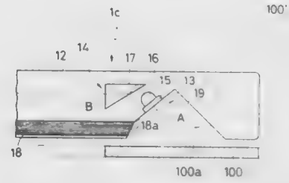
positioning a light sensor at the particular distance from the pinhole to obtain the production of signals by the light sensor in accordance with the characteristics of the light sensed by the sensor.

4,732,474

APPARATUS FOR OPTICALLY INSPECTING OBJECT HAVING REFLECTING SURFACE

Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Continuation of Ser. No. 765,670, Aug. 14, 1985. This application Jul. 10, 1987, Ser. No. 72,121
Claims priority, application Japan, Aug. 18, 1984, 59-170997; Aug. 18, 1984, 59-125023; Aug. 18, 1984, 59-125024
Int. Cl.[4] G01N *21/88*
U.S. Cl. 356—237 **8 Claims**



1. An apparatus for optically inspecting defects on and/or within an object having a reflecting surface, said apparatus comprising:

an elongated tubular body having one and the other longitudinal ends;

a genrally V-shaped space disposed adjacent said one longitudinal end of said tubular body and defined by a front and a rear surface which are located respectively remote from and adjacent the other longitudinal end of said tubular body;

a reflecting surface formed at said front surface;

irradiating means located at said rear surface for emitting illuminating light toward said reflecting surface, said reflecting surface reflecting the illuminating light to irradiate the object;

an image-transmitting system mounted in said tubular body and including light-receiving means located at said rear surface for receiving an image of the object irradiated by the illuminating light reflected by said reflecting surface, said light-receiving means having an optical axis extending obliquely with respect to a longitudinal axis of said tubular body;

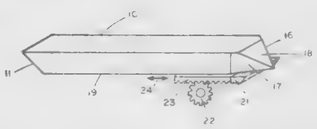
said reflecting surface having an area covering an extent of a field of vision of said light-receiving means through the reflection from the reflection surface of the object.

4,732,475

INTERNAL REFLECTION NANOSAMPLING SPECTROSCOPY

Nicolas J. Harrick, Croton Dam Rd., Ossining, N.Y. 10562

Filed Jul. 25, 1986, Ser. No. 889,238
Int. Cl.[4] G01N *21/01*
U.S. Cl. 356—300 **12 Claims**



1. A single pass, single reflection, internal reflection element for use in internal reflection spectrometry comprising:

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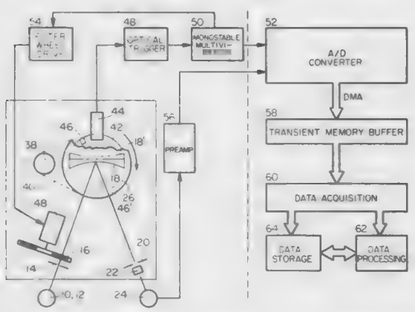
(a) a radiation-transparent optical element having at one end a first surface for entry of a beam of radiation and having at another end a second surface smaller in area than the first surface for receiving a sample to be examined and having a third surface from which the radiation may exit, said optical element being configured in such manner that radiation entering the first surface will in a single pass be guided by multiple internal reflections to and concentrated to become incident once on the smaller second surface at an angle exceeding the critical angle such that it will become modulated by interaction with the sample and the resultant radiation after incidence once on the second surface directed toward the third surface for transmission therethrough, said second surface having a sampling area about one mm or smaller in diameter.

4,732,476

CONTINUOUSLY ROTATING GRATING RAPID-SCAN SPECTROPHOTOMETER

Yoav Barshad, Ann Arbor, Mich., assignor to Barspec Ltd., Rehovot, Israel

Filed Jul. 26, 1985, Ser. No. 759,291
Int. Cl.[4] G01J *3/18*
U.S. Cl. 356—308 **11 Claims**



1. A spectrophotometer comprising a source of multispectral radiation and means to direct the radiation to an optical grating,

an optical grating located in the path of the radiation from the source,

said optical grating mounted on a turntable of relatively high mass for rotation about its optical axis,

means to continuously rotate the optical grating about its optical axis at a constant uninterrupted angular velocity,

triggering means to select a specified angular range from each revolution of the optical grating,

a sample detector and an analog to digital converter in communication with the sample detector and the triggering means, and

a direct memory access buffer to receive output from the analog to digital converter,

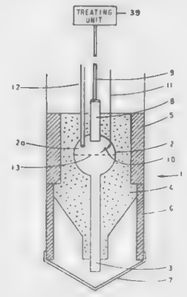
whereby the analog to digital converter samples the output of the detector during the time period for the specified angular range upon actuation by the triggering means and stores the digitized information in the buffer.

4,732,477

ANALYZING PROBE

Lars Kumbrant, Orsundsbro, Sweden, assignor to Geotronics Metaltech AB, Orsundsbro, Sweden

Continuation of Ser. No. 665,172, Oct. 26, 1984, abandoned. This application Jan. 13, 1987, Ser. No. 2,941
Claims priority, application Sweden, Oct. 27, 1983, 8305914
Int. Cl.[4] G01N *21/67*
U.S. Cl. 356—313 **7 Claims**



1. A disposable sampler for drawing a sample from a molten charge, said sampler being adapted to be mounted on a means such as a rod, for submerging the sampler into the molten charge, said means comprising a fibre-optical light conductor for transferring light signals from the sampler to an analyzing device, said sampler comprising:

a body of ceramic material having a cavity;

means forming a part of said body, and including an inlet, for facilitating flow of said molten material into said cavity, halting said molten material in said cavity, and solidifying said molten material to form a counter electrode in said cavity;

an electrode extending into said cavity, adapted to ignite a spark or luminous arc between said electrode and said counter electrode in said cavity;

means for applying a voltage to said electrode; and

a light conducting body in the form of a rod and provided with a connection with said fibre-optical light conductor, said light conducting body extending into said cavity adjacent the position where said spark or arc is to be ignited.

4,732,478

PROCESS FOR DETERMINING, BY OPTICAL EMISSION SPECTROMETRY, THE CONTENT IN A STEEL OF AN ELEMENT SUCH AS ALUMINUM, IN THE DISSOLVED STATE AND IN THE PRECIPITATED STATE

Gérard Willay, Ars-sur-Moselle; Bernard Boury, and André Wittmann, both of Metz, all of France, assignors to Institut de Recherches de la Siderurgie Francaise, Maizieres-Les-Metz, France

Filed Apr. 18, 1986, Ser. No. 853,757
Claims priority, application France, Apr. 25, 1985, 85 06363
Int. Cl.[4] G01N *21/67*
U.S. Cl. 356—313 **5 Claims**

1. A process for determining, by optical emission spectrometry, the content in a steel of an element such as aluminium, in the dissolved state and in the precipitated state, said process comprising the steps of:

subjecting a sample of the steel to be analyzed to spark discharging by causing an excitation circuit to generate sparks by successive elementary discharges;

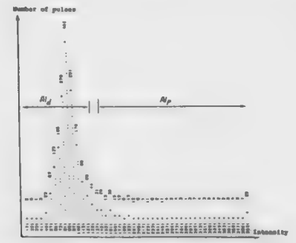
directing the optical emission of the sparks onto a diffraction grating so as to separate a light emission corresponding to the element to be metered;

charging an integration capacitor with a current representative of the intensity of the light emission in response to each of said elementary discharges;

converting the value of the charge of said capacitor to digital data;

registering said digital data so as to store the various digital data representative of the respective light emission intensities responsive to said successive elementary discharges constituting a spark discharging cycle;

determining among said stored digital data the number of intensities having a value comprised in each of a plurality



of contiguous channels in order to set up a frequency diagram as a function of the light emission intensity;

smoothing a curve representative of said frequency diagram, said smooth curve showing a part of substantially gaussian course on the low intensity side;

determining the content of dissolved element as a linear function of the intensity value corresponding to the maximum peak of said gaussian part of the smooth curve; and

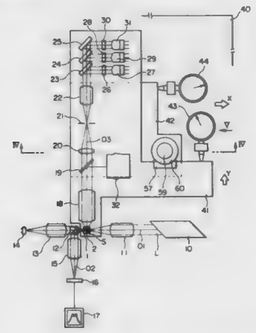
determining the content of precipitated element by summing products n_i, C_i for all the channels located beyond the gaussian part, on the high intensity side of said frequency diagram, where n_i is the number of intensities in channel i and C_i is the middle intensity value of the same channel i.

4,732,479

PARTICLE ANALYZING APPARATUS

Masayuki Tanaka, Kawasaki; Shinichi Obe, Yokohama; Naoki Yugachi, Yokohama, and Akira Tago, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,981
Claims priority, application Japan, Oct. 18, 1985, 60-232804; Oct. 28, 1985, 60-241006; Nov. 11, 1985, 60-252334
Int. Cl.[4] G01N *15/02, 21/00*
U.S. Cl. 356—336 **17 Claims**



1. A particle analyzing apparatus comprising:

an irradiating optical system having an axis for applying a light beam to a particle to be examined flowing through a circulation portion in a flow cell;

a photometering optical system for photometering the light from the particle to be examined irradiated by said irradiating optical system; and

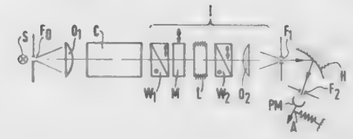
moving means for rendering a base bed on which said flow cell and said photometering optical system are placed movable relative to said irradiating optical system.

4,732,480

INTERFEROMETRIC DEVICE FOR DETECTING GAS

Gerard Fortunato, and Dominique Laurent, both of Lyons, France, assignors to Elf France, Courbevoie, France

Filed Apr. 17, 1986, Ser. No. 853,038
Claims priority, application France, Apr. 25, 1985, 85 06349
Int. Cl.[4] G01B *9/02*; G01J *3/45*
U.S. Cl. 356—346 **6 Claims**



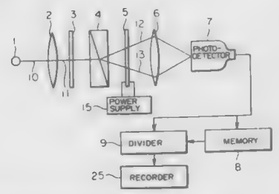
1. Interferometric device for the detection and/or analysis of gas, of the type comprising an optical assembly forming the image of a luminous source (S) on the sensitive element of the detector, this image being formed through a cell (C) containing the gaseous mixture to be analyzed which is followed by an interferometry assembly (I) comprising a birefringent plate (L) and a modulating means located between an analyser and a polarizer followed by an interferential filter wherein, the analyser and the polarizer consist of two polarizing prisms (W_1 and W_2) the optical axes of which are perpendicular to that of the device and each give two photometrically identical images which are rectilinearly and perpendicularly polarized and the modulating means consist of a photoelastic modulator (M) comprising a silica or fluorine plate excited by a piezoelectric ceramic caused to vibrate in order to give said plate a birefringency variable through compression, having an axis parallel to that of the birefringent plate (L), the interferential filter being constituted by a grating multiplexer device (H, H').

4,732,481

POLARIZATION INTERFEROMETER

Shigeru Matsui, Katsuta, and Masaru Inoue, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,244
Claims priority, application Japan, Apr. 25, 1986, 61-94528
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 **8 Claims**



1. A polarization interferometer comprising:

a light source to be measured;

a Wollaston prism for splitting light from said light source into two light beams;

a pair of polarizers disposed before and behind said Wollas-

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ton prism in the traveling direction of the light from said light source, the plane of polarization of each polarizer being inclined at 45° to each of two crystallographic axes of said Wollaston prism;

means for spatially forming an interference fringe by said two light beams from said Wollaston prism;

detection means for detecting said interference fringe formed by said interference-fringe forming means;

changeover means for putting one of said polarizers in a non-polarizing state;

memory means for storing a first detection signal which is obtained from said detection means in a state that said one polarizer is put in the non-polarizing state by said changeover means; and

means for dividing a second detection signal which is obtained from said detection means in a state that said one polarizer is put in a polarizing state by said changeover means, by the first detection signal stored in said memory means, and for outputting the result of the division.

4,732,482

METHOD AND APPARATUS FOR REDUCING THE DATA RATE IN FOURIER SPECTROSCOPY

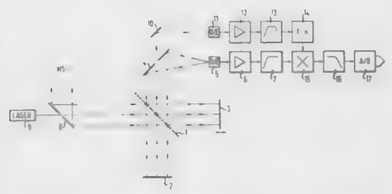
Harald Rippel, Münich, Fed. Rep. of Germany, assignor to Kayser-Threde GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,412

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542161

Int. Cl.⁴ G01J *3/00*

U.S. Cl. 356—346 **9 Claims**



1. A method for reducing the data rate of a digitalized measuring signal product in Fourier spectroscopy, comprising the steps of:

(a) producing an interferogram of an unknown measuring beam to be analyzed using a double-beam interferometer having a moving mirror displaced at a substantially constant, desired speed,

(b) converting the interferogram into a first electrical analog signal,

(c) producing a second electrical analog signal having a frequency modulated in proportion to a deviation between the instantaneous actual speed of the moving mirror and said desired speed,

(d) mixing the first analog signal representing the interferogram with the second analog signal to obtain sum and difference frequency signals,

(e) filtering out the difference frequency signal obtained as a result of the frequency mixing, and

(f) digitalizing the filtered out difference frequency signal.

4,732,483

INTERFEROMETRIC SURFACE PROFILER

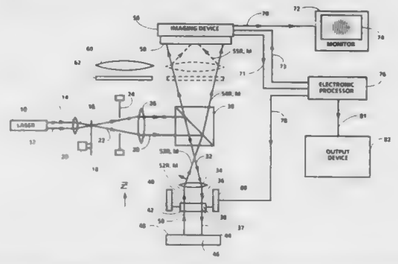
James F. Biegen, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Mar. 19, 1987, Ser. No. 27,643

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—351 **26 Claims**

1. An interferometric profiler capable of measuring the topography of a surface under test comprising a source of a first spatially coherent linearly polarized input beam; means optically aligned with said input beam for significantly reducing the spatial coherence of said input beam; means optically aligned with said coherence reduced input beam for producing a linearly polarized collimated second beam which has significantly reduced spatial coherence; means optically aligned with said surface under test and said second beam for splitting said second beam into a linearly polarized, reflected reference wavefront and a circularly polarized, transmitted measurement wavefront; said second beam splitting means including a flat reference surface spaced from said surface under test; means for varying the spacing between said reference surface and said surface under test; means optically aligned with said reference



surface and sa id surface under test for recombining said reference wavefront and said measurement wavefront after it interacts with said surface under test; an imaging device optically aligned with said surface under test for photosensing and viewing either alignment spots or an interference pattern produced from said recombined reference and measurement wavefronts; means for imaging said surface under test onto said photosensitive elements; said imaging means comprising means for bringing a very smooth surface under test into focus onto said photosensitive elements; and means operatively connected to said imaging means for processing the output of said imaging device for providing a profile of said surface under test.

4,732,484

APPARATUS FOR MEASURING THE DIMENSIONS OF A MINUTE OBJECT

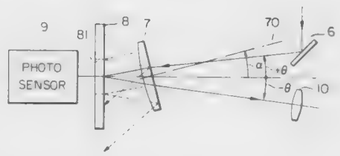
Takeshi Suto, Funabashi, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 745,945

Claims priority, application Japan, Jun. 26, 1984, 59-131498

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—372 **4 Claims**



1. An optical apparatus for precisely measuring the dimensions of an object, comprising:

means for illuminating said object;

a screen member having a light transparent slit formed therein and having at one side thereof a reflecting surface surrounding said slit, said screen member being movable in a predetermined direction parallel to said reflecting surface, and said slit being elongated perpendicular to said direction;

a projection optical system having means for forming a projection image of said object on said reflecting surface;

observation optical means for observing said image; and

means provided at a side of said screen member opposite to said one side for receiving light passed through said slit;

said apparatus further comprising field lens means disposed at said one side of said screen member and opposed to said reflecting surface, each of said projection optical system and said observation optical means having an optical path with a portion thereof passing through said field lens means, said optical path portion of said projection optical system being inclined by an angle θ with respect to a normal to said reflecting surface and said field lens means having an optical axis that is inclined by an angle α with respect to said normal, said angles being formed in the same direction of inclination from said normal in a plane that is perpendicular to said reflecting surface and that is parallel to the length of said slit, and satisfying the relationship $\theta < \alpha$.

4,732,485

OPTICAL SURFACE PROFILE MEASURING DEVICE

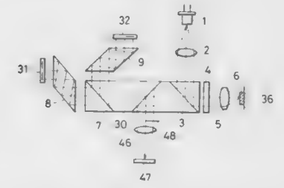
Terumasa Morita; Noriyuki Miyahara, both of Hachiouji, Japan, and Hisao Kitagawa, Hamburg, Fed. Rep. of Germany, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,845

Claims priority, application Japan, Apr. 17, 1985, 60-81993; May 14, 1985, 60-102237; Jun. 19, 1985, 60-132025

Int. Cl.⁴ A01B *11/30*

U.S. Cl. 356—376 **27 Claims**



1. An optical surface profile measuring device having a measuring light projecting optical system including therein a light source, a collimator lens, a polarization beam splitter, a ¼-wave plate and an objective lens to project a measuring light onto a surface to be measured; a light transmitting system including therein said objective lens, said ¼-wave plate, said polarization beam splitter and a first beam splitter to transmit the reflected light from the measured surface; and a first detecting system including therein a plurality of photosensors arranged to receive said reflected light passed through said polarization beam splitter and further divided by said first beam splitter and to emit an output signal in accordance with a distance between said measured surface and a focal point of said objective lens said optical surface profile measuring device further comprising:

a second detecting system including therein (a) a second beam splitter arranged between said polarization beam splitter and said first beam splitter in said light transmitting system, and (b) photosensor means arranged to receive reflected light passed through said polarization beam splitter and reflected by said second beam splitter, for emitting an output signal in accordance with a distance between said measured surface and a focal point of said objective lens.

4,732,486

CONTACT-FREE OPTICAL LINEAR MEASUREMENT DEVICE

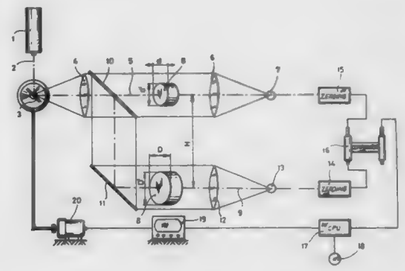
Jurgen Rinn, Lausnbach, Fed. Rep. of Germany, assignor to Heyligenstaedt & Comp. Werzeugmaschineafabrik GmbH, Fed. Rep. of Germany

Filed Oct. 15, 1985, Ser. No. 787,673

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437412

Int. Cl.⁴ G01B *11/08*

U.S. Cl. 356—387 **7 Claims**



1. A contact-free, optical linear measurement device for measuring an object comprising first means for generating a first beam of light which is constantly displaced along mutually parallel paths within a first defined area; first sensor means for sensing said first beam; second means for generating a second beam of light which is constantly displaced along mutually parallel paths within a second defined area and at a fixed distance from the paths of said first beam; second sensor means for sensing said second beam; said object being interposed between said beam generating means and said sensing means; and means for determining the degree of inclination of said object in relation to the plane formed by the two beam paths and for determining a linear measure of said object independent of the inclination thereof as a function of dark and light signals from said first sensor.

4,732,487

NON-INTRUSIVE AGITATION OF A FLUID MEDIUM

Geoffrey J. Pollard, Bedford, Great Britain, assignor to The British Hydromechanics Research Association, Beford, Great Britain

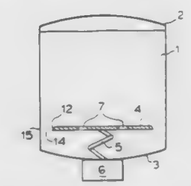
PCT No. PCT/GB84/00404, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02352, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 26, 1984, Ser. No. 756,517

Claims priority, application United Kingdom, Oct. 25, 1983, 8331594

Int. Cl.⁴ B01F *11/00*

U.S. Cl. 366—112 **13 Claims**



1. Apparatus for non-intrusive agitation of a fluid medium, such as to effect mixing of two or more fluids, comprising a

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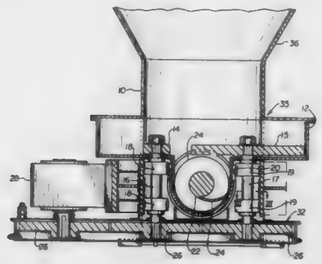
container for the fluid medium, impeller means disposed within said container for effecting fluid agitation, said impeller means including an impeller spaced from a wall portion of said container and support means having a point of attachment to said impeller and extending from said impeller to an end of said support means which is attached to said wall portion, said support means thereby supportingly connecting said impeller to said wall portion, said impeller means having flexibility such that portions of said impeller are movable relative to said wall portion to effect said fluid agitation, and a vibrator unit placed externally against said wall portion of said container and operable to impart vibrations to said wall portion of said container, said vibrations being transmitted by said wall portion to said support means and thereby vibrating said impeller and effecting said fluid agitation.

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APPARATUS TO UNIFORMLY FEED PLUG FLOW MATERIAL FROM STORAGE TO LINE OPERATION

James D. Foresman, Hugbesville, Pa., assignor to Sprout-Bauer, Inc., Muncy, Pa.

Filed Jun. 11, 1986, Ser. No. 872,943
Int. Cl.⁴ B01F *15/02*
U.S. Cl. 366—155 **2 Claims**



1. An apparatus for feeding a plug flow material from the outlet of a material storage vessel into a flow line passing beneath the material storage vessel, comprising:

a. plug screw means disposed in the flow line for moving material therethrough, said plug screw means having a screw having an axis disposed parallel to the flow line and an inlet opening to receive material to the screw, the screw being adapted for rotation about its axis whereby the received material is passed through the flow line;

b. an inlet hopper pan disposed superadjacent the inlet opening to said plug screw means, said hopper pan having a outlet opening to the inlet opening to said plug screw means and an inlet opening for receiving material;

c. an inlet chute interconnecting the material storage vessel in flow communication with said hopper pan thereby establishing a material flow passageway therebetween, said inlet chute having an inlet opening adapted to mate with the outlet of the material storage vessel for receiving said plug flow material therefrom and an outlet opening adapted to mate with the inlet opening to said hopper pan for passing the plug flow material thereto; and

d. agitator means disposed in said hopper pan superadjacent the outlet from said hopper pan for sweeping the plug flow material therefrom through the inlet opening to the screw of said plug screw means, said agitator means mounted to rotating shaft means perpendicularly disposed to the axis of the screw of said plug screw means whereby the agitator means mounted to the shaft means is rotated about an axis of rotation perpendicular to the axis of the screw of said plug screw means.

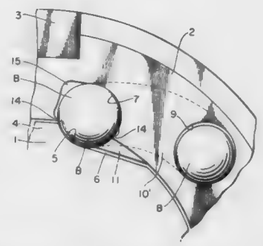
and wherein said agitator means mounted to said rotating shaft means comprises a pair of agitator blades, one mounted to a first rotating shaft means and one mounted to a second rotating shaft means, said first and second rotating shaft means disposed on opposite sides of said plug screw means with their axis of rotation in a common vertical plane, the common vertical plane being disposed perpendicular to the axis of the screw of said plug screw means.

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CIRCULATING TYPE BALL SPLINE BEARING

Kazuhiko Tanaka, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,999
Claims priority, application Japan, Apr. 5, 1986, 61-78743
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 384—45 **5 Claims**



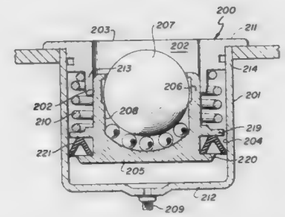
1. A circulating type ball bearing comprising a spline shaft having a generally cylindrical shape, on the outer periphery of which are formed a plurality of axially extending ridges 4 at several places along its circumference, each of said ridges retaining, as the crest surface, part of the circumference of the spline shaft and each of the opposing side surfaces thereof having a circular arc cross section portion to form a load carrying ball groove with a continuing and adjacent relieved surface portion, a cylindrical outer sleeve having an axial bore and capable of receiving said spline shaft in an axially displaceably movable fashion within its internal axial bore, the inner peripheral surface of said internal annular bore being provided with a plurality of load carrying ball grooves in facing relation with said load carrying ball grooves formed on the outer periphery of said spline shaft, and a plurality of balls of predetermined diameter intervening between the facing pairs of the axially extending load carrying ball grooves of said outer sleeve and of said spline shaft, respectively, wherein ball return bores are provided within the side wall of said cylindrical outer sleeve including ball return bores within the side wall thereof with each of the respective ball return bores being so positioned as seen in the cross section as to be on the spline shaft side from an extension line connecting the centers of two adjacent load carrying balls present in two adjacent load carrying ball grooves that are formed on the inner periphery of said cylindrical outer sleeve, a plurality of arcuateley bent ball turn channels for guiding the load carrying balls to said ball return bores being formed within an end lid that is provided at each of the opposite end faces of the cylindrical outer sleeve and each of the load carrying ball grooves of said cylindrical outer sleeve having a Greek letter omega shaped cross section with an axially extending slit opening narrower than said ball predetermined diameter on the inner surface of said cylinder outer sleeve thereby retaining therein a greater part of each whole volume of the load carrying ball.

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ANTI-FRICTION ELEMENT

Camillo Masciarelli, 415 Berlin Rd., Marlboro, Mass. 01752

Continuation of Ser. No. 855,495, Apr. 23, 1986, Pat. No. 4,660,904. This application Mar. 4, 1987, Ser. No. 21,638
Int. Cl.⁴ F16C *29/04;* **B60B** *33/08;* **B65G** *13/00*
U.S. Cl. 384—49 **4 Claims**



1. Anti-friction element for use in a table or the like having a work surface, comprising:

(a) a main body having a tubular wall defining a bore,

(b) a flange extending radially outwardly from the wall to rest on the table work surface, the flange having a friction surface spaced above the said work surface,

(c) a piston slidable in the bore, the piston carrying a ball which is rotatable in a cavity in the piston, the piston being movable from a first position in which the ball lies substantially entirely within the bore below the said friction surface of the flange to a second position in which the ball protrudes from the bore above the said friction surface,

(d) means for introducing fluid under pressure to the bore in order to move the piston and to carry the ball to the said second position, and

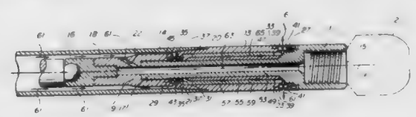
(e) means located in the bore to bias the piston to normally maintain the piston and the ball in the said first position.

4,732,491

DOWNHOLE MOTOR BEARING ASSEMBLY

Bela Geczy, Orange, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 27, 1986, Ser. No. 900,677
Int. Cl.⁴ E21B *10/22;* **F16C** *17/10, 33/12*
U.S. Cl. 384—95 **6 Claims**



1. A bearing and drive shaft structure for a downhole drilling apparatus comprising:

a unitary housing;

an inner cylindrical surface on the interior of said housing;

a first plurality of cylindrical mounting holes formed in one end of said housing about a first set of axes parallel to the axis of said inner cylindrical surface;

a second plurality of cylindrical mounting holes formed at the opposite end of said housing about a second set of axes parallel to the axis of said inner cylindrical surface;

a matrix bearing surface molded to said cylindrical surface;

a drive shaft means mounted within said housing and extending out of each end of said housing and having a cyindrical outer surface disposed opposite the inner cylindrical surface of said housing;

a matrix bearing surface molded to said cylindrical outer surface;

first and second mounting surfaces formed at each end of said drive shaft means, and opposite said first plurality and second plurality of mounting holes, respectively;

a third plurality of cylindrical mounting holes formed in said first mounting surface about a third set of axes parallel to the axis of said cylindrical outer surface and at the same radius therefrom as said first set of axes;

a fourth plurality of cylindrical mounting holes formed in said second mounting surface about a fourth set of axes parallel to the axis of said cylindrical outer surface and at the same radius therefrom as said second set of axes; and

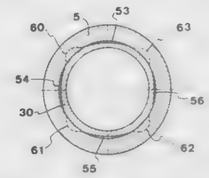
thrust bearing inserts mounted in each of said first, second, third, and fourth plurality of holes, said first and third plurality of holes and second and fourth plurality of holes being disposed on respective common circumferences to form first and second thrust bearings, respectively.

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BEARING RING FOR SUPPORTING ITEMS ON SOLID OR HOLLOW CYLINDRICAL PARTS

Georges Bonfils, St. Germain les Trois Cloches, France, assignor to S.F.E.N.A., Velizy Villacoublay, France

Division of Ser. No. 602,642, Apr. 19, 1984, Pat. No. 4,651,402.
This application Apr. 30, 1986, Ser. No. 857,269
Claims priority, application France, Apr. 29, 1983, 83 07108
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.⁴ F16C *17/00*
U.S. Cl. 384—129 **2 Claims**



1. In combination, a metal bearing ring and a hollow metal cylindrical part supporting said ring outside or outside said hollow metal cylindrical part, said bearing ring being formed and mounted to said hollow metal cylindrical part by the method comprising the following steps:

providing said ring of highly resilient metal having a cylinder-engaging surface of a diameter that overlaps the diameter of the corresponding ring-engaging surface of said cylindrical metal part;

applying localized forces to at least two circumferentially spaced points on the ring to locally, elastically deform the ring such that said overlap increases at said points and wherein said overlap decreases at other circumferentially spaced points intermediate said at least two circumferentially spaced points;

machining the deformed cylindrical part-engaging surface of the ring while applying said localized forces thereto during and after said machining, so that there is no overlap between the diameter thereof and the diameter of the corresponding ring-engaging surface of said cylindrical part;

engaging the machined metal ring against the metal cylindrical part while still applying said localized forces thereto; and

removing the applied forces;

such that before machining, a first set of exterior forces produces a series of elastic deformations at certain points within said ring and a series of reverse elastic deformations at said other points, and after machining and after assembly, a second set of internal forces within said ring produces a series of elastic deformations at said other circumferential points defining on said surface of said ring

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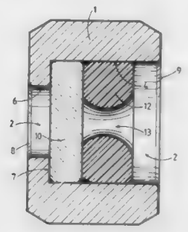
abutting said hollow metal cylindrical part low amplitude corrugations which press resiliently against said hollow metal cylindrical part at said other points without stress concentrations at said other points leading to an attendant fatigue damage to said metal bearing ring and metal cylindrical part assembly thereby insuring the deformation holding of the metal bearing ring and hollow metal cylindrical part assembly.

4,732,493

AUTOLUBRICATING BEARING

Philippe Bonelio, Grand-Saconnex, Switzerland, assignor to Sarcem S.A., Meyrin, Switzerland

Continuation-in-part of Ser. No. 756,090, Jul. 17, 1985, Pat. No. 4,636,096. This application Nov. 17, 1986, Ser. No. 930,935
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.⁴ F16C *17/08*
U.S. Cl. 384—243 **6 Claims**



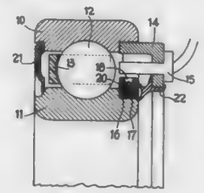
1. An autolubricating bearing, comprising a metallic body having a central through passage having a cylindrical surface in which is disposed a flat disc having flat parallel opposite surfaces, one of said flat surfaces being in abutment with said metallic body and the other of said flat surfaces forming an abutment for a pivot, and a cylindrical member of autolubricating synthetic resin secured in the body, said member having an internal medial bearing surface adapted to receive said pivot and two surfaces widening in opposite directions from said medial bearing surface toward frontal surfaces of said member, all of one of said frontal surfaces of said member being in contact with said other flat surface of the disc.

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BEARING OR ROLLER BEARING WITH DATA SENSOR

Roger Guers, Seynod, and Georges Godard, Poisy Chef Lieu, both of France, assignors to S. N. R. Roulements, Annecy, France

Filed Oct. 1, 1986, Ser. No. 914,478
Claims priority, application France, Jun. 10, 1986, 86 08348
Int. Cl.⁴ F16C *32/00*; G01B *7/14*
U.S. Cl. 384—448 **15 Claims**



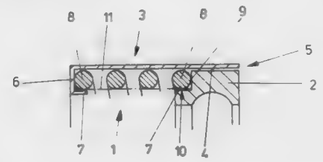
1. A bearing having a sensor, comprising:
a first annular bearing element;
a second annular bearing element which is rotatable relative to said first bearing element;
a continuous magnetic wire ring rotatable coaxially with said second bearing element, a circumference of said ring defining multiple magnetized portions with circumferentially alternating north and south poles; and
a magnetic sensor fixed to said first bearing element and spaced from said ring by a predetermined gap.

4,732,495

ARRANGEMENT FOR ADJUSTMENT OF ROLLING BEARING

Manfred Brandenstein, Eussenheim; Rudolf Wolter, Schweinfurt, and Horst M. Ernst, Eltingshausen, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,318
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 8533642[U]
Int. Cl.⁴ F16C *33/64, 33/58, 25/08*
U.S. Cl. 384—518 **5 Claims**



1. An arrangement for adjustment of a rolling bearing having an outer ring with a side surface, said arrangement including a sleeve in which said outer ring is radially and axially movably arranged, said sleeve having a base connected thereto, a helical spring arranged with prestress between said base and said side surface of said outer ring, the first projection means connected to said base and second projection means connected to said outer ring, whereby said first and second projection means are radially displaceable relative to each other, said helical spring being arranged to radially form-lock with said first and second projections means by means of terminal windings at respective ends of said helical spring, where in said first projection means comprises a plurality of circumferentially distributed, axially extending, radially stamped depressions in said sleeve.

4,732,496

TWO-PIECE BALL CAGE FOR BEARING ASSEMBLY

Donald J. Shail, Bridgewater, Conn., assignor to The Barden Corporation, Danbury, Conn.

Continuation of Ser. No. 795,533, Nov. 6, 1985, abandoned. This application Dec. 18, 1986, Ser. No. 943,857
Int. Cl.⁴ F16C *33/38*
U.S. Cl. 384—526 **4 Claims**



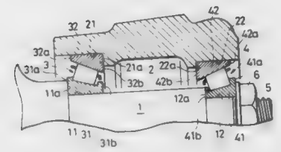
1. A ball cage including in combination a pair of cage portions having opposing generally semicylindrical recesses defining circumferentially spaced radial bores for receiving balls and having means defining mating surface portions extending between said bores, said bores having their axes in a plane, the mating surface portions of one of said cage portions being formed with means defining radially outwardly projecting circumferentially extending lip sections, the mating surface portions of the other of said cage portions being formed with radially inwardly projecting circumferential lip sections adapted to interlock with said outwardly projecting lip sections to prevent axial separation of said cage portions while permitting relative rotational movement thereof, said lip sections projecting predetermined distances beyond said plane from opposite sides thereof, said distances each being less than the radius of said bores and being such as to permit balls substantially of the diameter of said bores to be inserted axially into the recesses of one of said cage portions and to permit the other of said cage portions then to be mated with said one cage portion with said balls in said bores.

4,732,497

BEARING DEVICE

Shiro Sawa; Yoshihide Toda; Kenichi Horii, and Katsuhiko Ikeda, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Oct. 10, 1986, Ser. No. 917,551
Int. Cl.⁴ F16C *19/38*
U.S. Cl. 384—585 **1 Claim**



1. An apparatus for rotatably supporting the end of an axle in two places by a first angular contact roller bearing and an opposed second angular contact roller bearing, each of which has an inner ring and an outer ring, comprising:
an axle having an outer periphery;
a housing having an inner periphery arranged about a portion of said axle;
said inner periphery of said housing and said outer periphery of said axle defining an inner bearing space and an outer bearing;
said inner bearing space having the first angular contact roller bearing disposed therein and having a first step on said outer periphery of said axle and a second step, opposed to said first step, on said inner periphery of said housing;
an outer bearing space, axially spaced from said inner bearing space, having the second angular contact roller bearing disposed therein and having a first step on the outer periphery of said axle and a seocnd step opposed to said first step, on the inner periphery of said housing;
said first step corresponding to said outer bearing space extending radially inwardly from said first step corresponding to said inner bearing space;
the outer ring of said first angular contact roller bearing having an edge face for abutting against said second step corresponding to said inner bearing space;
the inner ring of said first angular contact roller bearing having an edge face for abutting against said first step corresponding to said inner bearing space;
the outer ring of said second angular contact roller bearing having an edge face for abutting against said second step corresponding to said outer bearing space;
the inner ring of said second angular contact roller bearing having an edge face for abutting against said first step corresponding to said outer bearing space; and
nut means in threaded engagement with the outer periphery of said axle, operable to force said inner ring of said conical bearing into engagement with said second first step corresponding to said outer bearing space so that the following relationship is satisfied:

$$A+B+X=C+Y$$

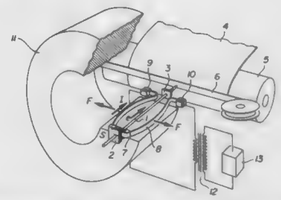
where:
A=the axial distance between said second step of said inner bearing space and said second step of said outer bearing space;
B=the axial distance between said first and second steps of said inner bearing space;
C=the axial distance between said first step of said inner bearing space and said first step of said outer bearing space;
X=the distance between said abutting portion of said outer ring of said second roller bearing and said first step of said outer bearing space; and
Y=the distance between said abutting portion of said inner ring of said second angular contact roller bearing and said first step of the outer bearing space.

4,732,498

NEEDLE MATRIX PRINTER

Jacques Vermot-Gaud, Perly, and Didier Joyeux, Petit-Lancy, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

PCT No. PCT/CH85/00176, § 371 Date Aug. 19, 1986, § 102(e) Date Aug. 19, 1986, PCT Pub. No. WO86/03718, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 16, 1985, Ser. No. 905,386
Claims priority, application Switzerland, Dec. 19, 1984, 6023/84
Int. Cl.⁴ B41J *3/12*
U.S. Cl. 400—124 **7 Claims**



1. A needle matrix printer comprising a set of needles each of which is mounted to be longitudinally slidable and is associated with an electrical lead which is flexible over at least part of its length and is situated in a plane containing said needle, a part of which is in engagement with the central part of said lead, at least one segment of the said lead being situated in the air-gap of a permanent magnet having a homogeneous magnetic field perpendicular to said plane, a lateral force being exerted on said lead when a current passes through it, characterised in that the two ends of said lead are fixed to two respective anchoring elements, said lead forming an elongate open loop between said elements, which is positioned on opposite sides of the needle and in a common plane therewith so that the needle is free to move along its longitudinal axis, said loop including a longitudinal strand to form the said segment situated in said air-gap, and means for exerting the said lateral force on the longitudinal strand to deform said loop and thereby move said central part along the longitudinal axis of said needle so as to move said needle.

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4,732,499

RIBBON CARTRIDGE FOR PRINTERS

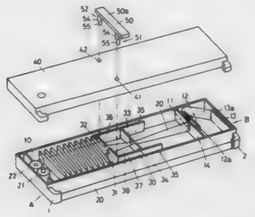
Masamitsu Nojima, and Takashi Sawada, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 770,578, Aug. 29, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 77,080

Claims priority, application Japan, Aug. 31, 1984, 59-133136[U]

Int. Cl.[4] B41J *32/02*

U.S. Cl. 400—196.1 **6 Claims**



1. A ribbon cartridge for printers, comprising a longitudinally elongated case having a broad base portion, two parallel side plates, an inlet for the ribbon at a first longitudinal end thereof and an outlet for the ribbon at a second longitudinal end thereof, a sliding guide longitudinally slidably mounted in said case, and an endless ink ribbon enclosed in said case, a part of which is exposed outside said case between said inlet and outlet, a greater part of said ribbon being enclosed in said case in a space between said sliding guide and said first longitudinal end of said case, extending therein in a zigzag manner, means for stopping said sliding guide at a position, said sliding guide comprising a front guide plate at an inlet side thereof, a rear guide plate at an outlet side thereof apart from said front guide plate, and a pair of side frames, said front guide plate having an inlet slit therein parallel to said side frames, and said rear guide plate having an outlet slit therein, said outlet slit in said rear guide plate of said sliding guide being inclined sideways at an oblique angle with respect to said side frames, said means being provided to stop the sliding guide so as to form a space between said rear guide plate and said second longitudinal end, said ink ribbon being engaged within both of said slits so as to correct bending or twisting of said ribbon.

4,732,500

DRIVE MECHANISM INCLUDING FLOATING PRESSURE RING FOR INK RIBBON CASSETTE

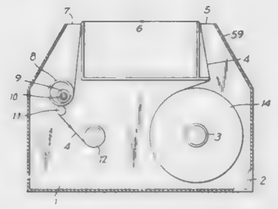
Markus Bürgin, Monchaltorf, Switzerland, assignor to Franz Büttner AG, Egg, Switzerland

Filed Oct. 29, 1985, Ser. No. 792,370

Claims priority, application Switzerland, Nov. 23, 1984, 5616/84

Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—208 **13 Claims**



1. In an ink ribbon cassette having a top, a bottom, a side wall connecting the top and bottom and an ink ribbon supply means, an improved ink ribbon drive mechanism comprising:

a rotatably supported driver;

a freely rotating roller mounted within the cassette adjacent to the driver: and

a pressure ring having an internal diameter larger than the external diameter of the roller mounted about the roller with a portion of the inner surface of the ring contacting the roller and a portion of the outside surface of the ring contacting the driver, the pressure ring, the rotating roller and the driver positioned in the housing so that a ribbon fed from the ribbon supply means contacts a portion of each of the pressure ring and driver for advancing the ribbon past the ring and driver with the pressure on the ribbon increasing in response to an increase in tension on the ribbon.

4,732,501

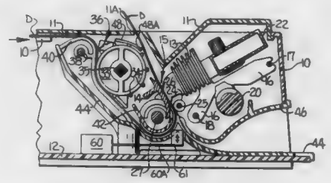
METHOD AND APPARATUS FOR LOADING OF A WEB INTO A PRINTER

Tim V. Angst, Charlotte, and Joel G. Goodwin, Concord, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,187

Int. Cl.[4] B41J *11/28*

U.S. Cl. 400—616.3 **26 Claims**



1. A printer for use with data processing apparatus comprising:

means for recording information on a web, the means for recording information including a platen attached to the printer and a print head for generating characters, the print head being disposed in a predetermined spaced relationship from the platen to define a print station therebetween;

means for engaging and moving the web through the print station;

signal means for generating a normal mode signal and a load assist mode signal; and

means for driving the means for engaging and moving the web, the means for driving being responsive to the normal mode signal from said signal means for operating at a normal rate during normal printing operation, and being responsive to the load assist mode signal from said signal means by operating at a slower than normal rate to facilitate alignment and engagement of the web with the means for engaging and moving the web during web loading operations.

4,732,502

PRINTER

Takeshi Yokoi, Kagamihara, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 799,698, Nov. 19, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 62,393

Claims priority, application Japan, Nov. 19, 1984, 59-175234[U]; Nov. 20, 1984, 59-245475

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—693 **9 Claims**

1. A printer comprising:

a main body casing having a frontwardly extending portion and a rearwardly extending portion, said main body casing including a main frame extending between said frontwardly extending portion and said rearwardly extending portion, said frontwardly extending portion of the main body casing including a main cover at one side thereof and a recess at the other side thereof, said main cover being mounted on said main frame;

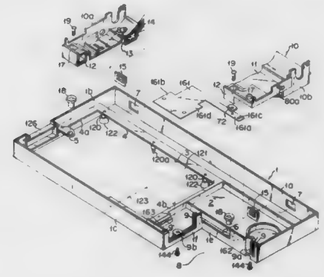
a printing mechanism unit for printing operation, said printing mechanism unit being mounted on said rearwardly extending portion of the main body casing and including a platen for supporting a printing sheet, a carriage having a print head and movable relatively to the platen, platen drive means, and carriage drive means for moving the carriage, said platen extending substantially over the width of the main frame;

said main body casing further having a subcover which is removably mounted on said main frame to be located above said printing mechanism unit and to be removable independently of said main cover;

a control unit for controlling the printing operation of the printing mechanism unit, said control unit being mounted in the frontwardly extending portion of the main body casing and including first switch means which is mounted on said main cover;

power supply means for supplying electric power to the printing mechanism unit for printing operation; and

a power supply means casing containing the power supply means and removably attached to the main body casing in



said recess, so that the power supply means, the control unit and the printing mechanism unit are electrically connected when the power supply means casing is attached to the main body casing,

said power supply means including a high-voltage input means adapted to be connected to an external power source for high-voltage power input, transforming means for changing a high-voltage input current into a predetermined low-voltage current lower in potential than the input current, low-voltage output means for delivering the low-voltage current transformed by the transforming means to the control unit and the printing mechanism unit, said low-voltage output means having a connector removably connected to the main body casing, and second switch means for switching the electrical connection between the high-voltage input means and the transforming means, said second switch means being located in the power supply means casing to permit external manual operation;

said first and second switch means being disposed in front of said printing mechanism unit and extending through said main cover and said power supply means casing, respectively;

said main cover and said power supply means casing having their respective upper surfaces at substantially the same height;

whereby the respective outer peripheral surfaces of the main body casing and the power supply means casing are flush and continuous with each other, forming substantially rectangular outline of the printer.

4,732,503

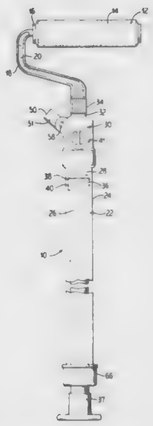
RESERVOIR FLUID DISPENSER WITH CONTROL VALVE

Peter Bader, Minneapolis, Minn.; Dennis A. Gross, Lake Forest; Robert M. Barrett, Rolling Meadows, both of Ill., and Wayne M. Bekius, Milaca, Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 7, 1986, Ser. No. 894,361

Int. Cl.[4] B05C *1/10*

U.S. Cl. 401—197 **18 Claims**



1. An apparatus for applying a liquid to a surface comprising:

an applicator;

a body member, the applicator being secured to an end of the body member, the body member defining a reservoir for housing a fluid;

a piston means for exerting a force on the fluid in the reservoir; and

the body member including two channels, a first channel being in fluid communication with a channel in the applicator, a second channel being in fluid communication with an area outside the body member, the body member further including a single valve movable to a first or second position for establishing when the valve is in the first position fluid communication between the reservoir and the first channel and establishing when the valve is in the second position fluid communication between the reservoir and the second channel, the valve allowing, when fluid communication is established, fluid flow in both a first direction into the reservoir from the respective channel and fluid flow in a second direction out of the reservoir and into the respective channel.

2. An apparatus for applying a liquid to a surface comprising:

an applicator;

a body member, the applicator being secured to an end of the body member, the body member defining a reservoir for housing a fluid;

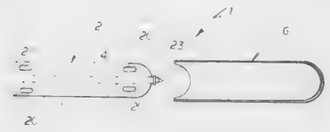
a piston means for exerting a force on the fluid in the reservoir; and

the body member including two channels, a first channel being in fluid communication with a channel in the applicator, a second channel being in fluid communication with an area outside the body member, the body member further including a valve for allowing fluid communication between the reservoir and either the first channel or second channel, said second channel includes a one-way

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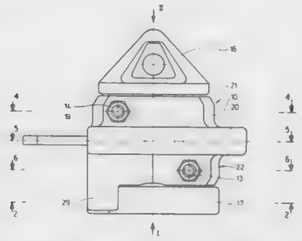
valve between said valve and an aperture in fluid communication with the area outside the body member, and said body member includes means for deactivating said one-way valve.

4,732,504
FLEXIBLE FLAT BALLPOINT PEN
Rolando D. Telli, Milan, Italy, assignor to Design Machine S.N.C. di Adalberto Brunetti e Danilo Telli, Milan, Italy
Filed Sep. 12, 1986, Ser. No. 907,046
Claims priority, application Italy, Sep. 12, 1985, 22988/85[U]
Int. Cl.[4] B43K *7/00, 9/00*
U.S. Cl. 401—209 **9 Claims**



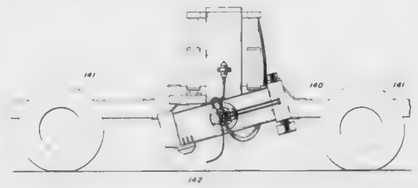
1. A ballpoint pen, comprising:
a manually grippable flat soft flexible elongate body constituted of two flat coextensive strips of a soft flexible material;
edge welds between said strips fastening said flat coextensive strips together along the perimeters thereof and including opposite longitudinal edges and ends of the body while leaving the perimeters of said strips unconnected at one end of said body, said body being formed with a passage open at said one end and closed by one of said welds at an opposite end thereof; and
a ballpoint ink cartridge formed with a ballpoint tip on an end thereof received in said passage so that said tip projects from said one end of said body, and a tubular ink reservoir of flexible material received wholly in said body over a major portion of the length of said body and connected to said tip, said welds along said opposite longitudinal edges being spaced from said ink reservoir.

4,732,505
COUPLING PIECE FOR CONNECTING CONTAINERS
Jürgen Gloystein, Osterholz-Scharmbeck, Fed. Rep. of Germany, assignor to Conver Ingenieur Technik GmbH & Co. KG, Bremen, Fed. Rep. of Germany
Filed Mar. 5, 1986, Ser. No. 836,483
Int. Cl.[4] B25G *3/00;* **B65D** *21/02*
U.S. Cl. 403—14 **9 Claims**



1. A coupling device for connecting containers, comprising:
a housing having continuously widening abutment, center parts arranged bilaterally therefrom and a continuous central opening;
a locking bolt mounted rotatably in the opening of the housing, with a first crossbar located at one end of the locking bolt outside the housing and a second crossbar located at the other end of the locking bolt outside the housing;
the first crossbar having a first longitudinal axis, and the second crossbar having a second longitudinal axis offset from the first longitudinal axis by a predetermined angle;
the center part of the housing having corner portions which are arranged such that the center part may be rotated through the predetermined angle in an opening of a corner fitting of a container; and
the center part of the housing having a pair of diametrically opposed stops, each projecting outwardly and protruding into a corresponding recess in the second crossbar and permitting limited rotation of the locking bolt.

4,732,506
SURFACE CRUSHING APPARATUS
Marvin G. Bays, Ponca City, Okla., assignor to Mertz, Inc., Ponca City, Okla.
Filed Dec. 12, 1986, Ser. No. 940,981
Int. Cl.[4] E01C *23/12*
U.S. Cl. 404—90 **27 Claims**

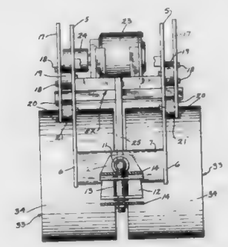


1. Apparatus for breaking a hard surface comprising:
(a) a hydraulic force generating means having a hydraulic cylinder means, a hydraulic piston means slidably mounted inside said hydraulic cylinder means, a first mass means attached to said hydraulic piston means, second mass means coupled to hydraulic cylinder means; hydraulic control means having an electrical input, and an hydraulic input and a hydraulic output coupled to said hydraulic cylinder means in a manner to move said hydraulic piston means reciprocally in said hydraulic cylinder means;
(b) means for attaching said hydraulic force generating means to an impacting tool; and,
(c) electrical means coupled to said electrical input in a manner to control said reciprocation at substantially the resonant frequency of said hydraulic force generating means;
whereby when said hydraulic force generating means is in resonance with said impacting tool in partial contact with said hard surface, said impacting tool will crush and break said hard surface.

4,732,507
WALK BEHIND SOIL COMPACTOR HAVING A DOUBLE VIBRATORY DRUM AND AN ARTICULATED FRAME
Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W, Inc., Slinger, Wis.
Filed Mar. 3, 1987, Ser. No. 21,163
Int. Cl.[4] E01C *19/28*
U.S. Cl. 404—117 **9 Claims**

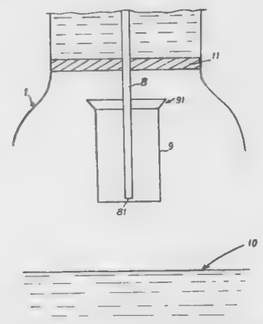
1. A soil compactor, comprising a rear unit having a drive wheel means, first frame means, articulated joint means connecting said first frame means to said rear unit, second frame means connected to said first frame means and including a vertical support plate, horizontal shaft means journalled for rotation on said support plate, a pair of drums mounted on said shaft means and positioned on either side of said plate, said shaft means being supported solely by said plate, drive means

for driving said drums and including a drive element extending between said drums and operably connected to said shaft



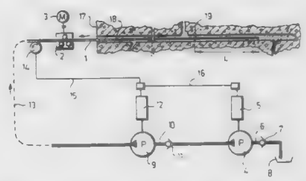
means, and vibratory means mounted on said second frame means for imparting vibration to said drums.

4,732,508
SAFETY DEVICE FOR A FILLING TUBE OF AN UNDERGROUND FACILITY FOR STORING LIQUEFIED GAS UNDER PRESSURE
Georges Berezoutzky, Cesson, France, assignor to Societe Francaise de Stockage Geologique-Geostock, Paris La Defense, France
Filed Aug. 13, 1986, Ser. No. 896,048
Claims priority, application France, Aug. 13, 1985, 85 12321
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—53 **1 Claim**



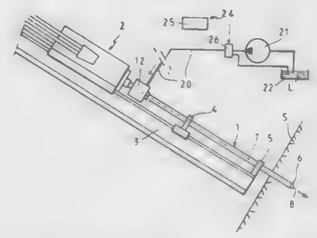
1. A safety installation for a vertically oriented tube (8) for inserting a liquid substance for storage in an underground cavity (1) defined in a water-impregnated rock mass, said liquid being a liquid phase of a substance which is a gas at ordinary temperature, which liquefies under pressure, which has a density less than the density of water, and which is immiscible with water, said liquefied gas being stored in said cavity under a liquid-gas equilibrium pressure applicable to the ambient temperature in the cavity, said safety installation being characterized by: a bottom, open outlet end (81) of the tube being disposed in an upper, gaseous phase portion of the cavity, and above a level (10) of the liquid stored in the cavity, and a can (9) open at a top thereof and disposed around the bottom end of the tube such that said bottom end is disposed proximate a bottom of the can, the volume of the can above said bottom end of the tube being greater than the volume of the tube up to a height corresponding to a head of water necessary for reaching an equilibrium pressure with the cavity.

4,732,509
METHOD AND A DEVICE FOR FEEDING CONCRETE INTO A DRILL HOLE IN THE CONCRETE BOILING OF A ROCK
Jarmo Leppänen, Ylöjärvi, Finland, assignor to Oy Tampella AB, Tampere, Finland
Filed Oct. 21, 1986, Ser. No. 921,144
Claims priority, application Finland, Nov. 7, 1985, 854378
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—260 **10 Claims**



1. A method for feeding concrete into a drill hole in the concrete bolting of a rock, comprising the steps of:
pushing a feeding hose into a hole;
pumping concrete into the hole through the feeding hose; and
drawing the feeding hose outwards within the hole in a synchronized manner with the pumping of concrete, said drawing normally being at a predetermined, continuous speed, wherein the amount of concrete pumped into the feeding hose for the distance the feeding hose is withdrawn is greater than the concrete amount which would fill an unbroken hole when the feeding hose is withdrawn said distance.

4,732,510
PROCESS FOR DRIVING AND CEMENTING IN GROUND ANCHORS, APPARATUS AND ANCHOR BARS FOR SAID PROCESS
Claude C. Louis, 40 Bis, avenue Bosquet, 75007 Paris, France
Continuation of Ser. No. 703,477, Feb. 20, 1985, abandoned.
This application Mar. 26, 1987, Ser. No. 31,171
Claims priority, application France, Feb. 23, 1984, 84 02742
Int. Cl.[4] E02D *5/80, 7/26*
U.S. Cl. 405—269 **14 Claims**



1. Process for driving and cementing anchors in ground comprising the steps of:
taking an anchor rod with a longitudinal duct open at a tip located at the remote end of the rod in the ground,
taking an interface device connected at the other end of the rod, said interface device comprising a cylinder acting as a dolly and having a top end which forms a helmet, said cylinder containing a chamber communicating with the longitudinal duct of the rod,
taking a grout sufficiently liquid to be pumped at high pressure, and,

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taking a high-pressure pump for puming and ejecting said liquid grout through said longitudinal duct so that the kinetic energy of the grout emerging from the duct through the tip of the rod is high enough to produce hydraulic fracturing of the ground,

and using a percussion/vibration hammer or the like to strike the helmet of the cylinder to mechanically transmit its energy of impact to the rod and hence to the ground as a mechanical shock wave, wherein the hammer strikes at a frequency that is sufficient to prevent the ground reforming between successive impacts, which frequency is greater than 10 Hz.

4,732,511

MINE ROOF SUPPORTS

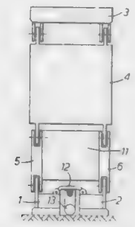
Dennis F. Rutherford, Cheltenham, England, assignor to Dowty Mining Equipment Ltd., Tewkesbury, England

Continuation of Ser. No. 290,221, Aug. 5, 1981, abandoned. This application May 19, 1983, Ser. No. 495,454

Claims priority, application United Kingdom, Aug. 16, 1980, 8026754

Int. Cl.⁴ E21D *23/04*

U.S. Cl. 405—296 **4 Claims**



1. A mine roof support having a pair of separate substantially parallel spaced apart floor-engaging members, a roof-engageable member or members, a shield pivotally-connected to the roof-engageable member or members, prop means carried by the floor engaging members by which the roof-engageable member or members can be urged into engagement with a roof and a strengthening member interconnecting a pair of parallel links to form therewith a torsionally-stiff device providing the sole direct connection between the rear-end portions of the floor-engaging members by which the forces tending to cause relative displacement of those rear-end portions in the vertical direction are substantially resisted and being constructed to provide a torsion box with the parallel links, which torsion box is sufficiently rigid to resist anticipated forces tending to cause such relative displacement.

4,732,512

PNEUMATIC CONVEYOR SYSTEMS

Phillip J. Welch, Knutsford, England, assignor to British Nuclear Fuels plc, Risley, England

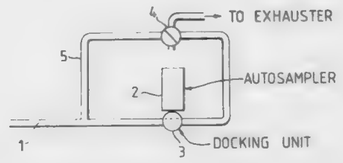
Filed Jun. 28, 1985, Ser. No. 749,719

Claims priority, application United Kingdom, Jul. 11, 1984, 8417712

Int. Cl.⁴ B65G *51/20*

U.S. Cl. 406—84 **4 Claims**

1. A pneumatic conveyor system, comprising a main duct for the transport of objects between stations, a docking unit and valve means associated with each station, the valve means including a valve body first, second, third and fourth angularly spaced valve ports, a branch duct leading from the main duct to the first port, an exhauster for creating suction in the main duct connected with the second port, means for connecting the third port with the docking unit, the fourth port opening to atmosphere, and a rotatable valve member in the valve body selectively operable to provide unobstructed communication between any two angularly adjacent ports of said ports in the valve body while blocking communication between the other



ports of said ports, and said valve member in all positions blocking communication between two ports of said ports angularly separated by another of said ports.

4,732,513

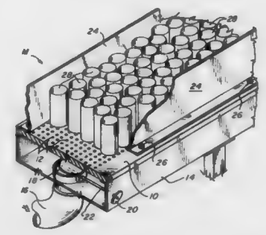
CONTROLLED SPEED COVERLESS AIR CONVEYOR

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Filed Aug. 29, 1986, Ser. No. 901,593

Int. Cl.⁴ B65G *51/03*

U.S. Cl. 406—88 **9 Claims**



1. A controlled speed coverless air conveyor for conveying en masse articles having widely varying diameters and heights, at constant speed, said conveyor comprising:

a surface extending from an upstream location to a downstream location for moving the article en masse, first and second opposite side edges and an underside with a prearranged pattern of nearly vertical flotation air jets with a very slight downstream vector communicating said surface and said underside;

a plenum connectable to a source of air under pressure and attached to said underside of said conveyor; and

a sidewall along each of said side edges having a height at least as high as the tallest article to be conveyed on said conveyor to form an air dam so that substantially uniform higher than ambient air pressure is formed which moves as a stream above said conveyor, each of said sidewalls being tilted inwardly from bottom to top at a sufficient angle so that there is no sidewall attachment effect between the lower portion of said sidewalls and the sidewalls of the articles but there is a sidewall attachment effect between the upper portion of said sidewalls and the upper portion of the sidewall of the container due to air flowing therebetween to vertically stabilize the articles as they move from said upstream location to said downstream location.

4,732,514

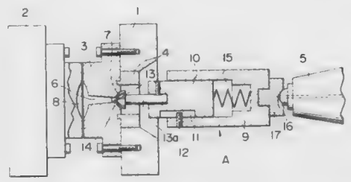
DEVICE FOR USE IN RESHAPING THE GATE OF A METAL MOULD FOR PLASTIC INJECTION MOULDING

Fumiyuki Shiina, Tokyo, Japan, assignor to Kabushiki Gaisha Sankoh-Chemical, Osaka, Japan

Filed Oct. 1, 1986, Ser. No. 914,148

Int. Cl.⁴ B23C *3/16*

U.S. Cl. 408—86 **2 Claims**



1. A device for reshaping a gate recess of a metal injection mould for accommodating the injection nozzle of a plastics injection moulding apparatus, the device comprising;

a cylindrical barrel having a longitudinally extending hollow interior space with an open front end;

a cylindrical body slidably fitted in the longitudinally extending hollow space of the barrel;

a rotary convex edged cutting tool detachably fixed to the front end of the cylindrical body and having a convex blade complementary in shape to the reshaped concave gate recess of the mould;

spring means acting between the rear end of the cylindrical body and the rear end of the barrel to bias the front end of the body from the barrel;

and a nozzle seat plate rotatably mounted on the rear end of the barrel for rotation relative to the barrel and having a concave recess complementary, in shape, to a tip of the injection nozzle of the apparatus.

4,732,515

RAILROAD TRACKS MILLING METHOD AND APPARATUS

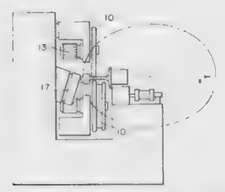
Josef Pomikacsek, Gmunden, Austria, assignor to Dr. Techn. E. Linsinger & Co Gesellschaft m.b.H., Steyrermühl, Austria

Filed Oct. 29, 1986, Ser. No. 924,450

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538345

Int. Cl.⁴ B23C *3/02*

U.S. Cl. 409—131 **9 Claims**



1. A method of working of the contact surfaces of rails of railroad tracks railroad tracks by milling, wherein the rails are moved in the longitudinal direction past a stationary milling unit and are guided by laterally disposed rollers, using the milling unit and a milling tool having a rotating ring with cutter elements disposed on the inside thereof, comprising aligning the cutter flight circle of the milling tool with respect to the rail such that one diameter of the circle of the milling tool coincides with an axis of symmetry of a rail profile, and extending the flight circle plane of the cutter obliquely with respect to the longitudinal axis of the rail in such a manner that the projection of the cutter flight circle into the rail profile plane containing the rail profile axis of symmetry produces an ellipse, the course of the ellipse corresponding to the quasi-elliptical contact surface profile.

4,732,516

LASHING BAR

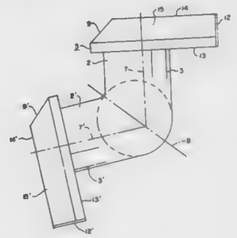
Dieter Borchardt, Rissener Dorfstr. 45, 2000 Hamburg 56, Fed. Rep. of Germany

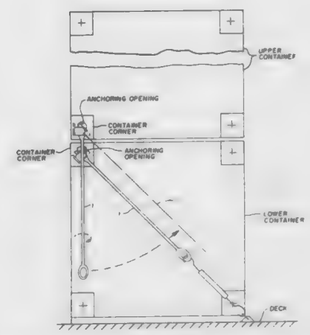
Filed Jan. 12, 1987, Ser. No. 2,313

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 8601121[U]

Int. Cl.⁴ B63B *25/28;* **B60P** *7/13*

U.S. Cl. 410—77 **8 Claims**





1. A lashing bar for hanging in an anchoring opening of a container corner with two hooking-in fittings provided at the upper end of a bar which for each fitting has a pin extending substantially at a right angle to said bar and to which end is fixed a hooking-in portion, which is asymmetrical with respect to the plane in which the central axis of the bar is located and to which the longitudinal axis of the portion of the pin connected to the hooking-in portion is parallel, so that the first side of the hooking-in portion projects further sideways over the plane than the facing, second side and which in the case of a said hooking-in fitting hung into an anchoring opening and said bar pivoted into a clamping position engages behind marginal regions of the anchoring opening, whereby one of the hooking-in portions is constructed to engage behind the marginal regions of the anchoring opening when the lower end of said bar is pivoted towards one side of the extension of the vertical axis and the other hooking-in portion is constructed for engaging behind the marginal regions of the anchoring opening when the lower end of said bar is pivoted to the other side of the extension of the vertical axis and the two hooking-in portions are homologous to a plane located between them, characterized in that the longitudinal axes of the portions of pins connected to the hooking-in portions form an angle ϕ smaller than

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180°, whereby in a plane normal to the central axis of bar the spacing between the lateral and regions of the first sides of the hooking-in portions is greater than the spacing between the lateral end regions of the second sides of the hooking-in portions.

8. In combination,

a deck having a first container stacked thereon and a second container stacked on said first container;

the first container being provided on one side thereof with left and right upper corner fittings;

the second container being provided on a corresponding side thereof with left and right lower corner fittings;

one of said upper corner fittings of said first container being vertically adjacent one of said lower corner fittings of said second container;

each said corner fitting being a hollow structure having a cavity with an aperture on the respective said side of the respective said container;

two lashing bars;

each said lashing bar having a generally vertically extending bar portion with a lower end which can be secured with respect to said deck when the respective lashing bar has said bar portion thereof disposed in a first selected angular orientation relative to vertical;

one said lashing bar further having two hooking-in fittings provided thereon at an upper end thereof which have respective plate-like hooking-in fittings which face laterally away from said bar portion with an angle of less than 180° being included between said hooking-in fittings in a plane which is transverse to the longitudinal axis of said bar portion;

said hooking-in fittings on said one lashing bar being alternately useful, depending on whether said one upper corner fitting is a left or a right upper corner fitting by being inserted through a respective said aperture into a respective said cavity in a respective said upper corner fitting when the respective lashing bar has said bar portion thereof disposed in a second selected angular orientation relative to vertical, but which becomes clamped to the respective said upper corner fitting when said bar portion is thereafter rotated from said second selected position to said first selected position;

said one lashing bar having said bar portion thereof in said first selected position thereof with one said hooking-in fitting thereof clamped in said one upper corner fitting and having said lower end thereof secured with respect to said deck;

the other said lashing bar further having at least one hooking-in fitting provided thereon at an upper end thereof, each of which hooking-in fitting has a respective plate-like hooking-in fitting which faces laterally away from said bar portion;

said at least one hooking-in fitting being useful by being inserted in said one lower corner fitting when the respective lashing bar has said bar portion thereof disposed in a second selected angular orientation relative to vertical, but which becomes clamped to the respective said lower corner fitting when said bar portion is thereafter rotated from said second selected position thereof to said first selected position thereof;

said hooking-in fittings on said one lashing bar being so spatially oriented that said bar portion of said other lashing bar may be rotated from said second selected position thereof to said first selected position thereof without hindering engagement with said one lashing bar;

said other lashing bar having said bar portion thereof in said first selected position thereof with said at least one hooking-in fitting thereof clamped in said one lower corner fitting and having said lower end thereof secured with respect to said deck.

4,732,517

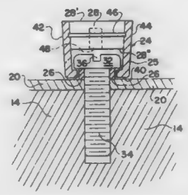
ANTI-TAMPER FASTENER SHIELDING APPARATUS

Jack S. Crouch, Charlotte, and Edward F. Zink, Matthews, both of N.C., assignors to Carolina Moldings, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 555,033, Nov. 23, 1983, Pat. No. 4,621,230. This application Dec. 9, 1985, Ser. No. 806,756

Int. Cl.[4] F16B *31/02*

U.S. Cl. 411—39 **9 Claims**



1. Apparatus for assembly with a fastener of the type having a stem and an enlarged head during use of said fastener for deterring and detecting tampering therewith, said apparatus comprising annular collar means for extension therethrough of said fastener stem and for disposition adjacent the underside of said fastener head in assembly with said fastener and closure means adapted to mate with said collar means for cooperatively enclosing said fastener head to deter access thereto, said collar means including an outer annular collar member having an annular collar portion, an inner annular washer member, and frangible means connecting said collar member and said washer member and adapted to break to detach said collar member and said washer member from one another under force of engagement of said fastener head with said collar means upon installation of said fastener in assembly with said collar means, said washer member being of a greater axial dimension than said collar portion for installed engagement of said fastener head with said washer member to permit said collar member to rotate freely about said fastener and said washer member, thereby preventing removal action frictionally upon said fastener by action upon said collar member.

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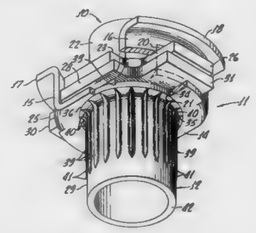
FATIGUE-RESISTANT FLARED FASTENER

Rahmatollah F. Toosky, Irvine, Calif., assignor to Deutsch Fastener Corp., Lakewood, Calif.

Filed Dec. 16, 1986, Ser. No. 942,536

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—181 **21 Claims**



15. In combination with a workpiece having an opening therethrough, a first surface at one end of said opening, a second surface at the opposite end of said opening, a first corner at the intersection of the wall of said opening and said first surface, and a second corner at the intersection of the wall of said opening and said second surface, a fastener for imparting fatigue resistance to said workpiece comprising

a nut,

a basket retaining said nut,

said basket having opposed side walls and a bottom wall interconnecting said side walls and having an opening therethrough, said bottom wall overlying said first surface with said opening through said bottom wall being aligned with said opening in said workpiece, and

a sleeve having a head overlying said bottom wall of said basket and a tubular portion extending from said head,

said tubular portion having

a first part of a first relatively large exterior diameter extending through said opening in said bottom wall of said basket and terminating substantially at the undersurface of said bottom wall,

a second part of a second relatively small exterior diameter spaced longitudinally of said sleeve from said first part and received in said opening in said workpiece with the outer end of said sleeve extending beyond said opening and being bent outwardly to form a flange overlying said second surface for retaining said fastener to said workpiece, said sleeve at the base of said flange being deflected outwardly against said second corner and deflecting and compressing said workpiece radially outwardly and axially inwardly of said opening at said second corner, and

a third part projecting from said first part and inclined inwardly toward the longitudinal axis of said sleeve and toward the outer end thereof so as to interconnect said first and second parts, said third part engaging said first corner and deflecting and compressing said workpiece radially outwardly and axially inwardly of said opening at said first corner,

said second part having a plurality of rounded lobes thereon extending longitudinally thereof and embedded in the wall of said opening for preventing rotation of said sleeve relative to said workpiece, the exterior lateral dimension of said second part across the crests of said lobes being less than said first diameter,

said tubular portion of said sleeve being expanded outwardly between said flange and said third part for compressing said workpiece at said opening, whereby the fatigue life of said workpiece is increased by said compression thereof at said first and second corners and along said opening.

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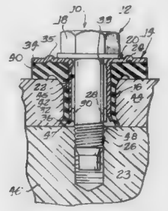
FASTENER ASSEMBLY WITH AXIAL PLAY

David P. Wagner, Geneva, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 24, 1986, Ser. No. 945,811

Int. Cl.[4] F16B *21/07*

U.S. Cl. 411—337 **3 Claims**



1. A fastener assembly adapted for use in connection with first and second apertured workpieces, said fastener assembly comprising a fastener, a washer and a rubber grommet, the fastener having a head with a clamping surface thereunder, a shank and a reduced diameter entering portion; said shank having an upper shank portion of a predetermined axial extent, a lower threaded shank portion of a predetermined axial extent and a pair of integrally formed wings spaced a predetermined axial distance from the head of the fastener between said upper shank portion and said lower threaded shank portion; said washer including a radial flange and an axially extending sleeve and a rim extending laterally from the uppermost extremity of the sleeve and a flared portion extending outwardly from the lowermost extremity of the sleeve; said washer being telescopically associated with said fastener, the inner diameter of said rim of said washer being adapted to snap over the pair of wings securing the washer and the fastener together; the inner diameter of the sleeve of the washer being greater than the diameter of said upper shank portion and said lower threaded shank portion allowing substantial axial play between said washer and said fastener; said rubber grommet having an axially extending sleeve and a rim extending laterally from the uppermost extremity of said sleeve of said rubber grommet, said rubber grommet telescopically stretching over said washer, said wings being spaced from said entering portion such that said entering portion does not substantially project beyond a free end of the sleeve of said rubber grommet when said wings abut said rim, and said wings lying directly adjacent said threaded portion and spaced the substantial length of the upper shank portion from said head to provide for substantial axial play of the fastener in the washer.

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NON-ROTATING TOGGLE BOLT ASSEMBLY

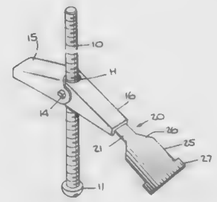
Louis N. Giannuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 815,812, Jan. 2, 1986, Pat. No. 4,668,144, which is a continuation-in-part of Ser. No. 635,068, Jul. 27, 1984, Pat. No. 4,616,968. This application Jun. 23, 1986, Ser. No. 877,351

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] F16B *21/00*

U.S. Cl. 411—342 **8 Claims**



1. A non-rotating toggle bolt assembly for supporting a fixture or other object against the outer surface of a hollow wall, said assembly comprising:

A. a bolt having means at one end to effect turning thereof, and a threaded shank whose length exceeds the thickness of the wall for which it is intended;

B. a collapsible toggle threadably received on the end of the shank, said toggle when in the collapsed state assuming reduced dimensions permitting its passage through a hole in the wall, the toggle when emerging from the hole assuming enlarged dimensions; and

C. locking means to prevent rotation of the toggle, whereby when said bolt is turned, the toggle will then advance along the shank toward the inner surface of the wall to engage said inner surface, said locking means being constituted by an elongated member coupled at one end to the toggle and having a restraining zone therein whose form is such as to cause it to engage the wall of the hole, the length of the member being such that in the course of installation when the toggle is collapsed to pass through the hole, the member but not the restraining zone also

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passes therethrough, the restraining zone being substantially closer to the bolt turning means than the toggle is to the turning means, and the restraining zone do not emerge from the hole but engages the wall of the hole when the toggle after emerging from the hole assumes its enlarged dimensions, whereby the restraining zone prevents rotation of the toggle, said elongated member being a strap extension provided with a relatively broad end portion that functions as the restraining zone.

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SETTING DEVICE FOR PASTING ROLLERS IN A BOOK CASING MACHINE

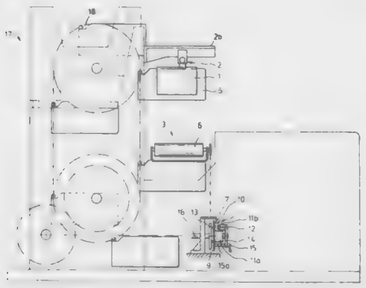
Helmut Kolkhorst, Rahden, Fed. Rep. of Germany, assignor to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,937

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614254

Int. Cl.⁴ B42C 9/00

U.S. Cl. 412—1 **18 Claims**



1. Apparatus for setting the pasting rollers in a book case machine, the machine having an endless, power-driven conveyor with horizontally oriented saddle plates engaging a book block on a transport path, comprising:

a pasting unit including a pair of horizontally disposed pasting rollers located on both sides of the path of the saddle plates, the rollers including recesses which are configured with leading edges adapted to fit into the fold angles of a book block:

first means external to the pasting unit, for indicating when the fold angles of a book block carried by a saddle plate are aligned with a reference elevation:

second means, coupled to the pasting unit, for indicating when the leading edges of the rollers are in a reference angular position:

third means, associated with said conveyor, for raising and lowering the saddle plate along said path and stopping the plate when said fold angle is at said reference elevation; and

fourth means, coupled to said second means, for rotating the rollers independently of the conveyor until the leading edges of the rollers are in said reference position when the fold angle is at said reference elevation.

8. The apparatus of claim **6** wherein said second means and said fourth means are embodied in an adjustment mechanism situated remotely from said pasting unit.

4,732,522

INSTALLATION FOR LOADING AND UNLOADING PARTS INTO AND FROM A CONTAINER

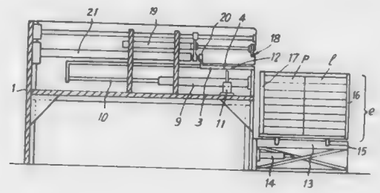
Anne M. Pencé, Courcelles, 89570 Neuvy-Sautour, France

Filed Jun. 2, 1986, Ser. No. 869,967

Claims priority, application France, Jun. 12, 1985, 85 08869

Int. Cl.⁴ B65G 59/04, 65/08

U.S. Cl. 414—118 **8 Claims**



1. An installation for handling parts between a container in which they are placed in layers and piles and a table, said installation comprising a frame, a table mobile horizontally in one direction along said frame, means displacing in a controlled manner said table along said direction so that its free end protrudes from the frame, at least one container formed of at least one bottom and three fixed vertical side walls, an open side of the container having a width slightly greater than the width of the table free end, elevator means beside the frame in the direction of movement of the table and adapted to move vertically in a controlled manner a said container with said open side in register with the table so that the end of said table can be introduced into said container, means for displacing parts substantially horizontally between the inside of said container and the end surface of the table, the table free end carrying a detection crosspiece for the frontal face of a stack of parts forming a layer situated below a layer of parts to be handled, said detection crosspiece controlling by detection of said frontal face the stoppage of a motor device which controls the advance of the table and its reverse motion over a short distance.

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SHIP UNLOADING MECHANISM

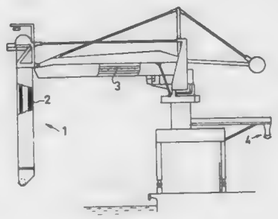
Jorma Antikainen, Hyvinkaa; Matti Sepling, Rajamaki, and Jyri Jusslin, Hyvinkaa, all of Finland, assignors to Kone Oy, Hyvinkaa, Finland

Filed Oct. 10, 1986, Ser. No. 917,607

Claims priority, application Finland, Oct. 29, 1985, 854251

Int. Cl.⁴ B65G 67/60

U.S. Cl. 414—139 **2 Claims**



1. A ship unloading mechanism, comprising:

an endless, vertically operating compartmented belt conveyor for transporting material to be lifted up from a ship's hold;

said compartmented belt conveyor having upwardly facing compartments for receiving said material;

a horizontal conveyor at a top end of said compartmented belt conveyor for receiving said material and for further transporting said material; and

means at a lower end of said compartmented belt conveyor for supplying said material to said compartmented belt conveyor;

said supplying means comprising vaned wheel means for flinging said material at high velocity from the hold into said upwardly facing compartments of said compartmented belt conveyor;

said compartmented belt conveyor further having an upwardly transporting conveyor run which has an outwardly curving shape consistent with the sag of said belt conveyor when said belt conveyor is at its maximum negative unloading angle, means defining a cover having a similarly outwardly curving shape adjacent said compartments and roller means for urging said upwardly transporting conveyor run to assume the outwardly curving shape.

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COMPUTER-CONTROLLED STORAGE SYSTEM

Seppo Suominen, Lehtokuja 2, SF-76820 Huuha, Finland

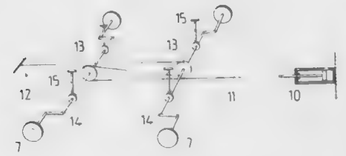
PCT No. PCT/FI85/00038, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04638, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 9, 1985, Ser. No. 817,837

Claims priority, application Finland, Apr. 9, 1984, 841385

Int. Cl.⁴ B65G 1/04

U.S. Cl. 414—267 **4 Claims**



1. A computer-controlled storage system for moving and storing goods items comprising

at least two horizontal storage lines provided with guide members, said storage lines lying parallel to each other,

at least one transport carriage mounted on, and movable along, said guide members of each of said storage lines, each of said carriages comprising a frame and a lifting member;

drive means moving said transport carriages along said guide members, said drive means comprising a power unit external to said transport carriages, a power transmission mechanism for said transport carriages, and cable means connecting said carriages to said mechanism;

a power transmission arrangement external to the transport carriages and continuously connected to said lifting member of each of said transport carriages for raising said lifting member to lift a goods item positioned on said guide members above the lifting member off said guide members for movement with the transport carriage, said power transmission arrangement lowering said lifting member so that the goods item rests on the guide members for storage, said power transmission arrangement being operable to raise or lower said lifting member at any location along said guide members, said transport carriages being so mounted on said guide members as to be movable to any desired position along the storage lines beneath goods items resting on said guide members when the lifting member is in the lowered position; and

locating and controlling means operatively associated with said power transmission mechanism of said drive means and having recording means coupled to said power transmission mechanism for determining the location of the transport carriages along said storage lines and for storing same in the memory of a computer,

said power transmission mechanism (**17**) of said transport carriages being connected to a common power unit (**16**) and recording means (**20**) so that said transport carriages move simultaneously in parallel.

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ROBOT

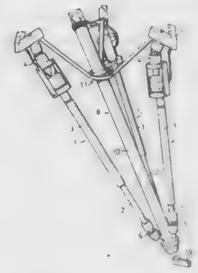
Karl-Erik Neumann, Gräddö, Sweden, assignor to Neos Product HB, Norrtalje, Sweden

Filed Apr. 21, 1986, Ser. No. 854,355

Claims priority, application Sweden, May 10, 1985, 8502327

Int. Cl.⁴ B25J 9/14

U.S. Cl. 414—729 **9 Claims**



1. A robot comprising at least three telescopic setting devices each of which can be lengthened and shortened in its longitudinal direction, each setting device of said three setting devices being secured via a first joint to a fixed frame enabling each said setting device to pivot freely in relation to said frame and one end of each said setting device being attached via a second joint to a movable positioning head, and an intermediate arm extending from said positioning head and located between said setting devices (**1**), wherein said frame supports a universal joint comprising a central through-hole having a cross section somewhat greater than that of said intermediate arm and wherein said intermediate arm extends slidingly through said central through hole of said universal joint so that said arm can be moved with radial control in axial direction and set at different angles to said frame.

4,732,526

EXPLOSION-PROOF INDUSTRIAL ROBOT

Seiichiro Nakashima; Kenichi Toyoda; Akihiro Terada, and Hitoshi Mizuno, all of Hino, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00365, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/00256, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 28, 1985, Ser. No. 848,378

Claims priority, application Japan, Jun. 29, 1884, 59-133002

Int. Cl.⁴ B25J 3/00

U.S. Cl. 414—730 **8 Claims**

1. An industrial robot for use in an atmosphere containing an inflammable or explosive gas, comprising:

a stationary base unit having therein a first airtight chamber;

a swiveling body unit rotatably connected to said stationary base unit through a first hollow shaft for rotation about a first axis and having therein a second airtight chamber which is communicated with said first airtight chamber through the interior of said first hollow shaft;

an upper arm rotatably connected to said swiveling body unit through a second hollow shaft fixed to said upper arm for rotation about a second axis perpendicular to said first

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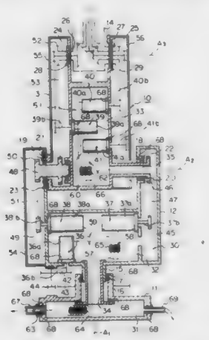
axis and having therein a third airtight chamber which is communicated with said second airtight chamber through the interior of said second hollow shaft;

a forearm rotatably connected to said upper arm for rotation about a third axis parallel to said second axis and for supporting thereon a three-axis wrist assembly having three degrees of motion;

a first group of three electric drive motors, for driving said swiveling robot body unit, said upper arm and said forearm, respectively, said electric drive motors being located in said second airtight chamber;

a second group of three electric drive motors, for driving said wrist assembly, said second group of electric drive motors being located in said third airtight chamber;

a first group of electric cables connected to said first group of three electric motors in said second airtight chamber



and extending from the interior of said second airtight chamber into a fixed pipe fixedly connected to said stationary base unit through said first hollow shaft and further into said first airtight chamber;

a second group of electric cables connected to said second group of three electric motors in said third airtight chambers and extending from the interior of said third airtight chambers into said fixed pipe through said second hollow shaft, said second airtight chamber, said first hollow shaft and into said first airtight chamber; and,

an air supply pipe connected to said stationary base unit for supplying pressurized air to said first, second and third airtight chambers to maintain the interior of said airtight chambers at a predetermined pressure higher than atmospheric pressure outside said airtight chambers and thus prevent seepage of said inflammable or explosive gas into said airtight chamber.

4,732,527

PROCEDURE FOR TRANSFERRING OBJECTS WITHOUT BREAKING CONFINEMENT

Francois Couche, Les Mureaux, France, assignor to Cogema, France

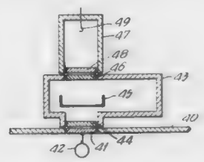
Filed Aug. 1, 1985, Ser. No. 761,567
Int. Cl.⁴ G21C *19/00*
U.S. Cl. 414—786 **8 Claims**

1. Procedure for transferring an object along an axis from a contamination and radioactive zone A to a clean zone B where said object will be contained in a movable enclosure, said two zones A and B being separated by a slab containing a plug in line with the transfer axis, the object to be transferred being coupled to said slab plug and the uncontaminated zone B being kept clean throughout the transfer and transport operations in terms of both contamination and radiation, involving the following steps:

(a) set up a pre-enclosure having two plugs, on opposite sides thereof and both located on the transfer axis, on and surrounding the slab plug;

(b) set up a in a sealed manner on the pre-enclosure a movable enclosure also equipped with a plug such that said plug is in contact with the plug of the pre-enclosure opposite the slab plug;

(c) couple together the plugs which are in contact with one another, to form two fast pairs the first of which pairs consists of the slab plug and the pre-enclosure plug in immediate contact with it and the second of which pairs consists of the single plug of the enclosure and the pre-enclosure plug in immediate contact with it;



(d) remove said second pair of plugs sideways inside the pre-enclosure;

(e) secure said first pair of plugs and the object to be transferred to a hoist and transfer them all to the enclosure;

(f) refit said second pair of plugs along the transfer axis, in the respective plug holes of the enclosure and pre-enclosure, then uncouple the two plugs from one another and secure them individually in their holes;

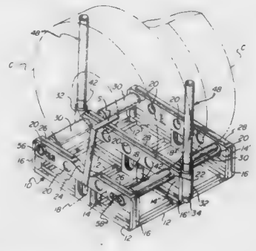
(g) remove the enclosure containing said first pair of plugs and the object to another location.

4,732,528

RETURNABLE SKID AND METHOD AND ASSEMBLY USING SAME

Bruce R. Good, Plantsville, Conn., assignor to Cold Metal Products Corp., Youngstown, Ohio

Filed Oct. 14, 1986, Ser. No. 918,055
Int. Cl.⁴ B65D *19/06*
U.S. Cl. 414—786 **17 Claims**



1. A returnable skid for coils of products, comprising:

a frame-like, generally rectangular base with a substantially flat bottom surface;

a pair of upstanding side supports extending transversely along the opposite lateral margins of said base;

a pair of generally rectilinear end supports extending laterally across said side supports adjacent the opposite ends of said base and thereabove to define, in cooperation with said side supports, an upwardly opening recess for receiving edge portions of coils of products seated on said skid and disposed with their axes parallel to the plane of said bottom surface, each of said end supports being substantially hollow to define an elongated cavity within the interior thereof, and being open at least at one end to permit access thereto;

a pair of generally rectilinear separator posts dimensioned and configured to fit individually within said cavities of said end supports, and to permit insertion through said one ends thereof;

means for disengageably mounting one of said posts in an upstanding attitude adjacent each of said opposite ends of said base and between said side supports; and

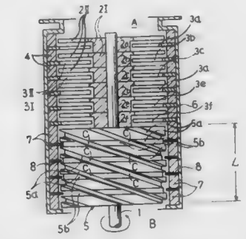
means for disengageably securing said posts within said cavities, whereby said posts may be supported by said mounting means to extend between two coils so seated on said skid, and may be stored within said cavities when not in use.

4,732,529

TURBOMOLECULAR PUMP

Kiyoshi Narita, and Jyuichi Kawaguchi, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 705,000, Feb. 25, 1985, abandoned.
This application Mar. 27, 1987, Ser. No. 31,193
Claims priority, application Japan, Feb. 29, 1984, 59-38958; Feb. 29, 1984, 59-38959
Int. Cl.⁴ F01D *1/36*
U.S. Cl. 415—90 **5 Claims**



1. A turbomolecular pump comprising;

(a) a housing having a suction port and an exhaust port;

(b) a pump comprising a group of axial blades which is arranged adjacent to the suction port, wherein the pump consists of a group of rotors and stators arranged alternately; and

(c) a special composite pump arranged in the housing adjacent to the exhaust port, wherein the special composite pump is a combination of a rotor blade body having spiral grooves which are separated by a plurality of ring grooves into multi-stages, said rotor body being formed to be an integral connection of a plurality of cylindrical bodies, and a stator blade body, the blades of which are inserted into the ring grooves of the rotor body.

4,732,530

TURBOMOLECULAR PUMP

Shinjiroo Ueda, Abiko; Takeshi Okawada, Ibaraki; Osami Matsushita, Ibaraki, and Kazuaki Nakamori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,462
Claims priority, application Japan, Jul. 25, 1984, 59-152812
Int. Cl.⁴ F01D *1/36*
U.S. Cl. 415—90 **10 Claims**

1. A turbomolecular pump for evacuating a space, the turbomolecular pump comprising:

a casing;

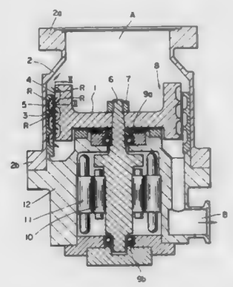
a rotor in said casing extending axially thereof;

a stator in said casing located in face-to-face relation to said rotor;

a plurality of axially spaced circumferential rows of rotor grooves on an outer peripheral surface of said rotor, said rotor grooves in each row being equidistantly spaced from each other and tilting at a predetermined angle with respect to the axis of the rotor; and

a plurality of axially spaced circumferential rows of stator grooves on a surface of said stator facing the rotor, said stator grooves in each row being equidistantly spaced from each other and tilting at the same angle as said rotor grooves but being oriented in an opposite direction to the rotor grooves;

said rows of rotor grooves and said rows of stator grooves being alternately arranged in axially staggered relation to each other, each of said rotor grooves in one of the rows having a portion extending from a position midway of the rotor groove to an end thereof on an outlet side, said



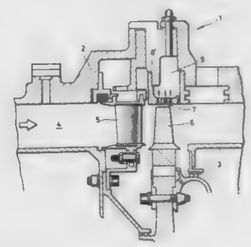
portion of the rotor groove overlapping a first portion of a corresponding confronting one of said stator grooves and a corresponding one of the rows, said first portion of the stator groove extending from an end thereof on an inlet side to a position midway of the stator groove, the stator groove having a second portion extending from a position midway of the stator groove to an end of the outlet side, said second portion of the stator groove overlapping a portion of a corresponding confronting one of said rotor grooves in a subsequent row, which portion extends from an end of the rotor groove in a subsequent row on the inlet side to a position midway of the rotor groove in the subsequent row.

4,732,531

AIR SEALED TURBINE BLADES

Mitsuhiro Minoda, Tokyo; Shigeo Inoue, Tama; Hiroshi Usui, Akigawa, and Hiroyuki Nouse, Tokyo, all of Japan, assignors to National Aerospace Laboratory of Science and Technoloyg Agency, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,067
Claims priority, application Japan, Aug. 11, 1986, 61-188332
Int. Cl.⁴ F01D *11/00*
U.S. Cl. 415—115 **3 Claims**



1. A turbomachine comprising:

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a casing forming a fluid passage through which a primary fluid flows;

rotor blades disposed for rotation in the fluid passage with a clearance between distal ends of said rotor blades and said casing;

a secondary fluid chamber being provided radially outwardly of said casing; and

said casing having a plurality of spaced blow holes extending circumferentially thereof for communicating the secondary fluid chamber with the clearance, said blow holes being formed at an incline with respect to the wall of said casing in such a manner that a secondary fluid discharged from said blow holes is imparted with a flow component that opposes a direction of rotation of the blades and a flow of the primary fluid leaking from the clearance.

4,732,532

ARRANGEMENT FOR MINIMIZING BUZZ SAW NOISE IN BLADED ROTORS

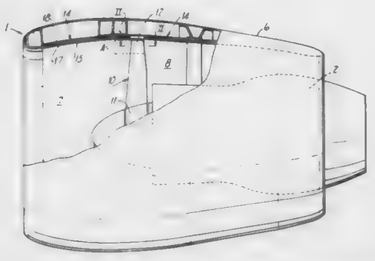
Peter J. G. Schwaller, Horsley Woodhouse, and David R. Newby, Allestree, both of England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 150,673, May 16, 1980, abandoned. This application Nov. 12, 1982, Ser. No. 441,152

Claims priority, application United Kingdom, Jun. 16, 1979, 7921077

Int. Cl.⁴ F04D *29/66*

U.S. Cl. 415—119 **4 Claims**



1. A rotor including a plurality of rotor blades, said rotor being adapted for rotation within a duct under conditions in which at least radially outer portions of said rotor blades attain at least sonic velocity thereby producing shockwaves within said duct, said blades being subject to manufacturing tolerances manifested in blade-to-blade variations of at least one selected dimensional characteristic of said blades, which dimensional characteristic has a significant effect on shockwave strengths, whereby said blades generate shockwaves which vary in strength from blade to blade around said rotor thereby causing buzz saw noise within said duct, said rotor being produced by a process in which the blades are arranged in a sequence which minimizes the intensity of at least one selected buzz saw noise tone, said process comprising the steps of:

(a) measuring said at least one selected dimensional characteristic of each blade to be assembled into said rotor;

(b) notionally arranging said blades around said rotor in a chosen sequence;

(c) evaluating the shockwave strength at each said blade as arranged in sequence;

(d) calculating at least one Fourier coefficient of said shockwave strengths for said sequence, said at least one Fourier coefficient being selected to correspond to said at least one selected buzz saw noise tone;

(e) rearranging said blades around said rotor in further sequences and repeating steps (c) and (d) for each such sequence to determine which one of said sequences produces an acceptable minimum value of said at least one Fourier coefficient; and

(f) assembling said blades into said rotor such that they are arranged in that one of said sequences for which said minimum value of said at least one Fourier coefficient is obtained.

4,732,533

MOUNTING ARRANGEMENT FOR TURBOMACHINES, ESPECIALLY STEAM TURBINES

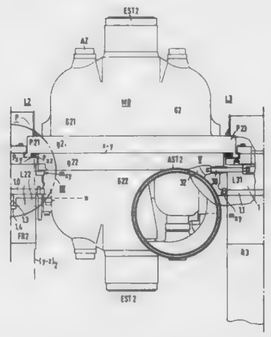
Axel Remberg, and Detlef Haase, both of Müilheim/Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Müilheim/Ruhr, Fed. Rep. of Germany

Filed Jun. 26, 1986, Ser. No. 879,131

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522917

Int. Cl.⁴ B63B *25/14*

U.S. Cl. 415—134 **12 Claims**



1. Mounting arrangement for turbomachines, especially steam turbines having a plurality of coaxially juxtaposed turbine stages with shafts rigidly coupled to one another to form a shaft line, the turbine stages having turbine mounts including turbine shaft mounts and turbine housing mounts, the turbine mounts having respective mount housings mounted on foundation locks between the turbine stages and at the ends of the shaft line, the turbine stages having housings mounted at the ends thereof by means of support lugs symmetrically on both sides of the shaft so as to be axially and radially-centrically thermally movable as well as adjustable in x, y, and z direction in horizontal axial planes, and by means of axial centering guiding means in vertical axial planes, on and along the mount housings, respectively, or other foundation parts, the support lugs having support and guide surfaces and the axial centering means having guide surfaces extending in horizontal axial planes (x-z) and in vertical planes oriented plane-parallel to the vertical axial plane (x-y) and, for defining axial fixed points of thermal expansion of the housings, in planes (y-z) normal to the axis, respectively, the direction x being the axial shaft direction, z the horizontal direction transverse to the axis, and y the vertical coordinate running perpendicularly to the x-z plane, comprising respective step-shaped projections formed on the support lugs of the turbine stage housings and jutting axially outwardly and with a step-shaped upwardly offset setback axially inwardly adjacent said projections while forming a horizontal bottom surface serving as a support and guide surface; the respective mount housing having support flanges gripping under the support lugs at both sides of the shaft in accordance with the position of the support lugs, said support flanges having a depression for accommodating therein said stepshaped projection and having a stepshaped raised rim axially adjacent said stepshaped projection for engaging in said setback of said support lug; mutual engagement of said projection in said depression, and said raised rim in said setback providing clearance sufficient to form laterally accessible gaps; adjustment and slide shims insertable in the gap between a roof surface of said raised rim and a bottom surface of said setback for the purpose of slidable height positioning, said shims being securable in position thereof; said support lugs being secured against lifting forces and moments in a set height position by means of locks detachably fastened to a cover surface of said support flanges and engaging the stepshaped projections of the support lugs by means of lock projections having contact surfaces which are adjustable in height.

4,732,534

ROTOR BLADE JACKET FOR AXIAL GAS TURBINES

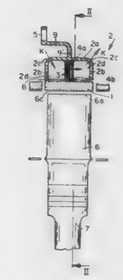
Hagen Hanser, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1986, Ser. No. 911,295

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535106

Int. Cl.⁴ F01D *11/08*

U.S. Cl. 415—136 **5 Claims**



1. A rotor blade jacket for an axial gas turbine having a rotor with rotor blades exending in a radial direction, comprising a closed ceramic ring surrounding said rotor blades, metal housing ring means surrounding said closed ceramic ring, brush ring means comprising bristles all of said bristles extending at the same slant relative to said radial direction between said housing metal ring means and said closed ceramic ring for centering said closed ceramic ring in a heat expansion compensating manner, first means for operatively securing radially outer ends of said bristles to said metal housing ring means, and second means for operatively securing radially inner ends of said bristles to an outer circumference of said closed ceramic ring, whereby said closed ceramic ring is positively positioned, held, and centered around said rotor blades by said brush ring means.

4,732,535

FLUID FLOW REVERSING APPARATUS

Henry Tubbs, Derby, England, assignor to Rolls-Royce plc, London, England

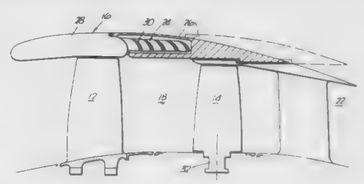
Filed Dec. 9, 1986, Ser. No. 939,883

Claims priority, application United Kingdom, Jan. 25, 1986, 8601829

Int. Cl.⁴ F02C *3/06*

U.S. Cl. 415—144 **4 Claims**

1. Fluid flow reversing apparatus in the fan duct of a ducted fan gas turbine engine comprising a cowl which defines the outer wall of the fan duct, a fluid flow exit path in the cowl, a first stage of rotatable blades in the duct and upstream of the fluid flow exit path, a second stage of rotatable blades in the duct and downstream of the fluid flow exit path means for covering and uncovering the fluid flow exit path and wherein each of the blades of the second stage of rotatable blades are pivotable about a longitudinal axis thereof to an attitude which on continued rotation of the second stage, induces a reversed flow of ambient air via the duct nozzle, in opposition to the flow induced by the first stage of rotatable blades, which flows



meet radially inwardly of the fan flow exit path and passes therethrough when it is uncovered.

4,732,536

TURBO-MACHINE COMPRESSOR WITH VARIABLE INCIDENCE STATOR VANES

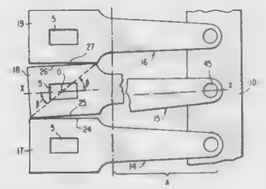
Claude R. L. Lejars, Draveil; Jacky Naudet, Bondoufle; Jean-Max M. Silhouette, Melun, and Jacques M. P. Stenneler, Le Chatelet En Brie, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." , Paris, France

Filed Jun. 18, 1986, Ser. No. 875,684

Claims priority, application France, Jun. 20, 1985, 85 09360

Int. Cl.⁴ F04D *29/56*

U.S. Cl. 415—160 **12 Claims**



1. In a turbo-machine compressor,

an array of variable incidence stator vanes, each vane having;

first pivot means at a first end by which the vane is mounted for variable orientation, and

second pivot means at a second end, and

means for varying the incidence of the vanes including

a plurality of links, each such link being connected at a first end portion thereof to the second pivot means of a respective vane, and

a ring member on which a second end portion of the links are pivotally connected so that motion of the ring member about the longitudinal axis of the compressor results in simultaneous adjustment of the stator vanes,

each longitudinal side of the link being formed with a contact surface substantially parallel to the axis of the second pivot means, and the contact surfaces of adjacent links being so disposed that in the event of failure of one said link the contact surface of that link will make contact with the contact surface of an adjacent link thereby limiting the change in incidence of the vane connected with the failed link.

4,732,537

AIR OPERATED PUMP AND MOTOR

John P. Kusz, Chicago, and Thomas J. Danowski, Streamwood, both of Ill., assignors to Safety-Kleen Corporation, Elgin, Ill.

Filed Jul. 31, 1987, Ser. No. 79,943

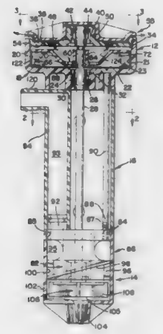
Int. Cl.⁴ F01D *25/32*

U.S. Cl. 415—205 **11 Claims**

1. An air operated pump and motor unit for transferring

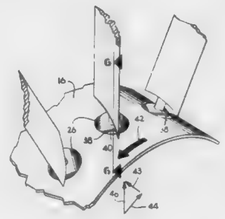
VOL 1088 ISS 4 MR 22 1988 UMI

liquid from beneath a liquid surface to a a point above the liquid surface, said pump and motor unit comprising, in combination, a rotor head assembly, an impeller head assembly, and a spacer tube unit disposed between said assemblies and affixed and its upper and lower ends respectively to said rotor and impeller assemblies, said impeller head assembly including means defining a pumping chamber with at least one liquid inlet and at least one liquid outlet, a liquid discharge line extending from said liquid chamber outlet to a liquid discharge outlet, a liquid impeller assembly disposed within said pumping chamber and including a plurality of blades each carried by an impeller hub, said rotor head assembly comprising a rotor housing having an inner end face, a radially inwardly directed cylindrical sidewall portion and a cover assembly closing off the top of said rotor housing and having an axially inner surface spaced from and in facing relation to said inner end face of said housing, said sidewall and end facer thereby defining an air chamber for said rotor element, a rotor element disposed within said chamber and mounted for rotation about a drive shaft axis, said rotor element having a hub affixed at its center to a drive shaft extending from said rotor hub and being joined to said impeller hub, said rotor element also having a blade



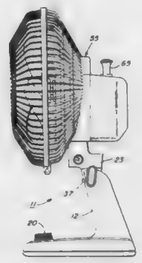
carrier unit of generally annular form and having a plurality of radially extending blade units disposed on the side of said annular blade carrier facing said housing inner end face, and a spider unit extending between and joining said rotor hub and said blade carrier and also providing plurality of passages for axial airflow therethrough, said rotor hub and said spider lying adjacent said housing inner end face, with said carrier having portions lying adjacent said cover assembly axially inner surface, said rotor assembly thereby subdividing said rotor chamber into upstream and downstream chambers communicating with each other through said passages in said spider, said rotor housing also including means defining at least one high pressure inlet in said sidewall portion, said cover assembly including an inner cover unit and an outer cover unit spaced closing axially apart from each other to define therebetween a radially extending diffuser passage, said inner cover unit further including a plurality of passages extending axially between said downstream chamber and said diffuser passage, whereby air passes in use from said air inlet to said upstream chamber, and then to said downstream chamber through said axial spider passages, and thereafter through said cover passages to and through said diffuser passages.

4,732,538
BLADE HUB AIR SCOOP
Gary C. Wollenweber, Cincinnati; Wu-Yang Tseng, West Chester, and Thomas J. Sullivan, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 585,820, Mar. 2, 1984, abandoned. This application Sep. 5, 1985, Ser. No. 773,514
Int. Cl.[4] B64C *11/06, 11/14*
U.S. Cl. 416—94 **7 Claims**



1. In a gas turbine engine with a variable pitch rotatable propulsor blade, including means for varying the pitch of said blade, air control means comprising:
a platform fixedly attached to a radially inner end of said blade;
wherein said platform is generally positioned in a first opening in a rotatable annular surface, and said platform and surface define outer and inner spaces, so that in a first position corresponding with a blade pitch for steady state altitude cruise power operation of said engine an edge portion of said platform substantially conforms to said surface, and in a second position corresponding with a blade pitch for takeoff power operation of said engine, said edge portion is displaced radially outwardly from said surface thereby allowing fluid communication between said outer and inner spaces.

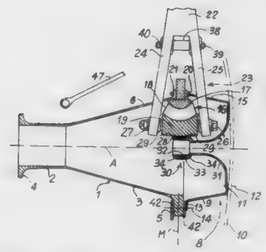
4,732,539
OSCILLATING FAN
Shao Shin-Chin, San-Chung, Taiwan, assignor to Holmes Products Corp., Holliston, Mass.
Filed Feb. 14, 1986, Ser. No. 829,235
Int. Cl.[4] F04D *29/60*
U.S. Cl. 416—100 **10 Claims**



1. An electric fan comprising:
a. a base having an upwardly projecting portion terminating in bifurcated portions,
b. a neck joint,
c. a fan unit mounted on said neck joint,
d. means for mounting said neck joint on said bifurcated portions for tilting movement back and forth about a horizontal axis over a defined angular distance.

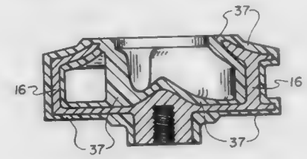
e. means for maintaining said neck joint in a selected angular position over said defined angular distance, and
f. a clip made of flexible material disposed between said neck joint and said bifurcated portions and independent from said maintaining means for limiting the extent of the forward movement of said neck joint relative to said bifurcated portions to a portion of said defined angular distance.

4,732,540
INTEGRATED HUB-MAST AND GYROPLANE ROTOR HEAD COMPRISING IT
Rene L. Mouille, Aix-en-Provence, and Bruno Guimbal, Chateauneuf-les-Martigues, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Jul. 16, 1986, Ser. No. 886,278
Claims priority, application France, Jul. 22, 1985, 85 11159
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—140 **25 Claims**



1. An integrated hub-mast for a gyroplane rotor having a plurality of blades, the hub-mast comprising:
a hollow-tubular hub body having an axis of rotation (A),
a tubular mast forming portion coaxially firmly secured to one end of the hub body,
a foot coaxially formed on one end of the mast forming portion opposite the hub body,
the hub body widening out radially from said one end thereof and being pierced with openings equal in number to the plurality of blades evenly spaced apart in the circumferential direction about the periphery of hub body,
a reinforcing ring fixed to the other end of the hub body in a plane (M) of rotation of the plurality of blades and having a plurality of coupling fastenings, the ring taking up centrifugal forces introduced into the hub-mast from rotation of the blades,
a forked fastening part for each one of the plurality of blades, each forked part having two branches, one of the two branches passing through one of the openings in the hub body under the reinfrocing ring, the other branch passing over the reinforcing ring,
a plurality of stratified spherical stops, one for each blade, housed inside the hub body, each spherical stop having a radially external frame fixed against an internal face of the reinforcing ring such that a center of rotation of the spherical stop is substantially situated in the reinforcing ring and a radially internal frame, radially internal ends of the two branches of one forked fastening part being fixed to the internal frame of one spherical stop,
a plurality of resilient drag return and damping members, one for each blade, each member being connected to one of the coupling fastenings of the reinforcing ring and being operatively asociated with one of the blades,
one central flapping stop internal to the hub body for limiting flapping of the blades on one side at least of the plane (M) of rotation of the blades, and
a support coaxially housed in the hub body supporting the central flapping stop.

4,732,541
CENTRIFUGAL ELASTOMERIC COATED IMPELLERS
John Hyll, Salt Lake City, Utah, assignor to Baker International Corporation, Orange, Calif.
Division of Ser. No. 743,067, Jun. 10, 1985, Pat. No. 4,706,928. This application Mar. 31, 1986, Ser. No. 845,976
Int. Cl.[4] F04D *29/22*
U.S. Cl. 416—186 R **8 Claims**



1. A closed shrouded impeller comprising:
a pair of elastomeric-covered, disk-like shrouds; said shrouds being denominated a forward shroud and a rear shroud; said forward shroud having a thickness; said shrouds being positioned spacedly apart from one another and parallel to each other;
a plurality of elastomeric-covered upstanding vanes positioned between said pair of shrouds and mounted to each said shroud respectively; each of said vanes being configured in a radial, arc-like shape to extend from a central region of each said shroud, outward to a periphery of each shroud; each pair of adjacent vanes defining a vane passage there between having a peripheral outlet and a corresponding central inlet opening; said forward shroud defining a centrally positioned throat opening therein which extends through said thickness of said forward shroud; said throat opening communicating with each vane passage formed between said forward disk-like shroud and said rear disk-like shroud; said vanes extending into said throat opening; said throat opening being contiguous with each said central inlet opening, and communicating therewith, said rear shroud having a conical upstanding projection at its center which extends toward said forward shroud; said projection having a first longitudinal axis colinear with an axis of rotation of said rear shroud; said projection having an apex positioned elevationally below an upper surface of each of said vanes; said projection forming a curved channel to interconnect said inlet throat with said vane passages, said central inlet opening of each said vane passage being at least twice as wide as a width of a corresponding said vane passage peripheral outlet opening;
wherein said impeller operates to introduce an axial inlet flow through said throat to a right-angle peripheral flow within said impeller with a minimum eddying effect.

4,732,542
LARGE AIRFOIL STRUCTURE AND METHOD FOR ITS MANUFACTURE
Michael Hahn, Ottobrunn, and Franz Sperber, Kolbermoor, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränker Haftung
Continuation of Ser. No. 700,335, Feb. 12, 1985, Pat. No. 4,643,646, which is a continuation of Ser. No. 361,840, Mar. 25, 1982, abandoned. This application Jul. 14, 1986, Ser. No. 885,239
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113079
Int. Cl.[4] B64C *11/26*
U.S. Cl. 416—226 **7 Claims**

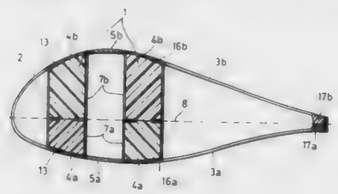
1. A large wind-driven power plant having a rotor blade with an airfoil structure having an upper airfoil surface and a lower airfoil surface comprising:
three modular sections consisting essentially of a leading

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section defining a leading edge of said airfoil, a trailing section defining a trailing edge of said airfoil, and a spar section immediate said leading and trailing sections;

said modular sections being separately formed and subsequently assembled together to form said airfoil structure;

said spar section being formed to consist essentially of an upper airfoil skin segment defining a part of said upper airfoil surface, a lower airfoil skin segment defining a part of said lower airfoil surface, said parts of said upper and lower airfoil surfaces extending along the section of said airfoil structure defined by said spar section and a spar including upper and lower laminate layers and at least one



foam bar unit extending completely between and supporting said laminmate layers;

said laminate layers each consisting essentially of laminate material having a unidirectional fiber orientation and laminate material having a thrust transmitting fiber orientation connected to said laminate material having unidirectional fiber orientation;

said foam bar unit being connected between and supporting said laminate material having a unidirectional fiber orientation;

said laminate layers of said spar forming said upper and lower airfoil skin segments.

4,732,543

LIQUID SENSOR SYSTEMS FOR LIQUID-EMPLOYING APPARATUS AND SENSORS FOR USE IN SUCH SYSTEMS

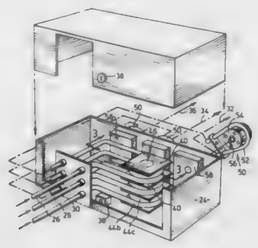
Michael S. Hrycyshyn, Stoney Creek, Canada, assignor to Moyer Diebel Limited, Jordan Station, Canada

Filed Sep. 4, 1986, Ser. No. 904,080

Claims priority, application Canada, Sep. 16, 1985, 490859

Int. Cl.[4] F04B *49/06*

U.S. Cl. 417—44 **16 Claims**



1. A capacitive liquid sensor for liquid-employing apparatus comprising a pair of spaced flat parallel conductive plates, and a liquid-carrying structure constituted by a plurality of turns of non-conductive material disposed between the plates in physical contact therewith and establishing a tortuous elongated path between them for liquid which moves through the turns and thereby constitutes part of the dielectric of the resultant capacitor.

4,732,544

VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR

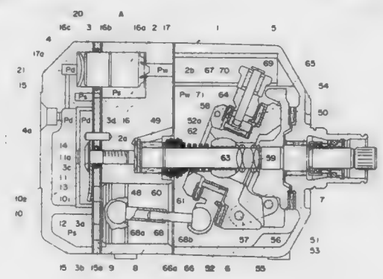
Juetsu Kurosawa; Takeo Iijima; Hiroshi Nomura, all of Konan, and Takashi Koike, Tokyo, all of Japan, assignors to Diesel Kiki Co., Ltd. and Fujikoki Manufacturing Co., Ltd., both of Tokyo, Japan

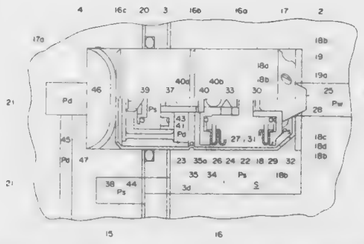
Filed Jun. 4, 1987, Ser. No. 58,288

Claims priority, application Japan, Jun. 12, 1986, 61-137351; Jun. 12, 1986, 61-137352

Int. Cl.[4] F04B *1/26*

U.S. Cl. 417—222 **3 Claims**





1. A variable capacity wobble plate compressor comprising: a crankcase; a wobble plate accomodated within said crankcase; a suction chamber; a discharge pressure chamber; a communication passage communicating between said crankcase and said suction chamber; and a pressure-control valve disposed across said communication passage for adjusting pressure in said crankcase to change the inclination angle of said wobble plate whereby the delivery quantity or capacity is varied, said pressure-control valve comprising deformable means variable in length with a change in the suction pressure; a valve body attached to one end of said deformable means for selectively opening and closing said communication passage depending on the length of said deformable means; a first movable member attached to the other end of said deformable means; a first spring interposed between said valve body and said first movable member and urging said valve body in a closing direction; a second movable member having a pressure-receiving portion for receiving at least discharge pressure from said discharge pressure chamber, said second movable member being selectively brought into and out of urging contact with said first movable member in response to at least a change in the discharge pressure acting upon said pressure-receiving portion; and a spring seat disposed in opposite and spaced relation to said pressure-receiving portion of said second movable member; and a second spring interposed between said spring seat and said second movable member, wherein when the discharge pressure is higher than a predetermined value, said second movable member is biased away from said first movable member by the discharge pressure against at least the force of said second spring, and when the discharge pressure is lower than the predetermined value, said second movable member is urged against said first movable member by at least the force of said second spring against the discharge pressure to urge said valve body in the closing direction via said first movable member, said first spring, and said deformable means.

4,732,545

APPARATUS FOR LUBRICATING WOBBLE PLATE BEARINGS OF A WOBBLE PLATE TYPE COMPRESSOR

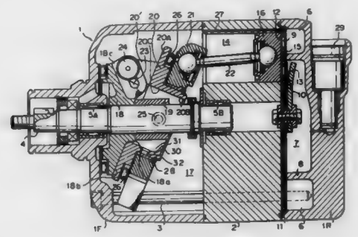
Masaki Ohta; Kenji Takenaka; Hiroaki Kayukawa, and Akihiko Hyodo, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 7, 1986, Ser. No. 928,921

Claims priority, application Japan, Nov. 8, 1985, 60-172692[U]

Int. Cl.[4] F04B *1/28*

U.S. Cl. 417—222 **4 Claims**



1. A variable capacity wobble type compressor comprising:

a compressor head having therein a suction chamber for a refrigerant to be compressed and a discharge chamber for a compressed refrigerant,

a cylinder block having therein a plurality of cylinder bores in which reciprocatory pistons are disposed so as to draw the refrigerant from said suction chamber and then to discharge the refrigerant after compression to said discharge chamber,

a crankcase connected to said cylinder block and receiving therein an axial drive shaft having a lug plate mounted thereon to be rotatable with said drive shaft,

a rotary drive plate arranged so as to surround said drive shaft and rotate with said drive shaft, said rotary drive plate including a large disc portion engaged, via a bracket thereof, with said lug plate in such a manner that said drive plate is rotated with said lug plate and wobbled with respect to said drive shaft, said rotary drive plate further including a small cylindrical portion concentrically and integrally extending from said large disc portion and having a central quadrilateral bore extending therethrough and permitting said drive shaft to extend therethrough,

a non-rotary wobble plate supported on said large disc portion and said small cylindrical portion of said drive plate, via thrust and radial bearings, respectively, so as to cause a compressing motion of said reciprocatory pistons,

a dam formed in an outermost end face of said small cylindrical portion of said rotary drive plate as an integral lip-like raised portion defining an oil reservoir in an end portion of said quadrilateral bore of said small cylindrical portion at a position in proximity of said radial and thrust bearings for receiving and preserving lubricating oil therein during wobbling of said non-rotary wobble plate,

an oil supply conduit extending from a bottom of said oil reservoir to said radial bearing for continuously lubricating said radial and thrust bearings,

a guide means for permitting inclination of said wobble plate from a plane perpendicular to said drive shaft while preventing any rotation of said wobble plate about said drive shaft, and

a control valve for controlling an angle of inclination of said wobble plate so as to vary a compressor discharge capacity in accordance with a refrigerating load.

4,732,546

ADJUSTING DEVICE FOR A FUEL INJECTION PUMP

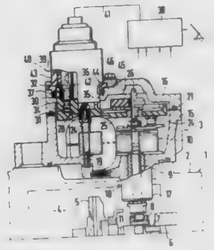
Wolfgang Fehlmann, and Dieter Junger, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,797

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3609995

Int. Cl.[4] I04B *49/00;* **F02M** *37/04;* **H01R** *4/00*

U.S. Cl. 417—289 **5 Claims**



1. An adjusting device for controlling an annular slide (8) relative to a control bore (7) of a pump piston (6) in a fuel injection pump having a fluid-tight housing, said housing comprising a lower part (15) and a cap (16), an electric control motor (10) firmly disposed in the lower part of said housing, a molded substrate secured in the lower part of said housing, said substrate (25) comprises an electrically insulating material, conductors (28) embedded in said substrate for connection of control elements which are connected to said control motor for controlling said control motor, a plug connection in an opening (35) of the cap said plug connection including elements (30) having ends (31) in pressure contact with the ends of said conductors (28) in said substrate with ends (32) of the connection elements protruding from said substrate away from said conductors (28), said plug connection is firmly connected to the substrate (25) which has an extension (34) protruding from the substrate and integrally secured thereto, said extension (34) passes through an opening in said cap (16) with a tight fit and in a sealed manner.

4,732,547

APPARATUS FOR IMPELLING LIQUID

Peter A. Shelton, Es Molí Nou De Canet, Es Glayete, Majorca, Spain

PCT No. PCT/GB85/00128, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04453, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 29, 1985, Ser. No. 815,094

Claims priority, application United Kingdom, Mar. 29, 1984, 8408097

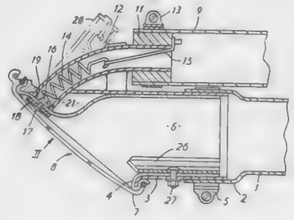
Int. Cl.[4] F04B *9/08, 43/10*

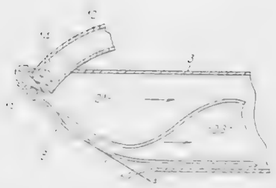
U.S. Cl. 417—379 **11 Claims**

1. Apparatus for cylically impelling liquid by means of gas under pressure, comprising a duct for the liquid, a flexible partition having a zone anchored with respect to said duct and extending from said anchored zone in the downstream direction of the duct, an opening in the wall of the duct for the supply of gas under pressure from a gas duct, the opening being adjacent, and on the downstream side of, the anchored zone of the partition, a valve member carried by, or formed by

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part of, the partition, and resilient spring means urging the valve member to close the opening until the pressure of gas accumulating, in use, in the gas duct is sufficient to overcome the resilient means and deliver through the opening a pulse of





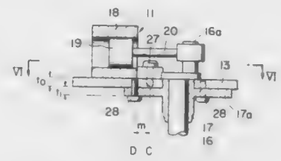
gas for causing the partition to impel liquid, said resilient spring means acting only on said valve member, said resilient spring means exerting a closing force on said valve member much greater than any closing force of which said flexible partition alone may be capable.

4,732,548

ENCLOSED TYPE COMPRESSOR

Toshikazu Iida; Eiichi Aikawa, both of Yokohama; Sumio Minagawa, Kawasaki, and Takayoshi Fujiwara, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 800,964, Nov. 22, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,310
Claims priority, application Japan, Nov. 29, 1984, 59-252524
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—415 **4 Claims**



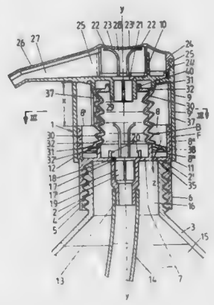
1. An enclosed type compressor comprising:
an enclosed-type casing;
a compressor mechanism provided in said casing and comprising a cylinder and a piston reciprocatable horizontally in said cylinder, and end portion of said cylinder being provided with projecting portions and a recess formed between said projecting portions as viewed in a plan view;
an electric motor comprising a stator, a rotor, and an output shaft extending vertically in said casing for driving said piston in a crank driving manner;
a main bearing which supports said output shaft rotatably;
a frame member made of a metal plate extending substantially horizontally in said casing;
first securing means for securing said main bearing to said frame member at a plurality of positions on both sides of said output shaft; and
second securing means for securing said cylinder of said compression mechanism at said projecting portions of said cylinder so that a part of the outer peripheral portion of said output shaft is intruded into said recess of said cylinder end portion.

4,732,549

DOSAGING PUMP WITH PUMP BELLOWS ON BOTTLES OR THE LIKE

Alfred von Schuckmann, Kervendonk, Fed. Rep. of Germany, assignor to Mega Product- und Verpackungsentwicklung Marketing GmbH & Co. Kommanditgesellschaft, Wuppertal, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 836,937
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509178; Jun. 15, 1985, 3521611; Jan. 9, 1986, 3600356
Int. Cl.[4] F04B *43/00, 21/04;* **B67D** *5/42;* **B65D** *88/54*
U.S. Cl. 417—472 **12 Claims**



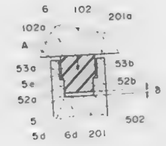
1. In a dosaging pump having a pump bellows and two valves, which is adapted to be placed on a container, in particular, bottles and the like, one of the valves being associated with a nozzle and the other with an inlet side, the improvement comprising
a cup having a bottom and a surrounding wall, the latter surrounds said pump bellows,
a cap engages over said pump bellows, said cap includes a cover, said cap has a side wall,
said one valve comprises a nozzle-side valve-closure member which is seated in the cover of said cap, said side wall of said cap being guided on said surrounding wall of said cup,
the other valve comprises an inlet-side valve-closure member, the latter being seated within the bottom of said cup,
said bottom of said cup is formed with an air-inlet opening,
said cup and said cap have collars,
end folds of the pump bellows are seated on said separate collars of said cap, and said end folds extend into outwardly directed protruding base support rings, and
a cup-bottom side of said base support rings has a sealing lip extending over said air-inlet opening in the cup bottom and said lip has a free-standing lip section resting against an inner wall of said cup.

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SCROLL FLUID MACHINE WITH FINE REGULATION ELEMENTS IN GROOVES HAVING STEPPED PORTION

Yasuyuki Suzaki; Toshiyuki Nakamura, and Takahiro Maeda, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1986, Ser. No. 927,220
Claims priority, application Japan, Nov. 27, 1985, 60-268438
Int. Cl.[4] F01C *1/04, 19/08;* **F16J** *15/16*
U.S. Cl. 418—55 **19 Claims**



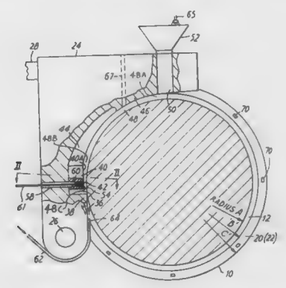
1. A scroll fluid machine, in which a plaurlity of chambers are formed between spiral side plates and bed plates by combining a fixed scroll with an orbiting scroll each being formed of the spiral side plate, standing on the bed plate, and a fluid taken in said chambers is compressed or expanded by rotating the orbiting scroll, characterized by being provided with spiral fine regulation elements having the same curvature as each spiral side plate of said both scrolls and grooves formed along end faces of the spiral side plates of said both scrolls, said grooves being provided with a stepped portion formed halfway in the direction of depth thereof, an opened portion of said grooves above the stepped portion having a width larger than that of a bottom portion of said grooves below the stepped portion thereof, said spiral fine regulation elements being forced into said grooves, and wherein means are provided for maintaining said spiral fine regulation elements under a stable fixed condition in said grooves.

4,732,551

CONTINUOUS EXTRUSION OF METALS

John East, Wantage, United Kingdom, and Ian Maxwell, Reading, England, assignors to Metal Box Public Limited Company, United Kingdom

Continuation-in-part of Ser. No. 574,514, Jan. 27, 1984, abandoned. This application Feb. 11, 1986, Ser. No. 828,752
Claims priority, application United Kingdom, Feb. 3, 1983, 8302951; Apr. 12, 1983, 8309836
Int. Cl.[4] B22F *3/02;* **B21C** *23/01*
U.S. Cl. 425—79 **13 Claims**



1. Apparatus for effecting continuous extrusion of metal from a feedstock in particulate or comminuted form, which apparatus includes:
(a) a rotatable wheel member arranged for rotation when in operation by a driving means, said wheel member has formed peripherally thereon a continuous circumferential groove;
(b) a cooperating shoe member which extends circumferentially around a substantial part of the periphery of said wheel member and which has a portion which projects in a radial direction partly into said groove with small working clearance from the side walls of said groove, said shoe member portion defining with the walls of said groove an enclosed passageway extending circumferentially of said wheel member;
(c) feedstock inlet means disposed at an inlet end of said passageway for enabling feedstock in loose particulate or comminuted form to enter said passageway at said inlet end whereby to be engaged and carried frictionally by said wheel member, when rotating, towards the opposite, outlet end of said passageway;
(d) an abutment member carried on said shoe member and projecting into said passageway at said outlet end thereof so as to substantially close said passageway at that end and thereby impede the passage of feedstock frictionally carried in said groove by said wheel member, thus creating an extrusion pressure in said passageway at said outlet end thereof;
(e) a die member carried on said shoe member and having a die orifice opening from said passageway at said outlet end thereof, through which orifice feedstock carried in said groove and frictionally compressed by rotation of said wheel member, when driven, is compressed and extruded in continuous form, to exit from said shoe member via an outlet aperture; and
(f) cooling means disposed downstream from said abutment member and adapted to cool adjoining parts of said abutment, shoe and wheel members at a location disposed immediately downstream of said abutment member, and to extract from said parts heat generated upstream of said abutment member in said passageway;
said passageway comprising a primary zone extending downstream from said inlet end of said passageway, in which primary zone said particulate or comminuted feedstock is compacted, by rotation of said wheel member, to progressively eliminate voids in the advancing feedstock and so form an agglomerated mass of feedstock metal, and an adjoining, substantially shorter, secondary zone disposed downstream of said primary zone and extending at least to said die orifice, in which secondary zone said mass of metal is progressively compressed, by rotation by said wheel member, to a desired extrusion pressure sufficient to extrude said mass of metal through said die orifice, the radial depth of said passageway being substantially unchanging in said primary zone, and decreasing gradually in said secondary zone in the direction of rotation of said wheel member at a relatively high rate and in a manner such as to produce in that zone adjacent the die orifice a metal flow pattern more closely resembling that which is achievable with feedstock in solid form.

4,732,552

FIBER PROCESSING APPARATUS HAVING SLOTTED OUTLETS

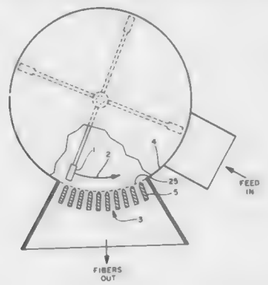
Raymond Chung, Fulton County, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 21, 1984, Ser. No. 612,522
Int. Cl.[4] B28B *5/00*
U.S. Cl. 425—82.1 **9 Claims**

1. In an apparatus for processing fibrous materials having arcuately travelling impact elements enclosed within a chamber by an internal surface arcuately spaced apart from said impact elements, wherein said chamber contains an outlet having a multiplicity of openings through which fibers leave the apparatus, the improvement comprising an outlet consisting essentially of a plurality of spaced-apart dividers aligned in a direction perpendicular to the direction of travel of the impact elements and having a leading surface or portion thereof which is inwardly slanted in the direction of travel of the

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impact elements, said dividers being separated by continuous or semi-continuous slots having a widthwise dimension substantially less than the lengthwise dimension separating any surface interruptions connecting opposite sides of said slot.

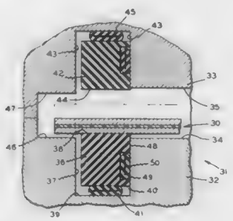


4,732,553

SEAL CONSTRUCTION FOR A MOLD STRUCTURE FOR ENCAPSULATING GLASS WITH A GASKET

Peter H. Hofer, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Jul. 6, 1987, Ser. No. 69,890
Int. Cl.[4] B29C *39/10*
U.S. Cl. 425—116 **24 Claims**



1. A seal assembly for a mold for encapsulating at least a portion of a window assembly with a gasket forming material comprising;

sealing means having a first surface adapted to contact a window assembly and a second surface opposite said first surface;

a first bladder means in contact with said second surface of said sealing means whereby when said sealing means and said first bladder means are positioned in a groove in a mold and said first bladder means is inflated and pressure is applied in a local area of said first surface, said bladder means automatically deforms to transfer at least a portion of said pressure to an adjacent area of said first surface of said sealing means;

said sealing means having a third surface generally perpendicular to said first surface adapted to contact a wall in a mold and a fourth surface opposite said third surface; and

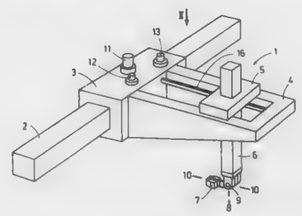
a second bladder means in contact with said fourth surface of said sealing means whereby when said sealing means and said second bladder means are positioned in a groove in a mold and said second bladder means is inflated, said third surface of said sealing means cooperates with said wall of the mold to seal against passage of gasket forming material.

4,732,554

APPARATUS FOR REMOVING INJECTION MOLDED ARTICLES FROM INJECTION MOLDING MACHINES

Dieter Hellmann, Beilngries, Fed. Rep. of Germany, assignor to Battenfeld Maschinenfabriken GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 39,535
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613074
Int. Cl.[4] B29C *45/42*
U.S. Cl. 425—139 **8 Claims**



1. An apparatus for removing injection molded articles from an opened injection mold of an injection molding machine, the injection mold including a closing unit, said apparatus further comprising a guide bed, a carriage movably mounted on the guide bed, the guide bed aligned parallel to the direction of operation of the closing unit, a cantilever attached to the carriage, the cantilever extending transversely of the guide bed, a slide member mounted on the cantilever so as to be movable in longitudinal direction of the cantilever, an adjustable support member having a lower end mounted in the slide member, a grasping member for grasping injection molded articles, the grasping member being attached to the lower end and adjustable relative to the support member about at least two joints extending perpendicularly to each other, a first drive for driving the carriage, a second drive for driving the slide member, and a third drive for driving the support member, the first, second and third drives mounted on the carriage above the guide bed, at least one rotatable shaft mounted in the cantilever and extending in longitudinal direciton of the cantilever, the at least one shaft serving to guide the slide member on the cantilever, the at least one shaft being coupled to the third drive, the at least one shaft including a drive member extending over the entire length of the shaft, an exclusively rotatable transmission element mounted in the slide member, the transmission element being mounted longitudinally movable on the shaft and in rotational engagement with the drive member, and a linear drive attached to the support member, the transmission element being in continuous drive connection with the linear drive.

4,732,555

TILE MAKING APPARATUS

Thomas W. Whitelaw, 127 Latrobe Parade, Dromana, Victoria, Australia

PCT No. PCT/AU85/00313, § 371 Date Aug. 11, 1986, § 102(e) Date Aug. 11, 1986, PCT Pub. No. WO86/03448, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 11, 1985, Ser. No. 912,600
Claims priority, application Australia, Dec. 11, 1984, PG8518
Int. Cl.[4] B29C *39/04*
U.S. Cl. 425—218 **5 Claims**

1. Apparatus for forming tiles from hardenable material, comprising

(i) a support bed for supporting a moving train of abutting molds which are driven therealong;

(ii) feed means for depositing a continuous layer of the tile material in the unhardened state on the molds;

(iii) a drum, the peripheral surface of the drum being contoured to shape the upper surface of the unhardened material carried by the molds as the drum turns;

(iv) drum support means, the drum being disposed over the support bed downstream of the feed means;

(v) drive means for rotating the drum at a peripheral speed that matches the speed of the moving train of molds whereby there is substantially no relative velocity in the direction of movement of the molds between the layer of tile material and the contiguous peripheral surface of the rotating drum;

(vi) partition means on the drum for breaking the continuous layer of tile material at the junction between the abutting molds at the forward end of the train; and

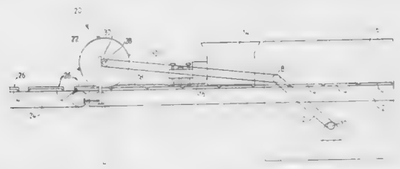
(vii) means situated ahead of the train for moving the foremost mold away from the train upon the breaking of the continuous layer.

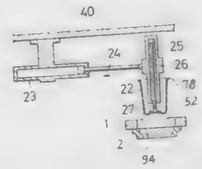
4,732,557

STRETCHING BLOW MOLDING APPARATUS FOR CUP-LIKE CONTAINERS

Daiichi Aoki, Nagano, Japan, assignor to Nissei ASB Machine Co., Ltd., Japan

Filed Oct. 25, 1985, Ser. No. 791,368
Claims priority, application Japan, Oct. 31, 1984, 59-229723
Int. Cl.[4] B29C *49/00, 49/12*
U.S. Cl. 425—522 **16 Claims**





1. An injection blow molding apparatus for manufacturing plastic cup-like articles from an injected preform, comprising:

a support including a first surface for carrying and holding a preform having a peripheral edge by the peripheral edge of the preform and having an opening through the support;

an injection stage having an injection mold part including an opening therein and a core mold part for disposition inside the opening of said injection mold part, the injection stage having means for releasably accepting the support in the opening of said injection mold part and in between the injection mold part and the core mold part to define an injection cavity in which the preform is molded and is thereafter supported and carried by the support;

a molding stage having a blow mold for blow molding the preform into a finished article; and

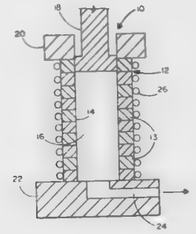
removing means for removing the finished article from the support, through the opening in the support, the removing means including means for engaging the finished article and for raising the article through the opening in the support.

4,732,556

APPARATUS FOR SYNTHESIZING AND DENSIFYING MATERIALS USING A SHAPE MEMORY ALLOY

Tien-Hon Chiang, El Toro, and Donald N. Thatcher, Brea, both of Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Filed Dec. 4, 1986, Ser. No. 937,796
Int. Cl.[4] B30B *12/00*
U.S. Cl. 425—405.2 **13 Claims**



1. A isostatic press comprising:

a hollow cylinder the wall of which comprises a shape memory alloy, the cylinder forming an interior chamber for receiving parts to be pressed, the axial ends of said chamber being enclosed, said parts being compacted charge reactants capable of a self-sustaining combustion reaction when ignited;

at least one mechanical ram enclosing an axial end of said chamber for applying axially-directed pressure on said parts;

means for igniting said reactants, the combustion of which raises the temperature of the reaction chamber and means controlling the temperature of said shape memory alloy for selectively causing transformation of said alloy between a martensitic phase and its parent phase for selectively changing the inner radial dimension of said chamber and applying a compressive force on said parts.

4,732,558

INJECTION MOLD WITH END CORE LOCKS AND EXTENDED SIDE CORE LOCKS FOR FORMING A PARTITIONED CONTAINER

Walter A. Grannen, III, Bargersville, Ind., assignor to E-W Mold & Tool Co., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 823,528, Jan. 29, 1986, Pat. No. 4,676,731. This application Sep. 8, 1986, Ser. No. 905,249
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] B29C *45/13*
U.S. Cl. 425—570 **14 Claims**

1. A case mold assembly comprising:

a frame;

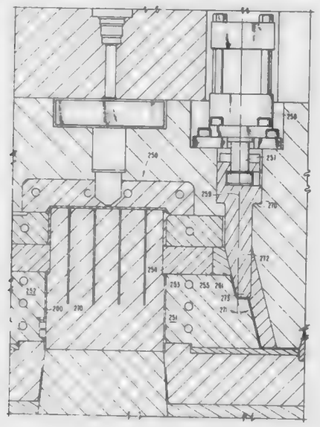
a female mold mounted on said frame and having a cavity for the plastic injection molding of a case, said female mold including a smooth flat interior surface and a cap;

a male mold mounted on said frame and including a plurality of cores with said cores located apart forming slots between said cores, said male mold including a top side, a first side, a second side, a first end, and a second end, said first side oppositely disposed from said second side, said first end oppositely disposed from said second end and said first end and said second end parallel to said slots, said male mold further including a longitudinal axis, an end axis, and a side axis, said longitudinal axis extending lengthwise with respect to said cores and with said male mold being movable therealong into said female mold for the formation of said case therebetween, said end axis extending perpendicular to said longitudinal axis and

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normal to said first end and said second end, said side axis extending perpendicular to said end axis and said longitudinal axis, said cores having bottom ends mounted to said frame with said cores extendable into said cavity to form interior walls extending across said case upon said plastic injection, said cores having smooth flat top ends defining said top side of said male mold, said top ends spaced apart from said smooth flat interior surface to form a smooth flat bottom wall of said case;

injection means operable to inject molten plastic between said female mold and said male mold and into said slots and to maintain said plastic under pressure for a specified time period;



end locking means mounted to said frame for limited motion parallel to the direction of said end axis and when in one position said end locking means extending into endways engagement with said first end and said second end whereby the outward movement of the outermost cores is limited; and,

side locking means mounted to said frame and extending in a direction parallel to said side axis and when in one position extending internally between said cores being the sole means extending between said cores keeping said cores spaced apart during injection of plastic, said side locking means being positioned a distance apart from said cap at least equal to one-third the length of said container.

4,732,559

COMBUSTION DEVICE

David S. Pearl, II, Fort Lauderdale; Louis H. Webb, III, Dania, and Stephen B. Kocell, Pompano Beach, all of Fla., assignors to Uniweld Products Incorporated, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 828,187, Feb. 11, 1986, abandoned. This application Nov. 7, 1986, Ser. No. 927,946

Int. Cl.[4] F23D *14/82*

U.S. Cl. 431—346 **13 Claims**

1. A combustion device for generating a linear flame comprising:

(a) means for combining a combustible gas and a combustion supporting gas, said means comprising an elongated tube having a forward section terminating in a front end, a middle section, and a rearward section, said middle section communicating at its ends with said forward section and said rearward section, respectively, said rearward section being provided with combustible gas and combustion supporting gas intake means; and

(b) stalling means for stalling said combined combustible gas and combustion supporting gas, said stalling means comprising a baffle positioned in said forward section, said baffle comprising:

(1) a substantially circular inner portion comprising a wire mesh;

(2) a generally annular solid portion surrounding said inner portion; and





(3) a plurality of radially extending ribs which connect said baffle to the inside wall of said forward section and define a plurality of passageways between said inside wall and said generally annular portion.

4,732,560

HUMIDITY PROTECTED RADIATION-RESPONSIVE SWITCH

Michael R. Kling, White Deer, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 332,899, Dec. 21, 1981, abandoned. This application Sep. 14, 1983, Ser. No. 532,090

Int. Cl.[4] F21K *5/00*

U.S. Cl. 431—359 **13 Claims**

1. A humidity protected radiation-responsive switch for a photoflash unit comprising an admixture of silver carbonate and/or silver oxide, titanium dioxide and a binder of blended polystyrene and a butadiene styrene copolymer.

4,732,561

APPARATUS FOR COOLING HOT MATERIAL

Karl Eiring; Manfred Durr, both of Oelde, and Heinz-Herbert Schmits, Rheda-Wiedenbruck, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

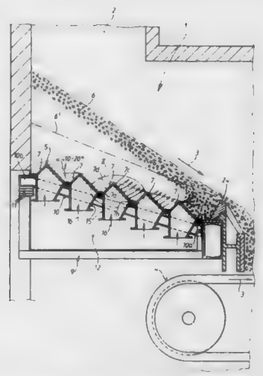
Filed Oct. 9, 1986, Ser. No. 917,162

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3538059

Int. Cl.[4] F27D *15/02*

U.S. Cl. 432—78 **26 Claims**

1. In apparatus for cooling hot material discharged from a kiln or the like to a cooler grate via an inlet, the improvement comprising a transfer stage interposed between said kiln and said grate and occupying said inlet and over which said material moves along a path from said kiln to said grate, said transfer stage comprising a group of individual carrier elements connected to one another and extending transversely across the length and breadth of said inlet, a common frame supporting all of said carrier elements, each of said elements having air holes through at least one wall thereof extending along said path, said group of elements being downwardly inclined between about 10° and 20° to the horizontal in the direction of



movement of said material, and means for adjusting said frame to a position in which the inclination of said carrier elements enables said transfer stage to support thereon a layer of said material at its angle of repose, thereby enabling said layer of material to provide a protective covering for said carrier elements and enabling additional material discharged onto said layer to move along said path, said air holes being aligned to direct air in the direction of material movement along said material transfer stage.

4,732,562

DEVICE FOR USE IN THE THAWING OF FROZEN DOOR LOCKS

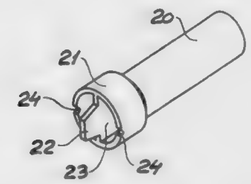
Johannes S. Palsson, Taastrupgaardsvej, 177, DK-2630 Taastrup, Denmark

Continuation-in-part of Ser. No. 841,762, Mar. 20, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 31,837

Claims priority, application Denmark, Sep. 30, 1985, 4419/85

Int. Cl.[4] F26B *21/00;* **F24J** *3/00;* **E05B** *17/00*

U.S. Cl. 432—224 **18 Claims**



1. A device for thawing a frozen door lock having a keyhole comprising:

a tubular member of heat insulating material;

plug support means in and adjacent to one end of said tubular member;

plug means at said one end of said tubular member extending outwardly from said plug support means and having a shape to facilitate insertion thereof into the keyhole of the door lock; and

means for guiding air blown into the other end of said tubular member onto the door lock so that heat from said air is conducted through the door lock to thaw any frozen matter therein comprising said plug support means being shaped to provide axial openings at both sides of said plug means for the passage of air therethrough.

4,732,563

POWER UNIT, IN PARTICULAR FOR DENTAL INSTRUMENTS, AND TOOL UNIT FOR USE IN CONNECTION WITH SUCH POWER UNIT

Sven K. L. Goof, 236 A, Gl. Strandvej,, DK-3050 Humlebak, Denmark

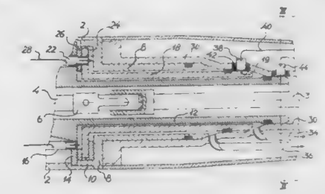
PCT No. PCT/DK85/00078, § 371 Date Apr. 9, 1986, § 102(e) Date Apr. 9, 1986, PCT Pub. No. WO86/01094, PCT Pub. Date Feb. 27, 1986

PCT Filed Aug. 13, 1985, Ser. No. 849,681

Claims priority, application Denmark, Aug. 14, 1984, 3899/84

Int. Cl.[4] A61C *1/00*

U.S. Cl. 433—29 **6 Claims**



1. A power unit for a hand-held instrument, such as a dental handpiece, comprising an elongate housing equipped with means for transmitting electrical current and at least one fluid therethrough, and provided at one end with connector stub means for removably connecting a tool unit to said power unit; said connector stub means having walls including longitudinal partitions defining passages for the flow of fluid through the interior of said connector stub means; wherein the improvement comprises

at least one of said longitudinal partitions of said connector stub means being formed of electrically conductive material and being adapted for connection to a source of electrical current; said one partition being electrically isolated from other walls of said connector stub means and including a laterally-directed externally-exposed contact face for establishing electrical connection with a corresponding contact face of a tool unit connectable to said power unit.

4,732,564

DENTAL IMPLANT ALIGNMENT AND BENDING APPARATUS

Frank R. Potucek, and Edward J. Smith, both of Clearwater, Fla., assignors to Surgical Appliances, Inc., Clearwater, Fla.

Filed Dec. 23, 1986, Ser. No. 945,587

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—50 **10 Claims**

5. A dental implant aligning device in combination with a jaw pattern jig to establish the alignment of a one piece metal mandible implant comprising:

(a) as part of the jaw pattern jig a base plate having multiple left and right spaced apart bores,

(b) a left and right positioning device, each positioning device having a means, affixed to the base plate by a screw engaged to one of the bores, for supporting a position shaft having a slot for capturing a distal end of a ramus member,

(c) an anterior end of each ramus member being captured by a locking element of the implant aligning device,

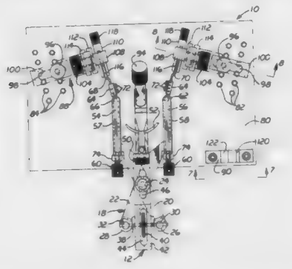
(d) the implant aligning device having a scissors member with two crossing blades, a front end of each blade integral with a rod enclosed within a movable housing, the

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movable housing having a front mounted swivel fitting integral with the locking element,

(e) a longitudinally movable adjustment plate mounted over the scissors and supporting a rod integral with an anterior foot member of the dental implant at a front end,

(f) a vice tightening screw mounted on the jaw pattern jig



between the scissors blades of the implant aligning device, the vice tightening screw moving a first block in a slot of the jig to capture the anterior foot between the first block and a second block permanently affixed to the slot in the jig, the position of the implant aligning device together with the ramus members and anterior foot member being thereby precisely aligned.

4,732,565

ELECTRIC CONNECTOR

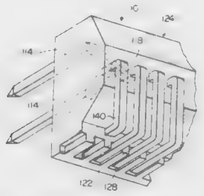
Michio Ito, Tokyo; Eiji Matsuda, Yokohama, and Tetsuya Kaneko, Tokyo, all of Japan, assignors to MG Company, Ltd., Miyagi, Japan

Filed May 19, 1986, Ser. No. 865,041

Claims priority, application Japan, May 28, 1985, 60-78612[U]; Sep. 14, 1985, 60-203973; Nov. 1, 1985, 60-245930; Nov. 5, 1985, 60-247699

Int. Cl.[4] H01R *23/70*

U.S. Cl. 439—79 13 Claims



1. An electric connector for elelctrically connecting between an electric element and conductors on a planar surface of a printed circuit board, comprising a plastic main body and a plurality of conductor members penetrating the main body, each of the conductor members having, at one end a connecting portion for connecting to the electric element and at the other end a terminal portion for connecting to said one conductor on the printed circuit board, each terminal portion of the conductor members having a first face which is subject to surface mounting contact with one of said conductors on the printed circuit baord when the electric connector is arranged on the printed circuit board with each connecting portion of the conductor members extending parallel to the printed circuit board and a second face which is subject to surface mounting contact with one of said conductors on the printed circuit board when the electric connector is arranged on the printed circuit board with each connecting portion of the conductor members extending perpendicularly to the printed circuit board, said main body having a plurality of grooves in a surface thereof, the ends of the terminal portions of the conductor members being seated in said grooves.

4,732,566

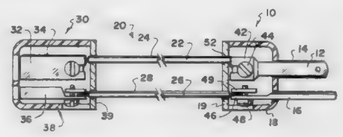
ELECTROCUTION PROOF LINE AND EXTENSION CORD

Frank Martucci, 360 Tom Hunter Rd., Fort Lee, N.J. 07024

Filed Jun. 18, 1987, Ser. No. 63,408

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—106 4 Claims



1. An electrocution-proof line comprising, a plug having a housing with four wire connection sites, a first conductive blade extending from said plug housing and connected to a first one of said sites, a second conductive blade extending from said plug housing and connected to a second one of said sites, a grounding prong extending from said housing and connected to a third and to a fourth one of said sites, and a line cord having four conductive wires, each of said wires being connected respectively to one of said first, second, third and fourth sites, whereby two of said wires of said line cord act as grounding wires to provide a redundant grounding pathway for current.

4,732,567

APPARATUS AND METHOD FOR PREVENTING REVERSAL OF THE RELATIVE DISPLACEMENT BY HAND OF ENGAGED MALE AND FEMALE COMPONENTS

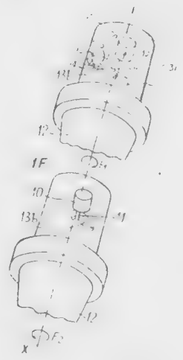
Joseph Crestin, Vanves, France, assignor to Societe d'Exploitation des Procedes Marechal (SEPM), S.A., Paris, France

Filed Aug. 13, 1986, Ser. No. 896,062

Claims priority, application France, Aug. 21, 1985, 85 12569

Int. Cl.[4] H01R *13/625*

U.S. Cl. 439—332 32 Claims



1. An apparatus for preventing a reversal in the relative displacement of two components when said two components are positioned at a position beyond which a reversal in the relative displacement of said two components is undesirable, wherein said two components comprise a male component and a female component, wherein one of said components is adapted to be displaced by hand relative to the other of said components in a first direction and then in a second, reverse direction opposite from said first direction, wherein said apparatus comprises:

(a) a first element attached to one of said components, wherin said first element is adapted to be displaced in a direction substantially perpendicular to said first direction; and

(b) a second element attached to the other of said components, wherein said second element is adapted to engage said first element, wherein said second element extends substantially parallel to said first direction, wherein said second element comprises an abutment surface extending substantially perpendicular to said first direction, wherein said abutment surface comprises means for preventing a reversal in the direction of displacement of said first element at said position.

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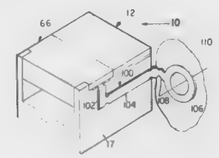
ELECTRICAL CONNECTOR WITH INTEGRAL GROUND STRAP FOR SHIELDED CABLE

Charles Hall, Roanoke, Va., assignor to Virginia Plastics Company, Roanoke, Va.

Continuation of Ser. No. 841,042, Mar. 17, 1986, abandoned, which is a continuation of Ser. No. 761,667, Aug. 1, 1985, abandoned, which is a continuation of Ser. No. 597,279, Apr. 6, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 935,076

Int. Cl.[4] H01R *13/648, 23/02*

U.S. Cl. 439—676 26 Claims



1. An electrical jack, which comprises:

an insulating housing having a front end, a rear end and conductor-receiving means;

a plug-receiving opening extending into said front end of said insulating housing;

a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising an intermediate portion extending through said conductor-receiving means, a spring contact portion extending from one end of said intermediate portion into said plug-receiving opening, and an end portion extending from the other end of said intermediate portion; and

at least one ground conductor positioned in said housing adjacent said plurality of conductors and including a ground spring contact portion extending into said opening and formed similarly to said spring contact portion of each of said conductors, said ground conductor including grounding means extending outside said insulating housing and having a surface area substantially greater than that of said ground spring contact portion for coupling said ground conductor to a source of ground potential; and

said grounding means comprises a ground strap extending integrally from and substantially wider than said ground spring contact portion, and having a free end; and

said ground strap includes terminal means formed at said free end for connecting the same to the source of ground potential; and

said ground strap includes an arm coupled to said ground spring contact portion and extending out of said housing, and a leg extending angularly from said arm.

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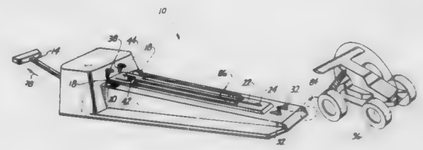
TOY VEHICLE LAUNCHER

Keith Hippely, Manhattan Beach, and George Soulakis, Hermosa Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 7, 1986, Ser. No. 882,644

Int. Cl.[4] A63H *29/00*

U.S. Cl. 446—430 6 Claims



1. A toy vehicle launcher comprising:

a body portion having an elongated slot therein;

wheels attached to an axle rotatably mounted on said body portion, said axle having a gear attached thereto;

slider means operably engaging said elongated slot for pulling a toy vehicle forward;

support means for releasably mounting said toy vehicle on top of said body portion, said support means including a flexible support attached to said body portion;

a rack passing through an aperture in said body portion and operably engaging said axle; and

cam means for bending said flexible support as said rack is pulled.

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COLORED THERMOPLASTIC RESIN

Alan S. Baumgartner; Patrick D. Moore, and Richard A. VanDahm, all of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 775,614, Sep. 13, 1985, Pat. No. 4,640,690. This application Jun. 23, 1986, Ser. No. 877,056
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.[4] D06P *3/00, 5/13, 3/79, 3/24*
U.S. Cl. 8—506 10 Claims

1. A colored thermoplastic resin composition which comprises a thermoplastic resin and a colorant in the form of a polyalkyleneoxy-substituted chromophore group incorporated into said thermoplastic resin in a minor amount sufficient to provide coloration, while said thermoplastic resin is in a molten phase so as to distribute said colorant throughout the mass of said thermoplastic resin whereby said colorant is essentially non-extractable from said resin.

4,732,571

PROCESS FOR DYEING OF POLYMERS OF ETHYLENE WITH BASIC DYES

John R. B. Boocock, and Vaclav G. Zboril, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 756,177, Jul. 18, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 947,850
Claims priority, application Canada, Jun. 27, 1985, 485660
Int. Cl.[4] C08L *23/02, 51/06;* D06P *1/41, 3/79*
U.S. Cl. 8—513 14 Claims

1. A process for dyeing a polyolefin article, comprising the steps of:

(A) contacting the polyolefin article with an aqueous dyebath, said aqueous dyebath having a pH of 5.0–7.5, a temperature of at least 35° C. and containing basic dye in a concentration of at least 0.4 g/l, said polyolefin being a blend comprising (i) 65–99 parts by weight of a polyethylene selected from the group consisting of homopolymers of ethylene and copolymers of ethylene with C_3–C_{10} higher alpha-olefins, and mixtures thereof, and (ii) 1–35 parts by weight of a copolymer selected from the group consisting of direct copolymers and graft copolymers wherein (a) said direct copolymer is a copolymer of ethylene with at least one alpha,beta-ethylenically unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, the acid moieties being randomly or non-randomly distributed in the polymer chain, the carboxylic acid content being 0.5–50% by weight of the direct copolymer, (b) said graft copolymer is obtained by grafting 0.1 to 20 percent by weight of at least one alpha,beta-unsaturated carboxylic acid having 3 to 8 carbon atoms or unsaturated carboxylic acid anhydride onto a preformed polyolefin backbone derived from ethylene or ethylene and C_3 to C_8 alpha-olefin, and (c) said copolymer is a copolymer of (a) or (b) in the form of a zinc ionomer,

(B) maintaining said polyolefin article in contact with the aqueous dyebath for a period of at least 20 seconds, and

(C) removing the polyolefin article so dyed from the aqueous dyebath.

4,732,572

AMINE SALTS OF SULFOMETHYLATED LIGNIN

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,781
Int. Cl.[4] C08H *5/02;* C09B *67/18*
U.S. Cl. 8—557 7 Claims

1. A method of producing amine salts of lignosulfonates, particularly suited for use as additives in other chemical compositions, comprising the steps of:

(a) ionizing the phenol component of a lignin material in alkaline liquid medium;

(b) methylolating the lignin material in the ortho position of the phenol component;

(c) lowering the pH of the liquid to an acid pH to precipitate the methylolated lignin material;

(d) washing the precipitated lignin material with water to remove inorganic salts and residual reactants therefrom; and

(e) reacting the washed, purified methylolated lignin material with an amine compound and a sulfur-oxygen-containing compound in liquid medium to produce sulfomethylated lignin amine salt.

4,732,573

NOVEL DYE SALTS OF CATIONIC DYES, HAVING THIOCYANATOMETALLATE OR CYANATOMETALLATE COMPLEX ANIONS FOR SPIN DYEING ACID MODIFIED POLYACRYLONITRILE

Kurt Hohmann, Neu-Isenburg; Peter Mischke, Bad Soden am Taunus, and Wolfgang Teige, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 23, 1986, Ser. No. 945,761
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1985, 3546294
Int. Cl.[4] C09B *23/10, 69/02;* D01F *6/18;* D06P *3/76*
U.S. Cl. 8—654 12 Claims

1. In a process for the spin-dyeing of acid-modified polyacrylonitrile or acid-modified copolymers of acrylonitrile in which a basic dye is used as the colorant, the improvement which comprises employing as the colorant a dye salt of a mono- or polycationic dye where the anion conforms to a formula (1) or (2)

$$[Me(XCN)_4]^{2(-)} \quad (1)$$

$$[Me(SCN)_6]^{n(-)} \quad (2)$$

in which

Me in the formula (1) is the divalent zinc cation, the divalent iron cation, the divalent cobalt cation, the divalent tin cation or the divalent copper cation, and

Me in the formula (2) stands for the divalent iron cation, the divalent nickel cation or the trivalent iron cation,

x stands for an oxygen or sulfur atom and

n depending on the valency of the corresponding metal cation, denotes the number 4 or 3.

4,732,574

LUMINOSITY ENHANCEMENT OF TRIOXANE FUELS

Alex Forschirm, Parsippany, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,792
Int. Cl.[4] C10L *7/00*
U.S. Cl. 44—7.1 5 Claims

1. A trioxane-based solid fuel having improved flame luminosity comprising trioxane and 0.1 to about 5 wt. % based on said fuel of a sodium salt wherein said sodium salt has a specific gravity of less than 2.00 and said salt is mixed within the trioxane-based solid fuel.

4,732,575

TRIOXANE FUELS WITH INCREASED HEAT CONTENT

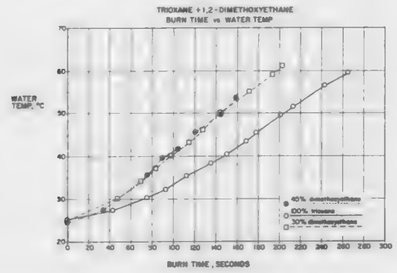
Alex Forschirm, Parsippany, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,889
Int. Cl.[4] C10L *7/00*
U.S. Cl. 44—7.6 10 Claims

1. A trioxane-based solid fuel having improved heat content comprising a mixture of a solid fuel consisting essentially of

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trioxane and an additive to enhance the heat content of said trioxane selected from the dialkyl ethers of alkanediols



wherein each of said alkyl ether groups contains 1 to 6 carbon atoms and the alkanediol contains 2 to 12 carbon atoms.

4,732,576

MOTOR FUEL AND FUEL OIL EMULSIONS USING A SALT AS EMULSIFIER

Werner Friedrich, Herten; Hans Maag, Marl, and Heinz Reimer, Bottrop, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

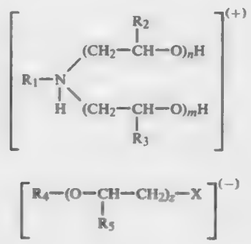
Filed Jul. 11, 1986, Ser. No. 884,583

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525124

Int. Cl.⁴ C10L *1/32*

U.S. Cl. 44—51 **21 Claims**

1. In a water/oil emulsion comprising combustion effective amounts of water, a motor fuel useful for internal combustion engines or a fuel oil and an emulsifier, the improvement wherein the emulsifier comprises at least 25% by weight of a compound of the formula:



wherein

R_1 and R_4 each independently is alkyl or alkenyl of 4 to 24 C atoms, and R_4 can also be alkylphenyl of 1 to 18 C atoms in the alkyl portion or H; R_2, R_3 and R_5 each independently is methyl or H; n plus m is a number from 1 to 20; z is 0 to 15; and X is $-COO^{(-)}$ or $-OCH_2COO^{(-)}$.

4,732,577

PROCESS FOR SEPARATING CARBON MONOXIDE HAVING SUBSTANTIALLY CONSTANT PURITY

Susumu Koizumi, Kurashiki; Shigeo Matsui, Kobe, and Kyoichi Kawata, Takaishi, all of Japan, assignors to Osaka Sanso Kogyo Ltd. and Kawasaki Steel Corp., both of, Japan

Filed Apr. 14, 1987, Ser. No. 38,696

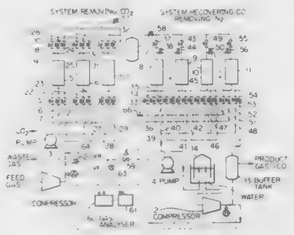
Claims priority, application Japan, Apr. 14, 1986, 61-84236

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—18 **7 Claims**

1. A process for obtaining a product gas stream having an enriched and substantially uniform concentration of carbon monoxide from a feed gas containing at least carbon dioxide, carbon monoxide and nitrogen comprising:

(a) subjecting said feed gas to pressure swing adsorption to substantially remove carbon dioxide therefrom and form a first stage product gas containing at least carbon monoxide and nitrogen;



(b) subjecting said first stage product gas to pressure swing adsorption to form a second stage product gas comprising carbon monoxide, wherein the level of carbon monoxide is continuously determined in at least the feed gas and the product gas and an amount of second stage product gas is added to the feed gas, the first stage product gas or both sufficient to maintain a substantially uniform carbon monoxide level in said second stage product gas.

4,732,578

PRESSURE SWING ADSORPTION PROCESS

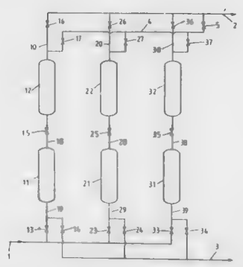
Christian Benkmann, Graefelfing, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,911

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1985, 3543468

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—21 **28 Claims**



1. In a pressure swing adsorption process for the selective adsorption of at least one gaseous component from a feed gas mixture comprising conducting the mixture in cyclic alternation through at least three adsorbers, each of said at least three adsorbers passing through a switching cycle in staggered fashion with respect to one another, said switching cycle including (a) an adsorption phase wherein said feed gas mixture is introduced at an elevated inlet pressure into an adsorber, said at least one gaseous component is adsorbed, and unadsorbed product gas is withdrawn from the adsorber; (b) a cocurrent expansion phase, after termination of said adsorption phase, during which the adsorber is regenerated by being depressurized to form an expansion gas which is passed on at least in part to other adsorbers for partial repressurization thereof; and (c) a pressurization phase during which the adsorber is subsequently repressurized to said inlet pressure, the improvement comprising each of said adsorbers being divided into a first adsorber section and a second adsorber section, said first and second adsorber sections being connected in series, and during said adsorption phase said feed gas mixture being respectively conducted through said first and second adsorber sections, said adsorber sections being isolated from each other after said cocurrent expansion phase and said first adsorber section being subjected to further depressurization while said second adsorber section is maintained at a higher pressure.

4,732,579

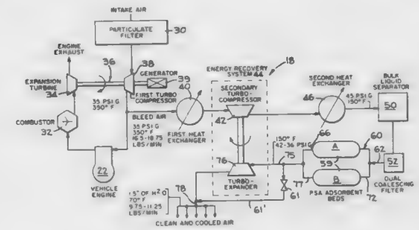
AIR PURIFICATION AND TEMPERATURE CONTROLLING SYSTEM AND METHOD

Joost Veltman, San Jose; Ram L. Malik, Fremont, and Michael D. Dickens, Danville, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 14, 1986, Ser. No. 852,006

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—23 **31 Claims**



1. A method of directing clean air at a desirable temperature to the crew compartment of a vehicle when in an environment of contaminated air comprising the steps of:

initially compressing and raising the temperature of the contaminated air;

subjecting the heated and compressed air to an initial cooling step for increasing the density of the air;

compressing the initially heated and compressed air;

subjecting the heated and compressed air to a secondary cooling step for decreasing the temperature of the contaminated air to a temperature lower than that at said initial compression step;

directing the contaminated air received from said secondary cooling step through a regenerative pressure swing adsorption system for providing clean output air with the contaminants removed therefrom; and

expanding and controlling the temperature of the clean output air before discharging the clean output air into the crew compartment of the vehicle for use by the crew.

12. A system for providing clean air to the personnel compartment of a vehicle when in an environment of contaminated air comprising:

first compressor means for compressing and raising the pressure of the contaminated air;

first cooling means for cooling the heated and compressed air to increase the density of the air;

second compressor means for again compressing the initially compressed air for raising the pressure thereof above that provided by said first compressor means;

second cooling means for lowering the temperature of the contaminated air below that of the air discharged from said second compressor means;

regenerable adsorption means for receiving the contaminated air from said second cooling means for providing clean output air with the contaminates removed therefrom;

means or expanding the clean output air thereby recovering energy from the air being cooled before discharging the cleaned and cooled output air into the personnel compartment of the vehicle, said energy received from expansion of the air being used to drive a component on the vehicle thereby providing an energy efficient system;

regenerable particulate filter means for receiving and prefiltering the contaminated air and directing the prefiltered air to said first compressor means;

a combustion powered means in the vehicle; and

a turbocharger operatively connected to said combustion power means and including an expansion turbine;

said first compressor means including an air compression turbine operatively connected to said expansion turbine and receiving intake air from said particulate filter means;

said combustion powered means directing exhaust gases into said expansion turbine for driving said first compression turbine for compressing and raising the pressure of the contaminated but prefiltered air, first conduit means for directing a major portion of the air into said combustion power means, and second conduit means for directing a minor portion of said prefiltered air into said first cooling means.

4,732,580

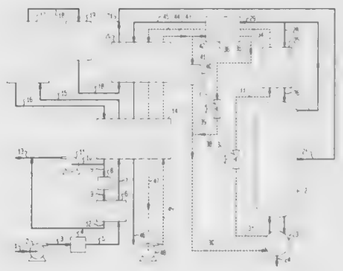
ARGON AND NITROGEN COPRODUCTION PROCESS

Ravi Jain, North Plainfield; Steven L. Lerner, Berkeley Heights; Robert A. Mostello, Somerville, and Donald L. MacLean, Annandale, all of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Oct. 1, 1986, Ser. No. 914,096

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—26 **25 Claims**



1. A process for the coproduction of argon and nitrogen from an air stream comprising

(i) elevating the pressure of said air stream in a compressor means;

(ii) lowering the temperature of the compressed air stream in a first heat exchanger means;

(iii) introducing the compressed and cooled air stream into a pressure swing adsorption unit comprising at least two adsorbent beds in order to remove oxygen and to yield a gaseous mixture comprising argon and nitrogen;

(iv) separating the argon and nitrogen mixture by cryogenic means.

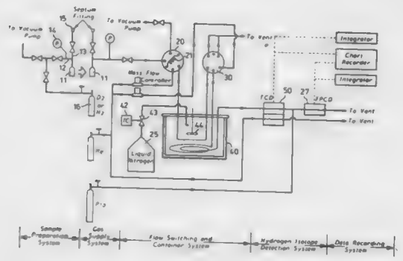
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,581

GAS CHROMATOGRAPHIC METHOD FOR SEPARATING HYDROGEN ISOTOPES

Christopher H. Cheh, 4239 Anworld Place, Mississauga, Ontario, Canada L4W 2W1; Ronald E. Massey, 3135 Bentworth Drive, Burlington, Ontario, Canada L7M 1V9; Otto K. Kveton, K. Kveton, 25 Dacre Crescent, Toronto, Ontario, Canada 25 Dacre Crescent, Toronto, Ontario, Canada M6S 2W2; Samuel H. Hawthorne, 3 Farmington Drive, Brampton, Ontario, Canada L6W 2V1, and Savtantar K. Sood, 97 Banting Crescent, Brampton, Ontario, Canada L6Y 2M3

Filed May 8, 1986, Ser. No. 861,336
Int. Cl.[4] B01D *15/08*
U.S. Cl. 55—67 31 Claims



1. A gas chromatographic method for separating one or more minor components from one or more major components of an isotopic mixture of hydrogen, comprising:

injecting a volume of the mixture at a first end of a first of a plurality of columns which are packed with a molecular sieve material, each column being maintained at a temperature of from about −180° C. to about −140° C.;

causing the injected mixture to flow through the first column by means of a pressurized stream of an inert gas, so that at least one minor component is chromatographically separated from a fraction of the total mixture;

eluting from a second end of the first column at least one volume of mixture containing an enriched concentration of said at least one separated minor component as compared to the original mixture injected; and

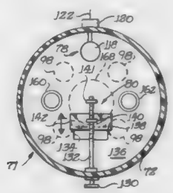
flowing said eluted volume through at least one more column so that chromatographic separation of the one or more minor components from the one or more major components is obtained.

4,732,582

SCRUBBING APPARATUS

Harry G. Mojonnier, 1238 Franklin Ave., River Forest, Ill. 60305

Filed Sep. 24, 1984, Ser. No. 654,304
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—165 14 Claims



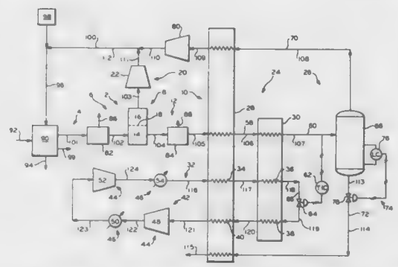
1. A scrubbing apparatus comprising: a gas-exchange scrubbing column for removing extraneous gaseous matter from water; and flow control means comprising an upper reservoir mounted above said scrubbing column for receiving a supply of water to be passed through said column, controllable valve means for regulating the flow of water to said upper reservoir, level sensing means in said upper reservoir responsive to the level of water therein for producing predetermined control signals in a predetermined systematic fashion in accordance with said level, said controllable valve means being responsive to said predetermined control signal for regulating the flow of water to said upper reservoir, and adjustable orifice means intermediate said upper reservoir and said column for delivering water from said upper reservoir to said column; sthe level of water in said upper reservoir set by said level sensing means cooperating with said adjustable orifice means to control the rate flow of water to the scrubbing column therebelow; wherein said adjustable orifice means is interposed between said upper reservoir and said scrubbing column and is adjustable for adjusting the rate of flow of water from said upper reservoir to said column and includes adjustment means extending externally of said scrubbing apparatus.

4,732,583

GAS SEPARATION

Bradley W. DeLong, Bartlesville, Okla., and Jeffrey R. Burkinshaw, Casper, Wyo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1984, Ser. No. 677,668
Int. Cl.[4] B01D *53/24*
U.S. Cl. 55—16 12 Claims



1. A process for separating a gas stream containing a high concentration of hydrogen gas from a high-pressure first gas stream containing a low concentration of hydrogen gas, said process comprising:

(a) introducing the high-pressure first gas stream into a separation zone containing a membrane which is selectively permeable to hydrogen and divides said separation zone into a high-pressure first chamber and a low pressure second chamber, wherein the first gas stream is introduced into the first chamber;

(b) withdrawing low-pressure high purity hydrogen gas permeate from the second chamber;

(c) withdrawing a second gas stream from the first chamber which has a lower concentration of hydrogen gas than the first gas stream, and is at a lower pressure than the first gas stream;

(d) cooling the second gas stream sufficiently to condense substantially all condensable components in the second gas stream and provide a high purity hydrogen third gas stream.

4,732,584

PROCESS FOR THE PURIFICATION OF PERMANENT GASES USING CHABAZITE ADSORBENTS

Charles G. Coe, Macungie, and David A. Roberts, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 866,544, May 22, 1986, abandoned. This application May 22, 1987, Ser. No. 53,283
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—66 7 Claims

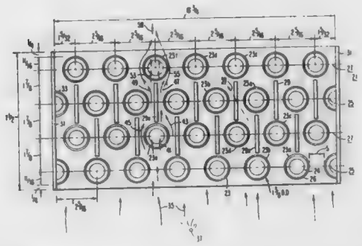
1. In a process for the selective adsorption of one or more minor constituents from a bulk gas stream containing one or more minor constituents, wherein the bulk gas stream containing one or more minor constituents is contacted with a zeolitic adsorbent, and wherein the minor constituent to be separated has a heat of adsorption greater than the bulk gas or the bulk gas is size excluded from the pore structure of the zeolitic adsorbent, the improvement for separating the minor constituents comprises utilizing a dehydrated chabazite adsorbent having a residual water content of less than 1.5 wt% as the zeolitic adsorbent, wherein the dehydrated chabazite adsorbent has at least 50% of any exchangeable ion capacity exchanged with a polyvalent metal cation; and operating the process under conditions such that the partial pressure of the minor constituent is in the linear low pressure region of the isotherm for the minor constituent.

4,732,585

FLUID TREATING FOR REMOVAL OF COMPONENTS OR FOR TRANSFER OF HEAT, MOMENTUM-APPARATUS AND METHOD

Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Continuation-in-part of Ser. No. 569,270, Jan. 9, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 842,203
Int. Cl.[4] B01D *47/14*
U.S. Cl. 55—90 19 Claims



1. Apparatus for treating fluids for liquid-gas contacting, for removing particulate, mist or fumes from fluids, or for transferring heat or mass between fluids, the said fluids flowing predominantly in a predetermined direction, the said apparatus including separate cylindrical elements arrayed in a plurality of rows, each said element being impermeable to the flowing fluids, said rows being transverse to said predetermined direction, and the elements of adjacent rows being staggered with reference to each other, the elements of each row being spatially separated from each other and from the elements of adjacent rows, so that an open flow space would normally surround each element, whereby there would normally undesirably be by-pass channels permitting by-pass flow for the fluids between the elements along the rows at an angle to said predetermined direction; the said apparatus being characterized by that said elements have non-reentrant surfaces on their upstream side with respect to the direction of flow of said fluid and further characterized by that said by-pass flow of said fluid is prevented by partitions bridging between at least a plurality of pairs of certain of said elements, the elements of each said bridging pair being in alternate rows, and the elements of intervening rows being positioned generally symmetrically with respect to said partitions, said partitions being substantially in contact with the surfaces of the elements which they bridge along the length of said elements to interpose substantially complete obstruction to said by-pass flow, said partitions being positioned transversely to said predetermined direction and being so shaped so as to minimize the pressure drop in the fluids flowing through said apparatus.

9. The method of removing particulate from a gas with apparatus including a plurality of cylindrical elements, each said element being imperforate to said gas, arrayed in rows with the elements of adjacent rows staggered with respect to each other, with each element physically separate from the elements of its row and adjacent rows, and with partitions extending between the elements of alternate rows, each said partition being substantially in contact with the surfaces of the elements between which it extends along the length of said each element to prevent diagonal by-pass flow through said rows, each of said partitions being interposed between a pair of elements of rows intermediate said alternate rows, each element and its adjacent partitions defining channels for the flow of gas, each channel being bounded by the continuous curvilinear surface of a said cylindrical element and a said adjacent partition, decreasing gradually in width from a first distance constituting a part of the distance between a pair of adjacent of said adjacent partitions to a second substantially smaller distance between said each element and one of said adjacent partitions and then gradually increasing in width from said smaller distance to a distance constituting a part of the distance between said adjacent partitions, the said first distance and the said second distance being so related to an effective venturi effect for a gas flowing through said each channel is present; the said method comprising injecting a liquid into said gas to produce drops of liquid in said gas, passing said liquid drops, gas and particulate forming a fluid through said channels defined by said rows of elements and their associated partitions generally transverse to said rows thereby to accelerate said drops of the liquid, said each channel from the region of said first distance through the region of said second distance, at a lower rate than the particulate is accelerated, whereby said liquid drops are at a lower velocity than said particulate and said particulate collides with said drops and is captured by its collision with said drops.

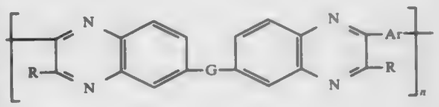
4,732,586

ASYMMETRIC OR COMPOSITE POLYQUINOXALINE BASE MEMBRANES, POSSIBLE APPLICATION TO GASEOUS PERMEATION AND MORE PARTICULARLY GASEOUS MIXTURE FRACTIONATION, AND MAINLY DEHYDRATION AND DEACIDIFICATION OF GASES, ESPECIALLY GASEOUS HYDROCARBONS

Richard Dick, 2, rue Nicolas Houël, 75005 Paris; André Le Jeune, 1, rue du 14 Juillet, 28000 Mainvilliers, and Francois Fournie, 37, rue La Quintinie, 75015 Paris, all of France

Filed Feb. 10, 1986, Ser. No. 827,599
Claims priority, application France, Feb. 11, 1985, 85 01879
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 8 Claims

1. An asymmetric gaseous permeation membrane, also applicable to fractionation of a gaseous mixture and in particular dehydration and deacidification of gases, in particular gaseous hydrocarbons, which is obtained from polymers of the polyquinoxaline family presenting the unit:



with: $n \geq 10$

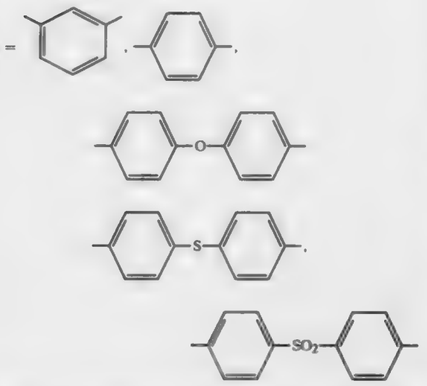
VOL 1088 ISS 4 MR 22 1988 UMI

and

R=H or phenyl radical,

G=carbon-carbon bond, or —O—, —S—, —SO_2—, —CO—

Ar =



presenting a dense "skin" of low thickness ranging from 0.05 to a few microns substantially without defects and any existing pores having a diameter less than 10 Å in order to permit gas molecules to pass through by a dissolution-diffusion mechanism, and having a permeability to methane as measured at 20° C. under 3 bars of 10^{-6} to 10^{-3} $cm^3/cm^2.sec.cm$ Hg, together with a separation on factor H_2O/CH_4 under the same conditions of at least 10.

6. An asymmetric gaseous permeation composite membrane comprising a microporous membrane supporting a think "skin" of polyquinoxaline of a thickness lower than 2 microns having a membrane permeability as measured at 20° C. under 3 bars of 10^{-6} to 10^{-3} $cm^3/cm^2.sec.cm$ Hg, together with a separation factor for H_2O/CH_4 under the same conditions of at least 10.

4,732,587

DEVICE FOR BREAKING DOWN A MIXTURE

Jochim Koch, Hollenbek, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Continuation of Ser. No. 445,842, Nov. 30, 1982, abandoned. This application May 7, 1984, Ser. No. 607,819

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1982, 3200679

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—162 **3 Claims**

1. A device for separating out a component of a mixture, comprising:

a mixture supply (2) for supplying the mixture;

a first inlet valve (4) and a second inlet valve (5) connected to said mixture supply for selectively passing and blocking the mixture;

a first tank (6) having an inlet connected to said first inlet valve;

a second tank (7) having an inlet connected to said second inlet valve;

said first and second tanks having absorbent therein for selectively absorbing the one component from the mixture;

a first outlet valve (8) connected to a first outlet of said first tank for discharging mixture from said first tank to flush the compound out of the absorbent of said first tank;

a second outlet valve (9) connected to a first outlet of said second tank for discharging mixture from said second tank to flush the component out of the absorbent of said second tank;

a pressure sensor (18) connected to said mixture supply for sensing the pressure (p) of said mixture supply;

a flush line (16) connected only between second outlets of said first and second tanks;

a choke (17) connected in said flush line for allowing, at all times, a restricted flow of mixture in said flush line, said flush line operating to supply mixture from one of said tanks to the other to flush said other tank;

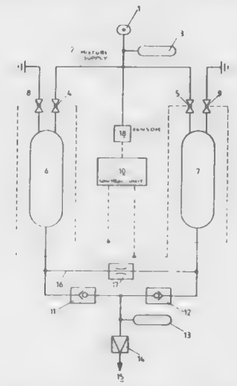
a first check valve (11) connected to said second outlet of said first tank for permitting passage of enriched mixture from said first tank;

a second check valve (12) connected to said second outlet of said second tank for permitting passage of enriched mixture from said second tank;

said first and second check valves having connected outlets connected to each other for discharging enriched mixture;

a pressure reducer (14) connected to said connected outlets but not to said flush line, for discharging enriched mixture from said connected outlets, said check valves preventing flow from said pressure reducer to said tanks; and

control means (10) connected to said sensor (18), said control means including a first control pathway connected to said first inlet valve (4) and said second outlet valve (9) for permitting passage of mixture through said first inlet valve and said second outlet valve simultaneously, and a second control pathway connected to said second inlet valve (5)



and said first outlet valve (8) for permitting passage of mixture through said second inlet valve and first outlet valve simultaneously, said control means including switching means connected to said first and second control pathways for switching between said first and second control pathways;

said switching means comprising a timing unit (20) for continuously establishing an optimum time (Ti) of operation of each of said first and second control pathways, a multiplier (21) connected to said timing unit for dividing a time constant (K) by said optimum time to produce an optimum switching signal (K/Ti), a comparator (22) connected to said multiplier and to said pressure sensor (18) for comparing the pressure (p) of said mixture supply to said optimum switching signal, and a flip-flop (23) connected to said first and second control pathways and to said comparator for switching between said first and second control pathways when said optimum switching signal is equal to the pressure of said mixing supply which then corresponds to an optimum pressure (Pi);

the mixture passing over said choke (17) in said flush line (16) from said second outlet of said first tank to said second outlet of said second tank to flush said second tank (7) while said flip-flop is switched to said first control pathway, and mixture passing over said choke (17) in said flush line (16) from said second outlet of said second tank to said second outlet of said first tank to flush said first tank (6) while said flip-flop is switched to said second control pathway.

4,732,588

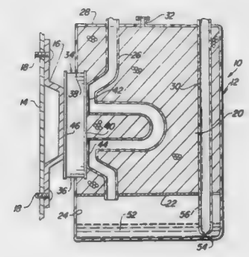
CANISTER USING THERMOELECTRIC COOLER

Charles H. Covert, Manchester; William E. Gifford, Hemlock, and Edwin C. Storey, Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1987, Ser. No. 49,405

Int. Cl.⁴ B01D *29/38, 53/04*

U.S. Cl. 55—196 **3 Claims**



1. In a fuel vapor storage canister of the type including: vapor inlet means for introducing vapor into said canister; adsorbing means in fluid communication with said inlet means for adsorbing vapor within said canister, said adsorbing means being temperature dependent by adsorbing vapor more efficiently when cooled and releasing vapor more efficiently when heated; vapor purge means in fluid communication with said adsorbing means for purging fuel vapor from said adsorbing means, the improvement comprising heat exchange means for selectively cooling said inlet means to promote condensation of vapors therein and for selectively and alternatively heating said adsorbing means for promoting purging of vapors from said adsorbing means.

4,732,589

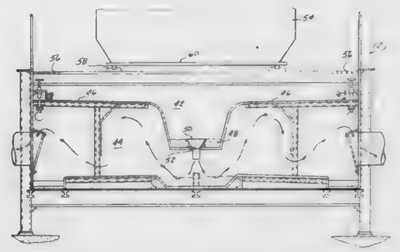
FLOW REGULATING VALVE FOR USE IN AN AIR SCRUBBING DEVICE

Harold W. Parslow, Jr., Mt. Clemens, Mich., assignor to Gra-Par Corporation, Warren, Mich.

Filed May 8, 1986, Ser. No. 861,149

Int. Cl.⁴ B01D *47/00*

U.S. Cl. 55—227 **4 Claims**



1. In a wet air scrubbing device for removing particulate contaminants from a gaseous medium by entraining the contaminants in a liquid stream, the wet air scrubbing device having a plurality of liquid entry ports, at least one gaseous entry opening, means for intimately contacting the introduced liquid with the gas and means for removing the gas and contaminant-laden liquid after said contact, the improvement comprising:

at least one adjustable control valve located at each liquid entry port, the control valve having a cylindrical discharge receptor firmly anchored in the air scrubbing device;

a liquid supply device connected to the cylindrical discharge receptor at a first end, the cylindrical discharge receptor conveying the liquid to the wet scrubbing device;

a conical valve body adapted to be matingly received within and releasably contact the cylindrical discharge receptor at a second end opposed to the liquid supply device, wherein the conical valve body comprises:

(a) a conically tapered projection constructed of polyurethane having an angular apex between about 20° and about 45° and a maximum diameter at least equal to that of the cylindrical discharge receptor, the angular apex adapted to extend into the cylindrical discharge receptor; and

(b) a disk-like ledge attached to the largest portion of the conically tapered projection, the disk-like ledge extending axially from the conically tapered projection; the disk-like ledge being formed of polyurethane;

(c) an attachment projection contiguous to the disk-like ledge, the attachment projection located on a face of the disk-like ledge opposite the conically tapered projection; and

means for movably inserting and retracting the conical valve body relative to the cylindrical discharge receptor, the inserting and retracting means being attached to the attachment projection.

4,732,590

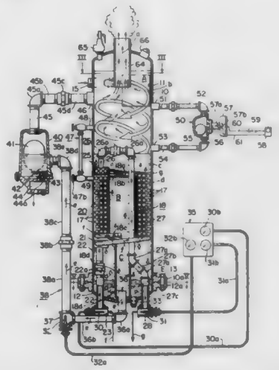
FLASH ECONOMIZER

John A. McNeil, 251 Butler St., Brookville, Pa. 15825

Filed Jan. 28, 1987, Ser. No. 7,609

Int. Cl.⁴ B01D *51/00*

U.S. Cl. 55—269 **9 Claims**



1. In a flash economizer for initially separating-out the dry steam content of a blowdown effluent and for then maximizing a transfer of the heat of its heat-containing condensate to a make-up effluent such as feed water wherein: an upright elongated enclosed processing container has an upper flashing chamber provided with a side inlet for introducing blowdown effluent therein and an upper outlet for removing flashed dry steam therefrom, has an intermediate heated condensate receiving and make up liquid circulating and heating chamber, has a lower cooled condensate receiving and discharging chamber provided with an outlet for discharging cooled condensate, and has a centrally positioned and vertically extending cylindrical inner wall member extending along its said intermediate chamber; said inner wall member having a cross-extend-

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ing closing-off top end wall provided with at least one relatively small open portion therein for restricted entry of heated condensate into said inner wall member, said inner wall member being open at its lower end into said lower chamber, said inner wall member defining thereabout an outer circular condensate-downflow area in a radially inwardly spaced relation with respect to and along a side wall of said container, a heat-exchange tubing array positioned to extend vertically along and to substantially fill said downflow area; said array having a group of continuous individual vertically extending heat-exchange coils, each said coil having upwardly spiraled convolutions in a substantially cross-aligned and in a spaced relation with convolutions of the other coils of the group, a lower header in an upper end of said bottom chamber to which lower ends of said coils are connected to receive make-up effluent to be heated, an upper header in a lower end of said upper flashing chamber to which upper ends of said coils are connected to deliver heated make-up effluent thereto, means set to assure maintenance of a level of heated condensate in the lower end of said flashing chamber above said closing-off top end wall and said upper header and in cooperation with said open portion to provide a full and maximum downflow of heated condensate along and about said coils of the tubing array as well as a downflow along and within said inner wall member into said lower chamber, first means connected to said lower header to supply make-up effluent to be heated thereto, and second means connected to said upper header for removing heated make-up effluent therefrom.

4,732,591

AIR-CLEANING APPARATUS

Yoshimoto Tujisawa, and Hideo Fukai, both of Kyoto, Japan, assignors to Daido-Maruta Finishing Co., Ltd., Kyoto, Japan

Filed Feb. 6, 1987, Ser. No. 11,813
Claims priority, application Japan, Jul. 15, 1986, 61-108883
Int. Cl.⁴ B01D *46/10*
U.S. Cl. 55—279 **11 Claims**



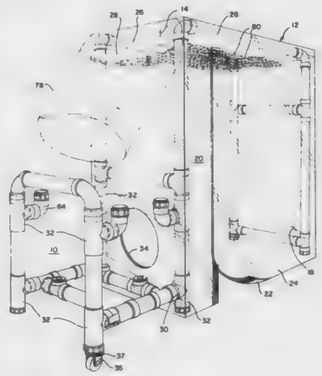
1. An air-cleaning apparatus presenting an appearance of a flowerpot, comprising: a hollow container provided with a ventilating hole in its lower portion and an opening in its upper portion; a fan provided inside said container at a position above said ventilating hole, for drawing air from the atmosphere and driving said air upward; a driving means for driving said fan; air-cleaning filter means disposed above said ventilating hole at a position above and/or under said fan; an air-permeable supporting plate disposed above said fan and said filter means; and a natural and/or imitation garden plant including a flowering plant, disposed on said supporting plate, said garden plant being covered at its root with an air-permeable filler.

4,732,592

PORTABLE CLEAN AIR FACILITY

Charles W. Spengler, 3310 Deforest Dr., Cincinnati, Ohio 45209

Filed Oct. 31, 1986, Ser. No. 925,436
Int. Cl.⁴ B01D *46/10*
U.S. Cl. 55—356 **7 Claims**



1. A portable quick assembly, disassembly clean air facility which includes:

a frame;

said frame including a power unit support section, a filter support section and an enclosure support section each of said support sections formed of spaced supporting means formed of P.V.C. pipe and P.V.C. fittings;

said power unit support section including a first support for supporting an air blower motor unit, and said filter support section including a second support for supporting a high efficiency particulate air filter (HEPA);

said enclosure support section including front and rear end vertically directed spaced uprights and horizontally directed spaced upper cross pieces that separate said front end from said rear end and which supports an enclosure;

said enclosure including an upper panel, a front end panel, a rear end panel and opposite side panels each of which are formed of a plastic sheet material and secured to each other by use of VELCRO or a pressure sensitive tape in an air tight manner and draped over said vertically directed uprights and over said horizontally directed cross pieces of said enclosure support section one of said side panels including an entrance sealed pressure sensitive tape.

4,732,593

SINTERED CERAMIC FILTER STRUCTURE HAVING BODY COMPRESSIVELY STRESSED BY SINTERED CERAMIC MATERIAL HAVING DIFFERENT SINTERING SHRINKAGE RATIO

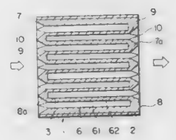
Hiroshi Kondo, Takahama; Yukihisa Takeuchi, Aichi; Hitoshi Yoshida, Okazaki, and Seiki Nakagawa, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 23, 1986, Ser. No. 878,297
Claims priority, application Japan, Jun. 24, 1985, 60-137152
Int. Cl.⁴ B01D *39/06*
U.S. Cl. 55—523 **10 Claims**

1. A sintered ceramic filter structure for cleaning exhaust gases emitted by an internal combustion engine, comprising:

an exhaust-gas cleaning portion formed by sintering a first ceramic material having a sintering-shrinkage ratio of a predetermined range, said exhaust-gas cleaning portion having a multiplicity of pores through which said exhaust gas passes, an exhaust-gas inlet portion, and an exhaust-gas outlet portion; and

an external wall portion integrally disposed around the outer periphery of said exhaust-gas cleaning portion with the exception of both said exhaust-gas inlet portion and said exhaust-gas outlet portion of said exhaust-gas cleaning portion, said external wall portion being formed by sintering a second ceramic material having a sintering-shrinkage ratio of another predetermined range smaller than the sintering-shrinkage ratio range of the first ceramic material so that a residual compressive stress is imparted to the external wall portion due to the difference of the sintering-shrinkage ratio between said external wall portion and said exhaust-gas cleaning portion.

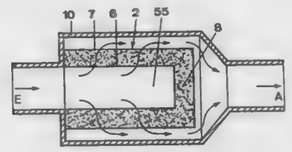


4,732,594

PROCESS FOR SCRUBBING EXHAUST GASES FROM DIESEL ENGINES AND FILTER CARTRIDGE FOR CARRYING OUT THE PROCESS

Tiberiu Mizrah, Schaffhausen, Fed. Rep. of Germany; Konrad Kampfer, Thayngen, and Wolfhart Rieger, Buch, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 6, 1986, Ser. No. 893,594
Claims priority, application Switzerland, Aug. 16, 1985, 3535/85
Int. Cl.⁴ B01D *39/06*
U.S. Cl. 55—523 **7 Claims**



1. A filter cartridge comprising a cylinder, a cylindrically shaped opening within said cylinder, the axis of which opening coincides with the axis of said cylinder, and said cylinder being formed of an open pore ceramic foam material having a composition consisting essentially of lithium aluminum silicate, the ceramic foam material being formed from a material consisting essentially of 68–95 wt % petalite, 1–5 wt % bentonite, 1–5 wt % kaolin and up to 30 wt % alumina.

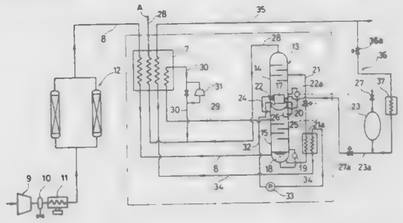
4,732,595

OXYGEN GAS PRODUCTION APPARATUS

Akira Yoshino, Osaka, Japan, assignor to Daidousanso Co., Ltd., Osaka, Japan

PCT No. PCT/JP86/00410, § 371 Date Apr. 10, 1987, § 102(e) Date Apr. 10, 1987, PCT Pub. No. WO87/01185, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 8, 1986, Ser. No. 49,864
Claims priority, application Japan, Aug. 23, 1985, 60-186313
Int. Cl.⁴ F25J *3/00*
U.S. Cl. 62—11 **1 Claim**

1. An oxygen gas production apparatus comprising an air compression means for compressing air from an outside source, a purification means for removing carbon dioxide gas and water vapor from the air compressed by said air compression means, a heat exchange means for chilling the compressed air from said purification means to a cryogenic temperature, a fractionation column for liquefying and fractionating the compressed air chilled to a cryogenic temperature by said heat exchange means and holding nitrogen in gaseous state and oxygen in liquid state, a liquid oxygen storage means for receiving liquid oxygen from an outside source and storing the same, a line for introducing into said fractionation column the liquid oxygen from said liquid oxygen storage means as the refrigerant for liquefaction of compressed air, a liquid level detection-control means for monitoring the liquid level of oxygen held in said fractionation column and controlling the amount of feed of liquid oxygen from said liquid oxygen storage means in response to changes in said liquid level, a second line for guiding gaseous nitrogen in said fractionation column to said heat exchange means as a refrigerant, an expansion means for cooling the gaseous nitrogen in said second line by the principle of adiabatic expansion, and an oxygen gas withdrawal line for guiding the liquid oxygen in said fractionation column to said heat exchange means as a refrigerant and withdrawing the gaseous oxygen produced by heat exchange as a product oxygen gas.

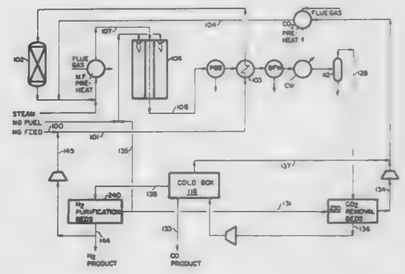


4,732,596

GAS SEPARATION PROCESS

David M. Nicholas, New Tripoli; Jeffrey A. Hopkins, Whitehall; Thomas M. Roden, Mucungie, and Joseph P. Bushinsky, Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 28, 1987, Ser. No. 43,564
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—18 **22 Claims**



1. The method for production of high purity hydrogen and high purity carbon monoxide from a mixed gas stream comprising these components together with carbon dioxide and a zero to a minor amount of one or more other gaseous contaminants which method comprises the steps of:

(a) passing said mixed gas stream into and through a first bed of solid adsorbent capable of selectively adsorbing carbon

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dioxide and water while discharging from said bed a dry CO_2-freed effluent;

(b) introducing said dry CO_2-freed effluent into a cryogenic environment for cooling the same therein under conditions effective for condensation of at least the major part of the carbon monoxide present in said dry CO_2-freed effluent;

(c) withdrawing from said cryogenic environment carbon monoxide of high purity;

(d) separately withdrawing from said cryogenic environment an uncondensed first gas stream product comprised of crude hydrogen and subjecting said first gas stream product to selective adsorption of non-hydrogen components therefrom in a second bed of solid absorbent, while recovering from said second bed the non-sorbed fraction as a product stream of essentially pure hydrogen;

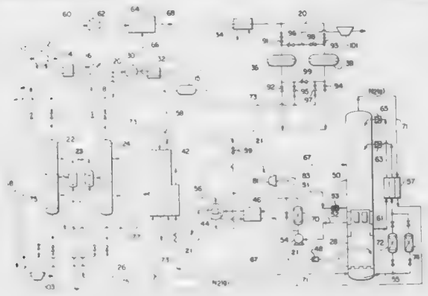
(e) purging said second solid adsorbent bed to desorb non-hydrogen components sorbed therein in step (d), and withdrawing from said bed a gas stream comprising the desorbed non-hydrogen components.

4,732,597

LOW ENERGY CONSUMPTION METHOD FOR SEPARATING GASEOUS MIXTURES AND IN PARTICULAR FOR MEDIUM PURITY OXYGEN PRODUCTION

Albert J. Jujasz, North Olmsted; James A. Burkhart, Olmsted Falls, both of Ohio, and Ralph Greenberg, New York, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 22, 1986, Ser. No. 854,600
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—24 **9 Claims**



1. A method for the separation of gaseous mixtures, the major components of which are oxygen and nitrogen, for producing medium purity oxygen, comprising:

compressing the gaseous mixture in a first compressor to super atmospheric pressure, and dividing the pressurized gaseous mixture into first and second mixture streams;

cooling said first mixture stream to its boiling point and introducing said first mixture stream into the high pressure chamber of a double rectification column;

compressing and cooling said second mixture stream, condensing the cooled second mixture stream, and delivering the condensed second mixture stream to the high pressure chamber of the double rectification column;

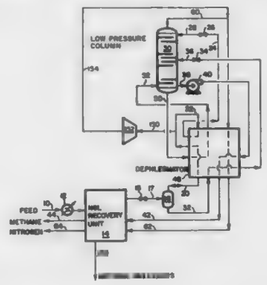
separating the gaseous mixtures in the double rectification column into a liquid oxygen product stream and a gaseous nitrogen stream, removing said liquid oxygen product stream from the low pressure chamber of the double rectification column, pumping said liquid oxygen product stream to a predetermined pressure, evaporating said oxygen product stream in an evaporator-condenser, heating said oxygen product stream, and blending said oxygen product stream with a compressed blend-air stream to the desired oxygen concentration.

4,732,598

DEPHLEGMATOR PROCESS FOR NITROGEN REJECTION FROM NATURAL GAS

Howard C. Rowles, Center Valley, and Ruth A. Davis, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 10, 1986, Ser. No. 929,045
Int. Cl.⁴ F25J *3/04*
U.S. Cl. 62—28 **17 Claims**



1. A process for the rejection of nitrogen from a pressurized natural gas feed stream containing nitrogen by cryogenic distillation comprising the steps of:

(a) cooling the pressurized natural gas feed stream containing nitrogen whereby said stream partially condenses;

(b) separating said feed stream into a liquid phase and a gaseous phase in a separator;

(c) cooling said gaseous phase in a dephlegmator whereby said gaseous phase is partially condensed and rectified and whereby gravity separates said partially condensed gaseous phase into a methane enriched condensed portion and a nitrogen enriched non-condensed portion;

(d) returning said methane enriched condensed portion to said separator in step (b) whereby said methane enriched condensed portion becomes part of said liquid phase;

(e) cooling, condensing and expanding said nitrogen enriched non-condensed portion and feeding said cooled, condensed, expanded, nitrogen enriched portion to a low pressure distillation column as reflux;

(f) subcooling the liquid phase of step (d) in said dephlegmator, expanding said subcooled liquid phase, and feeding said expanded subcooled liquid phase to an intermediate location of said low pressure distillation column;

(g) removing a first portion of a bottoms liquid from the bottom of said low pressure distillation column, at least partially vaporizing said first portion in said dephlegmator thereby providing refrigeration duty to said dephlegmator, and returning said partially vaporized first portion to the bottom of the low pressure distillation column thereby providing reboiler duty to said low pressure distillation column;

(h) removing a second portion of the bottoms liquid from the bottom of said low pressure distillation column, pumping said second portion to an elevated pressure, warming said second portion thereby recovering refrigeration value from said second portion, and removing said pumped, warmed, second portion from the process as a methane product; and

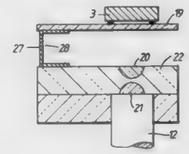
(i) removing an overhead vapor from the top of said low pressure distillation column, warming said overhead vapor thereby recovering refrigeration value from said overhead, and removing said warmed overhead vapor from the process as a nitrogen product.

4,732,599

METHOD FOR MANUFACTURE OF OPTICAL DEVICES

Ian Bennion, Ravensthorpe, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 26, 1985, Ser. No. 769,213
Int. Cl.⁴ C03C *15/00*; C03B *23/20, 11/08, 33/00*
U.S. Cl. 65—30.13 **7 Claims**



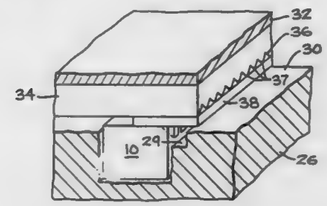
1. A method of fabricating optical sensing devices for detecting displacement of a part thereof comprising the steps of producing an assembly of optical sensing devices by bonding a multiplicity of optical devices to one surface of a relatively large transparent substrate so that the optical devices are accurately located relative to one another and to the substrate itself and securing the opposite surface of said substrate to one surface of another transparent optical element in parallel relationship by a resilient lattice spacer support means and then dividing the entire assembly into a multiplicity of individual unit parts each of which comprises an optical device bonded to one substrate unit and coupled to another substrate unit embodying an optical element, the coupling being provided by a divided part of the resilient lattice spacer support means which resiliently supports the two substrate units relative to one another in a cantilever fashion whereby relative movement between the two resiliently supported substrate units produces variations in the spacing between the optical device and the optical element and resulting in changes in the optical characteristics of the device which are sensed.

4,732,600

APPARATUS FOR FILLING NOTCHES PROVIDED IN A WORKPIECE WITH A SOFT FILLER MATERIAL

Edward Schiller, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 464,844, Feb. 8, 1983, Pat. No. 4,611,259.
This application May 15, 1986, Ser. No. 863,282
Int. Cl.⁴ C03C *27/02*
U.S. Cl. 65—154 **15 Claims**



1. An apparatus for filling notches provided in a notched workpiece with a soft filler material having a viscosity similar to glasses, comprising:

a bottom portion having a groove for receiving and holding a workpiece having a notched top surface; and

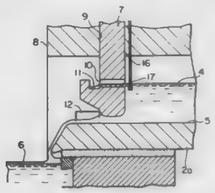
a top portion having a lower surface cooperating with said bottom portion and having at least one discrete location for applying a concentrated pressure to said soft filler material, said lower surface being positioned outside said notches in said workpiece when said workpiece is inserted in said groove, to enhance flow of said soft filler material into said notches when said top portion is assembled with said bottom portion with said soft filler material disposed therebetween.

4,732,601

APPARATUSES FOR PRODUCING PLATE GLASSES

Tadakazu Hidai, and Toshikazu Kondo, both of Ichihara, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Feb. 26, 1987, Ser. No. 19,053
Claims priority, application Japan, Feb. 28, 1986, 61-44795
Int. Cl.⁴ G03B *5/20*
U.S. Cl. 65—184 **3 Claims**



1. An apparatus for producing a plate glass which comprises

(A) a melter for storing a molten glass material,

(B) a molding portion for molding the molten glass material from the melter into a plate,

(C) a temperature adjusting tank located between the melter and the molding portion for maintaining the molten glass material from the melter at a uniform temperature, said temperature adjusting tank having a glass material channel for introducing the molten glass material maintained at the uniform temperature into the molding portion in a position facing on the molding portion, and

(D) a tweel for adjusting a flow rate of the glass material which is raisable and lowerable in the glass material channel and has a hole through which a surface layer stream of the molten glass material can be separated and passed in the glass material channel.

4,732,602

BRONZE ALLOY FOR GLASS CONTAINER MOLDS

John F. Dakan, Elkins, W. Va., and Donald G. Schmidt, Hinsdale, Ill., assignors to Kelly Machine & Foundry, Elkins, W. Va.

Filed Jun. 26, 1986, Ser. No. 878,616
Int. Cl.⁴ C22C *9/06*
U.S. Cl. 65—374.12 **20 Claims**

1. A glassmaking mold part adopted for use in glassware forming machines which comprises a substantially copper alloy consisting essentially of:

12–16 wt/o Ni; 8.5–11.5 wt/o Al, where wt/o denotes weight percent; with the balance being copper except for impurities typically found in copper base alloys including Sn, Pb, Zn, Sb, Si, S, P, Fe, Mn, and Nb; with the proviso that the Pb and Zn contents are less than 0.01.

11. A substantially copper alloy well suited for welding consisting essentially of:

12–16 wt/o Ni; 8.5–11.5 wt/o Al, where wt/o denotes weight percent; with the balance being copper except for impurities typically found in copper base alloys including Sn, Pb, Zn, Sb, Si, S, P, Fe, and Mn; with the proviso that the Pb and Zn contents are less than 0.01.

VOL 1088 ISS 4 MR 22 1988 UMI

4,732,603

1-ARYL-1,4-DIHYDRO-4-OXO-5-CARBOXYPYRIDAZINE DERIVATIVES AND THEIR USE AS PLANT GROWTH REGULATORS AND HYBRIDIZING AGENTS

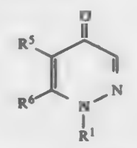
Dennis R. Patterson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 193,677, Oct. 3, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 551,438

Int. Cl.[4] **A01N** *43/58;* **C07D** *237/24, 309/38;* **C07B** *49/00*

U.S. Cl. 71—92 **8 Claims**

1. A compound of the formula



wherein R^1 is 4-Cl-C_6H_4; R^5 is CO_2Na or CO_2K; and R^6 is CH_3 or C_2H_5.

4,732,604

HERBICIDAL SULFONAMIDES

James V. Hay, Newark; Barry A. Wexler, Wilmington, both of Del., and Donna F. Zimmerman, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 769,691, Aug. 29, 1985, Pat. No. 4,666,501, which is a continuation-in-part of Ser. No. 680,549, Dec. 11, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,271

Int. Cl.[4] **C07D** *239/69, 401/12, 409/12;* **A01N** *43/54*

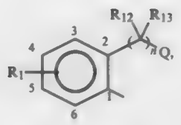
U.S. Cl. 71—92 **27 Claims**

1. A compound of the formula

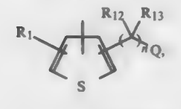


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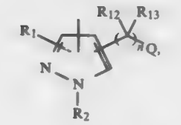
wherein
W is O or S;
R is H or CH_3;
L is



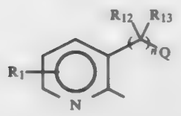
L-1



L-2

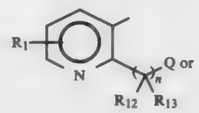


L-3

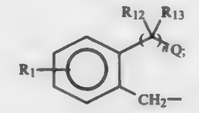


L-4

-continued

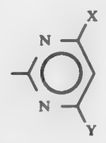


L-5



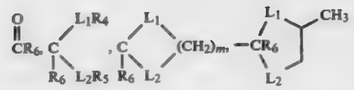
L-6

n is 0 or 1;
R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, CN, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CO_2R^{III}, CH_2CN, CH_2OCH_3 or CH_2SCH_3;
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R^I and R^{II} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
R_2 is C_1–C_3 alkyl;
Q is a 3- or 4-membered heterocyclic ring which contains one heteroatom selected from O, S and NR_3, or a 3- or 4-membered carbocyclic ring in which one carbon atom may optionally be in the form of a carbonyl group, or a fully-saturated 5- or 6-membered carbocyclic ring, and Q may be optionally substituted with 1–4 substituents selected from halogen, CN, OH, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_2–C_4 alkoxycarbonyl, C_1–C_4 alkylsulfonyl, (C_1–C_4 alkyl)-aminosulfamoyl and di(C_1–C_4 alkyl)aminosulfamoyl;
R_3 is C_1–C_4 alkyl;
R_{12} is H or OR_{14};
R_{13} is H or C_1–C_4 alkyl;
R_{14} is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 haloalkenyl, C_3–C_4 alkynyl, C_3–C_4 haloalkynyl, C_2–C_4 alkylcarbonyl, $C(O)NR_{15}R_{16}$, C_1–C_4 alkylsulfonyl, C_2–C_4 alkoxyalkyl or C_2–C_4 alkylthioalkyl;
R_{15} and R_{16} are independently H or C_1–C_2 alkyl;
A is



A-1

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl,



or $N(OCH_3)CH_3$;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_4 and R_5 are independently C_1–C_2 alkyl;
R_6 is H or CH_3;
and their agriculturally suitable salts; provided that
(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;
(b) when L is L-2 or L-3, then the Q substituent and the sulfonylurea bridge are on adjacent carbon atoms;
(c) when W is S, then R is H, and Y is CH_3, OCH_3, OC_2H, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2{\equiv}CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$;
(d) the total number of carbon atoms of R_{12} and R_{13} must be less than or equal to four; and
(e) when the total number of carbon atoms of X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two and the number of carbons of Q must be less than or equal to six.

19. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,732,605

PLANT GROWTH REGULATOR COMPOSITION

Shiro Hojo, Tokyo; Eiichi Kimura, Takamatsu, and Tetsuji Iwasaki, Wakayama, all of Japan, assignors to Kao Corporation and Japan Hydrazine Company, Inc., both of Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,829

Claims priority, application Japan, Dec. 25, 1985, 60-296130

Int. Cl.[4] **A01N** *43/58, 41/10*

U.S. Cl. 71—92 **2 Claims**

1. A plant growth regulator composition, comprising:
a growth regulating effective amount of the choline salt of 1,2-dihydropyridazine-3,6-dione and an ammonium $C_{8\text{-}22}$ alkyl sulfate as adjuvant at a molar ratio of 1/0.02 to 1/0.5.

4,732,606

PROCESS OF TREATING ALUMINUM-CONTAINING FUSED SLAG

Klaus Köbele, Dietzenbach; Gerhard Götz, Voerde; Manfred Beckmann, Neu-Isenburg; Ernst Rode, Frankfurt am Main, and Friedrich Berger, Neuberg, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Uraphos Chemie GmbH, Berlin, both of, Fed. Rep. of Germany

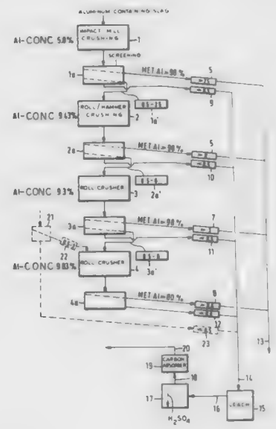
Continuation of Ser. No. 797,181, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 684.977, Dec. 21, 1984, abandoned, which is a continuation of Ser. No. 421,241, Sep. 22, 1982, abandoned. This application Nov. 17, 1986, Ser. No. 933,278

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3137950

Int. Cl.[4] **B02C** *23/14*

U.S. Cl. 75—24 **2 Claims**

1. A method of treating an aluminum-processing fused slag containing water-soluble salts, corundum, spinel and quartz in a major proportion and metallic aluminum in a minor proportion, said method comprising the steps of:
(a) crushing said aluminum-processing fused slag containing water-soluble salts, corundum, spinel and quartz in a major proportion and metallic aluminum in a minor proportion, by an impact crusher and sieving the resulting crushed slag in a first two-stage sieving apparatus, from said first sieving apparatus recovering a first metallic aluminum fraction having particle sizes above 25 mm and a content of metallic aluminum about 98 percent, a first intermediate fraction with particle sizes between 0.5 and 25 mm, and a first fine slag fraction having particle sizes below 0.5 mm;
(b) crushing said first intermediate fraction by a multi-rotor hammer mill and sieving the crushed fraction from said mill in a second two-stage sieving apparatus, from said second sieving apparatus recovering a second metallic aluminum fraction having particle sizes above 8 mm and a content of metallic aluminum above 98 percent, a second intermediate fraction with a particle sizes between 0.5 and 8 mm, and a second fine slag fraction having particle sizes below 0.5 mm;
(c) crushing said second intermediate fraction by a first roll crusher and sieving the crushed fraction from said first roll crusher in a third two-stage sieving apparatus, from said third sieving apparatus recovering a third metallic aluminum fraction with particle sizes above 3 mm and a content of metallic aluminum above 98 percent, a third



intermediate fraction with particle sizes between 0.5 and 3 mm, and a third fine slag fraction having particle sizes below 0.5 mm;
(d) crushing said third intermediate fraction by a second roll crusher and sieving the crushed fraction from said second roll crusher, from said sieving recovering a fourth metallic aluminum fraction with an aluminum content of above 80% and particle sizes above 0.6 mm and a fourth fine slag fraction with particle sizes below 0.6 mm,
(e) feeding water and said first, second, third and fourth fine slag fraction into a leaching vessel and in said vessel continuously dissolving the water-soluble constituents of said slag fractions to form an aqueous suspension, said suspension being in contact with said slag fractions for a residence time of two to four hours;
(f) from said leaching vessel separately withdrawing evolved gases and said suspension, filtering said withdrawn suspension and evaporating water from the filtered solution; and
(g) scrubbing said evolved gases with aqueous sulfuric acid and then passing the gases over an active carbon absorber.

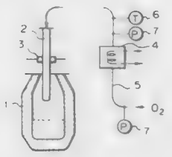
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,607

METHOD OF CONTROLLING THE STIRRING STRENGTH AND FLOW RATE OF A JET OF GAS BLOWN THROUGH A LANCE ONTO A MOLTEN METAL SURFACE

Takashi Sugimori, Mioo, and Sakae Furujo, Nara, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Nov. 21, 1986, Ser. No. 933,188
Claims priority, application Japan, Nov. 26, 1985, 60-265782
Int. Cl.[4] C21C 7/00
U.S. Cl. 75—59.13 7 Claims



1. A method of controlling independently of each other the stirring strength of a jet of oxygen gas and the flow rate of the oxygen gas to be blown onto a molten metal bath in a top-blowing oxygen furnace provided with an oxygen supplying conduit, a means of detecting the temperature of the supplied oxygen gas in said oxygen supplying conduit, a means of detecting the pressure thereof, and a means of heat-exchanging with the supplied oxygen gas, controlling the stirring strength of the jet of oxygen gas and the flow rate of the oxygen gas independently of each other; maintaining a lance of the top-blowing furnace at a predetermined position by controlling the temperature and the pressure of the supplied oxygen; achieving control of the stirring strength by varying the oxygen pressure while changing the oxygen temperature so as to maintain the oxygen flow rate at a given level; and, achieving control of the oxygen flow rate in the absence of variation of the stirring strength by varying the oxygen gas temperature and maintaining pressure of the oxygen unchanged.

4,732,608

METHOD FOR BIOLOGICAL PROCESSING OF METAL-CONTAINING ORES

Robert C. Emmett, Jr., Salt Lake City, and Lawrence T. O'Connor, Midvale, both of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 7, 1986, Ser. No. 827,324
Int. Cl.[4] C22B 11/04
U.S. Cl. 75—101 R 15 Claims

1. A continuous process for treating gold, silver or platinum bearing sulfide containing solids, said continuous process comprising:

providing a slurry retaining vessel;

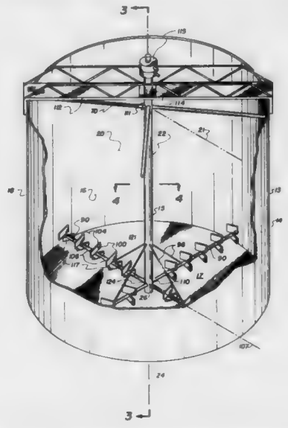
placing within said slurry retaining vessel a slurry comprised of a quantity of gold, silver or platinum bearing sulfide containing solids, water, a quantity of thiobacillus bacteria able to oxidize said sulfides and nutrients for said bacteria;

providing oxygen-and carbon dioxide containing gas to said bacteria within said slurry; said bacteria operating to oxidize said sulfide containing solids, within said slurry;

withdrawing a quantity of said slurry from said slurry retaining vessel;

separating non-oxidized sulfide containing solids from a remainder of said quantity of said slurry;

recycling the non-oxidized sulfide containing solids to the slurry retaining vessel;



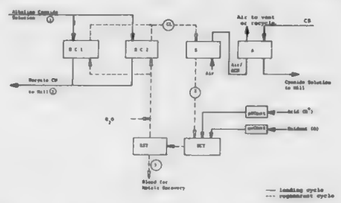
channeling said remainder of said slurry quantity to a second vessel for further treatment said remainder of said slurry containing oxidized solids.

4,732,609

RECOVERY OF CYANIDE FROM WASTE WATERS BY AN ION EXCHANGE PROCESS

Carla C. Frey, Mississauga; W. Roland Hatch, Brampton, and Margaret K. Witte, Mississauga, all of, assignors to Witteck Development Inc., Mississauga, Canada

Filed Sep. 18, 1986, Ser. No. 909,131
Claims priority, application Canada, Sep. 23, 1985, 491323
Int. Cl.[4] B01D 15/00
U.S. Cl. 75—117 9 Claims



1. A process for recovering cyanide reagents from mill effluent solutions containing alkali metal and alkaline earth metal cyanides, and water soluble complex metal cyanides, comprising the steps of:

(a) passing a mill effluent solution containing free cyanide and complexed metal cyanide ions through an anion exchange resin column to obtain a resin loaded with adsorbed complexed metal cyanide ions and a free cyanide ion containing column effluent solution substantially depleted of complexed metal cyanide ions;

(b) recycling said free cyanide ion containing column effluent solution to the mill for reuse;

(c) treating said loaded resin with an acidic solution bearing an oxidant selected from the group: hydrogen peroxide, ozone, water soluble metal peroxide compounds, water soluble hypochlorites, and water soluble chlorates, to obtain a regenerated resin and an acidic cyanide and metal ion containing regenerant solution;

(d) recovering hydrogen cyanide and metal from said regenerant solution obtained in step(c); and

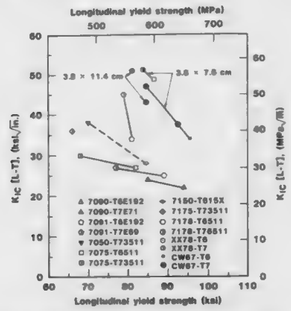
(e) returning the recovered hydrogen cyanide to the mill for reuse.

4,732,610

AL-ZN-MG-CU POWDER METALLURGY ALLOY

Gregory J. Hildeman, Murrysville; Linda C. Labarre, Penn Hills; David J. Brownhill, Plum Borough, and Arshad Hafeez, Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 24, 1986, Ser. No. 833,222
Int. Cl.[4] B22F 1/00
U.S. Cl. 75—249 22 Claims



1. Loose metal particles of an aluminum alloy consisting essentially of about 5 to 13% zinc, 1 to 3.5% magnesium, 0.5 to 3.0% copper, with iron being present up to 0.5%, with silicon being present up to 0.4%, plus nickel or cobalt or both being present in an amount effective essentially to place the iron in the incoherent dispersoid $Al_9(Fe,M)_2$, M being nickel or cobalt or both, M being present up to 0.75%, pluls means being present for forming coherent dispersoids, said means being present up to 1%, balance aluminum, said means being at least one of the elements Zr, V, Hf, Ta, and Ti.

4,732,611

WOOD POLISH

Ralph Raney, Franklin, Mich., assignor to Formula "R" Corporation, Southfield, Mich.

Filed Apr. 9, 1984, Ser. No. 598,485
Int. Cl.[4] C09G 1/06
U.S. Cl. 106—9 4 Claims

1. Combination wood cleaning and polishing composition consisting of boiled linseed oil, pure gum turpentine, and vinegar wherein each of said three ingredients consists of at least one-fifth by volume of the total composition.

4,732,612

POLISH EMULSION COMPOSITIONS

Frank J. Steer, and John A. Ferguson, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

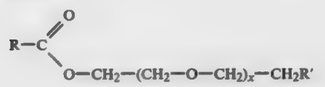
Filed Sep. 2, 1983, Ser. No. 528,832
Int. Cl.[4] C09G 1/08
U.S. Cl. 106—10 30 Claims

1. A furniture polish composition characterized by an internal aqueous phase and an external oil phase, the composition comprising on a weight basis:

(a) from about 10 to about 50% of a hydrocarbon solvent having an initial boiling point above about 85° C. and an end boiling point of below 200° C.;

(b) from about 0 to about 15% of a polysiloxane or blend of polysiloxanes having an average viscosity of from about 20 to about 30,000 cs at 25° C.;

(c) from about 0.5 to about 5% of a montan wax ester having the formula:



wherein R is the alkyl group of montanic acid, R—COOH; R' is hydrogen or OH, and x has an average value of from 2.5 to about 6.0;

(d) less than 0.5% of an emulsifier having an HLB of from 2 to 6, the weight ratio of the ester component (c) to said emulsifier (d) being greater than 1:1; and

(e) from about 30% to about 90% water, said furniture polish composition being a two-phase, single-emulsion composition.

4,732,613

RECORDING LIQUID

Makoto Shioya, Tokyo; Tsuyoshi Eida, and Masatsune Kobayashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,417
Claims priority, application Japan, Nov. 8, 1984, 59-234205; Nov. 8, 1984, 59-234206
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] C09D 11/00; G01D 9/00, 15/18
U.S. Cl. 106—20 24 Claims

1. A liquid composition, comprising: from about 0.1–20% by weight of water-soluble dye and from about 80–99.9% by weight of a solvent, wherein said liquid composition has a total concentration of divalent and higher valent metals selected from the group consisting of calcium, magnesium, manganese, iron, aluminum, silicon and compounds thereof of 20 ppm or less.

4,732,614

NOVEL CORRECTION COMPOSITIONS AND PROCESS FOR USING SAME

Lamar E. Brooks, Wellesley, Mass., and Sue R. Liu, Rogers, Ark., assignors to The Gillette Company, Boston, Mass.

Filed Jul. 15, 1985, Ser. No. 755,256
Int. Cl.[4] B41M 5/22; C09D 11/00
U.S. Cl. 106—21 22 Claims

1. A composition for correcting a marking on the surface of a pressure-sensitive chemical recording medium including a developer material comprising an acidic developer, said marking having been provided by interaction of the developer material with a color-providing material, said composition consisting essentially of a substantially uniform dispersion of from about 30 to about 70 parts by weight of an opacifying pigment, from about 3 to about 20 parts by weight of a soluble polymeric film-forming binder material, from about 0.5 to about 15 parts by weight of a Lewis acid and from about 80 to about 125 parts by weight of a solvent for the binder material, said composition providing a film which can cover the marking and can provide a visible corrected marking on contact with a pattern of said color-providing material corresponding to the corrected marking.

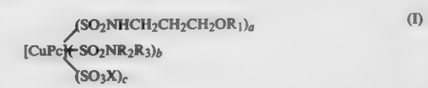
4,732,615

COPPER PHTHALOCYANINE COMPOUND AND AQUEOUS INK COMPOSITION COMPRISING THE SAME

Hideo Kawashita, Ibaraki, and Mitsuhiro Ota, Toyonaka, both of Japan, assignors to Taoka Chemical Co., Ltd. and Sumitomo Chemical Co., Ltd., both of Osaka, Japan

Filed Mar. 27, 1986, Ser. No. 844,587
Claims priority, application Japan, Mar. 29, 1985, 60-68258; Sep. 9, 1985, 60-200381
Int. Cl.[4] C09D 11/02
U.S. Cl. 106—22 7 Claims

1. An aqueous ink composition comprising a copper phthalocyanine compound of the formula:


(I)

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wherein CuPc is a copper phthalocyanine nucleus, R_1 is an alkyl group, an aralkyl group or an aryl group each having 3 to 18 carbon atoms, R_2 and R_3 are, the same or different, each a hydrogen atom or a hydroxyethyl group, X is an alkali metal, a hydrogen atom or an ammonium group, a is 1 or 2, b is 0, 1 or 2 and c is 1, 2 or 3 provided that a, b and c satisfy following equation:

$$2 \leqq a+b+c \leqq 4,$$

a wetting agent and water.

4,732,616

LITHOGRAPHIC INK ADDITIVES

Toshiro Kondo, and Eiji Kanada, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,469

Claims priority, application Japan, Dec. 11, 1984, 59-261089; Dec. 11, 1984, 59-261090

Int. Cl.⁴ C09D *11/00, 11/08*

U.S. Cl. 106—23 **14 Claims**

1. A lithographic printing ink which contains as an ink additive a compound having an alkylene oxide unit and an HLB value of 3 to 13, said compound having the formula

$$R\text{—}A)_mOH$$

wherein R represents an unsubstituted aliphatic or aromatic hydrocarbon radical, A represents an alkylene oxide group, and m is an integer of 1 or above.

6. A lithographic printing ink which contains as an ink additive a combination of (1) at least one compound having the formula $R\text{-}(\text{-}A)_mOH$ wherein R represents an aliphatic or aromatic hydrocarbon radical of 1 to 8 carbon atoms, A represents an alkylene oxide group and m is an integer of 1 or above and (2) at least one compound having the formula $R_1\text{-}(\text{-}A)_mOH$ where R_1 represents an aliphatic or aromatic hydrocarbon radical of 9 or more carbon atoms, A represents an alkylene oxide group and m is an integer of 1 or above, the molar ratio of the compound having a hydrocarbon radical of 1 to 8 carbon atoms to the compound having a hydrocarbon radical of 9 or more carbon atoms is in the range of from 1:5 to 5:1, the average HLB value of said combination being 3 to 13.

4,732,617

FLUORIDE-CONTAINING COMPOSITIONS

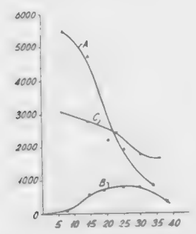
Brian E. Causton, Basingstoke, and Alfiati N. T. Thuy, Wentworth, both of England, assignors to National Research Development Corporation

Continuation of Ser. No. 738,689, May 28, 1985, abandoned, which is a continuation of Ser. No. 524,153, Aug. 18, 1983, abandoned. This application Sep. 23, 1986, Ser. No. 910,669

Claims priority, application United Kingdom, Aug. 24, 1982, 8224265

Int. Cl.⁴ C09K *3/00*

U.S. Cl. 106—35 **12 Claims**



1. An anti-caries composition for dental prophylaxis, which comprises poly(1,2-cyclohexylene phosphate) having a number average molecular weight of from 2,000 to 20,000, and an anti-caries effective amount of sodium fluoride.

4,732,618

POWDERED PIGMENTS WITH IMPROVED RHEOLOGICAL PROPERTIES, PROCESSES FOR THEIR PREPARATION AND THEIR USE WITH A CONTENT OF AT LEAST 5% OF UNSUBSTITUTED QUINACRIDONE

Ernst Spietschka, Idstein; Adolf Kroh, Selters, and Otmar Hafner, Glashütten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP85/00700, § 371 Date Aug. 11, 1986, § 102(e) Date Aug. 11, 1986, PCT Pub. No. WO86/03763, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 12, 1985, Ser. No. 902,444

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446088; Nov. 30, 1985, 3542437

Int. Cl.⁴ C09D *17/00*

U.S. Cl. 106—288 Q **8 Claims**

1. A powdered pigment which contains at least 5% of unsubstituted quinacridone and has improved rheological properties for use in a paint system on an alkyd/melamine, acrylic/melamine, acrylate/isocyanate or polyester/isocyanate basis both of a conventional nature and of a modern nature of the "high solids" type, onto which—as appropriate before, during or after finishing—1 to 20% by weight of the active substance of a paint additive prepared by reacting polyisocyanurates which still carry free isocyanate groups and are based on tolylene diisocyanate, hexamethylenediisocyanate or mixtures thereof, with (1) aliphatic mono- or poly-(hydroxycarboxylic acid)-C_1–C_{20}-alkyl esters (degree of polymerization 2–50), (2) polyethylene glycols (molecular weight 500–1,500) and (3) 5- or 6-membered, saturated or unsaturated heterocyclic compounds which contain at least 1 nitrogen atom in the ring and contain reactive amino or hydroxy-C_1–C_6-alkyl groups, until isocyanate groups are no longer detectable, has/have been applied.

4,732,619

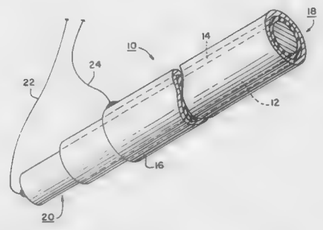
SELF RENEWING THERMOCOUPLE

Jacob Nanigian, Lake Worth, Fla., assignor to Nanmac Corporation, Lake Worth, Fla.

Filed Jan. 8, 1987, Ser. No. 1,452

Int. Cl.⁴ H01V *1/02*

U.S. Cl. 136—228 **24 Claims**



1. A renewable, elongated thermocouple probe comprising:
(a) a first elongated thermocouple element having a length dimension extending along a longitudinal axis and having a width dimension extending transverse to the longitudinal axis, the first thermocouple element formed from a first metallic thermocouple material and having a length substantially greater than its width;

(b) a second elongated thermocouple element having a length dimension extending along a longitudinal axis and having a width dimension extending transverse to the longitudinal axis, the second thermocouple element formed from a second metallic thermocouple material different from said first material and surrounding said first thermocouple element to define a thermocouple probe, said second thermocouple element having a length substantially greater than its width;
(c) electrical insulation means positioned between opposed surfaces of said first and second thermocouple elements to electrically insulate said thermocouple elements from each other;
(d) said thermocouple elements each having spaced first and second longitudinal ends, each of said first ends electrically connected to a thermocouple reference junction, and each of said second ends and said insulation means having end faces that lie in and define an end surface of the thermocouple probe; and
(e) connection means extending between each of said second ends and bridging said insulation means to define a temperature sensing tip, the tip being abrasively erodable while maintaining continuous temperature sensing capability as the length of the probe diminishes.

4,732,620

THERMOELEMENT COMPRISING A GRAPHITE/BORON CARBIDE THERMOCOUPLE

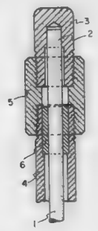
Klaus Hunold, Kempten; Alfred Lipp, Bad Worishofen; Klaus Reinmuth, Durach, and Peter Arnold, Sulzberg, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 536,883, Sep. 28, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 840,989

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1982, 3235838

Int. Cl.⁴ H01L *35/28*

U.S. Cl. 136—228 **11 Claims**



1. In a thermoelement comprising a graphite/boron carbide thermocouple, including two arms constructed as a tube and a rod, said rod arranged concentrically inside the tube, and electrically connected at one end, the improvement which comprises, one arm of said thermocouple being self bonded, pressureless sintered boron carbide having a density of from 60 to 80% of the theoretical density of pure boron carbide.

4,732,621

METHOD FOR PRODUCING A TRANSPARENT CONDUCTIVE OXIDE LAYER AND A PHOTOVOLTAIC DEVICE INCLUDING SUCH A LAYER

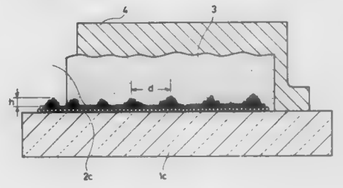
Kenji Murata, Osaka, and Yasuo Kishi, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 10, 1986, Ser. No. 872,684

Claims priority, application Japan, Jun. 17, 1985, 60-131284; Jun. 17, 1985, 60-131285

Int. Cl.⁴ H01L *31/06*

U.S. Cl. 136—256 **12 Claims**



7. A photovoltaic device comprising a transparent substrate with a substantially flat surface; a front electrode of a TCO layer formed on said flat surface of said substrate, said TCO layer having a chemically etched exposed surface having a roughness assuring a decreased, substantially constant reflectance throughout the visible light range, wherein said roughness of said exposed surface has an unevenness of about 1000–5000 Å with a periodicity of about 2000–10,000 Å; a semiconductor layer for photoelectric conversion formed on said exposed surface of said TCO layer; and a back electrode formed on said semiconductor layer.

4,732,622

PROCESSING OF HIGH TEMPERATURE ALLOYS

Andrew R. Jones, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 23, 1986, Ser. No. 910,688

Claims priority, application United Kingdom, Oct. 10, 1985, 8524977; Oct. 10, 1985, 8524976

Int. Cl.⁴ C21D *8/00*

U.S. Cl. 148—11.5 P **16 Claims**

1. A method of producing products composed of a mechanically-alloyed, dispersion-strengthened iron-base material comprising the steps of consolidating the alloy, in its mechanically alloyed particulate form, and processing the consolidated body to the desired product shape, the improvement comprising subjecting the alloy to at least two recrystallisation anneals, at least the second and any further recrystallisation anneals being preceded by a working operation which imparts stored internal energy to the body.

4,732,623

METHOD OF MAKING HIGH STRENGTH STEEL TUBE

Heinz Gross, Dortmund; Friedrich Reith, Hamm; Friedhelm Retzlaff, Kamen-Methler, and Karl H. Schlusnus, Hamm, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 106,548, Dec. 26, 1979, Pat. No. 4,414,042. This application Jan. 30, 1984, Ser. No. 499,995

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900022

Int. Cl.⁴ C21D *7/14*

U.S. Cl. 148—12.3 **6 Claims**

1. A method of converting pre-rolled precipitation-hardenable fine-grain medium-carbon low alloy steel plates or strips into steel profiles having a yield strength of $\geqq 500 N/mm^2$, a tensile strength of $\geqq 600 N/mm^2$ and high toughness, comprising the first step of cooling the rolled steel plates or strips from

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a final rolling temperature above the A_1-temperature level, down to a temperature of about 400° C. in an atmosphere which in part supresses radiation and convection heat losses and thus reduces the cooling rate; the second step of thereafter cooling the steel plates or strips to room temperature; the third step of cold-processing the cooled steel plates or strips to form an open profile therefrom; the fourth step of subjecting the profile to annealing so as to dissolve coarse precipitants thereon; and the fifth step of cooling the profile to form finely dispersed precipitants therein; winding up the steel to form a coil before said first step, and thereafter cooling the coil by overaging at high temperature corresponding to said temperature in said first step; said third step comprising further the step of converting the open profile into a tube by welding adjacent longitudinal edges of the profile together; said fourth step comprising further solution-annealing the profile above the A_{C3}-temperature; the steel having a composition of:

0.13 to 0.35%	carbon
0.10 to 0.80%	silicone
0.90 to 1.70%	manganese
max. 0.035%	phosphorous
max. 0.035%	sulfur
max. 0.70%	copper
max. 0.80%	nickel
max. 0.020%	nitrogen
max. 0.08%	aluminum
0.02 to 0.20%	niobium and/or titanium and/or vanadium,

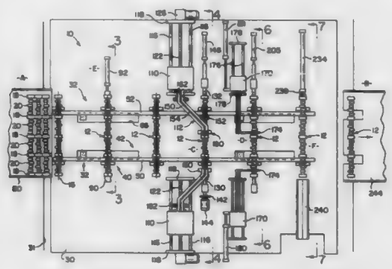
the balance being iron and impurities.

4,732,624

METHOD FOR HARDENING CAMSHAFTS

Norbert R. Balzer, Boaz, Ala., assignor to Tocco, Inc., Boaz, Ala.

Division of Ser. No. 769,399, Aug. 26, 1985, Pat. No. 4,618,125. This application Jul. 28, 1986, Ser. No. 889,751
Int. Cl.⁴ C21D *1/18*
U.S. Cl. 148—150 **5 Claims**



1. A method for hardening axially spaced cams of elongated camshafts, each camshaft having an axis of rotation and a plurality of cams axially spaced along said axis and with the cam lobes of each cam having an axially outwardly projecting tip at a preselected circumferential orientation, said method comprising the steps of:

(a) providing a first induction heating coil having a generally circular inner surface and an electrically insulating gap at a selected location on said inner surface of said first heating coil;

(b) providing a second induction heating coil having a generally circular inner surface and an electrically insulating gap at a selected location on said inner surface of said second heating coil;

(c) providing a first power supply for energizing said first heating coil;

(d) providing a second power supply for energizing said second heating coil;

(e) mounting one of said camshafts with said axis extending through said first heating coil;

(f) mounting one of said camshafts with said axis extending through said second heating coil;

(g) causing relative movement of said one camshaft axially with respect to said first coil until a first of said cams is within said first coil;

(h) causing relative movement said one camshaft axially with respect to said second coil until a second of said cams is within said second coil;

(i) circumferentially indexing said one camshaft with respect to said first coil until said tip of said first cam is adjacent said electrically insulating gap of said first coil;

(j) energizing said first coil by said first power supply to heat said first cam to a predetermined temperature in its circumferentially indexed position;

(k) applying a quenching media to said first cam while it is within said first heating coil;

(l) circumferentially indexing said one camshaft with respect to said second coil until said tip of said second cam is adjacent said electrically insulating gap of said second coil;

(m) energizing said second coil by said second power supply to heat said second cam to a predetermined temperature in its circumferentially indexed position;

(n) applying a quenching media to said second cam while it is within said second heating coil;

(o) then indexing a first subsequent unhardened cam axially into said first heating coil and a second subsequent unhardened cam into said second heating coil; and,

(p) again actuating said first and second energizing means to heat said first and second subsequent cams with said first and second heating coils, respectively, including the steps of quenching said cams.

4,732,625

COPPER-NICKEL-TIN-COBALT SPINODAL ALLOY

Ronald J. Livak, Los Alamos, N. Mex., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,993
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.⁴ C22C *9/02*
U.S. Cl. 148—433 **31 Claims**

1. A copper base spinodal alloy prepared by powder metallurgy consisting essentially of from about 5 to about 30 percent by weight nickel, from about 4 to about 13 percent by weight tin, from about 0.5 to about 3.5 percent by weight cobalt and the balance copper, said alloy having an unaged microstructure characterized by an equiaxed grain structure of substantially all alpha, face-centered-cubic phase with a substantially uniform dispersed concentration of tin and a substantial absence of tin segregation.

4,732,626

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Koji Edamura; Akio Torii, and Hiroshi Sakai, all of Chita, Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Filed Mar. 3, 1987, Ser. No. 21,206
Claims priority, application Japan, Mar. 10, 1986, 61-50463
Int. Cl.⁴ C06B *45/02*
U.S. Cl. 149—21 **8 Claims**

1. A water-in-oil emulsion explosive composition containing a continuous phase consisting of a carbonaceous fuel component, a dispersed phase consisting of an aqueous solution of inorganic oxidizer salt, an emulsifier, and a density adjusting agent, wherein the improvement comprises:

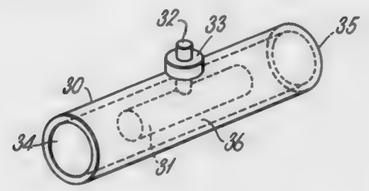
1–45% by volume of a cushioning medium consisting of an organic substance having a bulk modulus of not higher than 1×10^{11} dyne/cm^2, said cushioning medium occupying not less than 2% by volume but less than 30% by volume in the total volume of the density adjusting agent and the cushioning medium.

4,732,627

METHOD FOR IMPROVING THE QUALITY OF AN EMULSION EXPLOSIVE COMPOSITION

John Cooper, and Ian J. Kirby, both of Alloway, Scotland, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 9, 1986, Ser. No. 906,735
Claims priority, application United Kingdom, Sep. 19, 1985, 8523127; Jan. 21, 1986, 8601370
Int. Cl.⁴ D03D *23/00*
U.S. Cl. 149—109.6 **9 Claims**



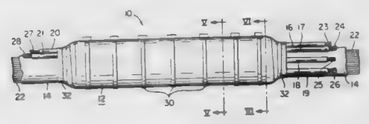
1. A method of improving the quality of an emulsion explosive composition comprising a discontinuous phase containing an oxygen-supplying component and an organic medium forming a continuous phase characterised by selecting an electrical characteristic of the explosive composition, establishing a predetermined range of acceptable values for that characteristics, measuring the selected characteristic of the explosive composition, and, in response to a measured electrical characteristic outside the predetermined range, diverting the unacceptable composition, or treating the composition to restore the selected electrical characteristic thereof to within the predetermined acceptable range.

4,732,628

METHOD OF SEALING AND REPAIRING ELECTRICAL CABLES

Zoltan B. Dienes, Annandale, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J. and Zoltan B. Dienes, Annandale, N.J.

Continuation of Ser. No. 335,399, Dec. 29, 1981, Pat. No. 4,666,537, which is a continuation-in-part of Ser. No. 143,414, Apr. 24, 1980, Pat. No. 4,358,634. This application Jan. 30, 1987, Ser. No. 8,903
Int. Cl.⁴ H01B *13/06*
U.S. Cl. 156—48 **9 Claims**



1. A method of sealably covering an exposed electrical cable comprising the steps of:

applying sealant material around said exposed cable;

placing a protective cover over said sealant material; and

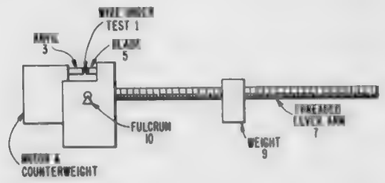
mechanically compressing said cover into contact with said sealant material to effect a seal between said cover and said cable.

4,732,629

METHOD FOR MANUFACTURING AN INSULATED CONDUCTOR HAVING A HIGH CUT-THROUGH RESISTANCE

Peter B. Cooper, 555 Paper Mill Rd., Newark, Del. 19714, and Sarah J. Lane, 3 Phelps La., Newark, Del. 19711

Filed Jul. 25, 1986, Ser. No. 889,230
Int. Cl.⁴ H01B *13/08*
U.S. Cl. 156—53 **6 Claims**



1. A method for increasing the cut-through resistance of a PTFE insulated conductor comprising:

(a) insulating a conductor with at least one layer of expanded PTFE tape that has been compressed to a density of greater than about 1.9 g/cm^3 and has a crystalline melt point above 375° C.; and

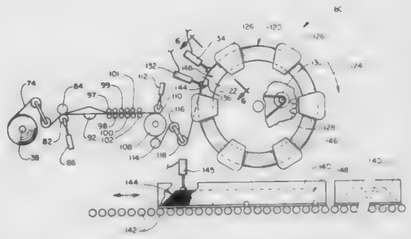
(b) heating said insulated conductor to a temperature above 345° C.

4,732,630

METHOD FOR PRODUCING EXPANDABLE HONEYCOMB MATERIAL

John T. Schnebly, Boulder, Colo., assignor to Thermocell, Ltd., Broomfield, Colo.

Filed Mar. 26, 1986, Ser. No. 844,187
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—64 **36 Claims**



1. A process of fabricating expandable honeycomb material comprising:

folding a continuous length of material along opposite side portions thereof into a generally flat tubular form having upper and lower layers;

applying adhesive along the length of said continuous material by first heating said material, applying said adhesive in a liquid state to said heated material, and then cooling said material to solidify said adhesive;

winding said folded tubular material with solidified adhesive lines thereon about a rack in such a manner that the tubular material is deposited in a plurality of continuous layers one on another with lines of solidified adhesive being disposed between adjacent layers;

radially cutting said wound layers and placing said cut layers in a vertically aligned stack while removing them from said rack;

heating said vertically stacked layers to a temperature suffi-

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cient to activate said lines of adhesive and bond said layers together; and

cooling said stacked tubular material to form a unitary stack of tubular, expandable honeycomb material.

4,732,631

METHOD OF MANUFACTURING A TAPE HAVING A SERIES OF SURFACE-TYPE FASTENER PIECES

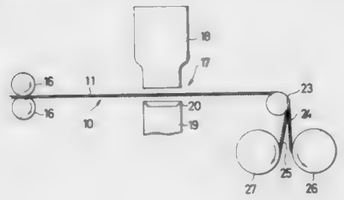
Kozo Shimizu, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 884,900

Claims priority, application Japan, Jul. 19, 1985, 60-157995

Int. Cl.[4] B32B *31/08, 31/18*

U.S. Cl. 156—73.3 **4 Claims**



1. A method of manufacturing a tape having a series of surface-type fastener pieces, comprising the steps of:

intermittently feeding a surface-type fastener tape blank composed of a release sheet of paper and a surface-type fastener of synthetic resin attached by an adhesive layer to the release sheet and comprising a base strip and a plurality of fastening elements;

fusing said surface-type fastener in a predetermined pattern and melting the adhesive layer along said pattern and pushing it away from said pattern to produce gaps which define a series of surface-type fastener pieces on said release sheet;

pressing the fastening elements along the periphery of each fastener piece against said base strip to fuse said peripheral fastening elements to said base strip; and

after the production of the gaps, separating said release sheet with said series of surface-type fastener pieces attached thereto by said adhesive layer from a scrap composed of a surface-type fastener web from which the surface-type fastener pieces have been blanked out.

4,732,632

PROTECTING ELONGATED SUBSTRATE WITH MULTIPLE-LAYER POLYMER COVERING

George Pieslak, Menlo Park; Tony G. Alvernaz, Fremont, both of Calif.; Robin John, Kessel-lo, Belgium; James A. Rinde, Fremont, and Eric Van Zele, Atherton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 670,245, Nov. 9, 1984, abandoned, and Ser. No. 702,116, Feb. 15, 1985, abandoned. This application Oct. 18, 1985, Ser. No. 789,001

Int. Cl.[4] B32B *31/00;* **B05D** *3/02*

U.S. Cl. 156—86 **11 Claims**

1. A method of applying a protective covering to an elongated substrate which comprises:

(a) applying to the substrate at a temperature of not more than about 80° C., a curable polymeric composition which is a liquid at about 20° C., is curable to a substantial extent within about 24 hours at a temperature of not more than about 80° C., and comprises

(i) a resin component;

(ii) a curing agent;

(b) applying a multiple-layer polymeric covering, having an innermost layer and an outermost layer, the innermost layer comprising uncured polymeric heat activatable sealant capable of interacting with said curable composition, over the curable polymeric composition in a manner such that said innermost layer is in intimate contact with said composition; and

(c) allowing the curable composition to cure while maintaining intimate contact between said innermost layer and said composition at a temperature at which the outermost layer of the covering does not melt or flow.

4,732,633

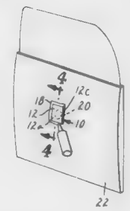
METHOD OF PATCHING DAMAGED SHEET MATERIAL

Richard J. Pokorny, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 1, 1986, Ser. No. 891,598

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 **10 Claims**



1. Method for repairing a damaged area in the surface of a body made of metal comprising the steps of:

(1) exposing bare metal surface in the vicinity surrounding the damaged area to be repaired,

(2) cleaning the bare metal surface,

(3) providing a thin, corrosion-resistant patch consisting of a covering member having a face side, a back side, and an edge side bounded by the face side and the back side, said back side having a layer of adhesive coated thereon, said covering member having a thickness of from about 0.13 to about 0.46 mm, said layer of adhesive having a thickness of from about 0.05 to about 0.38 mm, said adhesive having a peel strength of at least 7 lb./in.,

(4) applying said patch to the damaged surface, said back side of said patch being in contact with and adhering to the bare metal surface adjoining and surrounding the patch by means of said adhesive, and

(5) applying flexible putty to the bare metal surface adjoining and surrounding the patch and abutting the edge side of the patch in an amount sufficient to obtain a smooth transition from the face side of the patch to the metal surface.

4,732,634

METHOD OF FORMING THREADED POLAR OPENINGS FOR COMPOSITE PRESSURE VESSELS

Paul W. Hill, Cumberland, Md., and Thomas C. White, Ridgley, W. Va., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 426,514, Sep. 29, 1982, Pat. No. 4,602,480. This application Dec. 10, 1984, Ser. No. 680,021

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—161 **11 Claims**

1. A method of filament winding a pair of pressure vessels, each of said vessels having a large opening that is internally threaded with threads that are integral therewith, said method comprising:

(a) providing first and second thread formers as part of a mandrel used in making said vessels, said thread formers spaced by a spacer having a common center axis with said thread formers and other portions of said mandrel and respectively configured to provide said threads for each of said openings;

(b) winding filament about said mandrel in a helical layer having filament disposed, relative to lines parallel with said center axis, at an angle having an absolute value between about 5° and 35°, said winding being over said thread formers, spacer and other portions of said mandrel;

(c) winding filament over said helical layer in a hoop layer having filament disposed, relative to lines parallel to said center axis, at an angle having an absolute value between about 82° and 89°, said hoop layer terminating at locations axially proximate those ends of said thread formers that are remote from said spacer;

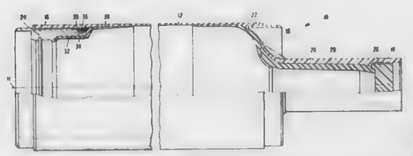
(d) winding filament over said helical layer on said spacer at an angle, relative to lines parallel with said center axis, that has an absolute value between about 82° and 89°;

(e) cutting said helical layer circumferentially about said spacer midway between said thread formers;

(f) pulling said helical layer into each of said thread formers with a first tow of filament wound at the pitch of said threads;

(g) removing said filament carried on said spacer;

(h) laying a first filamentary cloth around said thread former carrying said thread first tow therein and a second filamentary cloth around said second thread former carrying said first tow therein;



(i) pulling said first and second filamentary cloths into said thread formers with a second tow wound at the pitch of said threads;

(j) continuing fabrication of said pressure vessels by winding a second helical layer as in (b), winding a second hoop layer as in (c), winding filament on said spacer over said second layer as in (d), cutting said second helical layer as in (e), pulling said second helical layer into said thread formers with a third tow as in (f), removing filament from said spacer as (g), laying third and fourth filamentary cloths as in (h), and pulling said first and second filamentary cloths into said thread formers with a third tow as in (i);

(k) building up said pressure vessel after still another helical layer and filamentary cloths are pulled by a fourth tow into said thread formers, said building up comprising winding hoop and helical layers about said mandrel over said thread formers;

(l) curing thermosettable resin carried by said cloths, hoop and helical layers and tows to provide said pressure vessel.

4,732,635

METHOD OF MAKING SPLICEABLE SHEET MATERIAL

Dennis L. Levens, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 23, 1984, Ser. No. 592,711

Int. Cl.[4] B44C *1/17;* **B29C** *65/00;* **C09J** *5/10*

U.S. Cl. 156—230 **4 Claims**

1. A method of making spliceable sheet material comprising the steps of:

a. obtaining an uncured but curable sheet of polyolefinic compound,

b. placing in contact with a lateral border on one side of said sheet a transfer tape comprising a thermoplastic heat-sealable polyolefinic layer carried by a strippable release liner, said layer having a melt index of at least 0.5 dl/g and a softening point of at least 80° C. and being in contact with said sheet, to form an assembly,

c. subjecting said assembly to elevated pressure and temperature for a time sufficient to cure said compound and firmly bond the heat-sealable thermoplastic olefinic layer to the cured sheet material, said release liner remaining in position until said sheet material is to be spliced, at which time it is removed.

4,732,636

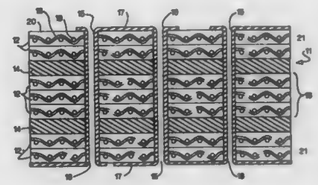
METHOD FOR PRODUCING A PREPREG HAVING IMPROVED DIMENSIONAL STABILITY

Kenneth J. Varker, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1986, Ser. No. 866,516

Int. Cl.[4] B32B *31/10, 31/18*

U.S. Cl. 156—252 **14 Claims**



1. A method for manufacturing substantially planar panels of resin-impregnated fabric, whereby shrinkage thereof during manufacture is reduced, the steps comprising:

(a) providing a substantially planar fabric having a warp;

(b) coating said fabric with a curable resin;

(c) partially curing said resin;

(d) cutting said partially cured resin-impregnated fabric into panels having outer boundaries;

(e) after said partial curing step, transversely cutting at least a plurality of said fabric warp within said outer boundaries of said panels at at least one location; and

(f) after transversely cutting said fabric warp, fully curing said resin.

4,732,637

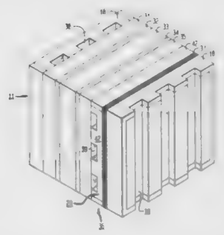
METHOD OF FABRICATING AN INTEGRAL GAS SEAL FOR FUEL CELL GAS DISTRIBUTION ASSEMBLIES

Charles J. Dettling, E. Hanover, and Peter L. Terry, Chathum, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 687,806, Dec. 31, 1984, abandoned, which is a division of Ser. No. 484,014, Apr. 11, 1983, Pat. No. 4,505,992. This application Apr. 3, 1986, Ser. No. 848,840

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—295 **10 Claims**



1. A method of producing a bipolar assembly for use in a fuel cell stack wherein contiguous plates are provided to distribute oxidant and reactant gas respectively to adjacent cells of said

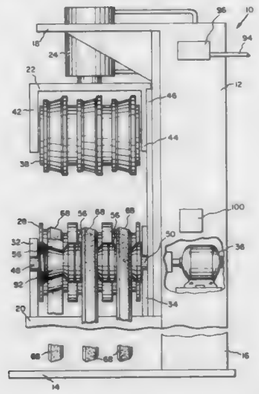
VOL 1088 ISS 4 MR 22 1988 UMI

stack comprising the steps of: providing at least two electrically conductive distribution plates having a foraminous structure suitable for transporting gas therethrough;
disposing a layer of thermally sensitive, insulative sealant material between said plates;
applying pressure and elevated temperature to said plates and layer of thermally sensitive sealant material sufficient to render said layer deformable and bond said plates together upon redistribution of said sealant within the pores of said plates;
said layer of insulative sealant material being present in such amount to impregnate the pores of said plates and form a substantially gas-impermeable barrier at the interface between said plates, said plates being bonded so that they are in contact with one another in electroconductive registry;
whereby said bipolar assembly is suitable to a series type electrical arrangement within said fuel cell stack and effectively isolates reactant and oxidant gasses on opposite sides of the interface between said conductive distribution plates of said bipolar assembly during operation of said fuel cell stack.

4,732,638
APPARATUS FOR ROLLING HEAD RINGS

Donald E. Baker, Mesa, Ariz.; Gary L. Bowen, Meriden, and John R. Thiele, Topeka, both of Kans., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 29, 1985, Ser. No. 759,668
Int. Cl.[4] B29D *30/48;* **G05G** *15/00;* **B29C** *69/00*
U.S. Cl. 156—358 **9 Claims**

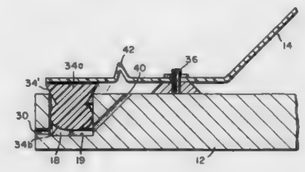


1. Apparatus for rolling the wire ends in a clamp area portion of a bead ring formed of multiple turns of metal wire coated with an uncured rubber compound comprising at least a pair of rollers each having a rolling surface, and one of said rollers being movable radially into and out of closely spaced nonengaging relationship with the other of said rollers, said rolling surface of one of said rollers having a first groove, said first groove having a base surface and side surfaces so that upon movement of said rolling surface of the other of said rollers into closely spaced relationship with said rolling surface of said one of said rollers the contoured space therebetween has substantially the same cross section as the cross section of the formed bead ring, pressure means to urge said rolling surface of one of said rollers towards said rolling surface of the other of said rollers to first, maintain said rolling surfaces spaced apart to provide the cross section of said contoured space therebetween, and second to thereby enable the wire ends to be conformed to said cross section by said rollers under the pressure applied by said pressure means, and drive means rotating at least one of said rollers in one direction to roll said clamp area portion from a beginning position at one end to an ending position at the other end while said clamp area portion of said bead ring is pressed between said rollers.

4,732,639
VACUUM BAGGING APPARATUS

Cosby M. Newsom, 15517 S. Seaforth Ave., Norwalk, Calif. 90650

Continuation-in-part of Ser. No. 771,520, Aug. 30, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,141
Int. Cl.[4] B29C *65/00;* **B32B** *35/00*
U.S. Cl. 156—382 **15 Claims**

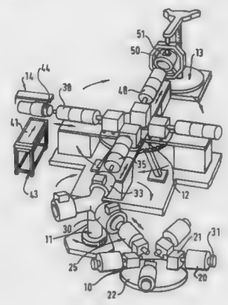


1. A bonding apparatus for vacuum bagging comprising:
(a) a base having a top surface provided with an outer peripheral vacuum manifold;
(b) a diaphragm having a top member and a downwardly depending side wall adapted for placement on said base and in conjunction therewith defining a chamber and encompassing vacuum ports;
(c) an evacuation port connected to a vacuum source whereby said chamber may be evacuated of ambient atmosphere to form a vacuum therein; and
(d) an edge member associated with said side wall, including a solid, conformable seal adapted to provide at least a first seal against said outer peripheral vacuum manifold.

4,732,640
APPARATUS FOR THE MANUFACTURE OF PNEUMATIC TIRES

Anthony G. Goodfellow, Merseyside, England, assignor to W & A Bates Limited, United Kingdom

Filed Apr. 19, 1985, Ser. No. 724,888
Claims priority, application United Kingdom, May 9, 1984, 8411820
Int. Cl.[4] B29D *30/08*
U.S. Cl. 156—396 **6 Claims**

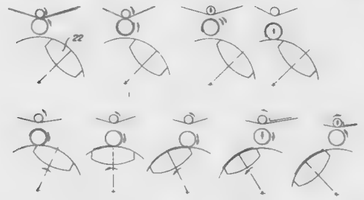


1. A tire carcass building apparatus comprising:
(i) a first rotatable turret having a plurality of first formers for the manufacture of tire carcass cylindrical inner liners thereon and which are rotatably displaceable between a number of stations;
(ii) a third rotatable turret having a plurality of second formers for the manufacture of a tire carcass and which are rotatably displaceable between a number of stations,
(iii) a transfer means for transport of the inner liners from one station on the first rotatable turret to a second station on the third rotatable turret, and which comprises a second rotatable turret with at least three cylindrical transfer sleeves each for supporting a respective cylindrical inner liner on its inner periphery, said transfer sleeves being rotatably displaceable between fixed positions and arranged so that one of the transfer sleeves is in alignment one with said one of the stations of the first turret, and simultaneously, another of the transfer sleeves is in alignment one with one of said stations of the third turret; and
(iv) the first and second formers being mounted for movement with respect to their respective axes so as to become concentric with a transfer sleeve aligned therewith.

4,732,641
METHOD FOR ROTATIONAL DECORATION OF ARTICLES

Jacek A. Nechay, Northboro; Fritz E. Bauer, Shrewsbury; Bernard R. Danti, Lexington, all of Mass., and Mark Lukkarinen, Merrimack, N.H., assignors to Dennison Manufacturing Co., Framingham, Mass.

Filed Jul. 1, 1985, Ser. No. 750,447
Int. Cl.[4] B65C *9/04, 9/00;* **B44C** *1/00*
U.S. Cl. 156—448 **26 Claims**



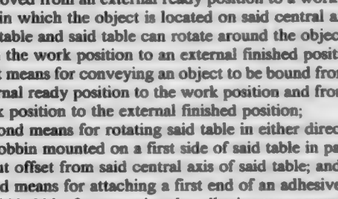
4. The method of applying labels to articles, comprising:
(a) advancing a label on a carrier to a transfer site;
(b) operating a transfer roller against said carrier;
(c) displacing the rotational axis of an intermediate rotational member at the transfer site to move said member into contact with said carrier and remove the label therefrom;
(d) causing said rotational member to apply the label to an article.

4,732,642
APPARATUS FOR PEELING PROTECTIVE FILM OFF A THIN ARTICLE

Minoru Ametani, Takatsuki, Japan, assignor to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 626,083, Jun. 29, 1984, Pat. No. 4,631,103. This application Aug. 27, 1986, Ser. No. 900,952
Claims priority, application Japan, Apr. 10, 1984, 59-72546; May 25, 1984, 59-107191
Int. Cl.[4] B32B *1/00, 31/00*
U.S. Cl. 156—497 **4 Claims**

1. An apparatus for peeling and removing a protective adhesive film having an adhesive force stuck to one side of a thin article such as a silicon wafer, comprising:
pressing/feeding means for feeding the thin article having the protective adhesive film adhered to one side thereof while pressing an adhesive tape having an adhesive force against said protective adhesive film on the article to stick it thereon;
holding means for holding in position the article having said protective adhesive film to which said adhesive tape has been adhered; and
peeling means adapted to be movable in a direction substantially parallel to the thin article held in position for peeling said adhesive tape off the article to peel said protective adhesive film off the article by the adhesive force of said

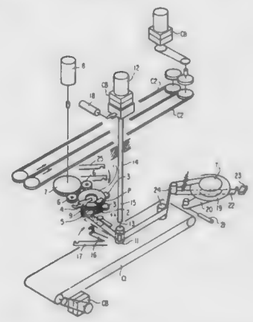


adhesive tape acting on said protective adhesive film, the adhesive force of said adhesive tape being larger than the adhesive force of said protective adhesive film.

4,732,643
BINDING APPARATUS

Hajime Chikatani, Hachioji, Japan, assignor to Daisei Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 911,997
Claims priority, application Japan, Oct. 1, 1985, 60-218542
Int. Cl.[4] B65B *51/08, 61/00*
U.S. Cl. 156—459 **8 Claims**



1. A binding apparatus comprising:
(a) a table having a central axis, a circumferential periphery, and a groove extending from said circumferential periphery to the center of said table, said groove being sized, shaped, and positioned to permit an object to be bound to be moved from an external ready position to a work position in which the object is located on said central axis of said table and said table can rotate around the object and from the work position to an external finished position;
(b) first means for conveying an object to be bound from the external ready position to the work position and from the work position to the external finished position;
(c) second means for rotating said table in either direction;
(d) a bobbin mounted on a first side of said table in parallel to but offset from said central axis of said table; and
(e) third means for attaching a first end of an adhesive tape to said bobbin, for wrapping the adhesive tape around said bobbin a predetermined number of times, for cutting the adhesive tape to form a second end of a piece of adhesive tape sufficient in length to pass several times around the object to be bound, for positioning the portion of the piece of adhesive tape between said bobbin and the second end of the adhesive tape so that said portion is at least approximately parallel to said first side of said table and so that said portion passes over said groove at least approximately transversely to said groove, for gripping the second end of the adhesive tape while said first means conveys an object

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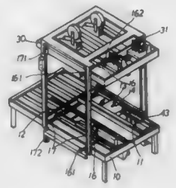
to be bound from the external ready position to the work position, during which motion the object strikes the portion of the adhesive tape between said bobbin and the second end of the adhesive tape, and for releasing the second end of the adhesive tape before said second means rotates said table several times, thereby unwinding the piece of adhesive tape from said bobbin and winding the piece of adhesive tape around the object to be bound.

4,732,644

AUTOMATIC TAPE-FIXING DEVICE FOR CARTON-SEALING MACHINE

Tuan-Mei C. Chiu, Chiayi Hsien, Taiwan, assignor to Tien Heng Machinery Co., Ltd., Chiayi Hsien, Taiwan

Filed Jan. 6, 1987, Ser. No. 744
Int. Cl.⁴ B65B *61/00*
U.S. Cl. 156—468 **1 Claim**



1. An automatic tape-fixing device for a carton sealing machine, having means for applying tapes along the edges of a carton, and being equipped with short and elongated brushes disposed in line and at adjustable distance from each other along the upper and lower sides of upper and lower frames in a symmetric manner to apply tapes to four edges simultaneously of a forwardly moving carton, and said short and elongated brushes operated by air-actuated cylinders being disposed at a proper distance from the tape applying means, said tape-fixing device comprising:

a short brush having a split-clamp end for securing the same to a chain member driven by a pair of sprockets each having a gear located thereunder which engages with a rack disposed in front of an air-actuated cylinder so that said short brush can be actuated to repeatedly move back and forth;

an elongated brush being disposed in line and at proper distance, next to said short brush, and provided with an extended pin at each end thereof which is in contact association with a knife-shaped cam protrusion for confinedly guiding the movement of said elongated brush by means of the contour of said cam protrusion, and said elongated brush being connected to a brush actuating base by an elongate hinge bar having a pair of twisting springs located at each end thereof to change the operating position of said brush actuating base. and an air-actuated cylinder being secured to the bottom of the base;

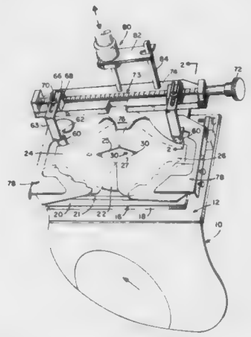
the above-mentioned components being structured so that the components are disposed in pairs on an upper and lower frame, four worm rods being disposed between the frames and secured to said upper frame with their top ends by four mounting seats, and at the bottom ends thereof being provided with sprockets, connected to each other by a chain member so that said four worm rods can be simultaneously actuated to rotate by a motor located at the bottom end of one worm rod to effect adjustment of the distance between said upper and lower frames, the distance between conveyor belts disposed on said upper and lower frames being changed by moving one of said conveyor belts to the left or right by means of a worm rod horizontally disposed with one end thereof secured to a mounting seat and the other end attached to a turning knob so that the conveyor belts can be adjusted for cartons of different size.

4,732,645

SHOE SUBSTRATE REINFORCING MACHINE

Andrew J. Gilbride, Swampscott, Mass., assignor to DVSG Patentverwaltungs G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,289
Int. Cl.⁴ B05C *13/00*
U.S. Cl. 156—578 **6 Claims**



1. A machine for depositing powder in a selected configuration, fusing the deposited powder into a laminate and pressing the fused laminate against a shoe substrate to adhere the fused laminate to the shoe substrate comprising:

means for supporting a family of shoe substrates to which a fused laminate is to be adhered, each of said shoe substrates having selectively configured shapes which are to be accurately positioned on said supporting means to properly receive the substrates, said supporting mans including

surface means onto which the shoe substrates are to be placed,

guide means for assisting an operator in the accurate placement of the shoe substrates on said surface means, said guide means including

a pair of locating surface means,

means for conjointly, horizontally displacing said pair of locating surface means in a first direction toward or away from each other,

means for independently adjusting the horizontal location of each of said locating surface means in a direction perpendicular to said first direction, and

means for independently adjusting the vertical location of each of said locating surface means.

4,732,646

METHOD OF FORMING IDENTICALLY POSITIONED ALIGNMENT MARKS ON OPPOSITE SIDES OF A SEMICONDUCTOR WAFER

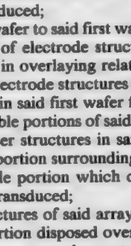
Gerhard Elsner, Sindelfingen; Johann Greschner, Pliezhausen, and Holger Hinkel, Böblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1987, Ser. No. 26,510
Claims priority, application European Pat. Off., Mar. 27, 1986, 86104222.4
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—626 **17 Claims**

1. A method of forming identically positioned alignment marks on front and back sides of a semiconductor wafer, characterized by

coating the front and the back sides of said semiconductor wafer with an insulating layer forming front and back side insulating layers,

directing high-energy heavy ions onto said front side insulating layer, said heavy ions penetrating said front side insulating layer, said semiconductor wafer and said back side insulating layer, forming single disturbed crystal lattice nuclear tracks in said front and back side insulating layers, without disturbing the crystal lattice of the semiconductor wafer, and



etching said nuclear tracks in said front and back side insulating layers with corresponding, identically positioned pores being opened in said front and back side insulating layers, whereby said pores provide alignment marks for individual further method steps.

4,732,647

BATCH METHOD OF MAKING MINIATURE CAPACITIVE FORCE TRANSDUCERS ASSEMBLED IN WAFER FORM

Harry E. Aine, 8601 Signal Ridge Rd., Philo, Calif. 95466

Continuation-in-part of Ser. No. 664,475, Oct. 24, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 875,598
Int. Cl.⁴ G01L *1/22;* **H01L** *21/306*
U.S. Cl. 156—633 **9 Claims**

1. In a batch method for fabricating non-hermetically sealed force transducer structures, the steps of:

recessing a first wafer according to a pre-determined pattern to form an array of force transducer structures in said first wafer each of said force transducer structures having a deflectable portion which deflects in accordance with the force to be transduced;

bonding a second wafer to said first wafer, said second wafer having an array of electrode structures on a major face thereof disposed in overlaying relationship with said first wafer with the electrode structures facing the force transducer structures in said first wafer for electric interaction with the deflectable portions of said transducer structures;

said force transducer structures in said first wafer each including a frame portion surrounding and being connected to said deflectable portion which deflects in response to the force to be transduced;

said electrode structures of said array each including a planar electrode portion disposed overlaying the deflectable portion of said force transducer structures in non-electrical contact therewith and including a lead portion extending from said planar electrode portion across and in overlaying spaced apart relation with said frame portion of said transducer structures to define a gas communication passageway in the space between said lead portion and the overlayed frame portion across said frame and for making electrical contact to said planar electrode structure without electrically contacting said frame portion;

removing material from said second wafer to form cleave lines generally outlining individual ones of said frame portions of said first wafer with the cleave lines in said second wafer extending only partially through the thickness of said second wafer; and

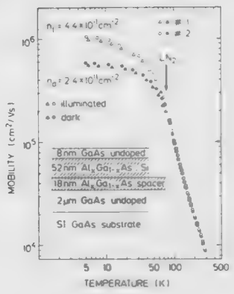
cleaving the bonded first and second wafers along said cleave lines to separate individual force transducer structures, one from the other in said array of structures, whereby said force transducer structures are assembled in wafer form and then cleaved from the assembled wafer to provide a batch method of fabricating said force transducer structures.

4,732,648

METHOD OF PREPARING SEMICONDUCTOR SUBSTRATES

Hans Fronius, Stuttgart; Albrecht Fischer, Lochgau, and Klaus Ploog, Stuttgart, all of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,473
Claims priority, application European Pat. Off., Dec. 17, 1985, 85116120.8; Apr. 11, 1986, 86105025.0
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—636 **11 Claims**



1. A method of preparing semiconductor substrates to reduce the formation, in particular of oval defects, during subsequent growth of semiconductor structures thereon, in particular growth of heterostructures by molecular beam epitaxy, wherein the substrates are chemically cleaned and are provided with a thin oxide layer as protection against contamination during handling prior to growth of a said semiconductor structure thereon, characterised in that the substrate is first subjected to mechano-chemical etch polishing using an abrasive free fabric or paper polishing lap soaked with an oxidising etching solution and is then treated by placing it in a concentrated acid, in particular H_2SO_4 subjected to agitation.

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METHOD FOR MANUFACTURE OF PRINTED CIRCUIT BOARDS

Gary B. Larson, Cheshire; Ann S. Williams, Southbury, and Raymond A. Letize, West Haven, all of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Jun. 18, 1986, Ser. No. 875,640
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] C23F 1/00; B44C 1/22; C03C 15/00
U.S. Cl. 156—652 9 Claims

1. A method for manufacturing printed circuit boards comprising the steps of:
(a) providing a non-conductive substrate having a copper layer on both sides thereof and having through-holes made therein and having surrounding pad surfaces;
(b) depositing copper on the copper layer and through-hole and surrounding pad surfaces;
(c) applying a resist image which provides a trace pattern on said copper layer;
(d) subjecting the resulting substrate to a copper electroplating process to deposit additional copper thickness on all exposed copper surfaces including said trace pattern and said through-hole and surrounding pad surfaces;
(e) applying a tin or tin-lead alloy etch resist to said exposed copper surfaces;
(f) removing the imaged material;
(g) etching away all copper from those areas not protected by said etch resist;
(h) subjecting said etch resist to the action of a first stripper composition comprising an oxidant for the metals of said etch resist and an acid acceptor for the metal cations so oxidized to leave a thin film of tin smut on said surfaces previously protected by said etch resist;
(i) subjecting said thin film of tin smut to the action of a second stripper composition comprising an aqueous solution containing a mixture comprising an alkali metal hydroxide and an alkali metal chlorite until said thin film of tin smut has been removed and replaced by a layer of copper oxide; and
(j) thereafter selectively applying a solder mask to at least the said trace pattern.

4,732,650

BLEACHING OF CELLULOSIC PULPS USING HYDROGEN PEROXIDE

Robert J. Michalowski, Midland, Mich.; Steven H. Christiansen, Richwood, Tex.; Jimmy Myers, Sweeny, Tex., and David A. Wilson, Richwood, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 15, 1986, Ser. No. 907,694
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] D21C 9/16
U.S. Cl. 162—17 41 Claims

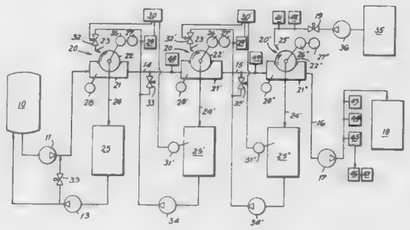
1. In a process for bleaching wood pulp using hydrogen peroxide in an alkaline silicate-free aqueous system, the improvement which comprises the steps of (1) pretreating the pulp with a polyaminocarboxylic acid or salt thereof and (2) bleaching with hydrogen peroxide stabilized with
(a) an aminophosphonic acid chelant or salt thereof and
(b) at least one polymer of
(i) an unsaturated carboxylic acid or salt thereof,
(ii) an unsaturated carboxylic amide or
(iii) an unsaturated carboxylic amide wherein the amide hydrogens are substituted with an alkylsulfonic acid group or salt thereof.

4,732,651

METHOD FOR MONITORING AND CONTROLLING A PULP WASHING SYSTEM

Khaim Lisayansky, Chester, and William E. Blecha, Warwick, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 646,416, Aug. 31, 1984, abandoned.
This application Dec. 11, 1986, Ser. No. 941,545
Int. Cl.[4] D21C 9/02, 9/06
U.S. Cl. 162—49 3 Claims



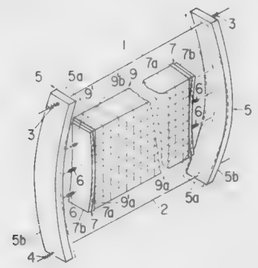
1. A method for monitoring and controlling the operation of a pulp washing system comprising the steps of:
(a) continuously measuring the dilution factor and the soda loss of the pulp washing system to determine when a process disturbance, which results in an increase of soda loss, occurs;
(b) when a process disturbance occurs periodically determining the efficiency of the stage washers of the pulp washing system based on measured values of displacement ratio and wash liquor ratio to determine whether the displacement ratio of the pulp washing system has decreased for a specific wash liquor ratio;
(c) when the measured value of the displacement ratio for a specific wash liquor ratio decreases, the process further comprising the substeps of,
(1) adjusting at least the speed of rotation of at least one drum of one washing stage and the pulp slurry vat level of at least one vat of the same washing stage of the pulp washing system to return the pulp washing system to a maximum displacement ratio by,
a. periodically measuring the wash liquor ratio and maintaining the wash liquor ratio at a target value,
b. periodically measuring the displacement ratio while controllably varying individually the drum rotation speed and the vat level,
c. determining the values which corresponds to the maximum displacement ratio for the drum roation speed and vat level, and
d. adjusting the drum rotation speed and the vat level to the determined values which correspond to the maximum displacement ratio for the drum rotation speed and the vat level, and
(2) adjusting the amount of wash liquor added to the system to maintain the dilution factor or soda loss value within a predetermined ranged; and
(d) when the measured value of the displacement ratio for the specific wash liquor ratio remains substantially the same, adjusting the amount of wash liquor added to the system to return and maintain the dilution factor or soda loss value within a predetermined range.

4,732,652

CLAMPING SYSTEM FOR COKE OVEN HEATING WALLS

Heinz Dürselen; Jürgen Neitzel; Arnulf Schüffler, and Walter Stanke, all of Essen, Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 655,993, Sep. 28, 1984, abandoned, which is a continuation of Ser. No. 320,717, Nov. 12, 1981, abandoned. This application Apr. 14, 1987, Ser. No. 38,428
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044897
Int. Cl.[4] C10B 29/04, 29/08
U.S. Cl. 202—268 17 Claims



1. In a coke-oven-type industrial furnace having a brick heating wall which is subject both to thermal and mechanical operational loads, the heating wall defining opposite vertical end faces, a upright central plane, and horizontal upper and lower edge and vertical edges at each end face, a clamping system for preventing detrimental tensile and shearing stresses in the heating wall, said system comprising at least one clamping plate engaging each said end face of the heating wall, an upright yoke-shaped beam having upper and lower end portions situated above and below said clamping plate and an intermediate portion facing said clamping plate, cross tie rods connected by springs to said end portions of the beam to apply clamping forces thereto, and pressing elements provided between said intermediate portion of said beam and said clamping plate to transfer the clamping forces via said clamping plate into said heating wall, said beam being elastically suspended between said pressing elements and said connecting springs exclusively opposite said heating wall of the furnace and, prior to the application of the thermal and mechanical operational loads, said beam having a substantially convex configuration, and pliable insulating means provided between the mating surfaces of said end face of the heating wall and said clamping plate to compensate local roughness in excess of 2.5 millimeters therebetween, wherein the mutual arrangement of the cross tie rods, the connecting springs, the beam, the clamping plate and the pressing elements being such as to fulfill at least one of the following conditions for the distribution of clamping forces into the heating wall:
(a) clamping forces starting approximately midway between said horizontal edges of each end face of the heating wall decrease toward respective horizontal edges over a length of about 75% of the distance between the horizontal edges according to a bell-shaped or parabolic characteristic curve;
(b) the resultants of the clamping forces when viewed in longitudinal direction of the heating wall act on midlines of two outer marginal areas of the end face within a distance of approximately 65 millimeters from said vertical edges, and the resultants are applied at angles between 0 and 30° relative to said central plane of the heating wall;
(c) the effect of interfering forces in the case of any thermal and/or mechanical disturbance is resiliently held by the cross tie rods, the connecting springs, the beam, the clamping plate and the pressing elements within limits of 5 to 20% of preset clamping forces so as to maintain the desired distribution of the clamping forces over the entire length of the clamping plate.

4,732,653

SEPARATION OF ETHANOL FROM T-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Mark G. Vosburgh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Oct. 7, 1985, Ser. No. 784,870
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] B01D 3/40; C07C 29/84
U.S. Cl. 203—51 11 Claims

1. A method for recovering ethanol from a mixture of ethanol and tertiary butanol which comprises distilling a mixture of ethanol and t-butanol in a rectification column in the presence of about one to two parts of extractive agent per part of ehtanol - t-butanol mixture, recovering ethanol as overhead product and obtaining the extractive agent and t-butanol from the stillpot, the extractive agent comprises at least a benzoate containing from seven to twenty-six carbon atoms.

4,732,654

PREPARATION PROCESS OF INDOLE

Atsuyoshi Yamauchi, Naka; Seiya Iguchi, Tokyo; Yuzo Ono, Osaka; Hiroshi Kimura, Kamakura, and Satoshi Morita, Yokosuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 806,515, Dec. 13, 1985, abandoned.
This application Jul. 15, 1987, Ser. No. 75,247
Claims priority, application Japan, Dec. 26, 1984, 59-272748
Int. Cl.[4] B01D 3/14; C07D 209/04
U.S. Cl. 203—81 4 Claims

1. A process for preparing and highly purifying indole comprising reacting aniline and ethylene glycol in the vapor phase in the presence of a catalyst, said catalyst selected from the group consisting of a solid acid catalyst, a metallic catalyst and any combination thereof, at a temperature from 200° C. to 600° C. and a pressure from 1.1×10^5 Pa to 1.0×10^7 Pa, and then serially, distilling the thus-obtained reaction liquid in order to recover unreacted aniline as tops and in order to recover an indole-containing liquid as bottoms, separating and removing high-boiling point impurities and non-volatile substances from the indole-containing liquid by evaporation of the indole-containing component of the liquid and condensing the indole-containing component and rectifying the resulting indole-containing condensate in order to obtain high-purity indole containing substantially no aniline.

4,732,655

MEANS AND METHOD FOR PROVIDING TWO CHEMICAL PRODUCTS FROM ELECTROLYTES

Abraham Morduchowitz, Monsey, N.Y., and Ronald L. Cook, Aurora, Ill., assignors to Texaco Inc., White Plains, N.Y.

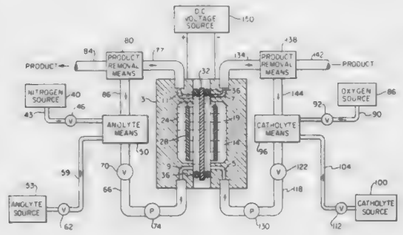
Filed Jun. 11, 1986, Ser. No. 873,024
Int. Cl.[4] C25C 1/00
U.S. Cl. 204—59 R 2 Claims

1. A method comprising the steps of:
locating an anode in an anode chamber of a reaction cell,
locating a cathode in a cathode chamber of the reaction cell,
separating the cathode chamber from the anode chamber by an ionic transfer membrane,
providing nitrogen as a sparging gas to the anode chamber of the reaction cell,
providing a mixture of tetrabutylammonium perchlorate and methanol as an anolyte to the anode chamber,
providing oxygen as a sparging gas to the cathode chamber of the reaction cell,
providing a mixture of methanol, benzene and tetrabutylam-

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monium perchlorate as a catholyte to the cathode chamber of the reaction cell,

applying a DC voltage across the anode and the cathode



thereby forming dimethoxymethane in the anolyte and phenol in the catholyte,

removing dimethoxymethane from the reacted anolyte, and

removing phenol from the reacted catholyte.

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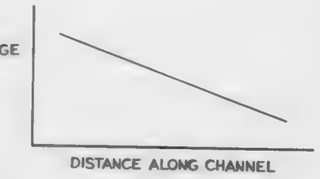
APPARATUS AND PROCESS FOR RESOLVING SAMPLE SPECIES

Stanley M. Hurd, Hamden, Conn., assignor to Bios Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 791,605, Oct. 25, 1985, Pat. No. 4,670,119. This application Apr. 10, 1987, Ser. No. 37,209

Int. Cl.⁴ G01N *27/28*

U.S. Cl. 204—182.4 **12 Claims**



8. Process for resolving sample species in an electrolyte solution containing two or more types of ions which comprises: confining an electrolyte solution in a continuous electrophoresis chamber having a long axis, an upper portion and a lower portion; establishing an electric current throughout said solution; and providing a plurality of parallel, vertically aligned, spaced-apart electrode pairs with the members of each pair situated on opposite sides of said electrophoresis chamber and bordering on said electrophoresis chamber such that the plane formed between each pair is orthogonal to the long axis of the focusing chamber; and applying a non-linear voltage gradient along the length of the electrophoresis chamber by means of said electrode pairs wherein the lines of electric force have a net component parallel to the long axis of the electrophoresis chamber; providing fluid flow of said electrolyte in said chamber from the upper portion to the lower portion; and injecting a sample species to be resolved into a single upper portion of said chamber, whereby sample species to be resolved will move in response to said fluid flow and such that the non-linear voltage gradient serves to counteract forces of diffusion as the sample species travel along said chamber and whereby good resolution is obtained in species of widely divergent electrophoretic mobility.

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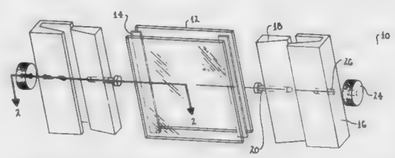
GEL-SLAB PLATE ASSEMBLY

Daniel November, and Edmund R. Goldberg, both of New York, N.Y., assignors to Haake-Buchler Instruments, Inc., Saddle Brook, N.J.

Filed Jun. 22, 1987, Ser. No. 64,558

Int. Cl.⁴ G01N *27/28, 27/26*

U.S. Cl. 204—299 R **2 Claims**



1. An end clamp means for a gel slab plate assembly, said assembly including a pair of flat, rectilinear plates separating at longitudinal ends thereof by spacers, in which said clamp means comprises:

(a) an elongate wedge element having a longitudinal dimension substantially equal to the longitudinal dimension of said pair of plates, said wedge, in transverse cross-section, substantially defining a scalene triangle having a major base, a minor base, and a hypotenuse, said major base thereof adapted for flush press-fit contact with a longitudinal end of said pair of rectilinear plates;

(b) a substantially U-shaped clamp housing proportioned to longitudinally surround, on three sides, one longitudinal edge of said pair of plates, said housing having, on said plate surrounding surface thereof, an inclined plane proportional to mate with said hypotenuse of said wedge element;

(c) means for selectively moving said hypotenuse of said wedge element along said inclined plane of said clamp housing through an analog range of linear motion including, at a boundary condition thereof, a press-fit contact of said major base of said clamp wedge against the longitudinal edge of said pair of plates, whereby a uniform pressure of said major base of said wedge element against the plate edge may be conveniently and safely obtained by the selective advance of said moving means.

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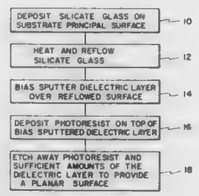
PLANARIZATION OF SILICON SEMICONDUCTOR DEVICES

Eddie C. Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1986, Ser. No. 937,577

Int. Cl.⁴ C23C *14/34;* **H01L** *21/308, 21/324*

U.S. Cl. 437—228 **5 Claims**



1. A method of providing a substantially planar surface over a semiconductor device, wherein said device is formed, at least in part, in a silicon substrate, said silicon substrate having a principal surface and wherein some device features extend from or are formed upon said principal surface, the method comprising the steps of:

depositing a layer of silicate glass selected from the group consisting of borophosphosilicate glass, borosilicate glass, phosphosilicate glass and arsenic doped silicate glass, over said device features and at least that portion of said principal surface adjacent said features;

heating said silicate glass layer sufficiently to cause said silicate glass to reflow and form a layer with a smoothly contoured upper surface;

depositing a layer of dielectric material over said smoothly contoured upper surface by bias sputtering;

depositing a photoresist on top of said dielectric layer; and

etching away all of said photoresist and a sufficient portion of said dielectric layer by an etching process which etches said dielectric and said photoresist at substantially the same rate, to provide a substantially planar surface of said dielectric layer.

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SPUTTERING METHOD FOR MAKING THIN FILM FIELD EFFECT TRANSISTOR UTILIZING A POLYPNICTIDE SEMICONDUCTOR

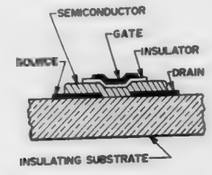
Rozalie Schachter, Flushing; Marcello Viscogliosi, North Tarrytown, and Lewis A. Bunz, Peekskill, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 619,053, Jun. 11, 1984, Pat. No. 4,558,340, Continuation-in-part of Ser. No. 509,175, Jun. 29, 1983, Pat. No. 4,509,066, and a continuation-in-part of Ser. No. 442,208, Nov. 16, 1982, Pat. No. 4,508,931. This application Nov. 8, 1985, Ser. No. 796,429

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—192.25 **7 Claims**



1. A method of making a transistor comprising vacuum plasma sputtering of successive layers in contact of a semiconductor comprising MP_x, where M is at least one alkali metal, P is at least one pnictide, and x is substantially 15 or greater, and an insulating layer comprising a pnictide.

4,732,660

MEMBRANE ELECTROLYZER

Keith R. Plowman, Lake Jackson, Tex., and Richard E. Zachary, Clinton, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 773,900

Int. Cl.⁴ C25B *9/00, 11/03, 11/10, 11/12*

U.S. Cl. 204—265 **8 Claims**

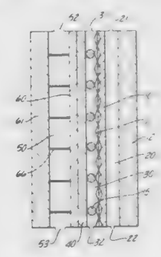
1. A membrane electrolyzer having at least one electrolytic cell having elements comprising:

(A) a cell housing divided into two compartments, an anode compartment containing an anode and anolyte and a cathode compartment containing a cathode and catholyte, said compartments separated by an ion exchange membrane,

(B) a gas diffusion polymer cathode having current distributing means,

(C) an internally supported anode or said anode supported by an endplate of said anode compartment, and

(D) spacing means in said cathode compartment adjacent to said ion exchange membrane, wherein the force exerted by gas pressure applied to said gas diffusion cathode is



transmitted to said anode by cell elements comprising said spacing means and said ion exchange membrane.

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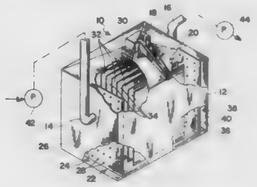
ELECTROLYTIC PURIFICATION SYSTEM

Francis C. Wright, Yardville, N.J., assignor to Mercer International, Inc.

Filed Oct. 24, 1985, Ser. No. 790,847

Int. Cl.⁴ C02F *1/46*

U.S. Cl. 204—275 **3 Claims**



1. An electroyltic flotation system for purification of wastewater, comprising:

a. a tank for containing wastewater;

b. an inlet for the admission of the wastewater at a first end of said tank;

c. a first perforated distribution baffle extending vertically across said tank to create a flow distribution region between said first end of said tank and said first perforated distribution baffle;

d. a second perforated distribution baffle extending vertically across said tank opposite and substantially parallel to said first perforated distribution baffle, said first and said second perforated distribution baffles creating a substantially non-turbulent flow of said wastewater in a flow path perpendicular to said perforated distribution baffles from said first to said second perforated distribution baffle, said flow path of wastewater having a cross-section parallel to said first and second perforated distribution baffles;

e. a plurality of planar electrodes extending vertically in said tank and perpendicular to said first and second perforated distribution baffles, said planar electrodes are immersed in said wastewater and aligned parallel to said flow of wastewater, spanning substantially the entire cross-section of the flow path of wastewater and splitting the flow of wastewater into vertical substantially non-turbulent streams parallel to said electrodes;

f. a first outlet for the emission of purified wastewater flowing from said second perforated distribution baffle out of said tank;

g. a means for pumping said wastewater from said inlet to said first outlet at a rate which allows the flow of wastewater between said planar electrodes to be substantially non-turbulent;

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h. means for driving the electrodes with a current density between adjacent electrodes of less than 100 amperes per square meter to generate microbubbles in said flow of wastewater between said adjacent electrodes, the microbubbles adhere to and float waste in said wastewater above said electrodes;

i. a second outlet means located above said electrodes for emission of said waste floated by said micro-bubbles out of said tank.

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MEASURING ELECTRODE

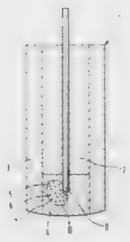
Uvo Hölscher, Stockelsdorf, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,552

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507183

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—415 9 Claims



1. A measuring head assembly for making pH measurements such as for transcutaneously determining CO_2 partial pressure, the measuring head assembly comprising:

a measuring head defining a measuring head surface and having an opening formed in said surface;

a reference electrode having a first measuring surface and being mounted in said opening so as to cause said first measuring surface to be next to said measuring head surface, said reference electrode further having a receiving opening formed therein;

a measuring electrode unit mounted in said receiving opening, said unit including:

a supporting structure made of electrically insulating material and defining a cavity electrically insulated from said reference electrode;

an electrode lead seated in said supporting structure with a portion of said lead extending into said cavity;

a solid contact body filling said cavity so as to embed said portion of said lead therein to establish electrical contact therewith;

said solid contact body containing a mixture of a metal oxide, the metal of said oxide and a matrix carrier; and,

said solid contact body having an outer surface defining a second measuring surface having a width greater than the diameter of said lead;

said measuring head surface, said first measuring surface and said second measuring surface being disposed one next to the other and being mechanically shaped so as to be flush and conjointly define a smooth, uninterrupted composite measuring surface.

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OXYGEN SENSOR

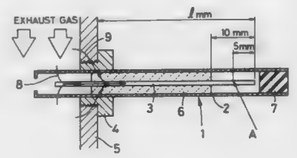
Nobuhide Kato, Aichi, and Takao Murase, Konan, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 16, 1985, Ser. No. 788,142

Claims priority, application Japan, Oct. 18, 1984, 59-220138

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—426 16 Claims



1. An oxygen sensor for determining an oxygen partial pressure for a measurement gas in a measurement-gas space, comprising:

an elongate planar oxygen sensing element with an outer peripheral portion, having an oxygen detecting portion adjacent to a first longitudinal end thereof, and electrical terminal means adjacent to a second longitudinal end thereof, said electrical terminal means comprises a plug including at least one pair of electrical contacts which are exposed on a surface of said planar oxygen sensing element;

connector means disposed adjacent to said electrical terminal means, said connector means including electrical connectors which are held in direct electrical contact with said electrical terminal means, said electrical connectors comprising a resilient material and being held in a resilient pressed electrical contact with said at least one pair of electrical contacts of the electrical terminal means;

tubular protective means having an inner surface and an outer surface for accommodating and protecting said oxygen sensing element therein, said tubular protective means comprising a first protective covering portion for protecting at least an end portion of said sensing elment which is located within said measurement-gas space and exposed to said measurement gas and which includes said oxygen detecting portion, said tubular protective means further comprising a second protective covering portion covering a remaining portion of said sensing element which is not exposed to said measurement gas;

a retainer housing for attaching said tubular protective means to a partition wall defining said measurementgas space, said elongate planar oxygen sensing element having a length of at least 40 mm as measured from said partition wall to said second longitudinal end; and

at least two air-tight masses of an inorganic particulate material which fill in at least portions of a space defined between the outer peripheral portion of the oxygen sensing element and the inner surface of the tubular protective means, said at least two air-tight masses being spaced apart from each other along a longitudinal axis of the tubular protective means, one of said at least two air-tight masses being located adjacent to said retainer housing and a second one of said at least two air-tight masses being located between said electrical terminal means and said one air-tight mass.

4,732,664

PROCESS FOR SOLID SEPARATION FROM HYDROPROCESSING LIQUID PRODUCT

Rodolfo B. Solari Martini, Los Teques; Roger Marzin; Jose Guitian Lopez, both of San Antonio de los Altos; Jose V. Rodriguez Golding, Caracas, and Julio H. Krasuk, Los Teques, all of Venezuela, assignors to INTEVEP, S.A., Caracas, Venezuela

Filed Nov. 26, 1984, Ser. No. 674,874

Int. Cl.[4] C10G *67/02*

U.S. Cl. 208—97 15 Claims

1. A process for separating finely divided solid particles having a particle size of at least 0.1 microns in diameter from a hydrocracked liquid product consisting essentially of:

(a) providing a petroleum derived hydrocarbon feedstock characterized by a high degree of asphaltene content of greater than about 10 wt. %;

(b) adding a solid catalyst additive to said petroleum derived hydrocarbon feedstock in a concentration of between 0.1 wt. % to 10 wt. % wherein said solid additive has a particle size of at least 0.1 microns in diameter;

(c) hydrocracking said petroleum dervied hydrocarbon feedstock in the presence of said solid catalyst additive in a hydrocracking reactor under high severity conditions wherein asphaltene conversion levels are greater than 60% so as to obtain an unstable product characterized by an asphaltene content of at least 1 wt. % and polymerized unsaturated radicals which promote the agglomeration of said solid catalyst particles;

(d) removing said unstable product from said hydrocracking reactor;

(e) mixing said unstable product with solvent in a solvent to unstable product ratio of between 5/1 to 10/1 so as to obtain an unstable product/solvent mixture wherein said solvent is a hydrocarbon cut having a boiling range of between 50° to 350° C. with a paraffinic content of greater than 50 wt. %;

(f) feeding said unstable product/solvent mixture to a first precipitating zone; and

(g) precipitating the agglomerated solid catalyst particles in said first precipitating zone wherein greater than 80 wt. % of said solid particles are removed.

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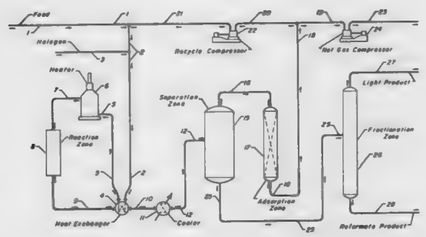
HIGH SEVERITY CATALYTIC REFORMING PROCESS

Richard W. Bennett, Western Springs; Paul R. Cottrell, Arlington Heights; Norman L. Gilsdorf, Clarendon Hills, and Michael D. Winfield, Bloomingdale, all of Ill., assignors to UOP Inc., De Plaines, Ill.

Continuation-in-part of Ser. No. 813,797, Dec. 27, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,559

Int. Cl.[4] C10G *35/04*

U.S. Cl. 208—134 3 Claims



1. A high-severity catalytic reforming process comprising:

(a) passing a mixture comprising a catalytic reforming feed stream and a recycle stream into a catalytic reforming reaction zone which is maintained at high-severity reforming conditions;

(b) cooling an effluent stream comprising hydrogen and hydrocarbonaceous catalytic reforming reaction products which is withdrawn from said reaction zone;

(c) passing said cooled effluent stream into a vapor-liquid separation zone and recovering therefrom a liquid stream comprising hydrocarbons and a hydrogen-rich gas stream;

(d) passing said hydrogen-rich gas stream through an adsorption zone wherein said gas is contacted with a treating material which removes polycyclic aromatic compounds from said gas stream, said compounds remaining in the adsorption zone;

(e) mixing a portion of said hydrogen-rich gas stream, which is said recycle stream, with said feed stream to form said charge stock mixture and withdrawing the balance of said hydrogen-rich gas stream, which is denoted as net hydrogen, from the catalytic reforming area, all of said hydrogen-rich gas stream being substantially free of polycyclic aromatic compounds; and

(f) fractionating said liquid stream and recovering an overhead product comprising light hydrocarbons and a bottoms product comprising reformate.

4,732,666

FROTH FLOTATION

Jacobus C. Welgemoed, Sasolburg; Haimi N. Singer, Parktown, and Phillip M. Viviers, Sasolburg, all of South Africa, assignors to Sentrachem Limited, Johannesburg, South Africa

Filed Oct. 16, 1986, Ser. No. 920,259

Claims priority, application South Africa, Oct. 25, 1985, 85/8208

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 12 Claims

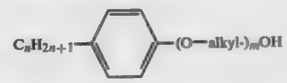
1. A process for recovering phosphate values from a finely divided ore containing the phosphate values and gangue by froth flotation includes the steps of:

(1) suspending the finely divided ore containing the phosphate values and the gangue in a liquid at a pH of greater than 7;

(2) adding to the suspension a froth flotation collector comprising:

(a) a tall oil fatty acid; and

(b) an emulsifier for the tall oil fatty acid selected from alkylphenylalkoxylates having the formula

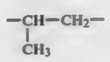


wherein:

n is an integer from 8–10 inclusive;

m is an integer from 10–20 inclusive; and

alkyl is $—CH_2—CH_2—$ or



the froth flotation collector comprising 80 to 99% by weight tall oil fatty acid and 20 to 1 by weight emulsifier;

(3) introducing a gas into the liquid to produce a froth containing the phosphate values and leaving suspended the other solid gangue; and

(4) recovering the phosphate values.

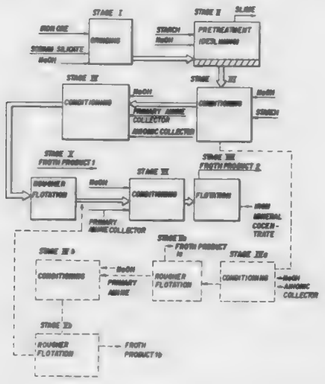
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,667

PROCESS AND COMPOSITION FOR THE FROTH FLOTATION BENEFICIATION OF IRON MINERALS FROM IRON ORES

Martin Hellsten, Odsmal; Marie Ernstsson, Goteborg, and Bo Idstrom, Stenungsund, all of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed Feb. 20, 1985, Ser. No. 703,241
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—166 26 Claims



1. A process for the froth flotation beneficiation of iron minerals from iron ores containing silicate and phosphate minerals while preferentially and selectively floating the silicate and phosphate minerals, which comprises carrying out the flotation at an alkaline pH in the presence of a primary amine having the formula:

$$R_1[OC_{n_1}H_{2n_1}]_{m_1}-[NHC_{n_2}H_{2n_2}]_{m_2}-NH_2 \quad I$$

in which:

R_1 is a hydrocarbon group having from about six to about eighteen carbon atoms;

n_1 and n_2 are 2 or 3; and

m_1 is from 0 to 1 and m_2 is from 0 to 1; and an anionic group containing compound having the formula:

$$R_2-[O]_{m_6}-[C_{n_3}H_{2n_3}O]_{m_3}-[CH_2CHCH_2]_{m_4}-[X]_{m_5}-\underset{\displaystyle R_4}{\overset{\displaystyle R_3}{N}}-H \quad II$$

(OH)

in which:

R_2 is a hydrocarbon group having from about one to about twenty-four carbon atoms;

X is a a group

$$-\overset{\displaystyle O}{\overset{\|}{C}}- \text{ or } -OCH_2\overset{\displaystyle O}{\overset{\|}{C}}-$$

n_3 is a number form 2 to 4;

m_3 is a number from 0 to 4 ;

m_4 is 0 or 1;

m_5 is 0 or 1;

m_6 is 0 or 1;

R_3 is selected from the group consisting of hydrogen; hydrocarbon groups having from one to about eighteen carbon atoms; and

$R_2[O]_{m6}-[C_{n3}H_{2n3}O]_{m3}-[CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2]_{m4}-[X]_{m5}$;

R_4 is selected from the group consisting of methylene carboxylic acid —CH_2COOH; methylene phosphonic acid

$$-CH_2-\overset{\displaystyle O}{\overset{\|}{P}}-(OH)_2;$$

and ethylene phosphoric acid

$$-CH_2CH_2-O-\overset{\displaystyle O}{\overset{\|}{P}}-(OH)_2;$$

and salts thereof.

4,732,668

NOVEL COLLECTORS FOR THE SELECTIVE FROTH FLOTATION OF MINERAL SULFIDES

Richard R. Klimpel; Robert D. Hansen, and Edwin J. Strojny, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 740,091, May 31, 1985, abandoned. This application May 6, 1986, Ser. No. 860,163
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—166 13 Claims

1. A method of recovering metal-containing sulfide minerals or sulfidized metal-containing oxide minerals from an ore which comprises subjecting the ore, in the form of an aqueous pulp, to a froth flotation process in the presence of a flotating amount of an organic compound of the general structural formula:

$$(R)_2-C\!=\!C-(R^1)_2$$

wherein each R and each R^1 is independently hydrogen, an aliphatic, cycloaliphatic, aromatic or combination thereof, unsubstituted or substituted with one or more hydroxy, ether, cyanogen, halogen or thioether moieties, provided at least one R or R^1 is not hydrogen and the epithio collector has at least 6 and less than 20 carbon atoms, under conditions such that the metal-containing sulfide mineral or sulfidized metal-containing oxide mineral is recovered in the froth.

4,732,669

CONDITIONER FOR FLOTATION OF COAL

Kenneth H. Nimerick, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 21, 1986, Ser. No. 888,319
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 16 Claims

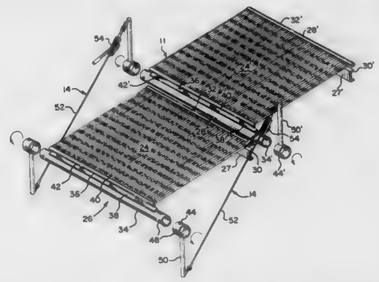
1. A method for recovering coal which comprises the steps of floating coal in an aqueous frothing medium containing an amount of a condensation product of an alkanolamine and naphthenic acid. sufficient to increase the recovery of coal as compared to the recovery of coal in an identical proces using none of said condensation product.

4,732,670

TENSIONING ASSEMBLY FOR VIBRATORY SCREENS

Robert D. Nelson, Princeton, Ill., assignor to Production Engineered Products, Inc., Walnut, Ill.

Continuation of Ser. No. 667,266, Nov. 1, 1984, abandoned. This application May 28, 1986, Ser. No. 869,461
Int. Cl.[4] B07B *1/49*
U.S. Cl. 209—314 7 Claims



1. In a classifying apparatus including a rigid frame, at least a pair of classifying screens in the frame positioned such that overs from one to said screens travels from that screen to the other of the screens, and means for tensioning the screens, wherein the improvement in the means for tensioning the screens comprises:

means for stationarily anchoring one end of each of said screens;

elongate rotatable means, one for each of said screens, adjacent the other end of each of said screens and extending across the width of the screens and said frame, each of said rotatable means including engaging means for engaging the other end of each of the screens substantially across the width of the screens;

mounting means for mounting said rotatble means for rotation relative to the frame; and

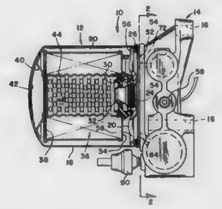
means for simultaneously rotating said rotatable means in the same direction as each other for simultaneously drawing a tension on each of said screens when said screens are anchored at one end and engaged at their other end by said engaging means, said means for rotating being connected to each of said rotatable means such that the means for rotating, when tensioned, simultaneously rotates said rotatable means in the same direction as each other.

4,732,671

DIESEL FUEL FILTER/WATER SEPARATOR

Donald I. Thornton, Warwick, R.I., and Richard H. Peyton, Berkley, Mass., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 4, 1986, Ser. No. 892,567
Int. Cl.[4] B01D *27/08, 35/18*
U.S. Cl. 210—86 13 Claims



1. Separating device for separating a pair of immiscible components of a liquid mixture, comprising a support housing and a replaceable cartridge, said housing including means for mounting said cartridge on the exterior of said housing, said cartridge including means for effecting coalescence of one of said components, said housing including a sump cavity defined within said support housing, an inlet passage and an outlet passage defined within said support housing, a separating membrane separate from said cartridge and mounted within said support housing, said inlet passage communicating said fluid mixture into said cartridge, said outlet passage communicating one of said components from said cartridge and through said housing, and sealing means defined on said support housing and said cartridge for sealing the support housing to said cartridge, said support housing defining conduit means communicating with said cartridge to communicate the other of said components from said cartridge and into said sump, said cartridge defining a chamber therewithin, said coalescence effecting means including coalescing media in said chamber dividing the chamber into an inlet section communicated with the inlet passage and an outlet section, whereby, after coalescence of said components is effected by said coalescing media, said one component collecting in one portion of the outlet section and said other component collects in another portion of the outlet chamber, said outlet passage communicating with said one portion of the outlet section, the conduit means communicating with the other portion of the outlet section, said coalescing media being an elongated annular array of material for effecting coalescence, said array having an axis, said annular array defining inner and outer circumferences, the inner circumference defining the inlet section and being communicated with the inlet passage, the cartridge including a cartridge housing having an axis coaxial with the axis of said array and having an inner circumference cooperating with the outer circumference of said array to define said outlet section, said axes being oriented so that said other component collects by gravity in said another portion of the outlet section, said axes being oriented sufficiently close to horizontal to permit collection of said other component by gravity in said another portion.

4,732,672

UNIVERSALLY APPLICABLE MOUNTING APPARATUS FOR HIGH PRESSURE LIQUID CHROMATOGRAPHY COLUMNS

Chih-Hen Kiang, and George J. Lee, both of P.O. Box 361932, Milpitas, Calif. 95035-1596

Filed Mar. 26, 1987, Ser. No. 30,676
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 19 Claims



16. A connector assembly for a high pressure liquid chromatography column, comprising:

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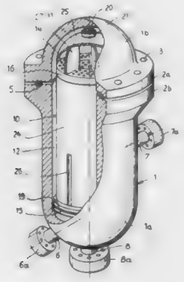
(a) a tubular connector assembly sleeve having a slotted end and a non-slotted end, each end being open and internally threaded, said sleeve having a longitudinal slot extending from the slotted end to adjacent the non-slotted end;
(b) a threaded cap for closing the slotted end of said sleeve;
(c) a tubular ferrule holder having a threaded end for engaging the internal threads of the non-slotted end of said sleeve and a plain end formed with a ferrule seat for receiving a ferrule;
(d) a plastic elastically deformable ferrule mounted in said ferrule seat of the ferrule holder;
(e) an L-shaped tube having two legs, one leg slidably mounted in said ferrule holder and in said ferrule;
(f) a cylindrical tube retainer slidably mounted in said tubular sleeve, said retainer having a radial slot and a circumferential slot, the slots meeting to form an L-shaped cavity for mounting said L-shaped tube such that one leg of said tube is directed coaxially along said tubular sleeve toward the non-slotted end of said tubular sleeve, and the other leg of said tube is directed radially through said longitudinal tubular sleeve slot;
(g) a spherical ball press-fitted in the L-shaped cavity of said tube retainer after said L-shaped tube is inserted to retain said L-shaped tube associated with said slotted cylindrical retainer; and
(h) a coil spring interposed between said threaded cap and said tube retainer for biasing said tube retainer toward said non-slotted end of the sleeve.

4,732,673

DEVICE FOR THE ULTRAFILTRATION OF A PRESSURIZED HIGH-TEMPERATURE LIQUID

Philippe Dagard, Marly Le Roi, and Jacques Riviere, Colombes, both of France, assignors to Framatome, Courbevoie, France

Filed May 29, 1986, Ser. No. 867,985
Claims priority, application France, May 29, 1985, 85 08054
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—247 **6 Claims**



1. Device for ultrafiltrating a pressurized high-temperature liquid the temperature and pressure of which are of the order of 300° C. and 155.10^5 Pa, respectively, having a first, pressure-resistant casing (1) containing an assembly of tubes (14) which form an ultrafiltration wall and which are fastened in a first tube plate (15), at one of their ends constituting an inlet end for a liquid to be filtered, and in a second tube plate (16), at their other end, and a chamber (28) delimited by said first tube plate (15) and said first casing (1), into which opens a pipe (6) supplying said liquid to be filtered, a filtrate discharge pipe (7) and a concentrate discharge pipe (8) likewise opening into said first casing (1), wherein said device comprises, inside said first casing (1), which consists of two separable parts (1*a*, 1*b*), a removable filtration assembly (10) consisting of
(a) a second casing (11) located inside said first casing (1) so as to provide a continuous space (12) between its outer wall and the inner wall of said first casing (1) and on which said tube plates (15, 16) are fastened transversely so as to delimit, inside said second casing (11), a filtration chamber (24) which contains said tubes (14) and which is located between said two tube plates (15, 16) and a distribution chamber (25) downstream of said filtration chamber (24) in the direction of a tube outlet;
(b) a first set of partitions (37) which are fastened inside said second casing (11) in said filtration chamber (24) and which delimit filtrate circulation compartments (24*a*, 24*b*, 24*c*, 24*d*, 24*e*, 24*f*) extending continuously in the axial direction of said tubes (14) between said two tube plates (15, 16), partitions of this first set having orifices (40) at one of their ends, so that each of said compartments (24*a*, 24*b*, 24*c*, 24*d*, 24*e*, 24*f*) communicates with two adjacent compartments at its end adjacent to said first plate (15) or at its end adjacent to said second plate (16), respectively, with the exception of one (24*a*) of said compartments which communicates with a single adjacent compartment (24*b*) and of another compartment (24*f*) which communicates with a single adjacent compartment (24*e*) and with a space (12) which is contained between said two casings and into which opens said filtrate discharge pipe (7); and
(c) a second set of partitions (27) which are fastened on the inside of said concentrate distribution chamber (25) and which delimit compartments (25*a*, 25*b*, 25*c*) each communicating with the ends of a said assembly of tubes (14), an inflow chamber (28) for said liquid to be filtered likewise containing a partitioning (30) fastened to said first casing (1) which delimits compartments (28*a*, 28*b*, 28*c*, 28*d*) each communicating with the ends of a said assembly of tubes (14), said assemblies of tubes (14) communicating with said compartments of said distribution chamber (25) and with said compartments of said inflow chamber (28) respectively being selected so that a circulation with a constant flow of liquid is established in said tubes (14), in one direction or the other, between said inflow chamber (28) and said distribution chamber (25), one (28*d*) of said compartments of said inflow chamber (28) communicating with said concentrate discharge pipe (8).

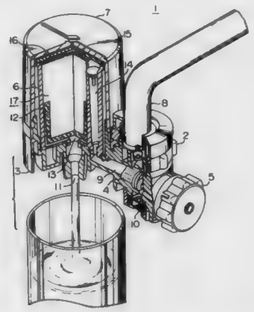
4,732,674

WATER PURIFIER

Kozo Tamura; Syoichi Nihira; Akira Maejima, and Kenzo Mikada, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 805,786, Dec. 6, 1985, abandoned. This application Apr. 3, 1987, Ser. No. 33,893
Claims priority, application Japan, Dec. 6, 1984, 59-256540
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—266 **9 Claims**

1. A water purifier comprising a housing having an inlet for raw water to be purified and an outlet for purified water, said housing containing a cartridge comprising a water purifying material arranged therein so that the raw water to be purified passes through said water purifying material when the raw water to be purified is supplied from the inlet for raw water, characterized in that granular activated carbon having a plurality of pores is employed as said water purifying material, said pores extending from an outer periphery of said granular activated carbon to within the interior of said granular activated carbon and being open to the outside of said granular activated carbon at its periphery; a water-soluble salt selected from the group consisting of calcium carbonate, sodium carbonate and magnesium carbonate is provided on surfaces of the pores within said granular activated carbon so as to permit said water-soluble salt to dissolve into the water; and a fluidic film is provided on the periphery of said granular activated carbon; wherein said water-soluble salt is dissolved in a manner such



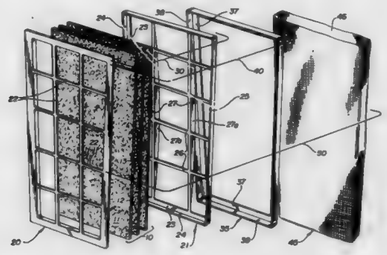
that water filling said pores of said granular activated carbon contains the water-soluble salt in a saturated state.

4,732,675

DENSITY GRADIENT FILTRATION MEDIA

Anthony Badolato, Willingboro, N.J., and Melissa A. Prince, San Francisco, Calif., assignors to McNeilab, Inc., Fort Washington, Pa.

Continuation of Ser. No. 456,649, Jan. 10, 1983, Pat. No. 4,668,394. This application Aug. 7, 1986, Ser. No. 894,222
Int. Cl.[4] B01D *29/14*
U.S. Cl. 210—314 **6 Claims**



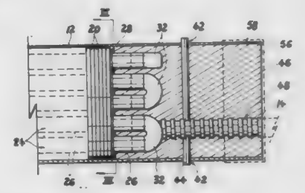
1. Filtration media comprising an upstream fibrous layer. at least one downstream fibrous layer said upstream layer including synthetic fibers having a denier in the range of 4 to 8, said layers having a weight ranging from about 6.5 ounces per square yard to about 11.5 ounces per square yard, a thickness ranging from about 0.035 inch to about 0.080 inch, a mean pore size ranging from about 40–80 microns, and a bubble point of at least about 2.5 inches of water, said downstream fabric including synthetic fibers having a denier in the range of 22–28, said downstream fabric having a weight ranging from about 6.5 ounces per square yard to about 11.0 ounces per square yard, a thickness in the range of about 0.030 inch to about 0.070 inch, a mean pore size in the range of about 35–60 microns, and a bubble point of at least about 4.0 inches of water;
wherein said upstream fibrous layer and said at least one downstream fibrous layer each comprise a needle-loomed, calendered polyester non-woven fabric; and
wherein said upstream fibrous layer and said at least one downstream fibrous layers are held together by mechanical engagement and entanglements of the fibers comprising said layers.

4,732,676

FILTER DEVICE CONTAINING SERIES-CONNECTED FIBROUS TUBE ELEMENTS

Otto Molnár, Strand, and Johan P. Barnard, Wellington, both of South Africa, assignors to Bakke Industries, Paarl, South Africa

Continuation of Ser. No. 535,868, Sep. 26, 1983, abandoned, which is a continuation of Ser. No. 281,177, Jul. 6, 1981, abandoned. This application Nov. 27, 1985, Ser. No. 802,619
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.73 **5 Claims**



1. A liquid filter device which includes:
(a) an elongated tubular housing;
(b) a stack of discs provided in the housing, the discs having holes which are in alignment so as to define a plurality of elongated passages;
(c) separating means separating the discs from each other so as to provide a flow gap between adjacent discs;
(d) an end disc provided at each end in the housing, each end disc having holes which respectively are in alignment with the elongated passages of the stack of discs;
(e) a filter tube provided in each elongated passage and projecting at opposite open ends through and beyond the end discs;
(f) a fluid inlet into the housing to feed fluid into the interior of at least one filter tube;
(g) a fluid outlet to withdraw fluid, which has passed through the filter tubes and into a flow gap between the discs;
(h) U-shaped tubular members provided at both open ends of at least two said filter tubes for interconnecting open ends of filter tubes at both ends of the tubular housing so as to allow series flow to take place from the open end of one filter tube into the end of at least one other filter tube at said ends of the tubular housing via said U-shaped tubular members;
(i) a resin casting provided in situ in the housing at each end of the housing and extending from the respective end disc to encapsulate and seal both the U-shaped tubular members and the exposed surfaces of the ends of the filter tubes extending beyond the end disc and associated with the U-shaped tubular members so as to maintain the U-shaped tubular members in fluid-tight relationship with the interconnected ends of the filter tubes, and so as to seal the U-shaped tubular members in fluidtight relationship relative to the stack of discs and the filter tubes in the tubular housing between the end discs; and
(j) locking means for firmly locking the resin castings in place relative to the housing.

4,732,677

THERMALLY FORMED STACKED DISC FILTER

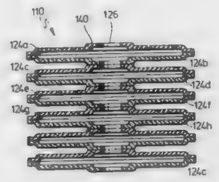
Donald I. Thornton, Warwick, R.I., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 17, 1986, Ser. No. 908,442
Int. Cl.[4] B01D *46/02*
U.S. Cl. 210—347 **7 Claims**

1. Fluid filter element for filtering a fluid filtrate comprising a stack of identical discs, said discs being formed from an air laid, nonwoven batt of randomly arrayed fibers, said batt including a thermoplastic component, said thermoplastic compo-

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nent at least partially fusing the fibers of the batt to define a disc having a stable, predetermined, self-supporting shape so that said stack of discs is structurally self-supporting and does not require supporting structural elements other than the discs themselves, said discs being contoured such that when the discs are stacked upon one another a flow path for the filtrate through the discs is defined both radially and axially with respect to the discs, each of said discs defines an axis and each of said discs including opposed, continuous, uninterrupted



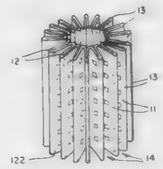
radially extending surfaces on opposite side thereof, each of said surfaces includes portions offset axially from the remainder of the corresponding radially extending surface, said axially offset portions engaging corresponding portions of adjacent discs to define said flow paths between said discs, one of said axially offset portions extending in one axial direction from the outer circumferential surface of the disc and the other axially offset portion extending in the opposite axial direction from the inner circumferential surface of the disc.

4,732,678

FILTER BODY HAVING CLOSELY ADJACENT FILTER MATERIAL

Kingsley E. Humbert, Jr., Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed May 1, 1986, Ser. No. 858,016
Int. Cl.[4] B01D *26/06*
U.S. Cl. 210—440 **28 Claims**



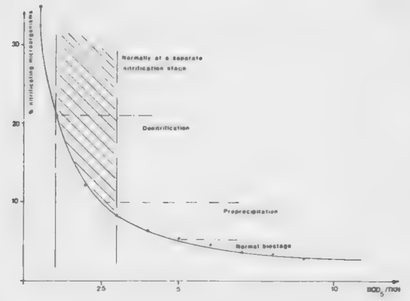
1. A filter device comprising:
an impervious container body open at at least one end thereof;
a pleated filter having a plurality of substantially radially disposed pleats mounted in said container body;
each radially disposed pleat comprising a double layer of filter material with inner folds connecting each pleat to the adjacent pleats;
outer folds of each pleat throughout the length of said pleated filter being in direct contact with the inner surface of said container body for positive support thereby; and
at least one edge of each of the double layers of each of the respective pleats of said pleated filter being sealed together individually.

4,732,679

SEWAGE-WATER PURIFYING PROCESS

Johan L. I. Karlsson, Lidingö , Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 11, 1986, Ser. No. 905,972
Claims priority, application Sweden, Sep. 16, 1985, 8504289
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 **7 Claims**



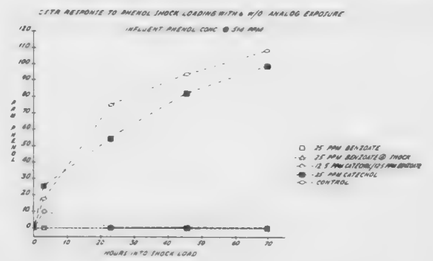
1. A method for purifying water containing organic material by reducing the nitrogen content of the water comprising:
(a) subjecting the water to preprecipitation by adding a multivalent metal salt, separating the precipitate so as to reduce the BOD content by up to 75% and thereby reduce the BOD_5 to total nitrogen content ratio, and subsequently subjecting the water to steps (b) and (c) in any order wherein (b) and (c) are as follows;
(b) subjecting the water to anaerobic fermentation using the organic material in the water as a carbon source so as to reduce nitrate present in the water to nitrogen gas;
(c) subjecting the water to aerobic fermentation while simultaneously stripping nitrogen gas from the water; and
(d) passing bacteria-containing sludge from the aerobic fermentation step to the anaerobic fermentation step.

4,732,680

BIOCHEMICAL CONVERSION PROCESSES

Timothy W. Weaver, Golden, Colo.; Patric L. Friend, and Wilson K. Whitekettle, both of Conroe, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 8, 1985, Ser. No. 732,023
Int. Cl.[4] C02F *3/34*
U.S. Cl. 210—610 **14 Claims**



1. A method of improving the amount and rate of the biodegradation of an undesirable toxic aromatic organo compound to more acceptable, less toxic forms, which comprises under appropriate conditions, exposing in an aqueous medium said compound to a microbial population which is capable of biodegrading the said organo compound to said more acceptable form, the improvement being treating said microbial population with a sufficient amount for the purpose of a chemical which is structurally analogous to said compound, and which chemical, because of its analogous structure to the compound, permits the microbial population to adapt to the chemical and thereby affect the population in such a manner that its degradation capacity for said compound is increased without a substantial attendant increase in population.

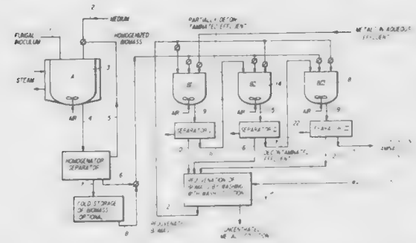
7. A method of improving the amount and rate of the biodegradation of an undesirable toxic phenolic compound to more acceptable, less toxic forms, which comprises under appropriate conditions, exposing in an aqueous medium said compound to a microbial population which is capable of biodegrading the said phenolic compound to said more acceptable form, the improvement being treating said microbial population with a sufficient amount for the purpose of a benzoic acid derivative which is easily degraded by the population and which is structurally analogous to said phenolic compound, and which derivative, because of its analogous structure to the compound, permits the microbial population to adapt to the derivative and thereby affect the population in such a manner that its degradation capacity for said phenolic compound is increased without a substantial attendant increase in population.

4,732,681

REMOVAL OF CONTAMINANTS

Margalith Galun, and Esra Galun, both of Rehovot, Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Ramat, Israel

Filed Apr. 29, 1986, Ser. No. 857,140
Claims priority, application Israel, May 2, 1985, 75073
Int. Cl.[4] C02F *3/32;* **C12R** *1/645*
U.S. Cl. 210—611 **10 Claims**



1. A process for the substantial decrease of heavy metal concentration in industrial effluents which comprises contacting such aqueous effluent for a sufficient period of time with a fungal hyphae biomass of *Cladosporium cladosporioides* Acc. No. 285712, so as to adsorb a large percentage of such heavy metals on said biomass.

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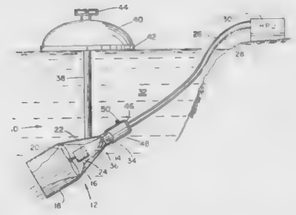
AERATION APPARATUS AND METHOD

Ted R. Rymal, Conroe, Tex., assignor to Poscon, Inc., Conroe, Tex.

Filed Nov. 3, 1986, Ser. No. 926,193
Int. Cl.[4] B01F *3/04;* **C02F** *3/14, 1/74*
U.S. Cl. 210—620 **18 Claims**

1. Apparatus for increasing the dissolved oxygen concentration of a body of waste water to enhance aerobic treatment, comprising:
an outer housing having a restricted waste water inlet, a large opening waste water outlet, and a central axis positionable at an inclined angle in the body of waste water;
the outer housing including an incoming fluid portion defining an interior cavity expanding radially from a fluid inlet end to a fluid discharge end, and having a discharging fluid portion interconnected with the fluid discharge end of the incoming fluid portion for discharging waste water with increased dissolved oxygen concentration through the waste water outlet;
a propeller mounted within the incoming fluid portion and rotatable in a plane substantially adjacent the fluid discharge end of the incoming fluid portion;
adjustable valve means for substantially restricting the flow of waste water through the restricted waste water inlet and to the propeller;
means for introducing an oxygen-containing gas to the interior cavity of the incoming fluid portion; and
drive means for rotating the propeller and causing at least a substantial portion of the interior cavity of the incoming fluid portion to become evacuated of waste water and for intermixing the waste water and oxygen-containing gas to substantially increase the dissolved oxygen in the waste water discharged through the waste water outlet.

13. A method for increasing the gas concentration in a body of water to enhance aerobic treatment utilizing a power-driven propeller rotating in a submerged housing having a fluid inlet and a fluid outlet, the method comprising:



providing the housing with an incoming fluid portion expanding radially from a fluid inlet end to a fluid discharge end;
providing the housing with a discharging fluid portion having substantially a cylindrical configuration;
positioning the housing within the water with the fluid inlet below the surface of the water and the fluid outlet below the fluid inlet;
orienting the housing in the water at an inclined angle;
substantially restricting the flow of water through the fluid inlet and to the propeller;
rotatably mounting the propeller within the incoming fluid portion and adjacent the fluid discharge end of the incoming fluid portion;
rotating the propeller to cause at least a substantial portion of the housing between the fluid inlet and the propeller to become evacuated of water; and
introducing a selected gas to the portion of the housing between the fluid inlet and the propeller to fill the evacuated portion of the housing, whereby the propeller rotates partially in the selected gas and forces gas into the water being discharged from the housing.

4,732,683

PURIFICATION METHOD FOR ALPHA INTERFERON

Jerzy Georgiades, Missouri City, and Marian Kruzel, Houston, both of Tex., assignors to BioSpectrum, Inc., Stafford, Tex.

Filed Dec. 2, 1986, Ser. No. 936,816
Int. Cl.[4] B01D *15/08;* **A61K** *45/02*
U.S. Cl. 210—635 **16 Claims**

1. A method of purifying interferon alpha comprising the steps;
(a) loading a crude interferon alpha solution to a glass sorbent chromatography;
(b) eluting interferon alpha from the glass sorbent with a first hydrophobic electrolyte solution having a pH ranging from about 6 to about 9;
(c) loading the eluate of step (b) to a molecular sieving

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chromatography having a resolution capacity of about 10,000 to about 100,000 molecular weight;

(d) developing the molecular sieve with a second hydrophobic electrolyte solution and collecting the eluate corresponding to a molecular weight ranging from about 10,000 to about 40,000; and

(e) loading the collected eluate of step (d) to a Zn++ chelate resin and collecting the non-adsorbed flow through eluate, which contains purified interferon alpha.

4,732,684

METHOD FOR PREVENTING THE BULKING OF ACTIVATED SLUDGE

Kiyoharu Fujino, Yokkaichi, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,720

Claims priority, application Japan, Dec. 27, 1985, 60-295890

The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.

Int. Cl.⁴ C02F *3/12*

U.S. Cl. 210—631 **4 Claims**

1. A method for preventing the bulking of activated sludge, which comprises adding to the activated sludge a water-soluble cationic polymer having an intrinsic viscosity of at least 0.05 as measured in a 2 M KBr aqueous solution obtained by the reaction of a dialkylamine, ammonia and epichlorohydrin, in an amount of from 0.05 to 25 parts by weight relative to 100 parts by weight of the dried solid content of the activated sludge.

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METHOD OF LIQUID-LIQUID EXTRACTION USING MATERIAL EXCHANGE COLUMNS

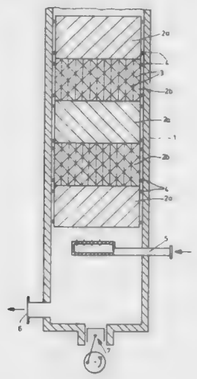
Hans-Walter Brandt, Odenthal; Friedhelm Steffens, Leverkusen; Johannes-Peter Schäfer, Kürten, and Jürgen Schröter, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 2, 1986, Ser. No. 914,223

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 8529714[U]

Int. Cl.⁴ B01D *11/04*

U.S. Cl. 210—634 **7 Claims**



1. A method of liquid-liquid extraction using a material exchange column having an internal column wall with an ordered packing based on a plurality of layers which are stacked parallel to the column axis and make point contact with one another the method comprising employing a packing having a plurality of vertically stacked layers making point contact with one another, said layers having a specific surface area of at least 300 m^2/m^3 of packing volume, conveying at least one continuous phase and one dispersed phase through the packing, consecutively or periodically redirecting the at least one continuous phase and at least one dispersed phase from a peripheral zone of the packing into a center portion of the packing by a plurality of rim seal means, said rim seal means being composed of an elastic material not wettable by the dispersed phase and which are provided for in a form of a tube sealing an annular gap between the packing and the internal column wall, against the packing.

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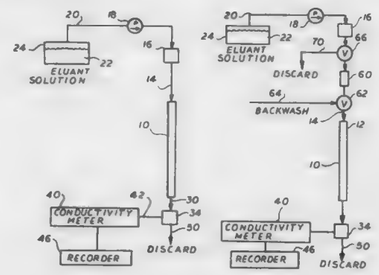
WEAK ELUANT ION CHROMATOGRAPHY

Hamish Small, Leland; Mark E. Soderquist, and James W. Pischke, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1985, Ser. No. 811,144

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—656 **6 Claims**



3. In the method of chromatographic analysis of a plurality of species of ions in sample solutions and including the steps of

introducing into a separator column A a sample solution containing ionic species of interest, containing a resin bed including an ion exchange resin,

adding a developing solution to the sample-containing separator column to resolve ionic species present in the sample solution and to elute the ionic species from the resin bed of the column separator for conductivly detecting the separated ionic species carried through the resin and delivered from the separator column, and for producing visually perceptible indicia of the ionic species,

the improvement wherein the resin in the resin bed comprises a low capacity, high-performance stationary phase retained in the separator column, and

wherein the developing solution for eluting the ionic species of the sample solution comprises a solution of a weakly ionized electrolytes selected from the group consisting of water, pyridine, H_2CO_3, and mixtures thereof, said improvement being characterized in effectively obviating the need for an eluant suppressor column of the type conventionally used for substituting ions of lesser conductivity for highly conductive ions which are ordinarily contained in the eluant and which interfer with conductive detection of ions of interest.

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CHROMATOGRAPHY COLUMN AND PROCESS FOR PACKING SAME

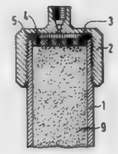
Peter Müller, Darmstadt; Werner Gunkel, Rossdrof; Günther Sättler, Reinheim, and Willi Wintermeyer, Seeheim Jugenheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 782,828, Oct. 2, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,721

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1984, 3536095

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—656 **5 Claims**



1. An improvement in a column used for high pressure liquid chromatography wherein the column includes a tube for containing a sorbent packing; the tube having inlet and outlet ends with coupling joints at each end and a filter at the outlet end, the improvement characterized by:

a supporting framework within the tube adjacent the ends thereof and extending longitudinally from the ends into the tube for retaining the pressurized sorbent stabilized in the tube under pressure even when a coupling joint is removed from the tube;

pressurized sorbent in the tube, the sorbent being introduced by filling the tube with the supporting framework therein under predetermined high pressure by suspending the sorbent material in a carrier liquid, the sorbent material being retained by the filter element while the carrier liquid passes through the filter element substantially unhindered, and

a perforated plate positioned in at least one end of the tube outboard of the framework wherein sorbent under pressure is introduced into the tube through the perforated plate.

4,732,688

EFFLUENT TREATMENT

Stephen J. Bryan, High Shincliffe, and Martyn V. Twigg, Yarm, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 16, 1986, Ser. No. 886,262

Claims priority, application United Kingdom, Jul. 29, 1985, 8519059

Int. Cl.⁴ C02B *1/34*

U.S. Cl. 210—753 **9 Claims**

1. A process for decomposing an oxidising agent in effluent to be oxidatively treated which comprises contacting said effluent with a catalyst bed comprising an intimate mixture of:

(i) at least one finely divided oxide of an element (M) of Group III of the Periodic Table,

(ii) finely divided nickel oxide,

and/or hydrates of said Group III oxide or nickel oxide, supported on pieces of a non-porous substantially inert material, said intimate mixture containing 0.5 to 50% by weight of said Group III oxide (expressed as M_2O_3).

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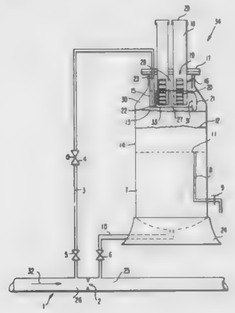
FEEDER ASSEMBLY FOR ADDING DISSOLVABLE AGENT TO A FLOWING LIQUID

Donald J. Harvey; Richard J. Coin, both of Mentor; Homer L. Turley, Painesville, and Bonnie I. Nelson, Mentor, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Mar. 3, 1986, Ser. No. 835,391

Int. Cl.⁴ C02F *1/76*; E04H *3/20*

U.S. Cl. 210—754 **20 Claims**



1. A pressure feeder assembly for adding a controlled dissolution of a dissolvable agent to a flowing liquid, whereby said liquid is brought into controlled contact with said agent in solid form, such as to dissolve agent in said liquid in controlled, proportional manner, the feeder assembly comprising:

a feed conduit connectable to a main liquid conduit comprising a pressure-difference creating device such as a flow restricting orifice providing a high pressure zone and a low pressure zone, the feed conduit leading from said high pressure zone to

a dissolution chamber in which the liquid is brought into controlled contact with at least one feed tube containing stacked tablets of solid dissolvable agent; said dissolution chamber having

a linear weir regulating the liquid level in the dissolution chamber between a maximum flooded and a drained condition such that the liquid level is proportional to the liquid flow rate, said linear weir connecting said dissolution chamber with

a holding chamber for the liquid containing dissolved agent;

a dischange conduit leading from the holding chamber to said low pressure zone of the main conduit; wherein

said holding chamber comprises means for compensating variations of the pressure in the main conduit.

17. A method of adding a solvable agent in controlled manner to a flowing liquid whereby the liquid is brought into contact with said agent in solid form and whereby the final concentration of the agent in the liquid is in a proportional manner indedependent from the flow rate and the pressure of the liquid, the method comprising the steps of:

providing in a main flow of said liquid a pressure reducing device providing a high pressure zone and a low pressure zone therein;

establishing a proportional side flow of said main flow leading to a dissolution chamber in which the liquid is brought into controlled contact with stacked tablets of dissolvable agent contained within a feed tube, said controlled contact being such that an amount of said agent proportional to said main flow is contacted by and dissolved in said liquid;

passing said side flow from within said dissolution chamber through a linear weir providing a liquid level in the dissolution chamber which is proportional to said main flow; and

leading said side flow containing dissolved agent from said linear weir to a pressure compensating holding chamber

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and through a discharge conduit back to the low pressure zone of said main flow.

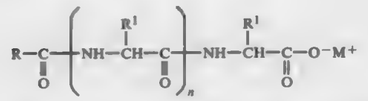
4,732,690

OIL RECOVERY COMPOSITION

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 712,938, Mar. 18, 1985, Pat. No. 4,612,991.
This application Jun. 17, 1986, Ser. No. 908,411
Int. Cl.[4] E21B *43/22*
U.S. Cl. 252—8.554 9 Claims

1. An aqueous saline surfactant composition comprising
(a) sodium chloride brine,
(b) at least one acylated polypeptide salt surfactant represented by the following structural formula:



wherein R is a C_9 to C_{19} alkyl, alkenyl, alkadienyl, or alkatrienyl group from a fatty acid, R^1 is a side chain of amino acids, M is an alkali metal cation, an alkaline earth metal cation, ammonium, or an amine group and n is a positive integer and
(c) at least one cosurfactant selected from the group consisting of (1) hydrocarbon sulfonates selected from the group consisting of petroleum sulfonates, olefin sulfonates and alkyl sulfonates having an equivalent weight of from about 225 to about 600, and (2) an alcohol having 1–12 carbon atoms per molecule or an alcohol of 4–20 carbon atoms per molecule which has been ethoxylated or propoxylated with an average of 1–8 ethylene oxide or propylene oxide units per molecule or mixtures of two or more of said alcohols.

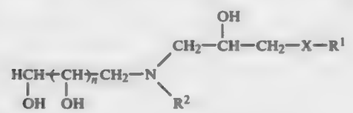
4,732,691

LUBRICANT COMPOSITIONS, NOVEL GLUCAMINE DERIVATIVES AND COMPLEX COMPOUNDS CONTAINING SAME

Hermann O. Wirth, Bensheim, and Hans-Helmut Friedrich, Lautertal, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,953
Claims priority, application Switzerland, Jun. 21, 1985, 2648/85; Jul. 2, 1985, 2818/85
Int. Cl.[4] C10M *129/04, 133/08*
U.S. Cl. 252—47.5 7 Claims

1. A composition comprising a lubricant and about 0.01 to 5% by weight of at least one compound of the formula



(I)

wherein n is 2, 3 or 4, X is —S—, —O—, —O—CO— or —CH_2—, R^1 is C_1–C_{22}alkyl, C_5–C_6cycloalkyl or phenyl, and R^1 is hydrogen, C_1–C_8-alkyl, C_2–C_4-alkyl which is substituted by an —OH group, or a group of the formula —CH_2—CH(OH)—CH_2—X—R^1, wherein X and R^1 have the given meanings.

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COSMETIC CLEANSING COMPOSITION

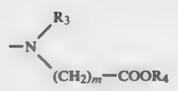
Arlette Zabotto, Paris, and Jean-Claude Contamin, Morangis, both of France, assignors to L'Oreal, Paris, France

Filed Apr. 23, 1986, Ser. No. 854,817
Claims priority, application France, Apr. 23, 1985, 85 06125
Int. Cl.[4] C11D *3/48*
U.S. Cl. 252—106 16 Claims

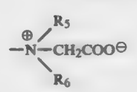
1. Cosmetic composition for removing eye make-up consisting essentially of an aqueous solution of a mixture of surface active agents said mixture comprising:
(1) from 0.05 to 3% by weight of at least one amphoteric surface-active agent selected from
(a) the compounds of formula (I):

(I)

in which:
n is from 1 to 3;
R_1 denotes a fatty chain containing from 7 to 17 carbon atoms; and
R_2 denotes a residue of formula (II) or (III):

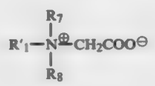


(II)



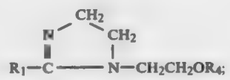
(III)

in which:
m is 1 or 2;
R_5 denotes a residue —$CH_2CH_2Or_4$ or a residue —$CH_2CH_2OCH_2CH_2COOR_4$;
R_4 denotes a hydrogen atom or an alkali metal;
R_5 denotes a C_1–C_2 alkyl or hydroxyalkyl residue; and
R_6 denotes a C_1–C_2 alkyl or hydroxyalkyl residue or a residue —$(CH_2)_mCOOR_4$,
(b) the compounds of formula (IV):

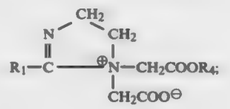


(IV)

in which:
R'_1 denotes a fatty chain containing from 8 to 18 carbon atoms;
R_7 and R_8 denote, independently, a C_1–C_2 alkyl residue; and
(c) the compounds of formula (V), (VI) or (VII):

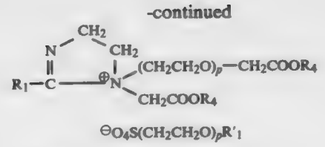


(V)



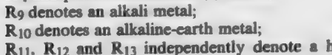
(VI)

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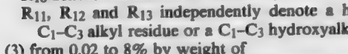


(VII)

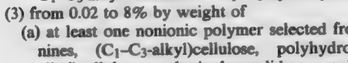
in which
R_1, R'_1 and R_4 are as defined in (a) and (b) above; and p is from 0 to 4;
(2) from 0.05 to 3% by weight of at least one anionic surface-active agent selected from the compounds of formula (VIII), (IX), (X) and (XI):



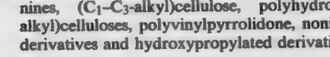
(VIII)



(IX)



(X)



(XI)

in which:
R'_1 and p are as defined in (1) above;
R_9 denotes an alkali metal;
R_{10} denotes an alkaline-earth metal;
R_{11}, R_{12} and R_{13} independently denote a hydrogen, a C_1–C_3 alkyl residue or a C_1–C_3 hydroxyalkyl residue;
(3) from 0.02 to 8% by weight of
(a) at least one nonionic polymer selected from polyalanines, (C_1–C_3-alkyl)cellulose, polyhydroxy-(C_1–C_3-alkyl)celluloses, polyvinylpyrrolidone, nonionic starch derivatives and hydroxypropylated derivatives of guar gum,
(b) at least one anionic polymer taken from the group consisting of polyacrylamides containing carboxylate groups, polyacrylamidosulphonic acid and its salts, and the polymers and homopolymers of acrylic or methacrylic acid and their salts, with a molecular weight of less than 100,000,
or
(c) a mixture of polymers (a) and (b) provided that the total concentration of the surface active agents in the composition does not exceed 5% by weight, the above percentages being calculated relative to the total weight of the composition.

4,732,693

SOAP-NONIONIC DETERGENT COMPOSITIONS CONTAINING A CELLULOSE ETHER ANTI-REDEPOSITION AGENT

Andrew T. Hight, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,589
Claims priority, application United Kingdom, Jul. 29, 1985, 8519046
Int. Cl.[4] C11D *3/22, 3/37, 9/26, 10/04*
U.S. Cl. 252—132 6 Claims

1. A detergent composition for washing soiled fabrices without undue redeposition of soil and without the use of substantial amounts of phosphate builders, said composition comprising:
(i) from 20 to 50% by weight of a soap selected from water-soluble alkali metal salts of C_8–C_{26} fatty acids;
(ii) from 5 to 25% by weight of a nonionic detergent active compound selected from ethoxylated C_7–C_{22} primary and secondary alcohols, the weight ratio of said soap to said nonionic detergent active compound being from 1:1 to 10:1;
(iii) from 0.05 to 5% by weight of a cellulose ether selected from alkyl/hydroxyalkyl cellulose dervicatives in which the average number of substituent groups per anhydroglucose unit is from 1.5 to 3.0, the alkyl substituent groups containing 1 to 4 carbon atoms and the hydroxyalkyl groups containing 2 to 4 carbon atoms wherein the degree of substitutiton of alkyl groups is from about 0.8 to about 1.9 and the degree of substititution of hydroxyalkyl groups is from about 0.1 to about 1.0 per anhydroglucose unit; and
(iv) from 0 to 10% by weight of a phosphate builder selected from water-soluble alkali metal pyrophosphates, polyphosphates and phosphonates,
said percentages being by weight of the overall composition, and said composition being free of other synthetic surfactants.

4,732,694

SUDS SUPPRESSOR COMPOSITIONS AND THEIR USE IN DETERGENT COMPOSITIONS

Maxim S. Gowland, Keyingham; Stephen A. Johnson, East Boldon, and Russell Pell, Kenton Bank Foot, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 639,966, Aug. 10, 1984, abandoned.
This application Jul. 2, 1986, Ser. No. 881,584
Claims priority, application United Kingdom, Aug. 27, 1983, 8323131
Int. Cl.[4] C11D *1/17*
U.S. Cl. 252—174.21 6 Claims

1. A process for preparing a suds suppressor composition, said process comprising the steps of
(a) forming a high shear mix of polydimethylsiloxane and hydrophobic silica suds suppressing agents in a weight ratio of polydimethylsiloxane to hydrophobic silica in the range from 75:25 to about 99:1, the polydimethylsiloxane having a viscosity at 25° C. in the range from about 20 to about 12,500 cs,
(b) forming a dispersion of (i) the product of step (a) and (ii) polydimethylsiloxane suds suppressing agent having a viscosity at 25° C. of at least about 25,000 cs in (iii) a water-soluble or water-dispersible organic carrier, the combination of (i) and (ii) having a viscosity at 25° C. of at least about 18,000 cs, said water-soluble or water-dispersible organic carrier comprising from about 1% to 100% by weight of a first organic carrier component having a melting point in the range from about 38° C. to about 90° C., and from 0% to about 99% by weight of a second organic carrier component selected from the group consisting of ethoxylated nonionic surfactants having a hydrophilic-lipophilic balance (HLB) in the range from about 9.5 to about 13.5 and a melting point in the range from about 5° C. to about 36° C.

4,732,695

PAINT STRIPPER COMPOSITIONS HAVING REDUCED TOXICITY

Roland L. Francisco, Walnut, Calif., assignor to Texo Corporation, Cincinnati, Ohio

Filed Feb. 2, 1987, Ser. No. 9,937
Int. Cl.[4] C11D *7/50*
U.S. Cl. 252—162 13 Claims

1. A paint stripper and coatings remover composition consisting essentially of a mixture of effective amounts of benzyl alcohol, an aromatic naphtha, and a substance selected from the group consisting of N-methyl 2-pyrrolidone and N-vinyl 2-pyrrolidone.

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4,732,696

MONOGLYCOSIDES AS VISCOSITY MODIFIERS IN DETERGENTS

Allen D. Urfer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 796,674, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 668,762, Nov. 6, 1984, abandoned. This application May 22, 1987, Ser. No. 54,127
Int. Cl.[4] C11D 3/06
U.S. Cl. 252—174.17 17 Claims

1. A liquid detergent composition comprising:
(a) from about 5% to about 30% by weight of an anionic surfactant;
(b) from about 1% to about 5% by weight of a monoglycoside containing 8 to 30 carbons in the hydrophobic moiety;
(c) about 2% by weight of ammonium chloride; and
(d) from about 30% to about 95% by weight of water, and wherein
(e) the content, if any, of glycoside compounds having a degree of polymerization, D.P. of 2 or more within said composition is such that the average D.P. of all glycoside compounds within said composition is less than 1.4 and (ii) the pH of said composition is from 5 to 5.5.

4,732,697

DETERGENT COMPOSITION FOR CLEANING DYEING MACHINE

Naoki Kyochika, and Shigeru Nagao, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 30, 1986, Ser. No. 857,917
Claims priority, application Japan, May 17, 1985, 60-105675
Int. Cl.[4] C11D 11/00
U.S. Cl. 252—174.24 12 Claims

1. In a method for removing residual dyes and water impurity residues comprising contacting the surfaces of a dyeing machine with a detergent composition, the improvement wherein said detergent composition comprises
(a) a water-soluble or water-dispersible polymer of an unsaturated carboxylic acid monomer or a polymerizable derivative thereof and
at least one of (b-1) an alkylene oxide adduct of an aliphatic compound or an aromatic compound, (b-2) a sulfonate of a monocyclic compound or a condensed polycyclic compound or (b-3) an aliphatic aldehyde condensate of said sulfonate.

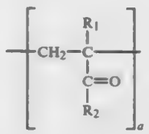
4,732,698

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

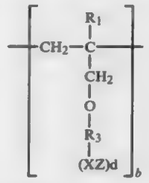
Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a division of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Feb. 10, 1987, Ser. No. 12,926
Int. Cl.[4] C02F 5/14
U.S. Cl. 252—181 7 Claims

1. A composition for providing a protective passive oxide film on the surface of a metallic part in contact with an aqueous medium with little or no attendant deposition of scale on said part, said composition comprising a water soluble polymer comprising repeat unit moieties (a) and (b) wherein said repeat unit (a) comprises the structure



and wherein said repeat unit (b) comprises the structure



wherein each R_1 is independently H or lower alkyl (C_1–C_3), R_2 is OH or OM, M is a water soluble cation, R_3 is a hydroxy substituted alkylene radical having from 1 to about 6 carbon atoms, X is SO_3, Z is H or a water soluble cation or cations, and d is 1, the molar ratio a:b of said polymer being between about 30:1 to 1:20, a water soluble orthophosphate compound, the ratio on a weight basis of the polymer to the orthophosphate expressed as PO_4^{-3} being from about 1:8 to 4:1, and a polyphosphate compound, the weight ratio of orthophosphate to polyphosphate on a PO_4^{-3} to PO_4^{-3} basis being from about 15:1 to about 1:3.

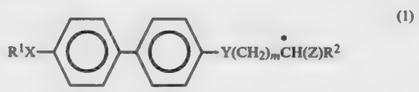
4,732,699

BIPHENYL CARBONIC ACID ESTER COMPOUNDS AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Ryoichi Higuchi, Tokyo; Takao Sakurai, Kawasaki; Naoko Mikami, Yokohama; Kiriko Akaiwa, Tokyo, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 878,798
Claims priority, application Japan, Jul. 1, 1985, 60-144136; Jan. 28, 1986, 61-16060
Int. Cl.[4] G02F 1/13; C07C 69/96; C09K 19/12
U.S. Cl. 252—299.66 4 Claims

1. A liquid crystal compound represented by the following general formula (1):



(1)

wherein R^1 represents C_{6-14} alkyl group, R^2 represents straight or branched alkyl group with or without optically active carbon, X represents a group selected from —OCOO—, —O—, —COO—, —OCO— or single bond, Y represents a group selected from —$COOCH_2$—, —OCO— or —OCOO—, in which either X or Y is at least —OCOO— group, m represents 0 or 1, Z represents a chlorine or bromine, a carbon atom marked with * represents optically active carbon atom.

4,732,700

PARTIAL OXIDATION OF VANADIUM-CONTAINING HEAVY LIQUID HYDROCARBONACEOUS AND SOLID CARBONACEOUS FUELS

Mitri S. Najjar, Hopewell Junction, N.Y.; Michael W. Becker, Los Alamitos, and John S. Stevenson, Gardena, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,375
Int. Cl.[4] C10J 3/46
U.S. Cl. 252—373 56 Claims

1. In a partial oxidation process for the production of gaseous mixtures comprising H_2+CO in the reaction zone of a down flowing gas generator, the improvement comprising:
(1) mixing together the following materials to produce a feed mixture (i) a vanadium-containing fuel whose ash includes a minimum of 2.0 weight % of vanadium selected from the group consisting of liquid hydrocarbonaceous fuel, a slurry of solid carbonaceous fuel, and mixtures thereof; (ii) supplemental copper-containing additive; and (iii) at least a portion of the remainder of the copper-containing slag after separation of the coarse slag fraction in (5);
(2) reacting by partial oxidation in a refractory-lined free-flow unpacked reaction zone of said gas generator the vanadium-containing feed mixture from (1) with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H_2+CO along with vanadium-containing molten slag comprising a liquid phase washing agent that collects and transports vanadium-containing laths and spinels and other ash components and refractory out of the reaction zone;
(3) passing the hot raw effluent gas stream from (2) down through a coaxial discharge passage in the bottom of the reaction zone of said gas generator and then into a connecting slag separation chamber that is provided with a bottom outlet; depositing a portion of the slag entrained in said hot raw gas stream on the walls of said separation chamber and building up the thickness of said slag on the walls of said chamber until chunks of slag having a diameter in the range of about ¼ inch to 10 inches and a Cu/V weight ratio which is less than that of the feed mixture in (1) separate from the wall and fall into quench water contained in a quench tank located below the bottom outlet in said separation chamber;
(4) passing through said quench tank at least a portion of the hot effluent gas stream leaving said slag separation chamber to produce said gaseous mixture comprising H_2+CO, and solidifying molten slag and separating out in said quench tank slag and particulate matter that were entrained in said hot raw gas stream; and
(5) passing the water and solids from the bottom of said quench tank into a water-solids separation zone; removing a portion of the water from said vessel and recycling said water to the quench tank; and separating a coarse copper-containing slag fraction from the remainder of the slag and recycling said remainder of the slag to (1); wherein said coarse slag fraction has a Cu/V weight ratio which is less than that of the feed mixture in (1).

4,732,701

POLYMER COMPOSITION HAVING POSITIVE TEMPERATURE COEFFICIENT CHARACTERISTICS

Motoi Nishii, Ohmihachiman; Hitoshi Miyake, and Hideto Fujii, both of Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 934,495
Claims priority, application Japan, Dec. 3, 1985, 60-270700
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—511 13 Claims

1. A polymer composition having positive temperature coefficient characteristics, comprising 100 parts by weight of a mixture consisting of from 40 by 90% by weight of a crystalline polymer and from 60 to 10% by weight of an electrically conductive powder having a particle diameter of from 10 to 200 μm and from 10 to 300 parts by weight of a semiconductive inorganic substance having a specific resistance of from 10^{-2} to 10^{8} ohm-cm and a particle diameter of not more than 300 μm.

3. A polymer composition having positive temperature coefficient characteristics, comprising 100 parts by weight of a mixture consisting of from 40 to 90% by weight of a crystalline polymer and from 60 to 10% by weight of an electrically conductive powder having a particle diameter of from 10 to 200 μm and from 10 to 300 parts by weight of a semiconductive inorganic substance having a specific resistance of from 10^{-2} to 10^{8} ohm-cm and a particle diameter of not more than 300 μm;
said crystalline polymer being high density polyethylene, low density polyethylene, polypropylene, ethylene-propylene copolymer, ethylene-vinylacetate copolymer, polyamide, polyester or fluorine containing ethylene-based polymers, or a combination thereof;
said electrically conductive powder being carbon black, graphite, metal powders, powdered carbon fibers or a mixture thereof; and
said semiconductive inorganic substance being silicon carbide, boron carbide or titanium black or a mixture thereof.

4,732,702

ELECTROCONDUCTIVE RESIN PASTE

Mitsuo Yamazaki, and Iwao Maekawa, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,488
Claims priority, application Japan, Feb. 13, 1986, 61-29782
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—512 13 Claims

1. An electroconductive resin paste, comprising a resin obtained by reacting 0.01 to 0.5 carboxylic acid equivalent of a homopolymer or a copolymer of butadiene having carboxylic acid terminal groups with 1 epoxy equivalent of an epoxy resin having two or more epoxy groups in one molecule, a curing agent and an electroconductive filler which is (i) an electroconductive metal powder or (ii) an inorganic insulating powder coated with a surface electroconductive film, said electroconductive filler being in an amount of from 60 to 95% by weight based on the resin and the electroconductive filler.

4,732,703

LIQUID DETERGENT COMPOSITIONS CONTAINING STABILIZERS TO PREVENT PHASE SEPARATION

Frederik van Voorst Vader, Vlaardingen; Wilhelmina K. Toet, The Hague, and Johannes C. van de Pas, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

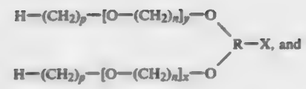
Continuation of Ser. No. 697,827, Feb. 4, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 14,102
Claims priority, application United Kingdom, Feb. 16, 1984, 8404120
Int. Cl.[4] C11D 3/04, 3/34, 3/36, 17/08
U.S. Cl. 252—532 10 Claims

1. An aqueous liquid detergent composition having suspending properties which comprises:
(1) from 5 to 50% by weight of detergent-active mixture consisting essentially of:
(a) a detergent-active material selected from the group consisting of nonionic detergent-active materials and anionic derivatives of polyalkoxylated nonionic detergent-active materials, and
(b) a detergent-active material selected from the group consisting of anionic detergent-active materials other than component (a) and cationic detergent-active materials, the weight ratio between component (a) and component (b) being within the range of 1:5 to 1:1;
(2) from 3 to 50% by weight of one or more salting-out electrolytes selected from the group consisting of the alkali metal and ammonium orthophosphates, -pyrophosphates, -tripolyphosphates, -silicates, -borates, -carbonates, -sulphates, -citrates, -nitrilotriacetates and -carboxymethyloxysuccinates in an amount that would cause the component (1) surfactants to salt out during a storage period of 14 days or less in the absence of component (3); and
(3) from 0.1 to 30% by weight of a stabilizing compound or mixture of stabilizing compounds selected from the group consisting of:
(I) anionic alkylpolyalkyleneoxide derivatives having the formula

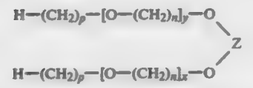
$$Y—(CH_2)_p—[O—(CH_2)_n]_s—O—(CH_2)_q—X,$$

(II) anionic di(alkylpolyalkyleneoxide) derivatives having the formula:

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(III) anionic di(alkylpolyalkyleneoxide) derivatives having the formula:



in which Y is a salt of a mono-valent oxygen-containing anionic group, Y is hydrogen or a salt of a mono-valent oxygen-containing anionic group, Z is a phosphate or phosphonate salt, R is C_1–C_3 alkynyl, q is 0–4, p is 0–4, z is 4–10, x is 0–10, y is 0–10 and x+y is 4–10 and n is 2–3, said stabilizing compound being present in an amount sufficient to prevent phase separation for a storage period of at least 60 days.

4,732,704

MANUAL DISHWASHING LIQUID DETERGENT CONTAINING FATTY ALKYLMONOGLUSIDE

Manfred Biermann, Muelheim; Martin Bischoff, Erkrath; Ortburg Guirr, Krefeld; Peter Sandkuehler, Hilden; Harald Schnegelberger, Leichlingen; Karl-Heinz Schmid, Mettmann; Klaus Schumann, Erkrath; Eric Sung, Monheim, and Klaus-Dieter Wisotzki, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,690

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 3534082

Int. Cl.[4] C11D *1/14, 1/83*

U.S. Cl. 252—548 7 Claims

1. A liquid manual dishwashing detergent composition comprising from about 2 to about 25% by weight of an anionic surfactant selected from the group consisting of a C_{12}–C_{14} alkyl sulfate and a C_{12}–C_{14} alkyl ether sulfate, from about 1 to about 15% by weight of a fatty acid alkanolamide, and from about 2 to about 25% by weight of a fatty alkylmonoglucoside containing about 1 glucose unit per fatty alkyl group, based on the weight of said detergent composition.

4,732,705

PROCESS FOR THE IMPROVEMENT OF THE STABILITY PROPERTIES OF SOLIDIFIED RADIOACTIVE ION EXCHANGE RESIN PARTICLES

Dietrich Laske, Zurich, and Lothar Döhring, Hettenschwil, both of Switzerland, assignors to Gesellschaft zur Förderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen, Bern, Switzerland

Filed Nov. 12, 1985, Ser. No. 796,747

Claims priority, application Switzerland, Nov. 12, 1984, 5407/84

Int. Cl.[4] G21F *9/16, 9/08*

U.S. Cl. 252—628 10 Claims

1. In a method of packaging radioactive anion and/or cation exchange resin particles for shipment or storage wherein the resin particles are added to a cement mixture so as to form a cement matrix and the cement matrix is then allowed to solidify, the improvement comprising adding a chemically affecting additive to said resin particles and/or heating said resin particles prior to or during the solidification of said cement matrix to reduce their swelling factor to below 1.7, said swelling factor representing the quotient of the settled volume of said resin particles in a water-moistened, swelled state and the settled volume of said resin particles in a dry state, thus reducing the swelling and shrinking properties of said resin particles to such an extent that an increased amount of said resin particles can be added to said cement mixture per unit volume without reducing the water resistance of the solidified cement matrix to an unacceptable level.

4,732,706

METHOD OF PREPARING LOW VISCOSITY, ELECTRICALLY CONDUCTIVE FERROFLUID COMPOSITION

Lucian Borduz, Nashua, and Kuldip Raj, Merrimack, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Division of Ser. No. 875,985, Jun. 19, 1986, Pat. No. 4,687,596, which is a continuation-in-part of Ser. No. 713,757, Mar. 19, 1985, Pat. No. 4,604,229, which is a continuation-in-part of Ser. No. 736,388, May 21, 1985, Pat. No. 4,604,222, which is a continuation-in-part of Ser. No. 773,627, Sep. 9, 1985, Pat. No. 4,673,997. This application May 26, 1987, Ser. No. 54,412

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—510 13 Claims

1. A method of preparing a low viscosity, electrically conductive ferrofluid composition, which method comprises:

(a) dispersing magnetic particles in an amount sufficient to provide magnetic properties in a polar liquid carrier in the presence of a surfactant to provide a ferrofluid composition;

(b) the improvement which comprises:

(i) adding to the ferrofluid composition a dissociation or ionizing amount of a dissociation or ionizing agent for the surfactant to provide a ferrofluid composition having an electrical resistivity of 1×10^7 ohms-centimeters or less, the agent consisting of an oxygen-containing agent selected from a group consisting of an alkylene polyol, an ether of an alkylene polyol and combinations thereof.

4,732,707

DETERGENT COMPOSITIONS CONTAINING SPECIAL ALKYL ETHER SULPHATE IN COMBINATION WITH ALKYLBENZENE SULPHONATE AND/OR DIALKYL SULPHOSUCCINATE ESTERS

Appaya R. Naik, Birkenhead, England, and Francesco M. Orlandini, Codogno, Italy, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 764,169, Aug. 9, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 14,137

Claims priority, application United Kingdom, Aug. 17, 1984, 8420945

Int. Cl.[4] C11D *1/29, 1/75*

U.S. Cl. 252—548 9 Claims

1. A foaming detergent composition comprising from 2 to 95% by weight of an active detergent system consisting essentially of:

(a) a linear C_8–C_{14} alkylbenzene sulphonate and/or a C_4–C_{10} dialkyl sulphosuccinate, and

(b) an alkyl ether sulphate of the formula I

$$R_1—O—(CH_2CH_2O)_n—SO_3X_1 \quad (I)$$

wherein R_1 is an alkyl group, the average degree of ethoxylation n is from 2 to 7 and X_1 is a solubilising cation, the alkyl ether sulphate of the formula I consisting substantially wholly of material in which the group R_1 has 12 to 13 carbon atoms, and comprising at least 55% by weight of material in which the group R_1 is branched at the 2-position, and comprising at least 35% by weight of material in which the group R_1 carries at the 2-position an alkyl group containing 2 or more carbon atoms,

the weight ratio of (a) to (b) being within the range of from 2:1 to 0.5:1.

4,732,708

METHOD FOR CONVERTING VEGETABLE MATERIAL INTO CHEMICALS

Rainer Ekman; Christer Eckerman, both of Turku; Tapio Mattila, and Elias Suokas, both of Espoo, all of Finland, assignors to Kemira Oy, Helsinki, Finland

Filed Feb. 20, 1986, Ser. No. 832,091

Claims priority, application Finland, Mar. 4, 1985, 850863

Int. Cl.[4] C11B *3/08;* C07C *51/16, 51/295, 67/39*

U.S. Cl. 260—413 10 Claims

1. Method for converting suberin and cutin type biopolyesters comprising straight chain hydroxyacid monomers containing 10 to 40 carbon atoms into a plain mixture of organic acids and their salts containing only a few main components, characterized in that the conversion is carried out by depolymerization with acid or alkali and by oxidation with a strong oxidant or strong alkali at elevated temperature.

4,732,709

PREPARATION OF OPTICALLY-ACTIVE DI-(3-CHLORO-2-OXY-PROPYLTRIMETHYLAMMONIUM)-TARTRATE

Leander Tenud, Visp, and Jacques Gosteli, Basel, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Division of Ser. No. 832,760, Feb. 25, 1986, Pat. No. 4,692,543, which is a continuation-in-part of Ser. No. 717,547, Mar. 29, 1985, abandoned. This application Jun. 24, 1986, Ser. No. 877,786

Claims priority, application Switzerland, Apr. 4, 1985, 1704/84

Int. Cl.[4] C07C *87/30*

U.S. Cl. 260—501.15 6 Claims

1. Process for the production of di-[(−)-3-chloro-2-oxypropyltrimethylammonium]-L-(+)-tartrate comprising converting racemic 3-chloro-2-oxypropyltrimethylammonium-chloride by racemate resolution with L-(+)-tartaric acid in the presence of a trialkyl amine into the di-[(−)-3-chloro-2-oxypropyltrimethylammonium]-L-(+)-tartrate.

4,732,710

PROCESS FOR THE PREPARATION OF AN ANHYDROUS AND AQUEOUS 3-CHLORO-2-SULFOPROPIONIC ACID REAGENT AND ISOLATION OF THE CRYSTALLINE ACID

Martin M. Tessler, Edison, and Dennis V. Neigel, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 306,129, Sep. 28, 1981, Pat. No. 4,438,047, which is a continuation-in-part of Ser. No. 208,371, Nov. 19, 1980, abandoned. This application Nov. 21, 1983, Ser. No. 553,463

Int. Cl.[4] C07C *143/02*

U.S. Cl. 260—513 R 3 Claims

1. A composition of matter, comprising crystalline 3-chloro-2-sulfo-propionic acid.

4,732,711

HERBICIDAL NOVEL 1-(2-TRIFLUOROMETHOXY-PHENYLSULPHONYL)-3-HETEROARYL-(THIO)UREAS

Hans-Joachim Diehr; Carista Fest, both of Wuppertal; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Wolfgang Roy, Langenfeld; Hans-Joachim Santel, Cologne; Robert R. Schmidt, Bergisch Gladbach; Ludwig Ese, Leverkusen, and Ernst Kysela, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

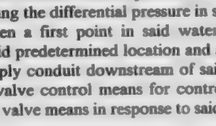
Division of Ser. No. 769,186, Aug. 23, 1986. This application May 30, 1986, Ser. No. 868,962

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 34319174

Int. Cl.[4] C07C *154/00;* C07D *251/02*

U.S. Cl. 260—545 R 1 Claim

1. The compound 2-trifluoromethoxy-phenylsulphonyl isocyanate of the formula



4,732,712

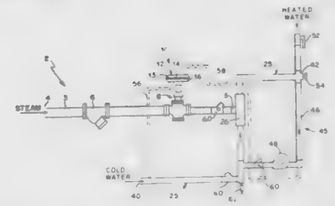
STEAM INJECTION WATER HEATER

Gregory Burnham, Andover; Jack Kahrs, Denville, both of N.J., and Anthony T. Posluszny, Land O'Lakes, Fla., assignors to Leslie Controls, Inc., Tampa, Fla.

Filed May 28, 1987, Ser. No. 55,010

Int. Cl.[4] G05D *11/00*

U.S. Cl. 261—64.3 16 Claims



1. Apparatus for controlling the temperature of a supply of water comprising a water supply conduit including a water inlet end and a water outlet end, a steam supply conduit for supplying steam to said water supply conduit at a predetermined location between said water inlet end and said water outlet end, steam supply control valve means for controlling the supply of said steam to said water supply conduit at said predetermined location thereon, pressure differential sensing means for sensing the differential pressure in said water supply conduit between a first point in said water supply conduit upstream of said predetermined location and a second point in said water supply conduit downstream of said predetermined location, and valve control means for controlling said steam supply control valve means in response to said sensed differential pressure.

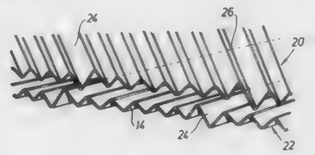
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,713

INSERTABLE CONTACT BODY

Lars Korsell, Sollentuna, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Sep. 23, 1985, Ser. No. 779,232
Claims priority, application Sweden, Oct. 3, 1984, 8404959
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—112 8 Claims



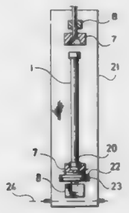
1. An insertable contact body for e.g. scrubbers, heat exchangers, cooling towers or the like, which contact body comprises sheets provided with folds or corrugations and which are disposed adjacent one another in such a manner that the folds in adjacent sheets form an angle with each other, characterized in that the sheets are provided with distance members by means of which they are kept at such a distance from one another that at least a major portion of those folds in adjacent sheets which form an angle with each other are positioned with an interspace between their crests without bearing against one another, wherein the sheets in the substantially major part of their edge portions are formed with edge folds which have greater fold height than the other folds in the contact body and that these edge folds bear against one another in adjacent sheets, and wherein the edge folds are aligned with and constitute continuations of the other folds of the sheets.

4,732,714

METHOD AND APPARATUS FOR CENTRIFUGAL CASTING OF CONTACT LENSES IN OPEN MOLDS

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 1, 1985, Ser. No. 718,401
Claims priority, application Czechoslovakia, Apr. 20, 1985, 2990-84
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 5 Claims



1. A method for producing a contact lens which comprises:
(a) providing a column of molds, each mold containing a polymerizable mixture therein, within a tube which provides a close fit with the column of molds, the tube being provided with airtight seals at each end;
(b) alternately evacuating the tube and filling the tube with an inert gas to remove oxygen-containing gas from the tube;
(c) rotating the sealed tube at 0.5 to 10 revolutions per minute for from 2 to 10 minutes around the axis of the column of molds while periodically tilting the tube to an angle of 60° measured from above the horizontal plane to as much as 10° below the horizontal plane;
(d) rotating the tube in the vertical position at 300 to 450 revolutions per minute while subjecting polymerizable mixture within molds contained in the tube to polymerization-initiating energy until at least the gel state is achieved; and,
(e) storing the sealed tube for a period to complete polymerization.

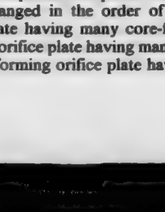
4. Apparatus for producing a contact lens which comprises:
(a) a tube with airtight seals at both ends, said tube accommodating in close-fitting relationship a quantity of molds containing polymerizable mixture;
(b) means for adjusting the angle of the tube from a vertical position to 10° below the horizontal plane;
(c) means for rotating the tube at a predetermined rate; and,
(d) means for initiating the polymerization of the polymerizable mixture in molds contained in the tube.

4,732,715

MANUFACTURE OF POLYMERIC CONTACT LENSES

Rajan Bawa, Fairport, and William G. Deichert, Macedon, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,351
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 7 Claims



7. A method of spin casting a contact lens of a desired surface configuration which comprises:
placing a quantity of polymerizable monomer on a mold surface,
irradiating said monomer on said mold surface with actinic radiation of wavelength and intensity effective to polymerize said monomer,
the irradiation of said monomer being through a mask pattern having shadow areas and clear areas where said mask is fixed relative to said mold surface and where said mask pattern controls the configuration of the lens said clear areas of said mask corresponding to relatively thick lens portions and said shadow areas corresponding to relatively thin lens portions,
the conditions of irradiating being such that in the regions of the monomer which correspond to the shadow areas of the mask the monomer is polymerized at a rate slower than in the regions corresponding to the clear areas of the mask.

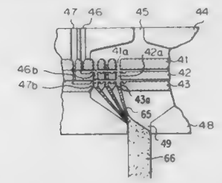
4,732,716

PROCESS FOR PREPARATION OF MULTIFILAMENT OPTICAL FIBERS

Kenichi Sakunaga; Hiroshi Terada, both of Otake; Takashi Yamamoto, Saiki, and Yasuteru Tahara, Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Jun. 30, 1986, Ser. No. 879,942
Claims priority, application Japan, Jun. 28, 1985, 60-143002; Jun. 29, 1985, 60-142985; Jun. 29, 1985, 60-99993[U]
Int. Cl.[4] B29D *11/00*; G02B *6/00*
U.S. Cl. 264—1.5 10 Claims

1. A process for the preparation of an islands-in-a-sea type multifilament optical fiber having 1,000 to 10,000 islands as optical filaments, which comprises using a composite spinning spinneret for the preparation of an islands-in-a-sea type multifilament fiber, which comprises four piled orifice plates consisting of an being arranged in the order of an uppermost core-forming orifice plate having many core-forming nozzle holes, a sheath-forming orifice plate having many sheath-forming nozzle holes, a sea-forming orifice plate having many sea-forming nozzle holes and a lowermost optical filaments-gathering orifice plate having a gatering hole, the nozzle holes of the sea-forming orifice plate having a trumpet-shaped opening extending toward the lower end face thereof and a sea component flow passage being formed between the sheath- and sea-forming orifice plates, and supplying a thermoplastic polymer



for forming the cores of the optical filaments from the core-forming nozzle holes, a thermoplastic polymer for forming the sheathes of the optical filaments from the sheath-forming nozzle holes and a sea-forming thermoplastic polymer from the sea-forming nozzle holes to effect and composite spinning and gathering of many filaments in the gathering hole.

4,732,717

PROCESS FOR PRODUCING PIEZO-ELECTRIC OR PYRO-ELECTRIC COMPOSITE SHEET

Tomomi Yanagida; Kisaku Nakagawa, both of Yokohama; Hiroshi Tokuta, Hiratsuka, and Toshimitsu Fukase, Odawara, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,685
Int. Cl.[4] B29C *71/04*
U.S. Cl. 264—22 18 Claims



1. A process for producing a piezo-electric or pyro-electric composite sheet of a structure in which particles of a piezo-electric or pyro-electric sintered body are dispersed in the form of a single layer in the insulating high polymeric substance and said particles are in direct contact with electrodes made on both sides of the sheet, which process comprises:
(i) coating a liquid insulating high polymeric substance to a uniform thickness on a carrier having a smooth surface, strewing particles of a piezo-electric or pyro-electric sintered body on said insulating high polymeric substance to form a single layer of the particles, said particles having a size such that they do not pass through 20 microns meshes but do pass through 148 micron meshes, curing or solidifying said insulating high polymeric substance, and then removing said carrier to obtain a sheet of said insulating high polymeric substance in which the piezo-electric or pyro-electric sintered body particles are dispersed in the form of a single layer;
(ii) removing the surface skin from both sides of the resultant sheet by a mechanical or chemical means until the degree of exposure of the piezo-electric or pyro-electric sintered body particles exposed from the sheet surfaces, defined as the ratio of the sum (B) of the areas of the exposed portions of the individual particles to the sum (A) of the vertically projected areas of the individual particles (B/A ratio), becomes 0.5 or more, to expose from both sides of the sheet the piezo-electric or pyro-electric sintered body particles dispersed in the form of a single layer; and
(iii) making electrodes on both sides of said sheet and implying a voltage thereto to effect poling of the sheet.

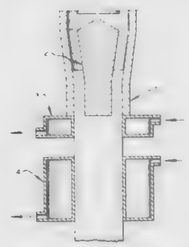
9. A process for producing a piezo-electric or pyro-electric composite sheet of a structure in which particles of a piezo-electric or pyro-electric sintered body are dispersed in the form of a single layer in an insulating high polymeric substance and said particles are in direct contact with electrodes made on both sides of the sheet, which process comprises:
(i) spreading particles of a piezo-electric or pyro-electric sintered body on a pressure-sensitive adhesive coated on the smooth surface of a carrier or on a pressure-sensitive film, said particles having a size such that they do not pass through 20 micron meshes but do pass through 148 micron meshes, thereby allowing said particles to adhere on said adhesive, and removing the superfluous particles which have not adhered to said adhesive, thereby to form a structure in which said particles are dispersed in the form of a single layer;
(ii) casting a liquid insulating high polymeric substance into the spaces between the particles adhering to said adhesive to cover said particles, curing or solidfying said polymeric substance and then removing the adhesive layer to obtain a sheet of said insulating high polymeric substances having said piezo-electric or pyro-electric sintered body particles dispersed in the form of a single layer;
(iii) removing the surface skin from both sides of the resultant sheet by a mechanical or chemical means until the degree of exposure of the piezo-electric or pyro-electric sintered body particles exposed from the sheet surfaces, defined as the ratio of the sum (B) of the areas of the exposed portions of the individual particles to the sum (A) of the vertically projected areas of the individual particles (B/A ratio), becomes 0.5 or more, to expose the piezo-electric or pyro-electric sintered body particles dispersed in the form of a single layer from both sides of said sheet; and
(iv) making electrodes on both sides of said sheet and implying a voltage thereto to effect poling of the sheet.

4,732,718

PROCESS FOR EXTRUSION OF EXPANDABLE PLASTIC MATERIALS

Pierre Jentet, Saint-Cloud, France, assignor to Atochem, France

Filed Apr. 18, 1986, Ser. No. 853,634
Claims priority, application France, Apr. 23, 1985, 85 06120
Int. Cl.[4] C08J *9/34*; B29C *47/06, 47/90*
U.S. Cl. 264—45.5 2 Claims



1. In the process for the extrusion of an expandable plastic composition comprising passing the partially expanded plastic composition through an extrusion die orifice having a cross-

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sectional area essentially the same as that of the entrance to the cooling fixture which defines the shape and dimensions in the final profile to be produced and essentially having the shape of the latter, by leaving a space empty of material within the profile in the course of extrusion through said cross-section and then confining the composition thus extruded immediately at the exit from said die cross-section and essentially along the extension of the extrusion axis, within a cooled and elongated shaping fixture open at both ends along said extrusion axis and having an exit cross-section identical to that of the profile to be obtained, the improvement comprising the steps of:

a. separating said cooled and elongated shaping fixture into at least two parts separated from one another by a free space, with the first said part not exceeding a few centimeters in length and being located in direct contact with the exit from the die, and

b. feeding the extruded composition through said separated, cooled, and elongated shaping fixture to achieve a lightened-core plastic composition having a dense surface with a density essentially similar to that of the original non-expanded plastic composition.

4,732,719

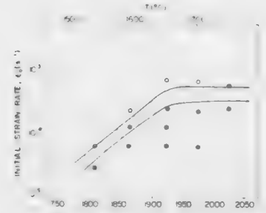
SUPERPLASTIC FORGING NITRIDE CERAMICS

Prakash C. Panda; Edgar R. Seydel, and Rishi Raj, all of Ithaca, N.Y., assignors to Jupiter Technologies, Inc., Ithaca, N.Y.

Filed Jan. 3, 1986, Ser. No. 816,040

Int. Cl.⁴ C04B *33/32*

U.S. Cl. 264—65 **12 Claims**



1. A process for preparing silicon nitride ceramic parts which are relatively flaw free and which need little or no machining, said process comprising the steps of

(a) preparing a starting powder by wet or dry mixing ingredients comprising by weight from about 70% to about 99% silicon nitride, from about 1% to about 30% of liquid phase forming additive and from 1% to about 7% free silicon;

(b) cold pressing to obtain a preform of green density ranging from about 30% to about 75% of theoretical density;

(c) sintering at atmospheric pressure in a nitrogen atmosphere at a temperature ranging from about 1400° C. to about 2200° C. to obtain a density which ranges from about 50% to about 100% of theoretical density and which is higher than said preform green density, and

(d) press forging workpiece resulting from step (c) by isothermally uniaxially pressing said workpiece in an open die without initial contact between said workpiece and die wall perpendicular to the direction of pressing and so that pressed workpiece does not contact die wall perpendicular to the direction of pressing, to substantially final shape in a nitrogen atmosphere utilizing a temperature within the range of from about 1400° C. to essentially 1750° C. and strain rate within the range of about 10^{-7} to about 10^{-1} seconds^{-1}, the temperature and strain rate being such that surface cracks do not occur, said pressing being carried out to obtain a shear deformation greater than 30% whereby superplastic forging is effected.

4,732,720

PROCESS FOR THE PRODUCTION OF UNIFORMLY DYEABLE NYLON 66 FIBER

Hiroshi Tanji, Fuji; Michitaka Iwata, Minoo, and Hideo Sato, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 746,750, Jun. 20, 1985, abandoned, which is a division of Ser. No. 651,646, Sep. 18, 1984, Pat. No. 4,542,063, which is a continuation of Ser. No. 350,417, Feb. 19, 1982, abandoned. This application Apr. 27, 1987, Ser. No. 47,553

Claims priority, application Japan, Feb. 26, 1981, 56-26129; Mar. 17, 1981, 56-37242

Int. Cl.⁴ D01D *5/084, 5/088*

U.S. Cl. 264—101 **2 Claims**



1. A process for producing a nylon 66 fiber with improved dyeability consisting essentially of extruding a melt of nylon 66 from a nozzle, passing the extruded filaments through a heating zone provided at the surface of the nozzle and having a length of about 5 cm to about 100 cm and a temperature of about 150° C. to about 260° C., applying a suction to the filaments with an aspirator located at a distance of about 5 cm to about 60 cm below the heating zone, and then winding at a winding speed of at least about 6,000 m/min.

4,732,721

METHOD FOR PRODUCTION OF SHAPED BODIES OF METAL SALTS OF POLYACRYLIC ACID

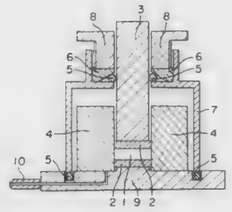
Tetsuo Konno, Ami, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,924

Claims priority, application Japan, Sep. 30, 1985, 60-214703; Sep. 30, 1985, 60-214704; Dec. 2, 1985, 60-269355

Int. Cl.⁴ B29C *33/10, 43/02;* C08F *8/42*

U.S. Cl. 264—102 **6 Claims**



1. A method for production of a shaped body, which comprises the steps of:

(a) charging a metal salt of powdered polyacrylic acid into a shaping mold; and

(b) pressure-forming said powder into a shaped body under a pressure in a range of from 1,000 kg/cm^2 to 100,000 kg/cm^2 at a temperature of from 100° C. to 400° C. in a vacuum.

4,732,722

PROCESS FOR PRODUCING A CROSSLINKED POLYOLEFIN INSULATED POWER CABLE

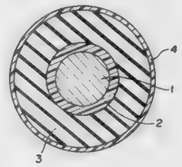
Fumio Aida, Tokyo; Takeo Shiono, Yokohama; Misao Hanai, Yokohama, and Shahrzad Tassavori, Yokohama, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Japan

Filed Nov. 14, 1985, Ser. No. 798,114

Claims priority, application Japan, Nov. 27, 1984, 59-179779[U]; Sep. 25, 1985, 60-211657

Int. Cl.⁴ B29C *35/02*

U.S. Cl. 264—105 **10 Claims**



1. A process for producing a crosslinked polyolefin insulated power cable consisting of a conductor, an inner semiconductive layer formed on the outer surface of said conductor and a crosslinked polyolefin insulating layer formed on said inner semiconductive layer, the process comprising:

extrusion-coating, on the outer surface of a conductor, (1) a first layer of a material, for the formation of an inner semiconductive layer, comprising a base polymer and N-vinylcarbazole, (2) a second layer of a crosslinkable polyolefin material for the formation of a crosslinked polyolefin insulating layer, said second layer being superimposed on said first layer, and (3) a third layer of a material for the formation of an outer semiconductive layer said third layer being superimposed on said second layer; and then

subjecting the coated conductor to a crosslinking treatment to cause a portion of said N-vinylcarbazole to diffuse into said second layer, thereby increasing the AC breakdown voltage of said second layer, and to form, on the outer surface of the conductor, an inner semiconductive layer, an intermediate crosslinked polyolefin insulating layer containing the diffused N-vinylcarbazole and an outer semiconductive layer.

4,732,723

METHOD OF PRODUCING A NET

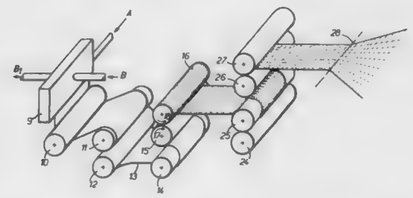
Willy B. Madsen; Finn H. Jensen, both of Copenhague Valby; Ole B. Rasmussen, Birkerod, all of Denmark; Guy Goldstein, Colmar, and Yves Roussin-Moynier, Wettolsheim, both of France, assignors to Beghin-Say, S.A., Thumeries, France

Division of Ser. No. 821,079, Aug. 2, 1977, Pat. No. 4,636,419, which is a continuation of Ser. No. 388,124, Aug. 13, 1973, abandoned. This application Aug. 21, 1986, Ser. No. 878,853

Claims priority, application United Kingdom, Aug. 11, 1972, 37499/72

Int. Cl.⁴ B29C *47/06, 55/06*

U.S. Cl. 264—147 **20 Claims**



1. Method of producing a net comprising the steps of forming a film or sheet consisting of a regular array of continuous, longitudinal, ribbon-formed filaments of a higher melting polymer substance (A) which are spaced apart from one another and which are each embedded in a matrix of lower melting polymer matter, subsequently impressing said film or sheet according to a linear, transverse pattern at a temperature at which the matrix is molten to semimolten, and (A) is pronouncedly more solid, and at a pressure adapted to collect at least the main portion of said lower melting polymer matter in a regular pattern of transverse stems, but leaving said filaments substantially undamaged, and subjecting the lower melting polymer matter to splitting between the filaments of (A) in said impressed areas.

4,732,724

PROCESS OF MAKING INJECTION MOLDINGS AND INJECTION MOLD FOR CARRYING OUT THE PROCESS

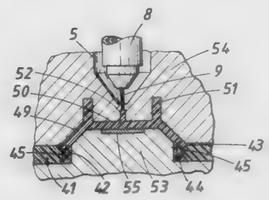
Franz Sterner, Mühlstrasse 21, A-4614 Marchtrenk, Austria

Filed Mar. 7, 1985, Ser. No. 709,326

Claims priority, application Austria, Mar. 21, 1984, 944/84; Aug. 7, 1984, 2250/84

Int. Cl.⁴ B29C *45/22*

U.S. Cl. 264—251 **2 Claims**



1. A process of manufacturing an injection molding in an injection mold which comprises two mold sections enclosing a molding cavity adapted to be supplied with molding material through an entrance opening in one of the mold sections, which process comprises maintaining the mold at a solidification temperature for the molding material, directly injecting the molding material into the cavity in a liquid state at a temperature different from the solidification temperature through a passage having a flow area not in excess of one square millimeter in a hollow needle tip at a free end of an injection nozzle extending through the entrance opening while greatly restricting the heat conduction between the hollow needle injection nozzle tip and the injection nozzle, introducing the hollow needle tip through the entrance opening into the cavity, and gradually withdrawing the hollow needle tip from the cavity during the supply of the molding material to the cavity in response to the extent to which the cavity has been filled with the molding material supplied thereto.

4,732,725

PROCESS AND DEVICE FOR THE PRODUCTION OF A SAFETY PANE

Michel-Jean Moncheaux, Compiégne, and Francois de Toytot, Thourotte, both of France, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Jan. 15, 1986, Ser. No. 821,255

Claims priority, application France, Jan. 15, 1985, 85 00497

Int. Cl.⁴ B29C *45/16;* B32B *27/40*

U.S. Cl. 264—255 **18 Claims**

1. Process for the production of a compound pane comprising a glass sheet and a transparent polyurethane-based layer thereon having energy-absorbent properties, characterized in that the polyurethane-based coating layer having energy absorbent properties is formed directly on the glass sheet by

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reactive injection molding, under a pressure between 2 and 10 bars, between said glass sheet and a rigid countermold, of a reactive mixtures of an isocyanate component having a viscosity under 5000 centipoises at 40 degrees C. and a polyalcohol component, with the isocyanate component containing at least one aliphatic or cycloaliphatic diisocyanate or a prepolymer of these isocyanates, with the polyalcohol component containing at least one long difunctional polyalcohol having a molecular mass between 500 and 4000 and at least one short diol as a chain extending agent and after polymerization of the reaction mixture, the countermold is removed.

4,732,726

INJECTION MOLD WITH INSERT TRANSFER MEANS AND METHOD

Walter A. Graanes, III, Bargersville, Ind., assignor to E. W. Mold & Tool Co., Inc., Indianapolis, Ind.

Filed Sep. 18, 1986, Ser. No. 908,800
Int. Cl.[4] B29C *65/18*
U.S. Cl. 264—272.21 19 Claims



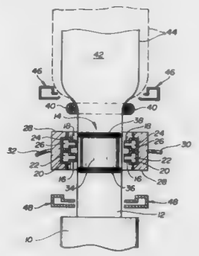
1. A mold for forming a product having an insert comprising:
- a first mold section;
- a first pin cantileveredly mounted to said first mold section and extending therefrom;
- a second mold section mounted with said first mold section to cooperatively close from an open position to a closed position and matable with said first mold section when in said closed position together creating a cavity therebetween forming said product, said second mold section having a hole aligned with said first pin when said first mold section and said second mold section are in said closed position;
- a second pin movably mounted to said second mold section and aligned with said first pin with said second pin extending out of said hole when said first mold section and said second mold section are apart to initially hold an insert on said second pin and to then retract in said hole allowing said first pin to be positioned closer to said hole when said first mold section and said second mold section are closed together transferring said insert from said second pin to said first pin; wherein,
- said first pin includes a tapered main body with a first proximal end fixedly mounted to said first mold section and a first distal end, said tapered main body decreases in cross-sectional size from said proximal end to said distal end; and
- said second pin is slidably mounted to said second mold section and is positioned in said hole, said second pin includes a second distal end contactable against said first distal end as said first mold section and said second mold section are closed together sliding said second pin into said hole transferring said insert on said second pin onto said first pin.

4,732,727

METHOD AND APPARATUS FOR PRODUCING MESH FILM

Carl B. Havens, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 3, 9186, Ser. No. 848,010
Int. Cl.[4] B29C *47/20, 47/90*
U.S. Cl. 264—519 20 Claims



1. Apparatus for producing mesh film, comprising:
- extrusion die means for extruding a tube of a heat-plastified, resinous, mesh film material,
- first cooling means, centrally located within the extruded tube, for cooling the internal surface of said tube, said first cooling means having an outer diameter substantially equal to the inner diameter of said extruded tube,
- a plurality of cooling nozzles, disposed radially outward from said first cooling means, for directing a plurality of streams of a cooling gas toward the exterior surface of said extruded tube, and
- an annular gas bearing spaced axially from said first cooling means such that said extruded tube passes therethrough after leaving said first cooling means, thereby permitting the diameter of said extruded tube to be increased subsequently by means of a trapped air bubble therewithin.

13. A method for producing mesh film, comprising the steps of:
- extruding a heat-plastified, resinous, mesh film material to form a tube of mesh film material,
- passing said tube of mesh film material over a centrally located generally cylindrical cooling means to cool the internal surface of said tube while directing a plurality of streams of cooling gas toward the exterior surface of said tube,
- thereafter, passing said tube through an annular gas bearing having an inner diameter approximately equal to the outer diameter of said cooling means, and
- thereafter, increasing the diameter of said tube by means of a trapped air bubble therewithin.

4,732,728

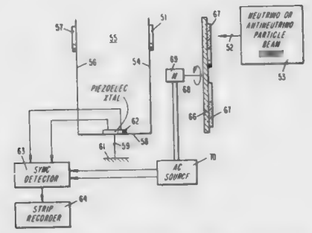
METHOD OF AND APPARATUS FOR DETECTING NEUTRINOS AND ANTINEUTRINOS WITH ELASTIC SCATTERERS

Joseph Weber, 9 W. Melrose St., Chevy Chase, Md. 20815

Filed Dec. 2, 1985, Ser. No. 803,293
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—153 27 Claims

1. A method of detecting a beam of neutrino or antineutrino particles comprising the steps of placing a single crystal arranged to contain coherent elastic scatterers for said particles

in a path of the beam so the beam is incident on the elastic scatterers, said scatterers responding to said particles of the beam incident thereon by transferring momentum from the



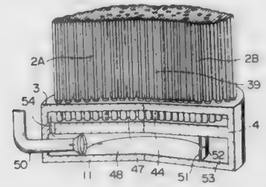
particles to mechanical momentum in the crystal, and detecting the mechanical momentum transferred to the crystal from the momentum of the particles.

4,732,729

FAST BREEDER REACTOR

Ken Amano, Hitachi, and Kotaro Inoue, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,904
Claims priority, application Japan, Feb. 24, 1984, 59-32425
Int. Cl.[4] G21C *15/00*
U.S. Cl. 376—176 13 Claims



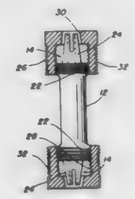
1. A fast breeder reactor comprising: a reactor vessel, a reactor core constituted by a plurality of fuel assemblies and a plurality of control rod guide pipes disposed in said reactor vessel, a partitioning member disposed between said reactor vessel and said reactor core and serving to separate the inside space of said reactor vessel into an upper plenum and a lower plenum, a high-pressure plenum, a medium-pressure plenum whose pressure is lower than that of said high-pressure plenum but is higher than said upper plenum; and a means of introducing a coolant into said high-pressure plenum, wherein said high-pressure plenum is disposed below said reactor core, said medium-pressure plenum being disposed between said reactor core and said high-pressure plenum, and wherein there is provided a channel for introducing said coolant from said medium-pressure plenum into said control rod guide pipe, a partition plate separating said high-pressure plenum and said medium-pressure plenum, said partition plate supporting lower ends of said fuel assemblies and said control rod guide pipes and support members thereof, the lower ends of said fuel assemblies and said control rod guide pipes and said support members thereof extending across said medium-pressure plenum in a direction toward said high-pressure plenum without extending across said high-pressure plenum and ending in said partition plate, and means for introducing coolant from said high-pressure plenum to the lower ends of said fuel assemblies.

4,732,730

STUCK FUEL ROD CAPPING SLEEVE

Donald A. Gorscak, Bethel Park; John J. Maringo, McKeesport, and Roy J. Nilsen, Upper St. Clair, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1986, Ser. No. 861,399
Int. Cl.[4] G21C *9/00*; B65D *41/04*
U.S. Cl. 376—277 3 Claims



1. A stuck fuel rod capping sleeve comprising:
- an inner cylindrical sleeve made of low work hardening, highly ductile material and having tapered and split end portions;
- an outer cylindrical sleeve made of moderately ductile material and mounted on the inner cylindrical sleeve, the outer cylindrical sleeve having threads located at each end thereof; and
- a locking sleeve threaded on each end of the outer cylindrical sleeve, each locking sleeve having threads located on its exterior surface.

4,732,731

COPPER ALLOY FOR ELECTRONIC INSTRUMENTS AND METHOD OF MANUFACTURING THE SAME

Makoto Asai, Nikko; Shoji Shiga, Utsunomiya; Toru Tanigawa, Nikko; Yoshimasa Ōyama, Nikko, and Shigeo Shinozaki, Nikko, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,429
Claims priority, application Japan, Aug. 29, 1985, 60-190605
Int. Cl.[4] C22C *9/06*
U.S. Cl. 420—473 7 Claims

1. A copper alloy for electronic instruments which consists essentially of 0.1 to 3.0 wt.% of Ni, 0.1 to 1.0 wt.% of Ti, wherein the ratio of Ni/Ti is greater than or equal to 4, 0.1 to 6.0 wt.% of Sn, and 0.005 to 3.0 wt.% in total of one or more elements selected from the group consisting of Zn, Mn, Mg, the rare earth elements, Ca, B, Sb, Te, Si, Co, Fe, Zr, Ag, MM (misch metal) and Al with the remainder being Cu and inevitable impurities, and wherein said alloy contains O_2 in an amount of not more than 20 ppm, and wherein said alloy has a particle diameter of precipitates of not more than 5 μm.

4,732,732

MIGRATION RESISTANT PHOSPHOR BRONZE ALLOY

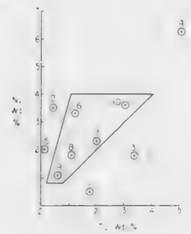
Motohisa Miyafuji; Yasuhiro Nakashima, and Isao Hosokawa, all of Shimonoseki, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 13, 1986, Ser. No. 930,115
Claims priority, application Japan, Nov. 13, 1985, 60-254357
Int. Cl.[4] C22C *9/04*
U.S. Cl. 420—476 2 Claims

1. A phosphor bronze alloy excellent in migration resistance, which consists essentially of from 3.0 to 9.0% by weight of Sn, from 0.03 to 0.35% by weight of P, from 1.0 to 5.0% by weight of Zn, and the substantial balance of Cu and impurities.

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4,732,733
COPPER-BASE ALLOYS FOR LEADFRAMES
Daiji Sakamoto, Yonago, and Rikizo Watanabe, Yasugi, both of Japan, assignors to Hitachi Metals, Ltd., Japan
Filed Aug. 22, 1986, Ser. No. 899,397
Claims priority, application Japan, Sep. 2, 1985, 60-193407
Int. Cl.[4] C22C *9/06*
U.S. Cl. 420—485 **7 Claims**



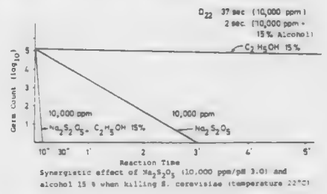
2. A copper-base alloy for leadframes consisting essentially of 0.8–4.0 weight % of Ni, 0.2–4.0 weight % of Ti, 0.05–0.6 weight % of Mg and 0.1–1.0 weight % of Mn in total, the balance being essentially Cu and inevitable impurities, and a ratio of Ni to Ti being 1–4.

4,732,734
METHOD FOR PREVENTING FLUOROELASTOMER-RELATED HYDROLYSIS OF FLUORINE-CONTAINING GAS STREAMS IN CONTACT WITH FLUOROELASTOMERIC ARTICLES OF AN INDUSTRIAL GAS STREAM HANDLING SYSTEM
Walter Bacher, Stutensee; Wilhelm Bier, Eggenstein-Leop.; Franz-Willi Treffner, Bochum, and Gerd Höfert, Fasanenweg 8, 2070 Ahrensburg, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe; Gerd Höfert, Ahrensburg and Steag Kernenergie GmbH, Essen, all of, Fed. Rep. of Germany
Filed May 29, 1986, Ser. No. 868,111
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525203
Int. Cl.[4] C23F *15/00*
U.S. Cl. 422—1 **5 Claims**

1. A method for preventing fluoroelastomer-related hydrolysis of a gas steam comprised of a fluorine-containing substance and contained in an industrial system comprised of at least one fluoroelastomeric article, the method comprising:
including in portions of the at least one article which contact the gas stream only a fluoroelastomer and lead oxide, the lead oxide content corresponding to a lead percentage in the fluoroelastomer ranging from 1 to 10 percent by weight.

4,732,735
METHOD OF STERILIZING PACKING MATERIALS FOR THE ASEPTIC PACKAGING OF FRUIT JUICE AND WINE
Erwin W. Wartenberg, Stuttgart, and Hong-An Duong, Filderstadt, both of Fed. Rep. of Germany, assignors to Tetra Pak Developpement S.A., Pully, Switzerland
Continuation of Ser. No. 745,337, Jun. 17, 1985, abandoned. This application Mar. 31, 1987, Ser. No. 33,021
Int. Cl.[4] A23C *3/00;* **B65B** *55/04*
U.S. Cl. 422—28 **13 Claims**

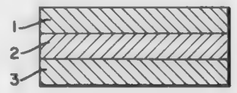
1. A method of sterilizing a container for foodstuffs selected from the group consisting of fruit juice and wine which comprises treating said container with an aqueous solution consisting essentially of sulfurous acid and an alcohol, both of which are employed in amounts to provide an aqueous solution effective to reduce at a given temperature the count of yeasts,



Synergistic effect of $Na_2S_2O_5$ (10,000 ppm/pH 3.0) and alcohol 15 % when killing S. cerevisiae (temperature 22°C)

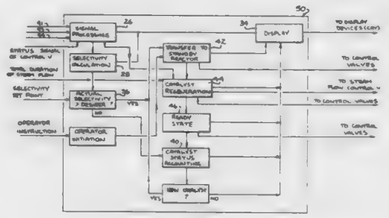
molds, acetobacters and lactic acid bacteria on said container by one decimal power in a period of not more than 15 seconds.

4,732,736
ANALYTICAL ELEMENT FOR THE DETECTION HYDROGEN PEROXIDE
Morio Kobayashi, Sagamihara; Kenichiro Okaniwa, Shiroyama; Mikio Koyama, Tokorosawa; Kunihiro Furukawa, Urawa, and Soichi Zanma, Kawaguchi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd. and Chugai Seiyaku Kabushiki Kaisha, both of Tokyo, Japan
Filed Nov. 15, 1985, Ser. No. 798,562
Claims priority, application Japan, Nov. 20, 1984, 59-243277
Int. Cl.[4] C12Q *1/28;* **G01N** *21/77, 31/22*
U.S. Cl. 422—56 **11 Claims**



1. In a multilayered analytical element for detecting hydrogen peroxide which comprises peroxidase-functional material, a hydrogen donor and a coupler, the improvement comprising arranging said peroxidase-functional material and said hydrogen donor in different layers in a manner so that they are separated from each other but are capable of interacting when a liquid sample is applied to the analytical element.

4,732,737
AUTOMATED CATALYST REGENERATION IN A REACTOR
Suresh C. Agarwal, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Apr. 25, 1983, Ser. No. 488,282
Int. Cl.[4] B01J *8/18*
U.S. Cl. 422—62 **6 Claims**

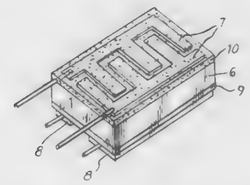


1. An apparatus for the automatic regeneration of catalyst used in a process for obtaining ethylene in an exit stream of a reactor from acetylene in a feed stream of the reactor, the reactor having regeneration means for regenerating the catalyst, comprising;
first sensor means including a chromatograph operatively connected to the feed stream for sensing a concentration of acetylene and hydrogen in the feed stream;
second sensing means including a chromatograph operatively connected to the exit stream for sensing a concentration of acetylene in the exit stream;
a control system connected to said first and second sensor means and to the regeneration means of the reactor for calculating a value for selectivity of the catalyst according to the relationship:

$$S=C_{H1}/(C_{A1}-C_{A2}),$$

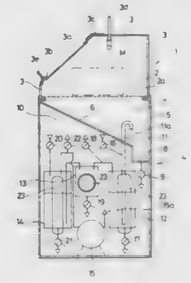
wherein C_{H1} is the hydrogen concentration in the feed stream, C_{A1} is the acetylene concentration in the feed stream and C_{A2} is the acetylene concentration in the exit stream, and for generating a control signal when the calculated value for the selectivity approaches a selected value for the selectivity which selected value is indicative that the catalyst should be regenerated, said control signal being applied to the regeneration means for activating the regeneration means to regenerate the catalyst; and
an auxiliary reactor containing catalyst for the process connected to the exit stream and the feed stream, valve means operatively engaged in at least one of the exit and feed streams, connected to said control system for supplying acetylene to said auxiliary reactor when the regeneration means are activated to regenerate catalyst in the first mentioned reactor.

4,732,738
COMBUSTIBLE GAS DETECTING ELEMENT
Yoshihiko Nakatani, Osaka, and Masayuki Sakai, Minamikawachi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 17, 1983, Ser. No. 496,492
Claims priority, application Japan, May 17, 1982, 57-83443; Aug. 19, 1982, 57-144512; Sep. 27, 1982, 57-168768
Int. Cl.[4] G01N *27/12*
U.S. Cl. 422—94 **10 Claims**



1. A combustible gas detecting element comprising:
a sintered body of α-Fe_2O_3 containing 0.005 to 10 weight percent of sulfate ions; and
a pair of spaced apart electrodes attached to said sintered body of α-Fe_2O_3 for applying an electric current to said sintered body,
whereby the presence of a combustible gas may be detected as a change in electrical resistance between said pair of electrodes.
4. A combustible gas detecting element comprising:
a sintered body of α-Fe_2O_3 containing 0.005 to 10 weight percent of sulfate ions, and at least one additive selected from the group consisting of the dioxides of tin, zirconium and titanium, the total amount of said at least one additive being 0.1 to 50 mole percent; and
a pair of spaced apart electrodes attached to said sintered body for applying an electric current to said sintered body,
whereby the presence of a combustible gas may be detected as a change in electrical resistance between said pair of electrodes.

4,732,739
AMALGAM PREPARING CHAMBER AND MERCURY-CAPTURING DEVICE
Yoshinobu Yamamura, Kawasaki, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan
Filed Apr. 15, 1986, Ser. No. 852,364
Claims priority, application Japan, Jun. 4, 1985, 60-83333[U]
Int. Cl.[4] B01D *50/00;* **A61C** *5/06*
U.S. Cl. 422—170 **10 Claims**



1. An amalgam-preparing chamber and mercury-capturing device therefor, which comprises an amalgam-preparing chamber which is positioned on top of a mercury-capturing means, and wherein:
(a) said amalgam-preparing chamber, comprises a space enclosed by a wall having a plate base at the lower end of said space, and wherein the wall has a transparent section, said base having a plurality of small openings into said mercury-capturing means; and an amalgam-preparing device in said enclosed space, and whereby said enclosed space is exposed to view by said transparent section in said wall, and further wherein said chamber has an openable door therefore; and wherein:
(b) said mercury-capturing means comprises:
(i) an upper closed separation chamber in flow communication with the openings in said base, and
(ii) a lower mercury vapor treatment chamber, wherein the upper and lower chambers are separated by an inclining partition which extends downwardly into a mercury reservoir groove with a discharge cock at the lower edge thereof, and wherein a vertically extended mercury vapor suction pipe extends through the inclining partition and has a downward suction inlet at the upper portion of the pipe in the upper closed separation chamber above the mercury reservoir groove, and wherein the lower portion of the pipe extends through the inclining chamber partition into a mercury-vapor capturing means which is connected in sequence to a check trap, neutralization means and a pumping means.

4,732,740
INTEGRATED HEAVY OIL PYROLYSIS PROCESS
Herman H. Woebcke, Barnstable; Swami Narayanan, Westwood, both of Mass., and Axel R. Johnson, North Babylon, N.Y., assignors to Stone & Webster Engineering Corporation, Boston, Mass.
Filed Oct. 9, 1984, Ser. No. 658,474
Int. Cl.[4] C10G *9/14*
U.S. Cl. 422—193 **1 Claim**

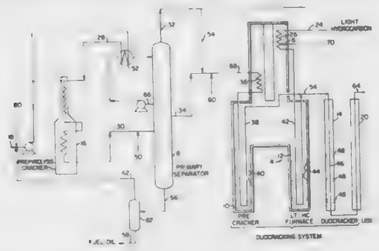
1. An apparatus for cracking a heavy hydrocarbon feedstock to produce olefins comprising:
(a) a pre-pyrolysis cracker including means for treating

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heavy hydrocarbon feedstock at elevated pressures and temperatures;

(b) a primary separator for separating the effluent from the pre-pyrolysis cracker into a heavy fuel oil fraction and a treated heavy hydrocarbon fraction;

(c) a pyrolysis furnace having means defining a convection section for preheating the treated heavy hydrocarbon fraction from the primary separator and for preheating a light hydrocarbon feedstock, means defining a first radiant section for partially cracking the treated heavy hydrocarbon fraction, and means defining a second and radiant section for cracking the light hydrocarbon feedstock;



(d) means defining a DUOCRACKER for completely cracking the partially cracked heavy hydrocarbon stream emanating from the pyrolysis furnace while quenching the cracked light hydrocarbon stream from the pyrolysis furnace; and

(e) a quencher for quenching the composite stream of heavy and light hydrocarbons from the DUOCRACKER to terminate the reactions.

4,732,741

METHOD OF MAKING BETA"-ALUMINA

James H. Duncan, Stafford; Peter Barrow, Alvaston, both of United Kingdom; Arnold Van Zyl, and Angus I. Kingon, both of Pretoria, South Africa, assignors to Lilliwyte Societe Anonyme, Rue Des Girondins, Luxembourg

Filed May 21, 1986, Ser. No. 866,057

Claims priority, application United Kingdom, May 24, 1985, 8513196; Oct. 16, 1985, 8525477

Int. Cl.[4] C01F *7/06*

U.S. Cl. 423—119 **34 Claims**

1. A method of making beta"-alumina which comprises dispersing in a precursor for aluminium oxide a member of the group comprising sodium oxide and its precursors, and dispersing in the precursor of aluminium oxide a spinel stabilizer which is a member of the group comprising spinel-forming oxides and the precursors thereof, to form a mixture, and then heating the mixture to a temperature at which the precursor of aluminium oxide is converted to beta"-alumina, the precursor of aluminium oxide being one which, when calcined in air by itself, has a calcination product which, when subjected to X-ray diffraction is defined herein, displays an X-ray diffraction trace whose peak with the highest intensity in the 2(theta) range of 44°–48° and whose peak with the highest intensity in the 2(theta) range of 63°–69° respectively have maximum intensities and integrated intensities which comply with equations (I) and (II):

A/S is greater than 0.03 (I);

and

B/S is greater than 0.04 (II),

in which:

$$A = \frac{(\text{maximum intensity})^2}{(\text{integrated intensity})}$$

in counts per second/2(theta)° for the calcination product in the 2(theta) range 44°–48°;

$$B = \frac{(\text{maximum intensity})^2}{(\text{integrated intensity})}$$

in counts per second/2(theta)° for the calcination product in the 2(theta) range 63°–69°;

$$S = \frac{(\text{maximum intensity})^2}{(\text{integrated intensity})}$$

in counts per second/2(theta)° for the 211 peak in a rutile (TiO_2) standard occuring in the 2(theta) range 52°–56°;

maximum intensity=the maximum intensity in counts per second above background displayed by the peak with the highest intensity in the 2(theta) range in question; and

integrated intensity=the area under the peak, above background, in the 2(theta) range in question, in units of 2(theta)°×counts per second.

A, B and S being mean values for at least five samples having a standard deviation of less than 10% and the rutile standard being the intensity standard rutile of the National Bureau of Standards of the United States Department of Commence accorded standard material No. 674 and having a d-spacing of 1.6874 Angstrom units for the 211 peak in question.

4,732,742

PROCESS FOR THE PRODUCTION AT A HIGH LEVEL OF PRODUCTIVITY OF ALUMINUM TRIHYDROXIDE IN A HIGH STATE OF PURITY AND WITH A MEDIAN DIAMETER OF LESS THAN 4 MICROMETERS, WHICH IS REGULATED AS REQUIRED

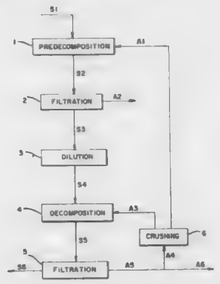
Jean-Philippe Puig, Aix en Provence, France, assignor to Aluminum Pechiney, France

Filed Dec. 12, 1986, Ser. No. 940,858

Claims priority, application France, Dec. 17, 1985, 85 19545

Int. Cl.[4] C01F *3/02*

U.S. Cl. 423—119 **9 Claims**



1. In a process for producing aluminum trihydroxide having a median diameter of less than 4 micrometers with unimodal distribution and minimum deviation comprising the steps of decomposing a supersaturated sodium aluminate solution by adding to said solution an amount of crushed aluminum trihydroxide seed having a BET specific surface area of at least 8 m^2/g such that the total surface area of said seed is at least 100 m^2 per liter of sodium aluminate solution, and agitating the resulting suspension until a weight ratio of dissolved Al_2O_3 to caustic Na_2O of at most 0.7 is obtained, the improvement comprising performing a pre-decomposition process prior to decomposition of the supersaturated sodium aluminate solution to remove impurities from said solution, said pre-decomposition process comprising the steps of

(a) bringing a supersaturated sodium aluminate solution to be decomposed having a dissolved Na_2O concentration of between 150 and 250 g/l and a ratio by weight of dissolved Al_2O_3 to dissolved Na_2O of between 0.9 and 1.3, together with an amount of crushed aluminum trihydroxide seed having a BET specific surface area of at least 8 m^2/g in a proportion of from 1 to 10 g of Al_2O_3 per liter of solution, and agitating said sodium aluminate solution and said seed for a period of from 1 to 3 hours at a temperature between 70° and 90° C. to form a suspension having a liquid phase and a solid phase;

(b) separating the solid phase, comprising aluminum trihydroxide and impurties, from the liquid phase, comprising supersaturated sodium aluminate solution having a ratio by weight dissolved Al_2O_3 to dissolved Na_2O of between 0.8 and 1.2, whereby said supersaturated sodium aluminate solution is substantially free from impurities after said separation.

4,732,743

PROCESS FOR CATALYTIC TREATMENT OF EXHAUST GASES

Torsten Schmidt, Berlin, and Robert Walter, Langenhagen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,873

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1985, 3538259

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—239 **14 Claims**

1. A process for removing nitrogen oxides (NO_x) from an exhaust gas largely avoiding formation of inactivating deposits on the catalyst comprising the steps of forming a mixture of ammonia and the exhaust gas and contacting the resulting mixture with a reducing catalyst at a temperature from about 150° to 250° C. wherein the time between the formation of the mixture and the occurrence of contact between the mixture and the catalyst is at most 1 second.

4,732,744

PROCESS FOR THE COMBINED REMOVAL OF SO_2 AND NO_x FROM FLUE GAS

Shih-Ger Chang, El Cerrito; David K. Liu, Oakland, both of Calif.; Elizabeth A. Griffiths, Neston, England, and David Littlejohn, Oakland, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 27, 1986, Ser. No. 923,541

Int. Cl.[4] C01B *21/00, 17/00*

U.S. Cl. 423—235 **48 Claims**

1. A process of the simultaneous removal of NO_x and SO_2 from a fluid stream itself comprised of NO_x and SO_2, which process comprises:

(A) contacting the fluid stream in a contacting zone with an aqueous reaction mixture itself comprising an effective amount of an iron (II) chelate of an amino acid moiety having at least one —SH group selected from amino acids, N-substituted amino acids, natural peptides and synthetic peptides, and an alkali which comprises a basic salt selected from the salts of sodium, potassium, lithium, calcium or magnesium;

(B) separating the fluid stream from the particulates formed in step (A) which particulates comprise the chelate of the amino acid moiety and fly ash;

(C) washing with the particulates of step (B) with a relatively neutral aqueous solution having a pH of between about 5 and 8 with subsequent separation of the aqueous wash and the particulates;

(D) subsequently washing the particulates of step (C) with an acidic aqueous solution of a mineral acid having a pH of between 1 to 3 with separation of the aqueous wash and the particulates;

(E) washing of the particulates of step (D) with an alkaline aqueous solution having a pH of between about 9 and 12 with subsequent separation of the aqueous wash and the particulates;

(F) adding additional amino acid moiety, iron (II) ion, and an alkali which comprises a basic salt selected from the salts of sodium potassium, lithium, calcium or magnesium to produce an effective concentration of chelating aqueous solution or slurry having a pH of between about 4 to 12; and

(G) recycling the aqueous solution of step (F) to the contacting zone of step (A).

4,732,745

PROCESS FOR MAKING PHOSPHORUS PENTASULFIDE

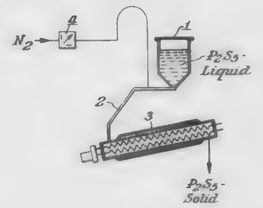
Herbert Diskowski, Erftstadt; Heinz Stephan, Hürth, and Hermann Niermann, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,007

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543522

Int. Cl.[4] C01B *25/14*

U.S. Cl. 423—303 **3 Claims**



1. In a process for making phosphorus pentasulfide, wherein a phosphorus melt and a sulfur melt are introduced through separate feed pipes from storage vessels into a reactor, reacted therein under nitrogen at temperatures between 300° C. and 400° C., and the resulting phosphorus pentasulfide melt is taken from the reactor through a discharge pipe and delivered to a cooling means, the improvement which comprises: introducing gaseous nitrogen into at least one of the said feed pipes for the phosphorus and the sulfur running to the reactor, and into the reactor discharge pipe for the phosphorus pentasulfide melt, the nitrogen being introduced into the pipes at a level lower than the liquids level of the melts in the respective storage vessels or in the reactor and under a pressure lower than the static pressure exerted in the pipes by the quantity of melt upstream of the gas inlets.

4,732,746

METHOD OF MAKING HIGH PURITY SILICON NITRIDE PRECURSOR

Gary M. Crosbie, Dearborn, and Ronald L. Predmesky, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 18, 1986, Ser. No. 853,539

Int. Cl.[4] C01B *33/00*

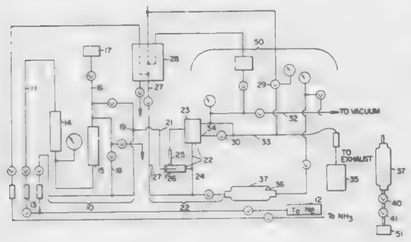
U.S. Cl. 423—324 **14 Claims**

1. A method of making silicon nitride precursor, comprising:

(a) reacting silicon halide vapor with liquid ammonia at a situs in an inert environment having a pressure equal to or greater than 35 psig and which environment is effectively

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devoid of organic contaminants, said reaction producing a mixture of precipitated silicon imide in liquid ammonia having dissolved ammonium halide;

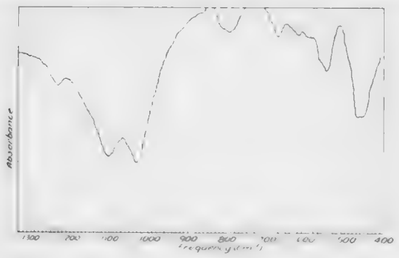


(b) extracting a portion of said mixture from said situs; and
(c) separating said liquid from said precipitate of said portion.

4,732,747
MAGNESIUM SILICATE COMPOSITIONS AND PROCESS FOR MAKING

Juan M. Garces, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 484,112, Apr. 11, 1983, Pat. No. 4,499,320, which is a continuation-in-part of Ser. No. 327,870, Dec. 7, 1981, abandoned. This application Feb. 12, 1985, Ser. No. 700,774
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] C01B *33/28, 33/24*
U.S. Cl. 423—328 **14 Claims**



1. A porous crystalline magnesium silicate having a three dimensional lattice and a composition according to the following formula in terms of the molar ratios of oxide on a dry basis:

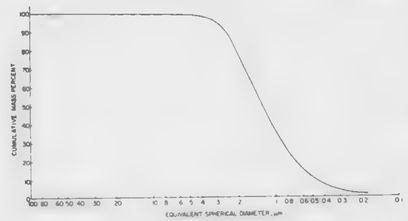
$$(M_{2/n}O)_p(MgO)_x(R_2O_3)_y(SiO_2)_z$$

wherein M is at least one ion-exchangeable cation having a valence n; R is a trivalent element or mixture thereof which is not ion-exchangeable by conventional means; $x/z \geqq 0$; $y/z \geqq 0$; $p/n \geqq y$; and p, x, z are positive numbers with p being from about 0.1 to about 4, x being from about 0.01 to about 2, z being from about 90 to about 96 and y being zero or a positive number from about 0 to about 3 further characterized by an X-ray diffraction trace having at least those interplanar d spacings listed in Table III of the specification and further provided that nonion-exchangeable cation and further provided that nonion-exchangeable magnesium is contained in the lattice and further characterized by infrared analysis in that said analysis exhibits at least two peaks in the 1200–980 cm^{-1} region.

4,732,748
FINELY DIVIDED CALCIUM CARBONATE COMPOSITIONS

Robert D. Stewart, Yorba Linda, Calif.; Norman O. Clark, Par, England, and Yew C. Chang, Westlake Village, Calif., assignors to Cyprus Mines Corporation, Englewood, Colo.

Filed Dec. 10, 1986, Ser. No. 940,533
Int. Cl.[4] C01F *11/18*
U.S. Cl. 423—430 **5 Claims**



1. A finely divided, wet-ground, dispersant-free calcium carbonate composition in which the particle size distribution of calcium carbonate is such that:
(a) the size of the calcium carbonate particles at the 50% point on a SediGraph particle size distribution curve representing the composition is from about 0.60 μm to about 1.30 μm in equivalent spherical diameter,
(b) the size of the calcium carbonate particles at the 80% point on said distribution curve divided by the size of the calcium carbonate particles at the 50% point on said distribution curve gives a number of from about 1.40 to about 1.90,
(c) the size of the calcium carbonate particles at the 20% point on said distribution curve is from about 0.80 μm to about 0.30 μm in equivalent spherical diameter, and the overall sizes of calcium carbonate particles present are such that:
no more than about 2 weight percent of the particles present are larger than about 8 μm in equivalent spherical diameter;
at least about 98 weight percent of the particles present are less than about 8 μm in equivalent spherical diameter;
at least about 97 weight percent of the particles present are less than about 5 μm in equivalent spherical diameter;
at least about 90 weight percent of the particles present are less than about 3 μm in equivalent spherical diameter;
at least about 75 weight percent of the particles present are less than about 2 μm in equivalent spherical diameter;
at least about 35 weight percent of the particles present are less than about 1 μm in equivalent spherical diameter, and
no more than about 25 weight percent of the particles present are less than about 0.4 μm in equivalent spherical diameter.

4,732,749
METHOD OF MANUFACTURING LONGER FIBERS OF POTASSIUM TITANATE

Akira Watanabe; Yoshimitsu Takeuchi; Gouji Saeki, and Megumu Shimomi, all of Okayama, Japan, assignors to Kyushu Refractories Co., Ltd., Bizen, Japan

Filed Jan. 17, 1986, Ser. No. 819,859
Claims priority, application Japan, Jan. 18, 1985, 60-8245
Int. Cl.[4] C01G *23/00*
U.S. Cl. 423—598 **3 Claims**

1. A method of manufacturing potassium titanate fibers comprising:
(a) placing a mixture of titanium- and potassium-containing compounds in a gas-permeable calcination vessel; and
(b) heat reacting said mixture;

wherein said vessel comprises at least 25 wt. % MgO.

4,732,750
PREPARATION OF MONODISPERSE TITANIA BY TITANIUM ALKOXIDE HYDROLYSIS

William L. Olson, Des Plaines, and William E. Lisa, Villa Park, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 11, 1986, Ser. No. 895,392
Int. Cl.[4] C01G *25/02*
U.S. Cl. 423—608 **13 Claims**

1. A process for the production of monodisperse titania particles comprising the steps of:
(a) dissolving titanium tetraalkoxide in an alcoholic medium to form a solution of said alkoxide in said alcoholic medium;
(b) providing a hydrolysis solution comprising alcohol and water in amounts sufficient to hydrolyze said alkoxide in said solution;
(c) adding said hydrolysis solution to said solution of said alkoxide to hydrolyze said alkoxide at hydrolysis conditions to form a dispersion of monodisperse titania particles, said hydrolysis being conducted in the presence of a component selected from the group consisting of (1) monoalkyl amines, (2) dialkyl amines, (3) trialkyl amines in combination with hydroxypropylcellulose and (4) mixtures thereof, said alkyl substituent having from 1 to 7 carbon atoms; and
(d) separating and recovering said monodisperse titania particles from said dispersion.

4,732,751
HIGH PURITY LITHIUM OXIDE PROCESS

Dennis J. Salmon, Gastonia, N.C., assignor to Lithium Corporation of America, Gastonia, N.C.

Continuation-in-part of Ser. No. 850,637, Apr. 11, 1986, abandoned. This application Jun. 1, 1987, Ser. No. 56,575
Int. Cl.[4] C01D *15/02*
U.S. Cl. 423—641 **3 Claims**

1. A process for producing high purity lithium oxide from lithium peroxide containing lithium carbonate or lithium hydroxide or a mixture thereof comprising the steps of:
(a) decomposing lithium peroxide containing up to 16% by weight of lithium carbonate or lithium hydroxide or a mixture thereof at a temperature of 350° to 450° C., in an inert, anhydrous atmosphere to produce impure lithium oxide; and
(b) heating the impure lithium oxide containing up to 25% by weight of lithium carbonate or lithium hydroxide or a mixture thereof under a pressure of not more than 0.2 kilo Pascals at 900° C. or more for at least one hour to obtain high purity lithium oxide of 99% or greater purity.

4,732,752
POLYVALENT EQUINE IMMUNE SERUM COMPOSITION AND METHOD FOR TREATING RHEUMATOID ARTHRITIS

Peter M. Stephan, London, England, assignor to Peter Stephan Center, Ltd., Miami, Fla.

Filed Oct. 23, 1986, Ser. No. 922,386
Int. Cl.[4] A61K *39/395*
U.S. Cl. 424—85 **8 Claims**

1. A therapeutic composition in dosage form comprising a pharmaceutically acceptable carrier and a polyvalent equine immune serum which contains antibodies to pig bone marrow, bone tissue, thymus, spleen, lymphatic ganglia, parathyroid gland, connective tissue, and serous membranes.

4,732,753
SUPPOSITORY DOSAGE FORM

Walter Fiiller, Therwil, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 11, 1985, Ser. No. 700,168
Claims priority, application Switzerland, Feb. 22, 1984, 858/84
Int. Cl.[4] A61K *9/02, 9/62, 9/36*
U.S. Cl. 424—85 **14 Claims**

1. A suppository dosage form consisting essentially of a therapeutically effective amount of ceftriaxone, a pharmaceutically compatible salt thereof or a hydrate of one of these compounds, a stabilizer consisting of a mono-, di- or triglyceride of a C_{12}–C_{18}-fatty acid or of a mixture of such glycerides, a potentiator consisting of a mixture which contains mono- and diglycerides of C_8–C_{10}-fatty acids.

4,732,754
METHOD FOR THE PREPARATION OF ANTIPERSPIRANT COMPOSITIONS HAVING ENHANCED EFFICACY

Helga Krevald, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 591,888, Mar. 21, 1984, abandoned, and a continuation of Ser. No. 353,730, Mar. 1, 1982, abandoned. This application Jan. 10, 1986, Ser. No. 818,383
Int. Cl.[4] A61K *7/34, 7/38*
U.S. Cl. 424—66 **10 Claims**

1. An improved method for increasing the antiperspirant efficacy of a water-in-oil emulsion antiperspirant or suspension stick, selected from the group consisting of suspensions of an astringent compound in a hydrophobic medium and emulsions of an aqueous solution of an astringent compound in a hydrophobic medium, wherein the improvement comprises incorporating into said composition from about 1 to 5 percent by weight, based on the total weight of said composition, of a saturated C_3 to C_8 alkanediol compound; said diol compound having no more than one carbon atom separating the hydroxy groups thereof.

4,732,755
SKIN BURN TREATMENT

Luis Grana, Park Ridge, Ill., assignor to University of Health Sciences/The Chicago Medical School, North Chicago, Ill.

Continuation-in-part of Ser. No. 458,216, Jan. 17, 1983, abandoned, which is a continuation of Ser. No. 276,936, Jun. 24, 1981, abandoned. This application Apr. 28, 1983, Ser. No. 489,590
Int. Cl.[4] A61K *31/78*
U.S. Cl. 424—81 **8 Claims**

1. A method of treatment of human or mammalian animal skin burn by providing a substitute skin protective dressing over the area of skin burn, comprising the steps of: applying onto the entire area of skin burn a layer of powder that is water soluble and hygroscopic and whose principal ingredient is sodium polyacrylate having a mean molecular weight of $3.6 \times 10^6 \sim 5.5 \times 10^6$, in powder form; then wetting the layer of powder with water to provide a highly viscous jelly-like layer that adheres firmly to the skin burn area; and the outer surface of the layer drying thereafter to form an outer surface of parchment-like consistency.

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4,732,756

(Z)-3-DODECEN-1-OL (E)-2-BUTENOATE AND ITS USE IN MONITORING AND CONTROLLING THE SWEETPOTATO WEEVIL

Robert R. Heath; James A. Coffelt, both of Gainesville, Fla.; Fredrick I. Proshold, St. Croix, V.I.; Philip E. Sonnet, Doylestown, Pa., and James H. Tumlinson, III, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 27, 1986, Ser. No. 879,696
Int. Cl.[4] A01N *25/00*; C07C *69/56*
U.S. Cl. 424—84 9 Claims

1. The substantially pure compound (Z)-3-dodecen-1-ol (E)-2-butenoate.

2. A sex attractant composition for the sweetpotato weevil, which comprises an effective attractant amount of the substantially pure compound (Z)-3-dodecen-1-ol (E)-2-butenoate and a carrier.

4,732,757

PREVENTION AND TREATMENT OF RHEUMATOID ARTHRITIS

Ralph J. Stolle, Lebanon, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research and Development Corporation, Cincinnati, Ohio

Continuation of Ser. No. 875,140, Feb. 6, 1978. This application Dec. 9, 1983, Ser. No. 558,909
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.
Int. Cl.[4] A61K *39/116, 39/085, 39/112, 37/04*
U.S. Cl. 424—87 4 Claims

1. A method for the treatment of rheumatoid arthritis caused by a mixed spectrum of infectious bacteria which reside in the gastrointestinal tract, including:

ORGANISMS
Staphylococcus aureus
Staphylococcus epidermidis
Streptococcus pyogenes, A. Type 1
Streptococcus pyogenes, A. Type 3
Streptococcus pyogenes, A. Type 5
Streptococcus pyogenes, A. Type 8
Streptococcus pyogenes, A. Type 12
Streptococcus pyogenes, A. Type 14
Streptococcus pyogenes, A. Type 18
Streptococcus pyogenes, A. Type 22
Aerobacter aerogenes
Escherichia coli
Salmonella enteritidis
Pseudomonas aeruginosa
Klebsiella pneumoniae
Salmonella typhimurium
Haemophilus influenzae
Streptococcus viridans
Proteus vulgaris
Shigella dysenteriae
Streptococcus, Group B
Diplococcus pneumoniae
Streptococcus mutans
Corynebacterium, Acne, Types 1 & 2

which comprises the oral administration of a quantity of nonfat milk solids equivalent to one quart of immunized cow's milk IgG, post-prandially two times daily, wherein the cow's milk IgG includes antibodies produced by the following microorganisms from American Type Culture Collection bacterial antigens:

ORGANISMS	*ATCC NO.
Staphylococcus aureus	11631
Staphylococcus epidermidis	155
Streptococcus pyogenes, A. Type 1	8671
Streptococcus pyogenes, A. Type 3	10389

-continued

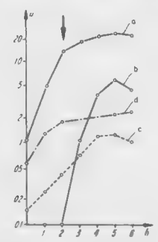
ORGANISMS	*ATCC NO.
Streptococcus pyogenes, A. Type 5	12347
Streptococcus pyogenes, A. Type 8	12349
Streptococcus pyogenes, A. Type 12	11434
Streptococcus pyogenes, A. Type 14	12972
Streptococcus pyogenes, A. Type 18	12357
Streptococcus pyogenes, A. Type 22	[illegible]
Aerobacter aerogenes	[illegible]4
Escherichia coli	26
Salmonella enteritidis	13076
Pseudomonas aeruginosa	7700
Klebsiella pneumoniae	9590
Salmonella typhimurium	13311
Haemophilus influenzae	9333
Streptococcus viridans	[illegible]749
Proteus vulgaris	13315
Shigella dysenteriae	11835
Streptococcus, Group B	
Diplococcus pneumoniae	
Streptococcus mutans	
Corynebacterium, Acne, Types 1 & 2	

4,732,758

PREPARATION WITH COLLAGENOLYTIC ACTIVITY HAVING HIGH ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Nicole Hurion, Paris, and Borivog Keil, Gif/S/Yvette, both of France, assignors to Institut Pasteur, Paris, France

Filed Sep. 5, 1984, Ser. No. 647,674
Claims priority, application France, Jan. 5, 1983, 83 00114; Jan. 5, 1983, 83 00112
Int. Cl.[4] A61K *37/62, 7/28*
U.S. Cl. 424—94.2 17 Claims



1. A composition comprising:

a collagenase which specifically recognizes a peptide sequence X-glycyl-L-prolyl in collagen in an amount effective to treat pathologies manifested by an uncontrolled alteration of collagen-rich structures in man or animal, in which X is a natural amino acid residue linked to the N-terminal end of the glycyl residue, said collagenase cutting said sequence specifically at the level of the X-glycyl linkage to degrade collagen into fragments and besides being inhibited at least partly by myosine;

an effective amount of a neutral protease which can degrade further said collagen fragments; and

an effective amount of an endonuclease which can contribute to the destruction of DNA released as pus by infected cells;

the proportions of said protease and said endonuclease with respect to 0.350 μkat of said collagenase not exceeding 200 caseinolytic units for said protease and 500 nucleasic units for said endonuclease.

4,732,759

BATH PREPARATIONS AND METHOD FOR PRODUCING THE SAME

Ichiro Shibanai, Tokyo, and Kenji Nakamura, Osaka, both of Japan, assignors to Japan Liquid Crystal Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,746
Claims priority, application Japan, Jun. 13, 1985, 60-129445
Int. Cl.[4] A61K *37/54, 35/78, 31/715*
U.S. Cl. 424—94.61 13 Claims

1. A stable bath preparation comprising a vitamin cyclodextrin clathrate compound and a saccharifying enzyme.

4,732,760

CURATIVE AND PREVENTIVE AGENT FOR ULCERS OF DIGESTIVE ORGANS

Yoshiro Iga, Nishinomiya; Kanemichi Okano, Osaka, and Toshiaki Akira, Ibaraki, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Continuation of Ser. No. 655,634, Sep. 28, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 875,529
Claims priority, application Japan, Nov. 14, 1983, 58-213686
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 3 Claims

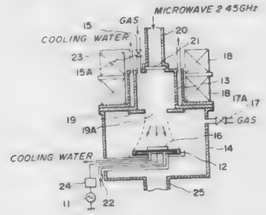
1. A method of preventing or inhibiting mucosal lesions and ulcers of the digestive organs which method comprises administering from 10 to 50 mg/kg/day to a person in need of same, of an extract having anti-ulcer activity extracted from cassia buds with hot water, an alcohol or a mixed water-alcohol solution, the alcohol being selected from the group consisting of methanol and ethanol.

4,732,761

THIN FILM FORMING APPARATUS AND METHOD

Katsuyuki Machida, Isehara, and Hideo Oikawa, Koganei, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,244
Claims priority, application Japan, Mar. 23, 1985, 60-57569
Int. Cl.[4] B05D *5/12*
U.S. Cl. 437—228 14 Claims



1. A method for forming a thin film to planarize a surface of a semiconductor device having convex and concave regions by an apparatus comprising:

a plasma generating chamber into which a gas is introduced to produce plasma;

a specimen chamber having a window;

a substrate electrode disposed in said specimen chamber for receiving a specimen substrate having interconnections thereon, said substrate electrode being disposed below said window;

a first gas introducing means for selectively introducing at least one of a first material gas of a thin film to be deposited on said specimen substrate and an inert gas into said plasma generating chamber;

a second gas introduction means for introducing a second material gas of a thin film to be deposited on said specimen substrate into said specimen chamber;

means for introducing plasma from said plasma generating chamber into said specimen chamber via said window and for impinging the introduced plasma substantially perpendicularly upon said specimen substrate; and

a bias electrical power source means for applying a high frequency bias voltage to said substrate electrode such that the ions of said at least one of said first material gas and said inert gas, which impinge substantially perpendicularly upon said specimen substrate, have sufficient energy for etching the film deposited on said specimen substrate, said method comprising the steps of:

placing a specimen substrate on said substrate electrode;

maintaining both said plasma generating chamber and said specimen chamber in a vacuum condition;

introducing said first material gas and said second material gas from said first and second gas introduction means, respectively, the ions of said first material gas being such that said interconnections are seldomly etched therewith and thin film consisting essentially of particles resulting from the rection between said first and second material gases in etched therewith; and

forming a thin film having a planar surface by said first and second material gases on said specimen substrate including said interconnections by applying a bias voltage from said bias electrical power source means to said substrate electrode, so that said ions of said first material gas impinge substantially perpendicularly upon said specimen substrate to etch said thin film during the formation of said thin film.

4,732,762

TIMED RELEASE PEST CONTROL COMPOSITION AND MEANS

Robert D. Sjogren, St. Paul, Minn., assignor to Metropolitan Mosquito Control District, St. Paul, Minn.

Continuation of Ser. No. 472,922, Mar. 7, 1983, abandoned. This application Mar. 20, 1985, Ser. No. 714,341
Int. Cl.[4] A01N *25/34*
U.S. Cl. 424—409 23 Claims

1. A controlled slow release pest control composition that can be hardened by the addition of a sufficient plaster hydrating amount of water, which consists essentially of an effective pest population controlling amount of a pest control agent, a plaster having high compressive strength of at least about 5,000 lbs. per square inch, and an effective electromagnetic radiation absorbing amount of finely divided carbon wherein the composition can be used in the form of a solid pest control means that when immersed in an aqueous pest breeding site can release an effective amount of the pest control agent for at least 30 days, and that when dry does not release the agent.

4,732,763

ACTIVE/PASSIVE IMMUNIZATION OF THE INTERNAL FEMALE REPRODUCTIVE ORGANS

Lee R. Beck; Charles F. Flowers; Donald R. Cowsar, and Albert C. Tanquary, all of Birmingham, Ala., assignors to Stolle Research and Development Corporation, Cincinnati, Ohio

Continuation of Ser. No. 121,480, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 952,109, Oct. 17, 1978, abandoned. This application Sep. 28, 1984, Ser. No. 655,989
Int. Cl.[4] A61K *39/02, 39/12, 9/50*
U.S. Cl. 424—433 19 Claims

1. Anti-B-HCG containing microparticles for the immunization of the internal female reproductive organs, said microparticles containing a biologically effective amount of anti-B-HCG incorporated in a matrix material which is biocompatible and biologically degradable, said microcapsules being capable of being transported after deposition in the vagina by the natural transport mechanism of the internal female reproductive organs across the cervix into the uterus wherein immunization is effected within said internal female organs, said microparticles having a diameter of from 10 to 100 μm.

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4,732,764

DEVICE FOR INTRODUCING NUTRIENTS AND/OR THERAPEUTIC MATERIALS INTO RUMINANT ANIMALS

Reginald G. Hemingway; Norman S. Ritchie, and James J. Parkins, all of Glasgow, Scotland, assignors to The University Court of the University of Glasgow, Glasgow, Scotland

Continuation of Ser. No. 505,191, Jun. 17, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 825,687

Claims priority, application United Kingdom, Jun. 22, 1982, 8218056

Int. Cl.[4] A23K *1/18*

U.S. Cl. 424—438 8 Claims

1. A pellet for introducing biologically active agents into a ruminant animal, said pellet having a specific gravity of 2.0 or greater so as to be retained in the rumen or reticulum of the ruminant animal and said pellet having a core formed of compressed particles, at least some of which contain a biologically active agent, and a synthetic resin coating forming a rigid skin surrounding said core, said skin being insoluble in the rumen liquor of the animal and having a thinness and brittleness such that the skin requires the support of the core to maintain its integrity, and without the support of the core disintegrates into fragments during the digestive process, and wherein said pellet is sectioned so as to expose said core to the rumen liquor so that the rumen liquor may progressively dissolve the core and release said biologically active agents while the brittle skin is progressively disintegrated as the core is dissolved.

4,732,765

SUSTAINED RELEASE COATING COMPOSITION AND PREPARATION COATED THEREWITH

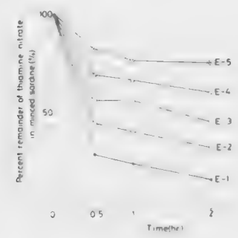
Tsutomu Sasagawa, Shizuoka; Toshiaki Sakashita, Hino, and Toshio Houma, Hachioji, all of Japan, assignors to Toyo Jozo Co., Ltd., Tagata, Japan

Filed Dec. 23, 1985, Ser. No. 812,522

Claims priority, application Japan, Dec. 25, 1984, 59-281663

Int. Cl.[4] A61K *9/70*

U.S. Cl. 424—476 4 Claims



1. A core material coated with a sustained release coating composition comprising a mixture of from 0.5–10 parts by weight of a metallic soap derivant from an acid having 12–22 carbon atoms per 100 parts by weight of an higher having 12–28 carbon atoms alcohol, the amount of said coating composition ranging from 1–10 times by weight of the core material.

4,732,766

BAIT

Knud Lindgard, 448 Iliwahi Loop, Kailua, Oahu, Hi. 96734

Continuation-in-part of Ser. No. 503,586, Aug. 10, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 710,572

Int. Cl.[4] A23K *1/18*

U.S. Cl. 426—1 6 Claims

6. The method of preparing a fish bait comprising the steps of:

(a) preparing a leavening solution of sugar, water and a leavening agent.

(b) physically mix the leavening solution with a sufficient quantity of flour containing gluten until a pour batter is formed.

(c) Rolling the pour batter into a precut resilient block of long staple, non woven plastic monofilaments until most of the gluten from the pour batter has attached to the monofilaments and all of the pour batter has completely sorbed in the remaining spaces of the block.

(d) Allowing the product thus obtained to rise as determined by the amounts of gases produced by the leavening agent.

(e) Applying a source of heat until it is solidified into a bread.

4,732,767

METHOD FOR REDUCING CHIP BLEED IN BAKED GOODS

Paul Seiden, Cincinnati, Ohio; Susie H. Mills, Ft. Thomas, Ky.; Edward D. Smith, III, and Martin A. Mishkin, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 10, 1986, Ser. No. 849,972

Int. Cl.[4] A21D *2/16*

U.S. Cl. 426—94 16 Claims

1. A method for reducing chip bleed in a flavor chip-containing cookie made from dough containing shortening, comprising adding to the dough from about 0.5% to about 5% based on the amount of shortening of an emulsifier which is at least about 70% crystalline at room temperature to form a stable oil-in-water emulsion, said emulsifier comprising:

(a) from about 40% to about 100% by weight, on the basis of monoglyceride content, fatty acid mono-diglycerides having from about 35% to about 99% fatty acid monoglycerides and from about 1% to about 50% fatty acid diglycerides, wherein at least about 65% of said fatty acids are selected from the group consisting of C_{16}–C_{18} saturated fatty acids and C_{18} trans-unsaturated fatty acids and mixtures thereof;

(b) from about 0% to about 60% by weight fatty acid esters of polyols having an average of from about 4 to about 14 hydroxyl groups, wherein from about 10% to about 66% of the hydroxyl groups are esterified, and wherein at least about 65% of said fatty acids are selected from the group consisting of C_{16}–C_{18} saturated fatty acids and C_{18} trans-unsaturated fatty acids and mixtures thereof; and

(c) from about 0% to about 60% by weight fatty acid monoglyceride esters of polycarboxylic acids and their derivatives; selected from the group consisting of diacetylated tartaric acid esters of monoglycerides, citric acid esters of monoglycerides, succinylated monoglycerides, ethoxylated monoglycerides, lactylated monoglycerides, and mixtures thereof; wherein at least about 65% of said fatty acids are selected from the group consisting of C_{16}–C_{18} saturated fatty acids and mixtures thereof.

4,732,768

SPONGE DOUGH PROCESS

Nickolas C. Kovach, Kansas City, Mo., assignor to Interstate Brands Corporation, Kansas City, Mo.

Filed Sep. 23, 1986, Ser. No. 911,050

Int. Cl.[4] A21D *8/02*

U.S. Cl. 426—27 8 Claims

1. In a sponge dough process for preparing a final dough including the steps of preparing a yeast-containing sponge fraction and a dough fraction, initially setting the sponge fraction and allowing it to ferment, mixing the sponge and dough fractions to yield a final dough, and dividing and proofing the final dough, the improvement which comprises the steps of:

preparing said sponge fraction such that the sponge fraction contains from about 40 to 60% by weight of the total flour content of the final dough, and initially setting said sponge fraction at a temperature of from about 72° to 80° F. and a pH of from about 5.2 to 5.6;

fermenting said initially set sponge fraction for a period of from about 1½ to 2½ hours and under conditions such that at the end of the fermentation period the sponge fraction has a temperature of from about 82° to 84° F. and a reduced pH as compared with the initial set pH;

reducing the temperature of the sponge fraction to a level of from about 40° to 45° F.;

mixing said dough fraction and said sponge fraction after the latter has been reduced in temperature to yield said final dough, and thereafter quiescently holding the final dough for a period of from about 15 to 30 minutes; and

subjecting the quiescently held final dough to an intermediate proofing step for a period of from about 6 to 8 minutes.

4,732,769

SOFT, UNRIPENED CHEESE

Tomaso Sozzi, Lausanne; Robert Poussz, L'Abergement a/Orbe, and Hugh Hose, Yverdon, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 25, 1986, Ser. No. 833,107

Claims priority, application Switzerland, Mar. 12, 1985, 1102/85

Int. Cl.[4] A23C *19/032*

U.S. Cl. 426—40 9 Claims

5. A process for producing a cheese comprising first inoculating and then incubating a concentrated, pasteurized milk having a dry matter content of from 18% to 35% by weight of which at least 40% by weight of the dry matter content is non-fat solids, with *Streptococcus cremoris* CNCM I-369, *Streptococcus cremoris* CNCM I-370 and *Streptococcus lactis* CNCM I-371 bacteria, with an incubation time and temperature and an amount of bacteria being sufficient to obtain a cheese having a pH of approximately 4.3 to 4.8.

4,732,770

EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME

Dennis G. Welygan, and Ronald O. Zemke, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 768,803, Aug. 23, 1985, Pat. No. 4,634,485, which is a division of Ser. No. 550,641, Nov. 10, 1983, abandoned. This application May 29, 1986, Ser. No. 868,786

Int. Cl.[4] A23P *1/12;* A23G *3/00;* A21C *11/16*

U.S. Cl. 426—94 17 Claims

1. Method of making an extruded food article comprising

(1) extruding at a first rate a first filament-forming, extrudable plastic mass which comprises a food or its precursor to form a plurality of spaced, straight continuous parallel elements;

(2) extruding, at a second rate faster than said first extrusion rate and between adjacent spaced, continuous parallel elements, a second filament-forming extrudable plastic mass which comprises a food or its precursor to form an undulatable element which is thinner than it is wide to provide a cross-section with an aspct ratio of at least two, with the undulatable element being positioned with each opposite face of its wide dimension facing one of said continuous straight parallel elements, the surfaces of said plastic masses having a tacky first physical state which permits said surfaces to bond to one another at points of mutual contact and a second physical state in which subsequent bonding will no longer occur and in which latter state said elements have sufficient structural integrity to maintain their extruded bonded shape;

(3) while the surfaces of said elements are sufficiently tacky to cause bonding therebetween at points of contact, causing said undulatable element to undulate in its thin dimension by permitting contact between a parallel element on one side of said undulatable element while maintaining the other adjacent parallel element in sufficiently close proximity to permit subsequent contact between it and the undulating undulatable element and to permit repetition of such undulation and subsequent contact, thereby providing a food article having an undulated element with apexes aligned on opposed sides wherein the apexes on one side of the undulated element are bonded to one of said parallel elements and the apexes on the other side of said undulated element are bonded to the other adjacent parallel element; and

(4) changing or permitting the change of said plastic masses to said second physical state.

4,732,771

METHOD FOR REMOVING SKINS AND PITS FROM AVOCADOS

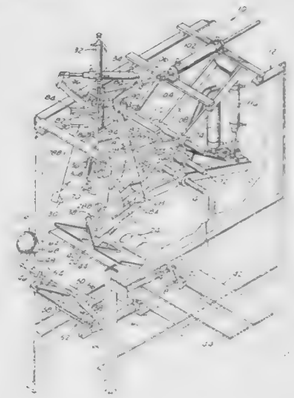
Ronald C. Bushman, Hacienda Heights, Calif., assignor to Brown International Corporation, Covina, Calif.

Division of Ser. No. 682,832, Dec. 18, 1984, Pat. No. 4,627,339.

This application Jul. 11, 1986, Ser. No. 884,606

Int. Cl.[4] A23P *1/00;* A23L *1/212*

U.S. Cl. 426—482 8 Claims



1. In a method for removing skins and pits from avocados, the steps comprising;

operating knife means for cutting through the skin and flesh of an avocado and for engaging and holding the avocado pit,

engaging jaw means with skin portions of the avocado on opposite sides of the knife means and removing the skin portions from the avocado flesh, and

separating flesh portions of the avocado from the pit by forcing the flesh portions of the avocado away from the pit while the pit is engaged and held by said knife means.

4,732,772

CHEESECAKE FILLING MIX AND PROCESS

James V. Nolte, Godfrey, Ill., assignor to Blanke Baer/BoweyKrimko Corp., Fenton, Mo.

Filed Sep. 9, 1986, Ser. No. 905,504

Int. Cl.[4] A23L *1/04;* A23C *13/14, 9/154*

U.S. Cl. 426—573 9 Claims

1. A process for producing a cheesecake filling mix, comprising the steps of

(a) providing an agitated mixture of cream, sugar, milk, and nonfat dry milk, in which the amount of cream is equal to at least one third of the weight of the final product, and additionally providing eggs in said mixture;

(b) adding to said mixture an effective amount of a premixed stabilizing composition which includes sodium caseinate, salt, modified starch, locust bean gum, mono and diglycer-

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ides, xanthan gum, sodium tripoly phosphate, and potassium sorbate;
(c) pasteurizing said mixture,
(d) homogenizing said mixture,
(e) cooling said mixture to ambient temperature subsequent to said homogenizing step,
(f) acidifying said cooled mixture with an effective amount of an acidifying composition including citric, phosphoric and acetic acids in water:
(g) agitating said mixture for a sufficient additional period of time and degree to impart a smooth consistency to said mixture; and
(h) refrigerating or freezing said mixture after said agitating until ready for use.

4,732,773
INSTANT BEVERAGE AND INSTANT TEA
Gerhard Schott, Mettmann, Fed. Rep. of Germany, assignor to Krüger GmbH & Co. KG, Bergisch Gladbach, Fed. Rep. of Germany
Filed Jul. 11, 1983, Ser. No. 512,662
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226765; Oct. 7, 1982, 3237077; Feb. 4, 1983, 3303709
Int. Cl.[4] A23F *3/30;* **A23J** *1/10;* **A23L** *2/00, 2/02*
U.S. Cl. 426—590 **5 Claims**

1. An instant beverage substantially free of cariogenic carbohydrates, said beverage forming a clear solution in aqueous media and being in the form of a powder, granules or paste comprising a vegetable or fruit extract and 44.9–94.7% by weight of a protein carrier, the carrier being soluble in an aqueous medium and consisting essentially of a short chain protein having a molecular weight in the range of 2,000 to 10,000 which is obtained from connective tissue.

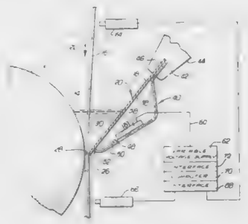
4,732,774
PROCESS FOR PREPARING TOFU CHARGED INTO A CONTAINER
Ko Sugisawa; Yasushi Matsumura; Koji Sengoku, and Yoshiaki Nagatome, all of Nara, Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan
Continuation of Ser. No. 740,333, Jun. 3, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 14,083
Claims priority, application Japan, Jul. 4, 1984, 59-138480
Int. Cl.[4] A23L *1/20;* **A23J** *3/00*
U.S. Cl. 426—634 **4 Claims**

1. A process for preparing tofu charged into a container, which comprises:
(a) adding polyphosphate and at least one substance selected from the group consisting of casein, casein salt and complexes consisting mainly of casein to a solution selected from the group consisting of soybean milk and aqueous solutions of isolated soybean protein, wherein the amount of said polyphosphate and said substance is 0.05–0.4%, and 0.1–1.2% relative to the weight of the solution, respectively;
(b) homogenizing the mixture under a pressure of 100 to 300 kg/cm^2 by a pressure-type homogenizer;
(c) adding a coagulant to the mixture; and
(d) coagulating the mixture by heating the same after it has been charged into a packaging container and sealed therein.

4,732,775
PROCESSES AND APPPARATUS FOR PRODUCING EXTRUDED FOODS
Christian Millauer, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Fed. Rep. of Germany
Continuation of Ser. No. 664,229, Oct. 24, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 878,521
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341090
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—635 **7 Claims**

1. A process for producing starch based extruded foods containing starch, water and at least one flavorant, said process consisting essentially of the following steps feeding 20 to 50% of dry starch based on the combined amount of starch and flavorant to a screw extruder in a feed zone, downstream of the addition of said dry starch adding only sufficient water to said screw extruder to provide a gelled product, mixing and kneading said starch and water in a first mixing zone of said screw extruder to provide a starch water mixture, gelling and heating said starch-water mixture to a temperature in the range of about 120 to 180° C. using substantially only shear forces of said screw extruder, adding said flavorant having a water content of more than 50% to said gelled heated starch-water mixture in a flavorant feeding zone of said screw extruder downstream of said first mixing zone, mixing and kneading said flavorant and said heated gelled starch-water mixture to form a flavored-starch mixture in a second mixing zone of said screw extruder and extruding said flavored starch mixture from said screw extruder.

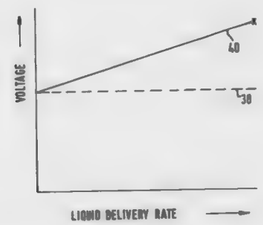
4,732,776
APPARATUS AND METHOD FOR CONTROLLING THE THICKNESS OF COATINGS ON PAPER OR OTHER MATERIALS
Matt Boissevain, Cupertino, Calif., assignor to Measurex Corporation, Cupertino, Calif.
Filed Feb. 24, 1987, Ser. No. 17,833
Int. Cl.[4] B05D *3/12*
U.S. Cl. 427—10 **14 Claims**



14. A method for applying a uniform thickness of a coating material to a web material from a continuous roll comprising:
selecting a thickness of the coating material to be applied to said web material at each of a plurality of selected cross-directional positions;
monitoring the thickness of the web material at said plurality of selected cross-directional positions across said web material before coating material is placed on said web material and producing first signals representative thereof;
placing coating material on said web material;
transporting web material from said roll on which said coating material has been placed through a slot formed by a surface and a metering element to remove excess coating material placed on said web material, the separation of said metering element and said surface at each of the selected cross-directional positions determining the total thickness of said web material and coating material passing through said slot at that selected cross-direction position;

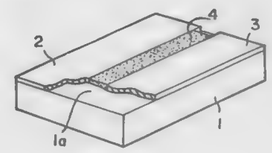
monitoring the thickness of said web material and coating material at said plurality of selected cross-directional positions after said web material has been transported through said slot and producing second signals representative thereof;
comparing in a device the corresponding first and second signals to determine the thickness of coating material applied at each selected cross-directional position and producing third signals representative thereof;
generating fourth signals representing the said selected thicknesses;
comparing in a device the corresponding third and fourth signals to determine the difference between the thickness of the coating material applied at each selected cross-directional position with the thickness of the coating selected to be applied, and producing control signals therefrom for each selected cross-directional position; and
applying said control signals to corresponding means for controlling the separation of said metering element and said surface at each selected cross-directional position while web material is being transported through said slot to change the thickness of the coating material applied in order that the coating material applied be the selected thickness at each selected cross-directional position.

4,732,777
ELECTROSTATIC COATING APPARATUS AND PROCESS
Kenneth R. Smythe, Farnborough, United Kingdom, assignor to Sale Tilney Technology PLC, United Kingdom
Filed Dec. 3, 1986, Ser. No. 937,563
Claims priority, application United Kingdom, Dec. 4, 1985, 8529932
Int. Cl.[4] B05D *1/04*
U.S. Cl. 427—27 **8 Claims**



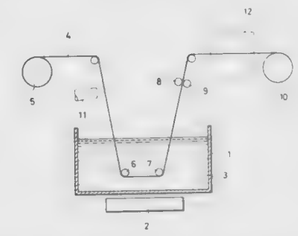
1. An electrostatic coating apparatus comprising an applicator, means for supplying liquid to the applicator at a controlled rate, means for establishing an electrosatic field between the applicator and a substrate to be coated and control means providing an output signal to the liquid supply means for setting the rate at which liquid is supplied to the applicator, the said control means also providing an output signal to the field establishing means which, in operation, sets the magnitude of the applied field, the said output signals being related to each other so that the applied field is varied automatically in accordance with any change in the rate of supply of liquid to the applicator.

4,732,778
METHOD FOR FORMING COMPOSITE LAYER BY LASER IRRADIATION UPON ALUMINUM ALLOY SUBSTRATE SURFACE OF POWDER MIXTURE CONTAINING METAL CARBIDE CERAMIC PARTICLES, SILICON, AND METAL ELEMENT FORMING INTER METALLIC COMPOUND WITH SILICON
Minoru Kawasaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Sep. 2, 1986, Ser. No. 902,624
Claims priority, application Japan, Aug. 30, 1985, 60-191393
Int. Cl.[4] B23K *9/06*
U.S. Cl. 427—53.1 **20 Claims**



1. A method for forming a composite layer on the surface of an aluminum alloy substrate, comprising the steps of:
(a) disposing a powder mixture containing a ceramic carbide of a metal, silicon and a metal element which forms with silicon an inter metallic compound having a specific gravity ratio of about 0.7 to about 2.0 relative to said ceramic carbide of a metal upon the surface of said aluminum alloy substrate; and:
(b) irradiating with a laser said power mixture as disposed upon said surface of said aluminum alloy substrate, so as to melt said silicon and said metal element which forms said inter metallic compound with said silicon in said powder mixture and a surface portion of said aluminum alloy substrate and so as to fuse them together.

4,732,779
FIBROUS MATERIAL FOR COMPOSITE MATERIALS, FIBER-REINFORCED METAL PRODUCED THEREFROM, AND PROCESS FOR PRODUCING SAME
Shinichi Towata, and Senichi Yamada, both of Toyota, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan
Filed May 21, 1986, Ser. No. 865,293
Claims priority, application Japan, May 21, 1985, 60-108772; Jun. 21, 1985, 60-135429
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—57 **17 Claims**



1. A process for producing a fibrous material for composite materials, comprising:
loosening a bundle of individual continuous fibers made of at least one heat resistant substance selected from the group consisting of ceramics, carbon, metals and intermetallic compounds, and
dipping said bundle of individual continuous fibers in a bath

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containing a suspending medium and short fibers, whiskers, or powders made of at least one heat resistant substance selected from the group consisting of ceramics, carbon, metals and intermetallic compounds,

thereby attaching said short fibers, whiskers, or powders to a surface of the individual continuous fibers.

4,732,780

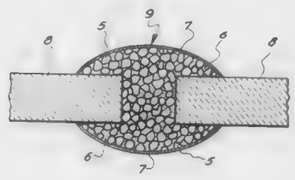
METHOD OF MAKING HERMETIC FEEDTHROUGH IN CERAMIC SUBSTRATE

Stephan P. Mitoff, Clifton Park; Richard J. Charles, Schenectady, and Wayne D. Pasco, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 780,137, Sep. 26, 1985, Pat. No. 4,684,446. This application Apr. 2, 1987, Ser. No. 33,368

Int. Cl.[4] H01L *21/88;* H05K *3/10*

U.S. Cl. 427—125 23 Claims



1. A process for forming an hermetic feedthrough in a ceramic substrate which comprises providing a sheet of a liquid phase sinterable ceramic composition having a feedthrough hole, at least substantially filling said feedthrough hole with a refractory metal metallization-forming material, firing the resulting structure to produce a sintered structure comprised of a sintered ceramic substrate having an electrically conductive refractory metal metallization, said ceramic substrate containing at least about 1% by volume of glassy phase, said metallization being comprised of a continuous phase of refractory metal and a continuous phase of glass, said refractory metal ranging from about 25% by volume to about 75% by volume of said metallization, said liquid phase ceramic composition and said metalliztion-forming material being formulated to produce said sintered structure, contacting said refractory metal at at least one exposed portion of said metallization with an intrusion metal selected from the group consisting of copper, nickel, tin, gold, iron, cobalt, and an alloy thereof, heating the resulting structure to an infiltration temperature which is above the transition temperature of said glass and at which said intrusion metal is liquid but said refractory metal is solid thereby infiltrating said liquid intrusion metal into said metallization, at said infiltration temperature said liquid metal preferentially wetting said refractory metal displacing said glass with said intrusion metal, and allowing the resulting structure to cool thereby solidifying said infiltrated liquid intrusion metal in place producing said feedthrough, said solid infiltrated intrusion metal at least partly occupying the volume space originally occupied by said displaced glass and being in contact with said refractory metal phase, said solid intrusion metal comprising at least about 25% by volume of said feedthrough, said process being carried out in an atmosphere which has no significant deleterious effect on said ceramic substrate, said refractory metal metallization and said intrusion metal.

4,732,781

METHODS FOR APPLYING NO MIX CEMENTS

H. Nash Babcock, Old Greenwich, and Edward P. Holub, Bethel, both of Conn., assignors to The Nomix Corporation, Fairfield, Conn.

Continuation-in-part of Ser. No. 843,316, Mar. 24, 1986, abandoned. This application Feb. 18, 1987, Ser. No. 15,834

Int. Cl.[4] B05D *1/12*

U.S. Cl. 427—140 32 Claims

1. A method for installing a cementitous composition upon a substrate which comprises:

saturating a substrate with water in substantial excess of that needed for hydration of the cementitious composition which is to be applied;

applying to said saturated substrate a dry cementitious composition comprising greater than 20 weight percent of the composition of finely divided particles of at least one cement binder, the major proportion of the particles having approximately the same drop rate, said composition applied to said saturated substrate without any type of physical mixing of the cementitous composition and water other than the mixing which occurs merely by applying the cementitious composition into said water and in a manner such that the cementitious composition combines with a portion of the water to completely hydrate the dry composition while displacing the remainder of the water from said substrate; and

allowing said hydrated cementitious composition to cure to a solid mass.

4,732,782

METHODS FOR APPLYING NO MIX CEMENTS

H. Nash Babcock, Old Greenwich, and Edward P. Holub, Bethel, both of Conn., assignors to The Nomix Corporation, Fairfield, Conn.

Continuation-in-part of Ser. No. 843,316, Mar. 24, 1986, abandoned. This application May 21, 1987, Ser. No. 53,561

Int. Cl.[4] B05D *1/12*

U.S. Cl. 427—427 22 Claims

1. A method for forming a cured cementitious composition which comprises:

providing an amount of water in excess of that needed for hydration of said amount of cementitious composition;

pouring a dry cementitious composition of finely divided particles of at least one cement binder in an amount of at least 20 percent by weight of the composition, the major proportion of the particles having approximately the same drop rate, into the water in a manner such that the cementitious composition combines with a portion of the water without any type of physical mixing of the cementitious composition and water other than the mixing which occurs merely by applying the cementitious compositions into the water to completely hydrate the dry composition while displacing the remainder of the water; and

allowing said hydrated cementitious composition to a substrate and allowing the applied composition to cure to a solid mass.

4,732,783

ORGANIC NONLINEAR OPTICAL MEDIA

Eui W. Choe, Randolph; Garo Khanarian, Berekely Heights, both of N.J., and Anthony F. Garito, Radnor, Pa., assignors to Hoechst Celanese Corporation, Somerville, N.J.

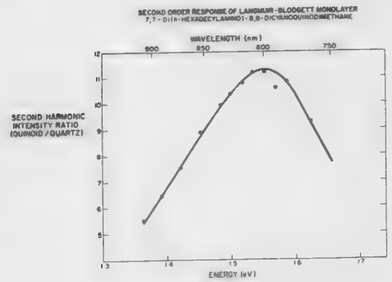
Division of Ser. No. 797,465, Nov. 13, 1985, Pat. No. 4,659,177. This application Dec. 3, 1986, Ser. No. 937,349

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—164 6 Claims

1. A process for preparing a nonlinear optical medium which comprises coating a transparent solid substrate surface by Langmuir-Blodgett deposition technique with at least one

monomolecular layer of uniaxial aligned quinodimethane molecules corresponding to the formula:





where R′ is a substituent selected from hydrogen and aliphatic, alicyclic and aromatic groups containing between about 6–30 carbon atoms; n is an integer with a value between about 0–3; and at least one of the R′ substituents is an electron-donating group.

4,732,784

PROCESS FOR TREATING A POLYMERIZATION REACTOR

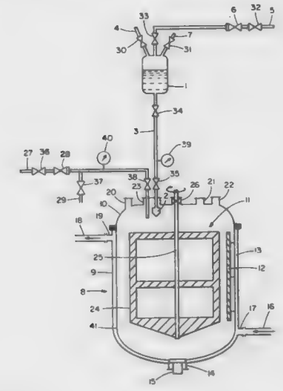
Paul Laroche, Saint-Auban; Jean-Bernard Pompon, deceased, late of Saint-Auban; by Marvonne Pompon, heir, Gap; by Laurence Pompon, heir, Paris; by Christophe Pompon, heir, Marseille, and by Lucie Pompon, heir, Gap, all of France, assignors to Atochem, Paris, France

Filed May 19, 1983, Ser. No. 495,953

Claims priority, application France, May 19, 1982, 82 08756

Int. Cl.[4] B05D *5/08;* C08L *93/04*

U.S. Cl. 427—230 16 Claims



1. A process for inhibiting the formation of polymer deposits in a polymerisation reactor comprising spraying an aqueous coating solution containing a resin extracted from pine wood within said reactor and than injecting and condensing steam within said reactor.

4,732,785

EDGE BEAD REMOVAL PROCESS FOR SPIN ON FILMS

James M. Brewer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1986, Ser. No. 911,834

Int. Cl.[4] B05D *5/12, 3/12*

U.S. Cl. 427—240 17 Claims

1. A method for removing an edge bead of a film that has been spun on to the surface of a disc having an edge wherein the edge bead resides near the edge of the disc, the method comprising the steps of multiple treatments of the edge bead with a solvent application, wherein each treatment comprises the steps of:

spinning the disc at a rotational speed that decreases over time, from a first speed to a second speed; and

applying to the edge of the disc a solvent in which the edge bead is soluble, while spinning the disc at a third speed less than the first speed;

wherein the first speed of each successive treatment is less than the first speed of the previous treatment.

4,732,786

INK JET PRINTABLE COATINGS

Robert Patterson; David H. Hollenberg, both of Neenah, Wis.; Robert C. Desjarlais, South Hadley, Mass., and George E. Alderfer, Neenah, Wis., assignors to James River Corporation, Richmond, Va.

Filed Dec. 17, 1985, Ser. No. 809,870

Int. Cl.[4] B41M *5/00*

U.S. Cl. 427—261 12 Claims

1. A method for ink jet printing comprising using in said ink jet printing a coated substrate, a layer of said substrate having a continuous coating on at least one surface thereof comprising:

(a) from 0 to 90 parts by weight of pigment;

(b) from 0 to 95 parts by weight of binder;

(c) from about 1 to 100 parts by weight of an insolubilized hydrophilic polymer; and

(d) from about 0.1 to about 50 milliequivalents per gram of polymer of a polyvalent cation selected from metallic salts, complexes and partially alkylated metal compounds having a valence greater than one and a coordination number greater than two.

4,732,787

VARNISHES WITH HIGH HARDNESS, RESISTANT TO ABRASION, PROCESS FOR THEIR PREPARATION, AND APPLICATION OF THESE VARNISHES TO COATING OF SOLID SUBSTRATES

Alain Vantillard, Sainte-Foy-les-Lyon; Joel Pellenc, Charly, and Claude Verne, Bron, all of France, assignors to Societe la Cellulose S.A., Pierre Benite, France

Filed May 13, 1986, Ser. No. 862,615

Claims priority, application France, May 13, 1985, 85 07806

Int. Cl.[4] C08K *3/36*

U.S. Cl. 427—386 12 Claims

1. A hard, abrasion-resistant varnish for coating the surfaces of solid substrates, comprising a solvent containing:

a. 4 to 90% by weight of the total of constituents (a), (b), and (c), of a colloidal silica;

b. 9 to 95% by weight of the total of constituents (a), (b), and (c), of the product of hydrolysis and partial condensation, in the presence of (a), of at least one nonepoxidized trialkoxysilane having the formula

R—Si—(OR′)$_3$

wherein R is a radical selected form the group consisting of alkyl radicals having from 1 to 4 carbon atoms, chloro-3-propyl, trifluoro-3,3,3-propyl, mercapto-3-propyl, methacryloxy-3-propyl, vinyl, and phenyl; and R′ is an alkoxyalkyl radical having from 2 to 4 carbon atoms;

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c. 1 to 87% by weight of the total of constituents (a), (b), and (c) of the product of hydrolysis and partial condensation, in the presence of (a) and (b), of at least one epoxidized trialkyloxysilane of the formula

$$R''—Si—(OR')_3$$

wherein R'' represents a radical containing an epoxide group;

d. 0.5 to 9% by weight of the total of constituents (a), (b), and (c), of a soluble aminoplast resin (d), selected from the group consisting of melamine-formaldehyde and ureaformaldehyde resins.

11. A process for coating a solid substrate with a varnish, said varnish comprising a solvent containing:

a. 4 to 90% by weight of the total of constituents (a), (b), and (c), of a colloidal silica;

b. 9 to 95% by weight of the total of constituents (a), (b), and (c), of the product of hydrolysis and partial condensation, in the presence of (a), of at least one nonepoxidized trialkoxysilane having the formula

$$R—Si—(OR')_3$$

wherein R is a radical selected form the group consisting of alkyl radicals having from 1 to 4 carbon atoms, chloro-3-propyl, trifluoro-3,3,3-propyl, mercapto-3-propyl, methacryloxy-3-propyl, vinyl, and phenyl; and R' is an alkoxyalkyl radical having from 2 to 4 carbon atoms;

c. 1 to 87% by weight of the total of constituents (a), (b), and (c) of the product of hydrolysis and partial condensation, in the presence of (a) and (b), of at least one epoxidized trialkyloxysilane of the formula

$$R''—Si—(OR')_3$$

wherein R'' represents a radical containing an epoxide group;

d. 0.5 to 9% by weight of the total of constituents (a), (b), and (c), of a soluble aminoplast resin (d), selected from the group consisting of melamine-formaldehyde and ureaformaldehyde resins, said process comprising the steps of contacting the substrate with the varnish and heating the substrate and varnish to a temperature of 120° C. for a period of up to two hours.

4,732,788

PROCESS FOR COATING SUBSTRATE AND AN AQUEOUS COATING COMPOSITION BASED ON A CATIONIC BINDER

Chantal H. Guioth, Rantigny; Etienne G. Maze, Bruil le Vert, and Jean J. Trescol, Ogent sur Oise, all of France, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 7, 1986, Ser. No. 882,280

Claims priority, application Netherlands, Jul. 5, 1985, 8501937

Int. Cl.[4] B05D *3/02;* **C08L** *37/00*

U.S. Cl. 427—388.2 **21 Claims**

1. A process for coating a substrate, comprising applying to said substrate an aqueous coating composition based on a cationic binder obtained by polymerization of a monomer mixture in the presence of 0.5 to 25 parts by weight of a polyethylenically unsaturated compound per 100 parts by weight of the monomer mixture,

said monomer mixture consisting of (a) 1–30% by weight of a hydroxy(cyclo)alkyl (meth)acrylate of which the (cyclo)alkyl group contains 2–8 carbon atoms, (b) 4–45% by weight of an amino (meth)acrylate of the formula

$$(R_1)_2NR_2OOC—\underset{\displaystyle R_3}{\overset{\displaystyle |}{C}}=CH_2$$

where at least one of the groups R_1 is an organic group containing 1–12 carbon atoms and the other group R_1 is an organic group containing 1–12 carbon atoms or a hydrogen atom, or the two groups R_1, together with the nitrogen atom attached thereto, form a heterocyclic group, R_2 is a hydrocarbon group containing 2–12 carbon atoms and R_3 is a hydrogen atom or a methyl group, (c) 0–80% by weight of a monovinyl aromatic hydrocabon containing 8–14 carbon atoms, and (d) 0–50% by weight of a different monoethylenically unsaturated monomer containing 2–20 carbon atoms;

said polyethylenically unsaturated compound being a polyurethane having 2–5 acryloyl groups or methacryloyl groups, a molecular weight of 400–7000 and a molecular weight per (meth)acryloyl group of at least 200;

amino groups in said binder being at least partially neutralized with an acid.

4,732,789

FLAME-RESISTANT COTTON BLEND FABRICS

Peter J. Hauser, Greensboro; Benny L. Triplett, Pleasant Garden, and Chumpon Sujarit, High Point, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 28, 1986, Ser. No. 923,965

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—393.3 **12 Claims**

1. A two step process for imparting washfast flame resistance to a polyester/cotton or nylon/cotton blend fabric that remains after multiple launderings, the process comprising the steps of:

(a) applying to a polyester/cotton blend fabric containing between 35% and 80% polyester, balance substantially entirely cotton or a nylon/cotton blend fabric containing between 10% and 65% nylon, balance substantially cotton, a flame retarding amount of a prepolymer condensate of urea and a tetrakis-(hydroxymethyl)phosphonium salt flame retardant that fixes to the cotton fibers, exposing the prepolymer condensate-containing fabric to a source of ammonia to form an ammoniated prepolymer, then oxidizing the ammoniated prepolymer to form a flame-retardant polymer network within the cotton fiber structure; and

(b) applying to the polyester/cotton or nylon/cotton blend fabric a flame retarding amount of (1) a cyclic phosphonate ester of (2) hexabromocyclododecane flame retardant that fixes to the polyester or nylon fibers and curing the fabric at elevated temperatures thereby fixing the applied cyclic phosphonate ester or hexabromocyclododecane to the polyester or nylon fibers.

4,732,790

COLOR PLUS CLEAR APPLICATION OF THERMOSETTING HIGH SOLIDS COATING COMPOSITION OF HYDROXY-FUNCTIONAL EPOXIES AND ANHYDRIDES

William P. Blackburn, Evans City; Ronald R. Ambrose, Allison Park; Samuel Porter, Jr., Natrona Heights, and Mary Jo Burkholder, Mars, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 21, 1986, Ser. No. 898,664

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—407.1 **13 Claims**

1. An improved process of applying a composite coating to a substrate, said process comprising applying to the substrate a colored film-forming composition to form a base coat, and applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat; followed by heating the composite coating to a temperature sufficient to provide effective cure; the improvement comprising the clear and/or base coat containing a high solids solvent-based thermosetting composition comprising:

(a) a low number average molecular weight hydroxy-functional polyepoxide,

(b) a curing agent consisting essentially of an anhydride,

(c) a cure catalyst selected from the group consisting of an onium salt which is a quaternary ammonium salt or a phosphonium salt, and a tertiary amine;

said composition is characterized in that it is curable in the absence of a melamine curing agent.

4,732,791

COLOR PLUS CLEAR APPLICATION OF THERMOSETTING HIGH SOLIDS COATING COMPOSITION OF EPOXIES, POLYOLS AND ANHYDRIDES

William P. Blackburn, Evans City; Ronald R. Ambrose, Allison Park; Samuel Porter, Jr., Natrona Heights, and Mary J. Burkholder, Mars, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 21, 1986, Ser. No. 898,670

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—407.1 **16 Claims**

1. An improved process of applying a composite coating to a substrate, said process comprising applying to the substrate a colored film-forming composition to form a base coat, and applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat; followed by heating the composite coating to a temperature sufficient to provide effective cure; the improvement comprising the clear and/or base coat containing a high solids thermosetting composition comprising:

(a) a low number average molecular weight polyepoxide,

(b) a low number average molecular weight hydroxyl group-containing polyfunctional material, and

(c) a curing agent consisting essentially of an anhyydride and,

(d) a cure catalyst selected from the group consisting of an onium salt which is a quaternary ammonium salt or a phosphonium salt, and a tertiary amine;

said composition is characterized in that it is curable in the absence of a melamine curing agent.

4,732,792

METHOD FOR TREATING SURFACE OF CONSTRUCTION MATERIAL FOR VACUUM APPARATUS, AND THE MATERIAL TREATED THEREBY AND VACUUM TREATMENT APPARATUS HAVING THE TREATED MATERIAL

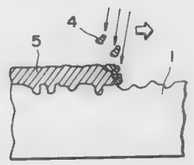
Yasutomo Fujiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,478

Claims priority, application Japan, Oct. 8, 1984, 59-210792

Int. Cl.[4] B05D *1/08, 1/10*

U.S. Cl. 427—423 **32 Claims**



1. A method for treating the surface of an element subject to vacuum in a vacuum apparatus having a chamber for forming and etching a deposition film on a substrate to be treated, which comprises forming a film on the surface of the element by a flame spraying method.

4,732,793

METHOD AND APPARATUS FOR LASER-INDUCED CVD

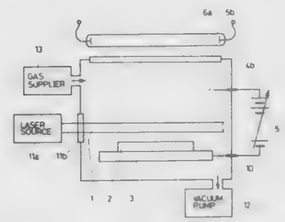
Hiromi Itoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1987, Ser. No. 10,582

Claims priority, application Japan, Feb. 7, 1986, 61-26125

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 **8 Claims**



1. A laser-induced CVD apparatus comprising;

a reaction chamber;

a vacuum pump for evacuating said chamber;

a gas supplier for supplying said chamber with a reactive gas;

a susceptor in said chamber for supporting a substrate on which a thin film is to be deposited;

a generally flat electrode provided opposite to said susceptor;

a laser source for emitting a laser beam to decompose said reactive gas and produce not only free radicals but also ions due to multiphoton absorption;

a DC power supplier connected between said electrode and said susceptor for generating an electric field therebetween, whereby said ions are efficiently transported toward said substrate and thus said film is deposited at an increased deposition rate; and

a mercury lamp means for applying ultraviolet to said substrate, whereby electrification of said film during deposition may be cancelled by electrons injected from said substrate due to a photoelectric effect.

4,732,794

PORCELAIN ENAMEL COMPOSITION AND SUBSTRATES COATED THEREWITH

Robert L. Hyde, Owings Mills, Md., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1986, Ser. No. 914,222

Int. Cl.[4] B32B *3/00, 15/00;* **C03C** *8/00, 3/078*

U.S. Cl. 428—210 **10 Claims**

1. A partially devitrified porcelain enamel composition formed by melting a mixture of materials which upon melting form an oxide mixture consisting essentially of:

(a) 20–50 wt % BaO

(b) 30–60 wt % SiO_2

(c) 2–20 wt % TiO_2

(d) 0–16 wt % K_2O

(e) 0–4 wt % Na_2O

(f) 0–4 wt % Li_2O

(g) 0–10 wt % Al_2O_3

(h) 0–3 wt % B_2O_3

(i) 0–3 wt % As_2O_3

(j) 0–10 wt % CaO

(k) 0–3 wt % CeO_2

(l) 0–10 wt % MgO

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(m) 0–3 wt % F_2
(n) 0–3 wt % N_2O_5
(o) 0–3 wt % PbO
(p) 0–3 wt % P_2O_5
(q) 0–3 wt % Sb_2O_3
(r) 0–3 wt % SnO_2
(s) 0–10 wt % SrO
(t) 0–7 wt % ZnO
(u) 0–10 wt % ZrO_2 and
(v) 0–3 wt % MoO_3

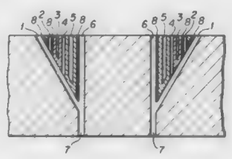
with the total weight percent being approximately 100 wt % to form a homogeneous melt, quenching the melt to form a frit and firing the frit.

4,732,795

HEAT-SHRINKABLE LAMINATE TUBULAR FILM

Masaki Ohya, and Yoshiharu Nishimoto, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,307
Claims priority, application Japan, Dec. 2, 1983, 58-228116
Int. Cl.⁴ B32B *7/02, 27/08, 27/30*
U.S. Cl. 428—36 **10 Claims**



1. A coextruded, biaxially stretched and laminated heat-shrinkable tubular film, comprising:

a gas-barrier layer of a copolymer of vinylidene chloride having a thickness, which is not more than 30% of the total thickness of the coextruded, biaxially stretched and laminated heat-shrinkable tubular film, of not less than 6 μm, outer layers of a polyolefin, at least one intermediate layer of a polyamide or a thermoplastic polyester, both of which show a crystal melting point of not more than 240° C., said intermediate layer having a thickness of 5 to 40% of the total thickness of the coextruded, biaxially stretched and laminated heat-shrinkable tubular film, and adhesive layers disposed between all or certain polymer layers, and

the total thickness of the coextruded, biaxially stretched and laminated heat-shrinkable tubular film being in the range of 20 to 120 micrometers,

the coextruded, biaxially stretched and laminated heat-shrinkable tubular film being produced by laminating and co-extruding the copolymer of vinylidene chloride, the polyolefin, polyamide or the thermoplastic polyester and the adhesive material, cooling, heating and stretching the resultant laminated tubular film.

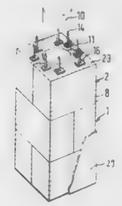
4,732,796

REFRACTORY SHEATHING FOR PIPES IN PREHEATING FURNACES

Peter Schatzschneider, Rommerskirchen, Fed. Rep. of Germany, assignor to Bloom Engineering (Europa) GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,451
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511606
Int. Cl.⁴ F16L *9/22, 59/12*
U.S. Cl. 428—36 **19 Claims**

1. A refractory sheathing of incombustible, compressed, flat insulating bodies made of mineral or ceramic fiber for thermally insulating pipes, skid pipes, supporting pipes, risers, and the like in preheating furnaces, pusher furnaces, or walking beam furnaces, the insulating bodies having an inner and, if desired, also an outer arc-shaped profile, enclosing the pipe to be insulated totally or almost totally in circumferential direction, and being secured at the pipe in close mutual abutment by at least two retainers which act at the ends of a plurality of adjacent insulating bodies forming a stack of insulating bodies,



characterized in that a plurality of insulating bodies are lined up on a plurality of spaced apart rods to form a highly compressed insulating body stack, in that a plurality of compression holding clamps are fixed spaced from each other on the rods between insulating bodies and the retainers provided at the ends of the stack, and in that the tips of the rods project beyond the end face of the stack of insulating bodies forming a prefabricated shaped section.

4,732,797

WET WIPER NATURAL ACID PRESERVATION SYSTEM

Dale H. Johnson, Greer; Joseph H. Miller, Greenville, both of S.C.; Jack H. Propp, Oshkosh, and Victor Turoski, Neenah, both of Wis., assignors to James River Corporation, Richmond, Va.

Filed Feb. 27, 1987, Ser. No. 19,756
Int. Cl.⁴ A61K *9/70;* **D06M** *13/20*
U.S. Cl. 428—74 **13 Claims**

1. In a wet wiper product of the type comprising a fibrous wipe, a liquid preservative composition, and a means enclosing the fibrous wipe and the liquid preservative composition, the improvement comprising a liquid preservative composition consisting essentially of:

(a) a mixture of citric acid and sorbic acid as the preservative component;
(b) water; and
(c) optional ingredients selected from the group consisting of skin moisturizers and fragrance compounds.

4,732,798

MULTILAYER CERAMIC SUBSTRATE AND METHOD OF MAKING THE SAME

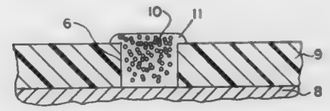
Toru Ishida, Hirakata; Yasuharu Kikuchi, Moriguchi; Tatsurou Kikuchi, Kyoto, and Yasuhiko Horio, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 651,032, Sep. 14, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,892
Claims priority, application Japan, Sep. 16, 1983, 58-171510; Oct. 18, 1983, 58-194627; Feb. 13, 1984, 59-24801; Feb. 23, 1984, 59-31472; Feb. 23, 1984, 59-31471; May 15, 1984, 59-96869
Int. Cl.⁴ B32B *3/00*
U.S. Cl. 428—137 **12 Claims**

1. A multilayered substrate comprising:

electrical insulating layers of ceramic; and

internal conductor layers of one base metal of tungsten, molybdenum, copper, nickel and iron, provided between each two of said electrical insulating layers, an uppermost layer of said electrical insulating layers being provided with orifices through which necessary portions at said internal conductor layers are exposed, said orifices at said uppermost insulating layer being filled with a filler material comprising a noble metal and a mixture of $BaO\text{-}B_2O_3$



series glass and alumina, which mixture is chemically inert to said base metal.

4,732,799

POLYETHYLENE NAPHTHALATE FILM

Seiji Sakamoto, Machida, and Yoshinori Sato, Yokohama, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 930,113
Claims priority, application Japan, Nov. 13, 1985, 60-254316
Int. Cl.⁴ G11B *5/704*
U.S. Cl. 428—141 **14 Claims**

1. A biaxially oriented polyethylene naphthalate film having a center line average roughness Ra μm and a film thickness T μm defined by the following relationship:

$$\frac{0.015}{T^{0.2}} \leqq Ra \leqq \frac{0.08}{T^{0.2}},$$

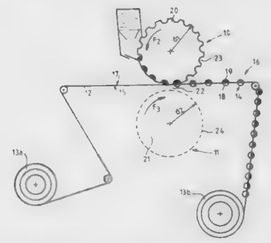
prepared by electrostatically cooling a polyethylene naphthalate sheet prepared from a polyethylene naphthalate melt having a resistivity of 1×10^7 to 5×10^8 Ω.cm as measured in the molten state.

4,732,800

PRODUCT ADAPTED TO BE STUCK HOT BY PRESSURE TO FLAT ARTICLES AND A PROCESS FOR ITS PRODUCTION

Pierre Groshens, Doingt-Flamicourt, France, assignor to Lainiere de Picardie, France

Filed Jan. 23, 1986, Ser. No. 821,846
Claims priority, application France, Jan. 23, 1985, 85 00922
Int. Cl.⁴ B32B *7/02;* **B05D** *5/10*
U.S. Cl. 428—196 **14 Claims**



1. A product adapted to be stuck hot and by pressure on flat articles such as garments, comprising a flat flexible support, a first heat-fusible layer applied to a front surface of the support, and a second layer less heat-fusible than the first layer and applied to a back surface of the support, wherein the said layers are discontinuous and disposed in the form of dots on the respective surfaces of the support, the dots of the layers being disposed opposite one another in cross-section.

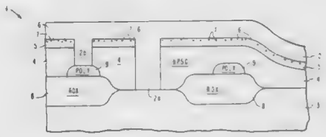
4. A process for the production of a product which comprises a flat flexible support, a first heat-fusible layer applied to a front surface of the support, and a second layer less heat-fusible than the first layer and applied to a back surface of the support, wherein the said layers are discontinuous, the process comprising the steps of passing the flat flexible support between at least two impression members, and applying the said layers to the said surfaces of the support by means of the impression members in such a manner that the said layers are disposed opposite one another in cross-section.

4,732,801

GRADED OXIDE/NITRIDE VIA STRUCTURE AND METHOD OF FABRICATION THEREFOR

Rajiv V. Joshi, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1986, Ser. No. 858,319
Int. Cl.⁴ B32B *27/14, 9/00;* **C25D** *11/02;* **B05D** *1/36*
U.S. Cl. 428—198 **27 Claims**



1. A multilayer structure including, in combination,

a substrate to which a layer containing a refractory metal is to be bonded, said substrate being one which does not bond strongly to said layer containing a refractory metal,

a layer containing said refractory metal,

an insulating bonding layer selected from the group consisting of silicon oxides, silicon nitrides, and silicon oxy-nitrides located between said layer containing said refractory metal and said bonding layer having free silicon particles therein and inclusions of said refractory metal substituted for at least some of said free silicon within at least the surface region of said bonding layer and forming bonding sites, the amount of said free silicon and said inclusions being sufficiently small that said bonding layer emains insulating, said layer containing said refractory metal being strongly bonded to said sites within said insulating bonding layer.

15. A method for forming a structure wherein a layer containing a refractory metal is to be bonded to a substrate to which said layer does not strongly adhere, comprising the steps of

depositing an insulating bonding layer selected from the group consisting of silicon oxides, silicon nitrides and silicon oxy-nitrides on said substrate, said bonding layer strongly adhering to said substrate and containing free silicon particles therein at least in a surface region of said bonding layer to be contacted by said layer containing said refractory metal,

substituting atoms of said refractory metal for at least some of said free silicon in said bonding layer to produce refractory metal inclusions within the body of said bonding layer, the amount of said free silicon and said inclusions being sufficiently small that said bonding layer remains insulating, said inclusions being bonding sites for deposition of said layer containing said refractory metal, and

depositing said layer containing said refractory metal onto said bonding layer, said bonding sites strongly adhering said deposited layer containing a refractory metal to said insulating bonding layer.

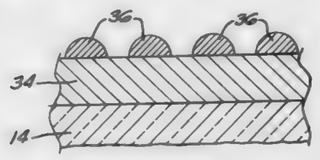
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4,732,802

CERMET RESISTIVE ELEMENT FOR VARIABLE RESISTOR

Wayne P. Boone, Riverside; Ronald L. Froebe, Rubidoux; Gordon McClure, Pasadena; Ronald E. Thomas, Jr., and Philip F. Weingartner, both of Alta Loma, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Sep. 26, 1986, Ser. No. 912,875
Int. Cl.[4] B32B *3/00, 15/00;* H01C *10/32*
U.S. Cl. 428—210 32 Claims



1. A resistive element for a variable resistor or the like, comprising:

an insulative substrate;

a layer of resistive film on said substrate, said resistive film being substantially of a material selected from the group consisiting of cermets and carbon-filled polymers; and

an array of discrete, spaced-apart islands of predominantly conductive material formed on the surface of said layer in a repetitive pattern of predetermined spacing, said predominantly conductive material being selected from the group consisting of high metal content thick film inks, high metal oxide content thick film inks, substantially pure conductive metal, and carbon-filled polymers, whereby the interfaces between said islands and said layer form electrically conductive junctions between said islands and said layer.

4,732,803

LIGHT WEIGHT ARMOR

W. Novis Smith, Jr., 412 S. Perth St., Philadelphia, Pa. 19147

Filed Oct. 7, 1986, Ser. No. 916,235
Int. Cl.[4] B32B *7/02, 5/12;* F41H *1/02, 5/04*
U.S. Cl. 428—212 25 Claims



1. An armor structure comprising a plurality of zones of resinous materials, said zones being arranged in decreasing Young's modulus and increasing elongation characteristics, at least one of said zones comprising a resin matrix having fibers incorporated therein; said resin matrix having the same or higher elongation at break as the fibers incorporated therein, and said fibers being oriented to transfer impact energy laterally.

4,732,804

ABLATIVE AND FLAME RESISTANT COMPOSITION

Erich F. Kujas, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 12, 1985, Ser. No. 775,363
Int. Cl.[4] D06M *7/00, 11/02;* B32B *27/02, 27/16*
U.S. Cl. 428—229 9 Claims

5. In an ablative heat shield for a spacecraft the improvement wherein the ablative heat shield is comprised of a fibrous reaction product of acrylic acid and a novoloid fiber having methylol groups.

9. The ablative heat shield according to claim 5 wherein the fibrous reaction product is formed into a woven fabric and adhered to the surface of the spacecraft.

4,732,805

ACTIVATED CARBON

Frederick A. P. Magga, Wiltshire, England, assignor to Charcoal Cloth Ltd., Berkshire, England

Continuation of Ser. No. 658,185, Oct. 5, 1984, abandoned. This application Sep. 18, 1986, Ser. No. 908,902
Int. Cl.[4] B32B *5/30*
U.S. Cl. 428—240 24 Claims

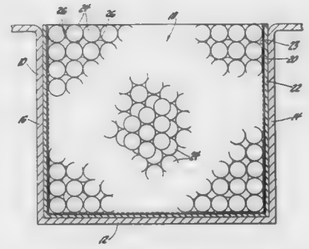
1. A waterproof cloth comprising a fabric of active carbon material having a coating of discrete solid particles of a particulate hydrophobic material deposited on its surface, said particulate hydrophobic material being present in a range from 5% to 10% by weight of said active carbon material, which renders said active carbon material substantially waterproof, and whereby said surface coating is permeable by a gas.

4,732,806

STRUCTURAL MEMBER COMPRISING GLASS MACROSPHERES

Joseph S. Wycech, Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 864,311, May 19, 1986, Pat. No. 4,695,343, which is a division of Ser. No. 674,226, Nov. 23, 1984, Pat. No. 4,610,836, which is a continuation-in-part of Ser. No. 531,058, Sep. 12, 1983, abandoned. This application Jan. 28, 1987, Ser. No. 7,901
Int. Cl.[4] B32B *1/00, 3/12*
U.S. Cl. 428—241 3 Claims



1. A reinforcement for a structural member comprising:

a flexible sheet material saturated with a low temperature adhesive to stiffen the sheet material for formation into a shape adapted to fit closely within the structural member, said sheet material having a high temperature cured adhesive coating at least the face of the cloth contacting with the structural member to effect a heat cured bonding of the sheet material to the structural member upon heating to a high temperature; and

a plurality of adhesive coated glass macrospheres filling the flexible sheet material and bonded to one another and to the sheet material to further reinforce the structural member, said macrospheres having voids therebetween whereby airflow may be communicated through the reinforced structural member.

4,732,807

PLATED RESIN ARTICLE

Tetsuro Maeda; Fukuaki Wada; Susumu Ohoka, and Akihiro Okamoto, all of Chiba, Japan, assignors to Denki Kagaku Kogyo K.K., Japan

Filed Feb. 11, 1985, Ser. No. 700,222
Claims priority, application Japan, Feb. 9, 1984, 59-22647
Int. Cl.[4] B32B *15/06, 15/08, 27/08*
U.S. Cl. 428—327 5 Claims

1. A metal plated resin article formed by subjecting a molded article of a transparent vinyl cyanide-conjugated diene-aromatic vinyl resin comprising 10 to 24% by weight of a conjugated diene rubber having a weight average particle size of 150 mμ or less and a copolymer of a vinyl cyanide monomer and an aromatic vinyl monomer as a continuous resin phase, said continuous resin phase copolymer not containing a component having an ester bond, said vinyl cyanide-conjugated diene-aromatic vinyl resin containing incorporated therein an alcohol or phenol having a boiling point of 200° C. or above in an amount of 0.1 to 10 parts by weight per 100 parts by weight of the vinyl cyanide-conjugated diene-aromatic vinyl resin, to wet metal plating.

4,732,808

MACROMER REINFORCED PRESSURE SENSITIVE SKIN ADHESIVE SHEET MATERIAL

Stephen E. Krampe; Cheryl L. Moore, and Charles W. Taylor, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 797,851, Nov. 14, 1985, Pat. No. 4,693,776, which is a continuation-in-part of Ser. No. 734,907, May 16, 1985, abandoned. This application Apr. 15, 1986, Ser. No. 852,167
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—355 19 Claims

1. An adhesive sheet material suitable for application to skin, said adhesive sheet material comprising a conformable backing member and a skin adhesive composition which is applied to at least a portion of one surface of said conformable backing member, said skin adhesive composition comprising a copolymer of copolymerized A monomers, C macromers, and optionally B monomers, wherein:

A is a monomeric acrylate or methacrylate ester of a non-tertiary alcohol, said alcohol having from about 1 to about 14 carbon atoms with the average number of carbon atoms being from about 4 to about 12;

B, when used, is at least one ethylenically unsaturated compound copolymerizable with said A monomer, with B monomers comprising from about 0% to about 25% of the total weight of A and B monomers; and

C is a macromer having the general formula:

$$X-(Y)_n-Z$$

wherein:

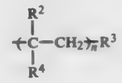
X is a vinyl group copolymerizable with said A and B monomers, X having the general formula:



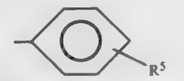
wherein R is a hydrogen atom or COOH group and R′ is a hydrogen atom or a methyl group;

Y is a divalent linking group with n being either 0 or 1; and

Z is a monovalent polymeric moiety having a T_g greater than about 20° C. and a weight average molecular weight in the range of about 2,000 to about 30,000 and being essentially unreactive under copolymerization conditions, Z having the general formula:



wherein R^2 is a hydrogen atom or a lower alkyl group, R^3 is a lower alkyl group, n is an integer from about 20 to about 500, and R^4 is a monovalent radical selected from the group consisting of:



and $-CO_2R^6$ wherein R^5 is a hydrogen atom or a lower alkyl group and R^6 is a lower alkyl group;

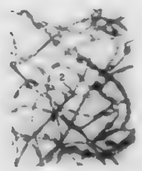
wherein the number and composition of said C macromers is such that the skin adhesive composition has a creep compliance of at least about 1.2×10^{-5} cm²/dyne when measured after about 3 minutes of subjection to stress.

4,732,809

BICOMPONENT FIBER AND NONWOVENS MADE THEREFROM

Robert D. Harris, Jr., Marietta, Ga.; James P. Parker, Asheville, N.C., and Charles L. King, Arnhem, Netherlands, assignors to BASF Corporation, Williamsburg, Va.

Continuation of Ser. No. 462,289, Jan. 31, 1983, abandoned, which is a continuation of Ser. No. 279,125, Jun. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 230,051, Jan. 29, 1981, abandoned. This application Jan. 30, 1987, Ser. No. 14,074
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—373 4 Claims



1. A heterofilament comprising:

(a) a fiber component consisting of polyester; and,

(b) a latently adhesive component having a melting point of at least 15° C. below the melting point of said fiber component and which forms interfilamentary bonds with said fiber component upon the application of heat to a temperature and time to said fiber component in an amount sufficient to melt said latently adhesive component but below the softening point of said fiber component; wherein said heterofilament has a thermomechanical response such that a shrinkage force greater than about 0.01 g/denier appears in said fiber component only after the resolidification of said latently adhesive component.

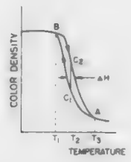
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,810

REVERSIBLE TEMPERATURE-INDICATING COMPOSITION

Tsutomu Kito, Gifu; Norikazu Nakasuji, Aichi; Takashi Katsoka, Aichi; Hiroshi Inagaki, Aichi; Yutaka Shibahashi, Aichi, and Nobuaki Matsunami, Gifu, all of Japan, assignors to Pilot Ink Co., Ltd., Japan

Filed Dec. 23, 1985, Ser. No. 812,572
Int. Cl.[4] B01J *13/02;* **G01K** *11/16*
U.S. Cl. 428—402.2 **4 Claims**



1. A reversible temperature-indicating composition consisting essentially of:

(A) an electron-donating chromatic organic compound selected from the group consisting of diaryl phthalides, polyaryl carbinols, leuco auramines, acyl auramines, aryl auramines, Rhodamine B lactams, indolines, spiropyrans, and fluorans;

(B) a compound selected from the group consisting of phenolic compounds having 6 to 49 carbon atoms, metal salts of the phenolic compounds, aromatic carboxylic acids having 7 to 12 carbon atoms, aliphatic carboxylic acids having 2 to 5 carbon atoms, metal salts of carboxylic acids having 2 to 22 carbon atoms, acidic phosphoric esters having 1 to 44 carbon atoms, metal salts of the acidic phosphoric esters and triazole compounds having 2 to 24 carbon atoms; and

(C) an ester compound, said components (A), (B), and (C) being present in a weight ratio in the range of 1:0.1 to 50:1 to 800,and being in a form of homogeneous fused mixture, wherein said component (C) is selected from following compounds having ΔT value [melting point (° C.)—clouding point (° C.)] in the range of 3° C. or less: a branched alkyl ester and arylalkyl ester of straight-chain saturated aliphatic carboxylic acid and an alkyl ester of aliphatic carboxylic acid having double bond(s), branched alkyl group, hydroxyl group, carbonyl group or halogen atom in the carbon chain.

2. A reversible temperature-indicating composition as claimed in claim 1, wherein the composition comprises the core of microcapsules having a diameter of 30 μm or less.

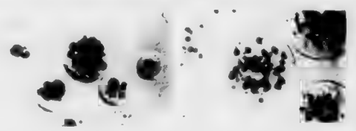
4,732,811

AGAROSE-POLYALDEHYDE BEADS AND THEIR BIOLOGICAL APPLICATION AFFINITY CHROMATOGRAPHY, HEMOPERFUSION, CELL SEPARATION, ETC.

Shlomo Margel, Rehovot, Israel, assignor to Yeda Research and Development Company, Ltd., Rehovot, Israel

Continuation of Ser. No. 462,315, Jan. 31, 1983, abandoned. This application Oct. 22, 1986, Ser. No. 921,963
Claims priority, application Israel, Feb. 28, 1982, 65131
Int. Cl.[4] B32B *5/16, 9/02, 9/04*
U.S. Cl. 428—403 **8 Claims**

1. A substantially spherical agarose-polyaldehyde bead having a diameter between 40 μm and 2 cm comprising a polymer containing free aldehyde groups, the polymer being in the form of substantially uniform microspheres, each of which has a diameter below about 0.4 μm, and each being a polyacrolein-type compound, polyglutaraldehyde or starch dialdehyde, the



microspheres being encapsulated within an aqueous homogeneous, porous matrix of agarose or agar gel.

4,732,812

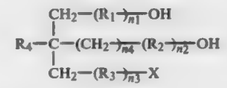
MAGNETIC RECORDING MEDIUM

Stephen R. Ebner, Cottage Grove; Gene A. Sjerven, Lake Elmo; Arthur J. Ellsworth, South St. Paul, all of Minn.; Takashi Amano, Yokohama, and Nobuyoshi Kawasaki, Sagamihara, both of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 23, 1986, Ser. No. 877,268
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—425.9 **26 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a coating of a dispersion of a magnetic powder in a binder, said binder consisting essentially of a cured compound derived from:

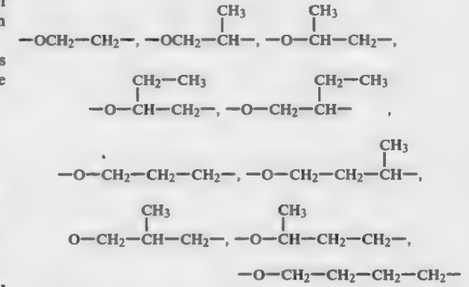
(1) a phosphorylated polyoxyalkyl polyol present in an amount in the range of 30 to 80 percent by weight of the binder and represented by the following formula:



wherein

n_1, n_2 and n_3 may independently be 0 to 10 inclusive and n_4 is 0 or 1

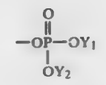
R_1, R_2, R_3 are independently selected from the group consisting of



R_4 is selected from the group consisting of H, $-CH_3$, $-CH_2-CH_3$, $-CH_2-CH_2-CH_3$,



X is a dispersing group such as



wherein Y_1 and Y_2 are selected from the group consisting of H, Na, Li, K; and

(2) An organic isocyanate compound;

wherein said phoshorylated polyoxyalkyl polyol and said organic isocyanate compound are present in a ratio which effectively homogeneously disperses said magnetic powder and securely binds said magnetic powder when coated on said non-magnetic support.

4,732,813

MAGNETIC RECORDING ELEMENT

Hendrikus F. Huisman, Steenbergen, and Henricus J. M. Pigmans, Eindhoven, both of Netherlands, assignors to PD Magnetics, B.V., Oosterhout, Netherlands

Filed Apr. 24, 1987, Ser. No. 42,268
Claims priority, application Netherlands, Apr. 29, 1986, 8601097
Int. Cl.[4] G11B *5/706*
U.S. Cl. 428—425.9 **2 Claims**

1. A magnetic recording element comprising a carrier and a magnetic coating provided thereon which has a polyester urethane binder, a magnetic pigment and a dispersing agent, the pigment being finely distributed in the binder under the influence of the dispersing agent, characterized in that the dispersing agent is a compound of the following formula:



(1)

or a salt thereof, in which

R is an alkyl group or an alkylaryl group having 6–30 C atoms,

R_1 is a hydrogen atom, alkyl group having 1–4 C atoms or the group $-(CH_2-CH_2-O)_m-(CH_2-CH_2)_n-SO_3H$ or a salt thereof,

m=2–20,

n=0 or 1, and

x=0 or 1.

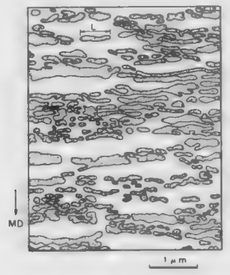
4,732,814

POLYESTER FILM WITH SMOOTH AND HIGHLY ADHESIVE SURFACE AND METHOD OF MAKING SAME

Kenji Hatada, Kurita; Ken-ichi Kawakami, Abiko, and Hiroaki Kobayashi, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,208
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—480 **12 Claims**

1. A biaxially stretched polyester film having a multiplicity of elongated and directionally arranged ultra-fine protrusions on the surface thereof, wherein said protrusions have a height of 50 to 300 angstroms and a width of 100 to 300 angstroms and 1 to 20 protrusions are present per μm of the surface length as observed on a cross-section perpendicular to the direction of the arrangement of the protrusions, said protrusions being an integral part of the polyester film and tightly adherent thereto



and being dyeable with osmic acid, and said film having a static friction coefficient (μs) of 0.3 to 3.0.

4,732,815

HEAT TRANSFER SHEET

Akira Mizobuchi; Yoshiaki Hida; Shigeki Umise, all of Tokyo; Kyoichi Yamamoto, and Kyohei Takahashi, both of Sagamihara, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Aug. 16, 1985, Ser. No. 766,297
Claims priority, application Japan, Aug. 20, 1984, 59-172998; Aug. 20, 1984, 59-172999; May 10, 1985, 60-99378
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—484 **22 Claims**

1. A heat transfer sheet for heat-sensitive printing by means of thermal heads, comprising a base film, an anti-sticking layer formed on the thermal head-contacting surface of said base film, and a hot melt ink layer formed on the opposite surface of said base film,

said antisticking layer preventing sticking of the heat transfer sheet to the thermal heads,

said hot melt ink layer comprising an ink composition having a melt viscosity of from 10 cps to 60 cps at 100° C. thereby to effect filling of the printed areas of a transferable paper during printing.

4,732,816

COVER SYSTEM FOR CONCRETE

D. Gerald Walters, Dover, Del., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Apr. 30, 1986, Ser. No. 857,925
Int. Cl.[4] B32B *27/30;* **B05D** *3/02*
U.S. Cl. 428—522 **17 Claims**

1. A method for retarding the formation of surface cracks on an uncured latex-modified portland cement concrete substrate, comprising:

(a) contacting the surface of said uncured substrate with a layer of ethylene-vinyl acetate copolymer latex in amounts sufficient to retard the formation of surface cracks on the concrete substrate and prevent water evaporation from the concrete substrate, and

(b) curing the concrete substrate at atmospheric conditions.

4,732,817

WOOD PRESERVATION

W. Robert Lotz, 9559 N. Regent Rd., Milwaukee, Wis. 53217, and Donald F. Hollaway, 441 Buck Island Rd., West Yarmouth, Mass. 02673

Filed Apr. 21, 1986, Ser. No. 853,982
Int. Cl.[4] B05D *1/18;* **C09D** *5/16, 5/18*
U.S. Cl. 428—541 **29 Claims**

1. An organic solvent-free process for treating a pressure

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permeable wood species having poor resistance to decay, weathering, leaching, insect attack, fungal attack or the like, which comprises the steps of:

a. preparing an aqueous solution of tanni extract obtained from one or more plant materials from one or more plant species which have been found to possess resistance to decay, weathering, insect attack, fungal attack or the like;

b. impregnating said wood species with said aqueous extract solution wherein said aqueous extract solution comprises from about 1 to 10 weight % of tannin extract; and

c. subsequently impregnating said wood species with an aqueous solution of a fixative to prevent leaching of the extract from said wood species, said fixative being selected from the group consisting of non-ionic surface active agents and cationic surface active agents wherein said aqueous fixative solution comprises from about 0.1 to about 5 weight % of said fixative.

12. The treated wood product prepared by the process of claim 1.

4,732,818

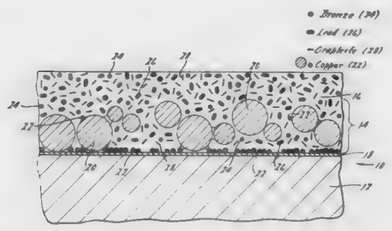
COMPOSITE BEARING MATERIAL WITH POLYMER FILLED METAL MATRIX INTERLAYER OF DISTINCT METAL PARTICLE SIZES AND METHOD OF MAKING SAME

George C. Pratt, Ann Arbor; Michael C. Montpetit, Chelsea, and Michael D. Lytwynec, Brighton, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 607,863, Apr. 30, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 913,610

Int. Cl.[4] B22F *3/00*; C21D *1/00*; C22C *32/00*

U.S. Cl. 428—547 12 Claims



1. A composite bearing material suitable for both dry and lubricated bearing applications comprising:

(a) a metal backing;

(b) a porous metal interlayer on said metal backing, said porous metal interlayer consisting essentially of a relatively non-homogeneous mixture of particles form two distinct particle size ranges including a relatively fine powder range of about −300 mesh and less and a relatively coarse powder range form about −60 to +150 mesh, said relatively fine powder range comprising from about 5% to about 30% by weight of the total powder constituting said porous metal interlayer and wherein a substantial portion of said relatively fine powder is segregated from the particles in said coarse powder range to the innermost surface of said porous metal interlayer adjacent said metal backing and bonded to said metal backing and certain of said particles within said relatively coarse range, said particles from said relatively coarse range being bonded to one another and forming a open structure of numerous pores throughout at least the outermost surface of said porous metal interlayer; and

(c) a polytetrafluoroethylene based composition substantially filling the pores of said porous metal interlayer and forming a surface layer on the bearing material, said polytetrafluoroethylene based composition comprising from about 2% to about 10% by volume of at least one material selected from the group consisting of tin bronze and other copper alloys, as well as mixtures thereof; from about 5% to about 30% by volume of at least one material selected from the group consisting of metallic lead, metallic cadmium, an oxide of lead, and an oxide of cadmium, as well as mixtures thereof; from about 5% to about 30% by volume of at least one material selected from the group consisting of natural graphite and artifical graphite, as well as mixtures thereof; and the remainder comprising polytetrafluoroethylene.

4,732,819

LIGHT-WEIGHT VEHICLE FRAME STRUCTURE

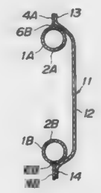
Katsusuke Komuro, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 607,616, May 7, 1984, abandoned. This application May 16, 1986, Ser. No. 864,019

Claims priority, application Japan, May 7, 1983, 58-79957[U]

Int. Cl.[4] B60R *21/13*

U.S. Cl. 428—582 9 Claims



1. A light-weight vehicle frame structure including a first structural member having a metal tubular body having a longitudinal axis and first and second edges held in substantial abutment against each other in a cross section substantially perpendicular to said longitudinal axis; a first flange integrally continuous to said first edge and extending outwardly of said tubular body up to a first length at least greater than zero; a second flange integrally continuous to said second edge and extending outwardly of said tubular body up to a second length equal to or greater than zero; an outer edge of said second flange and said second edge being fused to a portion of said first flange and said first edge, respectively; said metal tubular structural member having a uniform cross section along said longitudinal axis; and a second structural member of a planar shape and having a portion extending coplanar with and attached to one of said first and second flanges.

4,732,820

ALUMINUM ALLOY SUITABLE FOR USE AS A MATERIAL FOR SLIDING PARTS

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Continuation of Ser. No. 626,349, Jun. 29, 1984, abandoned. This application Jun. 13, 1986, Ser. No. 874,837

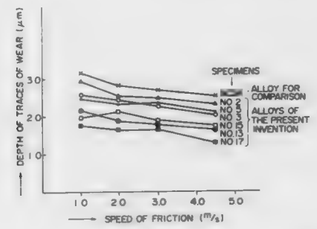
Claims priority, application Japan, Apr. 27, 1984, 59-85923

Int. Cl.[4] B32B *15/01*

U.S. Cl. 428—650 24 Claims

1. An Al alloy suitable for use as the material of a sliding part, consisting essentially of: 11.5 weight percent to 18 weight % of Si, more than 3 weight % but up to 10 weight % of Sn,

not smaller than 0.2 weight but less than 2 weight % of Cu, and the balance substantially Al.



9. An Al alloy suitable for use as the material of a sliding part according to claim 1, wherein said Al alloy is lined with a back metal.

4,732,821

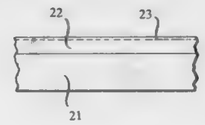
NICKEL-BASED ELECTRICAL CONTACT

Joachim J. Hauser, Summit; Andreas Leiberich, New Providence; John T. Plewes, Chatham, and Murray Robbins, Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 823,986, Jan. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 735,779, May 20, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 30,761

Int. Cl.[4] H01H *1/02*

U.S. Cl. 428—671 14 Claims



1. Device comprising an electrically conducting member having a contact surface,

said contact surface comprising the surface of at least a portion of a surface region of said member,

said surface region consisting essentially of a contact material,

an amount of at least 70 atom percent of said contact material consisting of nickel and hydrogen,

and hydrogen being present in said amount in a concentration which results in an enhanced electrical contact property of said contact surface.

4,732,822

INTERNAL ELECTROLYTE SUPPLY SYSTEM FOR RELIABLE TRANSPORT THROUGHOUT FUEL CELL STACKS

Maynard K. Wright, Bethel Park; Robert E. Downs, Monroeville, both of Pa., and Robert B. King, Westlake, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

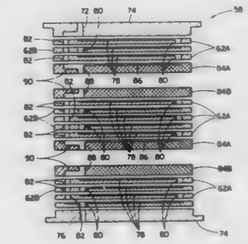
Filed Dec. 10, 1986, Ser. No. 940,320

Int. Cl.[4] H01M *2/38*

U.S. Cl. 429—34 61 Claims

1. In a fuel cell stack having electrolyte feed and drain means and a plurality of stacked fuel cells, each fuel cell including bipolar plates separating said fuel cell from adjacent fuel cells in said stack thereof and an electrolyte-containing matrix disposed between said plates, an improved internal electrolyte supply system interconnecting said feed and drain means, comprising:

(a) first means defined repeatedly throughout said fuel cell stack for flowing electrolyte along a series of first paths each extending directly through at least one cell between said plates thereof so as to expose electrolyte to said matrix of said cell; and



(b) second means defined repeatedly throughout said fuel cell stack for flowing electrolyte along a series of second paths extending through said plates of said cell stack and by-passing respective ones of said first paths so as to supply electrolyte directly to respective others of said first paths without first going through said ones of said first paths.

4,732,823

ELECTROLYTE FLOWING CONSTRUCTION FOR ELECTROLYTE CIRCULATION-TYPE CELL STACK SECONDARY BATTERY

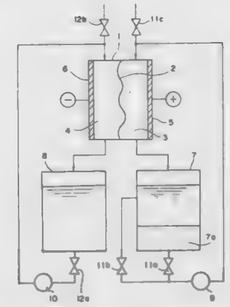
Hiromichi Ito, and Takafumi Hashimoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,433

Claims priority, application Japan, Dec. 10, 1984, 59-186117[U]

Int. Cl.[4] H01M *10/38*

U.S. Cl. 429—72 4 Claims



1. A metal-halogen electroyte circulation-type cell stack secondary battery comprising a plurality of electrode means each having an electrode member enclosed by a first frame member, a plurality of separating means each having a separator member enclosed by a second frame member, said electrode means and said separating means being alternately stacked in a manner that a positive electrode chamber and a negative electrode chamber are provided respectively on both sides of each of said separator members, positive electrolyte circulating first manifold means and negative electrolyte circulating second manifold means formed in each of said first and second frame members therethrough, and first and second channel means and first and second microchannel means

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formed in the opposite surfaces of at least one of said first and second frame members on the side of each of said positive electrode chamber and said negative electrode chambers, respectively, said first and second channel means communicating with said first or second manifold means and said first and second microchannel means respectively communicating said first and second channel means with an interior of each said positive or negative electrode chamber to hinder an electrolyte flowing therethrough, said positive and negative electrolytes flowing out from the positive and negative electrode chambers and substituted by air after the charging of the battery, said first and second microchannel means being respectively arranged on vertical side portions of each said at least one frame member, said first microchannel means being provided with a long wall-shaped projection extending from its connecting portion to said channel means along one of said verticle side portions to form a pair of inlet paths at forward and rearward ends thereof and a plurality of short wall-shaped projections located closely in said forward and rearward inlet paths, the electrolyte introduced to said first microchannel means being divided by a forward end of said long wall-shaped projection into two flowing parts, said second microchannel means being located symmetrically against a center point of a surface of said electrode member with said first microchannel means.

4,732,824

ALKALI METAL ELECTRO-CHEMICAL STORAGE CELL

Peter J. Bindin, Runcorn, Great Britain, assignor to Chloride Silent Power Limited, London, England

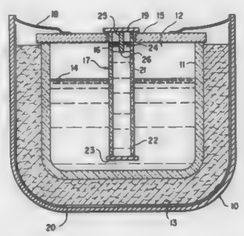
PCT No. PCT/GB86/00441, § 371 Date Mar. 24, 1987, § 102(e) Date Mar. 24, 1987, PCT Pub. No. WO87/00695, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 23, 1986, Ser. No. 46,856

Claims priority, application United Kingdom, Jul. 24, 1985, 8518651

Int. Cl.[4] H01M *6/20*

U.S. Cl. 429—104 **8 Claims**



1. An alkali metal electro-chemical storage cell comprising anode and cathode regions containing alkali metal and cathodic reactant respectively, a cationically conductive solid electrolyte member separating the anode and cathode regions, and respective anode and cathode current collectors and associated connection terminals, the anode current collector comprising a further cationically conductive solid electrolyte member extending into alkali metal in said anode region and separating a contact breaker region from alkali metal in said anode region, a body of the alkali metal contained in the contact breaker region, normally up to at least a predetermined level in a functional undamaged cell, a first electrically conductive member providing electronic interconnection between alkali metal in the contact breaker region and alkali metal in the anode region when at the minimum state of charge of the cell, and a second electrically conductive member providing electronic interconnection between the connection terminal associated with the anode current collector and said alkali metal in the contact breaker region only when at and above said predetermined level.

4,732,825

FLAT CELL

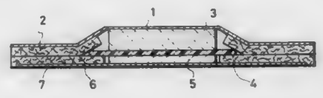
Nobuo Kamata; Iwao Kishi; Toyoo Harada; Kazutoshi Takeda; Hiroaki Aihara, and Tatsuo Arakawa, all of Sendai, Japan, assignors to Seiko Electronic Components Ltd., Miyagi, Japan

Filed Jun. 12, 1986, Ser. No. 873,674

Claims priority, application Japan, Dec. 10, 1985, 60-277432

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—162 **29 Claims**



1. A flat cell comprising: a positive terminal plate having an inner surface; a positive material in contact with the inner surface of the positive terminal plate; a negative material opposed to the positive material; a separator interposed between the positive material and the negative material, said separator containing an electrolyte; a negative terminal plate having an inner surface in contact with the negative material, the negative terminal plate being confronted with the positive terminal plate at their peripheral portions; and sealing means for sealing the confronted peripheral portions of the positive and negative terminal plates with each other, said sealing means comprising a positive sealing member formed on the peripheral portion of the positive terminal plate and a negative sealing member formed on the peripheral portion of the negative terminal plate, said positive sealing member and said negative sealing member being composed of a two-material three-layer film formed of a maleic acid modified polyethylene resin layer/a high-density polyethylene resin layer/a maleic acid modified polyethylene resin layer.

4,732,826

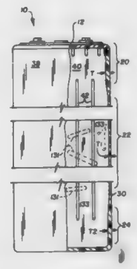
THICK-THIN BATTERY JAR

James S. Hardigg, Conway, Mass., assignor to Hardigg Industries. Inc., Southdeerfield, Mass.

Filed Dec. 19, 1986, Ser. No. 943,723

Int. Cl.[4] H01M *2/02*

U.S. Cl. 429—176 **14 Claims**



1. A battery jar comprised of side, end and bottom walls wherein the side and end walls are divided into upper, middle and lower sections with the wall thickness in each section being T, T1 and T2, respectively, wherein T2 is greater than T1 and less than T.

4,732,827

PROCESS FOR PRODUCING ELECTROLYTE FOR REDOX CELL

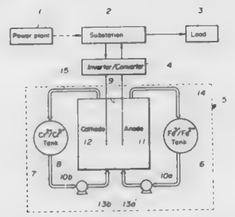
Hiroko Kaneko; Ken Nozaki; Takeo Ozawa, all of Ibaraki; Koichi Oku, Tokyo; Takashi Shimanuki, Tokyo, and Yoshinori Koga, Tokyo, all of Japan, assignors to Japan Metals and Chemical Co., Ltd. and Agency of Industrial Science and Technology, both of, Japan

Filed Jul. 2, 1986, Ser. No. 881,273

Claims priority, application Japan, Jul. 5, 1985, 60-147684; Nov. 19, 1985, 60-259591

Int. Cl.[4] H01M *4/36;* **C22B** *34/00*

U.S. Cl. 429—202 **8 Claims**



1. A process for producing an anolyte and a catholyte for redox cells which comprises the steps of:

mixing chromium ore and carbonaceous substances to form a product;

heating the product at 1200° to 1400° C. to produce a pre-reduced chromium product in which iron and chromium in chromium ore are partially reduced;

dissolving said pre-reduced chromium product in hydrochloric acid to extract iron and chromium.

4,732,828

METHOD FOR FORMING A PHOSPHOR SCREEN OF A CATHODE RAY TUBE

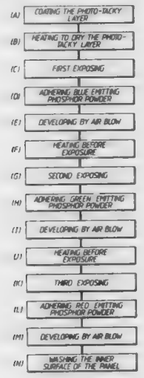
Seiji Sagou, and Takeo Itou, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 5, 1986, Ser. No. 927,106

Claims priority, application Japan, Nov. 8, 1985, 60-248904

Int. Cl.[4] G03C *5/00;* **B05D** *5/06*

U.S. Cl. 430—28 **11 Claims**



1. In a method for forming a phosphor screen of a cathode ray tube comprising the steps of:

coating a photo-tacky layer on a panel of the cathode ray tube;

exposing a surface of the photo-tacky layer to light to form a pattern of adhesive surfaces on the layer; and

adhering phosphor powder to the pattern and in which the exposing and adhering steps are repeated, two times or more, wherein

at least a heating before exposure step for heating the photo-tacky layer to a temperature in the range of 40°–110° C. is contained in the steps after the adhering steps for a first phosphor.

4,732,829

POLYMER PRINTING

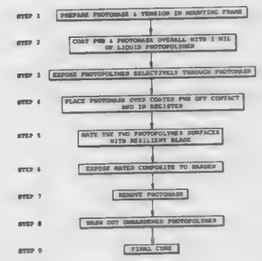
Donald Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Continuation-in-part of Ser. No. 364,309, Apr. 1, 1982, Pat. No. 4,506,004. This application Nov. 19, 1984, Ser. No. 672,500

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[4] G03C *3/00*

U.S. Cl. 430—11 **11 Claims**



1. The intermediate product in the method of printing on a printed wiring board substrate with a metallic surface, a pattern formed by a thin two layered polymer coating, comprising in combination, a liquid polymer layer of paste-like consistency at least about 0.001 inch thickness for forming a significant part of said pattern sandwiched between an outer polymer layer partially cured with a predetermined pattern for forming a significant part of said pattern and said metallic substrate surface.

4,732,830

ELECTROPHORETIC DISPLAY PANELS AND ASSOCIATED METHODS

Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Division of Ser. No. 670,571, Nov. 13, 1984, Pat. No. 4,655,897. This application Jul. 7, 1986, Ser. No. 882,271

Int. Cl.[4] G02F *1/03*

U.S. Cl. 430—20 **4 Claims**

1. A method of fabricating an X-Y matrix for an electrophoretic display, comprising the steps of:

(a) depositing a thin layer of indium-tin-oxide (ITO) on a carrier plate of glass,

(b) etching said layer to form a vertical line pattern indicative of a Y access grid,

(c) depositing a first thin layer of photoresist material over said vertical line pattern,

(d) masking said first thin layer of photoresist according to a horizontal line pattern,

(e) treating said masked layer to photolithographically form a series of depressions in said first photoresist layer with said depressions forming a horizontal line pattern with each horizontal line defined by a raised photoresist area between depressions,

(f) plating said photoresist layer with a conductive metal to

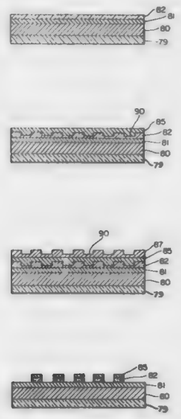
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completely fill said depressions while covering said raised area to form a smooth top metal surface,

(g) depositing a second layer of photoresist over said smooth top metal surface,

(h) masking said second layer of photoresist according to said horizontal line pattern,

(i) treating said masked second layer to photolithographically form a series of depressions in said second photoresist layer with said depressions forming a second horizontal line pattern congruent to said first horizontal line pattern,



(j) removing all of said photoresist and plating located in said depressions including all of said photoresist in said second layer to obtain said horizontal line pattern over said vertical line pattern with each horizontal line separated from associated vertical lines by a thin layer of photoresist indicative of said raised area between depressions.

4,732,831

XEROPRINTING WITH PHOTOPOLYMER MASTER

James Riesenfeld, Basking Ridge, N.J.; William Bindloss, Wilmington, Del.; Graciella Blanchet, Wilmington, Del.; Rolf Dessauer, Wilmington, Del., and Alan S. Dubin, Greenville, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 858,172, May 1, 1986, abandoned. This application Jun. 1, 1987, Ser. No. 56,303

Int. Cl.[4] G03G *13/14, 13/22, 13/26*

U.S. Cl. 430—49 **22 Claims**

1. A xeroprinting process which utilizes a suspension of electrostatically charged toner particles in a dispersant liquid to develop an oppositely-charged electrostatic image on a photopolymer master and which comprises the steps:

(1) imagewise exposing to actinic radiation an electrostatic photopolymer master having a photopolymerizable resistivity in exposed areas of the layer;

(2) without removing unexposed areas of the layer, charging the master by corona discharge while on a conductive support to form a latent image of electrostatic charge on the exposed areas;

(3) developing the image by applying to both exposed and unexposed areas of the master the suspension of oppositely charged electrostatic toner particles; and

(4) transferring the toner image to another surface.

4,732,832

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR USING ALUMINUM PHTHALOCYANINE COMPOUND IN CHARGE GENERATING LAYER

Sumitaka Nogami, Yokohama; Yoshihiko Mori, and Tatsuro Iwabuchi, both of Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 938,482

Claims priority, application Japan, Dec. 6, 1985, 60-273360; Jan. 31, 1986, 61-18042; Aug. 11, 1986, 61-186960

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—58 **5 Claims**

1. A layered photoconductor comprising a charge generating layer and a charge transfer layer superimposed on an electroconductive substrate, which photoconductor has as the main component of said charge generating layer an aluminum phthalocyanine derivative defined by the following requirements:

(a) that said derivative is a chlorinated aluminum phthalocyanine represented by the formula, $AlC_{32}N_8H_{(17-x)}Cl_x$ (wherein x represents a number in the range of 1.0 to 3.0),

(b) that the weight on heating (the ratio of weight lost by heating on a thermobalance at a temperature increasing rate of 5° C./min. from 140° to 220° C. to the weight prior to heating) is 6±0.5% by weight,

(c) that the X-ray diffraction spectrum shows strong diffraction peaks at the Bragg angles of 6.7 degrees, 11.2 degrees, 16.7 degrees, and 25.6 degrees, and

(d) that the visible absorption spectrum shows the maximum absorption in a wavelength range of 640 nm to 660 nm or 750 nm to 850 nm.

4,732,833

ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING AMORPHOUS SILICON AND PARA MICROCRYSTALLINE SILICON

Shuji Yoshizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1987, Ser. No. 9,296

Claims priority, application Japan, Mar. 26, 1986, 61-67928

Int. Cl.[4] G03G *5/08*

U.S. Cl. 430—84 **15 Claims**

1. An electrophotographic photoreceptor, comprising a substrate, and

a photoconductive layer supported on said substrate, said photoconductive layer containing amorphous silicon and para microcrystalline silicon.

4,732,834

LIGHT RECEIVING MEMBERS

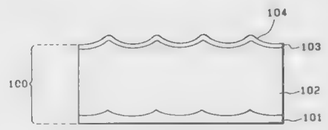
Mitsuru Honda; Atsushi Koike, both of Chiba; Kyosuke Ogawa, Miye, and Keiichi Murai, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,993

Claims priority, application Japan, Oct. 17, 1985, 60-230010

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—84 **29 Claims**



1. A light receiving member which comprises a support and a light receiving layer having a photosensitive layer composed of amorphous material containing silicon atoms and at least either germanium atoms or tin atoms and a surface layer, said surface layer being of multi-layered structure having at least an abrasion-resistant layer at the outermost side and a reflection preventive layer in the inside, and said support having a surface provided with irregularities composed of spherical dimples.

4,732,835

CARRIER FOR USE IN ELECTROPHOTOGRAPHIC DEVELOPERS

Mitsuhiro Katayama; Kenkichi Hara; Kazuyoshi Oka, all of Gunma, Japan; Ulf Engström, Höganäs, and Svenn E. Larrasen, Nyhamnsläge, both of Sweden, assignors to Kanto Denka Kogyo Co., Ltd., Tokyo, Japan and Höganäs AB, Höganäs, Sweden

Filed Jun. 9, 1986, Ser. No. 871,798

Claims priority, application Japan, Jun. 10, 1985, 60-125462

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—106.6 **6 Claims**

1. A resin-coated particulate carrier material useful, in conjunction with a toner, for preparting a two-component electrophotographic developer, said carrier material consisting essentially of:

a core having a spherical body of magnetite surrounded by an outer surface layer comprising metallic iron; and

a resinous coating layer covering said core; and

exhibiting a saturation magnetization in the range of about 90 to about 150 emu/g.

4. An electrophotographic two-component developer comprising a carrier material as claimed in claim 1 in conjunction with a toner.

4,732,836

NOVEL MIXED ESTER O-QUINONE PHOTOSENSITIZERS

Robert E. Potvin, West Warwick; Jonas O. St. Alban, Westerly, and Chester J. Sobodacha, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

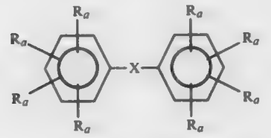
Filed May 2, 1986, Ser. No. 859,284

Int. Cl.[4] G03C *1/54;* **G03F** *7/26*

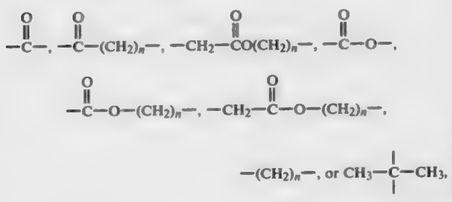
U.S. Cl. 430—192 **16 Claims**

1. A photoresist composition having improved solution stability comprising an admixture of a novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition comprising the condensation product of:

I. A phenolic compound having the structure:



wherein: R_a is H, OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being OH, and X is a single C—C bond, —O—, —S—, $-SO_2-$,



n is 1 or 2,

II. A 1,2 naphthoquinonediazide-4-sulfonic acid (Diazo); and

III. An organic acid represented by the formula

wherein W is

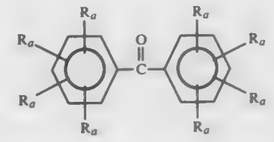


or $-SO_2-V$, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl;

wherein the molar ratio of the amount of Diazo reacted to the amount of organic acid reacted is in the range of from about 1:1 to about 39:1, and the amount of Diazo and organic acid reacted with said phenolic compound being sufficient to produce a photosensitizer composition capable of inhibiting the dissolution rate of an alkali soluble resin in alkaline developing solution.

2. A photoresist composition having improved solution stability comprising an admixture of novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition comprising the condensation product of:

I. A phenolic compound having the structure:



wherein: R_a is H, OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being OH;

II. A 1,2 naphthoquinonediazide-4-sulfonic acid (Diazo); and

III. An organic acid halide represented by the formula:

wherein W is



or $-SO_2-V$, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl; wherein the molar ratio of the amount of Diazo reacted to the amount of organic acid reacted is in the range of from about 1:1 to about 39:1, and the amount of Diazo and organic acid reacted with said phenolic compound being sufficient to produce a photosensitizer composition capable of inhibiting the dissolution rate of an alkali soluble resin in alkaline developing solution.

16. A method for producing an article which comprises coating a photoresist composition comprising a novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition according to claim 2 onto a substrate; imagewise exposing said composition to sufficient ultraviolet radiation to render said imagewise exposed portions substantially soluble in an aqueous alkaline solution; and then removing the thusly exposed composition portions from said substrate with an aqueous alkaline developing solution.

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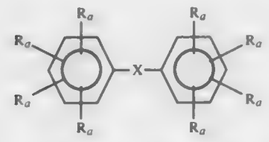
NOVEL MIXED ESTER O-QUINONE PHOTOSENSITIZERS

Robert E. Potvin, West Warwick; Jonas O. St. Alban, Westerly, and Chester J. Sobodacha, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

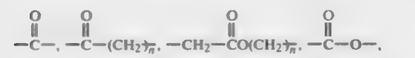
Filed May 2, 1986, Ser. No. 858,631
Int. Cl.[4] G03C *1/54*; G03F *7/26*
U.S. Cl. 430—192 17 Claims

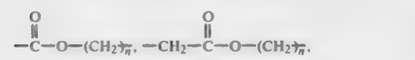
1. A photoresist composition having improved solution stability comprising an admixture of a novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition comprising the condensation product of:

I. A phenolic compound having the structure:

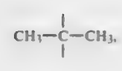


wherein: R_a is H, OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being OH, and X is a single C—C bond, —O—, —S—, $—SO_2—$,





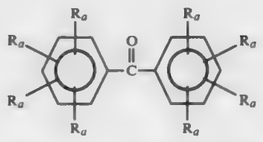
$—(CH_2)_n—$, or



n is 1 or 2;

II. A 1,2 naphthoquinonediazide-5-sulfonic acid (Diazo); and

III. An organic acid represented by the formula



wherein: R_a is H, OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being OH;

II. A 1,2 naphthoquinonediazide-5-sulfonic acid (Diazo); and

III. An organic acid halide represented by the formula:

$W—R_3$

wherein W is



or $—SO_2—V$, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl; wherein the molar ratio of the amount of Diazo reacted to the amount of organic acid reacted is in the range of from about 2:3 to about 19:1, and the amount of Diazo and organic acid reacted with said phenolic compound being sufficient to produce a photosensitizer composition capable of inhibiting the dissolution rate of an alkali soluble resin in alkaline developing solution.

17. A method for producing an article which comprises coating a photoresist composition comprising a novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition according to claim 2 onto a substrate; imagewise exposing said composition to sufficient ultraviolet radiation to render said imagewise exposed portions substantially soluble in an aqueous alkaline solution; and then removing the thusly exposed composition portions from said substrate with an aqueous alkaline developing solution.

4,732,838

METHOD OF FORMING A PATTERNED GLASS LAYER OVER THE SURFACE OF A SUBSTRATE

Franco N. Sechi, Princeton Township, Mercer County; Paul F. Pelka, Wharton, and Katherine E. Pinkerton, Flemington, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 814,994, Dec. 31, 1985, abandoned. This application Feb. 11, 1987, Ser. No. 13,529
Int. Cl.[4] G03C *11/00*
U.S. Cl. 430—198 8 Claims

1. A method for forming a fused glass layer having a predetermined pattern defined therein over a substrate, said method comprising the steps of:

(a) applying a coating over the substrate, said coating being comprised of a mixture of (i) a photoresist composition which will react with a suitable plasma at a temperature below its thermal decomposition temperature to form gaseous reaction products and (ii) a glass frit having a glass transition temperature above the thermal decomposition temperature of the photoresist composition;

(b) selectively exposing an area of the coating corresponding to the predetermined pattern to radiation;

(c) developing the coating to selectively remove the area of the coating corresponding directly to the predetermined pattern;

(d) completely removing said photoresist composition by subjecting the coating remaining over the substrate to said plasma at a temperature below the thermal decomposition temperature of the photoresist composition for a time sufficient for the plasma to react with the photoresist composition to form gaseous reaction products; and

(e) firing the remaining glass frit coating at or above its glass transition temperature for a time sufficient to fuse the glass frit, thereby forming said patterned fused glass layer with a smooth surface over said substrate.

2. A photoresist composition having improved solution stability comprising an admixture of novolak or polyvinyl phenol resin, a solvent and a photosensitizer composition comprising the condensation product of:

I. A phenolic compound having the structure:

4,732,839

ALKALI METAL ALGINATE SURFACE LAYER FOR HEAT DEVELOPMENT PROCESS

Karl-Wilhelm Schranz, Odenthal-Hahnenberg, and Günther Schenk, Cologne, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 902,151
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532141
Int. Cl.[4] G03C *5/54*, *1/90*
U.S. Cl. 430—203 6 Claims

1. Heat development process for the production of colour images in which an imagewise exposed colour photographic recording material having at least one layer of binder arranged on a layer support and containing light-sensitive silver halide, optionally in combination with a substantially light-insensitive silver salt, and at least one non-diffusible, colour providing compound capable of releasing a diffusible dye as a result of development is developed by heat treatment, and in which the dye relesed imagewise from the non-diffusible colour providing compound is transferred by heat treatment to a surface of a separate image receptor sheet which is brought with its active side into surface contact with the recording material and has a receptor layer which is arranged on a layer support and is capable of absorbing diffusible dyes, whereupon the image receptor sheet is separated from the recording material, characterised in that either the light-sensitive recording material or the image receptor sheet or both contain an alkali metal alginate in a surface contact layer for improving contact between the recording material and the image receptor sheet.

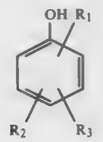
4,732,840

PLANOGRAPHIC PRINTING PLATE METHOD USING LIGHT SENSITIVE MATERIAL INCLUDING PHENOLIC RESOL WITH DIBENZYLIC ETHER GROUPS

Akira Hasegawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 21, 1986, Ser. No. 842,217
Claims priority, application Japan, Mar. 22, 1985, 60-57797; Mar. 22, 1985, 60-57798; Apr. 1, 1985, 60-68661
Int. Cl.[4] G03F *7/08*
U.S. Cl. 430—302 6 Claims

1. A method for making a planographic printing plate, which comprises (a) image-wise exposing a light-sensitive material with actinic radiation, said light-sensitive material being in the form of a layer on a hydrophilic surface of a substrate thereby enabling a planographic printing plate to be obtained and including a light-sensitive composition comprising (i) a phenolic resol wherein the ratio of the number of dibenzylic ether linkages to the total number of dibenzylic ether, methylene and methylol linkages linked to phenolic nucleus is 15 mol.% or more and which phenolic resol is obtained by a reaction between at least one phenol of the formula (I):



(I)

wherein R_1, R_2 and R_3 may be the same or different and represent a hydrogen, halogen, hydroxyl, nitro, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, phenyl having 6 to 20 carbon atoms, or substituted phenyl having 6 to 20 carbon atoms, and an aldehyde and/or ketone under neutral or weakly acidic conditions and subsequent removal of water, and (ii) at least one member selected from the group consisting of diazo resins, o-quinone diazide compounds, light-sensitive azide compounds, high molecular compounds having a —CH=CH—CO— group in the main or side chain thereof, addition-polymerizable unsaturated compounds and acid-decomposition compounds, and wherein ingredients (i) and (ii) are together in admixture or as a light-sensitive esterified reaction product of the phenolic resol with o-quinone diazide sulfonyl halide,

(b) developing the resulting exposed material to form a printing plate image, and

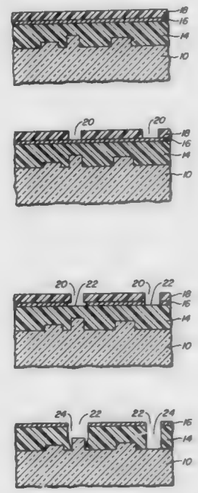
(c) heating the resulting developed material to a temperature of not less than 140° C. to increase printing durability.

4,732,841

TRI-LEVEL RESIST PROCESS FOR FINE RESOLUTION PHOTOLITHOGRAPHY

Kenneth J. Radigan, Los Gatos, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Mar. 24, 1986, Ser. No. 843,340
Int. Cl.[4] G03F *7/26*
U.S. Cl. 430—311 10 Claims



1. A method for defining very small features on a semiconductor substrate, said method comprising:

forming a planarizing layer on the substrate to a thickness sufficient to planarize topographic features on the substrate;

forming an image transfer layer over the planarizing layer, by applying a curable liquid silicone resin over the substrate;

curing the image transfer layer in a non-oxidizing plasma;

forming an imaging layer over the cured image transfer layer, said layer being a photoresist and having a thickness below 0.5 μm;

patterning the imaging layer by photolithography;

transferring the pattern in the imaging layer to the image transfer layer;

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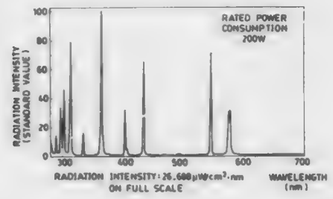
transferring the pattern in the image transfer layer to the planarizing layer; and
defining features on the substrate based on the pattern in the planarizing layer.

4,732,842

EXPOSURE METHOD OF SEMICONDUCTOR WAFER BY RARE GAS-MERCURY DISCHARGE LAMP

Takehiro Kira, Kobe, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,682
Claims priority, application Japan, Feb. 19, 1985, 60-29292
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—311 **4 Claims**



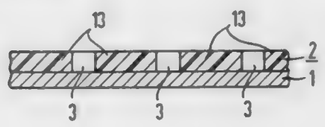
1. In a method for producing with high resolution a pattern image on a semiconductor wafer, one side of which has been coated with an ultraviolet sensitive material, by exposing the wafer to light emitted from a discharge lamp, the improvement comprising:
filling the discharge lamp with 0.1–5 atmospheres of xenon at room temperature and with 1–30 milligrams of mercury per cubic centimeter, at room temperature, of the interior space of the envelope of said discharge lamp;
radiating from the lamp light having a peak wavelength at 365 nm;
projecting said light through a lens system having a high transmittance for light having a wavelength of 365 nm, through a photomask defining a pattern and through a filter having a transmittance of at least 90% for light having a wavelength of 365 nm; and
exposing the coated side of the semiconductor wafer to the projected light so as to print a reduced image of the photomask pattern on the coated side of the wafer wherein the minimum line width of the image is 0.8 μm.

4,732,843

IRRADIATION CROSS-LINKABLE THERMOSTABLE POLYMER SYSTEM, FOR MICROELECTRONIC APPLICATIONS

Klaus Budde, Unterhaching; Friedrich Koch, Munich, and Ferdinand Quella, Neubiberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,513
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429606
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—312 **6 Claims**



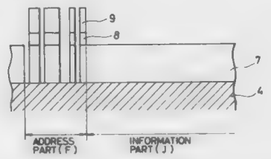
1. A process for the production of a multi-layered wiring laminate using a polymer system comprising an irradiation cross-linkable thermostable polymer for use in the manufacture of multi-layer wiring systems having a reaction product of a fluorinated linear oligomer having at least two reactive end groups per polymer molecule with a radiation-sensitive substance the process comprising the steps of: (a) coating a metal foil with said polymer (b) imaging such coating with a desired wiring pattern by irradiation with masked light, (c) dissolving away the non-irradiated portions of such resulting irradiated coating to produce a developed wiring image in the resulting coating, (d) electroplating portions of said metal foil where such portions are exposed through said developed resulting coating, and (e) depositing over the resulting so electroplated surface at least one additional coating of said polymer, and (f) repeating said steps (b), (c), and (d) with respect to each said additional coating, thereby to produce a desired multilayered wiring laminate.

4,732,844

METHOD FOR MANUFACTURING OPTICAL DISK WITH ADDRESS AND GUIDE GROOVES

Minemasa Ota, and Osamu Kumasaka, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,268
Claims priority, application Japan, Feb. 13, 1984, 59-23010
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—322 **5 Claims**



1. A method for manufacturing an optical disk with address pits and guide grooves comprising the steps of:
applying to one planar surface of a recording board a first photoresist layer and applying to said first photoresist layer a second photosensitive layer, said first photoresist layer comprising a material sensitive only to recording light having a first wavelength spectrum and said second photoresist layer comprising a material sensitive only to recording light having a second wavelength spectrum different from said first wavelength spectrum;
selectively subjecting said second photoresist layer to light within said second wavelength spectrum and at an intensity such that the entire thickness of said second layer in selected first areas is exposed;
selectively subjecting said first photoresist layer in selected second areas, located relative to said selected first areas, to light within said first wavelength spectrum and at an intensity such that the entire thickness of said first layer in said selected second areas is exposed; and
developing said exposed second layer to create a pattern shaped in accordance with said first area and developing said first layer using the remaining photosensitive material of said second layer as a mask.

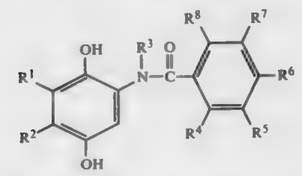
4,732,845

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Mihayashi Keiji, and Nobutaka Ohki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 28, 1986, Ser. No. 889,972
Claims priority, application Japan, Jul. 26, 1985, 60-165511
Int. Cl.⁴ G03C *1/33*
U.S. Cl. 430—551 **13 Claims**

1. A silver halide color photographic material containing at least one substantially colorless compound selected from the group consisting of compounds represented by formula (I)



(I)

and alkaline unstable precursors thereof, bis, tris and tetrakis compounds derived from the compound, and polymers derived from the compound; wherein R^1 and R^2 each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl, acylamino, alkoxy, aryloxy, alkylthio, arylthio, sulfonyl, carbamoyl, or sulfamoyl group; or R^1 and R^2 together form a carbocyclic ring; R^3 represents a hydrogen atom or an alkyl group; and R^4, R^5, R^6, R^7, and R^8 each represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, or a substituted or unsubstituted alkyl, acylamino, sulfonamido, alkoxy, aryloxy, alkylthio, arylthio, amino, acyl, acyloxy, carbamoyl, carbamoylamino, carbamoyloxy, sulfamoyl, sulfamoylamino, alkoxycarbonyl, aryloxycarbonyl, alkoxycarbonylamino, aryloxycarbonylamino, alkoxycarbonyloxy, aryloxycarbonyloxy, heterocyclic ring, alkoxysulfonyl or aryloxysulfonyl group; or two adjacent groups together form a carbocyclic ring or a heterocyclic ring; the sum of the carbon atom number of R^1 to R^8 is at least 8; and the compound of formula (I) is substantially insoluble in water and does not form a color image by coupling reaction with an oxidized product of a developing agent.

4,732,846

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Toshiaki Aono; Masatoshi Kato, and Hiroshi Hara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 30, 1986, Ser. No. 857,285
Claims priority, application Japan, Apr. 30, 1985, 60-91258
Int. Cl.⁴ G03C *1/40, 5/54*
U.S. Cl. 430—619 **17 Claims**

1. A heat-developable light-sensitive material comprising a support having provided thereon at least
(a) a binder;
(b) a light-sensitive silver halide;
(c) at least one silver salt of a compound represented by formula (I) or (II)



(I)

wherein Z represents a non-metallic atomic group forming a heterocyclic ring together with the nitrogen atom,

A—C≡C—H (II)

wherein A represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group;
(d) a silver salt of a compound represented by formula (III)

B—S—H (III)

wherein B represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; and
(e) a reducing agent.

4,732,847

MONOCLONAL ANTIBODIES FOR DNA-RNA HYBRID COMPLEXES AND THEIR USES

W. Dorsey Stuart, Honolulu, Hi., and Mark B. Frank, Irvine, Calif., assignors to University of Hawaii, Honolulu, Hi.

Continuation of Ser. No. 271,769, Jun. 9, 1981, abandoned. This application Dec. 29, 1982, Ser. No. 454,317
Int. Cl.⁴ C12Q *1/68;* G01N *33/577;* C07K *15/04*
U.S. Cl. 435—6 **15 Claims**

1. IgM or IgG mouse monoclonal antibodies which specifically bind to DNA-RNA hybrid complexes but which do not bind to isolated RNA or DNA.

5. A method for detecting the presence of a nucleotide sequence which comprises:
fixing a DNA or RNA sequence to a solid support as a single strand;
hybridizing said fixed single stranded nucleic acid sequence with a sequence of the other type of nucleic acid having a predetermined nucleic acid sequence to bind to any homologous fixed sequence to form a hybrid duplex;
adding to said hybrid duplex mouse IgG or IgM monoclonal antibodies which specifically bind to DNA-RNA hybrid complexes, whereby said monoclonal antibodies bind to hybrid duplexes bound to said solid support; and
determining the presence of monoclonal antibody bound to said solid support by means of a label providing a detectable signal, which label is bound directly or indirectly to said monoclonal antibody.

4,732,848

PROCESS FOR THE DETERMINATION OF AN IMMUNOLOGICALLY-BINDABLE SUBSTANCE INVOLVING A FAB FRAGMENT

Helmut Lenz, and Gerd Kleinhammer, both of Tutzing, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,503
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430905
Int. Cl.⁴ G01N *33/53*
U.S. Cl. 435—7 **6 Claims**

1. A process for determining an immunologically bindable substance comprising:
(a) incubating a liquid sample solution containing the substance to be determined with a solid phase antibody against the bindable substance to be determined, which solid phase antibody is present in an amount insufficient to bind all of said bindable substance, a conjugate of the bindable substance to be determined and an Fab fragment of an antibody directed against a determinable enzyme, said conjugate being present in a predetermined amount and a sample of said determinable enzyme,
(b) separating said solid and liquid phases, and
(c) measuring the enzyme activity in one of the two phases as a measure of bindable substance in said liquid sample.

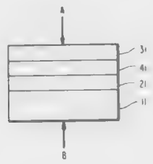
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4,732,849

MULTILAYERED CHEMICAL ANALYSIS MATERIAL FOR ANALYSIS OF AQUEOUS LIQUIDS

Osamu Seshimoto, and Masao Kitajima, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 600,220, Apr. 17, 1984, abandoned, which is a continuation of Ser. No. 206,604, Nov. 13, 1980, abandoned. This application Feb. 10, 1986, Ser. No. 828,562
Claims priority, application Japan, Nov. 13, 1979, 54-146000
Int. Cl.⁴ C12Q *1/58*
U.S. Cl. 435—12 **44 Claims**



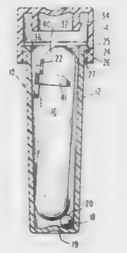
1. A multi-layered, chemical analysis element for analysis of an aqueous liquid, which comprises:
(a) a light-transmitting, water impermeable support having provided thereon in sequence and without any intermediate layer;
(b) a reagent layer; and
(c) a porous, sample-spreading layer; with
(i) said reagent layer (b) containing a lake dye precursor dispersed in a hydrophilic biner, wherein said lake dye precursor is haematoxylin, brazilin, dithizone, diphenylcarbazide, oxine, rubeanic acid, formaldoxime, dimethylglyoxime, alizarin, or sodium rhodinate,
(ii) urease incorporated in the reagent layer (b) or in a layer immediately adjacent the reagent layer (b), and
(iii) a member selected from the group consisting of a lake forming metal salt and a lake forming metal oxide selected from the group consisting of TiO_2, SiO_2, Al_2O_3 and an EDTA metal salt, incorporated in at least one of the reagent layer (b) and a layer immediately adjacent the reagent layer (b).

4,732,850

FRANGIBLE CONTAINER WITH RUPTURING DEVICE

James R. Brown, Colonia, N.J., and Steven T. Buglino, Bayport, N.Y., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 5, 1985, Ser. No. 752,283
Int. Cl.⁴ C12Q *1/22;* **C12M** *1/24*
U.S. Cl. 435—31 **8 Claims**



1. A frangible container and rupturing device comprising:
(a) a substantially non-deformable tubular vial;
(b) a sealed, frangible container within said tubular vial, said tubular vial having a cap which presses onto said sealed, frangible container, said cap including means for centering the top of said container within said vial; and
(c) fulcrum means attached to said container near the end of said container adjacent to said cap of said vial, whereby when said cap is depressed said means for centering said container engages said container and causes said fulcrum means to provide a lateral force against the side of said container thereby providing sufficient pressure to rupture said container when said cap fully engages said vial.

4,732,851

IMMOBILIZATION OF CELLS WITH A POLYAZETIDINE PREPOLYMER

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Purification Engineering, Inc., Columbia, Md.

Continuation-in-part of Ser. No. 358,784, Mar. 16, 1982, Pat. No. 4,436,813. This application Feb. 10, 1983, Ser. No. 465,551
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.⁴ C12P *37/00, 1/00;* **C12N** *11/08, 11/04*
U.S. Cl. 435—43 **7 Claims**

1. A composition comprising immobilized cells having enzyme activity, the cells being immobilized by applying an aqueous dispersion of the cells and curable polyazetidine prepolymer as a coating to a solid inert carrier and curing the prepolymer on said carrier at a temperature below the temperature at which the enzyme activity of the microbial cells is significantly reduced to immobilize said cells while retaining their enzyme activity.

4,732,852

SITE DIRECTED PEPTIDASE CLEAVAGE

Stanley N. Cohen, Portola Valley, and Annie C. Y. Chang, Palo Alto, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 323,347, Nov. 20, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,755
Int. Cl.⁴ C12P *21/00*
U.S. Cl. 435—68 **16 Claims**

1. A method for specifically reducing the size of an extended peptide to a desired peptide product comprising:
combining an extended peptide with at least one antibody specific for an antigenic determinant site of said extended peptide to protect an enzymatically hydrolyzable labile bond from peptidase cleavage to produce an antibody bound peptide, wherein said antibody is selected to protect a selected region of said polypeptide;
combining said antibody bound peptide with a peptidase under conditions to provide hydrolytic cleavage of at least one exposed labile bond; and
isolating said peptide product of said hydrolytic cleavage free of antibody.

4,732,853

METHOD OF MAKING CHIRAL EPOXY ALCOHOLS

George M. Whitesides, Newton, Mass., and Wolfgang Ladner, Herbstein-S-Lanzenhain, Fed. Rep. of Germany, assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Nov. 21, 1984, Ser. No. 673,994
Int. Cl.⁴ C12P *17/02;* **C12N** *9/08, 9/18;* **C07P** *41/00*
U.S. Cl. 435—123 **11 Claims**

1. The method of making chiral epoxy alcohols and esters which comprises providing a racemic carboxylic acid ester of an epoxy alcohol, bringing said ester into contact with water and a hydrolytic enzyme to hydrolyze said ester to the extent of about 5% to about 95%, and separating the resultant free alcohol from unhydrolyzed ester.

4,732,854

METHOD OF PRODUCING DEXTRANASE

Donal F. Day, and David W. Koenig, both of Baton Rouge, La., assignors to Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation-in-part of Ser. No. 837,839, Mar. 10, 1986. This application Dec. 19, 1986, Ser. No. 943,328
Int. Cl.⁴ C12N *9/46, 15/00, 1/16;* **C12R** *1/645*
U.S. Cl. 435—211 **17 Claims**

1. A culture of the strain of *Lypomyces starkeyi,* ATCC No. 20825, having the capability to hyperproduce extracellular dextranase about three times the dextranase production of the wild variety after 72 hours when cultured at a controlled pH in the range of from about 3.0 to about 4.0 in an aqueous nutrient medium containing assimilable carbon source, nitrogen source, and mineral source.

4,732,855

PROCESS FOR PREPARATION OF PROPIONIC ACID

Joseph G. Zeikus, and Thomas E. Thompson, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 3, 1984, Ser. No. 596,263
Int. Cl.⁴ C12N *1/38;* **C12P** *7/52;* **C12R** *1/01*
U.S. Cl. 435—141 **8 Claims**

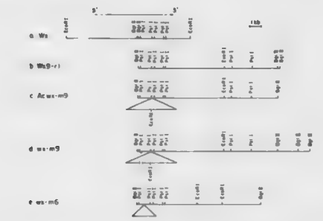
1. In the method of producing propionate or propionic acid which comprises cultivating a propionic acid-producing bacterium having the identifying characteristics of *Propionispira arboris* ATCC No. 33732 which produces a reversible hydrogenase and converts carbohydrates first to pyruvate and then the pyruvate to acetate, carbon dioxide and propionic acid or propionate under anaerobic conditions in a medium which contains a simple carbohydrate substrate, essential minerals, vitamins and growth factors, the improvement which comprises employing an overpressure of hydrogen effective to cause the hydrogenase produced by the bacterium to suppress the conversion of the pyruvate to acetate and carbon dioxide and to promote the formation of propionate or propionic acid.

4,732,856

TRANSPOSABLE ELEMENTS AND PROCESS FOR USING SAME

Nina V. Federoff, Baltimore, Md., assignor to Carnegie Institution of Washington, Washington, D.C.

Filed Apr. 3, 1984, Ser. No. 596,224
Int. Cl.⁴ C12N *15/00;* **C12Q** *1/68;* **C07H** *15/12*
U.S. Cl. 435—172.3 **20 Claims**



1. An essentially pure transposon isolated from maize, wherein said transposon is Ac.

4,732,857

PROCESS FOR PRODUCING ENZYME CAPABLE OF INACTIVATING CYTOSOLIC ASPARTATE AMINOTRANSFERASE ISOZYME

Sawao Murao, 8-12, Horiagemidori-machi 2-cho, Sakai-shi, Osaka, and Toyokazu Nishino, 15-1, Ueno-cho, Ibaragi-shi, Osaka, both of Japan

Filed Jan. 2, 1985, Ser. No. 688,251
Claims priority, application Japan, Jan. 12, 1984, 59-4494
Int. Cl.⁴ C12N *9/52;* **C12R** *1/465*
U.S. Cl. 435—220 **1 Claim**

1. A process for preparing an enzyme capable of inactivating cytosolic aspartate aminotransferase isozyme which comprises cultivating a strain of *Streptomyces violaceochromogenes strain No.* 9722 (FERM BP-646) under operating conditions effective to produce and accumulate recoverable amounts of said enzyme and recovering said enzyme from the culture.

4,732,858

ADHESION PROMOTING PRODUCT AND PROCESS FOR TREATING AN INTEGRATED CIRCUIT SUBSTRATE

Terry Brewer, Rolla; Tony D. Flaim, St. James, and Mary G. Moss, Rolla, all of Mo., assignors to Brewer Science, Inc., Rolla, Mo.

Filed Sep. 17, 1986, Ser. No. 908,346
Int. Cl.⁴ B05D *5/12;* **B03C** *1/495*
U.S. Cl. 437—228 **10 Claims**

1. In a method of producing microelectronic components and the like by photolithography using a silane adhesion promoter to enhance the bond of coatings to a microelectronic substrate the improvement comprising applying a solution of a silane adhesion promoter to the microelectronic substrate, the solution of a silane adhesion promoter comprising an adhesion promoting organosilane and an aqueous solvent composition containing a hydroxylic solvent, the solution containing between about 0.05 to 0.5 weight percent of an adhesion promoting organosilane in an aqueous solvent composition containing a hydroxylic solvent, the solvent composition consisting essentially of between about 5 to 50 weight percent water and between about 50 to 95 weight percent hydroxylic solvent, the solution being storage stable and the combined aqueous solvent composition containing hydroxylic solvent being effective to enhance the adhesion promoting property of the organosilane when coated with a microelectronic coating and subjected to processing thereof.

4,732,859

METHOD FOR CONFERRING BACTERIOPHAGE RESISTANCE TO BACTERIA

Charles L. Hershberger, New Palestine, and Paul R. Rosteck, Jr., Beech Grove, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 414,290, Sep. 3, 1982, Pat. No. 4,530,904. This application Sep. 5, 1984, Ser. No. 647,338
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.⁴ C12N *9/14, 1/20, 1/00, 15/00, 9/10;* **C12P** *21/00*
U.S. Cl. 435—320 **15 Claims**

1. A recombinant DNA cloning vector comprising
(1) a DNA segment that confers a restriction and cognate modification activity to a bacterium,
(2) a replicon that is functional in said bacterium and,
(3) a gene that expresses a functional polypeptide in said bacterium
subject to the limitation that (1) said modification activity is expressed in said bacterium prior to said restriction activity and (2) that said gene that expresses a functional polypeptide is neither a gene that confers antibiotic resistance to said bacterium nor said DNA segment that confers restriction or cognate modification activity to the bacterium.

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4,732,860

PROCESS FOR DETERMINING THE PERKALLIKREIN CONTENT AND THE PARTIAL THROMBOPLASTIN TIME OF A PLASMA SAMPLE

Kaut Bartl, Wilzhofen, and Helmut Lill, Wielenbach, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 822,364

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504405

Int. Cl.[4] G01N *21/78, 33/86;* C12Q *1/56*

U.S. Cl. 436—34 9 Claims

1. Process for the simultaneous photometric determination of the prekallikrein content of a plasma sample and the partial thromboplastin time of said sample comprising incubating a plasma sample with a surface activator along with calcium ions and a phospholipid to form a reaction mixture, measuring the extinction of the reaction mixture, adding a chromogenic substrate specific to thrombin to the reaction mixture, measuring an optically determinable group liberated from the chromogenic substrate in the reaction mixture by measuring the extinction of the reaction mixture at short time intervals or continuously, said incubation taking place at a temperature of from 20° to 40° C., and simultaneously determining a gradient of a linear part of a curve obtained by plotting time against the extinction of the reaction mixture as a measure of the prekallikrein content of the plasma sample and the partial thromboplastin time by measuring the time it takes the extinction of the reaction mixture to reach a predetermined level.

4,732,861

METHOD AND APPARATUS FOR DETECTING OIL AEROSOL

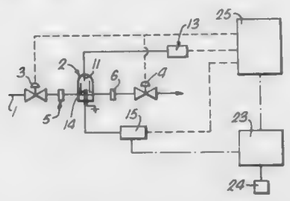
Ian Sinclair, and James I. T. Stenhouse, both of Loughborough, England, assignors to Domnick Hunter Filters Limited, Birtley, Great Britain

Filed Oct. 17, 1986, Ser. No. 920,834

Claims priority, application United Kingdom, Oct. 18, 1985, 8525774

Int. Cl.[4] G01N *25/30*

U.S. Cl. 436—159 12 Claims



1. A method of detecting oil aerosol in an air flow, the method comprising passing the air flow through a space between an electrode and an electrically conductive catalyst, causing electrical discharge between the electrode and the catalyst so as electrostatically to precipitate oil from the air flow on to the catalyst, terminating the discharge, stopping the air flow, heating the catalyst in substantially stagnant air, to a temperature at which catalytic combustion of the precipitated oil occurs, and sensing heat generation due to said catalytic combustion to produce an output signal indicative thereof.

4,732,862

DETERMINATION OF CEA BINDING SUBSTANCE USING ANTI-GOAT IMMUNOGLOBULINS

Alberto Bartorelli, No. 20, Via Fogazzaro, Milano, Italy

Filed Nov. 14, 1984, Ser. No. 671,370

Claims priority, application Italy, Nov. 21, 1983, 49370 A/83

Int. Cl.[4] G01N *33/053, 33/534, 33/541, 33/537*

U.S. Cl. 436—513 5 Claims

1. A method for the determination of CEA binding substance (CBS), which comprises

incubating the serum of a patient with carcinoma in a first incubation with CEA that has been radioactively labeled (^{125}I-CEA, 50,000 cpm, 80 μCi/μg of specific activity) for at least 16 hours at room temperature;

adding anti-goat immunoglobulin antiserum in toto or depleted of the cross-reaction capacity for human IgA, IgG and IgM; and

incubating in a second incubation for 1 hour at room temperature; and

centrifuging and decanting the resulting supernatant; and counting the resulting precipitate with a gamma counter.

4,732,863

PEG-MODIFIED ANTIBODY WITH REDUCED AFFINITY FOR CELL SURFACE FC RECEPTORS

Thomas B. Tomasi, Corrales, and William L. Anderson, Albuquerque, both of N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Dec. 31, 1984, Ser. No. 687,811

Int. Cl.[4] G01N *33/53, 33/552, 33/574, 33/577*

U.S. Cl. 436—547 22 Claims

1. A PEG-modified antibody obtained by reaction of a carboxylated polyethylene glycol with a carboxyl activating agent to form a polyethylene glycol active ester intermediate, and reaction of the active ester intermediate with an antibody to form the PEG-modified antibody, wherein said PEG-modified antibody is biologically-active, covalently linked to polyethylene glycol, and has decreased immunogenicity, decreased non-specific reactivity, and increased specific reactivity as compared to unmodified antibody.

17. In an immunological diagnostic method wherein an antibody or complex thereof is employed in an immunoreaction as a diagnostic agent, the improvement comprising employing the PEG-modified antibody of claim 1 or complex thereof as the diagnostic agent.

4,732,864

TRACE-LABELED CONJUGATES OF METALLOTHIONEIN AND TARGET-SEEKING BIOLOGICALLY ACTIVE MOLECULES

Glen L. Tolman, Chelmsford, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1983, Ser. No. 539,733

Int. Cl.[4] G01N *33/53;* A61K *43/00;* C07K *7/00*

U.S. Cl. 436—547 44 Claims

1. A conjugate of (a) a target-seeking biologically active molecule selected from the group consisting of antibodies, antibody fragments, hormones, peptides, proteins and drugs which bind to receptors and localize in certain organs, tissues and cells of the mammalian body and (b) metallothionein or metallothionein fragment in which at least a part of the metal in the metallothionein or fragment is a trace-labeled metal having sufficient affinity for the metallothionein or metallothionein fragment to bind thereto.

4,732,865

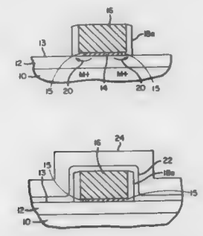
SELF-ALIGNED INTERNAL MOBILE ION GETTER FOR MULTI-LAYER METALLIZATION ON INTEGRATED CIRCUITS

David R. Evans, Aloha; James S. Flores, and Susan S. Dottarar, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 3, 1986, Ser. No. 915,303

Int. Cl.[4] H01L *21/385, 21/441, 21/467*

U.S. Cl. 437—12 15 Claims



1. In an integrated circuit fabrication process, a method of making a multi-layer metallization structure including a conductor metal and a barrier metal comprising a composition of titanium-tungsten which includes an amount of contaminant sodium ions, the method comprising:

depositing a layer of the barrier metal on a surface of a semiconductor substrate;

depositing a layer of the conductor metal on the barrier metal layer, the barrier metal layer separating the conductor metal from said surface;

patterning the conductor and barrier metal layers to define said structure along the substrate surface as a predetermined pattern of conductive interconnects and gate contacts having a pair of opposite sidewalls;

depositing a layer of a gettering composition over the substrate including in contact with each of the sidewalls of the metallization structure, the gettering composition being selected to react with and bind any of the contaminant sodium ions coming in contact therewith;

selectively removing a portion of the gettering composition layer to expose a top surface of the conductor metal layer while leaving a sidewall portion of the gettering composition layer contacting the substrate along each of the sidewalls of the metallization structure;

removing a portion of the contaminant sodium ions from the barrier metal so as to reduce the amount of said ions available to contaminate the semiconductor substrate; and

depositing and adhering a layer of an insulative material onto the exposed conductor metal and the sidewall layers of the gettering composition.

4,732,866

METHOD FOR PRODUCING LOW NOISE, HIGH GRADE CONSTANT SEMICONDUCTOR JUNCTIONS

Jerry L. Chruma, Scottsdale; William E. Gandy, Jr., Phoenix; Tommie R. Huffman, Tempe, and Syd R. Wilson, Phoenix, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 12, 1984, Ser. No. 588,628

Int. Cl.[4] H01L *21/425, 29/90*

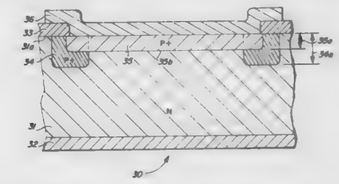
U.S. Cl. 437—20 4 Claims

1. A process for forming low noise semiconductor junctions comprising:

providing a semiconductor substrate containing an impurity of a first conductivity type and a first concentration;

implanting an impurity of a second type in said substrate to a dose about 1×10^{16} ions/cm^2 or larger; and

rapidly heating and cooling said substrate without melting to activate an increase the depth of penetration of said implanted impurity without decreasing the slope of the concentration profile of said implanted impruity in said substrate at said first concentration.



4,732,867

METHOD OF FORMING ALIGNMENT MARKS IN SAPPHIRE

George L. Schnable, Lansdale, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1986, Ser. No. 925,983

Int. Cl.[4] H01L *17/00;* H04L *21/265*

U.S. Cl. 437—22 7 Claims

1. A process for producing indicia in a sapphire substrate comprising ion implanting a portion of the substrate with a dosage of silicon ions sufficient to contrast the implanted portion from the remainder of the substrate.

4,732,868

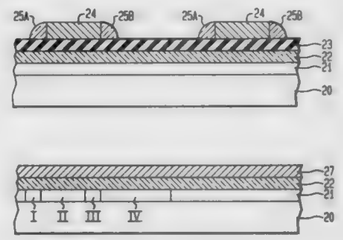
METHOD OF MANUFACTURE OF A UNIPHASE CCD

David N. Nichols, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1987, Ser. No. 31,974

Int. Cl.[4] H01L *21/425, 29/78*

U.S. Cl. 437—29 4 Claims



1. In the manufacture of a uniphase charge coupled device, the process of providing a desired doping concentration in a semiconductive substrate for use in the charge-coupled device comprising the steps of:

forming over the substrate a mask including a plurality of strip portions, each including a central portion of one material with vertical side walls and edge portions of a different material on opposite side walls of the central portion;

implanting ions of one type through the mask into exposed regions of the substrate;

removing corresponding ones of the edge portions of each strip;

implanting ions of both the one and the opposite types into the exposed region of the substrate;

removing the central portion of each strip;

implanting ions of the one type into exposed regions of the substrate; and

removing the remaining edge portion of each strip.

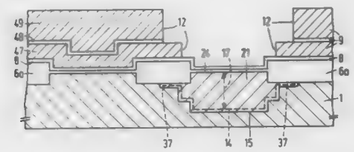
VOL 1088 ISS 4 MR 22 1988 UMI

4,732,869

METHOD OF FORMING IMPLANTED REGIONS IN A SEMICONDUCTOR DEVICE BY USE OF A THREE LAYER MASKING STRUCTURE

Paulus M. T. M. van Attekum; Hubertus J. den Blanken; Paulus A. van der Plas, and Reinier de Werdt, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,480
Claims priority, application Netherlands, Jul. 11, 1985, 8501992
Int. Cl.[4] H01L *21/225, 29/78*
U.S. Cl. 437—34 **16 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of

forming at least a first pattern of field insulation at a first major surface of a semiconductor body, said first pattern bounding at least one active region at said first major surface, and said first pattern having a predetermined thickness;

forming a masking structure on said first major surface, said masking structure having at least one opening above at least a part of said at least one active region;

carrying out ion implantation to said at least one active region through said at least one opening to dope said at least one active region to a depth at least approximately equal to said predetermined thickness;

wherein said masking structure is formed on said first major surface by the steps of

forming a first masking layer on said first major surface, said first masking layer being of a first thickness, and said first masking layer being of a different material from said first pattern of field insulation,

forming a second masking layer on said first masking layer, said second masking layer being of a second thickness greater than said first thickness, and said second masking layer being of a different material than said first masking layer, and

forming a third masking layer on said second masking layer, said third masking layer being of a third thickness less than said second thickness, and said third masking layer being of a different material than said second masking layer,

wherein said at least one opening is formed through said second masking layer and said third masking layer, said first masking layer covering at least parts of said first major surface at said at least one opening through said second and third masking layer.

4,732,870

METHOD OF MAKING COMPLEMENTARY FIELD EFFECT TRANSISTORS

Takashi Mimura, Machida, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 745,160, Jun. 17, 1985. This application Aug. 11, 1987, Ser. No. 84,052
Claims priority, application Japan, Jun. 18, 1984, 59-123755
Int. Cl.[4] H01L *21/203, 21/205, 21/265*
U.S. Cl. 437—40 **7 Claims**

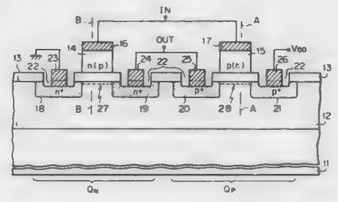
1. A method of producing a semiconductor device comprising the steps of:

epitaxially forming a channel layer of an undoped single crystalline semiconductor on a semi-insulating single crystalline substrate;

epitaxially forming a buffer layer of an undoped single crystalline semiconductor on said channel layer;

epitaxially and selectively forming a first control layer of a doped single crystalline semiconductor on said buffer layer;

epitaxially and selectively forming a second control layer of a doped single crystalline semiconductor on said buffer layer;



forming a first control electrode and a second control electrode on said first control layer and said second control layer and said second control layer, respectively;

forming a pair of impurity regions of a first conductivity type in said channel layer;

forming a pair of impurity regions of a second conductivity type, opposite said first conductivity type, in said channel layer; and

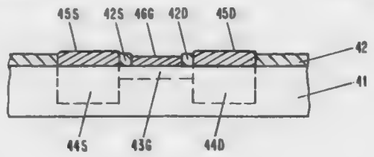
forming electrodes on said impurity regions, respectively.

4,732,871

PROCESS FOR PRODUCING UNDERCUT DUMMY GATE MASK PROFILES FOR MESFETS

Peter L. Buchmann, Langnau a.Albis; Volker Graf, Wollerau, both of Switzerland; Peter D. Hoh, Stormville, N.Y.; Theodor O. Mohr, Wettswil, and Peter Vettiger, Langnau a.Albis, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1987, Ser. No. 31,648
Claims priority, application European Pat. Off., Jul. 11, 1986, 86109500.8
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—41 **28 Claims**



1. A process for fabricating undercut mask profiles for use in semiconductor device manufacturing comprising the steps of:

depositing a first layer of dielectric material on the surface of a substrate in a plasma enhanced chemical vapor deposition reactor at a first plasma excitation frequency to impart a given etch rate to said first layer,

depositing a second layer of dielectric material on said first layer at a second plasma excitation frequency to impart an etch rate lower than said given etch rate to said second layer,

patterning said first and second layers such that at least one vertical edge of each of said layers is exposed, and

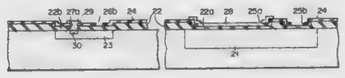
etching said first and second layers at said at least one vertical edge to remove portions of said first layer at a rate higher than the rate at which portions of said second layer are removed.

4,732,872

METHOD FOR MAKING A BIPOLAR TRANSISTOR AND CAPACITORS USING DOPED POLYCRYSTALLINE SILICON OR METAL SILICIDE

Shigeru Komatsu, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 668,188, Nov. 5, 1984, abandoned, which is a continuation of Ser. No. 361,091, Mar. 23, 1982, abandoned. This application Jun. 26, 1985, Ser. No. 748,711
Claims priority, application Japan, Mar. 25, 1981, 56-43697
Int. Cl.[4] H01L *21/225*
U.S. Cl. 437—47 **2 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of:

forming a semiconductor substrate of a first conductivity type having a first impurity region and a second impurity region of a second conductivity type;

forming an oxide film on said semiconductor substrate;

forming on said oxide film a silicon nitride film having a first opening above said first impurity region and a second opening above said second impurity region;

forming a contact hole in said oxide film through said second opening;

forming a conductive layer containing an impurity of the first conductivity type, and made of a material selected from the group consisting of polycrystalline silicon and metal silicide, on said silicon nitride film and exposed regions of said oxide film and said substrate;

selectivity removing said conductive layer to leave a first portion on said oxide film and a second portion on said substrate, said first portion acting as a barrier layer for protecting said oxide film, and said second portion acting as an intermediate layer;

forming a third impurity region of the first conductivity type in said second impurity region by diffusing the impurity of said second portion into said second impurity region; and

forming metal electrodes connected to said barrier layer and said intermediate layer.

4,732,873

METHOD OF FABRICATION OF NON-LINEAR CONTROL ELEMENTS FOR A FLAT ELECTROOPTICAL DISPLAY SCREEN

Jean N. Perbet, Gif sur Yvette; Bruno Mourey, Boulogne Billancourt; Michel Graciet, Villeron sur Yvette; Michel DeFrance, La Ville du Bois; Patrick Truffer, Les Ulis, and Nicolas Szylo, Limours, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 31, 1986, Ser. No. 846,276
Claims priority, application France, Apr. 2, 1985, 85 05007
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—101 **3 Claims**

1. A method of fabrication of non-linear control elements for an electrooptical display screen comprising electrooptical material placed between a first and a second plate, comprising the following successive steps performed on the second plate:

(a) a first step involving deposition of a layer of n^+ doped amorphous semiconductor material;

(b) a second step involving deposition of undoped amorphous semiconductor material;

(c) a third step involving deposition of a layer of metallic material;

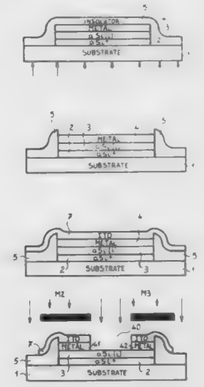
(d) a fourth step which involves masking of the control elements to be formed;

(e) a fifth step which involves etching of the three unmasked layers mentioned above so as to form mesa structures;

(f) a sixth step involving deposition of a layer of insulating material;

(g) a seventh step which involves etching of the layer of insulating material located at the surface of the layer of metallic material;

(h) an eighth step involving deposition of a layer of conductive material;



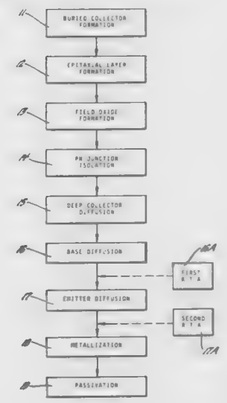
(i) a ninth step which involves etching on the one hand of the layer of conductive material in order to define display screen electrodes and control leads such that the electrodes are coupled with control leads by means of control elements thus formed, and on the other hand of the layer of metallic material in order to form two metallic control-element gates on each control element.

4,732,874

REMOVING METAL PRECIPITATES FROM SEMICONDUCTOR DEVICES

Douglas R. Sparks, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 15, 1986, Ser. No. 919,324
Int. Cl.[4] H01L *21/225, 21/265*
U.S. Cl. 437—247 **9 Claims**



1. A process of making a silicon wafer of a silicon device essentially free of transition metal precipitates which com-

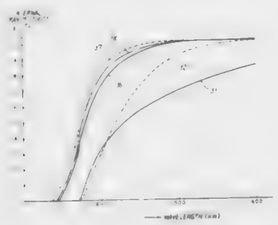
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prises the steps of heating the wafer rapidly to a temperature of between 550–750 degrees C., maintaining such temperatures for between 30–90 seconds, rapidly cooling the wafer for quenching the transition metal atoms in solution, and thereafter avoiding conditions in the further processing under which the metal atoms can reform into precipitates.

4,732,875
OPTICAL GLASS

Koji Sagara, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 832,265
Claims priority, application Japan, Feb. 22, 1985, 60-32560
Int. Cl.⁴ C03C *3/253, 3/15*
U.S. Cl. 501—42 **9 Claims**



1. Optical glass consisting essentially of, by weight, 10–80% of TeO_2, 7.9–30% of B_2O_3, 0–22% of GeO_2, 5–35% of La_2O_3, 0–18% of Y_2O_3, 0–25% of Gd_2O_3, 0–15% of Yb_2O_3, 0–20% of Ta_2O_5, and 0–26% of Nb_2O_5, a first sum of B_2O_3 and GeO_2, a second sum of La_2O_3, Y_2O_3, Gd_2O_3, and Yb_2O_3, and a third sum of Ta_2O_5 and Nb_2O_5 being between 7.9% and 30%, between 5% and 50%, and between 1% and 26%, respectively.

4,732,876
OPHTHALMIC AND OPTICAL GLASS

Izumi Nagamine, Sagamihara, and Nobuhiro Nozawa, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Ohara, Kanagawa, Japan

Continuation-in-part of Ser. No. 843,786, Mar. 25, 1986, abandoned. This application May 28, 1987, Ser. No. 55,012
Claims priority, application Japan, Apr. 4, 1985, 60-71597
Int. Cl.⁴ C03C *3/068, 4/00*
U.S. Cl. 501—78 **2 Claims**

1. An ophthalmic and optical glass having a refractive index (ηd) in the range of 1.75 to 1.84, Abbe number (νd) in the range of 33 to 40 and specific gravity of 4.0 or less, said glass consisting essentially of the following ingredients in weight percent:

B_2O_3	21.5–26%
SiO_2	1–14%
in which $B_2O_3 + SiO_2$	25–40%
Li_2O	3.5–12%
Na_2O	0–5%
K_2O	0–5%
MgO	0–10%
CaO	6–17%
SrO	0–10%
BaO	0–10%
ZnO	0–10%
in which MgO + CaO + SrO + BaO + ZnO	6–17.5%
La_2O_3	18–40%
Gd_2O_3	0–15%
Y_2O_3	0–15%
TiO_2	4–13%
ZrO_2	1–10%
Nb_2O_5	1–30%
Al_2O_3	0–5%
As_2O_3	0–1%
and Sb_2O_3	0–1%

4,732,877
ALUMINA COMPOSITE REINFORCED BY ZIRCONIA-CLAD ALUMINA FIBERS

William L. Olson, and Keith R. Karasek, both of Elk Grove, Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 781,548, Sep. 30, 1985, abandoned. This application May 5, 1986, Ser. No. 859,667
Int. Cl.⁴ C04B *35/02, 35/10, 35/48*
U.S. Cl. 501—95 **8 Claims**

1. A fully dense ceramic composite comprising an alumina matrix containing surface zirconated alumina fibers.

4,732,878
OXIDATION RESISTANT CARBON CONTAINING ALUMINA-SILICA ARTICLES

George F. Everitt, Lake Elmo; Terence P. Johnson, Hastings, and Lien-Huong T. Pham, Saint Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 26, 1986, Ser. No. 912,829
Int. Cl.⁴ C04B *35/10, 35/14*
U.S. Cl. 501—100 **24 Claims**

1. A shaped article comprising a continuous alumina-silica or alumina-boria-silica matrix first phase and an in-situ generated discontinuous carbon second phase, said article being stable to an oxidative atmosphere when heated at 1300° C. for at least 30 minutes.

4,732,879
METHOD FOR APPLYING POROUS, METAL OXIDE COATINGS TO RELATIVELY NONPOROUS FIBROUS SUBSTRATES

Marie R. Kalinowski, Granville, and Gary M. Nishioka, Pataskala, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 8, 1985, Ser. No. 796,137
Int. Cl.⁴ B01J *37/34, 35/06, 21/06, 21/02*
U.S. Cl. 502—5 **15 Claims**

1. A method for the preparation of a catalytically active flexible fibrous element comprised of a porous, catalytically active layer of at least one metal oxide coated on, and disposed as the external surface of, a flexible fibrous substrate of substantially non-porous fibers having surface hydroxyl groups selected from the group consisting of glass and ceramic fibers, said method including the steps of

a. preparing a coating solution of at least one substantially unhydrolyzed hydrolyzable metal alkoxide precursor of said at least one catalytically active metal oxide dissolved in a substantially anhydrous organic solvent;

b. applying a thin, substantially uniform layer of said coating solution on a contaminant free surface of said non-porous fibrous substrate;

c. drying said coated substrate in the presence of water or water vapor in a manner so as to initiate hydrolysis of said metal alkoxide to the corresponding metal hydroxide and condensation thereof to the corresponding metal oxide; and

d. curing said coated substrate initially in a microwave oven and thereafter further curing in a thermal oven at a temperature in the range of between about 250° C. and about 500° C. so as to drive said hydrolysis and condensation reactions substantially to completion, and to substantially remove the organic constituents from said coated substrate and form said element, said curing being done at a temperature less than that which will cause a substantial loss of catalytic activity.

4,732,880
METHOD FOR THE NEUTRALIZATION OF A-ZEOLITE OBTAINED IN SYNTHESIS PLANTS

Nistri Ugo, Genoa; Colombo Paolo, Saronno, and Da Col Lino, Silea, all of Italy, assignors to Mira Lanza S.p.A., Genoa, Italy

Filed Aug. 16, 1985, Ser. No. 766,418
Claims priority, application Italy, Sep. 12, 1984, 12598 A/84
Int. Cl.⁴ B01J *29/06, 20/18*
U.S. Cl. 502—62 **10 Claims**

1. A method for the neutralization of a wet filter cake of alkaline A-Zeolites which are unstable in a strong acid environment comprising the steps of:

adding an effective amount of a surface-active agent to said wet filter cake of alkaline A-Zeolite to form an alkaline suspension of A-Zeolite, and

quickly neutralizing said alkaline suspension of A-Zeolite with a strong acid to maintain a pH of at least about 10 to avoid damage to said A-Zeolite.

2. The method according to claim 1, wherein said surface active agent is selected from the group consisting of sodium dodecyl benzenesulphonate, sodium alkyl benzenesulphonate, sulphonated alcohols, ethoxylated alcohols, sulphonated ethoxylated alcohols, ethoxylated alkyl-phenols, and sulphonated ethoxylated alkyl-phenols.

3. The method according to claim 1, wherein said strong acid is concentrated sulphuric acid or concentrated phosphoric acid.

4,732,881
CATALYSTS FOR UP-GRADING STEAM-CRACKING PRODUCTS

Raymond Le Van Mao, Montreal, Canada, assignor to The Abestos Institute, Quebec, Canada

Filed Sep. 25, 1986, Ser. No. 911,381
Int. Cl.⁴ B01J *29/28*
U.S. Cl. 502—71 **6 Claims**

1. A catalyst suitable for up-grading products resulting from the steam-cracking of hydrocarbons, said catalyst comprising 2.5 to 7.5% wt of Cr_2O_3, 5 to 17.5% wt of Al_2O_3 and 75 to 85% wt of a Zn-ZSM-5 zeolite or a Zn-ZSM-5 zeolite/asbestos.

2. The catalyst of claim 1, wherein CR_2O_3 and Al_2O_3 are mechanically mixed with the Zn-ZSM-5 zeolite or the Zn-ZSM-5 zeolite/asbestos.

3. The catalyst of claim 1, wherein CR_2O_3 and Al_2O_3 are directly deposited on the Zn-ZSM-5 zeolite or the Zn-ZSM-5 zeolite/asbestos.

4,732,882
CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Luanne M. Allen, Port Arthur, Tex.; Robert O. Hagerty, Edison, and Richard O. Mohring, Bridgewater, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,359
Int. Cl.⁴ C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—104 **56 Claims**

1. In a process for preparing an alpha-olefin polymerization catalyst composition comprising a transition metal compound, a magnesium compound and a metal alkyl, the improvement comprising using trimethylaluminum as the metal alkyl.

4,732,883
CATALYTIC OXIDATION OF PROPYLENE TO ALLYL ACETATE

James E. Lyons, Wallingford, and George Suld, Springfield, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Division of Ser. No. 722,094, Apr. 10, 1985, Pat. No. 4,602,104, which is a continuation-in-part of Ser. No. 664,565, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,140, Dec. 7, 1983, abandoned. This application Feb. 27, 1986, Ser. No. 833,702
Int. Cl.⁴ B01J *31/04*
U.S. Cl. 502—170 **2 Claims**

1. Process for preparing an activated palladium metal catalyst which comprises contacting a supported palladium metal catalyst with a C_3–C_6 olefin in an acetic acid medium in the substantial absence of oxygen at temperatures of greater than about 50° C. for a period of time sufficient to provide at least a small but perceptible quantity of said catalyst.

4,732,884
PROCESS FOR PRODUCING COMPOSITE OXIDE CATALYSTS

Kohei Sarumaru; Etsuji Yamamoto, and Teruo Saito, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,647
Claims priority, application Japan, Mar. 24, 1986, 61-65280; Aug. 23, 1986, 61-197739; Aug. 23, 1986, 61-197740
Int. Cl.⁴ B01J *21/08, 23/78, 23/84, 23/88*
U.S. Cl. 502—205 **7 Claims**

1. A process for producing a composite oxide catalyst, wherein a Mo-Bi composite oxide catalyst represented by the following formula is produced by a process comprising incorporating the compounds as respective element sources into a composite in an aqueous system and subjecting the composite to heat treatment, characterized in that use is made as a Bi source of a compound of bismuth carbonate complex of (a) Bi and Na, or (b) Bi, Na and X or (c) Bi and X which comprises at least a part of each of the required Na and/or X

$$Mo_aBi_bCo_cNi_dFe_eNa_fX_gY_hZ_iSi_jO_k$$

wherein: X represents Mg, Ca, Zn, Ce and/or Sm; Y represents K, Rb, Cs and/or Tl; Z represents B, P, As and/or W; a–k represent atomic ratios, respectively, and when a equals 12, b=0.5 to 7, c=0 to 10, d=0 to 10, c+d=1 to 10, e=0.05 to 3, f=0.01 to 1, g=0 to 1, h=0.04 to 0.4, i=0 to 3, j=0 to 48 and k is a numeral which satisfies the oxidation state of the other elements.

4,732,885
PROCESS FOR THE PREPARATION OF CATALYSTS USEFUL FOR THE MANUFACTURE OF MALEIC ANHYDRIDE

Robert C. Edwards, Naperville, and Bernard L. Meyers, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 729,469, May 1, 1985, Pat. No. 4,652,543, which is a continuation-in-part of Ser. No. 537,983, Sep. 30, 1983, Pat. No. 4,515,904. This application Apr. 7, 1986, Ser. No. 848,755
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.⁴ B01J *27/198, 31/00, 27/188, 27/19*
U.S. Cl. 502—209 **35 Claims**

1. A process for manufacture of a phosphorus-vanadium oxide catalyst which comprises a phosphorus-vanadium mixed oxide, the atomic ratio of vanadium to phosphorus being in the range of 0.5:1 to 1.25:1 wherein the catalyst has a characteristic powder X-ray diffraction pattern using copper K alpha radiation, as follows,

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d, angstrom	Line Position 2θ degrees	Relative Intensity
5.71	15.52	37
4.80	18.46	8
4.52	19.64	24
3.67	24.21	18
3.29	27.06	25
3.11	28.67	12
2.94	30.41	100
2.79	32.00	12
2.65	33.81	7
2.61	34.28	7
2.40	37.39	12

suitable for use in the manufacture of maleic anhydride from butane which process comprises reacting at a temperature of about 0° C. to about 200° C. a vanadium compound in an organic ether solvent having from about 2 to about 10 carbon atoms, with a phosphoryl halide in the presence of water or an aliphatic alcohol having from about 1 to about 8 carbon atoms, eliminating the solvent, and activating the catalyst by the addition of butane, or another C_4 hydrocarbon feedstock and water, and a phosphorus compound at a temperature of about 300° C. to about 500° C. wherein the amount of water added is about 1,000 parts per million to about 40,000 parts per million by weight of the reactor feed gas stream.

4,732,886

HYDROGEN TREATING CATALYST FOR HYDRODESULFURIZATION-CRACKING OF MINERAL OIL

Takeshi Tomino; Mitsugu Yumoto, both of Ibaraki, and Kinya Tawara, Saitama, all of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Continuation-in-part of Ser. No. 745,111, Jun. 17, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 932,417
Claims priority, application Japan, Jun. 15, 1984, 59-124025
Int. Cl.[4] B01J *21/04, 23/88*
U.S. Cl. 502—314 **11 Claims**

1. A hydrogen treating catalyst consisting essentially of alumina, 3 to 7% by weight of nickel calculating as NiO and 10 to 20% by weight of molybdenum calculating as MoO_3, which has a total pore volume of 0.55 to 1.0 ml/g, an average pore diameter of 50 to 250 Å, and factor P of 3 to 4, wherein the volume of pores having a diameter of larger than the average pore diameter +10 Å and smaller than the average pore diameter +500 Å is 10 to 30% of the total pore volume in catalyst pore distribution,

wherein the factor P is represented by the following formula:

$$P=PD/S$$

wherein $\overline{PD}$ represents an average pore diameter measured by a mercury porosimeter which is the pore diameter (Å) corresponding to the pressure at which ½ of the total pore volume is saturated with mercury, and S represents a proportion (%) of volume of pores in a range of $\overline{PD}\pm5$ Å based on the total pore volume.

4,732,887

COMPOSITE POROUS MATERIAL, PROCESS FOR PRODUCTION AND SEPARATION OF METALLIC ELEMENT

Heiichiro Obanawa, Kamakura, and Minoru Akiyama, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1985, Ser. No. 784,644
Claims priority, application Japan, Oct. 12, 1984, 59-212499; Oct. 12, 1984, 59-212500
Int. Cl.[4] B01J *20/26*
U.S. Cl. 502—402 **16 Claims**

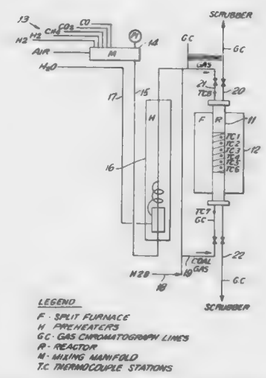
1. A composite porous material comprising a particulate inorganic porous material and, contained in the pores of said inorganic porous material, a crosslinked organic resin having a micro-void, said composite material having a surface area larger than that of said inorganic porous material.

4,732,888

DURABLE ZINC FERRITE SORBENT PELLETS FOR HOT COAL GAS DESULFURIZATION

Mahesh C. Jha, Arvada; Antonio E. Blandon, Thornton, both of Colo., and Malcolm T. Hepworth, Edina, Minn., assignors to AMAX Inc., Greenwich, Conn.

Filed May 15, 1986, Ser. No. 863,287
Int. Cl.[4] B01J *20/02*
U.S. Cl. 502—406 **9 Claims**



1. A durable, pelletized and indurated sorbent for removing hydrogen sulfide from hot coal gas which consists essentially of zinc ferrite, has a surface area of about 0.5 to about 5 $m.^2$/gram, and is prepared by mixing fine iron oxide and fine zinc oxide, each having a particle size of less than about 1 micron in substantially equi-molar amounts with an inorganic binder in an amount greater than zero and up to about 15%, by weight, and an organic binder in an amount greater than zero and up to about 5%, by weight, up to about 5%, by weight, of manganese oxide, up to about 0.2%, by weight, of an alkali metal carbonate and up to about 0.2%, by weight, of molybdenite, said inorganic binder being capable of a strong bridging action between zinc ferrite particles during induration and said organic binder being capable of burning away during induration to form a porous structure, pelletizing the resulting mixture with water, drying the resulting pellets and indurating the dried pellets and a temperature of about 1600° F. to about 2000° F. to form strong, porous sorbent pellets having a crush strength of about 5 to about 20 lbs. Dead Weight Load.

4,732,889

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF THE ANEMIA OF RHEUMATOID ARTHRITIS

Osamu Cynshi, Tokyo, and Koji Mizuno, Saitama, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,222
Claims priority, application Japan, Feb. 6, 1985, 60-21165
Int. Cl.[4] A61K *37/10*
U.S. Cl. 514—8 **1 Claim**

1. A method for treating the anemia of rheumatoid arthritis in a patient who is suffering from anemia of rheumatoid arthritis which comprises administering to said patient a therapeutically effective amount of human erythropoietin for treating anemia of rheumatoid arthritis in a pharmaceutically acceptable carrier.

4,732,890

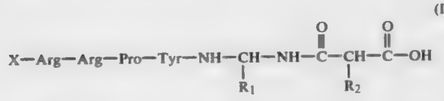
RETRO-INVERSO HEXAPEPTIDE NEUROTENSIN ANALOGS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Fabio Bonelli; Antonello Pessi, both of Rome, and Antonio S. Verdini, Monterotondo, all of Italy, assignors to Eniricerche S.p.A., San Donato Milanese, Italy

Filed Aug. 5, 1986, Ser. No. 893,146
Claims priority, application Italy, Sep. 19, 1985, 22214 A/85
Int. Cl.[4] A61K *37/02;* **C07K** *7/02;* **C07C** *101/24*
U.S. Cl. 514—11 **5 Claims**

1. A retro-inverso hexapeptide neurotensin analog of the following general formula

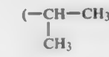
(I)



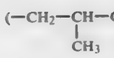
wherein:

X is a hydrogen atom or an acyl radical R_3—CO— wherein R_3 is a straight or branched (C_1-C_7)alkyl group,

R_1 and R_2, each independently, represent the side-chain residue of the amino acid glycine (—H), alanine ($—CH_3$), valine



leucine



or isoleucine



Arg is the abbreviated designation for arginine,

Pro is the abbreviated designation for proline,

Tyr is the abbreviated designation for tyrosine, and the pharmaceutically acceptable salts, lower alkyl esters and amides thereof.

4,732,891

PLACENTA-DERIVED ANTICOAGULATING SUBSTANCE, PROCESS FOR PREPARING SAME AND ANTICOAGULANT COMPRISING SAME AS AN EFFECTIVE COMPONENT

Masahiro Maki, Akita, and Hideo Tani, Kodaira, both of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Sep. 19, 1986, Ser. No. 909,296
Claims priority, application Japan, Sep. 30, 1985, 60-217512
Int. Cl.[4] C07K *15/06;* **A61K** *35/50, 37/24*
U.S. Cl. 514—21 **10 Claims**

1. A human placenta-derived anticoagulating substance substantially free from glucose having the following properties:

(1) a molecular weight, as determined by SDSpolyacrylamide gel electrophoresis, reduced state, of 34,000±2,000;

(2) an isoelectric point, as determined by isoelectric column electrophoresis using an ampholite, of 4.7±0.1;

(3) a stability such that said substance is

(a) inactivated by heat treatment at 50° C. for 30 minutes,

(b) stable at a pH of 4 to 10, and

(c) stable in plasma at 37° C. for 30 minutes;

(4) an activity such that said substance is

(a) capable of prolonging a recalcification

(b) capable of prolonging a prothrombin time,

(c) capable of prolonging an activated partial thromboplastin time; and said substance has

(5) an amino acid composition consisting essentially of in mole percent:

Aspartic acid	9.8
Threonine	7.0
Serine	6.3
Glutamic acid	13.3
Proline	2.0
Glycine	7.5
Alanine	8.0
½ Cystine	0.3
Valine	4.6
Methionine	1.8
Isoleucine	5.3
Leucine	11.8
Tyrosine	3.6
Phenylalanine	4.2
Histidine	1.4
Lysine	7.2
Arginine	6.2.

4,732,892

L-α-AMINO ACIDS AS TRANSDERMAL PENETRATION ENHANCERS

Pramod P. Sarpotdar, Audubon; James L. Gaskill, Devon; Robert P. Giannini, East Norriton, and Charles R. Daniels, Erdenheim, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 12, 1985, Ser. No. 754,805
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—178 **8 Claims**

1. A pharmaceutical composition for transdermal administration of a steroidal contraceptive, comprising a steroidal contraceptive and an amount of an L-α-amino acid, selected from Tryptophan, Alanine, Proline, Serine, Cysteine, Glycine, Isoleucine, Leucine, Valine and α-Aminobutyric Acid, Norvaline and Norleucine, effective to enhance the penetration of said steroidal contraceptive through the skin, dispersed in a transdermally effective carrier.

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AMINO-ANTHRACENEDIONES-PLATINUM COMPLEXES USEFUL AS ANTICANCER COMPOUNDS

Alessandro Pasini; Franco Zunino; Odoardo Tofanetti; Carmelo A. Gandolfi, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

Filed Aug. 2, 1985, Ser. No. 761,787
Claims priority, application Italy, Aug. 3, 1984, 22224 A/84; Jun. 27, 1985, 21324 A/85
Int. Cl.⁴ C07F 15/00
U.S. Cl. 514—185 14 Claims

1. A cis-platinum complex of formula I

$$cis\text{-}[L\text{-}(Pt^{II}XX')](Solv)_n \quad (I)$$

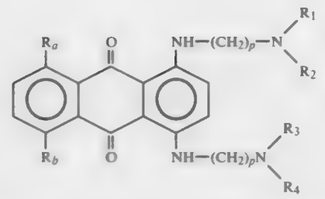
wherein

X and X', which can be the same or different, are a ligand selected from the group consisting of Cl, OH, CH_3SOCH_3.Cl, CH_3SOCH_3.OH;

n is zero or ½ or an integer from 1 to 6;

solv represents a crystallization solvent selected from the group consisting of water, a lower C_1–C_5 alcohol, acetonitrile or ethylacetate and

L is a bidentate ligand selected from the group of 1,4-diamino-9,10-anthracenedione of formula II



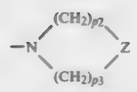
(II)

wherein

each of R_a and R_b, which are the same or different, are hydrogen or hydroxy;

R_1, R_2, R_3 and R_4, which are the same or different, are hydrogen, C_1–C_5 lower alkyl or $-(CH_2)_{p1}-OH$;

p and p_1 are, independently, the integer 2 or 3; or at least one of R_1, R_2 and R_3, R_4 respectively, taken together with the nitrogen atom to which they are connected independently forms an hetercyclic ring having the formula



wherein Z is $-CH_2-$ or O, while p_2 and p_3 are independently 1 or 2, and a salt of said ligand L with pharmaceutically and veterinary acceptable acids; wherein the two central nitrogen atoms of the aminoalkylamine side-chains are coordinated with said platinum^{II} atom.

12. Pharmaceutical composition for the treatment of a tumor susceptible to platinum^{II} therapy in a patient in need of such treatment, said composition comprising an antitumoral effective amount of a complex of claim 1 and a pharmaceutically acceptable carrier therefor.

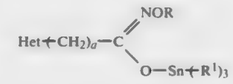
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FUNGICIDAL INSECTICIDAL AND ACARICIDAL TIN SALTS OF HETEROCYCLIC HYDROXAMIC ACIDS

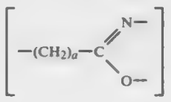
William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 6, 1984, Ser. No. 678,730
Int. Cl.⁴ A61K 31/555; A01N 55/04; C07D 213/78, 237/24
U.S. Cl. 514—188 27 Claims

1. A compound of the formula



wherein Het is a 6-membered aromatic heterocyclic ring containing 1 ring nitrogen atom and the remaining ring atoms carbon atoms optionally substituted with 1 to 2 substituents independently selected from halo, nitro, trihalomethyl, lower alkyl of 1 to 3 carbon atoms, or lower alkoxy of 1 to 3 carbon atoms; k is alkyl of 1 to 7 carbon atoms; R^1 is aryl of 6 to 10 carbon atoms, lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, all optionally substituted with 1 to 3 halogen atoms; and a is 0 or 1, with the proviso that a ring nitrogen is not bonded to the hydroxamic acid



moiety.

8. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim 1.

20. A method of killing insects which comprises contacting said insect or its environment with an insecticidally effective amount of a compound of claim 1.

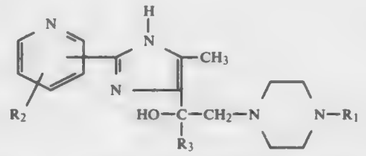
4,732,895

α-[5-METHYL-2-(PYRIDINYL)-1H-IMIDAZOL-4-YL]SUBSTITUTED-1-PIPERAZINEETHANOLS USEFUL FOR TREATING HYPERTENSION

Corris M. Hofmann, Hohokus, N.J.; Howard Newman, Monsey, N.Y., and Andrew S. Tomcufcik, Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 2, 1986, Ser. No. 858,633
Int. Cl.⁴ A61K 31/33, 31/495; C07D 498/00, 403/14
U.S. Cl. 514—211 23 Claims

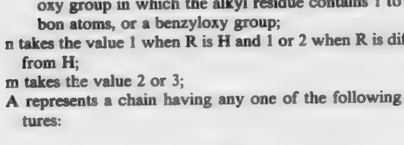
1. A compound selected from the group consisting of those of the formula:



wherein R_1 is phenyl, monosubtituted phenyl [wherein the substituents are fluoro, chloro, bromo, trifluoromethyl, alkyl (C_1–C_3) or alkoxy (C_1–C_3)], 2-thiazxolyl, 2-pyrimidinyl or 2-chlorodibenzo [b,f][1,4]oxazepin-11-yl, R_2 is hydrogen or alkyl (C_1–C_3) and R_3 is hydrogen, phenyl or alkyl (C_1–C_3); and the pharmacologically acceptable acid-addition salts thereof.

21. A method of treating hypertension in a warm-blooded animal which comprises administering to said animal a hypotensive amount of a compound of claim 1.

23. A compound of the formula:



wherein R_1 is phenyl, monosubstituted phenyl [wherein the substituents are fluoro, chloro, bromo, trifluoromethyl, alkyl (C_1–C_3) or alkoxy (C_1–C_3)],2-thiazolyl, 2-pyrimidinyl or 2-chlorodibenzo [b,f][1,4] oxazepin-11-yl and R_2 is hydrogen or alkyl (C_1–C_3).

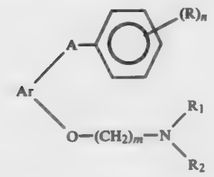
4,732,896

AROMATIC DERIVATIVES COMPRISING AN AMINOALKOXY CHAIN, THE SALTS THEREOF, THE PROCESS FOR PREPARING THESE DERIVATIVES AND SALTS AND THE APPLICATION THEREOF IN THERAPEUTICS

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Bernard M. Pourrias, Meudon La Foret, and Raphaël Santamaria, Paris, all of France, assignors to Delalande S.A., France

Division of Ser. No. 451,537, Dec. 21, 1982, Pat. No. 4,536,500. This application Jun. 26, 1985, Ser. No. 748,862
Claims priority, application France, Dec. 24, 1981, 81 24244; Dec. 15, 1982, 82 21053
Int. Cl.⁴ A61K 31/445, 31/535; C07D 295/08, 413/12
U.S. Cl. 514—212 5 Claims

1. An aminoalkoxy aromatic derivative, corresponding to the general formula:



(I)

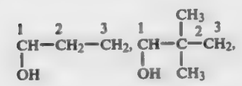
in which:

R represents a hydrogen or halogen atom, a methyl or alkoxy group in which the alkyl residue contains 1 to 4 carbon atoms, or a benzyloxy group;

n takes the value 1 when R is H and 1 or 2 when R is different from H;

m takes the value 2 or 3;

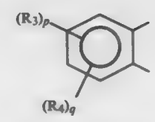
A represents a chain having any one of the following structures:



the aromatic group Ar being linked to position 1 of this chain;

R_1 and R_2 form, in conjunction with the nitrogen atom to which they are linked, a radical chosen from the following; pyrrolidino, piperidino, hexamethyleneimino, and morpholino; and

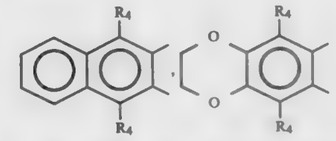
Ar represents: either a benzene group of structure:



in which R_3 represents a halogen atom or a nitro or methyl group,

R_4=alkoxy with 1 to 4 carbon atoms, p=0, 1 or 2; q=1, 2, 3, 4; p+q≦4;

or a naphthalene or benzodioxannic group respectively of structure;



where R_4 has the same meanings as previously defined; as well as its mineral or organic acid addition salts.

5. A pharmaceutical composition having an activity antagonistic to calcium comprising a therapeutically effective amount of a compound as claimed in claim 1 in combination with a pharmaceutically acceptable carrier.

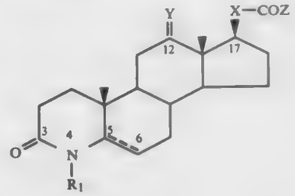
4,732,897

STEROIDIC 5α-REDUCTASE INHIBITORS

Gianfranco Cainelli, Bologna; Giorgio Martelli, S. Lazzaro di Savena; Mauro Panunzio, Bologna; Giuseppe Spunta, Ozzano dell'Emilia; Giuliano Nannini, Bresso, and Enrico di Salle, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan and Consiglio Nazionale Delle Ricerche, Rome, both of, Italy

Filed Feb. 3, 1986, Ser. No. 825,348
Claims priority, application United Kingdom, Mar. 7, 1985, 8505862
Int. Cl.⁴ C07J 73/00; A61K 31/58
U.S. Cl. 514—222 9 Claims

1. A compound of the following formula (I)



(I)

wherein

R_1 is

(a) hydrogen;

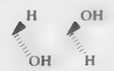
(b) C_1–C_6 alkyl unsubstituted or substituted by a substituent chosen from carboxy, halogen and amino;

(c) a phenyl, α-naphthyl, β-naphthyl or benzyl group, either unsubstituted or ring substituted by a substituent chosen from C_1–C_6 alkyl, halogen, nitro, amino and hydroxy, or

(d) $-OR_2$ wherein R_2 either has one of the meanings (a), (b) and (c) reported above for R_1; or is a C_2–C_{12}-aliphatic or aromatic carboxylic acyl or a hydroxy protecting group chosen from the group consisting of

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dimethyltert butyl silyl, trimethylsilyl, and 2-tetrahydropyranyl;
X is direct bond or a straight or branched C_1–C_6-aliphatic hydrocarbon chain;
the symbol =Y represents



or =O;
Z is
(a') hydroxy;
(b') C_1–C_6 alkoxy; or
(c')



wherein each of R_3 and R_4 is, independently, hydrogen or C_1–C_6 alkyl; or R_3 and R_4 taken together with the nitrogen atom to which they are linked, from a hexatomic heteromonocyclic ring choser: from piperidino, piperazino, morpholino and thiomorpholino;
the symbol ——— represents a single or double bond, and the pharmaceutically acceptable salts thereof.

8. A 5α-reductase inhibiting pharmaceutical composition comprising an effective amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof, according to claim **1**, as the active substance, and a pharmaceutically acceptable carrier and/or diluent.

9. A method of inhibiting 5α-reductase in a patient in need of such inhibition, said method comprising administering to said patient an inhibiting amount of a compound of claim **1**.

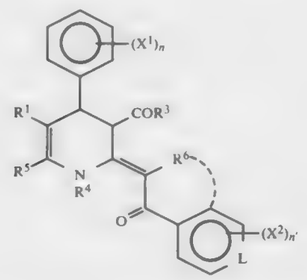
4,732,898

2-(2-ARYL-2-OXOALKYLIDENE) ANALOGS OF-3,5-PYRIDINEDICARBOXYLIC ACID DIALKYL ESTERS USEFUL FOR TREATMENT OF CARDIOVASCULAR DISORDERS

Edward W. Badger, Dexter, and Michael D. Taylor, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 857,012, Apr. 29, 1986, abandoned. This application Mar. 3, 1987, Ser. No. 16,896
Int. Cl.⁴ A61K *31/455;* **C07D** *211/90, 401/06, 215/54*
U.S. Cl. 514—225 **20 Claims**

1. A compound of the formula (I)



and pharmaceutically acceptable base or acid addition salts thereof; wherein
(2) R^1 is
(i) cyano,
(ii) nitro,
(iii)



wherein R^2 is (i) OR^7 wherein R^7 is hydrogen or (ii) ZR^8 wherein Z is alkylenyl of from one to six carbons, inclusive, and R^8 is hydrogen, optionally substituted phenyl which may have one or two substituents the same or different wherein the substituents are alkyl of from one to six carbons, inclusive, NO_2, halogen, alkoxy, amino, monoalkylamino wherein the alkyl is of from one to six carbons, inclusive, or dialkylamino wherein the alkyl is of from one to six carbons, inclusive; thienyl, furyl, pyryl, pyridyl, quinolyl, isoquinolyl, pyrimidyl, pyridazinyl, quinazolyl, quinoxalyl, pyrazolyl, imidazolyl, oxazolyl, isoxazolyl, thiazolyl, triazolyl, pyrazinyl, oxazinyl, thiazinyl, indolizinyl, indolyl, benzofuranyl, indazolyl, benzothienyl, benzimidazolyl, benzoxazolyl, cinnolinyl, phthalazinyl, naphthyridinyl or benzothiazinyl, amino, monoalkylamino wherein the alkyl is of from one to six carbons, inclusive, or dialkylamino wherein alkyl is of from one to six carbons, inclusive; or
(iv) A-$(CH_2)_q$ wherein q is an integer of two, three, or four and A is



when taken together with R^5;
(3) R^3 is
(i) ZR^8 wherein Z and R^8 are each independently as defined above,
(ii) OR^7 wherein R^7 is independently as defined above, or
(iii) phenyl unsubstituted or substituted by from one to five, wherein the substituents are the same or different and are (i) hydrogen, (ii) alkyl of from one to six carbons, inclusive, (iii) nitro, (iv) alkoxy of from one to six carbons, inclusive, (v) cyano, (vi) amino, (vii) monoalkylamino wherein the alkyl is of from one to six carbons, inclusive, (viii) dialkylamino wherein the alkyl is of from one to six carbons, inclusive (ix) halogen or (x) trifluoromethyl;
(4) R^4 is hydrogen or alkyl of from one to six carbons, inclusive
(5) R^5 is (i) hydrogen,
(ii) alkyl of from one to six carbons, inclusive, or
(iii) taken together with R^1 as defined above;
(6) R^6 is
(i) hydrogen,
(ii) alkyl of from one to six carbons, inclusive, or
(iii) $(CH_2)_q$, when taken together with X^2 when X^2 is on the carbon having the ---- and q' is 1, 2, or 3;
(7) n is an integer of zero through five;
(8) X^1 may each be the same or different and is
(i) alk_l of from one to six carbons, inclusive,
(ii) nitro,
(iii) halogen,
(iv) alkoxy of from one to six carbons, inclusive,
(v) cyano,
(vi) amino,
(vii) monalkylamino wherein the aikyl is of from one to six carbons, inclusive,
(viii) dialkylamino wherein the alkyl is of from one to six carbons, inclusive, or
(ix) trifluoromethyl; and
(9) X^2 may each be the same or different and is
(i) alkyl of from one to six atom carbons, inclusive,
(ii) nitro,
(iii) halogen,

(iv) alkoxy of from one to six carbons, inclusive,
(v) cyano,
(vi) amino,
(vii) monoalkylamino wherein the alkyl is of from one to six carbons, inclusive,
(viii) dialkylamino wherein the alkyl is of from one to six, inclusive, or
(ix) trifluoromethyl;
(10) n' is an integer of from zero through five;
(11) L is CH; or N with the proviso that then n' is 0 and --- is nothing.

19. A pharmaceutical composition for the treatment of congestive heart failure, coronary heart disease, myocardial ischemia, angina, and hypertension comprising an anticongestive heart failure, cardiotonic, antimyocardial ischemic, antiangina, or antihypertensive effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

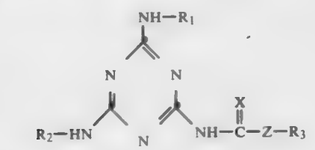
4,732,899

(D)ALKOXYCARBONYLAMINO-S-TRIAZINE DERIVATIVES AND THE USE THEREOF AGAINST PESTS WHICH ARE PARASITES OF DOMESTIC ANIMALS AND CULTIVATED PLANTS

Jean-Claude Gehret, Aesch, and Odd Kristiansen, Möhlin, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,299
Claims priority, application Switzerland, Dec. 2, 1985, 5130/85
Int. Cl.⁴ A01N *43/68*
U.S. Cl. 514—245 **11 Claims**

6. A method of controlling harmful insects or ectoparasites or endoparasites, which method comprises applying to the insect or parasite or to the locus thereof an insecticidally or parasiticidally effective amount of a compound



(I)

wherein
R_1 is C_3–C_6alkyl or C_3–C_6cycloalkyl;
R_2 is hydrogen, C_1–C_6alkyl, C_3–C_6cycloalkyl or the group —C(X)—ZR_3;
R_3 is C_1–C_6alkyl, C_1–C_6haloalkyl, C_2–C_4alkenyl or C_2–C_4-haloalkenyl;
X is oxygen or sulfur; and
Z is oxygen or sulfur;
or of an acid addition salt thereof.

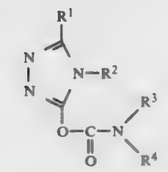
4,732,900

1,2,4-TRIAZOLO-CARBAMATES

Karl-Heinz Weber, Gau-Algesheim; Dieter Hinzen, Zornheim; Franz-Josef Kuhn, Gau-Algesheim; Erich Lehr, Waldalgesheim; Wilhelm Frölke, Ingelheim am Rhein; Wolfgang Tröger, Stromberg; Helmut Ensinger, Wackernheim; Gerhard Walther, Bingen, and Albrecht Harreus, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,184
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439450
Int. Cl.⁴ C07D *249/12, 401/12, 401/14;* **A61K** *31/41*
U.S. Cl. 514—255 **10 Claims**

1. A 1,2,4-triazolo-carbamate of the formula



I

wherein
R^1 is hydrogen, a straight-chained or branched alkyl group with 1 to 8 carbon atoms, a 3 to 6-membered carbocyclic ring, a benzyl or phenethyl group;
R^2 is a phenyl or pyridinyl group which may be mono- or disubstituted by halogen, methyl, methoxy or trifluoromethyl;
R^3 and R^4, which may be identical or different, are each hydrogen, a straight-chained or branched alkyl group with 1 to 6 carbon atoms, a cycloalkyl group with 3 to 6 carbon atoms, a phenyl pyridine or pyrazine group optionally substituted by halogen, methoxy or trifluoromethyl or by a straight-chained or branched alkyl group with 1 to 6 carbon atoms; or, R^3 and R^4together with the nitrogen atom to which they are attached form a (ILLEGIBLE) optionally substituted by one or more straight-chained or branched alkyl groups with 1 to 4 carbon atoms, or a physiologically acceptable acid addition salts thereof.

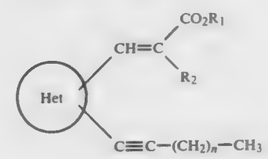
4,732,901

CERTAIN PYRIDYL, THIENYL OR FURYL PROPENOIC ACIDS OR ESTERS HAVING ANTI-INFLAMMATORY ANTI-ALLERGIC PROPERTIES

Derek R. Buckle, Redhill, England, assignor to Beecham Group p.l.c., England

Filed Feb. 27, 1986, Ser. No. 834,317
Claims priority, application United Kingdom, Mar. 1, 1985, 8505285
Int. Cl.⁴ C07D *213/55, 307/54, 333/24;* **A61K** *31/44*
U.S. Cl. 514—277 **12 Claims**

1. A compound of the formula



wherein
R_1 is hydrogen or C_1–C_6 alkyl;
R_2 is hydrogen;
n is an integer of from 2 to 12;



represents pyridyl, thienyl or furyl or a pharmaceutically acceptable salt thereof.

12. A method of treating inflammatory disorders in mammals which comprises administering to the sufferer an effective non-toxic amount of a compound according to claim **1** or a pharmaceutically acceptable salt thereof.

VOL 1088 ISS 4 MR 22 1988 UMI

4,732,902

PYRROLOISOQUINOLINYL-DIMETHYLOXOALKYL ALKONOATES AND THEIR USE AS ANTIPSYCHOTIC AGENTS

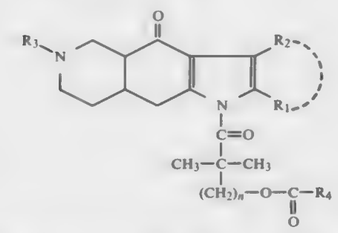
Leo Berger, Montclair, and Gary L. Olson, Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 23, 1986, Ser. No. 866,532

Int. Cl.[4] **A61K** *31/40, 31/435;* **C07D** *471/04;* **C07C** *67/02*

U.S. Cl. 514—292 **33 Claims**

1. A compound of the formula



I

wherein R_1 and R_2 independently, are hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or alkenyl of 2 to 7 carbon atoms, or taken together are alkylene of 3 to 6 carbon atoms; and R_3 is hydrogen, alkyl of 1 to 24 carbon atoms, hydroxyalkyl of 1 to 24 carbon atoms, phenylhydroxyalkyl of 1 to 24 carbon atoms, halophenylhydroxyalkyl of 1 to 24 carbon atoms, alkylphenylhydroxyalkyl wherein alkyl is of 1 to 24 carbon atoms, alkoxyphenylhydroxyalkyl wherein alkoxy and alkyl each is of 1 to 24 carbon atoms, alkoxyalkyl wherein alkoxy and alkyl each is of 1 to 24 carbon atoms, aryloxyhydroxyalkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms, alkoxyhydroxyalkyl wherein alkoxy and alkyl each is of 1 to 24 carbon atoms, alkanoyloxyalkyl wherein alkanoyl is of 1 to 7 carbon atoms and alkyl is of 1 to 24 carbon atoms, benzoyloxyalkyl wherein alkyl is of 1 to 24 carbon atoms, arylcarbonylalkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms, alkoxycarbonylalkyl wherein alkoxy and alkyl each is of 1 to 24 carbon atoms, aralkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms, alkenyl of 2 to 7 carbon atoms, alkylcycloalkyl wherein cyclo-alkyl is of 3 to 6 carbon atoms and alkyl is of 1 to 24 carbon atoms, alkynyl of 2 to 7 carbon atoms, thienylalkyl of 1 to 24 carbon atoms, furylalkyl of 1 to 24 carbon atoms, arylcarboxamidoalkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms, alkanoylalkyl wherein alkanoyl is of 1 to 7 carbon atoms and alkyl is of 1 to 24 carbon atoms, benzoylalkyl wherein alkyl is of 1 to 24 carbon atoms, cyclic-alkyloxoalkyl wherein cyclic-alkyl is of 3 to 6 carbon atoms and alkyl is of 1 to 24 carbon atoms, cyclic-alkylhydroxyalkyl wherein cyclic-alkyl is of 3 to 6 carbon atoms and alkyl is of 1 to 24 carbon atoms, alkenyloxyalkyl wherein alkenyl is of 2 to 7 carbon atoms and alkyl is of 1 to 24 carbon atoms, aralkenyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkenyl is 2 to 7 carbon atoms, aryloxyalkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms nitro, amino, alkyl of 1 to 24 carbon atoms-amino, and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms, or aryl-N-imidazolonylalkyl wherein aryl is phenyl or phenyl bearing one or more substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 24 carbon atoms, alkoxy of 1 to 24 carbon atoms, nitro, amino, alkyl of 1 to 24 carbon atoms-amino and di-alkyl of 1 to 24 carbon atoms-amino, and alkyl is 1 to 24 carbon atoms; R_4 is alkyl of 1 to 24 carbon atoms, and n is the integer 2 or 3,

a corresponding optical isomer, a corresponding geometric isomer or a mixture thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,732,903

CERTAIN CYCLOPROPYL DICARBOXYLATES HAVING PESTICIDAL AND INSECTICIDAL ACTIVITY

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 550,081, Nov. 8, 1983, Pat. No. 4,542,142, which is a continuation-in-part of Ser. No. 279,076, Jun. 30, 1981, abandoned. This application Jul. 17, 1985, Ser. No. 756,396

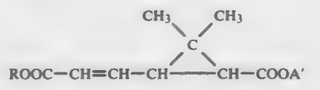
Claims priority, application France, Jul. 2, 1980, 80 14722; Nov. 22, 1982, 82 19515; Jan. 28, 1983, 83 01344

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.[4] **C07D** *213/55;* **C07C** *121/75, 69/743;* **A01N** *43/40*

U.S. Cl. 514—345 **13 Claims**

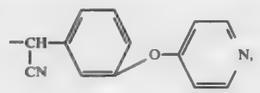
1. A compound selected from the group consisting of cyclopropane carboxylic acid derivatives with a 3-unsaturated side chain of the formula



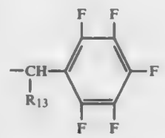
I'

wherein A' is selected from the group consisting of

(1)

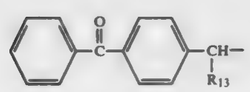


(2)



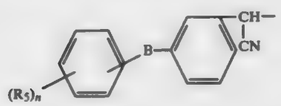
wherein R_{13} is selected from the group consisting of hydrogen or- CN,

(3)



wherein R_{13} has the above definition and

(4)



wherein B is attached to the meta or para position and includes —O— or —S—; $(R_5)_n$ represents hydrogen, $—CH_3$ or halogen and n is 0, 1 or 2 and R is selected from the group consisting of benzyl or benzyl substituted with one member selected from the group consisting of alkyl of 1 to 4 carbon atoms, akenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms alkadienyl of 4 to 8 carbon atoms, methylenedioxy or halogen, the double bond having Z or E geometry.

13. A method of combatting insects comprising contacting said insects with an insecticidally effective amount of a compound of claim **1**.

4,732,904

ANTIESTROGENIC HYDRAZONES

Lee R. Morgan, 725 Topaz St., New Orleans, La. 70124

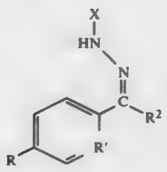
Continuation-in-part of Ser. No. 685,991, Dec. 24, 1984. This application Sep. 16, 1985, Ser. No. 776,424

Int. Cl.[4] **C07D** *213/53, 213/65;* **C07C** *109/14;* **A61K** *31/44*

U.S. Cl. 514—357 **93 Claims**

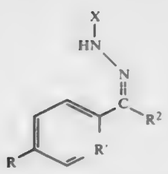


1. A compound of the formula



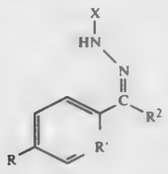
wherein R is hydroxy, R^1 is carbon, R^2 is hydroxyphenyl, and X is hydrogen.

2. A compound of the formula



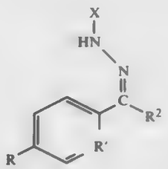
wherein R is hydrogen, hydroxy or methoxy; R^1 is carbon or nitrogen; R^2 is methyl, phenyl, hydroxyphenyl or methoxyphenyl; X is azidophenyl.

3. A compound of the formula



wherein R is hydrogen, hydroxy or methoxy; R^1 is carbon or nitrogen; R^2 is methyl, phenyl, hydroxyphenyl, or methoxyphenyl; X is aminophenyl.

8. A composition comprising a pharmaceutically inert carrier and, in an amount sufficient to impair growth of an estrogen dependent tumor cell, a compound of the formula



wherein R is hydrogen, hydroxy or methoxy; R^1 is carbon or nitrogen; R^2 is methyl, phenyl, hydroxyphenyl, methoxyphenyl or dimethoxyphenyl; X is azidophenyl, aminophenyl, nitrophenyl or dinitrophenyl.

4,732,905

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND A MIXTURE OF 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE AND 2-METHYL-4-ISOTHIAZOLIN-3-ONE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteker-tle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 13, 1987, Ser. No. 25,312

Int. Cl.[4] **A01N** *33/18, 43/80*

U.S. Cl. 514—372 **8 Claims**

1. A bacterial inhibiting composition comprising a synergistic, aqueous mixture of (a) 2-bromo-2-nitropropane-1,3-diol (BNPD) and (b) a mixture of about 75% 5-chloro-2-methyl-4-isothiazolin-3-one and about 25% 2-methyl-4-isothiazolin-3-one, the weight ratio of said BNPD (a) to said mixture (b) being from about 16:1 to about 1:1.

VOL 1088 ISS 4 MR 22 1988 UMI

4,732,906

DIOXOLOBENZIZOXAZOLE DERIVATIVES

Hiroshi Koga, Saitama; Takashi Dan, Tokyo; Haruhiko Sato, Tokyo, and Etsuro Onuma, Tokyo, all of Japan, assignors to Chugai Seiyaki Kabushiki Kaisha, Tokyo, Japan

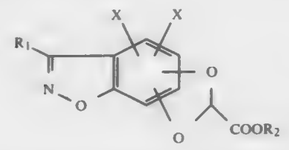
Filed Mar. 18, 1986, Ser. No. 840,680

Claims priority, application Japan, Apr. 8, 1985, 60-74709; Jul. 18, 1985, 60-159703

Int. Cl.[4] C07D *261/20*

U.S. Cl. 514—379 6 Claims

1. A dioxolobenzisoxazole compound of the formula



wherein R_1 is a phenyl group substitutable with a halogen atom, a lower alkyl group having 1–3 carbon atoms or a lower haloalkyl group, or a thienyl group; R_2 is a hydrogen atom or a lower alkyl group having 1–4 carbon atoms; and X and Y which may be the same or different represent a hydrogen atom or a halogen atom, and non-toxic salts thereof when R_2 is a hydrogen atom.

4,732,907

ANTIPROTOZOAL DIAMIDINES AND BIS-IMIDAZOLINE

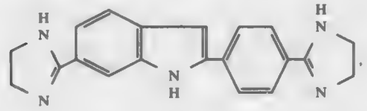
Edward A. Glazer, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 770,328, Aug. 28, 1985, Pat. No. 4,624,958, which is a division of Ser. No. 484,803, Apr. 14, 1983, Pat. No. 4,546,113. This application Jul. 25, 1986, Ser. No. 889,540

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—402 1 Claim

1. A method of treating a susceptible protozoal infection in a mammal which comprises parenteral administration of an antiprotozoal effective amount of a compound of the formula



or a pharmaceutically-acceptable salt thereof, in a pharmaceutically acceptable liquid vehicle.

4,732,908

METHOD AND COMPOSITIONS FOR CONTROLLING INSECTS, AND MEMBERS OF THE ORDER ACARINA, WHICH COMPOSITIONS CONTAIN, AS ACTIVE INGREDIENTS 2-(1-INDOLINYL-METHYL)-IMIDAZOLINES OR SALTS THEREOF

Urs Burckhardt, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

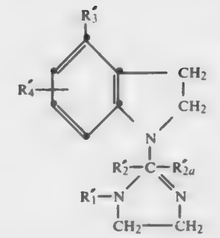
Continuation of Ser. No. 635,695, Jul. 30, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 23,931

Claims priority, application Switzerland, Aug. 9, 1983, 4334/83; Jul. 11, 1984, 3362/84

Int. Cl.[4] A01N *43/50*; C07D *403/06*

U.S. Cl. 514—402 9 Claims

1. A compound of the formula



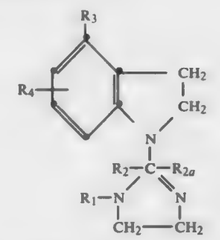
or a salt thereof, wherein

R_1 is hydrogen or C_1–C_{12}-alkyl,

R_2 and R_{2a} independently of one another are each hydrogen or C_1–C_4-alkyl, or together are C_2–C_4-alkylene, R_3 and R_4 are independently hydrogen, halogen or C_1–C_3-alkoxy, or C_1–C_4-alkyl which is unsubstituted or substituted by halogen,

provided that both R_3 and R_4 are not hydrogen.

9. A method of controlling insects and acarids on animals and plants, which method comprises applying thereto or to the locus thereof an effective amount of a composition containing a compound of the formula



or a salt thereof, wherein

R_1 is hydrogen or C_1–C_{12}-alkyl,

R_2 and R_{2a} independently of one another are each hydrogen or C_1–C_4-alkyl, or together are C_2–C_4-alkylene, and

R_3 and R_4 independently of one another are each hydrogen, halogen or C_1–C_3-alkoxy, or C_1–C_4-alkyl which is unsubstituted or substituted by halogen, together with a suitable carrier and/or other additive.

4,732,909

3-(3-HALOPHENYL-3,4-DIAZATETRACYCLO-[6.3.1.1^{6,10}.0^{1,5}]TRIDEC-4-EN-2-ONE COMPOUNDS AND USE THEREOF TO TREAT HYPOXIA

Vassil S. Georgiev, Penfield; George B. Mullen, Avon, and Patricia A. Swift, Rochester, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 10, 1987, Ser. No. 61,068

Int. Cl.[4] A61K *31/415*; C07D *231/54*

U.S. Cl. 514—404 4 Claims

1. A compound having the formula:

(I)

wherein R is a halogen.

3. A method for treating a warm-blooded animal for hypoxia which comprises administering to such animal an effective amount of a compound of claim 1.

4,732,910

ENZYME INHIBITING SUBSTANCE

Satoshi Yaginuma; Akira Asahi; Masaki Takada; Mitsuo Hayashi, and Kiyofumi Fukukawa, all of Shizuoka, Japan, assignors to Toyo Jozo Co, Ltd., Japan

Filed Mar. 24, 1986, Ser. No. 843,003

Claims priority, application Japan, Mar. 26, 1985, 60-59439; Jan. 23, 1986, 61-10982

Int. Cl.[4] A61K *31/355*; C07D *303/48*

U.S. Cl. 514—475 2 Claims

1. A compound represented by the formula [I]:

wherein R represents a hydrogen atom or a hydroxyl group, a pharmaceutically acceptable salt or a hydrate thereof.

4,732,911

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND BIS (TRI N-BUTYL TIN) OXIDE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 13, 1987, Ser. No. 25,309

Int. Cl.[4] A01N *33/18, 55/04*

U.S. Cl. 514—493 7 Claims

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of 2-bromo-2-nitropropane-1,3-diol (BNPD) and bis(tri n-butyl tin)oxide (BTO), the weight ratio of said BNPD to BTO being about 16:1 to 1:32.

4,732,912

PHENOL DERIVATIVES

William R. Pilgrim, Reims, France; Derek W. Young, Wilmslow, United Kingdom; Brian S. Tait; Graham C. Crawley, both of Macclesfield, United Kingdom; Philip N. Edwards, Bramhall, United Kingdom, and George B. Hill, Sandbach, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 27, 1984, Ser. No. 604,964

Claims priority, application United Kingdom, Apr. 28, 1983, 8311678

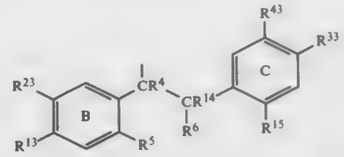
Int. Cl.[4] A61K *31/10, 31/215, 31/275*; C07C *147/10*

U.S. Cl. 514—510 9 Claims

1. A phenol derivative of the formula:

NU—A—X—R[1]

where NU is a bis-phenolic nucleus of the general formula



wherein one of R^{13} and R^{23}, and one of R^{33} and R^{43}, has the formula R^3O-, wherein each R^3, which may be the same or different, is hydrogen or alkyl, cyaloalkyl, alkanoyl, alkoxycarbonyl, carboxyalkanoyl, or aroyl each of up to 10 carbon atoms, and wherein the other of R^{13} and R^{23}, and the other of R^{33} and R^{43}, is hydrogen:

wherein R^4 and R^{14}, which may be the same or different, each is hydrogen or alkyl of up to 5 carbon atoms, or R^4 and R^{14} are joined together so that CR^4-CR^{14} is an olefinic double bond;

wherein R^5 and R^6 together form a direct link or —CH_2—, —$CH(CH_3)$—, —CH_2CH_2—, —$(CH_2)_3$— or —CH=CH—, and R^{15} is hydrogen;

and wherein the aromatic rings B and C each is unsubstituted or substituted with one or more halogen or methyl or ethyl substituents;

where A is straight- or branched-chain alkylene, alkenylene or alkynylene each of from 4 to 12 carbon atoms;

or A has the formula:

—A^1—Y^3—A^{21}—

wherein A^1 is alkylene or alkenylene and A^{21} is a direct link or alkylene, alkenylene or cycloalkylene, such that A^1 and A^{21} together have a total of 2 to 10 carbon atoms, and Y^3 is phenylene or naphthylene which is unsubstituted or substituted with one or more halogen or methyl or ethyl substituents;

wherein R^1 is alkyl, alkenyl, cycloalkyl, halogenoalkyl, each of up to 10 carbon atoms, phenyl, chlorophenyl, o-ethylphenyl, p-cyanophenyl, p-hydroxyphenyl, p-methoxyphenyl, alkyl of 1 to 3 carbon atoms which bears a phenyl, tolyl, halogenophenyl or trifluoromethylphenyl substituent, α-methylbenzyl, 3,4-dichlorobenzyl, p-cyanobenzyl or p-methylthiobenzyl; and wherein X is —S—, —SO— or —SO_2—;

or a pharmaceutically acceptable salt of a compound wherein R^3 is carboxyalkanoyl.

7. A method for producing an antioestrogenic effect in a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective amount of at least one phenol derivative as claimed in claim 1.

4,732,913

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND 2,2-DIBROMO-3-NITRILOPROPIONAMIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteketde, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 25, 1987, Ser. No. 18,884
Int. Cl.[4] A01N *33/18, 37/34*
U.S. Cl. 514—528 **6 Claims**

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of 2-bromo-2-nitropropane-1,3-diol (BNPD) and 2,2-dibromo-3-nitrilopropionamide (DBNP), wherein the weight ratio of said BNPD to DBNP is from about 16:1 to about 1:4.

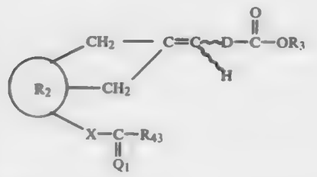
4,732,914

PROSTACYCLIN ANALOGS

Douglas R. Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 877,253, Feb. 13, 1978. This application May 14, 1987, Ser. No. 49,888
Int. Cl.[4] C07C *177/00*; A61K *31/557*
U.S. Cl. 514—530 **2 Claims**

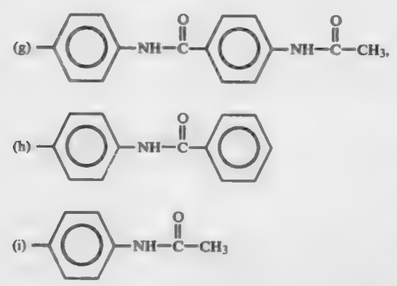
1. A compound of the formula I



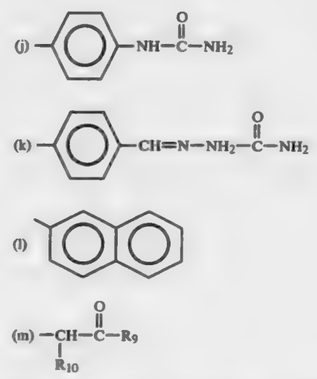
wherein D is
(1) —$(CH_2)_d$— wherein d is one to 5, inclusive,
(2) —$(CH_2)_d$—CF_2— wherein d is one to 5 inclusive,
(3) —$(CH_2)_k$—CH=CH— wherein k is one or 2,
wherein Q_1 is



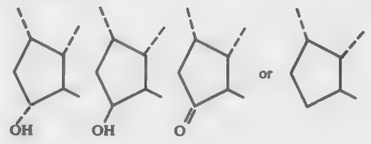
wherein R_8 is hydrogen or methyl;
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive



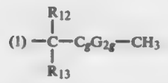
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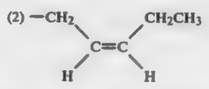
wherein R_9 is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and
wherein R_{10} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation;
wherein R_9 is



wherein R_{43} is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —$CR_{12}R_{13}$— and terminal methyl, wherein R_{12} and R_{13} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_{12} and R_{13} is fluoro only when the other is hydrogen or fluoro; or hydrogen or fluoro; or



wherein X is —C≡C—; and wherein ~ indicates attachment in alpha or beta configuration.

4,732,915

PROCESS FOR INCREASING SOLUBILITY OF DRUG

Atul Ayer, Mountain View; Felix Theeuwes, Los Altos, and Patrick S. L. Wong, Hayward, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 547,789, Nov. 2, 1983, Pat. No. 4,610,686. This application Jun. 23, 1986, Ser. No. 877,068
Int. Cl.[4] A61K *9/22, 9/52*
U.S. Cl. 514—567 **8 Claims**

1. A process for increasing the solubility of haloperidol in aqueous and biological fluids, which process consists of blending haloperidol with maleic acid, and which blend is useful for the controlled delivery of a therapeutically effective amount of haloperidol by a delivery system.

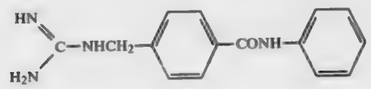
4,732,916

NOVEL GUANIDINOMETHYLBENZOIC ACID DERIVATIVES

Toshio Satoh, 57-3, Nagao, Jyoroku-cho, Tokushima-shi, Tokushima-ken; Hitoshi Matsumoto, and Hisao Kakegawa, both of Tokushima, all of Japan, assignors to Kabushiki Kaisha Medi-Creat, Tokyo and Toshio Satoh, Tokushima, both of, Japan

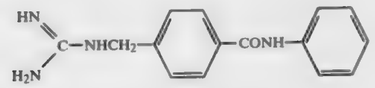
Filed Jul. 16, 1986, Ser. No. 886,158
Claims priority, application Japan, Jul. 30, 1985, 60-166903
Int. Cl.[4] C07C *129/08, 103/28*; A61K *31/65*
U.S. Cl. 514—620 **2 Claims**

1. A guanidinomethylbenzoic acid derivative represented by the formula



or a salt thereof.

2. An antiulcer agent comprising an effective amount of a guanidinomethylbenzoic acid derivative represented by the formula



or a salt thereof, and a pharmaceutical carrier.

4,732,917

PROCESS FOR PREPARING SUCROSE ENCRUSTED METHYLCELLULOSE PARTICLES FOR USE IN BULK LAXATIVE COMPOSITIONS

Dhiren N. Shah, Loveland; Gregory V. Hammer, and Jack Domet, both of Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 695,984, Jan. 29, 1985, Pat. No. 4,626,287. This application Aug. 26, 1986, Ser. No. 900,562
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] C08L *1/28*
U.S. Cl. 514—781 **16 Claims**

1. In a process for preparing a sucrose encrusted hydroxypropylmethylcellulose particle suitable for use in a bulk laxative composition wherein sucrose and hydroxypropylmethylcellulose are mixed in the presence of water the improvement which comprises mixing hot sucrose syrup with powdered hydroxypropylmethylcellulose.

4,732,918

HEAT INTERCHANGING PROCESS AND REACTOR THEREFOR

Reiner Lohmueller; Ulrich Lahne; Michael Heisel, all of Munich; Helmut Schneider, Gruenwald; Markus Raab, Germering, and Karl Höbel, Geretsried, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,702
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414717
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—712 **19 Claims**

1. In a process comprising conducting methanization of a synthesis gas consisiting essentially of carbon oxides and hydrogen in a reactor containing a feed inlet zone at one end, a product outlet zone at the other end and a catalyst bed cooled by indirect heat exchange wherein a coolant is conducted crosscurrently through the catalyst bed, the improvement which comprises cooling the bed in a zone of gradually increasing cooling surface intensity near the feed inlet zone of the reactor, said zone of gradually increasing cooling surface intensity ranges between 5 and 20% of the length of the cooled catalyst bed, said cooling surface intensity reaching a maximum value, and conducting the preponderant cooling of the catalyst bed at said maximum value of cooling surface intensity in the central part of the reactor, all of said cooling being conducted in a single heat exchanger.

4,732,919

REACTION INJECTION MOLDED ELASTOMER MADE FROM A QUASI-PREPOLYMER OF A POLYOXYALKYLENE POLYAMINE AND AN AROMATIC ISOCYANATE

Robert A. Grigsby, Jr., Georgetown; Richard J. G. Dominguez, Austin, and Wheeler C. Crawford, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1986, Ser. No. 927,472
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 **16 Claims**

1. A reaction injection molded elastomer made by reacting in a closed mold a reaction product of a polyoxyalkylene polyamine and an aromatic isocyanate wherein the polyoxyalkylene polyamine is present in less than the stoichiometric amount with an additional amount of a polyoxyalkylene polyamine and an amine terminated crosslinker.

4,732,920

HIGH STRENGTH PARTICULATES

John W. Graham, Rte. 5, Box 289, Alvin, Tex. 77511, and A. Richard Sinclair, 2903 Virginia, Houston, Tex. 77098

Continuation of Ser. No. 705,712, Feb. 26, 1985, Pat. No. 4,597,991, which is a division of Ser. No. 437,431, Oct. 27, 1982, Pat. No. 4,518,039, which is a continuation-in-part of Ser. No. 294,813, Aug. 20, 1981, abandoned. This application Apr. 23, 1986, Ser. No. 854,943
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[4] C08K *11/22*; B22C *3/36*
U.S. Cl. 523—145 **18 Claims**

1. A free-flowing high strength particle, useful in the production of shell molds and cores in the foundary industry and in the treatment of subterranean formations, comprised of high strength centers and a heat curable resin coating and manufactured through process steps comprising:
incorporating a coupling agent into said heat curable resin;
coating said centers with a coupling agent;
reacting said coupling agent with said centers;
heating said centers to a temperature above the melting point of said resin;
adding said resin to said centers;
mixing said resin and said centers until said resin is dispersed over the surface of said centers; and
quenching said mixture with water.

4,732,921

FLAME RETARDANT POLYBUTYLENE TEREPHTHALATE

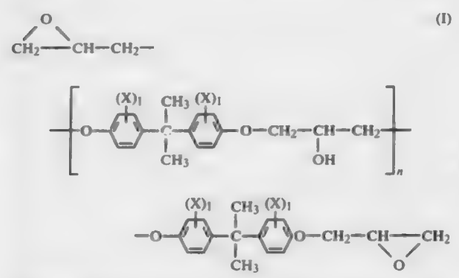
Arie Hochberg, Montclair; Nancy C. Eickman, Mountainside, and Frank Haimbach, IV, Montclair, all of N.J., assignors to Hoechst Celanese Corporation, Chatham, N.J.

Filed Dec. 5, 1986, Ser. No. 938,198
Int. Cl.[4] C08K *3/22, 67/02*
U.S. Cl. 523—460 **20 Claims**

1. A molding composition comprising a polybutylene tere-

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phthalate and a halogenated flame retardant comprising a halogenated epoxy resin having the general structure of formula I



(I)

wherein n is an integer describing the degree of polymerization and is sufficient to provide said brominated epoxy resin with a molecular weight of at least about 20,000 to about 40,000; X is a chlorine or bromine atom; and i is the same or different for each aromatic substituent and is an integer of from 1–4.

4,732,922

FLAME RETARDANT POLYETHYLENE TEREPHTHALATE COMPOSITIONS

George R. Kriek, Bethel Park, and Mark W. Witman, Pittsburgh, both of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 873,244, Jun. 11, 1986, abandoned. This application Feb. 26, 1987, Ser. No. 19,097

Int. Cl.[4] C08K *5/34;* **C08L** *67/02*

U.S. Cl. 524—94 **4 Claims**

1. A reinforced thermoplastic molding composition comprising:

(a) flame retarded polyethylene terephthalate resin having an intrinsic viscosity of at least 0.3 deciliters per gram measured as a 0.5% by weight solution in a 1:1 mixture of phenol and tetrachloroethane at 25° C. and containing at least a sufficient amount of a flame retardant agent to display a flammability rating of V2 at 1/16" in accordance with UL-94,

(b) between about 5 and about 50 weight percent of a reinforcing filler, and

(c) between 1.5 and 5 weight percent of a metal salt of a sulfonated EPDM rubber,

said weight percent of said (b) and said weight percent of (c) being in relation to the weight of said (a).

4,732,923

BUTADIENE POLYMER COMPOSITION

Takeshi Takata, Hyogo; Shinichi Yachigo, Osaka; Yukoh Takahashi, Osaka; Manji Sasaki, Osaka, and Taisuke Okita, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

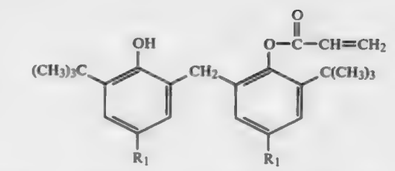
Filed Jul. 16, 1986, Ser. No. 886,104

Claims priority, application Japan, Jul. 16, 1985, 60-157550

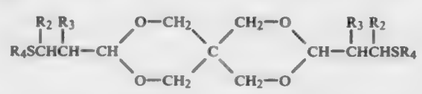
Int. Cl.[4] C08K *5/09, 5/15*

U.S. Cl. 524—108 **4 Claims**

1. A butadiene polymer composition characterized in that a phenolic compound (I) represented by the general formula,



wherein R_1 represents a C_1–C_4 alkyl group, and a sulfur-containing compound (II) represented by the general formula,



wherein R_2 and R_3 independently represent a hydrogen atom or a C_1–C_6 alkyl group, and R_4 represents a C_3–C_{18} alkyl group, are incorporated in butadiene polymer, the weight ratio of (I) to (II) being 1 to 0.5–10.

4,732,924

METHOD FOR PRODUCING VINYL AROMATIC RESIN COMPOSITION

Eiichi Terada, Kimitsu; Hiroshi Kurokawa, and Shigemi Kawazoe, both of Ichihara, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 881,118

Claims priority, application Japan, Jul. 17, 1985, 60-157838; Jul. 17, 1985, 60-157839

Int. Cl.[4] C08F *279/02;* **C08L** *51/04*

U.S. Cl. 524—269 **7 Claims**

1. A method for producing a vinyl aromatic resin composition containing a rubber in a dispersed state which comprises 60–90% by weight of a copolymer of a vinyl aromatic monomer with an unsaturated dicarboxylic anhydride in which the content of the vinyl aromatic monomer unit is 70–98 mol% and the content of the unsaturated dicarboxylic anhydride unit is 2–30 mol%, 10–35% by weight of a graft copolymer and 0–9% by weight of a diene based rubber, by copolymerizing a vinyl aromatic monomer with an unsaturated dicarboxylic anhydride in the presence of a rubber by a multi-stage continuous process which comprises mixing 2–25% by weight of a graft copolymer, as said rubber, which comprises (a) 50–85% by weight of a polymer main chain containing a butadiene unit in an amount of 50% by weight or more, (b) 40–5% by weight of a polymethacrylate side chain attached by graft-polymerization to the polymer main chain (a) and (c) 0–40% by weight of a polystyrene side chain attached by graft-polymerization to the polymer main chain (a) or 2–25% by weight in total of this graft copolymer and a diene based rubber with 95–75% by weight of a vinyl aromatic monomer, then adding an unsaturated dicarboxylic anhydride to the resulting mixture and continuing polymerization reaction until the conversion of the vinyl aromatic monomer reaches a value within the range of 30–80% by weight.

4,732,925

VULCANIZABLE ELASTOMERIC ROOF SHEETING AND FLASHING COMPOSITION

James A. Davis, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 10, 1986, Ser. No. 884,153

Int. Cl.[4] C08K *3/04*

U.S. Cl. 524—426 **12 Claims**

1. A roof sheeting or flashing composition comprising:

(a) 100 parts by weight of a vulcanizable elastomer selected from the group consisting of EPDM, neoprene, chlorosulfonated polyethylene and chlorinated polyethylene;

(b) from about 6.0 to bout 55.0 parts by weight of a metallurgical carbon having a particle size distribution of 97% less than 5 microns, 50% less than 1.5 microns and 30% less than 1 micron; and

(c) from about 0.5 to about 6.0 parts by weight of a vulcanizing agent.

4,732,926

DRY BLENDABLE POLYPROPYLENE COMPOSITION

Douglas L. Faulkner, Oak Park, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1986, Ser. No. 912,404

Int. Cl.[4] C08K *3/34;* **C08L** *47/00*

U.S. Cl. 524—449 **2 Claims**

1. A dry blended high impact polypropylene composition comprising essentially of

3 to 21 weight percent of total composition in a coblend of ethylene propylene diene monomer rubber and high density polyethylene with said rubber being the major component,

4 to 30 weight percent of total composition a reinforcing filler of mica having at least 60% of its particles in the size range between −40 mesh to +100 mesh,

49 to 93 weight percent of total composition a polypropylene homopolymer in a powder form having a midpoint particle size distribution between 30 to 40 mesh,

said particle sizes of mica matching said particle sizes of polypropylene in suca a way that after mixing in a mechanical mixer with said coblend of ethylene propylene diene monomer rubber and high density polyethylene without melting any of the three components a homogeneous blend is produced suitable for use in an injection molding machine.

4,732,927

RUBBER COMPOSITION FOR TREADS

Eiji Ida, Takatsuki, and Keijiro Oda, Kawanishi, both of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Filed Dec. 15, 1986, Ser. No. 941,284

Claims priority, application Japan, Dec. 28, 1985, 60-297526

Int. Cl.[4] C08K *3/04;* **C08L** *7/09, 9/00, 9/06*

U.S. Cl. 524—495 **3 Claims**

1. A rubber composition for treads characterized in that the composition comprises 100 parts by weight of a rubber component and 50 to 100 parts by weight of carbon black admixed therewith, the rubber component comprising 10 to 50 parts by weight of a solution-polymerized star styrene-butadiene rubber (I) which is 10 to 20 wt. % in styrene content, 30 to 50 wt. % in the vinyl content of the butadiene portion and at least 40% in the efficiency of coupling with a tin halide, 20 to 70 parts by weight of a solution-polymerized straight-chain styrene-butadiene rubber (II) which is 10 to 30 wt. % in styrene content and 10 to 25 wt. % in the vinyl content of the butadiene portion and 10 to 50 parts by weight of natural rubber or isoprene rubber (III), the carbon black being in the range of 75 to 105 in nitrogen adsorption specific surface area (N_2SA) calculated in the unit of m^2/g, at least 15 in the difference between N_2SA and the iodine adsorption number (IA) thereof calculated in the unit of mg/g and 0 to 5 in the difference between N_2SA and the cetyltrimethylammonium bromide adsorption specific surface area (CTAB) thereof, the composition being −50° to −30° C. in the peak temperature of loss tangent, tan δ, as determined by a dynamic viscoelasticity tester.

4,732,928

HIGHLY ELASTIC THERMOPLASTIC ELASTOMER COMPOSITION

Ken Mizushiro, Fuchu, and Hideo Morita, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki, Osaka, Japan

Filed Sep. 19, 1986, Ser. No. 909,233

Claims priority, application Japan, Oct. 2, 1985, 60-218028

Int. Cl.[4] C08K *11/00, 5/01*

U.S. Cl. 524—505 **27 Claims**

1. A thermoplastic elastomer composition having superior compression set performance and moldability, consisting essentially of the following components (a) to (d):

(a) a styrenic block copolymer having in the same molecule at least two of polymeric block A mainly comprised of vinyl aromatic compounds and at least one of polymeric block B mainly comprised of conjugated diene compounds, and containing vinyl aromatic compounds in an amount of not less than 15% by weight and not more than 60% by weight;

(b) a styrenic block copolymer having in the same molecule at least one of each of polymeric block A mainly comprised of vinyl aromatic compounds and polymeric block B mainly comprised of conjugated diene compounds, and containing vinyl aromatic compounds in an amount of not less than 60% by weight and not more than 95% by weight;

(c) a polyphenylene ether resin having the reduced viscosity ranging from 0.15 to 0.70 in 0.5 g/dl of a chloroform solution at 30° C.; and

(d) a non-aromatic rubber softening oil, and the contents of said components (a), (b), (c) and (d) in the composition satisfying the following formulae (1), (2) and (3) in weight ratio:

$$2.0 \geqq b/a \geqq \quad (1)$$

$$1.4 \geqq c/(a+b) \geqq 0.1 \quad (2)$$

$$3.0 \geqq d/(a+b) \geqq 0.1 \quad (3),$$

wherein the composition has a compression set of not higher than 60% as measured according to JIS K 6301 (70° C., 22 hrs., 25% compression).

4,732,929

SILICON-CONTAINING POLYOLS

Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 462,159, Jan. 31, 1983, abandoned. This application Feb. 27, 1987, Ser. No. 19,917

Int. Cl.[4] C08G *77/04;* **C08L** *83/00*

U.S. Cl. 524—541 **17 Claims**

1. An organic coating composition comprising:

I. a silicon-containing polyol comprising a reaction product prepared by reacting:

(A) at least one hydrophobic polyol;

(B) an organosilicon-containing material comprising

(1) at least one organosilicon-containing substance free of functional groups attached directly to carbon and essentially free of alkali metal ions, having atoms bonded directly to Si, all of said atoms being selected from the group consisting of O, N, Cl and combinations thereof, said organosilicon-containing substance additionally having moieties directly bonded to Si which are displaceable by reaction with water and/or alcohol, wherein, optionally, at least a part of said organosilicon-containing substance is hydrolyzed to a compound or a mixture of compounds, said compound or mixture of compounds containing a residual amount of said moieties directly bonded to Si which are displaceable;

(2) optionally a nonfunctional organosilane, a hydrolyzed nonfunctional organosilane, or a mixture thereof; and

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(3) optionally a functional organosilane, a hydrolyzed functional organosilane or a mixture thereof; and

(C) at least one higher monofunctional alcohol corresponding to the formula R-OH wherein R represents alkyl of at least 4 carbon atoms, aryl, alkylaryl, arylalkyl, alkyloxyalkyl, or aryloxyalkyl;

wherein said reaction product has a content of hydroxyl groups from said polyol ranging from 0.4 to 10 milliequivalents per gram of said reaction product, has a content of groups RO— from said higher monofunctional alcohol ranging from 0.1 to 7 milliequivalents per gram of said reaction product, has a content of said moieties directly bonded to Si which are displaceable of less than 1 milliequivalent per gram of said reaction product and remains ungelled when subjected to a two-step gel test consisting of (1) heating a 10 gram sample of said reaction product at 177° C. for 240 minutes in a glass jar covered by a piece of masking tape, followed by repeating step 1 in the presence of 0.5 grams of stannous octoate; and

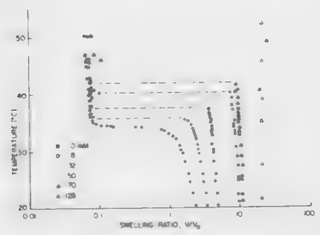
II. a curing agent for said silicon-containing polyol; wherein said coating composition is essentially free of elemental zinc and cures to an essentially organic coating.

4,732,930

REVERSIBLE, DISCONTINUOUS VOLUME CHANGES OF IONIZED ISOPROPYLACRYLAMIDE CELLS

Toyoichi Tanaka, Newton, and Yoshitsugu Hirokawa, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 20, 1985, Ser. No. 735,910
Int. Cl.[4] C08J *3/06;* C08K *39/00;* C08F *20/54*
U.S. Cl. 524—742 4 Claims



1. An ionic gel having a reversible phase transition function characterized by a drastic volume change in response to a change of liquid medium composition, temperature, pH or ion composition which comprises a polymerized product obtained by polymerization of isopropylacrylamide in the presence of an ion-containing monomer selected from the group consisting of a metal-containing acrylate and a metal containing methacrylate, a crosslink agent and a lquid medium selected from the groups consisting of water, a solvent compatible with water and a mixture of said solvent and water, said ion containing monomer being ion exchanged to replace said metal with hydrogen ion subsequent to said polymerization.

4,732,931

HEAT CURABLE FLUOROSILICONE COATING COMPOSITION

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 9, 1986, Ser. No. 917,329
Int. Cl.[4] C08G *77/06;* C08L *83/04*
U.S. Cl. 524—862 7 Claims

1. A curable liquid composition exhibiting a viscosity of from 0.01 to 10 Pa.s at 25° C., said composition comprising the product obtained by blending to homogeneity

(a) a fluorosilicone gum exhibiting a Williams plasticity number of from 120 to 400 at 25° C., where at least 75 mole percent of the repeating units of said gum correspond to the formula MeRfSiO, Me represents methyl, Rf represents a perfluoroalkylethyl radical containing a total of from 3 to 10 carbon atoms, any remaining units are individually selected from the group consisting of dimethylsiloxane and methylvinylsiloxane units, and the gum contains from 0.3 to 3 mole percent of silicon-bonded vinyl radicals;

(b) an organohydrogensiloxane containing an average of at least 3 silicon-bonded hydrogen atoms per molecule in an amount sufficient to cure said composition, where at least a portion of the silicon bonded hydrocarbon radicals present in said organohydrogensiloxane are represented by Rf;

(c) a platinum-containing hydrosilation catalyst in an amount sufficient to promote curing of said composition;

(d) from 1 to 25 percent by weight, based on the weight of said composition, of a finely divided reinforcing silica filler prepared by treating said filler with an effective amount of a siloxane of the general formula $HO(MeRfSiO)_nH$ where the average value of n is from 3 to 12, and

(e) a volatile solvent for (a), (b) and (c).

4,732,932

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS WITH IMPROVED ADHESION

Alan M. Waldern, Brussels, Belgium, assignor to Dow Corning S.A., Brussels, Belgium

Filed Dec. 8, 1986, Ser. No. 939,321
Int. Cl.[4] C08L *83/04*
U.S. Cl. 524—862 10 Claims

1. An organopolysiloxane composition comprising (A) a polyorganosiloxane having per molecule on average at least two units of the general formula $Q_aQ'SiO_{3-a/2}$ any remaining units having the general formula $Q_bSiO_{4-b/2}$ wherein Q is selected from the group consisting of a monovalent hydrocarbon and a monovalent substituted hydrocarbon group having no more than 8 carbon atoms, Q' denotes an organic group having olefinic unsaturation, a has a value of from 1 to 2 and b has a value of from 0 to 3, and at least 80% of the Q groups are methyl groups, (B) an organohydrogen polysiloxane having on average at least two silicon-bonded hydrogen atoms per molecule, any remaining substituents of the silicon atoms being a monovalent hydrocarbon group having no more than 8 carbon atoms, at least 50% of said remaining substituents being methyl groups, (C) a catalyst selected from, the group consisting of metals from group VIII of the Periodic Table and compounds of said metals between (A) and (B), and (D) an organosilane having the general formula



where R is a monovalent hydrocarbon group, having no more than 8 carbon atoms and which may contain ether oxygen atoms, R' is chosen from the group consisting of a hydrocarbon and hydrocarbonoxy groups containing from 2 to 5 carbon atoms and aliphatic unsaturation, and R'' represents an epoxy-substituted group selected from monovalent hydrocarbon groups, hydrocarbonoxy groups, halogenated hydrocarbonoxy groups, hydrocarbon groups containing oxygen in the form of a hydroxyl group, a hydrocarbonoxy group containing oxygen in the form of an ether linkage or hydrocarbonoxy groups containing oxygen in the form of a hydroxyl group.

4,732,933

NEOCARZINOSTATIN COMPLEXES, A METHOD FOR PRODUCING THE SAME, AND AN ANTITUMOR AGENT CONTAINING SAID COMPLEXES AS AN ACTIVE COMPONENT

Hiroshi Maeda, 631-3, Aza-Tamukae, Hotakubohon-machi Kumamoto City; Ryunosuke Kanamaru; Nakao Ishida, both of Sendai; Toshihiko Yoshitake, Kurashiki, and Minoru Ueda, Okayama, all of Japan, assignors to Kayaku Antibiotics Research Co., Ltd.; Kuraray Co., Ltd.; Yamanouchi Pharmaceutical Co., Ltd., all of Kurashiki and Hiroshi Maeda, Kumamoto, all of, Japan

Continuation of Ser. No. 469,235, Feb. 24, 1983, abandoned.
This application May 6, 1985, Ser. No. 730,823
Claims priority, application Japan, Feb. 27, 1982, 57-31558; Jan. 31, 1983, 58-15075
Int. Cl.[4] C08L *89/00;* A61K *31/785*
U.S. Cl. 525—54.1 15 Claims

1. A neocarzinostatin complex having the following formula:

$$(SMA)_n—(NCS)$$

wherein (NCS) is a neocarzinostatin residue, n is an integer ranging from 1 to 35, and (SMA) comprises the residue of a half-esterified styrene-maleic acid copolymer having an average molecular weight of from 1,000 to 10,000, said half-esterified styrene-maleic acid copolymer comprising (i) styrene residues, (ii) maleic acid residues covalently bonded to (NCS), (iii) free maleic acid residues, and (iv) half-esterified maleic acid residues, and further wherein the total amount of said residues (ii) and (iii) ranges from an average of 0.1 per molecule to 60 mole % of said (SMA).

4,732,934

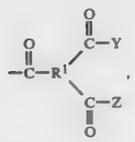
FUNCTIONALIZED THERMOPLASTIC POLYMERS, BLENDS PREPARED THEREFROM, AND METHODS FOR PREPARING BLENDS

Susan J. Hathaway, Schenectady, N.Y., and Robert A. Pyles, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1986, Ser. No. 939,391
Int. Cl.[4] C08L *77/00*
U.S. Cl. 525—66 9 Claims

1. A thermoplastic blend comprising the following, and reaction products thereof:

(a) about 30% by weight to about 70% by weight of a thermoplastic polymer having recurring carbonate units in the main chain and end groups of the formula



wherein

R^1 is a trivalent group selected from the group consisting of aliphatic chains containing about 2–20 carbon atoms and aromatic groups containing about 6–20 carbon atoms; and

Y and Z are individually selected from the group consisting of hydroxy and alkoxy groups, wherein Y and Z taken together are oxygen; and

(b) about 30% by weight to about 70% by weight of a polyamide.

4,732,935

THERMOPLASTIC RESIN COMPOSITION

Takayuki Katto; Yasumasa Komatsu, and Zenya Shiiki, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 618,662, Jun. 8, 1984, Pat. No. 4,636,553.
This application Aug. 29, 1986, Ser. No. 901,644
Claims priority, application Japan, Jun. 14, 1983, 58-106098
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.
Int. Cl.[4] C08L *51/06, 69/00*
U.S. Cl. 525—67 16 Claims

1. A thermoplastic resin composition comprising:

5 to 85% by weight of a copolymer (A) prepared by copolymerizing 40 to 85% by weight of a monomer mixture of 2-isopropenylnaphthalene and α-methylstyrene, the proportion of 2-isopropenylnaphthalene being 5 to 70% by weight based on the total weight of 2-isopropenylnaphthalene and α-methylstyrene, 7.5 to 35% by weight of acrylonitrile, and 0 to 40% by weight of at least one vinyl monomer copolymerizable with the foregoing monomers;

1 to 40% by weight of a graft copolymer (B) prepared by polymerizing 15 to 50 parts by weight of at least one monomer, as the graft component, selected from the group consisting of methacrylic acid alkyl esters, acrylic acid alkyl esters, aromatic vinyl compounds, and vinyl cyanide compounds in the presence of 50 to 85 parts by weight of a alkyl acrylate-containing rubber, as the rubber component, provided that the sum of the graft component and rubber component is 100 parts by weight; and

10 to 90% by weight of a polycarbonate (C).

4,732,936

ALPHA METHYLSTYRENE AND PARA METHYLSTYRENE COPOLYMERS

John F. Holohan, Jr., Allegheny County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 673,250, Nov. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 592,659, Mar. 23, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 810,133
Int. Cl.[4] C08L *53/02;* C08F *212/06*
U.S. Cl. 525—88 8 Claims

1. A copolymer having a R&B softening point of greater than 150° C. and as high as about 162° C., a tg of greater than 100° C., a $\bar{M}w$ of about 5,000 to about 10,000, a molecular weight distribution of less than 3 and derived from by weight, about 75% to about 25% alpha methylstyrene and from about 25% to about 75% of an isomeric mixture of vinyl toluene having at least 95% of the para isomer, less than 5% of the meta isomer and trace amounts of the ortho isomer.

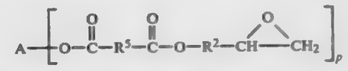
4,732,937

EPOXIDE-FUNCTIONALIZED POLYPHENYLENE ETHERS AND METHOD OF PREPARATION

Paul D. Sybert, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 866,661, May 27, 1986. This application Jul. 14, 1986, Ser. No. 885,112
Int. Cl.[4] C08L *71/04, 71/02, 77/06, 77/10*
U.S. Cl. 525—92 7 Claims

1. A resinous composition comprising at least one polyphenylene ether and at least one polyamide, at least a portion of said polyphenylene ether being an epoxidefunctionalized polyphenylene ether having the formula



wherein A is a polyphenylene ether moiety, R^2 is a $C_{(1-4)}$

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alkylene radical, R^5 is an aromatic hydrocarbon radical, and p is 1 or 2.

4,732,938

THERMOPLASTIC POLYAMIDE—POLYPHENYLENE ETHER COMPOSITIONS

Thomas S. Grant, Vienna; Ronald L. Jalbert, Woodland Park, and David Whalen, Parkersburg, all of W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Dec. 6, 1985, Ser. No. 805,644
Int. Cl.[4] C08L *71/04*; C08G *65/48*
U.S. Cl. 525—92 **8 Claims**

1. A composition comprising from 25 to 95 wt % of a polyamide and, correspondingly, from 75 to 5 wt % of a carboxylated phenylene ether resin, said carboxylated resin being the product of melt-mixing a mixture consisting essentially of 100 parts by weight phenylene ether resin and from 0.05 to 1.0 pbw of an ethylenically unsaturated carboxylic acid compound.

4,732,939

FLAME-RETARDANT OLEFINIC RESIN COMPOSITIONS

Kazuo Hoshi, Ibaraki, and Yasuo Nakagawa, Nishinomiya, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 4,220
Claims priority, application Japan, Jan. 20, 1986, 61-7973; Jun. 5, 1986, 61-129064
Int. Cl.[4] C08L *23/26*
U.S. Cl. 525—106 **19 Claims**

1. A flame-retardant olefinic resin composition comprising the product of reacting component (1) with component (2) essentially in the absence of both of the following:

a free-radical generator and a catalytic accelerator;

wherein components (1) and (2) are as follows:

(1) 100 parts by weight of an ethylenic polymer resin mixture having an average density of 0.890 to 0.915 g/cm^3, of:

(a) an ethylenic polymer consisting mainly of an ethylene-alpha-olefin copolymer, and

(b) at least 2% based on the total weight of (a) and (b) of a silane-grafted polymer obtained by grafting a silane to at least one component of said ethylenic polymer (a), and

(2) 50 to 300 parts by weight of a hydrated metal compound whereby hydrolytic condensation occurs between said hydrated metal compound and said silane grafted polymer to form siloxane linkages between the metal of said hydrated metal compound and silanol groups of said silane-grafted polymer.

4,732,940

CROSSLINKED RESIN COMPOSITIONS

Noboru Yamaoka, Yokohama; Kiyoyasu Tanabe, Tokyo; Katumi Usui; Takashi Mizoe, both of Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,884
Claims priority, application Japan, Dec. 27, 1984, 59-274121
Int. Cl.[4] C08L *23/26, 23/12, 23/18*
U.S. Cl. 525—194 **6 Claims**

1. A crosslinked resin composition obtained by cross-linking a composition consisting essentially of (A) 80–10 wt. % of a propylene polymer and (B) 20–90 wt. % of an ethylene/α-olefin compolymer having the following properties (i) to (iv) and prepared by copolymerizing ethylene wiht an α-olefin having 3 to 12 carbon atoms in the presence of a catalyst, said catalyst comprising a solid component and an organoaluminum compound, said solid component containing at least magnesium and titanium:

(i) Melt index	0.01–100 g/10 min.
(ii) Density	0.870–0.905 g/cm^3
(iii) Maximum peak temperature measured according to a differential scanning calorimetry (DSC)	not lower than 100° C.
(iv) Insolubles in boiling n-hexane	not less than 10 wt. %.

4,732,941

PROCESS FOR PREPARING A STABLE DISPERSION OF VINYL POLYMER

Nobushige Numa, Ebina, Japan, assignor to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Jun. 27, 1986, Ser. No. 879,781
Claims priority, application Japan, Jul. 5, 1985, 60-148821; Jul. 24, 1985, 60-163293
Int. Cl.[4] C08F *259/00*
U.S. Cl. 525—276 **8 Claims**

1. A process for preparing a stable dispersion of vinyl polymer, the process comprizing polymerizing at least one monomer polymerizable in radical polymerization in an organic liquid in which the monomer is soluble and in which the polymer produced from the monomer is insoluble and in the presence of a dispersion stabilizer comprising at least one polymer selected from the group consisting of:

(A) at least one polymer selected from the polymers of acrylic or methacrylic monomer containing perfluoroalkyl group and represented by the formula



$$CH_2=\overset{R}{\overset{|}{C}}-COO-(CH_2)_n-R_f \qquad (1)$$

wherein R is hydrogen or methyl, n is an integer of 1 to 11, and R_f is straight chain or branched chain perfluoroalkyl group having 1 to 21 carbon atoms,

(B) at least one copolymer containing as a copolymerizing component about 1% or more by weight of the perfluoroalkyl-containing acrylic or methacrylic monomer of the formula (1), and

(C) at least one polymer which essentially contains fluoroolefin, is soluble in an organic solvent and has a weight-average molecular weight of about 5,000 to about 120,000 and a fluorine content of about 1 to about 60% by weight.

4,732,942

HYDROCARBON COMPOSITIONS CONTAINING POLYOLEFIN GRAFT POLYMERS

Christopher S. Liu, Poughkeepsie; Benjamin J. Kaufman, Hopewell Junction, and Maria M. Kapucinski, Carmel, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,837
Int. Cl.[4] C08F *255/04, 255/06, 255/00*
U.S. Cl. 525—301 **24 Claims**

1. A linear, substantially oil-soluble polymer having a carbon-carbon backbone bearing a graft moiety derived from, as graft monomer, a carboxy saturated-hydrocarbyl ester of a carboxylic acid containing an ethylenically unsaturated carbon-carbon double bond.

4,732,943

DENTAL RESTORATIVE MATERIAL

Derrick R. Beech, Greensborough; Ezio Rizzardo, Wheelers Hill; Wayne D. Cook, Northcote, and Malcolm C. Smail, North Melbourne, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization

Filed Apr. 21, 1986, Ser. No. 854,026
Claims priority, application Australia, Apr. 24, 1985, PH0281
Int. Cl.[4] C08F *265/04*
U.S. Cl. 525—303 **17 Claims**

1. An adhesive for attaching polymeric or polymerizable restorative materials to dentine or other tooth structure, which comprises a polymer with pendent ethylenic unsaturation made by the reaction of (a) a condensate of ϵ-caprolactone with one or more acrylic monomers containing hydroxy groups and (b) a polymer containing binding groups capable of binding to the dentine or other tooth structure.

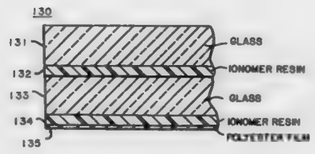
4,732,944

IONOMER RESIN FILMS

W. Novis Smith, Jr., Philadelphia, Pa., assignor to Advanced Glass Systems, Inc., Trumbauersville, Pa.

Division of Ser. No. 642,042, Aug. 17, 1984, Pat. No. 4,619,973.
This application May 27, 1986, Ser. No. 866,913
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—329.9 **12 Claims**





1. In a copolymer containing alpha olefin units and alpha, beta ethylenically unsaturated carboxylic acid units, the improvement which comprises said copolymer being cross-linked with isophorone diamine.

4,732,945

SYNTHESIS BY REACTING OXIRANE RESIN WITH CARBOXYL COMPOUNDS

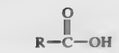
Laurence G. Dammann, Westerville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 15, 1986, Ser. No. 919,076
Int. Cl.[4] C08F *8/34, 8/00*
U.S. Cl. 525—350 **10 Claims**

1. A method for synthesizing an aliphatic hydroxyl-functional resinous product which comprises:

providing a resin which contains aliphatic hydroxyl functionality selected from primary hydroxyl functionality, secondary hydroxyl functionality, or both and contains oxirane functionality,

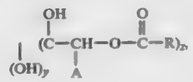
reacting said resin with a carboxyl functional capping agent bearing functionality selected from phenolic hydroxyl functionality, mercapto functionality, or both, and represented as follows:



$$R-\overset{O}{\overset{\|}{C}}-OH$$

where R bears said functionality selected from phenolic hydroxyl functionality, mercapto functionality, or both;

under conditions and for a time such that said carboxyl functionality of said capping agent selectively reacts with the oxirane functionality of said resin to produce a resinous product containing aliphatic hydroxyl functionality and containing functionality selected from phenolic hydroxyl functionality, mercapto functionality, or both, and represented as follows:



$$(OH)_y \quad \underset{A}{CH}-O-\overset{O}{\overset{\|}{C}}-R)_z$$

where:

A is H or



$$(OH)_b$$

where, y and z are integers each independently varying from 1 to about 40, b is an integer ranging from 0 to about 40, and each wavy line represents an organic chain.

4,732,946

PROCESS FOR THE PREPARATION OF CHELATION RESINS

George R. Killat, and Edward R. Husser, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 8, 1983, Ser. No. 559,542
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—379 **7 Claims**

1. A process for preparing a chelation resin comprising a water-insoluble polymer having attached thereto a plurality of chelation groups, said process comprising

(a) attaching

(1) a Michaels addition adduct of ammonia, a primary amine, an alkylene diamine or a polyalkylene polyamine and at least one mole of an alkyl or inertly substituted alkyl ester of an α,β-ethylenically unsaturated carboxylic acid per mole of amine hydrogen to

(2) a water-insoluble organic polymer having a plurality of reactive groups which react with a nitrogen atom of the Michaels addition adduct to attach the adduct thereto through said nitrogen atom, then

(b) converting at least one of the ester groups on said Michaels adduct to an acid group.

4,732,947

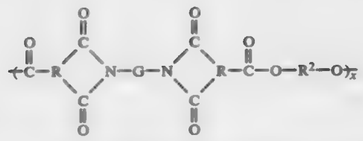
BLOCK POLYETHERIMIDE ESTER POLYMERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

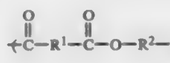
Filed Dec. 2, 1986, Ser. No. 936,693
Int. Cl.[4] C08G *81/00*
U.S. Cl. 525—437 **28 Claims**

1. A thermoplastic elastomeric polyetherimide ester block copolymer comprising at least one polyetherimide ester recurring structural unit represented by the formula

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and at least one ester recurring structural unit represented by the formula



wherein:

G is a divalent radical remaining after the removal of the amino groups of a high molecular weight alkylene ether diamine;

R^1 is the divalent radical remaining after the removal of the carboxylic groups of a dicarboxylic acid;

R^2 is the divalent radical remaining after the removal of the hydroxyl groups of a diol;

R is a trivalent organic radical;

y is a number having an average value of from 2 to about 200; and

x is a number having an average value of from 2 to about 40.

4,732,948

SOLID PHASE POLYCONDENSATION PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYETHERIMIDE ESTER POLYMERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 2, 1986, Ser. No. 936,698

Int. Cl.[4] C08G *8/00*

U.S. Cl. 525—437 **25 Claims**

1. A method for preparing high molecular weight polyetherimide ester polymers comprising:

(A) preparing a polyetherimide ester oligomer by coreacting

(i) at least one diol,

(ii) at least one dicarboxylic acid or an ester forming reactive derivative thereof, and

(iii) a set of reactants selected from

(a) (1) at least one high molecular weight poly(oxy alkylene)diamine, and (2) at least one tricarboxylic acid or its derivative, or

(b) at least one high molecular weight polyoxyalkylene diimide diacid,

at elevated temperature and for a period of time effective to form said oligomer and then

(B) heating said oligomer at a temperature effective to further polymerize said oligomer to a high molecular weight polyetherimide ester but below the melting point of said oligomer.

4,732,949

POLYDIORGANOSILOXANE/POLYCARBONATE BLOCK COPOLYMERS

Winfried Paul; Werner Nouvertné, both of Krefeld, Fed. Rep. of Germany; Hartmut Löwer; Mark W. Witman, both of Pittsburgh, Pa., and Ulrich Grigo, Kempen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,470

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506472

Int. Cl.[4] C08F *283/02*

U.S. Cl. 525—464 **8 Claims**

1. A process for the production of a thermoplastic poly-(diorganosiloxane)/polycarbonate block copolymer comprising reacting

(a) α,ω-bis-hydroxyaryloxy polydiorganosiloxane having a degree of polymerization of between 5 and 100,

(b) at least one other diphenol,

(c) a chain stopper and, if desired,

(d) a chain branching agent,

with phosgene in the two-phase boundary process characterized in that said chain stopper is a member selected from the group consisting of a monoalkylphenol, a halogenocarbonic acid ester of a monoalkyl phenol, a dialkylphenol and a halogenocrbonic acid ester of a dialkyl phenol wherein the alkyl substituents contain 8 to 20 carbon atoms and in that chain stopper is employed in a sufficient amount such that a quantitative reaction of the phenolic component is obtained, said copolymer being characterized in that its weight average molecular weight, determined by ultracentrifugation or by light scattering, is about 10,000 to 30,000 and in that it contains 0.5 to 10% by weight of poly-(diorganosiloxane) structural units.

4,732,950

CATHODIC ELECTRODEPOSITION COATING COMPOSITION

Masanori Nagai, Yokohama; Kenji Hasui, Ayase, and Toshio Shinohara, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Feb. 9, 1987, Ser. No. 12,497

Claims priority, application Japan, Feb. 25, 1986, 61-40099

Int. Cl.[4] C25B *13/06;* **C08K** *3/20*

U.S. Cl. 525—524 **9 Claims**

1. A cathodic electrodeposition coating composition which comprises:

(A) 100 parts by weight of an amine-unsaturated carboxylic acid adduct of epoxidized polybutadiene having a number average molecular weight of from 500 to 10,000 and containing from 70 to 200 mmol of a tertiary amino group, from 20 to 200 mmol of an α,β-unsaturated monocarboxylate group and from 200 to 2,000 mmol of a carbon-carbon double bond, per 100 g of the resin;

(B) from 20 to 200 parts by weight of an addition reaction product of (a) 1 mol of an epoxy resin containing at least two epoxy groups per molecule, and (b) from 1.5 to 2.0 mol of an α,β-unsaturated monocarboxylic acid;

(C) from 5 to 50 parts by weight of an addition reaction product other than (A) of (a) 1 mol of an epoxy resin containing at least two epoxy groups per molecule, and (b) a mixture of from 0.5 to 1.5 mol of an α,β-unsaturated monocarboxylic acid and from 0.5 to 1.5 mol of a secondary amine, provided that the total amount of the two components of the mixture is from 1.5 to 2.0 mol; and

(D) from 0 to 100 parts by weight of other water-dilutable resin.

4,732,951

POLYETHER-BASED PHOTOPOLYMERS

Hellmut Ahne, Röttenbach, and Winfried Plundrich, Kalchreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 24, 1986, Ser. No. 878,020

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522537

Int. Cl.[4] C08G *18/62*

U.S. Cl. 525—528 **16 Claims**

1. A polyether-based photopolymer which comprises an addition product of an olefin-unsaturated monoisocyanate and a phenoxy resin having at least one hydroxyl group.

4,732,952

"B STAGEABLE" HIGH SERVICE TEMPERATURE EPOXY THERMOSETS

Frederick J. Hirsekorn, Delran, N.J., and William D. Emmons, Huntingdon Valley, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 5, 1986, Ser. No. 938,296

Int. Cl.[4] C08G *59/06, 59/18*

U.S. Cl. 525—530 **9 Claims**

1. A B-stage thermosettable composition comprising a polyepoxide and a cyclopolymerized linear anhydride monomer, where said linear anhydride monomer cyclopolymerizes with itself in the presence of said polyepoxide without significant crosslinking with said polyepoxide to form the the thermoplastic B-stage composition which is stable upon storage at room temperature and which produces a high service temperature thermoset by the reaction of said cyclopolymerized anhydride with said polyepoxide upon curing, and where the molar ratio of said linear anhydride monomer to polyepoxide ranges from about 0.4/1 to 1/1.

4,732,953

NOVEL POLYVINYL CHLORIDE SUSPENSION POLYMERIZATION PROCESS AND PRODUCT HAVING IMPROVED PLASTICIZER ABSORPTION

William F. Carroll, Jr., Radnor; Stephen T. Fitzpatrick, Gilbertsville; John M. Ogorzalek, and Edward P. Tefft, both of Pottstown, all of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,323

Int. Cl.[4] C08F *2/20, 14/06*

U.S. Cl. 526—88 **5 Claims**

1. A process for the suspension polymerization of vinyl chloride monomer and optionally other comonomers which comprises the following steps:

(1) preparing a solution of polymerization initiator and other oil-soluble additives in the vinyl chloride monomer and comonomers;

(2) preparing a solution of suspending agent and other water-soluble additives in water at a temperature of about 40° to 90° C.;

(3) mixing solutions (1) and (2) in a polymerization reaction zone with a sufficient level of agitation to produce oil-phase droplets that are larger than the desired final product particle size, and maintaining this level of agitation until the reaction proceeds to a conversion of about 1 to 10 percent;

(4) increasing the level of agitation to form oil-phase droplets commensurate in size to the desired product particle size and continuing until the reaction proceeds to a monomer conversion of about 60 to 95 percent; and

(5) recovering the resin product produced;

wherein the levels of suspending agent and agitation are chosen to substantially preclude agglomeration of resin particles during the reaction, thereby producing resin wherein the resin grain size distribution results diretly from the oil phase droplet distribution created in step (4).

4,732,954

NOVEL POLYVINYL CHLORIDE SUSPENSION POLYMERIZATION PROCESS AND PRODUCT HAVING IMPROVED PLASTICIZER ABSORPTION

William F. Carroll, Jr., Radnor, and Stephen T. Fitzpatrick, Gilbertsville, both of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,322

Int. Cl.[4] C08F *2/20*

U.S. Cl. 526—88 **9 Claims**

1. A process for the suspension polymerization of vinyl halide monomer which comprises the following steps:

(1) preparing a solution of polymerization initiator and other oil-soluble additives in the viny halide monomer;

(2) preparing a solution of suspending agent and other water-soluble additives in water,

(3) mixing solutions (1) and (2) in a polymerization reaction zone with a sufficient level of agitation to produce oil-phase droplets that are larger than the desired final product particle size;

(4) heating the reaction mixture to an elevated temperature while maintaining the agitation substantially at the level established in step (3) until the reaction proceeds to a conversion of about 0.25 to 10 percent;

(5) increasing the level of agitation to form oil-phase droplets commensurate in size to the desired product particle size and continuing the polymerization reaction until the reaction proceeds to a monomer conversion of about 60 to 95 percent; and

(6) recovering the resin product produced;

wherein the levels of suspending agent and agitation are chosen to substantially preclude agglomeration of resin particles during the reaction; thereby producing resin wherein the resin grain size distribution results directly from the oil phase droplet distribution created in step (5).

4,732,955

GROUP TRANSFER POLYMERIZATION CATALYZED BY MERCURY COMPOUNDS

Ira B. Dicker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1986, Ser. No. 912,118

Int. Cl.[4] C08F *4/44, 4/16, 4/10*

U.S. Cl. 526—188 **18 Claims**

1. A Group Transfer Polymerization process that produces a "living" polymer comprising contacting under polymerizing conditions at least one acrylic monomer of the formula $CH_2{=}CHC(O)X'$ with a tetracoordinate organosilicon initiator of the formula

$$Q'SiZ,\ Q''Si(Z^1)_2 \text{ or } [Z^1(Q'')Si]_2O$$

wherein:

Q' is $[X''(R^1)_q]_{3-x}(R^1)_x$;

Q'' is $[X''(R^1)_q]_{2-y}(R^1)_y$;

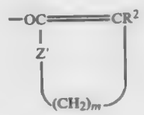
each X'', independently, is O, N or S;

q is 1 or, when X'' is N, 2;

x is 0, 1, 2 or 3;

y is 0, 1 or 2;

Z is $-OC(X^2){=}C(R^2)(R^3)$,



or mixtures thereof;

Z^1 is $-OC(X^2){=}C(R^2)(R^3)$;

X^2 is $-OSi(R^1)_3$, $-R^6$, $-OR^6$ or $-NR'R''$;

R^6 is:

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms;

(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof;

(d) a radical of (a), (b) or (c) containing one or more functional substituents that are unreactive under polymerizing conditions; or

(e) a radical of (a), (b), (c) or (d) containing one or more initiating sites;

each of R^2 and R^3 is independently selected from H and a hydrocarbyl or polymeric radical defined as for R^6;

Z' is O or NR'; and

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m is 2, 3 or 4

and co-catalyst, said process is further characterized in that the co-catalyst is a mercury compound of the formula R^7HgI or HgL_2,

wherein the formulas,

L is I or ClO_4;

X' is $—OSi(R^1)_3$, —R, —OR or —NR'R";

each R^1, independently, is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms or —H, provided that at least one R^1 group is not —H;

R is:

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms;

(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof;

(d) a radical of (a), (b) or (c) containing one or more functional substituents that are unreactive under polymerizing conditions; or

(e) a radical of (a), (b), (c) or (d) containing one or more reactive substituents of the formula —Z'(O)-C—CH=CH_2 wherein Z' is O or NR'; and

each of R' and R" is independently selected from C_{1-4} alkyl; and

R^7 is a hydrocarbyl radical having 1 to 10 carbon atoms.

4,732,956

STYRYLOXY RESINS AND COMPOSITIONS THEREOF

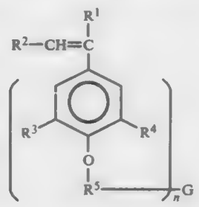
John Woods, Dublin; John Rooney, Kildare, and Stephen J. Harris, Dublin, all of Ireland, assignors to Loctite (Ireland) Ltd., Dublin, Ireland

Continuation-in-part of Ser. No. 667,724, Dec. 4, 1984, Pat. No. 4,543,397, which is a continuation-in-part of Ser. No. 621,419, Jun. 18, 1984, abandoned. This application Sep. 24, 1985, Ser. No. 779,737

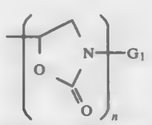
Int. Cl.⁴ C08F *283/04*; C07D *211/26*

U.S. Cl. 526—260 **2 Claims**

1. Cationically polymerizable compounds of the formula:



wherein R^1 and R^2 are H or one of R^1 or R^2 is H and the other is methyl; R^3 and R^4 are H, lower alkyl, or alkoxy if R^2 is not methyl; R^5 is divalent hydrocarbon radical; n is an integer of at least 2 and G is a n-valent organic radical of the formula



where G_1 is the residue of a diisocyanate or polyisocyanate free of amino, aliphatic hydroxyl, or aliphatic thiol, or other groups which interfere with cationic polymerization.

4,732,957

POLYURETHANE-BASED REACTIVE MASS AND ITS USE FOR THE PRODUCTION OF COATINGS

Peter Schuster, Mannheim; Rudolf Puneezen, Brühl; Karl Nützel, Neulussheim; Richard Kopp, and Werner Rasshofer, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 839,940

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511754

Int. Cl.⁴ C08G *18/48*

U.S. Cl. 528—58 **10 Claims**

1. Reactive polyurethane mass comprising

(i) and isocyanate reactive organic compound selected from the group consisting of difunctional and trifunctional polyethers having OH numbers of from 20 to 200 obtained by the chemical addition of ethylene oxide, propylene oxide or mixtures thereof to suitable starter molecules or polyesters or polyesters having an OH number of from 40 to 150 which are modified by polymers or natural polyols modified with ketone from aldehyde condensates,

(ii) a tin catalyst,

(iii) an aliphatic isocyanate compound selected from the group consisting of trimers based on hexamethylene diisocyanate, reaction products of 2 moles hexamethylene diisocanate and 1 mole carbon dioxide, reaction products of 2 moles hexamethylene diisocyanate and 1 mole of dipropylene glycol.

4,732,958

EPOXY FUSION PROCESS

Roy J. Jackson, and Larry S. Corley, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

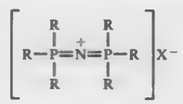
Filed Dec. 30, 1986, Ser. No. 947,723

Int. Cl.⁴ C08G *59/62*, *59/02*

U.S. Cl. 528—89 **18 Claims**

1. A process for preparing an advanced epoxy resin, the process comprising:

contacting in a reaction mixture a polyepoxide having an average of more than 1 vicinal epoxide group per molecule and a weight per epoxide less than about 500 with a hydroxyl group-containing compound in the presence of a catalytic amount of an iminium catalyst of the formula



in which each R is selected independently from substituted or unsubstituted hydrocarbyl and X is a compatible anion, at a temperature in the range of about 100° C. to about 200° C. for a time sufficient to produce an advanced epoxy resin having a weight per epoxide of at least about 500.

4,732,959

POLYESTERPOLYOL DERIVATIVE AND A POLY(URETHANE)UREAMIDE OBTAINED THEREFROM

Kozo Otani, Amagasaki, and Yoshio Yamada, Takatsuki, both of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Filed Nov. 13, 1985, Ser. No. 797,665

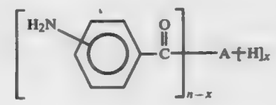
Claims priority, application Japan, Nov. 22, 1984, 59-247176; Nov. 22, 1984, 247177

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.⁴ C08G *18/00*, *18/32*; C08F *283/00*

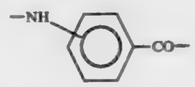
U.S. Cl. 528—68 **8 Claims**

1. A polyesterpolyol derivative of the formula



wherein

A is an n-valent radical obtained by removal of terminal hydrogen atoms from an n-valaent polyesterpolyol having a molecular weight of 400 to 10,000 and containing



group in the main chain,

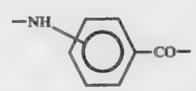
n is an integer of 2 to 4,

x is an average value and a number of 0 to (n—1),

—NH— group of

in the main chain forms an amido group connected with a carbonyl group of an aminobenzoic acid and/or a carbonyl group of a polybasic acid component of the polyesterpolyol and,

—CO— group of



in the main chain forms an ester group or amido group,

4,732,960

PROCESS FOR THE PRODUCTION OF NEW POLYISOCYANATE COMPOSITIONS AND THEIR USE FOR THE PRODUCTION OF PLASTICS BY THE ISOCYANATE POLYADDITION PROCESS

Werner Rasshofer, Cologne; Reiner Paul, Mülheim/Ruhr, and Joachim Probst, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1986, Ser. No. 818,926

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501857

Int. Cl.⁴ C08G *18/67*

U.S. Cl. 528—75 **21 Claims**

1. A polyisocyanate preparation containing urethane groups and having an isocyanate content of about 18 to 285% by weight which is prepared by a process which comprises reacting

(a) an organic polyisocyanate having aromatically bound isocyanate groups and an isocyanate content of about 30 to 50% by weight or a mixture comprising said organic polyisocyanate, said mixture having an isocyanate content of about 30 to 50% by weight with

(b) an organic polyhydroxyl compound comprising

(b1) a polyhydroxypolyacrylate having an average molecular weight, as determined by vapor pressure osmometry, of 232 to about 100,000, optionally containing urethane or ester groups in side chains and containing on statistical average at least one alcoholic hydroxyl group per molecule and

(b2) up to about 250% by weight, based on b1), of at least one polyhydroxyl compound other than b1) having a molecular weight of 62 to about 12,000, wherein the equivalent ratio of isocyanate groups to hydroxyl groups is at least 1.8:1.

4,732,961

EPOXY TYPE SPHERICAL PARTICULATE ADHESIVE AND PROCESS FOR PREPARATION THEREOF

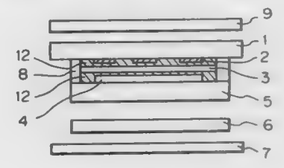
Koichiro Oka, Osaka, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 909,058

Claims priority, application Japan, Sep. 25, 1985, 60-211400

Int. Cl.⁴ B05D *1/18*

U.S. Cl. 528—87 **20 Claims**



1. An epoxy spherical particulate adhesive comprising particles of a partially amine cured epoxy resin as the main component, wherein the epoxy resin contains an at least partially compatible latent curing agent in the interior of the particles, the average particle diameter is 0.3 to 500 μm, and substantially all the epoxy resin particles are spherical.

16. A process for the preparation of an epoxy spherical particulate adhesive comprising a partially amine cured epoxy resin as the main component, which comprises mixing an aqueous slurry obtained by emulsifying or suspending an epoxy compound containing a latent curing agent compatibly therein into a liquid composed mainly of water to form spherical particles, with a slurry of fine particles of an inorganic oxide having an average particle diameter smaller than 0.2 μm, and stirring the mixture to obtain an epoxy type spherical particulate adhesive covered with the inorganic oxide.

18. A process for the preparation of an epoxy spherical particulate adhesive according to claim 16, wherein the latent curing agent is a phenolic compound.

4,732,962

HIGH TEMPERATURE EPOXY TOOLING COMPOSITION OF BISPHENOL-A EPOXY, TRIFUNCTIONAL EPOXY, ANHYDRIDE CURING AGENT AND AN IMIDAZOLE CATALYST

Richard P. Atkins, Utica, and Chen-Shih Wang, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1987, Ser. No. 15,997

Int. Cl.⁴ C08G *45/08*

U.S. Cl. 528—94 **10 Claims**

1. A durable, high temperature epoxy tooling composition

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for use in cast-to-size forming tools consisting essentially of bisphenol-A epoxy, a trifunctional aromatic epoxy, an anhydride curing agent, and an imidazole catalyst, said composition having a tensile strength of at least 80 MPa and a heat deflection temperature of at least 170° C. when cured.

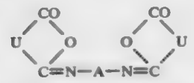
4,732,963

THERMOSETTING BIS(ISOIMIDE)-DIPHENOL RESIN

Robert L. Wank, 2449 Sommerset Dr., Brea, Calif. 92621, and John D. Harper, 5146 Dorado Dr., Huntingdon Beach, Calif. 92649

Filed Feb. 6, 1987, Ser. No. 11,696
Int. Cl.⁴ C08G *83/00*
U.S. Cl. 528—205 **6 Claims**

1. A thermosetting polymer resin prepared by the reaction of an ethylenically unsaturated bis(isoimide) having the general structure



wherein U represents a divalent radical containing a carbon-to-carbon double bond and having from two to twelve carbon atoms, and A represents a divalent radical having from two to thirty carbon atoms, with a dihydric phenol having the general structure

HO—A′—OH

wherein A′ represents phenylene or substituted derivatives thereof and contains from six to thirty carbon atoms, the molar ratio of said bis(isoimide) to said dihydric phenol being between 50:1 and 1:1 and the reaction temperature being between about 250° F. to about 500° F.

4,732,964

COPOLYESTER HOT MELT ADHESIVE

Richard E. Myers, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 24, 1987, Ser. No. 18,308
Int. Cl.⁴ C08G *63/16, 63/18*
U.S. Cl. 528—302 **11 Claims**

1. A copolyester which is particularly useful as a hot melt adhesive which is comprised of repeat units which are derived from (a) a diacid component which consists essentially of (1) from 70 to 90 mole percent terephthalic acid and (2) from 10 to 30 mole percent isophthalic acid; and (b) a diol component which consists essentially of (1) from 10 to 20 mole percent ethylene glycol and (2) from 80 to 95 mole percent hexamethylene glycol.

4,732,965

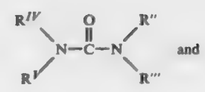
PROCESS FOR THE MANUFACTURE OF POLYAMIDES FROM DIAMINE AND DIAMIDE UTILIZING UREA AS CATALYST

Benedict S. Curatolo, Maple Heights; Robert C. Sentman, Macedonia, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 16, 1985, Ser. No. 809,596
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.⁴ C08G *69/28*
U.S. Cl. 528—336 **10 Claims**

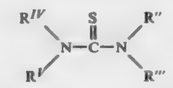
1. A process for the manufacture of a polyamide comprising contacting at least one α,ω-diamine, at least one α,ω-diamide and a catalyst comprising a urea, thiourea, or a derivative of urea or thiourea, at an elevated temperature and pressure; wherein the urea, thiourea and derivatives of urea and thiourea are selected from the group consisting

(A) urea and derivatives thereof having the structure



and

(B) thiourea and derivative thereof having the structure



wherein R″, R‴, R^{IV} and R^{V} are each independently hydrogen, a C_1–C_{20} aliphatic radical, a C_5–C_7 alicyclic radical or a phenyl radical.

4,732,966

POLYAMIDE RESIN CONTAINING FREE AMINO GROUPS PRODUCED FROM POLYMERIC FATTY ACID

Alec F. Wilson, Eltham, Great Britain, assignor to Coates Brothers PLC, Orpington, England

Filed Feb. 11, 1986, Ser. No. 828,765
Claims priority, application United Kingdom, Feb. 12, 1985, 8503515
Int. Cl.⁴ C08G *69/34*
U.S. Cl. 528—339.3 **4 Claims**

1. A polyamide containing free amino groups and suitable for use as a curing agent for polyepoxy compounds, said polyamide having an amine value of from 100 to 400 mg KOH/g, an acid value of from 0 to 20 mg KOH/g, and derived from (a) a polycarboxylic acid component comprising polymeric fatty acids together with from 10 to 90 mole %, based on the acid component of one or more aromatic dicarboxylic acids containing two carboxylic acid groups and at least one benzene ring, each carboxylic acid group being directly linked to a benzene ring, and (b) a polyamine component containing at least 50 mole % of at least one aliphatic polyamine defined by the formula:

$$H_2NR(RNH)_nNH_2$$

in which R is an alkylene radical and n is an integer of from 1 to 6.

4,732,967

POLYARYLENE SULPHIDE HAVING HIGH MELT VISCOSITY

Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf; Dieter Freitag, and Wolfgang Alewelt, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 761,360, Aug. 1, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 905,751
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3428984
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.⁴ C08G *75/16*
U.S. Cl. 528—388 **2 Claims**

1. Polyarylene-sulphide with a melt viscosity η_m 20 to 500,000 Pascal-seconds and an average weight relative molecular weight M_w(rel) from 25,000 to 500,000 wherein

$$1\ g\eta_m = 3.48.1\ gM_w(rel) - 14.25 \pm 0.1.$$

4,732,968

PROCESS FOR GRANULATING A WATER-ABSORBENT RESIN EMPLOYING (A) WATER (B) INORGANIC POWDER & (C) SURFACTANT IN AN INERT SOLVENT

Shigeji Obayashi, Akashi; Morio Nakamura, Kakogawa, all of Japan; Takushi Yamamoto; Hitoshi Tanaka; Yuji Sakamoto, and Yasuhiro Shimada, all of Himeji, Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed Dec. 3, 1986, Ser. No. 937,284
Claims priority, application Japan, Dec. 4, 1985, 60-273682
Int. Cl.⁴ C08J *3/12;* C08K *3/44*
U.S. Cl. 528—490 **11 Claims**

1. A process for granulating a water-absorbent resin, characterized in that 0.000005–0.2 part by weight of a powdery inorganic material is added with agitation in an inert solvent in the presence of 0.1–5.0 parts by weight of water and 0.005–0.2 part by weight of a surface active agent to 1 part by weight of a water-absorbent resin containing a carboxylate as a constituent of the polymer, and the water and the inert solvent are removed by distillation.

4,732,969

DES-19-LEUCINE, 20-GLUTAMINE-CALCITONIN

Ronald C. Orlowski, Frankfort; Jay K. Seyler, and James E. Geever, both of Bourbonnais, all of Ill., assignors to Armour Pharmaceutical Corporation, Blue Bell, Pa.

Filed May 5, 1986, Ser. No. 859,527
Int. Cl.⁴ C07K *7/36*
U.S. Cl. 530—307 **9 Claims**

1. des-19-leucine, 20-glutamine-Calcitonin, wherein the calcitonin is salmon, eel or chicken.

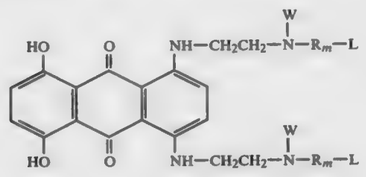
4,732,970

ANTITUMOR AMINO ACID AND PEPTIDE DERIVATIVES OF 1,4-BIS(AMINOALKYL AND HYDROXY-AMINOALKYL)AMINO)-5,8-DIHYDROXY-YANTHRAQUINONES

Thomas L. Fields; Keith C. Murdock, both of Pearl River; Martin L. Sassiver, Spring Valley, and Janis Upeslacis, Pomona, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 13, 1986, Ser. No. 874,195
Int. Cl.⁴ C07K *5/00, 5/02, 7/00;* C07C *103/75*
U.S. Cl. 530—323 **20 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein m is an integer from 1 to 10, inclusive; W is hydrogen or β-hydroxyethyl; L is hydrogen, carbobenzyloxy, tert.-butyloxycarbonyl or fluorenylmethoxycarbonyl; and each R group is an amino acid moiety independently selected from the group of D or L amino acids consisting of cysteine, leucine, isoleucine, phenylalanine, typrosine, proline, tryptophan, hydroxyproline, aspartic acid, asparagine, glutamic acid, glutamine, lysine, ornithine, arginine, histidine, alanine, glycine, methionine, valine, threonine and serine which are linked through amide bonds between the α-amino functionality of one amino acid and the carboxyl group of the adjacent amino acid and wherein any side-chain functionality may be substituted by protecting groups thereon; and the pharmacologically acceptable acid-addition salts thereof.

4,732,971

SYNTHETIC VACCINES FOR FOOT AND MOUTH DISEASE

Richard D. DiMarchi, Carmel, and Gerald S. Brooke, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 740,780, Jun. 3, 1985, abandoned. This application May 16, 1986, Ser. No. 864,186
Int. Cl.⁴ C07K *7/10;* A61K *39/00*
U.S. Cl. 530—324 **21 Claims**

1. A compound capable of eliciting a neutralization response against foot-and-mouth disease virus containing a sequence of the formula

X-A-Y-B-Z

in which A and B are amino acid residue sequences comprising sequences of the foot-and-mouth disease virus VP_1 capsid protein serotypes, one of which contains from 18 to 24 amino acid residues and includes the amino acid residue sequence in positions 141 to 158 of the O serotype or the equivalent sequence of other serotypes and the other of which contains from 14 to 20 amino acid residues and includes the amino acid residue sequence in positions 200 to 213 of the O serotype or the equivalent sequence of other serotypes;

X is H, H-Cys, or H-Cys-Cys, the sulfhydryls of which may be blocked or free;

Z is OH, Cys-OH, or Pro-Cys-Gly-OH, the sulfhydryls of which may be blocked or free; and

Y is a sequence of from about 2 to about 6 amino acid residues.

4,732,972

POLYPEPTIDES HAVING GROWTH HORMONE RELEASING ACTIVITY

Arthur M. Felix, West Caldwell, and Edgar P. Heimer, Sparta, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 577,660, Feb. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 472,700, Mar. 7, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 789,922
Int. Cl.⁴ C07C *103/52*
U.S. Cl. 530—324 **3 Claims**

1. (Leu^{27})-GRF(1-44).

4,732,973

ACTIVE SITE MODIFIED PROTEASE α-1-ANTITRYPSIN INHIBITORS

Philip J. Barr, Orinda; Robert A. Hallewell, San Francisco, and Steven Rosenberg, Oakland, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Jun. 14, 1984, Ser. No. 620,408
Int. Cl.⁴ C07K *13/00*
U.S. Cl. 530—350 **4 Claims**

1. An analog of human alpha-1-antitrypsin wherein the amino acid corresponding to the m. thionine at position 358 of wild-type alpha-1-antitrypsin is substuted with an aliphatic amino acid, said analog exhibiting human leukocyte elastase activity and resistant to oxidation by N-chlorosuccinimide.

4,732,974

METAL ION LABELING OF CARRIER MOLECULES

Robert A. Nicolotti, Furguson; Alan R. Ketring, both of Mo., Koon Y. Pak, Frazer, Pa., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 5, 1986, Ser. No. 836,535
Int. Cl.⁴ C07K *3/08;* A61K *39/00, 39/42, 43/00*
U.S. Cl. 530—390 **11 Claims**

1. A method of preparing a conjugate of a protein or polypeptide and a metal ion which comprises reacting a metal ion transfer complex comprising a chelate of 4,5-dihydroxyl-m-benzenedisulfonic acid or a salt thereof and a metal ion with a protein or polypeptide that is covalently bound to an exoge-

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nous chelating group, said exogenous chelating group having a greater chelating affinity than 4,5-dihydroxyl-m-benzenedisulfonic acid for the metal ion, the reaction being carried out in an aqueous medium at a pH at which the protein or polypeptide is stable.

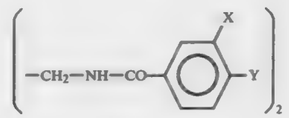
4,732,975

DISAZO COMPOUNDS

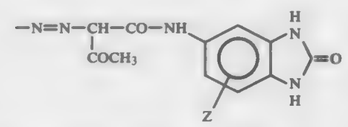
Manfred Pesenacker, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,818
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048610
Int. Cl.[4] C09B *33/153, 35/035;* D06P *1/44, 3/79*
U.S. Cl. 534—742 7 Claims

1. A compound of the formula



wherein one of the substituents X and Y means hydrogen, chlorine, methyl, methoxy or nitro, and the other means



wherein Z is hydrogen, chlorine or methyl.

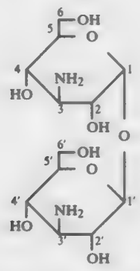
4,732,976

3,3-NEOTREHALOSADIAMINE ANTIBIOTIC AND PRODUCING IT WITH NOVEL MICROORGANISM

Takashi Tsuno, Higashimurayama, and Masataka Konishi, Kawasaki, both of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,880
Int. Cl.[4] C07G *11/00;* C07H *15/00, 17/00;* A61K *35/00*
U.S. Cl. 536—16.8 3 Claims

1. A 3,3'-neotrehalosadiamine compound represented by the structural formula:



its non-toxic pharmaceutically acceptable salts and hydrates.

3. A composition containing the compound of claim 1 and a pharmaceutically acceptable carrier.

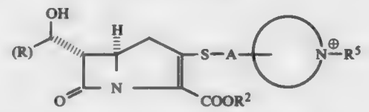
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CARBAPENEM ANTIBIOTICS

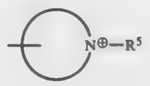
Choung U. Kim, Manlius, N.Y., assignor to Bristol Myers Company, New York, N.Y.

Division of Ser. No. 768,248, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 705,780, Feb. 22, 1985, Pat. No. 4,644,061, which is a continuation-in-part of Ser. No. 530,011, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 425,755, Sep. 28, 1982, abandoned. This application Nov. 10, 1986, Ser. No. 929,239
Int. Cl.[4] C07D *487/04;* A61K *31/40*
U.S. Cl. 540—350 10 Claims

1. A compound having the formula

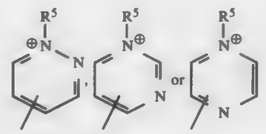


wherein A is C_1–C_6 straight or branched chain alkylene; R^2 is hydrogen, an anionic charge or a conventional readily removable carboxyl protecting group, providing that when R^2 is hydrogen or a protecting group, there is also present a counter ion; and



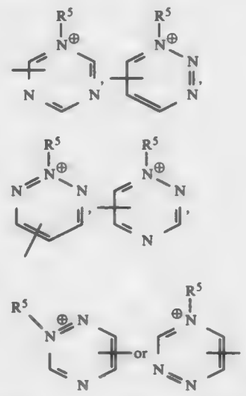
represents a radical of the formula

(a)



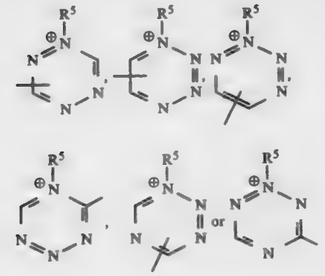
wherein R^5 is C_1–C_6 alkyl and wherein available ring carbon atoms are optionally substituted by 1–3 substituents independently selected from C_1–C_4 alkyl;

(b)



wherein R^5 is C_1–C_6 alkyl and wherein available ring carbon atoms are optionally substituted by 1 or 2 substituents independently selected from C_1—C_4 alkyl; or

(c)



wherein R^5 is C_1–C_6 alkyl and wherein an available ring carbon atom is optionally substituted by C_1–C_4 alkyl; or a pharmaceutically acceptable salt thereof.

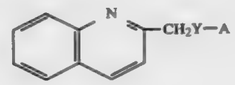
4,732,978

NOVEL SUBSTITUTED NAPHTHYLOXYMETHYL QUINOLINE DERIVATIVES AS ANTI-INFLAMMATORY AND ANTIALLERGY AGENTS

Anthony F. Kreft, Trooper; Kenneth L. Kees, West Chester; John H. Musser, Malvern; James J. Bicksler, Eagleville, and Winifred P. Howse, Phoenixville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 784,143, Oct. 3, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 905,619
Int. Cl.[4] A61K *31/47;* C07D *215/12*
U.S. Cl. 546—152 5 Claims

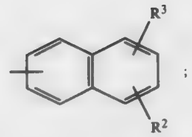
1. A compound having the formula



wherein
R is hydrogen or lower alkyl;
Y is $—CH_2—$, —S—, —O— or



and
A is



R^2 is hydrogen or halo; and
R^3 is hydrogen or halo.

4,732,979

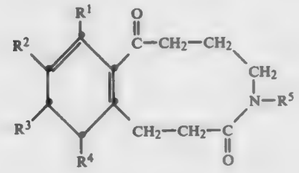
BENZAZECINE DERIVATIVES FOR COGNITIVE AND MEMORY FUNCTIONS

Werner Aschwanden, Ettingen; René Imhof, Gipf-Oberfrick, both of Switzerland; Roland Jakob, Inzlingen, Fed. Rep. of Germany, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 21, 1987, Ser. No. 5,712
Claims priority, application Switzerland, Jan. 23, 1986, 266/86
Int. Cl.[4] C07D *227/08, 225/06, 221/06;* A61K *31/395*
U.S. Cl. 540—461 20 Claims

1. A compound of the formula

I



wherein R^1 and R^2 are independently hydrogen or chlorine, R^3 is hydrogen, fluorine, chlorine, bromine or methoxy, R^4 is hydrogen, chlorine or methoxy, and R^5 is hydrogen, acetyl, propionyl, benzoyl, chlorobenzoyl, methoxybenzoyl or phenylacetyl, with the proviso that 2 or 3 of the groups R^1 to R^4 are hydrogen.

4,732,980

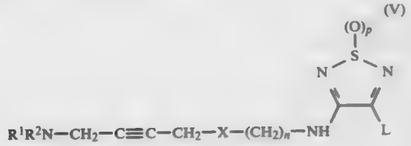
INTERMEDIATES FOR 3-AMINO-1,2,5-THIADIAZOLE-1-OXIDES

Thomas H. Brown, Tewin, and Peter Blurton, Welwyn Garden City, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 819,338, Jan. 16, 1986, Pat. No. 4,663,331. This application Dec. 8, 1986, Ser. No. 939,607
Claims priority, application United Kingdom, Jan. 22, 1985, 8501535
Int. Cl.[4] C07D *417/12, 285/10;* A61K *31/55*
U.S. Cl. 540—480 1 Claim

1. A compound of the formula (V):

(V)



wherein:
R^1 and R^2 are independently hydrogen or C_{1-6} alkyl, or R^1 and R^2 together represent $—(CH_2)_q—$wherein q is 4 to 7, to form together with the nitrogen atom to which they are attached, a 5–8 membered saturated ring, optionally substituted by C_{1-6} alkyl;
X is $—CH_2—$or sulphur;
n is 2 or 3, or if X is $—CH_2—$n can also be 1;

is 1 or 2; and
L is halogen, phenylthio, C_{1-6} alkoxy, or C_{1-6} alkylthio.

VOL 1088 ISS 4 MR 22 1988 UMI

4,732,981

3-PYRAZOLIDINONE SALTS

Malcolm D. Tirel, Alderley Edge, and William E. Long, Wilmslow, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

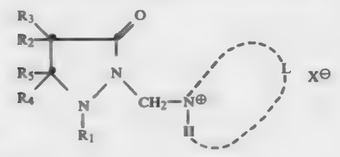
Division of Ser. No. 834,985, Feb. 28, 1986, Pat. No. 4,687,846. This application Apr. 1, 1987, Ser. No. 32,721

Claims priority, application United Kingdom, Mar. 15, 1985, 8506603

Int. Cl.[4] C07D *401/06, 413/06*

U.S. Cl. 544—140 4 Claims

1. A 1-phenyl-3-pyrazolidinone salt of the formula



in which

$X^{\ominus}$ is an inorganic anion,

L represents the atoms necessary to complete an unsubstituted pyrrolidine, piperidine or morpholine ring,

R_1 is phenyl which is unsubstituted or substituted by alkyl, alkoxy, chloro, hydroxyl or amino,

R_2 and R_3 are each hydrogen or lower alkyl which is unsubstituted or substituted or hydroxyl, alkoxy, aryloxy or amino, and

R_4 and R_5 are each hydrogen, lower alkyl which is unsubstituted or substituted by hydroxyl, alkoxy, aryloxy or amino, or phenyl which is unsubstituted or substituted by alkyl, alkoxy, chloro, hydroxyl or amino.

4,732,982

NOVEL ALKOXYIMINO ETHER DERIVATIVES OF 5-ACYL-2(1H)-PYRIDINONES

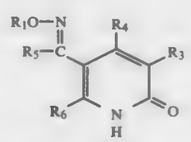
Winton D. Jones; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 548,398, Nov. 3, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 834,692

Int. Cl.[4] C07D *401/06*

U.S. Cl. 546—261 6 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein

R_1 is $C_{1\text{-}10}$ alkyl,

R_3 is H, lower alkyl, —C≡N, —NH_2, —$CONH_2$ or —COOR with R being hydrogen or lower alkyl,

R_4 is hydrogen or lower alkyl,

R_5 is pyridyl,

R_6 is hydrogen, $C_{1\text{-}10}$ alkyl, phenyl X-substituted phenyl, hydroxy or lower alkoxy, and X is lower alkyl, lower alkoxy, lower alkyl thio, lower alkyl sulfone, lower alkyl sulfoxide, halogen, nitro, lower alkanoyl, alkoxy carbonyl, carboxy, cyano, NH_2 , $CONH_2$, COOR with R being hydrogen or lower alkyl, amidino, imidazol-2-yl, or CF_3.

4,732,983

PYSCHOTROPIC POLYCYCLIC IMIDES

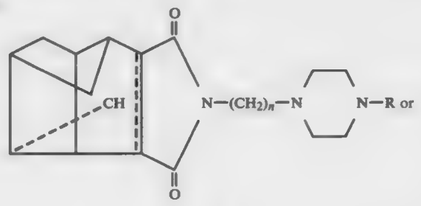
Gary P. Stack, Merion; Guy A. Schiehser, Malvern, both of Pa., and Magid A. Abou-Gharbia, Wilmington, Del., assignors to American Home Products Corporation, New York, N.Y.

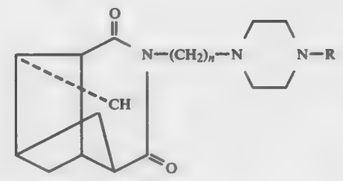
Filed Apr. 3, 1987, Ser. No. 34,522

Int. Cl.[4] C07D *401/14, 403/14, 403/04, 403/06*

U.S. Cl. 544—295 8 Claims

1. A compound of the formulae:





in which

n is one of the integers 2, 3, 4 or 5;

R is phenyl, halophenyl, trifluoromethylphenyl, alkoxyphenyl in which the alkoxy substituent contains 1 to 3 carbon atoms, 2-pyrimidinyl, halopyrimidin-2-yl, 2-pyrazinyl, halopyrazin-2-yl, 2-pyridinyl, halopyridin-2-yl, cyanopyridin-2-yl, quinolyl, or haloquinolyl;

and the dotted lines represent optional unsaturation; or a pharmaceutically acceptable salt thereof.

4,732,984

PIPERAZINOISOTHIAZOLONES WITH PSYCHOTROPIC ACTIVITY

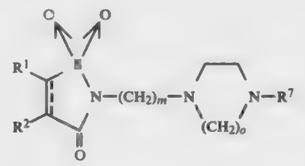
Magid A. Abou-Gharbia, Wilmington, Del.; Guy A. Schiehser, Malvern, and Scott J. Childress, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 788,315, Oct. 17, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,507

Int. Cl.[4] C07D *417/14*

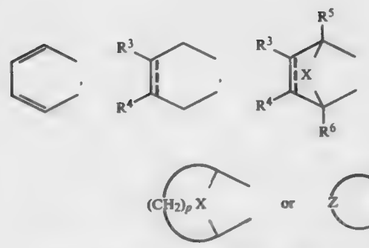
U.S. Cl. 544—295 22 Claims

1. A compound having the formula



wherein

R^1 and R^2 are each, independently, hydrogen, lower alkyl, aryl of 6 to 12 carbon atoms or halo, or R^1 and R^2 taken together represent —CH=CH—S—, =CH—S—CH=, —S—CH=CH—,



where the dotted lines represent optional double bonds;

R^3, R^4, R^5 and R^6 are each, independently, hydrogen, lower alkyl, aryl of 6 to 12 carbon atoms or halo;

R^7 is 2-pyridinyl, 2-pyrimidinyl, 2-pyrazinyl, 3-pyridazinyl or phenyl or any of

the foregoing R^7 moieties substituted by lower alkyl, trifluoromethyl,

cyano, nitro or halo, with the proviso that when R^1 and R^2 taken together represent



then R^7 is other than 2-pyridinyl, 2-pyrimidinyl, substituted pyrimidin-2-yl, phenyl or substituted phenyl;

Z is—$(CH_2)_m$— or vinylene;

X is lower alkylene, vinylene or O;

m is 2–5;

n is 1–4;

o is 1–3;

p is 1–4;

and the pharmaceutically acceptable salts thereof.

4,732,985

2-OXYGEN CONTAINING HETEROALKOXYALKYL DIHYDROPYRIDINE INTERMEDIATES

David Alker, Margate; Simon F. Campbell, Deal, and Peter E. Cross, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

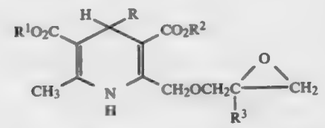
Filed Nov. 5, 1986, Ser. No. 927,881

Claims priority, application United Kingdom, Nov. 9, 1985, 8527698

Int. Cl.[4] C07D *403/12*

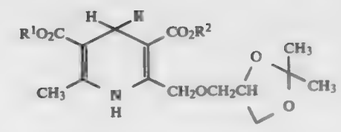
U.S. Cl. 546—268 2 Claims

1. A compound of the formula



wherein R is selected from the group consisting of 2-chlorophenyl, 2,3-dichlorophenyl and 2-chloro-3-trifluoromethylphenyl; R^1 and R^2 are independently C_1–C_4 alkyl and R_3 is H or C_1–C_4 alkyl.

2. A compound of the formula



wherein R is slected from the group consisting of 2-chlorophenyl, 2,3-dichlorophenyl and 2-chloro-3-trifluoromethylphenyl; and R^1 and R^2 are independently C_1–C_4 alkyl.

4,732,986

BENZOTHIAZOLE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Kay Brune, Marloffstein; Heidrun Engler, Cadolzburg; Istvan Szelenyi, Schwaig; Peter Mörsdorf, Cadolzburg; Helmut Schickaneder, Eckental, and Kurt H. Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

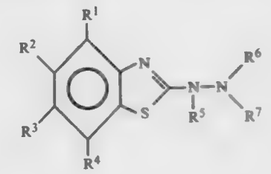
Continuation of Ser. No. 716,716, Mar. 27, 1985, abandoned. This application May 12, 1987, Ser. No. 51,214

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413875

Int. Cl.[4] C07D *277/82*

U.S. Cl. 548—161 6 Claims

1. Benzothiazole derivatives corresponding to the general formula I



(I)

wherein

R^1 represents a hydrogen atom,

R^2 represents a hydrogen or halogen atom,

R^3 represents a hydrogen atom, a halogen atom or a C_1–C_3 alkyl group,

R^4 represents a hydrogen atom,

R^5 represents a linear C_1–C_3 alkyl group,

R^6 represents a hydrogen atom, and

R^7 represents a formyl group; and the physiologically acceptable salts thereof.

4,732,987

PROCESS FOR THE PREPARATION OF D-(+)-BIOTIN

Eike Poetsch, Mühltal, and Michael Casutt, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 39,342

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613245; Feb. 7, 1987, 3703872

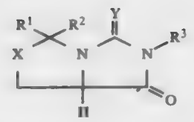
Int. Cl.[4] C07D *495/04*

U.S. Cl. 548—303 18 Claims

1. A process for the preparation of D-(+)-biotin, comprising:

(i) Reducing a starting material compound of the formula,

VOL 1088 ISS 4 MR 22 1988 UMI

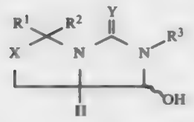


wherein

R^1 and R^2 are each in independently H, alkyl, substituted alkyl, cycloalkyl, aryl, aralkyl or heteroaryl, wherein the heteroatom is O, N, or S, or taken together are alkylene, substituted alkylene or heteroalkylene, wherein the heteroatom is O, N, or S;

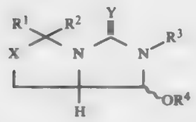
R^3 is H or benzyl, benzyl substituted by one or more of C_{1-4}-alkyl, C_{1-4}-alkoxyl, C_{35} alkyl-2-enyl or C_{3-6}-trialkylsilyl;

X and Y independently are each O or S; to an alcohol of the formula



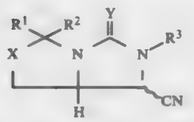
by reacting said starting material compound with a reducing agent or by catalytically hydrogenating said starting material compound;

(ii) converting said alcohol into an activated ester of the formula

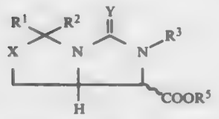


wherein R^4 is an activating ester group and is alkanoyl, aroyl, alkylsulfonyl or azole.M, wherein azole is a fused or non-fused, substituted or unsubstituted, nitrogen-containing 5-membered ring, and M is CO, CS, SO_2, SO or S;

(iii) reacting said activated ester with an alkali metal cyanide, an alkaline earth metal cyanide or a cyanosilane, to give a nitrile of the formula

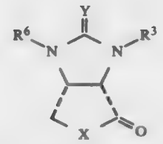


(iv) reacting said nitrile with a base or an acid to give an acid derivative of the formula



wherein R^5 is H or alkyl;

(v) cyclizing said derivative with water being split off, to give a lactone of the formula



wherein R^6 is H or R^1R^2CH;

(vi) converting the product of step (v) by known processes to D-(+)-biotin.

4,732,988

BICYCLIC PRECURSORS FOR THE PREPARATION OF BIOTIN

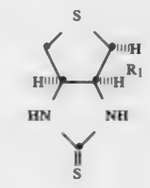
Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 910,116, Sep. 30, 1986, Pat. No. 4,694,087, which is a division of Ser. No. 807,064, Feb. 18, 1986, Pat. No. 4,631,345, which is a division of Ser. No. 587,757, May 17, 1984, Pat. No. 4,581,459, which is a division of Ser. No. 379,247, May 17, 1982, Pat. No. 4,468,516. This application Jul. 13, 1987, Ser. No. 72,931

Int. Cl.[4] C07D *495/04*

U.S. Cl. 548—303 **2 Claims**

1. A compound of the formula



wherein

R_1 is $-(CH_2)_4CH_3$,

$-(CH_2)_3OR$ or $-(CH_2)_5OR$ wherein R is alkyl, said alkyl having from 1 to 4 carbon atoms,

$-(CH_2)_4CN$, or $-(CH_2)_4COOR'$ wherein R' is alkyl or phenyl, said alkyl having from 2 to 4 carbon atoms.

4,732,989

SUBSTITUTED ALKYL IMIDAZOLE DERIVATIVES

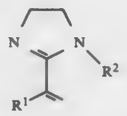
Peter L. Myers, Aylesbury, and Chris D. Floyd, Great Missendes, both of Great Britain, assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 717,981, Mar. 29, 1985. This application Oct. 17, 1986, Ser. No. 919,949

Int. Cl.[4] C07D *233/04*; A61K *31/415*

U.S. Cl. 548—352 **5 Claims**

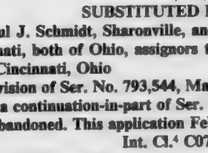
1. A compound of the formula



wherein

R^1 is phenyl or substituted phenyl wherein the phenyl is substituted with from 1 to 3 substituents independently selected from the group consisting of C_1–C_4 alkyl and halogen; and

R^2 is C_1–C_{12} alkyl, phenyl, phenyl (C_1–C_4 alkyl), substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of C_1–C_4 alkyl, halogen and trifluoromethyl; or a



group wherein t is an integer of from 1 to 4 and W^1, W^2, and W^3 are independently hydrogen, C_1–C_4 alkyl, halogen or trifluoromethyl.

4,732,990

QUATERNIZED NITROGEN CONTAINING COMPOUNDS

Robert B. Login, Oakland; Ratan K. Chaudhuri, Butler; David J. Tracy, Lincoln Park, and Michael W. Helioff, Westfield, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Oct. 24, 1986, Ser. No. 922,923

Int. Cl.[4] C07D *207/12, 211/76, 295/12*

U.S. Cl. 548—550 **9 Claims**

1. The quaternized compound having the formula



wherein X^- is a chloride, bromide or iodide anion; m is an integer having a value of from 1 to 4; R is C_3 to C_9 alkylene and is optionally substituted with C_1 to C_4 alkyl and R_1, R_2 and R_3 are each independently selected from the group consisting of alkyl, hydroxyalkyl, aryl, alkaryl, and aralkyl radicals, said groups having from 1 to 30 carbon atoms and at least one of R_1, R_2 and R_3 having at least 8 carbon atoms in a linear chain.

4,732,991

SUBSTITUTED PHTHALIDES

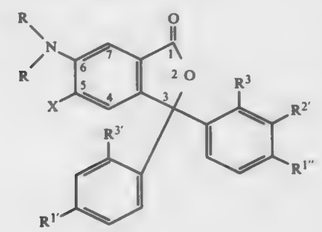
Paul J. Schmidt, Sharonville, and Nathan N. Crounse, Cincinnati, both of Ohio, assignors to Hilton Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 793,544, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 726,482, Sep. 24, 1976, abandoned. This application Feb. 18, 1986, Ser. No. 830,300

Int. Cl.[4] C07D *307/88*

U.S. Cl. 549—308 **3 Claims**

1. A 3-(2-$R^{3'}$-4-$R^{1'}$-phenyl)-3-(2-R^3-3-$R^{2'}$-4-$R^{1''}$-phenyl) 5-X-6-N(R)$_2$phthalide of the formula



wherein

R represents non-tertiary alkyl of one to four carbon atoms;

$R^{1'}$ represent non-tertiary alkoxy of one to three carbon atoms;

$R^{1''}$ represent dialkylamino in which alkyl is non-tertiary alkly of one to four carbon atoms;

$R^{2'}$ represents hydrogen or alkyl of one to three carbon atoms;

R^3 represents hydrogen, alkyl of one to three carbon atoms, non-tertiary alkoxy of one to four carbon atoms, halo or dialkylamino in which alkyl is non-tertiary alkyl of one to four carbon atoms;

$R^{3'}$ represents hydrogen, alkyl of one to three carbon atoms, non-tertiary alkoxy of one to four carbon atoms or halo; and

X represents hydrogen or halo.

4,732,992

METHOD FOR RECOVERY OF ALKYLALUMINUM HALIDES

Loyd W. Fannin, Dickinson; Clark C. Crapo, Houston, and Dennis B. Malpass, LaPorte, all of Tex., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1986, Ser. No. 944,726

Int. Cl.[4] C07F *3/06*

U.S. Cl. 556—129 **6 Claims**

1. In a process for the production of dialkylzinc compounds by reaction of a trialkylaluminum compound either with zinc chloride or with metallic zinc and an alkyl halide, in which a dialkylaluminum halide is produced as a co-product, the dialkylzinc is removed from the reaction products by distillation, and the dialkylaluminum halide is thereafter removed from the reaction products by distillation, the improvement comprising contacting the dialkylaluminum halide, prior to removal of it by distillation, with a dialkylaluminum hydride.

4,732,993

FLUOROALKOXYALUMINUM COMPOUNDS AND THEIR USE IN POLYMERIZATION PROCESSES

Dennis B. Malpass, La Porte; Andrzej M. Piotrowski, Houston, and Michael J. Breen, La Porte, all of Tex., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 21, 1986, Ser. No. 933,410

Int. Cl.[4] C07F *5/06*

U.S. Cl. 556—181 **15 Claims**

1. A compound having the formula

$$R_nAl(OR_f)_{3-n}$$

in which R is a C_1–C_6 alkyl group, R_f is a C_1–C_6 fluoroalkyl group, and $0<n<3$.

4,732,994

STABILIZED ORGANOPOLYSILOXANE OILS

Manfred Riederer, Burghausen, and Martin Piehler, Mehring, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 61,630

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620503

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—401 **6 Claims**

1. A method for stabilizing organopolysiloxane oils containing triorganosiloxy groups in their terminal units, which comprises contacting the organopolysiloxane oils with a compound selected from the group consisting of the formulas

$$R'_3SiX \text{ and } (R'_3Si)_2Y,$$

where R' is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and halogenated monovalent hydrocarbon radicals having from 1

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to 18 carbon atoms; X is selected from the group consisting of a halogen atom, a hydrogen atom, a hydroxyl group and a monovalent radical consisting of nitrogen, hydrogen, oxygen and has from 0 to 6 carbon atoms and which is bonded to the silicon atom via an oxygen or a nitrogen atom; Y is a divalent radical selected from the group consisting of an oxygen atom, a radical of the formula NH, a radical of the formula NR'', and a divalent radical consisting of nitrogen, hydrogen, oxygen and has from 0 to 6 carbon atoms, which is bonded to the silicon atoms via a group selected from oxygen, nitrogen and oxygen and nitrogen atoms and R'' represents a hydrocarbon radical having from 1 to 8 carbon atoms.

4,732,995

NOVEL ISOCYANATE SILANE DERIVATIVES HAVING AT LEAST ONE TRIFLUOROETHOXY GROUP

Yasushi Yamamoto, Takasaki, Japan, assignor to Shin-Estu Chemical Co., Ltd., Japan

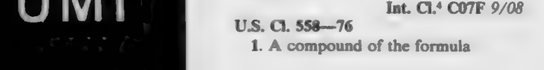
Filed Jun. 18, 1987, Ser. No. 63,532

Claims priority, application Japan, Jun. 19, 1986, 61-143514

Int. Cl.[4] C07F *7/10, 7/18*

U.S. Cl. 556—414 **7 Claims**

1. A isocyanate silane derivative of the following general formula



in which R represents an unsubstituted or substituted monovalent hydrocarbon group having from 1 to 8 carbon atoms, and n is a value of 0, 1 or 2.

4,732,996

TREATMENT OF ALKOXYSILANES

Kenneth W. Moorhead; Kirsten L. Reading; David J. Rengering, all of Midland, and Antony P. Wright, Mills Township, Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 10, 1987, Ser. No. 13,742

Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—466 **21 Claims**

1. A process for reducing residual chloride level in an alkoxysilane having a boiling point at atmospheric pressure of less than about 130° C., said process comprising:

(A) contacting at a pressure greater than atmospheric and at a temperature of higher than about 130° C. the alkoxysilane and an alkaline metal compound, said compound being selected from a group consisting of (i) alkaline metal oxides and (ii) alkaline metal hydroxides;

(B) cooling the materials so contacted; and

(C) separating any residual solids from the alkoxysilane, said residual solids comprising at least unreacted alkaline metal compound and salts resulting from the reaction of the alkaline metal compound and the residual chloride.

4,732,997

DIBENZOXAPHOSPHORIN COMPOUNDS

Paul Tschopp, Düdingen, and David G. Leppard, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

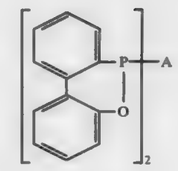
Division of Ser. No. 795,859, Nov. 7, 1985, Pat. No. 4,661,440. This application Nov. 18, 1986, Ser. No. 932,211

Claims priority, application Switzerland, Nov. 7, 1984, 5359/84

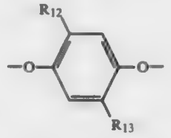
Int. Cl.[4] C07F *9/08*

U.S. Cl. 558—76 **1 Claim**

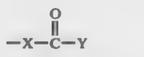
1. A compound of the formula



wherein A is a group of the formula



in which R_{12} and R_{13} are each a group of the formula



wherein X is C_2–C_8-alkylene and Y is a OR_4 or $—N(R_5)(R_6)$ group wherein R_4 is C_1–C_{18}-alkyl which is uninterrupted or interrupted one or more times by —O— or is phenyl or benzyl, R_5 and R_6, independently of each other, are each hydrogen, C_1–C_{18} alkyl, phenyl, benzyl or a $—(CH_2)_m—O—R_8$ group wherein R_8 is C_1–C_{18}-alkyl and m is a number between 1 and 4.

4,732,998

BISPHOSPHONIC ACIDS AND ESTERS

Ernst T. Binderup, Tåstrup, Denmark, assignor to Leo Pharmaceutical Products, Ltd., Ballerup, Denmark

PCT No. PCT/DK85/00071, § 371 Date Mar. 31, 1986, § 102(e) Date Mar. 31, 1986, PCT Pub. No. WO86/00902, PCT Pub. Date Feb. 13, 1986

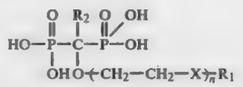
PCT Filed Jul. 25, 1985, Ser. No. 852,248

Claims priority, application United Kingdom, Jul. 31, 1984, 8419489

Int. Cl.[4] C07F *9/38, 9/40*

U.S. Cl. 558—161 **10 Claims**

1. A compound of formula I



(I)

in which R_1 is a straight or branched, saturated or unsaturated aliphatic or alicyclic C_1–C_{10} hydrocarbon radical, an aryl or an aryl-C_1–C_4-alkyl radical, R_1 if desired being unsubstituted or substituted with straight or branched C_1–C_4-alkyl, amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)-amino, carboxy, C_1–C_4-alkoxycarbonyl, hydroxy, C_1–C_4-alkoxy, phenoxy, mercapto, C_1–C_4-alkylthio, phenylthio, halogen, trifluoromethyl; R_2 stands for hydrogen, C_1–C_8-alkyl, aryl-C_1–C_4-alkyl or halogen; X is O or S, and n is an integer from 0 to 2; with the provisos that R_2 cannot be hydrogen or methyl if n=O and R_1 is methyl and that R_2 cannot be hydrogen or methyl if n=O and R_1 is unsubstituted n-butyl, n-pentyl or n-hexyl; and pharmaceutically acceptable, non-toxic salts and in the body easily hydrolyzable esters thereof.

4,732,999

OPTICALLY-ACTIVE DI-[3-CHLORO-2-OXY-PROPYLTRIMETHYLAMMONIUM]-TARTRATE

Leander Tenud, Visp, and Jacques Gosteli, Basel, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Division of Ser. No. 832,760, Feb. 25, 1986, which is a continuation-in-part of Ser. No. 717,547, Mar. 29, 1985. This application Jun. 24, 1986, Ser. No. 877,784

Claims priority, application Switzerland, Apr. 4, 1984, 1704/84

Int. Cl.[4] C07C *121/43*

U.S. Cl. 558—354 **8 Claims**

1. Process for producing optically-active carnitine nitrile chloride from optically-active di-(3-chloro-2-oxy-propyltrimethylammonium)-tartrate comprising (a) dissociating di-(3-chloro-2-oxypropylmethylammonium)-tartrate using tartaric acid at a temperature and a pH which are effective to achieve said dissociation, whereby optically-active 3-chloro-2-oxy-propyltrimethylammonium is obtained, (b) converting the latter with a strong base into optically-active glycidyltrimethylammonium chloride at a temperature and a pH which are effective to achieve said conversion, and (c) reacting the chloride with acetone cyanohydrin or prussic acid at a temperature and a pH which are effective to achieve said reaction, whereby the optically-active carnitine nitrile chloride results.

4,733,000

OPTIALLY ACTIVE 1-AMINO-2-(4-HYDROXYPHENYL)ETHYLPHOSPHONIC ACID AND DERIVATIVES THEREOF

Kunikatsu Shirahata, Tokyo, Japan, and Masaji Kasai, Rockville, Md., assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

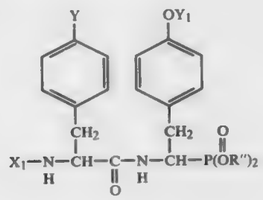
Continuation of Ser. No. 697,420, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 442,184, Nov. 16, 1982, abandoned. This application Mar. 17, 1986, Ser. No. 842,744

Claims priority, application Japan, Nov. 17, 1981, 56-184199

Int. Cl.[4] C07F *9/40*

U.S. Cl. 558—166 **4 Claims**

1. A compound of the formula:



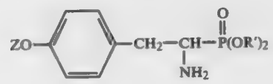
wherein

R'' is lower alkyl;

X_1 is benzyloxycarbonyl or t-butoxycarbonyl; and

Y is hydrogen, hydroxyl or a group represented by OY_1, wherein Y_1 is a hydroxyl-protecting group selected from the group consisting of methyl, ethyl, benzyl and benzyloxycarbonyl, and wherein the aromatic amino acid part has L-configuration and the 1-amino-2-(4-hydroxyphenyl)ethylphosphonic acid part has negative specific rotation.

4. A compound of the formula:



wherein R' is lower alkyl and Z is benzyl.

4,733,001

METHOD FOR PREPARING A MIXTURE OF STEREOISOMERS OF α-CYANO-3-PHENOXYBENZYL ISOVALERATE ESTER DERIVATIVES HAVING A HIGHER INSECTICIDAL AND ACARICIDAL ACTIVITY

Yukio Suzuki; Masahiro Hayashi, both of Osaka, and Kenzi Takuma, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

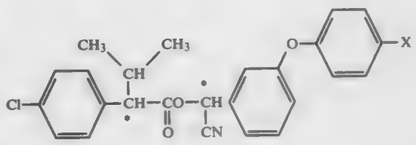
Filed May 28, 1981, Ser. No. 267,982

Claims priority, application Japan, May 28, 1980, 55-71940

Int. Cl.[4] C07C *121/52*

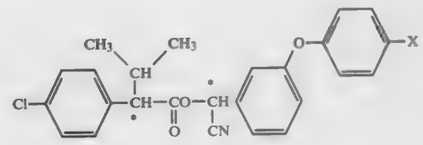
U.S. Cl. 558—354 **34 Claims**

1. A method for preparing a mixture of stereoisomers of α-cyano-3-phenoxybenzyl isovalerate ester derivatives of the formula:



wherein X is a hydrogen atom or a fluorine atom, and * indicates an asymmetric carbon atom, which mixture is rich in a Y-isomer which is an enantiomer pair of a compound of said formula, one enantiomer having an (S)-configuration on both the acid and alcohol moieties and the enantiomer thereof having an (R)-configuration on both the acid and alcohol moieties, which method comprises removing crystals of a compound of said formula rich in an X-isomer which is an enantiomer pair of a compound of said formula, one enantiomer having an (S)-configuration on the acid moiety and an (R)-configuration on the alcohol moiety and the enantiomer thereof having an (R)-configuration on the acid moiety and an (S)-configuration on the alcohol moiety, from a mother liquor containing an ester of said formula which is a mixture of said X-isomer and said Y-isomer to obtain a mixture rich in said Y-isomer.

27. A crystalline-form mixture of stereo-isomers of α-cyano-3-phenoxybenzyl isovalerate ester derivatives of the formula:



wherein X is a hydrogen atom or a fluorine atom, and * indicates an asymmetric carbon atom, which contains at least 60% of an enantiomer pair of a compound of said formula, one enantiomer having an (S)-configuration on the acid moiety and an (R)-configuration on the alcohol moiety and the enantiomer thereof having an (R)-configuration on the acid moiety and an (S)-configuration on the alcohol moiety.

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4,733,002

LIPOXYGENASE INHIBITOR

Kazumasa Yokoyama; Chikara Fukaya, both of Osaka; Masanori Sugiura, Kyoto; Youichiro Naito, Kyoto; Youichiro Nishida, Kyoto, and Tadakazu Suyama, Kyoto, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

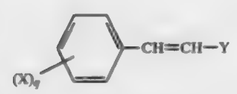
Filed May 23, 1985, Ser. No. 737,005

Claims priority, application Japan, May 23, 1984, 59-104998; May 23, 1984, 59-104999; Jun. 22, 1984, 59-129530; Jun. 27, 1984, 59-133496; Aug. 8, 1984, 59-166981; Aug. 31, 1984, 59-183253

Int. Cl.[4] C07L *69/76*

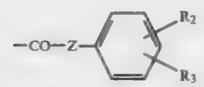
U.S. Cl. 560—55 6 Claims

1. A lipoxygenase inhibitor composition comprising as active ingredient a lipoxygenase inhibiting effective amount of a substituted styrene derivative having formula (I)



(I)

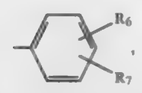
wherein X represents a hydroxyl group or a lower alkoxy group, q is an integer of 2 or 3; and Y represents a member selected from the group consisting of —$COOR_1$ wherein R_1 represents an alkyl group having 4 to 10 carbon atoms, which may be substituted by halogen(s);



wherein R_2 and R_3 each represents a hydrogen atom, a lower alkoxy group or a hydroxyl group and Z represents a radical of the formula, —O—$(CH_2)_n$—CH=CH—, —NH—$(CH_2)_n$—CH=CH— or —NH—$(CH_2)_n$—, wherein n is an integer of 1 to 4; —CO—NH—C_mH_{2m+1} wherein m is an integer of 6 to 14; —CO—$(CH_2)_l$—R_4 wherein R_4 represents a phenyl group which may be substituted by a hydroxyl group, a lower alkoxy group or a halogen atom, or a hydrogen atom and l is zero or an integer of 1 to 7, said l being an integer of 1 to 7 when said R_4 represents a hydrogen atom; and —C_pH_{2p}—R_5 wherein R_5 represents a hydrogen atom or a



wherein R_6 and R_7 each represents a hydrogen atom, a hydroxyl group, a lower alkoxy group or a halogen atom and p is an integer of 1 to 8 when R_5 is a hydrogen atom, and zero or an integer of 1 to 5 when R_5 is



and a pharmaceutically acceptable carrier.

4,733,003

OCTAHYDRONAPHTHALENE DERIVATIVES AND THEIR PREPARATION

Junya Ide; Shigeki Muramatsu; Yoshio Tsujita, and Masao Kuroda, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

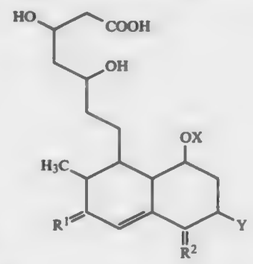
Division of Ser. No. 753,254, Jul. 9, 1985, Pat. No. 4,604,472, which is a continuation of Ser. No. 421,395, Sep. 22, 1982, abandoned. This application May 6, 1986, Ser. No. 860,185

Claims priority, application Japan, Sep. 25, 1981, 56-151871

Int. Cl.[4] C07C *131/02, 131/14, 69/74, 61/10*

U.S. Cl. 560—119 14 Claims

1. A compound of the formula (II):



(II)

wherein

X represents a hydrogen atom or a 2-methylbutyryl group;

Y represents a hydrogen atom or a methyl group;

R^1 and R^2 are the same or different and each represents an oxygen atom or a group of formula =N—OR^3 wherein R^3 represents a hydrogen atom or an alkyl grouo and with the proviso that at least one of R^1 and R^2 is =N—OR^3);

or a pharmaceutically acceptable salt or ester thereof.

4,733,004

CONTINUOUS ESTERIFICATION OF METHACRYLIC ACID AND PRODUCT RECOVERY

Ralph F. Pascoe, Marysville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,621

Int. Cl.[4] C07C *67/08*

U.S. Cl. 560—205 5 Claims

1. In the process for the esterification of methacrylic acid with a lower alkanol to form the corresponding ester over a solid cationic catalyst in which the methacrylic acid is used in excess of the alkanol on a molar basis, the improvement which comprises carrying out the process at a temperature in the range of from 60° to 150° C. and:

(A) employing a hydraulically fluidized solid catalyst reactor for the continuous esterification reaction,

(B) including in the esterification reaction a solvent which is a hydrocarbon having from 6 to 15 carbon atoms,

(C) passing the effluent from the esterification reactor into a first distillation column in which the ester and water by-product are taken overhead,

(D) taking the unesterified methacrylic acid, solvent, and heavy residues from the bottom of the first distillation column,

(E) separating the water from the ester overhead from (C) and recovering the ester product,

(F) separating heavy residues from the methacrylic acid-solvent from (D) in a second distillation column,

(G) recycling the methacrylic acid-solvent from (F) back to the esterification reactor (A), and

(H) disposing of the heavy residues from (F).

4,733,005

PHOSPHINYL-CONTAINING ETHYLENICALLY UNSATURATED COMPOUNDS

Donald L. Schmidt, and Gerald K. McEwen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 854,275, Apr. 21, 1986, Pat. No. 4,658,003. This application Dec. 1, 1986, Ser. No. 936,685

Int. Cl.[4] C07F *9/32*

U.S. Cl. 560—222 6 Claims

1. (Hydroxy)-phosphinylalkyl acrylate, (hydroxy)-phosphinylalkyl methacrylate, or an alkali metal, alkaline earth metal or ammonium salt thereof.

4,733,006

CARBONYLATION PROCESS WITH AN ALKALI METAL ACETATE AS CATALYST STABILIZER

Thomas C. Singleton, Chesterfield, and Frank E. Paulik, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 221,228, Dec. 29, 1980, abandoned. This application Aug. 18, 1983, Ser. No. 524,508

Int. Cl.[4] C07C *51/10, 51/12, 53/08, 67/36, 67/37*

U.S. Cl. 562—519 5 Claims

1. In a carbonylation process wherein at least one reactant selected from the group consisting of an alcohol, an ester derivative of said alcohol, a halide derivative of said alcohol and an ether derivative of said alcohol is (1) reacted with carbon monoxide in a liquid phase in a reaction zone and in the presence of a catalyst system that contains (a) rhodium component, and (b) an iodine or bromine component, (2) passing at least a portion of the liquid reaction mass in which the carbon monoxide has been depleted from the reaction zone to a separation zone, and (3) recycling the remaining liquid reaction mass from the separation zone to said reaction zone, the improvement which comprises supplying to the carbon monoxide deficient zones of the process a separately added catalyst stabilizer soluble in said reaction mass in an amount sufficient to maintain the rhodium component in soluble form, said catalyst stabilizer being an alkali metal acetate.

4,733,007

PROCESS FOR THE PRODUCTION OF 1,12-DODECANOIC DIACID

Juan Andrade, Ridgewood, N.J.; Klaus Koehler, Hainburg, and Guenter Prescher, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 77,843

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628664

Int. Cl.[4] C07C *51/235*

U.S. Cl. 562—534 12 Claims

1. A process for the production of 1,12-dodecanoic diacid comprising selecting undecyl-10-ene-acid as an unsaturated carboxy compound and hydroformylating said compound in the presence of a rhodium complex catalyst to form the corresponding aldehyde in a reaction mixture, said catalyst being hydridotris-triphenylphosphine-rhodium-carbonyl combined with triphenylphosphine and/or triphenylphosphite, and thereafter oxidizing the 11-formyl undecanoic acid which is thus formed with oxygen in the presence of an inorganic or organic Co(II) salt.

4,733,008

PROCESS FOR THE PRODUCTION OF 1,12-DODECANOIC DIACID

Juan Andrade, Ridgewood, N.J.; Klaus Koehler, Hainburg, and Guenter Prescher, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 77,844

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628662

Int. Cl.[4] C07C *51/235*

U.S. Cl. 562—534 12 Claims

1. A process for the production of 1,12-dodecanoic diacid comprising selecting 1,9-decadiene as an olefin and hydroformylating said olefin in the presence of a rhodium complex catalyst to form the corresponding aldehyde in a reaction mixture, said rhodium complex being hydridotris-triphenylphosphine-rhodium-carbonyl combined with triphenylphosphine and/or triphenylphosphite, and thereafter oxidizing the 1,12-dodecane-dialdehyde which is thus formed with oxygen in the presence of an inorganic or organic Co(II) salt.

4,733,009

METHOD FOR SEPARATING GLYCINE AND L-SERINE FROM A SOLUTION CONTAINING SAME

Shoichiro Miyahara; Toshio Matsumoto; Tooru Miyahara; Akio Sakaguchi, and Kazunari Nitta, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,160

Claims priority, application Japan, Jul. 29, 1985, 60-165936

Int. Cl.[4] C07C *99/12*

U.S. Cl. 562—554 9 Claims

1. A method for separating glycine and L-serine from a solution thereof which comprises:

(a) passing a solution containing both glycine and L-serine in the dissolved state through a column of a strongly acidic ion exchange resin having an effective size of 0.15 to 0.40 mm and a uniformity coefficient of not greater than 1.7 at a linear velocity of not greater than 2 meters per hour, followed by passing water through the column at a linear velocity of not greater than 2 meters per hour to obtain an effluent fraction containing a substantial portion of said L-serine charged as an effluent, while retaining the glycine within the column, and then

(b) bringing an alkaline solution into contact with the column to obtain an eluate containing substantially all of said glycine.

4,733,010

METHOD OF SEPARATING MONOHYDRATE OF L-CYSTEINE HYDROCHLORIDE

Shyoichiro Miyahara; Toshiaki Kamiguchi; Tadashi Hashimukai, and Kazunari Nitta, all of Fukuoka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 9, 1987, Ser. No. 59,845

Claims priority, application Japan, Jun. 19, 1986, 61-141425

Int. Cl.[4] C07C *51/487;* C07B *57/00*

U.S. Cl. 562—554 5 Claims

1. A method of separating L-cysteine from a solution containing L-cysteine, L-cystine, L-serine and an inorganic salt, comprising:

adding hydrochloric acid to said solution until it contains at least 15% by weight of hydrochloric acid;

holding said solution at a temperature of at least 20° C. to separate a solid containing said L-cystine and said salt from said solution;

cooling said solution to a temperature not higher than 10° C. to allow crystallization to form the monohydrate of L-cysteine hydrochloride; and

separating said monohydrate from said L-serine in said solution.

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4,733,011

NEW INTERMEDIATES FOR THE PREPARATION OF 13-THIAPROSTAGLANDIN DERIVATIVES

Bernhard Riefling, Seeheim, and Hans-Eckart Radunz, Mühltal, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

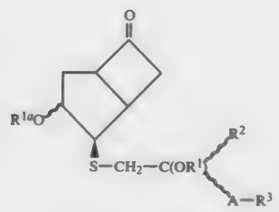
Division of Ser. No. 280,191, Jul. 6, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 767,015

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025325

Int. Cl.[4] C07C *177/00*

U.S. Cl. 568—43 17 Claims

1. A compound of the formula



wherein A is a C—C single bond, —CH_2—, —$CH(CH_3)$—, —$C(CH_3)_2$—, —CH_2—CH_2—, —$CH(CH_3)CH_2$—, —$C(CH_3)_2CH_2$—, —CH_2—CH_2—CH_2— or —CH_2O—; R^{1a} and R^1 each independently is hydrogen or a protective group which can be cleaved by solvolysis with an acid or a base or by catalytic hydrogenolysis; R^2 is H or alkyl of 1 to 3 C atoms; R^3 is alkyl of 3 to 5 C atoms, phenyl or phenyl which is monosubstituted to trisubstituted by F, Cl, OH, OCH_3, OC_2H_5, CF_3 or alkyl or 1 to 3 C atoms, or, when A is not —CH_2O—, can also be pyridyl, thienyl, naphthyl or alkoxy of 1 to 4 C atoms; ▬ indicates a bond in the β-position and a wavy line (〰) means that the bond can be in the α- or β-position.

4,733,012

PROCESS FOR THE PREPARATION OF 4-HALOMETHYLBENZALDEHYDE

Hermann Brüunling, and Dieter Kippe, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,834

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611760

Int. Cl.[4] C07C *45/63*

U.S. Cl. 568—437 13 Claims

1. A process for the preparation of a 4-halomethylbenzaldehyde, the halogen being chlorine, bromine or iodine, comprising the step of:

reacting 4-hydroxymethylbenzaldehyde with a hydrogen halide selected from the group consisting of gaseous hydrogen chloride, aqueous hydrochloric acid, a combination of gaseous hydrogen chloride and aqueous hydrochloric acid, gaseous hydrogen bromide, aqueous hydrobromic acid, a combination of gaseous hydrogen bromide and aqueous hydrobromic acid, gaseous hydrogen iodide, aqueous hydriodic acid and a combination of gaseous hydrogen iodide and aqueous hydriodic acid.

4,733,013

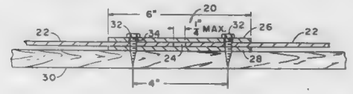
SHIELD SYSTEM AND SANDWICH SEAM FOR ATTENUATION OF ELECTROMAGNETIC ENERGY

Leland H. Hemming, Poway, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 22, 1986, Ser. No. 921,707

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 MS 23 Claims



1. A structure for attenuating the passage of electromagnetic energy comprising

at least two panels made of electromagnetic energy-attenuating material having adjacent edges thereof disposed in substantially abutting relationship to form at least a portion of an enclosure,

electromagnetic energy-attenuating strips disposed astraddle and lengthwise of the adjacent edges of said panels on opposing faces thereof with substantially no non-energy-absorbing material therebetween, and

two rows of relatively closely spaced screws connecting said strips and panels together in a sandwich seam that substantially resists passage of electromagnetic energy.

4,733,014

LEAD FRAME

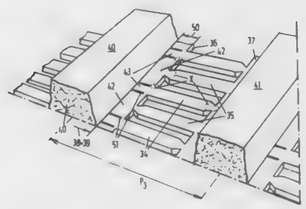
Richardus H. Fierkens, Herwen, and Dirk de Kler, Loosdrecht, both of Netherlands, assignors to ASM-Fico Tooling B.V., Netherlands

Filed May 25, 1983, Ser. No. 498,144

Claims priority, application Netherlands, May 26, 1982, 8202154

Int. Cl.[4] H01L *23/48*

U.S. Cl. 174—52 FP 3 Claims



3. In a semiconductor device lead frame for a molded semiconductor device package and having at least a pair of finger leads and a dam bar therebetween for cooperation with a package molding die, the improvement wherein the dam bar is partially severed from each finger lead on its edge intended for facing a molded body of the package.

4,733,015

TERMINATION ASSEMBLY

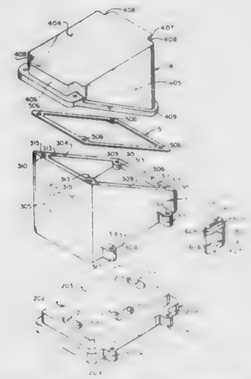
Bruce M. Barnes, Valencia, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 5, 1986, Ser. No. 859,340

Int. Cl.[4] H05K *5/06*

U.S. Cl. 174—65 R 14 Claims

1. A termination assembly comprising a plastic molded support fixture, a plastic molded enclosure and a plastic molded lid, and connecting means for connecting said support fixture, enclosure and lid, said support fixture having a floor having top and bottom surfaces, and at least one open-ended tube depending from said floor bottom surface and opening through said top surface of said floor; said enclosure having a bottom wall, at least one socket wall depending from said bottom wall, said socket wall having an inner surface defining a socket with an open mouth at a lower end thereof of a shape and position complementary to the opening of said tube in said top surface of said support fixture floor, and a knock-out plate forming a closure for said enclosure socket at the upper end thereof, the wall defining the inside surface of said support fixture tube being convergent downwardly through at least a portion of its height, the inner surface of the socket defined by the enclosure socket wall being convergent upwardly, and an elastically compressible grommet, shaped complementarily to said tube and socket walls being seated in said tube and socket and compressed therebetween when said support fixture and enclosure are assembled, said grommet having a linear element-receiving opening in it.



4,733,016

TRANSIT FOR CABLES AND PIPES

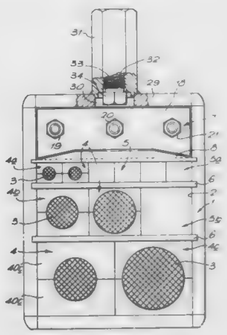
Michael Twist, Davyhulme, and Alan Platt, Denton, both of England, assignors to Hawke Cable Glands Limited, Staffordshire, England

Filed Feb. 2, 1987, Ser. No. 9,943

Claims priority, application United Kingdom, Feb. 11, 1986, 8603369

Int. Cl.[4] H02G *3/18*

U.S. Cl. 174—65 R 12 Claims



1. A lead-through transit of the kind comprising a rectangular metal frame defining an opening through which cables or pipes extend, a series of sets of modular blocks assembled in

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rows within said frame opening, said modular blocks surrounding each cable or blanking off a modular space, and a compression and packer assembly mounted in said frame opening and clamping the assembled modular blocks together and around each cable with the compression and packer assembly completing filling of said frame opening, the improvement being that said compression and packer assembly comprises:

a rigid plate located in said frame and applying pressure to the assembled array of said blocks and cables in a first direction which is in a plane transverse to the axes of said cables and substantially within opposed side walls of said frame between which rows of said modular blocks extend;

a compression bolt mounted in an end wall of said frame for threaded displacement in said first direction and temporarily engaging said plate to apply a load to said plate and said assembled array and temporarily clamping said modular blocks and cables together;

a plurality of packer blocks of resilient material including at least one first packer block inserted into a clearance space in said frame opening between said end wall and said plate and beside said compression bolt to partially fill said clearance space and at least one a second packer block which is inserted into said clearance space beside said at least one first packer block after said compression bolt is removed from said clearance space such that said packer blocks are seated beside each other between said side walls of said frame and completely filling said clearance space, each said packer block defining a respective through bore extending in a second direction substantially parallel to said axes of the cables, and

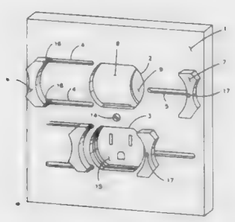
a respective compressor stud extending through each said bore and applying compression to the associated packer block within the confines of said frame to maintain pressure on said plate and said assembled array of modular blocks and cables.

4,733,017

ELECTRICAL OUTLET COVER PLATE

Sherry J. Wolfe-Taylor, 19114 Wickfield Ave., Warrensville Hts., Ohio 44122, and Donald B. Keys, 1998 Nelawood Ave., East Cleveland, Ohio 44112

Filed Dec. 3, 1986, Ser. No. 937,403
Int. Cl.⁴ H02G *3/14*
U.S. Cl. 174—67 **2 Claims**



1. A cover plate having means for covering electrical outlets of the standard type used in residential, commercial and industrial locations, said cover plate including a pair of shutters for each outlet of said standard type electrical outlets, each shutter of said pair being spring-loaded and having an access hole located therein, each shutter of said pair including an independent-positioning lever to shift said shutter, said shutter access holes when shifted being alignable with each other and also with a corresponding access hole located in said cover plate, there being one outlet of said standard type electrical outlets exposed for each said pair of shutters shifted into such alignment, thereby allowing the insertion of an electrical-plug terminal.

4,733,018

THICK FILM COPPER CONDUCTOR INKS

Ashok N. Prabhu, E. Windsor Township, Mercer County; Kenneth W. Hang, W. Windsor Township, Mercer County, and Edward J. Conlon, Princeton Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 2, 1986, Ser. No. 914,304
Int. Cl.⁴ H05K *1/09*; **C03C** *8/04, 8/16, 8/18*
U.S. Cl. 174—68.5 **6 Claims**

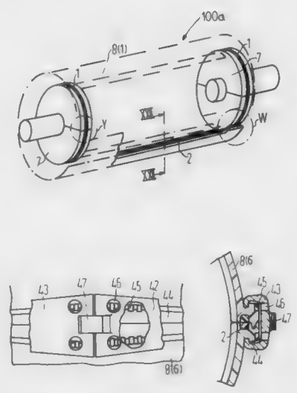
1. A copper conductor ink comprising, on a weight basis:
(a) from about 65 to about 85 percent of copper powder;
(b) from about 5 to about 15 percent of a glass frit comprising, on a weight basis:
from about 52 to 53 percent of zinc oxide;
from about 25 to 26 percent of boron trioxide;
from about 6 to 8 percent of silicon dioxide;
from about 7 to 12 percent of lead oxide;
from about 2 to 5 percent of aluminum oxide;
from 0 to about 2 percent of antimony trioxide; and
from 0 to about 1 percent of cerium oxide;
(c) from about 1 to about 4 percent of bismuth oxide; and
(d) from about 5 to about 25 percent of a suitable organic vehicle.

4,733,019

CABLE JOINT WITH END BODIES AND A LONGITUDINALLY SLOTTED SLEEVE

Klaus Pichler, Otterfing; Dieter Kunze, Neuried; Jan Rost, Traubing, and Wolfgang Haeder, Eichenau, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,471
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1985, 3536599
Int. Cl.⁴ H02G *15/113*
U.S. Cl. 174—92 **24 Claims**



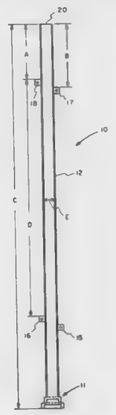
1. In a cable joint having a pair of end bodies with sealing glands for cables extending therethrough and a sleeve having a longitudinally extending slot with two edge portions with flanges, said sleeve being wrapped around the spaced apart end bodies and held there by a closing means engaging said flanges, the improvements comprising a sealing system having annular sealing portions and at least one longitudinal sealing portion, said flanges having a wedge shape and having means for forming a groove for receiving and holding the longitudinal sealing portion between the flanges, said flanges having radial indentations on a radial outer surface, said closing means including a pair of closing bars having a wedge shape for engaging the flanges, said closing bars having cut out portions to enable engaging said indentations with a tool to urge the closing bar into and out of a closing position on said flanges, said sealing portions being of an elastic material constructed to be sufficiently flexible so that the closing bars and flanges can be constructed as simple as possible and can be actuated by utilizing conventional tools for obtaining the necessary closing pressure.

4,733,020

DIELECTRIC UTILITY CABLE GUARD

Carl T. Elzy, Newbury Park, Calif., assignor to General Telephone Company of California, Thousand Oaks, Calif.

Filed May 18, 1987, Ser. No. 50,653
Int. Cl.⁴ H02G *3/04, 3/26*
U.S. Cl. 174—136 **12 Claims**



1. An electrically non-conductive utility cable riser guard for use in connection with an above ground structure, said guard comprising:
a channel-shaped open-ended elongated body having a rounded bottom portion and two side-wall portions, said body being composed of a glass fiber reinforced synthetic resin material having an overall thickness greater than ¼";
attachment means for securing said body to an above ground structure, said attachment means comprising a plurality of flat tabs integral to and extending from the outer edge of each side-wall portion; and
a stepped footing integrally molded to one end of said body and comprising a plurality of concentric steps extending longitudinally from said body for mating with electrical conduits of different diameters.

4,733,021

LINE TIE ASSEMBLY WITH CAPTURED CUSHIONING PAD

James A. Weir, Carthage, Tex., assignor to Helical Line Products Company, Rocky River, Ohio

Filed Dec. 31, 1986, Ser. No. 948,308
Int. Cl.⁴ H01B *17/22*
U.S. Cl. 174—173 **22 Claims**



1. A line tie assembly for securing an elongated line to a support therefor, the support including a head portion having a line-receiving groove and a reduced diameter neck portion mounting the head portion, said line tie assembly comprising:
(a) a first line tie component for wrapping about the neck portion of the support and for wrapping about a first adjacent portion of the line for securing the line to the support;
(b) a second line tie component separate from said first line tie component for wrapping about the neck portion of the support diametrically opposite from said first line tie component and for wrapping about a second adjacent portion of the line on an opposite side of the support from the first adjacent line portion for securing the line to the support; and
(c) a flexible cushioning device connected to and extending between both of said first and second line tie components in a captured relationship, said cushioning device adapted to be disposed between the line and the groove in the support.

15. A line tie for securing an elongated line to a support therefor, the support including a head portion having a line-receiving groove and a reduced diameter neck portion mounting the head portion, said line tie comprising:
a first tie portion having a pair of legs with helical preformed configurations for wrapping about a first adjacent portion of the line and a U-shaped bight integrally connecting said pair of legs, said bight for wrapping about the neck portion of the support; and
a flexible cushion portion for location between the line and the groove in the support, said flexible cushion portion having a body and a tab extending from said body, said tab having means for looping about a portion of said U-shaped bight to pivotally connect said flexible cushion portion with said first tie portion.

4,733,022

TOUCH SCREEN INPUT SYSTEM

R. Langdon Wales, Moccasin Hill, Lincoln, Mass. 01773, and H. W. Crowley, 310 Parker, Newton, Mass. 02159

Filed Jan. 3, 1986, Ser. No. 816,065
Int. Cl.⁴ G09C *21/00*
U.S. Cl. 178—18 **30 Claims**



1. A touch screen input system for use with a display screen having a photo-active display surface including a controllable sweeping beam, said system comprising: at least one photo-detector means, means for mounting the photo-detector means adjacent the photo-active display surface but in non-interfering view of the photo-active display surface, in combination with detection means including means for continuously registering the position of the beam in the display surface, pointer means adapted to reflect light directly from the beam to said photo-detector means to provide a latch signal, and means responsive to said latch signal and said means for continuously registering for holding a signal identifying display screen location corresponding to pointer means location.

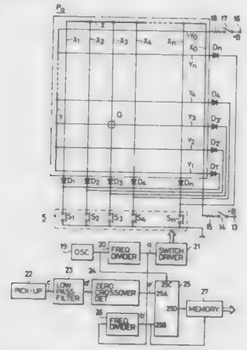
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4,733,023

COORDINATE POSITION DIGITIZING SYSTEM FOR DETERMINING POSITION OF A PICK-UP ELEMENT RELATIVE TO A PLATE IN HORIZONTAL AND VERTICAL DIRECTIONS EMPLOYING SEQUENTIAL SWITCHING OF VERTICAL AND HORIZONTAL CONDUCTORS

Hideshi Tamaru, Sagamihara; Akio Sakano, Ibaragi; Nobuo Kitamura, Sagamihara; Kimiyoshi Yoshida, Zushi, and Kunio Shikakura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 507,092, Jun. 23, 1983, abandoned.
This application Sep. 18, 1986, Ser. No. 908,959
Claims priority, application Japan, Jul. 10, 1982, 57-120441
Int. Cl.[4] G09C *21/00*; G01B *07/14*
U.S. Cl. 178—20 10 Claims



1. A coordinate position digitizing system comprising;

a position determining plate having a first connecting line along a first direction on the plate and a second connecting line along a second direction on the plate, a plurality of first conductors extending in parallel with one another at intervals of a regular space, each of said first conductors having one end connected to said first connecting line as a common line, a plurality of second conductors extending in parallel with one another at intervals of a regular space and across said first conductors, each of said conductors having one end connected to said second connecting line as a common line,

first and second control switch means, the first control switch means selectively connecting the first connecting line to one pole of a power supply when the second control switch means is open and the second control switch means selectively connecting the second connecting line to said one pole of the power supply, so that the first and second switch means alternately connect the first and second lines to said one pole,

driving and controlling means provided in common to said first conductors and said second conductors for sequentially connecting the other ends of said first conductors to another pole of the power supply during a first sequence when said first control switch means is closed and for sequentially connecting the other ends of said second conductors to said another pole of the power supply during a second sequence when said second control switch means is closed,

pick-up means movably positioned with respect to the position determining plate and responsive to field variations caused by the operation of the driving and controlling means to produce a signal representative of the position of the pick-up means with respect to the first and second directions of the position determining plate, and

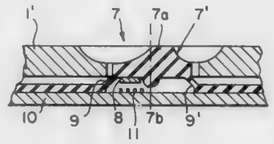
information producing means connected to the pick-up means for producing a smoothly varying signal from a signal output by the pick-up means, and for determining a cross-over of the smoothened signal over a predetermined potential, the information producing means including timing means for receiving a first time signal for each entire first and second sequence when one of the first or second position switches is closed and for receiving a second time signal corresponding to said cross-over of said predetermined potential, and utilizing said first and second time signals to determine a horizontal or vertical position of the pick-up means depending upon whether the second or first position switch is closed.

4,733,024

KEY SWITCH

Masaji Takeshima, and Kiyoshi Kinugawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1986, Ser. No. 924,337
Claims priority, application Japan, Nov. 7, 1985, 60-171680[U]
Int. Cl.[4] H01H *19/04*
U.S. Cl. 200—6 R 7 Claims



1. A key switch comprising;

a depressable element;

a key switch surface positioned to only one, first side of center on an upper surface of said depressable element, said key switch surface having at least a generally flat top portion;

a flexible element allowing said depressable element to move vertically at least when a force substantially perpendicular to said flat top portion is applied to said key switch surface;

rotation fulcrum means for permitting said depressable element to move in a predetermined direction when a second force which is nonperpendicular to said flat top portion is applied to said key switch surface;

movable contact means positioned to another, second side of center on an underside of said depressable element, said first and second sides being on opposite sides of center of said depressable element; and

stationary contact means adapted to touch said movable contact means when said depressable element rotates on said fulcrum means in the predetermined direction when said second force is applied to said key switch surface of said depressable element.

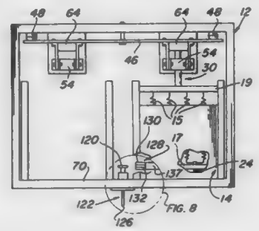
4,733,025

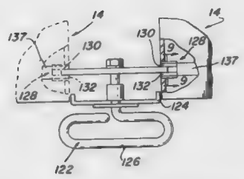
MULTI-STATION POWER SUPPLY WITH ROTARY SWITCH FOR CONNECTING TWO STATIONS TOGETHER

David H. Buerkel, Wayne, Pa., assignor to Applied Energy Systems, Inc., Malvern, Pa.

Division of Ser. No. 892,670, Aug. 1, 1986, Pat. No. 4,682,046.
This application Jul. 20, 1987, Ser. No. 75,380
Int. Cl.[4] H02J *1/00*
U.S. Cl. 200—16 B 4 Claims

1. A multi-station electrical apparatus including a support for slidably receiving at least two control units positioned adjacent to each other, each control unit being slidable between a first position, in which said unit is connected to a positive potential, and a second position, in which said unit is connected to a negative potential, said adjacent control units including electrical connectors joined to circuitry of its respective unit, and bridging connector means associated with said support and movable between a first position, out of engagement with the electrical connectors of said adjacent control





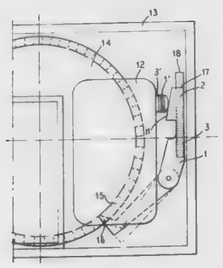
units, and a second position interconnecting the electrical connectors of the adjacent control units for coupling the circuitry of the adjacent control units together.

4,733,026

ADJUSTABLE SWITCH AND ACTUATOR ARM

Gerhard Wehrle, Donaueschingen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 10,985
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 8602585
Int. Cl.[4] H01H *43/10, 3/42*; F16H *53/00*
U.S. Cl. 200—38 D 7 Claims



6. An electrical appliance switch having a switchable contact assembly, comprising:

switch controller;

cylindrical actuator in contact with said switch controller, said actuator having detent toothing on at least a portion thereof; and

adjustable longitudinal actuation cam having at least one notch for frictionally engaging said detent toothing, said actuation cam having an oblong tubular jacket for surrounding a portion of said actuator and having a closed bottom end, an inner diameter of said jacket being slightly greater than an outer diameter of said cylindrical actuator, said actuation cam contacting the switchable contact assembly;

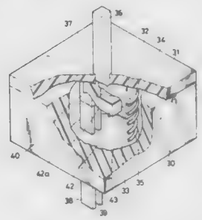
wherein adjustment of said actuation cam substantially sets a lead path of said actuator.

4,733,027

AUTO-RETURN TYPE PUSH SWITCH

Toshihisa Hirata, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 20, 1987, Ser. No. 4,968
Claims priority, application Japan, Mar. 18, 1986, 61-38285[U]
Int. Cl.[4] H01H *15/02*
U.S. Cl. 200—16 D 2 Claims



1. An auto-return type push switch comprising a case composed of an open casing and a cover plate for covering the open face of said casing,

a slide member accomodated movably in said casing which has a lug projecting outside said case through a hole in said cover plate, a cylinder portion, and a collar portion,

a pair of fixed electrodes disposed side by side in parallel erected on a bottom surface of said casing, each of said electrodes having a non-conductor portion and a conductor portion for providing the ON/OFF state of the swtich,

a clip-shaped movable contact segment accomodated in said cylinder portion of said slide member which is contactable with said fixed electrodes, and

a helical spring provided between said collar portion of said slide member and the bottom surface of said casing so as to surround said cylinder portion,

wherein one contact leaf of said movable contact segment is in sliding contact with one of said fixed electrodes and the other contact leaf with the other of said fixed electrodes.

4,733,028

SWITCH

Dennis P. Flumignan, Sterling Heights, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Jan. 27, 1987, Ser. No. 6,918
Int. Cl.[4] H01H *1/42, 13/02, 15/02*
U.S. Cl. 200—16 B 1 Claim

1. An electrical switch comprising:

an insulating housing defining a chamber having an opening therein,

a pair of electrically conductive terminals extending into said chamber,

an insulating member extending into said chamber between and beyond said terminals in juxtaposed supporting relation thereto,

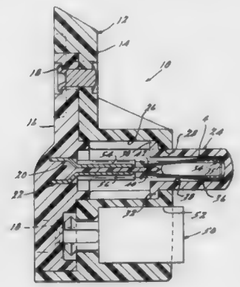
a plunger, extending outwardly of said chamber through the opening therein and movable relative thereto and to said terminals,

spring means normally biasing said plunger outwardly of said housing,

a U-shaped conductive contact member supported by said plunger for movement therewith, said contact member having spaced leg portions engageable with said terminals, respectively, to complete an electrical circuit there-

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between, engagement of said contact member with said terminals moving the leg portions of said contact member away from one another thereby to develop inherent resilient contact pressure on said terminals, respectively, the



insulating member on said housing extending between the legs of said contact member at all positions of said plunger and supporting said terminals in compression against contact pressure exerted by the leg portions of said contact member.

4,733,029

OPERATING HANDLE LOCKING DEVICE FOR CIRCUIT INTERRUPTER

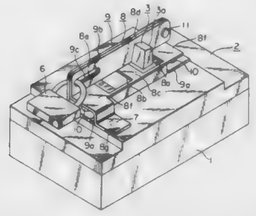
Yoshiaki Kobayashi, and Yutaka Nakayama, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 20, 1986, Ser. No. 865,015

Claims priority, application Japan, May 23, 1985, 60-111031; May 23, 1985, 60-76611[U]

Int. Cl.⁴ H01H *9/28*

U.S. Cl. 200—43.15 **2 Claims**



1. An operating handle locking device for holding an operating handle of an electrical switchgear in an ON position or in an OFF position, said operating handle locking device comprising:

a locking plate having a first aperture for receiving therein the operating handle when it is in the ON position, a second aperture for receiving therein the operating handle when it is in the OFF position, and a blocking portion disposed between said first and second apertures for blocking the movement of the operating handle between said positions;

a support plate secured to said switchgear for movably supporting said locking plate in an operating handle nonlocking position in which the operating handle is disengaged from said first and second apertures;

a locking means for locking said locking plate in an operating handle locking position relative to said support plate; and

a trip button for externally tripping the switchgear, said locking plate further having a cover portion for covering said trip button when said locking plate is in the locking position.

4,733,030

STEERING COLUMN SWITCH FOR MOTOR VEHICLES

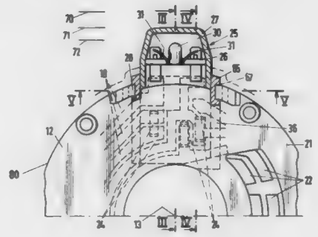
Herbert Erdelitsch; Walter Hecht, and Horst Rachner, all of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

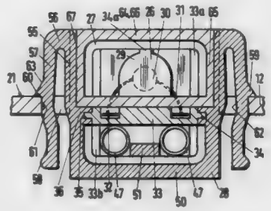
Filed Dec. 16, 1986, Ser. No. 942,169

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544804

Int. Cl.⁴ H01H *9/00*

U.S. Cl. 200—61.54 **6 Claims**





1. A switch assembly for use on a steering column of a motor vehicle, said switch assembly comprising a printed circuit board for mounting on a steering column so that it extends approximately perendicular thereto, first stationary contact means on one side of said printed circuit board and second stationary contact means on a second side thereof, said first and second sides being opposite each other, a switch lever including a first switch slide member adjacent said first stationary contact means, said switch lever being rotatably moveable for moving said first switch slide member in a plane parallel to said first side of said printed circuit board for connecting or disconnecting said first switch slide member with said first stationary contact means and selectively operating an electric circuit, an actuating member and a second switch slide member moveable in a straight line parallel and adjacent said second side of said printed circuit board for connecting or disconnecting said second switch slide member with said second stationary contact means and selectively operatibng an electric hazard warning circuit, a socket adjacent said second side of said printed circuit board which receives and guides said actuating member and said second switch slide member, said socket including a plurality of extensions extending generally perpendicular to said printed circuit board from adjacent said second side therof, each of said extensions terminating adjacent said first side of said printed circuit board in a free end, and a locking hook formed on each free end, the locking hooks bearing on said first side of said printed circuit baord and locking said second switch slide member and actuating member to said printed circuit board.

4,733,031

SWITCHING APPARATUS PROTECTED AGAINST SHORT CIRCUIT CURRENTS

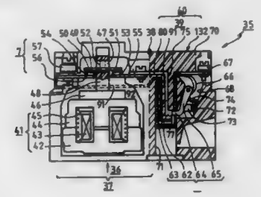
Elie Belbel, 11, rue des Econdeaux, 93800 Epinay Sur Seine; Christian Blanchard, 4, rue de Tilana, 92000 Nanterre; Andrè Haury, 75, Avenue, Thiers, 93340 Le Raincy, and Michel Lauraire, 43, Avenue du Capitaine Guynemer, 92400 Courbevoie, all of France

Filed May 6, 1986, Ser. No. 860,372

Claims priority, application France, May 6, 1985, 85 07163

Int. Cl.⁴ H01H *9/30, 33/00*

U.S. Cl. 200—144 A **13 Claims**



1. A protective switching apparatus comprising:

a first connection terminal adapted to be connected to a current line of an electrical network, so as to have an electrical potential;

a second connection terminal adapted to be connected to a load which is conceived so as to be traversed by a nominal current;

a first switch which is controlled by an electromagnet and which is adapted for establishing and interrupting frequently said nominal current, said first switch comprising a first input power terminal connected to said first connection terminal, and an output power terminal;

a second switch with automatic opening having properties for limiting fault currents, so as to provide protection of said line and to prevent dammage of the first switch, said second switch having a second input power terminal connected to said first output terminal, a second output power terminal connected to said second connection terminal, first and second contacts respectively connected to said second input power terminal and to said second output power terminal and means acting on at least one of said contacts when a fault current is occuring, for causing the second switch to pass from a closed position to an open position wherein a first arc path having a first resistance is formed between said first and second contacts;

a transfer electrode located in the vicinity of said first and second contacts and isolated therefrom, said transfer electrode being connected to said first connection terminal by a conductor placed in parallel across the first switch;

and a first mobile isolating piece adapted to be propelled between said first and second contacts during said automatic opening, so as to form with said transfer electrode and said second contact a second arc path having a second resistance less than the said first resistance.

4,733,032

ELECTRIC CIRCUIT BREAKER ARC CHUTE COMPOSITION

Franco P. Pardini, Milan, Italy, assignor to General Electric Company, New York, N.Y.

Filed Jun. 1, 1987, Ser. No. 55,967

Int. Cl.⁴ H01H *33/02*

U.S. Cl. 200—144 C **16 Claims**

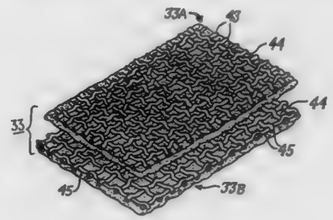
1. A current limiting circuit breaker comprising:

a molded plastic case and cover;

a pair of separable contacts arranged at the ends of a corresponding pair of contact carriers within said case;

an operating mechanism connected with one of said contact carriers for moving one of said contacts between open and closed positions; and

an arc chute facing said contacts and receiving an arc which forms when said contacts are separated while current flows through said contacts, said arc chute including a



plurality of metal arc plates supported by a pair of opposing side supports, each of said side supports comprising a first layer of woven cloth fibers impregnated with a plastic resin arranged on a second layer of woven glass fibers impregnated with said plastic resin.

4,733,033

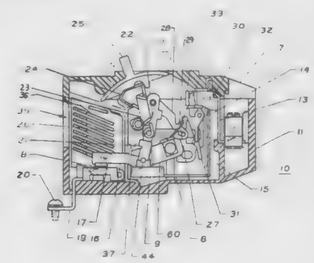
MOLDED CASE CIRCUIT BREAKER CONTACT ARRANGEMENT INCLUDING A SPRING CLIP CONTACT ARM RETAINER

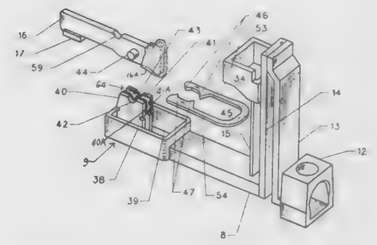
Robert A. Morris, Burlington; James M. Mitsch, West Hartford; Irenaeus S. Panus, New Britain; Yuet-Ying Yu, Waterbury, and Roger N. Castonguay, Terryville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,974

Int. Cl.⁴ H01H *9/00, 3/62*

U.S. Cl. 200—153 G **15 Claims**





1. A molded case circuit breaker comprising:

a stationary contact carrioer member having a stationary contact affixed at one end thereof and a terminal lug at an opposite end thereof for connection with an external circuit;

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a movable contact carrier support comprising a shaped metal bar having a pair of spaced parallel posts extending from one end;

a movable contact carrier comprising a contact end and a pivot end and having a movable contact affixed at said conatct end and a pivot pin within said pivot end, said pivot end of said movable contact carrier being movably retained between said spaced parallel posts;

an operating mechanism connected with said movable contact carrier to lift said movable contact away from said stationary contact and interrupt circuit current through said stationary and movable contacts;

means for sensing circuit current through said contacts and articulating said operating mechanism when said circuit current reaches a predetermined threshold; and

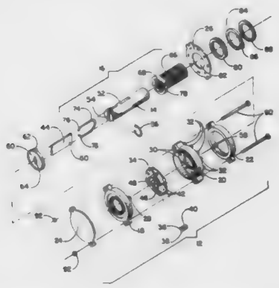
spring clip retainer means arranged in press-fit relation around said spaced parallel posts and said movable contact carrier pivot end to hold said movable contact carrier pivot end in electrical contact with said spaced parallel posts, said spring clip retainer means comprising a U-shaped flat metal strip terminating in a pair of spaced arms which are connected at one end by a bight portion, said spaced arms being co-planar with each other and with said bight portion.

4,733,034

COMPACT ROTARY SWITCH

L. Lamar Armstrong, and Peter Medicks, both of 525 Truck La., P.O. Box 860, Smithfield, N.C. 27577

Filed Jan. 15, 1987, Ser. No. 3,609
Int. Cl.[4] H01H *19/54*
U.S. Cl. 200—155 R **2 Claims**



1. A compact rotary switch comprising:

(a) a switch housing;

(b) a switch assembly disposed within said housing and rotatable about an axis of rotation;

(c) an externally threaded bushing for mounting said switch to a panel, said bushing being mounted on said switch housing and centered about said axis of rotation, said bushing including an inner serrated bearing surface having a plurality of circumferentially spaced grooves;

(d) a shaft rotatively journaled within said bushing for rotating said switch assembly, said bushing having a slot-like opening formed therein which aligns with the circumferentially spaced grooves on said inner bearing surface; and

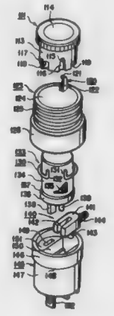
(e) spring means disposed within said slot-like opening in said shaft for yieldably stationing said shaft at incremental angles of rotation, said spring means being outwardly biased so as to engage and seat within said circumferentially spaced grooves in said inner serrated bearing surface.

4,733,035

SWITCH WITH DEVICE FOR PREVENTING ERRONEOUS OPERATION

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Industrial Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 884,141
Claims priority, application Japan, Jan. 28, 1986, 61-9617[U]; Apr. 4, 1986, 61-49681[U]
Int. Cl.[4] H01H *3/20*
U.S. Cl. 200—328 **1 Claim**



1. A switch including means for preventing erroneous operation, comprising:

a switch body having fixed contacts and a movable contact mounted therein;

a bushing securing to an upper portion of said switch body, said bushing having a generally cylindrical body with a central bore therethrough;

a generally cylindrical rotary knob having a cylindrical lower portion rotatably fitting said bushing central bore and having a large upper knob portion abutting on an upper surface of said bushing, said rotary knob having a central bore therethrough;

a cylindrical push button axially movable in said rotary knob central bore and having at a lower face thereof a leg fitting to a guide hole in said switch body and a plunger operatively engageable with said movable contact to actuate said contact;

said cylindrical outer surface of said push button and said cylindrical lower portion of said rotary knob being provided with cooperating camming elements having abutting surfaces; and

a restoring spring arranged between said rotary knob and said bushing to apply rotational biasing force to said rotary knob;

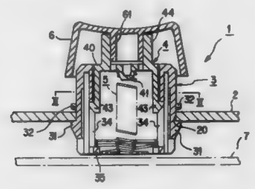
said camming elements being formed such that said rotational biasing force urges said rotary knob to a normally locked position wherein said push button is blocked against axial movement that would actuate said switch contacts, wherein manual rotation of said rotary knob against said biasing force operates to unblock said camming elements so that said push button may be operated axially to actuate said switch movable contact, and said axial operation and subsequent release and reverse axial movement of said push button causes said cooperating camming elements to operate to allow said rotational biasing force to return said rotary knob to said locked position and restore a blocked condition of said push button wherein said camming elements comprise a triangular shaped cam groove formed in the cylindrical surface of said push button and an engaging piece including a projection resiliently fixed to said rotary knob for engaging said triangular shaped cam groove wherein said triangular shaped cam groove includes a first groove portion extending peripherally around said cylindrical push button surface, a second groove portion extending axially on said push button surface, and a third oblique groove portion connecting said first and second sections, said groove sections each being formed with an inclined bottom surface that rises gradually to a point where the groove section meets the next groove section at a portion thereof where said bottom surface has a greater depth whereby said engaging piece is initially positioned in said first groove portion until said rotary knob is rotated to said second groove portion thus latching said engaging piece into said second groove portion and allowing axial movement of said push button, the axial movement of said push button allows said engaging piece to align with said third oblique groove to allow said cylindrical push button to return to its initial position.

4,733,036

COIL SPRING FOR KEY SWITCH

Haruyuki Koizumi, and Koichi Omae, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 724,296, Apr. 17, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 931,980
Claims priority, application Japan, Apr. 19, 1984, 59-57982 [U]; Apr. 19, 1984, 59-79863; Apr. 19, 1984, 59-79864; Apr. 19, 1984, 59-148584
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—340 **4 Claims**



1. A key switch comprising:

a guide member having a spring seat in a lower portion of a bore defined in said guide member, said lower portion of said guide member including an opening communicating with said bore;

a key plunger mounted within said bore for reciprocal movement;

a key top mounted on an upper end of said key plunger;

a pair of electrical contacts;

a coil spring formed of a continuous spring element interposed between said guide member and said key plunger, said coil spring comprising:

a smaller-diameter portion at which the spring element is coiled at a relatively small diameter;

a conical portion, extending continuously from one end of said smaller-diameter portion, at which the spring element is coiled so that its diameter progressively increases toward an open end of said conical portion, said conical portion having said open end positioned on said spring seat in said bore; and

a larger-diameter portion, extending continuously from another end of said smaller-diameter portion, at which the spring element has a diameter larger than the diameter of said spring element at said smaller-diameter portion, said coil spring, when said key switch is unactuated, being maintained by said key plunger and spring seat in a state wherein said conical portion is compressed and said smaller diameter portion is positioned in the lower portion opening of said guide member, said key plunger when depressed, compressing said coil spring to cause said smaller diameter portion to protrude from said lower portion opening of said guide member; and,

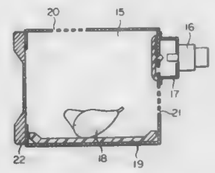
means responsive to said protrusion of said smaller diameter portion of said coil spring upon depression of said key plunger for actuating said electrical contacts.

4,733,037

HIGH FREQUENCY HEATING DEVICE HAVING AN ENERGY FEED SYSTEM INCLUDING A CYLINDRICAL WAVE GUIDE

Masahiro Nitta; Kimiaki Yamaguchi, both of Nara; Yoshihiro Toda, Kyoto, and Kezuyuki Inoue, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 15, 1986, Ser. No. 941,896
Claims priority, application Japan, Dec. 17, 1985, 60-283414
Int. Cl.[4] H04B *6/72*
U.S. Cl. 219—10.55 F **12 Claims**



1. A high frequency heating device comprising:

a high frequency oscillator having an output portion which includes an output antenna;

a heating chamber for accommodating an object to be heated, said heating chamber having a wall; and

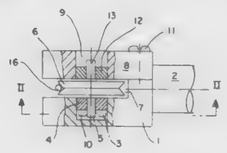
a cylindrical wave guide having an end which is coupled to said output portion of said high frequency oscillator and having an opposite end which is coupled to said wall of said heating chamber, said output antenna of said high frequency oscillator being disposed on the center axis of said cylindrical wave guide and said wall of said heating chamber having at least one arcuate slit formed therein, with the center of curvature of said at least one arcuate slit being positioned on the center axis of said cylindrical wave guide.

4,733,038

CONTACT MEMBER FOR SUPPLYING ELECTRICAL CURRENT TO AN ELECTRO-EROSION WIRE ELECTRODE

Roger Girardin, Vernier, Switzerland, assignor to Charmilles Technologies S.A., Geneva, Switzerland

Filed Nov. 24, 1986, Ser. No. 934,193
Claims priority, application Switzerland, Nov. 22, 1985, 4996/85
Int. Cl.[4] B23H *7/04;* **H01R** *41/00*
U.S. Cl. 219—69 W **10 Claims**



1. A contact device for the supply of electrical current to an electrode wire operating in an electro-erosion machine during the machining operation comprising:

an electrically conductive body having a pair of spaced apart arm portions defining a slot therebetween, said body having a bore extending on a generally horizontal axis trans-

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versly across said pair of arm portions, said bore extending partially into at least one of said pair of arm portions to form a cavity;

a pair of bearing members, each of said pair of bearing members mounted in said bore in a respective one of said pair of arm portions, each of said pair of bearing members having an aperture coaxial with said axis of said bore, one of said bearing members covering said cavity of said at least one of said pair of arm portions;

a shaft of electrically conductive material rotatably mounted in said aperture of each of said pair of bearing members; and having an end portion extending into said cavity;

a roller of electrically conductive material fixedly mounted on said shaft in said slot between said pair of bearings, said roller mounted to rotate with said shaft, said roller contacting said electrode wire,

a conducting fluid sealingly enclosed in said cavity, said conducting fluid covering said end portion of said shaft such that electrical current is conducted by said conducting fluid from said body to said shaft and thereby to said roller and said electrode wire.

4,733,039

METHOD OF LASER SOLDERING

George L. Schnable, Lansdale, Pa., and Peter J. Zanzucchi, Princeton Junction, N.J., assignors to General Electric Company, Schenectady, N.Y.

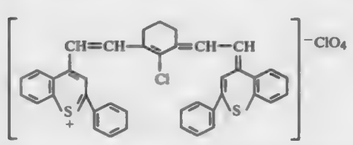
Continuation of Ser. No. 730,444, May 6, 1985, abandoned. This application Jul. 10, 1987, Ser. No. 73,371

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LD **10 Claims**

1. In a method of soldering employing a flux composition and a Nd:YAG laser beam as the heat source, the improvement which comprises:

adding an effective amount of a dye having the formula



to said flux composition to increase the amount of light at the emission wavelength of said laser beam which is absorbed by said flux composition.

4,733,040

METHOD FOR THE CONTROLLED WITHDRAWAL MOVEMENT OF AN ELECTRODE IN AN ELECTROEROSION MACHINE

Norman Pelloni, Gordola, and Antonio Prati, Locarno, both of Switzerland, assignors to AG fur Industrielle Elektronik AGIE Losone bei Locarno, Losone, Switzerland

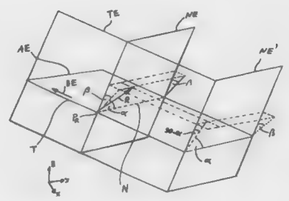
Filed Jul. 15, 1986, Ser. No. 885,949

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1985, 3525683

Int. Cl.⁴ B23H *7/26*

U.S. Cl. 219—69 M **11 Claims**

1. For use with an electroerosion machine, a method for the controlled withdrawal movement of a countersink electrode that has eroded an opening in a workpiece and in doing so has travelled along a given path and wherein there is a short circuit between the countersink electrode and the workpiece at a short-circuit point (P_K) on said path, said method comprising the steps of initially moving the countersink electrode back along said path for a length (δ) from the short-circuit point (P_K) to an intermediate point (P_R) to establish where there is still a short-circuit and, if the short-circuit is still present, moving the countersink electrode for a second time along a second and different path (R) away from the intermediate point (R_K).



4,733,041

WIRE CUT ELECTRIC DISCHARGE MACHINE

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

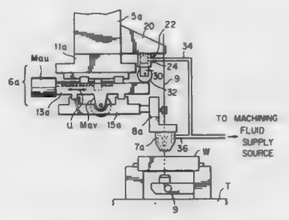
PCT No. PCT/JP86/00322, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00102, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 24, 1986, Ser. No. 19,273

Claims priority, application Japan, Jun. 25, 1985, 60-136945

Int. Cl.⁴ B23H *7/10*

U.S. Cl. 219—69 W **6 Claims**



1. A wire cut electric discharge machine comprising: a work table for supporting a work, capable of being moved in respective directions of an X-axis and a Y-axis perpendicularly intersecting each other in a horizontal plane; a vertical column disposed above said work table; a taper-machining table assembly secured to a lower end of said vertical column and capable of being moved in respective directions of a U-axis and a V-axis parallel to the X-axis and the Y-axis, respectively, and perpendicularly intersecting each other; a wire guide for guiding a wire electrode, secured to said taper-machining table assembly and having a machining fluid spouting nozzle; a machining fluid supply source; and balancing means which utilizes a pressure of a branch flow of a machining fluid supplied from said machining fluid supply source to said machining fluid spouting nozzle of said wire guide for applying a downward counterforce counteracting a reaction force of spouting of said machining fluid on the taper-machining table assembly to restrain said taper-machining table assembly and said wire guide from dislocation.

4,733,042

WELDING CONTROL APPARATUS INCLUDING A PRESSURE REGULATING VALVE OPERATED IN ACCORD WITH PREDETERMINED SCHEDULE OF VARIATIONS OF A WELDING FORCE CONTROL VARIABLE

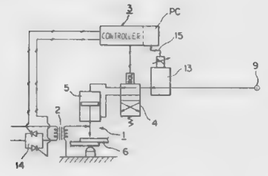
Toshihiro Nishiwaki, and Shozo Yamaguchi, both of Kanagawa, Japan, assignors to Obara Corporation, Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,377

Claims priority, application Japan, Sep. 22, 1986, 61-221777

Int. Cl.⁴ B23K *11/00*

U.S. Cl. 219—89 **11 Claims**



1. A method for controlling the welding operation of a welding machine having a compressed air supply, a power cylinder to which air under pressure from said compressed air supply is supplied via a reversing valve for reversing said power cylinder, the cylinder being arranged for applying welding force to a work piece, the method comprising:

interposing a pressure regulating valve between said air supply and reversing valve;

providing a predetermined schedule of variations of a welding force control variable representing the welding force to be applied to a work piece during at least one weld;

controlling the welding force by directly controlling the setting of said pressure regulating valve, by means of a control signal determined by said welding force control variable and applied to said pressure regulating valve, and;

controlling other control variables of welding operation including squeeze time, welding time, hold time, OFF time, cooling time, and welding current.

4,733,043

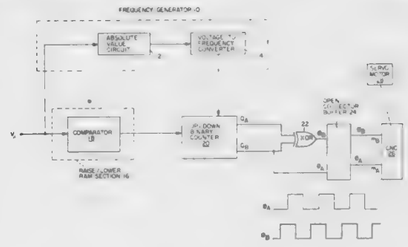
RAM STABILIZING CIRCUIT FOR ELECTRICAL DISCHARGE MACHINE

Oliver A. Bell, Jr., Statesville, N.C., assignor to Colt Industries Inc., New York, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,686

Int. Cl.⁴ B23H *1/02, 7/32*

U.S. Cl. 219—69 G **8 Claims**



1. A servo feed system for an electrical discharge machining apparatus for machining an electrically conductive workpiece by an electrode carrying ram across a dielectric filled gap, comprising:

an electrical servo feed motor operatively connected to said ram;

means connected to the gap for providing a gap voltage signal;

a first network connected to said signal for generating a first clock signal representative of ram velocity;

a second network connected to said signal for generating a second clock signal phase displaced from said first clock signal and representative of ram direction of movement; and

means for combining said signals to provide a control output for said servo feed motor.

4,733,044

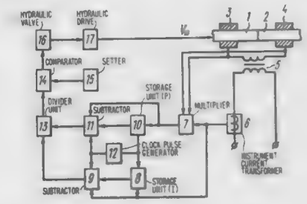
METHOD FOR CONTROLLING A FLASH-BUTT RESISTANCE WELDING PROCESS

Sergei I. Kuchuk-Yatsenko; Mikhail V. Bogorsky; Valery G. Krivenko; Daniil I. Belyaev; Sergei M. Samotryasov; Anatoly P. Nizov, and Alexei I. Gorlshnyakov, all of Kiev, U.S.S.R., assignors to Institute Electrosvarki Im. Patona, Kiev, U.S.S.R.

Filed Dec. 18, 1986, Ser. No. 943,664

Int. Cl.⁴ B23K *11/04*

U.S. Cl. 219—100 **1 Claim**



1. A flash-butt resistance welding process comprising the steps of:

flashing of parts being welded;

upsetting the parts being welded;

changing the direction of motion of the parts being welded during said flashing step by bringing together and separating the parts being welded;

measuring during said flashing step, at the same moment of time, the useful electric power and an electric parameter of the flashing process which is related to said useful electric power by a function which maximizes the useful power at a predetermined value of said electric parameter;

determining during said flashing step an increment in said useful electric power and an increment in said electric parameter of the flashing process within the same period of time;

determining during said flashing step the value and the sign of the ratio of said increments in said useful electric power and electric parameter of the flashing process;

ensuring during said flashing step the bringing together of the parts being welded up to a first moment when said ratio of said increments in said useful electric power and electric parameter of the flashing process reverses its sign;

ensuring during said flashing the separation of said parts being welded from said first moment to a second moment when said value of said ratio of said increments in said useful electric power and electric parameter of the flashing process reaches a preset value selected to suit the resistance of the welding circuit and the cross sectional area of the parts being welded.

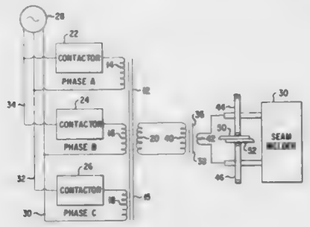
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,045

METHOD OF AND STRUCTURE FOR HIGH SPEED RESISTANCE SEAM WELDING

John F. Farrow, Plymouth, Mich., assignor to Medar, Inc., Farmington Hills, Mich.

Filed Dec. 8, 1986, Ser. No. 938,975
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—108 26 Claims



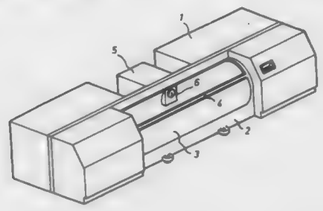
1. A method of high speed resistance welding comprising connecting an auxiliary transformer having three primary windings between a three phase source of electrical welding energy and high speed resistance seam welding structure and phase controlling the welding energy provided to the primary windings of the auxiliary transformer from the three phase source of welding energy including energizing each phase primary winding at a different time and with only one phase of the primary winding being energized at any time.

4,733,046

PRESSURE-TIGHT VACUUM CHAMBER OF AN ELECTRON BEAM ENGRAVING MACHINE FOR ELECTRON BEAM ENGRAVING OF PRINTING CYLINDERS FOR PRINTING TECHNOLOGY

Rolf Angelbeck, Kiel; Reinhard Geaell, Schonkirchen, and Hans Penza, Preetz, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE86/00001, § 371 Date Aug. 28, 1986, § 102(e) Date Aug. 28, 1986, PCT Pub. No. WO86/04282, PCT Pub. Date Jul. 31, 1986
PCT Filed Jul., 1986, Ser. No. 931,444
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501040; Jan. 16, 1985, 3501164
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EL 14 Claims



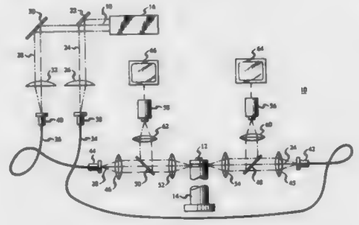
1. Pressure-tight vacuum chamber of an electron beam engraving machine for the acceptance of printing cylinders to be engraved, characterized by a lower part similar to a machine bed, by a vacuum hood placed pressure-tight on said lower part, said vacuum hood being fashioned as a barrel-like arch and being placed on a sealing lip surrounding said lower part at its edge, by a loading opening for said printing cylinders which is situated in the upper central region of said hood and extends in longitudinal direction of said hood, by a cover lowerable into said loading opening and sealable to said loading opening, and by lifting and conveying means situated at the face ends of said cover and of said loading opening, said cover being liftable out of its closed position therewith and being displaceable at the outer circumference of said hood in circumferential direction while releasing said opening in its open position and being returnable therewith from said open position over said opening and being lowerable into its closed position.

4,733,047

SPOT WELDING TECHNIQUE

David G. Cruickshank, Pennington, and Robert Webb, Ewing Township, Mercer County, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Feb. 20, 1987, Ser. No. 17,124
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC 7 Claims



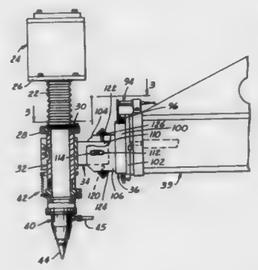
1. A method of fabricating an article comprising the steps of:
bonding a first body to a second body by irradiating the bodies with a plurality of laser beams derived from a single laser source; and
completing the fabrication of said article, characterized in that said bonding step comprises the steps of:
generating a beam of laser light;
splitting the beam into a plurality of independent beams;
directing each independent beam into a first end of a separate one of a plurality of lightguide fibers so a portion of each independent beam passes therethrough; and
positioning the opposite end of each fiber proximate the bodies to simultaneously bond the bodies together at a plurality of spaced sites with the independent beams passing through the fibers.

4,733,048

CRASH PROOF NOZZLE

William L. Clayton, Jr., Fowlerville, Mich., assignor to Raycon Textron Inc., Ann Arbor, Mich.

Filed Jul. 17, 1987, Ser. No. 74,571
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LB 11 Claims



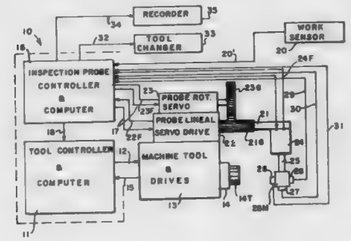
1. In nozzle apparatus for focusing a beam of collimated radiation from a laser source, the nozzle apparatus including a nozzle housing having a nozzle inlet, beam focusing means and a nozzle outlet and drive system for moving the nozzle apparatus with respect to a workpiece against which the collimated radiation is focused the improvement comprising:
upper housing means for receiving the beam from the laser source;
lower housing means connected to said upper housing means having beam focusing means therein and a nozzle tip;
coupling means for spring mounting said lower housing means on said upper housing means for causing shock absorbing movement with respect to said upper housing means when said lower housing means contacts an obstacle;
and switch means responsive to shock absorbing movement between said upper and lower housing means for signaling the machine drive means to stop until the obstruction is removed.

4,733,049

MACHINING METHOD AND APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 948,143, Oct. 3, 1978, abandoned, and a continuation-in-part of Ser. No. 693,416, Jun. 7, 1976, Pat. No. 4,118,139, and a continuation-in-part of Ser. No. 182,501, Sep. 21, 1971, Pat. No. 3,817,647, and a continuation-in-part of Ser. No. 775,433, Nov. 13, 1968, Pat. No. 3,476,431, and a continuation-in-part of Ser. No. 294,076, Jul. 10, 1963, Pat. No. 3,226,833. This application Apr. 16, 1980, Ser. No. 140,867
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LJ 7 Claims



1. A method of machining material comprising:
effecting first powered controlled movement of a tool with respect to a work member,
effecting second powered controlled movement of a radiation generating means with respect to said tool
transferring sufficient heat from said radiation generating means to cause a selected portion of a work member to become heat softened,
controlling the operation of said tool to cause it to engage the heat softened portion of said work member, and
continuing said first and second controlled movements of said tool and said radiation generating means while said tool is in engagement with said work member to cause said tool to remove at least a portion of said selected portion of said work member heated to said heat softened condition by said radiation generating means.

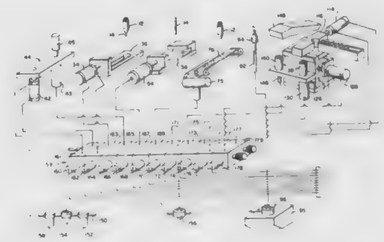
4,733,050

ROBOTIC WELDING HEAD CLEANING APPARATUS

Gerald R. Grafius, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1986, Ser. No. 947,657
Int. Cl.[4] B23K *9/24*
U.S. Cl. 219—125.1 15 Claims

1. Apparatus for maintaining a welding arm having a weld tip attached thereto such that weld wire extends normally from a face of said weld tip, said welding arm having a cylindrical gas nozzle releasable attached thereto which coaxially surrounds said weld tip, comprising:
a. means for removing said gas nozzle from and for reapplying said gas nozzle to said welding arm;



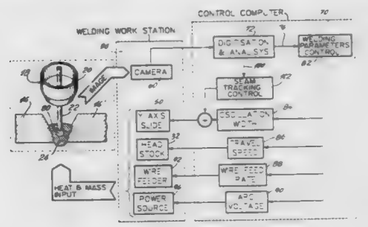
b. means for cutting said welding wire which extends from said weld tip to facilitate retraction of said welding wire; and
c. means for cleaning said face of said weld tip when said gas nozzle is removed from said welding arm.

4,733,051

METHOD AND APPARATUS FOR CONTROLLING ROOT PASS WELD PENETRATION IN OPEN BUTT JOINTS

Francois Nadeau, St-Bruno; Pierre Fafard, Ste-Julie; Guy Patenaude, Beloeil, and Jean Tremblay, Longueuil, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 25, 1987, Ser. No. 89,128
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—130.21 15 Claims



1. An apparatus for controlling weldpool penetration during root pass welding in an open butt joint defined in a workpiece to be welded by a welding torch with a welding wire being continuously fed from the welding torch to said joint to form a weldpool penetrating the joint, said workpiece and said welding torch being movable relative to one another, said apparatus comprising:
visual sensing means positioned ahead of said welding torch and in alignment with said joint for frontly viewing the weldpool at an angle of about 10° to about 20° relative to a line tangent to said workpiece at said weldpool, to thereby provide a full image of said weldpool defining a weldpool contour line, said sensing means and said welding torch being disposed on a common side relative to said workpiece; and
computer means including image processing means operatively coupled to control means, said image processing means adapted to process said weldpool image so as to analyse said weldpool contour line to derive therefrom weldpool penetration depth and to compare said weldpool penetration depth with a predetermined value, to thereby

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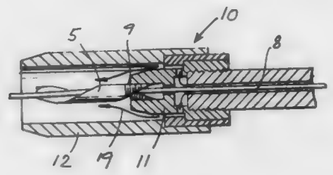
provide an information signal representative of weldpool penetration error which is fed to said control means, said control means issuing control signals in response to said information signal for controlling welding parameters such as to provide a root pass weld having a predetermined penetration.

4,733,052

CONTACT TIP WELDING ELECTRODE

Anders Nilsson, Vretstorp, and Rolf Nordqvist, Svartå, both of Sweden, assignors to ESAB Aktiebolag, Gothenburg, Sweden

Filed Feb. 14, 1986, Ser. No. 829,828
Claims priority, application Sweden, Feb. 15, 1985, 8500714
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—137.61 **18 Claims**



1. A contact tip for use in welding devices, said contact tip comprising a rod-shaped structure having at least one opening on a side thereof, said structure being for passing therealong and making contact with a wire electrode and for supplying welding current to said wire electrode,

said structure having a passage with a helical contact surface which has a longitudinal axis,

said helical contact surface making contact with said wire electrode in use for supplying welding current, and

said passage having a substantially straight component along said longitudinal axis.

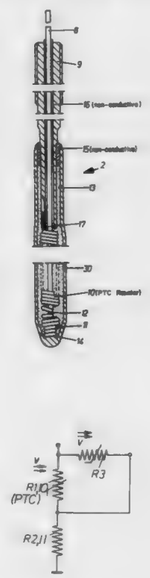
4,733,053

GLOW ELEMENT

Helmut Mueller, Maulbronner, Fed. Rep. of Germany, assignor to Beru Ruprecht GmbH & Co. KG, Ludwigsburg, Fed. Rep. of Germany

Filed Jan. 27, 1986, Ser. No. 822,875
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502525
Int. Cl.⁴ H05B *1/02, 3/00;* **F23Q** *7/00;* **F02P** *19/02*
U.S. Cl. 219—270 **6 Claims**

1. Glow element system having a glow element with a metallic glow tube (30) closed at an outer end in which are arranged at least two series-connected resistors (10, 11, 20, 21, 22), one of the at least two resistors being conductively electrically connected by one end to the closed end of the glow tube and the opposite end of the series-connected resistors being electrically connected to an internal pole (9) that projects into the glow tube from the other end thereof, characterized in that the internal pole (9) has a tubular construction, that at least one electrical conductor (8) is passed through the internal pole in electrically insulated relation thereto and is electrically connected to a junction (12, 23, 24) of the at least two resistors (10, 11, 20, 21, 22) and that the at least two resistors comprise a heating resistor (11) electrically connected to the closed end (14) of the glow tube (30) and a variable resistor (10) with a positive temperature coefficient electrically connected between the internal pole (9) and the heating resistor (11), and wherein a further variable resistor (R3) with a positive temperature coefficient is arranged externally of the glow element and



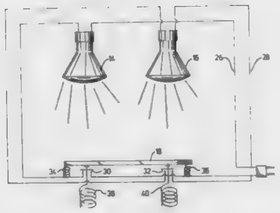
is electrically connected to the electric conductor (8) parallel to the variable resistor (10) of the series-connected resistors.

4,733,054

HOT FOOD STAND

Roger Paul, 2380 West Blood Rd., East Aurora, N.Y. 14052

Filed Nov. 17, 1986, Ser. No. 930,898
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—358 **2 Claims**



1. A hot food stand, comprising:

a. housing means;

b. support plate means mounted on a floor portion of said housing means and being operable to support a quantity of food positioned thereon;

c. a plurality of heating lamps mounted in a topmost portion of said housing means, said heating lamps serving to radiate heat downwardly on said food, thereby to effect a warming thereof;

d. a plurality of pressure sensitive switches, said switches being normally retained in an open condition by spring biasing means, said spring biasing means including individual springs for each of said plurality of pressure sensitive switches, each of said springs having different spring

constants to thus vary a pressure required to close each of said switches, a first of said switches when closed activating a first of said plurality of heating lamps as a result of food being placed at a first end of said support plate means, a second of said switches when closed activating a second of said plurality of heating lamps as a result of food being placed at a second end of said support plate means.

4,733,055

HEAT TRANSFER HEATING ELEMENT AND METHOD

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 25, 1986, Ser. No. 900,175
Int. Cl.⁴ H05B *3/06;* **H01C** *1/012;* **B05D** *5/12*
U.S. Cl. 219—540 **7 Claims**

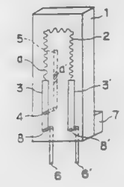
1. An electric heating element comprising a resistance element, a metal sheath in heat transfer relation to said resistance element on one side of said metal sheath and a soap-like coating of a mixture of boron nitride and refractory material taken from the group consisting of aluminum oxide, magnesium oxide, zirconium oxide and silicon carbide on another side of said sheath to be placed in heat transfer relation to an object to be heated.

4,733,056

HEATER BACKED WITH A CERAMIC SUBSTRATE

Takao Kojima, and Hiroyuki Ishiguro, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 15, 1986, Ser. No. 896,863
Claims priority, application Japan, Aug. 23, 1985, 60-183846
Int. Cl.⁴ H05B *3/16;* **H01C** *1/012*
U.S. Cl. 219—543 **5 Claims**



1. A heater backed with a ceramic substrate having a ceramic substrate as a base plate and heating element formed thereon, which comprises a conductor for retaining ionized elements, said conductor branching from a terminal lead portion of the minus side connected to the heater element under an applied electric current and extending at the back side of the base plate, along the heating element pattern at least partly thereof.

4,733,057

SHEET HEATER

Erwin K. E. Stanzel, Linsengericht, Fed. Rep. of Germany, and Chester L. Sandberg, Palo Alto, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 18, 1986, Ser. No. 853,783
Claims priority, application United Kingdom, Apr. 19, 1985, 8510058; Oct. 1, 1985, 8524188; Jan. 28, 1986, 8601982
Int. Cl.⁴ H05B *3/10;* **H01C** *7/10*
U.S. Cl. 219—548 **18 Claims**

1. A flexible wall, floor or ceiling heater which is in the form of a sheet and which comprises:

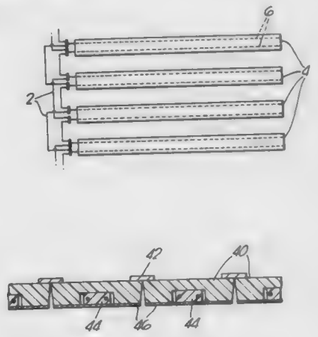
(a) first and second connection elements which can be connected to a source of electrical power;

(b) a plurality of discrete, elongate, self-regulating electrical heater elements, each of which comprises:

(i) a first elongate electrode which is connected to the first connection element,

(ii) a second elongate electrode which is connected to the second connection element, and

(iii) a plurality of resistive heating elements connected in parallel with each other between the first and second electrodes; and



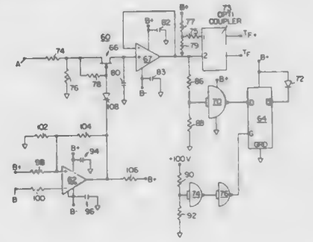
(c) a flexible support which is in the form of a sheet and to which the heater elements and the connection elements are secured in a substantially fixed spatial relationship in the plane of the sheet, with the heater elements being substantially parallel to each other and spaced apart from each other, and the connection elements being substantially at right angles to the heater elements.

4,733,058

FAIL TRANSISTOR DETECTION AND DISPLAY SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Kuang-Ta Ho, Charlotte, and Oliver A. Bell, Jr., Statesville, both of N.C., assignors to Colt Industries Inc., New York, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,377
Int. Cl.⁴ B23H *1/02;* **H02H** *3/00*
U.S. Cl. 219—69 S **6 Claims**



1. In an electrical discharge machining apparatus including an electronic power switch and a power supply connected to a gap and a drive circuit for periodically turning said switch on and off for providing machining power pulses to the gap, a system for detecting power switch failure, comprising:

detecting means coupled to said electronic switch for responding to its conduction;

means for keying the operation of said detecting means only during normal pulse off time of said power switch;

indicating means operatively connected to the output of said detecting means for providing a visual failure signal responsive to conduction during normal off time.

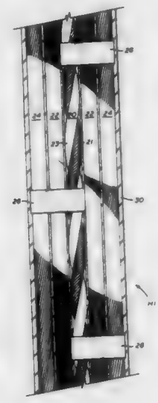
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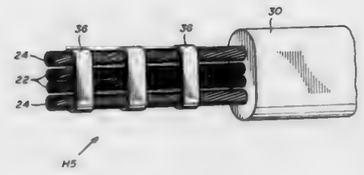
4,733,059

ELONGATED PARALLEL, CONSTANT WATTAGE HEATING CABLE

David C. Goss, San Marcos, and Chandrakant M. Yagnik, Austin, both of Tex., assignors to Thermon Manufacturing Company, San Marcos, Tex.

Filed Jun. 15, 1987, Ser. No. 62,783
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—548 27 Claims





1. An electrical heating cable, comprising:
first and second electrical conductor means extending substantially parallel to and spaced from each other along the length of the cable for carrying electrical current;
heating means for generating heat comprising a non-metallic, electrically conductive material arranged substantially parallel to said electrical conductor means;
means for alternately electrically connecting said heating means to said first and second electrical conductor means to establish an alternating series of electrical connections between said first electrical conductor means and said heating means and said second electrical conductor means and said heating means; and
protective cover encasing said electrical conductor means and said heating means.

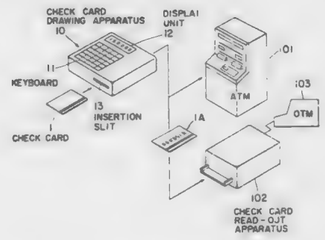
14. An electrical heating cable, comprising:
first and second electrical conductor means extending substantially parallel to and spaced from each other along the length of the cable for carrying electrical current;
heating means for generating heat, said means being connected to said first and second electrical conductor means;
heat conducting dielectric means for conducting heat from said heating means, positioned adjacent said heating means and between said first and second electrical conductor means; and
protective cover encasing said electrical conductor means, said heating means and said dielectric means.

4,733,060

CHECK NEGOTIATION SYSTEM BY MEANS OF CHECK CARDS AND CHECK CARD DRAWING APPARATUS

Syugo Dono; Fumio Miyanaga; Hiroshi Tomiyama; Sadaaki Uesaka, and Haruo Odagiri, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Dec. 11, 1984, Ser. No. 680,649
Claims priority, application Japan, Dec. 16, 1983, 58-237275
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 9 Claims



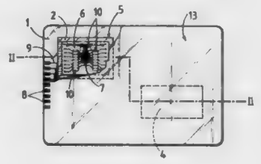
1. A check card drawing apparatus which comprises:
a keyboard for inputting data;
a display means for displaying the data inputted by said keyboard;
an insertion slit for receiving a check card and a data read-out/write-in means for reading out data written on a magnetic stripe of said check card inserted into said insertion slit and for writing data on said magnetic stripe of said check card;
a printing means for printing data at a predetermined position on said check card;
a memory for storing an account number specifically assigned to the check card drawing apparatus;
an ejection slit for ejecting said check card; and
a control means for controlling said keyboard, said display means, said data read-out/write-in means, said memory and said printing means and for controlling and conveying said check from said insertion slit to said ejection slit for ejecting said check card;
wherein the account number which was previously recorded on said magnetic stripe of said check card is read out by said data read-out/write-in means and checked against said account number stored in said memory.

4,733,061

CARD PROVIDED WITH A MICROPROCESSOR AND/OR AT LEAST ONE ELECTRONIC MEMORY

Paul Hegi, Bernex, Switzerland, assignor to Lupa Finances S.A., Geneva, Switzerland

Filed Jan. 6, 1986, Ser. No. 816,614
Claims priority, application Switzerland, Jan. 21, 1985, 252/85
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 8 Claims



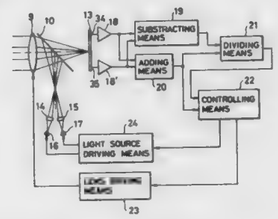
1. In an electronic card having electronic circuitry comprising at least one of a microprocessor and at least one electronic memory and having contacts which are accessible from the outside of the card; the improvement in which the card is made of several layers of compatible plastic materials of different compositions and different characteristics, forming a monolithic assembly, said layers are at least three in number, a core comprising at least one hard block having at least one void therein, and two protecting layers of lesser thickness than the core covering the upper and lower faces of said core; a film comprising a printed circuit the outputs of which are connected to a solid state circuit comprising said electronic circuitry, said film being disposed between the core and one of the protecting layers at the location of the hard block, the solid state circuit being located at least partially in said void of said hard block; the outputs of the printed circuit being connected by conductors to contacts of the card, these conductors being also disposed between the core and a said protecting layer.

4,733,062

FOCUS DETECTING DEVICE

Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 638,718, Aug. 8, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 27,048
Claims priority, application Japan, Aug. 18, 1983, 58-150741
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 8 Claims



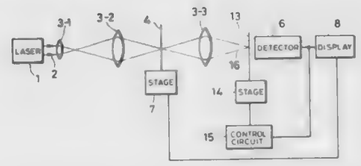
1. A focus detecting device comprising:
image forming lens means for forming an object image;
an image forming surface, behind said lens means;
two light source means for producing light, respectively arranged in two optical paths different from each other both of which pass through said image forming lens means and intersect with each other in front of and behind said lens means, said behind intersect being separated from said lens means by a distance equivalent to a distance between said lens means and said image forming surface;
means for alternately energizing said light source means to alternately project light on an object through said different optical paths;
photoelectric converting means, arranged in a position optically conjugate with said image forming surface with respect to said image forming lens means and having a single light receiving surface, for receiving the light emitted from said light source means, reflected by the object and returned through said image forming lens means, and for converting the light into a signal indicative thereof;
position detecting means, coupled to said photoelectric converting means, for calculating a position of incidence of returned light which is incident on said light receiving surface based on said indicative signal, to issue an output signal indicating the position thereof; and
signal processing means coupled to said position detecting means for detecting a displacement of the object image from a predetermined image forming position on the basis of a relative position relationship between the positions of light incidence as indicated by two output signals obtained from said position detecting means.

4,733,063

SCANNING LASER MICROSCOPE WITH APERTURE ALIGNMENT

Shigeharu Kimura, Kokubunji, and Chusuke Munakata, Nishitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1986, Ser. No. 941,642
Claims priority, application Japan, Dec. 13, 1985, 60-278918
Int. Cl.[4] G02B *21/36*
U.S. Cl. 250—201 1 Claim



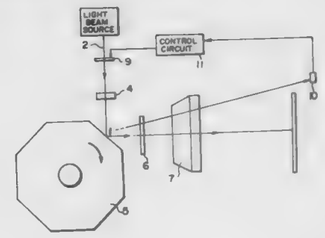
1. A scanning laser microscope comprising a laser which emits a laser beam, a first optical system which is disposed between said laser and a specimen so as to focus the laser beam on the specimen, specimen movement means for moving the specimen, a second optical system which is arranged with one focal position thereof held in agreement with a focal position of said first optical system on the specimen in order to focus the laser beam transmitted through the specimen or reflected therefrom, an aperture which is arranged at the other focal position of said second optical system and which is provided at a predetermined position within a plane of a photomask including rectilinear pattern edges orthogonal to each other formed on a transparent substrate, optical detection means for detecting the laser beam passed through said aperture, aperture movement means for moving said aperture, control means for controlling a movement of said aperture movement means in order to bring the position of said aperture into agreement with a focused position of the laser beam in such a way that coordinate positions at which the laser beam traverses the respective rectilinear pattern edges orthogonal to each other are found on the basis of output signals from said optical detection means, and display means for displaying the output signals of said optical detection means in correspondence with impinging positions of the laser beam on the specimen.

4,733,064

LIGHT BEAM SCANNER WITH FOCUS-VARYING MECHANISM

Hiromi Ishikawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 10, 1986, Ser. No. 827,868
Claims priority, application Japan, Feb. 13, 1985, 60-26052
Int. Cl.[4] G02B *27/17*
U.S. Cl. 250—201 4 Claims



1. A light beam scanner for scanning a surface in a main

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scanning direction with a light beam emitted from a light beam source while said surface is being continuously fed in an auxiliary scanning direction at a constant speed, said light beam scanner comprising:

(i) a rotating polygonal mirror for reflecting and deflecting the light beam toward said surface;

(ii) an optical system for focusing the light beam from the light beam source to fall on said rotating polygonal mirror as a linear image normal to the axis of rotation thereof where said linear image moves along each facet of the polygonal mirror;

(iii) a focus-varying mechanism disposed between said light beam source and said rotating polygonal mirror for adjusting the focus position of said light beam as it falls on said rotating polygonal mirror;

(iv) control means for controlling said focus-varying mechanism in synchronism with the rotation of said rotating polygonal mirror to maintain said focused linear image on said rotating polygonal mirror; and

(v) an anamorphic optical system disposed in a light beam path following said rotating polygonal mirror for focusing the light beam, which has fallen as a linear image on said rotating polygonal mirror, as a spot image on said surface being scanned.

4,733,065

OPTICAL HEAD DEVICE WITH DIFFRACTION GRATING FOR SEPARATING A LIGHT BEAM INCIDENT ON AN OPTICAL RECORDING MEDIUM FROM A LIGHT BEAM REFLECTED THEREFROM

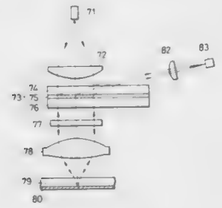
Hiroaki Hoshi, Kawasaki; Naosato Taniguchi, Yokohama; Kiyoshobu Endo, Yokohama; Tetsuro Kuwayama, Yokohama; Hiroshi Osawa, Yokohama, and Yasuo Nakamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Jun. 24, 1985, Ser. No. 748,342

Claims priority, application Japan, Jun. 27, 1984, 59-132293; Jun. 27, 1984, 59-132294; Jul. 4, 1984, 59-138368; Jul. 4, 1984, 59-138369; Feb. 5, 1985, 60-19193; Feb. 5, 1985, 60-19194; Apr. 9, 1985, 60-73590; Apr. 9, 1985, 60-73591; Apr. 9, 1985, 60-73592; Apr. 15, 1985, 60-78560; Jun. 14, 1985, 60-129482; Jun. 14, 1985, 60-129483; Jun. 14, 1985, 60-129484

Int. Cl.⁴ G01J *1/20*; G11B *7/09*

U.S. Cl. 250—201 **20 Claims**



1. An optical head device comprising:

a light source;

condensing means for condensing a light beam emitted from said light source on an optical recording medium;

a diffraction grating arranged in the optical path of an incident light beam entering the recording medium from said light source to transmit the incident light beam through said diffraction grating and to diffract light reflected from the recording medium for separating the reflected light from the incident light beam; and

a photodetector for receiving the light diffracted by said diffraction grating, said photodetector including a light receiving surface which is divided into a plurality of areas by at least a dividing line extending substantially in a direction in which a spot of the light diffracted by said diffraction grating moves on said light receiving surface due to the wavelength fluctuation of said light source.

4,733,066

DEVICE FOR CONTROLLING THE MOVEMENT OF A FOCAL POINT OF A LIGHT BEAM USED FOR DETECTING RECORDED INFORMATION

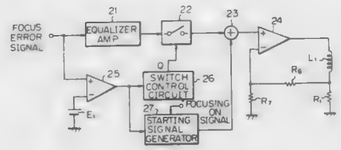
Yoshikiyo Konno, and Takashi Suzuki, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 523,789, Aug. 16, 1983, abandoned. This application Oct. 6, 1986, Ser. No. 915,896

Claims priority, application Japan, Aug. 17, 1982, 57-124256[U]

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. A device for controlling a focal point of a light beam for detecting recorded information, to be incorporated in an optical system for recording and reading out information comprising:

a focal lens for focusing the light beam on a recording medium;

resilient means for supporting said focal lens;

focus actuator means including a drive coil connected to said focal lens, for moving said focal lens in accordance with a drive signal;

photo detector means for detecting said light beam from said recording medium and producing a focus error signal;

drive amplifier means for producing a drive current for said focus actuator means in proportion to the level of an input signal;

starting signal generating means responsive to a focusing-on signal for generating a starting signal whose level increases with time after receipt of said focusing-on signal;

comparator means for receiving said focus error signal and a reference level and producing an output signal when the level of said focus error signal passes said reference signal; and

switching means connected to an input circuit of said drive amplifier means, for selecting said starting signal when said output signal of said comparator is not present, and selecting said focus error signal when said output signal of said comparator is present.

4,733,067

SEMICONDUCTOR LASER APPARATUS FOR OPTICAL HEAD

Hiroshi Oinoue, Tokyo, and Akira Nakamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

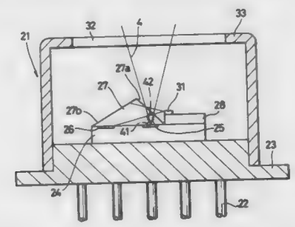
Filed Apr. 17, 1986, Ser. No. 853,210

Claims priority, application Japan, Apr. 22, 1985, 60-86178; Apr. 22, 1985, 60-86179

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—216 **5 Claims**

1. A semiconductor laser aparatus for use for an optical head having a stem, a substrate mounted on said stem, a semiconductor laser chip provided on said substrate, photodetector means and a cap with a window glass mounted on said stem to hermetically seal said substrate, said laser chip and said photodetector means, comprising: a beam splitter attached to said substrate and having a first surface inclined at a predetermined angle with respect to a radiant surface of said laser chip in order to reflect a beam radiated from said laser chip toward said window glass to thereby direct said beam to an objective lens of an optical head, and said photodetector means formed on said substrate and covered by said beam splitter so as to receive the return beam reflected back through said objective.



4,733,068

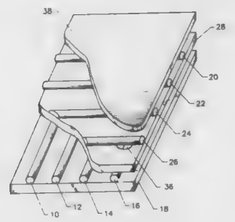
CROSSED FIBER OPTIC TACTILE SENSOR

Alfred W. Thiele, Woodland Hills; Jeffrey S. Schoenwald, Thousand Oaks, and David E. Gjellum, Moorpark, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 7, 1986, Ser. No. 848,515

Int. Cl.⁴ H01J *5/16, 40/14*

U.S. Cl. 250—227 **21 Claims**



1. A fiber optic sensor array, comprising:

a plurality of transmitting optical fibers;

a plurality of detecting optical fibers overlapping the transmitting fibers;

a planar compliant spacer separating the transmitting fibers from the detecting fibers;

an array of light emitting elements, each element in the emitting array being adapted to transmit light into one of the transmitting fibers; and

an array of light detecting elements, each element in the detecting array being adapted to detect light emanating from one of the detecting fibers,

such that a sensor elements is defined at each location were a detecting fiber overlaps a transmitting fiber, whereby light diverted out of the transmitting fiber at each element by inhomogeneities in the transmitting fiber is coupled into the detecting fiber at the element by inhomogeneities in the detecting fiber, the amount of light coupled into the detecting fiber being proportional to the distance between the transmitting fiber and the detecting fiber at the element.

4,733,069

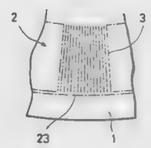
POSITION ENCODER USING A LASER SCAN BEAM

Yoshinori Narutaki, Machida, Japan, assignor to Optec Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,776

Int. Cl.⁴ G01D *5/36*; G11B *7/00*

U.S. Cl. 250—231 SE **5 Claims**



1. Apparatus for measuring the positional orientation of an object along a predetermined first path including an encoded member adapted for rigid connection to the object for movement therewith and a substantially stationary reading device adjacent the encoded member, movement of the object along the first path defining a second path on the encoded member corresponding to the relative movement of the reading device adjacent thereto; a plurality of position codes spaced along the second path of the encoded device, each code comprising position information uniquely defining a point along the second path, the position information for each code being contained along a first track oriented substantially transversely to the second path, the reading device including means for scanning the track adjacent the reading device whereby the positional orientation of the object along the predetermined first path may be measured.

4,733,070

ROTATIONAL INFORMATION OUTPUT DEVICE

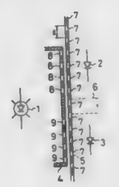
Tadashi Ookawa; Hiroyuki Tomita, both of Funabashi; Masataka Yahara; Masaharu Muramatu, both of Chiba; Sumio Kobayashi, Funabashi; Hiroshi Sugai, Sakura, and Hisakazu Ninomiya, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,340

Claims priority, application Japan, Dec. 7, 1984, 59-257505

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 SE **7 Claims**



1. A rotational information output device for use with a rotating shaft comprising: a light emitting means which emits the optimum quantity of light in correspondence with a control input for controlling the quantity of light; first and second photoconductive means which deliver electric signals in correspondence with the quantity of light which said photoconductive means receive; a fixed and a rotary slit plate, being disposed between said first and second photoconductive means and said light emitting means, which intermittently interrupt light entering from said light emitting means into said first and second photoconductive means such that said second photoconductive means delivers a signal whose phase is shifted π in relation to said first photoconductive means in correspondence with the rotation of a rotating shaft; a dc component separating

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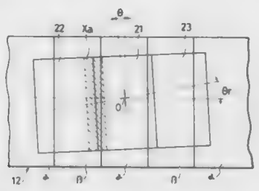
means which receives the output from said first and second photoconductive means and extracts the dc component contained in the output of said first and second photoconductive means, and a means of controlling the quantity of light which controls said input for the purpose of controlling the quantity of light in such a manner as to keep the output of said dc component separating means at a constant level.

4,733,071

OPTICAL ENCODER WITH VARIABLE FIBER/PHASE ANGLE ADJUSTMENT

Ichiro Tokunaga, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 663,217, Oct. 22, 1984, abandoned. This application Apr. 30, 1987, Ser. No. 45,199
Claims priority, application Japan, Oct. 21, 1983, 58-197285
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE 4 Claims



1. In an optical encoder having a code member on which a plurality of indicia portions are arranged at a predetermined pitch spacing, means for moving said code member and said indicia portions in one moving direction, and an optical sensor disposed relative to said indicia portions of said code member in order to derive two output signals having a phase difference between them,

the improvement wherein said indicia portions are alternating light reflective and non-reflective portions, said sensor comprises a signal head disposed proximate one side of said code member facing said indicia portions and having arranged in a row along a sensor axis a light emission portion between two light reception portions closely adjacent on each side thereof such that light emitted by said light emission portion is reflected by said reflective portions and not reflected by said non-reflective portions and the reflection and non-reflection of light by said alternating portions moving in said moving direction is detected by said two light reception portions to provide two output signals having a phase difference between them,

said light emission and light reception portions being constituted by tip ends of optical fibers arranged in close contact with each other along the sensor axis, and the other ends of the optical fibers being connected to light emission element and light reception elements, respectively, which are remote from the sensor head, and

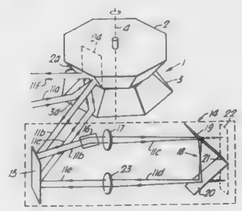
means for rotating said sensor head in order to adjust an azimuth angle between the sensor axis and the moving direction of the indicia portions of said code member such that a predetermined phase difference between the two output signals is obtained.

4,733,072

RANGEFINDER FOR IMAGING SYSTEM ELIMINATING EFFECT OF ROTOR ROTATION

Alan H. Lettington, Worcester, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 18, 1986, Ser. No. 908,719
Claims priority, application United Kingdom, Sep. 27, 1985, 8523849
Int. Cl.[4] H01J 3/14, 5/16, 40/14
U.S. Cl. 250—235 9 Claims



1. An optical imaging system comprising a rotatable scanner, said scanner comprising a plurality of mirrors extending round a rotor, and an optical system for directing light-radiation from a scene being scanned on to said rotor mirrors and thence to a detecting means, wherein there is further provided rangefinder means including:

a light transmitter having its boresight aligned with that of said optical directing system whereby the transmitted light returned from the scene by reflecting thereat is received by said optical directing system and likewise directed on to said rotor mirrors;

and light-beam reversing means arranged to receive said returned light after reflection from said rotor mirrors and to reflect said returned light back to said rotor mirrors along a path having a fixed angular relationship, in a plane parallel to the axis of rotation of the scanner, to its path on initially leaving said rotor mirrors whereby said returned light is then reflected from said rotor mirrors to a detecting means along a path having a fixed angular relationship, in a plane parallel to the axis of rotation of the scanner, to that of the light-radiation from the scene to the first-mentioned detecting means.

4,733,073

METHOD AND APPARATUS FOR SURFACE DIAGNOSTICS

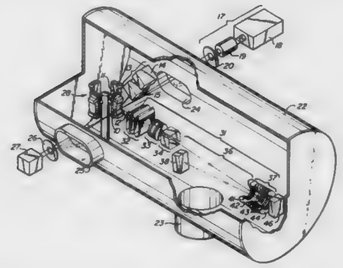
Christopher H. Becker, Menlo Park; Keith T. Gillen, and Sidney E. Buttrill, Jr., both of Palo Alto, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 564,949, Dec. 23, 1983, abandoned. This application May 16, 1986, Ser. No. 865,580
Int. Cl.[4] H01J 49/10
U.S. Cl. 250—288 36 Claims

1. A method of analyzing a surface including unknown species of matter comprising the steps of:

directing a probe beam at the surface to cause a sample of material to be removed therefrom;

directing a non-resonant ionizing beam of radiation at the removed sample proximate the surface, said ionizing beam having an intensity sufficient to induce non-resonant photo-ionization of said sample, whereby species of matter included in said sample will be non-selectively ionized; and



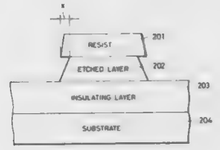
subjecting the ionized sample to mass-spectrometric analysis to determine the nature of said species.

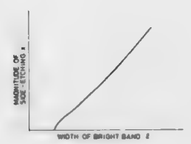
4,733,074

SAMPLE SURFACE STRUCTURE MEASURING METHOD

Makoto Kato, Kawasaki; Tetsuo Yokoyama, Nakano; Jyuntaro Arima, Katsuta; Shimbu Yamagata, Yokohama; Mikihiko Oi, Kokubunji, and Toshihiro Furuya, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,741
Claims priority, application Japan, Apr. 17, 1985, 60-80129; Apr. 17, 1985, 60-80130
Int. Cl.[4] H01J 37/00
U.S. Cl. 250—307 3 Claims





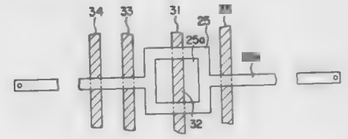
1. A side-etching amount measuring method for a scanning type electron microscope comprising the step of measuring a side-etching amount from a width of a bright band observed when an electron beam is applied from above a resist, using a relation between a side-etching amount actually measured for a cut sample beforehand and the width of the bright band.

4,733,075

STROBOSCOPIC SCANNING ELECTRON MICROSCOPE

Masayuki Sato, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 658,217, Oct. 5, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 898,814
Claims priority, application Japan, Oct. 20, 1983, 58-196303
Int. Cl.[4] G01N 23/00; H01J 37/26
U.S. Cl. 250—310 3 Claims



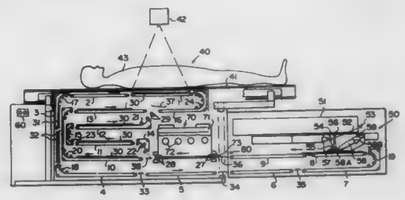
1. In a stroboscopic scanning electron microscope comprising an electron gun for emitting a primary electron beam into a tube of a microscope, a specimen holder for holding a specimen to be measured, said specimen comprising an integrated semiconductor device having a measuring point and at least one electrically conductive line adjacent said measuring point and a secondary electron detector for detecting secondary electrons emitted from the specimen, said primary electron beam emitted from said electron gun being made intermittent by opening and closing a pulse gate with a sampling pulse, and in which said secondary electrons emitted from said specimen to be measured are detected by said secondary electron detector in order to build up an image; said stroboscopic scanning electron microscope having a shield electrode means for eliminating local electric fields surrounding said measuring point on said specimen, said shield electrode means mounted above and ajacent to said specimen to be measured, said shield electrode means having an opening which surrounds said measuring point of said specimen, said shield electrode being supplied with a negative voltage which is sufficiently lower than ground potential for eliminating the local electric fields, said measuring point having a portion existing therearound due to said local electric fields caused by said at least one electrically conductive line, and wherein said portion has a first potential and said shield electrode is supplied with a second potential opposite said first potential so as to eliminate said local electric fields surrounding said measuring point.

4,733,076

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Kaoru Tamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1985, Ser. No. 793,039
Claims priority, application Japan, Oct. 30, 1984, 59-228757
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—327.2 10 Claims



1. An integrated radiation image recording and read-out apparatus comprising:

(i) a circulation and conveyance system for conveying at least two types of stimulable phosphor sheets for record-

VOL 1088 ISS 4 MR 22 1988 UMI

ing radiation images thereon along a predetermined circulation path,

(ii) an image recording section positioned on said circulation path for recording a radiation image on each stimulable phosphor sheet by exposing said stimulable phosphor sheet to a radiation having image information,

(iii) an image read-out section positioned on said circulation path and provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored thereon at said image recording section, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned by said stimulating rays to obtain an electric image signal,

(iv) an erasing section positioned on said circulation path for, prior to next recording on said stimulable phosphor sheet for which the image read-out has been conducted at said read-out section, releasing radiation energy remaining on the stimulable phosphor sheets after read-out in the image read-out section,

(v) at least one set of parallel branch paths consisting of a number of branch paths equal to the number of types of stimulable phosphor sheets provided at least in the part of the circulation path between the erasing section and the image recording section,

(vi) conveyunce means provided one in each branch path for conveying stimulable phosphor sheets of a prescribed type therethrough,

(vii) sorting means positioned at the inlet side of the branch paths near the erasing section for sorting the stimulable phosphor sheets conveyed along the circulation path by type and directing the stimulable phosphor sheets of each type into a prescribed one of the branch paths, and

(viii) designating means for use by an operator to send a sheet type designating signal to the conveyance means of a specific one of the branch paths, wherein a stimulable phosphor sheet of the designated type is selected from among the stimulable phosphor sheets directed into the branch paths by the sorting means and is sent to the recording section.

4,733,077

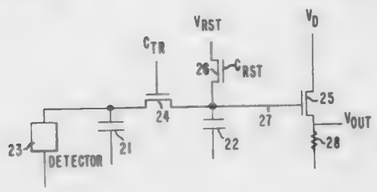
NOISE IMMUNE INFRARED READOUT CIRCUITRY

Steve D. Gaalema, Encinitas; Mary J. Hewitt, Playa Del Rey, and Arthur L. Morse, Hawthorne, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 20, 1984, Ser. No. 683,983

Int. Cl.[4] G01J *1/00;* **G01T** *1/22*

U.S. Cl. 250—338 **13 Claims**



1. An output encoding circuit for an associated IR detector element, the circuit including:

(1) a first capacitive element;

(2) means to periodically impose a signal across the first capacitive element proportional to the reset level of an associated infrared detector, so as to initiate a frame interval;

(3) means to accumulate the output of the associated infrared detector for a frame interval; and

(4) means (a) to readout from the first capacitive element the reset signal level, then (b) to impose on the first capacitive element a signal proportional to the output of the IR detector, and then (c) to readout the IR detector signal on the first capacitive element, these sequential operations (a), (b) and (c) defining a pixel address period substantially less than the frame interval, such that output encoding circuit produces a stepped output voltage representative of the delta change on the first capacitive element during the sequential readout operations for each successive frame interval.

4,733,078

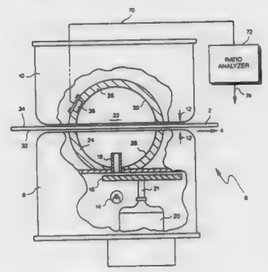
MEASUREMENT OF MOISTURE-STRATIFIED SHEET MATERIAL

Steven P. Sturm, Columbus, Ohio, assignor to AccuRay Corporation, Columbus, Ohio

Filed Aug. 25, 1986, Ser. No. 899,611

Int. Cl.[4] G01J *1/00;* **G01F** *23/00*

U.S. Cl. 250—339 **14 Claims**



1. Apparatus for measuring the moisture content of sheet material, such as paper, comprising:

(a) a source unit having a first area adapted to generally face a first surface of the sheet, the first area having an effective reflectivity;

(b) means, disposed within the source unit, for directing infrared radiation onto the first surface;

(c) a detector unit having a second area adapted to generally face a second surface of the sheet, the second area having an effective reflectivity, and the detector unit being spaced apart from the source unit to form a pass gap of sufficient width to allow substantially free movement of the sheet therethrough; and

(d) means, disposed within the detector unit, for detecting infrared radiation that has emitted from the directing means and repeatedly interacted with the sheet and the first and second areas, and for producing detector responses from which measurements of the moisture content of the sheet can be derived, wherein the effective reflectivity of the second area is significantly greater than the effective reflectivity of the first area, the apparatus thereby being adapted to yield greater measurement sensitivity to moisture conditions prevailing in the sheet near the second surface than to those conditions prevailing near the first surface.

4,733,079

METHOD OF AND APPARATUS FOR THERMOGRAPHIC IDENTIFICATION OF PARTS

Mark J. Adams, Kennesaw, Ga.; Elton M. Crisman, Jr., St. Cloud, Fla., and Asrar A. Khan, Marietta, Ga., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 13, 1985, Ser. No. 808,761

Int. Cl.[4] G01J *5/02;* **G01K** *1/02*

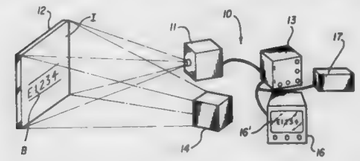
U.S. Cl. 250—341 **11 Claims**

1. A thermographic method of identifying bodies (objects) having a coating to be applied to at least a portion of the surface thereof, said method comprising the steps of:

(a) providing a body having a substantially constant reflectance;

(b) treating the surface of said body to alter the infrared reflectance of a portion of the surface of said body in an identifiable pattern;

(c) applying a coating to the surface of said body, said coating covering at least a portion of said identifiable pattern;



(d) directing infrared radiation from a source including at least one wavelength, from about three to about twenty micrometers, onto the surface of said body;

(e) scanning the surface of said body with an infrared sensing device to detect infrared sensing device to detect infrared radiation reflected by said body, as well as through said coating, and to generate a signal representative of reflected radiation; and

(f) creating a video image from said signal so that said identifiable pattern may be visually observed.

4,733,080

TEXTILE STRUCTURE MEASURMENT

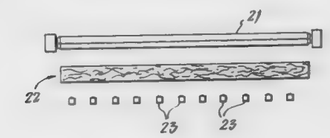
David Brunnschweiler, Balderstone; Peter G. Johnson, and Neil R. Henderson, both of Blackburn, all of England, assignors to Haigh-Chadwick Limited, West Yorkshire, England

Filed Mar. 3, 1986, Ser. No. 835,250

Claims priority, application United Kingdom, Mar. 9, 1985, 8506149

Int. Cl.[4] G01N *21/59*

U.S. Cl. 250—341 **9 Claims**



1. A method for measuring area density of a fibrous web, of the type used in the production of yarns and non-woven fabrics, the web being of such area density that its fibres obsure at least 75% of light transmitted across the web, comprising illuminating the web from one side with radiation from an infrared source and detecting the transmitting infra-red radiation on the other side of the web by a plurality of detectors spaced apart over the width of the web wherein said detectors output signals representative of an approximately exponential function of area denisty, and linearising and calibrating said signals to give signals representative of area density.

4,733,081

METHOD AND APPARATUS FOR SENSING A HUMAN BODY

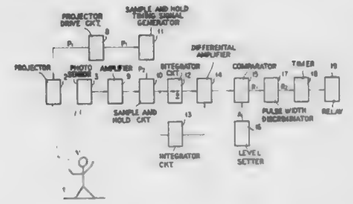
Yoshio Mizukami, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 12, 1986, Ser. No. 873,508

Claims priority, application Japan, Jun. 12, 1985, 60-126348; Dec. 28, 1985, 60-202953[U]

Int. Cl.[4] G01J *5/10;* **G05F** *15/20*

U.S. Cl. 250—341 **4 Claims**



1. An apparatus for sensing a human body comprising a projector for projecting infra-red rays towards a human body sensing region, a photo-sensor for receiving infra-red rays reflected from said human body sensing region and outputting an electrical signal corresponding to an intensity of incident infra-red rays, a first integrator circuit connected to the output side of said photo-sensor and having a relatively small time constant, a second integrator circuit connected to the output side of said photo-sensor and having a relatively large time constant, and a response circuit means connected to the outputs of said first integrator circuit and said second integrator circuit for outputting a human body sense signal when the difference between said outputs is held at a predetermined level or higher consecutively for a predetermineu period of time.

4,733,082

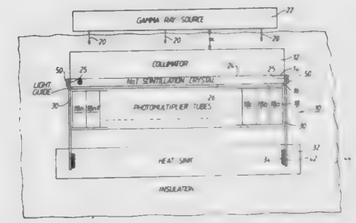
GAMMA RAY CAMERA METHODS AND APPARATUS EMPLOYING COOLED SCINTILLATION CRYSTAL

John F. Moore, Lake Bluff, and Richard T. Bernardi, Prospect Heights, both of Ill., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1986, Ser. No. 865,826

Int. Cl.[4] G01T *1/164*

U.S. Cl. 250—363 S **6 Claims**



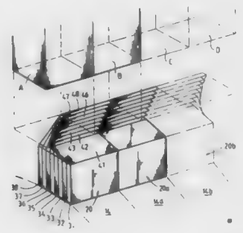
1. A method for improving the operation of a gamma camera which employs a planar scintillation crystal having a circumferential edge, comprising the steps of

(a) cooling said crystal by thermally coupling said circumferential edge to a heat sink; and

(b) applying pressure to said circumferential edge sufficient to maintain said crystal in compression when cooled.

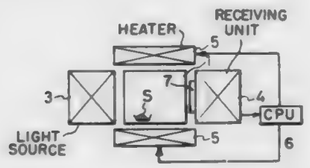
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,083
LIGHT GUIDES FOR A POSITRON EMISSION TOMOGRAPHY CAMERA
Wai-Hoi Wong, Houston, Tex., assignor to Clayton Foundation for Research, Houston, Tex.
Filed Jun. 18, 1986, Ser. No. 875,804
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—363 S **9 Claims**



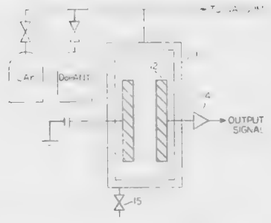
1. A positron emission tomography camera comprising,
a plurality of scintillation crystals in planes which are positioned side-by-side around a patient area to detect radiation therefrom and forming adjacent rows of crystals transverse to said planes,
each row of each plane having a plurality of crystals for detecting radiation and
a row of light detectors positioned adjacent each row of crystals for receiving detected radiation from the adjacent row of crystals, the number of light detectors in each row being greater than the number of planes of crystals,
a row of light guides positioned between each row of crystals and each row of coacting light detectors, the number of light guides being equal to the number of crystals, said guides having first and second ends with the first end of each light guide being positioned adjacent to one crystal, and the second end of each light guide being positioned adjacent a row of light detectors, and
the second ends of said light guides being offset longitudinally in the row a different amount from each other for providing an identification to the light detectors of which crystal detects radiation.

4,733,084
METHOD OF DETECTION AND QUANTITATIVE DETERMINATION OF SULFUR AND SULFUR MONITOR USING THE METHOD
Hajime Oosaka, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jan. 7, 1986, Ser. No. 816,843
Claims priority, application Japan, Jan. 9, 1985, 60-943; Jan. 9, 1985, 60-944; Jan. 9, 1985, 60-945
Int. Cl.[4] G01N *21/33*
U.S. Cl. 250—373 **4 Claims**



2. A sulfur monitor comprising:
a vessel with a built-in heater filled with a gaseous sulfur sample;
a pair of windows provided in said vessel in the direction in which light travels;
a light source means for emitting into a first of said windows at least one spectral line selected from a first group of peaks consisting of positive peaks at wavelengths in nm of 263, 265.5, 268, 270.5, 273, 276, 279 and 282, and from a second group of peaks consisting of negative peaks at wavelengths in nm of 264.5, 267, 269.5, 272, 275, 278 and 281; and
a light-receiving photometric unit positioned so as to receive light having passed through said gaseous sulfur sample for performing detection of the height of peak intensity of any one of the spectral lines transmitted through said gaseous sulfur sample in said vessel; and
a computer means for quantitatively determining sulfur on the basis of said height, whereby the sulfur input and pressure are controlled on a semi-real time basis.

4,733,085
PHOTOSENSITIVE DOPANTS FOR LIQUID NOBLE GASES
David F. Anderson, Wheaton, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jul. 1, 1986, Ser. No. 880,628
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—374 **13 Claims**

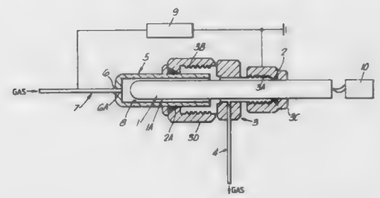


1. A method of detecting radiation with an ionization detector comprising the steps of:
dissolving a photosensitive dopant in a noble gas; liquifying the doped noble gas;
placing the doped liquified noble gas in said ionization detector;
introducing radiation to be detected into said ionization detector;
collecting free ions in the ionization detector;
counting the free ions collected within the ionization detector.

4,733,086
THERMAL ELECTRON SOURCE
Peter G. Simmonds, Dorset, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Mar. 7, 1986, Ser. No. 837,132
Claims priority, application United Kingdom, Mar. 15, 1985, 8506788
Int. Cl.[4] H01J *27/20*
U.S. Cl. 250—423 P **6 Claims**

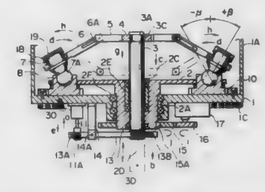
1. An electron capture detector (ECD) including an anode and a cathode and means therebetween for passage of a gas stream including trace elements for detection wherein the cathode comprises:
(a) a source of stable ultra-violet light having a cylindrical envelope;

(b) a coating of photoemissive material provided over the cylindrical envelope of the source, the coating comprising a thin conducting layer of metal selected such that the work function is less than the principal irradiance of light, so that said source of stable ultra-violet light and said



coating form a cathode having a photoemissive thermal electron source of cylindrical geometry; and
(c) cathode connection means conductively connected to the photoemissive metallic layer such that electrical circuitry can be connected to the cathode.

4,733,087
ION BEAM TREATING APPARATUS
Masamichi Narita; Yoshio Miura, and Hideaki Kikuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 20, 1986, Ser. No. 876,467
Claims priority, application Japan, Jul. 1, 1985, 60-142471
Int. Cl.[4] G21K *5/08*; G01F *21/00*
U.S. Cl. 250—442.1 **9 Claims**



1. An ion beam treating apparatus comprising: a vacuum vessel; a plurality of work piece holding portions for holding work pieces that are to be treated in said vacuum vessel; rotary receiving plates on which said work piece holding portions are mounted; a rotary disc for rotating said rotary receiving plates; a driving device for driving said rotary disk; and a tilting mechanism for tilting said work piece holding portions in any direction with respect to the direction of ion beam emitted from an ion source;
wherein said tilting mechanism is comprised of a linking mechanism for transmitting the rotation of said rotary receiving plates to said work piece holding portions, titled links for tilting said work piece holding portions, a shaft being coupled to said tilted links and mounted for axial movement in said rotary disk at the center thereof, and moving means for moving said shaft, so that distances are maintained equal between the ion source and the work pieces to be treated, and each of the work pieces are irradiated with the ion beam with a uniform intensity.

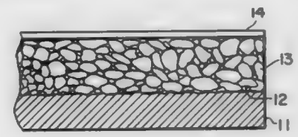
4,733,088
RADIATION DETECTOR
Hiromichi Yamada, Hino; Yasuo Tsukada, Ome; Atsushi Suzuki, Higashiyamato; Hajime Yamamoto, Tokyo; Minoru Yoshida, Tokyo; Kenji Maio, Tokyo, and Hideji Fujii, Tokyo, all of Japan, assignors to Hitachi, Ltd.; Hitachi Medical Corp. and Hitachi Metals, Ltd., all of Tokyo, Japan
Filed Aug. 11, 1986, Ser. No. 895,455
Claims priority, application Japan, Sep. 2, 1985, 60-191951; Apr. 30, 1986, 61-98330; Jul. 11, 1986, 61-161847
Int. Cl.[4] C09K *11/475*; G01T *1/202*
U.S. Cl. 250—483.1 **9 Claims**

1. A radiation detector, which comprises a light-transmitting, sintered scintillator body prepared by admixing a powdered scintillator capable of emitting light by radiation and represented by the general formula

$$(Ln_{1-x-y}Pr_xCe_y)_2O_2S: (X)$$

wherein Ln is at least one element selected from the group consisting of Gd, La and Y, X is at least one element selected from the group consisting of F and Cl, x is in a range of $3\times10^{-6}\leqq X\leqq0.2$, y is in a range of $10^{-6}\leqq y\leqq5\times10^{-3}$, and X is in an amount of 5 to 1,000 ppm, with 0.001 to 10% by weight, on the basis of the powdered scintillator, of one member selected from the group consisting of Li_2GeF_6, $(NH_4)_2GeF_6$, Na_2GeF_6, K_2GeF_6, $NaPF_6$, KPF_6,NH_4PF_6, Na_3AlF_6, K_2SiF_6, $Li_2SiF_6.2H_2O$, Na_2SiF_6, LiF, $NaHF_2$, KHF_2, NH_4HF_2, Na_2TiF_6, K_2TiF_6, K_2ZrF_6, $(NH_4)_2ZrF_6$, $MgSiF_6$, $SrSiF_6$, $Li_2B_4O_7$, $LiBF_4$, $NaBF_4$ and KBF_4 as a densification additive, filling the mixture into a metal container, vacuum sealing the container, and subjecting the container to hot isostatic pressing and subsequent annealing, and a photodetector for detecting the light emitted from the scintillator.

4,733,089
RADIOGRAPHIC INTENSIFYING SCREEN
Akira Kitada, and Terumi Matsuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Continuation of Ser. No. 485,833, Apr. 18, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 821,888
Claims priority, application Japan, Apr. 20, 1982, 57-64674
The portion of the term of this patent subsequent to Mar. 11, 2003, has been disclaimed.
Int. Cl.[4] G21K *4/00*
U.S. Cl. 250—483.1 **8 Claims**



1. A radiographic intensifying screen, comprising a support of a plastic film and at least one phosphor layer comprising a binder and a phosphor dispersed therein, in which said support is provided on a surface facing said phosphor layer with a great number of pits having a mean depth of 1–10 μm, inclusive, a maximum depth of more than 1 μm ranging to 50 μm, inclusive, and a means diameter of 10–50 μm, inclusive, whereby light emitted by said phosphor and advancing towards said surface of said support is reflected diffusely.

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4,733,090

SCREENS FOR STORING X-RAY IMAGES AND METHODS FOR THEIR USE

Charles D. DeBoer, and George W. Luckey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 721,130, Apr. 8, 1985, Pat. No. 4,637,898, which is a continuation of Ser. No. 238,404, Feb. 26, 1981, abandoned. This application Aug. 1, 1986, Ser. No. 891,797
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.⁴ G01T *1/105*
U.S. Cl. 250—484.1 **14 Claims**

1. A method of storing an image produced by x-ray exposure and releasing the stored image comprising:

exposing an x-ray storage screen, comprised of an isotropic storage phosphor and a polymer coated on a support, to x-radiation of a first wavelength in an imagewise manner to store an image pattern in the storage screen,

retrieving the image pattern from the storage screen by exposing the storage screen to radiation of a second wavelength, thereby stimulating radiation of a third wavelength,

the polymer having an index of refraction which matches that of the phosphor at the second wavelength, and

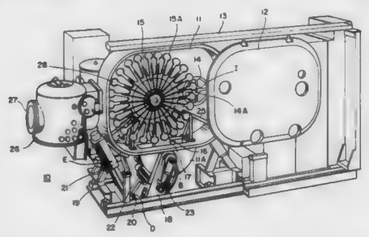
the support being non-reflective to radiation of the second wavelength.

4,733,091

SYSTEMS AND METHODS FOR ION IMPLANTATION OF SEMICONDUCTOR WAFERS

Frederick J. L. Robinson, Crawley, and Michael T. Wauk, II, Haywards Heath, both of England, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 652,020, Sep. 19, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 774,192
Int. Cl.⁴ G21K *5/08*
U.S. Cl. 250—492.2 **23 Claims**



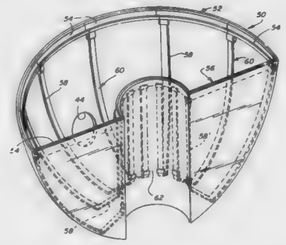
1. In a system for scanning semiconductor wafers through an ion beam, means generating an ion beam oriented in a prearranged direction defining one axis of a rectangular coordinate system relative thereto; a scan wheel assembly for carrying a plurality of semiconductor wafers and having a central axis; drive means for rotating said scan wheel assembly about said central axis to scan said wafers across said ion beam generally in the direction of a second axis of said rectangular coordinate system; scan means for producing relative scanning movement between said scan wheel assembly and said ion beam generally in the direction of a third axis of said rectangular coordinate system; said scan wheel assembly comprising a central hub, a plurality of separate spoke arms mounted to and supported by said central hub and extending radially outward therefrom; and a plurality of heat sink elements, and said heat sink elements being supported on said spoke arms substantially without intervening structure; each supported on the outer end of one of said spoke arms and including means for mounting a semiconductor wafer thereon, said spoke arms each having a width substantially less than the maximum width of said heat sink elements; said scan means overscanning said heat sink elements in and out of said ion beam so that said ion beam strikes only a portion of said spoke arms in one overscan position and the total heat load produced on said scan wheel assembly by said ion beam is substantially reduced.

4,733,092

INTERNAL RADIATION ATTENUATION SYSTEM

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed Sep. 3, 1987, Ser. No. 771,937
Int. Cl.⁴ G21C *11/00;* **G21F** *1/00, 3/04*
U.S. Cl. 250—515.1 **10 Claims**



1. An internal radiation attenuation system for a radioactive environment having a substantially enclosed radioactive workspace having an internal configuration with at least one entrance portal, said workspace internal configuration having an upper wall or ceiling, side walls and a bottom wall, comprising:

means for forming a frame for supporting a plurality of radiation attenuation means to substantially conform to at least a portion of the inside of said workspace internal configuration, said frame means including a plurality of interlocking segments, including means for assembling said segments into said frame means, said interlocking segments form a skeleton spaced around the periphery of said internal workspace, interlocked with one another, said frame means further including means for supporting said radiation attenuation means around at least a portion of the periphery of said internal workspace, said frame means skeleton forming a free standing support structure standing and supported primarily by said bottom wall without vertical support from said ceiling.

4,733,093

ELECTRONIC APPARATUS WITH CIRCUIT CARDS AND SIGNALS OPTICALLY COUPLED THEREBETWEEN

Alan F. Graves, Sherwood Park, and Ernst A. Munter, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

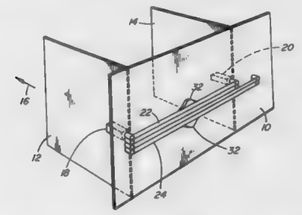
Continuation of Ser. No. 593,682, Mar. 26, 1984, abandoned. This application Aug. 19, 1986, Ser. No. 898,774
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **20 Claims**

1. Electronic apparatus comprising:

a backpanel;

a plurality of circuit cards arranged perpendicularly to and electrically connected to the backpanel;

optical coupling means on said circuit cards for emitting optical signals to or receiving optical signals from the backpanel; and



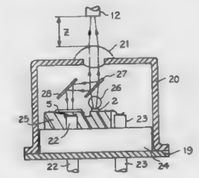
an optically conductive plastics moulding on the backpanel for coupling the optical signals between the circuit cards.

4,733,094

BIDIRECTIONAL OPTOELECTRONIC COMPONENT OPERATING AS AN OPTICAL COUPLING DEVICE

Jean F. Carpentier, Meudon la Foret; Philippe Morel, Paris, and Jacques Simon, Ris Orangis, all of France, assignors to Thomson-CSF, Paris, France

Filed May 9, 1986, Ser. No. 861,567
Claims priority, application France, May 10, 1985, 85 07147
Int. Cl.⁴ G02B *27/00;* **H01L** *31/12*
U.S. Cl. 250—551 **9 Claims**



1. A bidirectional optoelectronic photocoupler comprising:

a encapsulating box;

a micro lens mounted through the top surfaces of said box;

a light emitting diode mounted on a mounting surface on the bottom of said box in line with the optical axis of said microlens;

at least one detecting photodiode mounted on the same mounting surface as said light emitting diode and outside the optical axis of said microlens;

first planar reflecting means placed within said box along the optical axis of said microlens and inclined with respect to said axis made of a semitransparent mirror;

second planar reflecting means placed within said box in a parallel plane to said first planar reflecting means; and

support means for holding said first and second planar reflecting means in said box.

4,733,095

METHOD AND DEVICE FOR DETECTING AVERAGE LIQUID LEVEL IN A BOTTLE

Michito Kurahashi, Osaka; Hisao Tomikawa, Kagamigahara, and Yuji Doi, Takatsuki, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Nov. 24, 1986, Ser. No. 933,987
Claims priority, application Japan, Nov. 28, 1985, 60-268178
Int. Cl.⁴ G01N *15/06*
U.S. Cl. 250—577 **14 Claims**

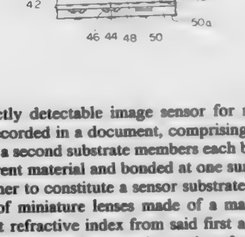
1. A method for detecting a liquid level in a bottle comprising the steps of:

irradiating first light beam toward an area of liquid surface adjacent the peripheral bottle wall at a first side of the bottle from a position below said liquid surface and located at said first side of the bottle;

irradiating second light beam toward an area of liquid surface adjacent the peripheral bottle wall at said second side of the bottle from a position below said liquid surface and located at said first side of the bottle;

receiving a first horizontally directed component of said first light beam reflected at the liquid surface and a second horizontally directed component of said first light beam refracted through said liquid, at said first side;

producing a first light intensity indicative signal having higher values at signal positions corresponding to elevations, at which said first and second horizontally directed components of said first light beam are received;



receiving a third horizontally directed component of said second light beam reflected at the liquid surface and a fourth horizontally directed component of said second light beam refracted through said liquid, at said second side;

producing a second light intensity indicative signal having higher values at signal positions corresponding to elevations, at which said third and fourth horizontally directed components of said second light beam are received;

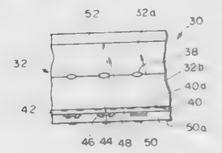
processing said first and second intensity indicative signals for deriving average signal position to derive an average liquid level.

4,733,096

DIRECTLY DETECTABLE IMAGE SENSOR EMPLOYING A LENS ARRAY AND METHOD OF PRODUCING THE SAME

Hiroyuki Horiguchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1986, Ser. No. 941,742
Claims priority, application Japan, Dec. 19, 1985, 60-284370
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **18 Claims**



1. A directly detectable image sensor for reading images which are recorded in a document, comprising:

a first and a second substrate members each being made of a transparent material and bonded at one surface thereof to each other to constitute a sensor substrate;

an array of miniature lenses made of a material having a different refractive index from said first and second substrate members and arranged at an interface between said first and second substrate members; and

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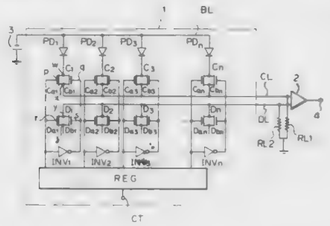
sensor means provided on a surface of one of said first and second substrate members.

4,733,097

HIGH SIGNAL TO NOISE RATIO OPTICAL IMAGE READER

Toshiyuki Iwabuchi, and Masaaki Sakamoto, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,027
Claims priority, application Japan, May 25, 1985, 60-112706
Int. Cl.[4] H01L *27/14;* H04N *5/30*
U.S. Cl. 250—578 **5 Claims**



1. An optical image reader for reading a document, comprising:

an array of photosensing elements comprising a plurality of photosensing elements;

a signal common line;

a dummy common line;

a plurality of signal switches each corresponding to each photosensing element, each switch being composed of a complementary MOS switch comprising a P channel MOS switch element and an N channel MOS switch element connected in parallel with each other, each switch having a first switch terminal, a second switch terminal, a first control terminal and a second control terminal, the first switch terminal of each signal switch being connected to the corresponding photosensing element and the second switch terminal thereof being commonly connected to the signal common line;

a plurality of dummy switches each combining with the corresponding signal switch to constitute a pair of switches, each dummy switch being composed of a complementary MOS switch comprising a P channel MOS switch element and an N channel MOS switch element connected in parallel thereto, each dummy switch also having a first switch terminal, a second switch terminal, a first control terminal and a second control terminal, the first switch terminal of each dummy switch being commonly connected to the dummy common line, the second switch terminal thereof keeping an open state, the first control terminal thereof being connected to the first control terminal of the corresponding signal switch, and the second control terminal thereof being connected to the second control terminal of the corresponding signal switch;

a plurality of inverters each corresponding to each pair of switches, each inverter having an input terminal and an output terminal, the input terminal of each inverter being connected to the first control terminals of the corresponding signal switch and dummy switch, and the output terminal thereof being connected to the second control terminals of the corresponding signal switch and dummy switch;

a scanning pulse generating means for providing scanning pulses to each pair of switches comprising the signal switch and dummy switch, having plural output terminals each being connected to the input terminal of the corresponding inverter and the first switch terminal of the corresponding signal switch and dummy switch; and

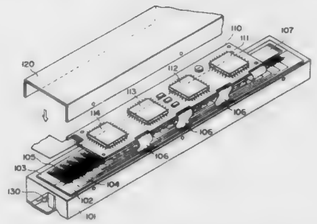
a differential amplifier having two input terminals being connected to the signal common line and the dummy common line respectively for detecting the difference between an output delivered from the signal common line and an output delivered from the dummy common line.

4,733,098

IMAGE READING APPARATUS COMPRISING FIRST AND SECOND SUBSTRATES SEPARATED AT A FIXED DISTANCE

Shinichi Seito, Atsugi; Makoto Ogura; Tatsundo Kawai, both of Hiratsuka, and Hirofumi Iwamoto, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 756,723, Jul. 19, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 6,676
Claims priority, application Japan, Aug. 30, 1984, 59-130602[U]
Int. Cl.[4] H01J *40/14;* H01L *27/14, 31/00*
U.S. Cl. 250—578 **11 Claims**



1. An image reading apparatus, comprising a photosensor for receiving light from an original document at a predetermined position relative to said photosensor, a wiring section for use in driving said photosensor, a circuit for driving said photosensor and for processing an output signal from said photosensor, a first substrate supporting said circuit, substrate means supporting said photosensor and said wiring section a base fixedly supporting said substrate means, a cap supporting said substrate at a position such that said substrate means is between said substrate and the predetermined position, and a flexible electrical connector electrically connecting said photosensor with said circuit; said cap, said base and said connector being so structured and arranged as to permit assembly of said apparatus by fixing said substrate to said cap, said substrate means and said connector to said photosensor and said circuit and thereafter putting said cap in place in contact with said base and fixing said cap and said base relative to each other.

4,733,099

MAGNETIC PROPULSION POWER PLANT

William O. Hutson, Jr., Rte. 3, Box 18B, Magnolia, Miss. 39652

Continuation-in-part of Ser. No. 657,721, Apr. 1, 1985. This application May 4, 1987, Ser. No. 46,235
Int. Cl.[4] H02K *47/00*
U.S. Cl. 290—1 R **18 Claims**

1. A magnetically powered motor providing both mechanical and electrical power output which comprises in combination

(a) housing means including a front cover means and a back cover means, both of said cover means having centrally located bearing means and having connecting members which connect said cover means;

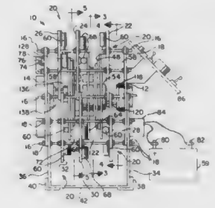
(b) at least two peripharal frame members between said cover means and attached to said connecting members, said frame members each having at least one electromagnetic drive means located thereon;

(c) a DC power source electrically connected to said electromagnetic drive means;

(d) a drive shaft bearing mounted in said bearing means and extending between said front and said back cover means and outwardly of one of said cover means;

(e) at least one electromagnetically driven stage fixedly attached to said drive shaft for rotation thereof about the central longitudinal axis of said drive shaft and in registry with one of said at least two peripheral frame members, said fixed stage having at least one dynamically balanced magnetic element located adjacent the periphery of said fixed stage and in proximate driven relation to said electromagnetic drive means during the rotation of said fixed stage, at least one dynamically balanced electromagnetic field generating coil means adjacent said central axis and electrically connected to said power source;

(f) at least one electromagnetically driven stage bearing mounted on said drive shaft for rotation thereof about said central axis and in registry with the other of said at least



two frame members, said bearing mounted driven stage having at least one dynamically balanced magnetic element located adjacent the periphery of said bearing-mounted stage and in proximate driven relation to said electromagnetic drive means for being driven in counter rotation to the rotation of said fixed stage, and at least one dynamically balanced armature means adjacent said central axis and electrically connected to a suitable receiver for electrical power generated in said armature; and

(g) a timing and polarity selection assembly electrically connected to said DC power source and said electromagnetic drive means,

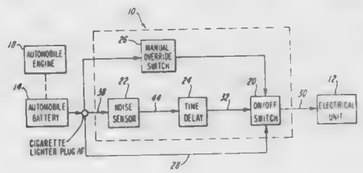
so that activation of said timing and polarity selection assembly energizes said electromagnetic drive means in the sequence and with the polarity required to initiate and sustain rotation of said fixed stage and counterrotation of said bearing mounted stage and provide thereby for the simultaneous rotation of said drive shaft for mechanical power and for electrical power at a level twice that expected from the rotational speed of said fixed and said bearing mounted stages.

4,733,100

AUTOMATIC ON/OFF CIRCUIT WITH TIME DELAY

Abdul K. Nusairat, Bellbrook, and Kurt L. Farmer, Dayton, both of Ohio, assignors to Fox Technology, Inc., Dayton, Ohio

Filed Jan. 14, 1987, Ser. No. 3,369
Int. Cl.[4] H02H *3/32;* H02J *7/00*
U.S. Cl. 307—9 **9 Claims**



1. An automatic on/off cirucit for applying power to an electrical unit, such as a radar receiver, from the electrical battery/generator power source of a motor vehicle, in which a varying electrical noise signal is superimposed whenever the vehicle's engine is running and in which said noise signal is absent whenever the engine is not running for automatically turning such unit "on" when the engine is running and for turning said unit "off" after the engine has stopped, comprising:

switch means electrically connected between said electrical power source and said electrical unit for receiving power from said electrical power source, said switch means being electrically switchable between "on" and "off" electrical states to correspondingly transmit and not transmit said power to said electrical unit for turning it "on" and "off";

sensor means electrically connected to said electrical power source sensing the presence or absence of said varying electrical noise signal superimposed thereon, said sensor means being operable to produce a first electrical output signal when the presence of said varying electrical noise signal is sensed and a second electrical output signal when the absence of said varying electrical noise signal is sensed; and

time delay means electrically connected between said sensor means and said switch means for receiving said respective first and second electrical output signals from said sensor means and being actuated in response thereto to corresponding first and second output states after lapse of a preset period of time, said time delay means when actuated to said first state from said second state after lapse of said preset time period causing said switch means to switch from said "off" to "on" state and when actuated to said second state from said first state after lapse of a present time period causing said switch means to switch from said "on" to "off" state.

4,733,101

VEHICLE POWER ANTENNA CONTROL WITH INHIBIT DURING CRANKING

Donald E. Graham, Dayton; Richard E. Wainwright, Kettering; Jeff A. Foust, Farmersville, and Gary R. Denton, Vandalia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 930,923
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 307—10 R **3 Claims**

1. In a power antenna control apparatus for a vehicle comprising an engine, an ignition switch with off, run and start positions, engine start means responsive to the ignition switch in its start position, a radio receiver effective to generate an extend signal when activated and a retract signal when deactivated, means effective to deactivate the radio receiver with the ignition switch in its off and start positions, a power antenna for the radio receiver and antenna drive means effective to extend and retract the antenna relative to the vehicle, the improvement comprising, in combination:

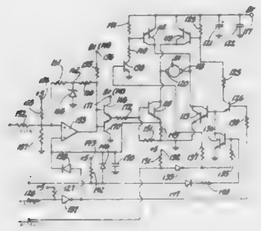
first control means responsive to the extend signal to activate the drive means toward a fully extended antenna position;

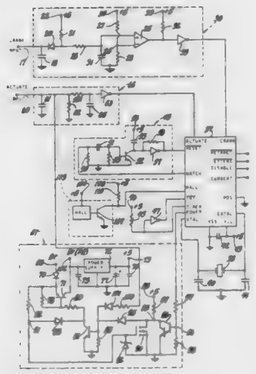
second control means responsive to the retract signal to activate the drive means toward a fully retracted antenna position;

third control means responsive to the ignition switch in its start position to deactivate the drive means at least in the

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extend direction and for at least a predetermined period of time deemed sufficient for starting of the engine, whereby





reversal of antenna extension during engine starting is prevented.

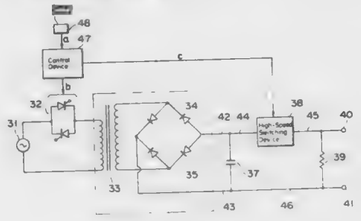
4,733,102

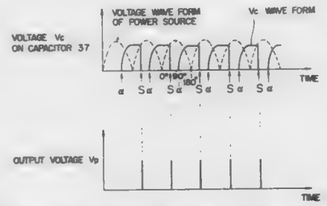
PHASE ANGLE REGULATED RECTIFIER AND PULSE PRODUCING SYSTEM

Yutaka Nakayama, and Kazutaka Tominatsu, both of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,053
Claims priority, application Japan, Jan. 30, 1986, 61-16741; Jun. 5, 1986, 61-85591[U]
Int. Cl.⁴ H02M *9/06*
U.S. Cl. 307—107 **4 Claims**

1. An impulse high voltage generator comprising:
- a step-up transformer having a primary winding and a secondary winding for stepping up an AC voltage from an AC power source;
- a thyristor connected to said primary winding of said transformer for controlling the AC voltage supplied said transformer by varying a firing angle;
- a full-wave rectifier connected to said secondary winding of said transformer and having an output;
- a capacitor connected to said output of said rectifier and charging to a DC voltage;
- high-speed switching means connected to said capacitor for selectively supplying said DC voltage to a load as an impulse high voltage;
- a discharging resistor connected to said switching means;
- setting means for setting an occurrence frequency of said impulse high voltage; control means for triggering said thyristor at a firing angle in accordance with the occurrence frequency set by said setting means to charge said capacitor with said DC voltage and for controlling conduction of said high-speed switching means during non-conductive periods of said thyristor to discharge said capacitor so that the impulse high voltage is generated to said discharging resistor;





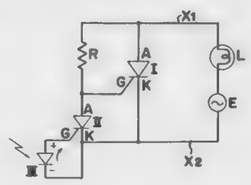
said control means triggering said thyristor in the range of 90° to 180° and 270° to 0° of the AC voltage, said control means controlling the conduction of said high speed switching means to be only in the range of 0° to 90° and 180° to 270° of the AC voltage, said control means thereby enabling conduction of said thyristor and conduction of said high-speed switching means at different times within a single half cycle of the AC voltage.

4,733,103

LIGHT SENSITIVE SWITCHING CIRCUIT

Hiromu Itoh, Nara; Junichiro Kikunaga, Tondabayashi; Tatsuya Kato, and Kenji Hachimura, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1985, Ser. No. 769,876
Claims priority, application Japan, Aug. 27, 1984, 59-177878; Aug. 31, 1984, 59-182987; Sep. 10, 1984, 59-189960; Sep. 11, 1984, 59-190325; Oct. 24, 1984, 59-224854
Int. Cl.⁴ H01H *35/00;* **H03K** *3/42;* **H01J** *40/14*
U.S. Cl. 307—117 **16 Claims**



1. A light sensitive switching circuit for supplying electric

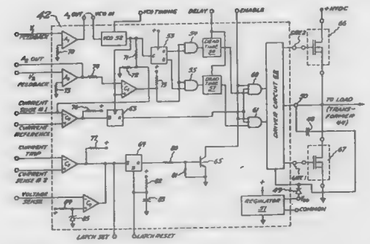
power from a power source to a load when it becomes darker than a predetermined brightness comprising:
- first and second lines means for connecting said power source and said load in series therebetween to supply power from said power source;
- a first thyristor connected between said first and second lines means;
- a second thyristor connected to said first thyristor such that the anode of said second thyristor is connected to the gate of said first thyristor and the cathode of said second thyristor is connected to the cathode of said first thyristor;
- a photovoltaic cell connected between the gate and the cathode of said second thyristor.

4,733,104

INTEGRATED CIRCUIT FOR CONTROLLING POWER CONVERTER BY FREQUENCY MODULATION AND PULSE WIDTH MODULATION

Robert L. Steigerwald, Scotia, N.Y., and Keku M. Mistry, Shalimar, Fla., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 805,651, Dec. 6, 1985, Pat. No. 4,685,040. This application May 4, 1987, Ser. No. 45,494
Int. Cl.⁴ H03K *3/01, 5/01, 7/08*
U.S. Cl. 307—260 **5 Claims**



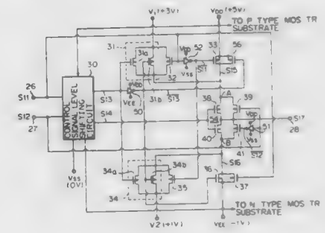
1. An integrated circuit comprising:
- voltage-controlled oscillator means for providing a variable frequency VCO signal in response to an external input signal;
- a first flip-flop having an input and a pair of complementary outputs, said flip-flop input being connected to the output of said voltage-controlled oscillator means;
- a first two-input AND gate for providing a turn-on pulse and having one input connected to one of said flip-flop outputs;
- a second two-input AND gate for providing a turn-on pulse and having one input connected to the other of said flip-flop outputs;
- amplifier means for receiving an input signal and providing an output signal,
- a first comparator having one input coupled to the output of said amplifier means and having its other input coupled to the output of said voltage-controlled oscillator means, the output of said first comparator being coupled to the remaining inputs of said first and second AND gates;
- a third AND gate having an input responsive to an enable signal;
- a fourth AND gate having an input responsive to said enable signal;
- a first dead-time circuit coupling the output of said first AND gate to an input of said third AND gate, said first dead-time circuit delaying the beginning of each turn-on pulse from said first AND gate by a first predetermined dead-time;
- a second dead-time circuit coupling the output of said second AND gate to an input of said fourth AND gate, said second dead-time circuit delaying the beginning of each turn-on pulse from said second AND gate by a second predetermined dead-time; and
- a driver circuit connected to the outputs of said third and fourth AND gates, said driver circuit having outputs adapted to drive a pair of series-connected converter switches, said driver circuit adapted to be coupled to an external capacitor for providing a voltage sufficient to drive the upper one of said converter switches.

4,733,105

CMOS OUTPUT CIRCUIT

Yasuhiro Shin, and Kazuhiko Yamada, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,810
Claims priority, application Japan, Sep. 4, 1985, 60-195530
Int. Cl.⁴ H03K *5/01*
U.S. Cl. 307—261 **9 Claims**



1. A CMOS output circuit formed on a semiconductor substrate comprising:
- (a) a control signal level shifting circuit responsive to a plurality of external control signals for delivering a plurality of control signals respectively converted to different amplitude levels;
- (b) a first switch means responsive to one of said control signals from said control signal level shifting circuit for selectively delivering a first reference voltage;
- (c) a second switch means responsive to one of said control signals from said control signal level shifting circuit for delivering a second reference voltage;
- (d) a third switch means responsive to one of said control signals from said control signal level shifting circuit for delivering a third reference voltage;
- (e) a fourth switch means responsive to one of said control signals from said control signal level shifting circuit for selectively delivering a fourth reference voltage;
- (f) a fifth switch means for selectively delivering one of said first, second, third, and fourth reference voltages to an output terminal based on one of said control signals from said control signal level shifting circuit;
- (g) a sixth switch means, connected in parallel with said first switch means, responsive to one of said external control signals for selectively delivering said first reference voltage;
- (h) a seventh switch means, connected in parallel with said second switch means, responsive to one of said external control signals for selectively delivering said second reference voltage;
- (i) an eighth switch means, connected in parallel with said third switch means, responsive to one of said external control signals for selectively delivering said third reference voltages;
- (j) a ninth switch means, connected in parallel to said fourth switch means, responsive to one of said external control signals for selectively delivering said fourth reference voltage;
- (k) a tenth switch means, connected between output nodes of said first and third switch means, and said output terminal, responsive to one of said external control signals for deliv-

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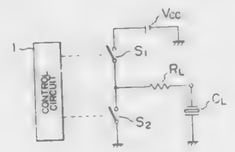
ering said first or third reference voltage to said output terminal; and

(l) an eleventh switch means, connected between outputs of said second and fourth switch means, and said output terminal, responsive to one of said external control signals for delivering said second or fourth reference voltage to said output terminal.

4,733,106
CAPACITIVE LOAD DRIVING DEVICE

Mitsuhiko Okutsu, Katsuta; Tatsuo Shimura, Hitachi, and Tadaaki Kariya, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., both of, Japan

Filed Apr. 1, 1985, Ser. No. 718,283
Claims priority, application Japan, Mar. 30, 1984, 59-65015
Int. Cl.⁴ H03K *3/26*
U.S. Cl. 307—270 **13 Claims**



1. A device for driving a capacitive load in response to an external control signal, comprising:

charging circuit means being connectable with the capacitive load for charging the latter and including a switching element, said switching element being arranged to be rendered electrically conductive to supply a charge current to the capacitive load when the device receives said control signal; and

discharging circuit means connectable with the capacitive load for discharging the latter with a discharge current passing therethrough when said control signal ceases, said discharging circuit means including means for generating a cutoff signal from said discharge current and applying the cutoff signal to said switching element to ensure turn-off of said switching element, in which said switching element is constituted by a unidirectional tetrode thyristor having an anode connectable with a power source, a cathode connectable with the capacitive load, a first gate for receiving said control signal and a second gate, and said cutoff signal generating means is constituted by a diode having its anode connected with the cathode of said thyristor and its cathode connected with said second gate.

4,733,107
LOW CURRENT HIGH PRECISION CMOS SCHMITT TRIGGER CIRCUIT

Timothy G. O'Shaughnessy, Yorba Linda, and Kenneth W. Ouyang, Huntington Beach, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

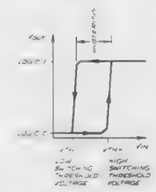
Filed Jul. 10, 1986, Ser. No. 883,937
Int. Cl.⁴ H03K *3/29, 5/153*
U.S. Cl. 307—290 **24 Claims**

1. A Schmitt Trigger circuit comprising:

a differential comparator having a first input for receiving an input signal, a second input for receiving a comparison signal to be compared to the input signal, an output switchable from a first output state to a second output state, and power supply terminals for the application of current from a power supply to the comparator;

feedback means, coupled to the second input, for providing one of a predetermined first and second voltages as the comparison signal in accordance with the output state of the comparator, said feedback means including power supply terminals for the application of current from the power supply to the feedback means; and

switch means, coupled to at least one of the power supply

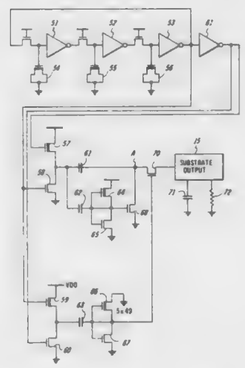


terminals of the comparator and feedback means and controlled by the input signal, for controlling the application of current from the power supply to at least one of the comparator and feedback means.

4,733,108
ON-CHIP BIAS GENERATOR

Ho-Dai Truong, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 28, 1982, Ser. No. 392,915
Int. Cl.⁴ H03K *3/01, 3/353, 17/56*
U.S. Cl. 307—296 R **4 Claims**



1. An on-chip bias generator for providing a bias to the substrate of said chip of the type having oscillator means for producing a series of square waves, rectifying means for producing a negative bias voltage from said square waves, and a capacitor for coupling said square waves from said oscillator means to said rectifying means, an improved rectifying means comprising:

a first FET for coupling the output side of said capacitor to said substrate,

a second FET for coupling the output side of said capacitor to ground, and

logic means responsive to the output of said oscillator means for allowing said first FET to conduct only when the square wave is at one level and for allowing said second FET to conduct only when the square wave is at the other level.

4,733,109
SECOND HARMONIC GENERATION WITH SCHIFF BASES

Michael C. Palazzotto, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1986, Ser. No. 825,469
Int. Cl.⁴ H03F *7/00*
U.S. Cl. 307—427 **28 Claims**

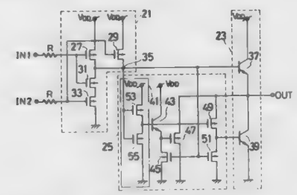


1. A second harmonic generator comprising, in combination, a laser source of coherent light radiation at a fixed fundamental frequency, an organic molecular crystalline compound, means for directing the output radiation of the laser onto the compound, and output means for utilizing the second harmonic frequency, said compound being a Schiff base which crystallizes in a non-centrosymmetric configuration and which contains a moiety selected from the group consisting of (a) 4-dialkylaminophenyl methylene amino, (b) 2-hydroxyphenyl methylene amino, and (c) 4-hydroxyphenyl methylene amino, said compound being transparent to radiation at said fixed fundamental frequency and said second harmonic frequency.

4,733,110
BICMOS LOGICAL CIRCUITS

Hiroyuki Hara, Tokyo, and Yasuhiro Sugimoto, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 23, 1987, Ser. No. 29,194
Claims priority, application Japan, Mar. 22, 1986, 61-62009
Int. Cl.⁴ H03K *19/01*
U.S. Cl. 307—446 **8 Claims**



1. A logical circuit which comprises:

a logical operational portion (21) consisting of first and second type MOS transistors for performing a logical operation of input signals;

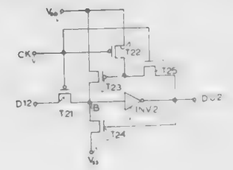
an output control portion (25) having an inverter circuit (41) for inverting an output signal from said operational portion and the remaining circuit portion comprising a first bipolar transistor (43) connected between power supply (V_{DD}) and the ground and conductively controlled by the output signal from said inverter circuit, a first-type first MOS transistor (55) conductively controlled by the output signal from said logical operational portion, a first-type second MOS transistor (47) connected between an output terminal and the ground and conductively controlled by the emitter potential of said bipolar transistor, a first-type third MOS transistor (49) conductively controlled by the output signal from said inverter circuit and a first-type fourth MOS transistor (51) conductively controlled by the output signal from said logical operational portion, said first-type third and fourth MOS transistors being connected in series between the output terminal and the ground; and

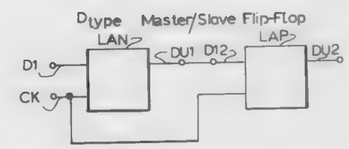
an output portion (23) consisting of a second bipolar transistor (37) conductively controlled by the output signal from said logical operational portion and a third bipolar transistor (39) conductively controlled by the output signal from the source potential of the first-type third MOS transistor, said second and third bipolar transistors being connected in series between the power supply and the ground for producing the result of the logical operation of the input signals with the junction of the series connected bipolar transistors being the output terminal (OUT) of the logical circuit.

4,733,111
SEQUENTIAL-LOGIC BASIC ELEMENT IN CMOS TECHNOLOGY OPERATING BY A SINGLE CLOCK SIGNAL

Mario Fassino, Turin, and Guido Ghisio, Ivrea, both of Italy, assignors to Cselt—Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed May 30, 1986, Ser. No. 869,171
Claims priority, application Italy, Jul. 17, 1985, 6765 A/85
Int. Cl.⁴ H03K *3/289, 17/04, 23/52, 27/00*
U.S. Cl. 307—452 **5 Claims**





1. A CMOS sequential-logic element comprising:

a logic inverter having an input and an output, the output signal of said element appearing at said output of said logic inverter;

a first MOS transistor having a gate and principal electrodes connected in series between a data-input terminal for said element and said input for connecting said input with said data-input terminal upon application of a clock signal to said gate and for disconnecting said input from said data-input terminal in the absence of a clock signal applied to said gate;

a second MOS transistor having a gate connected to said output of said logic inverter and principal electrodes in circuit with said input and forming a first positive feedback network between said output and said input of said logic inverter effective upon development of a logic level at said input of said logic inverter which would be affected by an error caused by a threshold voltage of said first transistor;

a second positive feedback network between said output and said input of said logic inverter for rendering said second positive feedback network effective in the absence of a clock signal and enabling said second positive feedback network to intervene only when at said input of said logic inverter a logic level exists which is unaffected by said error; and

means for applying the same clock signal simultaneously to said gate of said first transistor and to said second positive feedback network, and one of said first and second transistors being of the PMOS conduction type while the other

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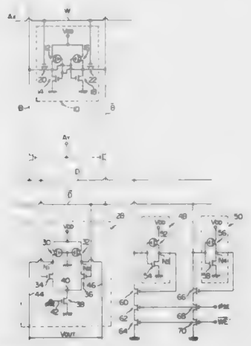
of said first and second transistors is of the NMOS conduction type, and wherein:
said element has an active phase at a low-voltage level of said clock signal;
said first transistor is of the PMOS type;
said second transistor is of NMOS type and has a gate and a drain connected respectively to the output and input of said logic inverter, and a source connected to a low-level supply; and
said second positive feedback network comprises:
a third transistor of NMOS type having a source connected to the output of the inverter and a gate supplied with said clock signal simultaneously with the energization of the gate of said first transistor,
a fourth transistor of PMOS type having a source connected to a high-level supply and a gate supplied with said clock signal,
a fifth transistor of PMOS type having a source connected to said high-level supply and a drain connected to the input of the logic inverter, and
means interconnecting the gate of the fifth transistor, the drain of the fourth transistor and the drain of the third transistor, said first to fifth transistors being all of the enhancement type.

4,733,112

SENSE AMPLIFIER FOR A SEMICONDUCTOR MEMORY DEVICE

Takashi Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,197
Claims priority, application Japan, Oct. 28, 1985, 60-242046
Int. Cl.[4] H03K *3/356, 17/04, 19/017, 17/687*
U.S. Cl. 307—530 **8 Claims**



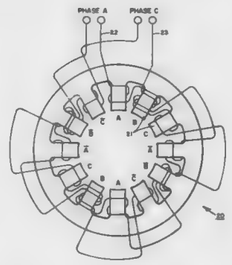
1. A sense amplifier circuit comprising
(a) first and second input lines to which voltages with a difference therebetween are to be applied respectively,
(b) a differential amplifier provided between sources of voltages of high and low levels and having a pair of input terminals respectively connected to said first and second input lines,
(c) first and second inverter means each having an input terminal and an output terminal, the input terminal of the first inverter means being connected to said first input line and the input terminal of the second inverter means being connected to said second input line,
(d) a first transistor having a current path provided between said first input line and the source of said voltage of low level and a control terminal connected to the output terminal of said first inverter means, and
(e) a second transistor having a current path provided between said second input line and the source of said voltage of low level and a control terminal connected to the output terminal of said second inverter means.

4,733,113

WINDING FOR OPERATION OF A THREE-PHASE STEPPING MOTOR FROM A TWO-PHASE DRIVE

Robert C. Smith, Hartford, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Feb. 5, 1987, Ser. No. 11,487
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—49 R **11 Claims**



1. A three-phase stepping motor adapted to be driven from a two-phase drive, comprising:
(a) a moving member magnetically interacting with a stationary member;
(b) the stationary member having first, second, and third sets of poles having thereon coils for magnetic energization thereof;
(c) the poles of the fiist and second sets each having a single coil thereon;
(d) the poles of the third set each having two coils thereon;
(e) the coils on the first set of poles and one of the coils on each pole of the third set of poles being connected to one phase of the drive; and
(f) the coils on the second set of poles and the other of the coils on each pole of the third set of poles being connected to the other phase of the drive.

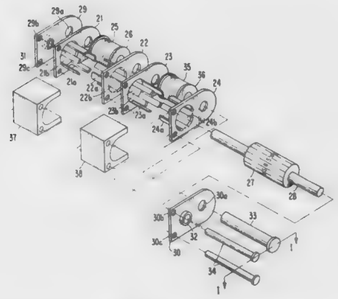
4,733,114

STEPPING MOTOR

Satoshi Suyama, Neyagawa, and Toru Arakawa, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 915,278
Claims priority, application Japan, Oct. 7, 1985, 60-223008
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—49 R **10 Claims**

1. A stepping motor comprising:
at least two pairs of parallel stator plates each having a first hole and a second hole having a circular circumference from which a plurality of stator poles are extended in a perpendicular direction to each plate of said pair of stator plates and arranged circumferentially at predetermined constant intervals, each pair of stator plates of said at least two pairs of stator plates being disposed so that said stator poles of said each pair of stator plates are arranged alternately so as to form a cylindrical space surrounded by said alternately arranged stator poles, one stator plate of one of said pairs of stator plates of said at least two pairs of stator plates being in contact with one stator plate of another pair of stator plates of said at least two pairs of stator plates so that one end of said cylindrical space formed by said one pair of stator plates coincides with one end of said cylindrical space formed by said another pair of stator plates to form an extended cylindrical space;
a cylindrical rotor disposed within said extended cylindrical space and having a plurality of alternately arranged N and S permanent magnet poles at a side surface thereof, each of said permanent magnet poles extending in a direction parallel to a rotational axis of said rotor and opposing said stator poles at a predetermined constant distance from said stator poles;
a common core rod penetrating said at least two pairs of parallel stator plates each through said first hole so as to be in parallel to said rotational axis of said rotor; and
at least one pair of energizing coils each disposed between said each pair of stator plates and wound around said common core rod so that said common core rod magnetically couples said at least two pairs of parallel stator plates, whereby said rotor is positioned out of each of said at one pair of energizing coils.

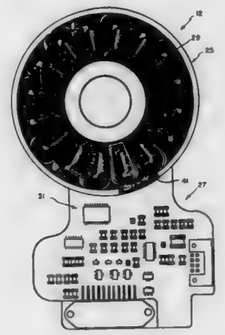


4,733,115

ELECTRIC MOTOR

Michael J. Barone, Spenceport, and David L. White, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1986, Ser. No. 942,121
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 R **7 Claims**



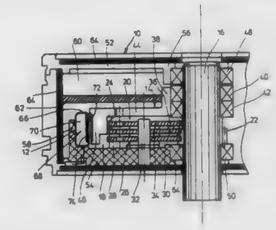
1. An electric motor comprising:
a generally planar rotor adapted to be rotated about an axis, said rotor being a multipolar permanent magnet;
a generally planar stator axially spaced from said rotor, said stator including a motor coil disposed opposite said rotor and a control section formed integrally with said coil and extending from one side thereof, said stator including a conductor layer having a first portion in said coil and a second portion in said control section, said conductor layer comprising elements of said coil formed in said first portion and a conductor pattern formed in said second portion which is electrically connected to said coil elements and formed integrally therewith; and
control elements supported on said control section and connected to said conductor pattern to control current in said coil elements.

4,733,116

ANGLE SENSOR WITH REDUCTION GEAR

Klaus Schulz, Berlin, Fed. Rep. of Germany, assignor to Oelsch Kommanditgesellschaft, Berlin, Fed. Rep. of Germany

PCT No. PCT/EP85/00684, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/03580, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 7, 1985, Ser. No. 892,175
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445243
Int. Cl.[4] H02K *11/00;* **G01B** *7/30;* **G01D** *5/04*
U.S. Cl. 310—68 B **8 Claims**



1. Angle transmitter containing
(a) a flat housing (10),
(b) a stator (12) arranged in the flat housing (10),
(c) a rotor (14) rotatably supported relative to the stator (12) in the housing (10) and cooperating with the stator (12) in the housing (10) and cooperating with the stator (12) through a limited angular range for producing an output signal dependent upon the rotational angle,
(d) an input shaft (16) and
(e) a reducing gear (18) by means of which the input shaft (16) is coupled to the rotor (14),
characterized in that
(f) the input shaft (16) is journalled in said flat housing (10),
(g) the rotor (14) is rotatably supported on the input shaft (16), the rotor comprising a hub (38) rotatably supported at the input shaft (16) adjacent the external toothing (22) of the input shaft (16) by means of two rolling bearings (40, 42), as well as an annular, disc-shaped central portion (44) adjoining the end of the hub (38) which is adjacent the external toothing (22), the rotor further including a circumferential portion (46) of basic cylindrical shape and which adjoins the central portion (44) along the circumference thereof on the side remote from the hub (38) and comprises the internal toothing,
(h) the reducing gear (18) is arranged within the flat housing (10) in an annular space (20) formed between the rotor (14) and the input shaft (16),
(i) the reducing gear containing an external toothing (22) at the input shaft (14) as well as an internal toothing (24) at the rotor (14) concentric relative to the input shaft (16) and spaced therefrom and
(j) in the housing (10), rotatably supported gear means (26) mesh with the external toothing (22) of the input shaft (16), on the one hand, and the internal toothing (24) of the rotor (14), on the other hand, the gear means protruding into the annular space (20) bounded by the circumferential portion (46), the central portion (44) and the input shaft (16).

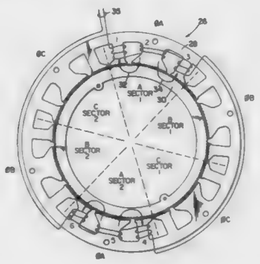
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,117

RELUCTANCE SYNCHRO/RESOLVER

Allen R. Perrins, Branford, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Apr. 27, 1987, Ser. No. 43,081
Int. Cl.[4] H02K *19/20*; G05B *1/06*
U.S. Cl. 310—162 1 Claim



1. A variable reluctance synchro/resolver comprising:

a stator assembly means having a plurality of first and second salient pole members, two of said second pole members being in spaced relation with and disposed at opposite sides of said first pole member, said one first and two second pole members being associated with one phase of each of three phases A, B and C and being arranged successively around the circumference of said stator assembly, the pole members associated with a given phase being disposed oppositely from pole members associated with the same phase;

a plurality of electrically energizable windings disposed one for one on each of said first and second pole members, each of said first and said second pole members associated with a given phase being quadrifilarly wound with said first pole members being wound in a direction opposite from said second pole members, each of said pole members of a given phase having a winding associated with each of the four conductors of said quadrifilar windings;

rotor means positioned adjacent said first and second pole members and movable with respect to them for changing the inductance of said quadrifilar windings as a function of the position of the rotor means relative to said first and second pole members;

an alternating current source for providing an excitation signal to a first conductor associated with a first winding on each of said pole members associated with each of said phases A, B and C, said respective first windings being connected in a series aiding arrangement;

a second conductor associated with a second winding on each of said pole members associated with phase B and a third conductor associated with a third winding on each of said pole members associated with phase B being connected in a series aiding arrangement and a second conductor associated with a second winding on each of said pole members associated with phase C and a third conductor associated with a third winding on each of said pole members associated with phase C being connected in a series aiding arrangement, one end of said B series aiding and said C series aiding arrangments being connected to produce a series opposing arrangement and producing an output voltage signal across the other ends of said B and C series arrangements having a magnitude equal to 2B–2C and representative of a resolver-based signal Rcosθ, and

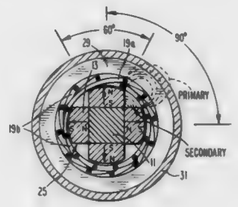
a second conductor associated with a second winding on each of said phase A pole members and a third conductor associated with a third winding on each of said phase B pole members being connected in a series aiding arrangement, and a fourth conductor associated with a fourth winding on each of said phase B pole members and a fourth conductor associated with a fourth winding on each of said phase C pole members being connected in a series aiding arrangement, one end of said A series aiding and said B, C series aiding arrangements being connected to produce a series opposing arrangement and producing an output voltage signal across the other ends of said A and said B, C series arrangements having a magnitude equal to 2A–B–C and representative of a resolver-based signal Rsinθ.

4,733,118

LOW DAMPING TORQUE BRUSHLESS D.C. MOTOR

Emil S. Mihalko, Lansdale, Pa., assignor to HHK Inc., Plumsteadville, Pa.

Filed Sep. 22, 1986, Ser. No. 910,567
Int. Cl.[4] H02K *7/14*, *21/14*
U.S. Cl. 310—177 22 Claims



14. A hand-held surgical tool, comprising:

a motor portion including a brushless D.C. motor comprising:

a rotor including an even plurality of permanent magnets radially spaced apart affixed to a rotatable shaft separated each from the other 360/N mechanical degrees between their respective centerlines where N is the number of magnets, each said magnet having a coercive force capable of producing a substantially unidirectional field;

a plurality of coils formed in a cylindrical array about said rotor, each said coil comprising electrical conductors formed in a polygonal array having a predetermined number of turns and including at least two sides parallel with said shaft with their respective centerlines spaced by a predetermined distance, and being substantially perpendicular to said magnetic field;

commutation sensing means mounted contiguously upon preselected ones of said plurality of coils for detecting the magnitude and polarity of a magnetic field produced by said permanent magnets;

a housing surrounding said plurality of coils with said commutation sensing means and said rotor;

an adaptor portion coupled to said motor portion for transmitting a torque supplied by said shaft; and

a workpiece coupled to said adaptor portion, said workpiece being adapted to rotate with said torque by said shaft.

4,733,119

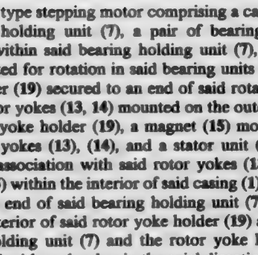
1-PHASE SELF-STARTING DISK-TYPE BRUSHLESS MOTOR WITH COGGING-PRODUCING ELEMENT

Manabu Shiraki, and Osami Miyao, both of Kanagawa, Japan, assignors to Shicoh Engineering Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1986, Ser. No. 909,719
Int. Cl.[4] H02K *21/14*
U.S. Cl. 310—268 24 Claims

1. A 1-phase energized brushless motor, comprising: a magnet rotor mounted for rotation and having 2P north and south poles, P being an integer equal to or greater than 1; at least one coreless armature coil disposed at a stationary same-phase position in an opposing relationship to said magnet rotor with an air gap left therebetween; a stator yoke for mounting said armature coil thereon; a single position-detecting element for determining in which direction electric current flows through said armature coil; and an electric circuit for detecting a pole of said magnet rotor to selectively energize said armature coil; said stator yoke having formed therein at least one cutaway portion defined by an arc of the stator yoke and two ends, each of which extends in a radial direction of the stator yoke or a direction oblique to the radial direction, and between said ends, having an angular width θ determined substantially by the following expression:

$$T \leqq m \cdot T \leqq \theta < 2n \cdot T$$



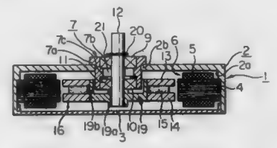
where T is the angular width of each pole of said magnet rotor, m is an integer ranging from 1 to 2n; and n is an integer of at least 1 with 2n being equal to or smaller than the total number 2P of the poles of said magnet rotor; said stator yoke being located such that at least one of said ends of said cutaway portion thereof is positioned within a range from a position at which a maximum starting torque can be obtained or any other same-phase position to a position spaced backwardly therefrom by a distance equal to about one half of the angular width of each pole of said magnet rotor in the direction of rotation of said magnet rotor.

4,733,120

FLAT TYPE STEPPING MOTOR

Eiji Kawabe, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 65,887
Claims priority, application Japan, Jun. 27, 1986, 61-149485
Int. Cl.[4] H02K *5/04*
U.S. Cl. 310—268 3 Claims



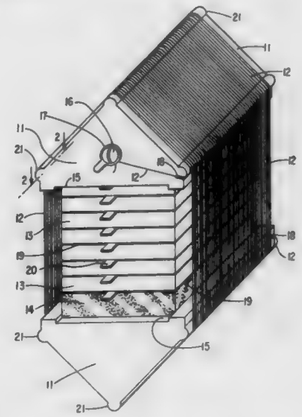
1. A flat type stepping motor comprising a casing (1) having a bearing holding unit (7), a pair of bearing units (9, 10) mounted within said bearing holding unit (7), a rotary shaft (12) mounted for rotation in said bearing units (9, 10), a rotor yoke holder (19) secured to an end of said rotary shaft (12), a pair of rotor yokes (13, 14) mounted on the outer periphery of said rotor yoke holder (19), a magnet (15) mounted between said rotor yokes (13), (14), and a stator unit (6) mounted in operative association with said rotor yokes (13, 14) and said magnet (15) within the interior of said casing (1), characterized in that the end of said bearing holding unit (7) is introduced into the interior of said rotor yoke holder (19) and in that said bearing holding unit (7) and the rotor yoke holder (19) are overlapped with each other in the axial direction of the motor.

4,733,121

SOLID STATE HEAT TO ELECTRICITY CONVERTER

Alvin J. Hebert, 1232 W. 186th St., Gardena, Calif. 90248

Filed Oct. 14, 1986, Ser. No. 918,071
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—311 13 Claims



1. A heat to electricity converter comprising:

a memory material wire having sufficient length to provide a coil-like winding encasement under a pressure of several hundred pounds per square inch of the following stack of plates:

two identical electrically and thermally insulating prismatic pressure plates having memory wire guide and attachment means for the ends of said memory material wire and for electrical contact electrodes, said electrodes facilitating resistive heating and rejuvination of said memory material wire, wherein said identical plates form the top and bottom of said stack;

a rectangular parallelopiped block of laminated electroactive plates having electrically conductive electrode surfaces, said electrode surfaces extending beyond the surfaces of said electroactive plates to facilitate electrical output connections;

a mechanical impedance matching rectangular pressure transmitting spring material plate;

wherein said memory material wire has sufficient cross sectional area and number of said winding turns to provide approximately 7,000 pounds per square inch of compressive pressure to said stack of plates during the heating portion of hot-cold-strain cycling of said memory material wire, and whereby said cycling causes contraction of said memory material wire during heating and expansion during cooling, said contraction and expansion producing increasing and decreasing pressure on said electroactive plates, thereby generating a useful alternating electrical potential at said electroactive plate electrode surfaces.

4,733,122

ACOUSTIC SURFACE WAVE FILTER BANK

Hideyuki Shinonaga, Saitama, and Yasuhiko Ito, Tokyo, both of Japan, assignors to Koknsai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,546
Claims priority, application Japan, Nov. 1, 1985, 60-244106
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R 4 Claims

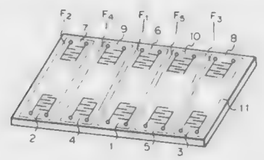
1. An acoustic surface wave filter bank, comprising:

at least one piezoelectric substrate having a plurality of acoustic surface wave filters fabricated thereon, each

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acoustic surface wave filter comprising an input interdigital transducer and an output interdigital transducer, wherein representative center frequencies (f_1, f_2, f_3, f_4, f_5, where $f_1<f_2<f_3<f_4<f_5$) of each acoustic surface wave filter are different from one another,

wherein said filters are allocated in a package so that center



frequencies of adjacently located filters are not adjacent to one another, with respect to frequency,

wherein said filters are allocated with no isolation means between adjacent filters, and

wherein said filters are allocated such that the maximum center frequency separation is obtained among all the allocated combination of filters.

4,733,123

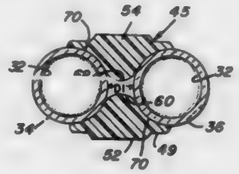
DIFFUSER FOR AN ARC DISCHARGE LAMP

John J. Zwald, Marblehead, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 14, 1986, Ser. No. 918,435

Int. Cl.[4] H01J *61/38*; F21V *11/00*

U.S. Cl. 313—116 **20 Claims**



1. A diffuser for an arc discharge lamp, said lamp having a sealed envelope of light-transmitting vitreous material and having a pair of end portions and including at least two longitudinally extending leg members having a predetermined spacing therebetween and a transversely extending envelope portion joining said longitudinally extending leg members, said diffuser comprising means having light-scattering properties and formed for disposal adjacent said leg members in a predetermined alignment with said predetermined spacing between said leg members to provide an appearance of a substantially uniform light output from the entirety of said envelope during operation of said lamp.

4,733,124

CATHODE STRUCTURE FOR MAGNETRON

Tomokatsu Oguro, and Hidetsuyo Baba, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 807,371

Claims priority, application Japan, Dec. 12, 1984, 59-260706

Int. Cl.[4] H01J *25/50*

U.S. Cl. 313—341 **12 Claims**

1. A cathode structure for a magnetron producing microwave oscillation energy from an output terminal, said cathode structure comprising a pair of opposite end shields for supporting both ends of a filament helically wound in an axial direction, and a getter fixed on one of said opposite end shields positioned on the side of said output terminal, the improvement wherein

(a) said one of said opposite end shields is formed with convex outer surface with respect to the other one of said opposite end shields, and



(b) said getter is a thin disc formed concavely so as to be in substantially contiguous contact with said outer surface, extends closely fitted over substantially the entirety of said outer surface, and is provided in its central portion with an upright annular wall of a central burring hole which extends from the convex outer surface of said disc.

4,733,125

COLOR PICTURE TUBE

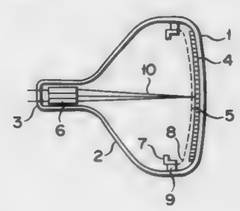
Kiyoshi Tokita, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 654,174, Sep. 25, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 894,088

Claims priority, application Japan, Sep. 28, 1983, 58-178148

Int. Cl.[4] H01J *29/07, 29/94*

U.S. Cl. 313—402 **8 Claims**



1. A color picture tube having a ceramic-coated shadow mask, said picture tube comprising:

an envelope;

a phosphor screen formed on an inner surface of said envelope;

a shadow mask containing metal being disposed in said envelope and in a vicinity of said phosphor screen and having a main surface portion with a number of apertures;

an electron gun for emitting electron beams which are selectively transmitted through said apertures and bombard said phosphor screen so as to emit multi-color light;

a layer comprising a ceramic material being chemically bonded to a portion of said main surface portion of the shadow mask, said layer being located on the side of said shadow mask facing said electron gun, said ceramic material having a thermal expansion coefficient smaller than that of the metal of said shadow mask, wherein said layer is bonded to said shadow mask such that a residual tensile stress remains in said shadow mask due to a difference in the thermal expansion coefficient between said shadow mask and said layer and the thermal expansion of said shadow mask caused by electron bombardment is suppressed with the result that doming of said shadow mask is suppressed; and

a conductive layer formed on said layer.

4,733,126

PHOSPHOR AND FLUORESCENT LAMP USING THE SAME

Masahiko Yamakawa, Yokohama, and Kenji Terashima, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 9, 1987, Ser. No. 36,452

Claims priority, application Japan, Apr. 16, 1986, 61-86183; Sep. 5, 1986, 61-207672

Int. Cl.[4] C09K *11/465*; H01J *61/44*

U.S. Cl. 313—487 **3 Claims**

1. A blue emitting phosphor represented by a general formula $(Ba_wCa_xMg_yEu_z)O.aAl_2O_3.\ bSiO_2$ where $0.1\leqq w\leqq 0.5$, $0.0004\leqq x\leqq 0.0020$, $0.1\leqq y\leqq 0.8$, $0.03\leqq z\leqq 0.10$, $w+x+y+z=1$, $1.5\leqq a\leqq 4.5$, and $0.0005\leqq b\leqq 0.0030$.

3. A fluorescent lamp comprising a phosphor film on an inner surface of a glass bulb, wherein said phosphor film contains a mixture of:

a blue emitting first phosphor represented by a general formula $(Ba_wCa_xMg_yEu_z)O.aAl_2O_3.bSiO_2$ where $0.1\leqq w\leqq 0.5$, $0.0004\leqq x\leqq 0.0020$, $0.1\leqq y\leqq 0.8$, $0.03\leqq z\leqq 0.10$, $w+x+y+z=1$, $1.5\leqq a\leqq 4.5$, and $0.0005\leqq b\leqq 0.0030$;

a green emitting second phosphor represented by a general formula $Ln_2O_3.c(Mg_{1-u}Ca_u)O.d[(Al_2O_3)_{1-v}(SiO_2)_v]$ (where Ln is at least one element selected from the group consisting of lanthanum, gadolinium, yttrium, cerium, and terbium, and $1.5\leqq c\leqq 5.0$, $2.5\leqq d\leqq 14.0$, $0.001\leqq u\leqq 0.005$, and $0.0002\leqq v\leqq 0.0010$); and

a red emitting third phosphor represented by a general formula $(Y_{1-t}Eu_t)_2O_3$ (where $0.020\leqq t\leqq 0.065$), the first, second, and third phosphors being contained in ratios of 0.2 to 35% by weight, 35 to 60% by weight, and 30 to 60% by weight, respectively, with respect to 100% by weight of the mixture.

4,733,127

UNIT OF ARRAYED LIGHT EMITTING DIODES

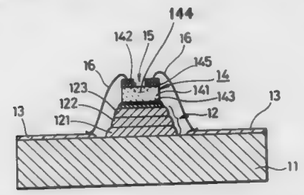
Hiromi Takasu, and Shigeru Sakaguchi, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

Filed Jun. 7, 1985, Ser. No. 742,584

Claims priority, application Japan, Jun. 12, 1984, 59-121059; Jun. 12, 1984, 59-121060; Jul. 31, 1984, 59-162256

Int. Cl.[4] H01L *33/00*; G09G *3/20, 3/32*

U.S. Cl. 313—500 **3 Claims**



1. A unit of arrayed light emitting diodes comprising:

a substrate,

an elongate printed conductor formed on said substrate, light emitting diode arrays disposed on said elongate printed conductor and having a plurality of light emitting portions on the surface of said light emitting diode arrays,

patterns formed on said substrate in the vicinity of said elongate printed conductor, for connecting said light emitting diode arrays, and

a multi-layer connection formed on said substrate,

said elongate printed conductor having at least one thick film of a thickness of 10 μm or less,

said light emitting portions being arrayed over said plurality of light emitting diode arrays, the arrays of the light emitting portions being substantially parallel to a longer side edge of said elongate printed conductor,

said patterns being fine patterns having a density of four lines or more per millimeter, and

said multi-layer connection being formed remotely from said elongate printed conductor and not on said fine patterns.

4,733,128

ELECTROLUMINESCENCE DISPLAY DEVICE CONTAINING A ZINC SULFIDE EMISSION LAYER WITH RARE EARTH ELEMENTS AND/OR HALIDES THEREOF AND PHOSPHORUS

Takao Tohda, Ikoma; Yosuke Fujita, Ashiya; Masahiro Nishikawa, Amagasaki; Tomizo Matsuoka, Neyagawa; Atsushi Abe, Ikoma, and Tsuneharu Nitta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

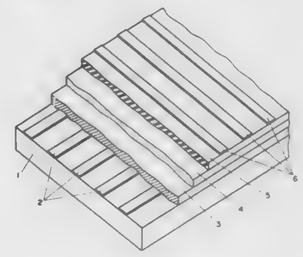
PCT No. PCT/JP84/00036, § 371 Date Oct. 5, 1984, § 102(e) Date Oct. 5, 1984, PCT Pub. No. WO84/03099, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 9, 1984, Ser. No. 673,557

Claims priority, application Japan, Feb. 10, 1983, 58-20606

Int. Cl.[4] H05B *33/14, 33/18*

U.S. Cl. 313—503 **6 Claims**



1. An electroluminescent display device having an emission layer comprising zinc sulfide containing

at least one member selected from the group consisting of rare earth elements and their halides as an activator; and

phosphorus as a coactivator.

4,733,129

STREAK TUBE

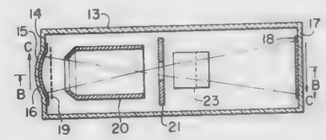
Katsuyuki Kinoshita, and Yutaka Tsuchiya, both of Hamamatsu, Japan, assignors to Hamamatsu TV Co., Ltd., Hamamatsu, Japan

Filed Dec. 28, 1981, Ser. No. 335,203

Claims priority, application Japan, Mar. 6, 1981, 56-32899

Int. Cl.[4] H01J *31/50*

U.S. Cl. 313—529 **3 Claims**



1. A streak tube, comprising:

an envelope having a longitudinal axis and first and second opposite ends, the first end of said envelope having a concave internal surface;

a photocathode surface formed within said envelope on said concave internal surface;

a mesh electrode mounted within said envelope adjacent

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said photocathode surface, the distance between said photocathode surface and said mesh electrode being maximum along the longitudinal axis of said envelope and decreasing gradually toward the periphery thereof;

a phosphor screen affixed to the interior of the second end of said envelope facing said photocathode surface;

an aperture electrode interposed between said mesh electrode and said phosphor screen;

a focusing electrode interposed between said mesh electrode and said aperture electrode; and

a deflection electrode interposed between said aperture electrode and said phosphor screen, electrons emitted from any position on said photocathode surface at a give instant being transmitted through the envelope to enter simultaneously into the deflection field generated by said deflection electrode.

4,733,130

INSULATING TUBE SURROUDING ANODE TUBE IN ANALYTICAL GLOW DISCHARGE TUBE

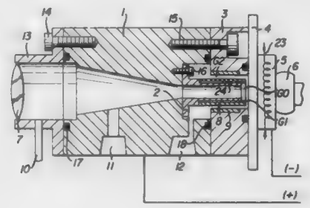
Takao Miyama; Tanaka Shoichi, and Fukui Isao, all of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

PCT No. PCT/JP85/00086, § 371 Date Oct. 24, 1985, § 102(e) Date Oct. 24, 1985, PCT Pub. No. WO85/04015, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 26, 1985, Ser. No. 799,375

Int. Cl.⁴ H01J *1/88, 17/04*

U.S. Cl. 313—619 **4 Claims**



1. An analytical glow discharge tube in which a sample as a cathode is placed facing an anode tube end with a specified discharge gap therebetween, and wherein gas in the discharge gap is directed to the outer side of the anode tube so as to be exhausted, said discharge tube comprising:

an insulating tube disposed around said anode tube and spaced apart from said sample, an end of said insulating tube projecting beyond said anode tube end toward said sample such that said gas is exhausted around the outer circumferences of said insulating tube, and wherein an exhaust passage, for said exhaust gas flowing in the discharge region between the anode and the cathode, has a width narrower than said discharge gap.

4,733,131

MULTIPLE-BEAM KLYSTRON

Duc T. Tran, Bures sur Yvette, and Georges Faillon, Meudon, both of France, assignors to Thomson-CSF, Paris, France

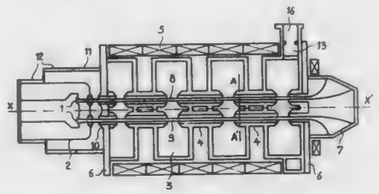
Filed May 27, 1987, Ser. No. 54,498

Claims priority, application France, May 30, 1986, 86 07825

Int. Cl.⁴ H01J *25/02*

U.S. Cl. 315—5.14 **2 Claims**

1. A multiple-beam klystron comprising several resonant cavities, with drift tubes in which the dimensions of the cavities are set in such a way that the klystron works optimally in the mode TM_{0n} (n being a whole number greater than 1), a klystron in which the drift tubes cross the cavities, passing



through a region where, even in the absence of these tubes, the electrical field would have an absolute maximum limit.

4,733,132

HIGH ENERGY ACCELERATOR

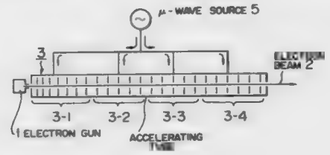
Kenji Miyata, and Masatsugu Nishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,347

Claims priority, application Japan, Mar. 29, 1985, 60-67183; Jun. 7, 1985, 60-122785

Int. Cl.⁴ H01J *25/10*

U.S. Cl. 315—5.41 **6 Claims**



1. An accelerator having a periodic structure for accelerating charged particles by means of high frequency electro-magnetic wave comprising:

a hollow acceleration tube extending in one direction; and

washer-shaped electrode means including a plurality of washer-shaped electrodes disposed within and separated from said acceleration tube, each of said washer-shaped electrodes having substantially uniform thickness, the sizes of said acceleration tube and said washer-shaped electrodes being such that the strength peak of the electric field is approximately equal at the inner portion and at the peripheral portion of said washer-shaped electrodes.

4,733,133

METHOD AND APPARATUS FOR PRODUCING MICROWAVE RADIATION

Raphael A. Dandl, San Marcos, Calif., assignor to Applied Microwave Plasma Concepts, Inc., Carlsbad, Calif.

Filed Nov. 26, 1985, Ser. No. 801,937

Int. Cl.⁴ H01J *17/26;* H05B *31/26*

U.S. Cl. 315—111.41 **34 Claims**

1. A method for producing pulses of high-power microwave radiation within an enclosure having a magnetic field, at least one magnetic mirror region, and a source of neutral gas to be ionized, comprising the steps of

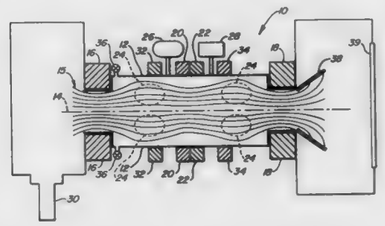
developing a selected gas pressure within the enclosure,

generating the magnetic field at a strength suitable for causing electron cyclotron heating,

introducing high frequency microwave energy of a selected frequency and power level into the magnetic mirror region,

continuing electron cyclotron heating to form a generally

stable, high-beta, relativistic electron plasma in the enclosure, and then



inducing a convectively unstable wave into the plasma for producing a pulse of relatively intense microwave radiation at a frequency near a local electron gyrofrequency of the plasma.

4,733,134

LIQUID METAL ION SOURCE WITH PULSE GENERATOR CONTROL

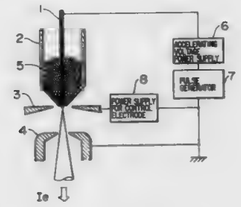
Hifumi Tamura, Hachioji; Tohru Ishitani, Sayama; Kaoru Umemura, and Yoshimi Kawanami, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1986, Ser. No. 865,976

Claims priority, application Japan, May 24, 1985, 60-110474

Int. Cl.⁴ H01J *7/24;* H05B *31/26*

U.S. Cl. 315—111.81 **5 Claims**



1. A liquid metal ion source comprising:

an ion emitter tip;

ion source material holder means holding ion source material for supplying liquid metal ion source material to said ion emitter tip;

ion extracting means for extracting ions from said ion emitter tip; and

voltage applying means for applying a voltage between said ion extracting means and said ion emitter tip, said voltage applying means including means providing a DC voltage which is at the neighborhood of the threshold V_{th} for ion beam extracting from said ion emitter tip, and pulsing means for providing a pulse voltage superposed on said DC voltage so as to provide a pulsed voltage applied between said ion extracting means ans said ion emitter tip whereby a pulsed voltage having good rising and falling characteristics and a pulsed ion beam are obtained.

4,733,135

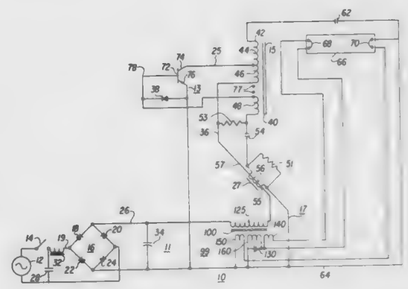
SELF-REGULATING, NO LOAD PROTECTED ELECTRONIC BALLAST SYSTEM

Jacques M. Hanlet, Loxahatchee, Fla., assignor to Intent Patents A.G., Liechtenstein, Liechtenstein

Continuation-in-part of Ser. No. 580,624, Feb. 23, 1984, Pat. No. 4,587,461. This application May 6, 1986, Ser. No. 860,200

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—224 **32 Claims**



1. A self-regulating, no load protected electronic ballast system having a power source for actuating at least one gas discharge tube with a regulated current and limited voltage to maintain said gas discharge tube input and output power at predetermined values, comprising:

(a) filter means connected to said power source for (1) maintaining a substantially smooth direct current voltage signal, and (2) suppressing harmonic frequencies generated by said electronic ballast system;

(b) induction means coupled to said filter means and having a tapped primary winding providing an auto-transformer configuration for establishing the magnitude of said regulated current, said induction means having a trigger control winding for generating a control current, said induction means further including no-load protection means for generating a voltage across said gas discharge tube responsive to said regulated current and for maintaining said output voltage at a predetermined value when said gas discharge tube is decoupled from said electronic ballast system, said no-load protection means having a transformer with a primary winding coupled in series relation with said filter means and said tapped primary winding of said induction means, said transformer including a multiplicity of secondary windings, said primary winding forming a variable inductance for reducing said regulated current when said gas discharge tube is decoupled from said ballast system;

(c) switching means being feedback coupled to said induction means for establishing said regulated current, said switching means including regulation means for maintaining said power output of said gas discharge tube at a predetermined and substantially constant value, said regulation means including a toroidal transformer having (1) a first winding coupled in series relation with said trigger control winding and said switching means for modifying said control current, and, (2) a second winding coupled to said tapped primary winding of said induction means and said filter means in series relation for feedback to said first winding of said toroidal transformer.

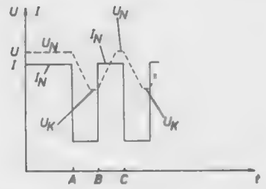
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,136

METHOD OF REGULATING THE POWER OF VAPOR DISCHARGE LAMPS

Volker Schaft, Barkenkoppel 38, 2000 Hamburg 65, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,554
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505182
Int. Cl.[4] H05B *41/16, 41/392*
U.S. Cl. 315—291 4 Claims



1. A method of regulating current of turnedon vapor discharge lamps having an arc discharge that continues to exist as a vaporized charge carrier in a slightly charged lamp and that is operated under reduced power capacity although at anytime being capable without a time delay lag to be switched to any desired operating point from a partial load range to a rated full load range as a radiation source of luminous flux, said method including the steps of:

reducing the lamp current;

measuring the drop in voltage during and after said reducing of lamp current;

determining a time period of constant voltage that follows said drop in voltage caused by commencement of condensation of the vaporized charge carrier as a result of cooling off of the slightly charged lamp;

increasing said lamp current when said time period of constant voltage is reached so that said lamp is heated up prior to collapse of the arc discharge;

measuring the increase in voltage during and after said increasing of said lamp current; and

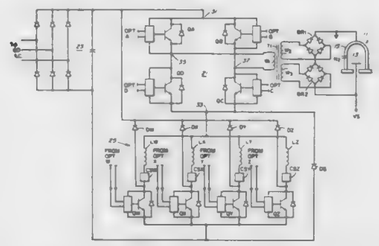
reducing said lamp current when a predetermined voltage is reached.

4,733,137

ION NITRIDING POWER SUPPLY

Richard M. Dunham, Salisbury, N.H., assignor to Walker Magnetics Group, Inc., Worcester, Mass.

Filed Mar. 14, 1986, Ser. No. 839,527
Int. Cl.[4] G05F *1/00*; H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—291 10 Claims



1. Apparatus for powering a gaseous discharge device, said apparatus comprising:

a bridge of switching devices, said bridge having a pair of d.c. input terminals and a pair of a.c. output terminals;

a high frequency step-up transformer, the primary of which is connected to the a.c. output terminals of said bridge;

high voltage rectifier means for driving a gaseous discharge from the secondary of said step-up transformer;

at least one inductor;

at least one current switching means;

means connecting said current switching means, said inductor and the input terminals of said bridge in series across said d.c. supply;

at least one diode connected across said inductor and said bridge input terminals but not said current switching means for freewheeling inductive current;

means for sensing the current drawn by a discharge fed by said high voltage rectifying means;

means responsive to said current sensing means for pulse width modulating the conduction of said current switching means;

means, operative in a first state for driving the switching devices in said bridge in alternating patterns of conduction phases for converting d.c. power to a.c. power at a frequency which is substantially higher than a.c. line frequency and operative in a second state for driving all of said switching devices into conduction thereby to effectively shunt said a.c. output terminals;

means for sensing the voltage across a discharge fed by said high voltage rectifier means; and

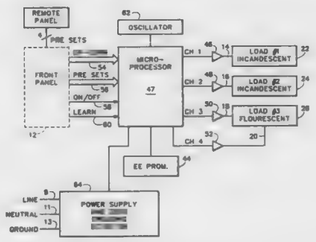
means responsive to said voltage sensing means for switching said driving means from said first state to said second state if the discharge voltage drops below a level indicative of the forming of an arc.

4,733,138

PROGRAMMABLE MULTICIRCUIT WALL-MOUNTED CONTROLLER

Gordon W. Pearlman, and Steven B. Carlson, both of Portland, Oreg., assignors to Lightolier Incorporated, Jersey City, N.J.

Continuation-in-part of Ser. No. 804,827, Dec. 5, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 937,893
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—307 9 Claims



1. A programmable circuit controller connected to a source of AC power for controlling a plurality of AC lighting circuits, comprising:

(a) level adjustment switch means for controlling the levels of AC power provided to each of said AC lighting circuits, respectively;

(b) learn switch means for storing signals representing power levels established by said level adjustment switch means in a memory;

(c) preset switch means for designating a plurality of power levels established by said level adjustment switch means to be stored in a memory as a predetermined set when said preset switch means is actuated simultaneously with the actuation of said learn switch means; and

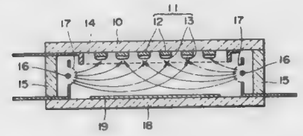
(d) wherein said preset switch means comprises a plurality of switches, each switch representing one predetermined set of lighting levels to be recalled from said memory and established as current lighting levels when one of said switches is actuated independently of said learn switch means.

4,733,139

FLUORESCENT DISPLAY DEVICE

Kiyoshi Morimoto, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Feb. 21, 1986, Ser. No. 831,508
Claims priority, application Japan, Feb. 28, 1985, 60-39880
Int. Cl.[4] H01J *29/70, 29/72*
U.S. Cl. 315—366 6 Claims



1. A fluorescent display device comprising:

an evacuated casing having a substrate, side walls and a cover plate;

at least one display section formed on said substrate, said display section having a plurality of anodes each comprising anode conductors having a phosphor layer deposited on the surface thereof so as to effect luminous display by selectively applying display signals to said anodes depending upon an image to be displayed;

cathodes for emitting a shower of unfocused electrons to be impinged upon said anodes, said cathodes being arranged laterally out of an area opposite to said anodes;

control electrodes for controlling electrons emitted from said cathodes, said control electrodes comprising,

first control electrodes arranged in front of each of said cathodes for extracting the shower of unfocused electrons emitted from said cathodes and for accelerating the shower of unfocused electrons into an evacuated space in said casing, and

second control electrodes arranged in a manner to be spaced from and opposite to said anodes for accelerating and controlling the shower of unfocused electrons extracted into said evacuated space in said casing so as to impinge electrons upon said anodes; and

a deflecting electrode having a constant voltage applied thereto formed on said cover plate for deflecting and diffusing the shower of unfocused electrons within said evacuated space in said casing;

wherein said deflecting electrode is kept at a different potential intermediate between the cathode potential and the anode potential during the operation of said fluorescent display device.

4,733,140

SIDE PINCUSHION CORRECTION CIRCUIT WITH AUTOMATIC PICTURE TRACKING

Kirk Oliver, Forest Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 6, 1987, Ser. No. 695
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—371 7 Claims

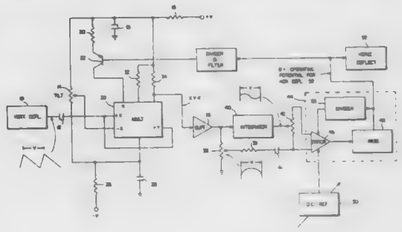
1. The method of compensating the sides of a raster, defined by a horizontal deflection system and a vertical deflection system; for pincushion distortion comprising the steps of:

applying a vertical deflection related ramp signal to two inputs of a multiplier to develop a vertical rate parabolic signal therefrom;

applying a variable DC voltage to another input of the multiplier to develop a tilt in said vertical rate parabolic signal;

deriving a substantially sinewave signal from said vertical rate parabolic signal;

combining said sinewave signal with said vertical rate parabolic signal for adjusting the phasing thereof; and



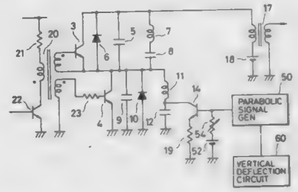
modulating the horizontal deflection system with said phase adjusted vertical rate parabolic signal.

4,733,141

HORIZONTAL OUTPUT CIRCUIT FOR CORRECTING PIN CUSHION DISTORTION OF A RASTER

Kiyoshi Watanuki, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,238
Claims priority, application Japan, Jan. 20, 1986, 61-7912
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—371 11 Claims



1. A horizontal output circuit for a cathode ray tube comprising:

a horizontal deflection coil;

an S-shape capacitor connected in series with said horizontal deflection coil;

a horizontal output transistor and a switching transistor connected in series and being responsive to a control means, said horizontal output transistor being connected in parallel with the series circuit of said horizontal deflection coil and said S-shape capacitor for timely producing a horizontal deflection current through said horizontal deflection coil;

a second capacitor connected in parallel with said series circuit for resonating with said series circuit during the time said horizontal output transistor is non-conducting;

a DC voltage source having first and second ends;

a third capacitor having a first end coupled to a first end of said series circuit and wherein the second end of each of said series circuit and said third capacitor being operatively coupled to the first and second ends of said DC voltage source, respectively;

a fourth capacitor connected between one end of said series circuit and said second end of said DC voltage source;

said switching transistor being connected between said one end of said series circuit and said other end of said DC voltage source and alternately turning on and off in response to said control means, wherein said horizontal output transistor and said switching transistor are switched into the conducting state approximately simulta-

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neously, and also the time at which said switching transistor is turned off by said control means precedes the turn-off time of said horizontal output transistor;

a current source operatively connected in parallel with said third capacitor, including a control terminal, for producing an output current having an amplitude which is responsive to a control signal supplied to said control terminal; and

a signal generator for generating a parabolic signal of a vertical frequency to be supplied to said control terminal of said current source, thereby effecting a voltage across said third capacitor with an amplitude which is modulated parabolically.

4,733,142

WINDSCREEN WIPER CONTROL

John Bicknell, Rudgwick, England, assignor to Cogent Limited, London, England

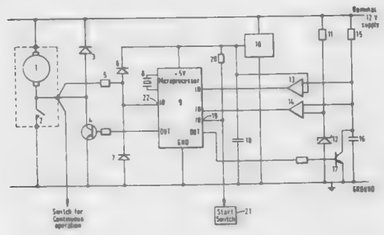
PCT No. PCT/GB86/00062, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/04554, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 5, 1986, Ser. No. 930,291

Claims priority, application United Kingdom, Feb. 5, 1985, 8502872

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—283 **9 Claims**



1. A method of controlling a windscreen wiper in which each single sweep of the wiper is timed and the delay between successive sweeps is adjusted in dependence on the time of the previous sweep of the wiper, characterized by establishing an estimated minimum sweep time value on the basis of a first measured sweep time, effectively establishing an estimated maximum sweep time value at a value higher than the estimated minimum sweep time value by a predetermined amount, automatically updating the estimated minimum sweep time value on the basis of a newly measured balue when a sweep time is measured which is below the current estimated minimum sweep time value, and determining the delay between successive sweeps from the relation of the measured previous sweep time to the estimated minimum and maximum sweep time values.

9. A windscreen wiper comprising a motor for sweeping a windscreen wiper blade across a windscreen and electronic control apparatus arranged to control the operation of the motor so as to provide a delay between sweeps of the wiper blade, which delay varies in dependence on the time the wiper blade takes to sweep the screen, the control apparatus including means to determine the time the wiper blade takes to sweep the screen, means to calculate a delay between sucessive sweeps of the wiper blade and means to control the motor according, characterized in that the control apparatus includes a microprocessor having means to establish an estimated minimum sweep time value on the basis of a first measured sweep time, means to effectively establish an estimated maximum sweep time value at a value higher than the estimated minimum sweep time value by a predetermined amount, means to automatically update the estimated minimum sweep time value on the basis of the newly measured value when a sweep time is measured which is below the current estimated minumum sweep time value, and means to determine the delay between successive sweeps from the relation of the measured previous sweep time to the estimated minimum and maximum sweep time values.

4,733,143

LINEAR MOTOR

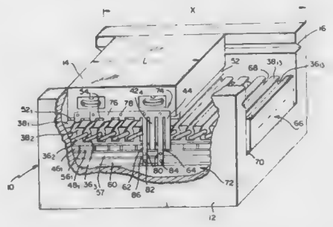
Anwar Chitayat, North Port, N.Y., assignor to Anorad Corporation, Hauppauge, N.Y.

Division of Ser. No. 383,351, Jun. 1, 1982, Pat. No. 4,560,911.

This application Jan. 7, 1985, Ser. No. 650,435

Int. Cl.[4] H02K *41/00*

U.S. Cl. 318—135 **3 Claims**



1. A DC linear motor comprising: a metallic frame;

a stationary magnetic member affixed to said metallic frame;

said stationary magnetic member including a plurality of windings;

said plurality of windings being spaced apart along a longitudinal axis;

a movable member;

a surface on said movable member facing said plurality of windings;

a plurality of permanent magnets on said surface spaced from said stationary magnetic member;

a planar power pickup rail and slip ring assembly disposed parallel to said longitudinal axis;

said assembly including a plurality of conductive areas on its surface;

each of said conductive areas being permanently electrically connected to at least one winding of said plurality of windings;

at least first and second brushes affixed to said movable member;

means for resiliently urging said at least first and second brushes into sliding electrical contact with said assembly;

said plurality of conductive areas and said first and second brushes being spaced along said longitudinal axis to provide an electrical connection from said first brush through one of said conductive areas to a first end of one of said plurality of windings, through said one of said plurality of windings to a second end thereof, and through a second of said conductive areas to said second brush whereby a complete electrical circuit through said one of said plurality of windings is attainable;

at least first and second conductive power pickup rails on said assembly, said first and second conductive power pickup rails being disposed in the same plane as said conductive areas and parallel to said longitudinal axis;

at least third and fourth brushes on said movable member;

means for resiliently urging said at least third and fourth brushes into contact with said at least first and second conductive power pickup rails respectively;

a first interconnection between said third brush and said first brush; and

a second interconnection between said fourth brush and said second brush.

4,733,144

ELECTRONIC DIGITIZED PROPORTIONAL-INTEGRAL CONTROLLER

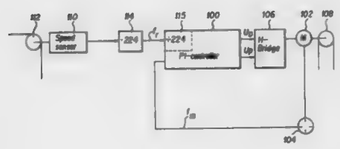
Wilhelmus T. L. Bisseling, Meerlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 27, 1987, Ser. No. 30,589

Claims priority, application European Pat. Off., Apr. 1, 1986, 86104381.8

Int. Cl.[4] G05B *19/28*

U.S. Cl. 318—318 **16 Claims**



1. An electronic proportional-integral controller for controlling the speed of an electric motor in accordance with a reference signal whose frequency represents the desired output speed of the controlled electric motor and a speed signal whose frequency represents the actual output speed of the controlled electric motor, comprising:

(a) a proportional circuit for generating a P-control signal corresponding to the difference between the frequencies of the reference signal and the speed signal and wherein the proportional circuit comprises a logic circuit connected to an up/down counter such that the logic circuit:

(1) converts the speed signal into a standardized speed signal which changes its state on each rising flank of the speed signal;

(2) converts the reference signal into a standardized reference signal which changes its state on each rising flank of the reference signal;

(3) delivers a sequence of upward counting pulses to the counter in synchronism with a first clock signal when there is present a pulse of the standardized speed signal and no pulse of the standardized reference signal;

(4) delivers a sequence of downward counting pulses to the counter in synchronism with the first clock signal when there is present a pulse of the standardized reference signal and no pulse of the standardized speed signal;

(5) generates a read signal to output the value of the counter which is the P-control signal; and

(6) generates a reset signal to reset the counter if a pulse has occurred in both the standardized speed signal and in the standardized reference signal and both standardized signals simultaneously have a pulse break;

(b) an integrator circuit which uses the speed signal and the reference signal for generating an I-control signal corresponding to the time integral of the difference between the frequencies of the reference signal and the speed signal;

(c) an addition circuit connected to both the proportional circuit and the integrator circuit for generating a sum signal corresponding to the sum or the weighted sum of the P-control and I-control signals; and

(d) an output stage for controlling the motor in accordance with the sum signal of the addition circuit.

4,733,145

DRIVE CONTROL SYSTEM FOR VEHICLE MOUNTED, ELECTRICALLY DRIVEN DEVICES

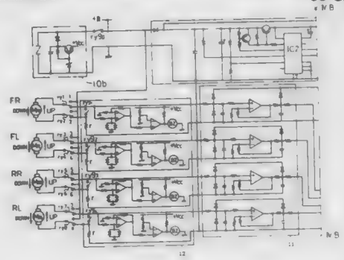
Masao Ohashi, Kariya; Tomio Yasuda, Kasukabe; Ryuji Iizawa, Tokyo, and Kiyomi Hori, Kawasaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Fujitsu Ltd., Kanagawa, both of, Japan

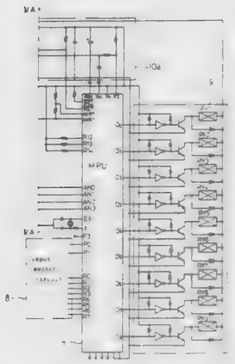
Filed Jul. 3, 1986, Ser. No. 882,108

Claims priority, application Japan, Jul. 11, 1985, 60-152968; Jul. 12, 1985, 60-153606

Int. Cl.[4] H02P *7/68*; G05D *3/10*

U.S. Cl. 318—54 **30 Claims**





1. Drive control system for vehicle mounted, electrically driven devices comprising:

support means for supporting at least one vehicle mounted, electrically driven device in a movable manner;

a motor drive mechanism for driving the vehicle mounted device;

a motor driver for energizing an electric motor contained in the motor drive mechanism;

input means for inputting a drive command to the motor drive mechanism;

means for detecting when the vehicle mounted device has reached a limit position;

first detecting means for detecting if an ignition key is inserted in an associated receptacle of an ignition switch mounted on the vehicle;

second detecting means for detecting an opening or closing of a door of the vehicle;

and control means including means for controlling the energization of the motor through the motor driver in response to the input means and means for energizing the motor through the motor driver in response to the second detecting means indicating a closing of the door and the first detecting means indicating that the ignition key is not

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inserted until the position detecting means detects that the device has reached the limit position.

30. A drive control system for vehicle mounted device which is adapted to be electrically driven comprising:

support means for supporting the vehicle mounted device in a movable manner;

a motor drive mechanism for driving the vehicle mounted device;

a motor driver for energizing an electric motor of the motor drive mechanism;

means for commanding a drive to the motor drive mechanism;

control means for controlling the energization of the motor through the motor driver in response to a command from the commanding means;

alarm means;

and alarm activating means for energizing the alarm means whenever an induced current through the motor, when it is not energized, exceeds a given value.

4,733,146

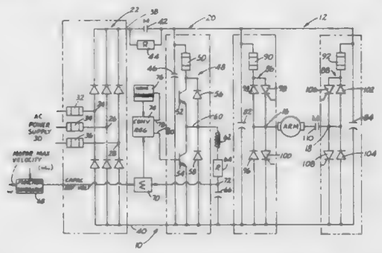
ENERGY RECOVERY SYSTEM FOR CYCLIC DRIVES

Russell S. Hamby, River Bend, N.C., assignor to Reliance Electric Company, Cleveland, Ohio

Continuation of Ser. No. 669,946, Nov. 9, 1984, abandoned. This application Dec. 15, 1986, Ser. No. 942,027

Int. Cl.⁴ H02J *9/04;* **B66B** *5/00*

U.S. Cl. 318—393 **8 Claims**



1. A system for recovering the electrical energy produced by an electric motor during deceleration for reuse during subsequent acceleration of the motor comprising capacitance means for storing the electrical energy produced by the electric motor during deceleration, means for controlling the charging and discharging of said capacitance means permitting the amount of electrical energy stored therein to be proportional to the difference between the total maximum rotational kinetic energy of the motor and any load associated therewith and the total instantaneous rotational kinetic energy of the motor and any load associated therewith, and means for allowing the transfer of said electrical energy from said capacitance means to the motor for reuse during the subsequent acceleration of the motor, said energy transfer allowing means having a duty cycle that is varied causing the instantaneous terminal voltage of said capacitance means to be proportional to the difference between the total maximum rotational kinetic energy of the motor and any load associated therewith and the total instantaneous rotational kinetic energy of the motor and any load associated therewith.

4,733,147

CONTROL DEVICE OF A DIRECT-CURRENT ELECTRIC MOTOR FOR A WINDSHIELD WIPER

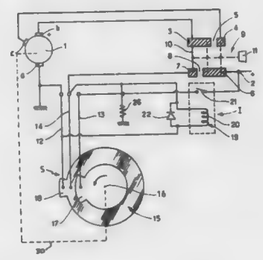
Guy Muller, Sevres; Herve Nomerange, Pontault-Combault, and Jean-Claude Dekin, Fresnes, all of France, assignors to Equipements Automobiles Marchal, France

Filed Jun. 17, 1986, Ser. No. 875,290

Claims priority, application France, Jun. 18, 1985, 85 09212

Int. Cl.⁴ B60S *1/08*

U.S. Cl. 318—443 **12 Claims**



1. In a control device of a direct-current electric motor having an armature for driving a windshield wiper, comprising:

a manually controlled switch for controlling the operation of said windshield wiper;

a first terminal of the armature connected to ground;

a second terminal of the armature connected to a power supply terminal through said manually controlled switch;

a parking switch means for controlling the stopping of said motor in a fixed position corresponding to a parking position of said windshield wiper, wherein said parking switch means comprises an electric circuit having a plurality of contact means, said plurality of contact means being designed to interact with a track means, said track means having electrically conductive and insulating sectors; and means for ensuring relative rotary movement, controlled by said motor and taking place between said plurality of contact means and said track means;

the control device being characterized in that the interaction of said plurality of contact means and said track means ensures that the power supply to the motor is maintained up to a desired fixed stopping position and that, when this stopping position is reached, the power supply to the motor is cut off and the motor armature is short-circuited, and wherein said plurality of contact means comprises a first contact connected to said manually controlled switch, a second contact connected to ground, and a third contact connected to said power supply terminal via an electrical breaker means, said electrical breaker means being designed to remain open when said motor is operated continuously and close when said manually controlled switch is actuated to stop said motor.

4,733,148

METHOD AND DEVICE FOR BRAKE CONTROL FOR A MOTION-MONITORED AND CONTROLLED DRIVE MOTOR FOR A PRINTING MACHINE

Anton Rodi, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

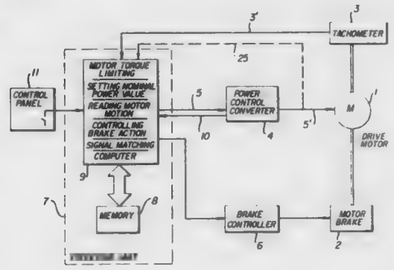
Continuation-in-part of Ser. No. 812,126, Dec. 23, 1985, abandoned. This application May 20, 1986, Ser. No. 865,145

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447090

Int. Cl.⁴ F16D *66/00*

U.S. Cl. 318—490 **11 Claims**

1. Apparatus for checking the operation of a brake for a motor for a printing press, comprising a motion signal generator coupled to the motor for producing a motion signal; a processor unit operatively responsive to said motion signal; a start switch connected to the processor unit for producing a motor start signal; the processor unit having a processor unit output; motor control means including a power converter being responsive to the processor unit output, having an output for controlling the motor; and the processor unit further having a brake output for checking the brake of the printing press motor.



6. Method for testing the operation of a brake for a drive motor having means for sensing the motion, and means for controlling the motion of the motor, comprising the steps of: engaging the brake; applying to the motor a current of a given first value; sensing as a first sensing step the motion of the motor; disengaging the brake; applying to the motor a current having a given second value being less than said given first value; sensing as a second sensing step the motion of the motor; and generating an error signal of in at least in said first sensing step motor motion is sensed, and in said second sensing step no motor motion is sensed.

4,733,149

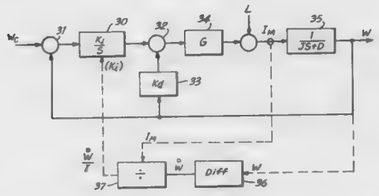
ADAPTIVE CONTROL SYSTEM

Wayne T. Culberson, Pulaski, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 31, 1985, Ser. No. 739,688

Int. Cl.⁴ G05B *13/00*

U.S. Cl. 318—561 **13 Claims**



1. A method for adaptive control in a system including a controller, control elements and controlled elements including an electric motor, comprising:

providing a command signal which is a velocity command for a controlled parameter;

providing a feedback signal indicating the actual value of the controlled parameter and which is the actual velocity of said electric motor;

using a controller including

integration in the forward loop thereof,

comparison of said command signal and said feedback signal prior to said integration; and

summation with said feedback signal in said forward loop after said integration; and

dynamically controlling the forward loop gain for said integration as a function of the derivative of motor velocity divided by motor current.

4,733,150

DEVICE AND METHOD FOR COMPENSATING THE GRAVITATIONAL EFFECT ON AN ELEMENT, RAISABLE AND LOWERABLE BY AN ELECTRIC MOTOR, OF A MACHINE TOOL OR OF A ROBOT

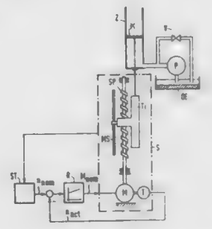
Wolfgang Papiernik, and Johann Steff, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,414

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528685

Int. Cl.⁴ G05D *23/275*

U.S. Cl. 318—632 **2 Claims**



1. A method for compensating a gravitational effect on a moveable element of a machine such as a machine tool or a robot, comprising the steps of:

positioning the moveable element in a predetermined sequence of positions while setting a controller which initially has no control variable input to maintain each respective position;

recording each respective resulting manipulated variable output of said controller which corresponds to each respective predetermined position;

superposing as a subsystem control variable each recorded manipulated variable for each of the sequence of positions respectively; and

optimizing the setting of the controller.

4,733,151

CONTROL SYSTEM FOR VIBRATION TESTING APPARATUS

Gary Butts, Huntington Beach, Calif., assignor to Ling Electronics, Inc., Anaheim, Calif.

Filed May 29, 1987, Ser. No. 55,459

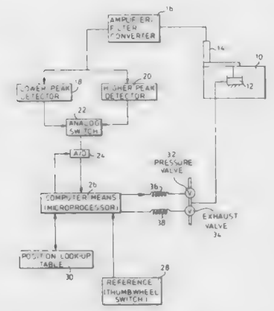
Int. Cl.⁴ G05D *15/00*

U.S. Cl. 318—645 **7 Claims**

1. A load support servomechanism for a shaker apparatus circuit comprising:

VOL 1088 ISS 4 MR 22 1988 UMI

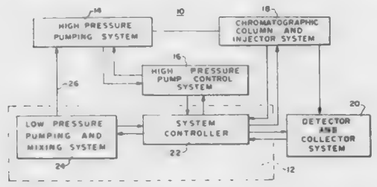
a position sensor which provides a current proportional to the position of an armature of said shaker apparatus;
a pair of peak detectors connected to an output of said position sensor which output has said proportional current flowing therethrough;
a bank of switches with individual switches of said bank of switches connected to respective buffered outputs of said peak detectors;
an A/D converter connected to a buffered output of said bank of switches;
a microprocessor which receives inputs from said A/D converter over a bus and which conveys clock, read and



write signals to said A/D converter;
a power supply which comprises means for generating AC and DC voltage and which has an AC voltage connection to said switching bus and DC connections to said A/D converter, said microprocessor, and to a buffer circuit which produces said buffered output of said bank of switches; and
a pair of amplifying and switching means converted to respective outputs of said microprocessor and to a DC voltage source.

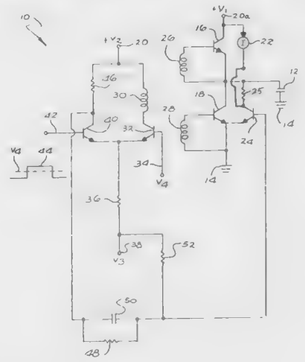
means for generating a signal representing the velocity of the motor;
means for detecting a position of said apparatus for a change of speed;
a feedback loop having velocity negative feedback means and positive feedback means and means for connecting the velocity negative feedback means and positive feedback means into circuit with said power means;
said feedback loop including means for alternately controlling the output signal from said power means by an input signal which increases in power with time under the control of an increasing positive feedback signal from said motor and by an input signal which varies in power in relation to the difference between a relative constant motor speed and a preset motor speed;
means for storing a preset analog value of velocity having an amplitude representing said preset analog value of velocity;
said velocity negative feedback means having means for comparing said preset analog value of velocity with said signal representing the velocity of the motor to generate a velocty feedback error signal for controlling said power means for driving the motor with an input power related to said velocity feedback error signal;
means for storing said velocity feedback error signal when said output signal from said power means is controlled by an input signal which increases in power with time under the control of an increasing positive feedback signal from said motor;
said positive feedback means including means for applying a signal to said power means related to a constant, whereby the motor accelerates at a predetermined rate; and
timing means for timing a period of time for said output signal from said power means to be controlled by an input signal which increases in power with time under the control of an increasing positive feedback signal from said motor, which period of time is related to the amplitude of said preset analog signal.

4,733,152
FEEDBACK SYSTEM
Robert W. Allington, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.
Filed Mar. 10, 1986, Ser. No. 838,295
Int. Cl.[4] G05B *19/40*; B01D *15/08*
U.S. Cl. 318—685 **4 Claims**



1. A feedback system for controlling a motor comprising:
apparatus driven by a motor at a plurality of preselected speeds correlated with positions of said apparatus;
power means having an ouput signal for driving said motor at a speed related to the power means output signal;

4,733,153
SWITCHING SYSTEM FOR CAPACITOR CHARGING/DISCHARGING
Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.
Filed Jul. 2, 1987, Ser. No. 69,317
Int. Cl.[4] H03K *7/06*; H02M *7/00*; H03G *3/00*
U.S. Cl. 320—1 **12 Claims**



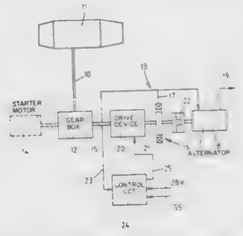
1. In combination in an electronic switch controlling the

charging and discharging of charge storage means having first and second terminals,
means for providing a reference voltage,
means for providing an energizing voltage,
first switching means connected to the first terminal of the charge storage means and the energizing voltage means and having open and closed states and operative in the open state to prevent the energizing voltage from being introduced to the charge storage means and operative in the closed state to provide for the introduction of the energizing voltage to the charge storage means to charge the charge storage means,
second switching means connected to the first terminal of the charge storage means and the reference voltage means and having open and closed states and operative in the open state to prevent the discharge of the charge storage means and operative in the closed state to provide for the discharge of the charge storage means through the reference voltage means,
means for providing an input signal having leading and trailing edges,
means responsive to the leading edge of the input signal for instantaneously pulsing the first switching means to the closed state and the second switching means to the open state and for maintaining the first switching means in the closed state and the second switching means in the open state for a particular period of time after the leading edge of the input signal,
means for maintaining a substantially constant flow of current to the charge storage means after the particular period of time in which the first switching means is closed,
the pulsing means being responsive to the trailing edge of the input signal for instantaneously pulsing the first switching means to the open state and the second switching means to the closed and for maintaining the first switching means in the open state and the second switching means in the closed state for the particular period of time after the trailing edge of the input signal, and
third switching means having slower response characteristics than the second switching means for maintaining the discharge of the charge storage means to the reference voltage means after the particular period of time in which the second switching means is closed.

4,733,154
Patent Not Issued For This Number

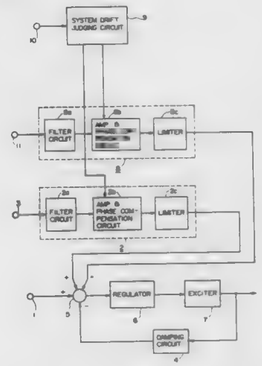
4,733,155
SPEED CONTROL UNIT FOR AN AIRCRAFT GENERATOR
Sidney B. Smith, Adeyfield, England, assignor to Lucas Industries Public Limited Company, Great Britain
Filed Sep. 19, 1986, Ser. No. 909,488
Claims priority, application United Kingdom, Oct. 11, 1985, 8525096
Int. Cl.[4] H02P *15/00*
U.S. Cl. 322—10 **5 Claims**

1. A speed control unit for an aircraft generator, comprising a continuously variable ratio drive device, means for sensing the speed of an output shaft of said drive device, and a control circuit for generating an error signal responsive to a difference between a sensed speed and a desired speed of said output shaft, said drive device being responsive to said error signal for varying the ratio of the input and output speeds of said drive device to maintain said output speed substantially constant, said control circuit including means for delaying application of said error signal to said drive device until said output shaft has reached a predetermined speed, and a circuit for increasing the



rise time of said error signal after said predetermined speed has been reached.

4,733,156
POWER SYSTEM STABILIZING APPARATUS
Seiichi Tanaka, and Masaru Shimomura, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1986, Ser. No. 870,011
Claims priority, application Japan, Jun. 5, 1985, 60-121917
Int. Cl.[4] H02P *9/10, 9/14*
U.S. Cl. 322—20 **5 Claims**



1. A power system stabilizing circuit for controlling a voltage regulator whose output voltage is applied to the field windings of a synchronous generator, comprising:
a first power stabilizer including a phase compensation circuit having an adjustable phase delay, for receiving a signal relating to a first parameter indicative of the operation of said synchronous generator and producing an output signal that results in an increase in the synchronizing torque of the generator;
a second power stabilizer including a phase compensation circuit having an adjustable phase delay, for receiving a signal relating to a second parameter indicative of the operation of said synchronous generator and producing an output signal that results in an increase in the braking torque of the generator;
a system drift judging circuit for detecting drift in the operation of said generator and adjusting said phase delays in response to detected drift; and

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means for applying said output signals from said power stabilizers to said voltage regulator.

4,733,157

ELECTRONIC VOLTAGE REGULATOR WITH TWO-DIRECTIONAL ACTION FOR ALTERNATORS

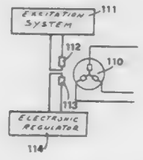
Luigi Malesani, Padua, Italy, assignor to M.E.C.C. Alte S.p.a., Creazzo, Italy

Filed Dec. 12, 1985, Ser. No. 808,063

Claims priority, application Italy, Dec. 14, 1984, 85669 A/84

Int. Cl.[4] H02P *9/10, 9/30*

U.S. Cl. 322—28 **6 Claims**



1. An electronic voltage regulator for regulating the output voltage of an alternator to a desired value, comprising:

control means for comparing said output voltage with a predetermined reference voltage and producing an impulse signal indicative of the magnitude of deviation of said output voltage above or below said reference voltage; and

regulating means, including a single auxiliary winding, and responsive to said impulse signal for providing an auxiliary voltage on said auxiliary winding, said auxiliary voltage being superimposed on said output voltage to obtain an output voltage at said desired value.

4,733,158

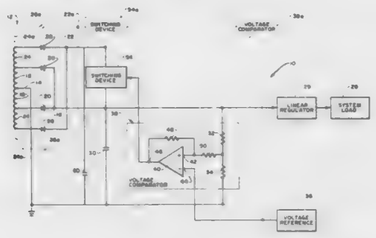
CONTROL CIRCUIT FOR TAP-SWITCHING POWER SUPPLIES AND MULTI-TAP TRANSFORMERS

Vito J. Marchione, Panorama City, and James W. Brunelle, Granada Hills, both of Calif., assignors to Datametrics Corporation, Chatsworth, Calif.

Filed Aug. 21, 1986, Ser. No. 898,713

Int. Cl.[4] G05F *1/16*

U.S. Cl. 323—258 **12 Claims**



1. A control circuit for automatically controlling the output voltage of a multi-tap transformer in response to a varying input line voltage and/or system load current demands, the control circuit comprising:

voltage sensing means being in parallel with the transformer voltage output and a linear regulator for sensing changes in the line or system load current demand requirements:

voltage reference means for automatically generating a pre-selected voltage reference level signal for the line or system load current demand requirements;

voltage comparison means operatively connected with said voltage sensing means for generating an enable signal whenever the line or system load current demand requirements sensed by said voltage sensing means falls below said voltage reference level signal;

switching means operatively connected to said voltage comparison means, said linear regulator and across a high tap and a low tap of the multi-tap transformer for connecting said high tap to supply a preregulator voltage to said linear regulator for the system load whenever said enable signal is present and for disconnecting said high tap from supplying said preregulator voltage whenever said enable signal is absent.

4,733,159

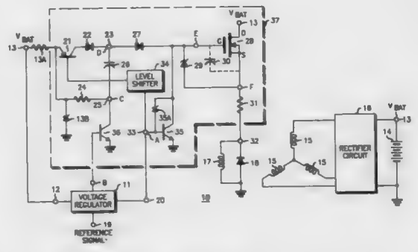
CHARGE PUMP VOLTAGE REGULATOR

Arthur J. Edwards, Hoffman Estates, Ill., and Mihaly Lamoth, Coppet, Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 28, 1986, Ser. No. 924,100

Int. Cl.[4] G05F *1/56*

U.S. Cl. 323—282 **18 Claims**



1. A voltage regulator comprising:

regulator means for receiving a sensed voltage signal and for providing, in response to the effective comparison of said sensed voltage signal with a reference signal, a regulator output signal, comprising pulses, having a predetermined frequency and a predetermined signal characteristic determined in accordance with said comparison;

drive circuit means coupled to said regulator means and comprising a power switching device having a control terminal effectively coupled to said regulator output signal and having at least two output terminals, said output terminals coupled in series with a control element of a voltage control means which determines said sensed voltage signal, across a maximum power source voltage potential, said drive circuit means controlling said sensed voltage, via said control means, in accordance with said characteristic of said regulator output signal to maintain said sensed voltage signal at a predetermined voltage level determined by said reference signal, said drive circuit means including a peak voltage increasing means for receiving said regulator output signal and effectively providing in response thereto a corresponding increased magnitude voltage signal generally varying as said regulator output signal but varying up to a peak voltage potential in excess of said maximum power source voltage potential,

wherein the improvement comprises said peak voltage increasing means comprising a capacitor selectively series coupled and decoupled across a predetermined power source voltage potential in accordance with pulses of a high frequency signal having a pulse frequency substantially in excess of the frequency of said regulator output signal, said peak voltage increasing means, therefore, comprising a high frequency charge pump which provides said increased voltage signal, said increased voltage signal having the same general waveform as said regulator output signal but increased in voltage magnitude to achieve a peak voltage potential in excess of said maximum power source voltage potential, the charge pump providing said increased voltage signal as an output which is coupled to said control terminal of said power switching device.

4,733,160

CIRCUIT FOR GENERATING A REFERENCE VOLTAGE HAVING A PREDETERMINED TEMPERATURE DRIFT

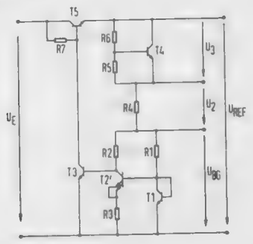
Dieter Draxelmayr, Villach, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,986

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533165

Int. Cl.[4] G05F *3/20*

U.S. Cl. 323—314 **3 Claims**



1. A circuit for generating a reference voltage with a predetermined temperature drift, comprising a supply circuit; output terminals; a series circuit connected to said supply circuit and between said output terminals including a network and a circuit for generating an electrical variable having a positive temperature coefficient, wherein said network includes at least one active component; and wherein said circuit for generating an electrical variable having a positive temperature coefficient includes: a first branch having a first transistor connected as a diode with a base and a collector, a first collector resistor connected to the collector of said first transistor, a second branch parallel to said first branch having a second transistor with a base, a collector and an emitter, a second collector resistor connected to the collector of said second transistor and an emitter resistor connected to the emitter of said second transistor, and said bases of said first and second transistors are interconnected, and a regulator with negative feedback for regulating an operating point setting having an input circuit connected to said circuit for generating an electrical variable having a positive temperature coefficient and an output circuit connected to said output terminals.

4,733,161

CONSTANT CURRENT SOURCE CIRCUIT

Hisao Kuwahara, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 25, 1987, Ser. No. 18,475

Claims priority, application Japan, Feb. 25, 1986, 61-39535

Int. Cl.[4] G05F *3/20*

U.S. Cl. 323—315 **10 Claims**

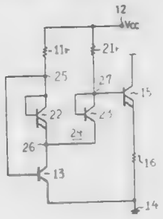
1. A constant current source circuit for an integrated device having a predetermined power supply voltage, comprising:

first current source means responsive to the power supply voltage for supplying a first input current to the circuit;

resistor means for controlling the level of the output current of the circuit;

output transistor means coupled to the resistor means for supplying the output current to the resistor means, including an emitter having an emitter area;

stabilizing transistor means coupled to the output transistor means for supplying a fixed voltage to the output transistor means in response to the first input current from the first current source means; and



means coupled between the stabilizing transistor means and the output transistor means for reducing variations in the output current of the circuit without substantially increasing the emitter area of the output transistor means.

4,733,162

THERMAL SHUTOFF CIRCUIT

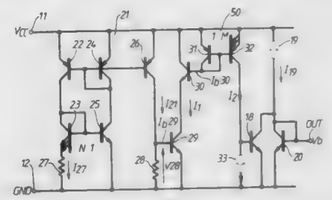
Hiroyuki Haga, Tokyo; Mitsuru Nagata, and Hiromi Kusakabe, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 1, 1986, Ser. No. 936,159

Claims priority, application Japan, Nov. 30, 1985, 60-269676

Int. Cl.[4] G05F *3/20*

U.S. Cl. 323—316 **15 Claims**



1. A thermal shutoff circuit for controlling current to an external circuit in response to changes in the temperature of the shutoff circuit, comprising:

means for supplying a voltage which varies with changes in temperature; and

switch means, responsive to the temperature variable voltage, for interrupting the current to the external circuit when the temperature of the shutoff circuit exceeds a predetermined amount, said switch means including

transistor means for compensating for variations in the current amplification ratios of other transistors in said thermal shutoff circuit, said transistor means including

a detection transistor having a base current responsive to the temperature variable voltage, and

a compensation transistor connected in series to the detection transistor for generating an equivalent base current to the base current of the detection transistor.

4,733,163

DIGITALLY CONTROLLED CURRENT SOURCE

Ira Miller, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 2, 1987, Ser. No. 7

Int. Cl.[4] G05F *3/20*

U.S. Cl. 323—317 **9 Claims**

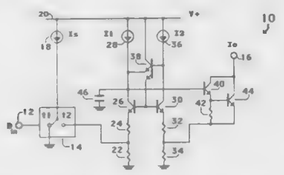
1. Current source for providing an output current the magnitude of which is controlled in a predetermined manner, comprising:

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constant current source means for providing first, second and third currents at respective outputs;

a current mirror circuit coupled to said constant current source means and including first and second resistors through which said first and second currents flow respectively, said current mirror having an input and an output;

first switch means coupled to said constant current source



means for steering said third current through said first resistor in response to receiving a control signal supplied to an input thereof; output circuit means coupled between said output of said current mirror and said second resistor and having an output, said circuit means being responsive to said third current being steered through said first resistor for providing the output current, said output being an output of the current source.

4,733,164

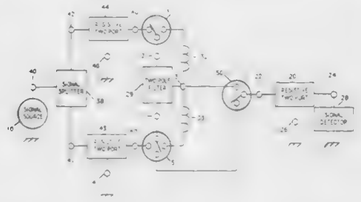
METHOD AND APPARATUS FOR FREQUENCY MEASUREMENT AND ADJUSTMENT OF MONOLITHIC CRYSTAL FILTERS

Franz L. Sauerland, 2851 Southington, Shaker Hts., Ohio 44120

Filed Apr. 3, 1986, Ser. No. 847,699

Int. Cl.[4] G01R *23/07, 29/22*

U.S. Cl. 324—56 **17 Claims**



7. An apparatus for measuring up to four characteristic frequencies of a monolithic filter, said four frequencies including the symmetric and antisymmetric frequencies and two resonator frequencies, and said apparatus comprising:

a. a signal input means for providing two balanced input signals that are decoupled from each other,

b. an output signal detector, and

c. switching means for selectively interconnecting the terminals of a monolithic filter with the signal input means and with the output signal detector so as to selectively excite and measure the characteristic frequencies by means of selective signal transmission through the filter and signal detection in the output signal detector.

4,733,165

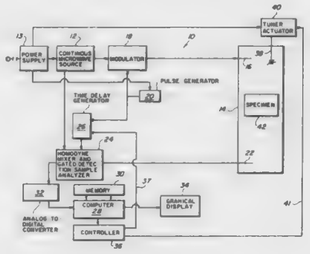
MULTIMODE RESONANCE CHAMBER AND METHOD OF DETERMINING AN EQUIVALENT SINGLE MODE RELAXATION RESPONSE

Robert E. Richardson, King George, and Reginald I. Gray, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1986, Ser. No. 838,073

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—58.5 C **25 Claims**



1. A resonance system comprising:

multimode chamber means having wall means for shielding the interior of the chamber means from the surrounding environment,

transmitting antenna means connected to the chamber means and inserted in the chamber means interior at a given point for continuously transmitting a series of microwave pulses therein so as to excite the interior thereof,

power supply means and continuous microwave source means connected to the power supply means, a pulse output of said microwave source means being connected to the antenna means, said microwave source means being comprised of adjustable oscillator means for controlling the carrier frequency of a pulse transmitted to the antenna means,

detection means connected to the chamber means and inserted in the chamber means interior at a second point relatively spaced from the antenna means, said detection means for sensing at the second point in terms of voltage a transient relaxation response curve of the relative field strength in the chamber means interior thereat for each pulse transmitted by the antenna means,

analyzer means separately connected to the detection means for simultaneously analyzing and converting each detected response curve into a series of digitized data points in relation to a series of selected time delays after each pulse excitation of the chamber means interior, where each detected response curve is analyzed by selecting a series of data points with each data point being for a time delay of the series of selected time delays and then converting each analyzed data point into a squared voltage value prior to digitizing the squared voltage value of each selected data point of an analyzed response curve,

computer means connected to the digital output of the analyzer means for storing a set of digitized data where the stored set relates to more than one series of digitized data points for more than one analyzed response curve of the chamber means, and

controller means interposed between and connected to the computer means and the oscillator means, said controller means for causing the oscillator means to adjust its frequency after each series of digitized data points for a response curve is stored in the computer means in order to cause said microwave source means to provide a different carrier frequency for transmitting a pulse to the chamber means interior for the purpose of generating a different transient relaxation response curve to be detected by said detection means,

said computer means for also determining a group of data points in relation to time where each data point of the group is an ensemble averaged mean squared voltage of a plurality of selected digitized data points of the stored set at a common time delay for each selected data point of the plurality with each common time delay being a given time delay of the series of selected time delays, said computer means for then graphically plotting the ensemble averaged mean squared voltage values of the group of data points (logarithmic scale) in relation to time so as to form a curve from which the equivalent single mode relaxation response for the multimode chamber means of the system is determined.

4,733,166

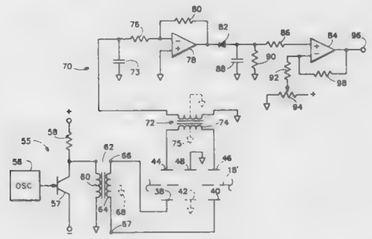
APPARATUS FOR MEASURING THE MOISTURE CONTENT OF MOVING MATERIALS

Delmer W. Wagner, 326 Pine Grove Rd., Rogue River, Oreg. 97537

Filed Mar. 17, 1986, Ser. No. 840,154

Int. Cl.[4] G01R *27/26;* **G01N** *27/22*

U.S. Cl. 324—61 R **11 Claims**



3. Apparatus for measuring moisture content of moving material between first and second sides of said material, said apparatus comprising:

means for generating an alternating electrical signal;

first conductor means disposed in facing relation of the first side of said material for transmitting the alternating electrical signal;

second conductor means disposed in facing relation to the first side of said material in laterally spaced relation to said first conductor means for transmitting the alternating electrical signal;

means for coupling said signal generating means to said first and second conductor means, said first conductor means being in out-of-phase relation with respect to said second conductor means;

at least third conductor means disposed in facing relation to the second side of said material and opposite said first conductor means for receiving said alternating electrical signal transmitted from said first and said second conductor means; and

output circuit means coupled to said third conductor means for detecting the moisture content of said moving material disposed between said first and third conductor means according to the amount of shunting in said moving material of said transmitted alternating electrical signal, said receiving means being electrically referenced to a same level as said second conductor means.

4,733,167

MEASUREMENT CIRCUIT FOR DIGITAL TO ANALOG CONVERTER

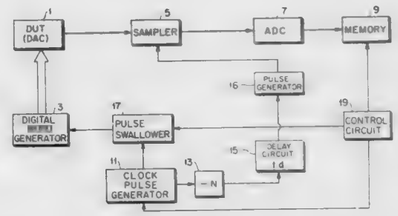
Toshio Tamamura, Hachioji, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 13, 1986, Ser. No. 829,363

Claims priority, application Japan, Feb. 14, 1985, 60-26730

Int. Cl.[4] G01R *19/25*

U.S. Cl. 324—73 R **4 Claims**



1. Apparatus for measuring characteristics of a digital to analog converter (DAC) by measuring a periodic analog output signal produced by the DAC in response to a sequence of a digital input words while the DAC is operating at a high converting rate, comprising:

clock pulse generating means;

a digital word generator, triggered by the clock pulses, for providing a periodic sequence of digital input words to the DAC;

sampling means, responsive to the clock pulses, for sampling the periodic analog output signal from the DAC at a sampling point having a constant delay time with respect to the triggering time of the digital word generator, to produce sampled analog values; and

pulse swallowing means, connected between the clock pulse generating means and the digital word generator, for selectively eliminating clock pulses to shift the sampling point from the analog output corresponding to one digital input word to the analog output corresponding to a different digital input word from the DAC, without altering the delay time of the sampling point with respect to the triggering time of the digital word generator.

4,733,168

TEST ENABLING CIRCUIT FOR ENABLING OVERHEAD TEST CIRCUITRY IN PROGRAMMABLE DEVICES

Timothy L. Blankenship, Palm Bay, Fla., and Joseph G. Nolan, III, San Jose, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 21, 1986, Ser. No. 842,272

Int. Cl.[4] G01R *15/12*

U.S. Cl. 324—73 R **18 Claims**

9. In a programmable memory device having a testing circuit, a test enabling circuit connected to said testing circuit, and an input means for receiving a test signal and a normal operational signal, said testing circuit and a normal operational circuit connected at a common node to said input means, wherein said improvement is said test enabling circuit which comprises:

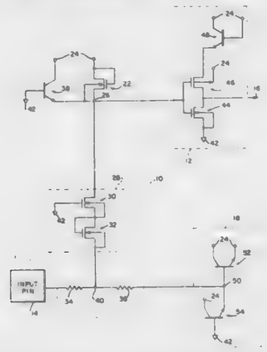
a first and second resistive means forming a voltage divider means between said input means and a voltage supply with a nodal point therebetween coupled to said testing circuit for providing a first signal at said nodal point in response to said operational signal without voltage division and a second signal at said nodal point in response to a single said test signal with voltage division, wherein said first resistive means is of a higher value than said second resistive means; and

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a clamping means to said nodal point for preventing said second signal from exceeding a specified potential.

17. In a programmable memory device having a test enabling circuit and a normal operational circuit sharing a common node, an input means for receiving a test signal and a normal operational signal, said normal operation circuit having an input protection circuit for protecting said operational circuit from electrostatic discharge (ESD), the improvement being said input protection circuit which comprises:

a first diode means connected between a power supply and a nodal point for providing a sink for positive ESD;



a second diode means connected between a ground potential and said nodal point for providing a sink for negative ESD;

a third diode means having a reverse breakdown voltage equivalent to a magnitude of said test signal, said third diode means being connected between said nodal point and said second diode means for preventing current from flowing through said second diode means to said input means when said test signal is applied to said input means.

4,733,169

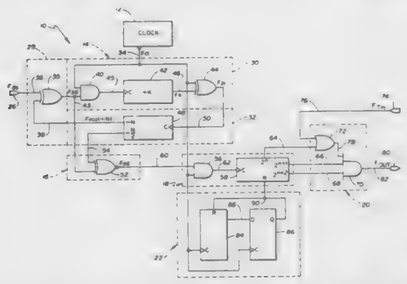
DIGITAL FREQUENCY DETECTOR

Mervin L. Grindahl, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Apr. 15, 1986, Ser. No. 852,155

Int. Cl.[4] G01R *23/10*

U.S. Cl. 324—79 D **37 Claims**



1. A digital phase locked loop for receiving an input pulse train having an input frequency and for generating an output pulse train having a frequency and duty cycle which approach predetermined values relative to the input pulse train when the input frequency is within a predetermined frequency lock range comprising:

clock means for generating a clock pulse train having a constant frequency;

feedback means operably coupled to the clock means for generating a feedback pulse train having a frequency within the predetermined frequency lock range, the predetermined frequency lock range having a lower limit equal to a first fraction of the clock frequency and an upper limit equal to a second fraction of the clock frequency;

comparison means operably coupled to the feedback means for receiving the input pulse train and comparing the input pulse train and the feedback pulse train and generating the output pulse train, the output pulse train having a duty cycle corresponding to the coincidence between the input pulse train and the feedback pulse train; and

pulse inserter means operably coupled to the feedback means and the clock means and the comparison means for generating a modified clock pulse train in response to the duty cycle of the output pulse train, whereby the modified clock pulse train is received by the feedback means and the frequency of the feedback pulse train is continuously modified to approach the input frequency when the input frequency is within the predetermined frequency lock range.

4,733,170

MICROWAVE POWER SENSORS

Paul A. McAllister, Huntingdon; Thomas G. McConnell, Hitchin, and Frederick R. Weston, Stevenage, all of England, assignors to Marconi Instruments Limited, St. Albans, England

Filed May 28, 1986, Ser. No. 867,697

Claims priority, application United Kingdom, May 28, 1985, 8513373; Mar. 19, 1986, 8606785

Int. Cl.[4] G01R *23/04, 5/26;* **H01P** *1/00*

U.S. Cl. 324—95 **13 Claims**



1. A microwave power sensor including

a waveguide section;

power absorption means having two power elements located within said waveguide section, said power absorption means absorbing microwave power applied thereto;

a fin line structure located within said waveguide section, said power absorption means being mounted on said structure for coupling to a source of incident microwave power; and

means for applying a reference power signal at a submicrowave frequency to the absorption means via a transmission line having a predetermined characteristic impedance, the two power elements of said power absorption means being connected effectively in series to receive said microwave power and effectively in parallel to receive said reference power signal.

4,733,171

DIFFERENTIAL SWITCHED-CAPACITOR DUAL SLOPE WATTHOUR METER CIRCUIT

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1987, Ser. No. 10,607

Int. Cl.[4] G01R *11/02*

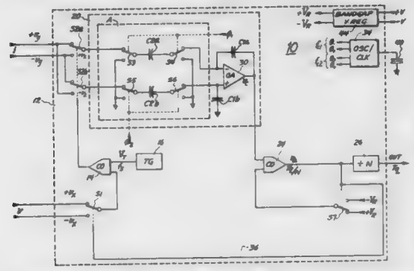
U.S. Cl. 324—142 **18 Claims**

1. An electronic circuit for measuring energy consumption in an electrical system comprising:

multiplying means for providing first and second signals of equal magnitude and opposite polarity, each of said signals representing instantaneous power in the electrical system;

a switched-capacitor integrator for integrating said signals to provide a third signal representative of average energy,

said integrator comprising a differential amplifier having an inverting input and a non-inverting input, a feedback capacitor connected between an output of the amplifier and the inverting input, a first switched-capacitor network coupled between the inverting input and said multiplying means for supplying the first signal to the inverting input, and a second switched-capacitor network coupled between the non-inverting input and said multiplying means for providing the second signal to the non-inverting input,



said first and second switched-capacitor networks each comprising an input capacitor and analog switches for connecting the input capacitor between said multiplying means and a respective input of said amplifier or to a reference potential; and

means for operating said switches such that during a first time interval said first and second signals are supplied substantially simultaneously to said amplifier inputs and during a second time interval said input capacitors are connected to said reference potential.

4,733,172

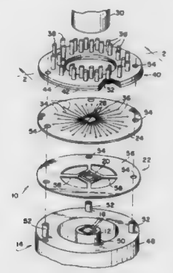
APPARATUS FOR TESTING I.C. CHIP

Robert Smolley, Porteuguese Bend, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 835,818, Mar. 8, 1986. This application Dec. 15, 1986, Ser. No. 941,907

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 P **15 Claims**



10. Apparatus for testing an IC chip having a plurality of contact areas, comprising:

a chip insulating board having a plurality of openings therethrough, with at least some of the openings at positions corresponding to the IC chip contact areas;

a test circuit board having inner contact areas at positions corresponding to some of the openings in the chip insulating board and a plurality of electrically-conductive traces on at least one side of the test circuit board electrically connecting the inner contact areas with a plurality of outer contact areas located about the periphery of the test circuit board;

a plurality of conductive connector elements disposed in selected ones of the openings in the chip insulating board for making electrical connections between the chip and inner circuit board contact areas;

a coaxial cable insulating board having a plurality of openings therethrough, with at least some of the openings at positions corresponding to the outer contact areas;

a coaxial cable support frame for supporting coaxial cables at positions corresponding to some of the openings in the coaxial cable insulating board; and

a plurality of conductive connector elements disposed in selected ones of the openings in the coaxial cable insulating board for making electrical connections between the outer contact areas and the ends of the coaxial cables.

4,733,173

ELECTRONIC COMPONENT MEASUREMENT APPARATUS

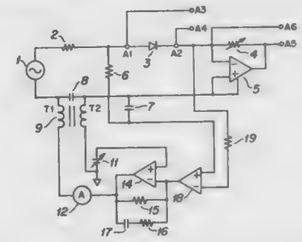
Heinz-Gunter Bach, and Wolfgang Dressler, both of Berlin, Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 30, 1985, Ser. No. 792,939

Claims priority, application Japan, Nov. 2, 1984, 59-232224

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 D **2 Claims**



1. Apparatus for measuring A.C. characteristics of a component to which superimposed A.C. signals and D.C. bias voltages are applied, in a measurement circuit having a variable range resistor, comprising:

an A.C. signal source connected to the component under test for providing the A.C. signal across the component;

a D.C. variable voltage source connected with the A.C. signal source for providing a selected D.C. bias voltage superimposed on the A.C. signal;

means for detecting the D.C. voltage drop across the component under test;

control means including an operational amplifier with high gain for comparing the D.C. voltage drop across the component under test with the output voltage of the D.C. variable voltage source to control the applied D.C. voltage to maintain the D.C. voltage drop across the component under test substantially equal to the output voltage of the D.C. variable voltage source; and

means for measuring the A.C. characteristics of the component under test.

4,733,174

CIRCUIT TESTING METHOD AND APPARATUS

Philip S. Crosby, Portland, Oreg., assignor to Textronix, Inc., Beaverton, Oreg.

Filed Mar. 10, 1986, Ser. No. 837,990

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 R **17 Claims**

1. The method of testing a circuit device characterized by conductive circuit paths including a first circuit path, said method comprising:

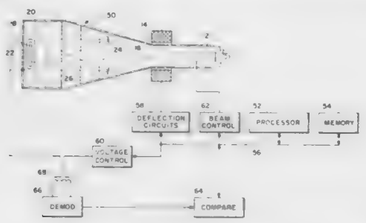
positioning said circuit device in a substantially evacuated chamber,

directing a flood beam of electrons toward said circuit device for establishing a surface of said circuit device at a first stable potential, and

directing a writing beam of electrons toward a selected

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portion of a first circuit path of said circuit device for changing the potential of said portion such that said flood beam of electrons maintains said portion at a second stable potential,



wherein said second stable potential is on the opposite side of the first crossover in the secondary emission characteristic for said portion from said first stable potential.

4,733,175

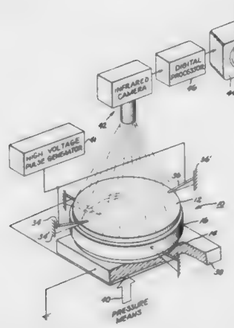
VARISTOR DEFECT DETECTION BY INCIPIENT HOT SPOT OBSERVATION

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 616,759, Jun. 4, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 813,809

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 R **24 Claims**



24. A method for detecting defects in current conducting devices comprising the steps of:

(a) providing a current conducting device having a first uninterrupted electrically and thermally conductive electrode on a first side thereof and a second interrupted electrically and thermally conductive electrode on a second side thereof;

(b) providing only one current pulse through said current conducting device with a current level and time duration product at least equal to a current level and time duration product rating of said current conducting device;

(c) mapping a temperature distribution of said first electrode after said current pulse before temperature variations across said first electrode induced by said current pulse can equillibrate;

(d) providing a visual display apparatus indicia of the mapped temperature distribution;

(e) selecting a threshold temperature level for said current conducting device indicative of the existence of a defect therein; and

(f) comparing said mapped temperature distribution to said threshold temperature level and assigning a defect status to said current conducting device if said temperature distribution includes a temperature at least as high as said threshold temperature.

4,733,176

METHOD AND APPARATUS FOR LOCATING DEFECTS IN AN ELECTRICAL CIRCUIT WITH A LIGHT BEAM

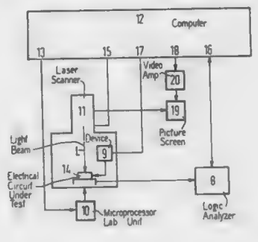
Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,502

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433650

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—158 R **15 Claims**



1. A method for defect locating in an electrical circuit with use of a light beam, comprising steps of:

driving at least one scan point on the electrical circuit to be analyzed for defects with a drive voltage having a periodically repeating waveform;

supplying an operating voltage to the electrical circuit;

directing said light beam to said at least one scan point of said electrical circuit, said light beam causing a disruption of a function of the electrical circuit at the scan point by releasing charge carriers with said light beam, said function disruption occurring when the operating voltage to the circuit is changed to a critical level;

defining a first value for at least one critical parameter other than the operating voltage, and operating the electrical circuit by setting the operating voltage at a first level where the circuit will function without fault;

with said critical parameter at said first value, changing the operating voltage while the light impinges the scan point so as to determine whether a fault will occur at a changed second operating voltage level, and when a fault does occur, noting said second operating voltage level;

changing the critical parameter from said first value to a second value and operating the electrical circuit by setting the operating voltage at a third level where the circuit will function without fault; and

with said critical parameter at said second value, changing the operating voltage while the light impinges the scan point so as to determine whether a fault will occur at another changed fourth operating voltage level, and when a fault does occur, noting said fourth operating voltage level.

4,733,177

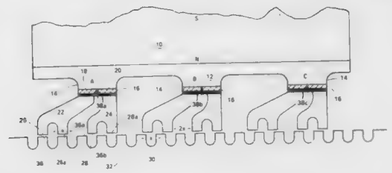
HIGH RESOLUTION HIGH OUTPUT MAGNETO RESISTIVE TRANSDUCER FOR DETERMINING STATIC AND DYNAMIC POSITION

Joseph P. Pawletko, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 695,975, Jan. 29, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 11,817

Int. Cl.[4] G01B *7/14;* **G01R** *33/06;* **H01L** *43/08*

U.S. Cl. 324—207 **5 Claims**



1. A high resolution positioning sensor for determining static and dynamic position comprising:

(a) means for producing a magnetic field;

(b) means operatively connected to said magnetic field producing means for concentrating lines of magnetic flux produced thereby;

(c) a magneto resistive element operatively connected to said concentrating means, said magneto resistive element being adapted to change resistive properties as a function of magnetic flux density, and said magneto resistive element generating an electrical signal indicative of magnetic flux density;

(d) a reference position scale comprising a transducer grid having a plurality of substantially uniformly spaced protuberances, each of said protuberances having a predetermined width at its extremity;

(e) two flux couplers operatively connected to said magneto resistive element and being separated from one another by substantially twice said protuberance extremity width, said flux couplers being adapted to move relative to said reference position scale and being disposed out of phase with one another with respect to said plurality of protuberances of said transducer grid for modulating flux distribution between said concentrating means and said transducer grid so that said electrical signal represents the position of said reference position scale relative to said flux couplers irrespective of relative motion therebetween.

4,733,178

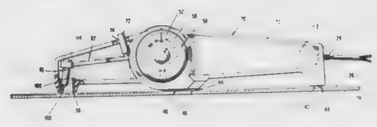
MAGNETIC THICKNESS GAUGE WITH THIRD SUPPORT

Frank Koch, Ogdensburg, N.Y., assignor to Linda Koch, Ottawa, Canada

Division of Ser. No. 341,337, Jan. 21, 1982. This application Oct. 1, 1985, Ser. No. 782,728

Int. Cl.[4] G01B *7/10*

U.S. Cl. 324—230 **9 Claims**



1. In a gauge for magnetically measuring the thickness of a coating including a housing, a balance arm rotatably mounted to the housing, a probe assembly at a location along said balance arm for providing a magnetically attracting force to urge said balance arm toward said coating to be measured, and a spring for biasing the probe assembly away from the coating to be measured, said probe assembly being adjacent a first end of said housing and including a magnet, the improvement comprising first, second and third supports provided on said housing, said supports mutually arranged to support said housing simultaneously, said first support being provided at said first end, the second support being provided at a second end of the housing opposite of said first end and said third support being provided at a midsection of the housing intermediate of said first and second ends, whereby stability of said gauge during use may be enhanced.

4,733,179

METHOD OF DETERMINING AN INTERFERENCE-MAGNETIC FIELD IN A MOTOR VEHICLE PROVIDED WITH AN ELECTRONIC COMPASS

Harald Bauer, Nuremberg, and Gerhard Hettich, Rosstal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

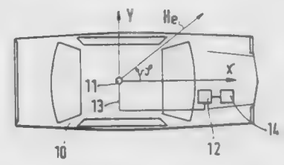
PCT No. PCT/DE84/00242, § 371 Date Jul. 31, 1985, § 102(e) Date Jul. 31, 1985, PCT Pub. No. WO85/02902, PCT Pub. Date Jul. 4, 1985

PCT Filed Nov. 14, 1984, Ser. No. 763,143

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345818

Int. Cl.[4] G01R *33/02;* **G01C** *17/38*

U.S. Cl. 324—244 **1 Claim**



1. A method of determining an interference magnetic field component in a motor vehicle provided with an electronic compass, the compass having a fixedly mounted magnometer consisting of two probes, each probe having a horizontally arranged rod-like core of magnetisable material, the cores in respective probes including an angle of 90° relative to each other and each supporting a winding, means for applying an alternating auxilliary voltage to said windings to alternately magnetize said cores up to saturation, said auxilliary voltage being combined with voltages induced in said windings due to a constant magnetic field composed of an earth's magnetic field component and an interference magnetic field component, said combined voltages producing an alternating measuring voltage, and means for evaluating the duty cycle ratio of positive and negative halfwaves of said measuring voltage, the method comprising the steps of measuring the magnitude and direction (Hg1) of the constant magnetic field in a first position of the vehicle, then measuring the magnitude and direction (Hg2) of the constant magnetic field in a second position in which the vehicle is turned around a vertical axis by 180°, then computing from the determined values (Hg1, Hg2) the magnitude of the interference field component (Hs) according to vector equation

$$H_s = \tfrac{1}{2}(Hg1 + Hg2)$$

and storing the computed H_s value for further processing.

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4,733,180

APPARATUS FOR MEASURING WEAK MAGNETIC FIELDS HAVING SUPERCONDUCTING CONNECTIONS BETWEEN A SQUID ARRAY AND A GRADIOMETER ARRAY

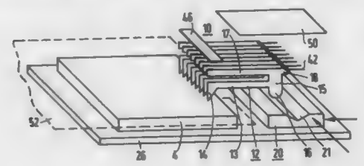
Eckhardt Hoenig, and Hanns-Jörg Weisse, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 854,775

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515217

Int. Cl.[4] H03K 3/38; G01R 33/02

U.S. Cl. 324—248 6 Claims



1. Apparatus for measuring weak magnetic fields having a multiplicity of superconducting connections between a SQUID array arranged on a substrate provided with contact pads, and a gradiometer array, said superconducting connections comprising contact comb means comprising a plurality of flat substantially U-shaped spring contact means which are at least partially ssupeconducting and which are electrically insulated from each other and disposed with their flat sides parallel to each other and perpendicularly to the surface of the contact pads, said spring contact means forming a packet, said spring contact means having a first leg, a second middle leg and a third leg, the first leg of the spring contact means being provided with a first projection comprising a pressure contact for one of the contact pads, the middle leg of the spring contact means being provided with a second projection extending in the same direction as the first projection, said second projection being supported in a slot of an adjusting block means of electrically insulating material, said slot extending perpendicularly to the flat sides of the spring contact means and parallel to the plane of the contact pads, pressure plate means being provided for applying a force directed parallel to the flat sides of the spring contact means and perpendicularly to the surface of the contact pads against the third leg of said spring contact means.

4,733,181

SINGLE-WINDING MAGNETOMETER WITH SCHMITT TRIGGER OUTPUT CIRCUIT

Harald Bauer, Nuremberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00244, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/02912, PCT Pub. Date Jul. 4, 1985

PCT Filed Nov. 14, 1984, Ser. No. 745,391

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345713

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] G01R 33/04; G01L 17/28

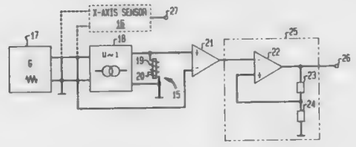
U.S. Cl. 324—253 7 Claims

1. Magnetometer for time coded measurement of constant magnetic fields, comprising at least one sensor having

a magnetizable rod-shaped core (20) and

a single, dual-purpose winding (19) disposed on the core, the winding both carrying an alternating current for generating an auxiliary alternating magnetic field which magnetizes the core (20) up to and into saturation alternately in each of two directions and, together with the magnetic field that is to be measured, generating a measurement voltage (U_m, U_{m1}), the positive and negative half-waves of which deviate from one another as a function of the magnetic field that is to be measured and serve to indicate the magnitude of the magnetic field that is to be measured, and wherein

the measurement voltage (U_m, U_{m1}) is applied to an input of



a substracting amplifier (21) for substracting a voltage derived from said alternating current, and whose output is applied to the input of a Schmitt trigger switch (25) having switching limits that are symmetrical to one another and an output which is a rectangular-wave voltage signal (Uy), the duty cycle of which is a measure of the magnetic field detected by the core (20).

4,733,182

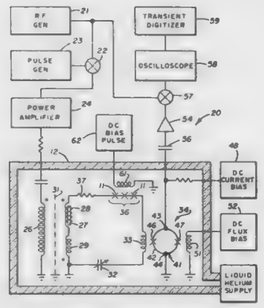
JOSEPHSON JUNCTION Q-SPOILER

John Clarke, Berkeley, Calif.; Claude Hilbert, Austin, Tex.; Erwin L. Hahn, and Tycho Sleator, both of Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 25, 1986, Ser. No. 844,034

Int. Cl.[4] G01R 33/08

U.S. Cl. 324—301 11 Claims



7. A detection system for detecting the gyroprecessional resonance of a specimen having a particle system with magnetic or electric dipole moments, said detection system comprising:

means for irradiating said specimen with a pulse of high frequency radiation,

detector means for detecting signals produced by magnetic resonance of said specimen,

a dc SQUID having a superconducting ring and two shunted Josephson tunnel junctions interrupting said ring, said ring having a bias current input at one side thereof between said junctions and a bias current output at the other side thereof between said junctions,

means for establishing a constant magnetic flux threading said SQUID ring,

means for supplying a bias current to said bias current input of said SQUID,

an input coil inductively coupled to said SQUID ring, and

a resonant circuit coupling said detector means to said input coil, said resonant circuit having inductive and reactive components and at least one Josephson tunnel junction connected in series with one of said components.

4,733,183

NUCLEAR MAGNETIC RESONANCE METHODS AND APPARATUS

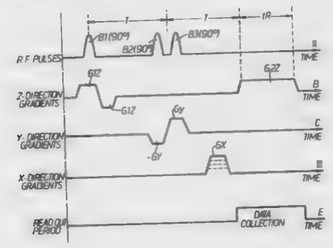
Ian R. Young, Sunbury-on-Thames, United Kingdom, assignor to Picker International Limited, Middlesex, England

Filed Nov. 19, 1984, Ser. No. 673,189

Claims priority, application United Kingdom, Nov. 25, 1983, 8331500

Int. Cl.[4] G01R 33/20

U.S. Cl. 324—309 5 Claims



1. A method of investigating the distribution of a quantity in a selected elongated region of a body using NMR techniques comprising the steps of: (1) exciting nuclear magnetic spins preferentially in a first selected slice of the body which is adjacent a particular one of a plurality of detector means which are at spaced positions along the direction of the length of said region and extends generally perpendicular to the length of said region and contains a portion of the length of said region; (2) rotating through 180° degrees the nuclear magnetic spins in second selected slice of the body containing substantially the whole length of said region and intersected by said first slice said second slice being generally perpendicular to said first slice; (3) spatially encoding in at least one direction parallel to said second slice the spins occurring in the portion of said second slice intersected by said first slice; (4) detecting signals representative of said encoded spins using only said particular one of said plurality of detector means; (5) processing said signals to retrieve data; and (6) repeating steps (1), (2), (3), (4) and (5) a plurality of times with a different spatial encoding of spins in each step (3) so that the data retrieved during steps (5) together indicate the distribution of said quantity in said portion of said second slice in planes parallel to said second slice; and (7) repeating steps (1) to (6) a plurality of times, utilizing different particular ones of said detector means, the selected first slice for each step (1) each time being for a different particular slice of the body adjacent a different one of said detector means and hence containing a different portion of the length of said region.

4,733,184

METHOD FOR THE DETERMINATION OF THE NUCLEAR MAGNETIZATION DISTRIBUTION IN A LAYER OF A REGION UNDER INVESTIGATION, AND NUCLEAR SPINTOMOGRAPH FOR CARRYING OUT THE METHOD

Graeme-Colin McKinnon, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

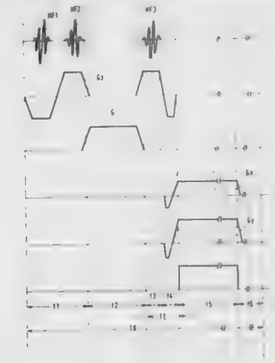
Filed Jan. 7, 1987, Ser. No. 1,294

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604281

Int. Cl.[4] G01R 33/20

U.S. Cl. 324—309 10 Claims

1. A method for determining nuclear magnetization distribution in a layer of a region under investigation, which region is exposed, in the presence of a homogeneous steady magnetic field, to a number of sequences, each sequence comprising at least two high-frequency pulses, a magnetic gradient field effective during at least one high-frequency pulse and having a gradient extending perpendicularly to the layer, each sequence further including a measurement interval which occurs after the pulses and during which a further magnetic gradient field with a gradient which extends in the layer and which is variable in its direction is applied and, for the reconstruction of the



absorption distribution, the nuclear spin resonance signals generated in the region under investigation are recorded, characterized in that in each sequence the nuclear spin resonance in two regions each disposed on a respective one of two sides of the layer is excited by at least one high-frequency pulse, and in that, after dephasing of the excited nuclear magnetization, the nuclear magnetization is excited by a further high-frequency pulse in a region encompassing a part of said two regions as well as the layer.

4,733,185

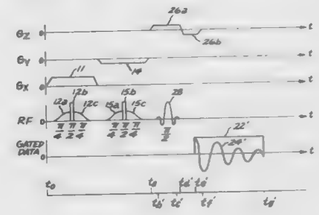
METHODS FOR LOCALIZATION IN NMR SPECTROSCOPY

Paul A. Bottomley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1987, Ser. No. 56,513

Int. Cl.[4] G01R 33/20

U.S. Cl. 324—309 27 Claims



1. A method for acquiring, with a reduced sensitivity to localization artifacts, an NMR spectroscopy response signal from a portion of a sample in a desired voxel located at the intersection of three different surfaces, comprising the steps of:

(a) immersing the sample in a static magnetic field B_o;

(b) exciting nuclear magnetic resonance in the sample with a localization subsequence which selectively differentiates NMR signals in only two of the three surfaces; and

(c) then providing a readout subsequence which is spatially selective for NMR in the sample on the remaining surface

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and which occurs immediately prior to the commencement of acquisition of an NMR response signal from the desired voxel.

4,733,186

METHOD FOR THE OPERATION OF A NUCLEAR MAGNETIC RESONANCE APPARATUS FOR THE FAST IDENTIFICATION OF THE LONGITUDINAL RELAXATION TIME T_1

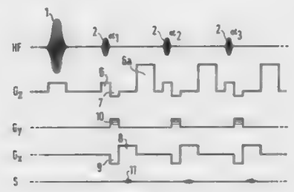
Arnulf Oppelt, Spardorf, and Rainer Graumann, Hoechstadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,603

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538464

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **9 Claims**



1. A method for operating a nuclear magnetic resonance apparatus in which an examination subject is disposed comprising the steps of:

generating a fundamental magnetic field in which said examination subject is disposed;

exciting a spin system in said examination subject by a sequence of RF pulses for generating nuclear magnetic resonance signals and measuring said nuclear magnetic resonance signals, said sequence of RF pulses being formed by a plurality of partial read pulses having respective flip angles of less than 90°, with a chronological spacing between successive partial read pulses being less that the longitudinal relaxation time of said spin system, and one pulse preceding said partial read pulses for placing said spin system in a selected start magnetization condition and;

reading out the nuclear magnetic resonance signal after every partial read pulse.

4,733,187

NMR IMAGING APPARATUS

Toru Shimazaki; Yoshihiko Watanabe, and Yasuo Imanishi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00294, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07460, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 12, 1986, Ser. No. 23,558

Claims priority, application Japan, Jun. 12, 1985, 60-128896

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—312 **2 Claims**

1. An NMR imaging apparatus having:

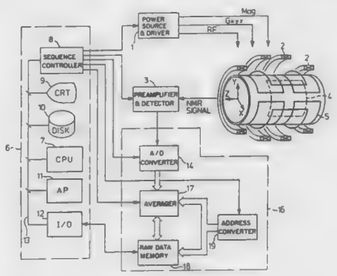
magnetic field applying means **1**, **2**, **4** and **5** for applying magnetic fields for measuring an NMR signal to an object to be examined;

measuring means **3** and **4** for measuring said NMR signal produced on said object to be examined;

an A/D converter **14** for converting a measuring signal output from said measuring means into digital data; and

a computer system **6** including a sequence controller **8** for controlling said magnetic field applying means in accordance with a sequence based on a multislice multiecho method (an image at the same slice which has a different echo time is defined as a slice in a broad sense), a memory **10** in which digital data converted by said A/D converter is stored, and a central processing unit **7** for controlling said sequence controller and reconstructing a tomogram of said object to be examined on the basis of said digital data stored in said memory;

characterized in that said NMR imaging apparatus is provided with a raw data memory **18** which is capable of



storing output data of said A/D converter for the maximum number of slices that are acquired at least one scanning and is capable of transferring the stored data for at least one scanning to said memory of said computer system; and

an address converting means for converting the address of output data of said A/D converter before said data is stored in said raw data memory so that a block of raw data for each slice is formed in said raw data memory.

4,733,188

NMR IMAGING METHOD

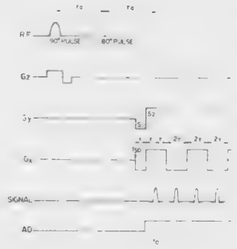
Kensuke Sekihara, Mountain View, Calif.; Shigeru Matsui, Koganei, and Hideki Kohno, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,113

Claims priority, application Japan, Apr. 10, 1985, 60-74226

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—312 **8 Claims**



1. An NMR imaging method for obtaining a spin distribution image of a certain region of an object placed in a static magnetic field, including steps of;

(a) exciting nuclear spins in said region of said object,

(b) inverting the sense of said nuclear spins by a 180° RF pulse in order to generate a spin echo,

(c) applying a first fixed gradient magnetic field along a first direction and a second gradient magnetic field periodically inverted in sense in a second direction perpendicular to the first direction to said object in order to generate a train of spin echoes,

(d) sampling spins signals of said train of spin echoes in order to obtain a data group,

(e) repeating the steps of (a)–(d) in order to obtain a plurality of data groups with the phase of the wave form of said second gradient magnetic field remaining constant in each repetition and said phase being altered in the successive repetitions, and

(f) reconstructing the spin distribution image by applying two-dimensional Fourier transform to said plurality of data groups.

4,733,189

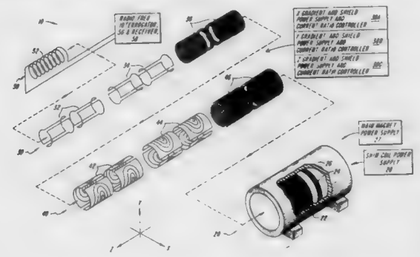
MAGNETIC RESONANCE IMAGING SYSTEMS

William F. B. Punchard, Sudbury, and Robert D. Pillsbury, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 3, 1986, Ser. No. 870,031

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—318 **17 Claims**



15. A method of suppressing eddy currents induced in components of a magnetic resonance imaging system by electromagnetic gradient-producing elements, the method comprising: disposing an active electromagnetic shield element about each of said gradient-producing elements in a magnetic resonance imaging system, and driving said active shield element with a currrent of opposite direction to minimize the external field of said gradient-producing element.

4,733,190

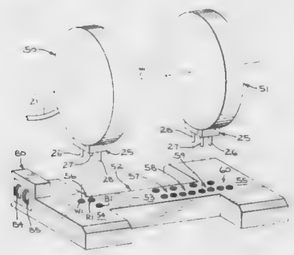
NMR LOCAL COIL WITH ADJUSTABLE SPACING

Gerald T. Dembinski, New Berlin, Wis., assignor to Medical Advances, Inc., Wauwatosa, Wis.

Filed Mar. 16, 1987, Ser. No. 26,305

Int. Cl.⁴ G01K *33/20*

U.S. Cl. 324—318 **7 Claims**



1. A local coil assembly for use in NMR imaging which comprises:

a base;

a first local coil module mounted to the base and extending upward therefrom;

a plurality of sockets disposed in the base, each at a different distance from the first local coil module;

a second local coil module having a connector thereon which mates with each of the plurality of sockets to enable the second local coil module to be connected to the base at any one of the sockets; and

a set of reactive components, each reactive component being connected to a respective one of the sockets such that when the second local coil module is inserted in a socket, the reactive component thereat electrically connects to a resonator in the second local coil module and alters the resonant frequency thereof;

wherein the values of the respective reactive components are selected such that the second local coil module may be connected to any of said plurality of sockets without any substantial change in the resonant frequency of the assembly.

4,733,191

CIRCUIT FOR CHANGING A PERIODIC INTELLIGENCE SIGNAL INTO A DIRECT-CURRENT SIGNAL

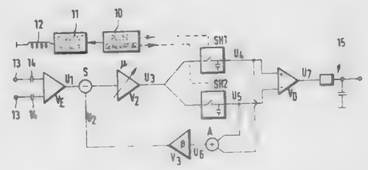
Friedhelm Doll, Wermelskirchen, Fed. Rep. of Germany, assignor to Turbo-Werk Messtechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 10, 1986, Ser. No. 928,961

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540170

Int. Cl.⁴ G01F *1/60*

U.S. Cl. 329—109 **9 Claims**



1. Circuit for changing a periodic intelligence signal with overlaid disturbance signals into a direct-current signal the amplitude of which corresponds to that of an intelligence signal, comprising:

an input amplifier,

a second amplifier located subsequent to the input amplifier,

two scanning/holding circuits controlled in such a manner that one of them receives and holds the output signal of the second amplifier at each positive half-wave of the information signal, and that the other receives and holds the output signal of the second amplifier at each negative half-wave of the information signal, and

a sum and difference amplifier for receiving the signals of the scanning/holding circuits via its inputs and for generating the direct-current signal,

characterized in that a summing device is provided for summing up the output signals of the scanning/holding circuits, the output signal of the summing device being subtracted from the output signal of the input amplifier, and in that the result of the subtraction is transmitted to the scanning/holding circuits after being amplified by the second amplifier.

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4,733,192

AMPLIFYING ARRANGEMENTS INCLUDING A KLYSTRON HAVING A POWER TRANSFER CHARACTERISTIC WHICH IS SUBSTANTIALLY THE SAME OVER ITS ENTIRE PASSBAND

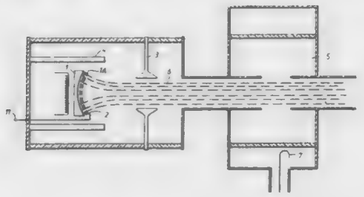
Roy Heppinstall, Witham; George I. F. Tupper, High Wycombe; Paul Eaton, Crawley, and Edmund K. Tunstall, Carlton on Otmoor, all of United Kingdom, assignors to British Broadcasting Corporation, London and English Electric Valve Company Limited, Chelmsford, both of, England

Filed Jun. 27, 1986, Ser. No. 879,607

Claims priority, application United Kingdom, Jul. 2, 1985, 8516731

Int. Cl.[4] H03F *3/56*

U.S. Cl. 330—45 10 Claims



1. An amplifying arrangement including

a klystron having an interaction cavity and a power transfer characteristic, an interaction cavity and a beam controlling electrode, said beam controlling electrode having a potential applied thereto;

means for applying a high frequency carrier modulated with a modulating signal to said interaction cavity; and

means for controlling the potential of said beam controlling electrode in dependence on the modulating signal, whereby the klystron power transfer characteristic is made substantially the same at substantially all frequencies over a desired passband of the klystron.

4,733,193

ARRANGEMENT FOR ELIMINATING SIGNAL HUM

Jiri Klokocka, Kronovagen 7, S-182 74 Stocksund, Sweden

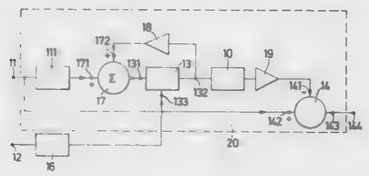
PCT No. PCT/SE85/00471, § 371 Date Jun. 20, 1986, § 102(e) Date Jun. 20, 1986, PCT Pub. No. WO86/03354, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 19, 1985, Ser. No. 881,360

Claims priority, application Sweden, Nov. 21, 1984, 8405878

Int. Cl.[4] H03F *1/26*

U.S. Cl. 330—149 13 Claims



1. An arrangement for eliminating signal hum, comprising a first signal input (11) for supplying the signal to the arrangement;

a second signal input (12) for supplying to the arrangement a hum signal of the same frequency as one of the partial frequencies of the hum;

a delay circuit (13) having an input (131) connected to the first signal input (11), and an output (132) connected to a substraction circuit (14), which has a second input (142) connected to the first signal input (11), and has an output (143) connected to the output (144) of the arrangement; and

a synchronizing circuit (16) between the second signal input (12) and a control input (133) on the delay circuit (13), characterized in that an addition circuit (17) is connected between the first signal input (11) and the input (131) of the delay circuit (13); in that a first amplifier (18) having an. amplification factor a according to the relationship: $0 \leqq a \leqq 1$ is coupled between the output (132) of the delay circuit and the second input (172) of the addition circuit (17); and in that a second amplifier (19) having an amplification factor b according to the relationship $0 \leqq b \leqq 1$ is coupled between the output (132) of the delay circuit (13) and the first input (141) of the subtraction circuit (14).

4,733,194

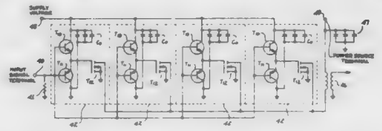
APPARATUS AND METHOD FOR PARALLELING POWER FIELD EFFECT TRANSISTORS IN HIGH FREQUENCY AMPLIFIERS

Don P. Roehrs, New River, and Helge O. Granberg, Phoenix, both of Ariz., assignors to Signal One Corporation, Phoenix, Ariz.

Continuation of Ser. No. 701,492, Feb. 14, 1985, abandoned. This application May 26, 1987, Ser. No. 58,592

Int. Cl.[4] H03F *3/26, 3/68*

U.S. Cl. 330—251 9 Claims



1. A power amplifier circuit capable of operating as a switching amplifier in the standard r(adio) f(requency) communications range of 1.6 MHz to 30 MHz and above, said power amplifier circuit using parallel power MOSFETs with active drivers without sacrificing frequency response and eliminating frequency limiting components such as resistors, low Q inductors, rf transformers, or any other passive elements increasing the series gate resistances of the power FETs thus limiting the band width, such elements or an active driver are required to prevent spontaneous oscillations in parallel power FETs, comprising:

a plurality of N-channel power field effect transistors, each of said power field effect transistors having a source terminal coupled to a common potential and having a drain terminal coupled to a common load impedance; and

a plurality of active driver circuits, each of said active driver circuits coupled to a common input terminal, each of said active driver circuits coupled to a gate of an associated power field effect transistor, each active driver circuit charging and discharging a gate terminal of said associated power field effect transistor thereby decoupling said associated gate terminal from gate terminals of other of said plurality of field effect transistors.

4,733,195

TRAVELLING-WAVE MICROWAVE DEVICE

Hua Q. Tserng, Dallas, and Bumman Kim, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 15, 1986, Ser. No. 885,908

Int. Cl.[4] H03F *3/60*

U.S. Cl. 330—286 13 Claims

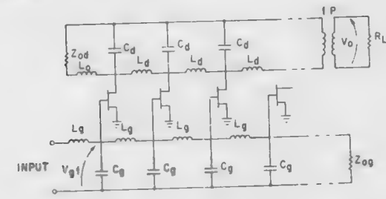
1. A travelling-wave device, comprising:

(a) an input transmission line;

(b) an output transmission line;

(c) at least one active device distributed between said two transmission lines;

(d) a first termination for said input transmission line, said first termination providing substantial reflection and phase shift at a first frequency, wherein said first frequency is about the upper end of the frequency band of said travelling-wave device; and



(e) a second termination for said output transmission line, said second termination providing substantial reflection and phase shift as said first frequency, wherein the sum of the phase shifts of said first and second terminations approximates the sum of the phase shifts along the lengths of said input and output transmission lines.

4,733,196

CURRENT GAIN STAGE WITH LOW VOLTAGE DROP

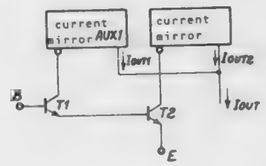
Pietro Menniti, Milan, and Antonella Lanati, Pavia, both of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Dec. 4, 1986, Ser. No. 937,869

Claims priority, application Italy, Dec. 23, 1985, 23363 A/85

Int. Cl.[4] H03F *3/04;* G05F *3/16*

U.S. Cl. 330—288 3 Claims



1. A current gain stage having an input terminal and an output terminal and operable to produce an output current which is a precise amplified replica of a current applied to said input terminal, said current gain stage comprising:

a first transistor and a second transistor substantially connected in cascade, each of said transistors having a load connected to its collector, the base of said first transistor constituting said input terminal and the collector of said second transistor constituting said output terminal, each of said transistors having respective collector currents;

wherein the collector load of said first transistor is a current mirror operable to produce an output current equal to the collector current of said first transistor; and

wherein the output current of said current mirror is added to the collector current of said second transistor.

4,733,197

EXTENDED RANGE PHASELOCKED LOOP

Peter E. K. Chow, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 19, 1987, Ser. No. 16,750

Int. Cl.[4] H03L *7/00*

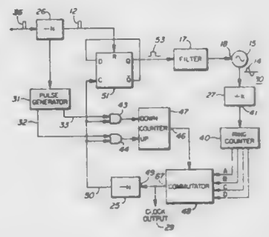
U.S. Cl. 331—1 A 14 Claims

1. A phaselocked loop circuit having a comparator adapted to generate a control signal proportional to a phase difference between signals at a pair of inputs thereof to which are respectively coupled an independent input signal and a local input signal dependently related to an output signal of a controllable oscillator, and filter means coupling the control signal to the oscillator for acquisition at a predetermined rate, the circuit comprising:

means for generating a threshold signal in predetermined phase relation with the independent signal;

delay means operatively connected to the oscillator for generating a plurality of sequential signals in successively delayed phase relation with the oscillator output signal;

detector means responsive to coincidence of the threshold signal and the delayed signals for generating a phase error



signal indicative of a predetermined phase difference between the independent and local input signals; and

commutator means controllably responsive to the phase error signal for selecting individual ones of the delayed signals at a predetermined phase delay thereof and applying the delayed signals to the local signal input for generating an enhanced control signal proportional to an apparent increased phase difference between the independent and local input signals, thereby increasing the rate of acquisition to pre-empt concurrent cycle slipping of the controllable oscillator.

4,733,198

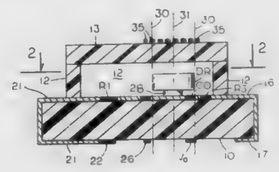
MECHANICALLY TUNABLE SEALED MICROWAVE OSCILLATOR

Martin J. Blickstein, Austell, Ga., and Lynn Carpenter, State College, Pa., assignors to Murata Erie North America, Inc., Smyrna, Ga.

Filed Oct. 6, 1986, Ser. No. 915,574

Int. Cl.[4] H03B *5/18*

U.S. Cl. 331—96 10 Claims



1. A mechanically tunable sealed, microwave oscillator comprising an hermetically sealed dielectric case through which a conductor extends to ambience for external circuit connection, a dielectric resonator mounted within said case adjacent said conductor for generation of an electromagnetic field that extends through said case upon resonator excitation by current flow at microwave frequencies through said conductor, and a set of conductive elements removably mounted to the exterior of said case the selective removal of which serves to adjust the resonant frequency of the dielectric resonator.

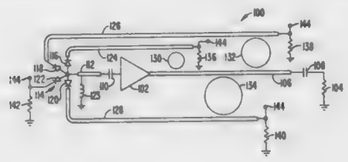
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,199

MULTI-FREQUENCY DIELECTRIC RESONATOR OSCILLATOR USING PARALLEL FEEDBACK

Amarpal S. Khanna, San Jose, Calif., assignor to Avantek, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 809,161, Dec. 16, 1985, Pat. No. 4,649,354. This application Feb. 9, 1987, Ser. No. 12,740
Int. Cl.[4] H03B 5/18
U.S. Cl. 331—99 8 Claims



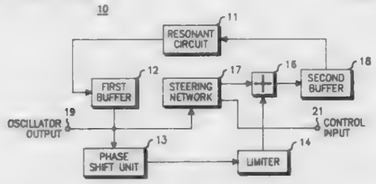
1. A switchable dielectric resonator oscillator for generating microwave energy at a selected one of a plurality of available frequencies in the microwave range, said oscillator comprising:
an amplifier operable for oscillation within a frequency band in the microwave range and at a particular frequency as determined by a parallel feedback signal supplied to an input terminal of said amplifier;
switching means for selectively connecting any one of a plurality of dielectric resonators and associated feedback microstrip lines to the input terminal of said amplifier, wherein said switching means includes a plurality of diodes each connected in series between a feedback microstrip line and the input terminal of said amplifier, and includes diode biasing means for individually biasing said diodes; and
a plurality of dielectric resonators and associated feedback microstrip lines operable for supplying a parallel feedback signal through said switching means to the input terminal of said amplifier, wherein each of said dielectric resonators is disposed between a feedback microstrip line that is coupled to said switching means and an output microstrip line that is coupled to the output terminal of said amplifier, wherein the oscillation frequency of said amplifier is determined by a resonant frequency of whichever of said dielectric resonators is connected through said switching means to the input terminal of said amplifier.

4,733,200

CONTROLLED FEEDBACK PATH VOLTAGE CONTROLLED OSCILLATOR

Lawrence M. Ecklund, Wheaton, and Charles J. Marik, Richmond, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 14, 1986, Ser. No. 918,943
Int. Cl.[4] H03B 5/12, 5/36
U.S. Cl. 331—116 R 16 Claims



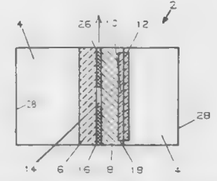
1. A voltage controlled oscillator comprising:
(a) resonant circuit means for resonating at a resonant frequency and having an input for receiving a feedback signal and an output for providing an oscillator output signal;
(b) first feedback means for receiving said oscillator output signal and for providing a first feedback signal as a function of said oscillator output signal, said first feedback signal having a substantially fixed predetermined phase relationship with respect to said oscillator output signal;
(c) second feedback means for receiving both said oscillator output signal and a control signal and for providing a second feedback signal as a function of said oscillator output signal and said control signal, such that said control signal can control when said second feedback signal has a first predetermined phase relationship with respect to said oscillator output signal and when said second feedback signal has a second and different predetermined phase relationship with respect to said oscillator output signal, wherein said second feedback means includes phase shift means for receiving said oscillator output signal and for phase shifting said oscillator output signal 90 degrees, and wherein said phase shift means includes:
(d) first phase lead means for providing a phase lead that decreases with increasing frequency; and
(e) second phase lead means for providing a phase lead that increases with increasing frequency;
(f) summing means for receiving and combining said first feedback signal and said second feedback signal, and for providing said combined feedback signals to said input of said resonant circuit means, such that said oscillator output signal has a frequency that can be controlled, at least in part, by said control signal.

4,733,201

STACKED FERRITE RESONANCE ISOLATOR

Joseph Helszajn, Edinburgh, United Kingdom, and William Thorpe, Cambridge, Canada, assignors to Com Dev Ltd., Cambridge, Canada

Filed Mar. 18, 1986, Ser. No. 840,689
Claims priority, application Canada, Oct. 16, 1985, 493084
Int. Cl.[4] H01P 1/365
U.S. Cl. 333—24.2 11 Claims



1. A resonance isolator comprising a waveguide with dielectric substrate materials located within said waveguide to create a plane of circular polarization, with means to apply a biasing magnetic field to said waveguide, with at least two layers of ferrite material being stacked in contact with one another and mounted parallel to the plane of circular polarization and parallel to an E-plane of an electromagnetic field of the waveguide so that forward and reverse waves in said plane of circular polarization can be separated, at least two of the layers of ferrite material having dissimilar internal anistropy.

4,733,202

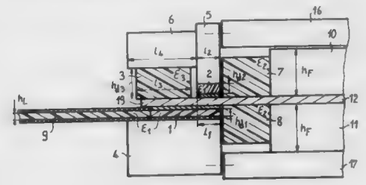
COUPLING DEVICE BETWEEN AN ELECTROMAGNETIC SURFACE WAVE LINE AND AN EXTERNAL MICROSTRIP LINE

Gérard Forterre, Colombes, and Julien Prevot, Osny, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 22, 1986, Ser. No. 921,426
Claims priority, application France, Oct. 25, 1985, 85 15880
Int. Cl.[4] H01P 5/10
U.S. Cl. 333—26 16 Claims

1. A device for coupling between a symmetric electromagnetic surface wave line and an external microstrip line, the surface wave line, ending in at least one access microstrip, operating in a symmetric field distribution mode, whereas the external microstrip line operates in a disymmetric field distribution mode, said coupling device including a plurality of line elements of small lengths and with transverse dimensions small

with respect to the wave length of a signal, the nature and structure of these line elements providing a progressive transition between the symmetric and disymmetric modes in four steps:
electromagnetic surface wave mode, a symmetric mode of the surface wave line,



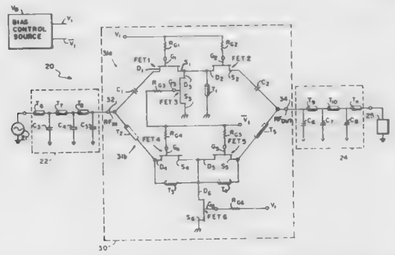
three plate mode implemented by a three plate mode line element,
microstrip mode with two different dielectrics,
air microstrip mode, a disymmetric microstrip mode of the external microstrip line.

4,733,203

PASSIVE PHASE SHIFTER HAVING SWITCHABLE FILTER PATHS TO PROVIDE SELECTABLE PHASE SHIFT

Yalcin Ayasli, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 12, 1984, Ser. No. 588,591
Int. Cl.[4] H03H 7/19
U.S. Cl. 333—139 15 Claims



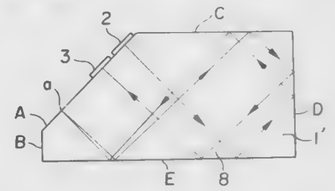
1. A radio frequency network having an input terminal and an output terminal, and a pair of control signal terminals each fed by one of a pair of control signals with said network comprising:
a first signal path means for capacitively coupling the input terminal to the output terminal;
a second signal path means for inductively coupling the input terminal to the output terminal;
means for connecting to a reference potential the first signal path means and for connecting between the input and output terminals the second signal path means in response to a first state of said control signals to configure said first and second path means as a low pass filter, and for connecting to said reference potential the second path means and for connecting between the input and output terminals the first signal path means in repsonse to a second, different state of said control signals, to configure said first and second path means as a high pass filter; and
wherein the means for connecting said first and second path means comprises:
two sets of transistors with one set respectively disposed in each one of said first and second path means, and each set comprising:
(a) a pair of transistors having drain and source electrodes coupled in series with a first one of the drain and source electrodes of one transistor coupled to a first one of the drain and source electrodes of the other transistor; and
(b) a thrid transistor having drain and source electrodes coupled between the common connection of the pair of transistors and the reference potential.

4,733,204

ULTRASONIC-WAVE DELAY ELEMENT

Michihiko Uemura; Naomitsu Umemura, and Tunaomi Fukui, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,381
Claims priority, application Japan, Mar. 28, 1985, 60-43926[U]; Mar. 28, 1985, 60-43927[U]
Int. Cl.[4] H03H 9/36
U.S. Cl. 333—143 6 Claims



1. An ultrasonic-wave delay element comprising:
pentagonal delay medium body formed by cutting at an angle of about 45° a part of the major surface defined by a rectangular shape and a pair of input and output electro-mechanical transducers provided on a side A formed by cutting said major surface, wherein said input and output electro-mechanical transducers are positioned and attached to said cut side A at positions near a longer side C contiguous to said cut side A with respect to the center of the cut side A;
such that upon activation of one of said transducers a wave is produced which has a reflection point for said wave in said cut side A with no reflection occurring on a shorter side B which is contiguous to said cut side A;
wherein said wave reflects at two or more reflection points on said longer side C;
further wherein said wave reflects at two reflection points on the other shorter side D which is isolated from said cut side A; and
wherein said wave reflects at four or more reflection points on the other longer side E which is isolated from said cut side A.

4,733,205

ELECTRICAL FILTER

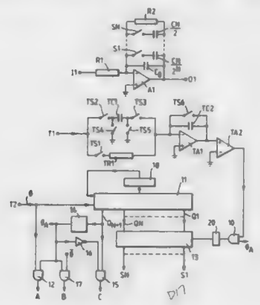
John B. Hughes, Hove, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1987, Ser. No. 40,897
Claims priority, application United Kingdom, Apr. 30, 1986, 8610562
Int. Cl.[4] H03H 7/075, 7/06, 11/12
U.S. Cl. 333—172 11 Claims

1. An integrated electrical filter comprising at least one capacitor, at least one resistor, and a trimming circuit for adjusting the product of the resistance of the resistor and the capacitance of the capacitor, characterised in that the trimming circuit comprises means for charging a further capacitor from a reference voltage source through a further resistor for a first period comprising 2^N periods of a clock signal, where N is a first integer, means for removing the charge from the further capacitor in discrete increments during a second period comprising 2^N+P periods of the clock signal, where P is a second integer, first connection means for connecting a stray capacitance formed between the further capacitor and an underlying conductive layer in parallel with the further capacitor for a third period which comprises the first P periods of the

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clock signal occurring during the second period, means for counting the number of increments required to remove the charge accumulated on the further capacitor during the first



period, and means for adjusting the value of said at least one capacitor or said at least one resistor in dependence on the number of increments counted.

4,733,206

CONNECTOR PLUG WITH AN INTEGRATED ELECTRICAL RADIO FREQUENCY SUPPRESSION FILTER

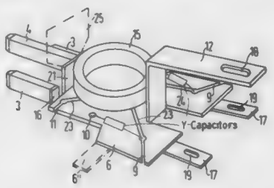
Josef Dirmeyer, Bodenwoehr; Heinz Kathmann, Regensburg; Franz Merkle, Ottobrunn; Franz Oberberger, Moetzing; Walter Wilhelm, Wenzenbach, and Josef Wimmer, Regenstauf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,509

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432502

Int. Cl.⁴ H03H *7/01*

U.S. Cl. 333—181 **11 Claims**



1. In an electrical connector plug of the type having load terminals which extend via electrical conductors through a metallic filter housing to power supply terminals including a ground conductor electrically connected to the metallic filter housing, and in which filter components are disposed in the metallic filter housing and have leads interconnected with the electrical conductors to form a radio frequency suppression filter, the improvement wherein:

an insulating lamina is provided and includes openings therethrough and defines a separating barrier between the filter components and the ground conductor;

the ground conductor comprises a wide central area for connection to respective power supply terminals by way of respective Y-capacitors;

the filter component leads extend through the openings of the lamina and are interconnected on the opposite side of the lamina with the load terminals and power supply terminals;

a plastic material encapsulates the components, the lamina and the electrical conductors, including the ground conductor, to form a plug with the terminals extending therefrom; and

the metallic housing is mounted on the plug and comprises openings for receiving the terminals, including the ground conductor, therethrough.

4,733,207

SURFACE ACOUSTIC WAVE FILTERS

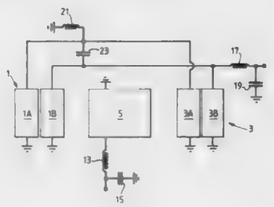
Robert C. Peach, Watford, England, assignor to The General Electric Company, p.l.c., England

Filed Jun. 12, 1987, Ser. No. 62,090

Claims priority, application United Kingdom, Jun. 25, 1986, 8615522

Int. Cl.⁴ H03H *9/64*

U.S. Cl. 333—193 **9 Claims**



1. A SAW filter comprising: a first bidirectional ID transducer of symmetrical form; a second ID transducer comprising two parts each of which parts is in the form of one half of a respective bidirectional ID transducer of symmetrical form, the two parts being positioned with respect to one another and the first transducer so that when respectively excited by corresponding signals of different phases they co-operate to produce a unidirectional acoustic signal propagating towards the first transducer from one side thereof; and a third transducer acoustically coupled with the first transducer and comprising two parts, each of which parts is electrically connected in parallel with a respective one of the two parts of said second transducer, and each of which parts of the third transducer is effectively in the form of the mirror image about the centre line of the first transducer of the other half of the bidirectional transducer whose one half constitutes the part of the second transducer with which it is connected.

4,733,208

DIELECTRIC FILTER HAVING IMPEDANCE CHANGING MEANS COUPLING ADJACENT RESONATORS

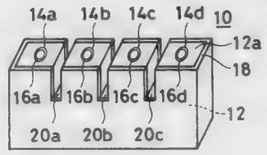
Youhei Ishikawa; Kikuo Tsunoda, and Toshiro Hiratsuka, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 16, 1985, Ser. No. 766,263

Claims priority, application Japan, Aug. 21, 1984, 59-173586

Int. Cl.⁴ H01P *1/205*

U.S. Cl. 333—202 **10 Claims**



1. A dielectric filter comprising:

a generally cubic shape dielectric block,

an outer conductor formed on an outer surface of said dielectric block,

a plurality of holes formed in a main surface of said dielectric block and extending substantially parallel to each other into said dielectric block and thereby defining a direction that is lengthwise with respect to said holes, and

a plurality of inner conductors formed on respective inner surfaces of said plurality of holes and respectively constituting resonance elements in cooperation with said outer conductor,

the impedance of a first part along said lengthwise direction, from said main surface, of at least one of said resonance elements being unequal to the impedance of a second part of said at least one resonance element, said impedance of said first part being unequal to said impedance of said second part, at least in one of an even mode and an odd mode;

said impedance of said first part of said at least one resonance element being set by impedance changing means which includes thickness changing means to change the amount of dielectric material of said dielectric block surrounding said first part of said resonance element in said lengthwise direction of said resonance element; and

said thickness changing means including at least one groove which is formed through said dielectric block adjacent said first part of said resonance element;

said dielectric filter further comprising electrodes formed on the surfaces of said groove and connected electrically to said outer conductor.

4,733,209

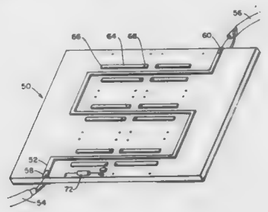
CERAMIC SCRAMBLER MODULE

Richard J. Paynting, Cumberland, R.I., assignor to Augat Inc., Mansfield, Mass.

Filed Jun. 27, 1986, Ser. No. 879,285

Int. Cl.⁴ H01P *1/203, 1/201*

U.S. Cl. 333—205 **9 Claims**



1. A signal scrambler, comprising:

a signal conductor having a plurality of distinct angularly related contiguous subsections disposed on a substrate material including a ground plane, and having an impedance relative to said ground plane and exhibiting a non-resonant transmission characteristic when input signals provide a proper impedance match thereto;

a plurality of resonant conductors disposed in close proximity to a plurality of said signal conductor subsections for providing significant electrical coupling to said signal conductor, each of said plurality of resonant conductors having a selected resonant frequency; and

control means disposed on said substrate and being operative to provide an active and a passive state for each of said plurality of resonant conductors, wherein each said resonant conductor in the passive state provides no influence on the transmission characteristics of the signal conductor, and each said resonant conductor in the active state causes a significant transmission loss at the resonant frequency of the active resonant conductor.

4,733,210

AUXILIARY SWITCH HOOKUP ASSEMBLY IN A MOTOR CONTACTOR

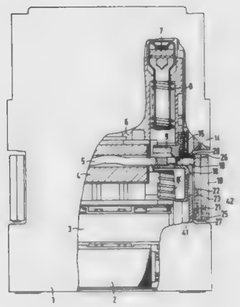
Johann Bauer, Ebermannsdorf, and Klaus-Dieter Paul, Sulzbach-Rosenberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,700

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 8531355[U]

Int. Cl.⁴ H01H *9/02, 67/02*

U.S. Cl. 335—132 **12 Claims**



1. An auxiliary switch hookup assembly in a motor contactor, comprising:

a motor contactor housing;

an auxiliary switch including an auxiliary switch housing and an operating projection protruding from said housing;

mounting means for releasably mounting said auxiliary switch housing to said motor contactor housing;

support means movably disposed in said motor contactor housing for supporting a contact bridge, said support means being provided with an opening, said operating projection being insertable through said opening and engageable with edges in said support means defining said opening so that said operating projection and said support means are entrained to one another to enable said operating projection to shift said support means;

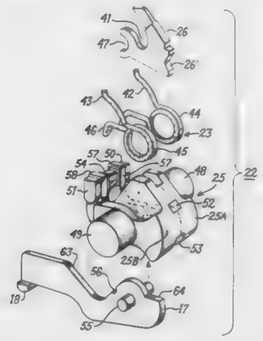
a slide member slidably mounted to said support means and defining at least a portion of an aperture limiting wall for operation of said auxiliary switch;

first spring means including a contact compression spring and a return pressure spring disposed in said auxiliary switch for ensuring conductive engagement of contacts upon actuation of said auxiliary switch and for restoring said auxiliary switch to a neutral position upon a deactuation of said auxiliary swtich, said first spring means having a combined spring constant; and

second spring means for biasing said slide member against said operating projection to hold said operating projection against said support means, said second spring means having a spring constant greater than said combined spring constant, whereby said second spring means can exert a spring force greater than a total force exerted by said first spring means.

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4,733,211
MOLDED CASE CIRCUIT BREAKER CROSSBAR ASSEMBLY
Roger N. Castonguay, Terryville; David Arnold, Old Saybrook, and David J. Meiners, Southington, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed Jan. 13, 1987, Ser. No. 3,002
Int. Cl.[4] H01H *3/00*
U.S. Cl. 335—192 **20 Claims**



1. A molded case circuit breaker crossbar assembly comprising:
- a plastic crossbar body member including a pair of spaced parallel upstanding arms integrally formed therein;
- a stop member extending across an end of each of said crossbar arms;
- detent means integrally formed on each of said crossbar arms outboard said stop member;
- first slot means formed on a bottom surface of said crossbar member;
- a movable contact carrier having a movable contact on one end and a pivot post extending through said carrier at an opposite end, said contact carrier being inserted within said first slot means;
- a contact spring mounted on a top surface of said crossbar member and comprising a pair of spring coils joined by a crossover arm, said spring further including a pair of legs, each of said spring legs extending from one of said spring coils;
- a circuit breaker operating mechanism for lifting said movable contact carrier upon overcurrent conditions through said movable contact; and
- an operating cam supported on said crossbar member and engaging a roller connected with said operating mechanism.

4,733,212
PULSE LATCHING SOLENOID
Arthur V. Goodwin, Pittsford, N.J., assignor to Wright Components, Inc., Phelps, N.Y.
Filed Apr. 29, 1987, Ser. No. 43,958
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—253 **12 Claims**

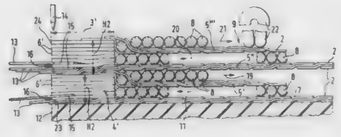
1. A latching solenoid comprising:
- coil means, having a central axial opening, for selectively developing, upon activation, first and second magnetic fields in respective opposite first and second directions along said axial opening;
- paramagnetic means for providing a paramagnetic path from said central axial opening, around the outside of said coil means, and back to said central axial opening, said path having a gap within said central axial opening;
- plunger means for selectively closing said gap, said plunger means comprising a spring and a plunger of paramagnetic material slidably positioned in said central axial opening to close said gap, with said spring positioned between said plunger and said paramagnetic means to oppose said plunger closing said gap; and wherein

said paramagnetic means includes a portion of paramagnetic material which, upon activation of said coil means to develop said first magnetic field and position said plunger



to close said gap, forms a temporary permanent magnet of sufficient strength to maintain said plunger, in opposition to said spring, in position to close said gap upon deactivation of said coil means and which, upon activation of said coil means to develop said second magnetic field, is demagnetized sufficiently to permit said spring to bias said plunger in position to open said gap.

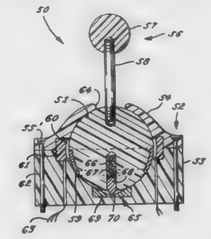
4,733,213
LAYER WINDING FOR ELECTRICAL EQUIPMENT
Otto Graul, Bamberg, Fed. Rep. of Germany, assignor to MWB Messwandler-Bau Aktiengesellschaft, Bamberg, Fed. Rep. of Germany
Division of Ser. No. 760,891, Jul. 31, 1985, Pat. No. 4,653,178.
This application Nov. 3, 1986, Ser. No. 925,972
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428893
Int. Cl.[4] H01F *27/32*
U.S. Cl. 336—206 **4 Claims**



1. A layer winding for transformers, measuring transformers, choke coils and coils for other inductive apparatus having insulating layers and winding layers consisting of insulating tapes and conductors, respectively, which alternate with one another, wherein the respective insulating layer is wound at the same time and in the same direction with the winding layer wound on the insulating layer and the insulating tape has a larger width than the width or diameter of a conductor, and in which the insulating tape is wound at least within a larger section of an insulating layer with a larger pitch than the conductor and an edge of insulating material of twice the height of a winding layer is established at edge areas of the winding layers, and wherein the width of the insulating tape adjacent an outer end face of a layer winding edge area has a continuously reduced portion of about 15 to 30 percent of its width along the conductor between the outer edge areas of the layer winding, the continuously reduced portion of the insulating tapes being terminated with a free end approximately at the outer end faces of the layer winding edge areas, and wherein free spaces occurring at the edge areas toward the outer end faces of the winding layers during the winding of insulating layers with predetermined pitch are compensated by being filled with

coaxial windings of residual tape in the outer edge zones of the edge areas, said residual tape also being terminated with a free end approximately at the outer end faces of the winding edge areas.

4,733,214
MULTI-DIRECTIONAL CONTROLLER HAVING RESILIENTLY BIASED CAM AND CAM FOLLOWER FOR TACTILE FEEDBACK
Herman J. Andresen, 1014 Central Rd., Glenview, Ill. 60025
Division of Ser. No. 496,843, May 23, 1983, Pat. No. 4,639,667.
This application Nov. 18, 1986, Ser. No. 932,461
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—128 **20 Claims**

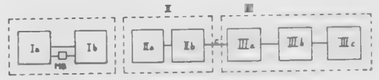


1. A multi-directional controller comprising a reference frame and a carrier, means for guiding the carrier with respect to the reference frame in first and second generally orthogoal directios while restraining motion of the carrier with respect to the reference frame in a third direction generally orthogonal to said first and second diectios, manipulator means connected to the carrier for manually positioning the carrier with respect to the reference frame in the first and second directions, and means for sensing the displacement of the carrier with respect to the reference frame along said first and second directions,

wherein said multi-directional controller further comprises cam and cam follower means disposed between said carrier and said reference frame for providing forces between said carrier and said reference frame which are a predetermined function of the displacement of said carrier with respect to said frame in each of said first and second orthogonal directions, and wherein said cam and cam follower means includs a cam follower and a cam, said cam follower engaging said cam and travelling in two orthogonal directions over a two-dimensional regin of said cam as said carrier is manually positioned with respect to said reference frame over a two-dimensional region of trave defined by said first and second orthogonal directions, and said two-dimensional region of said cam is programmed to provide a desired reaction force as a predetermined function of position of said carrier with respect to said frame.

4,733,215
REMOTE CONTROL APPARATUS FOR A PROPERTY PROTECTION DEVICE
Serafino Memmola, Varese, Italy, assignor to DELTA Elettronica S.p.A., Varese, Italy
Continuation-in-part of Ser. No. 817,884, Jan. 10, 1986, abandoned. This application Aug. 11, 1986, Ser. No. 895,481
Claims priority, application Italy, Nov. 13, 1985, 83623A/85; Jan. 10, 1986, 83602A/86
Int. Cl.[4] B60R *25/04;* **G08C** *19/00*
U.S. Cl. 340—64 **20 Claims**

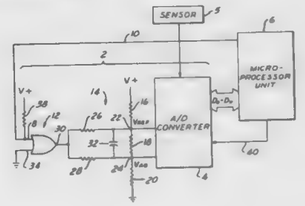
17. Remote control apparatus for automatically controlling a protection device associated with a property, said device being capable of switching between at least two states with respect to the protection of said property, said remote control apparatus comprising:
- (a) means for generating at least one control signal for controlling the state of said protection device;
- (b) means for transmitting said signal, said transmitting means being portable and having a range substantially limiting the distance said signal can be transmitted;
- (c) means for receiving said signal, said receiving means responsive to said signal to switch said device to a first state when said signal has been received and to a second state when said signal has not been received for a preselected time interval; and



- (d) means for detecting the presence of at least one person inside said property, said detecting means being responsive to said presence to prevent said receiving means from switching said device between said first and second states while said person is inside said property,

whereby said device is in said first state when said transmitting means is within said range of said receiving means and said device is in said second state when said transmitting means is outside said range of said receiving means and no person is inside said property.

4,733,216
N+1 BIT RESOLUTION FROM AN N BIT A/D CONVERTER
Danny O. Wright, Grafton, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Oct. 29, 1986, Ser. No. 925,031
Int. Cl.[4] H03M *1/12*
U.S. Cl. 340—347 AD **5 Claims**



4. A method of generating an N+1 bit resolution from an N bit A/D converter comprising the steps of:
- generating a conversion signal from a microprocessor to initiate the conversion of an analog signal to a digital word by the A/D converter;
- generating a first N bit digital word from the analog signal in the A/D converter;
- generating a control signal from the microprocessor indicating that an N+1 bit digital word resolution is to be generated;
- responding to said control signal to generate an electrical signal according to the following formula

$$V_{"dither"}=(V+)/2^{(N+1)}$$

where N=the number of bits of normal resolution of the A/D converter; where V+=the high voltage reference to the A/D converter
- applying said electrical signal to the A/D converter to shift the input range of the analog signal;
- generating a second N bit digital word from the analog signal in the A/D converter; and then

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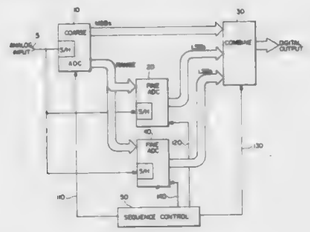
summing the first and second N bit digital words in the microprocessor to get an N+1 bit digital word wherein the least significant bit position resolution has been increased.

4,733,217

SUBRANGING ANALOG TO DIGITAL CONVERTER

Andrew G. F. Dingwall, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 8, 1986, Ser. No. 860,806
Int. Cl.[4] H03M *1/42*
U.S. Cl. 340—347 AD **4 Claims**



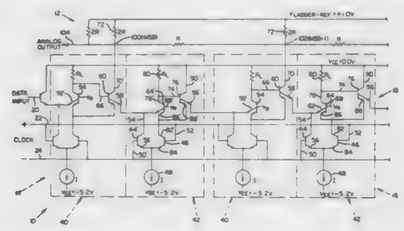
1. A subranging analog-to-digital converter, comprising:
an analog input terminal;
a coarse analog-to-digital converter having an analog input port coupled to said input terminal, a digital output terminal and a range indication output terminal;
first and second fine analog-to-digital converters each having an analog input port coupled to said input terminal, a range selection input terminal coupled to said range indication output terminal, and a digital output terminal; and
means having respective input terminals coupled to the digital output terminals of said coarse and said first and second fine analog-to-digital converters for alternately combining signals from said first and second fine analog-to-digital converters with signals from said coarse analog-to-digital converter to produce a sequence of digital samples representing said analog signal.

4,733,218

COMBINED DIGITAL-TO-ANALOG CONVERTER AND LATCH MEMORY CIRCUIT

Einar O. Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 18, 1986, Ser. No. 888,199
Int. Cl.[4] H03M *1/78*
U.S. Cl. 340—347 DA **4 Claims**



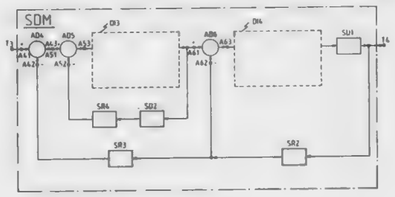
1. A combined digital-to-analog converter and latch memory circuit, comprising:
a resistive ladder network having plural input nodes and an output, each of the input nodes corresponding to a different bit of a digital word;
plural current-controlled latch subcircuits, each of the latch subcircuits using an amount of current to control the operation thereof and having a current output for delivering the amount of current to one of the input nodes to represent the logic state of a corresponding one of the bits, thereby to store in the latch subcircuits the logic states of the bits of the digital word and to provide at the output an analog signal that corresponds to the weighted value of the digital word, said latch subscripts being mutually coupled in a series, and each having a data input and a data output, the data output of one of said latch subcircuits being coupled to the data input of the next adjacent latch subcircuit in the series to form a serial shift register; and
positive and negative clock input terminals for receiving a differential clock signal such that said latch subcircuits are responsive to the clock signal in order to store data applied to their inputs.

4,733,219

CONVERTER CIRCUIT

Peter P. F. Reusens, Destenbergen, and Jozef D. G. L. Cannaerts, Zaventem, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 26, 1987, Ser. No. 19,443
Claims priority, application Belgium, Feb. 27, 1986, 2/60933
Int. Cl.[4] H03M *7/32*
U.S. Cl. 340—347 DD **10 Claims**



1. In a converter circuit of the type having
an input terminal, to which input signals to be converted are applied,
an output terminal,
a first subtractor circuit,
a first integrator circuit,
a second subtractor circuit,
a second integrator circuit,
said first subtractor, said first integrator, said second subtractor, and said second integrator circuits all being coupled between said input and said output terminals, and
a first feedback loop for coupling said output terminal to said second subtractor circuit as well as to said first subtractor circuit,
the improvement comprising:
a third subtractor circuit coupled between said first subtractor circuit and said first integrator circuit, and
a second feedback loop for coupling the output of said first integrator circuit to said third subtractor circuit.

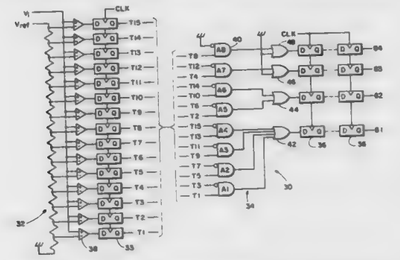
4,733,220

THERMOMETER-TO-ADJACENT BINDARY ENCODER

Daniel G. Knierim, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 784,414, Oct. 4, 1985. This application Oct. 20, 1986, Ser. No. 920,936
Int. Cl.[4] H03M *1/36, 7/16*
U.S. Cl. 340—347 DD **7 Claims**

1. An encoder for converting a plurality of first digital signals into a plurality of second digital signals, each said first digital signal representing a bit of a thermometer code and each said second digital signal representing a bit of a corresponding adjacent binary code, said encoder comprising:
a plurality of first regenerating means, one corresponding to each of said first signals, for regenerating said first digital signals, thereby to produce a set of third digital signals, said third digital signals being grouped into signal subsets, one said signal subset corresponding to each of said second digital signals, and each of said third digital signals being grouped into only one of said signal subsets;
means associated with each said digital signal subset for generating a corresponding fourth digital signal, the state of each said fourth digital signal being determined by the collective states of said corresponding signal subset such that said fourth digital signals in combination represent an



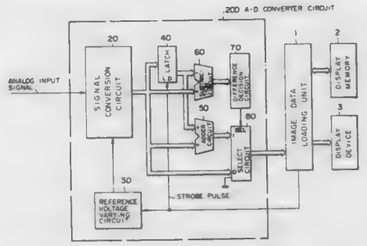
adjacent binary code corresponding to the thermometer code represented by said first digital signals; and
second regenerating means for regenerating said fourth digital signals, thereby to produce said second digital signals, said second regenerating means comprising a plurality of regeneration stages, each stage producing a set of output signals by regenerating a set of input signals, the stages being serially connected to form a pipeline such that the input signals to each stage other than a first stage of said pipeline comprise the output signals produced by a preceding stage of the pipeline, the fourth digital signals being applied as input signals to said first stage, the second digital signals being generated by a last stage of said pipeline.

4,733,221

A-D CONVERTER CIRCUIT

Takatoshi Ishii, Tokyo, Japan, assignor to ASCII Corporation, Tokyo, Japan

Filed Jun. 13, 1986, Ser. No. 874,110
Claims priority, application Japan, Jun. 14, 1985, 60-128057; Sep. 10, 1985, 60-198682; Nov. 27, 1985, 60-267026
Int. Cl.[4] H03M *1/20*
U.S. Cl. 340—347 AD **9 Claims**



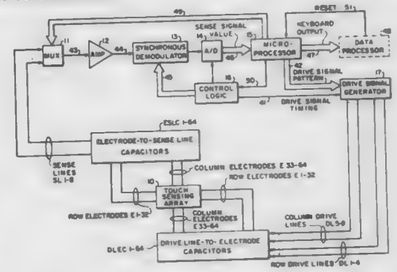
1. A solid-state trip device having an analog instantaneous trip release to bring about high-speed opening of the contacts of a circuit breaker with current limiting comprising:
a current sensor which generates a derivative analog signal di/dt proportional to the derivative in relation to time of the current flowing in a conductor of the circuit breaker;
an integrating circuit receiving said derivative signal di/dt and emitting a signal representative of the current i;
a first threshold comparator circuit comparing said signal representative of the current and an upper threshold value to emit an instantaneous tripping signal when said current signal i exceeds said upper threshold value;
a second threshold comparator circuit comparing said derivative signal di/dt with a second threshold value to generate a selection signal of a lower instantaneous tripping threshold, when said derivative signal exceeds said second threshold.

4,733,222

CAPACITANCE-VARIATION-SENSITIVE TOUCH SENSING ARRAY SYSTEM

John W. Evans, La Jolla, Calif., assignor to Integrated Touch Arrays, Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 566,045, Dec. 27, 1983, abandoned. This application Apr. 18, 1986, Ser. No. 853,428
Int. Cl.[4] G06F *3/02*
U.S. Cl. 340—365 C **45 Claims**



1. A capacitance-variation-sensitive touch sensing array system comprising
an array of electrodes with each electrode including a connected series of conductive tabs;
an array of keys with each key overlying at least one tab of at least one of said electrodes for varying the capacitance between said electrode and ground upon the key being touched by an operator;
an array of drive lines capacitively coupled to the electrodes, with individual drive lines being coupled to a plurality of the electrodes;
drive means for applying drive signals to the drive lines to drive the electrodes coupled thereto;
an array of sense lines capacitively coupled to the electrodes, to derive sense signals from the electrodes when drive signals are applied to the drive lines, with each of said sense lines being so coupled to a plurality of the electrodes as to be interconnected via unique combinations of electrodes to said drive lines such that the sense lines derive unique combined patterns of variations in said sense signals in response to actuation of each of the keys;
means coupled to the sense lines for sensing said patterns of variations in said sense signals; and
means coupled to the sensing means for processing the sense signals to provide information associated with any particular key that is touched by an operator;
whereby the number of keys exceeds the product of the number of drive lines and the number of sense lines.

4,733,223

APPARATUS FOR MONITORING A COMMUNICATIONS SYSTEM

William C. Gilbert, 8625 E. Valley Vista Dr., Scottsdale, Ariz. 85253

Filed Mar. 26, 1987, Ser. No. 31,084
Int. Cl.[4] G08B *26/00*; H04B *3/00*
U.S. Cl. 340—505 **15 Claims**

1. Apparatus for monitoring and transmitting status of components at remote locations in a communications system, said

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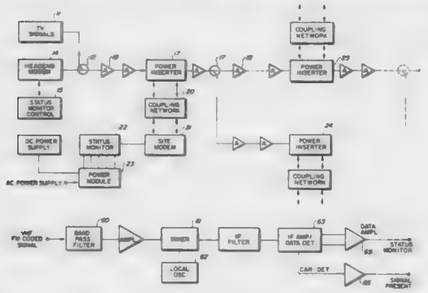
system transmitting information signals and address codes within a frequency band from a head-end to a plurality of spaced utilization circuits, said apparatus comprising:

(a) high frequency demodulating means for recovering said address information at each said remote location;

(b) status monitoring means for storing data indicative of component status at each said remote location and providing same upon being addressed;

(c) low frequency modulating means for encoding a first carrier at a first frequency with data from status monitoring means in said system;

(d) first means for coupling said low frequency modulating



means to the head-end whereby said first carrier is transmitted to said head-end;

(e) low frequency demodulating means for decoding a second carrier at a second frequency and recovering data from other of said remote locations, said demodulating means being coupled to said low frequency modulating means for supplying data thereto; and

(f) second means for coupling said low frequency demodulating means to other of said remote locations for receiving low frequency signals therefrom.

4,733,224

DETECTOR SYSTEM WITH MULTIPLE SENSORS EACH SENSING DIFFERENT DANGER CONDITIONS

Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1986, Ser. No. 933,127

Claims priority, application Japan, Nov. 21, 1985, 60-259768

Int. Cl.⁴ G08B *19/00*

U.S. Cl. 340—521 **12 Claims**



1. In a combined detector for use with a central monitoring unit, said detector having a plurality of sensors and address coincidence detection means for detecting whether an access address coincident with a selected address is present in an access signal from said central monitoring unit, the combined detector being adapted to exchange an information signal with said central monitoring unit using a coincidence detection signal of the address coincidence detection means, the improvement comprising count means having a count output for counting successive coincidence detection signals and a plurality of switching means respectively connected to an output terminal of each of said sensors, said switching means each having a control input connected to said count output and being selectively switched using a count output of said count means to successively through-connect the output of one sensor to said central monitoring unit.

4,733,225

COOLING MEDIUM TEMPERATURE MONITORING SYSTEM FOR ROTARY ELECTRIC MACHINE

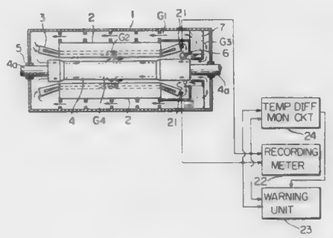
Yutaka Uematsu, and Morio Matsusaki, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,302

Claims priority, application Japan, Oct. 4, 1984, 59-207007; Oct. 4, 1984, 59-207009

Int. Cl.⁴ G08B *17/00*

U.S. Cl. 340—584 **5 Claims**



1. A cooling medium temperature monitoring system for a rotary electric machine for cooling stator coils by means of a cooling medium flowing in a plurality of cooling medium passages provided in the stator coils, comprising:

a plurality of temperature detecting means for measuring the temperatures of the cooling medium in the outlets of the plurality of cooling medium passages and for providing outputs corresponding thereto;

a means for setting temperature warning values as a function of the output of a generator, and

a means for respectively comparing said outputs of said plurality temperature detecting means with said set warning values of said warning value setting means and for generating an alarm signal when said output of any of said plurality of detecting means exceeds a corresponding set warning value.

4,733,226

OVERLAPPED-TRANSFER DETECTING APPARATUS FOR MAIL ARTICLE

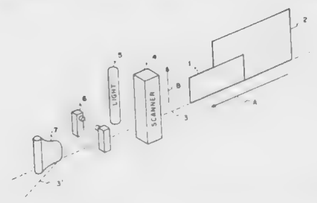
Shigenobu Kasuya; Yoshihiro Matsuda, and Tetsuo Umeda, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 7, 1987, Ser. No. 1,163

Claims priority, application Japan, Jan. 7, 1986, 61-1078

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—674 **10 Claims**



1. An apparatus for detecting articles while they are being moved along a transport path, said apparatus comprising detector means for detecting each article as it moves along said path, scanner means for detecting the height of each of said articles throughout its entire length while said articles are moving past said detector means, and means responsive to an apparent change in height for signaling a possible overlap condition to indicate that probably said detector means has responded once to more than one article.

4,733,227

COLOR DISPLAY WITH AUTOMATIC COLOR CONTROL DEVICE

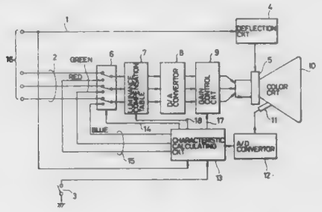
Seiichi Kanema, Nishitama, and Shigeo Tsujioka, Higashiyamato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 820,640

Claims priority, application Japan, Jan. 21, 1985, 60-8907

Int. Cl.⁴ H04N *9/68*

U.S. Cl. 340—701 **1 Claim**



1. In color displays of the type which produce color pictures on a color cathode ray tube display according to radiation order signals of red, green and blue, the improvement comprising:

detection means for detecting the radiation state of the surface of said cathode ray tube;

difference signal calculation means for calculating a difference signal between the detection output of said detection means and the output corresponding to a radiation quantity that must be obtained originally and for outputting linearity compensation data that can calculate a mean deviation of a practical radiation quantity from said radiation order signals and a gain control value that can compensate for the deviation of the practical radiation quantity from said radiation order signals, from the output of said detection means, in synchronism with picture position data of a horizontal-vertical deflection signal of said cathode ray tube; and

compensation means for compensating for said radiation order signals in accordance with said difference signal including a brightness compensation table storing said linearly compensation data and a gain control circuit controlling the amplification gain of the signal corrected by said compensation table in synchronism with said picture position data, between the input terminals of said radiation order signals and the input terminal of said cathode ray tube.

4,733,228

TRANSFORMER-COUPLED DRIVE NETWORK FOR A TFEL PANEL

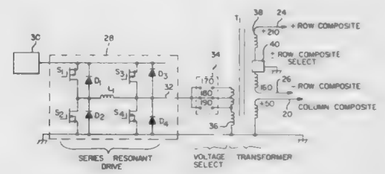
Robert T. Flegal, Beaverton, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Jul. 31, 1985, Ser. No. 760,990

Int. Cl.⁴ G09G *3/28*

U.S. Cl. 340—719 **11 Claims**

1. A driving network for a TFEL panel, said panel comprising a plurality of capacitive pixels defined by the respective intersections of a first plurality of scanning electrodes and a second plurality of data electrodes comprising a transformer having an input winding connected to a source of driving voltage and a plurality of output windings and responsive to an input pulse of a predetermined frequency for providing composite simultaneous scanning electrode and data electrode drive pulses on differing ones of said output windings and



further including switching means connected to an output of said transformer for providing scanning electrode composite drive pulses of a first polarity during a first image frame and scanning electrode composite drive pulses of a second polarity during a second image frame.

4,733,229

HIGHLIGHTING GRAY SCALE VIDEO DISPLAY TERMINAL

Frank R. Whitehead, 9307 Ridgeside La., Orangevale, Calif. 95662

Filed Jan. 24, 1984, Ser. No. 573,833

Int. Cl.⁴ G09G *1/14*

U.S. Cl. 340—723 **17 Claims**

1. Apparatus for displaying image information consisting of pixels having discrete digitally encoded intensities, comprising:

(a) a source of digitized intensity information for each pixel, said intensity information being in the form of a first predetermined number of information levels;

(b) display means capable of displaying pixels at a second predetermined number of discrete display intensity levels in response to digitized display control signals;

(c) transfer means for converting each of said information levels into one of said display control signals in accordance with a first predetermined transfer function in a first area of said display, and in accordance with a second predetermined transfer function in a second area of said display; and

(d) highlighting means for selecting said second transfer function in said second area of said display, said second area being selectable;

(e) said first and second transfer functions being such that level changes in a constant direction in said information level produce level changes in a constant direction in said display intensity level so as to change the brightness and/or contrast of said display but not its informational content.

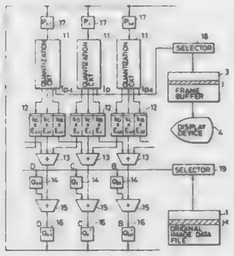
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,230

METHOD OF DISPLAYING CONTINUOUS TONE PICTURE USING LIMITED NUMBER OF DIFFERENT COLORS OR BLACK-AND-WHITE LEVELS, AND DISPLAY SYSTEM THEREFOR

Tsuneya Kurihara, Kodaira, and Akio Yajima, Suginami, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,307
Claims priority, application Japan, Sep. 6, 1984, 59-185344
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—728 **11 Claims**



1. A method of displaying continuous tone images from input image value data signals representing respective image values of a respective picture element of picture elements forming a plurality of successive lines of an image to be displayed by parallel processing of lines in sequence, comprising the steps of:

(a) comparing each of the input image value data signals forming a first line of said image with a plurality of standard value data signals each representing a respective one of a plurality of displayable image values and selecting for each input image value data signal the one standard value data signal which is closest to that input image value data signal;

(b) calculating the quantifying error between each input image value data signal forming said first line of said image and the standard value data signal selected for each input image value data signal;

(c) generating a respective compensation quantity for each input image value data signal of said first line of said image based on predetermined weighting coefficients and the quantifying error for that input image value data signal and the quantifying errors of a predetermined number of adjacent input image value data signals in said first line;

(d) adding the generated compensation quantity for each input image value data signal of said first line only to an image value data signal of a second line of said image to be displayed to produce input image value data signals of said second line;

(e) repeating steps (a) through (d) for all lines of input image value data signals following said first line until standard value data signals have been selected for the input image value data signals of all of the lines of said image; and

(f) displaying said selected standard value data signals to produce the appearance of a continuous tone image.

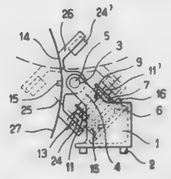
4,733,231

SYSTEM FOR DISPLAYING A SEGMENT, PRIMARILY FOR USE IN A REMOTE-CONTROLLED DIGITAL DISPLAY

Roland Lagache, Le Canon, France, assignor to Lafon S.A., Bassens, France

Filed May 16, 1985, Ser. No. 734,558
Claims priority, application France, May 23, 1984, 84 08007
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—783 **6 Claims**

1. A system for displaying a display segment comprising a support having mounting means extending therefrom, a shaft, serving as a pivot pin, fixed in said support, a relatively thin display segment having a display face for displaying a portion of a character and rotatably mounted on said fixed shaft between two positions one constituting a display position and the other a retracted position, a pair of permanent magnets carried by the display segment on the face thereof opposite the display face, each of said permanent magnets mounted on opposite sides of said fixed shaft near an end of said display segment,



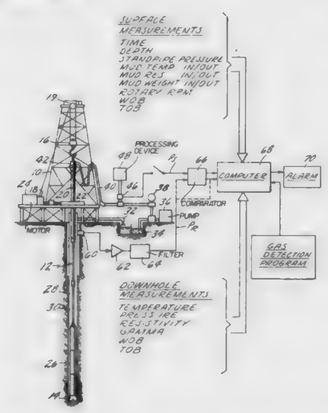
electromagnet means of a very low remanence having a core extending perpendicular to the axis of said fixed shaft so that one of said permanent magnets or the other of said permanent magnets may be in contact with an end of said core at any one time, and control means for supplying spaced electrical pulses to said electromagnet whereby the permanent magnet in contact with said one end of said core of said electromagnet means is repelled from said one end causing the other permanent magnet to move toward the other end of said core of said electromagnet means.

4,733,232

METHOD AND APPARATUS FOR BOREHOLE FLUID INFLUX DETECTION

Donald S. Grosso, West Hartford, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Continuation of Ser. No. 507,136, Jun. 23, 1983, abandoned.
This application Dec. 1, 1986, Ser. No. 936,351
Int. Cl.[4] G01V *1/00*; H04H *9/00*; E21B *47/00*
U.S. Cl. 340—861 **14 Claims**



1. Apparatus for detection of fluid influx in a borehole in which a drill string is positioned, the drill string cooperating with the wall of the borehole to define an annulus, and in which drilling fluid is circulated from the surface through the interior of the drill string and into the annulus back to the surface, the apparatus for detection of fluid influx including:

means for generating a coherent energy signal at a downhole location and propagation said signal as a primary signal in the drilling fluid in said drill string and as a secondary signal in the drilling fluid in said annulus;

means for detecting said primary signal;

means for detecting said secondary signal;

means for measuring the difference between at least one selected parameter of said primary signal with the same selected parameter of said secondary signal, wherein the entire drill string is a reference with which to make a differential comparison to the entire annulus; and

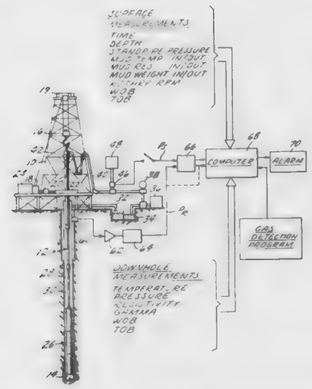
means for determining changes in said measured difference between the selected parameter of said primary and secondary signals wherein fluid influx into the annulus is determined.

4,733,233

METHOD AND APPARATUS FOR BOREHOLE FLUID INFLUX DETECTION

Donald S. Grosso, West Hartford, and G. Robert Feeley, Jr., Middletown, both of Conn., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Continuation of Ser. No. 507,146, Jun. 23, 1983, abandoned.
This application Dec. 1, 1986, Ser. No. 936,185
Int. Cl.[4] G01V *1/00*; H04H *9/00*; B21B *47/00*
U.S. Cl. 340—861 **11 Claims**



1. Apparatus for detection of fluid influx in a borehole in which a drill string is positioned, the drill string cooperating with the wall of the borehole to define an annulus, and in which drilling fluid is circulated from the surface through the interior of the drill string and into the annulus back to the surface, and in which data bearing primary signals are transmitted to the surface in the drilling fluid by operation of pressure generating means in said drill string, and in which reflected signals of said primary signals are transmitted to the surface in the annulus through the drilling fluid, the apparatus for detection of fluid influx including:

means for detecting in said annulus the reflected signals of the primary signals in the drilling fluid in said drill string, said reflected signals defining secondary signals;

means for detecting said primary signals;

means for measuring the difference between at least one selected parameter of said primary signals with the same selected parameter of said secondary signals wherein the entire drill pipe is a reference with which to make a differential comparison to the entire annular space; and

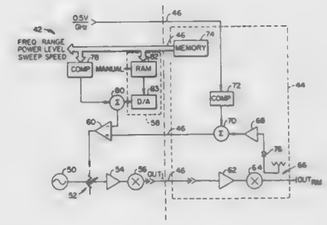
means for determining changes in said measured difference between the selected parameter of said primary and secondary signals wherein fluid influx into the annulus is determined.

4,733,234

REMOTE CALIBRATED POWER SOURCE SYSTEM AND METHOD

Stephen T. Sparks, and John R. Regazzi, both of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 16, 1986, Ser. No. 852,599
Int. Cl.[4] G08C *15/06*
U.S. Cl. 340—870.04 **8 Claims**



1. A remote calibrated power source system comprising an instrument which generates a power signal, the instrument being positioned at a first location, and a remote calibrated power source module which provides a calibrated power output signal, the remote module being positioned at a second location removed from the first location, and

wherein the remote module comprises:

power sampling means which samples the power signal generated by the instrument and generates a voltage sample signal corresponding to the sampled power signal;

a logarithmic amplifier which receives the voltage sample signal and converts the voltage sample signal into decibel units of measurement;

first compensation means which generates a frequency-varying correction voltage signal;

first summing means which receives both the correction voltage signal and the converted voltage sample signal and generates a compensated voltage sample signal in response thereto; and

memory means which stores data pertinent to the operation of the system, including frequency error compensation data and logarithmic adjustment data, the logarithmic adjustment data being related to the characteristics of the logarithmic amplifier,

and wherein the instrument comprises:

means for generating the power signal;

second compensation means which receives frequency compensation data from the memory means and generates a frequency-varying correction voltage signal in response thereto;

a reference voltage generator which receives the logarithmic adjustment data from the memory means and generates a corresponding logarithmically adjusted reference voltage signal;

second summing means which receives the frequency-varying correction voltage signal and the logarithmically adjusted reference voltage signal and generates a compensated reference voltage signal in response thereto;

comparison means which receives the compensated reference voltage signal and the compensated voltage sample signal and generates a modulating difference voltage signal in response thereto; and

modulator means which modulates the power signal in response to the modulating difference voltage signal.

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4,733,235

CAPACITANCE TYPE DISPLACEMENT MEASURING INSTRUMENT

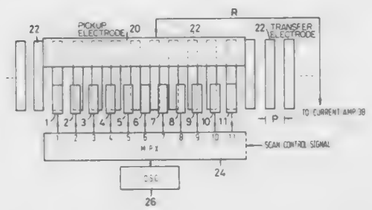
James A. Baer, Menlo Park; Charles B. Clark, Los Altos; Joseph S. Eckerle, Redwood City; Hugh F. Frohbach, Sunnyvale, and Russell T. Wolfram, Los Altos, all of Calif., assignors to Mitutoyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,525

Claims priority, application Japan, Oct. 27, 1983, 58-201674

Int. Cl.⁴ G08C *19/10*

U.S. Cl. 340—870.37 **6 Claims**



1. A capacitance type displacement measuring instrument having two members movable relative to each other in a moving direction and carrying electrodes thereon, wherein a change in electric capacity between the electrodes due to a change in displacement between the two members is detected on the basis of a change in phase of a detection signal and a displacement value between said two members is measured from the change in the capacity, said measuring instrument comprising:

an oscillator for generating an alternating current (AC) signal of a predetermined amplitude;

a multiplexer for successively sampling the AC signal from said oscillator;

transmitting electrodes provided on one of said members, said transmitting electrodes being arranged to correspond to at least one cycle of said AC signal at a predetermined pitch in the moving direction of said member, said AC signal being successively applied by said multiplexer to successive transmitting electrodes;

a plurality of transfer electrodes provided on the other of said members, said transfer electrodes being arranged at a predetermined pitch differing from the predetermined pitch of said transmitting electrodes, part of said transfer electrodes being opposed to said transmitting electrodes;

at least one pickup electrode provided on said one of said members and opposed to a remaining part of the transfer electrodes; and

phase detecting means for detecting a change in phase of pickup signals of a substantially triangular waveform detected by said at least one pickup electrode.

4,733,236

SPACE TARGET WITH MULTI-SPECTRAL ENERGY REFLECTIVITY

Kenneth R. Matosian, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 10, 1985, Ser. No. 807,154

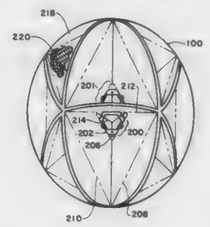
Int. Cl.⁴ G01B *13/00*

U.S. Cl. 342—7 **16 Claims**

1. Multispectral energy responsive space satellite reflecting apparatus comprising:

a rigid spherical polyhedron incorporating a plurality of adjacent reentrant pyramidal cavities formed by intersecting planar divider members each common to two adjacent cavities and intersecting at pyramid apices located at the center of said spherical polyhedron;

a plurality of optical reflector members located one in the apex adjacent portion of each said pyramidal cavity in physical separation from the cavity apex and capable of outwardly reflecting optical energy directed into said cavity from an external source; and



a plurality of radio frequency energy reflector members located one in each said pyramidal cavity and disposed over a portion of the interior surface thereof and capable of conducting and reflecting radio frequency energy received from an external source.

4,733,237

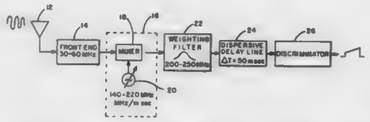
FM/CHIRP DETECTOR/ANALYZER AND METHOD

John T. Apostolos, Merrimack, and Chester E. Stromswold, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 7, 1985, Ser. No. 689,524

Int. Cl.⁴ G01S *7/36*

U.S. Cl. 342—13 **32 Claims**



1. An apparatus for detecting frequency-modulated signals whose frequencies are swept at chirp rates, the apparatus comprising:

A. a frequency translator for generating translated signals by translating the input signals by a frequency difference that is repeatedly swept linearly at a frequency-translator sweep rate;

B. a dispersive delay line, having an input port connected to receive the translated signals and having an output port at which it presents delayed signals that are delayed versions of the translated signals in which the delay depends on the frequency component being delayed, the difference in delay for a given frequency difference being substantially the negative of the frequency difference divided by the frequency-translator sweep rate; and

C. a frequency discriminator connected to receive the delayed translated signals and generate a discriminator output proportional to the instantaneous frequency of the delayed translated signal, the time rate of change of a discriminator output component thereby indicating the chirp rate of the frequency-modulated signal component that gave rise to it.

4,733,238

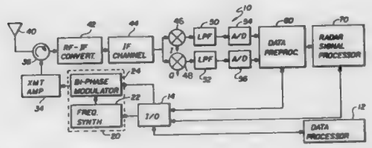
METHOD AND SYSTEM FOR RADAR COMPATIBLE DATA COMMUNICATION

William H. Fiden, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 17, 1986, Ser. No. 931,282

Int. Cl.⁴ G01S *13/86*

U.S. Cl. 342—60 **34 Claims**



10. A combined radar and communication system including means for providing simultaneous radar and communication functions, said means including:

a transmitter including means for encoding a radar transmit signal with message data;

a first receiver including means for decoding returns from said transmitted signal to eliminate said message data; and

a second receiver including means for decoding said radar signal to extract said message data, said second receiver including means for providing digitized in-phase and quadrature signals representing said transmitted signals.

4,733,239

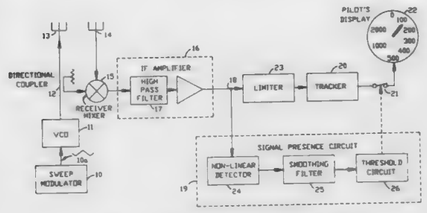
RADAR ALTIMETER

Jerry C. Schmitt, 19930 Countryview Ter., Spring Hill, Kans. 66083

Filed Feb. 27, 1984, Ser. No. 583,668

Int. Cl.⁴ G01S *13/34*

U.S. Cl. 342—94 **3 Claims**



1. A radar altimeter for determining the altitude of an object above a surface comprising:

(a) a frequency modulated radar transmitter adapted to transmit a continuous frequency wave;

(b) a receiver adapted to receive a frequency modulated radio frequency continuous wave reflected from a surface, the receiver having (i) a mixer means whereby the reflected wave and a portion of the transmitter output are combined, and (ii) a means to amplify the mixer means output signal;

(c) a signal presence means adapted to produce an output signal when the radar altimeter is receiving an adequate reflected wave from a surface, comprising:

(i) a means for producing an input signal to a smoothing filter means, the level of which is the approximate logarithm of the receiver output level when the receiver output level exceeds a pre-set minimum and approaches zero when the receiver output level is below the pre-set minimum;

(ii) a smoothing filter means that integrates its input signal level as a function of time; and

(iii) a threshold means for producing an output signal only when the output of the smoothing filter exceeds a reference level;

(d) a tracker means for producing a signal, the amplitude of which is proportional to the receiver output frequency and thereby proportional to the altitude;

(e) a switch means for gating the output of the tracker means off when an output signal from the signal presence means is at one level and for gating the output of the tracker means on when an output signal from the signal presence means is at another level, thereby ensuring that the radar altimeter is producing an output only during periods when the radar altimeter is producing reliable altitude indications.

4,733,240

PHASED ARRAY TRANSMITTER

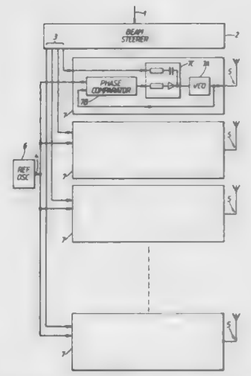
Caleb R. Bradley, Oslo, Norway, assignor to The Marconi Company Limited, Stanmore, England

Filed Jan. 16, 1987, Ser. No. 4,011

Claims priority, application United Kingdom, Jan. 18, 1986, 8601214

Int. Cl.⁴ H01Q *3/22, 3/24, 3/26*

U.S. Cl. 342—372 **4 Claims**



1. A phased array transmitter comprising: a reference oscillator, an array of antenna elements; for each element a phase lock loop comprising a voltage controlled oscillator whose output is connected to the associated element, and a phase comparator arranged to compare a signal derived from the output of the voltage controlled oscillator with a signal derived from the reference oscillator, and control means for controlling the phases at which the oscillators lock; characterised in that the control means comprises a circuit located between the phase comparator and the voltage controlled oscillator which circuit performs a sum-and-integrate function on voltages received from (i) the phase comparator and (ii) a phase control input to the loop.

4,733,241

POSITION FINDING AND COLLISION AVOIDANCE SYSTEM

George B. Litchford, Northport, and Burton L. Hulland, Glenwood Landing, both of N.Y., assignors to Litchstreet Co., Northport, N.Y.

Continuation of Ser. No. 811,950, Dec. 20, 1985. This application Jun. 24, 1987, Ser. No. 65,143

Int. Cl.⁴ G01S *3/02*

U.S. Cl. 342—453 **12 Claims**

1. Apparatus at an Own station within the service area of an SSR for determining the position of a transponder-equipped

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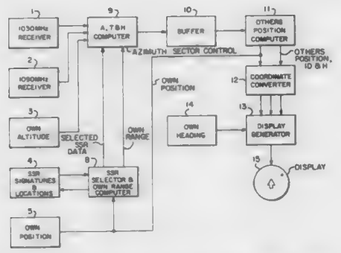
Other station within said service area, including at the Own station:

a. means for receiving the interrogations transmitted by said SSR,

b. means for geographically locating said SSR,

c. means for receiving replies transmitted from said Other station in response to said interrogations,

d. means for determining, from the time relationships between said received interrogations and said replies, data defining the position of said Other station with respect to the Own station in coordinates of differential azimuth (A),



e. means for determining, from the time relationships between said received interrogations and said replies, data defining the position of said Other station with respect to the Own station in coordinates of differential time of arrival (T),

f. means for determining the position of the Own station, and

g. means for computing, from said data and the known positions of said SSR and said Own station, the position of said Other station.

4,733,242

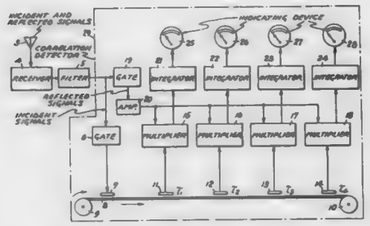
SUBMARINE DETECTION SYSTEM

Louis A. deRoza, Upper Montclair, N.J., assignor to ITT Corporation, Nutley, N.J.

Filed Jul. 20, 1959, Ser. No. 829,181

Int. Cl.⁴ G01S *3/02*

U.S. Cl. 342—458 **7 Claims**



1. A system for detecting the depth of an object submerged in a medium having radiation transmission characteristics substantially different than the atmosphere by use of radiated electromagnetic energy, comprising means to receive an incident radiation of a source of natural random electromagnetic energy having a multiplicity of frequencies regardless of the place of origin of said source or its distance from said receiving means and the reflection of said electromagnetic energy caused by the presence of an object submerged in said medium and means to compare selected frequencies of the reflected radiation with corresponding selected frequencies of the incident radiation to determine the time difference therebetween, the time difference detected being a measure corresponding substantially to the depth of the submerged object and proportional to the velocity of the selected frequencies of the radiation in said medium.

4,733,243

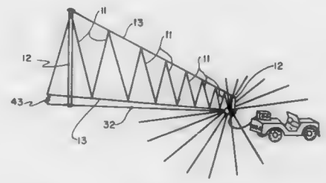
BROADBAND HIGH FREQUENCY SKY-WAVE ANTENNA

Bernard E. Feigenbaum, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1986, Ser. No. 943,095

Int. Cl.⁴ H01Q *11/10*

U.S. Cl. 343—736 **3 Claims**



1. A broadband antenna system comprising a pair of support lines, one of said support lines being horizontal and the other at a vertical angle of 30°±5° to the horizontal, a length of antenna wire strung continuously between said support lines in a vertical zig-zag manner so as to present a plurality of interconnected inverted-V sections, said plurality being equal to ten±two, the legs of each inverted-V section meeting at the ends thereof with the ends of the legs of inverted-V sections immediately adjacent thereto, each inverted-V section providing a spatial phase reversal to the current from leg-to-leg, the angle between adjacent legs of the inverted-V sections being a constant equal to 30°±5°, impedance matching transformer means for coupling input signals to the shortest of the inverted-V sections, resistance means connected to the tallest of the inverted-V sections for terminating the antenna in its characteristic impedance, and counterpoise means coupled to said resistance means and said transformer means and serving to balance the zig-zag antenna.

4,733,244

POLARIZATION SEPARATING REFLECTOR, ESPECIALLY FOR MICROWAVE TRANSMITTER AND RECEIVER ANTENNAS

Peter Edenhofer; Manfred Galka, both of Bochum; Juergen Habersack, Ottobrunn, and Norbert Nathrath, Taufkirchen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1985, Ser. No. 771,196

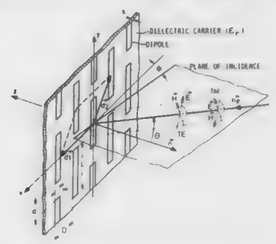
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431986

Int. Cl.⁴ H01Q *19/195, 15/24*

U.S. Cl. 343—756 **8 Claims**

1. An antenna reflector system for a microwave transmitter antenna or for a microwave receiver antenna, comprising a plurality of low-loss dielectric layers arranged symmetrically to form a substrate, a plurality of individual dipoles arranged in a resonance pattern to form a single dipole lattice or array on said substrate which forms a mechanically stiff carrier for said dipoles, all of said dipoles having substantially the same given dipole length (L) and substantially the same resonant frequency, a first spacing (d) between neighboring dipoles in the direction of said dipole length, each dipole having a given dipole width (w), a second spacing (D) between neighboring dipoles in the direction of said dipole width, said dipole length (L) and said first (d) and second (D) spacings being so selected that an optimal broadband antenna characteristic is achieved, said dipoles being arranged in columns which are displaced

relative to each other so that dipoles of one column fully overlap said first spacing (d) between the dipoles of another



neighboring column and vice versa for forming polarization separators which together achieve said broadband antenna characteristic.

4,733,245

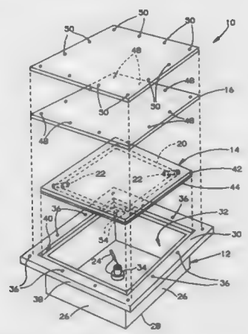
CAVITY-BACKED SLOT ANTENNA

Michael E. Mussler, Nederland, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jun. 23, 1986, Ser. No. 877,071

Int. Cl.⁴ H01Q *13/18*

U.S. Cl. 343—769 **31 Claims**



1. An antenna, comprising:

(a) a dielectric substrate having an adherent electrically conductive sheet forming a directionally-radiating elongated slot and means forming a microwave cavity backing said elongated slot;

(b) a dielectric layer composed of material having a dielectric constant of twenty or more overlying said conductive sheet and coupled to said slot to effect reduction of the resonant frequency of said antenna and permit a reduction in the size of the means forming a microwave cavity; and

(c) r.f. transmission means electrically coupled to said conductive sheet across and on opposite sides of said slot and adapted to carry r.f. energy.

4,733,246

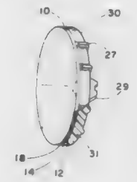
PLASTIC ANTENNA STRUCTURE HAVING A LAMINATED REFLECTOR

Jacob C. Rubin, Rochester, and Hans P. Baumeister, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 20, 1985, Ser. No. 777,986

Int. Cl.⁴ H01Q *15/16*

U.S. Cl. 343—912 **1 Claim**



1. Antenna reflector comprising:

(I) a thermoformable laminate material having at least one reflective metallic layer disposed between two plastic layers, and

(II) a support structure molded onto said laminated reflector, wherein:

(a) one of said two plastic layers comprises a plastic film,

(b) said one reflective metallic layer comprises a reflective metallic layer deposited on said plastic film,

(c) the other of said two plastic layers comprises a plastic support layer bonded to said metallic layer, and

(d) said reflector is generally parabolically shaped with a ratio of focal length divided by diameter (f/d) of not less than about 0.4 so as to reduce stress in said reflective metallic layer.

4,733,247

INK JET RECORDING METHOD IN WHICH THE PROJECTED INK DROPLETS HAVE A WEBER NUMBER OF NO MORE THAN 500

Ryuichi Arai, Sagamihara, and Mamoru Sakaki, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1986, Ser. No. 875,304

Claims priority, application Japan, Jun. 18, 1985, 60-130701

Int. Cl.⁴ G01D *15/16, 15/34*

U.S. Cl. 346—1.1 **8 Claims**

1. An on-demand ink-jet recording method comprising the steps of:

providing a recording medium which comprises a substrate and an ink receiving layer provided on the substrate, wherein the surface of the ink receiving layer has a Bekk smoothness of at least 100 sec. based on JIS P 8119; and

projecting droplets of ink toward the ink receiving layer of the recording medium so as to form substantially circular dots thereon,

wherein the Weber number (We) of the ink droplets, as represented by the following equation, is not more than 500:

$$We = \frac{\rho \cdot d \cdot v^2}{\gamma}$$

where ρ represents the density of the ink (g/cm^3); d represents the diameter of the ink droplets (μm); v represents the velocity of the ink droplets (m/sec); and γ represents the surface tension of the ink (dyne/cm).

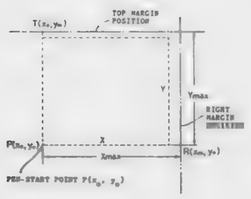
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,248

APPARATUS FOR RECORDING GRAPHICAL REPRESENTATIONS WITH CHECKING OF THE RECORDING AREA

Masaaki Hibino, Yokkaichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 10, 1986, Ser. No. 850,024
Claims priority, application Japan, Apr. 13, 1985, 60-78799
Int. Cl.[4] G01D 9/00
U.S. Cl. 346—33 R 8 Claims



1. A recording apparatus capable of recording a graphical representation on a recording medium with a recording instrument which is movable relative to the recording medium along an X axis and a Y axis, comprising:

a graphic pattern memory for storing a set of graphic pattern data representative of a pattern of said graphical representation;

an input device through which is entered graph data which is to be presented in said pattern;

a graph memory for storing said graph data entered through said input device;

recording control means for effecting and controlling relative movements between said recording instrument and said recording medium so as to record said graphical representation on said recording medium with said recording instrument in accordance with said graphic pattern data and said graph data;

setting means for selecting a maximum X-axis recordable range within which a recording on said recording medium with said recording instrument is possible along said X axis, and a maximum Y-axis recordable range within which the recording is possible along said Y axis;

recording-area checking means including arithmetic means for calculating, based on said graphic pattern data and said graph data, independently of said maximum X-axis and Y-axis recordable ranges, an X-axis plotting range and a Y-axis plotting range which define a plotting area of said graphical representation, said recording-area checking means further including judging means for determining if said X-axis plotting range and said Y-axis plotting range exceed said X-axis and Y-axis recordable ranges, respectively; and

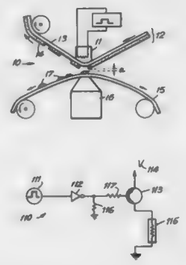
indicator means, responsive to said judging means, for indicating that said X-axis potting range exceeds said maximum X-axis recordable range if said judging means determines that said X-axis plotting range exceeds said maximum X-axis recordable range, and indicating that said Y-axis plotting range exceeds said maximum Y-axis recordable range if said judging means determines that said Y-axis plotting range exceeds said maximum Y-axis recordable range.

4,733,249

PRINTER AND METHOD OF PRINTING

Kohei Iwamoto; Hitoshi Fukushima; Katusmori Takei, and Yoshitaka Yamaguchi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 69,681, Jul. 6, 1987, which is a continuation-in-part of Ser. No. 841,925, Mar. 20, 1986. This application Jul. 15, 1987, Ser. No. 73,549
Claims priority, application Japan, Jun. 17, 1986, 61-168265
Int. Cl.[4] G01D 15/00
U.S. Cl. 346—74.4 22 Claims



1. A printer for printing on a transfer medium utilizing thermoplastic magnetic ink, comprising:

a thermal head for selectively applying thermal energy to melt selected portions of the thermoplastic magnetic ink;

a magnetic head substantially spatially fixed relative to the thermal head for applying a magnetic force to the thermoplastic ink which causes the melted portions to be transferred onto the transfer medium;

a strip of thermoplastic magnetic ink medium positioned for displacement in the space between the thermal head and transfer medium, the strip including a base layer facing and contacting the thermal head and a thermoplastic magnetic ink layer facing the transfer medium;

first movement means for moving one of the transfer medium and the thermal and magnetic heads relative to the other at a first speed; and

second movement means for moving the magnetic thermoplastic ink medium strip relative to the magnetic and thermal heads at a second speed, the first and second movement means being adapted to permit the first and second speeds to be unequal.

4,733,250

RECORDING APPARATUS

Mineo Nozaki, Kawasaki; Masasumi Nagashima, Yokosuka; Yoshio Uchikata, Kawasaki, and Osamu Asakura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,861, Mar. 29, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,435
Claims priority, application Japan, Apr. 1, 1983, 58-55159; Apr. 5, 1983, 58-58715
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—76 PH 9 Claims

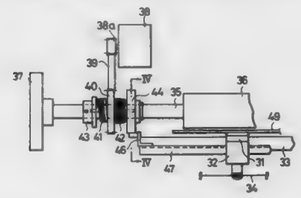
1. Recording apparatus comprising:

recording means for recording on a recording sheet;

conveying means for conveying the recording sheet;

driving means for selectively driving a first transmitting means and a second transmitting means, wherein said first transmitting means transmits a driving force of said driving means to said recording means during a recording operation such that said recording means may be displaced between a recording position where the recording means records on the recording sheet and a stand-by position where the recording means is separated from the recording position and said second transmitting means transmits the drive force of said driving means to said conveying means such that said conveying means may convey the recording sheet; and

selecting means for selectively transmitting the drive force of said driving means to said first transmitting means and



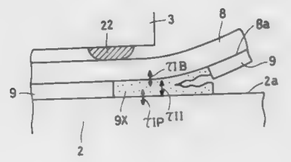
said second transmitting means such that said recording means may assume at different times the recording position and at other times the stand-by position during the recording operation, and such that said conveying means may convey the recording sheet, respectively.

4,733,251

THERMAL TRANSFER PRINTING

Sadatoshi Murakami; Satoru Yamasaki, both of Fukuyama; Masaru Ohnishi, Kamakura; Kenji Nomura, Amagasaki; Masayuki Tanaka, and Sayoko Hirata, both of Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,607
Claims priority, application Japan, Jul. 2, 1986, 61-156531
Int. Cl.[4] G01H 15/10
U.S. Cl. 346—76 PH 16 Claims



1. A thermal transfer printing method which is performed by the use of a thermal printer including a platen for the support of a recording medium to be printed, a thermal print head having at least one heating element and a length of ink carrier ribbon with the recording medium positioned between the thermal print head and the length of ink carrier ribon, said ink carrier ribbon having a base film and an ink layer, which method comprises the steps of:

pressing the ink carrier ribbon relatively against the platen by means of the thermal print head with the ink layer brought in contact with the recording medium;

electrically energizing the heating element to emit heat to cause that portion of the ink layer, which is aligned with the heating element, to fuse; and

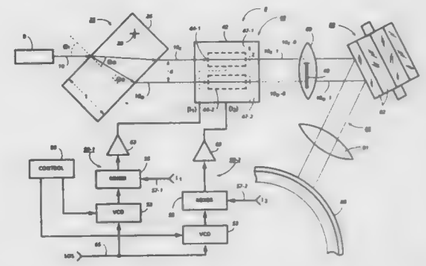
causing that portion of the ink layer so fused to partially transfer onto the recording medium when a cohesive force acting internally of the ink layer becomes smaller than an adhesive force acting between the ink layer and the recording medium and, at the same time, smaller than a adhesive force acting between the ink layer and the base film, whereby said cohesive force is substantially destroyed so as to permit the thickness of the ink layer to be substantially split into halves such that one of the halves is transferred onto the receiving medium and the other of the halves remains adhering to the base film.

4,733,252

BEAM SPLITTER FOR MULTIBEAM A/O MODULATORS AND PRINTER SYSTEMS

Joseph J. Daniele, Pittsford, and Kwok-leung Yip, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1987, Ser. No. 31,961
Int. Cl.[4] G01D 9/42, 15/14; H04N 1/21
U.S. Cl. 346—108 7 Claims



1. In an electronic printing apparatus having a movable recording member on which images are written in accordance with image signals using a beam of high intensity light, modulator means for modulating said beam in accordance with the image signals, and a rotating scanning element for scanning the beam output of said modulator means across said member to write images on said member, the combination of:

(a) a laser for providing said beam, said beam provided by said laser being unpolarized;

(b) a beam splitter comprising a birefringent crystal interposed in the optical path of said unpolarized beam between said laser and said modulator means,

said crystal being positioned so that said unpolarized laser beam impinges on said crystal at a predetermined angle of incidence,

said crystal splitting said unpolarized beam into first and second parallel beams with the polarization of the first beam being orthogonal to the polarization of the second beam;

(c) said modulator means including a substrate and two discrete drive electrodes, said substrate and said drive electrodes cooperating to provide two separate modulating channels, said first and second beams each impinging at discrete points on said substrate for input to separate ones of said modulating channels, each of said drive electrodes receiving image signals independently of the other drive electrode whereby said separate modulator channels modulate said first and second beams independently to provide two distinct imaging beams for writing on said member,

said substrate being comprised of a material that is substantially insensitive to said orthogonal polarization of said first and second beams impinging thereon.

4,733,253

APPARATUS AND METHOD FOR DETECTING AND ELIMINATING DIODE LASER MODE HOPPING

Joseph J. Daniele, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1986, Ser. No. 882,123
Int. Cl.[4] G01D 9/42; H01S 3/13
U.S. Cl. 346—108 12 Claims

1. In a printer having a recording member on which images to be printed are formed through exposure, said recording member being movable in a first scanning direction, a laser for generating a beam of high intensity light for exposing said member in accordance with an image signal, a rotatable holographic disc having a succession of beam diffraction gratings,

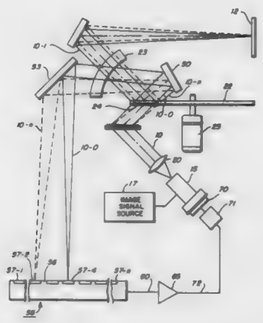
VOL 1088 ISS 4 MR 22 1988 UMI

said disc being disposed relative to said laser so that the beam emitted by said laser is in the path of rotation of said disc whereby said beam impinges on said facets in succession as said disc rotates to provide an exposure beam for scanning said recording member in a second scanning direction, the combination of:

(a) wavelength compensating means for compensating for temperature induced laser mode hop of said beam in said first scanning direction, said compensating means being between said laser and said disc and providing in cooperation with said disc diffraction gratings a non-exposure beam;

(b) a beam position detector;

(c) means for focusing said non-exposure beam on said position detector;



(d) said beam position detector outputting a signal representative of the current point where said non-imaging beam impinges on said beam position detector;

(e) comparator means for comparing the signal output of said beam position detector with a reference signal representing a preselected point within a non-mode hop region of said laser beam and outputting a control signal when said current point and said preselected point of beam impingement on said beam position detector differ;

(f) temperature controlling means for controlling temperatures of said laser; and

(g) control means for operating said temperature controlling means in response to said control signal to adjust the temperature of said laser so that said non-imaging beam impinges at substantially said preselected point on said beam position detector whereby mode hop of said laser beam in said second scanning direction is avoided.

4,733,254

THERMAL HEAD AND IMAGE FORMING APPARATUS USING THE SAME

Hayamitu Yukihiro, Yokohama; Kunihiko Miura, Hiratsuka, and Takefumi Nosaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 21, 1986, Ser. No. 921,271

Claims priority, application Japan, Oct. 31, 1985, 60-244307

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—140 R **18 Claims**

1. A thermal head for an image forming apparatus including a movable image formation sheet, said thermal head comprising:

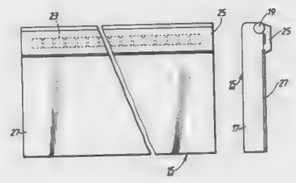
(a) a rod member having an elongated, curved, circumferential surface;

(b) heating means comprising a plurality of heating elements disposed on said rod member in the elongated direction thereof for applying heat to the movable image formation sheet;

(c) a plurality of lead electrodes attached to said rod member in the circumferential direction thereof, one end of each one of said plurality of lead electrodes being connected to a corresponding one of said plurality of heating elements and the other end of each one of said plurality of lead electrodes having a connecting portion;

(d) a supporting member for supporting said rod member when the movable image formation sheet is moving across said rod member; and

(e) an integrated circuit having a plurality of connecting terminals thereon, each one of said plurality of connecting terminals being connected to said connecting portion of a



corresponding one of said plurality of lead electrodes, said integrated circuit being adapted to individually energize each one of said plurality of heating elements through the corresponding one of said plurality of lead electrodes in response to an image signal, each one of said plurality of connecting terminals of said integrated circuit and said connecting portion of the corresponding one of said plurality of lead electrodes being on at least substantially the same plane.

4,733,255

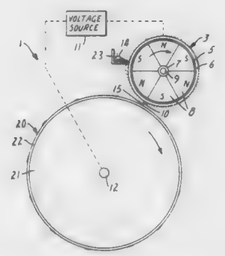
DIELECTRIC COATING FOR RECORDING MEMBER

Vincent K. Rasbury, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1986, Ser. No. 858,970

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—153.1 **14 Claims**



1. A recording member suitable for use in an electrographic recording system for recording toner images on a recording member, said system including first and second opposed electrodes spaced apart to define a recording region therebetween, means for driving the recording member through said recording region, and a means for transporting magnetically attractable, electronically conductive toner powder from a toner reservoir to said recording region to selectively deposit on said recording member in response to the selective application of voltage pulses across said electrodes, said recording member comprising a conductive substrate bearing a dielectric coating comprising a polymetric material containing a conductive metal complex therein wherein said metal complex is present in said dielectric coating an amount sufficient that the resistivity of the dielectric recording member is sufficiently high to prevent so much charge from flowing off the toner powder into the recording member at such a rate as to reduce the electrical

force to a level insufficient to overcome the magnetic force in image areas.

4,733,256

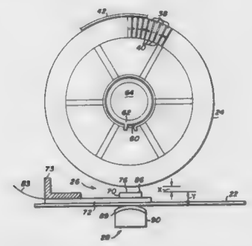
ELECTROSTATIC COLOR PRINTER

Peter C. Salmon, 70 Angela Dr., Los Altos, Calif. 94022

Filed Mar. 31, 1986, Ser. No. 845,993

Int. Cl.⁴ G01D *15/00*

U.S. Cl. 346—157 **21 Claims**



1. An improved printhead for use with a toner delivery system capable of delivering charged toner particles, the printhead comprising:

a baseplate;

a multilayer conductive means attached to the baseplate; and

at least one integrated circuit mounted on the conductive means, each of the integrated circuits having an array of imaging electrodes including logic, memory, and high voltage driver means associated therewith for selectively driving said electrodes between a first potential and a ground potential.

4,733,257

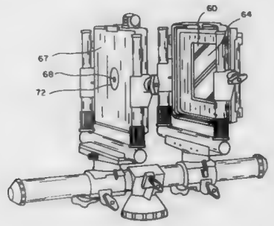
ALIGNMENT METHOD AND ARRANGEMENT FOR USE WITH A VIEW CAMERA

William R. Ziegler, 417 Shirley Way, Menlo Park, Calif. 94025

Filed May 13, 1987, Ser. No. 49,738

Int. Cl.⁴ G03B *5/06*

U.S. Cl. 354—189 **19 Claims**



1. An alignment arrangement for use with a view camera assembly having a lens standard for containing a lensboard which carries the camera's lens and defines the camera's lens plane, a film standard in spaced-apart confronting relationship with said lens standard and configured to receive a film holder containing film, a camera housing connected with and extending between said lens and film standards, and means for supporting the lens standard, film standard and camera housing such that the standards can be adjustably moved with respect to one another to maintain a confronting, parallel relationship, said alignment arrangement comprising:

(a) a first mirror member having a mirror body including a mirrored surface, said first mirror member being configured to fit within said film standard in lieu of a film holder so that said mirrored surface faces said lens standard;

(b) a second mirror member having a mirror body including a mirrored surface and a view hole through said mirror body and mirrored surface, said second mirror member being adapted to replace temporarily said lens and its lensboard within said lens standard so that said second mirrored surface faces said film standard and first mirrored surface and so that the mirrored surfaces can be viewed through said view hole from outside said lens standard; and

(c) indicia on at least one of said mirrored surfaces such that, when said mirrored surfaces are viewed through said view hole from outside said lens standard, said indicia will take only one of many different forms if the two mirrored surfaces are parallel, whereby the lens and film standards can be adjusted to provide said one form in another to insure that the lens plane of the camera is parallel with the camera film.

4,733,258

INTERCHANGEABLE LENS CAMERA SYSTEM

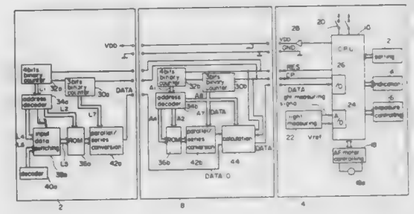
Hiroshi Kojima, Sakai, Japan, assignor to Minolta Camera KK, Japan

Filed Sep. 27, 1985, Ser. No. 780,940

Claims priority, application Japan, Sep. 28, 1984, 59-204355

Int. Cl.⁴ G03B *7/091*

U.S. Cl. 354—286 **8 Claims**



1. A camera system capable of mounting an intermediate accessory between an interchangeable lens and a camera body, comprising:

first means, provided in the interchangeable lens, for producing a first signal which corresponds to one part of the vignetting amount occurring in the interchangeable lens when the intermediate accessory is mounted between the interchangeable lens and the camera body;

second means, provided in the intermediate accessory, for producing a second signal which corresponds to the remainder of said vignetting amount; and

means, provided in the camera body, for calculating an exposure in accordance with both of said first and second signals when the intermediate accessory is mounted between the interchangeable lens and the camera body.

4,733,259

TILTABLE TRIPOD ATTACHMENT FOR A CAMERA

Chong Y. Ng, 905 NE. 45th St., Seattle, Wash. 98105

Filed Mar. 16, 1987, Ser. No. 25,956

Int. Cl.⁴ G03B *17/00*

U.S. Cl. 354—293 **10 Claims**

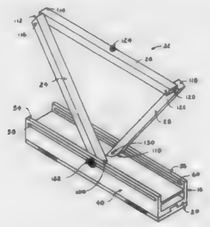
10. An attachment for a camera tripod, support, or the like for use with cameras of the type having rectangular formats in order to allow horizontal to vertical reformatting of the camera view without introducing horizontal parallax error into the view, comprising:

three pivotally interconnected arms, one of the arms having means for securing a camera thereto;

a frame having pivotal connection means for pivotally connecting one of the arms thereto; and

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a base, slidably connected to the frame for relative linear movement therebetween, wherein a camera secured to one of the arms by the camera-securing means can be rotated ninety degrees about the pivotal connection means



and the frame can be linearly displaced with respect to the base to eliminate horizontal parallax error introduced by rotation of the camera about the pivotal connection means.

4,733,260

CONTINUOUS PLATE MAKING METHOD FOR PHOTOSENSITIVE RESIN PLATE AND DEVICE THEREOF

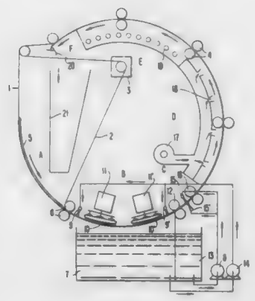
Haruo Kubo, and Kosaku Onodera, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Mar. 1, 1985, Ser. No. 707,268

Claims priority, application Japan, Mar. 5, 1984, 59-42651; Mar. 6, 1984, 59-43614

Int. Cl.[4] G03D *15/04*

U.S. Cl. 354—317 **7 Claims**



1. A continuous plate making method for a photosensitive resin plate, which comprises the steps of: setting the photosensitive resin plate on an inside surface of an endless belt which moves in a substantially circular orbit so that the inside surface thereof is radially faced to the inside of the orbit; and continuously subjecting the photosensitive resin plate to, at least, washing out, drying and then post light exposure as the belt moves continuously.

4,733,261

AUTOMATIC FOCUSING CAMERA

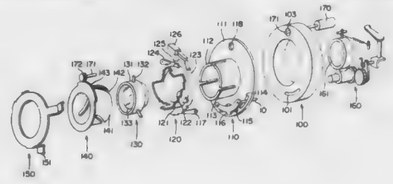
Hirokazu Gunshi; Minoru Yamada; Eiji Ito; Masaru Nagai; Kenji Miyama, and Masataka Sawamura, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

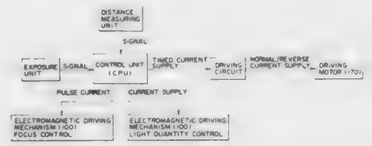
Continuation of Ser. No. 740,649, Jun. 3, 1985, abandoned. This application Jun. 10, 1987, Ser. No. 61,028

Claims priority, application Japan, Jun. 8, 1984, 59-117,827; Jun. 8, 1984, 59-117,828; Jun. 8, 1984, 59-117,829; Jun. 8, 1984, 59-117,830; Jun. 13, 1984, 59-122,223

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **22 Claims**





1. An automatic focusing camera comprising

(a) means for detecting a distance to an object and for generating a distance signal;

(b) means for converting said distance signal into a pulse signal having a pulse number corresponding to said distance;

(c) a lens;

(d) means for controlling a position of said lens, said means for controlling being capable of moving in a first direction;

(e) an electromagnetic driving means having a reciprocally moving element corresponding to said pulse signal,

said electromagnetic driving means driving said means for controlling stepwise in said first direction by an amount corresponding to said pulse number whereby said means for controlling is moved from at least one initial position to a focusing position; and

(f) means for actuating said driving means for a period after an exposure of said object so that said means for controlling is moved in said first direction from said focusing position to one of said at least one initial position.

4,733,262

CAMERA SYSTEM CAPABLE OF AUTOMATIC FOCUS CONTROL

Nobuyuki Taniguchi, Tondabayashi; Norio Ishikawa, Osaka; Yasuaki Akada, Sakai; Takeshi Egawa, Osaka, and Kunio Kawamura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 575,839, Jan. 31, 1984, Pat. No. 4,623,238. This application Mar. 18, 1986, Ser. No. 841,219

Claims priority, application Japan, Feb. 1, 1983, 58-15860; May 9, 1983, 58-81533; Jul. 11, 1983, 58-126433; Jul. 26, 1983, 58-137371

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **11 Claims**

1. In a camera system capable of automatic focus control in response to focus detection by means of receiving light from an object through an optical system, an improvement comprising:

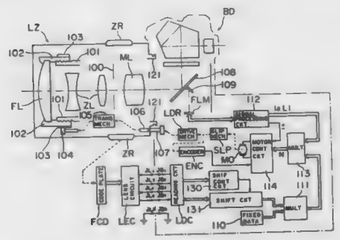
means for receiving light through the optical system to produce electric signals;

means for processing the electric signals to generate defocusing information indicative of the degree of defocusing and defocusing direction relative to a predetermined plane;

means for generating a driving power and for driving said optical system for automatic focus control;

means for controlling the generating means in response to the processing means;

means for causing the receiving means and the processing means to periodically repeat the production of the electric signals and the generation of the defocusing information



during the generation of the driving power to keep the controlling means informed of the most recent defocusing information in the course of generation of the driving power;

means for detecting when the optical system is in a near-focus zone and for reducing the amount of said driving power in response to said detection including first means responsive to the processing means for reporting an in-focus condition during the generation of the driving power, and second means response to the processing means for reporting an in-focus condition with the generation of the driving power completely stopped; and

means for stopping the generation of the driving power in response to the second reporting means to fix the focus adjustment for picture taking when the in-focus condition is reported.

4,733,263

PHOTOGRAPHIC CAMERA

Nobuyuki Taniguchi, Nishinomiya; Takeo Hoda, Kawachinagano; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1986, Ser. No. 932,149

Claims priority, application Japan, Nov. 20, 1985, 60-258735; Nov. 20, 1985, 60-258736; Dec. 11, 1985, 60-276920

Int. Cl.[4] G03B *15/03, 17/24*

U.S. Cl. 354—419 **4 Claims**

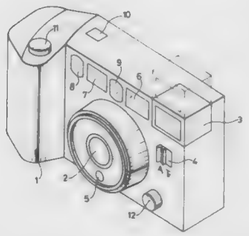
1. A photographic camera comprising:

means for selecting a real focal length photographing mode in which a normal range in a frame of a film will be printed on a photographic paper and a pseudo focal length photographing mode in which a range narrower than the normal range in a frame of the film will be printed on a photographic paper;

means for measuring an amount of light coming from an object to be photographed to produce a light measuring signal indicative of the measured amount of light;

means responsive to said light measuring signal for discriminating whether the measured amount of light is under a predetermined amount to produce a discriminating signal indicative of the discriminated result;

means responsive to said discriminating signal for producing a flash emission signal during an exposure control operation, only when the measured amount is discriminated to be under the predetermined amount, in the condition the real focal length photographing mode is selected, and for producing a flash emission signal during an exposure



control operation independently of the discriminating signal, in the condition the pseudo focal length photographing mode is selected; and

means for emitting a flash of light in response to the flash emission signal.

4,733,264

CHARGE-COUPLED DEVICE FOR AUTOMATIC FOCUSING AND CAMERA SHAKE DETECTOR USING SUCH CHARGE-COUPLED DEVICE

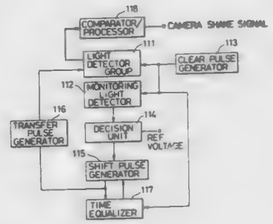
Takayuki Hatase, Yokohama; Yoshimi Ohno, Kawasaki; Susumu Iguchi, Yokohama; Daisuke Hata, Funabashi, and Kazumasa Aoki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,242

Claims priority, application Japan, Feb. 5, 1986, 61-023609; Feb. 20, 1986, 61-035546; Feb. 27, 1986, 61-042353

Int. Cl.[4] G03B *7/08, 3/00*

U.S. Cl. 354—430 **2 Claims**



1. A camera shake detector comprising:

a light detector group for photoelectrically converting an object image formed by an optical system;

a monitoring light detector disposed in the vicinity of said light detector group for photoelectrically converting the average brightness of the object image;

clear pulse generator means coupled to said monitoring light detector for generating a clear pulse to clear said monitoring light detector and said light detector group to a certain level;

decision means coupled to said monitoring light detector for ascertaining whether an output from said monitoring light detectro drops below a reference voltage;

shift pluse generator means coupled to said monitoring light detector for issuing a shift pulse to shift stored charges from said light detector group to a transfer unit when the output from said monitoring light detector is found to be

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lower than the reference voltage by said decision means, and for issuing a second shift pulse to shift stored charges from said light detector group to the transfer unit again after said first-mentioned stored charges have been transferred from said light detector group;

transfer pulse generator means for generating a transfer pulse to transfer the stored charges from said light detector group;

time equalizer means for equalizing a time period between a first cliear pulse and a first shift pulse to a time period between a second clear pulse and a second shift pulse; and

a comparator/processor for comparing first and second image output signals from said light detector group to ascertain whether there is a camera shake.

4,733,265

DATA RETAINING APPARATUS FOR A CAMERA

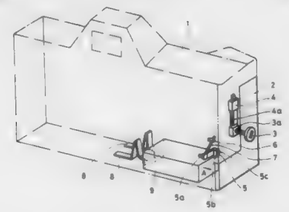
Shosuke Haraguchi, and Yoshihiko Aihara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

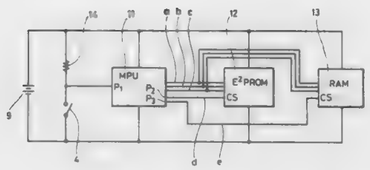
Filed May 29, 1987, Ser. No. 55,364

Claims priority, application Japan, Jun. 13, 1986, 61-91128[U]

Int. Cl.[4] G03B *7/26*

U.S. Cl. 354—484 **6 Claims**





1. In a camera having data processing circuits, a battery receptacle and a cover for the battery receptacle, a data retention apparatus comprising:

(a) a switch adapted to be switched from a first condition to a second condition by the operation of opening the cover for the battery receptacle;

(b) a non-volatile memory circuit connected to said switch to receive data from said data processing circuits in said camera upon the switching of said switch to said second condition; and

(c) an operation member which can be operated after the operation of opening said cover to release a battery from said receptacle, said operation member maintaining the supply of electrical power from said battery to said data processing circuits and to said non-volatile memory circuit until said operation member is operated.

4,733,266

IMAGE FORMING APPARATUS

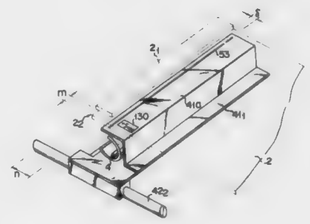
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

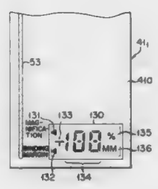
Filed Oct. 28, 1985, Ser. No. 792,312

Claims priority, application Japan, Oct. 29, 1984, 59-227419; Oct. 29, 1984, 59-227421; Oct. 31, 1984, 59-227904

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **15 Claims**





9. An image forming apparatus comprising:

a photosensitive body for holding an electric charge on a surface thereof;

charging means for supplying the electric charge to said photosensitive body;

scanning means for optically scanning an image of an original, the scanning means indicating a preset image forming range and being moved to one end of a binding margin so as to indicate the binding margin;

image exposure means for exposing, with light guided by said scanning means, a designated portion of said photosensitive body to which the electric charge is supplied from said charging means so as to form an electric charge pattern in accordance with the image of the original;

developing means for developing the electric charge pattern formed on said photosensitive body by said image exposure means;

means for transferring and fixing an image developed by said developing means to a transfer medium;

binding margin display means for setting an image nonforming range upon operation of said scanning means on the surface of an original table prior to a copying operation so as to display the binding margin; and

means for preventing formation of an image with a range displayed by said binding margin display means.

4,733,267

APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

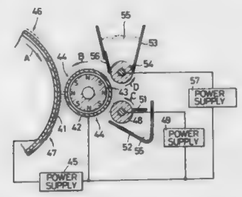
Shigekazu Enoki, Kasawaki; Noriyuki Kimura, Kawasaki, and Shunji Katoh, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1987, Ser. No. 39,168

Claims priority, application Japan, Apr. 18, 1986, 61-090687; Jul. 7, 1986, 61-159199; Oct. 20, 1986, 61-249300

Int. Cl.[4] G03G *15/09*

U.S. Cl. 355—3 DD **5 Claims**



1. An apparatus for developing an electrostatic latent image, comprising:

a magnetic brush for holding toner and resiliently contacting a latent image carrier in an image developing region to supply the toner to an electrostatic latent image formed on the latent image carrier;

toner supply means for supplying charged toner to said magnetic brush in a toner supplying region;

toner recovery means for recovering residual toner from said magnetic brush in a toner recovering region after the image has been developed by the toner; and

said magnetic brush being composed of a magnetically coherent carrier of particles.

4,733,268

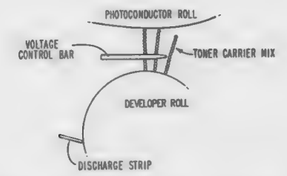
VOLTAGE CONTROL BAR FOR ELECTROPHOTOGRAPHY

Gary S. Beardsley, Morgan Hill, and Michael H. Lee, San Jose, both of Calif., assignors to International Business Machines Corporation, New York, N.Y.

Filed May 9, 1986, Ser. No. 861,487

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **5 Claims**



1. An electrophotographic apparatus comprising a photoconductor drum or belt and a developer or developer/cleaner roll in a fixed position so that a space is provided between said drum or belt and said roll, a developer mix of toner and carrier in the form of chains provided in the space between said drum and said roll, said space being chosen so that said chains do not simultaneously contact both said drum and said roll, said apparatus characterized by the improvement that an electrically conductive voltage control bar is inserted into said space between said photoconductor drum or belt and said roll whereby toner buildup on said roll is minimized.

4,733,269

CONTROL SYSTEM FOR COLOR COPIER

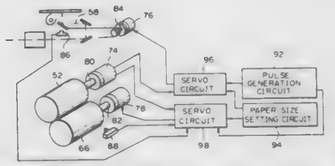
Nobuo Kasahara, Yokohama, and Tadahide Sawamura, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,492

Claims priority, application Japan, Feb. 13, 1986, 61-29618

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **5 Claims**



1. A control system for a color copier having a scanning optical system, a photoconductive drum and a transfer drum, comprising:

a paper size setting means for setting a size of a transfer paper to be used before a copying operation;

a scanning sensor means for sensing a start of a scanning performed by said optical system;

a home sensor means for sensing an instantaneous angular position of said transfer drum; and

a control means for determining a transfer start time and a transfer end time in response to a paper size signal outputted by said paper size setting means, an output signal of said scanning sensor means, and an output of said home sensor means, and variably controlling a rotation speed of said transfer drum during an interval between said transfer start and transfer end times so as to align a leading end of a transfer paper loaded on said transfer drum and a leading end of each of toner images formed on said photoconductive drum and different in color from each other.

4,733,270

MULTI-COLOR IMAGE RECORDING APPARATUS CAPABLE OF REMOVING A RECORDED-ON ROLL MEDIUM, WITHOUT UNROLLING

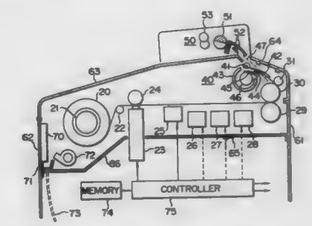
Masaji Nishikawa; Masashi Asano, and Atsushi Yagi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1987, Ser. No. 45,125

Claims priority, application Japan, May 15, 1986, 61-111134

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **10 Claims**



1. A multi-color image recording apparatus comprising:

image-forming/processing station means for forming images in a plurality of colors in a superposed manner, in units of individual colors, on an identical unrolled portion of a recording roll medium, in accordance with color image formation data;

recording medium conveying means for reciprocating a plurality of times, when the images in the plurality of

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colors are to be formed, the identical unrolled portion of the recording roll medium in relation to said image-forming/processing station means, in accordance with formation of the image in the plurality of colors, and conveying a recorded-on unrolled portion of the recording roll medium to a downstream side of said image-forming/-processing station means when image formation in the plurality of colors is completed;

recording medium storing means, provided on the downstream side of said image-forming/processing station means, for temporarily storing the unrolled portion of the recording roll medium on which image formation in each of the plurality of colors is to be performed;

recording medium discharging means, provided on the downstream side of said image-forming/processing station means, for discharging the unrolled portion of the recording roll medium on which image formation in each of the plurality of colors has been performed; and

switching means, provided on the downstream side of said image-forming/processing station means, which can be switched between first and second positions, the first position being a position for guiding the unrolled portion of the recording roll medium toward said recording medium storing means when image formation in the plurality of colors is performed, and the second position being a position for guiding the unrolled portion of the recording roll medium toward said recording medium discharging means when image formation in the plurality of colors is completed.

4,733,271

IMAGE REPRODUCTION APPARATUS WITH DETECTOR FOR DETECTING POSITION OF MOVEABLE COPIER UNIT

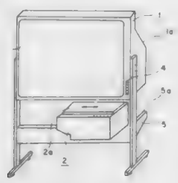
Koichi Arai, Higashiyamatoshi, Japan, assignor to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,798

Claims priority, application Japan, Apr. 30, 1985, 60-93283; Apr. 30, 1985, 60-93284

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—5 **13 Claims**



1. An image forming device comprising:

(a) a display unit including a board display surface comprising means for receiving a handwritten image thereon, said image being erasable;

(b) a copying unit adapted to be moved between a first position in which said image written on said display surface is copied and a second position in which an original document having an image written thereon is copied, said copying unit including a photosensitive body for forming an electrostatic latent image corresponding to a handwritten image on said display surface of said original document, means for uniformly charging the surface of said photosensitive body, and means for removing unnecessary charges from said photosensitive body surface and for removing electric charges on said photosensitive surface when said copying unit is not located at either of said first or second positions;

(c) means for detecting whether said copying unit is located at a predetermined position; and

(d) means for actuating said charge eraser means in response to the output of said detecting means.

4,733,272

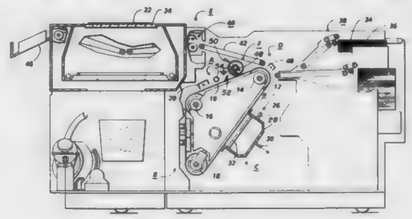
FILTER REGENERATION IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

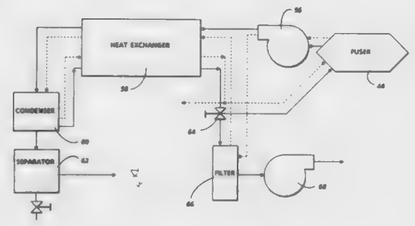
William C. Howe, and Dexter A. Dyer, both of Walworth, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 17, 1986, Ser. No. 886,503

Int. Cl.⁴ G03G *15/10, 15/20*

U.S. Cl. 355—10 **12 Claims**





7. An electrophotographic printing machine of the type having an electrostatic latent image recorded on a photoconductive member developed with a liquid developer material comprising at least a liquid carrier having pigmented particles dispersed therein to form a liquid image thereon that is transferred to a sheet of support material, wherein the improvement includes:

means, in the operative mode, for applying heat to the sheet of support material having the liquid image thereon to remove liquid carrier therefrom so as to dry the sheet of support material and fuse the pigmented particles thereto in image configuration, and, in the standby mode when said heat applying means does not apply heat to the sheet of support material, for generating heat;

means for collecting the liquid carrier removed from the sheet of support material by said heat applying means;

means for filtering the air flowing from said collecting means to remove residual liquid carrier therefrom; and

means, in the standby mode, for directing heated air from said heat applying means to said filter means to regenerate said filter means.

4,733,273

LIQUID DEVELOPING APPARATUS

William A. Lloyd, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1986, Ser. No. 880,772

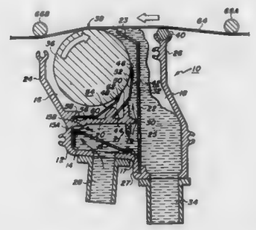
Int. Cl.⁴ G03G *15/10*

U.S. Cl. 355—10 **17 Claims**

1. A liquid development apparatus for developing with a liquid developer and wiping excess developer from an electrographic latent image formed on an image bearing, charge retaining surface of a moving recording medium comprising:

a roll supported for rotational movement in tangential engagement with the surface of said recording medium forming a development apex between the surface of said roll and said recording medium, the circumference of said roll sufficiently large to provide a tangential engaging surface with said recording medium surface,

a baffle plate supported in spaced relation to said roll and positioned upstream from said roll relative to said moving recording medium for receiving a flow of said liquid developer between it and said roll and directing said liquid developer into said development apex to form a meniscus with the surface of said recording medium, the top of said baffle plate spaced from said recording medium surface to form an outlet for liquid developer from said development apex over the top of said plate,



said roll rotated in a direction against the direction of movement of said recording medium to form a fluid seal between the surface of said roll and said medium to prevent liquid developer from passing therebetween,

said tangential engaging surface against said medium movement comprising a first portion of forward tangential engagement with the surface of said recording medium to form said fluid seal with said recording medium surface and to force expended liquid developer in said development apex toward said outlet and a second adjacent portion of leeward tangential engagement with the surface of said recording medium to wipe said recording medium surface.

4,733,274

COPYING APPARATUS

Tetsuji Tachika, Tokyo; Hisashi Sakamaki, Yokohama, and Hiroyuki Hattori, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 637,004, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 215,023, Dec. 10, 1980, Pat. No. 4,499,861, which is a division of Ser. No. 797,846, May 17, 1977, Pat. No. 4,275,958. This application Oct. 6, 1986, Ser. No. 915,904

Claims priority, application Japan, May 21, 1976, 51-58705

Int. Cl.⁴ G03G *15/00, 21/00*

U.S. Cl. 355—14 R **9 Claims**

1. A copying apparatus comprising:

processing means for copying;

numeral key means for entering numeric data necessary for a copying operation;

first memory means for storing numeric data entered from said numeral key means;

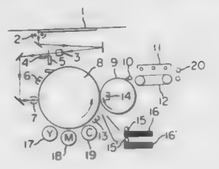
display means for displaying a numeral based on the numeric data stored in said first memory means;

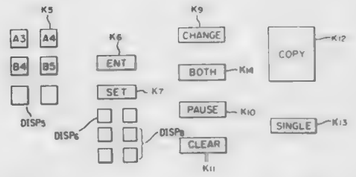
second memory means having a plurality of memory locations for storing plural numeric data transferred from said first memory means;

storage control key means for causing the numeric data stored in said first memory means to be transferred to said second memory means and stored therein;

reading means for reading out numeric data stored in said second memory means;

storage control means for controlling storage of the numeric data in said second memory means, when numeric data involved in a first copy mode has been stored in a first memory location of said second memory means, said storage control means causing numeric data involved in a second copy mode stored in said first memory means to be stored in a second memory location of said second memory means, which is different from said first memory location thereof, by means of an input operation of said





storage control key means, without cancelling the numeric data involved in the first copy mode stored in the first memory location of said second memory means; and

processing control means for controlling said processing means in accordance with numeric data read out from said second memory means by said reading means so as to carry out a copying operation in a copy mode according to the numeric data stored in said second memory means.

4,733,275

SYSTEM FOR STORAGE AND PRINTING A PLURALITY OF IMAGES

Susumu Sugiura, Yamato; Tadashi Sato, Kokubunji, and Norio Nakajima, Hachiohji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 910,785, Sep. 23, 1986, abandoned, which is a continuation of Ser. No. 842,712, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 775,116, Sep. 12, 1985, abandoned, which is a continuation of Ser. No. 706,974, Mar. 1, 1985, abandoned, which is a continuation of Ser. No. 586,646, Mar. 7, 1984, Pat. No. 4,505,576, which is a continuation of Ser. No. 390,025, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 201,537, Oct. 28, 1980, abandoned. This application May 4, 1987, Ser. No. 45,233

Claims priority, application Japan, Oct. 30, 1979, 54-140783

Int. Cl.⁴ G03G *14/00*

U.S. Cl. 355—14 C **37 Claims**

1. An image forming system comprising:

image memory means for storing a plurality of image-defining information;

means for causing image-defining information to be stored in said memory means;

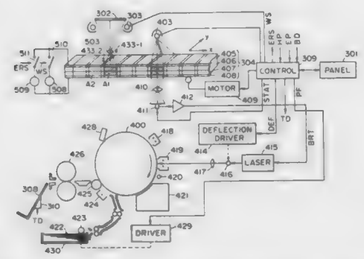
means for reading out the image-defining information from the memory means;

means for image forming on a recording medium in accordance with serial data corresponding to the image-defining information read out from said memory means by said reading out means;

control data memory means for storing control data for selecting the image-defining information stored in said

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image-defining memory means, said data memory means being capable of storing first control data corresponding to first image-defining information without cancelling second control data corresponding to second image-defining information; and



means for controlling said reading out means in accordance with control data stored in said control data memory means so as to read out the desired first image-defining information in accordance with the first control data and second image-defining information in accordance with the second control data and for providing the serial data into said image forming means.

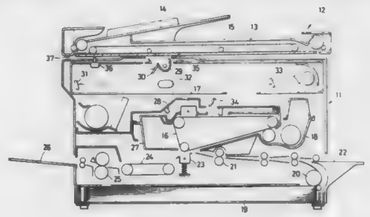
4,733,276

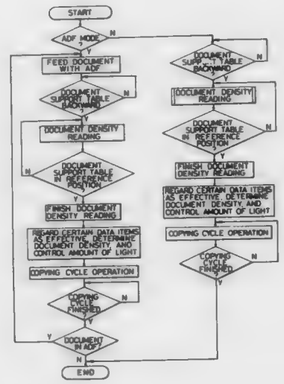
AUTOMATIC DENSITY CONTROL DEVICE FOR USE IN COPYING MACHINE

Yohtaro Kakitani, Yokosuka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,491
Claims priority, application Japan, Feb. 18, 1986, 61-033542
Int. Cl.[4] G03G *15/04, 15/06*
U.S. Cl. 355—14 E 1 Claim

1. An automatic density control device in a copying machine combined with an automatic document feeder capable of feeding a document onto a document support table, comprising:
- document density detector means for detecting the density of a document placed on the document support table;
- scanner means movable in a forward direction for exposure to the image of the document on the document support table and movable in a backward direction for enabling said document density detector means to read the density of the document on the document support table;
- reference position detector means for detecting when said scanner means reaches a reference position; and
- control means for determining the density of the document from a document density signal from said document density detector means in a range prior to generation of a signal by said reference position detector means when said scanner means moves back to the reference position, for determining an amount of exposure or an image developing bias voltage based on the document density signal, and for producing an output indicative of the amount of exposure or the image developing bias voltage in response to a first signal from said reference position detector means after the document has been fed by the automatic document feeder.



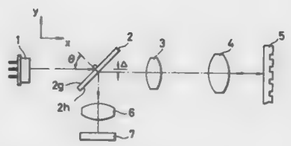


4,733,277

APPARATUS FOR REPRODUCING INFORMATION FROM AN OPTICAL DISK

Hiroshi Kokado, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1986, Ser. No. 943,007
Claims priority, application Japan, Dec. 20, 1985, 60-285656
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—43 6 Claims



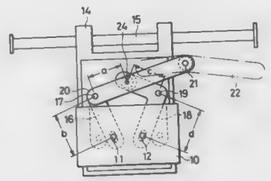
1. An apparatus for reproducing information from an optical disk, comprising
- a semiconductor laser having a junction plane producing laser light;
- an image forming optical unit which focuses said laser light received along an optical axis from said junction plane to form an image on an information recording surface of an optical disk;
- a photoelectric transducer unit;
- a detecting optical unit which converges light reflected from said surface of said optical disk and directs said converged light to said photoelectric transducer unit; and
- a parallelepiped plate associated with said image forming optical unit passing said laser light and having a diffraction grating on a surface receiving said laser light, an angle within a plane containing said junction plane and formed between said optical axis and a normal to said receiving surface being adjusted to a predetermined value.

4,733,278

APPARATUS FOR FORMING IMAGE ON COPYING MACHINE AT VARIABLE ZOOM RATIO

Ikuo Negoro, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,976
Claims priority, application Japan, Dec. 25, 1985, 60-296166
Int. Cl.[4] G03B *27/36*
U.S. Cl. 355—58 6 Claims



1. An apparatus for forming an image at a variable zoom ratio, comprising:
- a lens barrel displaceable along an optical axis;
- a first lens group;
- a second lens group mounted behind said first lens group along said optical axis and fixed to said barrel;
- a third lens group mounted behind said second lens group along said optical axis;
- a first frame slidable along said optical axis in said barrel and supporting said first lens group
- a second frame slidable along said optical axis in said barrel and supporting said third lens group;
- a swing lever;
- means for swinging said swing lever in response to a displacement of said lens barrel along said optical axis;
- a pair of link levers coupled to said swing lever and said first and second frames; and
- a rotatable eccentric pin carried by said swing lever and coaxially supporting both of said link levers at first ends thereof, whereby an amount of said separation of said first and second frames is adjustable by a rotation of said eccentric pin, whereby a separation of said first and second frames is changed in response to said displacement of said lens barrel along said optical axis.

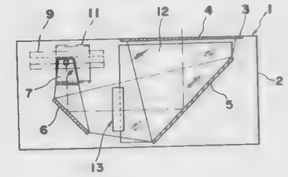
4,733,279

MICROFILMING CAMERA

Takeshi Okano, Nishinomiya, and Sadaaki Nakaoka, Osaka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1986, Ser. No. 931,835
Claims priority, application Japan, Nov. 18, 1985, 60-177934[U]; Nov. 18, 1985, 60-259201
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—65 5 Claims

1. A microfilming camera comprising a main mirror disposed beneath a transparent document support for the support thereon of a document to be microfilmed, which main mirror is used to deflect the optical path of a photo-taking system, a side mirror disposed on each side of the space delimited between the document support and the main mriror, and illuminating sources positioned exteriorly of the optical path and disposed in face-to-face relationship with the respective side mirrors, inwardly of said side mirrors and forwardly of the main mirror, and light shields having internal mirror surfaces positioned about said illumination sources and limiting illumination therefrom to that in the direction of said side mirrors while preventing direct illumination of said main mirror whereby rays of light emanating from the illuminating sources



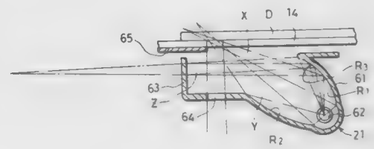
are directed from the illuminating sources, first to the side mirrors and then towards the main mirror which in turn directs them towards the document support to illuminate the document placed on the document support eliminating the possibility of mirror reflection of respective images of the illuminating sources while creating an optical path of sufficient length for proper illumination of the document to be microfilmed while rendering the camera assembly as a whole compact.

4,733,280

ORIGINAL ILLUMINATING DEVICE OF A COPYING MACHINE

Yoichiro Irie, Suita, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1986, Ser. No. 921,505
Claims priority, application Japan, Oct. 29, 1985, 60-242372
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—67 5 Claims



1. A device for illuminating an original document on an electrophotographic copying machine and to prevent a tip shadow on a copy obtained from the machine, said device comprising a contact glass for supporting an original document, an illuminant, a condenser mirror, and a second mirror which is opposite from and faces toward said condenser mirror, said condenser mirror being provided with a shape capable of guiding a majority of light from said illuminant onto an original document which is placed on said contact glass, said second mirror facing said condenser mirror being located in a path of light from the illuminant and condenser mirror but being displaced from direct paths of light which extend from the illuminant and condenser mirror to the original document, said condenser mirror having a shape and orientation capable of reflecting light back to said illuminant.

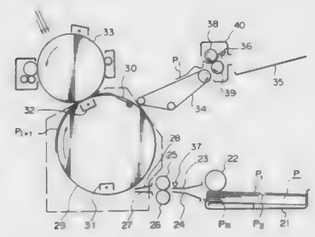
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4,733,281

TRANSPORT CONTROL DEVICE FOR AN IMAGE RECORDING APPARATUS

Kenji Yoshinaga, and Kenji Takeda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,652
Claims priority, application Japan, Feb. 28, 1985, 60-37379; Jun. 20, 1985, 60-133089
Int. Cl.⁴ F03G *15/00*
U.S. Cl. 355—14 R **11 Claims**



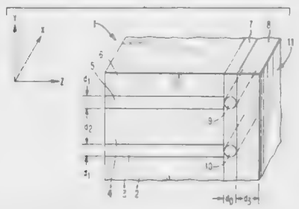
1. An image recording apparatus comprising:
support means for supporting a sheet material;
recording means for recording an image on a sheet material supported on said support means;
transport means for transporting a sheet material to said support means and transporting a sheet material after image recording from said support means;
detection means for detecting an abnormality in the transportation of a sheet material transported by said transport means at a position downstream of said support means; and
control means adapted, in case an abnormality in the transportation of a first sheet material is detected by said detection means in the course of a recording operation by said recording means for a second sheet material, to control said transport means so as to stop the transport operation for the first sheet material and to so control said recording means as to continue the recording operation for the second sheet material.

4,733,282

ONE-DIMENSIONAL QUANTUM PIPELINE TYPE CARRIER PATH SEMICONDUCTOR DEVICES

Leroy L. Chang, Goldens Bridge, and Leo Esaki, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1985, Ser. No. 765,403
Int. Cl.⁴ H01L *27/12*
U.S. Cl. 357—4 **9 Claims**



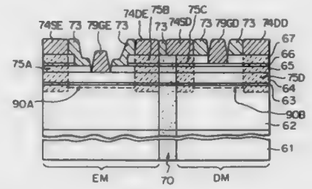
1. A semiconductor device having a one dimension quantum pipeline type carrier path comprising
in a semiconductor crystal body
a region of epitaxially contiguous layers of alternating first and second energy band gap semiconductor materials,
said second energy band gap being larger than said first, the width dimension for each said second higher energy band gap layer beig greater than the width dimension of each said first energy band gap layer,
a face of said region perpendicular to said layers therein providing an internal interface in said crystal body
a carrier path layer of a semiconductor material having a third energy band gap, said third energy band gap being smaller than said first energy band gap,
said carrier path layer having first and second sides,
said first side of said carrier path layer being epitaxial with said internal interface
said carrier path layer having a width dimension perpendicular to said interface that is approximately the length of the mean free path of a carrier in said semiconductor material
a control portion,
said control portion having first and second surfaces
said control portion being of a semiconductor material having a fourth energy band gap
said fourth energy band gap being at least larger than said third energy band gap,
said first surface of said control portion being epitaxial with said second side of said carrier path layer,
said second surface of said control portion being separated from said first surface of said control portion by a dimension operable to permit current influencing signal responsiveness to current in said carrier layer by signals applied through said control portion
at least one set of first and second ohmic electrodes of said carrier path layer positioned at separated carrier path length locations at at least one intersection of said carrier path layer and one said first band gap layer of said region and,
at least one current control electrode positioned on said second side of said control portion in current influencing proximity to the portion of said carrier path layer between each said set of ohmic electrodes.

4,733,283

GAAS SEMICONDUCTOR DEVICE

Shigeru Kuroda, Hadano, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 587,967, Mar. 9, 1984. This application Sep. 19, 1986, Ser. No. 909,464
Claims priority, application Japan, Mar. 14, 1983, 58-42007
Int. Cl.⁴ H01L *29/80, 29/161, 27/02*
U.S. Cl. 357—22 **6 Claims**



1. A GaAs semiconductor device comprising an enhancement-mode FET and a depletion-mode FET which have a heterojunction and at least one of which utilizes a two-dimensional electron gas, said semiconductor device comprising:
a semi-insulating GaAs substrate;
an updoped GaAs layer formed on said semi-insulating GaAs substrate;
an N-type AlGaAs layer formed on said undoped GaAs layer and including an exposed portion;
a first N-type GaAs layer formed on said N-type AlGaAs layer and having a groove formed therein;
an etching stoppable N-type AlGaAs layer formed on said first N-type GaAs layer;

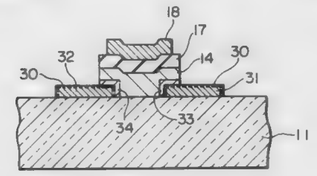
a second N-type GaAs layer formed on said etching stoppable N-type AlGaAs layer and having a groove formed therein;
a gate electrode of said enhancement-mode FET self-aligningly filling the groove formed in said first GaAs layer and formed on an exposed portion of said N-type AlGaAs layer for providing an electron supply layer for said enhancement-mode FET; and
a gate electrode of said depletion-mode FET for self-aligning filling a groove formed in said second N-type GaAs layer and formed on an exposed portion of said etching stoppable AlGaAs layer, said etching stoppable layer, said first GaAs layer and said N-type AlGaAs layer providing an electron supply layer for said depletion-mode FET, said gate electrode of said enhancement-mode FET and said gate electrode of said depletion-mode FET being formed simultaneously.

4,733,284

SEMICONDUCTOR DEVICES AND LAMINATES INCLUDING PHOSPHORUS DOPED TRANSPARENT CONDUCTIVE FILM

Shigeo Aoki, Habikono, Japan, assignor to Hoxiden Electronics Co., Ltd., Osaka, Japan

Filed Sep. 26, 1986, Ser. No. 911,695
Claims priority, application Japan, Oct. 4, 1985, 60-221665
Int. Cl.⁴ H01L *29/46, 29/54, 29/78*
U.S. Cl. 357—23.7 **4 Claims**



4. A thin film transistor comprising source and drain electrodes of an ITO film containing phosphorus and formed on an insulating substrate, a semiconductor layer partly in contact with said source and drain electrodes and forming an active region of said thin film transistor, said semiconductor layer being formed through a plasma assisted chemical vapor deposition process, surface areas of said semiconductor layer in contact with said ITO film containing phosphorus to form an ohmic layer.

4,733,285

SEMICONDUCTOR DEVICE WITH INPUT AND/OR OUTPUT PROTECTIVE CIRCUIT

Hiroshi Ishioka; Tohru Tsujide, and Makoto Miyazawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,353
Claims priority, application Japan, Jul. 24, 1984, 59-153649
Int. Cl.⁴ H01L *29/78, 27/02, 29/04*
U.S. Cl. 357—23.13 **11 Claims**

10. A semiconductor device comprising a semiconductor substrate of one conductivity type, a pad on an insulating film provided on said semiconductor substrate, a first region of an opposite conductivity type formed in said semiconductor substrate, a resistor layer of polycrystalline silicon on an insulating film provided on said substrate and electrically connected between said pad and said first region, an insulated gate field effect transistor formed in said semiconductor substrate and having a gate electrode electrically connected to said first region, and a second region of said oposite conductivity type formed in said semiconductor substrate and disposed between said first region and said insulated gate field effect transistor,



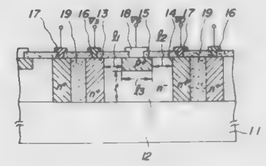
said second region completely surrounding said first region in a plan view of the device.

4,733,286

SEMICONDUCTOR PHOTOELECTRIC CONVERTING DEVICE

Kazuya Matsumoto, Ina, Japan, assignor to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 946,099, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 686,847, Dec. 27, 1984, abandoned. This application Jun. 16, 1987, Ser. No. 62,417
Claims priority, application Japan, Dec. 28, 1983, 58-245059
Int. Cl.⁴ H01L *27/14, 29/80*
U.S. Cl. 357—30 **11 Claims**



1. In a semiconductor photoelectric converting device including a lateral static induction transistor, said lateral static induction transistor comprising:
a substrate having a high resistance;
a semiconductor layer of a first conductivity type applied on a surface of said substrate, said semiconductor layer having a surface;
a source region of said first conductivity type formed in the surface of said semiconductor layer;
a drain region of said first conductivity type formed in the surface of said semiconductor layer; and
gate means, formed in the surface of said semiconductor layer between said source and drain regions, for storing photocarriers generated by a light excitation, and for controlling a source-drain current flowing in parallel with the surface of said semiconductor layer, a magnitude of said source-drain current being substantially proportional to an amount of said stored photocarriers multiplied by an amplification factor.

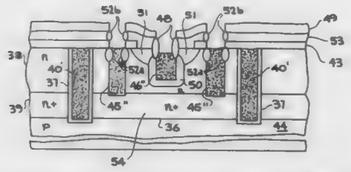
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4,733,287

INTEGRATED CIRCUIT STRUCTURE WITH ACTIVE ELEMENTS OF BIPOLAR TRANSISTOR FORMED IN SLOTS

Robert W. Bower, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 576,659, Feb. 3, 1984, abandoned. This application Nov. 26, 1986, Ser. No. 922,625
Int. Cl.⁴ H01L *29/72, 27/12, 29/06, 29/04*
U.S. Cl. 357—34 **11 Claims**



1. An integrated circuit structure comprising a bipolar transistor formed in slots in a semiconductor substrate, said structure comprising:

(a) a substrate comprising a buried collector layer doped to form a layer comprising a first conductivity type, an epitaxially grown layer over said buried layer, a first insulation layer on said epitaxial layer, a doped polycrystalline semiconductor layer on said insulation layer, and a second insulation layer over said polycrystalline semiconductor layer;

(b) a first slot formed in said substrate extending down through said second insulation layer, said doped polycrystalline semiconductor layer, said first insulation layer, and a portion of said epitaxial layer,

(c) insulation material formed on the upper portion of the sidewall of said slot comprising the exposed sidewall of said polycrystalline layer and an upper portion of the sidewall of said slot comprising the exposed epitaxial layer to electrically isolate said slot from said doped polycrystalline semiconductor layer and from a base contact region to be formed in said upper portion of said epitaxial layer;

(d) an active base region formed in said epitaxial layer of said substrate adjacent to and surrounding the bottom and sidewalls of said first slot below said portion of said slot sidewall within said epitaxial layer having insulation material thereon, said active base region being formed in said epitaxial layer by diffusing a dopant through the exposed lower portion of the sidewall of said first slot below said portion of said sidewall having insulation formed thereon to form an active base region of opposite conductivity type to said buried collector layer;

(e) a base contact region formed in said upper portion of said epitaxial layer adjacent said insulation material on said slot sidewall within said epitaxial layer, but electrically separated from said slot by said insulation material, said base contact region in said epitaxial layer being formed over said said active base region and in electrical contact with both said said doped polycrystalline semiconductor layer and said active base region whereby said polycrystalline region forms a contact for said active base region through said base contact region;

(f) an emitter formed in said first slot in said substrate comprising a semiconductor material of opposite conductivity to said active base region in said epitaxial layer;

(g) a collector contact slot formed in said substrate spaced from said first slot and extending down through said second insulation layer, said doped polycrystalline semiconductor layer, said first insulation layer, and said epitaxial layer, into said buried collector layer;

(h) insulation material formed on the upper portion of the sidewall of said collector contact slot comprising the exposed sidewall of said polycrystalline layer and an upper portion of the sidewall of said collector contact slot comprising the exposed epitaxial layer of approximately the same depth as said base contact region formed in said epitaxial layer to thereby electrically isolate said collector contact slot from said doped polycrystalline semiconductor layer and said base contact region formed in said upper portion of said epitaxial layer; and

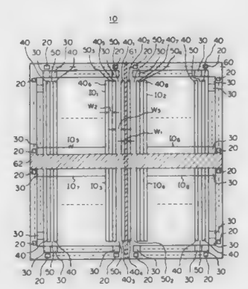
(i) doped semiconductive material within said collector contact slot comprising an active collector region and a collector contact region to provide electrical contact to said buried collector at the bottom of said collector contact slot.

4,733,288

GATE-ARRAY CHIP

Shinji Sato, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 509,608, Jun. 30, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 828,097
Claims priority, application Japan, Jun. 30, 1982, 57-111529
Int. Cl.⁴ H01L *27/02*
U.S. Cl. 357—40 **10 Claims**



1. A gate-array chip comprising:

a semiconductor bulk;

a plurality of groups of basic-cell arrays arranged in parallel on said semiconductor bulk of said gate-array chip, each of said groups of basic-cell arrays including a plurality of basic-cells;

a plurality of impurity regions provided for each of said groups of basic-cell arrays, formed on said semiconductor bulk and in regions between each of said groups of basic-cell arrays, first predetermined ones of said impurity regions and first predetermined ones of said groups of basic-cell arrays located on either side of said predetermined ones of said impurity regions connected to form input-/output circuits;

a first cutting region, formed between second predetermined ones of said basic-cell arrays, for enabling said plurality of groups of basic-cell arrays on said gate-array chip to be cut into smaller plurality of groups of basic cell arrays to form chips smaller than said gate-array chip; and

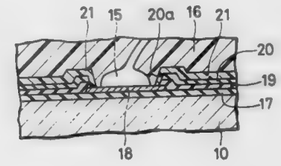
first input/output pad forming regions formed adjacent to said first cutting region.

4,733,289

RESIN-MOLDED SEMICONDUCTOR DEVICE USING POLYIMIDE AND NITRIDE FILMS FOR THE PASSIVATION FILM

Kazuhiro Tsurumaru, Fuchu, Japan, assignor to Hitschi, Ltd., Tokyo, Japan

Continuation of Ser. No. 670,812, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 256,110, Apr. 21, 1981, abandoned. This application Mar. 10, 1986, Ser. No. 837,757
Claims priority, application Japan, Apr. 25, 1980, 55-54137
Int. Cl.⁴ H01L *29/34, 23/48, 23/28*
U.S. Cl. 357—54 **16 Claims**



1. A semiconductor device comprising:

a wiring layer having wiring and having a bonding pad on which a metal wire is to be bonded, the wiring of the wiring layer being directly connected to the bonding pad, the wiring layer being formed selectively on an insulating film overlying a main surface of a semiconductor substrate in which a desired circuit element is formed;

a nitride film formed over said insulating film and said wiring layer and having a hole for exposing the surface of said bonding pad, said nitride film being formed on the peripheral portion of the bonding pad;

a metal wire bonded to the surface of said bonding pad; and

a sealing resin formed to cover said metal wire and said nitride film, said sealing resin forming a seal for the circuit element, to thereby provide a resin-sealed semiconductor device;

further including a polyimide resin film sandwiched between said sealing resin and said nitride film, said polyimide resin film being formed on the peripheral portion of the bonding pad, the nitride film cooperating with the polyimide resin film to sufficiently prevent moisture from passing to the bonding pad so as to substantially prevent corrosion of the bonding pad due to the moisture, the nitride film and the polyimide resin film thereby protecting the peripheral portion of the bonding pad whereby a resin-sealed semiconductor device can be provided.

4,733,290

SEMICONDUCTOR DEVICE AND METHOD OF FABRICATION

Bruce A. Reardon, Brockton, and Joel L. Goodrich, Westford, both of Mass., assignors to M/A-COM, Inc., Burlington, Mass.

Filed Apr. 18, 1986, Ser. No. 853,706
Int. Cl.⁴ H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—69 **6 Claims**

1. a semiconductor device comprising,

a base semiconductor substrate,

means defining a closed peripheral cavity in the substrate extending in frame configuration,

an insulating layer in the cavity,

a layer of polysilicon disposed over the insulating layer to substantially fill the cavity and provide structural support,

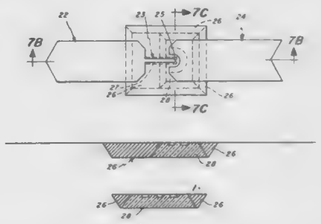
an epitaxy layer disposed over the surface of the substrate as well as over the insulating and polysilicon layers,

a second insulating layer having windows defined therein for enabling ohmic contact with the epitaxy layer and substrate, respectively,

and separate conductor leads to provide contact to the epitaxy layer and substrate respectively,

said semiconductor substrate and epitaxy layer being oppositely doped to form a device region,

said insulating layer in the cavity being non-reactant to the etching of the substrate while permitting etching of the substrate so as to enable exposure of the conductor leads,



said conductor leads comprising beam leads that extend in opposite directions from the substrate,

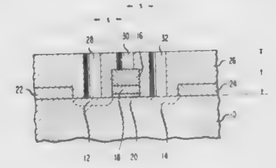
at least one of said beam leads having a major area thereof spaced by a minor area in comparison to the major area so as to space the major area from the device region to thus minimize parasitic capacitance.

4,733,291

CONTACT VIAS IN SEMICONDUCTOR DEVICES

Roland A. Levy, Berkeley Heights, and Kurt Nassau, Bernardsville, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 15, 1985, Ser. No. 798,422
Int. Cl.⁴ H01L *23/48, 29/44, 29/60*
U.S. Cl. 357—68 **6 Claims**



1. A microminiature device comprising

a dielectric layer made of a reflowable mateiral,

spaced-apart vias in said layer, said vias having no overhangs therein at equilibrium after reflow, the smallest spacing s between vias being approximately $\leqq 1.75$ μm,

wherein t is the maximum thickness of any of the walls defining said vias in said layer,

and wherein t/s is approximately $\leqq 0.393$.

4,733,292

PREPARATION OF FRAGILE DEVICES

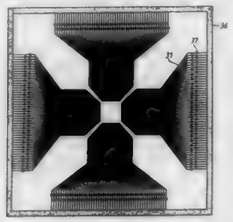
Charles R. Jarvis, Hockley, United Kingdom, assignor to The General Electric Company p.l.c., London, England

Filed Aug. 6, 1986, Ser. No. 893,872
Claims priority, application United Kingdom, Aug. 6, 1985, 8519710
Int. Cl.⁴ H01L *23/48, 29/46;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 357—70 **13 Claims**

13. A generally planar lead frame comprising: several leads each having a relatively robust portion and a contiguous, relatively fragile portion thinner and narrower than the robust portion, the fragile portion having a flat face; and a flat support

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in the plane of the lead-frame, all of the fragile portions being embedded in said flat support such only said flat face of each



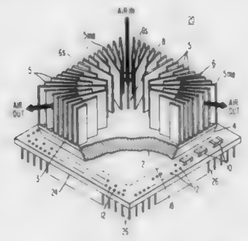
fragile portion is exposed in said plane for electrical contact, and each fragile portion is as wide at said flat face as it is beneath that flat face.

4,733,293

HEAT SINK DEVICE ASSEMBLY FOR ENCUMBERED IC PACKAGE

Paul G. Gabuzda, Laguna Beach, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Feb. 13, 1987, Ser. No. 14,575
Int. Cl.[4] H05K *7/20*
U.S. Cl. 357—81 **9 Claims**



1. An integrated circuit cooling assembly comprising, in combination:

(a) an integrated circuit package having underside connecting pins and an upper surface area which is encumbered along the peripheral edges by electrical contacts and components, said upper surface area including:

(a1) a non-encumbered surface area for adhesive attachment of a heat sink unit;

(b) said heat sink unit for mounting on said non-encumbered surface area and including:

(b1) a spreader baseplate for supporting a plurality of metallic fins radially oriented from the center of said baseplate, said baseplate including:

(b1a) a tapered portion having an upper and lower plane whereby said upper plane supports said metallic fins on a larger base area than said lower plane which makes adhesive contact to said non-encumbered surface area;

(b1b) said plurality of radially oriented fins residing perpendicularly to said baseplate and being of equal widths and arranged with space gaps therebetween having a width approximately equal to the width of each of said fins, said fins being repetitively patterned in lengths of long-short-medium-short;

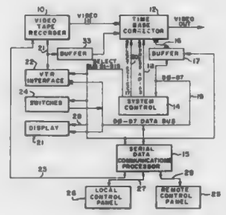
(b1c) a central cylindrical orifice opening enabling alignment with an impinging air flow directed perpendicularly toward said central opening of said baseplate upper plane, said central opening being formed by the inner edges of said long length fins.

4,733,294

TIME BASE CORRECTOR MEMORY ARRANGEMENT AND MEMORY CONTROL

Jan S. Wesolowski, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 17, 1985, Ser. No. 788,606
Int. Cl.[4] H04N *9/44, 9/89*
U.S. Cl. 358—17 **11 Claims**



8. In a digital time base corrector for correcting time base errors in an unstable video signal comprised of digital samples by synchronizing the video signal with a reference video signal, said time base corrector being of the type having a frame memory for storing said digital samples, apparatus for controlling the storage and retrieval of samples into and from said memory, comprising:

a write address counter for generating write addresses for effecting the storage of said data samples in sequence for an entire frame and then repeating the cycle;

a read address counter for generating read addresses for effecting the reading of said data samples in sequence for an entire frame and then repeating the cycle;

a write address loading control for loading a calculated write address into said write address counter to change said write address generation sequence;

a read address loading control for loading a calculated read address into said read address counter to change said read address generation sequence;

timing control for generating timing signals which control the starting time of said read address generation sequence and the loading of said calculated read address, and for generating timing signals which control the starting time of said write address generation sequence and the loading of said calculated write address; and

memory control means for calculating said starting read address and transferring it to said read address loading control and for calculating said starting write address and transferring it to said write address loading control.

4,733,295

LUMINANCE SELECTION APPARATUS FOR VIDEO SIGNAL CONTROL SYSTEM

Robert L. Hemsky, and Terry L. Tucker, both of Boca Raton, Fla., assignors to Utah Scientific Advanced Development Center, Inc., Ft. Lauderdale, Fla.

Continuation of Ser. No. 791,372, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 760,339, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 604,845, Apr. 27, 1984, Pat. No. 4,642,682. This application May 15, 1987, Ser. No. 52,122
Int. Cl.[4] H04N *9/74*
U.S. Cl. 358—22 **22 Claims**

1. In a color video signal control system, a luminance responsive color correction system for selecting a region of a video image for receiving corrections to a video parameter, comprising:

means responsive to the luminance of an input color video signal exceeding a predetermined threshold magnitude for providing a control signal; and

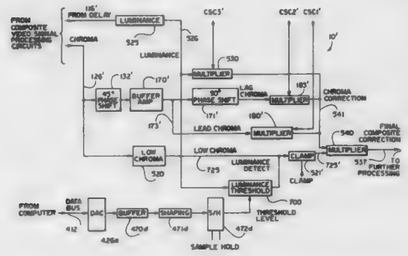
means for varying said predetermined threshold magnitude a plurality of times on a given video line;

means for detecting the instantaneous hue of said input color video signal;

color correction means responsive to said control signal and said detected instantaneous hue for correcting a video parameter of said input color video signal;

whereby a video parameter of said input color video signal may be corrected a plurality of times on a given video line as a function of luminance which may vary during said given video line.

13. Apparatus for selecting a region of a video image for receiving corrections to a video parameter as a function of the



luminance and of a video characteristic of said region, comprising:

luminance threshold means responsive to a video characteristic of an input video signal for selecting a particular one of a plurality of luminance threshold signals;

operator control means for selectively varying at least one of said plurality of luminance threshold signals;

video signal correction means responsive to said video characteristic for selecting a particular one of a plurality of video signal correction signals; and

means responsive to said selected one of said luminance threshold signals and said selected one of said video signal correction signals for correcting a parameter of said input video signal to provide a corrected video output signal.

4,733,296

MULTI-TUBE COLOR TV CAMERA IN WHICH LINEAR AND NON-LINEAR COMPONENTS OF A REGISTRATION ERROR DUE TO CHROMATIC ABERRATION OF A LENS ARE CORRECTED WITH CORRESPONDING DEFLECTION CORRECTION SIGNALS

Masanori Honbo, Mitaka; Kenji Takahashi, Kanagawa; Koji Kudo, and Shusaku Nagahara, both of Hachioji, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha & Hitachi, Tokyo, Japan

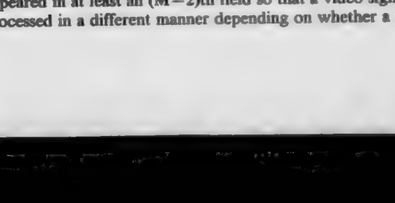
Filed Feb. 18, 1986, Ser. No. 829,822
Claims priority, application Japan, Feb. 15, 1985, 60-26267
Int. Cl.[4] H04N *9/093, 9/09*
U.S. Cl. 358—51 **6 Claims**

1. A method for correcting a registration error in a TV camera caused by chromatic aberration of a lens, said TV camera including a plurality of camera tubes for converting an image obtained through said lens into a corresponding plurality of separate signals by scanning a photoelectric conversion target in each of said camera tubes with a respective electron beam, each separate signal representing one of a plurality of different color component of said image, and a deflection circuit for feeding deflection waveforms employed to deflect said electron beams in said camera tubes to respective deflecting devices associated with said camera tubes, said method comprising the steps of:

generating a correction signal corresponding to a linear component of said registration error and a correction signal corresponding to a non-linear component of said registration error; and

controlling said deflection circuit on the basis of said correction signals.

4. A correction circuit for correcting a registration error in a TV camera caused by chromatic aberration of a lens, said TV camera including a plurality of camera tubes for converting an image obtained through said lens into a corresponding plurality of separate signals by scanning a photoelectric conversion target in each of said camera tubes with a respective electron beam, each separate signal representing one of a plurality of different color components of said image, and a deflection circuit including horizontal and vertical synchronizing pulse generating means for providing horizontal and vertical synchronizing pulses, said deflection circuit being adapted for generating deflection waveforms employed to deflect said electron beams in said camera tubes and for feeding said deflection waveforms to respective deflecting devices associated with said camera tubes, said correction circuit comprising:



first integrating means for integrating said horizontal and vertical synchronizing pulses to obtain saw-tooth waveforms of horizontal and vertical scanning periods, respectively;

second integrating means for integrating said saw-tooth waveforms of said horizontal and vertical scanning periods to obtain parabolic waveforms of said horizontal and vertical scanning periods, respectively;

adding means for adding said parabolic waveform of said horizontal scanning period to said parabolic waveform of said vertical scanning period;

first multiplying means for multiplying a waveform obtained from said adding means by said saw-tooth waveform of said horizontal scanning period; and

second multiplying means for multiplying said waveform obtained from said adding means by said saw-tooth waveform of said vertical scanning period;

said deflection circuit being controlled on the basis of said saw-tooth waveforms of said horizontal and vertical scanning periods and outputs of said first and second multiplying means.

4,733,297

VIDEO SIGNAL PROCESSING CIRCUIT OF MOTION ADAPTIVE TYPE

Kenji Katsumata; Masato Sugiyama; Akihide Okuda; Shigeru Hirahata; Isao Nakagawa, all of Yokohama, and Sunao Suzuki, Kamakura, all of Japan, assignors to Hitachi Ltd. & Hitachi Video Eng., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,431
Claims priority, application Japan, Apr. 9, 1986, 61-79976
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—105 **15 Claims**

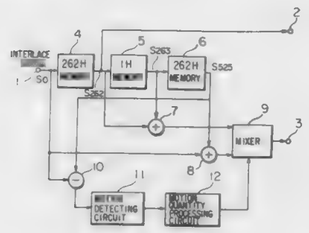
1. A video signal processing circuit of motion adaptive type including a circuit for identifying motion of a picture in a video signal on the basis of a difference signal between a line signal appearing in an M-th field and a corresponding line signal appeared in at least an (M−2)th field so that a video signal is processed in a different manner depending on whether a por-

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tion of the video signal to be displayed is a still picture or a moving picture, said motion identifying circuit comprising:

an attenuating circuit attenuating a first signal coresponding to said difference signal;

field delay means for substantially delaying said first signal by one field;



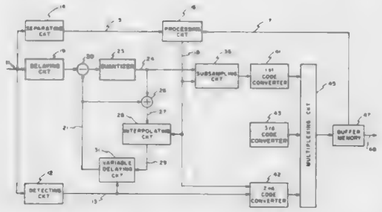
an output circuit generating, on the basis of a second signal associated with said first signal and the output signal of said field delay means, a third signal representing motion of said picture; and a horizontal filter spreading at least one of said first, second and third signals in the horizontal direction by receiving said signal as an input signal.

4,733,298

METHOD OF CODING A VIDEO SIGNAL WHEREBY PICTURES CAN BE REPRODUCED WITH A HIGH QUALITY AND A DEVICE THEREFOR

Toshio Koga, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 13, 1985, Ser. No. 797,630
Claims priority, application Japan, Nov. 14, 1984, 59-240057
Int. Cl.⁴ H04N *7/12, 7/18*
U.S. Cl. 358—133 **7 Claims**



1. A method of coding a digital video signal which is representative of successive pictures, each picture being dividible into a predetermined number of blocks of picture elements, said method comprising the steps of:

detecting an original motion vector representative of a movement of each block between two of said pictures;

predictable coding said digital video signal by using said original motion vector to produce a coded signal;

producing an on-off control signal representative of whether subsampling is turned on or off at each of said blocks;

subsampling a part of said coded signal into a subsampled signal with reference to said on-off control signal and leaving as it is a remaining part as a non-subsampled signal;

code-converting both said subsampled and said non-subsampled signals into a converted code signal; and

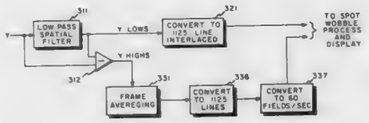
code-converting said original motion vector and said on-off control signal into a converted motion vector and a converted control signal which is distinguishable from said converted motion vector.

4,733,299

METHOD AND APPARATUS FOR GENERATING PROGRESSIVELY SCANNED TELEVISION INFORMATION

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Mar. 26, 1987, Ser. No. 30,731
Int. Cl.⁴ H04N *7/01*
U.S. Cl. 358—140 **8 Claims**



1. A method for generating a progressively scanned video signal representative of images, comprising the steps of:

deriving an interlaced relatively low spatial frequency video signal representative of said images, at a relatively fast frame refresh rate;

deriving a relatively high spatial frequency video signal representative of said images, at a relatively slow frame refresh rate;

converting said interlaced relatively low spatial frequency video signal to an interlaced relatively low spatial frequency video signal having an increased number of lines, the information for each converted field coming from a field of the original interlaced relatively low spatial frequency video signal;

converting said relatively high spatial frequency signal to a relatively high spatial frequency signal having said relatively fast frame refresh rate, each field of said converted relatively high spatial frequency signal containing information from more than a single field of the original relatively high spatial frequency video signal; and

combining the converted relatively low spatial frequency video signal and the converted relatively high spatial frequency video signal to obtain said progressively scanned video signal.

4,733,300

CONTOUR SIGNAL CORRECTION CIRCUIT FOR TELEVISION RECEIVER

Masato Sugiyama; Isao Nakagawa; Shigeru Hirahata; Kenji Katsumata, all of Yokohama, and Sunao Suzuki, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,962
Claims priority, application Japan, Dec. 9, 1985, 60-274942
Int. Cl.⁴ H04N *7/01, 5/14, 5/44*
U.S. Cl. 358—140 **3 Claims**

1. In combination, a contour signal correction circuit for use in a television receiver and a scanning line interpolation circuit for converting a television signal of a signal structure for interlaced scanning into a television signal for sequential scanning, said scanning line interpolation circuit comprising:

an input terminal supplied with a digitized video signal of the signal structure for interlaced scanning;

a first line memory supplied with the video signal received by said input terminal therefrom for delaying the video signal by one horizontal scanning period to produce a first delayed signal;

first adder means connected with said input terminal and said first line memory and supplied with the received video signal from said input terminal and supplied with the first delayed signal from said line memory for adding together the video signal and the first delayed signal to produce a first added signal including the video signal and the first delayed signal;

a field memory connected with said first line memory and supplied with the first delayed signal from said first line memory for delaying the first delayed signal by 262 horizontal scanning periods to produce a second delayed signal;

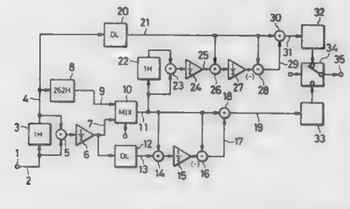
a mixer circuit connected with said first adder means and said field memory for mixing the first added signal with the second delayed signal to produce an interpolated scanning line signal;

a first time base compressor circuit supplied with the first delayed signal produced in said first line memory for compressing the time base of the first delayed signal to $\frac{1}{2}$ to produce a compressed first delayed signal;

a second time base compressor circuit supplied with the interpolated scanning line signal produced in said mixer circuit for compressing the time base of the interpolated scanning line signal to $\frac{1}{2}$ to produce a compressed interpolated scanning line signal; and

a switching circuit connected with said first and second time base compressor circuits for alternately selecting and outputting the compressed first delayed signal and the compressed interpolated scanning line signal; said contour signal correction circuit comprising:

a second line memory connected with said mixer circuit and supplied with the interpolated scanning line signal from said mixer circuit for delaying the interpolated scanning



line signal by one horizontal scanning period to produce a third delayed signal;

second adder means connected with said second line memory and said mixer circuit for adding together the third delayed signal and the interpolated scanning line signal to produce a second added signal;

third adder means supplied with the second added signal from said second adder means and supplied with the first delayed signal from said first line memory for adding together the second added signal and the first delayed signal to produce a third added signal;

first subtractor means supplied with the third added signal from said third adder means and supplied with the first delayed signal from the first line memory for subtracting the third added signal from the first delayed signal to generate a first subtracted signal;

fourth adder means connected between said first line memory and said first time base compressor circuit and also connected with said first subtractor means for adding the first subtracted signal to the first delayed signal;

fifth adder means supplied with the first added signal from said first adder means and supplied with the interpolated scanning line signal for adding together the two signals to produce a fifth added signal;

second subtractor means supplied with the fifth added signal from said fifth adder means and supplied with the interpolated scanning line signal from said mixer circuit for subtracting the fifth added signal from the interpolated scanning line signal to produce a second subtracted signal; and

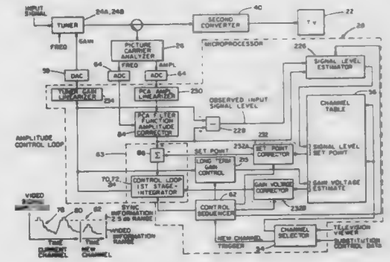
sixth adder means connected between said mixer circuit and said second time base compressor circuit and also connected with said second subtractor means for adding the second subtracted signal to the interpolated scanning line signal.

4,733,301

SIGNAL MATCHING SIGNAL SUBSTITUTION

W. Andrew Wright, Jr., Bethlehem, Pa., assignor to Information Resources, Inc., Chicago, Ill.

Continuation of Ser. No. 870,093, Jun. 3, 1986, abandoned. This application Jun. 26, 1987, Ser. No. 65,638
Int. Cl.⁴ H04N *5/262*
U.S. Cl. 358—181 **8 Claims**



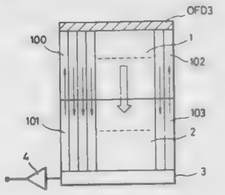
1. A signal matching signal substitution system wherein substitute signals in a substitute channel are substituted at a viewer's television receiver in lieu of normal signals in a normal channel, said system comprising receiving means for selectively receiving signals in respective normal and substitute television channels, input gain control means responsive to a gain control signal for controlling the output signal level of said receiving means, means for switching said receiving means between said normal channel and said substitute channel, means for determining the input signal level of currently received signals in a currently received channel and generating an amplitude signal indicative of said input signal level, set point means responsive to said amplitude signal corresponding to the input signal level for the normal channel most recently received for providing a set point for said output signal level, and means responsive to said set point and said output signal level for generating said gain control signal maintaining said output signal level at said set point.

4,733,302

IMAGE SENSOR OR AN IMAGE SENSING APPARATUS

Takao Kinoshita, Tokyo; Shinji Saksi, Yokohama; Akira Suga, Yokohama, and Akihiko Tojo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 697,155, Feb. 1, 1985, Pat. No. 4,647,978. This application Sep. 22, 1986, Ser. No. 909,937
Claims priority, application Japan, Feb. 6, 1984, 59-20586
Int. Cl.⁴ H04N *3/15*
U.S. Cl. 358—213.26 **9 Claims**



1. Image pickup apparatus comprising:

(a) image pickup means for converting an optical image into an electrical signal, the image pickup means including:

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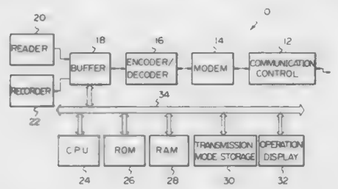
(i) first charge transfer means for transferring one part of the electrical signal in a first direction; and
(ii) second charge transfer means for transferring another part of the electrical signal into a charge drain in a second direction different from said first direction;
(b) control means for controlling said first and second charge transfer means to simultaneously drive said first and second charge transfer means; and
(c) encoder means for producing a television signal by using the signal transferred by said first charge transfer means in said image pickup means.

4,733,303

FACSIMILE APPARATUS

Takako Koshiishi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 685,791, Dec. 24, 1984, abandoned. This application Jun. 19, 1987, Ser. No. 65,154
Claims priority, application Japan, Dec. 26, 1983, 58-244273
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 **12 Claims**



1. A facsimile apparatus comprising:
storage means for storing sequentially and destination by destination transmission mode data associated with past transmissions of video data including the time of day and the date of transmission;
setting means for setting up a transmission mode responsive to said stored information, for transmitting video data to any selected destination by referencing the stored transmission mode data associated with the selected destination; and
updating means for updating the transmission mode data associated with the selected destination.

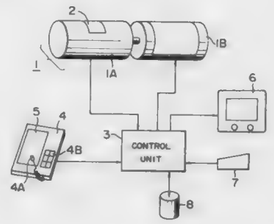
4,733,304

METHOD OF PROCESSING PICTURE DATA FOR PRINTING PROCESS AND DEVICE IMPLEMENTING THE SAME

Yuji Homma, Tsurugashima; Nobuo Tsumita, Yokohama; Kenji Suzuki, Tokyo; Yoshiaki Kudo, Chiba, and Shinichi Miyajima, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Oct. 4, 1985, Ser. No. 784,234
Claims priority, application Japan, Oct. 11, 1984, 59-213099; May 14, 1985, 60-101941
Int. Cl.[4] H04N *1/387*
U.S. Cl. 358—280 **11 Claims**

1. A processing method for graphic arts picture data comprising the steps of:
(a) applying pixel dropping processing to picture data input from a manuscript in a manner that only preselected pixel data are left among pixels constituting said picture data to indicate the entire picture image on a display using the modified picture data subject to said pixel dropping processing,
(b) designating a specified point and a trimming range in said modified picture data while observing said picture image indicated on said display,
(c) indicating the picture image on divided sections of said display in a divided fashion using said picture data indicative of peripheral portions of said specified point and said trimming range without applying pixel dropping processing to said picture data, and



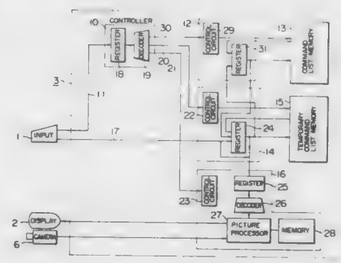
(d) visually confirming the position of said specified point and said trimming range by utilizing said picture image indicated on said display in a divided fashion and applying a necessary corrective processing to said picture image, thus precisely designating said trimming range.

4,733,305

CONVERSATIONAL PICTURE PROCESSING SYSTEM

Shuuichi Miura; Tadashi Fukushima; Yoshiki Kobayashi, all of Hitachi; Masao Takatoo, Katsuta, and Yoichi Takagi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,031
Claims priority, application Japan, Mar. 16, 1984, 59-49117
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **6 Claims**



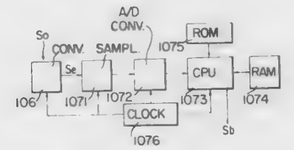
1. A conversational picture processing system comprising:
an input unit including means operable by an operator for inputting information including picture processing commands and operating commands;
a temporary storage unit for temporarily storing picture processing commands received from said input unit;
a command list storage unit for storing picture processing commands to be registered;
an execution unit including means for storing picture data and means for executing a picture processing command received from said input unit or said temporary storage unit on said picture data in said storing means;
control means for controlling said execution unit to control execution of a picture processing command inputted through said input unit or read from said temporary storage unit, for storing a picture processing command into or reading a picture processsing command from said temporary storage unit or said command list storage unit, and for transferring a selected picture processing command from said temporary storage unit to said command list storage unit, in response to respective operating commands entered through said input unit; and
a picture display unit connected to said execution unit for displaying processed picture data obtained as a result of execution of a picture processing command by said execution unit.

4,733,306

METHODS OF DISCRIMINATING AND COPYING AN IMAGE

Masahiko Matsunawa, and Yoshinori Abe, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 703,522, Feb. 20, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 10,500
Claims priority, application Japan, Feb. 20, 1984, 59-29791; Feb. 20, 1984, 59-29792; Feb. 20, 1984, 59-29793; Feb. 20, 1984, 59-29794; Feb. 20, 1984, 59-29795; Feb. 20, 1984, 59-29796; Feb. 20, 1984, 59-29797
Int. Cl.[4] H04N *1/23*
U.S. Cl. 358—280 **22 Claims**



1. A method of discriminating a density characteristic of an image which comprises:
scanning an original image with a photoelectric conversion device,
quantizing an image signal based upon the output obtained through the photoelectric conversion device,
preparing a density histogram representing effective reflection density on one axis and frequency on another axis corresponding to said quantized image signal,
detecting a peak density value corresponding to a peak present on said density histogram relative to the effective reflection density axis of said histogram, and detecting a density width value for a range of reflection density values covered by said density histogram, and
discriminating said original image according to both said peak density value and said density width value.

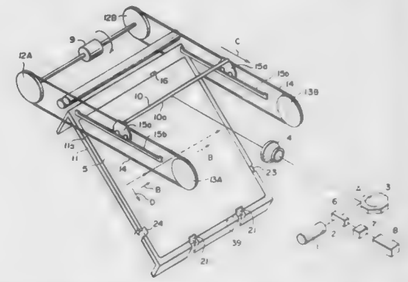
4,733,307

LIGHT BEAM RECORDING APPARATUS, LIGHT BEAM READ-OUT APPARATUS AND LIGHT BEAM SCANNING APPARATUS

Hideo Watanabe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 30, 1986, Ser. No. 913,484
Claims priority, application Japan, Oct. 1, 1985, 60-218393; Oct. 1, 1985, 60-218394; Oct. 2, 1985, 60-219820; Oct. 2, 1985, 60-219821; Oct. 2, 1985, 60-219822; Oct. 9, 1985, 60-225872; Oct. 9, 1985, 60-225873; Oct. 16, 1985, 60-230292; Oct. 16, 1985, 60-230293; Oct. 16, 1985, 60-230294; Oct. 17, 1985, 60-232027; Oct. 17, 1985, 60-232028
Int. Cl.[4] H04H *1/04*
U.S. Cl. 358—285 **34 Claims**

1. A light beam recording apparatus in which a light beam emitted by a light beam source and modulated on the basis of image information is scanned in a main scanning direction on a recording material, and moved with respect to the recording material in a sub-scanning direction approximately normal to the main scanning direction, whereby the light beam is two-dimensionally scanned on the recording material and an image represented by said image information is recorded,
the light beam recording apparatus comprising:
(i) a main scanning light deflector positioned in an optical path of said light beam, which is emitted by said light beam source, for deflecting said light beam,
(ii) an image forming lens positioned in an optical path of said light beam, which has been deflected by said main scanning light deflector, for forming an image of said light beam on a predetermined straight line,
(iii) a long sub-scanning mirror positioned in an optical path of said light beam, which has passed through said image forming lens, for movement in the optical axis direction of said image forming lens, said sub-scanning mirror extending in said main scanning direction and



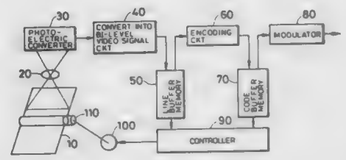
inclining with respect to said optical path of said light beam which has passed through said image forming lens, and
(iv) a recording material holding means for holding said recording material on a plane formed by a locus of a straight line moving as said sub-scanning mirror is moved in said optical axis direction of said image forming lens and lying at a position conjugate with said predetermined straight line, on which the image of said light beam is formed by said image forming lens, with respect to said sub-scanning mirror.

4,733,308

CONTROL METHOD OF VERTICAL SCAN SPEED

Koozoo Nakamura, Hitachi-oota; Nagaharu Hamada, Hitachi; Masaharu Tadauchi, Mito; Yasuyuki Kozima, Hitachi, and Kunihiro Sakata, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,826
Claims priority, application Japan, Aug. 14, 1985, 60-177543
Int. Cl.[4] H04M *1/17*
U.S. Cl. 358—288 **6 Claims**



1. In a method of controlling vertical scan speed in the relative movement of a document and a recording medium by a predetermined length in a vertical scan direction and effecting reading and recording of said document, the improvement comprising:
storing information signals in a line buffer memory and storing coded signal bits corresponding to the information signals in a code buffer memory for storing signals which are scheduled to be recorded;
setting vertical scan speeds in accordance with the number

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of the buffered code bits of said code buffer memory in at least a first vertical scan mode and a second vertical scan mode which is different from said first scan mode;

changing the mode from said first vertical scan mode to said second vertical scan mode when the number of the buffered code bits of said code buffer memory reaches a first reference value; and

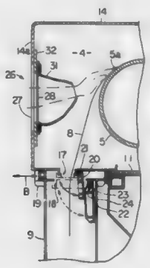
changing the mode from said second vertical scan mode to said first vertical scan mode when the number of the buffered code bits of said code buffer memory reaches a second reference value which is different from said first reference value.

4,733,309

APPARATUS FOR ENABLING AN OPERATOR TO MOUNT AN UNEXPOSED FILM ON AND DEMOUNT AN EXPOSED FILM FROM THE DRUM OF A COLOR SCANNER VIA A LIGHT-BLIND WINDOW

Yoshishige Mori, Fushimi, and Hitomi Atoji, Kita, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 30, 1986, Ser. No. 890,522
Claims priority, application Japan, Aug. 2, 1985, 60-171474
Int. Cl.⁴ H04N *1/06, 1/04;* **G03B** *27/58*
U.S. Cl. 358—289 **6 Claims**



1. An apparatus for mounting a film on and demounting the film from a color scanner or the like, the scanner including a recording chamber with a rotary drum and a film outlet opening, the apparatus comprising:

means for containing unexposed films detachably mounted on the scanner adjacent to the drum and opening into the recording chamber; and

a light-blind window located in a side of the recording chamber which is located toward an operator whereby an unexposed film can be manually removed from the unexposed film containing means, mounted on the drum and removed from the drum after being exposed by scanning.

4,733,310

PAPER SHEET AND ENVELOPE FEEDER APPARATUS

Ludwig J. Kapp, Blairstown; Dominick Fazio, Whippany, and Mark Crowley, Mine Hill, all of N.J., assignors to Ziyad, Inc., Deaville, N.J.

Filed May 23, 1986, Ser. No. 866,881
Int. Cl.⁴ H04N *1/23*
U.S. Cl. 358—300 **20 Claims**

1. Apparatus for selectively feeding paper or envelopes to a printer or copier, said printer or copier having an input area for receiving a sheet of paper or an envelope, comprising:

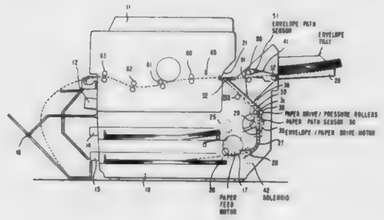
a plurality of storage trays each adapted to store paper;

paper drive means for directing a sheet of paper as selected from any of such storage trays to said input area along a predetermined paper path, said paper drive means including a first drive and a second drive motor each operative as controlled to direct said sheet of paper along said path;

sensing means disposed along said path and operative to sense the position of said paper sheet along said path with said sensing means operative to sense the leading edge of said paper sheet in a first position to provide a first signal and to sense the trailing edge of said paper sheet to provide a second signal;

control means coupled to said first and said second drive motors and said sensing means;

first means coupled to said first drive motor and operative to drive said sheet to said first position and to drive the leading edge of said sheet to a second position in response to a first control signal from said control means, which



first control signal is generated in response to said first signal being coupled to said control means;

second means coupled to said second drive motor to cause said sheet to continue to move along said path after the leading edge has arrived at the second position;

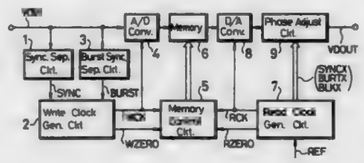
and said second drive motor to continue to operate for a predetermined period indicative of said paper sheet being positioned at said input area in response to a second control signal from said control means, which second control signal is generated in response to said second signal being coupled to said control means.

4,733,311

AUTOMATIC PHASE CONTROL CIRCUIT USED FOR TIME BASE CORRECTOR

Tadaaki Yoshinaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,827
Claims priority, application Japan, Oct. 20, 1984, 59-220738
Int. Cl.⁴ H04N *5/76, 5/04*
U.S. Cl. 358—320 **2 Claims**



1. A phase control apparatus for controlling a phase of a phase information pulse signal used for producing an initial address, said initial address being used for writing into or for reading out from a memory circuit of a time base corrector for reducing a time base error included in a reproduced video signal, said phase control apparatus including a phase shift circuit for shifting a phase of a horizontal synchronizing pulse, a phase comparator for comparing a phase between the phase shifted horizontal synchronizing pulse and a constant wave signal in phase with a chroma burst signal, and a feedback circuit connected between said phase comparator and said phase shift circuit for applying a feedback signal, generated in accordance with an output signal of said phase comparator, to said phase shift circuit so that the phase of said phase information pulse signal is synchronized with said constant wave signal, characterized by said feedback circuit comprising:

capacitor means for holding an amplitude of said output signal of said phase comparator;

display circuit means connected to said capacitor means for indicating a value of said output signal of said phase comparator;

switch circuit means; and

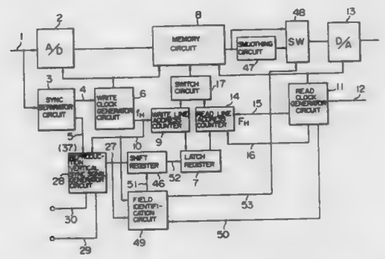
stabilizer circuit means connected between said capacitor means and said switch circuit means for stabilizing said feedback signal so that a value of said feedback signal is approximately zero voltage when said switch circuit means is operated.

4,733,312

TIME-BASE CORRECTOR

Takeshi Morimoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP85/00223, § 371 Date Dec. 20, 1985, § 102(e) Date Dec. 20, 1985, PCT Pub. No. WO85/05001, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 22, 1985, Ser. No. 819,508
Claims priority, application Japan, Apr. 24, 1984, 59-82162; Jul. 11, 1984, 59-143504; Jul. 11, 1984, 59-143508
Int. Cl.⁴ H04N *5/783, 5/93*
U.S. Cl. 360—10.1 **5 Claims**



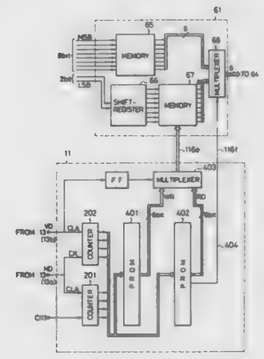
1. A time-base corrector comprising a memory for storing a reproduction video signal reproduced by a video tape recorder, a write/read address generator circuit for a write and read address for each line to the memory, a sync separator circuit for extracting a reproduction vertical sync signal and a reproduction horizontal sync signal from said reproduction video signal, a vertical sync signal forecasting circuit for counting a predetermined number of a signal synchronous with said reproduction horizontal sync signal and forecasting the position of a reproduction vertical sync signal in the next field, thereby to generate a forecast vertical sync signal, and a vertical sync signal compensation circuit supplied with the reproduction vertical sync signal and the forecast vertical sync signal and normally producing the reproduction vertical sync signal, said vertical sync signal compensation circuit outputting the forecast vertical sync signal in the case of dropout of the reproduction vertical sync signal, wherein the write line address of said memory is latched by the output of said vertical sync signal compensation circuit, and the signal thus latched is loaded as a read line address on the write/read address generator circuit at the position of the vertical sync signal of the external reference sync signal.

4,733,313

DIGITAL RECORDING AND PLAYBACK SYSTEM FOR X-RAY VIDEO SIGNALS

Morishi Izumita, Inashiro; Seiichi Mita, Kanagawa; Nobukazu Doi; Shusaku Nagahara, both of Hachioji, and Shigeyuki Ikeda, Katsushika, all of Japan, assignors to Hitachi, Medical Corp. and Hitachi Ltd., both of, Japan

Filed Apr. 22, 1986, Ser. No. 854,512
Claims priority, application Japan, Apr. 23, 1985, 60-86799
Int. Cl.⁴ H04N *5/78;* **A61B** *6/02*
U.S. Cl. 360—33.1 **4 Claims**



1. A digital recording and playback system for X-ray video signals comprising:

intensifying means for receiving and intensifying X-rays into a substantially circular image region;

scanning means for scanning said substantially circular image region by scanning a substantially rectangular region which includes said substantially circular image region, and for generating X-ray analog video signals correponding to pixel elements of said substantially rectangular region, said X-ray analog video signals comprising first video signals corresponding to said substantially circular image region within said substantially rectangular region and second video signals corresponding to a remaining portion of said substantially rectangular region which is outside of said substantially circular image region;

first means for converting said X-ray analog video signals into corresponding first digital data including said first and second video signals, said first digital data including n data bits per pixel element (n: integer);

second means for receiving said first digital data from said first means and for outputting second digital data consisting of m bits (m: integer $<$n) corresponding to said first video signal;

third means for recording said second digital data on a recording medium and for playing back said second digital data from said recording medium;

fourth means for receiving at least said second digital data from said third means and for generating third digital data indicative of said first digital data; and

fifth means for receiving said third digital data from said fourth means and for generating thrid video signals indicative of said X-ray analog video signals,

wherein said second means includes a first memory for storing m-bits of said first digital data, a second memory for storing remaining (n−m) bits of said first digital data as an m-bit unit, and a multiplexer for combining both outputs of said first and second memories into successive m-bit data.

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4,733,314

DISC UNIT INCLUDING AUTOMATIC EJECTION UPON MISINSERTION DETECTION

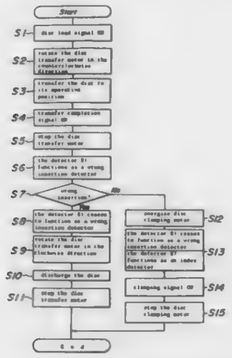
Tetsu Ogawa, Hanazono, and Masahiro Kato, Chichibu, both of Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Oct. 11, 1983, Ser. No. 540,873

Claims priority, application Japan, Oct. 14, 1982, 57-179123; Nov. 12, 1982, 57-197549

Int. Cl.⁴ G11B *17/04, 17/03, 19/04. 19/10*

U.S. Cl. 360—97 **6 Claims**



1. A data storage disc unit into which a disc, provided with a first aperture and encased in a disc cassette made of a light shielding material having a second aperture therein, is inserted into an operative position with a predetermined surface of said disc facing upward and the sides of said disc positioned in predetermined directions, said disc unit comprising:

a photosensor having a light emitting element and a light receiving element disposed on opposite sides of said disc cassette;

means for clamping said disc cassette;

means for generating a transfer completion signal when said disc cassette is inserted into said disc unit to its operative position, prior to clamping of said disc cassette;

means for varying the intensity of light emitted from said light emitting element in such a way that said light emitting element emits light of a relatively high intensity when said transfer completion signal is generated and said light emitting element emits light of a relatively low intensity after said disc cassette has been clamped;

means for detecting insertion of said disc cassette when said light of a relatively high intensity is emitted by said light emitting element and is transmitted through said second aperture in said disc cassette to determine that said disc cassette is correctly inserted into said disc unit with said predetermined surface upward and with said sides positioned in said direction;

wrong insertion detecting means for detecting the wrong insertion of said magnetic disc cassette when said photosensor does not detect said high intensity light pulses being transmitted through said first aperture prior to clamping of said disk cassette;

means for generating an index signal in response to an output from said light receiving element when said light of a relatively low intensity is emitted by said light emitting element and is transmitted through said first and second apertures in said disc and said disc cassette after clamping of said disc cassette; and

disc cassette discharging means responsive to a wrong insertion signal derived from said wrong insertion detecting means for discharging said disc cassette from said disc unit.

4,733,315

FEEDING DEVICE FOR A MAGNETIC HEAD

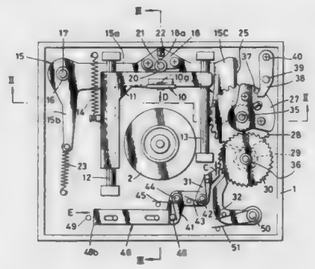
Takeshi Okuyama, and Yoshitaka Araki, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,105

Claims priority, application Japan, Oct. 9, 1984, 59-212241

Int. Cl.⁴ G11B *5/55*

U.S. Cl. 360—106 **15 Claims**



1. An apparatus for recording information on concentric circular recording tracks on a rotatable magnetic recording medium and/or reproducing the information from said recording tracks, comprising:

a magnetic head provided in opposed relationship with said recording medium;

a rotatable member;

driving means for intermittently rotating said rotatable member by a predetermined angle;

pivoting means having a pivot axis and intermittently pivoting in a predetermined direction about said pivot axis by a unit pivot angle corresponding to said predetermined angle in response to said rotatable member; and

means for intermittently moving said magnetic head in one direction on a straight line passing through the center of rotation of said recording medium in response to said pivoting means, said moving means including a support member holding said magnetic head and movable in a rectilinear direction and coupling means for point-coupling said pivoting means and said support member at a contact position spaced apart from said pivot axis by a predetermined distance to convert the pivotal displacement of said pivoting means into rectilinear displacement of said support member, said coupling means being provided so that when said magnetic head is opposed to a substantially central one of said concentric circular recording tracks, a segment passing through said contact position and the center of curvature of the path of said contact position while said pivoting means pivots is orthogonal to the direction in which said support member moves.

4,733,316

MAGNETIC TAPE CASSETTE WITH SLIDE GUARD RAMP ACTUATED CANTILEVER LOCKING LEVER

Kengo Oishi, and Shingo Katagiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

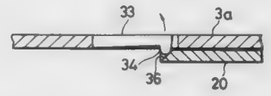
Filed Jul. 28, 1986, Ser. No. 890,046

Claims priority, application Japan, Aug. 9, 1985, 60-121657[U]

Int. Cl.⁴ G11B *15/32*

U.S. Cl. 360—132 **1 Claim**

1. A magnetic tape cassette comprising; upper and lower half cases joined together and defining a chamber therebetween, a pair of hubs on which a magnetic tape is wound positioned within said chamber, a hub locking member mounted to one of said upper and lower half cases, within said chamber, and engaging said hubs for locking said hubs against rotation, said upper and lower half cases having a front end, an opening within said front end through which said magnetic tape can be pulled forwardly of said cassette, a guard panel rotatably mounted to said cassette at said front end to open and close said opening, a generally U-shaped slide guard slidably mounted on the bottom of the lower half case, said lower half case including a bottom wall, a cantilever type locking member integral with said lower half case bottom wall and having an end part projecting downwardly from the bottom of the lower half case, said slide guard having aligned locking holes for selectively receiving said end part of said locking member so



that the position of the slide guard is maintained selectively by engagement of the end part of the locking member with a given one of said locking holes, the improvement comprising a tapered ramp formed on the edge of the slide guard remote from the front opening of said cassette, said tapered ramp being aligned with said locking holes and said ramp extending rearwardly of the cassette and inclined downwardly so that when the slide guard is attached to the lower half case, the end part of the locking chamber slides on said tapered ramp for cammed projection into the bottom of the lower half case so as to easily ride on the upper surface of the bottom wall of the slide guard until reaching a given one of said locking holes.

4,733,317

MAGNETIC TAPE CASSETTE HAVING A TAPE PASSAGE INCLUDING RIBS

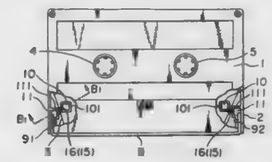
Takateru Sato, Saku, and Haruo Shibe, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,088

Claims priority, application Japan, Dec. 6, 1984, 59-185126[U]

Int. Cl.⁴ G11B *15/52, 23/02*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette comprising:

a casing body having top and bottom walls;

at least one magnetic tape reel mounted in said casing body for rotation about an axis extending in a first direction normal to said top and bottom walls;

a magnetic tape in said casing, a portion of said magnetic tape being wound around said at least one reel;

means for guiding said tape in said reel such that a width of said tape extends in said first direction;

first hollow cylindrical means passing through said casing body at one side of said tape guided in said cassette;

second hollow cylindrical means passing through said casing body at another side of said tape guided in said cassettte, said first and second cylindrical means together defining a passage therebetween through which said tape passes;

a circular hole in each of said first and second cylindrical means, said holes facing one another; and

ribs formed within said passage at opposing positions spaced from one another in said first direction by a distance greater than said tape width, said ribs comprising means for restricting movement of said tape in said first direction within said passage wherein said ribs are spaced from one another by not more than said tape width plus 0.5 mm, whereby detection errors are minimized.

4,733,318

MAGNETIC TAPE DRIVING DEVICE

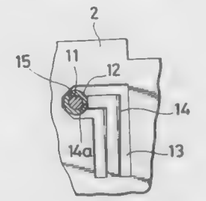
Tadao Arata, Inagi, Japan, assignor to Tanashin Denki Co., Ltd., Japan

Filed Dec. 19, 1986, Ser. No. 943,746

Claims priority, application Japan, May 21, 1986, 61-76358[U]

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—137 **5 Claims**



1. In a magnetic tape driving device of the type wherein a reel receiving member and a capstan are mounted for rotation on a base plate while a head supporting member and a pinch roller supporting member are mounted for movement on said base plate, the improvement wherein said base plate is composed of a metal plate on which said reel receiving member is mounted, and a synthetic resin plate overlying said metal plate and having securely mounted thereon a bearing metal member for supporting said capstan thereon, said metal plate having an opening formed therein, said bearing metal member extending through said opening in said metal plate, said metal plate having a resilient contacting piece formed adjacent said opening thereof for resiliently pressing against an outer periphery of said bearing metal member, said metal plate further having a receiving portion formed adjacent said opening thereof for bearing a contacting force of said contacting piece acting on the opposite side of said bearing metal member, whereby said synthetic resin plate is positioned relative to said metal plate by contacting engagement of said resilient contacting piece and said receiving portion of said metal plate with said bearing metal member.

4,733,319

HIGH-SPEED CURRENT LIMITING CIRCUIT BREAKER

Shigehiro Yoshida; Kazuhiro Yokouchi; Yuichi Wada; Masao Tomita, and Kiyoshi Fukuda, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,562

Claims priority, application Japan, Nov. 7, 1984, 59-236439

Int. Cl.⁴ H02H *9/02*

U.S. Cl. 361—58 **10 Claims**

1. A high-speed current limiting circuit breaker comprising:

a self-recovery type current limiting element for limiting a fault current,

a parallel resistance connected in parallel with said self-recovery type current limiting element,

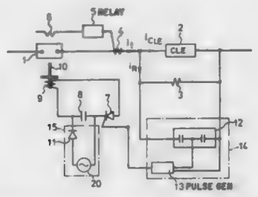
a circuit breaker connected in series with said self-recovery type current limiting element,

a fault current detector for detecting a fault current flowing through said circuit breaker,

a breaker tripping means for tripping said circuit breaker in response to an output of said fault current detector,

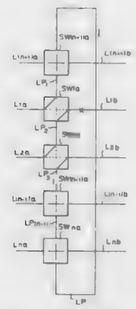
VOL 1088 ISS 4 MR 22 1988 UMI

a fault voltage detector for detecting a fault voltage generated on said parallel resistance,
a switching element connected with and actuated by said fault voltage detector,
an electro-magnetic repulsion coil which is connected in series with said switching element and a power source in a manner to be excited when said switching element is actuated, and



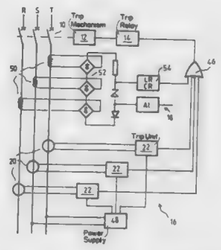
a movable rod for breaking said circuit breaker by tripping a latch in said circuit breaker by electro-magnetic repulsion when said coil is excited;
wherein said fault voltage detector comprises a voltage divider and a voltage detection pulse generator which detects the voltage generated on the parallel resistance and drives said repulsion coil.

4,733,320
LINE PROTECTION SWITCH EQUIPMENT
Satoshi Ikeuchi, Kawasaki; Ikuo Taniguchi, Inagi, and Kenji Yoshimoto, Chigasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 15, 1986, Ser. No. 896,954
Claims priority, application Japan, Aug. 16, 1985, 60-179452
Int. Cl.⁴ H02H *7/26*
U.S. Cl. 361—67 **7 Claims**



1. Line protection switch equipment in a communication system, connected between a plurality of pairs of communication lines, at least one pair of the communication lines being operatively used as a protection line and the other pairs of the communication lines being operatively used as working lines, said line protection switch equipment comprising:
loop lines for forming a loop; and
two-input and two-output switches, each connected to a corresponding one of the pairs of communication lines and to two of said loop lines corresponding thereto and switchable between two states—a normal state in which the corresponding one of the pairs of communication lines are connected together and the two loop lines corresponding thereto are connected together and a switched state in which each line in the corresponding one of the pairs of communication lines is connected to one of said loop lines corresponding thereto, whereby at least two of said switches, connected to a faulty working line and to the protection line, may be switched from the normal state to the switched state so that the faulty working line becomes the protection line and the protection line is used in place of the faulty working line.

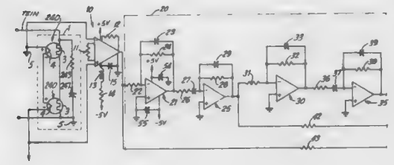
4,733,321
SOLID-STATE INSTANTANEOUS TRIP DEVICE FOR A CURRENT LIMITING CIRCUIT BREAKER
Francois Lindeperg, Sassenage, France, assignor to Merlin Gerin, France
Filed Apr. 13, 1987, Ser. No. 37,636
Claims priority, application France, Apr. 30, 1986, 86 06431
Int. Cl.⁴ H02H *3/093*
U.S. Cl. 361—96 **9 Claims**

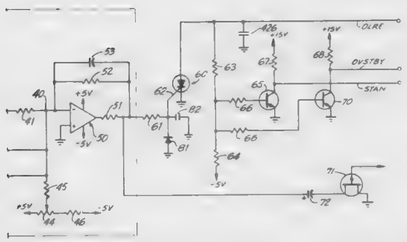


1. A solid-state trip device having an analog instantaneous trip release to bring about high-speed opening of the contacts of a circuit breaker with current limiting comprising:
a current sensor which generates a derivative analog signal di/dt proportional to the derivative in relation to time of the current flowing in a conductor of the circuit breaker,
an integrating circuit receiving said derivative signal di/dt and emitting a signal representative of the current i,
a first threshold comparator circuit comparing said signal representative of the current and an upper threshold value to emit an instantaneous tripping signal when said current signal i exceeds said upper threshold value,
a second threshold comparator circuit comparing said derivative signal di/dt with a second threshold value to generate a selection signal of a lower instantaneous tripping threshold, when said derivative signal exceeds said second threshold.

4,733,322
AC-DC TRANSFER STANDARD OVERLOAD PROTECTION CIRCUIT
Jerry Harper, West Caldwell, and Archie J. Harrison, Jr., Mount Arlington, both of N.J., assignors to Ballantine Laboratories, Inc., Boonton, N.J.
Continuation of Ser. No. 728,845, Apr. 30, 1985, abandoned.
This application Mar. 3, 1987, Ser. No. 22,541
Int. Cl.⁴ H01H *5/04*
U.S. Cl. 361—103 **15 Claims**

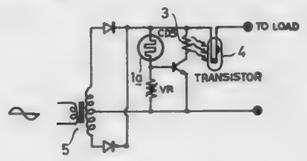
1. An overload protection circuit for a thermal transfer device having a fine wire heater element and a temperature sensor, the temperature sensor generating a sensor signal whose amplitude is dependent upon the amplitude of the voltage across the heater element, the temperature sensor being in thermal contact with the heater element, said protection circuit comprising:
(a) a first differentiator responsive to the amplitude of the sensor signal and producing a differentiated output signal; and
(b) a second differentiator responsive to the output signal from the first differentiator and producing a twice differentiated output signal; and





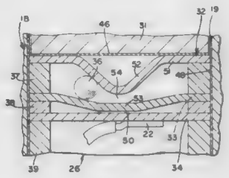
(c) means for actuating an overload signal responsive to the output signal of the first differentiator or second differentiator.

4,733,323
PHOTOTHERMIC AND TIME SWITCH DEVICES FOR OUTDOOR LOW TENSION POWER SUPPLY SYSTEM
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan
Filed May 23, 1985, Ser. No. 737,282
Int. Cl.⁴ H01H *61/02, 37/34;* **H02H** *5/04*
U.S. Cl. 361—105 **3 Claims**



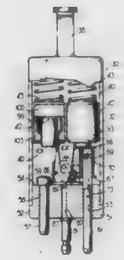
1. In a light-responsive control and overload protection circuit for low voltage illumination systems and which includes means responsive to ambient light for providing an enabling output, control means for switching heating current on when enabled, heat-producing means through which the heating current passes whenever the control means is enabled and heat-responsive circuit breaker means in circuit between a low voltage power source and load, the heat-producing means being thermally coupled to the heat-responsive circuit breaker means to transfer heat thereto and effect and maintain an opening thereof whenever sufficient ambient light is present, an improvement wherein said control means comprises means responsive to the enabling output for developing a start signal and an on time delay timer having an input receiving means responsive to the start signal for developing an on delay output control signal at a predetermined time after receipt of the enabling signal, said control means being responsive to the on delay output control signal thereby switching heating current on when enabled by the on delay relay signal, including a d.c. power supply and a capacitor, and wherein said means responsive to ambient light comprises a light-sensitive resistor connected in series with said capacitor across said d.c. power supply, including a first transistor and a Zener diode, said first transistor having its base coupled to a circuit point between said capacitor and said light-sensitive resistor via said Zener diode, and further including a second transistor and a pair of resistors, said pair of resistors being connected in series with one another and across said capacitor, said second transistor having its collector connected to the collector of the said first transistor and its base connected to the emitter of the said first transistor and to a circuit point between said pair of resistors.

4,733,324
SURGE ARRESTOR
Kenneth D. George, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.
Filed Apr. 6, 1987, Ser. No. 34,700
Int. Cl.⁴ H02H *9/04*
U.S. Cl. 361—118 **11 Claims**



9. A surge arrestor comprising a pair of electrodes and a third electrode, means mounting said electrodes in spaced relation to form a first gap between said pair of electrodes normal and a second gap between said third electrode and one electrode of said pair of electrodes, and gravity movable means between said pair of electrodes, said movable means being movable by gravity to a first position where it forms a first value of conductance between said pair of electrodes, and being movable by gravity to a second position where it forms a second value of conductance between said pair of electrodes said means providing at least two different voltage breakdown levels.

4,733,325
ELECTRICAL PROTECTIVE DEVICES
Robert P. Loesch, Omaha, Nebr., assignor to American Telephone and Telegraph Company AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Sep. 23, 1986, Ser. No. 910,549
Int. Cl.⁴ H02H *9/06*
U.S. Cl. 361—119 **21 Claims**



1. An electrical protector assembly for protecting a circuit against excessive current increases an voltage surges, said protector assembly comprising:
a dielectric housing supporting the assembly;

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a grounding subassembly for grounding said protector assembly when excessive voltage surges and excessive current increases occur in a circuit;

a voltage protection subassembly connected electrically to said grounding subassembly;

a current protection subassembly including a dielectric base for supporting first and second electrically conductive elements and a shunting element which are connected together to establish electrical contact between a circuit and said protector assembly, said shunting element being movably mounted and supported in a predetermined position along said first element in axial alignment therewith by a spacing member which comprises a fusible material, said fusible material being interposed between an end portion of said first element and a portion of said shunting element without being secured to said shunting element by a fused portion of said spacing member; and

means interposed between said voltage protection subassembly and said housing and removed from a current path between said voltage protection and grounding subassemblies for maintaining said voltage protection subassembly in electrical engagement with said shunting element, and which is effective upon melting of the spacing member caused by the flow of current above a predetermined level for causing said shunting element to be moved along said first element to engage said grounding subassembly and provide a current path from said first element to said grounding subassembly.

4,733,326

PROTECTIVE ARRANGEMENT FOR AN ELECTROMAGNETIC LOAD

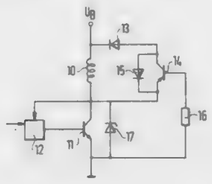
Klaus Harsch, Ditzingen; Wolfgang Kosak, Möglingen, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,356

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517490

Int. Cl.⁴ H01H *47/00*

U.S. Cl. 361—159 **10 Claims**



1. A protective arrangement for an electromagnetic consumer load, the protective arrangement comprising:

voltage supply means for said load;

first switching means for connecting said electromagnetic load to said voltage supply means and being switchable between a conductive state during which a current flows through said electromagnetic load and a blocking state in response to which a back emf develops across said electromagnetic load;

a free-wheeling circuit connected in parallel to said load, said free-wheeling circuit including:

a free-wheeling component and second switching means connected in series with said free-wheeling component;

said second switching means being nonresponsive during the conductive state of said first switching means and being responsive to a change from said conductive state to said blocking state of said first switching means for rendering said free-wheeling circuit conductive in response to said back emf so as to place said electromagnetic load into the free-wheeling condition when said voltage supply means has a first polarity and for rendering said free-wheeling circuit non-conductive irrespective of whether said first switching means is in the conductive or blocking states when said voltage supply means has a second polarity opposite to said first polarity.

4,733,327

ELECTRICAL CAPACITOR

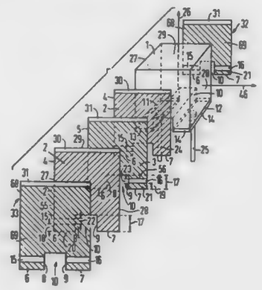
Reinhard Behn, Munich, and Ferdinand Utner, Regensburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 857,999, May 1, 1986, Pat. No. 4,667,382. This application Feb. 10, 1987, Ser. No. 13,135

Claims priority, application Fed. Rep. of Germany, May 13, 1985, 3517243

Int. Cl.⁴ H01G *4/30*

U.S. Cl. 361—306 **5 Claims**



1. An electrical capacitor, comprising:

a consolidated stack;

dielectric layers of plastic film laminated to one another to form said consolidated stack;

a metal coating layer on each of said dielectric layers, said metal layer being a regenerably thin layer of valve metal;

first and second projections formed by an incision in the direction of the thickness of said consolidated stack, said incision being substantially in the center of one narrow side of said consolidated stack;

said metal layers on alternate ones of said dielectric layers extending to the ends of alternate ones of said first and second projections, said metal layers covering a surface of each of said dielectric layers substantially to opposing long side edges corresponding to long sides of said consolidated stack, said metal layers defining metal-free strips on alternating ones of said dielectric layers to form remaining metal strips on said first and second projections;

said incision having a depth at least greater than the width of said remaining metal strips;

metal contacts formed on the end surfaces of said first and second projections by metal spraying, said metal contacts contacting said metal layers to connect said metal layers to one another and form antipolar coatings of said capacitor;

at least one cover layer on at least one of an upper and a lower side of said consolidated stack, said at least one cover layer being a capacitively ineffective cover layer of the same plastic film as said dielectric layers, said at least one cover layer being provided with a metal layer that defines metal-free insulating strips on both of said first and second projections to separate said metal layer from said metal contacts.

4,733,328

PROCESS FOR MANUFACTURING CAPACITIVE DEVICES AND CAPACITIVE DEVICES MANUFACTURED BY THE PROCESS

Daniel C. Blazej, Baldwinsville, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 653,252, Sep. 24, 1984, abandoned. This application Dec. 18, 1986, Ser. No. 943,526

Int. Cl.⁴ H01G *1/01, 3/06*

U.S. Cl. 361—320 **34 Claims**



1. A capacitive element which comprises: a laminated body comprising a metal substrate having one or more layered structures heat bonded to all or a portion of the surfaces thereof, each of said structures comprising a nonconductive layer comprised of sintered finely divided barium titanate and one or more glasses selected from the group consisting of alkali metal borates, silicates and germanates heat bonded to said metal substrate, and a metal conductive layer comprised of a sintered finely divided metal heat bonded to said non-conductive layer.

4,733,329

THREE-PHASE LOAD CENTER

Gregory P. Barner, Atlanta, and Drew S. Hancock, Marietta, both of Ga., assignors to Siemens Energy & Automation, Atlanta, Ga.

Filed Oct. 31, 1986, Ser. No. 926,008

Int. Cl.⁴ H02B *1/04;* **H05K** *7/20*

U.S. Cl. 361—355 **10 Claims**



1. A three-phase load center comprising:

an insulative base pan defining a top surface, a bottom surface, a slot, a first opening and a second opening, the top surface having a first and a second channel formed therein and the bottom surface having a first rib and a second rib formed thereon between the channels;

a first bus bar having an integrally formed upstanding stab and an opening, the first bus bar being positioned above the first channel, wherein the opening is aligned with the first opening;

a second bus bar having an integrally formed upstanding stab and an opening, the second bus bar being positioned above the second channel, wherein the second bus bar opening is aligned with the second opening, the second bus bar being electrically isolated from the first bus bar;

a third bus bar having a periphery and an integrally formed upstanding stab, the third bus bar being positioned beneath the base pan in contact with the ribs on the bottom surface of the base pan with the stab extending through the slot;

an insulator having a first opening and a second opening, the insulator being positioned such that the first opening is aligned with the first base pan opening and the second opening is aligned with the second base pan opening, wherein the insulator is positioned in contact with the third bus bar and extending beyond the periphery of the third bus bar; and

means for fastening the bus bars and the insulator to the insulative base pan.

4,733,330

WIRING-DEVICE MOUNTING STRUCTURE

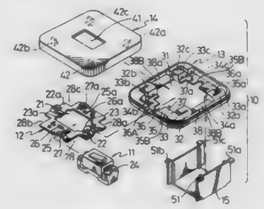
Sadamasa Tanaka, Yokkaichi; Takao Ota, Tsu, and Masaki Nakamura, Ichishi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 25, 1987, Ser. No. 18,397

Claims priority, application Japan, Mar. 19, 1986, 61-62767; Mar. 19, 1986, 61-62768

Int. Cl.⁴ H02B *1/10*

U.S. Cl. 361—356 **6 Claims**



1. A wiring device mounting structure comprising a mounting frame on which a wiring device is mounted for installation in a construction member, a laying plate interposed between said mounting frame and a mounting surface of said construction member, and a decorative plate having an opening therein for exposing a portion of said wiring device to the exterior, said mounting frame disposed between said laying plate and said decorative plate, said decorative plate covering a front face of said laying plate, said laying plate including support surface means facing an inner surface of said decorative plate, said mounting frame supported on said support surface means, said laying plate including raised portions disposed inside of an outer periphery of said laying plate and extending toward said inner surface of said decorative plate, said raised portions forming immovably rigid locking surfaces facing away from said inner surface and cam surfaces disposed in front of respective locking surfaces, the distance between said locking surfaces and said inner surface being less than the distance between said support surface means and said inner surface, a plurality of short locking projections disposed on said inner surface and extending toward said laying plate, free ends of said projections forming hooks and being engageable with said cam surfaces to be flexed sidewardly thereby until said hooks pass rearwardly beyond said locking surfaces and rebound to become superimposed behind said locking surfaces in manner requiring that said hooks be displaced sidewardly by a tool in order to remove said decorative plate forwardly from said laying plate, an outer edge of said laying plate including a recess arranged to receive a tool inserted between said outer edge and an outer edge of said decorative plate for flexing said decorative plate in a manner displacing adjacently disposed ones of said hooks sidewardly and out of superimposed relationship with said locking surfaces.

4,733,331

HEAT DISSIPATION MECHANISM FOR POWER SEMICONDUCTOR ELEMENTS

Claude Chauvet, Sevran, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Sep. 18, 1986, Ser. No. 908,632

Claims priority, application France, Sep. 30, 1985, 85 14419

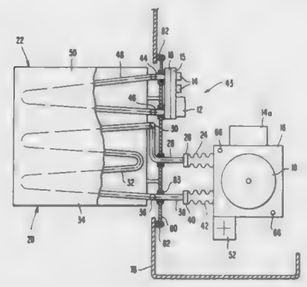
Int. Cl.⁴ H01L *23/46*

U.S. Cl. 361—385 **7 Claims**

1. A power semiconductor assembly with evaporative cooling, comprising a power semiconductor column in which power semiconductor elements are arranged in alternation and in thermal contact with evaporation blocks of good heat conducting material, each said evaporation block having a fluid inlet and a fluid outlet and being connected in a corresponding heat-dissipating fluid circuit, the corresponding fluid circuits of said evaporating blocks being separate from one another, each

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fluid circuit including respective heat exchange means having a fluid inlet connected to said fluid outlet of the corresponding evaporator block by way of a first flexible, electrically insulating fluid connection of that fluid circuit and a fluid outlet connected to said fluid inlet of the corresponding evaporation block by way of a second flexible, electrically insulating fluid connection of that fluid circuit, each fluid circuit containing a dielectric heat-carrying fluid which circulates between said



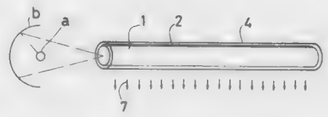
corresponding evaporation block and said heat exchange means, the circulating fluid providing a heat dissipation effect by evaporating due to heating in said corresponding evaporation block, passing to said heat exchange means through said first connection, condensing due to cooling in said heat exchange means, and returning to said corresponding evaporation block through said second connection.

4,733,332

ILLUMINATING DEVICE

Hiroshi Yamashita, Ikeda; Kanenaga Fujii, Kawanishi; Junji Hayakawa, Takatsuki; Toru Komiyama, and Shun Koizumi, both of Kawanishi, all of Japan, assignors to Agency of Industrial Science and Technology and Daikin Industries, Ltd., both of, Japan

PCT No. PCT/JP85/00081, § 371 Date Mar. 27, 1986, § 102(e) Date Mar. 27, 1986
PCT Filed Feb. 22, 1985, Ser. No. 855,068
Int. Cl.⁴ F21V *7/04*
U.S. Cl. 362—32 **16 Claims**



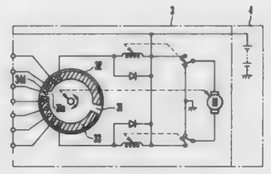
1. An illuminating device characterized in that the device comprises:
- a light-transmitting rod for transmitting the light incident on one end thereof toward the other end,
- a light-impervious diffusion pattern which is formed on the outer peripheral surface of the rod in the shape of a discrete line extending continuously or discretely axially of the rod and which is capable of diffusing and reflecting the transmitted light incident thereon back through the rod and out an opposite side of the rod in a directional projection, said diffusion pattern comprising a fine powder of high refractive index and an adhesive, and
- a transparent protective tube covering the peripheral surface of the rod with a circumferential clearance formed between the rod and the tube, the clearance between the rod and the protective tube being sealed off at opposite ends thereof.

4,733,333

CORNERING LAMP SYSTEM FOR VEHICLE

Hiroki Shibata; Atsushi Toda; Keiichi Tajima, and Masahiro Kusagaya, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 913,129
Claims priority, application Japan, Sep. 30, 1985, 60-216912; Sep. 30, 1985, 60-216913; Feb. 6, 1986, 61-22986; Apr. 15, 1986, 61-85114
Int. Cl.⁴ B60Q *1/06*
U.S. Cl. 362—40 **15 Claims**



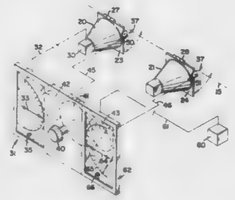
1. A cornering lamp system in conjunction with a steering mechanism of a vehicle comprising:
- lighting means having a least a first and a second headlight; means for changing the direction of a irradiation beam of light transmitted from said lighting means in a stepwise manner in accordance with said steering mechanism;
- variable phase timing means for moving one of said headlights prior to moving the other headlight when said steering mechanism is operated;
- delay means for operating to provide a stepwise change of direction of said lighting means to occur out of phase with a change of direction of said steering mechanism.

4,733,334

HEADLIGHT LEVELING DEVICE

Michael F. Krey, 11 Peninsula Rd., White Bear Lake, Minn. 55110

Filed Apr. 10, 1987, Ser. No. 36,585
Int. Cl.⁴ B60Q *1/10*
U.S. Cl. 362—71 **7 Claims**



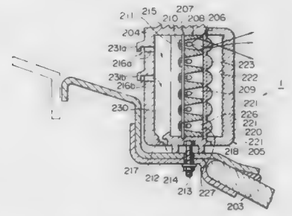
1. A vehicle headlight adjustment mechanism mounted in a vehicle, said adjustment mechanism comprising:
- (a) a ground level detection mechanism constructed and arranged to measure a level of a ground plane upon which the vehicle is positioned;
- (b) a headlight level detection mechanism constructed and arranged for measuring an orientation of headlight aim of the vehicle, relative to the vehicle and the horizontal;
- (c) a level comparison mechanism constructed and arranged for comparing a level detected by said ground level detection mechanism to said relative level detected by said headlight level detection mechanism; and
- (d) a headlight aim adjustment mechanism constructed and arranged for selective adjustment of headlight aim.

4,733,335

VEHICULAR LAMP

Hiroyuki Serizawa; Masaru Saaki; Jiro Miyagawa, all of Shizuoka; Toshinobu Takasaki, Tokyo, and Kenji Arima, Shizuoka, all of Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,592
Claims priority, application Japan, Dec. 28, 1984, 59-276805; Feb. 5, 1985, 60-19301; Mar. 11, 1985, 60-48066; Oct. 21, 1985, 60-233526
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 362—80 **32 Claims**



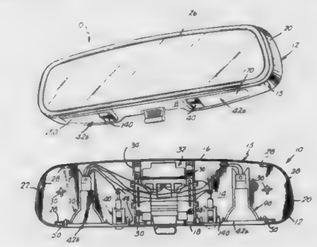
1. A vehicular lamp comprising:
- a supporting board (**210**);
- a plurality of light-emitting diodes (**209**) arranged on said supporting board;
- condenser lenses (**223**) provided in front of respective ones of said light-emitting diodes;
- diffusion lenses (**222**) arranged in front of said condenser lenses; and
- a housing member (**204**) supporting said supporting board, said condenser lenses, and said diffusion lenses, said housing member having air holes (**216**) formed therein, and said diodes are arranged on one side of said supporting board, and the other side of said supporting board and walls of said housing member form a chamber, said air holes being provided in the walls of said housing which form said chamber.

4,733,336

LIGHTED/INFORMATION CASE ASSEMBLY FOR REARVIEW MIRRORS

Brian I. Skogler, Spring Lake; Kenneth Schofield; William P. Lantz, both of Holland; Eldon J. Nyhof, Zeeland; Dorothy J. Helder, and Charles M. Flowerday, both of Holland, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Jun. 26, 1986, Ser. No. 879,158
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 362—142 **53 Claims**



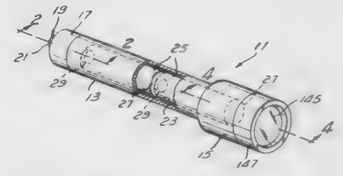
1. A case assembly for a vehicular rearview mirror comprising:
- a mirror case having a back and a peripheral sidewall defining a front opening adpated to receive a mirror element, said peripheral sidewall including top, bottom and end wall portions, said back spaced from said front opening to define an interior space within said case;
- means for mounting said case on a support;
- an opening in said bottom wall portion;
- carrier means for supporting a light, a control, an instrument or the like within said interior space, said carrier means including a rigid support and mounting means for mounting said support within said opening such that said support is generally flush with the exterior of said bottom wall portion; and
- removal means accessible from the bottom of said case assembly for allowing removal of said carrier means from said bottom wall opening without disassembling other portions of said mirror case.

4,733,337

MINIATURE FLASHLIGHT

Lee K. Bieberstein, Newport Beach, Calif., assignor to Lite Tek International Corp., Flushing, N.Y.

Filed Aug. 15, 1986, Ser. No. 896,940
Int. Cl.⁴ F21L *9/00*
U.S. Cl. 362—206 **15 Claims**



1. A flashlight, comprising:
- a lamp bulb holder;
- a head assembly, said assembly including a lens through which light from a bulb held by said lamp holder can be emitted;
- an elongated battery retainer for retaining one or more dry cell batteries in series, each of said batteries having a positively and a negatively charged terminal, said positively charged terminal oriented away from said head assembly;
- a spring to bias said batteries away from said head assembly;
- an end cap opposite said assembly from said battery retainer; and
- a switch mechanism in said end cap including a nonconductive contact housing, said housing including a recess having a depth slightly less than the height of said positively charged terminal and a width slightly greater than the width of said positively charged terminal, said positive terminal being received by said recess and being protected from damage by said housing.

4,733,338

ILLUMINATOR, PARTICULARLY FOR STREET LIGHTING AND INDUSTRIAL APPLICATIONS

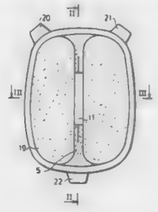
Zoltán Fehér; Miklós Csapody; Károly Jermendy, and András Szeverényi, all of Budapest, Hungary, assignors to Tungsram Reszvenytarsasag, Budapest, Hungary

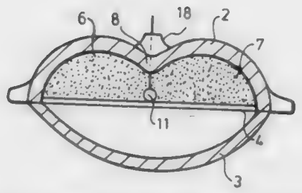
Filed Sep. 30, 1986, Ser. No. 913,721
Claims priority, application Hungary, Oct. 1, 1985, 3792/85
Int. Cl.⁴ F21V *7/00*
U.S. Cl. 362—310 **20 Claims**

1. An illuminator, particularly for street lighting and industrial applications, comprising a light source including a gas discharge tube, a closed outer vessel for receiving said gas discharge tube, said vessel comprising a rear half part and a front half part for forwarding light of said light source, at least said front half part being made of light transparent material, light reflecting means partly covering the inner surface of said rear half part of said outer vessel, mechanical fitting elements and electric connecting means, wherein said front half part and said rear half part are each symmetric relative to first and

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second symmetry planes and said first symmetry plane includes the longitudinal axis of said gas discharge tube, said longitudinal axis of said gas discharge tube being perpendicular to said





second symmetry plane, and said rear half part having a curved profile comprising two concavities in said second symmetry plane and a curved profile comprising one concavity in said first symmetry plane.

4,733,339

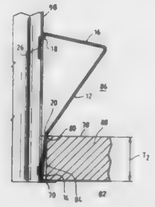
MOUNTING SYSTEM FOR RECESSED LIGHT FIXTURE

Jeffrey C. Kelsall, Roselle, Ill., assignor to Cooper Industries, Houston, Tex.

Filed Aug. 21, 1986, Ser. No. 898,479

Int. Cl.[4] F21S *1/06, 3/06*

U.S. Cl. 362—366 **13 Claims**



1. A mounting system for a recessed lighting fixture having side walls to be mounted in a hole in a ceiling mounted system comprising:

a bendable leg member, said bendable leg member movable between a first position along the side wall of the fixture and a second position away from the side wall of the fixture;

means for pivoting said bendable leg member between said first and second positions formed on one end of said bendable leg member;

means for retaining said bendable leg member in said second position;

whereby the recessed lighting fixture may be retained in the ceiling irrespective of ceiling thickness by first inserting the canister portion of the lighting fixture into the ceiling with said leg member in said first position and then pivoting said bendable leg member into engagement with the ceiling so that the engagement of said bendable leg member with the ceiling causes the bendable leg member to flex toward said recessed lighting fixture and engaging said means for retaining said bendable leg member with the side wall to retain said bendable leg member in said second position.

4,733,340

APPARATUS FOR STABILIZING TURBINE-GENERATOR SHAFT TORSIONAL OSCILLATIONS

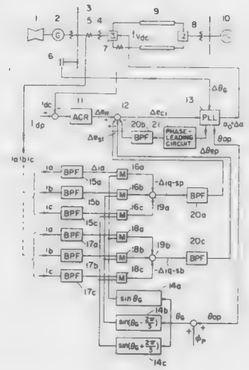
Akira Mase, Hino, and Atsushi Kurita, Koganei, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1987, Ser. No. 21,272

Claims priority, application Japan, Mar. 3, 1986, 61-45653

Int. Cl.[4] H02J *3/36*

U.S. Cl. 363—35 **3 Claims**



1. An apparatus for stabilizing turbine generator shaft torsional oscillations including:

(a) a current detector for detecting ac current of a turbine generator used in combination with a dc power-transmission system;

(b) a filter to which an output of said current detector is delivered, said filter comprising a first bandpass filter for detecting a sub synchronous component ($f_1 - f_m$) and a second bandpass filter for detecting a super synchronous component ($f_1 - f_m$) where fundamental frequency of said generator is represented by f_1 and a natural frequency of the mechanical shaft system of said generator is represented by f_m;

(c) a calculation circuit for applying conversion of at least one of d and q axis to respective outputs from said first and second bandpass filters using a generator phase θ_G to take out at least one of Δi_d and Δi_q of the sub and super synchornous components;

(d) a third bandpass filter to which an output from said calculation circuit is fed, said third bandpass filter for taking out a stabilization signal therefrom, and a circuit for controlling a converter for delivering an output of said generator to said dc power-transmission system on the basis of said stabilization signal.

4,733,341

PLURAL INVERTER SYNCHRONIZER AND CONTROL APPARATUS

Yoshiaki Miyazawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1986, Ser. No. 943,727

Claims priority, application Japan, Dec. 20, 1985, 60-286931

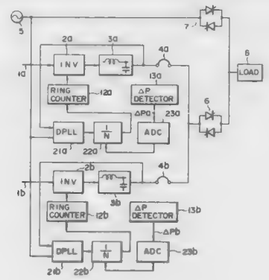
Int. Cl.[4] H02M *7/42*

U.S. Cl. 363—71 **9 Claims**

1. A control apparatus for controlling an inverter circuit, so that the inverter circuit is operated in synchronism with a predetermined reference frequency, and in a parallel mode with respect to an other power supply, said control apparatus comprising:

phase-locked loop means, coupled to said inverter circuit, for varying an output frequency of said inverter circuit, so that an output phase of said inverter circuit matches a phase of said predetermined reference frequency;

first control means, coupled to said inverter circuit, for detecting an active power deviation between an output of said inverter circuit and that of said an other power; and



programmable divider means, coupled to said control means, said phase-locked loop means, and said inverter circuit, for frequency-dividing an output of said phase-locked loop means with a ratio of the frequency dividing depending on said active power deviation is reduced, thereby controlling the share of active power between the output of said inverter circuit and that of said an other power supply.

4,733,342

POWER SUPPLY FOR AN INDUCTIVE USER, PARTICULARLY A GRADIENT COIL

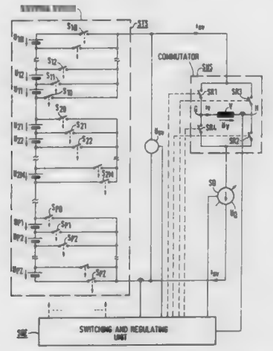
Albert Mueller, and Ingemar Neuffer, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 57,326

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621889

Int. Cl.[4] H02M *7/538*

U.S. Cl. 363—132 **16 Claims**



1. A power supply for generating brief current pulses with high edge steepness and a high final value for inductive users, which generates a high user voltage for rapid build-up of the pulse and a low user voltage for maintenance of said pulse, said power supply comprising:

a stepping switch which presets the magnitude of said user voltage;

a variable voltage source connected in series with said stepping switch and with said user which allows fine adjustment of the magnitude of said user voltage;

a voltage commutator connected to said user and being connected in series with said stepping switch and said variable voltage source which provides said user voltage with an appropriate operational sign for respectively rapidly building-up said pulse or dismantling said pulse; and

a switching and regulating means for driving said stepping switch, said variable voltage source and said voltage commutator dependent on the final value, the edge steepness, and the operational sign of said pulses.

4,733,343

MACHINE TOOL NUMERICAL CONTROLLER WITH A TROUBLE STOP FUNCTION

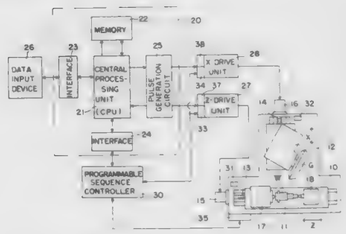
Takao Yoneda, Toyoake, and Yasuji Sakakibara, Hekinan, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 12, 1986, Ser. No. 828,650

Claims priority, application Japan, Feb. 18, 1985, 60-31218

Int. Cl.[4] G05B *9/02*

U.S. Cl. 364—184 **6 Claims**



1. In a machine control apparatus for controlling the movement of a movable member of a machine tool in accordance with a numerical control program, the improvement comprising:

first stop control means for immediately stopping said movable member;

second stop control means for stopping said movable member through the execution of a slow-down feed so as to prevent the actual position of said movable member from differing from a present position stored in said machine control apparatus;

trouble identification means for identifying the kind of a trouble occurring in said machine tool; and

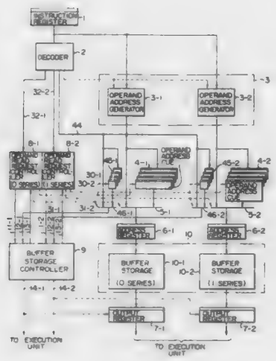
trouble processing means for selectively operating said first and second stop control means depending upon the kind of the trouble identified by said trouble identification means, when said movable member is being moved in accordance with one data block of said numerical control program.

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4,733,344
DATA PROCESSING APPARATUS FOR CONTROLLING READING OUT OF OPERANDS FROM TWO BUFFER STORAGES

Masaya Watanabe, and Shuichi Abe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,153
Claims priority, application Japan, Dec. 29, 1984, 59-279657
Int. Cl.[4] G06F 9/34
U.S. Cl. 364—200 3 Claims



1. A data processing apparatus for fetching an operand indicated by an instruction from a storage which includes a main storage and a buffer store which stores a copy of frequently used instructions and data stored in the main storage, comprising:

(a) first and second buffer storages in said buffer store and each being independently accessible;

(b) instruction means for decoding instructions received in sequence and for outputting for each instruction a fetch request and at least one operand address according to whether said instruction is a one-operand instruction or a two-operand instruction, including means responsive to a one-operand instruction for providing said operand address to said first buffer storage and responsive to a two-operand instruction for providing one operand address to said first buffer storage and another operand address to said second buffer storage; and

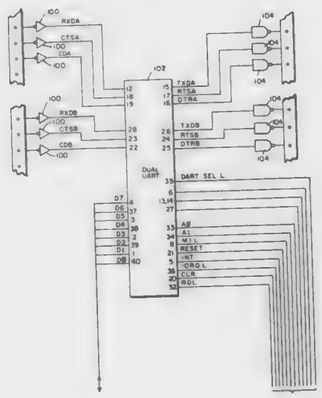
(c) storage control means for controlling the sequence of operation of said instruction means, including means connected to said buffer store for supervising the busy/free status of each of said first and second buffer storages, means for transferring a re-request signal to said instruction means upon a condition that said first buffer storage is busy when the fetch request calls for a one-operand instruction or a condition that at least one of said buffer storages is busy when said fetch request calls for a two-operand instruction, and means for indicating a busy state of said buffer store during a predetermined cycle when said re-request signal is transferred to said instruction means;

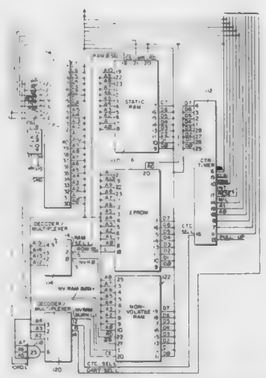
wherein said instruction means further includes means responsive to said re-request signal for outputting said fetch request and said operand address once again to said storage control means and said buffer store in the sequence of receipt of instructions for decoding by said instruction means.

4,733,345
COMPUTER-TELEPHONE SECURITY DEVICE

Paul D. Anderson, 1302 Westchester Ct., Mahomet, Ill. 61853

Filed Jul. 29, 1985, Ser. No. 759,689
Int. Cl.[4] G06F 7/04
U.S. Cl. 380—25 12 Claims



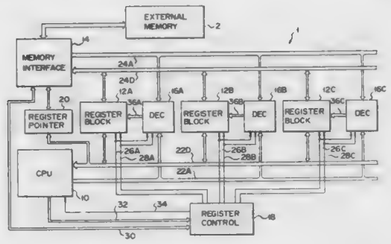


1. A computer access security system for authorizing access to a host computer from a remote terminal, comprising a master unit coupled to the host computer, a slave unit coupled to the remote terminal, the slave unit including means for storing a plurality of slave unit passwords, the master unit including means for storing a plurality of master unit passwords, the slave unit including means for transmitting each slave unit password to the master unit, the master unit including means for comparing the received slave unit passwords with the stored master unit passwords, the master and slave units including means for permitting the remote terminal access to the host computer as a function of a successful comparison of the slave unit passwords received by the master unit with the stored master unit passwords, one of the slave and master units including means for generating access data upon the successful comparison of the slave unit passwords received by the master unit with the stored master unit passwords and transmitting it to the other of the master and slave units, the master unit including means for using the access data to derive a plurality of new master unit passwords and replacing the stored master unit passwords with the new master unit passwords, the slave unit including means for using the access data to derive a plurality of new slave unit passwords identical to the new master unit passwords and replacing the stored slave unit passwords with the new slave unit passwords.

4,733,346
DATA PROCESSOR WITH MULTIPLE REGISTER BLOCKS

Koichi Tanaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 8, 1985, Ser. No. 763,716
Claims priority, application Japan, Aug. 20, 1984, 59-172742
Int. Cl.[4] G06F 9/06, 13/00
U.S. Cl. 364—200 16 Claims



1. A data processing apparatus comprising:

a memory;

a plurality of register blocks, each including a plurality of registers and each including state means for setting the corresponding register into one of a plurality of states including a "save" state, in which the corresponding register block supplies data to be saved in said memory for a subroutine call, a "restore" state in which the corresponding register block receives saved data from said memory for a subroutine return, an access state in which the correponding register can be accessed for a subroutine call or return to pass parameters, and a use state;

program executing means for accessing at least one of said plurality of register blocks and for executing a program including a subroutine call and a return, said program execution means including means, responsive to the program subroutine call and return, for generating a subroutine call signal and a return signal, respectively;

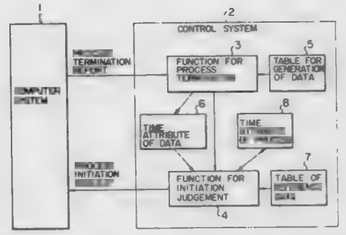
memory interface means for holding addresses for said memory, responsive to said subroutine call signal and return signal generated from said program executing means, for executing a data transfer between said memory and one of said plurality of register blocks set in the "save" state or the "restore" state, and for generating an end signal upon completion of said data transfer; and

register control means for setting a first one of said plurality of register blocks into said access state thereby allowing access by said program executing means in response to said subroutine call signal or return signal, for selectively setting a second one of said register blocks into said "save" state or "restore" state, and, responsive to said end signal, for selectively setting a third of said plurality of register blocks into said use state for use by said program executing means.

4,733,347
METHOD AND APPARATUS FOR SYNCHRONIZED CONCURRENT PROCESSES

Kazuhiko Fukuoka, Machida, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 27, 1984, Ser. No. 654,896
Claims priority, application Japan, Sep. 30, 1983, 58-180232
Int. Cl.[4] G06F 9/46
U.S. Cl. 364—200 5 Claims



1. A process execution control method for use in an information processing system which executes a plurality of processes each referring to at least one data item, to produce, as a result of execution, at least one data item, comprising:

a first step of storing, for each of said processes, an identifier of a data item to be referred to by each process and a time condition representative of a valid time attribute to be assigned to said data item;

a second step of storing, for each of said processes, time attribute information representative of a time point at which each process is to be executed;

a third step of storing a data item produced by executing a given one of said processes and said time attribute information of said second step associated with said executed process;

a fourth step of referring to time attribute information of each of the data items which have been already produced and selecting out of said plurality of processes one process in which every data item to be referred to by said one process satisfies said time condition previously defined at said first step; and

a fifth step of executing said selected process and updating said time attribute information corresponding to said executed process, so that said time attribute information of said executed process indicates an updated time point;

whereby data items having an identical identifier are given different time attribute informations depending upon time points of execution of a process by which execution of said data items have been produced, and a data item identified by said time attribute information is referred to by each process.

4,733,348
VIRTUAL-MEMORY MULTIPROCESSOR SYSTEM FOR PARALLEL PURGE OPERATION

Takashi Hiraoka, and Toyohiko Matsushita, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

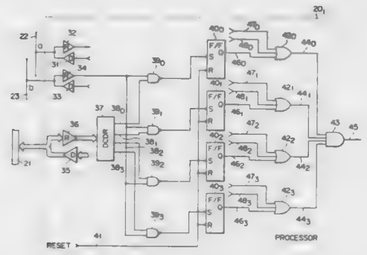
Filed May 30, 1985, Ser. No. 739,156
Claims priority, application Japan, May 31, 1984, 59-111900
Int. Cl.[4] G06F 12/08
U.S. Cl. 364—200 2 Claims

1. A virtual-memory-type multiprocessor system having a plurality of processors each having a translation lookaside buffer, comprising:

a first processor having a purge request signal generating means for supplying a common purge request signal requesting purging of translation lookaside buffers of said other processors;

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a plurality of flip-flops provided in each of said plurality of processors each of said flip-flop for storing a corresponding purge end signal, for each of said plurality of processors, each of said other processors, upon completion of purge operations in response to the common purge request signal, sending a corresponding processor number to each



other processor; each of said processors further comprising: a decoder for decoding each processor number sent and setting the flip-flop corresponding to the decoded processor number; and

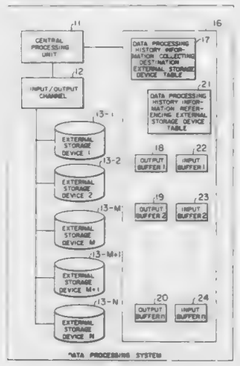
purge end detecting means connected to each of said plurality of flip-flops for detecting the end of the purging of all processors.

4,733,349

METHOD FOR RECORDING AND MANAGING PROCESSING HISTORY INFORMATION USING A PLURALITY OF STORAGE DEVICES

Takashi Sumiyoshi, Yokohama, and Toshiyuki Kinoshita, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,158
Claims priority, application Japan, Jun. 20, 1983, 58-110433
Int. Cl.⁴ G06F *3/06*
U.S. Cl. 364—200 **5 Claims**



1. A history information managing method for use in a data processing system which includes;

at least three external storage device for storing therein history information of various lengths;

first means for storing therein write position information indicating a position within a respective external storage device in which new history information is to be written for each said external storage device; and

second means for storing therein information indicating one of said external storage devices in which history information has been most recently written; said history information managing method comprising:

a first step of selecting one of said external storage devices in which the history information is to be next written in accordance with said second means;

a second step of reading out from said first means write position information corresponding to said one of the external storage devices selected in said first step;

a third step of writing the history information in a position indicated by said write position information which has been read out of said second step for said one of the external storage devices selected in said first step;

a fourth step of updating the content of said second means after processing of said first step; and

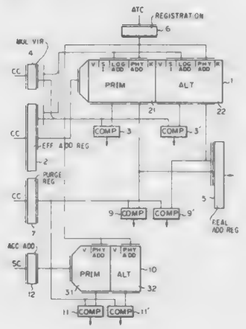
a fifth step of updating the write position information stored in said first means for said one of the external storage devices after processing of said second step in accordance with the length of the history information written in said third step.

4,733,350

IMPROVED PURGE ARRANGEMENT FOR AN ADDRESS TRANSLATION CONTROL SYSTEM

Hirosada Tone, Fuchu, and Tsutomu Tanaka, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 17, 1984, Ser. No. 682,509
Claims priority, application Japan, Dec. 29, 1983, 58-246112
Int. Cl.⁴ G06F *12/08*
U.S. Cl. 364—200 **7 Claims**



1. An address translation control system comprising:

an access means for accessing an address translation buffer;

said address translation buffer stores a plurality of entries of translated addresses, each of said entries including at least a valid flag, a logical address field and physical address field;

purge register containing a physical address to be purged from said address translation buffer;

first comparator means connected to said address translation buffer and said purge register, said first comparator means for comparing said physical address in said purge register with a physical address read from said address translation buffer, wherein use of said physical address from said address translation buffer is enabled when said first comparator means determines said physical address from said address translation buffer does not coincide with said physical address in said purge register, and use of said physical address from said address translation buffer is inhibited when said first comparator means determines said physical address from said address translation buffer does coincide with said physical address in said purge register;

memory array connected to said address translation buffer, said memory array stores copies of said valid flags and said physical addresses from said address translation buffer; and

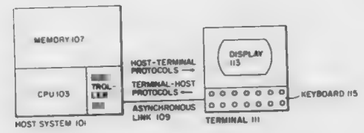
second comparator means connected to said purge register and said memory array, said second comparator means for comparing said physical address in said purge register with a physical address from said memory array, wherein said physical addresses in said memory array are sequentially accessed and compared by said second comparator means, and when said second comparator means determines that said physical address accessed from said memory array coincides with said physical address in said purge register, said coinciding physical address is purged from said address translation buffer and from said memory array.

4,733,351

TERMINAL PROTOCOLS

Richard J. Peirent, Tewksbury, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 31, 1984, Ser. No. 688,120
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 364—200 **4 Claims**



1. In a display device which is connected with a digital computer system, is responsive to sequential protocols received from the digital computer system, and displays sequences of characters, and in which each character is associated with an attribute defining how the character is to be displayed, means for controlling the display of the characters in the display device comprising:

(1) means for specifying a current attribute;

(2) writable attribute association means for associating each character to be displayed with its attribute:

(3) a rewrite attribute protocol specifying that the attribute associated with each character of a specified sequence of the characters be set to the current attribute; and

(4) means in the display device responsive to the rewrite attribute protocol and the means for specifying the current attribute for setting the writable attribute association means so that each character of the specified sequence is associated with the current attribute.

4,733,352

LOCK CONTROL FOR A SHARED STORAGE IN A DATA PROCESSING SYSTEM

Kouji Nakamura; Kanji Kubo; Katsuro Wakai, all of Hadano; Makoto Kishi, Ashigarakamigun, and Toshihisa Matsuo, Atugi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,913
Claims priority, application Japan, Dec. 30, 1983, 58-247670
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **5 Claims**

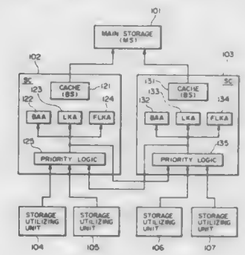
1. A lock control for a storage having a plurality of addressable storage locations shared by a plurality of storage utilizing units each capable of locking desired storage locations in said storage, comprising a plurality of lock control means each connected to at least one of said storage utilizing units for executing lock control for the storage utilizing unit or units connected thereto, each of said lock control means including:

lock address holding means for holding addresses of storage locations locked by said storage utilizing unit or units connected thereto;

lock address copy holding means for holding a copy of addresses of storage locations locked by the storage utilizing unit or units connected to another lock control means;

lock request receiving means connected to respective lock request receiving means of another lock control means for communicating a requested address involved in a storage location lock request;

comparing means for comparing a requested address involved in a storage location access request from one of



said connected storage utilizing unit or units with the contents of said lock address holding means and said lock address copy holding means, except for the addresses of storage locations locked by the storage utilizing unit which has issued said storage access request; and

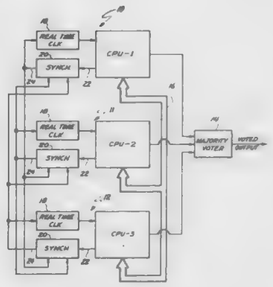
means operatively connected to said comparing means for controlling the processing of said storage access request according to the result of comparison by said comparing means.

4,733,353

FRAME SYNCHRONIZATION OF MULTIPLY REDUNDANT COMPUTERS

Vijay C. Jaswa, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,795
Int. Cl.⁴ G06F *15/16*
U.S. Cl. 364—200 **20 Claims**



1. A method of synchronizing a plurality of computer systems at predetermined frame intervals, the method being performed in each computer system and comprising the steps of instructing, at each frame interval, said computer system to set a sync flag and to enter a first state in which program execution is halted; determining which computer of said plurality have set a sync flag and defining a corresponding first set of computer systems with sync flags set; comparing the first set to a second set of computer systems which during a prior frame interval had set and then reset sync flags, and transitioning to a second state upon a first predetermined condition being

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satisfied; transitioning from the second state to a third state after a first predetermined pause and instructing the computer system to reset its sync flag and restart program execution; determining, in the third state, which computer systems of said plurality have reset sync flags and defining a corresponding third set of computer systems; comparing the third set with the second set and transitioning to a fourth state upon a second predetermined condition being satisfied; transitioning to a fifth state after a second predetermined pause; updating, in the fifth state, the second set to correspond to those computer systems which had set and then reset sync flags during said foregoing transitioning steps; and repeating all of the foregoing steps at each subsequent frame interval.

4,733,354

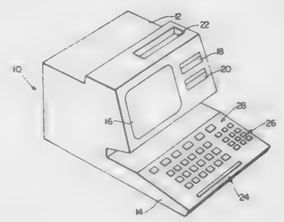
METHOD AND APPARATUS FOR AUTOMATED MEDICAL DIAGNOSIS USING DECISION TREE ANALYSIS

Brian Potter, 3305 Pottawattamie Trail, Michigan City, Ind. 46360, and Michael C. Potter, Spring Valley, Calif., assignors to Brian Potter, Michigan City, Ind.

Filed Nov. 23, 1984, Ser. No. 674,130

Int. Cl.[4] C06F *15/42*

U.S. Cl. 364—415 **13 Claims**



1. An interactive coomputerized system for performing a differential dermatopathological diagnosis of a biopsy based on characteristics of said biopsy product, said system comprising

an output means for presenting a set of plurality of selected histopathological changes to an operator;

an input means for entering operator selected responses;

a memory means for storing a hierarchical data base, said data base comprised of a plurality of downwardly linked files, each file comprised of a header record and a plurality of data records, said operator selected response corresponding to one of said data records, said header record comprised of a file identification field and a field for containing the number of the data records located in the file, and each said data record comprised of a linking identifier field and a data field, said data field containing a histopathological change when said identifier field contains an entry of a file identifier that points to a data record located below in the hierarchy and containing a differential diagnosis when said identifier field does not contain said file identifier; and

processor means under a programmed control for receiving operator entered responses, for responding to the contents of the identifier field of said operator selected record for retrieving the linked file stored elsewhere in said memory means, and for providing the data stored in said linked file to said output means.

4,733,355

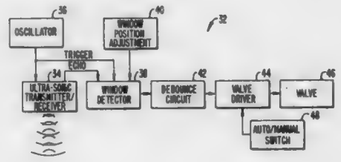
NON-CONTACTING RANGE SENSING AND CONTROL DEVICE

Richard W. Davidson, Dublin, and John W. Fletcher, Pleasanton, both of Calif., assignors to Agtek Development Company, Inc., Livermore, Calif.

Filed Feb. 10, 1986, Ser. No. 828,155

Int. Cl.[4] A01D *75/28*

U.S. Cl. 364—424 **14 Claims**



1. An apparatus for controlling the position of a grading implement of an earth-moving vehicle relative to a datum that extends along the direction of travel of the vehicle and that is elevated above ground level, said apparatus comprising:

position adjustment means coupled to the implement for moving the implement in one direction relative to the datum in response to a positive error signal and for moving the implement in an opposite direction relative to the datum in response to a negative error signal;

sonic means coupled for movement with the implement for periodically transmitting a sonic signal downward toward the datum and for receiving a sonic signal reflected upward from the datum, wherein the time period between the transmission and receipt of said sonic signal defines a measurement time period that is proportional to the separation distance between said sonic means and the datum;

timing means for periodically defining consecutive first, second, and third comparison time intervals of finite duration, wherein said first comparison time interval defines a positive error region beginning at a time after the transmission of the sonic signal by said sonic means, said second comparison time interval defines a nominal error region beginning at the end of said first comparison time interval, and said third comparison time interval defines a negative error region beginning at the end of said second comparison time interval; and

comparison means for periodically comparing said measurement time period to said comparison time intervals, for generating said positive error signal if said measurement time period ends during said first coparison time interval, for generating said negative error signal if said measurement time period ends during said third comparison time interval, for generating no error signals if said measurement time period ends during said second comparison time interval, for generating no error signals if said measurement time period ends before said first comparison time interval begins, and for generating no error signals if said measurement time period ends after said third comparison time interval ends.

4,733,356

CONTROL DEVICE FOR A VEHICLE ROUTE GUIDANCE SYSTEM

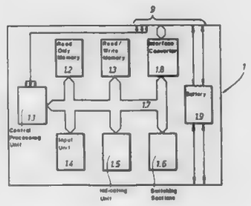
Peter Haeussermann, Backnang; Ferdinand Panik, Feilbach; Hermann Gaus, Stuttgart, and Gerhard Druecker, Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,478

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445668

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—424 **18 Claims**



1. A control device of a multiple component vehicle route guidance system comprising a vehicle-installed on-board section having a navigation computer and a vehicle-installed display for indicating the driver information data of the system, and the control device, which includes:

second operating means for inputting operation commands to said on-board section, said second operating means being operable only when said control device is in said second plugged-in position.

switching means for enabling and disabling various functions of said route guidance system, wherein in said second plugged-in position, said switching means disables said first operating means, and enables said second operating means to operate said on-board section; causes driver information data to be indicated only on said vehicle display; and causes automatic

integrated route computer means for computing a vehicle route,

first operating means for inputting operation commands to said integrated route computer means,

a control device display connected to said route computer means for indicating driver information data,

interface means for allowing said control device to operate independent of said vehicle or attached by being plugged in to said on-board section of said vehicle,

sensor means for detecting a first or second plugged-in position of said control device, wherein in said first plugged-in position, said first operating means is able to input operation commands to said integrated route computer means, and said driver information data is displayed on said vehicle-installed display,

and

route guidance mode of operation of the system to be automatically switched over to said on-board section.

4,733,357

LEARNING CONTROL SYSTEM FOR CONTROLLING AN AUTOMOTIVE ENGINE

Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,845

Claims priority, application Japan, Jul. 13, 1984, 59-146649

Int. Cl.[4] F02M *17/00*

U.S. Cl. 364—431.04 **6 Claims**

1. A system for updating data in an apparatus for controlling air-fuel ratio in an automotive engine by the updated data, the system comprising:

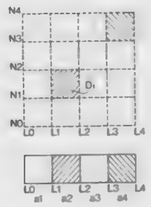
a table for storing data;

first means for detecting an operating condition of the engine and for producing a feedback signal dependent on the condition;

the apparatus comprising means for controlling the air-fuel ratio dependent on said feedback signal and on currently prevailing of the data in the table;

said system further comprising:

second means for determining that the engine (operating condition) is in a state suitable for updating the data stored in the table and for producing an output signal at the first occurrence of the state;



third means for detecting the output signal and for producing a first updating signal when the output signal did not exist before, and respectively for producing a second updating signal in accordance with the output signals after the first occurrence of said output signal;

fourth means responsive to the first updating signal for updating the data in the table with new value dependent on the feedback signal;

fifth means responsive to the second updating signal for incrementing and decrementing the data in the table with a minimum incremental value of one bit; and

sixth means for continuing the operation of the fifth means until the feedback signal reaches a desired value.

4,733,358

METHOD FOR OPTIMIZING THE AIR/FUEL RATIO UNDER NON-STEADY CONDITIONS IN AN INTERNAL COMBUSTION ENGINE

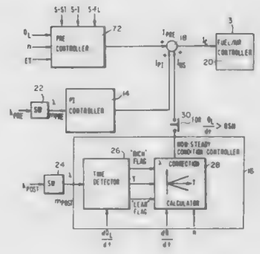
Jörg Abthoff, Plüderhausen; Dieter Schuster, Schorndorf; Christoph Noller, Waiblingen; Ferry Dürschmidt, Friolzheim, and Gunter Loose, Remseck, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,432

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424532

Int. Cl.[4] F02M *17/00*

U.S. Cl. 364—431.05 **12 Claims**



1. A control method for optimizing the fuel/air ratio under non-steady conditions in an internal combustion engine, which

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is equipped with a pre- and post-exhaust gas catalyst probe and a control system for adjusting undesired fuel/air ratio recognized by said probe comprising:

storing a plurality of sets of correction control values and time values of the duration which the post-catalyst probe indicates an undesirable fuel/air ratio, for a plurality of sets of specified engine-operating conditions in the non-steady range;

determining a non-steady range of operation;

sensing engine operation conditions, reading a set of a correction control value and a time value for the sensed engine-operating conditions, and modifying said read correcting control value to achieve a desired fuel/air ratio;

measuring the time the post catalyst probe indicated undesirable fuel/air ratio using said modified correcting control value;

comparing said measured time with the read time value; and storing said modified correction value and measured time value for the set of sensed engine operating conditions if said measured time value is less than said read time value.

8. In a control system for correcting fuel/air ratio of an internal combustion engine having a pre- and post-exhaust gas catalyst probe and means for adjusting said fuel/air ratio in response to ratios sensed by said probes to achieve a desired fuel/air ratio the improvement being means for providing non-steady sense of operation correction signal to said adjusting means comprising:

means for storing a plurality of sets of correcting control values and time values of the duration which the post-catalyst probe indicates an undesirable fuel/air ratio, for a plurality of sets of specified engine-operating conditions in the non-steady range;

means for determining non-steady range of operation;

means for sensing engine operating conditions;

means for reading a set of a correction control value and a time for said sensed engine operating conditions;

means for modifying said read correction control value to achieve a desired fuel/air ratio and providing said signal to said adjusting means in response to a determined non-steady range;

means for measuring the time the post-catalyst probe indicates an undesirable fuel/air ratio using said modified correction value;

means for comparing said measured time value with said read time value; and

means for storing said modified correction value and measured time value for the set of sensed engine operating conditions if said measured time value is less than said read time value.

4,733,359

DOCUMENT COLLATING AND INSERTING SYSTEM HAVING DISPLAYS FOR DOCUMENT COUNT VERIFICATION

Harry E. Luperti, Bethel, and Robert Irvine, Riverside, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 9, 1986, Ser. No. 861,686

Int. Cl.[4] B65B *5/06, 65/08*

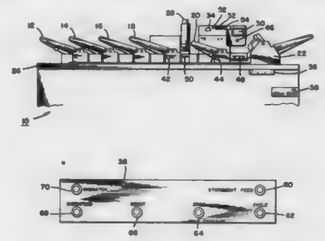
U.S. Cl. 364—478 **30 Claims**

1. A document count verification system in which the actual count of documents in a document set can be compared against the predetermined count of documents in the document set by a system operator, the predetermined count residing on a summary document, said system having means for counting the documents in the document set and displaying the count to the operator, said system also having a holding station for the documents after they are counted, said system comprising:

means for displaying the predetermined count to the operator;

cycle initiation means through which the operator initiates the counting of the documents in the document set, display of the count, and display of the predetermined count; and

mismatch set indicator means operable by the operator to indicate that the actual count as displayed to the operator



is unequal to the predetermined count as displayed to the operator which inhibits a subsequent document set from reaching the holding station until the operator removes the mismatch set of documents from the holding station.

4,733,360

DEVICE AND METHOD FOR INSPECTING CARD-LIKE ARTICLES

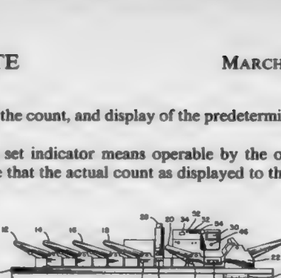
Michiaki Kobayashi, Washimiya; Shigeo Hachiki, Tokyo; Makoto Shibasaki, Tokyo, and Satoshi Sasaki, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Jun. 11, 1985, Ser. No. 743,397

Claims priority, application Japan, Jun. 14, 1984, 59-122776; Jun. 23, 1984, 59-129565

Int. Cl.[4] G06F *15/20;* **B07C** *5/34;* **G06K** *9/00;* **H04N** *7/18*

U.S. Cl. 364—507 **15 Claims**



1. A card-like article inspection device of the type for inspecting the outer appearance of a card-like article to check whether the surfaces of said card-like article have non-defective images or defective images, thereby classifying said card-like article into a first group consisting of non-defective card-like articles or into a second group consisting of defective card-like articles, comprising:

(a) a table comprising

(i) an article feeding portion for feeding a plurality of articles to be inspected in an upright and aligned state,

(ii) a defective-article placing portion disposed in parallel with said article feeding portion for discharging defective articles in an upright and aligned state, and

(iii) a non-defective article placing portion disposed in parallel with said article feeding portion for discharging non-defective articles in an upright and aligned state;

(b) an article transfer means disposed along one side of said table for intermittently transferring an inspected article held in an upright state in the lateral direction of said table

to said defective article placing portion or said non-defective article placing portion, said article transfer means comprising

(i) a guide frame disposed along said one side of said table for guiding an inspected article held in an upright state,

(ii) an article feed frame which is disposed so as to be reciprocated along said guide frame and has feed pawl means to hold an inspected article so as to transfer the same from a first position at the front end of said article feeding portion to a second position at the front end of said non-defective article placing portion adjacent to said article feeding portion and further from said second position to a third position of the placing portion further adjacent to said first mentioned placing portion along said guide means,

(iii) an article positioning mechanism for positioning an article at said first position so that said article thus positioned is subjected to inspection,

(iv) an article pushing mechanism for pushing the articles which have been inspected and transferred to said second and third positions into the respective placing portions depending upon the results of the inspection, and

(v) a synchronizing mechanism for synchronizing the reciprocal movement of said article feed frame with the operation of said article pushing mechanism;

(c) a camera which is disposed in an opposed relationship with said first position at the front end of said article feeding portion and which inspects the surface of a card held at said first position;

(d) an image processor for comparing a previously stored reference image with the image of an article being inspected, thereby determining whether said article being inspected is non-defective or defective; and

(e) a signal processor which controls said image processor and said article transfer means in synchronism with each other.

4,733,361

LIFE USAGE INDICATOR

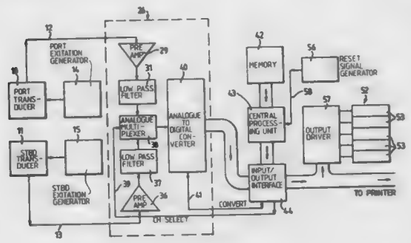
Uri R. Krieser, 24 Wrixon Avenue, East Brighton, 3187, Victoria, and Ken F. Fraser, 4 Nambrook Close, Dingley, 3172, Victoria, both of Australia

Continuation-in-part of Ser. No. 377,208, Apr. 29, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 783,556

Claims priority, application Australia, Sep. 3, 1981, PE5381

Int. Cl.[4] G01M *5/00*

U.S. Cl. 364—508 **11 Claims**



1. Apparatus for determining the life usage of a gear of a rotating gear system, said gear being operable over a range of operating conditions defined in part by a particular operating parameter, each tooth of said gear being normally subject to deterioration of a non-linear nature at different rates over the range of operating conditions so that the rate of life usage of the gear is dependent on the operating conditions subsisting at each instant in time, said gear being arranged to have associated therewith an operating parameter monitor for providing a monitor signal representing a measure of said operating parameter of said gear, said apparatus including: conditioning means for receiving said monitor signal and operative to condition said monitor signal for further processing, a life usage data memory have stored therein expected life usage data for said gear for each of a plurality of mutually exclusive operating parameter ranges, and a life usage calculator connected to receive said conditioned monitor signal and connected to said life usage data memory, said life usage calculator being operative to carry out a range determination, said range determination comprising determining in which one of the operating parameter ranges the measure of said operating parameter represented by said conditioned monitor signal falls at that time instant and said life usage calculator being further operative to carry out a life usage calculation, said life usage calculation comprising calculating from the appropriate life usage data in said memory a first measure of expected gear life usage, said calculator being further operative after a known time interval to repeat the operations of range determination and life usage calculation so as to provide a further measure of expected gear life usage being a measure of expected gear life usage within said time interval.

4,733,362

DRUG DISPENSING APPARATUS WITH A PRINTER HAVING PROGRAMMABLE FORMAT

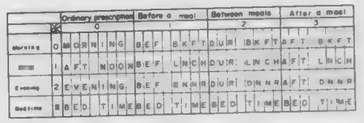
Manabu Haraguchi, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Sep. 20, 1985, Ser. No. 778,033

Claims priority, application Japan, Apr. 2, 1985, 60-69773

Int. Cl.[4] G08B *5/00;* **G07F** *11/68*

U.S. Cl. 364—479 **8 Claims**



	Ordinary prescription	Before a meal	Between meals	After a meal
	0	1	2	3
Morning	MORNING	BEF BKFT	DUR BKFT	AFT BKFT
	1 AFT NOON	BEF LNCH	DUR LNCH	AFT LNCH
Evening	2 EVENING	BEF DNNR	DUR DNNR	AFT DNNR
Bed time	BED TIME	BED TIME	BED TIME	BED TIME

1. A drug dispensing apparatus which forms divided separate packages during intermittent transport of a belt-like packaging sheet in a longitudinal direction, said drug dispensing apparatus printing predetermined information for each item on said separate packages and inserting one drug dose into each of said separate packages based on a prescription which has been input into said apparatus and which indicates unique medicinal needs of a patient, said separate packages being subsequently sealed for dispensing, said drug dispensing apparatus comprising:

a plurality of symbol keys, each symbol key being provided for each item of information to be printed on said separate packages;

pring format memory having stored therein print format for designating the number of characters to be printed and for designating printing portions which indicate where the printing information for each item is to be printed on said separate packages, said print format memory having memory portions corresponding in number to a maximum number of characters which can be printed onto the separate packages;

an address means for sequentially addressing the memory portions of said print format memory each time said symbol keys are operated;

output means for outputting the character codes representing symbols input through operation of said symbol keys;

preparation means for preparing the print format in said pring format memory by loading the character codes, representing the symbols input by said symbol keys, into the addressed memory portions of said print format memory;

prescription data memory for storing specific printing for each item to be printed on said separate packages, said

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prescription data memory storing said specific printing by storing the character codes representing characters which represent said specific printing;

print data memory having memory portions corresponding in number to the maximum number of characters which can be printed on the separate packages, said memory portions corresponding to said memory portions of said print format memory;

detecting means for detecting a range in size of each memory portion stored for each character code stored in the memory portions of said print format memory by extracting the memory portion storing the character codes, said detecting means specifying the range for printing the specific printing with respect to the item corresponding to the symbol represented by said character code on the separate packages;

print data preparing means for preparing print data by successively addressing the memory portions of print data memory corresponding to the maximum number of characters which can be printed on the separate packages for the specific printing with respect to specific items to be printed, and also, by reading from said prescription data memory, the respective character codes, representing characters constituting the specific printing which is equivalent to said item, for successive loading thereof into said memory portions of the addressed print data memory; and

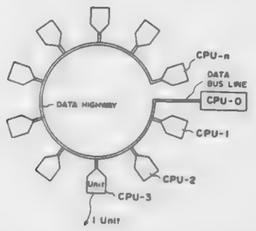
a printer for printing said separate packages based upon said print data stored in said print data memory, said separate packages being printed in synchronization with the intermittent transport of said packaging sheets in the longitudinal direction.

4,733,363

CONTROL SYSTEM FOR COMBINATORIAL WEIGHING OR COUNTING APPARATUS

Seiji Yamada; Hideo Nobutsugu; Yukio Nakagawa, all of Kyoto, Japan, assignor to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 668,894, Nov. 7, 1984. This application Jul. 8, 1986, Ser. No. 883,389
Claims priority, application Japan, Nov. 8, 1983, 58-209623
Int. Cl.⁴ G01G *19/04, 23/22, 19/22*
U.S. Cl. 364—567 **8 Claims**



1. A control system for a combinatorial weighing or counting apparatus for weighing articles charged in a plurality of weighing machines having hoppers and feeders, for effecting a combinatorial arithmetic operation on obtained weights or numbers of the articles converted from the weights, for selecting an optimum combination of added weights or numbers having an optimum added value which is closest to a target value within preset limits, and for discharging the articles from those weighing machines which give the selected optimum combination, said control system comprising:

a plurality of subcomputers, each provided for a group of weighing machines which are divided into a plurality of groups, for controlling the operation of the hoppers and feeders of the corresponding weighing machines, monitoring weight data from the weighing machines, and adjusting zero points and spans of the weighing machines; and

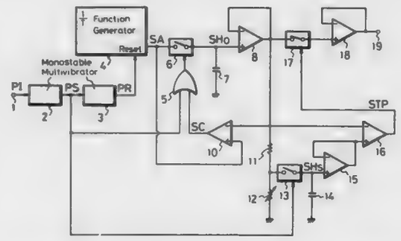
a main computer coupled to said subcomputers via a communication line for executing sa combinatorial arithmetic operation based on the weight data from said subcomputers to select weighing machines giving an optimum combination, transmitting data to said subcomputers corresponding to the weighing machines which have been selected as giving the optimum combination to discharge articles therefrom and for operating the feeders corresponding to said selected weighing machines for charging articles thereto, the operation commands delivered from said main computer to said subcomputers.

4,733,364

PERIOD DETECTING CIRCUIT

Yasufumi Yamagata, Shinjuku, Japan, assignor to Coco Research Inc., Tokyo, Japan

PCT No. PCT/JP84/00322, § 371 Date Feb. 19, 1985, § 102(e) Date Feb. 19, 1985, PCT Pub. No. WO85/00228, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 20, 1984, Ser. No. 706,849
Claims priority, application Japan, Jun. 21, 1983, 58-111690
Int. Cl.⁴ G06F *7/62*
U.S. Cl. 364—569 **1 Claim**



1. A period detecting circuit to which is supplied a pulse train to be measured and producing an output corresponding to its period comprising;

(a) multi-vibrating means receiving an input pulse train containing said pulse to be measured and generating an output pulse train having pulses delayed from the pulses of said input pulse train;

(b) a function generator means controlled by said delayed pulse for generating a variable signal corresponding to the period of a pulse of said input pulse train;

(c) first memory means for storing said variable signal from said function generator;

(d) multiplying means for multiplying said variable signal by a predetermined set value greater than one with respect to time;

(e) second memory means for storing the output from said multiplying means; and

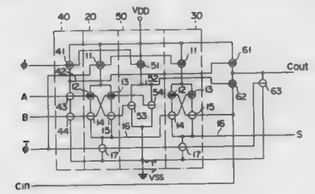
(f) comparing means for comparing outputs from said first and second means and for producing a stop mode detection output when the stored value in said first memory means becomes lower than the stored value in said second memory means.

4,733,365

LOGIC ARITHMETIC CIRCUIT

Masato Nagamatsu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 24, 1986, Ser. No. 933,859
Claims priority, application Japan, Nov. 26, 1985, 60-265515
Int. Cl.⁴ G06F *7/50*
U.S. Cl. 364—784 **5 Claims**



1. A logic arithmetic circuit comprising:

a first transistor of a first polarity type whose control terminal is supplied with a synchronizing signal, one terminal of an output current path of said first transistor being connected to a high potential;

second and third transistors of said first polarity type whose control terminals are supplied with first and second operand signals, respectively, one terminal of an output current path of each of said second and third transistors being connected to the other terminal of said output current path of said first transistor;

a fourth transistor, of a second polarity type, whose control terminal is supplied with said second signal, one terminal of an output current path of said fourth transistor being connected to the other terminal of said output current path of said second transistor;

a fifth transistor, of said second polarity type, whose control terminal is supplied with said first signal, one terminal of the output current path of said fifth transistor being connected to the other terminal of said output current path of said third transistor, and the other terminal of said output current path of said fifth transistor being connected to the other terminal of said output current path of said fourth transistor;

a sixth transistor, of said second polarity type, whose control terminal is supplied with said synchronizing signal, one terminal of an output current path of said sixth transistor being connected to a low potential, and the other terminal of said output current path of said sixth transistor being connected to said other terminals of said output current paths of said fourth and sixth transistors; and

an output terminal, for providing an output signal, connected to one of said one terminal of said output current path of said fifth transistor and said other terminal of said output current path of said first transistor.

4,733,366

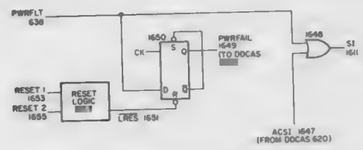
APPARATUS FOR PROVIDING AN INTERRUPT SIGNAL IN RESPONSE TO A PERMANENT OR TRANSIENT POWER FAILURE

Joseph P. Deyesso, Walpole; Edward Gershenson, Worcester; Louis A. Lemone, Stow; Mark C. Lippitt, Ashland; John R. McDaniel, Acton, and Paul F. Joseph, Oakdale, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 16, 1983, Ser. No. 495,182
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—900 **4 Claims**

1. Interrupt signal providing apparatus in electrical apparatus for providing an interrupt signal to a controller connected to said electrical apparatus in response to a power fail interrupt signal from said electrical apparatus indicating the electrical apparatus has detected a power failure in a component of the electrical apparatus, said interrupt signal providing apparatus comprising:

(1) interrupt logic means, including means for receiving said power fail interrupt signal, means for receiving controller signals including a reset instruction from said controller, and apparatus interrupt state signal means, connected to said means for receiving said power fail interrupt signal and said means for receiving controller signals, said apparatus interrupt state signals means including



Power Fail Interrupt Logic

means for setting an apparatus interrupt state signal in response to said power fail interrupt signal from said power fail interrupt signal receiving means and

means, responsive to said reset instruction and said power fail interrupt signal from said power fail interrupt signal receiving means, for resetting said apparatus interrupt state signal only if said power fail interrupt signal is not activated when said reset instruction is received; and

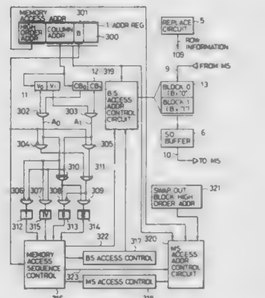
(2) apparatus interrupt state signal providing means, operatively connected to said interrupt logic means, for providing said apparatus interrupt state signal to said controller.

4,733,367

SWAP CONTROL APPARATUS FOR HIERARCHICAL MEMORY SYSTEM

Toshihisa Taniguchi, Hatano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,452
Claims priority, application Japan, Nov. 7, 1984, 59-233328
Int. Cl.⁴ G06F *13/18*
U.S. Cl. 364—900 **4 Claims**



1. A swap control apparatus for a hierarchical memory system which comprises:

an upper level memory;

a lower level memory having a plurality of entry areas as access unit areas each consisting of a plurality of block areas for holding a partial copy of the content of said upper level memory in blocks in a multiple-block-per-entry manner;

means for holding first information indicating a necessity of swap-out for each block in each entry area in said lower level memory;

means for generating an address including second informa-

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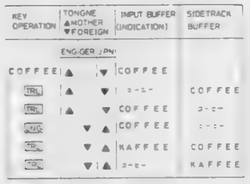
tion specifying an access target block to be accessed in an entry area;
replace control means for designating a replace target entry area in said lower level memory in which a block corresponding to said access target block forms a replace target block to be replaced with a block that is transferred from said upper level memory;
swap-out buffer means connected in a data path from said lower level memory to said upper level memory for temporarily holding data to be swapped out to said upper level memory; and
memory access sequence control means operatively connected to said upper level memory, said lower level memory, said holding means, said generating means and said replace control means, and responsive to said first and second informations and a replace target entry area designation by said replace control means, for controlling the operations of said upper level memory and lower level memory so that, when said first and second informations indicate that a replace target block in the replace target entry area does not need to be swapped out while another block in the replace target entry area needs to be swapped out, data transfer from the upper level memory to the replace target entry area is effected with priority over data transfer of said another block to the swap-out buffer means, so that all the blocks needing to be swapped out in said replace target entry area are swapped out when said replace target block is replaced.

4,733,368

ELECTRONIC DEVICE FOR BIDIRECTIONAL TRANSLATION

Masafumi Morimoto, Yamatokoriyama; Kunio Yoshida, Nara, and Tosaku Nakanishi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 253,663, Apr. 13, 1981, Pat. No. 4,623,985. This application Jul. 15, 1986, Ser. No. 885,822
Claims priority, application Japan, Apr. 15, 1980, 55-51064; Apr. 15, 1980, 55-51065
Int. Cl.⁴ G06F *13/38*
U.S. Cl. 364—900 **10 Claims**



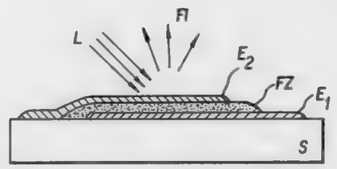
1. An electronic translator wherein a first word or words in a first language may be entered to obtain a second word or words in a second language equivalent to said first word or words, or wherein a second word or words may be entered to obtain a first word or words equivalent to said second word or words, comprising:
input means for entering one or more first words or one or more second words;
first memory means for storing a plurality of first words in the first language;
second memory means for storing a plurality of second words in the second language equivalent to respective first words in said first memory means;
access means responsive to said input means for addressing one of said first or said second memory means when one or more words are input in the first or second language, respectively, for retrieving the input words;
said access means further addressing the other of said first and second memory means for retrieving the word or words equivalent to the input words;
display means responsive to said input means for displaying the input word or words;
said display means being responsive to said access means for subsequently displaying said retrieved equivalent word or words; and
display control means for causing said display means to again display said input word or words corresponding to said retrieved equivalent word or words;
said display control means comprising a first switch means, wherein said display means and said access means are responsive to actuation of said first switch means for displaying said retrieved equivalent word or words subsequent to display of said input words and responsive to further actuation of said first switch means for again displaying said input words.

4,733,369

METHOD FOR PROVIDING SEPARATELY ADJUSTABLE VOLTAGE DEPENDENT OPTICAL PROPERTIES

Udo Bogner, Othlostrasse 9, D-8400 Regensburg, Fed. Rep. of Germany

Continuation of Ser. No. 415,903, Sep. 8, 1982, abandoned. This application Jan. 24, 1986, Ser. No. 822,142
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135591
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—119 **5 Claims**



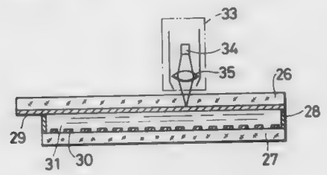
1. An electro-optical method comprising steps of
providing a transparent solid having isolated photo-absorbing centers capable of persistent spectral hole burning when subjected to narrow band light, such burned holes being capable of being filled when the solid is subjected to an electric field;
maintaining said solid at a temperature at which a process reverse to persistent hole burning cannot take place spontaneously;
burning a first persistent spectral hole in the solid at a first optical frequency by irradiating the solid with narrow band light of said first frequency while applying a first burning voltage of selected sign, value and temporal course to the solid to adjust the characteristics of the solid in dependence on voltage, that is, the optical response of the solid to applied voltage at said first frequency; and burning a second persistent spectral hole in the solid at a second optical frequency by irradiating the solid with narrow band light of said second frequency while applying a second burning voltage of selected sign, value and temporal course to the solid to adjust the optical characteristics of the solid at said second frequency;
whereby one may separately adjust the optical characteristics at separate frequencies, so that a voltage dimension is introduced as an additional dimension, that is, in addition to the frequency dimension.

4,733,370

INFORMATION HOLDING DEVICE

Masaaki Kitajima, Hitachiohta; Hideaki Kawakami, Mito; Yoshiharu Nagae, Hitachi, and Masahiro Takasaka, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 613,620, May 24, 1984. This application Jul. 8, 1987, Ser. No. 73,359
Claims priority, application Japan, May 25, 1983, 58-90716
Int. Cl.⁴ G11C *11/24, 11/42*
U.S. Cl. 365—149 **10 Claims**



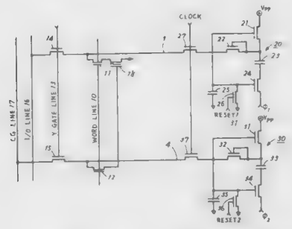
1. An information holding device comprising a pair of substrates whose opposing surfaces are formed with M electrodes on one side and N electrodes divided into K blocks ($2 \leqq L < N/2$) on the other side so that they oppose and that opposing parts between electrodes on the one side and those on the other side may form a matrix as a whole, a dielectric which is held between said pair of substrates and between the opposing parts, the dielectric having a capacitance, means to change the capacitance of the dielectric between at least any desired one of the opposing parts, and K detection means to simultaneously detect the capacitance of the dielectric between the opposing parts of any desired electrode on the one side and any desired electrode of each block on the other side, each of said K detection means including means to apply a voltage varying with time to said dielectric between said at least two opposing parts, and means to simultaneously detect principally displacement currents flowing through said dielectric between said at least two opposing parts.

4,733,371

SEMICONDUCTOR MEMORY DEVICE WITH HIGH VOLTAGE SWITCH

Yasushi Terada; Takeshi Nakayama, and Kazuo Kobayashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,440
Claims priority, application Japan, Aug. 30, 1985, 60-192808
Int. Cl.⁴ G11C *11/40;* H03K *17/10*
U.S. Cl. 365—185 **3 Claims**



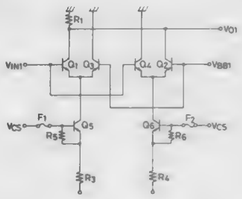
1. A semiconductor memory device comprising bit lines, control gate lines, a high voltage source and first and second high-voltage switches,
said first high-voltage switch including:
a first transistor having a drain connected to said high-voltage source and a gate connected to said bit line,
a second transistor having a drain connected to said bit line and a gate and a source connected to the source of said first transistor,
a first capacitor having an end connected to the source of said first transistor and said gate and source of said second transistor, and
a third transistor having a drain connected to the other end of said first capacitor, a gate connected to said bit line and a source applied with a first clock signal,
said second high-voltage switch including:
a fourth transistor having a drain connected to said high voltage source and a gate connected to said control gate line,
a fifth transistor having a drain connected to said control gate line and a source connected to the source of said fourth transistor,
a second capacitor having an end connected to said source of said fourth transistor and said gate and source of said fifth transistor, and
a sixth transistor having a drain connected to the other end of said second capacitor, a gate connected to said control gate line and a source supplied with a second clock signal.

4,733,372

SEMICONDUCTOR MEMORY HAVING REDUNDANCY

Hiroaki Nanbu, Hachioji; Kunihiko Yamaguchi, Sayama; Noriyuki Honma, Kokubunji; Kazuo Kanetani, Kokubunji; Motoaki Matumoto, Kokubunji; Kazuhiko Tani, Kokubunji, and Kenichi Ohata, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Device Eng., both of Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,930
Claims priority, application Japan, Aug. 23, 1985, 60-184242; Aug. 23, 1985, 60-184241; Nov. 27, 1985, 60-264895
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—200 **14 Claims**



1. A bipolar memory having redundancy, comprising:
a memory array including bipolar memory cells;
a redundancy row including at least one row of memory cells;
an address buffer made receptive of an address signal;
decoder means made receptive of said address signal for selecting said memory array; and
redundancy row selecting means including: first and second bipolar transistors having their bases made receptive of said address signal; third and fourth bipolar transistors having their emitter electrodes connected with the emitters of the first and second bipolar transistors and their bases made receptive of a reference voltage; and a current source having fuses connected with said emitter electrodes, respectively, so that a redundancy row selection signal may be outputted from the collectors of said first and third bipolar transistors or said second and fourth bipolar transistors,
whereby said fuses are cut so that the selection signal may be outputted when said address signal indicates the address of a fault row.

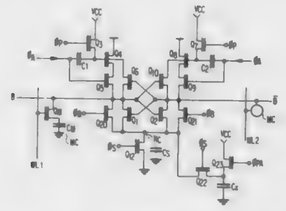
VOL 1088 ISS 4 MR 22 1988 UMI

4,733,373

DYNAMIC MEMORY WITH IMPROVED ARRANGEMENT FOR PRECHARGING BIT LINES

Tatsunori Murotani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1986, Ser. No. 824,030
Claims priority, application Japan, Jan. 30, 1985, 60-15877
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—203 **12 Claims**



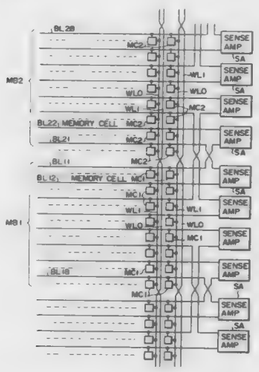
1. A dynamic memory, comprising; a pair of bit lines, amplifying means having a pair of input/output nodes and at least one internal node having a stray capacitance, means for connecting said pair of bit lines to said pair of input/output nodes, first means for operatively enabling said amplifying means to thereby amplify a difference in potentials on said pair of bit lines, second means for operatively short-circuiting said pair of bit lines via said internal node after said amplifying means is enabled by said first means, capacitor means, third means for charging said capacitor means before said pair of bit lines are short-circuited, and fourth means for transmitting charge accumulated in said capacitor means to said pair of bit lines when said pair of bit lines are short-circuited.

4,733,374

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Tohru Furuyama, Tokyo; Shigeyoshi Watanabe, Yokohama, and Tatsuo Ikawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1986, Ser. No. 844,626
Claims priority, application Japan, Mar. 30, 1985, 60-66757; Sep. 3, 1985, 60-194695
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—205 **10 Claims**



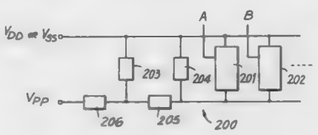
1. A dynamic semiconductor memory device comprising:
a base surface having a sense area and first and second memory cell areas diposed adjacent to each other, each said first and second memory cell areas being adjacent said sense area at one side thereof;
2^N sense amplifiers, N being an integer greater than one (1), disposed within said sense area, each of said amplifiers including a first input terminal and a second input terminal for receiving input signals, each said sense amplifier generating an output signal responsive to said input signals received at said first and second input terminals;
a plurality of first memory cells arranged in a plurality of rows and columns in said first memory area;
a plurality of second memory cells arranged in a plurality of rows and columns in said second memory cell area;
2^N first bit lines, N being said integer greater than one (1), each of said bit lines being commonly connected to one of said plurality of columns of said first memory cells and connected to said first input terminal of one of said sense amplifiers;
2^N second bit lines, N being said integer greater than one (1), each of said bit lines being commonly connected to one of said plurality of columns of said second memory cells and connected to said second input terminal of one of said sense amplifiers;
a plurality of first word lines, each of said first word lines being connected to one of said plurality of rows of said first memory cells; and
a plurality of second word lines, each of said second word lines being connected to one of said plurality of rows of said second memory cells.

4,733,375

NON-VOLATILE MEMORY CIRCUIT

Yoshiyuki Terashima, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,791
Claims priority, application Japan, May 28, 1984, 59-107701; Nov. 29, 1984, 59-252614
Int. Cl.⁴ G11C *7/02*
U.S. Cl. 365—206 **29 Claims**



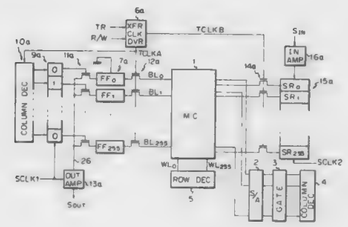
1. A non-volatile memory circuit having a power source and a high voltage application terminal for writing data, comprising:
non-volatile memory means coupled between the power source and the high voltage application terminal for storing data wherein the non-volatile memory means includes at least one memory device and switch means for permitting selective writing of data into each memory device;
voltage limiting means for limiting the voltage applied to the non-volatile memory means, coupled between the power source and the high voltage application terminal; and
current limiting means for limiting the current applied to the non-volatile memory means, coupled between the high voltage application terminal and the non-volatile memory means;
whereby the non-volatile memory means is protected from erroneous writing of data from outside noise and static noise.

4,733,376

SEMICONDUCTOR MEMORY DEVICE HAVING SERIAL DATA INPUT CIRCUIT AND SERIAL DATA OUTPUT CIRCUIT

Junji Ogawa, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 15, 1985, Ser. No. 787,044
Claims priority, application Japan, Oct. 17, 1984, 59-216057; Oct. 19, 1984, 59-218706
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—221 **15 Claims**



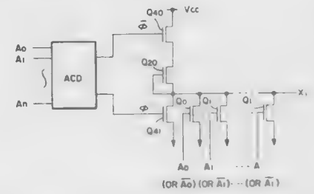
1. A semiconductor memory device, comprising:
a memory cell array including a plurality of memory cells arranged in a matrix and having a plurality of bit lines and a plurality of word lines;
a serial data input circuit operatively connected to said memory cell array and including:
at least one shift register set, each having a plurality of shift registers and consecutively storing serial input data applied from an external circuit; and
at least one first gate set, each having a plurality of gates for simultaneously connecting said plurality of shift registers of said at least one shift register set and said plurality of bit lines to store simultaneously said serial input data, stored in said plurality of shift registers, into memory cells selected by one of said word lines; and
a serial data output circuit operatively connected to said memory cell array and including:
at least one data bus;
at least one data holding circuit set, each having a plurality of data holding circuits and corresponding outputs, an input of each being operatively connectable to said corresponding bit lines through a corresponding one of said gates of said at least one second gate set;
at least one third gate set, each having a plurality of gates provided between the outputs of said plurality of said at least one data holding circuit and the at least one data bus and for outputting data held in said at least one data holding circuit to said at least one data bus; and
data output means having a gate driving circuit for selectively driving one of said gates in said at least one third gate set, said plurality of gates of said at least one second gate set being simultaneously operated to transfer a plurality of data on a selected word line into said at least one data holding circuit set, and said data held in said at least one data holding circuit set being output to said at least one data bus in response to the operation of said at least one third gate set.

4,733,377

ASYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE

Keizo Aoyama, Yamato; Kenji Agatsuma, and Yasuaki Suzuki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1983, Ser. No. 536,325
Claims priority, application Japan, Oct. 4, 1982, 57-174287
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—230 **4 Claims**



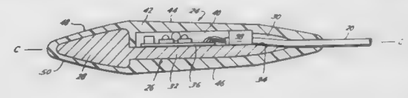
1. An asynchronous semiconductor memory device comprising:
an internal circuit for receiving an address signal and operating in response to said address signal, said internal circuit comprising:
a power supply line for supplying an operating voltage; and
a decoder circuit, connected to said power supply line, for receiving said address signal and said operating voltage and outputting a decoded output signal;
detecting means, connected to receive said address signal, for detecting a change of said address signal and for generating a respective detection output pulse having a predetermined width corresponding to a specified period; and
holding means, connected to said decoder circuit, for holding said internal circuit in a non-operating condition for said specified period, in response to each said detection output pulse in accordance with each respective change of said address signal, said holding means comprising:
a first transistor, connected between said power supply line and said decoder circuit, and connected to said detecting means, being controlled by said detection output pulse for disconnecting said decoder circuit and said power supply line for said specified period; and
a second transistor, connected to receive said decoded output signal and connected to said detecting means, being controlled in response to said detection output pulse for grounding said decoder circuit for said specified period.

4,733,378

ACTIVE LOW-PROFILE HYDROPHONE

Richard Pearce; Richard Marschall, and James Brown, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 6, 1986, Ser. No. 871,329
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 367—17 **7 Claims**



1. A hydrophone having a low-profile pisciform housing for lying on the bottom of a turbulently flowing body of water to detect transient pressure signals propagating through the earth and to convert the transient pressure signals to amplified out-

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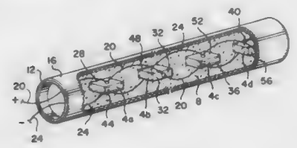
put signals indicative thereof passed over a conductor operably coupled to a transceiver for transmission to a remote recording device, said low-profile pisciform housing reducing ambient noise received by the sensing means by creating a positive positive pressure gradient along the housing exterior preventing said turbulently flowing body of water from separating from the housing.

4,733,379

LINE ARRAY TRANSDUCER ASSEMBLY

Robert A. Lapetina; Gordon L. Snow, and David P. Baird, all of Salt Lake City, Utah, assignors to Edo Corporation/Western Division, Salt Lake City, Utah

Continuation-in-part of Ser. No. 661,082, Oct. 15, 1984. This application Mar. 17, 1986, Ser. No. 840,603
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—20 **27 Claims**



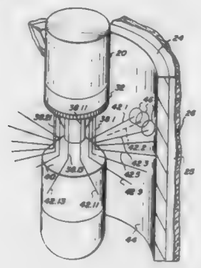
1. A flexible transducer assembly comprising
an array of spaced-apart piezoelectric elements arranged generally in a line and selected to have low cross-coupling characteristics, low sensitivity to incoherent mechanical perturbations in the directions longitudinal and lateral to the axis of the array, and high sensitivity to coherent mechanical perturbations, said elements being polarized in a direction generally transverse to the linear axis of the array, and each element including opposing surface areas which are generally parallel with the linear axis of the array,
a plurality of electrodes disposed on said opposing surface areas of the piezoelectric elements,
conductor means coupled to the electrodes of the piezoelectric elements to carry therefrom electrical signals produced by the elements when the elements are stressed by acoustical signals, and
wherein at least some of said elements are arranged with their opposing surfaces aligned in a direction different from the direction of alignment of other of said elements.

4,733,380

APPARATUS AND METHOD FOR ACOUSTICALLY INVESTIGATING A CASING SET IN A BOREHOLE

R. Mark Havira, New Fairfield, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Dec. 26, 1984, Ser. No. 686,123
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 **11 Claims**



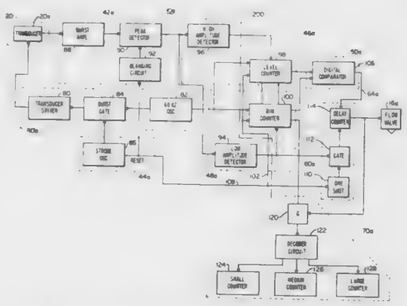
1. An apparatus for investigating a borehole having a borehole wall with a casing having a casing wall penetrating an earth formation comprising:
a tool shaped to move along the borehole, said tool having an axis which is generally parallel to the wall of the borehole;
a substantially continuous array of acoustic transducers concentrically mounted on the tool around the tool axis, said array being oriented to transmit and then detect acoustic energy traveling along a path generally parallel to the tool axis;
a substantially radially continuous acoustic reflection surface which is generally concentric with the tool axis and is axially spaced from the array and is interposed in the path of acoustic energy transmitted from and to be detected by the array;
means for selectively actuating the transducers in the array to produce circumferentially discrete pulsed beams of acoustic energy from the array with the beams distributed around the tool axis and being directed onto the reflection surface;
said reflection surface being inclined at such angle relative to the tool axis so as to reflect transmitted beams primarily onto discrete circumferential casing segments of the casing wall with an angle of incidence that is substantially normal to the casing wall and with a circumferentially curved acoustic wavefront;
the acoustic transducers that are energized to produce said pulsed beams being of a number so selected that the casing segments onto which the beams are incident circumferentially overlap; and
means for deriving from acoustic energy detected by the transducers an indication of a characteristic of the casing wall at said casing segments.

4,733,381

AUTOMATIC LEVEL SENSING SYSTEM

M. Zane Farmer, and Diane B. Farmer, both of 12 Christman Tree Dr., Ashburnham, Mass. 01430

Division of Ser. No. 632,375, Jul. 19, 1984. This application May 20, 1985, Ser. No. 735,547
Int. Cl.[4] G01S *15/02*
U.S. Cl. 367—93 **5 Claims**



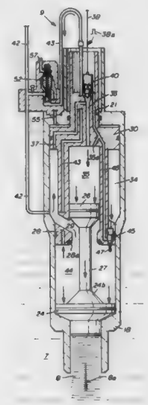
1. A receptacle counting system comprising:
ultrasonic sound wave transducer means for emitting ultrasonic sound waves and for receiving ultrasonic sound waves reflected from a receptacle whose content level is to be sensed;
a rim detector, responsive to said reflected ultrasonic sound waves, for determining the location of the rim of the receptacle;
a receptacle detector, responsive to said rim detector, for indicating when a receptacle is present; and
means responsive to the receptacle detector, for monitoring the number of receptacles presented to the system.

4,733,382

PNEUMATICALLY-OPERATED LIQUID SLUG PROJECTOR APPARATUS

Adrien P. Pascouet, 1854 S. Gessner, Houston, Tex. 77063

Division of Ser. No. 498,013, May 25, 1983, Pat. No. 4,594,697. This application Jun. 6, 1986, Ser. No. 871,645
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.
Int. Cl.[4] G01V *1/14, 1/38*
U.S. Cl. 367—146 **8 Claims**



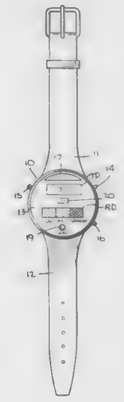
7. A liquid slug projector apparatus, comprising:
a generator having a housing including a first bore having a bottom stop wall defining a main port;
a second bore having a top stop wall defining a top port;
a first shuttle having a first piston, a second piston, and a push rod interconnecting said first and second pistons;
a second shuttle having a third piston, a fourth piston, and an interconnecting push rod defining a third bore therein;
said first piston being slidably mounted in said first bore;
said second piston being slidably mounted in said third bore;
said third piston being slidably mounted in said first bore;
said fourth piston being slidably mounted in said second bore;
said second shuttle having a sleeve which slidably and sealingly extends from said fourth piston through said top port;
said first bore defining a slug chamber for containing a liquid slug between said bottom stop wall and said first piston;
said second bore defining a return chamber between said fourth piston and said top stop wall;
said third bore defining with said second piston a trigger chamber;
a vent chamber formed between said first and third pistons;
a main reservoir chamber formed between said first and second shuttles and having a first inlet;
an air-operated valve having a valve body and a third shuttle;
said valve body defining fourth, fifth, and sixth bores;
said third shuttle having fifth, sixth, and seventh pistons slidably mounted in said fourth, fifth, and sixth bores of said valve body, respectively;
an upper chamber defined in said valve body above said fifth piston, and a lower chamber defined in said valve body below said sixth piston;
said upper chamber being continuously connected to a fluid source through bores in said third shuttle;
said first inlet being adapted to continuously receive compressed air from a compressed air source;
said compressed air maintaining said first and second shuttles in a rest position and then abruptly releasing said first shuttle from said second shuttle, thereby abruptly expelling said confined liquid slug at a very high-velocity through said main port into said liquid body;
said third shuttle in one operative position supplying fluid to said return chamber to cause said second shuttle to move toward and lock with said first shuttle; and
said third shuttle in another operative position venting said return chamber to the outside medium thereby causing said locked first and second shuttles to return to their rest position.

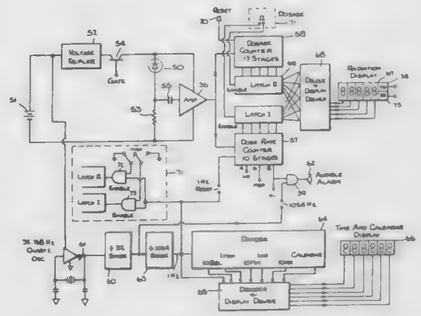
4,733,383

COMBINED DIGITAL AND ANALOG TIMEPIECE AND RADIATION MONITOR ASSEMBLY

Nelson J. Waterbury, 211 E. 70th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 907,827, Sep. 16, 1986. This application Nov. 21, 1986, Ser. No. 933,129
Int. Cl.[4] G04B *47/00*
U.S. Cl. 368—10 **18 Claims**





1. A timepiece and radiation monitor assembly comprising:
A. a case provided with a face;
B. a timekeeping section housed in the case and including a stable high-frequency time base coupled to frequency divider stages from which are derived timing pulses that are applied to a time display mounted on the face whereby the time display presents time indications in an analog or digital format, said divider stages also yielding reset pulses at timed intervals;
C. a radiation detector mounted on or in the case to provide signal pulses whose rate is dependent on the prevailing intensity of penetrating radiation; and
D. a radiation monitoring section housed in the case and linked to the timekeeping section which functions as a timing

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clock therefor, the monitoring section including a resettable electronic dose rate counter responsive to said reset pulses and coupled to the radiation detector for counting the number of signal pulses received during each of said time reset intervals to provide an intensity value whose prevailing level is indicated on a radiation intensity display independent of the time display and also mounted on said face, whereby the assembly provides radiation intensity as well as time indications, said radiation monitoring section further including a manually-settable dosage counter coupled to said radiation detector for continuously counting the signal pulses received from the detector from the instant the dosage counter is reset, a dosage indicator, and a switch which when actuated transfers the count accumulated in the dosage counter to the indicator.

4,733,384

PERPETUAL CALENDAR WATCH HAVING TWO MOTORS

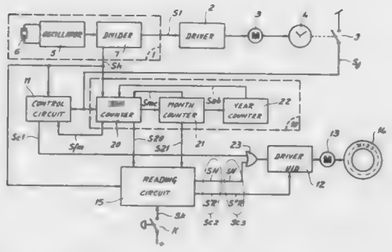
Pierre-André Meister, Bienne; Pierre Schmidli, Evilard; Bruno Erai, Bienne, and Bertrand Soltermann, Diesse, all of Switzerland, assignors to ETA S.A. Fabriques d'Ebauches, Grenchen, Switzerland

Filed May 6, 1987, Ser. No. 46,349

Claims priority, application Switzerland, May 26, 1986, 02109/86

Int. Cl.[4] G04B *19/24*

U.S. Cl. 368—28 **5 Claims**



1. An electronic watch which comprises:
a time-keeping circuit able to generate a time base signal;
a first motor activatable by said time base signal;
analogue hour-display means arranged to be driven by said first motor;
means for deriving, from said time base signal, a daily signal at the end of each day;
a perpetual calendar circuit comprising day, month and year counters connected in series and activatable by the daily signal, means for setting, in response to the state of the month and year counters, at the end of each month of less than 31 days, the day counter to the state that corresponds to the first day of the following month, and means for generating, at the end of each month, an end of month signal providing the complement to 31 of the state of the day counter;
a second motor;
analogue day of the month display means arranged to be driven by said second motor;
a control circuit for said second motor able to issue to the latter, in response to the daily signal and to the end of month signal, a first control signal enabling it to change the day of the month display by one day at the end of 31-day months and, at the end of less-than-31-day months, by the number of days corresponding to the end of month signal;
call means for generating a month calling signal; and
a reading circuit connected to said day and month counters and able to issue to said second motor, in response to said call signal, a second control signal representative of the gap between the states of these two counters that enables the day of the month display means to be set in a position in which the number shown is the number of the month, and then a third control signal, also representative of the gap between the states of said counters, that enables the day of the month display means to revert to a position in which the number displayed is the number of the day.

4,733,385

SIGNAL RECORDING AND REPRODUCING APPARATUS FOR AN OPTO-MAGNETIC DISK

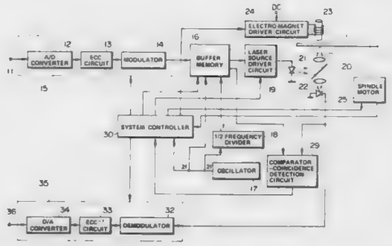
Fumiaki Henmi, Kanagawa; Kiyoshi Ohsato, Chiba, and Tamotsu Yamagami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,190

Claims priority, application Japan, Mar. 27, 1985, 60-060889; Apr. 7, 1985, 60-187888

Int. Cl.[4] G11B *11/12*

U.S. Cl. 369—13 **6 Claims**



1. A signal recording and reproducing apparatus for use with an opto-magnetic disk comprising:
an opto-magnetic disk having a large number of concentric recording tracks on which the information signals are recorded;
a head unit for recording signals on said disk or reproducing recorded signals therefrom;
recording means for supplying recording signals or erasing signals to said head unit;
reproducing means for reproducing signals read by said head unit; and
control means operable so that, in the case of recording information signals on said disk, said recording means are caused to consecutively sweep a given track on said disk at least twice within a time interval required for reproducing said track and so that said head unit is switched between a first sweeping time and a second sweeping time in such a manner that said recording means will supply erasing signals to said head unit during said first sweeping time and time-base-compressed recording signals thereto during said second sweeping time, said control means controlling said track jumping means to cause said head unit to jump tracks so as to move said head unit between adjacent tracks which have been recorded on said disk.

4,733,386

METHOD OF WRITING FILE DATA INTO A WRITE-ONCE TYPE MEMORY DEVICE

Kenji Shimoi, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

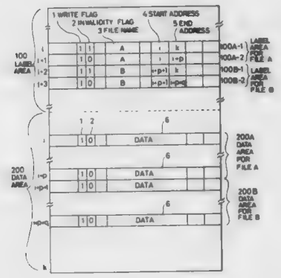
Filed Apr. 29, 1986, Ser. No. 857,087

Claims priority, application Japan, May 2, 1985, 60-93616

Int. Cl.[4] G11B *5/76, 15/52*

U.S. Cl. 369—59 **11 Claims**

1. A method for controlling the writing of file data into a storage device of the write-once type, including the steps of:
writing first label data into said storage device at a predetermined file label area, which is used for holding label data for plural files, in response to an applied request for writing new file data, said first label data including a file name, a start address indicative of a start location of a portion of a predetermined data area of said storage device in which no file data has been written, which data area is used for holding file data of said plural files, and a predetermined end address;



writing the requested file data into said portion of said data area starting from said start address and writing a signal for invalidating the first label data in said file label area after the writing of the requested file data; and
writing second label data into the file label area after writing said invalidating signal therein, said second label data including the file name, the start address and an end address of the area in which the requested file data has actually been written.

4,733,387

DISC LOADING/UNLOADING APPARATUS

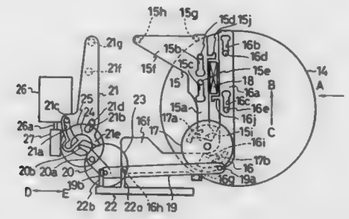
Yasuhiko Yoshimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1986, Ser. No. 905,931

Claims priority, application Japan, Sep. 11, 1985, 60-200866

Int. Cl.[4] G11B *17/04, 25/04*

U.S. Cl. 369—77.1 **14 Claims**



1. A disc loading/unloading apparatus for a disc player having a loading/unloading opening therein, comprising:
positioning means for contacting the outer perimeter of the disc at spaced locations on the perimeter upon insertion of the disc into the opening, the positioning means including at least first and second positioning members, said first and second positioning members contacting the perimeter of the disc at four spaced locations;
biasing means for urging the positioning members against the outer perimeter of the disc for holding the disc in a loaded position; and
means for ejecting the disc from the loaded position, including unloading means for pushing the disc toward the opening, and rotatable cam means cooperating with said unloading means for counteracting the biasing force of the biasing means and moving said positioning members to a released position out of contact with the disc until the disc moves toward the opening beyond a predetermined position.

4,733,388

INFORMATION RECORDING DISC

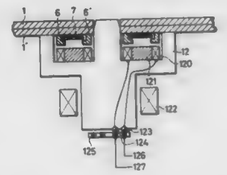
Nobuyuki Fujimoto, Odawara; Shinichi Abe, Kanagawa; Yoshito Tsunoda, Mitaka; Kazuo Shigematsu, Saitama; Yasunori Kanazawa, Hachiouji; Toshinori Sugiyama, Ibaragi, and Tetsurou Ikegaki, Toride, all of Japan, assignors to Hitachi Maxell, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,862

Claims priority, application Japan, Aug. 23, 1985, 60-184243; Nov. 19, 1985, 60-257855

Int. Cl.[4] G11B *25/04*

U.S. Cl. 369—270 **9 Claims**



1. An information recording disc comprising:
an information recording disc member for recording and reproducing information;
a magnetic attracting member; and
holding means fixedly secured to said disc member and forming a space therein for holding said magnetic attracting member so that said magnetic attracting member is held in the space of said holding means without being fixedly secured to said disc member.

4,733,389

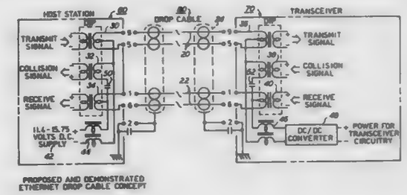
DROP CABLE FOR A LOCAL AREA NETWORK

John M. Puvogel, Lawndale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 28, 1986, Ser. No. 890,210

Int. Cl.[4] H04J *15/00*

U.S. Cl. 370—5 **2 Claims**



1. A multipoint data communication system for transmitting data to and from a plurality of communicating devices via an interconnecting cable, comprising
transceiver means coupled to said interconnecting cable for coupling the interconnecting cable to a communication device and a communicating device to the interconnecting cable,
drop cable means for coupling said transceiver means to said communicating device, and said communicating device to said transceiver means, said drop cable comprising two twisted pairs of wires with an overall shield, and
circuit means at said communicating device for interfacing between said communicating device and said drop cable,

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wherein three distinct signals and power are conveyed over the two twisted wire pairs in said drop cable utilizing a phantom signal technique of signal transmission,

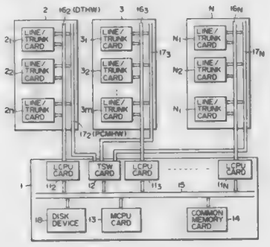
wherein said transceiver means includes three transformer means for transmitting said three distinct signals, the outputs of one of said transformers being connected to the center taps of the other two transformers, such that a signal introduced by said one transformer is directed to and forwarded by the other two of said transformers, wherein said three distinct signals are alternating current signals while the fourth element is direct current power, and wherein said fourth element representing power is kept separate from said third signal via capacitor means between the output of the other transformer and the center tap of one of said two transformers in both said transceiver means and said circuit means.

4,733,390

DATA TRANSMISSION SYSTEM

Masakazu Shirakawa, and Hiroyuki Hasegawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 8, 1986, Ser. No. 904,677
Claims priority, application Japan, Sep. 13, 1985, 60-201574
Int. Cl.⁴ H04J *3/02*
U.S. Cl. 370—85 **6 Claims**



1. A data transmission system comprising:

a plurality of data transmitting circuit means with different addresses allotted thereto;

common data receiving circuit means; and

common data transmission line means for coupling said plurality of data transmitting circuit means to said common data receiving circuit means, said common data transmission line means including a first transmission line through which a clock pulse signal determining the rate of data transmission is transmitted, a second transmission line through which a frame sync signal determining one frame period of time having a plurality of time slots and synchronized with said clock pulse signal is transmitted, and a third transmission line through which a data signal is transmitted from each of said data transmitting circuit means to said data receiving circuit means;

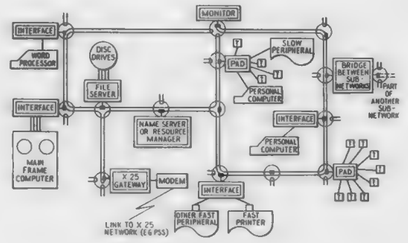
said plurality of data transmitting circuit means each being responsive to said clock pulse signal, said frame sync signal and its own allotted address to transmit data to said third transmission line with a first priority in a time slot corresponding to its own allotted address in the frame period of time and to have a right to transmit data to said third transmission line with a priority of a lower order than said first priority in the other time slots, each of said data transmitting circuit means transmitting data after confirming that no data is being transmitted by data transmitting circuit means having a priority of a higher order than its own priority in a time slot, in which it is given a priority of a lower order than said first priority.

4,733,391

COMMUNICATION NETWORKS

Robert J. Godbold; Peter R. Kirk, both of Chelmsford; Nicholas H. Pope, Billericay, and John A. Pye, Braintree, all of Great Britain, assignors to The General Electric Company plc, London, England

PCT No. PCT/GB84/00356, § 371 Date Jun. 7, 1985, § 102(e) Date Jun. 7, 1985, PCT Pub. No. WO85/01850, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 22, 1984, Ser. No. 744,010
Claims priority, application United Kingdom, Oct. 22, 1983, 8328317
Int. Cl.⁴ H04J *3/02*
U.S. Cl. 370—88 **25 Claims**



1. A communications network which includes a multiplicity of interconnected switch units, wherein:

each switch unit has a plurality of communication port pairs each comprising an OUT and an IN port, each of at least one unit having at least three such pairs;

via their respective port pairs, each switch unit is connected to at least one other switch unit by a communication path, there being at least one path to each such other unit, each path comprising an OUT and an IN channel, each of at least one unit being so connected by at least three paths to other units; and

for each switch unit its OUT and IN ports are internally interconnectable such that

if there is not port pair that must be involved in this interconnection, and is thus a mandatory pair, then the OUT port of any pair can be connected to the IN port of any pair,

while if there is such a mandatory port pair then the unit's port pairs are in a notional sequence with the mandatory pair at one end, and the OUT port of any non-mandatory pair can at least be connectd either to the IN port of that pair or to the IN port of any of the port pairs sequentially nearer the mandatory pair, and the OUT port of the mandatory port pair can be connected to the IN port of any non-mandatory pair;

whereby with the provisos above, the switch units are capable of being interconnectd via their non-mandatory port pairs one with another in an entirely arbitrary arrangement, and regardless of the actual physical-disposition interconnection arrangement of the units relative one to another the network may be configured as a ring by suitably internally interconnecting each such unit's communication port pairs so as to form a circular communications link serially joining all of the units in the network; and wherein

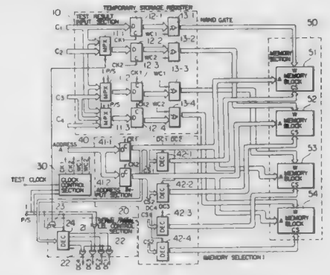
in operation both channels of each of the communication paths that are used in the configured network carry signals.

4,733,392

FAIL MEMORY EQUIPMENT IN MEMORY TESTER

Kazuo Yamaguchi, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,293
Claims priority, application Japan, Apr. 4, 1984, 59-65889
Int. Cl.⁴ G01R *31/28;* **G06F** *11/00*
U.S. Cl. 371—21 **1 Claim**



1. A fail memory equipment comprising:

memory means having an equal number of memory blocks and input channels through which results of a memory test are inputted to said memory equipment;

address input means temporarily storing addresses of memory test, for subsequently supplying an address to a corresponding memory block and selecting a memory cell of the corresponding memory block by decoding the address in response to a decode signal;

test result input means selecting an input channel carrying the memory test result in response to a mode designation and temporarily storing the memory test result, for subsequently writing the memory test result into a corresponding memory block;

serial/parallel control means responsive to the mode designation to produce the deocde signal from an address signal sent from said address input means; and

clock control means responsive to a test clock and the mode designation to produce a storage instruction clock for the temporary storage of the address of memory test and the memory test result and a write clock for writing the memory test result into the memory block in accordance with an interleave mode, a serial mode or a parallel mode, whereby the memory test results obtained at a high speed from a memory being tested through input channels are written in parallel into the respective memory blocks under the interleave mode the memory test result obtained at a low speed from a large capacity memory being tested through an input channel are serially written into the respective memory blocks under the serial mode, and the memory test result obtained from a number of memories being tested simultaneously through input channels are written in parallel into the respective memory blocks under the parallel mode.

4,733,393

TEST METHOD AND APPARATUS FOR CELLULAR ARRAY PROCESSOR CHIP

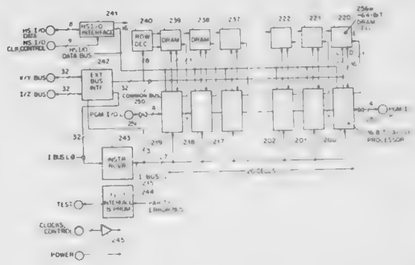
Steven G. Morton, Oxford, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 12, 1985, Ser. No. 808,418
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—21 **9 Claims**

1. A cellular array processor chip comprising:

a plurality of processor cells;

means associated with said chip, for simultaneously monitoring a plurality of said processor cells during chip testing, said means including a common bus, said common bus communicating with all of said plurality of processor cells whereby the signal on said common bus is indicative of



the presence or absence of a defective cell among said plurality of processor cells on said chip.

4,733,394

ELECTRICALLY PROGRAMMABLE SEMICONDUCTOR MEMORY SHOWING REDUNDANCE

Burkhard Giebel, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche Itt Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Apr. 23, 1986, Ser. No. 855,141
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1985, 85104945
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—21 **2 Claims**

1. An integrated memory system comprising:

an m x n matrix arrangement of memory cells, each memory cell having an electrically floating gate, said memory matrix including:

a main memory portion;

main decoder means for accessing data stored in said main memory;

a first memory portion containing spare rows;

first decoder means for accessing said spare rows;

a second memory portion wherein addresses of faulty rows in said main memory are stored; and

second decoder means for accessing memory rows of said second memory portion;

a microcomputer for controlling operation of said memory system;

a reference voltage source, said voltage source being adjustable in steps by said microcomputer;

a comparator having first inputs receiving first voltage signals derived from the drain currents of the memory transistor of a selected word, said comparator having second inputs coupled to said reference voltage source, said comparator having outputs coupled to said microcomputer;

a correction register having outputs coupled to said first

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decoder means for either transferring addresses to said first decoder means or blocking the operation thereof;

storing means coupled to said microcomputer and to said matrix arrangement for storing data in said matrix arrangement;

said microcomputer being operable to test for defective rows by transferring data into said main memory via said storing means, reading data stored in said memory and for setting said voltage source, and reading the outputs of said comparator;

said microcomputer performing said test for defective rows at predetermined time intervals;

said microcomputer storing addresses of defective rows in said second memory portion and storing data for each defective row in a spare row of said first memory portion.

4,733,395

DIGITAL WORD GENERATOR

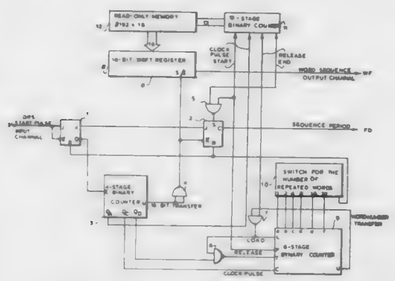
Hans-Joachim Gelbrich, and Erwin Lehmann, both of Berlin, Fed. Rep. of Germany, assignors to Wandel & Goltermann GmbH & Co., Eningen U.A., Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,336

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513551

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—27 **6 Claims**



1. A digital word generator for automatically generating periodically appearing continuous characters from n-bit words of all word sizes and permutations thereof, comprising a read-only memory provided with means effective during a test signal cycle of all possible 2^n word sizes and permutations thereof of a n-bit word for successively reading out only n-bit words of an essentially smaller number z, and means for obtaining the remaining permutations in accordance with the relation (2^n-z) by adding to the periodic part a framing bit sequence which determines said test signal cycle and has a length which does not have a common divisor with n so that in n test signal cycles successively all n possible cyclic permutations of binary digits of words provided in said read-only memory are generated.

4,733,396

APPARATUS FOR DETECTING AND CORRECTING DATA TRANSFER ERRORS OF A MAGNETIC DISK SYSTEM

David R. Baldwin, Sheppston, United Kingdom, and Shingo Sata, Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1986, Ser. No. 937,919

Claims priority, application Japan, Dec. 5, 1985, 60-272412

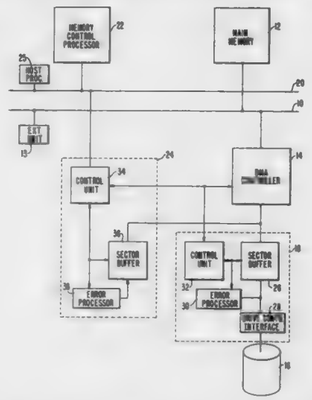
Int. Cl.⁴ G06F *11/12*

U.S. Cl. 371—38 **4 Claims**

1. An apparatus for detecting and correcting errors which occur when transferring individual sectors of data between a magnetic disk and a main memory of a magnetic disk system comprising:

a data transfer interface disposed on a transfer path connecting said magnetic disk and said main memory, for successively transferring said individual sectors of data between said magnetic disk and said data transfer interface during a first period of time, and for successively transferring said individual sectors of data between said data transfer interface and said main memory during a second period of time to write and read said individual sectors of data, said first period of time being at least twice as long as said second period of time, creating a free time period between the end of said second period of time and the end of said first period of time;

check data generation means operatively connected to said transfer path for successively generating original check data for said individual sectors of data and for affixing said



original check data to said individual sectors of data at times when said individual sectors are written to said magnetic disk;

error detection means operatively connected to said transfer path and to said check data generation means for generating an error signal indicating detection of an error sector in response to a difference between said original check data and said affixed check data for any of said individual sectors of data at times when said error sectors are read from said magnetic disk; and

error correction means responsive to send error signal for transferring said error sector from said main memory to said error correction means during a first said free time, and for correcting said error sector in accordance with said original check data and said affixed data to transfer a corrected said error sector from said error correction means to said main memory during a second said free time.

4,733,397

RESONANT CAVITY OPTICAL MODULATOR

Thomas F. Gallagher, Charlottesville, Va., and John P. Watjen, Sunnyvale, Calif., assignors to Electrical Power Research Institute, Inc., Palo Alto, Calif.

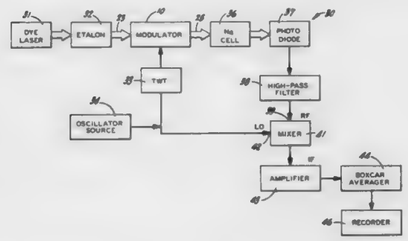
Filed Aug. 12, 1985, Ser. No. 765,039

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—26 **18 Claims**

1. A laser modulator comprising a waveguide for applying a selected high operating frequency modulating signal such as a radio frequency signal to a laser beam for frequency modulating the laser beam, and wherein the waveguide includes a

crystal section having its width selected so that the high operating frequency is just above the cut-off frequency, whereby



the associated phase velocity of the modulating signal in the crystal approximates the laser phase velocity in the crystal.

4,733,398

APPARATUS FOR STABILIZING THE OPTICAL OUTPUT POWER OF A SEMICONDUCTOR LASER

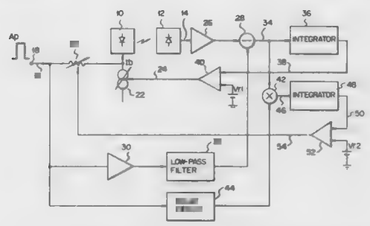
Taro Shibagaki, Tokyo, and Osamu Kinoshita, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Tohsiba, Kawasaki, Japan

Filed Sep. 30, 1986, Ser. No. 913,751

Claims priority, application Japan, Sep. 30, 1985, 60-216569; Jan. 27, 1986, 61-14943

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—31 **20 Claims**



1. An apparatus for stabilizing an optical output level of an electro-optical converter, said apparatus comprising:

modulator means for supplying said converter with drive pulses corresponding to an electrical input pulse signal, said modulator means further feeding a d.c. bias current to said converter;

light sensitive means for producing a first electrical signal indicative of the actual optical output level of said converter;

signal processing means for receiving said pulse signal to produce a second electrical signal indicative of an ideal optical output level of said converter;

subtraction means for detecting a difference between integration values of said first and second signals to produce as an error signal a third electrical signal indicative of a change in the actual optical output level of said converter; and

temperature-compensation means for receiving said electrical input pulse signal and said third signal, for applying a multiplication operation to said pulse signal and said third signal to extract a pulse component from said third signal, for generating a wave-shaped error signal in which a pulse component of said third signal is emphasized, and for producing first and second feedback signals based on said wave-shaped error signal to feed these feedback signals to said modulator means, said modulator means being responsive to said first and second feedback signals to independently modulate said d.c. bias current and the amplitude of said drive pulses applied to said converter, whereby the actual optical output level remains substantially constant.

4,733,399

SEMICONDUCTOR LASER DEVICE HAVING INTEGRAL OPTICAL OUTPUT MODULATOR

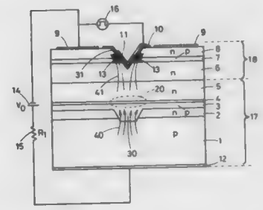
Yutaka Mihashi, and Yutaka Nagai, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1986, Ser. No. 856,937

Claims priority, application Japan, Apr. 30, 1985, 60-94805

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—50 **13 Claims**



1. In a semiconductor laser device:

a semiconductor laser portion; said semiconductor laser portion including

a semiconductor substrate of a first conductivity type, a first ohmic electrode connected to a surface of said substrate and

at least one semiconductor laser having a double hetero structure formed on the top surface of said semiconductor substrate of the first conductiveity type; and

at least one vertical field effect transistor portion formed on said semiconductor laser portion for modulating the optical output of said semiconductor laser portion; said vertical field effect transistor portion including

a first semiconductor layer of a second conductivity type which is opposite to said first conductivity type, formed on the top surface of said semiconductor laser portion;

a second semiconductor layer of the first conductivity type formed on the top surface of said first semiconductor layer; and

a third semiconductor layer of the second conductivity type formed on the top surface of said second semiconductor layer, wherein a striped groove deep enough to reach at least the first semiconductor layer from the top surface of said third semiconductor layer is formed in said first, second and third semiconductor layers; a second ohmic electrode connected to a surface of said third semiconductor layer; said field effect transistor portion further comprising

an insulating film formed on the top surface of said striped groove, and

a gate electrode formed on the top surface of said insulating film.

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4,733,400

SAFETY SHUTDOWN SYSTEM FOR A DYE LASER

Reinhardt Thyzel, Obere Bergstr. 3, 8501 Heroldsberg, and Eckhard Schröder, Eckental, both of Fed. Rep. of Germany, assignors to Reinhardt Thyzel, Heroldsberg, Fed. Rep. of Germany

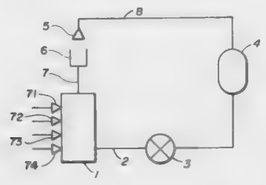
PCT No. PCT/DE85/00135, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO85/04990, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 26, 1985, Ser. No. 827,933

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1984, 3415574

Int. Cl.[4] H01S *3/20*

U.S. Cl. 372—51 5 Claims



1. A safety system for a dye laser comprising,

a supply vessel containing a dye solution filled to a dye filling level, said dye solution being pumped from said vessel, being discharged as a jet into an active laser region and flowing back into said vessel during laser operation,

means for measuring said dye filling level in said supply vessel, and

control means for switching off laser operation if said dye filling level fails to drop to a predetermined level after switching on laser operation, said control means switches off laser operation if said dye filling level is measured to be outside of a first predetermined range of high and low levels during laser operation.

4,733,401

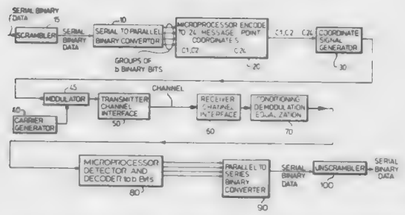
BLOCK CODING INTO 24 COORDINATES AND DETECTION OF TRANSMITTED SIGNALS

Fred M. Longstaff, Islington, Canada, assignor to Motorola Canada Limited, N. York, Canada

Filed Jun. 10, 1986, Ser. No. 872,594

Int. Cl.[4] H04L *23/02*

U.S. Cl. 375—37 15 Claims



1. Means for detecting coordinate signal values transmitted in sets of 24 modified in accord with pattern vectors derived from a Leech matrix having three rows:

11111111	00000000	00000000
00000000	11111111	00000000
00000000	00000000	11111111

wherein the coordinates were originally 0 modulo 4 and modified to be all even or all odd, where even coordinates are zero or two modulo 4, and odd coordinates are one or three modulo four, in each case dependent upon whether the selected pattern vector from said Leech matrix has a one or a zero and where the sum of the coordinates is 0 modulo 8 for even coordinates and 4 modulo 8 for odd coordinates,

means for receiving the signals derived from said transmitted signal values,

means for demodulating the received signals to detect 24 signal values,

means for storing such values,

means for providing such values modulo 4,

means for each value modulo 4 determining measures of the error if the transmitted modulo coordinate values were 0,1,2,3 respectively, and the penalty, being the measure of the increase in measure of the error for transmitted coordinate values of the next nearest transmitted coordinate differing by four,

where an octuple is a series of values cooresponding to places 1–8, 9–16 or 17–24, of the 24 values,

for each octuple means determining the sum of the coordinate error measures, and determining the smallest penalty in altering the mod 8 sum of the coordinates by altering a coordinate or substituting the complementary octuple,

means arranging the 256 possible transmitted octuple of coordinates mod 4 derived from the pattern vectors of said Leech matrix in 64 complementary even coordinate pairs and 64 complementary odd coordinate pairs,

means for each of the 128 pairs comparing each pair to determine which of the octuples in a pair have the lesser sum of error measures,

means for storing this information,

means for storing the information as to the smallest penalty and whether it involves substitution of the complementary octuple,

and means for storing the information as to whether in any octuple of the received values there are an even or odd number of coordinates which are the same mod 8 as mod 4,

means, for the 1024 possible combinations of triple octuples from the modified Leech matric, comparing these in groups of eights where the distinction between each group of eight triple octuples is solely determined by the selection eight available combinations of three rows of the said Leech matrix other than the rows previously recited,

means for each group of eight triple octuples for determining the triple octuple with the lowest sum of error measures, as derived from the octuples forming part of the triple octuple, which satisfies the modulo sum rule for the coordinates,

means determining from said triple octuple the Leech pattern vector used, and

means for reversing the effect of being modified in accord with such pattern vectors provided at the encoder to provide the coordinates before being modified,

means for determining the encoded information from said coordinates, the pattern vector and the choice of even or odd.

4,733,402

ADAPTIVE FILTER EQUALIZER SYSTEMS

Peter Monsen, Stow, Vt., assignor to Signatron, Inc., Lexington, Mass.

Filed Apr. 23, 1987, Ser. No. 41,831

Int. Cl.[4] H04B *7/08*

U.S. Cl. 375—100 12 Claims

1. A communications receiver system for receiving message signals transmitted through a multipath medium, said system comprising

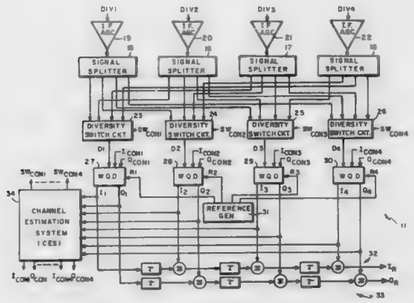
a plurality of diversity receivers each receiving one of a plurality of received diversity message signals from a message signal transmitted through said medium;

a plurality of switching means each associated with a different received signal time delay and responsive to said plurality of received diversity message signals for providing as a switching output signal therefrom the strongest signal or group of signals of said plurality of received diversity message signals at said associated time delay;

a plurality of weighting means each responsive to the switching output signal from a corresponding one of said switching means and to a weighting signal for providing a weighted output signal;

means for providing a said weighting signal to each of said weighting means; and

output time delay means responsive to the weighted output signals from said weighting means at each said associated time delay for combining said weighted output signals to provide a received output message signal therefrom.



4,733,403

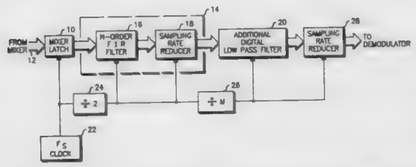
DIGITAL ZERO IF SELECTIVITY SECTION

Daniel A. Simone, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 12, 1986, Ser. No. 861,958

Int. Cl.[4] H04B *1/10;* G06G *7/02*

U.S. Cl. 375—103 26 Claims



1. A digital zero-IF selectivity section circuit operating on a recovered input signal, digitally clocked by a first clock at a rate of FS, in a receiver device, comprising:

second clock means for providing a periodic clock signal at a lesser rate than said first clock means;

first N-order decimating FIR digital filtering means, coupled to said second clock means, for selectively band-limiting the frequency spectrum of the recovered input signal;

one or more second digital filtering means, coupled to the output of said first N-order decimating FIR digital filtering means and operating at a clock rate less than or equal to said second clock rate, for further selectively band-limiting the frequency spectrum of the recovered input signal.

4,733,404

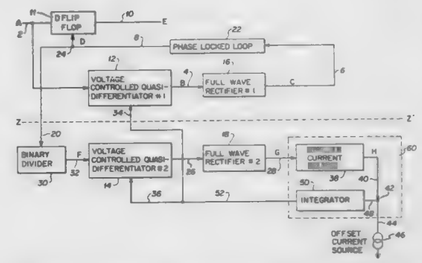
APPARATUS AND METHOD FOR SIGNAL PROCESSING

Vladimir E. Ostoich, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 25, 1986, Ser. No. 934,879

Int. Cl.[4] H03D *3/24;* H04L *7/02*

U.S. Cl. 375—119 16 Claims



1. Circuitry means for synchronizing received information transmitted having various bit rates, said circuitry means including holding means coupled to a communications link for receiving said information, signal shaping means coupled to said communications link for receiving said information, and a first clocking means coupled between said signal shaping means and said holding means for clocking said holding means in synchronism with said bit rates from said communications link, comprising:

divider means, coupled to an output of said first clocking means, for providing a divided clocking signal;

second signal shaping means, coupled to an output of said divider means, for shaping said divided clocking signal;

control means, coupled to an output of said second signal shaping means and having an output coupled to a control input of said first signal shaping means and to a control input of said second signal shaping means, for providing a signal to said first signal shaping means and said second signal shaping means such that output signals of said first shaping means and said second shaping means are a function of the signal to the respective said control inputs.

4,733,405

DIGITAL INTEGRATED CIRCUIT

Kazutoshi Shimizume; Takeshi Uematsu; Tetsu Haga, all of Kanagawa, and Youhei Hasegawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,150

Claims priority, application Japan, Oct. 15, 1985, 60-229319; Mar. 15, 1986, 61-058931; Apr. 21, 1986, 61-091828; Apr. 21, 1986, 61-091827

Int. Cl.[4] G11C *29/00, 19/28*

U.S. Cl. 377—29 16 Claims

1. In a digital integrated circuit having a plurality of clock flip-flop circuits and including first and second sources of clock signals, one of said sources being active at a time, each of said flip-flop circuits being a multiport flip-flop circuit and comprising, in combination:

first and second gate input terminals for receiving first and second gate, respectively,

first and second gate transistors connected to said first and second gate input terminals, respectively,

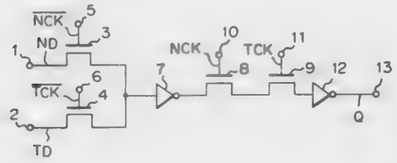
said first and second gate transistors being controlled by said first and second clock signals, respectively,

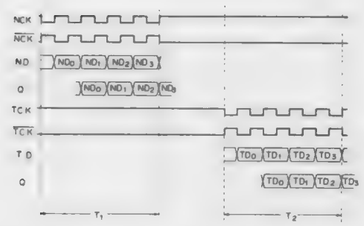
a first inverting circuit connected to said first and second gate transistors, and

third and fouth gate transistors serially connected to said first inverted circuit and controlled by said first and second clock signals, respectively;

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whereby said integrated circuit including said multiport flip-flop circuits can perform plural functions indepen-





dently with the application of one of said first and second clock signals to said first and third gates or to said second and fourth gates of said multiport flip-flop circuits.

4,733,406

IMAGE SENSING CHARGE COUPLED DEVICE

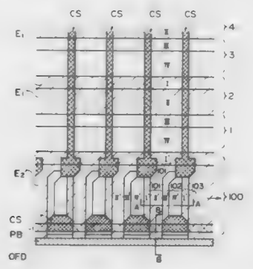
Takao Kinoshita, Tokyo, and Nobuyoshi Tanaka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 389,920, Jun. 18, 1982, abandoned. This application May 28, 1985, Ser. No. 738,549

Claims priority, application Japan, Sep. 17, 1981, 56-146588

Int. Cl.[4] **G11C** *19/28;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 377—61 **17 Claims**



1. A charge-coupled device comprising:

(A) storage means in a matrix of rows and columns for storing electrical charges, said storage means including a plurality of storage elements arranged in a matrix;

(B) read-out means for receiving the electrical charges from said storage means and for reading out the electrical charge in said read-out means;

(C) clear means for clearing charges, disposed adjacent to said read-out means,

wherein said clear means is disposed along said read-out means and is arranged to clear charges from said read-out means;

said clear means comprising;

(i) a first portion for extinguishing electrical charges;

(ii) a second portion disposed between said read-out means and said first portion, said second portion being arranged for introducing the charges into said first portion from said read-out means; and

(iii) electrode means common to said second portion in said clear means and a part of said read-out means for applying electrical signals to concurrently change the potential levels of said second portion and said part of said read-out means; and

(D) control means for controlling at least said storage means and said read-out means in a first control mode and a second control mode, wherein, in the first control mode, the charges from said storage means are sequentially read out as an electrical signal by said read-out means in a relatively long period and, in the second control mode, almost all of the charges from said storage means are sequentially introduced into said clear means through said read-out means to be cleared in a relatively short period.

4,733,407

CHARGE-COUPLED DEVICE

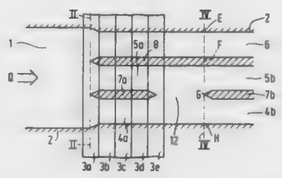
Jan W. Pathuis, and Theodorus F. Smit, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1986, Ser. No. 931,374

Claims priority, application Netherlands, Nov. 14, 1985, 8503128

Int. Cl.[4] **G11C** *19/28;* **H03H** *7/28;* **H01L** *29/78*

U.S. Cl. 377—62 **4 Claims**



1. A charge-coupled device comprising a charge transport channel, of which at least a part is provided with separation regions, by which this part of the channel is subdivided into n subchannels, by means of which a quantity of supplied charge Q is subdivided during transport through this part of the channel into n subcharges Q_j, where $j=1 \ldots n$ and n is integer and larger than 2, and at least a subchannel located at the edge of the channel which is separated from the adjacent subchannel by a separation region which has an interruption, as a result of which the subcharges transported in these subchannels are combined again at the area of the interruption and are then subdivided again into two subcharges during further transport.

4,733,408

SWITCH MECHANISM FOR AN IMAGE INTENSIFIER HOOD IN AN X-RAY DIAGNOSTICS SYSTEM

Georg Beikuefner, Roethenbach; Arthur Gall, Langensendelbach, and Adelbert Kupfer, Poxdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 2, 1986, Ser. No. 914,234

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 8532381[U]

Int. Cl.[4] **H05G** *1/54*

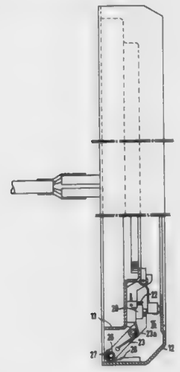
U.S. Cl. 378—117 **3 Claims**

1. In an x-ray diagnostics installation having an x-ray image intensifier with a hood surrounding the input luminescent screen thereof, a plurality of switch mechanisms or resiliently mounting said hood on a mounting ring attached to the housing of said x-ray image intensifier, said x-ray image intensifier being displaceable by a motor and said switch mechanisms being electrically connected to said motor for de-energizing

said motor upon dislodgement of said hood, each switch mechanism comprising:

at least one electrical switch connected for de-energizing said motor upon a change in state of said switch;

a lever having a first end disposed for actuating said electrical switch for causing a change of state thereof and having an opposite second end disposed at an obtuse angle with respect to said first end;



means for mounting said lever for pivotable movement around an axis parallel to a tangent of said ring; and

a beveled cam carried on an inside surface of said hood and pressing against said second end of said lever for pivoting said lever upon dislodgement of said hood and thereby causing a change of state of said electrical switch to de-energize said motor.

4,733,409

CASSETTE RECEPTACLE FOR X-RAY FILM CASSETTES

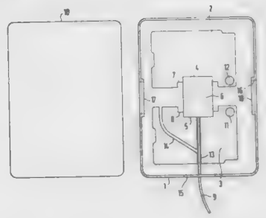
Manfred Haltrich, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,245

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 8500625[U]

Int. Cl.[4] **G03B** *41/16*

U.S. Cl. 378—167 **5 Claims**



1. A cassette receptacle for x-ray film cassettes including a radiation detector comprising:

a one-piece drawn plastic part having molded parts which project inwardly proceeding from a floor of the cassette receptacle to define a space for the radiation detector;

at least one depression in at least one molded part for receiving a cable of said detector;

projections provided at an upper side of said receptable to engage over a cassette placed above said detector;

at least one opening in said floor of said receptacle to provide manual engagement with said cassette to permit removal of said cassette; and

at least one fitting slot in a longitudinal side of said receptacle to permit the insertion of said radiation detector.

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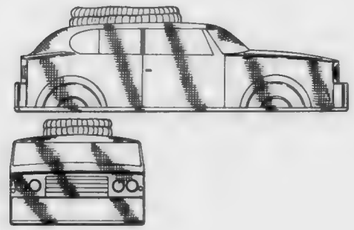
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MR
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1988

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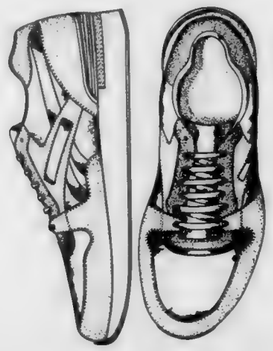
294,765
VEHICLE-SHAPED FLEXIBLE SLIPPER
Michael Otto, 3759 Walnut, Long Beach, Calif. 90807
Filed Aug. 5, 1985, Ser. No. 762,675
Term of patent 14 years
U.S. Cl. D2—279



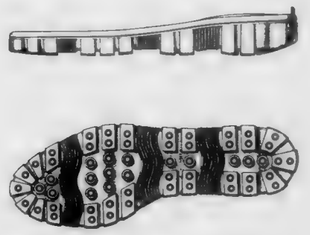
294,767
ATHLETIC SHOE
Brian F. Igoe, Wrentham, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Aug. 7, 1985, Ser. No. 763,186
Term of patent 14 years
U.S. Cl. D2—309



294,766
ATHLETIC SHOE
Brian F. Igoe, Wrentham, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Aug. 7, 1985, Ser. No. 763,188
Term of patent 14 years
U.S. Cl. D2—309

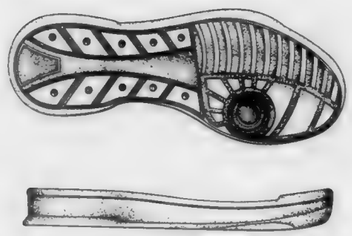


294,768
SHOE BOTTOM
Joseph P. Famolare, Jr., New York, N.Y., assignor to Famolare, Inc., New York, N.Y.
Filed Apr. 7, 1986, Ser. No. 850,883
Term of patent 14 years
U.S. Cl. D2—320

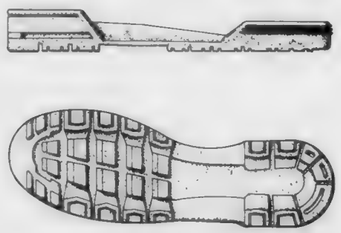


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294,769
SHOE SOLE
Steven P. Liggett, North Easton; Tuan N. Le, Cohasset, and Jeffrey P. Bun, Duxbury, all of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 20, 1985, Ser. No. 805,915
Term of patent 14 years
U.S. Cl. D2—320



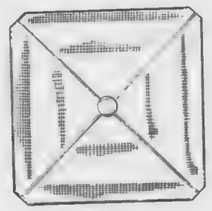
294,770
SHOE SOLE
Lawrence Selbiger, Portland, Oreg.; Gary Zuidema, Petaluma, and John Schelling, Orinda, both of Calif., assignors to The Donner Mountain Corporation, San Rafael, Calif.
Filed Jan. 9, 1987, Ser. No. 1,926
Term of patent 14 years
U.S. Cl. D2—320



294,771
SOCK
David S. Good, and Daniel H. Good, both of 1634 19th Ave. NE., Hickory, N.C. 28601
Filed Sep. 13, 1985, Ser. No. 776,154
Term of patent 14 years
U.S. Cl. D2—331

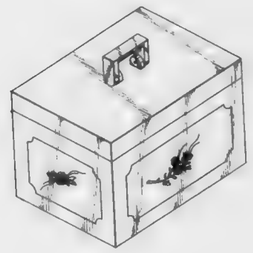


294,772
EMERGENCY UMBRELLA
Blair F. Baldwin, New York, N.Y., assignor to Bexel Corporation, New York, N.Y.
Filed Jul. 1, 1985, Ser. No. 750,922
Term of patent 14 years
U.S. Cl. D3—5

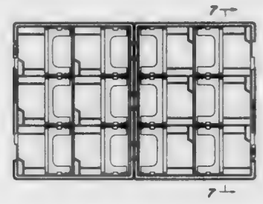


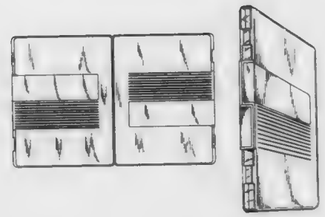


294,773
YARN ORGANIZER
Randall Beaty, P.O. Box 8426, Jackson, Miss. 39204
Filed Dec. 10, 1984, Ser. No. 679,995
Term of patent 14 years
U.S. Cl. D3—23

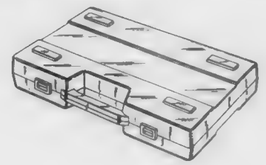


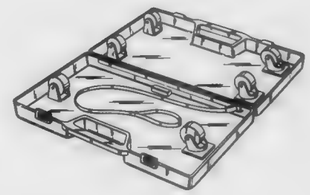
294,774
FLOPPY DISK KEEPING BOX
Katsuichi Kitada, Tokyo, Japan, assignor to Shin-Shin Shokai Co., Ltd., Tokyo, Japan
Filed Oct. 26, 1984, Ser. No. 665,310
Term of patent 14 years
U.S. Cl. D3—35



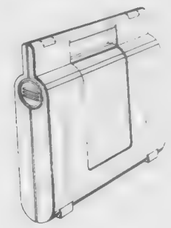


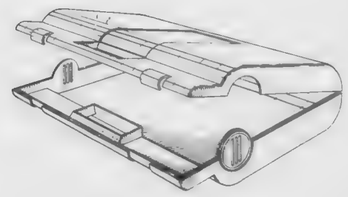
294,775
PORTABLE LUGGAGE CARRIER
Robert Rechberg, 2540 Shadow Ridge La., Orange, Calif. 92667
Filed May 3, 1985, Ser. No. 730,274
Term of patent 14 years
U.S. Cl. D3—73





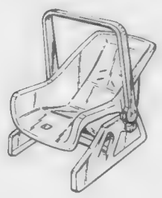
294,776
BRIEFCASE
Terence W. Gander, and Jeremy Gardner, both of Bracknell, United Kingdom, assignors to Sy Ziv Associates Inc., New York, N.Y.
Filed Jan. 16, 1986, Ser. No. 819,460
Claims priority, application United Kingdom, Jul. 31, 1985, 1028295
Term of patent 14 years
U.S. Cl. D3—73



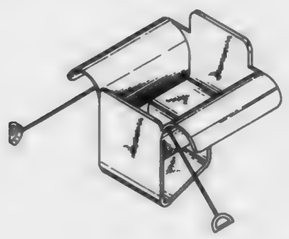


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294,777
INFANT AUTOMOBILE SEAT
Robert D. Wise, Akron, and Paul K. Meeker, Kent, both of Ohio, assignors to Gerber Products Company, Fremont, Mich.
Filed Oct. 3, 1985, Ser. No. 783,906
Term of patent 14 years
U.S. Cl. D6—333



294,778
CHILD'S CHAIR
Edward M. Lynch, R.R. No. 1, Box 9B, Aldrich, Minn. 56434
Filed Aug. 16, 1985, Ser. No. 766,415
Term of patent 14 years
U.S. Cl. D6—333



294,779
WIND PROTECTOR SUPPORT FRAME FOR AN OUTDOOR SPORTSMAN
May L. Cosby, P.O. Box 42, Clovis, N. Mex. 88101, assignor to May L. Cosby, Clovis, N. Mex.
Filed Jul. 25, 1985, Ser. No. 731,292
Term of patent 14 years
U.S. Cl. D6—335



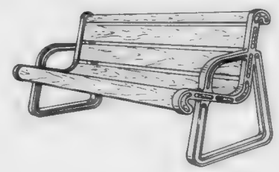
294,780
CHAIR
Charles R. Pollock, 34-24 86th St., Jackson Heights, N.Y. 11372, and William A. Jaremko, 255 E. 7th St., New York, N.Y. 10009
Filed Oct. 1, 1985, Ser. No. 782,366
Term of patent 14 years
U.S. Cl. D6—366



294,781
CHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Apr. 10, 1985, Ser. No. 721,650
Term of patent 14 years
U.S. Cl. D6—372



294,782
BENCH
Nicola Balderi, Englewood, Colo., assignor to Landscape Forms, Inc., Kalamazoo, Mich.
Filed Aug. 30, 1985, Ser. No. 771,264
Term of patent 14 years
U.S. Cl. D6—373



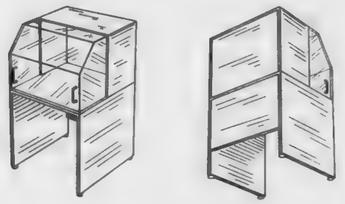
294,783
CHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Apr. 19, 1985, Ser. No. 725,588
Term of patent 14 years
U.S. Cl. D6—373



294,784
CHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Apr. 1, 1985, Ser. No. 718,109
Term of patent 14 years
U.S. Cl. D6—373



294,785
COMPUTER WORKSTATION UNIT
William J. Dickson, Toronto, Canada, assignor to Jamie Dickson Design Inc., Toronto, Canada
Division of Ser. No. 633,527, Jul. 23, 1984, Pat. No. Des. 289,114. This application Jan. 9, 1987, Ser. No. 2,499
Claims priority, application Canada, Apr. 12, 1984, 12-04-84-10
Term of patent 14 years
U.S. Cl. D6—421



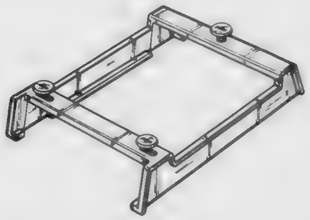
294,786
SPEAKER'S STAND
Charles Bossett, Jr., 1025 W. 76th St., Los Angeles
Filed Jul. 26, 1985, Ser. No. 759,182
Term of patent 14 years
U.S. Cl. D6—450



294,787
ETAGERE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Dec. 30, 1985, Ser. No. 814,908
Term of patent 14 years
U.S. Cl. D6—474

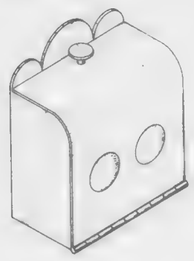


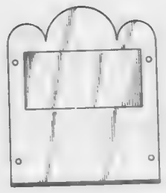
294,788
HANGING CONTAINER SUPPORT FRAME FOR WIRE SHELVES OR THE LIKE
Victor J. J. Cautereels, Borsbeek, Belgium, and Augusto A. Picozza, Johnston, R.I., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Dec. 30, 1985, Ser. No. 814,870
Term of patent 14 years
U.S. Cl. D6—513



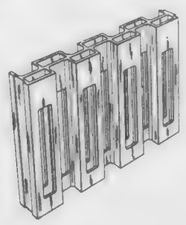
VOL 1088 ISS 4 MR 22 1988 UMI

294,789
COMBINED TOILET PAPER COVER AND CABINET
John W. Nunnally, 5648 Blackwell Rd., Bartlett, Tenn. 38134
Filed Jan. 15, 1985, Ser. No. 691,625
Term of patent 14 years
U.S. Cl. D6—523

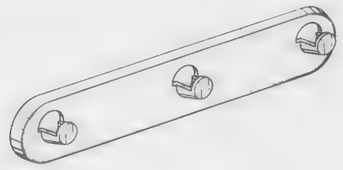




294,790
SKI RACK MODULE
Randall A. York, 16791 Summer Cloud La., Huntington Beach, Calif. 92646
Filed Feb. 21, 1985, Ser. No. 704,769
Term of patent 14 years
U.S. Cl. D6—552

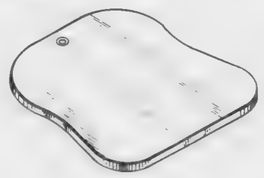


294,791
RACK FOR KITCHEN IMPLEMENTS OR THE LIKE
Dominick Loscalzo, Whitestone, and Howard W. Michaelson, Coram, both of N.Y., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 31, 1986, Ser. No. 847,059
Term of patent 14 years
U.S. Cl. D6—569

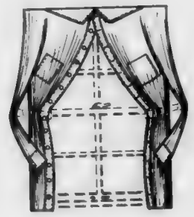


294,792
KITCHEN UTENSIL RACK OR THE LIKE
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Apr. 1, 1986, Ser. No. 847,607
Term of patent 14 years
U.S. Cl. D6—569

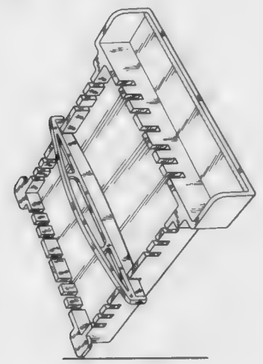
294,793
SEAT PAD
Peter Luccisano, Three Thompson St., Methuen, Mass. 02035
Filed Jul. 18, 1985, Ser. No. 756,744
Term of patent 14 years
U.S. Cl. D6—601



294,794
WINDOW CURTAIN OR THE LIKE
Roberta J. Wright, 1440 Illinois St., Sidney, Nebr. 69162
Filed Feb. 4, 1985, Ser. No. 698,015
Term of patent 14 years
U.S. Cl. D6—576



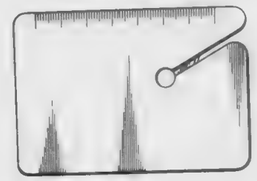
294,795
BISCUIT CUTTER
Harold E. Hassenfelt, Jr., 46 Wildwood Ct., Southern Pines, N.C. 28287
Filed Jun. 6, 1985, Ser. No. 741,910
Term of patent 14 years
U.S. Cl. D7—43



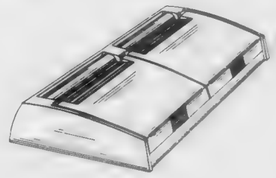
294,796
AUTOMOTIVE CARBURETOR REPAIR TOOL
James D. Bonbright, 19480 8th St. East, Sonoma, Calif. 95476
Filed Mar. 5, 1984, Ser. No. 586,243
Term of patent 14 years
U.S. Cl. D8—51



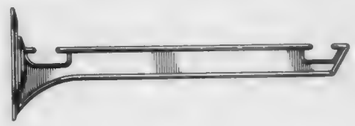
294,797
PACKAGE WRAPPING CUTTER
Katsuaki Itoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Kawasaki Seal Seisakusho, Kawasaki, Japan
Filed Mar. 25, 1985, Ser. No. 715,812
Term of patent 14 years
U.S. Cl. D8—98

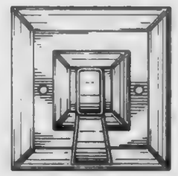


294,798
WEATHERPROOF ELECTRICAL RECEPTACLE COVER
George Hoehne, Glen Cove, N.Y., assignor to Slater Electric, Inc., Glen Cove, N.Y.
Continuation of Ser. No. 614,766, May 29, 1984, abandoned.
This application Apr. 15, 1987, Ser. No. 42,591
Term of patent 14 years
U.S. Cl. D8—353



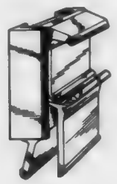
294,799
HANGER FOR PLASTIC BAG
John L. Vilkofsky, Jr., 2001 Dels La., Turlock, Calif. 95380
Filed Jan. 27, 1987, Ser. No. 7,412
Term of patent 14 years
U.S. Cl. D8—368





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294,800
CLIP FOR SUPPORTING MEDICAL DEVICES OR THE LIKE ON A SUPPORT RAIL
Lars A. H. Nilsson, Bagshot, England, assignor to M.T.D. Medical Technology and Development Ltd., Nicosia, Cyprus
Filed Apr. 2, 1984, Ser. No. 595,665
Claims priority, application Sweden, Oct. 4, 1983, 83-2553
Term of patent 14 years
U.S. Cl. D6—395



294,801
FLORAL PACKAGE
Charles C. Harris, 1022 Fox Chase Ind. Dr., Arnold, Mo. 63010
Filed Oct. 24, 1984, Ser. No. 664,208
Term of patent 14 years
U.S. Cl. D9—305



294,802
OIL CONTAINER
Theodore Beaver, Roselle, Ill., assignor to Witco Chemical Corporation, New York, N.Y.
Filed Jul. 15, 1985, Ser. No. 754,917
Term of patent 14 years
U.S. Cl. D9—375



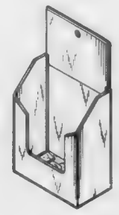
294,803
CONTAINER FOR LIQUIDS
Simon J. Richter, Marietta, Ga., and Frank G. Hohmann, Denville, N.J., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Jul. 16, 1985, Ser. No. 755,572
Term of patent 14 years
U.S. Cl. D9—375



294,804
BOTTLE
William Landerman, and William L. Williams, III, both of New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Sep. 12, 1985, Ser. No. 775,072
Term of patent 14 years
U.S. Cl. D9—377



294,805
DISPLAY BOX FOR POUCHES
Dale L. Boyer, Ridgefield, Conn., assignor to General Foods Corp., White Plains, N.Y.
Filed Oct. 12, 1984, Ser. No. 661,472
Term of patent 14 years
U.S. Cl. D9—415



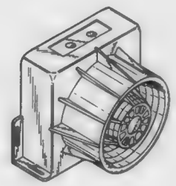
294,806
WRISTWATCH
Alain-Dominique Perrin, Rueil Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Jul. 9, 1985, Ser. No. 753,579
Claims priority, application Hague, Jan. 9, 1985, DM/004616
Term of patent 14 years
U.S. Cl. D10—32



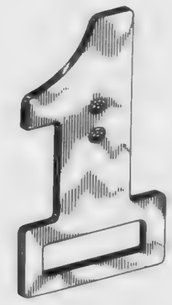
294,807
CASSETTE FOR CHROMATOGRAPH
S. Nicholas Stiso, San Jose, and Robert F. Zak, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Continuation-in-part of Ser. No. 672,546, Nov. 15, 1984. This application May 2, 1985, Ser. No. 730,234
The portion of the term of this patent subsequent to Aug. 4, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—81



294,808
AUTOMOBILE ALARM DEVICE
Willard L. Zeigner, San Ramon, Calif., assignor to Zemco, Inc., San Ramon, Calif.
Filed Jan. 21, 1986, Ser. No. 820,139
Term of patent 14 years
U.S. Cl. D10—106



294,809
EMBLEM FOR JEWELRY OR THE LIKE
Clifford R. Robinson, 7709 Dalgien Ct., Reynoldsburg, Ohio 43068
Filed Oct. 7, 1985, Ser. No. 785,276
Term of patent 14 years
U.S. Cl. D11—61



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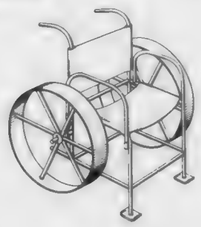
294,810
MAGNETIC FASTENER
Tamao Morita, 47-1, 6-chome, Arakawa, Arakawa-ku, Tokyo, Japan 116
Filed Apr. 17, 1985, Ser. No. 724,107
The portion of the term of this patent subsequent to May 15, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—231



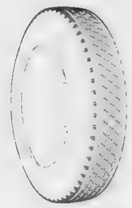




294,811
WHEELCHAIR FOR BEACH AND WATER
James S. Rice, 2316 Jackson Ave., and William L. Klohn, 1100 3rd St. South, both of Naples, Fla. 33940
Filed Apr. 23, 1985, Ser. No. 726,355
Term of patent 14 years
U.S. Cl. D12—131



294,812
AUTOMOBILE TIRE
Akihiro Takeuchi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 19, 1985, Ser. No. 725,297
Claims priority, application Japan, Feb. 4, 1985, 60-4124
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—146



294,813
AUTOMOBILE TIRE
Kenichi Fujiwara, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 11, 1986, Ser. No. 844,280
Claims priority, application Japan, Dec. 7, 1985, 60-51096
Term of patent 14 years
U.S. Cl. D12—147



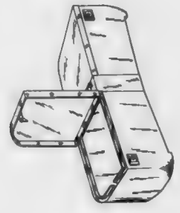
294,814
AUTOMOBILE TIRE
Akihiro Nakatani, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 11, 1986, Ser. No. 844,287
Claims priority, application Japan, Dec. 3, 1985, 60-50580
Term of patent 14 years
U.S. Cl. D12—147



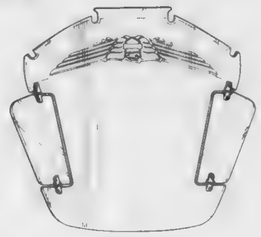
294,815
AUTOMOBILE TIRE
Hideaki Nagayasu, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 29, 1986, Ser. No. 858,263
Claims priority, application Japan, Jan. 23, 1986, 61-2250
Term of patent 14 years
U.S. Cl. D12—147



294,816
TOOL BOX FOR PICK-UP TRUCKS
Gerald Hoyt, 4626 Rockford Ct., Charlotte, N.C. 28209
Filed Feb. 27, 1986, Ser. No. 838,040
Term of patent 14 years
U.S. Cl. D12—157



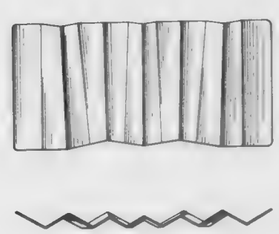
294,817
VENTED MOTORCYCLE WIND SCREEN
James M. Preisler, Mound, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed Feb. 14, 1985, Ser. No. 701,758
Term of patent 14 years
U.S. Cl. D12—182



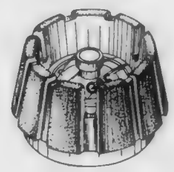
294,818
FRONT FENDER FOR AN AUTOMOBILE
Masahiko Kawatsu, and Tokuo Fukuichi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,915
Term of patent 14 years
U.S. Cl. D12—184



294,819
SOLAR SHADE FOR AUTOMOBILES AND THE LIKE
Donald R. Kuri, 888 Van Dyke Dr., Laguna Beach, Calif. 92651
Filed Jan. 2, 1986, Ser. No. 815,513
Term of patent 14 years
U.S. Cl. D12—191

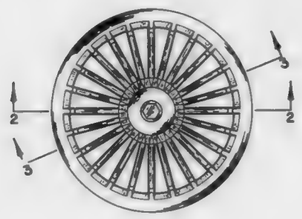


294,820
GAS CAP
Steven P. Belletire, Chicago, Ill., assignor to Attwood Corporation, Lowell, Mich.
Filed Nov. 4, 1985, Ser. No. 803,850
Term of patent 14 years
U.S. Cl. D12—197

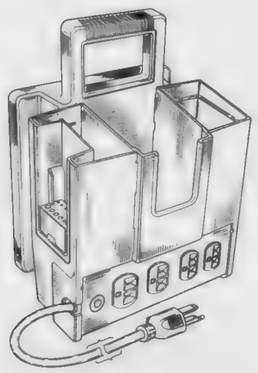


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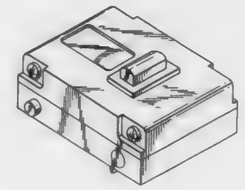
294,821
WHEEL COVER
Jimmy D. Danbom, Terrace Park, Milford, Iowa 51351
Filed Mar. 19, 1984, Ser. No. 590,751
Term of patent 14 years
U.S. Cl. D12—211

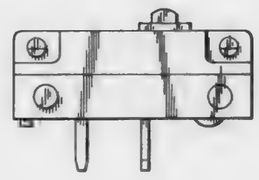


294,822
COMBINED POWER TOOL CARRIER AND POWERBOARD
Francis R. Bannigan, 64 Duerdin St., North Clayton, 3168, Victoria, Australia
Filed Dec. 19, 1984, Ser. No. 683,409
Term of patent 14 years
U.S. Cl. D13—30

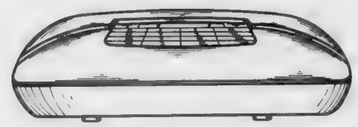


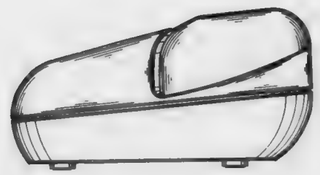
294,823
PUSH-BUTTON ELECTRIC MICROSWITCH
Raymond Holmes, Durham, England, assignor to Burgess Micro Switch Company Limited, Tyne & Wear, England
Filed Feb. 6, 1985, Ser. No. 698,879
Claims priority, application United Kingdom, Aug. 7, 1984, 1021366
The portion of the term of this patent subsequent to Feb. 23, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—38

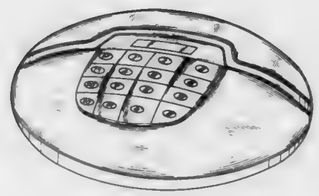




294,824
COMBINED HANDPIECE AND STAND TELEPHONE
Koun H. Lin, 4F-2, No. 145, 1 Sec., Taipei City, Taiwan
Filed Aug. 18, 1986, Ser. No. 897,408
Term of patent 14 years
U.S. Cl. D14—53

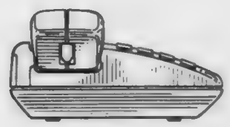




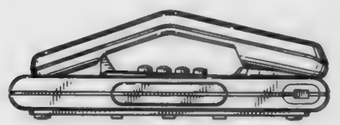


294,825
COMBINATION HANDSET AND STAND TELEPHONE
John C. Coons, and Jean M. Beirise, both of Cincinnati, Ohio, assignors to Southwestern Bell Telecommunications, Inc., St. Louis, Mo.
Filed Oct. 10, 1986, Ser. No. 917,828
Term of patent 14 years
U.S. Cl. D14—53

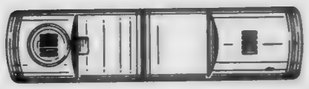




294,826
TELEPHONE SET
Takei Yoshiharu, New Territories, Hong Kong, assignor to Tasca International Ltd., Kowloon, Hong Kong
Filed Jun. 9, 1986, Ser. No. 873,312
Claims priority, application United Kingdom, Feb. 10, 1986, 1032160
Term of patent 14 years
U.S. Cl. D14—53

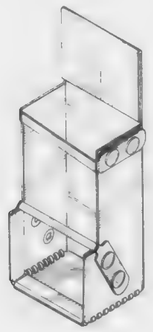




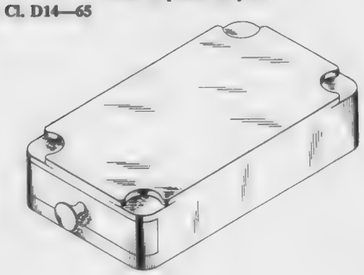


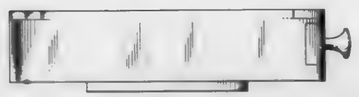
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294,827
PORTABLE HANDSET TELEPHONE CASE
Wade A. Woodfork, 1003 Church St., Apt. K, Gillette, Wyo. 82716
Filed Feb. 22, 1985, Ser. No. 704,588
Term of patent 14 years
U.S. Cl. D14—59

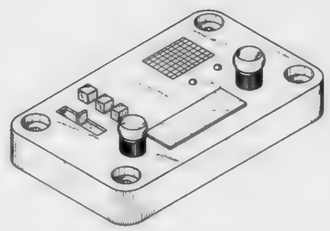


294,828
COMBINED SWIVEL BASE AND PULL-OUT DRAWER FOR A TELEPHONE OR SIMILAR ARTICLE
Lillie F. Jones, and Linda J. Hauber, both of 2515 Hermitage Way, Louisville, Ky. 40222
Filed Mar. 31, 1986, Ser. No. 847,592
Term of patent 14 years
U.S. Cl. D14—65

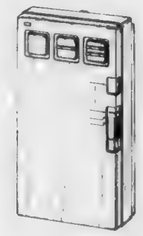




294,829
MOTORCYCLE MOUNTED RADIO
Michael D. Hogue, 3134 Queen Rd., Ravena, Ohio 44266
Filed Feb. 11, 1985, Ser. No. 700,093
Term of patent 14 years
U.S. Cl. D14—68



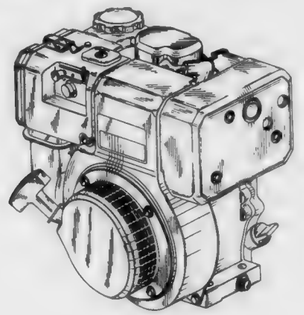
294,830
TRANSMITTER USED FOR ALARM DISPLAY PROCESSOR
Nobuhiro Umehara, Tokyo, and Yukio Igarashi, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 4, 1985, Ser. No. 688,762
Term of patent 14 years
U.S. Cl. D14—95

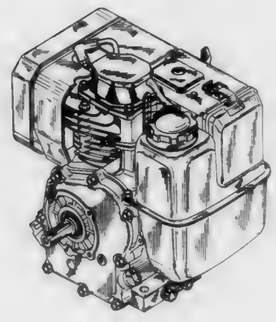


294,831
PORTABLE COMPUTER
Masaki Hara; Sadao Shiratani; Masaharu Sawatani, and Masataka Fukunaga, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 7, 1985, Ser. No. 763,237
Claims priority, application Japan, Feb. 13, 1985, 60-5051
Term of patent 14 years
U.S. Cl. D14—106



294,832
ENGINE
Yukinori Itou, Kawagoe; Kiyohide Sumi, Koga; Toyosaku Kowase, Kawagoe, and Masashi Takahashi, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 30, 1985, Ser. No. 760,444
Term of patent 14 years
U.S. Cl. D15—1

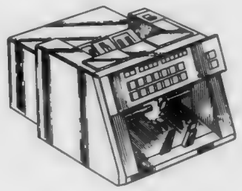




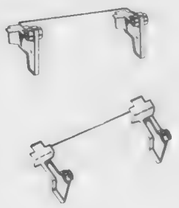
294,833
SUNGLASSES
W. Bruce Holden, Chico, Calif., assignor to Sport Optics of California, Chico, Calif.
Filed May 5, 1986, Ser. No. 859,757
Term of patent 14 years
U.S. Cl. D16—112



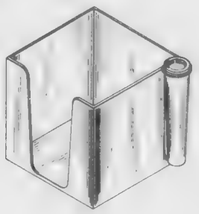
294,834
CURRENCY COUNTING MACHINE
Ronald McDonald, Milford, Mass., assignor to American Coin Currency Equipment Corporation, Hanover, Mass.
Filed May 3, 1985, Ser. No. 730,240
Term of patent 14 years
U.S. Cl. D18—3



294,835
ROLL PAPER HOLDER FOR PRINTER
Hiromitsu Nagahiro, Ube, Japan, assignor to Citizen Watch Company, Limited, Tokyo, Japan
Filed Nov. 15, 1985, Ser. No. 805,222
Claims priority, application Japan, Jul. 22, 1985, 60-31009
Term of patent 14 years
U.S. Cl. D18—22

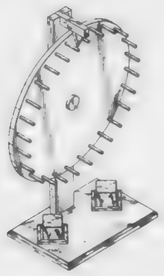


294,836
COMBINED PAPER AND PENCIL CADDY
Joseph M. Micucci, Longmeadow, Mass., assignor to Olympic Sales Club, Inc., Enfield, Conn.
Filed Feb. 25, 1985, Ser. No. 705,512
The portion of the term of this patent subsequent to Mar. 6, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—78

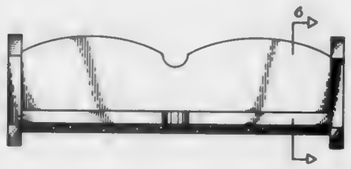


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294,837
COMBINED EDUCATIONAL GAME SPINNER AND BLOCKS THEREFOR
Martha L. Haines, 318 E. Essex La., Fort Wayne, Ind. 46825
Filed Jun. 7, 1985, Ser. No. 742,437
Term of patent 14 years
U.S. Cl. D21—39



294,838
DOMINO HOLDING CRADLE
Dorothy F. Wells, P.O. Box 4, Gilchchrist, Tex. 77617
Filed Feb. 11, 1985, Ser. No. 700,465
Term of patent 14 years
U.S. Cl. D21—54

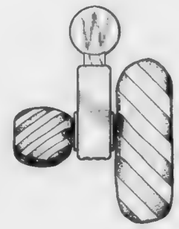


294,839
MIRROR POP-UP TOY
Paul Thom, Quincy, Mass., assignor to Kiddie Products, Inc., Avon, Mass.
Filed May 13, 1985, Ser. No. 733,539
Term of patent 14 years
U.S. Cl. D21—59

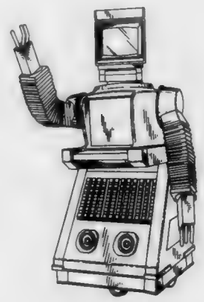


294,840
SPINNER PADDLE TOY
D. Michael Williams, New York, and Lois E. Kelly, Brooklyn, both of N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Feb. 8, 1985, Ser. No. 699,766
Term of patent 14 years
U.S. Cl. D21—92





294,841
ROBOT AMUSEMENT HOUSING
Gene R. Beley, 2810 Holiday Drive Ct., Morgan Hill, Calif. 95037
Filed Sep. 3, 1985, Ser. No. 771,613
Term of patent 14 years
U.S. Cl. D21—150



294,842
TOY EQUINE FIGURE
Steven P. Hanson, Winnetka; John V. Zaruba, Chicago, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 8, 1985, Ser. No. 699,929
Term of patent 14 years
U.S. Cl. D21—165



294,843
BASEBALL NOVELTY
Richard G. Lund, 7564 Major Ave. North, Brooklyn Park, Minn. 55443
Filed Jan. 17, 1986, Ser. No. 819,808
Term of patent 14 years
U.S. Cl. D21—204



294,844
BALL
Benjamin J. Winter, Newark, Calif., assignor to Winter Design-/Manufacturing, Inc., Pleasanton, Calif.
Filed Jul. 22, 1985, Ser. No. 757,508
Term of patent 14 years
U.S. Cl. D21—205



294,845
NOVELTY WINTER GOLF BALL
George M. Colclasure, 4233 Charter Ave., Oklahoma City, Okla. 73108
Filed Sep. 24, 1985, Ser. No. 779,422
Term of patent 14 years
U.S. Cl. D21—205



294,846
NOVELTY GOLF BALL
George M. Colclasure, 4233 Charter Ave., Oklahoma City, Okla. 73108
Filed Sep. 24, 1985, Ser. No. 779,624
Term of patent 14 years
U.S. Cl. D21—205

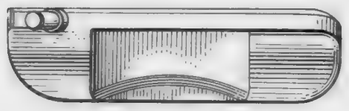


294,847
NOVELTY GOLF BALL
George M. Colclasure, 4233 Charter Ave., Oklahoma City, Okla. 73108
Filed Sep. 24, 1985, Ser. No. 779,625
Term of patent 14 years
U.S. Cl. D21—205

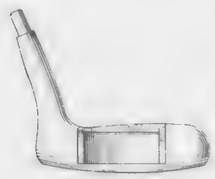


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294,848
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Jan. 14, 1985, Ser. No. 690,960
Term of patent 14 years
U.S. Cl. D21—217



294,849
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Jan. 14, 1985, Ser. No. 691,056
Term of patent 14 years
U.S. Cl. D21—217



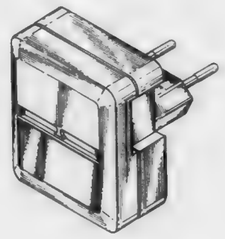
294,850
GOLF CLUB HEAD
Samuel P. Simmons, Torrance, Calif., assignor to Sigma Diversified Sports, Inc., Mojave, Calif.
Filed May 17, 1985, Ser. No. 735,057
Term of patent 14 years
U.S. Cl. D21—220



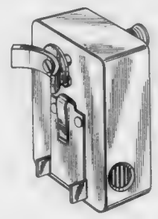
294,851
POOL CUE GUIDE
William A. Nicotra, 1358 Goettman St., Pittsburgh, Pa. 15212
Filed Sep. 16, 1985, Ser. No. 776,373
Term of patent 14 years
U.S. Cl. D21—232



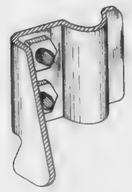
294,852
ELECTRICAL APPARATUS FOR VAPORIZING INSECTICIDE TABLETS
Peter Schroeder, Viersen; Franz P. Hennemann, Duesseldorf; Frank Grieser, Berg.-Gladbach, and Klaus Tranelis, Muelheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Jun. 17, 1985, Ser. No. 745,755
Claims priority, application Hague, Dec. 18, 1984, DM/004546
Term of patent 14 years
U.S. Cl. D22—120



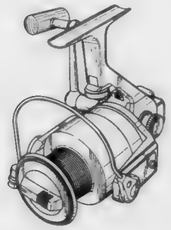
294,853
FISHERMAN'S CATCH ALERT UNIT
Rodney V. Nicks, 2225 Montemar St., Escondido, Calif. 92027
Filed Jun. 14, 1985, Ser. No. 744,622
Term of patent 14 years
U.S. Cl. D22—134



294,854
FISH STRINGER RETAINER BRACKET
Robert E. Friesz, 5821 S. 92nd St., Omaha, Nebr. 68127
Continuation-in-part of Ser. No. 517,664, Jul. 27, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,898
Term of patent 14 years
U.S. Cl. D22—134



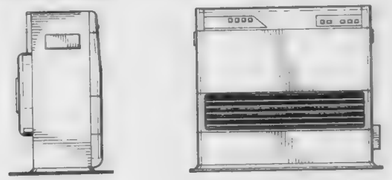
294,855
FISHING REEL
Kanji Iinuma; Kyoichi Kaneko; Nobuyuki Yamaguchi, and Michiki Kawai, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Sep. 27, 1985, Ser. No. 780,887
Term of patent 14 years
U.S. Cl. D22—141



294,856
ELEVATED WATER TANK
Lloyd E. Anderson, Sr., Des Moines, Iowa, assignor to Pitt-Des Moines, Inc., Pittsburgh, Pa.
Filed Apr. 3, 1985, Ser. No. 719,430
Term of patent 14 years
U.S. Cl. D23—202



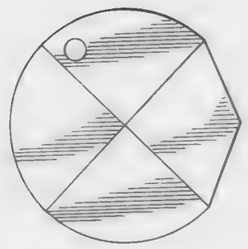
294,857
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Aichi, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Dec. 17, 1985, Ser. No. 809,822
Claims priority, application Japan, Jun. 18, 1985, 60-25741
Term of patent 14 years
U.S. Cl. D23—338



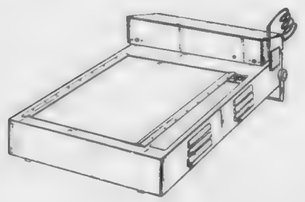
VOL 1088 ISS 4 MR 22 1988 UMI

294,858
FUME HOOD
G. Thomas Saunders, Geneva, Ill., and William E. Baitinger, West Lafayette, Ind., assignors to St. Charles Manufacturing Co., St. Charles, Ill.
Division of Ser. No. 819,545, Jan. 16, 1986. This application Apr. 27, 1987, Ser. No. 42,648
Term of patent 14 years
U.S. Cl. D23—364

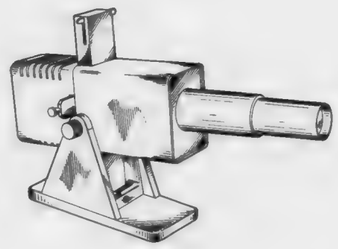




294,859
GEL READER FOR AUDIOGRAMS
John H. Kreisher, Ridgefield, and Martin J. Mattessich, New Haven, both of Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.
Filed Apr. 15, 1985, Ser. No. 723,209
Term of patent 14 years
U.S. Cl. D24—8



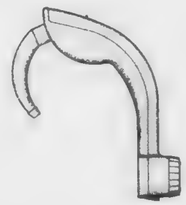
294,860
ACUITY CHART PROJECTOR OR THE LIKE
Paul A. Hoogesteger, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sep. 9, 1985, Ser. No. 774,121
Term of patent 14 years
U.S. Cl. D24—17



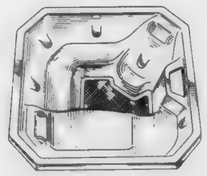
294,861
FORWARD CUTTING PORTION OF A DISPOSABLE SURGICAL SCALPEL BLADE OR THE LIKE
Steven G. Detsch, 4115 The Hill Rd., Bonita, Calif. 92002
Filed Sep. 13, 1985, Ser. No. 775,657
Term of patent 14 years
U.S. Cl. D24—28



294,862
BEHIND THE EAR HEARING AID
Berndt Diefenbach, Percha, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 21, 1985, Ser. No. 714,297
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 10/14085
Term of patent 14 years
U.S. Cl. D24—35



294,863
WHIRLPOOL BATHING SHELL
Robert C. Kingsley, Northridge, Calif., assignor to Hydro-Spa, Inc., Piru, Calif.
Filed Jun. 4, 1985, Ser. No. 740,984
Term of patent 14 years
U.S. Cl. D24—38

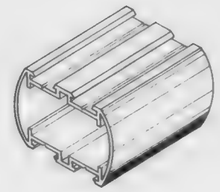


294,864
THERAPEUTIC INFRARED HEAT GENERATOR FOR PAIN RELIEF
Joseph Gialanella, Irvington, N.J., assignor to Infralux International, Inc., Fairfield, N.J.
Filed Jul. 22, 1985, Ser. No. 757,159
Term of patent 14 years
U.S. Cl. D24—40

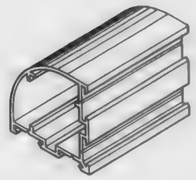




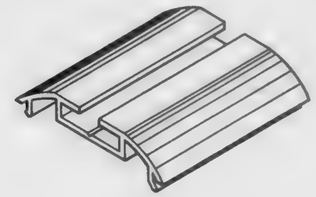
294,865
SHAPED BAR FOR WINDOW FRAMES
Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Israel
Filed May 16, 1985, Ser. No. 734,681
Term of patent 14 years
U.S. Cl. D25—122



294,866
SHAPED BAR FOR WINDOW FRAMES
Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Israel
Filed May 16, 1985, Ser. No. 734,683
Claims priority, application Israel, Nov. 30, 1984, 10,200
Term of patent 14 years
U.S. Cl. D25—122



294,867
SHAPED BAR FOR WINDOW FRAMES
Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Israel
Filed May 16, 1985, Ser. No. 734,684
Claims priority, application Israel, Jan. 18, 1985, 10295
Term of patent 14 years
U.S. Cl. D25—119



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294,868
LIGHT ATTACHMENT FOR THE END OF A CANE OR UMBRELLA
Chong S. Sim, 805 Marion St., Apt. 209, Seattle, Wash. 98104
Continuation-in-part of Ser. No. 707,314, Mar. 1, 1985, abandoned. This application Jun. 21, 1985, Ser. No. 747,481
Term of patent 14 years
U.S. Cl. D26—38

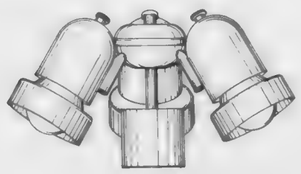


294,869
FLASHLIGHT
Eddie Kwan, Kowloon, Hong Kong, assignor to Burns Bros., Inc., Portland, Oreg.
Filed Jun. 5, 1985, Ser. No. 741,469
Term of patent 14 years
U.S. Cl. D26—49





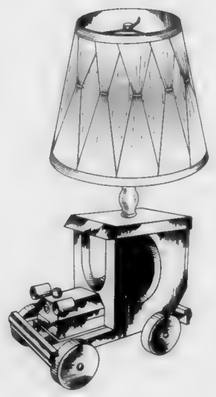
294,870
COMBINED LIGHTING FIXTURE AND AUDIO SPEAKER
John Hsu, Taipei, Taiwan, assignor to Sevenseas Traders, China
Filed Dec. 16, 1985, Ser. No. 809,568
Term of patent 14 years
U.S. Cl. D26—52



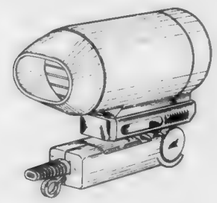
294,871
INDUSTRIAL LUMINAIRE
Robert L. Ewing, 1440 Twin Pines Ct., Newark, Ohio 43055; James S. Hughes, 48 E. Pacemont Rd., and William H. Faust, 150 W. Maynard Ave., both of Columbus, Ohio 43202
Filed Mar. 13, 1985, Ser. No. 711,411
Term of patent 14 years
U.S. Cl. D26—85



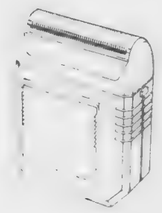
294,872
LAMP
Gerald D. Earegood, 1184 Sunnydale, Birrton, Mich.
Filed Jan. 23, 1985, Ser. No. 694,128
Term of patent 14 years
U.S. Cl. D26—97



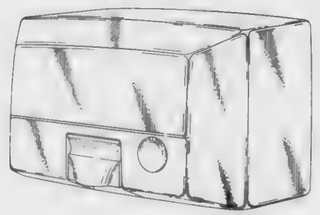
294,873
HAIR DRYER
Shinri Ogawa, and Akira Yamazaki, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jun. 12, 1986, Ser. No. 873,335
Claims priority, application Japan, Dec. 13, 1985, 60-52101
Term of patent 14 years
U.S. Cl. D28—13



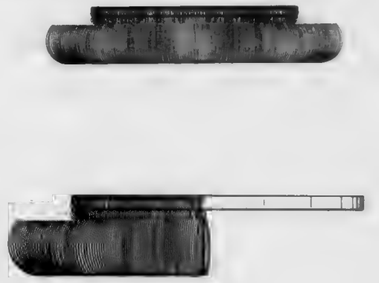
294,874
ELECTRIC DRY SHAVER
Masahide Aoki, and Masaru Komiya, both of Kodaira, Japan, assignors to Kyusyu Hitachi Maxell, Ltd., Japan
Filed Oct. 30, 1985, Ser. No. 792,886
Claims priority, application Japan, Apr. 30, 1985, 60-17972
Term of patent 14 years
U.S. Cl. D28—49



294,875
WALL MOUNTED DRYER
Henry C. Keck, South Pasadena, and Hiroshi Fukushima, Monterey Park, both of Calif., assignors to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Apr. 21, 1986, Ser. No. 857,414
Term of patent 14 years
U.S. Cl. D28—54.1



294,876
HAIR BAND
Chao C. Kuo, New Territories, Hong Kong, assignor to The Artistic Hair Products Company Limited, Hong Kong, Hong Kong
Filed Jul. 22, 1985, Ser. No. 757,797
Claims priority, application United Kingdom, Apr. 10, 1985, 1026082
Term of patent 14 years
U.S. Cl. D28—92

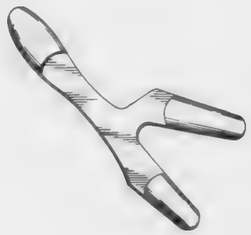


294,877
BILL FOR BASEBALL CAP OR THE LIKE
Michael R. Burley, 4922 Edinger Ave., Bldg. #3, Apt. #6, Huntington Beach, Calif. 92649
Filed Jan. 24, 1985, Ser. No. 694,209
Term of patent 14 years
U.S. Cl. D29—16

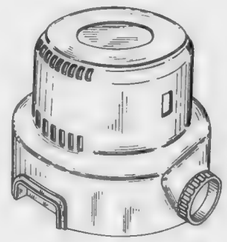


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BEAUTICIAN'S GLOVE OR THE LIKE
Janice Banks, 1301 Michigan Ave., Apt. #3, Santa Monica, Calif. 90404
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Term of patent 14 years
U.S. Cl. D29—22



294,879
HOUSING FOR A VACUUM CLEANER MOTOR
Robert C. Berfield, Jersey Shore, and Craig Seasholtz, Avis, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Hatada, Kenji; Kawakami, Ken-ichi; and Kobayashi, Hiroaki, to Toray Industries, Inc. Polyester film with smooth and highly adhesive surface and method of making same. 4,732,814, Cl. 428-480.000.

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Havira, R. Mark, to Schlumberger Technology Corporation. Apparatus and method for acoustically investigating a casing set in a borehole. 4,733,380, Cl. 367-35.000.

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Hay, James V.; Wexler, Barry A.; and Zimmerman, Donna F., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,732,604, Cl. 71-92.000.

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Heibel, Helmut, to Lucas Industries public limited company. Spot-type disc brake for vehicles. 4,732,242, Cl. 188-73.450.

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Helton, Doyle D. Fishing lure with temperature responsive color change. 4,731,948, Cl. 43-42.330.

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Heppinstall, Roy; Tupper, George I. F.; Eaton, Paul; and Tunstall, Edmund K., to British Broadcasting Corporation; and English Electric Valve Company Limited. Amplifying arrangements including a klystron having a power transfer characteristic which is substantially the same over its entire passband. 4,733,192, Cl. 330-45.000.

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Stoffregen, Robert T. Vibratory massager retained against body with belt having elastic strap. 4,732,140, Cl. 128-36.000.

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Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Three axis attitude control system. 4,732,353, Cl. 244-165.000.

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Sugimori, Takashi; and Furujo, Sakae, to Sumitomo Metal Industries, Ltd. Method of controlling the stirring strength and flow rate of a jet of gas blown through a lance onto a molten metal surface. 4,732,607, Cl. 75-59.130.

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Yaginuma, Satoshi; Asahi, Akira; Takada, Masaki; Hayashi, Mitsuo; and Fukukawa, Kiyofumi, to Toyo Jozo Co, Ltd. Enzyme Inhibiting substance. 4,732,910, Cl. 514-475.000.

Yagnik, Chandrakant M.: *See—*
Goss, David C.; and Yagnik, Chandrakant M., 4,733,059, Cl. 219-548.000.

Yahara, Masataka: *See—*
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Yajima, Akio: *See—*
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Yamabe, Hitoshi: *See—*
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Yamada, Hiromichi; Tsukuda, Yasuo; Suzuki, Atsushi; Yamamoto, Hajime; Yoshida, Minoru; Maio, Kenji; and Fujii, Hideji, to Hitachi, Ltd.; Hitachi Medical Corp.; and Hitachi Metals, Ltd. Radiation detector. 4,733,088, Cl. 250-483.100.

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Yamada, Kazuhiko: *See*—
Shin, Yasuhiro; and Yamada, Kazuhiko, 4,733,105, Cl. 307-261.000.
Yamada, Kazutoshi: *See*—
Yasuda, Ryoichi; and Yamada, Kazutoshi, 4,732,068, Cl. 83-575.000.
Yamada, Minoru: *See*—
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Yamada, Seiji, to Ishida Scales Mfg. Co., Ltd. Control system for combinatorial weighing or counting apparatus. 4,733,363, Cl. 364-567.000.
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Yamada, Yoshiaki, to Meinan Machinery Works, Inc. Veneer clipper. 4,732,067, Cl. 83-346.000.
Yamada, Yoshio: *See*—
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Yamada, Yukifumi: *See*—
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Yamagami, Tamotsu: *See*—
Henmi, Fumiaki; Ohsato, Kiyoshi; and Yamagami, Tamotsu, 4,733,385, Cl. 369-13.000.
Yamagata, Shimbu: *See*—
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Yamagata, Yasufumi, to Coco Research Inc. Period detecting circuit. 4,733,364, Cl. 364-569.000.
Yamaguchi, Kazuo, to Hitachi, Ltd. Fail memory equipment in memory tester. 4,733,392, Cl. 371-21.000.
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Yamaguchi, Takashi, to NEC Corporation. Sense amplifier for a semiconductor memory device. 4,733,112, Cl. 307-530.000.
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Yamakawa, Masahiko; and Terashima, Kenji, to Kabushiki Kaisha Toshiba. Phosphor and fluorescent lamp using the same. 4,733,126, Cl. 313-487.000.
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Yamamoto, Taizo; and Konishi, Hirokazu, to Nippon Elanco Kabushiki Kaisha. Capsule filling apparatus. 4,731,979, Cl. 53-529.000.
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Yamamura, Yoshinobu, to G-C Dental Industrial Corp. Amalgam preparing chamber and mercury-capturing device. 4,732,739, Cl. 422-170.000.
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Yamaoka, Noboru; Tanabe, Kiyoyasu; Usui, Katumi; Mizoe, Takashi; and Matsuura, Kazuo, to Nippon Oil Company, Limited. Crosslinked resin compositions. 4,732,940, Cl. 525-194.000.
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Yamashita, Nobuyuki: *See*—
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Yamauchi, Atsuyoshi; Iguchi, Seiya; Ono, Yuzo; Kimura, Hiroshi; and Morita, Satoshi, to Mitsui Toatsu Chemicals, Inc. Preparation process of indole. 4,732,654, Cl. 203-81.000.
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Yanagida, Tomomi; Nakagawa, Kisaku; Tokuta, Hiroshi; and Fukase, Toshimitsu, to Sumitomo Bakelite Company Limited. Process for producing piezo-electric or pyro-electric composite sheet. 4,732,717, Cl. 264-22.000.
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Yang, Tai-Her. Servo-clamping device. 4,732,373, Cl. 269-241.000.
Yang, Tai-Her. Photothermic and time switch devices for outdoor low tension power supply system. 4,733,323, Cl. 361-105.000.
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Yoshida, Shigehiro; Yokouchi, Kazuhiro; Wada, Yuichi; Tomita, Masao; and Fukuda, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. High-speed current limiting circuit breaker. 4,733,319, Cl. 361-58.000.
Yoshida, Takao, to Honda Giken Kogyo Kabushiki Kaisha. Disc brake apparatus. 4,732,241, Cl. 188-73.340.
Yoshihara, Tetsuya, to Nippon Kokan Kabushiki Kaisha; Nippon Rotary Nozzle Co., Ltd.; Kokan Kikai Kogyo Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Rotary nozzle system. 4,732,304, Cl. 222-598.000.
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Yoshinaka, Tadaaki, to Sony Corporation. Automatic phase control circuit used for time base corrector. 4,733,311, Cl. 358-320.000.
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Yoshioka, Mamoru; Nomura, Kenichi; Hoshi, Kouichi; and Izutani, Takahide, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling heater for heatng air-fuel ratio sensor. 4,732,128, Cl. 123-440.000.
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Maeda, Hiroshi; Kanamaru, Ryunosuke; Ishida, Nakao; Yoshitake, Toshihiko; and Ueda, Minoru, 4,732,933, Cl. 525-54.100.
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Zachary, Richard E.: *See*—
Plowman, Keith R.; and Zachary, Richard E., 4,732,660, Cl. 204-265.000.
Zack, Lawrence P.; and Palmer, Gary E., to Hako Minuteman, Inc. High speed floor burnishing machine. 4,731,895, Cl. 15-98.000.
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Zeikus, Joseph G.; and Thompson, Thomas E., to Wisconsin Alumni Research Foundation. Process for preparation of propionic acid. 4,732,855, Cl. 435-141.000.
Zemke, Ronald O.: *See*—
Welygan, Dennis G.; and Zemke, Ronald O., 4,732,770, Cl. 426-94.000.
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Oliver, Kirk, 4,733,140, Cl. 315-371.000.
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Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A. Method for manufacturing an electrohydraulic valve assembly. 4,731,914, Cl. 29-157.10R.
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Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A., 4,731,914, Cl. 29-157.10R.
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Ziegler, William R. Alignment method and arrangement for use with a view camera. 4,733,257, Cl. 354-189.000.
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Zink, Edward F.: *See*—
Crouch, Jack S.; and Zink, Edward F., 4,732,517, Cl. 411-39.000.
Ziph, Lea: *See*—
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Ziyad, Inc.: *See*—
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Zunino, Franco: *See*—
Pasini, Alessandro; Zunino, Franco; Tofanetti, Odoardo; Gandolfi, Carmelo A.; and Tongnella, Sergio, 4,732,893, Cl. 514-185.000.
Zwald, John J., to GTE Products Corporation. Diffuser for an arc discharge lamp. 4,733,123, Cl. 313-116.000.
Zygo Corporation: *See*—
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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

BASF Aktiengesellschaft: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Doerflinger, Walter: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Eskandry, Ezra D.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., Re. 32,627, Cl. 340-572.000.

Gentzler, David L.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., Re. 32,627, Cl. 340-572.000.

Heym, Manfred: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., to Sensormatic Electronics Corporation. Electrical surveillance apparatus with moveable antenna elements. Re. 32,627, Cl. 340-572.000.

Ito, Hiroshi: *See*—
Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, Re. 32,626, Cl. 315-39.000.

Kodama, Hitoshi: *See*—
Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, Re. 32,626, Cl. 315-39.000.

Komura, Hirotsugu: *See*—
Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, Re. 32,626, Cl. 315-39.000.

Lamanna, Peter J.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., Re. 32,627, Cl. 340-572.000.

Minowa, Yoshibumi: *See*—
Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, Re. 32,626, Cl. 315-39.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, Re. 32,626, Cl. 315-39.000.

Neumann, Peter: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Nissen, Dietmar: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Schaefer, Gerhard: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Sensormatic Electronics Corporation: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., Re. 32,627, Cl. 340-572.000.

Stutz, Herbert: *See*—
Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, Re. 32,628, Cl. 523-400.000.

Tesch, Helmut; Heym, Manfred; Doerflinger, Walter; Stutz, Herbert; Neumann, Peter; Nissen, Dietmar; and Schaefer, Gerhard, to BASF Aktiengesellschaft. Curable compositions based on epoxy resins. Re. 32,628, Cl. 523-400.000.

Weaver, Jon N.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., Re. 32,627, Cl. 340-572.000.

Yoshizawa, Kenji; Kodama, Hitoshi; Minowa, Yoshibumi; Ito, Hiroshi; and Komura, Hirotsugu, to Mitsubishi Denki Kabushiki Kaisha. Microwave generated plasma light source apparatus. Re. 32,626, Cl. 315-39.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

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Chow, Ho, to Jet Stream, Inc. Device for controlling the flow of fluid. B1 4,335,852, 3-22-88, Cl. 239-68.000.

Jet Stream, Inc.: *See*—
Chow, Ho, B1 4,335,852, Cl. 239-68.000.

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American Coin Currency Equipment Corporation: *See*—
McDonald, Ronald, 294,834, Cl. D18-3.000.

Anderson, Lloyd E., Sr., to Pitt-Des Moines, Inc. Elevated water tank. 294,856, 3-22-88, Cl. D23-202.000.

Antonious, Anthony J. Golf club head. 294,848, 3-22-88, Cl. D21-217.000.

Antonious, Anthony J. Golf club head. 294,849, 3-22-88, Cl. D21-217.000.

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Kawatsu, Masahiko; and Fukuichi, Tokuo, 294,818, Cl. D12-184.000.
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Nakamura, Kazuharu, 294,857, Cl. D23-338.000.
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Schroeder, Peter; Hennemann, Franz P.; Grieser, Frank; and Tranelis, Klaus, 294,852, Cl. D22-120.000.
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Wise, Robert D.; and Meeker, Paul K., to Gerber Products Company. Infant automobile seat. 294,777, 3-22-88, Cl. D6-333.000.
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Beaver, Theodore, 294,802, Cl. D9-375.000.
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Stiso, S. Nicholas; and Zuk, Robert F., 294,807, Cl. D10-81.000.

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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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8.554 4,732,690
47.5 4,732,691
106 4,732,692
132 4,732,693
162 4,732,695
174.17 4,732,696
174.21 4,732,694
174.24 4,732,697
181 4,732,698
299.66 4,732,699
373 4,732,700
510 4,732,706
511 4,732,701
512 4,732,702
532 4,732,703
4,732,704
4,732,707
628 4,732,705

CLASS 254

10.5 4,732,365
126 4,732,366

CLASS 260

413 4,732,708
501.15 4,732,709
513 R 4,732,710
545 R 4,732,711

CLASS 261

64.3 4,732,712
112 4,732,713

CLASS 264

1.4 4,732,714
4,732,715
1.5 4,732,716
22 4,732,717
45.5 4,732,718
65 4,732,719
101 4,732,720
102 4,732,721
105 4,732,722
147 4,732,723
251 4,732,724
255 4,732,725
272.21 4,732,726
519 4,732,727

CLASS 266

102 4,732,367
172 4,732,368
207 4,732,369
270 4,732,370

CLASS 267

52 4,732,371
204 4,732,372

CLASS 269

241 4,732,373

CLASS 270

55 4,732,374

CLASS 271

176 4,732,375
267 4,732,376
303 4,732,377

CLASS 272

76 4,732,378
125 4,732,379
132 4,732,380
134 4,732,381

CLASS 273

29 A 4,732,382
73 C 4,732,384
73 D 4,732,383
142 B 4,732,385
142 H 4,732,386
144 A 4,732,387
153 S 4,732,388
169 4,732,389
186 R 4,732,390
201 4,732,391
237 4,732,392
269 4,732,393
391 4,732,394
411 4,732,395

CLASS 277

3 4,732,396
207 A 4,732,397
212 FB 4,732,398

CLASS 280

12 B 4,732,399
87.04 A 4,732,400
163 4,732,401
242 WC 4,732,402
278 4,732,403
283 4,732,404
634 4,732,405
642 4,732,406
673 4,732,407
707 4,732,408
808 4,732,409

CLASS 283

67 4,732,410
75 4,732,411

CLASS 285

47 4,732,412
49 4,732,413
133.1 4,732,414
169 4,732,415
333 4,732,416

CLASS 290

1 R 4,733,099

CLASS 292

142 4,732,417
207 4,732,418

CLASS 296

26 4,732,419
43 4,732,420
136 4,732,421
221 4,732,422

CLASS 297

284 4,732,423
317 4,732,424
362 4,732,425
452 4,732,426

CLASS 299

33 4,732,427

CLASS 301

63 DD 4,732,428

CLASS 303

114 4,732,429

CLASS 307

9 4,733,100
10 R 4,733,101
107 4,733,102
117 4,733,103
260 4,733,104
261 4,733,105
270 4,733,106
290 4,733,107
296 R 4,733,108
427 4,733,109
446 4,733,110
452 4,733,111
530 4,733,112

CLASS 310

49 R 4,733,113
4,733,114
4,733,116
68 R 4,733,115
162 4,733,117
177 4,733,118
268 4,733,119
4,733,120
311 4,733,121
313 R 4,733,122

CLASS 312

109 4,732,431
214 4,732,432
221 4,732,433
4,732,434
311 4,732,435
330 R 4,732,430
341 R 4,732,436

CLASS 313

116 4,733,123
341 4,733,124
402 4,733,125
487 4,733,126
500 4,733,127
503 4,733,128
529 4,733,129
619 4,733,130

CLASS 315

5.14 4,733,131
5.41 4,733,132
39 Re.32,626
111.41 4,733,133
111.81 4,733,134
224 4,733,135
291 4,733,136
4,733,137
307 4,733,138
366 4,733,139
371 4,733,140
4,733,141

CLASS 318

54 4,733,145
135 4,733,143
283 4,733,142
318 4,733,144
393 4,733,146
443 4,733,147
490 4,733,148
561 4,733,149
632 4,733,150
645 4,733,151
685 4,733,152

CLASS 320

1 4,733,153

CLASS 322

10 4,733,155
20 4,733,156
28 4,733,157

CLASS 323

258 4,733,158
282 4,733,159
314 4,733,160
315 4,733,161
316 4,733,162
317 4,733,163

CLASS 324

56 4,733,164
58.5 C 4,733,165
61 R 4,733,166
73 R 4,733,167
4,733,168
79 D 4,733,169
95 4,733,170
142 4,733,171
158 D 4,733,173
158 P 4,733,172
158 R 4,733,174
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4,733,176
207 4,733,177
230 4,733,178
244 4,733,179
248 4,733,180
253 4,733,181
301 4,733,182
309 4,733,183
4,733,184

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4,733,186
312 4,733,187
4,733,188
318 4,733,189
4,733,190

CLASS 329

109 4,733,191

CLASS 330

45 4,733,192
149 4,733,193
251 4,733,194
286 4,733,195
288 4,733,196

CLASS 331

1 A 4,733,197
4,733,198
4,733,199
116 R 4,733,200

CLASS 333

24.2 4,733,201
26 4,733,202
139 4,733,203
143 4,733,204
172 4,733,205
181 4,733,206
193 4,733,207
202 4,733,208
205 4,733,209

CLASS 335

132 4,733,210
192 4,733,211
253 4,733,212

CLASS 336

206 4,733,213

CLASS 338

128 4,733,214

CLASS 339

586 4,732,437

CLASS 340

64 4,733,215
347 AD 4,733,216
4,733,217
4,733,221
347 DA 4,733,218
347 DD 4,733,219
4,733,220
365 C 4,733,222
505 4,733,223
521 4,733,224
572 Re.32,627
584 4,733,225
674 4,733,226
701 4,733,227
719 4,733,228
723 4,733,229
728 4,733,230
783 4,733,231
4,733,232
4,733,233
870.04 4,733,234
870.37 4,733,235

CLASS 342

7 4,733,236
13 4,733,237
60 4,733,238
4,733,239
372 4,733,240
453 4,733,241
458 4,733,242

CLASS 343

736 4,733,243
756 4,733,244
769 4,733,245
912 4,733,246

CLASS 346

1.1 4,733,247
33 R 4,733,248
74.4 4,733,249
76 PH 4,733,250
4,733,251
108 4,733,252
4,733,253
140 R 4,733,254
153.1 4,733,255
157 4,733,256

CLASS 350

1.1 4,732,438
4.1 4,732,439
6.6 4,732,440
96.10 4,732,442
4,732,443
96.14 4,732,444
4,732,445
96.15 4,732,446
96.16 4,732,447
96.18 4,732,448
4,732,449
4,732,450
96.20 4,732,451
96.21 4,732,452
125 4,732,441
130 4,732,453
164 4,732,454
255 4,732,455
334 4,732,456
356 4,732,457
419 4,732,458
454 4,732,459
4,732,460
631 4,732,461
632 4,732,462
4,732,463

CLASS 351

88 4,732,464
123 4,732,465
206 4,732,466

CLASS 353

25 4,732,467
120 4,732,468

CLASS 354

189 4,733,257
286 4,733,258
293 4,733,259
317 4,733,260
4,733,261
402 4,733,262
419 4,733,263
430 4,733,264
484 4,733,265

CLASS 355

3 DD 4,733,267
4,733,268
3 R 4,733,266
4,733,269
4,733,270
4,733,271
10 4,733,272
4,733,273
14 C 4,733,275
14 E 4,733,276
14 R 4,733,274
4,733,281
43 4,733,277
58 4,733,278
65 4,733,279
67 4,733,280

CLASS 356

124 4,732,470
152 4,732,471
4,732,472
237 4,732,473
4,732,474
300 4,732,475
308 4,732,476
313 4,732,477
4,732,478
336 4,732,479
346 4,732,480
4,732,481
4,732,482
351 4,732,483
372 4,732,484
376 4,732,485
387 4,732,486
731 4,732,469

CLASS 357

4,733,282
22 4,733,283
23.13 4,733,285
23.7 4,733,284
30 4,733,286
34 4,733,287
40 4,733,288
4,733,289
68 4,733,291
4,733,290
70 4,733,292
4,733,293

CLASS 358

17 4,733,294
22 4,733,295
51 4,733,296
105 4,733,297
133 4,733,298
140 4,733,299
4,733,300
181 4,733,301
213.26 4,733,302
257 4,733,303
280 4,733,304
4,733,305
4,733,306
285 4,733,307
4,733,308
289 4,733,309
4,733,310
320 4,733,311

CLASS 360

10.1 4,733,312
33.1 4,733,313
97 4,733,314
4,733,315
132 4,733,316
4,733,317
137 4,733,318

CLASS 361

4,733,319
67 4,733,320
96 4,733,321
103 4,733,322
105 4,733,323
118 4,733,324
119 4,733,325
159 4,733,326
306 4,733,327
320 4,733,328
355 4,733,329
356 4,733,330
385 4,733,331

CLASS 362

32 4,733,332
4,733,333
71 4,733,334
80 4,733,335
142 4,733,336
206 4,733,337
310 4,733,338
366 4,733,339

CLASS 363

35 4,733,340
71 4,733,341
132 4,733,342

CLASS 364

4,733,343
4,733,344
4,733,346
4,733,347
4,733,348
4,733,349
4,733,350
4,733,351
4,733,352
4,733,353
415 4,733,354
424 4,733,355
4,733,356
431.04 4,733,357
431.05 4,733,358
478 4,733,359
479 4,733,362
507 4,733,360
4,733,361
567 4,733,363
569 4,733,364
784 4,733,365
4,733,366
4,733,367
4,733,368

CLASS 365

119 4,733,369
149 4,733,370
185 4,733,371
200 4,733,372
203 4,733,373
205 4,733,374
206 4,733,375
221 4,733,376
230 4,733,377

CLASS 366

112 4,732,487
155 4,732,488

CLASS 367

17 4,733,378
4,733,379
35 4,733,380
93 4,733,381
146 4,733,382

CLASS 368

10 4,733,383
4,733,384

CLASS 369

13 4,733,385
59 4,733,386
77.1 4,733,387
270 4,733,388

CLASS 370

5 4,733,389
85 4,733,390
88 4,733,391

CLASS 371

21 4,733,392
4,733,393
4,733,394
27 4,733,395
38 4,733,396

CLASS 372

10.1 4,733,397
26 4,733,398
31 4,733,399
50 4,733,400
51 4,733,401

CLASS 375

37 4,733,402
100 4,733,403
103 4,733,404
119 4,733,405

CLASS 376

153 4,732,728
176 4,732,729
277 4,732,730

CLASS 377

29 4,733,405
61 4,733,406
62 4,733,407

CLASS 378

117 4,733,408
167 4,733,409

CLASS 380

25 4,733,345

CLASS 384

45 4,732,489
4,732,490
95 4,732,491
129 4,732,492
243 4,732,493
448 4,732,494
518 4,732,495
526 4,732,496
585 4,732,497

CLASS 400

124 4,732,498
196.1 4,732,499
208 4,732,500
616.3 4,732,501
693 4,732,502

CLASS 401

4,732,503
197 4,732,504

CLASS 403

14 4,732,505

CLASS 404

4,732,506
117 4,732,507

CLASS 405

53 4,732,508
260 4,732,509
269 4,732,510
4,732,511

CLASS 406

4,732,512
4,732,513

CLASS 408

4,732,514

CLASS 409

4,732,515

CLASS 410

4,732,516

CLASS 411

39 4,732,517
181 4,732,518
337 4,732,519
342 4,732,520

CLASS 412

1 4,732,521

CLASS 414

118 4,732,522
139 4,732,523
267 4,732,524
729 4,732,525
730 4,732,526
786 4,732,527
4,732,528

CLASS 415

90 4,732,529
4,732,530
115 4,732,531
119 4,732,532
134 4,732,533
136 4,732,534
144 4,732,535
160 4,732,536
205 4,732,537

CLASS 416

4,732,538
100 4,732,539
140 4,732,540
186 R 4,732,541
226 4,732,542

CLASS 417

4,732,543
222 4,732,544
4,732,545
289 4,732,546
379 4,732,547
415 4,732,548
472 4,732,549

CLASS 418

55 4,732,550

CLASS 420

473 4,732,731
476 4,732,732
485 4,732,733

CLASS 422

1 4,732,734
28 4,732,735
56 4,732,736
62 4,732,737
94 4,732,738
170 4,732,739
193 4,732,740

CLASS 423

119 4,732,741
4,732,742
235 4,732,744
239 4,732,743
303 4,732,745
324 4,732,746
328 4,732,747
430 4,732,748
4,732,749
608 4,732,750
641 4,732,751

CLASS 424

66 4,732,754
4,732,755
4,732,756
85 4,732,752
4,732,753
87 4,732,757
94.2 4,732,758
94.61 4,732,759
195.1 4,732,760
4,732,762
433 4,732,763
438 4,732,764
476 4,732,765

CLASS 425

79 4,732,551
82.1 4,732,552
116 4,732,553
139 4,732,554
218 4,732,555
405.2 4,732,556
522 4,732,557
570 4,732,558

CLASS 426

1 4,732,766
27 4,732,768
4,732,769
94 4,732,767
4,732,770
482 4,732,771
573 4,732,772
590 4,732,773
634 4,732,774
635 4,732,775

CLASS 427

10 4,732,776
27 4,732,777
53.1 4,732,778
4,732,793
4,732,779
57 4,732,780
125 4,732,781
140 4,732,783
230 4,732,784
240 4,732,785
261 4,732,786
386 4,732,787
388.2 4,732,788
393.3 4,732,789
407.1 4,732,790
4,732,791
423 4,732,792
427 4,732,782

CLASS 428

36 4,732,795
4,732,796
74 4,732,797
137 4,732,798
141 4,732,799
196 4,732,800
198 4,732,801
210 4,732,794
4,732,802
212 4,732,803
229 4,732,804
240 4,732,805
241 4,732,806
327 4,732,807
355 4,732,808
373 4,732,809
402.2 4,732,810
403 4,732,811
425.9 4,732,812
4,732,813
4,732,814
484 4,732,815
522 4,732,816
4,732,817
547 4,732,818
582 4,732,819
650 4,732,820
671 4,732,821

CLASS 429

34 4,732,822
72 4,732,823
104 4,732,824
162 4,732,825
176 4,732,826
202 4,732,827

CLASS 430

11 4,732,829
20 4,732,830
28 4,732,828
49 4,732,831
58 4,732,832
84 4,732,833
4,732,834
106.6 4,732,835
192 4,732,836
4,732,837
4,732,838
203 4,732,839
302 4,732,840
311 4,732,841
4,732,842
312 4,732,843
322 4,732,844
551 4,732,845
619 4,732,846

CLASS 431

346 4,732,559
359 4,732,560

CLASS 432

78 4,732,561
224 4,732,562

CLASS 433

29 4,732,563
4,732,564

CLASS 435

4,732,847
7 4,732,848
12 4,732,849
31 4,732,850
43 4,732,851
4,732,852
123 4,732,853
141 4,732,855
172.3 4,732,856
211 4,732,854
220 4,732,857
320 4,732,859

CLASS 436

34 4,732,860
159 4,732,861
513 4,732,862
547 4,732,863
4,732,864

CLASS 437

12 4,732,865
20 4,732,866
22 4,732,867
29 4,732,868
34 4,732,869
40 4,732,870
41 4,732,871
47 4,732,872
101 4,732,873
228 4,732,658
4,732,761
4,732,858
247 4,732,874

CLASS 439

79 4,732,565
106 4,732,566

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CLASSIFICATION OF PATENTS

332	4,732,567	212	4,732,896	[illegible]	4,732,921	[illegible]	4,732,949	390	4,732,974		CLASS 549
676	4,732,568	222	4,732,897		CLASS 524	524	4,732,950		CLASS 534	308	4,732,991
	CLASS 446	225	4,732,898	[illegible]	4,732,922	528	4,732,951	742	4,732,975		CLASS 556
[illegible]	4,732,569	245	4,732,899	108	4,732,923	530	4,732,952		CLASS 536	129	4,732,992
	CLASS 501	255	4,732,900	269	4,732,924		CLASS 526	16.8	4,732,976	181	4,732,993
42	4,732,875	277	4,732,901	426	4,732,925	88	4,732,953		CLASS 540	404	4,732,994
78	4,732,876	292	4,732,902	[illegible]	4,732,926		4,732,954	350	4,732,977	414	4,732,995
95	4,732,877	345	4,732,903	495	4,732,927	188	4,732,955	461	4,732,979	466	4,732,996
[illegible]	4,732,878	357	4,732,904	505	4,732,928	260	4,732,956	[illegible]	4,732,980		CLASS 558
	CLASS 502	372	4,732,905	541	4,732,929		CLASS 528		CLASS 544	76	4,732,997
3	4,732,879	379	4,732,906	742	4,732,930	58	4,732,957	140	4,732,981	161	4,732,998
[illegible]	4,732,880	[illegible]	4,732,907	862	4,732,931	[illegible]	4,732,959	295	4,732,983	166	4,733,000
71	4,732,881	[illegible]	4,732,908		4,732,932	75	4,732,960		4,732,984	354	4,732,999
[illegible]	4,732,882	[illegible]	4,732,909		CLASS 525	87	4,732,961		CLASS 546		4,733,001
170	4,732,883	475	4,732,910	54.1	4,732,933	89	4,732,958	152	4,732,978		CLASS 560
[illegible]	4,732,884	493	4,732,911	[illegible]	4,732,934	[illegible]	4,732,962	261	4,732,982	55	4,733,002
[illegible]	4,732,885	510	4,732,912	67	4,732,935	205	4,732,963	268	4,732,985	119	4,733,003
314	4,732,886	528	4,732,913	88	4,732,936	[illegible]	4,732,964		CLASS 548	205	4,733,004
[illegible]	4,732,887	530	4,732,914	92	4,732,937	336	4,732,965	161	4,732,986	222	4,733,005
[illegible]	4,732,888	567	4,732,915		4,732,938	339.3	4,732,966	303	4,732,987		CLASS 562
	CLASS 514	620	4,732,916	[illegible]	4,732,939	[illegible]	4,732,967		4,732,988	519	4,733,006
8	4,732,889	781	4,732,917	194	4,732,940	490	4,732,968	352	4,732,989	534	4,733,007
11	4,732,890		CLASS 518	276	4,732,941		CLASS 530	550	4,732,990		4,733,008
21	4,732,891	712	4,732,918	301	4,732,942	307	4,732,969		CLASS 549	554	4,733,009
[illegible]	4,732,892		CLASS 521	303	4,732,943	323	4,732,970	308	4,732,991		4,733,010
[illegible]	4,732,893	159	4,732,919	329.9	4,732,944	324	4,732,971		CLASS 556		CLASS 568
[illegible]	4,732,894		CLASS 523	350	4,732,945		4,732,972	129	4,732,992	43	4,733,011
211	4,732,895	145	4,732,920	379	4,732,946	350	4,732,973	181	4,732,993	437	4,733,012
		[illegible]	Re.32,628	437	4,732,947			404	4,732,994		
					4,732,948			414	4,732,995		
								466	4,732,996		

CLASSIFICATION OF DESIGNS

D2—	279	294,765		421	294,785		377	294,804		38	294,823		165	294,842		28	294,861
	[illegible]	294,766		[illegible]	294,786		415	294,805	D14—	53	294,824		204	294,843		35	294,862
		294,767		474	294,787	D10—	32	294,806			294,825		205	294,844		38	294,863
	320	294,768		513	294,788		[illegible]	294,807			294,826			294,845		40	294,864
		294,769		523	294,789		[illegible]	294,808		[illegible]	294,827			294,846	D25—	119	294,867
		294,770		552	294,790	D11—	61	294,809		65	294,828			294,847		122	294,865
	331	294,771		[illegible]	294,791		231	294,810		[illegible]	294,829		217	294,848			294,866
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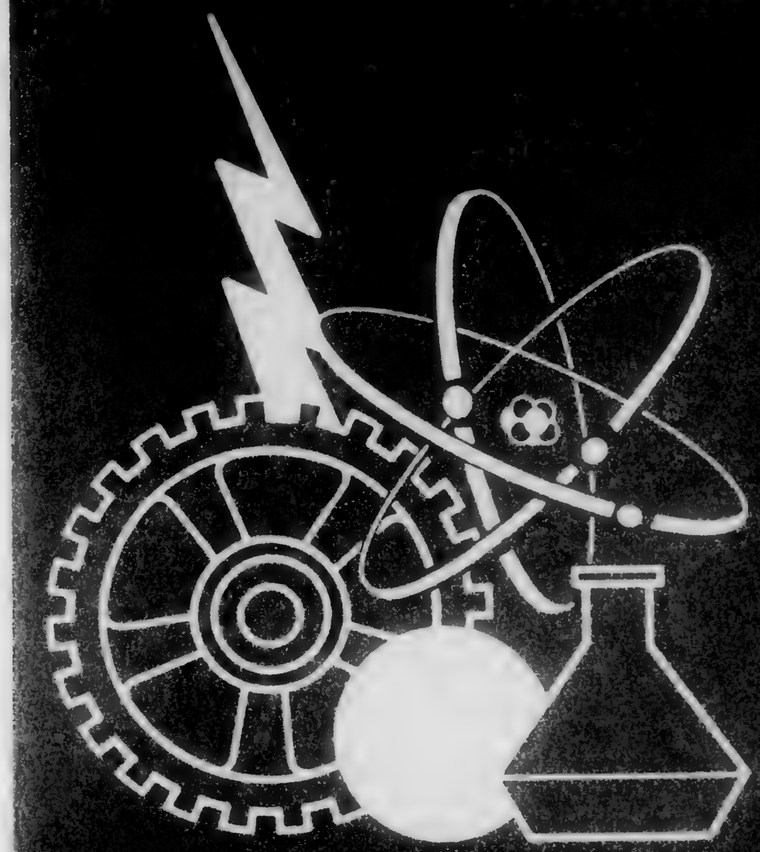
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For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Mar. 15, 1988, and was announced in the *Official Gazette* at 1087 O.G. 24 on Feb. 16, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1300.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Jan. 21, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without A Hearing as of Feb. 29, 1988

Chemical Discipline	–	March 6, 1987
Mechanical Discipline	–	February 3, 1986
Electricial Discipline	–	March 11, 1986

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Feb. 29, 1988

Chemical	–	October 30, 1985
Electrical	–	October 4, 1985
Mechanical	–	November 4, 1985

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of February, 1988

Affirmed	214
Affirmed-in-Part	45
Reversed	187
Total Decided	446

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 26, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,506,389 through 4,507,800
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 10, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,424,595	06/320,596	1/10/84
4,424,607	06/272,472	1/10/84
4,424,611	06/328,145	1/10/84
4,424,620	06/288,597	1/10/84
4,424,630	06/335,512	1/10/84
4,424,638	06/388,934	1/10/84
4,424,640	06/294,559	1/10/84
4,424,643	06/336,557	1/10/84
4,424,645	06/297,124	1/10/84
4,424,655	06/287,025	1/10/84
4,424,656	06/269,357	1/10/84
4,424,657	06/319,750	1/10/84
4,424,667	06/386,156	1/10/84
4,424,671	06/350,393	1/10/84
4,424,677	06/334,172	1/10/84
4,424,678	06/306,178	1/10/84
4,424,680	06/319,329	1/10/84
4,424,697	06/305,576	1/10/84
4,424,704	06/328,798	1/10/84
4,424,708	06/339,748	1/10/84
4,424,710	06/282,532	1/10/84
4,424,712	06/330,056	1/10/84
4,424,722	06/225,141	1/10/84
4,424,746	06/344,848	1/10/84
4,424,751	06/227,880	1/10/84
4,424,756	06/344,515	1/10/84
4,424,759	06/492,915	1/10/84
4,424,760	06/356,793	1/10/84
4,424,768	06/345,482	1/10/84
4,424,771	06/410,781	1/10/84
4,424,772	06/317,839	1/10/84
4,424,776	06/364,800	1/10/84
4,424,786	06/311,929	1/10/84
4,424,788	06/436,830	1/10/84
4,424,796	06/272.769	1/10/84
4,424,802	06/309,812	1/10/84
4,424,809	06/364,044	1/10/84
4,424,816	06/258,587	1/10/84
4,424,822	06/308,438	1/10/84
4,424,840	06/348,993	1/10/84

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Patent Number	Serial Number	Issue Date
4,424,848	06/344,647	1/10/84
4,424,851	06/327,462	1/10/84
4,424,854	06/319,919	1/10/84
4,424,857	06/429,419	1/10/84
4,424,858	06/424,691	1/10/84
4,424,862	06/358,729	1/10/84
4,424,866	06/300,337	1/10/84
4,424,872	06/314,510	1/10/84
4,424,873	06/326,493	1/10/84
4,424,876	06/296,393	1/10/84
4,424,878	06/219,869	1/10/84
4,424,883	06/356,446	1/10/84
4,424,904	06/265,543	1/10/84
4,424,915	06/361,523	1/10/84
4,424,916	06/272,768	1/10/84
4,424,921	06/336,575	1/10/84
4,424,926	06/294,294	1/10/84
4,424,928	06/356,897	1/10/84
4,424,934	06/251,859	1/10/84
4,424,941	06/251,126	1/10/84
4,424,942	06/302,027	1/10/84
4,422,961	06/261,374	1/10/84
4,424,966	06/298,933	1/10/84
4,424,969	06/273,344	1/10/84
4,424,972	06/246,978	1/10/84
4,424,981	06/342,125	1/10/84
4,424,987	06/306,415	1/10/84
4,424,996	06/328,705	1/10/84
4,425,003	06/318,104	1/10/84
4,425,013	06/267,133	1/10/84
4,425,014	06/285,423	1/10/84
4,425,016	06/305,645	1/10/84
4,425,019	06/271,431	1/10/84
4,425,025	06/217,556	1/10/84
4,425,030	06/241,937	1/10/84
4,425,035	06/268,795	1/10/84
4,425,042	06/281,317	1/10/84
4,425,061	06/302,250	1/10/84
4,425,072	06/245,932	1/10/84
4,425,083	06/298,060	1/10/84
4,425,086	06/298,122	1/10/84
4,425,088	06/303,679	1/10/84
4,425,092	06/290,177	1/10/84
4,425,097	06/300,360	1/10/84
4,425,109	06/326,179	1/10/84
4,425,113	06/390,463	1/10/84
4,425,118	06/412,704	1/10/84
4,425,124	06/251,860	1/10/84
4,425,131	06/513,949	1/10/84
4,425,136	06/247,709	1/10/84
4,425,142	06/441,482	1/10/84
4,425,155	06/401,513	1/10/84
4,425,157	06/355,089	1/10/84
4,425,168	06/415,205	1/10/84
4,425,175	06/367,669	1/10/84
4,425,192	06/504,595	1/10/84
4,425,200	06/309,066	1/10/84
4,425,203	06/380,155	1/10/84
4,425,212	06/323,441	1/10/84
4,425,220	06/346,522	1/10/84
4,425,227	06/308,491	1/10/84
4,425,229	06/300,205	1/10/84
4,425,251	06/367,727	1/10/84
4,425,264	06/384,962	1/10/84
4,425,265	06/422,526	1/10/84
4,425,266	06/350,931	1/10/84
4,425,267	06/296,627	1/10/84
4,425,270	06/250,431	1/10/84
4,425,273	06/389,624	1/10/84
4,425,295	06/233,296	1/10/84
4,425,305	06/405,294	1/10/84
4,425,314	06/300,652	1/10/84
4,425,320	06/307,540	1/10/84
4,425,327	06/236,816	1/10/84
4,425,333	06/314,064	1/10/84
4,425,338	06/364,074	1/10/84
4,425,344	06/287,356	1/10/84
4,425,345	06/328,729	1/10/84
4,425,346	06/342,655	1/10/84
4,425,348	06/297,799	1/10/84
4,425,351	06/446,353	1/10/84
4,425,353	06/282,799	1/10/84
4,425,354	06/232,729	1/10/84
4,425,358	06/370,503	1/10/84
4,425,361	06/322,488	1/10/84
4,425,365	06/496,664	1/10/84
4,425,367	06/419,109	1/10/84
4,425,381	06/338,844	1/10/84
4,425,387	06/414,162	1/10/84
4,425,394	06/390,166	1/10/84
4,425,397	06/225,888	1/10/84
4,425,413	06/326,435	1/10/84
4,425,414	06/432,275	1/10/84
4,425,421	06/421,419	1/10/84
4,425,423	06/419,405	1/10/84
4,425,431	06/243,821	1/10/84
4,425,436	06/351,486	1/10/84
4,425,446	06/391,008	1/10/84
4,425,453	06/380,636	1/10/84
4,425,471	06/256,860	1/10/84
4,425,477	06/346,435	1/10/84
4,425,488	06/384,898	1/10/84
4,425,494	06/271,533	1/10/84
4,425,503	06/393,223	1/10/84
4,425,504	06/281,271	1/10/84
4,425,510	06/383,496	1/10/84
4,425,513	06/349,111	1/10/84
4,425,516	06/259,651	1/10/84
4,425,518	06/247,495	1/10/84
4,425,519	06/486,502	1/10/84
4,425,534	06/325,107	1/10/84
4,425,544	06/241,307	1/10/84
4,425,546	06/240,614	1/10/84
4,425,553	06/227,557	1/10/84
4,425,556	06/259,908	1/10/84
4,425,558	06/286,849	1/10/84
4,425,565	06/373,857	1/10/84
4,425,583	06/260,614	1/10/84
4,425,586	06/243,577	1/10/84
4,425,594	06/306,537	1/10/84
4,425,598	06/271,510	1/10/84
4,425,600	06/300,765	1/10/84
4,425,606	06/346,302	1/10/84
4,425,607	06/346,303	1/10/84
4,425,631	06/287,835	1/10/84
4,425,644	06/273,373	1/10/84
4,425,649	06/228,845	1/10/84
4,425,651	06/302,831	1/10/84
4,425,654	06/328,765	1/10/84
4,425,657	06/285,563	1/10/84
4,425,662	06/302,282	1/10/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,371,314	06/251,608	2/1/83	4/6/81	2/24/88
4,385,745	06/258,659	5/31/83	4/29/81	2/24/88
4,398,793	06/232,594	8/16/83	2/9/81	2/24/88
4,416,276	06/315,053	11/22/83	10/26/81	2/24/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,853,094, Re. S.N. 028,105, Filed Oct. 14, 1986, Cl. 428/426, METHOD FOR CONCOMITANT PARTICULATE DIAMOND DEPOSITION IN ELECTROLESS PLATING, AND THE PRODUCT THEREOF, Theodore P. Christini, et al., Owner of Record: *E. I. DuPont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: John H. Mion, et al., Ex. Gp.: 152

4,212,926, Re. S.N. 131,165, Filed Dec. 9, 1987, Cl. 428/472, PARTS SUBJECT TO WEAR WHICH COME INTO CONTACT WITH METAL MELTS, Gunter Gelsdorf et al., Owner of Record: *Didier-Werke AG., Wiesbaden, Germany,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 154

4,556,997, Re. S.N. 131,164, Filed Dec. 10, 1987, Cl. 623/3, APPARATUS FOR DRIVING MEDICAL APPLIANCES, Sanshiro Takamiya, et al., Owner of Record: *Aisin Seiki Kabushiki, Kariya, Japan,* Attorney or Agent: John H. Mion, et al., Ex. Gp.: 332

4,557,269 Re. S.N. 131,161, Filed Dec. 10, 1987, Cl. 128/675, DISPOSABLE TRANSDUCER APPARATUS FOR AN ELECTROMANOMETRY SYSTEM, Gordon S. Reynolds, et al., Owner of Record: *Abbott Laboratories, North Chicago, Ill.,* Attorney or Agent: Martin L. Katz, et al., Ex. Gp.: 335

4,560,345, Re. S.N. 136,594, Filed Dec. 21, 1987, Cl. 431/344, LIQUID GAS-OPERATED LIGHTER, Friedrich Schachter, Owner of Record: *Inventor,* Attorney or Agent: Frank F. Scheck, et al., Ex. Gp.: 345

4,590,003, Re. S.N. 133,053, Filed Dec. 15, 1987, Cl. 530/330, PLATELET RELATED GROWTH REGULATOR, Daniel R. Twardzik, et al., Owner of Record: *Ongogen, Seattle, Wash.,* Attorney or Agent: Bertram I. Rowland, et al., Ex. Gp.: 153

4,669,607, Re. S.N. 134,501, Filed Dec. 18, 1987, Cl. 198/774, WORKPIECE TRANSFER, Arthur C. Mason, Owner of Record: *Lamb Technicon Corp., Warren, Mich.,* Attorney or Agent: Robert A. Choate, Ex. Gp.: 317

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,965,838, Reexam. No. 90/001,434, Requested: Feb. 1, 1988, Cl. 114/145A, BACKWASH BAFFLE AND STABLIZING DEVICE FOR PROPELLER DRIVEN WATERCRAFT, Frank O. Uht, Owner of Record: *R. Wayne Uht, Issaquah, Wash.,* Attorney or Agent: John Graybeal, Ex. Gp.: 310, Requester: Owner

4,026,055, Reexam. No. 90/001,439, Requested: Feb. 9, 1988, Cl. 42/1, TELESCOPIC SIGHT MOUNTING, Gerald T. Weast, Owner of Record: *John Vetter, Tulsa, Okla,* Attorney or Agent: Charles W. Chandler, Ex. Gp.: 220, Requester: Anthony Castorina, Arlington, Va.

4,264,751, Reexam. No. 90/001,438, Requested: Feb. 4, 1988, Cl. 525/437, COPOLYESTER RESIN HAVING MINIMAL CARBOXYL TERMINATED ENDS AND METHOD FOR PRODUCING THE SAME, Anthony S. Scheibelhoffer, Owner of Record: *The Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Alvin S. Rockhill, Ex. Gp.: 150, Requester: Robbins & Laramie, Washington, D.C.

4,279,426, Reexam. No. 90/001,441, Requested: Feb. 5, 1988, Cl. 277/237, SEAL FOR SPACE BETWEEN WINDOW SEAL OF A VEHICLE AND A CARRIER THEREBY, Earl Flack, Jr., Owner of Record: *Mary L. Flack, Arab, Ala.,* Attorney or Agent: Unknown, Requester: Universal Allied Products, Seattle, Wash.,

4,330,412, Reexam. No. 90/001,440, Requested: Feb. 12, 1988, Cl. 210/805, HYDROTHERAPY DEVICE AND APPARATUS, Stanley H. Frederick, Owner of Record: *ITT Corp., New York, N.Y.,* Attorney or Agent: Menotti J. Lombardi, Ex. Gp.: 130, Requester: Owner

4,505,620, Reexam. No. 90/001,435, Requested: Feb. 11, 1988, Cl. 405/224, FLEXIBLE OFFSHORE PLATFORM, Bernard Andrier, Owner of Record: *Entrepose GTM pour les Petroliers Maritimes et PM, Montreuil, France,* Attorney or Agent: Amster, Rothstein et al., Ex. Gp.: 350, Requester: Shell Oil Co., Houston, Tex.

4,642,970, Reexam. No. 90/001,436, Requested: Feb. 12, 1988, Cl. 53/433, REUSABLE INSULATED BOX AND METHOD OF MANUFACTURE, William Bane, Owner of Record: *William Bane, Wilmington, Del.,* Attorney or Agent: Shlesinger, Arkwright et al., Ex. Gp.: 320, Requester: Eric R. Katz, Kennesaw, Ga.

4,647,980, Reexam. No. 90/001,437, Requested: Feb. 17, 1988, Cl. 358/254, AIRCRAFT PASSENGER TELEVISION SYSTEM, Arnold R. Stevento, et al., Owner of Record: *Aviation Entertainment Corp., Valencia, Calif.,* Attorney or Agent: Kelly, Bauersfeld et al., Ex. Gp.: 260, Requester: Sundstrand Corp., Rockford, Ill.

Errata

The following registration number was inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of October 22, 1974.

855,196	TM 266	Oct. 22, 1974

Consequently, the above-identified registration is still active.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Feb. 24, 1988.

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Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Oct. 13, 1987, was listed inadvertently.

1,461,018 TM 140 Oct. 13, 1987

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Mar. 1, 1988. *Administrator for Trademark Operations.*

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Feb. 9, 1988, was listed inadvertently.

1,476,221 TM 113 Feb. 9, 1988

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Mar. 3, 1988. *Administrator for Trademark Operations.*

Request For Suggestions For New Search Terms to be Added to the CASPIR Topic Index Lists For Searching Computer & Data Processing Art in Class 364 Subclasses 200 and 900

The CASPIR (Computer Aided Search and Patent Image Retrieval) system is a successor to the CCMSS (Computer Controlled Microfilm Search System). CASPIR is a mechanized search system which includes a database of over 9000 patents and other published documentsclassified in 364/200 (General Purpose Programmable Digital Computer Systems) and 364/900 (Miscellaneous Digital Data Processing Systems). For additional information concerning CASPIR, see 1052 OG 56 (Mar. 26, 1985).

Each document in the CASPIR database is "coded" (or numerically indexed) with selected terms that reflect the conceptual content of the document. Searching involves the use of these terms and boolean logic to identify documents containing teachings related to the concepts which correspond to the selected terms. The identified patents or other documents are then viewable on a microstrip viewer.

Currently, there is a term list of about 400 topics (concepts) for searching in the 364/200 art and there is another term list of about 400 topics for searching in the 364/900 art. Copies of these terms lists are available at the CASPIR terminals in the Public Search Room (Crystal Plaza, CP-3-1A-03) or by contacting the undersigned.

Each of these two CASPIR term lists is being expanded to incorporate emerging and growing areas within the art. Suggestions are invited — from attorneys/agents, searchers, inventors, or other interested parties — for new terms to be included on the expanded CASPIR term lists. Suggestions may be either for additional breakouts (i.e., indents or more subdivisions detailed) of existing categories on the old term lists or for wholly new categories (outdents) or concepts which are becoming particularly pertinent within the computer architecture and data processing art.

Responses to this notice may also include brief comments or definitions (and/or illustrative examples of hardware/software elements) indicative of the intended scope of the suggested new terms. In suggesting terms, those responding should be aware of the necessity to weigh the cost of coding documents for each term versus the usefulness of the term for search purposes in determining how many and what kinds of terms are submitted.

Date: Any suggestions for new CASPIR terms should be received by May 2, 1988.

Address: Address written comments and suggestions to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 to the attention of Earl Levy, Crystal Plaza 4-11D-37. For further information contact Earl Levy by telephone at (703) 557-5088.

EARL LEVY,
Mar. 7, 1988. *Director, Group 230 Patent and Trademark Office.*

Status of PTO Services

The following is an update of the status of PTO services for February 1988:

Service Item	FY 1988 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	43 (see narrative)
Trademarks	30	39
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	2
Mail Coupons	12	4
Letter Orders	16	11
Certified Copies:		
Trademark Registrations	21	27
Applications-As-Filed	17	17**
File-Wrapper/Contents	N/A	21
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	48
Filing Reg. Certificates	Issue Date	Issue Date
Filing Temp. Drawings	6	18
Assignments:		
Recording Patent Assignments	20	18
Receipt Date of Patent Documents Returned		Feb. 10, 1988
Recording Trademark Assignments	20	40 (see narrative)
Receipt Date of Trademark Documents Returned		Jan. 22, 1988
Avg. Days from Issue Fee Payment to Issue Date	90–100	91
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	***
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.
** The 5% of orders for which fiche are not on site are not included in calculations.
*** Deliveries running 1 week late due to new GPO printing contractor start-up problems. Improvement expected over the next month.

IMPORTANT NOTICE

Incoming mail to the PTO has soared. Inappropriate phone calls to the Office and submission of inappropriately identified mail are taking valuable resources away from the processing of this mail.

The number of envelopes received in the Mail Room in the first four months of this fiscal year is almost 30% higher than for the same period last year. This sudden increase has taxed existing resources and a backlog has developed. It takes a new employee over one year to become proficient in recognizing the hundreds of different types of documents entering the Office, the appropriate fee codes to apply, and the appropriate destination. We are exploring alternatives for dealing with this problem.

We have discovered that many phone calls are being made to PTO personnel to verify if express mail and deposit box packages were received and on what date, to ask for serial numbers of newly filed applications, and to ask whether or not a particular paper was included in a package sent to the Office. These calls are draining hundreds of hours of time from the important function of processing the mail, including new applications. Such calls are inappropriately being made. Attorneys/applicants should include a return post card if they want early notification of date received and/or serial number. If the post card is not used, the filing receipt of notices or incomplete or informal application is the appropriate notification of such information.

The Commissioner has directed that this information is not to be given prior to issuance of the filing receipt or other formal notice. The service statistics report issued in the last Official Gazette of each month indicates the number of days it is taking to issue filing receipts. If it is clear that this period has been exceeded without notification being received, the Office will investigate.

The only recourse requesters have to obtain information other than as indicated above is by filing a petition in accordance with 37 CFR 1.182.

In regard to papers being submitted to the Office, a great deal of delay and wasted time results in trying to match papers not properly identified. On all papers related to patent applications or trademark applications, the series

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code/serial number must be identified. Responses to a "Notice to File Missing Parts" or "Notice of Incomplete Application" must be accompanied by a copy of such notice.

Given there are about 30,000 documents to be processed and routed each day, severe delays will continue to exist unless there is compliance with these Office guidelines.

IMPROVEMENTS TO SERVICES

- *Establishment of a Special Box for Expedited Processing of Issue Fees* — Effective immediately, the Patent and Trademark Office has established a special box designator for issue fees to allow expedited processing of the Issue Fee Transmittal (PTOL Form 85), and the order for advance copies.

  In order to take advantage of this new service, the envelope should be addressed:

  Box Issue Fees
  Commissioner of Patents and Trademarks
  Washington, D.C. 20231

  Only the Issue Fee Transmittal (PTOL Form 85), advance copy orders and the fees associated with these two services are to be placed in the envelope. Including documents other than those specified will delay their reaching the area for which they are intended.

  PLEASE USE THE NEW ISSUE FEE BOX.

- *Patent Bound Volumes* — Beginning with the Mar. 1, 1988 issue, we will make design patents available in the bound volume room (CP3, 2nd floor) along with all other patents. The design patents will be in a loose leaf notebook. Once a large enough quantity of design patents issue to complete a bound volume, these copies will be removed from the notebook and will be bound. This change in procedure was established as a result of a public suggestion.

- *Patent Search Room Copying Services* — For convenience of the users of the Patent Search Room we now have two photocopiers dedicated for 8½" x 11" paper. The machines are located in the North and South Stacks of the Patent Search Room. Previously, all copiers were supplied with legal size paper only and users who desired smaller size paper had to cut their copies.

HELPFUL HINTS

- *Expediting Processing Trademark Assignments* — As noted in our statistics we are currently running behind in processing trademark assignment documents. We are working to eliminate the backlog in this area. We have recently eliminated a backlog in patent assignment processing. The following helpful hints are offered to aid us in eliminating backlogs and to allow us to provide better service for all assignment processing:

  Many individuals are submitting assignment documents and requests for assignment services, together with application prosecution papers, directly to the examiner. Often, these requests get placed in the file and are not forwarded to the assignment area for handling. Please send all assignment documents and requests through the mailroom in order that they may be properly routed to the assignment area.

  Please separate requests for certified copies of assignments from requests for other services including requests for certified copies of other documents. Certification of assignment documents is not performed by the same individuals as certification of other documents.

- *Expediting Handling of Trademark Applications* — To facilitate processing of new trademark applications, place them in a separate envelope apart from all other mail. Identify on the outside of the envelope "TRADEMARK APPLICATION ONLY." More than one new trademark application may be placed in the same envelope. Do not place any papers in the envelope other than those related to the new trademark applications.

Mar. 7, 1988.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 29, 1988

D. 290,551	4,671,390	4,689,425	4,697,265
D. 291,019	4,673,479	4,689,439	4,697,666
D. 292,609	4,673,747	4,689,463	4,698,056
4,176,603	4,674,269	4,689,490	4,698,057
4,333,436	4,674,519	4,689,839	4,698,064
4,547,529	4,674,798	4,689,979	4,698,660
4,599,476	4,675,094	4,690,307	4,699,193
4,608,302	4,675,248	4,690,422	4,699,389
4,612,318	4,675,787	4,690,452	4,699,460
4,616,574	4,676,711	4,690,961	4,700,410
4,621,941	4,677,419	4,691,052	4,700,725
4,622,250	4,677,455	4,691,573	4,701,353
4,622,540	4,677,801	4,691,682	4,701,610
4,632,994	4,677,964	4,691,916	4,701,773
4,633,232	4,678,047	4,692,069	4,701,920
4,635,411	4,678,509	4,692,080	4,701,981
4,639,393	4,678,656	4,692,116	4,702,401
4,641,364	4,678,798	4,692,454	4,702,458
4,646,904	4,678,884	4,692,767	4,702,654
4,647,117	4,679,004	4,692,921	4,703,261
4,652,390	4,680,485	4,693,449	4,703,424
4,655,200	4,682,394	4,693,915	4,703,912
4,656,182	4,683,008	4,693,951	4,704,682
4,656,946	4,683,144	4,694,186	4,704,825
4,658,262	4,685,062	4,694,215	4,704,904
4,663,184	4,685,088	4,694,455	4,705,055
4,664,107	4,685,142	4,694,953	4,705,137
4,664,175	4,685,178	4,695,000	4,705,230
4,664,640	4,685,458	4,695,213	4,705,304
4,665,947	4,685,633	4,695,471	4,706,036
4,665,999	4,686,099	4,695,596	4,706,321
4,666,077	4,686,274	4,695,657	4,708,930
4,668,626	4,686,438	4,696,048	4,709,022
4,668,660	4,686,494	4,696,602	4,715,346
4,668,664	4,687,051	4,696,791	4,720,235
4,668,731	4,687,488	4,696,807	
4,669,879	4,687,635	4,696,993	
4,670,096	4,687,767	4,697,167	

Disclaimers

D. 284,009.—*Thomas A. Anzelone,* Fort Lauderdale, Fla. KEYBOARD PANEL. Patent dated May 27, 1986. Disclaimer filed Feb. 3, 1988, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to the claim of said patent.

3,933,644.—*James R. Skinner,* Cupertino, and *Albert Lang, Jr.,* Palo Alto, Calif. SPUTTER COATING APPARATUS HAVING IMPROVED TARGET ELECTRODE STRUCTURE. Patent dated Jan. 20, 1976. Disclaimer filed Dec. 4, 1987, by assignee, *Varian Associates, Inc.*

Hereby enters this disclaimer to claims 1 through 5, 7 and 8 of said patent.

4,439,642.—*John M. Reynard,* Framingham, Mass. HIGH ENERGY ULTRASONIC TRANSDUCER. Patent dated Mar. 27, 1984. Disclaimer filed Jan. 21, 1988, by the assignee, *Polaroid Corp.*

The term of this patent subsequent to Jan. 14, 1988 has been disclaimed.

4,483,339.—*Rolando Gillis,* Miami, Fla. VASCULAR SURGERY ROLL. Patent dated Nov. 20, 1984. Disclaimer filed Aug. 4, 1987, by the inventor.

The term of this patent subsequent to Nov. 20, 1998 has been disclaimed.

4,485,917.—*Jasper N. Smith,* Buffalo Grove, Ill. HAND WEARING APPAREL DISPLAY PACKAGE AND METHOD AND MACHINE FOR ASSEMBLY THEREOF. Patent dated Dec. 4, 1984. Disclaimer filed July 27, 1987, by the assignee, *Wells Lamont Corp.*

Hereby enters this disclaimer to claim 3 of said patent.

4,556,280.—*Robert J. Bagby,* Evanston, Ill. SINGLE CABLE OPTICAL FIBRE SIGNALING SYSTEM. Patent dated Dec. 3, 1985. Disclaimer filed June 8, 1987, by the assignee, *Ametek, Inc.*

Hereby enters this disclaimer to claims 2 through 20 of said patent.

4,560,789.—*Kenneth G. Davenport* and *Charles B. Hilton,* Corpus Christi, Tex. PROCESS FOR PRODUCING 4-ACETOXYACETANILIDE. Patent dated Dec. 24, 1985. Disclaimer filed Dec. 23, 1987, by the assignee, *Hoechst Celanese Corp.*

The term of this patent subsequent to June 18, 2002 has been disclaimed.

4,568,763.—*Kenneth G. Davenport* and *Charles B. Hilton,* Corpus Christi, Tex. PROCESS FOR PRODUCING N-ACYL-ACYLOXY AROMATIC AMINES. Patent dated Feb. 4, 1986. Disclaimer filed Dec. 23, 1987, by the assignee, *Hoechst Celanese Corp.*

The term of this patent subsequent to June 18, 2002 has been disclaimed.

4,665,485.—*Joseph R. Lundy,* New York and *Thomas J. Kazlausky,* Woodhaven, N.Y. METHOD AND APPARATUS FOR CHARACTERIZING THE UNKNOWN STATE OF A PHYSICAL SYSTEM. Patent dated May 12, 1987. Disclaimer filed Jan. 22, 1988, by the assignee, *Lundy Research Laboratories, Inc.*

Hereby enters this disclaimer to claims 9, 10 and 11 of said patent.

Disclaimer and Dedication

4,697,149.—*Paul R. Moran,* Winston-Salem, N.C. NMR FLOW IMAGING USING A COMPOSITE EXCITATION FIELD AND MAGNETIC FIELD GRADIENT SEQUENCE. Patent dated Sept. 29, 1987. Disclaimer and Dedication filed Jan. 25, 1988, by the assignee, *Wisconsin Alumni Research Foundation.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

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SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition). Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.
Box 8	All papers for the Office of the Solicitor.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box AF	Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.
Box FWC	Mail related to File Wrapper and Continuations.
Box Interference	Communications relating to interferences and applications and patents involved in interferences
Box Issue Fees	Issue Fee Transmittal (PTOL Form 85), advance copy orders and fees associated with these services.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, Free Library of	(215) 686-5330
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin -Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 13, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	2-18-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-18-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	4-17-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-5-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	2-18-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-87

Expiration of patents: The patents within the range of numbers indicated below expire during February 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,559,209 to 3,566,408, inclusive
Plant Patents ..... Numbers 3,022 to 3,029 inclusive

REEXAMINATIONS

MARCH 29, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,697,188 (824th)

APPARATUS FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS

George F. Pope, Burlington, N.C., assignor to Scoggins Mfg. Co., Inc., Graham, N.C.

Reexamination Request Nos. 90/000,829, Aug. 5, 1985 and 90/000,930, Dec. 31, 1985.

Reexamination Certificate for Patent No. 3,697,188, issued Oct. 10, 1972, Ser. No. 134,960, Apr. 19, 1971.

Division of Ser. No. 838,270, Jul. 1, 1969, Pat. No. 3,611,549.

Int. Cl.[4] B23B *35/00, 41/00, 51/08*

U.S. Cl. 408—230



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claim 2, dependent on an amended claim, is determined to be patentable.

1. Apparatus for facilitating drilling of holes in wooden structural members oftentimes located in inaccessible areas and for installing electrical conductor lines in such members; said apparatus comprising a drill including a relatively short, *rigid* helical drill bit having a tapered portion on its trailing end, and a spring steel readily flexible straight shaft of much greater length than and of small cross-section that said drill bit and having one end fixedly secured to the tapered end of said drill bit, and coupling means detachably connected to one end of said drill and adapted for connecting an electrical conductor line thereto to be pulled through the drilled holes upon passing the drill through the holes in a direction away from said coupling means.

2. An apparatus according to claim **1**, wherein said drill bit is provided with a transverse aperture therethrough adjacent its leading end, said coupling means comprising an attaching member extending through said aperture for attachment to said drill bit, a braided tubular member adapted for releasably and grippingly receiving an end portion of the electrical conductor line within one end thereof, and a swivel means interconnecting proximal ends of said members whereby said drill may be rotated relative to said braided tubular member without twisting an electrical conductor line grippingly received in the braided tubular member during rotation of the drill.

B1 4,039,228 (825th)

TILTING PAD BEARING

John Repose, Trenton, N.J., and Ulysses Niatas, Yardley, Pa., assignors to Delaval Turbine, Inc., Trenton, N.J.

Reexamination Request No. 90/001,039, Jun. 19, 1986.

Reexamination Certificate for Patent No. 4,039,228, issued Aug. 2, 1977, Ser. No. 684,406, May 7, 1976.

Int. Cl.[4] F16C *17/03*

U.S. Cl. 384—312



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

1. A bearing for a rotatable shaft comprising an annular housing defining a bore, a plurality of arcuate bearing shoes being spaced within the housing bore to define a cylindrical opening for axially receiving the shaft, said shoes being disposed in a free floating posture;

stop means being provided for maintaining said shoes in a generally operationally disposition in the absence of the shaft; and

pivot means for generally supporting each said shoe in the axial, radial and circumferential directions while providing for the universal movement thereof about a fixed point when a rotatable shaft is operationally mounted within the bearing.

B1 4,212,088 (826th)

APPARATUS FOR CLEANING SWIMMING POOLS

John M. Goettl, Phoenix, Ariz., and George J. Ghiz, 4736 E. Palo Verde, Phoenix, Ariz. 85018, assignors to George J. Ghiz, Phoenix, Ariz.

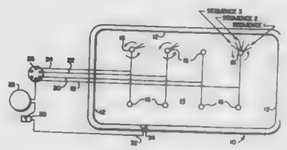
Reexamination Request No. 90/000,763, Jul. 25, 1985.

Reexamination Certificate for Patent No. 4,212,088, issued Jul. 15, 1980, Ser. No. 907,113, May 18, 1978.

Division of Ser. No. 832,464, Sep. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 616,677, Sep. 25, 1975, abandoned.

Int. Cl.[4] E04H *3/20;* **E08B** *3/02;* **A01G** *25/02;* **B05B** *15/10*

U.S. Cl. 4—490



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

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The patentability of claims **1–6** is confirmed.

1. A system for cleaning the inner surfaces of a swimming pool, said pool having

means for introducing water under pressure into said pool,

means for withdrawing water containing suspended deleterious matter from said pool and conducting said water to a filter where said suspended deleterious matter is separated from said water, and

means for returning said filtered water from said filter to said pool,

said system comprising a water delivery assembly located upon the inner surface of said swimming pool, said assembly comprising:

(a) a housing in fluid communication with a source of water under pressure, said housing having an outer open end communicating with the interior of said swimming pool;

(b) a rotatable water delivery head formed as a single moving part having an upper end and at least one water aperture therein to project a pressurized stream of water in adjacent parallel and scrubbing relation to the inner surface of said pool, said delivery head being mounted in said housing and adapted for reciprocal motion therewithin to an extended operative position and a retracted inoperative position, said delivery head also adapted for limited random rotation only when positioned between said extended operative position and said retracted inoperative position;

(c) said water delivery head responsive to the application of pressurized water to said housing for extending non-rotational to said extended operative position; said head also responsive to the removal of pressure from the water in said housing for retraction to said retracted inoperative position;

(d) means responsive to the application of pressurized water to said housing for rotating said delivery head a randon angular distance during movement between its retracted inoperative position and extended operative position; and

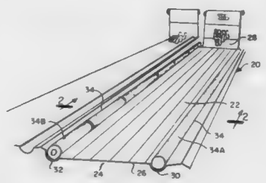
(e) means for stopping rotation of said delivery head when it is in its extended operative position to permit the projection therefrom of a pressurized stream of water, in a random direction, of sufficient velocity to clean the inner surface of said pool, said means for stopping said rotation comprising a radially extending collar on said delivery head, and an annular ledge in said housing, friction means on said collar and ledge coming into contact with each other when said head is in said extended position to stop rotation of said rotatable water delivery head.

B1 4,330,122 (827th)
CONVERTIBLE BOWLING ALLEY
Zena Sheinberg, and Alex Wortman, both of 526 Pauline Blvd., Ann Arbor, Mich. 48103, assignors to Zena Sheinberg and Alex Wortman, both of Ann Arbor, Mich.
Reexamination Request No. 90/001,265, Jun. 18, 1987.
Reexamination Certificate for Patent No. 4,330,122, issued May 18, 1982, Ser. No. 108,033, Dec. 28, 1979.
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—51

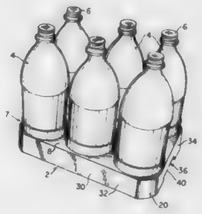
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. An improved bowling alley of the type comprising a bowling lane bed including an approach and a foul line at one end and a pin deck at the other end thereof and a pair of elongated gutters parallel to and abutting each side of said bowling lane bed, wherein the improvement comprises deflection means peripherally configured substantially complementary to the configuration of said gutters, said deflection means being removably disposed within said gutters for deflecting a bowling ball rolled down said alley to thereby prevent said ball from falling into said gutters, said deflection means being releasably held within said gutters solely by the substantially complementary configuration, whereby said bowling alley can serve as a conventional alley when said deflection means are removed from said gutters and can serve as a carom bowling alley when said deflection means are in place.



B1 4,344,530 (828th)
CASE FOR BEVERAGE BOTTLES
Pierre J. deLarosiere, Lisbon, Portugal, assignor to International Container Systems, Inc., Tampa, Fla.
Reexamination Request Nos. 90/001,057, Jul. 16, 1986 and 90/001,060, Jul. 28, 1986.
Reexamination Certificate for Patent No. 4,344,530, issued Aug. 17, 1982, Ser. No. 188,252, Sep. 17, 1980.
Int. Cl.[4] B65D *75/00*
U.S. Cl. 206—203



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

Claims **13–23** are added and determined to be patentable.

1. A case for transporting bottles, the bottles having a longitudinal symmetry axis and having a top closure for sealing the bottle and a base portion contoured to permit the bottle to stand on a flat surface, the base portion having a bottom which contacts the surface on which the bottle stands, the bottom being defined generally between an outer wall of the base portion of the bottle and an indentation in the base portion, the case being molded from a plastic material and comprising:

(a) an outer shell;

(b) a plurality of support elements connected to and generally disposed within the outer shell for reinforcing the shell, the outer shell and support elements being shaped to define a plurality of bottle pockets, a square lattice of vertex points being defined in fixed geometric relationship to the outer shell, the bottle pockets being located at vertex points of squares of the lattice, the outer shell being shaped relative to the lattice of vertex points to permit a plurality of such cases with bottles inserted in the bottle pockets to be arranged in a multilayered cross-stacked structure;

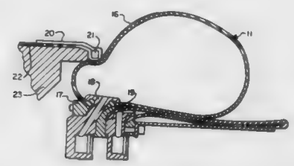
(c) bottle seating means associated with each of the bottle pockets for orienting and supporting bottles inserted into the pockets, each bottle seating means including:

(c-1) a bottle side-wall gripper connected to at least one of the outer case and the support elements, the gripper being configured to grip a radially outer wall of a base portion of a bottle inserted in the bottle pocket to position the bottle, and

(c.2) a bottle base support connected to at least one of the outer case and the support elements, the bottle base support being spaced apart along a pocket centerline from the bottle side-wall gripper, the bottle base support being positioned and configured to fit within the indentation in the base portion of a bottle inserted into the bottle pocket to support the bottle and, in cooperation with the bottle sidewall gripper, to orient the bottle so that the symmetry axis of the bottle substantially coincides with the pocket centerline; and

(d) stacking/cross-stacking case rests associated respectively with each of the bottle pockets, each case rest being connected to one of the outer shell and the support elements and located generally coaxially with respect to the pocket centerline spaced apart from the bottle base support in a direction opposing the corresponding bottle sidewall gripper, each case rest being configured to locate a closure of a bottle oriented generally coaxially with the pocket center line, so that cases of bottles can be stacked one on top of the other with the bottles of a lower case being positioned and oriented by the bottle seating means of the lower case to locate the closures of the bottles within the stacking/cross-stacking case rests of an upper case, weight of the upper case thereby being transmitted to closures of bottles in the lower case by way of case rests of the upper case.

B1 4,381,331 (829th)
NON-STICKING PLY END TURN-OVER BLADDER AND METHOD OF MANUFACTURE THEREOF
James L. Johnson, Indiana, Pa., assignor to McCreary Tire & Rubber Company, Indiana, Pa.
Reexamination Request No. 90/001,038, Jun. 23, 1986.
Reexamination Certificate for Patent No. 4,381,331, issued Apr. 26, 1983, Ser. No. 338,229, Jan. 11, 1982.
Continuation of Ser. No. 157,950, Jun. 9, 1980, abandoned.
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—224

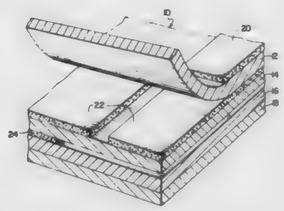


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A ply turn-over bladder formed of a rubbery polymer at least a portion of its outer surface having reduced adhesion to unvulcanized rubbery polymers, said portion comprising a fabric layer of spaced cords calendered with a coating of unvulcanized uncured rubbery polymer partially embedded in the rubbery polymer surface, the spaces between the cords being free of said polymer at said surface so that such cords project above said surface.

B1 4,425,386 (830th)
MULTI-SHEET ASSEMBLY USING AUTOGENOUS COATING
John C. H. Chang, Naperville, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.
Reexamination Request No. 90/001,167, Feb. 18, 1987.
Reexamination Certificate for Patent No. 4,425,386, issued Jan. 10, 1984, Ser. No. 395,870, Jul. 7, 1982.
Int. Cl.[4] B41M *5/16*
U.S. Cl. 427—256



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **12–20** is confirmed.

Claims **1** and **7** are determined to be patentable as amended.

Claims **2–6** and **8–11**, dependent on an amended claim, are determined to be patentable.

New claims **21–48** are added and determined to be patentable.

1. A multi-ply mailer form, comprising a plurality of sheets in superposed relationship, wherein the top sheet comprises a support bearing a localized autogenous coating comprising an admixture of electron-acceptor material and chromogen-containing microscopic pressure-rupturable capsules *on its upper surface*, said localized autogenous coating being capable of reacting under the impact of a printing stylus to release said chromogen from said capsules for reaction with said electron acceptor material in said autogenous coating without transfer to provide a visible image comprising address information.

B1 4,427,953 (831st)
MICROWAVE DIPLEXER
Thomas Hudspeth, Malibu, and Harmon H. Keeling, Kernville, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.
Reexamination Request No. 90/001,256, Jun. 9, 1987.
Reexamination Certificate for Patent No. 4,427,953, issued Jan. 24, 1984, Ser. No. 321,359, Nov. 16, 1981.
Int. Cl.[4] H01P *1/213*
U.S. Cl. 333—134

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

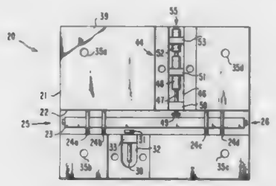
The patentability of claims **1–9** is confirmed.

1. A microwave diplexer comprising:

a microwave transmission line;

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a band rejection portion comprising a first rejection resonator disposed at a first predetermined position along said transmission line, and a second rejection resonator disposed at a second predetermined position along said transmission line, said second rejection resonator being disposed orthogonal to said first rejection resonator; and



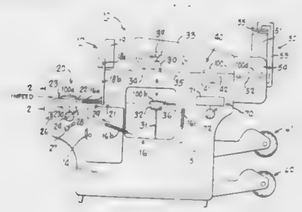
a bandpass portion disposed at a third predetermined position along said transmission line, said bandpass portion including first and second capacitively coupled bandpass resonators, said first bandpass resonator being capacitively coupled to said transmission line.

B1 4,548,024 (832nd)

INTEGRATED STRETCH-WRAP PACKAGING SYSTEM

Harvey A. Fine, Sayreville, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Reexamination Request Nos. 90/001,168, Feb. 9, 1987 and 90/001,206, Mar. 25, 1987.
Reexamination Certificate for Patent No. 4,548,024, issued Oct. 22, 1985, Ser. No. 580,129, Apr. 16, 1984.
Division of Ser. No. 245,283, Mar. 19, 1981, Pat. No. 4,458,470.
Int. Cl.⁴ B65B *11/16*
U.S. Cl. 53—502



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 4, 10, 12, 16, 18** and **22** are determined to be patentable as amended.

Claims **2, 3, 5–9, 11, 13–15, 17,** and **19–21,** dependent on an amended claim, are determined to be patentable.

1. A method for weighing, stretch wrapping and labelling a trayed product in a unitary weighing and wrapping machine for use in supermarkets, retail stores, and the like, comprising:

manually placing an unwrapped trayed product to be weighed and wrapped on a scale in a weighing station that is an integral part of said machine;

immediately weighing the trayed product while it is on said scale before it is wrapped, [including] and generating an electrical signal corresponding to the weight of the unwrapped trayed product;

withdrawing a length of stretch wrapping film from a film supply, to have the length of film extend through a region that lies, in the path of product flow through said machine, between the weighing station and a sealing station that is an integral part of said machine, the sealing station being disposed downstream of the weighing station in the direction of said product flow;

enveloping the top portion of the product in the length of stretch wrapping film after the product has been weighed;

tucking at least one edge of the film under the tray bearing the product;

advancing said trayed product and the length of enveloping stretch wrapping film along the path of product flow to said sealing station, to thereby further envelope the trayed product in the stretch wrapping film while the trayed product is being advanced to the sealing station;

severing the length of stretch wrapping film, the severing occurring at a point disposed between said scale and said sealing station, before said product is completely wrapped in said stretch film;

sealing at least certain of the tucked edges under the tray in the sealing station; and

applying a label to said stretch wrapping film, after it has been stretched, to specify the weight of the unwrapped trayed product in accordance with said electrical signal, after the film has been tucked under at least certain of the edges of the tray.

B1 4,562,136 (833rd)

TWO-COMPONENT DRY-TYPE DEVELOPER

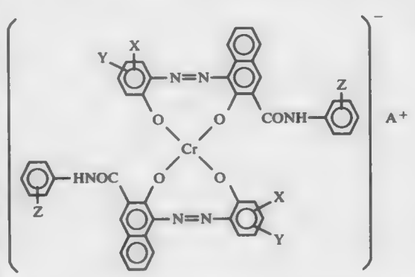
Satoru Inoue, Mishima; Mitsuru Uchida, Susono; Kimitoshi Yamaguchi, Numazu; Mitsuo Aoki, Numazu; Masami Tomita, Numazu, and Chiaki Uematsu, Fuji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Reexamination Request No. 90/001,250, Jun. 1, 1987.
Reexamination Certificate for Patent No. 4,562,136, issued Dec. 31, 1985, Ser. No. 669,749, Nov. 7, 1984.
Continuation-in-part of Ser. No. 471,387, Mar. 2, 1983, abandoned.
Claims priority, application Japan, Mar. 5, 1982, 57-033979; Apr. 24, 1982, 57-068075; May 17, 1982, 57-081571
Int. Cl.⁴ G03G *9/08*
U.S. Cl. 430—107

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. A two component dry type developer comprising carrier particles coated with a silicone resin and toner particles containing as a negative polarity control agent a monoazo metal complex dye of the formula



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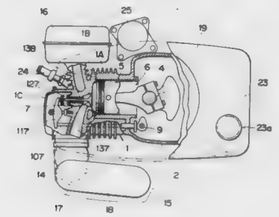
wherein X, Y and Z independently represent hydrogen, halogen, carboxy, hydroxy, nitro, sulfo or sulfonamide, and A^+ represents H^+, NH_4^+, K^+, Na^+ or an aliphatic ammonium cation.

B1 4,570,584 (834th)

GENERAL-PURPOSE INTERNAL COMBUSTION ENGINE WITH VERTICAL CRANK SHAFT

Yonekazu Uetsuji, Saitama, and Shoji Watanabe, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/001,228, Apr. 24, 1987.
Reexamination Certificate for Patent No. 4,570,584, issued Feb. 18, 1986, Ser. No. 542,629, Oct. 17, 1983.
Claims priority, application Japan, Oct. 15, 1982, 57-180867
Int. Cl.⁴ F02N *17/00*
U.S. Cl. 123—179 SE



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

Claim **5** is cancelled.

Claim **6** is determined to be patentable as amended.

New claims **7–16** are added and determined to be patentable.

7. A general-purpose internal combustion gasoline engine comprising:

(a) a cylinder block including a cylinder barrel, a cylinder head, and a cylinder cover;

(b) a crank shaft mounted in the cylinder block having an axis of rotation which extends vertically;

(c) intake and exhaust valves disposed in said cylinder head in overhead relationship and along a vertical plane including a longitudinal axis of said cylinder block, said intake valve being located upwardly of said exhaust valve;

(d) an intake passage defined entirely within a first side of said cylinder head, and openable and closable by said intake valve;

(e) an exhaust passage defined entirely within a second side of said cylinder head which is opposite to said first side, and openable and closable by said exhaust valve;

(f) a carburetor connected to said intake passage and located on the first side of said cylinder head;

(g) a muffler connected to said exhaust passage and located on the second side of said cylinder head;

(h) a valve drive mechanism composed of a cam shaft rotatable about its own axis in synchronism with rotation of said crank shaft; and

(i) a pair of push rods reciprocably movable rectilinearly in response to rotation of said cam shaft, said pair of push rods being disposed vertically one above the other and extending substantially parallel to axes of said intake and exhaust valves, said intake passage extending between said push rods, and being inclined upwardly toward said intake valve.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,629

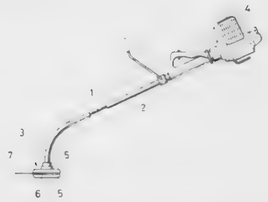
MOWING MACHINE WITH ANNULAR INERTIA SHIFTER

Toru Baba, Yokosuka, and Yasuo Saito, Fujisawa, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Original No. 4,557,052, dated Dec. 10, 1985, Ser. No. 577,709, Feb. 7, 1984. Application for reissue Nov. 12, 1986, Ser. No. 929,618

Int. Cl. A01G *3/06;* **A01D** *50/00*

U.S. Cl. 30—276 **16 Claims**



1. A mowing machine having a cutting head comprising a driving shaft, a casing means fixedly secured to the driving shaft for rotation therewith and having a plurality of circumferentially spaced projections formed thereon, at least one flexible cutting line in the form of a coil wound on a spool housed in and removably fixed to the casing means and having a free end portion, an annular inertia shifter disposed in the casing means in a relation surrounding the coil and the spool [at its radial outward position] *radially outwardly of the spool* for vertical and angular movements relative to the casing means and having a plurality of circumferentially spaced projections formed thereon and adapted to engage said projections on the casing means during the mowing operation of the machine, said inertia shifter being provided with at least one opening through which said free end portion of the cutting line extended radially outwardly.

Re. 32,630

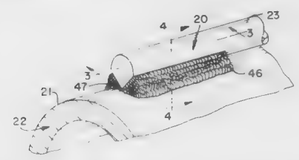
THERMOCOUPLE AND METHOD OF MAKING THE THERMOCOUPLE AND OF MOUNTING THE THERMOCOUPLE ON A HEAT EXCHANGER TUBE

Philip F. Finney, 425 E. Washington, Villa Park, Ill. 60181

Original No. 4,477,687, dated Oct. 16, 1984, Ser. No. 501,282, Jun. 6, 1983. Application for reissue Apr. 22, 1985, Ser. No. 727,001

Int. Cl.[4] H01L *35/02*

U.S. Cl. 136—229 **35 Claims**



1. A thermocouple assembly for measuring the surface temperature of a fired heat exchanger tube comprising, a cold junction end having a temperature readout instrument and a hot junction end having a temperature sensing junction member, the ends being connected by sheathed thermocouple conductors, said sheathed thermocouple conductors including an elongated tubular metal sheath, *and* a pair of spaced thermocouple conductors within said sheath, electrical insulating material spacing and supporting said conductors within the sheath in insulating relation from each other and from the sheath, said hot junction end being defined by a thermojunction tip, said tip including a face in which the conductors end, sheath are substantially coplanar, a junction member contacting said face and welded to said conductors at said face, said junction member being spaced from said sheath and insulating means disposed between said junction member and said sheath to electrically and thermally.

Re. 32,631

MEASUREMENT CIRCUIT FOR LOAD CELL

Howard P. Layer, Derwood, Md., assignor to Frazier Precision Instrument Company, Inc., Gaithersburg and Holometrics, Inc., Derwood, both of, Md.

Original No. 4,541,496, dated Sep. 17, 1985, Ser. No. 588,219, Mar. 12, 1984. Application for reissue Jul. 10, 1986, Ser. No. 884,728

Int. Cl.[4] G01G *3/14;* **G01B** *7/16;* **G01D** *3/04*

U.S. Cl. 177—211 **27 Claims**



1. A temperature compensated load sensing circuit for a load cell mass comparator including a load cell containing a plurality of strain gauges connected to form arms of a bridge circuit connected to a measuring circuit, comprising the combination of:

a pair of series connected resistance means coupled between the output side of the strain gauges in a first of two adjacent arms of said bridge circuit, said resistance means being of a relatively low resistance value compared to the resistance value of said strain gauges;

potentiometer means shunted across at least one of said pair of series connected resistance means, said potentiometer means having a relatively large resistance value compared to the resistance value of said resistance means and further including an adjustable voltage output terminal; and

means connecting said output terminal of said potentiometer means and the output side of the strain gauges in the second of two adjacent arms of said bridge circuit to said measuring circuit.

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Re. 32,632

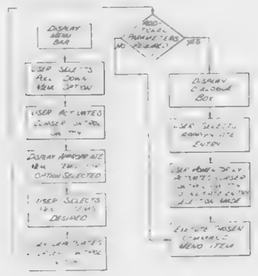
DISPLAY SYSTEM

William D. Atkinson, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Original No. 4,464,652, dated Aug. 7, 1984, Ser. No. 399,704, Jul. 19, 1982. Division of Ser. No. 399,704, Jul. 19, 1982, Pat. No. 4,464,652. Application for reissue Dec. 20, 1985, Ser. No. 811,372

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—709 **4 Claims**



11. In a computer controlled display system having a display wherein a plurality of command options are displayed along a menu bar and sub-command items corresponding to each option are displayed once said option has been selected, a method for selecting an option and an item, comprising the steps of:

(a) generating and displaying said menu bar comprising said plurality of command options;

(b) positioning a cursor on said display using a cursor control device for movement over a surface, the movement of said cursor control device over said surface by a user resulting in a corresponding movement of said cursor on said display;

(c) signalling said computer of an option choice once said cursor is positioned over a first predetermined area on said display corresponding to an option to be selected, said user signalling said computer by placing a switch coupled to said display system in a second position while moving said cursor control device over said surface such that said cursor is over said first predetermined area;

(d) generating and displaying said sub-command items corresponding to said selected option;

(e) positioning said cursor over a second predetermined area corresponding to a sub-command item to be selected, said switch being maintained in said second position until said cursor is positioned over said second predetermined area;

(f) placing said switch in a first position once said user has positioned said cursor over said second predetermined area;

whereby an option and an item associated with said option is selected.

Re. 32,633

CURSOR CONTROL DEVICE

Dean Hovey, Los Altos; James Sachs, Menlo Park; James Yurchenco, Palo Alto, and William Lapson, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Original No. 4,464,652, dated Aug. 7, 1984, Ser. No. 399,704, Jul. 19, 1982. Division of Ser. No. 399,704, Jul. 19, 1982, Pat. No. 4,464,652. Application for reissue Dec. 20, 1985, Ser. No. 811,635

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—710 **8 Claims**

1. A device for providing signals indicative of X-Y locations on a display system or the like, comprising:

a housing including a base having an opening for the passage of a rotatable ball;

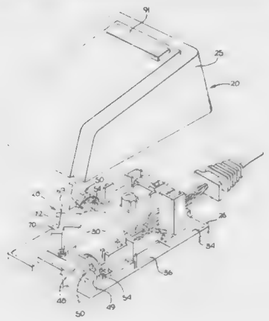
a unitary frame disposed on saide base including:

a domed portion integrally formed with said frame substantially surrounding and retaining said rotatable ball;

said domed portion having first and second cut-outs through said dome disposed substantially at 90 degrees with respect to one another, and a third cut-out disposed at an angle with respect to said first and second cut-outs;

X-Y position indicating means passing through said first and second cut-outs, for converting the rotation of said ball into signals indicative of X-Y positions on said display system;

biasing means passing through said third cut-out, for biasing said ball against said X-Y position indicating means;



means for removing said ball from said domed portion through said opening in said base, such that said ball and the interior of said dome may be serviced, said means for removing comprising:

outwardly extending lock ridges integrally formed with said opening in said base;

a lock cap having a second opening of smaller diameter then said base opening to permit only a portion of said ball to pass therethrough and contact said surface;

said lock cap further including outwardly extending lock tabs to interleaf with said lock ridges, such that rotation of said cap interleafs with said tabs and ridges thereby locking said cap onto said base;

whereby movement of said device over a surface such that a portion of said ball is maintained in contact with said surface results in X-Y positions defined on said display system.

Re. 32,634

ADHESIVE FOR BONDING CURED EPDM RUBBER

Chester T. Chmiel, Granger, Ind., and Daniel J. Cotsakis, Carlisle, Pa., assignors to Uniroyal Plastics Company, Inc., Mishawaka, Ind.

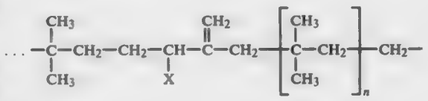
Original No. 4,501,842, dated Feb. 26, 1985, Ser. No. 565,266, Dec. 27, 1983. Application for reissue Nov. 3, 1986, Ser. No. 926,428

Int. Cl.⁴ C08L *9/00, 15/02, 53/00*

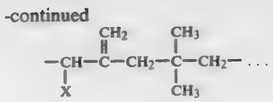
U.S. Cl. 524—432 **12 Claims**

1. An adhesive for bonding cured EPDM comprising:

(A) a halogenated butyl rubber of the formula:

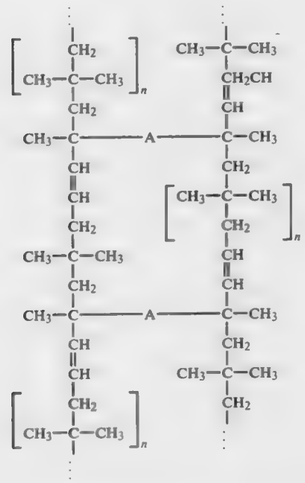


-continued



where X is Cl or Br and n is about 50

(B) a pre-crosslinked butyl rubber of the formula:



where A is a crosslinking agent and n is about 50

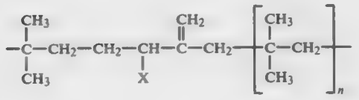
(C) a styrene/ethylene butylene/styrene block thermoplastic rubber,

(D) a thermoplastic, petroleum hydrocarbon feedstock derived aliphatic monomer resin derived from C_5–C_9 streams polymerized to varying molecular weights to give a softening point range of 162°–181° C. and

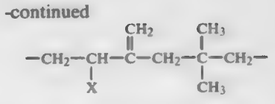
(E) an aliphatic isocyanate; wherein (A) is at a concentration of 20.0–45.0 PPHR, (B) is at a concentration of 40.0–65.0 PPHR, (C) is at a concentration of 15.0–20.0 PPHR, (D) is at a concentration of 120–160 PPHR and (E) is at a concentration of 20–35 PPHR.

10. A process for making an adhesive for the bonding of cured EPDM membrane comprising:

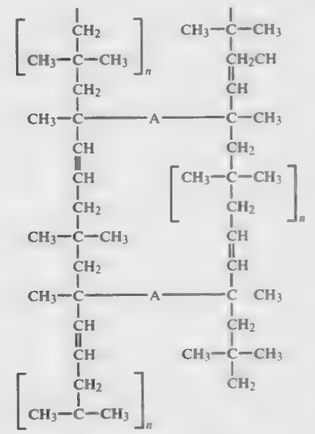
(A) Milling or mixing separately , *with carbon black, about 20.0 to about 45.0 parts PHR of* a halogenated butyl rubber of the formula:



-continued



where X is Cl or Br and n is about 50 and *about 40 to about 65 parts PHR* a pre-crosslinked butyl rubber of the formula:



where A=Crosslinking Agent and n is about 50,

(B) [Solubizing] *Solubilizing* the butyl rubbers of (A) with *about 15 to about 20 parts PHR of* a styrene/ethylene butylene/styrene block thermoplastic rubber, *about 120 to about 160 parts PHR of* a thermoplastic, petroleum hydrocarbon feedstock derived aliphatic monomer resin derived from C_5–C_9 streams polymerized to varying molecular weights to give a softening point range of 162°–181° C., *about 20 to about 35 parts PHR of* an aliphatic isocyanate based on an adduct of 1,6-hexamethylene diisocyanate, *about 5 to about 15 parts PHR of* an alkali-metal alumino-silicate zeolite adsorbent, *and about 0.5 to about 2 PHR of* zinc oxide [and carbon black] in an organic liquid having a solubility parameter of 8.5–8.9 and a hydrogen bonding index of 3.0–3.5.

11. The adhesive of claim 8 or claim 9 which is formulated by the process comprising:

(A) milling or mixing separately with carbon black, the halogenated butyl rubber component and the pre-crosslinked butyl rubber component; and

(B) solubilizing the butyl rubbers of (A) with the styrene/ethylene butylene/styrene block thermoplastic rubber component, the thermoplastic petroleum hydrocarbon feedstock, the aliphatic isocyanate, about 5 to about 15 parts PHR of an alkali metal alumino-silicate zeolite adsorbent, and about 0.5 to about 2 parts PHR of zinc oxide in an organic solvent having a solubility parameter of 8.5–8.9 and a hydrogen bonding index of 3.0–3.5, such that the resultant adhesive has a storage stability of greater than 6 months.

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PLANT PATENTS

GRANTED MARCH 29, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,135

MINIATURE ROSE PLANT 'BREAD 'N BUTTER'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,457
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant named, 'Bread 'n Butter' of hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms of bright Nasturtium Orange with softer orange and yellow reverse, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,136

MINIATURE ROSE PLANT 'DEBRA GAYE'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,458
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Derby Gaye' of a hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms which range in color from near Delft Rose to near Vermillion with bases of near Mimosa Yellow, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,137

MINIATURE ROSE PLANT 'SPRING BOUQUET'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,738
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Spring Bouquet', of a hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms ranging in color from near Crimson to near Rose Bengal with a base of near Naples Yellow and a reverse ranging from near Naples Yellow to near Barium Yellow with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,138

MINIATURE ROSE PLANT NAMED 'LITTLE PEACHES'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,758
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Little Peaches' of hardy, dwarf, compact growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms of soft yellow, ranging from Primrose Yellow to Mimosa Yellow with the outer margins blushing Empire Rose to Delft Rose, easily asexually reproduced from cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,139

MINIATURE ROSE PLANT 'SUGAR 'N SPICE'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,737
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Sugar 'n Spice' of a hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms which range in color from near Begonia to near Porcelain Rose, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,140

MINIATURE ROSE PLANT NAMED 'LOIS'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,742
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Lois', of a hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms ranging in color from near Amaranth Rose to near Pastel Mauve, easily asexually reproduced from cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

6,141

MINIATURE ROSE PLANT NAMED 'DILLY DILLY'

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 3, 1986, Ser. No. 825,791
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Dilly Dilly' of a hardy, dwarf, moderate growth, well-branched and attractive appearance, substantially as illustrated and described, characterized by its blooms which range in color from near Rose Purple to near Magnolia Purple, easily asexually reproduced from cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

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ERRATA

For CLASS	See PATENT NO.
357-023	4,733,482
441-079	4,733,496
141-031	4,733,680
118-050	4,733,746
437-141	4,734,168
261-091	4,734,235
549-450	4,734,507
128-019	4,734,546
313-023	4,734,610
363-022	4,734,828
340-568	4,734,896
363-112	4,734,906

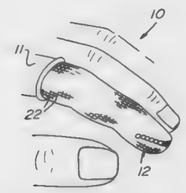
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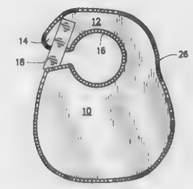
GENERAL AND MECHANICAL

4,733,410
FINGER COT CONSTRUCTION
Ruth E. Glotkin, 5115 Atlantic Ave., Ventnor, N.J. 08406
Filed May 12, 1986, Ser. No. 862,302
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—21 **1 Claim**



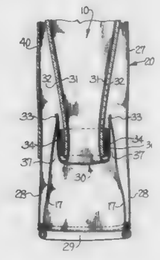
1. A finger cot fabricated of a first yarn and comprising a knit tube, a seam extending in closing relation laterally across one end of said tube, the other end of said tube being open, said tube having a longitudinally inwardly widening end portion extending from said one tube end for snugly receiving the distal end of a wearer's finger, a circumferential bead at said open tube end for retaining engagement with a received finger at a location spaced from the distal finger end, and elastic yarn interknit with said first yarn adjacent to said other tube end along a region extending inwardly a predetermined distance from said open tube end to define an elastic collar for frictional embracing engagement with a wearer's finger, said one end portion of said tube having vent openings on opposite sides thereof, said vent openings being arranged in a row extending longitudinally of said tube from opposite ends of said seam only.

4,733,411
DISPOSABLE BIB
Cynthia S. Foti, 3446 Harmony La., Spring Valley, Calif. 92077
Filed Feb. 24, 1986, Ser. No. 832,345
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **8 Claims**



1. A bib, comprising:
a paper layer;
a plastic layer;
means for holding the paper and plastic layers together in overlapping relationship including stitching connecting an outer boundary of each of the layers and a quantity of a non-toxic adhesive adhering the paper layer to the plastic layer;
the paper and plastic layers being configured to provide an apron and a yoke, the yoke extending from one side of the apron and terminating in a free end adjacent a second side of the apron and being adapted for surrounding a person's neck when the apron generally overlies the person's chest; and
a segment of an adhesively backed tape having a first end attached to the free end of the yoke and a second end extending from the free end of the yoke for overlapping attachment to the the second side of the apron substantially above the person's shoulder after the yoke has been placed around the person's neck.

4,733,412
INSULATED SKI GLOVE
William O. Campbell, 286 Stanaford Rd., Winston-Salem, N.C. 27104
Filed May 22, 1987, Ser. No. 53,121
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **11 Claims**



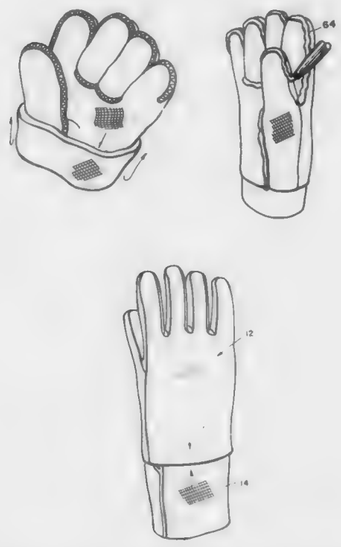
1. An insulated ski glove providing warmth and being highly flexible to permit the wearer to firmly grip and feel the ski pole when skiing, said glove comprising
(a) a hand-encasing inner glove member including finger and thumb stalls, a palm, a back, and a main cuff portion with an outer end opening extending beyond the wrist area of the wearer,
(b) a hand-encasing outer glove member conforming to and covering said hand-encasing inner glove member and including an outer end opening secured to said outer end opening of said main cuff portion of said hand-encasing inner glove member to provide an open end to receive the hand of the wearer,
(c) an auxiliary cuff member formed around the wrist area of said hand-encasing inner glove member, said auxiliary cuff member being formed by an outwardly folded layer of said hand-encasing inner glove member and forming an outwardly extending wrist encircling welt, and
(d) elastic band means secured in said outwardly extending wrist encircling welt and providing a resilient gripping of said auxiliary cuff with the wrist of the wearer and permitting said main cuff to be turned inwardly over said palm and around the back of said hand-encasing outer glove member while maintaining the resilient gripping engagement of said auxiliary cuff around the wrist of the wearer.

4,733,413
GLOVE CONSTRUCTION AND METHOD OF MAKING
Martin Dykstra, Grandville, Mich., assignor to Shelby Group International, Inc., Memphis, Tenn.
Filed Mar. 5, 1987, Ser. No. 22,015
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—169 **6 Claims**

1. A method of making a glove comprising the steps of:
(a) providing trank, forchette and thumb piece glove components, each having an inner liner layer and a barrier layer adhered to said inner liner layer; and provding a glove shell;

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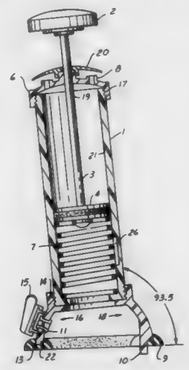
(b) stitching said components together with said inner liner layer on the outside and said barrier layer on the inside to form an assembled glove invert having protruding connecting seams between said components at the outer periphery of said invert;
(c) reversing said glove invert to place said inner liner layer inside, said barrier layer outside, and said protruding seams inside, while creating elongated peripheral depressions along the exterior of said invert seams;



(d) applying an adhesive sealant along said peripheral depressions of said inverted seams, and curing said adhesive sealant thereby sealing said seams to prevent water wicking thereat while said barrier layer allows moisture vapor egress; and
(e) securing said reversed glove invert inside said glove shell.

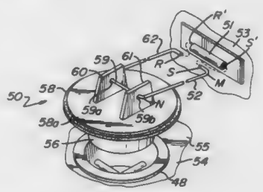
4,733,414
SPRING LOADED DRAIN CLEANING DEVICE
Karl A. Wilkes, 10345 Violetlawn, Detroit, Mich. 48204
Filed Oct. 2, 1986, Ser. No. 914,458
Int. Cl.⁴ E03D *11/00*
U.S. Cl. 4—255 **3 Claims**

1. A spring loaded drain cleaning device, comprising:
a hollow cylinder having at least one by-pass slot on its inside surface;
a cap removably attached to a first end of said cylinder, said cap further having a centrally positioned aperture and an air vent, said cap further having a splash guard attached thereto so as to prevent liquids exiting from said air vent from making contact with a user of said spring loaded drain cleaning device;
a cup removably attached to a second end of said cylinder, said cup having sides of circumferentially varying lengths, and sides of varying lengths terminating in a gasket, said sides of varying lengths providing said cylinder with an angle within a range substantially between 90 and 97 degrees as measured between the axial center of said hollow cylinder and a drain surface over which said hollow cylinder is placed;
a one-way valve attached to said cup which permits fluid passage when negative pressure exists in said cylinder;
a control valve attached to said cup for turning on and off functioning of said one-way valve;
a piston sealingly mounted inside said cylinder for reciprocation therein, said piston having a thickness in length less than said by-pass slot, said piston further having an end of



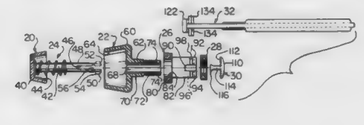
downward stroke at the axial position on said cylinder where said by-pass slot is located;
a rod attached to said piston at its upper end and extending through said aperture in said cap, said rod terminating in a handle; and
a biasing spring inside said cylinder located between said cup and said piston so as to provide biasing action between said cylinder and said piston.

4,733,415
AUTOMATIC DRAIN SEALER
Dino Ippoliti, 422 Main St. Washington #3, Harleysville, Pa. 19438
Division of Ser. No. 842,124, Mar. 20, 1986. This application Dec. 4, 1986, Ser. No. 938,714
Int. Cl.⁴ A47K *1/14*
U.S. Cl. 4—295 **8 Claims**



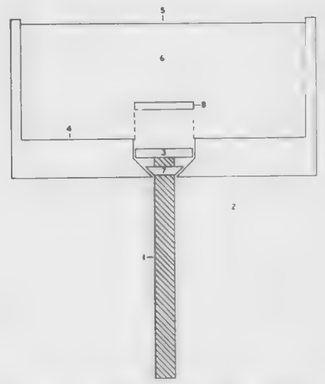
1. An apparatus for preventing insect and gas infestation into an enclosure from a drain located within a receptacle for retaining a liquid comprising:
(a) a sewer line for connection to said drain and for expelling said liquid therein;
(b) means for sealing said drain comprising first and second circular coupled parts, said first part being decoupled from said second part for blocking said drain when liquid is to be retained within said receptacle, and said second part being buoyant so as to float on a liquid surface;
(c) means attachable to or detachable from said receptacle to provide a reformable clamp means having distal and proximal ends wherein said reformable clamp means is detached at said proximal end from said receptacle after said first part has been decoupled from said second part and utilized to block said drain opening, and said reformable clamp means being reattached at said proximal end to said receptacle when said first part has been recoupled to said second part and when liquid is being expelled from said receptacle;
(d) a U-shaped bail means having first and second equal length longitudinal legs wherein each leg includes proximal and distal ends, said distal ends being integrally joined with one another, and further said proximal ends being freely movable in an inward and outward direction;
(e) means provided by said reformable clamp at said distal end for slidably aligning said first and second recoupled parts over said drain, wherein when said liquid is completely expelled from said receptacle said respective first and second recoupled parts will automatically block and seal said drain to prevent insects and gases from entering said enclosure from said sewer line.

4,733,416
PUSH-BUTTON OPERATING MECHANISM FOR A WATER CLOSET
Walter Ott, 16 Rouge St., Markham, Ontario, Canada L3P 1K8
Filed Nov. 13, 1986, Ser. No. 930,731
Claims priority, application Canada, Nov. 7, 1986, 522518
Int. Cl.⁴ E03D *5/09*
U.S. Cl. 4—410 **5 Claims**



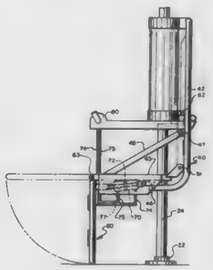
1. Push button apparatus for operating a flush valve or the like of a water closet, comprising:
button actuator means including a button and housing, said housing having a shank for passing through an opening in a water closet tank wall, said button having an actuator within and reciprocally movable relative to said housing shank, said button actuator including flexible bifurcated shank means, at least one shank means having a laterally enlarged end portion engageable with said housing shank to prevent unintended separation of said button form said shank, at least one of said bifurcated shank means including a groove on the inside surface thereof, and said button actuator including a cam element having a shank, said cam shank having a lateral end portion adapted to mate with said groove;
bracket means;
means for securing said bracket means in operative association with said button shank in a predetermined orientation therewith;
lever arm means;
means for actuating said lever arm means;
means on said bracket means and said lever actuating means for mounting said lever actuating means for pivotal movement relative to said bracket means upon reciprocal movement of said button actuator operatively contacting said lever actuating means;
said mounting means comprising pivot means and pivot socket means, means providing lateral access to said socket means, said pivot means being constructed such that it can be assembled with said socket means translationally through said access means when said pivot means is in a predetermined orientation with respect to said access means.

4,733,417
STEADY STATE SWIMMING POOL HEAT EXCHANGER
Dennis A. De Shon, P.O. Box 3255, Baton Rouge, La. 70821
Filed Jul. 20, 1987, Ser. No. 75,086
Int. Cl.⁴ E04H *3/18*
U.S. Cl. 4—493 **1 Claim**



1. A steady state swimming pool heat exchanger which transfers the constant heat contained in the earth to heat the water contained in a swimming pool, comprising:
a swimming pool,
a heat conducting rod sunk vertically into the earth to a depth at which the stable temperature of the earth may be reached, so as to conduct the heat from the earth to the water in said swimming pool,
a plate mounted on the top of the rod and recessed into the floor of the swimming pool to transfer heat from the rod to the water in the swimming pool,
a seal positioned around the rod, between said plate and the earth to prevent leakage of the water in the pool,
a non-conductive cover for the plate which may be positioned to restrict the flow of heat.

4,733,418
BATHING APPARATUS
Henry D. Luther, Massillon, Ohio, assignor to Enabling Devices, Inc., Massillon, Ohio
Filed Apr. 25, 1986, Ser. No. 856,005
Int. Cl.⁴ A47K *3/12*
U.S. Cl. 4—562 **8 Claims**



1. A bathing apparatus for moving a person into and out of a bathing receptacle; comprising:
a stanchion, said stanchion mounted independently of the bathing receptacle, one end of said stanchion being secur-

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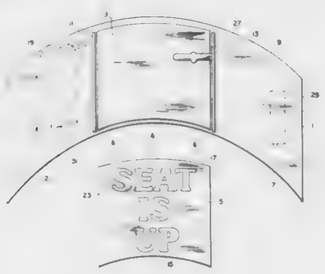
able to a floor and the remaining end of said stanchion being securable to a ceiling, a seat assembly, said seat assembly having a frame, said seat assembly frame pivotably attached to said stanchion, said stanchion having a means for raising and lowering said seat assembly, said stanchion means for raising and lowering said seat assembly being adjustably attached to said stanchion, a leg support, said leg support being pivotably connected to said seat assembly, a hydraulic cylinder, said hydraulic cylinder having one end thereof connected to said leg support and the other end thereof being connected to said seat assembly, said hydraulic cylinder capable of raising and lowering said leg support.

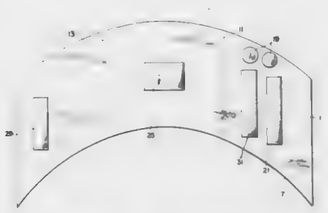
4,733,419

TOILET SEAT-UP INDICATOR

Suzanne Nee, 500 N. Metro Blvd, 2067M, Chandler, Ariz. 85226

Filed Jun. 25, 1987, Ser. No. 66,217
Int. Cl.[4] A47K *13/00, 17/00*
U.S. Cl. 4—661 **6 Claims**





1. A device for providing a visible indication that a toilet seat is in its vertical position comprising:

a housing having an upper edge surface and a lower edge surface;

a first compartment formed in said housing, said compartment having a source of light mounted therein;

a cover plate overfitting said housing and said light source, said cover plate having a message formed thereon;

a second compartment formed in said housing;

electronic circuit means mounted in said second copartment, said circuit means being connected to said light source for controlling the actuation of said light source;

position sensing means connected to said circuit means for selectively applying power to said circuit means as a function of position;

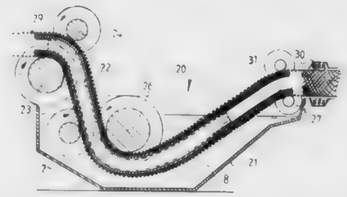
means to affix said housing to the interior surface of a toilet seat; said upper edge surface and said lower edge surface being curvilinear in shape.

4,733,420

METHOD AND APPARATUS FOR IMPREGNATING A WOVEN, STRANDED OR KNITTED SLEEVE OR TUBE OF FLEXIBLE FIBRES OR THREADS

Jan Schapink, Rijssen, and Frans B. Bruns, Almelo, both of Netherlands, assignors to Koninklijke Nijverdal-Ten Cate NV, Netherlands

Filed Oct. 14, 1986, Ser. No. 918,319
Claims priority, application Netherlands, Oct. 22, 1985, 8502880; May 15, 1986, 8601238
Int. Cl.[4] D06B *1/00, 7/10;* **D06C** *5/00*
U.S. Cl. 8—151 **17 Claims**



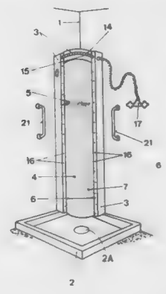
1. Method for impregnating a woven, stranded or knitted sleeve or tube of flexible fibers or threads, wherein the sleeve or tube to be impregnated is driven over an elongate guiding member extending through an impregnation station, for example a container of liquid impregnant, by means of a transport layer of tube extending between said sleeve or tube and said guiding member and driven in longitudinal direction of said guiding member, the guiding member being a supporting tube and that as a transport layer or tube, use is made of flexible tube or sleeve of finite length, which is pulled from the beginning of said supporting tube over said tube towards the rear end thereof, and from that rear end through said supporting tube back to the beginning thereof.

4,733,421

MASSAGING AND WASHING APPARATUS FOR PEOPLE

Hans Kuersteiner, Gais, Switzerland, assignor to Verena Kuersteiner, Gais, Switzerland

Filed Jun. 2, 1986, Ser. No. 870,203
Claims priority, application Switzerland, Nov. 22, 1985, 4989/85
Int. Cl.[4] A46B *13/02;* **A61H** *7/00*
U.S. Cl. 15—21 D **11 Claims**



1. A people massaging and washing apparatus, comprising:

frame means and first support means for supporting said frame means on a supporting surface;

an elongated, cylindrical brush means and second support means for rotatably supporting said brush means about a vertically upright axis of rotation on said frame means;

drive means for driving said brush means for rotation; and

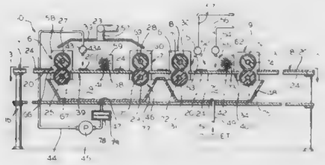
water supply means on said frame means for supplying a curtain of water in an arcuate pattern that extends generally coaxially to said axis of rotation and generally parallel to a peripheral portion of said brush means along the length of said brush means.

4,733,422

APPARATUS FOR WASHING AND RINSING OF USED LITHOGRAPHIC PLATE MEMBERS

Gary L. Schramm, Brookfield; Ralph G. Pontillo, New Berlin, and Richard J. Hladilek, West Allis, all of Wis., assignors to W. A. Krueger Co., Scottsdale, Ariz.

Filed May 28, 1985, Ser. No. 738,468
Int. Cl.[4] G03D *5/06;* **A46B** *13/04*
U.S. Cl. 15—77 **24 Claims**



1. A lithographic plate washing apparatus for the facilitated automatic washing and rinsing of previously used lithographic plate members having substantially flat central portions and pre-formed parallel flanged peripheral edges, said apparatus comprising:

feed fixture means capable of accommodating at least one of said flanged lithographic plate members thereon;

at least one drive means positioned adjacent to and operably aligned with said feed fixture means so as to receive and longitudinally propel at least one lithographic plate member through said apparatus;

said drive means having flange accommodation means to accommodate and preserve the shape of said peripheral flanges formed in said lithographic plates;

scrubbing station means operably positioned after said at least one drive means adjacent said feed fixture means so as to receive said lithographic plate members from said drive means and dispense cleaning solvent through solvent dispensing means and apply scrubbing action by scrubbing means contacting with said plate member;

said scrubbing station means having an entry side and an exit side;

said scrubbing station means further being operably associated with said drive means so as to enable said drive means to engage and longitudinally propel said lithographic plate members from said entry side of said scrubbing station means to said exit side of said scrubbing station means;

said scrubbing station means further including rinse means for the application of at least one liquid rinse to said plate members passing therethrough;

said scrubbing station means further including rinse fluid drainage means operably associated with said rinse means and said drive means for collection of said rinse fluid from said scrubbing station;

removal fixture means operably aligned with and juxtaposed to said scrubbing station means so as to receive said lithographic plate members from said drive means;

said removal fixture means further including lithographic plate member flange accommodation means associated therewith to further accommodate and preserve the shape of said peripheral flanges formed therewithin;

frame means operably supporting said feed fixture means, said drive means, said scrubbing station means and said removal fixture means;

said flange accommodation means of said drive means being operably aligned and associated with said feed fixture flange accommodation means and said removal fixture flange accommodation means so as to enable accommodation and preservation of said shapes of said peripheral flanges formed in said lithographic plate members as said plate members pass through said feed fixture means, said scrubbing station means, and said removal fixture means; and

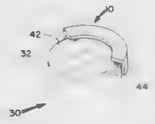
said feed fixture means, drive means, scrubbing station means, and removal fixture means cooperating so as to provide substantially automatic and continuous feeding, dispensing of cleaning solvent, scrubbing, rinsing, and removing of said lithographic plate members into, through and from said apparatus, while accommodating and preserving said peripheral flanges formed therein.

4,733,423

POP TOP CAN BRUSH

Gregory Blatt, P.O. Box 18, East Port, Me. 04631

Filed Sep. 5, 1986, Ser. No. 903,960
Int. Cl.[4] A46B *9/02*
U.S. Cl. 15—160 **1 Claim**



1. A hand-held pop top can brush for the cleaning of aluminum and metal pop top cans having a planer circumferential top indentation and a circumferential side indentation comprising a C shaped planer circular top surface having a C shaped circumferential perpendicular sidewall depending therefrom, said circular planer top surface and said circumferentially perpendicular sidewall being slightly circumferentially larger than the circumference of said aluminum or metal pop top cans; said circular planer top surface having a first non-abrasive cleaning means secured thereto and depending downwardly therefrom; said circumferentially perpendicular sidewall having a plurality of second non-abrasive cleaning means secured thereto and extending inwardly therefrom, said plurality of first cleaning means and plurality of said second means positioned so as to coincide with said circumferential indentations on said aluminum or metal pop top cans.

4,733,424

RETRACTABLE AND SLIDABLE DOORMAT HOUSING

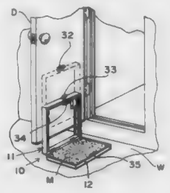
David E. Gurkin, 3035 Guildford "B" , Boca Raton, Fla. 33434

Filed Apr. 6, 1987, Ser. No. 34,683
Int. Cl.[4] A47L *23/22*
U.S. Cl. 15—161 **5 Claims**

1. A retractable doormat housing comprising, in combination, a rectangular housing frame member, means for mounting one side of said housing frame member against one side of an entranceway door, a rectangular doormat tray of substantially the same size as said housing frame member, a hinge for swingably attaching said doormat tray along the lower edge portion thereof with respect to a lower edge portion of said housing frame member, a doormat seated in said doormat tray, said doormat tray being moveable between a closed position against the outside of said housing frame member and an open position extending substantially perpendicularly outwardly of said housing frame member, manually releasable means for

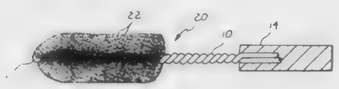
VOL 1088 ISS 5 MR 29 1988 UMI

retaining said doormat tray in said closed position and, means for slidingly mounting said housing frame member on said entrance door for vertical movement between upper and lower positions, selectively, of the entranceway door whereby said



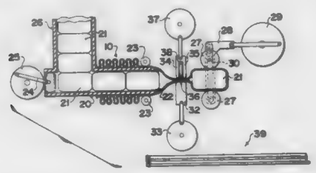
housing frame member is moved to its lower position to place said doormat tray adjacent a doorway entrance, and moved to its upper position for storage, and means for normally retaining said frame member in said upper position.

4,733,425
MASCARA BRUSH
Franklin J. Hartel, and Eric W. Sanderson, both of Palmer, Mass., assignors to Sanderson-MacLeod, Inc., Palmer, Mass.
Filed Jun. 16, 1986, Ser. No. 874,842
Int. Cl.[4] A46B *3/16, 9/00, 15/00*
U.S. Cl. 15—206 **5 Claims**



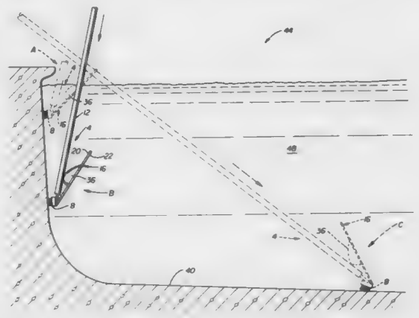
1. Applicator brush for liquid-type cosmetics comprising a core and bristle portion having a bristle face of generally circular configuration, said core being formed by lengths of metallic wire helically twisted together, said bristle portion being formed by a plurality of bristles extending radially from said core, pairs of said bristles being formed by discrete synthetic plastic filaments that are tubular or have irregularly shaped cross-sections and which are gripped medially of their outer ends by the twisted lengths of wire, the cross-sectional configuration and stiffness of said filaments being such that the gripping thereof will cause said filaments to be crimped so that the filaments flare outwardly in various directions from said core whereby the tip portions of said bristles are generally uniformly distributed throughout said bristle face.

4,733,426
FABRIC COVERED WASHING AID
Burrell F. George, 246 Chalfont Road, Winnipeg, Manitoba, Canada R3R OR3
Continuation-in-part of Ser. No. 558,295, Dec. 5, 1983, Pat. No. 4,582,625. This application Mar. 13, 1986, Ser. No. 839,089
Int. Cl.[4] A47L *13/46*
U.S. Cl. 15—244.3 **9 Claims**



1. A washing aid comprising a sponge body; a fabric envelope comprising a single layer of fabric fully surrounding the sponge body and unconnected therewith, said fabric being an elastic fabric formed from a spandex yarn and comprising a thin substantially incompressible layer of very low moture absorption characteristic and being elastically stretched from an untensioned condition thereof with each portion thereof tensioned by the elasticity of the layer into compressing contact with the sponge body, the sponge body being substantially compressed by the tensioned fabric envelope.

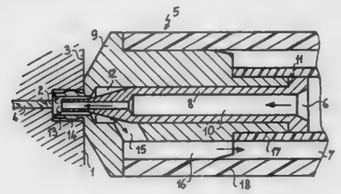
4,733,427
UNDERWATER BRUSH
Richard H. Conrad, 950 Idylberry Rd., San Rafael, Calif.
Filed Jun. 10, 1986, Ser. No. 872,531
Int. Cl.[4] A46B *15/00;* **E04H** *3/20*
U.S. Cl. 15—160 **4 Claims**



1. An underwater brush device comprising:
a brush including a handle for cleaning an underwater surface; and
a pivotable wing means attached to said brush for exerting a force on said brush in the direction of said surface to be cleaned when said brush is moved through the water in a first direction, and pivoting to exert no such force and not urge said brush in any direction when said brush is moved in the opposite direction, a stop means for preventing further wing pivot, so that when said brush is moved in said first direction, said wing means pivots until prevented from further pivoting by said stop means, and buoyancy means, so that when said brush is generally stationary in the water, said buoyancy means acts to orient said wing generally above said brush.

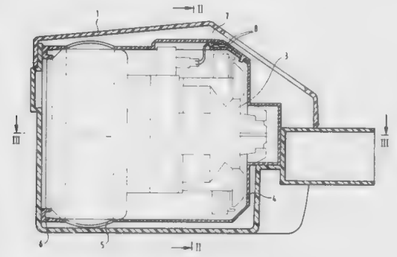
4,733,428
TOOL FOR CLEANING AN OPTICAL SURFACE
Jean L. Malinge, Sevres; Roger Collignon, Igny, and Rene Dousset, Versailles, all of France, assignors to Amphenol Corporation, Wallingford, Conn.
Filed Nov. 5, 1986, Ser. No. 927,026
Claims priority, application France, Nov. 12, 1985, 85 16669
Int. Cl.[4] B08B *3/02, 5/00*
U.S. Cl. 15—302 **7 Claims**

1. A cleaning tool for an optical surface comprising an injection duct for a cleaning fluid sent under pressure in the direction of said optical surface and an evacuation duct for said fluid, and means for positioning said tool relative to said optical surface wherein said injection duct is formed in an injector and said evacuation duct is formed in a jacket, wherein said injector and jacket are generally cylindrical in form and pierced from end to end with an axial bore and the injector is lodged in the bore of said jacket such that there is a space between the front end of the injector and the jacket, wherein said evacuation duct is formed, at least in part, by the space between the front end of the injector and said jacket and wherein said evacuation duct of said jacket comprises a longitudinal groove



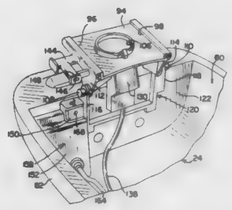
formed on the periphery of said jacket and a hole pierced in said jacket and connecting said groove with said space.

4,733,429
VACUUM CLEANER
Gernot Jacob, Weissach-Flacht, and Leon Radom, Ellhofen, both of Fed. Rep. of Germany, assignors to Progress-Elektrogerate Mauz & Pfeiffer Gmbh & Co., Fed. Rep. of Germany
Filed Nov. 25, 1985, Ser. No. 802,118
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443837
Int. Cl.[4] A47L *9/12*
U.S. Cl. 15—327 R **9 Claims**



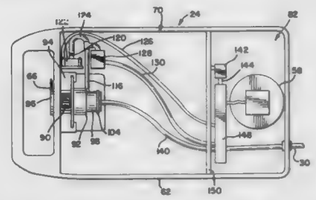
1. A vacuum cleaner comprising a housing having a dust space that is provided with a dust bag as placed therein, a motor space having a blower and a motor for driving said blower, said blower being in communication with said dust space for drawing air through the dust space and into said motor space, a shroud connected with the exhaust of said blower and having a plurality of air outlet ports but otherwise surrounding such motor air-tightly, an air filter mounted on said shroud on the outside of said air outlet ports thereof in such a way that air emerging from said air outlet ports passes through said air filter, and air air space as defined between said shroud and said housing for receiving air as discharged through said air filter from said air outlet ports of said shroud, said housing including air exit ports through which air may be discharged from said air space, and said shroud including a valve member formed in the wall thereof, said valve member opening at a given gauge pressure in said shroud so that the air drawn in is able to emerge from said shroud.

4,733,430
VACUUM CLEANER WITH OPERATING CONDITION INDICATOR SYSTEM
George A. Westergren, Linwood Township, Anoka County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 9, 1986, Ser. No. 939,755
Int. Cl.[4] A47L *9/19*
U.S. Cl. 15—339 **26 Claims**



1. A vacuum cleaner system condition indicator for use with a vacuum cleaner having an intake port, a dust collecting compartment, a dust bag in said compartment and a discharge port, comprising
first sensing means for sensing a first pressure differential between said intake port and said dust collecting compartment, said first sensing means providing a first sensing signal when said sensed first pressure differential is of at least a first magnitude,
second sensing means for sensing a second pressure differential between said discharge port and said dust collecting compartment, said second sensing means providing a second sensing signal when said sensed second pressure differential is of a least a second magnitude, and
indicator means associated with said first and second sensing means for providing sensorially perceptible indicating signals in response to said first and second sensing signals.

4,733,431
VACUUM CLEANER WITH PERFORMANCE MONITORING SYSTEM
William J. Martin, Watervliet, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 9, 1986, Ser. No. 939,756
Int. Cl.[4] A47L *9/19*
U.S. Cl. 15—339 **36 Claims**

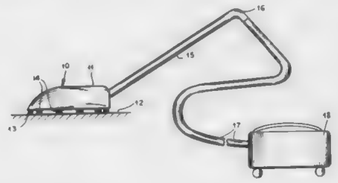


1. A vacuum cleaner condition indicator for use with a vacuum cleaner having a dust collecting compartment and a dust bag adapted to be disposed in said dust collecting compartment, comprising
dust bag sensing means for sensing the differential pressure between the inside of said dust bag and said dust collecting compartment to provide a first signal when said dust bag is properly disposed in said dust collecting compartment, and to provide a second signal when said dust bag is not properly disposed in said dust collecting compartments, and
indicating means associated with said dust bag sensing means

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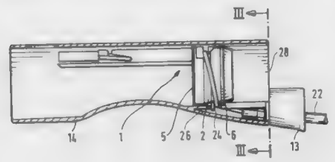
for providing sensorially perceptible indicating signals in response to said first and second signals.

4,733,432
POWER BRUSH, E.G. FOR VACUUM CLEANING APPARATUS
Boris Novoselsky, 66-01 110th St., Apt. 1B, Forest Hills, N.Y. 11375
Filed Oct. 17, 1986, Ser. No. 921,221
Int. Cl.[4] A47L *5/30*
U.S. Cl. 15—340 **15 Claims**



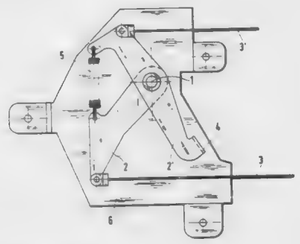
1. A power-driven brush, comprising:
a support displaceable in a travel direction over a surface adapted to be treated by the brush;
at least one member mounted on said support for displacement in a cyclical pattern with at least a component of said displacement being transverse to said travel direction;
a plurality of bristle carriers swivelably mounted on said member for pivotal movement about respective axes transverse to said surface;
respective bodies of bristles affixed to said carriers and each having an axis offset from the respective axis of pivotal movement of the respective carrier whereby the displacement of said member in said cyclical pattern causes said bodies to sweep said surface and induces each carrier to swivel relative to said member; and
drive means on said support operatively connected to said member for cyclically displacing the same relative to said support.

4,733,433
GRIP UNIT FOR A SUCTION HOSE OF A VACUUM CLEANER SYSTEM
Hans-Peter Simm, and Peter Hannemann, both of Wuppertal, Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany
Filed Nov. 24, 1986, Ser. No. 933,917
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 8533941[U]
Int. Cl.[4] H01R *4/64*
U.S. Cl. 15—410 **7 Claims**



1. A grip unit for a suction hose or suction pipe of a vacuum cleaner system and for defining air and electrical connections to further components of the vacuum cleaner system such as a suction pipe, nozzle and the like, the grip unit comprising:
a one-piece tubular member defining a longitudinal axis;
an elongated insert member adapted for insertion into said tubular member and having first and second longitudinal ends; and,
electrical interconnection means for providing an electrical circuit between said ends;
said insert member including:
channel means for accommodating said electrical interconnection means therein;
air passage means formed in said insert member for conducting air therethrough; and,
sealing means for sealing said air passage means with respect to the ambience when said insert member is inserted into said tubular member.

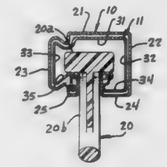
4,733,434
ARRANGEMENT FOR THE COUPLING OF A TOP AND REAR LID OF A VEHICLE HAVING A FOLDING TOP
Martin Wegge, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jul. 23, 1986, Ser. No. 888,227
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526471
Int. Cl.[4] E05D *7/00*
U.S. Cl. 16—365 **8 Claims**



1. A coupling arrangement for a vehicle having a convertible top, a top lid and a rear lid which lids have overlapping areas in their open positions comprising: two pivotal coupling element means that can be displaced with respect to one another, at a point remote from respective pivots of the element means; one pivotable coupling element means being connected with the top lid; the other coupling element means being connected with the rear lid; the top and rear lids being pivotable independently of one another until one coupling element means contacts a stop means provided at the other coupling element means; said contacting of one coupling element means and the stop means preventing opening of the top and rear lids to the overlapping area; and wherein pivoting of either of the top lid or the rear lid into its open position causing one of said coupling element means to close the respective other lid or hold it in the closed position; said two coupling element means each comprising a lever that can be pivoted at the body of the vehicle, independently of the lever of the other coupling means; each of said pivot levers having a transmission element coupled to an arm of said pivot levers and with the one of said top and rear lid respectively, and wherein said transmission element is a cable.

4,733,435
ADJUSTABLE TRAVERSE ROD ASSEMBLY
Ronald G. Darner, Fort Atkinson, Wis., assignor to Graber Industries, Inc., Middleton, Wis.
Filed Dec. 16, 1986, Ser. No. 943,387
Int. Cl.[4] A47H *15/00*
U.S. Cl. 16—87.4 R **19 Claims**

1. A traverse rod assembly comprising, inner and outer hollow rods formed of strip metal and each including top wall means, front wall means, rear wall means, and forward and rear bottom wall means spaced apart to define a downwardly opening slot therebetween, the inner rod having an external cross-section sufficiently smaller than the outer rod such that one end thereof is telescopically receivable in one end of the outer rod, the forward and rear bottom wall means of the outer rod having respective forward and rear carrier guide rails extending upwardly along opposite sides of the slot in the outer rod, the forward and rear bottom wall means of the inner rod having respective forward and rear carrier guide rails along opposite sides of the slot in the inner rod, the forward and rear carrier guide rails on the outer rod each having a hemmed upper edge with the hem disposed at the side of the associated rails remote from the slot in the outer rod, the forward and rear guide rails on the inner rod each having an upper guide portion



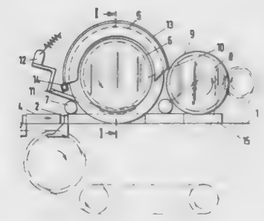
disposed alongside and at substantially the same level as the hemmed upper edges of the respective forward and rear guide rails on the outer rod, the forward and rear guide rails on the inner rod each having a lower guide portion horizontally and vertically offset from the upper guide portion on the associated rail and arranged to engage the respective forward and rear guide rails on the outer rod at the sides thereof remote from the slot in the outer rod and at a level below the hems on the upper edges thereof, and a plurality of drapery carriers each having a head portion adapted to engage the hemmed upper edges of the guide rails on the outer rod and the upper guide portions of the guide rails on the inner rod and a shank portion adapted to extend downwardly from the head portion through the slots in the inner and outer rods and engage the lower guide portions.

4,733,436
DOOR MECHANISM SPRING ASSEMBLY
Gaylord C. Dochnahl, Upland, Calif., assignor to Exemplar, Inc., Ontario, Calif.
Continuation-in-part of Ser. No. 744,953, Jun. 17, 1985. This application Apr. 16, 1987, Ser. No. 40,370
Int. Cl.[4] E05F *1/04*
U.S. Cl. 16—306 **22 Claims**



1. A spring assembly for counterbalancing a door mechanism having a pair of biasing connection points moving apart relative to each other as the door is lowered into a closed position, the assembly comprising:
(a) a helical compression spring having a first end and a second end;
(b) first and second tension members respectively engaging the first and second ends of the spring, the first tension member extending from the first end of the spring to beyond the second end of the spring;
(c) means for maintaining axial alignment of the spring with the tension members;
(d) means for connecting the tension members to the connection points of the door mechanism;
wherein the installed spring is axially compressed as the door is lowered into the closed position; and
(e) means for limiting the minimum deflection of the spring, comprising a moveable member slideable into and out of said means for maintaining axial alignment, the member being located for producing an initial preload of the spring prior to engagement of the connecting means, the initial preload producing a maximum compression slideable into and out of said means for maintaining axial alignment deflection of the spring corresponding to the closed position of the door.

4,733,437
APPARATUS AND METHOD FOR CUTTING DEEP-FROZEN FOODSTUFF
Heinz Nienstedt, Zum Nonnenberg 8a, D-4350 Recklinghausen, Fed. Rep. of Germany
PCT No. PCT/EP85/00685, § 371 Date Aug. 7, 1986, § 102(e) Date Aug. 7, 1986, PCT Pub. No. WO86/03441, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 7, 1985, Ser. No. 912,581
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445472; Dec. 29, 1984, 3447821; Apr. 6, 1985, 3512488; Aug. 1, 1985, 3527620
Int. Cl.[4] A22C *25/18*
U.S. Cl. 17—52 **18 Claims**



12. In a method for cutting deep-frozen foodstuff, in particular meat, fish and vegetables including providing deep-frozen foodstuff in the form of square bodies such as plates, and cutting the square bodies into smaller units such as small rods, by means of a circular saw comprising several saw blades arranged in parallel adjacent relationship in front of which each square body is shiftable in the forward direction on a table during the cutting operation; the improvement wherein said step of cutting is performed entirely from above the table, and further comprising the steps of collecting the cut foodstuff particles which are transported and centrifuged away by the circular saw above the circular saw, and depositing the collected particles behind the circular saw on the surface of the cut smaller units.

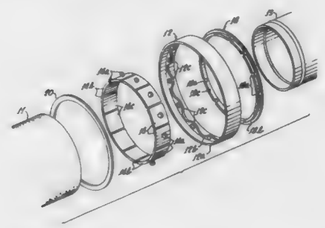
4,733,438
COOLANT HOSE CLAMP
John S. Stupakis, Arcadia, Calif., assignor to JSS Scientific Corporation, Arcadia, Calif.
Filed Apr. 2, 1987, Ser. No. 33,243
Int. Cl.[4] B65D *63/00;* **F16L** *19/00*
U.S. Cl. 24—19 **18 Claims**

1. A hose clamping device comprising:
a pluraliy of clamping means, each of said clamping means including a piston portion and a shoe portion configured

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for clampingly engaging a portion of the periphery of a hose;

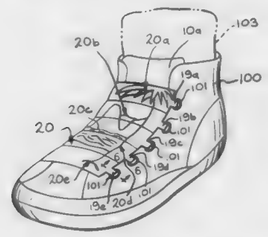
means including slot means for receiving said piston portions therein for retaining said clamping means with said shoe portions in contiguous relation, with said shoe portions generally defining a circular hose receiving opening;



a cam member having a plurality of cam edges generally equal in number to said plurality of clamping means; and

cam follower means on each of said clamping means responsive to angular displacement of said cam member relative to said retaining means for radially displacing said shoe portions of said clamping means relative to the periphery of a hose within said hose receiving opening.

4,733,439
FASTENER FOR SHOES
Keith B. Gentry, 6201 Beechfield, Apt. 307, Lansing, Mich. 48911
Filed Jun. 3, 1987, Ser. No. 57,616
Int. Cl.[4] A43C *9/00*
U.S. Cl. 24—143 A **15 Claims**



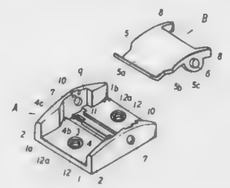
1. In a shoe fastener combination which extends between multiple spaced apart eyelets on either side of a tongue of the shoe the improvement which comprises:

(a) multiple elongate flat strips of an elastic material each strip having opposed sides and opposed ends of the sides wherein each of the strips extends and stretches across the shoe when a foot is in the shoe between the opposed ends so that each of the opposed ends are to be positioned adjacent one of the spaced apart eyelets, wherein the opposed sides of the strips are adjacent to or overlap each other when on the shoe;

(b) indicia which combine together to form a unitary image provided across at least two of the multiple strips when a foot is in the shoe and the strips are stretched; and

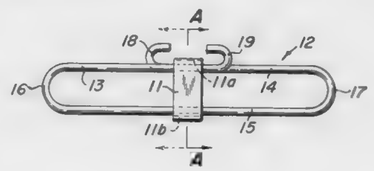
(c) holding means mounted on the ends of each of the strips or securing the strips to the eyelets so that the strips are stretched and the indicia on at least two of the multiple strips provide the unitary image when the foot is placed in the shoe.

4,733,440
BELT BUCKLE
Koichi Ogawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Jun. 9, 1987, Ser. No. 59,913
Claims priority, application Japan, Jul. 18, 1986, 61-110058[U]
Int. Cl.[4] A44B *11/25*; A44C *5/18*
U.S. Cl. 24—170 **1 Claim**



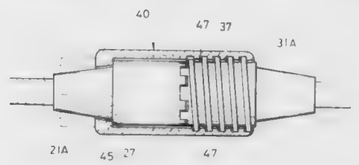
1. A buckle comprising a channel-shaped buckle body having a bottom wall and a pair of substantially parallel side walls respectively upstanding from the opposite longitudinal edges of said bottom wall, said bottom wall having a resilient latching member extending obliquely therefrom for resilient latching engagement with a groove in the underside of a belt or the like, and a manually operable release member pivotally connected to said side walls above said latching member, said release member having a cam portion engageable with said latching member from above the further having a finger piece, said finger piece being manually engageable to pivot said release member and thereby to remove said cam portion from a rest position spaced above said latching member into engagement with said latching member and thereby to deflect said latching member resiliently down and away from latching engagement with a groove in the underside of a belt or the like.

4,733,441
RECLOSABLE COUPLINGS
Carroll A. Buchanan, SR3 Box 141 Catalina Dr., Chesapeake Ranch Estates, Lusby, Md. 20657
Filed May 12, 1987, Ser. No. 48,948
Int. Cl.[4] A01K *91/04*; A44B *13/00*
U.S. Cl. 24—573 **11 Claims**



1. A reclosable coupling for interconnecting a plurality of apertured members, said coupling including: a resilient link comprising a pair of first side portions, a continuous second side portion, a pair of bight portions interconneoting said pair of first side portions with said continuous second side portion, and a pair of stops connected with said pair of first side portions, for said pair of first side portions to be deflective in said resilient link to carry said stops toward said continuous second side portion; and a collar having an opening therethrough entrant into first and second laterally opposite recessed end portions of said collar, means for said pair of first side portions of said link to be lapped side by side with one another and be about equidistantly spaced from said continuous second side portion of said link when said coupling is closed having said pair of first side portions of said link inside said recessed first lateral end portion of said collar and said continuous second side portion of said link inside said recessed second lateral end portion of said collar with said collar peripherally extending between said stops, and said collar and said stops being relatively movably interrelated, enabling either of said stops and said first side portion of said link related thereto to be selected and deflected toward said continuous second side portion of said link, and said collar then to be moved along the other of said first side portions of said link until said deflected first side portion of said link and the related said stop are outside said opening through said collar, thereby opening said coupling to receive a said apertured member onto said link.

4,733,442
CONNECTING APPARATUS FOR LINES
Masaki Asai, Nagoya, Japan, assignor to Meitoh Denki Kohji Kabushiki Kaisha, Aichi, Japan
Filed Oct. 24, 1986, Ser. No. 922,963
Claims priority, application Japan, Dec. 20, 1985, 60-288888
Int. Cl.[4] F16D *1/00*
U.S. Cl. 24—590 **11 Claims**



1. A connecting apparatus for lines comprising: a pair of connector elements having end pieces which have opposed end faces, said opposite end faces of said pair of connector elements coming into abutting contact with each other, said end faces having a plurality of complemental shapes to each other, at least one of said end pieces being provided with an outer peripheral threaded portion and the other end piece being provided with an abutment; and

a nut member in which said end pieces can be inserted so that said threaded portion of the end piece is screwed in the nut member, said nut member being provided with a counter abutment which can be engaged by said abutment of the end piece, so that, when the end pieces are inserted in the nut member, the end pieces can be integrally connected in and to the nut member by the screw engagement between the threaded portion of the end piece and the nut member and by the engagement between said abutment and the counter abutment.

4,733,443
FASTENING MEANS FOR SAFETY BELTS
Ulf Tolfsen, Fredrikstad, Norway, assignor to Loyd's Industri A/S, Boks 609, Fredrikstad, Norway
Filed Mar. 4, 1986, Ser. No. 835,940
Claims priority, application Norway, Mar. 28, 1985, 851249
Int. Cl.[4] A41F *1/00*
U.S. Cl. 24—641 **1 Claim**

1. In a fastening device for safety belts attached to one part of a safety belt adapted for releasable engagement with a locking tongue having a connecting opening and attached to another part of a safety belt, the improvement for resisting high G-forces arising during a collision comprising:

a one-piece locking case member having two spaced parallel plate portions each having inner and outer sides and forming an intermediate space between said inner sides for receiving said locking tongue therein;

a first pair of holes through said parallel plate portions adjacent one end thereof for securing said fastening device to a vehicle;

a second pair of holes through said parallel plate portions adjacent the other end thereof;

a third pair of holes through said parallel plate portions between said first and second pairs of holes;

two spaced sidewall portions on said case member each extending beyond the outer side of one of said plate portions and having pivot pin receiving recesses therein;

a locking flap adjacent said outer side of one of said plate portions;

a supporting lug extending from said locking flap and insertable into said third pair of holes in the locked position of the fastening device;

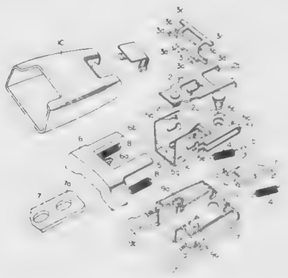
two hinge arms on said locking flap engaged with for turning about said one end of said case member;

a rivet member extending from said locking flap and insertable into in guided relationship with said second pair of holes and through the connecting opening in the locking tongue in the locked position;

an expeller member for expelling said locking tongue from said case member slidingly movable in said intermediate space and having two spaced expeller legs engageable with the inserted end of said locking tongue in the locked position;

an expeller cam on said expeller member between said expeller legs and having an inclined surface thereon;

a blocking member having an angularly shaped cross-section formed by two leg portions joined at a joining region and extending at an angle with respect to each other;



one of said leg portions being shaped for releasable blocking engagement with said locking flap in the locked position;

the other of said leg portions having a crossbar as a part thereof;

pivot pins extending oppositely from said joining region of said blocking member pivotally engaging in said pivot pin recesses for pivotally mounting said blocking member;

securing lugs extending oppositely from said one of said leg portions;

securing lugs extending oppositely from said expeller member;

tension securing springs having ends connected respectively to said securing lugs for resiliently urging said expeller member toward the expelling position and for resiliently urging said blocking member toward the blocking position;

an interior frame member for receiving said case member therein;

guide means on said interior frame member for retaining and guiding said blocking flap in the mounted position;

a push-button member movably mounted with respect to said interior frame and case member having lifting means thereon for separately enganging said locking flap and blocking member so that depressing said push button towards said interior frame moves said locking flap and blocking member against the force of said securing springs

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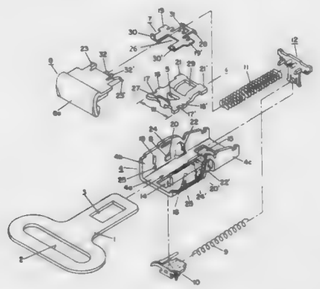
into tongue-release position so that said expelling member expels said tongue from said case member; and an outer casing.

4,733,444

SEAT BELT BUCKLE

Juichiro Takada, 3-12-1, Shin-machi, Setagaya-ku, Tokyo, Japan

Filed Apr. 29, 1987, Ser. No. 44,046
Claims priority, application Japan, May 8, 1986, 61-68284
Int. Cl.⁴ A44B *11/26*
U.S. Cl. 24—641 **2 Claims**



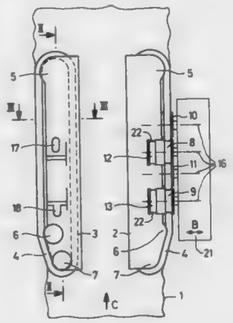
1. In a seat belt buckle for selectively retaining a buckle tongue in a latched position and having a generally channel-shaped frame that includes a base and a pair of side walls, a latch plate pivotably supported by the frame adjacent one end for movement between a latching position in which a latch projection thereon is received in a hole in the buckle tongue and in which the tongue is confined in a tongue-receiving space defined by the base of the frame and the latch plate, and a release position, in which the latch projection is disengaged from the hole in the buckle tongue, a release button received by the frame for movement substantially parallel to the base of the frame, a control member slidably carried by the latch member and engagable by the release button for movement therewith, the control member and frame having co-acting elements adapted to prevent movement of the latch member out of the latching position when the push button is in a first position and to permit movement of the latch member to the release position when the push button is depressed to a second position, and an ejector member continuously biased to eject the buckle tongue from the receiving space, the improvement wherein the latch plate has a lateral portion along each side located proximate the corresponding side wall of the frame and remote from said one end of the latch plate, wherein each lateral portion has a notch, wherein each side wall of the frame has a control projection configured and positioned to be received by the corresponding notch when the latch plate is not in the latched position, wherein the control member has a blocking portion on each side that closes the corresponding notch and engages the corresponding control projection to prevent the latch plate from moving out of the latched position when the release button is in said first position, each blocking portion being configured and positioned to be clear of the corresponding notch when the release button is depressed to the second position, wherein a spring is interposed between the frame and the release button and control member continuously biassing the control member and release button to the first position thereof, and wherein there are cam means coacting between the control member and the frame for pivoting the control member and latch plate to the release position when the control member is moved in response to movement of the release button to the second position.

4,733,445

APPARATUS FOR EXPANDING TUBULAR MATERIAL

Christian Strahm, Bronschhofen, and Paul Süss, Bettwiesen, both of Switzerland, assignors to Santex AG, Tobel, Switzerland

Filed Jun. 5, 1986, Ser. No. 870,987
Claims priority, application Switzerland, Jun. 5, 1985, 2434/85
Int. Cl.⁴ D06C *5/00*
U.S. Cl. 26—84 **11 Claims**



1. In an externally held, adjustable spreader for a tubular material which is initially in a flat state and which is movable in a first selected direction relative to the spreader, the spreader being arranged to spread the tubular material in a second selected direction perpendicular to the first selected direction, and comprising: at least two spreading and guiding units arranged to be laterally juxtaposed in the region enclosed by the tubular material, each unit having an outer guide face positioned to face outwardly of the region enclosed by the tubular material, and comprising at least one endless transporting belt having a circumference which extends in part along the outer guide face; and feed rollers arranged to be located outside the material and each releasably operatively engageable with said belt of a respective said unit, the improvement wherein said spreader further comprises:

a plurality of externally engaging support rollers, each having an axis of rotation perpendicular to the first selected direction and parallel to the second selected direction;

a plurality of counterrollers which are rotatably mounted in said units, and each releasably operatively engageable with a respective support roller so that said support rollers support said units individually and independently of one another, each said counterroller having an axis of rotation perpendicular to the first selected direction and parallel to the second selected direction; and

means supporting said feed rollers and said support rollers associated with one of said units for joint displacement in the second selected direction to permit setting a desired spreading width of the spreader.

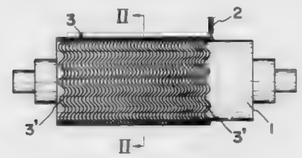
4,733,446

ROLL

Takanori Kuroki; Hironori Kuroki, and Tsuguo Honda, all of Fukuoka, Japan, assignors to Kuroki Kogyosho Co., Ltd., Fukuoka, Japan

Filed Jun. 18, 1982, Ser. No. 389,748
Int. Cl.⁴ B21B *27/02*
U.S. Cl. 29—121.6 **8 Claims**

1. A roll for rolling heated metal comprising a roll body, a built-up weld layer on said body, said built-up weld layer comprising a plurality of circumferential weld beads on the surface of said roll body, each of said weld beads having a wave-like configuration and each extending in a circumferential closed ring about said roll body, each of said weld beads being contiguous and in contact with an adjacent weld bead to form a continuous built-up weld layer on said roll body, said built-up weld layer having a smooth mirror-like surface.

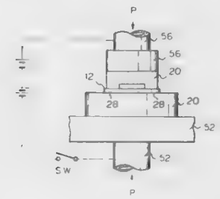


4,733,447

INK JET HEAD AND METHOD OF PRODUCING SAME

Yukihiro Ageishi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,072
Claims priority, application Japan, Oct. 15, 1984, 59-215791
Int. Cl.⁴ B21D *53/00;* **G01D** *15/18;* **B23K** *11/00*
U.S. Cl. 29—157 C **1 Claim**



1. A method of producing an ink jet head, comprising the steps of:

(a) forming at least one orifice for ink ejection through a flat nozzle member which includes a smooth surface;

(b) smoothing a surface of an ink chamber member, which defines an ink chamber inclusive of an ink passageway, to form a smoothed surface which corresponds to said smooth surface of said flat nozzle member; and

(c) bonding said nozzle member and said ink chamber member such that metallic bond is set up between the smoothed surface of the nozzle member and the smoothed surface of the ink chamber member by generating Joule heat by application of pressure and power,

wherein a member having high resistivity is associated with the nozzle member to concentrate the heat generation to the nozzle member side.

4,733,448

WHEEL MANUFACTURE FOR CORRECTION OF ROTATIONAL NON-UNIFORMITY OF A PNEUMATIC TIRE AND WHEEL ASSEMBLY

Anwar R. Daudi, E. Lansing, Mich., assignor to Motor Wheel Corporation

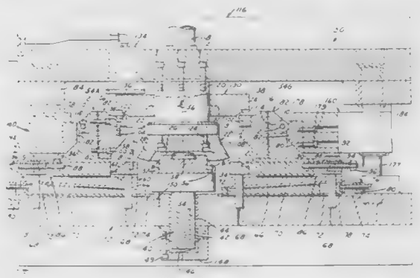
Division of Ser. No. 707,137, Mar. 1, 1985, Pat. No. 4,646,434.
This application Oct. 30, 1986, Ser. No. 924,834
Int. Cl.⁴ B21K *1/32*
U.S. Cl. 29—159.01 **6 Claims**

1. A method of manufacturing a vehicle wheel having a rim with a circumferential tire bead seat region and a rim base, and a disc having a periphery which internally engages said rim and a disc surface which defines a wheel mounting plane, said method comprising the steps of:

(a) fixturing said circumferential rim bead seat region so as to locate said rim in stationary position with said circumferential bead seat region having an average bead seat plane at predetermined orientation with respect to a predefined central axis by

(a1) engaging said circumferential bead seat region with a circumferential array of bead seat locating means, each of said locating means being independently adjustable in the direction of said axis, and

(a2) positioning said bead seat locating means axially of said axis so as to locate said average plane of said bead seat region at said predetermined orientation with respect to said axis,



(b) fixturing said disc such that said wheel mounting plane is perpendicular to said axis, and then

(c) pressing said disc into said rim along said axis such that said disc periphery is received by interference press-fit internally of said rim thereby to provide a said vehicle wheel having said mounting plane at said predetermined orientation with respect to said average bead seat plane.

4,733,449

SPIN CONNECTION ADSORPTION FILTER AND METHOD OF MAKING SAME

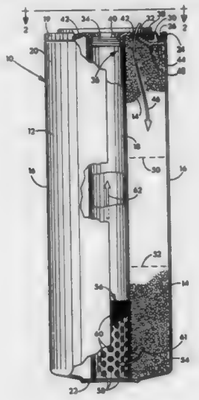
Michael R. Spearman, 1030 W. Larpenteur Ave., St. Paul, Minn. 55113

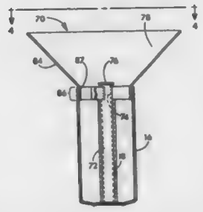
Division of Ser. No. 754,998, Jul. 15, 1985, Pat. No. 4,659,467.
This application Nov. 7, 1986, Ser. No. 927,941
Int. Cl.⁴ B23P *15/00*
U.S. Cl. 29—163.5 F **6 Claims**

1. A method of constructing an adsorption apparatus comprising assembling a quantity of adsorbent material to remove impurities in accordance with the mass transfer zone principle, selecting an elongated shell that is closed at one end and is open at the other end with an extension portion at the open end and extending away from the closed end, said shell having a length that is at least twice as long as the mass transfer zone, inserting an elongated cylindrical core in said shell that has a fluid opening at its lower end but is closed along its remaining length so that the lower end of said core is located adjacent said closed end of said shell, said elongated core being substantially the same length as said elongated shell except for the length of said extension portion, inserting a funnel having a centrally located downwardly extending rod portion, a truncated conical wall, a spacing means which spaces said truncated conical wall from said rod portion to form open filling areas therebetween into said shell so that said rod portion extends substantially completely all the way through said core and said truncated wall contacts the upper end of said extension portion which whereby centers said core relative to said shell, pouring said material into said funnel to fill the space between said sheel and said core with said material between said closed end and the beginning of said extension portion, removing said funnel, cutting off said extension portion, inserting a cap having inlet and outlet ports into said open end of said shell so that one of said ports is aligned with the upper end of

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said core and the other of said ports is in fluid communication with said material, and sealing off said open end of said shell to





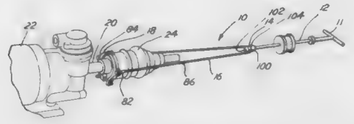
prevent fluid flow between said shell and said cap other than through said inlet and outlet ports.

4,733,450

FRONT WHEEL AXLE PULLER

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Aug. 22, 1986, Ser. No. 899,248
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—254 **9 Claims**



1. An improved tool for pulling an axle assembly from a transaxle case on front wheel drive vehicles, comprising in combination:

(a) a length of flexible cable having opposite ends;

(b) clamp means for clamping onto the axle assembly;

(c) attaching means for attaching the opposite ends of the flexible cable to the clamping means; and

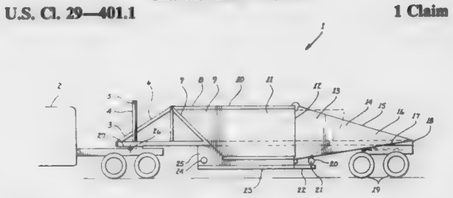
(d) tensioning means intermediate the ends of the cable, the tensioning means including (1) a slide hammer with a handle end and an attachment end, and (2) a slide nut having a cable passage for receipt of the flexible cable and an attachment portion for interlocking receipt of the attachment end of the slide hammer.

4,733,451

METHOD FOR CONSTRUCTING A COMBINATION REAR DUMP AND BOTTOM DUMP TRAILER

Wallace D. Voigt, 5448 E. Lupine, Scottsdale, Ariz. 85254

Filed Apr. 25, 1986, Ser. No. 856,676
Int. Cl.⁴ B60R *27/00*
U.S. Cl. 29—401.1 **1 Claim**



1. A method for providing a combination bottom dump and rear dump trailer apparatus comprising the steps of:

providing a bottom dump trailer, said trailer having a hopper means, bottom door means, bottom door support means and rear frame means, said hopper means of said bottom dump trailer having a rear wall, side walls and a front wall, inside surfaces of said walls and the top surface of said bottom door means forming a cargo area;

installing a lifting means on the front end of said bottom dump trailer;

cutting off said rear wall of said hopper means of said bottom dump trailer;

attaching hinges to the top corners of said rear wall of said hopper means of said bottom dump trailer;

attaching said hinges of said rear wall of said hopper means of said bottom dump trailer to said hopper means of said bottom dump trailer at the top rearmost corners of said hopper means;

removing said bottom door support means of said hopper means from inside said cargo area of said bottom dump trailer;

attaching said bottom door support means of said hopper means of said bottom dump trailer to outside surfaces of said walls of said hopper means of said bottom dump trailer;

attaching a rear frame member laterally across a rearmost portion of said rear frame member of said bottom dump trailer;

connecting said rear frame member and a rearmost portion of said top surface of said bottom door means with a bottom plate means; and thereafter

attaching rear side walls means connecting the rear portions of said side walls of said hopper means with said rear frame member and with said bottom plate means.

4,733,452

PRODUCTION OF JACKETS FOR FLEXIBLE MAGNETIC DISKS, AND APPARATUS FOR THIS PURPOSE

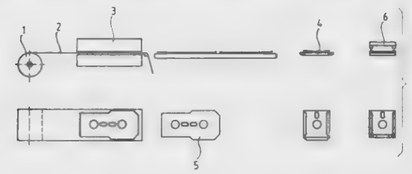
Bernhard Lenz, Rheinmuenster; Norbert Holl, Battenberg; Dietrich Gruehn, Appenweier, and Kurt Zwintzscher, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,536
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521383
Int. Cl.⁴ B21D *39/03;* **B23P** *19/00*
U.S. Cl. 29—428 **4 Claims**

1. A process for the production of a jacket for flexible magnetic disks, which includes the steps of punching jacket blanks out of a web of film material, covering those surfaces of the blanks which are intended to be the inner surfaces of the jacket with a nonwoven fabric, then folding the individual blanks together with the nonwoven fabric into jacket form, and joining those parts of the blank overlapped in this procedure to one another via tabs by welding, and inserting the magnetic storage

disk into the jacket before the end tab is closed, wherein the welding temperature for each weld joint is produced, by resistance heating, through the formation, for a short duration, of a large number of spot welds at spatially separated points of said joint.

3. Apparatus for the production of a jacket for flexible magnetic disks, in which jacket blanks are punched out of a web of film material, those surfaces of the blanks which are intended to be the inner surfaces of the jacket are covered with a nonwoven fabric, the individual blanks together with the nonwoven fabric are then folded into jacket form, and those parts of the blank overlapped in this procedure are joined to one another via tabs by welding, the magnetic storage disk being



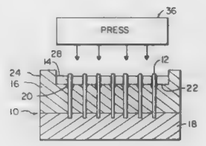
inserted into the jacket before the end tab is closed, and the welding temperature for each weld joint being produced, by resistance heating, through the formation, for a short duration, of a large number of spot welds at spatially separated points of said joint, said apparatus comprising a punching unit for producing jacket blanks from a film web, a unit for folding the blanks into jacket form and having a support surface for the jacket to be welded, and a welding strip which is arranged above said jacket and is electrically connected to a welding current source, and means for driving said welding strip toward the support surface with the aid of a movable holder, the welding strip consisting of a wavy electrical resistance belt which forms point-like weld surfaces and is fastened to the holder via a thermal insulation.

4,733,453

METHOD OF MAKING A MULTIPLE-PIN HEATSINK

John H. Jacoby, Providence, R.I., assignor to PinFin, Inc., Warren, R.I.

Filed Jan. 16, 1987, Ser. No. 4,065
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—432 **13 Claims**



1. A method of making a multiple-pin heatsink comprising:

forming in the upper surface of a die member a plurality of pin-receiving holes, each with a depth which is less than the length of a respective pin;

forming in a base element a plurality of pin-receiving holes which correspond to the pin holes in said die member;

introducing the pins into the holes in said die member and mounting said base element on the upper surface of said die member so that each said pin extends through and above a respective hole in said base element;

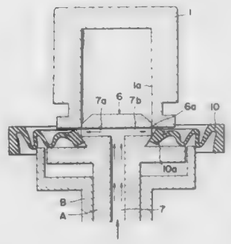
applying sufficient downward pressure to the upper ends of said pins to cold swage and expand said pins into permanent attachment above and below said base element; and removing said base element and said attached pins from said die member.

4,733,454

METHOD FOR INTEGRATING A BOOT PISTON INTO A DISK BRAKE

Hideo Mutoh, Kasukabe, and Tadashi Otsuji, Iwatsuki, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 884,079
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—450 **2 Claims**



1. A method of integrating a piston boot into a disc brake, comprising the steps of:

setting said piston boot at a middle portion of a cylinder jig, said middle portion being positioned between a small diameter upper step portion and a large diameter lower step portion and having radial air blow off vents;

inserting said upper step portion into an inner circumferential face of a piston while simultaneously advancing said lower step portion towards an end face of said piston from which said inner circumferential face extends and blowing air from said blow off vents, whereby said piston boot is radially expanded by said air and is fitted on an outer circumference of said piston adjacent said end face;

advancing a cup form jig slidably fitted around said lower step portion into engagement with said piston boot and further advancing said cup form jig and said piston boot until said piston boot is fitted into a piston boot fitting portion of said piston.

4,733,455

METHOD OF MANUFACTURING A MAGNETIC HEAD WITH AN MR ELEMENT

Hiroshi Nakamura; Masaki Murakami; Kouji Takeda; Yoshimasa Tanaka, all of Yokohama; Hirofumi Imaoka, Yokosuka; Mikio Naoi, Tokyo, and Takayuki Nakashima, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Jul. 29, 1986, Ser. No. 891,516
Claims priority, application Japan, Aug. 7, 1985, 60-173804
Int. Cl.⁴ G11B *5/42*
U.S. Cl. 29—603 **3 Claims**

1. A method of producing a magnetic head which includes an MR element and a permanent magnet for applying a bias magnetic field to the MR element, comprising the steps of:

(a) providing a thin sheet of metal;

(b) shaping said sheet in a predetermined pattern to produce a lead frame having an MR element mount section for mounting said MR element, a magnet mount section for mounting said permanent magnet, lead connecting sections to be electrically connected to said MR element, and tape-contact sections with which a magnetic tape is to make contact;

(c) bending said tape-contact sections perpendicularly to a general plane of said lead frame;

(d) placing said MR element in said MR element mount

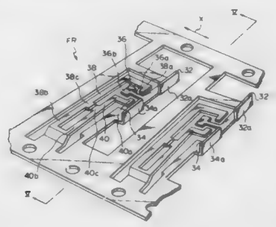
VOL 1088 ISS 5 MR 29 1988 UMI

section such that a tape-contact surface of said MR element is flush with said tape-contact sections of said lead frame;

(e) placing said permanent magnet in said magnet mount section;

(f) electrically connecting said lead connecting sections of said lead frame to connecting sections of said MR element;

(g) placing said frame in an assembled condition in a metal



mold and pouring synthetic resin into said metal mold such that said tape-contact surface of said MR element and said tape-contact surfaces of said lead frame are exposed to the outside and end portions of said lead connecting sections of said lead frame extend to the outside, thereby embedding said lead frame in the synthetic resin; and

(h) finishing a molding of the synthetic resin to a predetermined contour of said magnetic head.

4,733,456

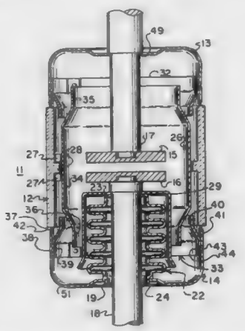
METHOD OF ASSEMBLING A SHIELD ASSEMBLY OF A VACUUM INTERRUPTER

Joseph C. Sofianek, Broomall; Ugo R. Tognella, Philadelphia, and Richard J. Bonnett, Swarthmore, all of Pa., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 796,148, Nov. 8, 1985, Pat. No. 4,665,287. This application Nov. 4, 1986, Ser. No. 926,704

Int. Cl.⁴ H01H *11/00*

U.S. Cl. 29—622 **3 Claims**



1. The method of assembling a vacuum interrupter of the type having at least one end bell that supports a contact rod and is secured to a cylindrical insulating casing that supports a mainshield concentrically positioned to surround the contact rod, comprising the steps of;

(a) providing a substantially cup-shaped end bell and a substantially cone-shaped end shield each comprising cylindrical wall portions dimensioned such that they are approximately contiguous to one another when the end shield is concentrically positioned within the end bell;

(b) embossing a plurality of inwardly extending protruberances in the cylindrical wall portion of the end bell;

(c) forming a plurality of apertures in the cylindrical wall portion of the end shield positioned to mate with the protruberances in the end bell;

(d) securing brazing shims to the cylindrical wall portion of the end bell adjacent to the inwardly extending protrusions;

(e) sliding the end shield into the end bell to snap engage the protrusions into the apertures; and

(f) brazing the end shield to the end bell.

4,733,457

APPARATUS FOR THE AUTOMATION OF OPERATIVE SYSTEMS WITH MECHANICAL HAND OR THE LIKE

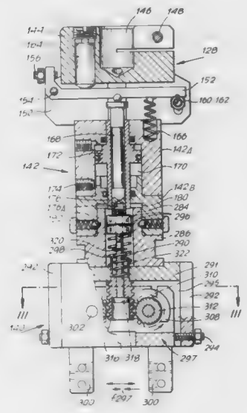
Ezio Tega, and Ezio Bazzo, both of Arezzo, Italy, assignors to Metalmeccanica Gori & Zucchi M.G.Z. S.p.A., Arezzo, Italy

Filed Jan. 29, 1986, Ser. No. 823,997

Claims priority, application Italy, Feb. 4, 1985, 9329 A/85; Apr. 17, 1985, 9386 A/85

Int. Cl.⁴ B23P *21/00*

U.S. Cl. 29—709 **8 Claims**



1. A Tool/Body assembly for a robot arm or the like comprising;

body means having a cylindrical cavity for receiving the shank of a tool, fluid passages, seat means extending radially outwardly from said cavity to the periphery of said body, and ball means moveably disposed within said seat means;

annular piston means surrounding said body means and being slideably disposed along said body means, said annular piston means including surfaces disposed proximate to said seat means and acting upon said ball means to urge said ball means towards said cavity; and

said tool including a cylindrical shank for reception within said cavity of said body means and said shank including a peripheral groove for receiving said ball means, said ball means being urged by said unnular piston means into engagement with said peripheral groove of said tool shank to releasably attach said tool to said body means and fluid passages for fluid communication with said fluid passages disposed in said body means.

4,733,458

BAYONET COUPLING FOR AXIALLY MOUNTING A RING-SHAPED MEMBER ON A SHAFT STUB

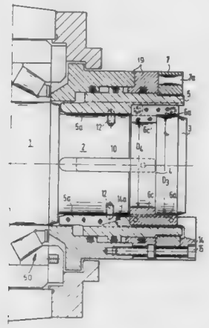
Ernst-Oskar Benfer, Bad Laasphe, and Gerd Irle, Hilchenbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 18,219

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605615

Int. Cl.⁴ B21D *53/10*

U.S. Cl. 29—724 **6 Claims**



1. In a shaft stub having a circular groove with a bayonet coupling for axially fixing a ring member on said shaft stub, particularly for fixing the inner cylinder of a hydraulic bearing extractor on said shaft stub, the improvement which comprises:

a support ring provided with a plurality of alternating angularly equispaced openings and supporting surfaces is formed by two supporting ring halves secured together by a plurality of fastening elements, said ring halves having inner collar halves which engage in said circular groove provided in said shaft stub; and

means for fixing at least one of said ring halves nonrotatably to said shaft stub; and

wherein said ring member is provided with a plurality of alternating angularly equispaced passages and abutting surfaces respectively interfittable with said opening and said supporting surfaces to form a rotatable portion of said bayonet coupling.

4,733,459

ELECTRONIC PART INSERTION APPARATUS

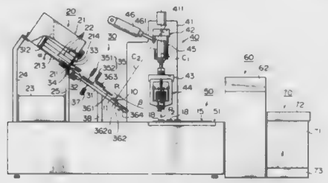
Eiji Tateno, Shimotsuga, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 17, 1986, Ser. No. 886,425

Claims priority, application Japan, Jul. 17, 1985, 60-156026; Jul. 17, 1985, 60-156028; Jul. 17, 1985, 60-156030; Jul. 17, 1985, 60-156031; Jul. 18, 1985, 60-156914

Int. Cl.⁴ H05K *3/30*

U.S. Cl. 29—741 **16 Claims**



1. An electronic part insertion apparatus comprising:

means for holding a printed circuit board;

an inclined portion inclined by a predetermined inclination angle and having at least one inclined surface on which electronic parts having leads slidably descend under their own weight;

positioning means, provided at a lower portion of said inclined portion, for positioning said electronic parts on said inclined surface according to the position of the leads of said electronic parts; and

hand means, pivotable around predetermined supporting points, for holding at a first pivoted position each electronic part which has been positioned on said inclined portion by grasping the leads thereof, moving the held electronic part to a second pivoted position adjacent said printed circuit board and then, at said second pivoted position, inserting each said held electronic part into said printed circuit board.

4,733,460

APPLICATOR DEVICE CONSTITUTING A MAGAZINE FOR ARTICLES TO BE APPLIED USING THE DEVICE, ESPECIALLY FOR CABLE MARKERS

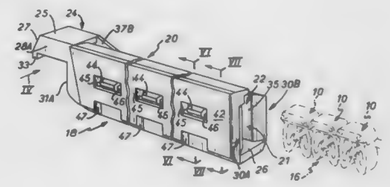
Jean C. Auger, Le Trait; Jean P. Barrtuso, Buchy, and Marc Gosse, Cleres, all of France, assignors to Legrand, Limoges, France

Filed Sep. 4, 1986, Ser. No. 904,048

Claims priority, application France, Sep. 9, 1985, 85 13330

Int. Cl.⁴ B23Q *7/10*

U.S. Cl. 29—811 **32 Claims**



1. Applicator device constituting a magazine for the articles to be applied using the device, said applicator device comprising an elongate body adapted to hold and guide said articles, a longitudinal hollow space inside said body open at each end of said body adapted to receive said articles, and a hood member at the open end of said body through whih said articles leave said body, the ends of the longitudinally walls of said body being longitudinally offset relative to each other at the end of said body from which said articles leave said body.

4,733,461

METHOD OF STACKING PRINTED CIRCUIT BOARDS

Tsuyoshi Nakano, Tokyo, Japan, assignor to Micro Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00704, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/04208, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 24, 1985, Ser. No. 903,568

Claims priority, application Japan, Dec. 28, 1984, 59-274368; Jan. 21, 1985, 60-007547; Feb. 16, 1985, 60-027553; May 8, 1985, 60-066991

Int. Cl.⁴ H05K *3/36*

U.S. Cl. 29—830 **10 Claims**

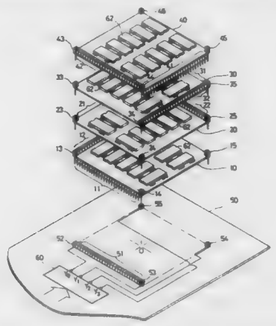
1. A method for stacking printed circuit boards, wherein a plurality of printed circuit boards, having electronic parts comprising circuits mounted thereon, are stacked on a mother board, comprising:

forming N printed circuit boards, respectively, in the same size and shape of a regular N-sided polygon, where N is an integer not less than three;

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providing said mother board, at a position corresponding to one side of said regular N-sided polygon, with a first connector in which terminals of a data bus line, an address bus line, and a timing signal line for reading/writing data are arranged, and providing said mother board, at 360/N-degree intervals around a center point of said regular N-sided polygon, with N second connectors, each consisting of one or more terminals, for selecting said printed circuit boards;

providing each of said printed circuit boards, on one face thereof at one side of said regular N-sided polygon, with a third connector in which terminals are arranged in the same manner as said first connector, providing each of said printed circuit boards, at a side adjacent to said side



having said third connector, with a fourth connector, each of whose terminals is connected to each of the terminals of said third connector thereon, respectively, and providing each of said printed circuit boards, on both faces thereof penetrating therethrough at positions confronting said N second connectors of said mother board, with N fifth connectors for coupling to said second connectors, respectively; and

stacking said N printed circuit boards on said mother board by rotating an $n+1^{th}$ printed circuit board about an axis which is perpendicular to said mother board and passing through the center point of said regular N-sided polygon of an nth printed circuit board through an angle of 360/N degree, where n is a positive number less than N.

4,733,462

APPARATUS FOR POSITIONING CIRCUIT COMPONENTS AT PREDETERMINED POSITIONS AND METHOD THEREFOR

Norio Kawatani, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 29, 1986, Ser. No. 867,926

Int. Cl.[4] H05K *3/34*; B23P *19/00*

U.S. Cl. 29—840 **31 Claims**

1. An apparatus for positioning circuit components at predetermined points, comprising:

(a) means for releasably holding at least one component which is to be mounted at a predetermined position on a printed circuit board;

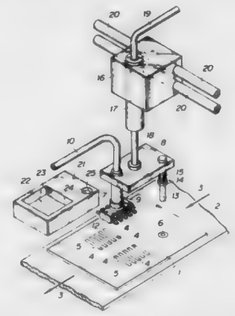
(b) a positioning member installed on the holding means; and

(c) means for transferring and placing the positioning member into a guide body at a known point on the printed circuit board, the guide body serving to guide the position member to a known position with respect to the printed circuit board, the guide body defining a recess and including a conductive pattern on which solder is deposited, and the positioning member including a bar whose tip is so formed as to be received in the recess defined by the guide body.

20. A method for positioning circuit components at predetermined positions on a printed circuit board comprising the steps of:

(a) grasping one circuit component in a first positional relationship relative to a positioning member;

(b) providing a convex body at a reference position on the printed circuit board; and



(c) placing the positioning member on the convex body so that the positioning member is guided to the reference position and the grasped circuit component is positioned at a predetermined position of the printed circuit board on which the circuit component is to be installed, said predetermined position having a second positional relationship relative to the reference position which is equal to the first positional relationship.

4,733,463

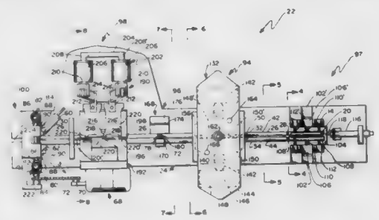
ELECTRICAL CABLE HARNESS FABRICATION

Clarence Kolanowski, LaGrange, and Richard L. Patterson, Riverside, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation-in-part of Ser. No. 768,382, Aug. 22, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 9,307

Int. Cl.[4] H01R *43/04*; B23P *23/00*

U.S. Cl. 29—861 **6 Claims**



1. In a method for fabricating an electrical cable harness including the steps of:

providing a termination station whereat an insulated multiconductor cable is terminated to a multi-circuit connector; feeding multiconductor cable to said termination station; supplying connectors to said termination station; applying a connector to the cable while at the termination station; cutting the cable adjacent the connector to provide a cable harness product; ejecting the harness product thus formed from the termination station; and testing the electrical integrity of the cable harness,

the improvement in said harness testing step comprising:

cutting said cable at a point spaced from the connector to form an intermediate harness product having a test tab including segments of the cable conductors extending beyond the connector;

stripping at least a portion of the insulation from the test tab to expose a portion of the conductor segments;

electrically testing by engaging adjacent exposed portions of the conductors with a test probe to test the electrical integrity of the harness between them;

repeating the above step for all of the adjacent conductors of the cable harness tab;

generating an output signal indicative of a positive or negative test result to a trimming actuator control;

selectively trimming the test tab only from those harnesses which generated a positive output signal during the testing step, and thereafter deliverying the tested harness product to an unloading station, whereby the presence of a test tab on a harness product at the unloading station provides a ready visual indication of a defective cable harness.

4. In a harness fabricator of the type including a termination station whereat insulated multiconductor cable is terminated to a multi-circuit connector, means for feeding multiconductor cable to said termination station, means for supplying connectors to said termination station, means for applying a connector to a cable at the termination station, means for cutting the cable adjacent the connector, means for ejecting the terminated and cut cable harness from the termination station, and harness testing means for testing the electrical integrity of the cable harness, the improvement in the harness testing means comprising:

said cutting means being adjustable to cut said cable at a point spaced from the connector to form an intermediate harness product having a test tab including segments of the cable conductors extending beyond the connector;

stripping means for baring the insulation from at least a portion of the test tab to expose a portion of the conductor segments; a cable tab probe for electrically engaging adjacent conductors of the cut and stripped tab to test the electrical integrity of cable harness test tab; and means for trimming the tab after testing, whereby a harness fabricator including simultaneous production and quality control testing capability is provided.

4,733,464

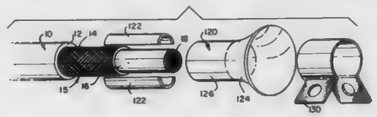
CABLE CONNECTORS

Leopold Gregorac, Kranj, Yugoslavia, assignor to United Ropeworks (U.S.A.) Inc., Montgomeryville, Pa.

Division of Ser. No. 824,487, Jan. 31, 1986. This application Apr. 29, 1987, Ser. No. 43,799

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—867 **13 Claims**



1. A method for terminating at least a conductive portion of a cable, said cable having a core comprising synthetic filaments, a polymeric sheath covering said core, an inner sheath comprising braided metallic filaments covering said polymeric sheath, and a polymeric outer jacket covering said inner sheath, comprising:

threading said cable into and through a tubular sleeve such that a portion of said cable proximate the portion of said cable to be terminated is exposed,

stripping a segment of said outer jacket from said portion of said cable to be terminated to expose part of said inner sheath,

stripping a segment of said exposed part of the inner sheath to expose a segment of said polymeric sheath and core having a first predetermined length, and to leave an exposed segment of said inner sheath having a second predetermined length,

radially expanding a portion of said exposed segment of the inner sheath by inserting expansion means between said core and said portion of the exposed inner sheath, and

covering said exposed inner sheath segment and said terminal core segment with said sleeve, said sleeve having an axial length which is greater than the second predetermined length and being positioned such that a portion of said sleeve extends beyond said exposed inner sheath and around a portion of said jacket.

4,733,465

PROCESS FOR MANUFACTURING ELECTRICAL CONTACT PIN

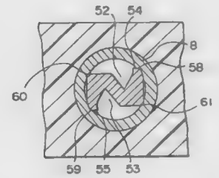
Yoshihito Tanaka, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 865,458, May 21, 1986. This application Mar. 6, 1987, Ser. No. 22,783

Claims priority, application Japan, Jul. 2, 1985, 60-144946

Int. Cl.[4] H01R *43/16*

U.S. Cl. 29—874 **2 Claims**



1. A process for manufacturing an electrical contact pin having a fixing part to be fitted into a through hole of a circuit board for fixing without using any solder, said fixing part having a substantially rectangular cross section, a pair of alternating substantially triangular recesses provided on a pair of opposite sides of said rectangular section, a pair of sharp corners adjacent to said triangular recesses extending beyond said sides to form a pair of resilient projected sharp corners, characterized by the step of pressing a metal work having a substantially rectangular cross section to form said fixing part in a pair of metal dies, a pair of alternating substantially triangular projections provided on the bottoms of said dies to form said substantially triangular recesses, a pair of opposite sides of said dies arranged so that there may be first small spaces between said pair of sides and the opposite sides of said work before pressed, and a part of said bottom of each die made deeper than the rest of said bottom to form a second small space between said part of said bottom and a top of said rectangular work, which communicates with said first space so as to form said resilient projected sharp corner when said work is squeezed between said metal dies.

4,733,466

BRUSH AND CUTTER UNIT FOR AN ELECTRIC RAZOR

Cortez Fletcher, Jr., 19047 Staleybridge Rd., Germantown, Md. 20874

Filed Oct. 10, 1986, Ser. No. 917,899

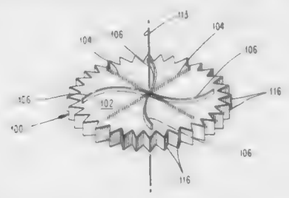
Int. Cl.[4] B26B *19/42*

U.S. Cl. 30—34.2 **19 Claims**

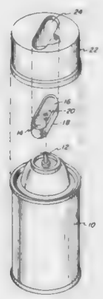
1. A device useful for shaving, comprising: at least one cutting unit having a surface portion, said unit being rotatably driveable; a shearing element fixedly attached to said cutting unit and rotatably driveable therewith; a brush fixedly attached to said surface portion and rotatably driveable with said cutting unit; means for rotatably driving said cutting unit comprising a motor means encased in a waterproof housing; guard means for separating said shearing element from a user's skin and for allowing hair stubble to engage said shearing element;

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means for retaining said at least one cutting unit; and a head portion detachable from said housing, said head portion comprising said guard means, said at least one cutting unit, and said retaining means.



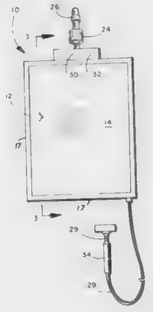
4,733,467
METHOD AND APPARATUS FOR COOLING A RAZOR
Charles Borenstein, 445 N.E. 195th St., North Miami Beach, Fla. 33179
Continuation-in-part of Ser. No. 710,419, Mar. 11, 1985, Pat. No. 4,642,893. This application Jun. 16, 1986, Ser. No. 874,590
Int. Cl.⁴ B26B *19/44*
U.S. Cl. 30—41 **14 Claims**



1. A cooling device for use in conjunction with a razor having a head that includes at least one blade, comprising:
means for containing a pressurized, fluid coolant, said containing means including an enclosed housing;
means for releasing said coolant from said containing means, said releasing means including a nozzle, said nozzle releasably engageable, allowing the release of said coolant upon engagement;
means for receiving the head of said razor, said receiving means communicating with said releasing means;
said receiving means including means for exposing said razor head to said coolant; whereupon, activation of said releasing means exposes the blade of said razor to said coolant, cooling, thermodynamically contracting and sharpening said blades, thereby allowing a user an efficient and pleasant shave.

10. A method of cooling the head of a razor, comprising:
providing a container which houses a coolant; said container having a nozzle, said nozzle releasably engageable, allowing the release of said coolant;
providing means for receiving the head of said razor, said receiving means communicating with said nozzle;
placing said razor head within said receiving means;
activating said nozzle by placing said razor head into said receiving means;
whereby said coolant is released from said container and introduced, through said receiving means, to said razor head, thereby thermodynamically contracting and sharpening the blade of said razor head, allowing for an efficient and pleasant shave.

4,733,468
SHAVING SYSTEM
Zlatko Zadro, 9641 Dove Cir., Fountain Valley, Calif. 92708
Filed Feb. 18, 1986, Ser. No. 830,178
Int. Cl.⁴ B26B *19/38*
U.S. Cl. 30—34 R **1 Claim**



1. A shaving system comprising:
a mirror comprising three parallel generally planar members, the first member being transparent, the second member adjacent to the back surface of the transparent member having a planar silver equivalent surface adjacent the transparent member which silver equivalent surface reflects light transmitted through the transparent member in a mirror arrangement, the third planar member being disposed parallel to the second member and central parallel surface a very small distance from the second planar member to form a very thin generally planar water flow chamber between the second and third members, sides disposed around the edges of the three parallel planar members to form said water flow chamber between the second and third members, the water flow chamber having interior surfaces defining a water inlet port and a water outlet port along opposite edges, the water outlet port of cross section not greater than the cross section of the water inlet port, the outer surface of the mirror defining each of said ports forming a protruding hose coupling surface capable of coupling to a hose in a substantially liquid tight coupling;
mirror coupling means capable of coupling the mirror near a shower head such that the silver equivalent surface faces substantially away from the nearest wall;
a shower tap off coupler capable of coupling to the water pipe furnishing water to a shower head such that a very small percentage of the water flowing toward the shower head through the water pipe is diverted instead through the shower tap off coupler which coupler has interior and exterior surfaces defining a water exit port including a protruding hose coupling surface capable of coupling to a hose in a substantially liquid tight coupling;
a small water powered generator capable of generating a small amount of electricity when water from the shower pipe via the shower tap off coupler flows therethrough, the generator having interior and exterior surfaces defining a water inlet port capable of mating with a hose coupled to the water outlet port of the shower tap off coupler, and the interior and exterior surfaces of the generator defining a water outlet port coupled in a liquid tight coupling to the water inlet port near the first edge of the mirror, electrical coupling means coupling electricity generated by the generator to a light means via an electricity outlet;
low power electric light means coupled to receive power from the generator and illuminate whenever the generator transmits electricity through the generator electricity outlet, the light means coupled near the top of the mirror to illuminate the volume of space adjacent to and near the mirror transparent surface;
hose means coupled between the water exit port of the shower tap off coupler and the water inlet port of the small water powered generator to transmit water from the shower tap off coupler to the generator;
a razor; and
hose means coupled between the water outlet port near the bottom of the mirror to the razor and coupled to the razor in such a manner that water from the mirror flows out of the hose means nearly adjacent the blade of the razor.

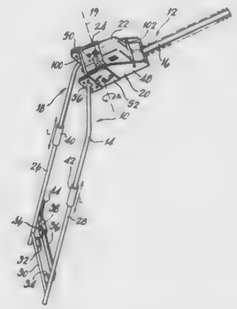
4,733,469
EXTRACTOR FOR INCREMENT BORER
Ingvar Hagiöf, Långsele, Sweden, assignor to Ingenjorsfirman I. Haglof AB, Solleftea, Sweden
Continuation of Ser. No. 468,977, Feb. 23, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,155
Claims priority, application Sweden, Feb. 25, 1982, 8201185
Int. Cl.⁴ G01N *1/04*
U.S. Cl. 30—130 **5 Claims**



1. An extractor for an increment borer for taking increment cores from trees, which borer consists of a tubular body, having an internal cylindrical portion which, at its forward end, transforms to a convergent conic portion, said borer being provided on its outer surface with screw threads for screwing the borer into a tree, characterized in that the extractor comprises a cylindrical tube, the outer diameter of which corresponds to the inner diameter of the cylindrical portion of the increment borer and the inner diameter of which corresponds to the smallest inner diameter of the increment borer at the forward conic end portion thereof, so that the extractor can be inserted into the borer over an increment core present in the borer, after the borer has been screwed into a tree, and that a bifurcation is located in the wall of the forward end of the extractor, so that the wall at said forward end is radially inwardly deformed plastically when said forward end is moved axially into and pressed against the said conic portion of the increment borer, and a guide plug adapted to be insertible into the rearward end of the extractor, said guide plug having a length dimension such that, when inserted in the extractor, its forward end will project into the increment borer when the forward end of the extractor is at the transition of the cylindrical portion of the increment borer to said conic portion.

4,733,470
MOUNTING APPARATUS
Henry J. Firman, 15 Apsley Way, Longthorpe, Petersborough, PE3 6NE, Cambridgeshire, Great Britain
Filed Oct. 14, 1986, Ser. No. 918,780
Claims priority, application United Kingdom, Oct. 17, 1985, 8525572
Int. Cl.⁴ B26B *13/00*
U.S. Cl. 30—231 **7 Claims**

4. Mounting apparatus for use with hedge and the like cutting means comprising:
support arm means adapted to be carried by a user to support drivable cutting means at one end thereof;
said cutting means being angularly adjustable with respect to said support arm means;
mounting means at said one end of said support arm means to receive and support a hand tool providing said cutting means;
said mounting means providing said angular adjustment of said cutting means with respect to said support arm means to vary the angle of cut; and
releasable securing means for releasably securing said hand tool to said mounting means whereby said hand tool may be detached for subsequent direct hand operation by a user;
said support arm means further comprising frame means having a pair of widely spaced frame side members extending lengthwise of the frame, one frame side member at each side thereof, and at least one frame cross-member connected between and linking said side members in a spaced apart relationship;
said frame means having said mounting means at its outer end to receive and support said hand tool and having in the region of its inner end a pair of spaced apart connectors for detachable connection to a user's body harness, one of said connectors being located in the region of each side of the frame at said inner end thereof, and said frame side members being spaced apart by a distance substantially greater than the width of said mounting means for said hand tool whereby said frame side members can be conveniently grasped between the inner and outer ends of



said frame means by the user during use, and said frame means can thus be held in an upward inclination while the weight of the apparatus and tool is substantially supported by said harness;
the spacial relationship of said frame with respect to said mounting means being such that said mounting means can receive and mount said cutting means so that the cutting means can cut in a lateral direction which is generally the same direction as the direction in which said frame side members are spaced apart, whereby said spaced apart frame members grasped by the user permit effective control of cutter movement in said lateral cutting direction;
control means for controlling the operation of said hand tool being mounted on said frame within finger reach of one of said user's hands when grasping said frame side members;
each of said frame side members further comprising two telescoping portions whereby said frame is telescopically length adjustable, and
said mounting means further comprises a generally channel section mounting member within which the main body of said hand tool is secured in use, said mounting member being pivotally connected to said frame means about a pivot axis extending generally laterally with respect to the lengthwise extent of said frame side members and generally parallel to the plane containing said frame side members.

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4,733,471

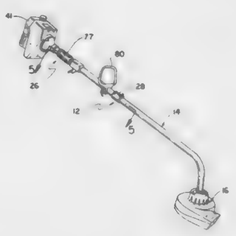
TOOL DRIVE ASSEMBLY AND CLAMP

Jon A. Rabe, El Toro, Calif., assignor to Hawaiian Motor Co., Long Beach, Calif.

Continuation of Ser. No. 608,332, May 8, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,122

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—276 **16 Claims**



1. A self-coupling split-shaft drive assembly for a tool comprising:

a motor;

a driver shaft;

means to couple said driver shaft to said motor;

a driven shaft for rotational coupling to said driver shaft having proper and improper orientations for said coupling;

coupler means to rotatably couple said driven shaft to said driver shaft, said coupler means including,

a spring to bias said driver shaft, and

a socket member fixed to said driver shaft to move with said driver shaft against the force of said spring under a force along said driven shaft in an improper orientation and to move with said driver shaft under the return force of said spring upon said rotational coupling of said shafts ;

said driver shaft being a shaft of substantial length and extending from a substantial distance away from said socket member.

4,733,472

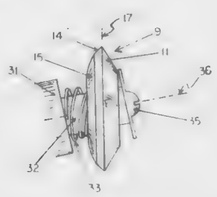
CAN OPENER BLADE

Neale Belcourt, 71 Hourigan Dr., Meriden, Conn. 06450

Filed Sep. 2, 1986, Ser. No. 902,760

Int. Cl.[4] B67B *7/54*

U.S. Cl. 30—422 **2 Claims**



1. A circular can opener blade comprising a bevelled edge formed by a slanted straight side and a slanted index side, said index side being extended by an outwardly curved portion which leads into a recessed portion, said straight side being terminated by a flat support region; all penetrated by an annular hole; wherein the index angle formed by the centerline of said blade and by said index side is 43–47 degrees, the side angle formed by said centerline and said slanted straight side is 22–30 degrees, said outwardly curved portion has a radius of 0.4–0.65 inch, and said annular hole has a diameter of 0.26–0.31 inch allowing a degree of freedom expressed by the angle formed by the centerline of a can opener shaft and by the centerline of said blade of 90 degrees plus/minus 10–20 degrees.

4,733,473

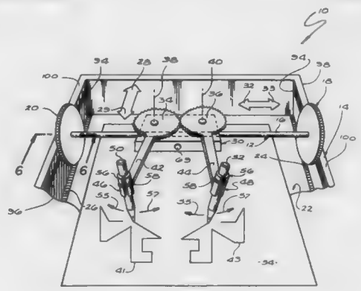
DUPLICATING DRAWING APPARATUS

Adolph E. Goldfarb, 14322 S. Wind Cir., Westlake Village, Los Angeles, Calif. 91361

Filed Dec. 31, 1986, Ser. No. 943,324

Int. Cl.[4] B43L *13/10*

U.S. Cl. 33—23.05 **9 Claims**



1. A duplicating drawing apparatus comprising:

a frame having a bottom wall, and a pair of racks extending in a X direction along opposite edges of the bottom wall, and having a pair of upright side walls each with a groove defined therein extending along the X direction;

a support assembly mounted on said frame for substantial linear movement in the X direction, and including a pair of spaed-apart pinion gears secured on a transverse rod that is aligned along a Y direction perpendicular to the X direction, the gears being respectively meshed with and rolling in the X direction along the racks, whereby the trasverse rod is restrained in its alignment along the Y direction while the support assembly is continuously adjustable in the X direction relative to the racks; and the ends of the transverse rod extending in the Y direction beyond the respective gears and into the respective sidewall grooves;

a pair of rotary members, each member being rotatably mounted on said support assembly by means of a subassembly that slides in the Y direction along the transverse rod, and each rotary member being so mounted for rotation about a respetive Z axis extending in a Z direction that is substantially at a right angle to said X and Y directions, said Z axes being substantially parallel to one another;

means for introducing substantial frictional drag in motion of the subassembly relative to the transverse rod;

connecting means attached to each of said rotary members for causing one rotary member to rotate in a substantially equal and opposite direction when the other rotary member is rotated;

an extension arm attached to each of said rotary members; and

means attached to each of said extension arms for holding a writing instrument;

said drag-introducing means substantially preventing motion of the subassembly along or about the transverse rod during manipulation of the extension arms; and

said extension arms being raisable from said frame by rotation of the subassembly about an axis defined by the transverse rod, through rolling motion of the pinions along the racks, despite said prevention of subassembly motion about the transverse rod by said drag-introducing means, and despite retention of the subassembly in place on the frame by restraint of the transverse-rod arm ends in said grooves;

whereby said pinions, racks, grooves and transverse-rod arm ends cooperate to permit rotary raising of said extension arms without subassembly motion relative to the transverse rod, while the subassembly is retained on the frame.

4,733,474

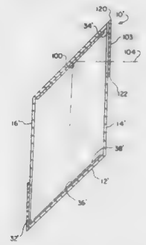
BOW SIGHT

John W. Cary, 2350 Milford Rd., Milford, Mich. 48042

Continuation-in-part of Ser. No. 803,384, Nov. 29, 1985, Pat. No. 4,646,444. This application Mar. 2, 1987, Ser. No. 20,454

Int. Cl.[4] F41G *1/46*

U.S. Cl. 33—265 **3 Claims**



1. For use in conjunction with a weapon of the type which fires a projectile toward a target along a predetermined path of travel and at a predetermined initial speed, a sight for setting the elevation of the weapon comprising:

an elongated housing having a forwardly facing side and a rearwardly facing side, a first opening formed through said housing sides, and open to said sides of said housing, and a second opening open to said forward side of said housing, said second opening being longitudinally spaced from said first opening,

means for securing said housing to the weapon so that said housing extends substantially transversely of said path of travel and so that said first opening is substantially parallel to said path of travel,

a first planar mirror mounted to said housing between the ends of and along one side of said first opening, said first planar mirror being angled with respect to said path of travel so that light travelling longitudinally through said housing is reflected by said first planar mirror through the other end of said first opening and substantially parallel to said path of travel,

wherein the other side of said first opening is transparent thus allowing a non-reflected image to pass therethrough, and

a second planar mirror mounted within said housing in alignment with said second opening, said second planar mirror being angled with respect to the path of travel so that light entering said second opening along said path of travel is reflected longitudinally through said housing towards said first planar mirror,

a parabolically curved lens having a degree of curvature which increases parabolically from one end and to a second end, said curved lens being disposed across said second opening so that said one end of said curved lens is adjacent a top of said second opening so that the curved lens refracts an image of a target to said second planar mirror which varies in position as a function of the distance between the target and the sight and the angle of the housing with respect to vertical so that said parabolic lens refracts an image to said second planar mirror and then to said first planar mirror in which the reflected and non-reflected images are automatically aligned when the elevation of the weapon is accurately aimed to fire the projectile at the target.

4,733,475

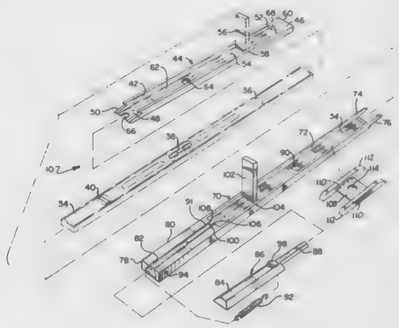
EXTENSION LEVEL APPARATUS

John W. Youmans, 546 Meadow Rd., Princeton, N.J. 08540

Filed May 20, 1987, Ser. No. 51,760

Int. Cl.[4] G01C *9/00, 9/24*

U.S. Cl. 33—372 **9 Claims**



1. An extension level apparatus suitable for use with a standard carpenter's level comprises, in combination:

(A) first and second elongated frame members,

(a) said first frame member having

(i) a centrally disposed channel extending from one end and terminating at the other end in a solid portion, said channel being adapted to frictionally receive a portion of said carpenter's level therein, the distal edge of said solid portion being at right angles to the longitudinal axis of said first frame member, said one end being provided with a V-shaped notch; and

(b) said second frame member having,

(i) a centrally disposed channel extending from one end and terminating at the other end in a solid portion, said solid portion being provided with a centrally disposed undercut channel extending to the distal edge of said second frame member, said channel being adapted to frictionally receive the remaining portion of said carpenter's level, said one end being provided with a V-shaped notch adapted to cooperate with said V-shaped notch provided in said first frame member, and

(ii) length adjustment means having one portion adapted to slideably engage said second frame member undercut channel and move freely therein; said one portion having a distal edge perpendicular to the longitudinal axis of said second frame member, a second portion of said length adjustment means extending towards said level when said length adjustment means is disposed within said second frame member, said length adjustment means being provided with means for locking said length adjustment means in a preselected position, and

(iii) elongated spring means having one end affixed to said length adjustment means and the other end affixed to said second frame member for urging said length adjustment means towards a length extending position.

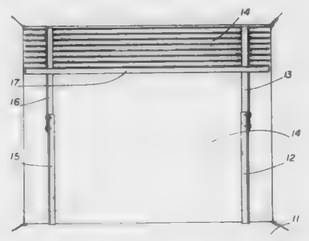
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4,733,476

APPARATUS FOR HORIZONTAL SCORING OF A CEMENTITIOUS WALL

Henry Schiffer, 21835 Elbosque Way, Boca Raton, Fla. 33433

Filed Mar. 30, 1987, Ser. No. 31,755
Int. Cl.[4] B05C *11/02*
U.S. Cl. 33—406 2 Claims



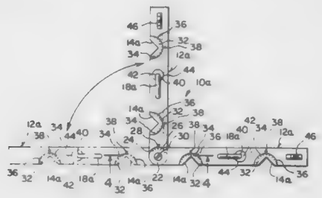
1. An apparatus for horizontal scoring of the surface of a cementitious wall comprising a straight member and at least two vertical guides, and each guide comprising a flat portion having a plurality of spaced pre-drilled nail holes for attachment of the guide to the wall of and an outwardly extending portion having a plurality of spaced slots for supporting said straight member in a horizontal position for use in horizontal scoring.

4,733,477

CHALK LINE FRAMING SQUARE

James R. Fincham, 11509 February Cir., Silver Spring, Md. 20904, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Mar. 17, 1987, Ser. No. 26,778
Int. Cl.[4] B43L *7/00, 13/00*
U.S. Cl. 33—451 4 Claims



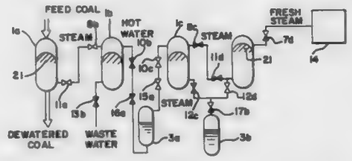
1. A chalk line framing square for a floor having tiles installed with adhesive thereon, said framing square comprising:
(a) a pair of arms at right angles, each of said arms having a pair of spaced apart notches that are V-shaped and formed on the outer edge thereof to act as view points for enabling visual alignment of said arms for laying out right angle intersecting chalk lines upon the floor so that the tiles can be properly installed with the adhesive to the floor; and
(b) a pair of handles, each of said handles affixed to the top of each of said arms to allow a person to hold said framing square to check squareness of the tiles without laying said framing square in the adhesive, wherein said arms are pivotally adjustable, said handles are pivotally mounted and said notches are formed on members pivotally mounted on said arms for laying out chalk lines at varying angles.

4,733,478

METHOD OF DEWATERING BROWN COAL

Takao Kamei, Ashiya; Fuminobu Ono; Keiichi Komai, both of Akashi, and Takeshi Wakabayashi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Oct. 6, 1986, Ser. No. 915,800
Claims priority, application Japan, Oct. 7, 1985, 60-223174; Oct. 7, 1985, 60-223175; Oct. 7, 1985, 60-223176
Int. Cl.[4] F26B *7/00*
U.S. Cl. 34—15 20 Claims



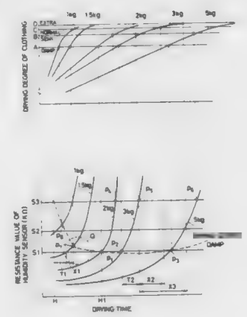
1. A process for steam dewatering of brown coal, using a plurality of autoclaves, each of which, in cyclic sequence among the autoclaves, repeats a batch process comprised of:
(1) atmospheric pressure stage to unload the coal dewatered and to load the coal to be dewatered;
(2) heating stage to heat and dewater said loaded coal; and
(3) depressurizing stage to lower the interior pressure for said unloading of coal,
wherein said heating stage comprises S2, an initial steaming step Si, a first steaming step S1 after said step Si, and a second steaming step S2 immediately after the said step S1 and at the end of said heating stage, the autoclaves in both said steps S1 and S2 being supplied with fresh steam from an external source, each said autoclave in said step Si being connected to said autoclave in the step S2, so that the steam flows from the latter to the former, thereby intensifying the steam ventilation at said step S2.

4,733,479

METHOD OF CONTROLLING AN ELECTRIC CLOTHES DRYER INCLUDING AUTOMATIC LOAD DETECTION

Shinichi Kaji, Katsuta; Keiji Hikino, Hitachi; Shin Nakamura, Hitachi, and Tsunetoshi Komatsu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 922,714
Claims priority, application Japan, Oct. 25, 1985, 60-237334
Int. Cl.[4] F26B *25/22*
U.S. Cl. 34—31 9 Claims



1. A method of controlling an electric clothes dryer including the steps of drying clothes in a rotative drum by supplying hot air to the rotative drum; detecting the moisture content of the clothes by means of a humidity sensor which produces

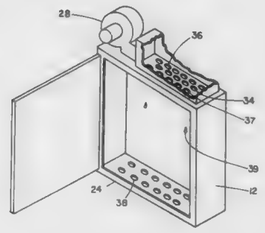
respective resistance values for different amounts of detected humidity; and controlling the duration of the drying of the clothes by means for a microcomputer on the basis of the resistance value of said humidity sensor and the amount of the load of the clothes, including measuring the drying time until a predetermined first resistance value of said humidity sensor is reached, determining whether the load of the clothes is a rated load or a small load depending upon whether or not said measured drying time for reaching said first predetermined resistance value exceeds a first predetermined amount of time, respectively, and determining the required hot air operation time in accordance with a first control method for a rated load of clothes and a second control method for a small load of clothes.

4,733,480

DRYER FOR GAS MASKS AND THE LIKE

Toby Hutchins, 229 Brown Rd., Pisgah Forest, N.C. 28769

Filed Mar. 9, 1987, Ser. No. 23,715
Int. Cl.[4] F26B *9/06*
U.S. Cl. 34—104 3 Claims



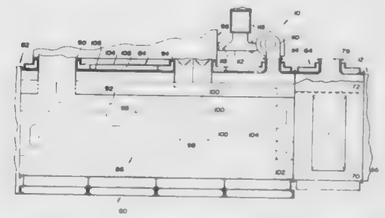
1. A dryer for gas masks and the like comprising:
a first enclosure for housing the masks; said first enclosure having at least top and side walls; at least one of said walls having a plurality of air inlet holes therein;
a second enclosure covering said air inlet holes; air movement connected to said second enclosure for forcing air into said second enclosure;
a first group of air inlet holes;
a plurality of attachment means for connecting the gas masks to each hole in said first group of said air inlet holes whereby air moves into the interior of the gas masks;
a second group of air inlet holes; at least one air inlet hole from said second group being adjacent to each air inlet hole of said first group;
said second group of air inlet holes not being adapted to be connected to gas masks whereby air passes over the exterior of the gas masks at the same time that air moves into the interior of the gas masks; said plurality of attachment means are connectors interfacing between said first group of air inlet holes and said masks; each connector includes a threaded stud and a threaded coupling ring connected to said stud; each of said masks including a threaded portion; said studs being connected to said threaded portion of said masks by said threaded coupling ring providing an airtight connection; said dryer further including a bottom wall and a plurality of air outlet holes in one of said walls of said first enclosure, whereby air and moisture passes from the inside of said first enclosure to the outside.

4,733,481

PAINT BAKE OVEN

Gordon F. Hubbert, Plymouth, Mich., assignor to Gladd Industries, Inc., Detroit, Mich.

Division of Ser. No. 570,071, Jan. 9, 1984, Pat. No. 4,635,381, which is a continuation-in-part of Ser. No. 393,274, Jun. 29, 1982, abandoned. This application May 19, 1986, Ser. No. 844,112
Int. Cl.[4] F26B *23/10*
U.S. Cl. 34—243 C 1 Claim



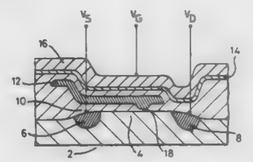
1. A paint bake oven of a modular construction including a radiant drying module comprising: an outer insulated housing of round cross-section and an inner housing of round cross-section received within the outer housing thereof and defining a product passage; said inner housing of the drying module including solid inner and outer curved walls and a bottom wall extending therebetween defining unitary closed chambers and a central upwardly projecting supply duct and a pair of outwardly curved side passages located within each of said chambers on opposite sides of the product passage; partitions in said chambers defining a circuitous path in a manner that perfects uniform heating of said inner curved wall; a return duct communicating with the side passages of the inner housing of the drying module; and a recirculating heater mounted on said outer housing above said product passage and communicating with said supply duct for supplying heated gas to the supply duct of the drying module and receiving gas from the return duct thereof after passage through the side passages to provide radiant heating of a product passing through the product passage.

4,733,482

EEPROM WITH METAL DOPED INSULATOR

James L. West, Kircaldy; Alan E. Owen; Komanduri V. Krishna, both of Edinburgh, and Jaoquim J. Delima, Thornton Heath, all of Great Britain, assignors to Hughes Microelectronics Limited, Glenrothes, Scotland

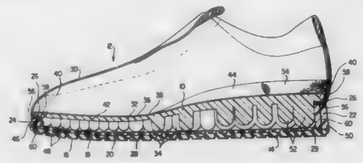
Filed Apr. 7, 1987, Ser. No. 35,524
Int. Cl.[4] H01L *29/78, 29/67;* G11C *11/40*
U.S. Cl. 357—23.5 9 Claims



1. A semiconductor memory device wherein non-volatile information is retained by storage of electrical charge trapped in or at a layer of the device surrounded by a dielectric layer, at least a portion of said dielectric layer comprising an amorphous inorganic oxide and/or nitride insulating material doped with a metal whose atomic number is 21 to 28, 39 to 45, or 57 to 78.

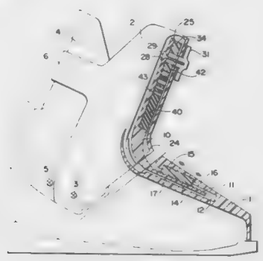
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,483
CUSTOM MIDSOLE
Yung-Mao Lin, Taichung, China, assignor to Autry Industries, Inc., Dallas, Tex.
Filed Mar. 12, 1987, Ser. No. 25,010
Int. Cl.[4] A43B *13/14, 13/18, 13/04*
U.S. Cl. 36—28 15 Claims



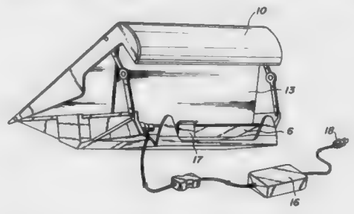
1. A midsole for disposal on an upper surface of an outsole, comprising:
a removable insert of said midsole, and a peripheral member of said midsole disposed laterally outwardly of said removable insert; said peripheral member forming an orifice, said removable insert insertable through said orifice to make contact to said upper surface of said outsole, said peripheral member permanently affixed to said upper surface of said outsole;
said removable insert having a lower surface for contacting said upper surface of said outsole, a plurality of convex cushioning elements formed to fill at least a major portion of said lower surface, said elements each operable to cushionably deform and flatten responsive to a force having a component perpendicular to said lower surface at said element, each element operable to deform independently of the remaining elements.

4,733,484
SKI BOOT
Marc Delery, Caluire, France, assignor to Compagnie Francaise d'Articles de Sport, DuPont, France
Filed Sep. 23, 1986, Ser. No. 910,671
Claims priority, application France, Oct. 9, 1985, 85 15157
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—120 6 Claims



1. A ski boot in plastic material comprising:
a shell adpated to receive the foot;
a front spoiler articulated on the shell for pivoting frontwards thereof, and adapted to grip the bottom part of the leg;
means for tightening the front spoiler on the bottom part of the leg; and
damping means comprising a flexible bending arciform plate situated in the plane of symmetry and adopting the general shape of the instep, said arciform plate being joined by its lower end to the shell at the level of the tarsus and metatarsus, said lower end comprising means for adjusting the forward inclination, and said arciform plate being further movably secured by its upper end to the front spoiler above the instep, said upper end cooperating with a compressible elastic return element during leaning forward movements.

4,733,485
DESKTOP FILM VIEWER
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Dec. 20, 1985, Ser. No. 811,823
Claims priority, application Japan, Jul. 20, 1985, 60-159296
Int. Cl.[4] G02B *27/02*
U.S. Cl. 40—361 17 Claims

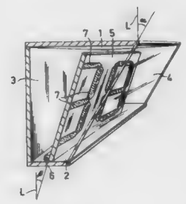


1. A desktop film viewer comprising:
a box-shaped structure having a cover member and a main member interfitting with each other,
a light transmission diffusion plate provided on said cover member,
a light source provided in said main member to illuminate said light transmission diffusion plate of said cover member,
a light reflecting surface located in said main member to reflect light from said light source onto said light transmission diffusion plate,
a reflecting plate suspended from said cover member for reflecting light onto said light transmission diffusion plate, said reflecting plate having two ends, one end being pivotably mounted on said cover member and the other end being slidably mounted on said light reflecting surface of said main member,
said box-shaped structure includes wedge-shaped side surfaces having acute angle edges where said main member and said cover member are pivotally connected to each other, and
support means for adjusting an angle of inclination of said cover member relative to said main member.

4,733,486
SIGN APPARATUS
Sten Gawell, Stenungsund, Sweden, assignor to Indel AB, Stenungsund, Sweden
Filed Mar. 19, 1986, Ser. No. 841,213
Claims priority, application Sweden, Mar. 20, 1985, 8501378
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—451 6 Claims

1. Sign apparatus intended for text and/or numerical display outdoors and including electrically driven character elements (7) each comprising rows of LED's defining a dot raster surface disposed on a panel (5), the former being illuminable and extinguishable from a remotely placed operating unit, and grouped such that different illuminated combinations form different characters, characterized in that the panel (5) is mounted inside a sign cabinet formed with a roof (1), intended for erection at a relatively great height above the observation plane where the observer stands, and has a window (4) comprising a color filter at a distance in front of the panel (5), said window (4) being disposed at a predetermined angle (α) of approximately twenty to thirty degrees to the vertical, so that

the surface of the window is inclined towards the observation plane, the panel (5) being disposed inside the window at an



angle (β) of approximately fifteen degrees to the vertical and being mounted for pivotal movement to adjust said angle of inclination (β).

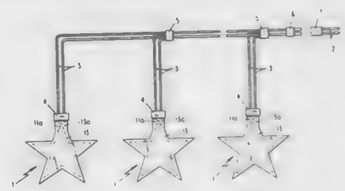
4,733,487
DISPLAY UNIT
Gerhard G. Gassmann, Vogelsang 5, D-7266 Neuweiler 2, Fed. Rep. of Germany
Filed Sep. 22, 1986, Ser. No. 910,373
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533575
Int. Cl.[4] G09F *11/12*
U.S. Cl. 40—472 11 Claims



1. Matrix type display unit comprising a transport belt providing a display surface on which characters, symbols or pictures are formed, said transport belt comprising a plurality of graphic display elements arranged in lines and columns; a composing unit controlled by a data processing unit capable of displacing said display elements out of the plane of said transport belt; and a plurality of separating strips corresponding to and aligned with said lines of said display elements, wherein said display elements (3) comprise a part of said transport belt (1) and are connected with said transport belt (1) along a portion of their perimeter and said transport belt (1) with said display elements (3) has a contrasting color in relation to said separating strips (4), whereby said display elements displaced by said composing unit are maintained in an invisible position behind said separating strips, and said display elements not displaced by said composing unit are maintained in a visible position in front of said separating strips.

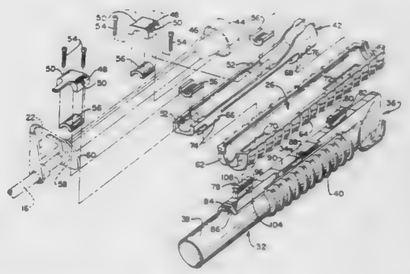
4,733,488
DECORATIVE DISPLAY APPARATUS
Meiso Yokoyama; Makoto Takahashi, and Hiroshi Ohkawa, all of Nagaoka, Japan, assignors to Nippon Seiki Co., Ltd., Nigata, Japan
Filed Feb. 13, 1985, Ser. No. 701,216
Int. Cl.[4] G09F *13/22*
U.S. Cl. 40—544 8 Claims

1. A two-sided luminous display apparatus, comprising:
a plurality of two-sided flat luminous display elements each having an electroluminescent layer formed contiguously between opposite first and second transparent electrodes and capable of shining in predetermined color and shape when a voltage is applied to said transparent electrodes,



wherein first and second electrode terminals respectively integral with said first and second transparent electrodes are formed for connection to power supply lines.

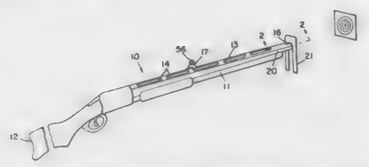
4,733,489
APPARATUS FOR RECONFIGURING AUTOMATIC RIFLE TO INCLUDE GRENADE LAUNCHING FUNCTION
Joseph C. Kurak, Fridley, Minn., assignor to R/M Equipment, Inc., Miami, Fla.
Continuation of Ser. No. 670,477, Nov. 14, 1984. This application May 22, 1987, Ser. No. 53,096
Int. Cl.[4] F41F *1/00, 5/00*
U.S. Cl. 42—77 7 Claims



1. Apparatus for configuring and deconfiguring an automatic rifle with a grenade launching device to be mounted to the barrel of the rifle, comprising:
(a) a unitary upper rack including a base portion and at least two quick connect/disconnect fittings depending from said base portion and being spaced from each other at fixed, defined distances along said base portion;
(b) means for securing said upper rack to the barrel of the rifle at a desired location therealong;
(c) a lower rack having means for suspending the grenade launching device therefrom;
(d) quick connect/disconnect fittings carried by said lower rack for selectively mating and unmating said upper and lower racks with respect to one another, said fittings carried by said lower rack being fixedly spaced from each other at a distance the same as that at which said fittings carried by said upper rack are spaced; and
(e) a hand guard attachable to the rifle to enclose said upper rack and a portion of the barrel of the rifle to which said upper rack is secured, said guard having apertures formed therein to permit said quick connect/disconnect fittings carried by said lower rack to pass through said apertures to mate precisely with said quick connect/disconnect fittings carried by said upper rack.

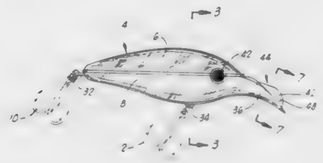
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,490
ALIGNMENT-IMPACT INDICATOR FOR FIREARMS
Walter J. Mulawski, 11 Nevada Dr., Chelmsford, Mass. 01824
Filed Oct. 16, 1986, Ser. No. 919,804
Int. Cl.[4] F41G *1/54*
U.S. Cl. 42—100 9 Claims



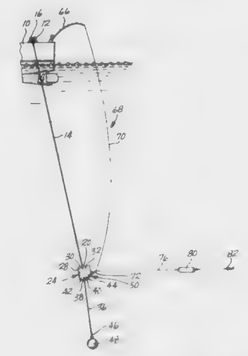
1. An indicator for indicating the impact center of shot patterns for a firearm having a barrel with a muzzle and having elevation adjusting means, comprising:
a sight guide for a selected distance and having indicia;
a grommet of rubber-like material for insertion in the barrel of the muzzle; and
means for affixing the grommet in the muzzle and for mounting the guide at the muzzle end facing the barrel for sighting;
the indicia having a marker for indicating the elevation impact center of shot pattern for a selected distance;
the barrel having a longitudinal axis, said means for affixing the grommet in the muzzle and for mounting the guide comprising means for compressing the grommet longitudinally thereby causing the grommet to expand transversely of the axis to engage the barrel,
said means for mounting the guide comprising the axial compressing means pressing against and retaining the guide against the muzzle,
whereby one preparing for shooting may adjust the firearm elevation adjusting means to match the selected sighting elevation marker of the indicia for the selected distance.

4,733,491
FISHING LURE
William H. Wilson, Fort Smith, and Jim Gowing, Altus, both of Ark., assignors to Ebsco Industries, Inc., Leeds, Ala.
Filed Jul. 16, 1986, Ser. No. 886,066
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.45 11 Claims



1. A fishing lure comprising:
a hollow body including:
an upper body half having a forward end and a rear end and having a concave inner side and a convex outer, upwardly facing side;
a lower body half having a forward end and a rear end and having a concave inner side and a convex outer, downwardly facing side, said lower body half further including a pair of opposed, transversely spaced, longitudinally extending chines located on said outer, downwardly facing side, said lower body half and upper body half being joined to each other along a longitudinally extending medial plane which extends horizontally from the forward end of the lure to the rear end thereof to form said hollow body in a configuration generally resembling a natural fish bait species; and
a diving plane attached to the forward end of said lower body half and extending downwardly from said medial plane at an accute angle.

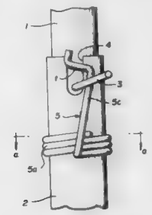
4,733,492
DOWNRIGGER FISHING SYSTEM AND RELEASABLE CONNECTION
Hobert A. Thompson, 3373 Willamette Dr., North, Salem, Oreg. 97303
Filed Apr. 26, 1984, Ser. No. 604,368
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—27.4 30 Claims



1. For use in a downrigger system, an improved releasable connection between a downrigger line and a fishing line, comprising:
a rudder plate having an upper end portion connectable to the lower end of an upper downrigger line extending downwardly from a boat to the rudder plate, a lower end portion connectable to the upper end of a lower downrigger line extending from the rudder plate to a downrigger weight or kite located below the rudder plate, a downwardly opening blind slot in a lower rear portion of the rudder plate, and a downwardly extending finger positioned immediately rearwardly of the slot, said finger having a generally straight forward edge; and
an eye member connectable at its rear to a fishing line and having a forward connector eye bounded at its front by a bight portion of the eye member which is sized to loosely fit within said slot, said bight portion including a rearwardly directed inner surface which makes contact with the forward edge of said finger when the bight portion of the forward connector eye is within said slot and the finger is within the forward connector eye.

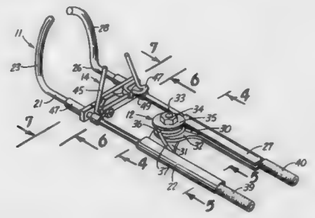
4,733,493
TRAP GUN
Paul A. Edstrom, Pocatello, Id., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Apr. 24, 1987, Ser. No. 42,033
Int. Cl.[4] A01M *27/00*
U.S. Cl. 43—84 3 Claims

1. In a trap gun having a hollow tube and a barrel nested in the tube, wherein the barrel includes a trigger extending through a slot in the tube's wall, wherein the tube includes means to trip the trigger, the improvement wherein the trip means comprises
(a) a hole in said tube's wall;
(b) a one-piece spring wire form having a helical segment wrapped around said tube, and first and second segments extending from opposite ends of said helical segment; wherein said first segment extends inwardly from said



helical segment and protrudes through said hole in said tube's wall; wherein said second segment longitudinally extends along said tube toward said trigger to engage said trigger when said barrel moves outwardly from said tube.

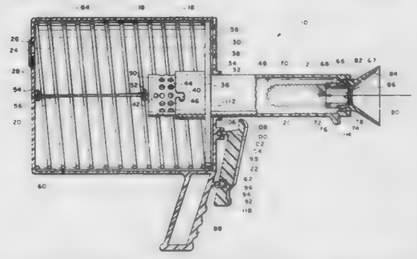
4,733,494
ANIMAL TRAP
Oscar F. Johnson, Rte. 12, McIntosh, Minn. 56556, and Frandell O. Johnson, Box 292, Greenbush, Minn. 56726
Filed Jun. 5, 1987, Ser. No. 58,517
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—85 20 Claims



1. An animal trap comprising: animal holding means having a first rod, first animal holding jaw attached to the first rod, a second rod located adjacent the first rod, second animal holding jaw attached to the second rod and located in general transverse alignment with the first jaw, means pivotally mounting the first rod to the second rod whereby the first and second jaws are movable relative to each other between an open position and a closed position, coil spring means located adjacent a portion of the means pivotally mounting the first rod to the second rod, said coil spring means cooperating with the first and second rods to bias the first and second jaws to the closed position, and a trigger mechanism for holding the first and second jaws in the open position against the force of the spring means, said trigger mechanism having an over center release means pivotally mounted on the first and second rods, and trip finger means pivotally mounted on the release means for movement between a set position and a trip position, said release means being released when the finger means is moved from the set position to the release position by an animal whereby the spring means moves the first and second jaws to the closed position to trap the animal between the first and second jaws.

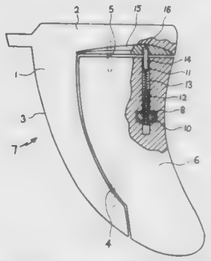
4,733,495
FLYING INSECT EXTERMINATOR
James Winnicki, 7500 Whirlaway St., Bakersfield, Calif. 93307
Filed May 21, 1987, Ser. No. 52,716
Int. Cl.[4] A01M *5/02*
U.S. Cl. 43—139 8 Claims

1. A flying insect exterminator comprising:
a housing, said housing have an enclosed interior chamber, said interior chamber being capable of containing a vacuum;
pump means mounted within said internal chamber, said pump means for producing a vacuum within said internal chamber;
a tube mounted on said housing, a portion of said tube being located within said internal chamber with another portion of said tube extending exteriorly of said housing, said tube being movable relative to said housing between a retracted position and an extended position, said tube having an outer free end, said outer free end forming an internal insect receiving chamber;



an insect collecting screen mounted within said tube and located adjacent said insect receiving chamber;
biasing means for thrusting of said tube from said retracted position to said extended position, said biasing means mounted within said internal chamber; and
port means mounted within said internal chamber and connected to said tube, upon said tube reaching said extended position said port means being opened permitting communication of said vacuum to said insect receiving chamber causing a suction to occur moving any insect from within said insect receiving chamber into said insect collecting screen.

4,733,496
PIVOTING SURFBOARD FIN
Peter Wallner, 4 Gross Michel Rd., Kororo, N.S.W. 2450, Australia
Filed Feb. 6, 1987, Ser. No. 12,661
Claims priority, application Australia, Feb. 18, 1986, PH4644
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—79 1 Claim



1. A fin for surfboards and other watercraft including the combination of; a fixed leading edge extending vertically down from a horizontal mounting section with an integrated foil, a channel of varying depth in an underside of said foil, a pivotably mounted blade section with a vertical locating hole, a spring loaded pin freely seated in said locating hole protruding sufficiently to contact along said channel, a resilient means to vary and limit the vertical travel of said pin in said locating hole.

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4,733,497

APPLICATOR FOR AGRICULTURAL AND HORTICULTURAL TREATING LIQUIDS

George Frikton, P.O. Box 148, Maleny, Queensland, 4552, Australia

PCT No. PCT/AU85/00320, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/03653, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 19, 1985, Ser. No. 912,245
Claims priority, application Australia, Dec. 21, 1984, PG8680; Nov. 13, 1985, 49939/85
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 10 Claims



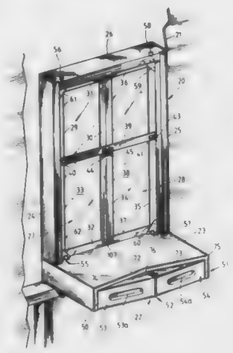
1. An applicator for agricultural and horticultural treating liquids, said apparatus comprising a supply conduit, a feed means for treating liquid and a swabbing brush which extends down from the supply conduit, which receives treating liquid from said feed means, and which, in opration as the applicator is advanced over an area to be treated, trails over the area to be treated and deposits treating liquid thereon, said swabbing brush comprising a multiplicity of pliable non-absorbent filaments which depend from support means disposed within an upper part of the supply conduit and which pass freely through a slotted aperture in a lower part of the supply conduit, and the feed means comprising a feed tube disposed within said supply conduit and at least one spray nozzle attached to said feed tube, and controllable means for feeding treating liquid under pressure onto the upper parts of the filaments between the support means and the slotted aperture so that the treating liquid descends down the filaments gravitationally.

4,733,498

FAST FOOD SERVICE ACCESS WINDOW WITH SEGMENTED PUSH-BAR

Carl P. Kriegel, Houston, Tex., assignor to M.C.E. Window, Inc., Houston, Tex.

Filed Dec. 20, 1985, Ser. No. 811,887
Int. Cl.[4] E05C *7/06*
U.S. Cl. 49—110 17 Claims



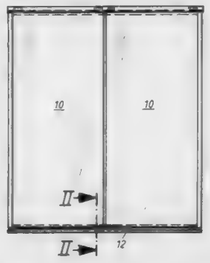
1. An access window comprising:
(a) at least one hinged window member;
(b) a segmented operator bar hinged at its outboard ends and articulated between said outboard end; and
(c) an adjustable flexible linkage operatively coupling the segmented operator bar to the window member wherein pushing said operator bar causes said window member to swing open.

4,733,499

DEVICE FOR LOCATING THE PANELS OF SLIDING DOORS AND THE LIKE IN SELECTED POSITIONS

Jürgen Guddas, Krumhörnweg 17, D-2800 Bremen 66, Fed. Rep. of Germany

Filed Feb. 27, 1987, Ser. No. 20,098
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606501
Int. Cl.[4] E05D *15/06*
U.S. Cl. 49—404 12 Claims



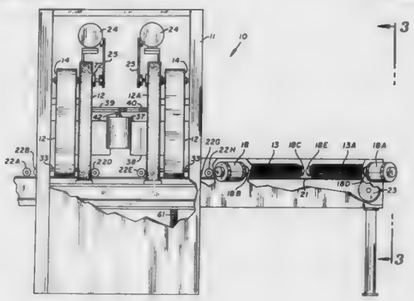
1. In a sliding door or window, the combination of a track defining an elongated path; a panel; a rolling element rotatably mounted on the panel and arranged to roll in said track along said path; and means for releasably locating the rolling element in a selected position with reference to said track, including at least one yieldable arm installed in said track so that the rolling element can ride thereover, said arm having a locating portion normally extending into said path to abut against the oncoming rolling element and to thereby yieldably hold the rolling element in the position in which the rolling element abuts said locating portion.

4,733,500

WOOD SURFACE TREATMENT METHOD AND SYSTEM EMPLOYING TANDEMLY ORIENTED CROSS-BELTS AND ROTARY ABRADERS

Eugene C. David, New Hope, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 753,869, Jul. 11, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,790
Int. Cl.[4] B24B *3/36*
U.S. Cl. 51—3 3 Claims



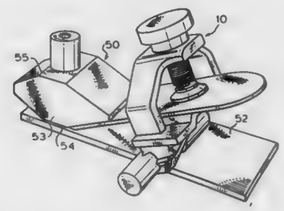
1. In a combination endless abrasive cross-belt and flexible rotary abrading surface treating apparatus having main frame means, means for receiving, guiding and driving an endless cross-belt with an abrasive coated outer surface about a predetermined path while trained about a plurality of cylindrical drums, platen means disposed substantially horizontally and generally midway between a first pair of said cylindrical drums and arranged to apply a working force along a predetermined plane and against the inner surface of an endless abrasive cross-belt while trained about said first pair of cylindrical drums, flexible rotary abraders arranged downstream of said platen to further treat the surface of a wooden workpiece, conveyor means moving along an axis of travel generally transverse to that of said abrasive cross-belt and having an upper surface for supporting wooden workpieces with their surfaces in contact with and opposed to said abrasive coated belt outer surface beneath said platen means and with the surfaces of said workpieces being opposed to the working surfaces of a flexible rotary abrader means, said combination abrasive cross-belt and flexible rotary abrading surface treating apparatus being characterized in that:
(a) said flexible rotary abrading surface treating apparatus includes a pair of rotary abraders disposed in superimposed relationship to said workpiece conveyor means immediately downstream of said platen means, and with said rotary abraders being disposed tandemly to and following downstream of said endless cross-belt, and wherein the axes of the flexible rotary abrading apparatus are arranged generally normal, one to the other and at an acute angle to the drive axis of the workpiece conveyor means, the arrangement being such that the outer peripheral surfaces of each individual cylindrical drum in said first pair is arranged generally along the plane of said endless abrasive cross-belt as the cross-belt moves beneath said platen means.

4,733,501

HONING GUIDE

Francis A. McLean, Ontario, Canada, assignor to Lee Valley Tools Ltd., Ottawa, Canada

Continuation-in-part of Ser. No. 778,625, Sep. 23, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,468
Int. Cl.[4] B24B *3/36*
U.S. Cl. 51—221 BS 3 Claims



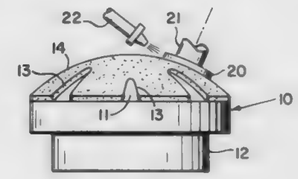
1. A honing guide for carrying a tool having a cutting edge to be honed over a honing surface, said guide comprising:
a tool support plate;
a bracket having at least one depending leg extending over said tool supporting plate;
adjustable fastening means for securing a tool to said tool supporting plate; and
roller means having an axis mounted on said bracket leg below said tool supporting plate to carry said tool at selected attitudes over said honing surface,
wherein said roller means is mounted eccentrically on a shaft, said roller means having a plurality of predetermined orienting stations thereon, and shaft orienting means mounted on said bracket for engaging selected ones of said orienting stations to select a variation in attitude of said cutting edge.

4,733,502

METHOD FOR GRINDING AND POLISHING LENSES ON SAME MACHINE

Gary A. Braun, Geneva, N.Y., assignor to Ferro Corporation, Cleveland, Ohio

Filed Sep. 4, 1986, Ser. No. 903,493
Int. Cl.[4] B24B *1/00*; B24D *11/00*
U.S. Cl. 51—284 R 10 Claims



1. A method of sequentially grinding and polishing an optical surface on a lens blank removably mounted on the spindle of a lens surfacing apparatus of the type having a cooperating lens surfacing lap, said method being performed without removing said lens blank from said spindle, and comprising the steps of:
a. releasably securing on said lens surfacing lap, by means of a high shear - low peel strength adhesive, a fining pad having abrasive fining particles fixed thereto by a non-water soluble matrix;
b. fine grinding said lens surface by said fining pad in the presence of a stream of liquid which is substantially free of any abrasive fining particles,
c. removing said fining pad from said lens surfacing lap;
d. releasably securing on said lens surfacing lap, by means of a high shear-low peel strength adhesive, a polishing pad having polishing particles fixed therein by a water-soluble matrix; and
e. polishing said lens surface by said polishing pad in the presence of a stream of liquid which is substantially free of any abrasive fining particles, whereby said successive fine grinding and polishing steps are accomplished while said lens blank remains on the same spindle of a lens surfacing apparatus.

4,733,503

ABRASIVE JET MACHINING

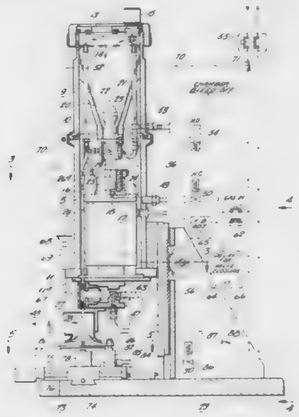
Ben J. Gallant, Corpus Christi, Tex., and Walter G. Kulischenko, East Brunswick, N.J., assignors to Airsonics License Partnership, Corpus Christi, Tex.

Filed May 1, 1986, Ser. No. 858,373
Int. Cl.[4] B24C *3/04*
U.S. Cl. 51—410 9 Claims

1. Apparatus for developing and handling an abrasive-laden gas stream, comprising a substantially vertical feed tube having an inlet at its upper end comprising an upwardly flared funnel and having a downwardly directed delivery nozzle at its lower end with a downwardly directed delivery nozzle opening, the vertical feed tube with said funnel and said nozzle having coaxial passages from the inlet of the funnel to the delivery nozzle opening, a pressurized gas receptacle in which said upwardly flared funnel is exposed, the pressurized receptacle having a bottom wall, and said vertical feed tube being extended downwardly through said bottom wall of the pressurized receptacle, a vibratory feed chamber in said pressurized receptacle, the feed chamber having a delivery duct adapted to feed a stream of particulate abrasive material into the inlet funnel of said feed tube to provide for carrying the particulate material in a stream of gas downwardly in said tube, a flow shut-off valve in said vertical feed tube below the bottom wall of the pressurized receptacle and upstream of the nozzle open-

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ing, a support for mounting a workpiece in spaced relation to the nozzle opening, and means for shiftably moving the work-



piece support in a direction transversely of the nozzle delivery passage.

4,733,504

MULTIPLE-GLAZED HEATED WINDOW

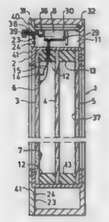
Bengt Lindgren, Sollentuna, Sweden, assignor to Termofrost Sweden AB, Spanga, Sweden

Continuation of Ser. No. 763,441, Aug. 1, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,131

Claims priority, application Sweden, Dec. 5, 1983, 8306711

Int. Cl.[4] E06B *7/12;* **G05D** *23/24;* **H02H** *5/10*

U.S. Cl. 52—1 **3 Claims**



1. A window for buildings, particularly dwelling houses and office buildings, comprising: a frame and at least two window panes; a first of said panes, the window pane on the side of the window which is intended to be located nearest the interior of a room, includes, applied directly on the surface of said side of said first pane remote from the room, an electrically conductive layer; a control circuit (8) for connection to a voltage source is mounted in the frame (2) of the window (1); a thermistor (14) is mounted between two of said panes in direct contact with the surface of said side of said first pane (3) intended to face away from the room, said thermistor (14) being connected to said control circuit (8) and being arranged in said circuit to produce an electric signal condition corresponding to the temperature of said first window-pane (3); said control circuit (8) includes a potentiometer and is arranged to supply and control the current to said electrically conductive layer so that said first window pane (3) can be brought to a given temperature as set by said potentiometer (16); and a second of said window panes (4,5), located toward and closer to the side of the window (1) intended to be located exterior of the room than is said first window pane (3) which carries the electrically conductive layer, having an infra-red reflecting layer (37) applied on the surface thereof facing said first pane and intended to face toward the interior of a room in which the window is to be installed.

4,733,505

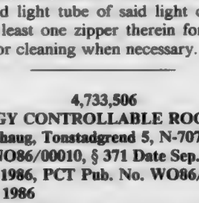
ENERGY-EFFICIENT SKYLIGHT STRUCTURE

James Van Dame, P.O. Box 28, River Jordan, British Columbia, Canada V0S 1L0

Filed Dec. 4, 1984, Ser. No. 677,825

Int. Cl.[4] E04B *7/18*

U.S. Cl. 52—22 **20 Claims**



1. An energy-efficient skylight structure for attaching to a ceiling having a hole therein, said structure including a roof membrane of light translucent material, the improvement comprising:

a framework being larger in size than the hole in the ceiling, said framework adapted to receive a light-diffusing panel;

means for attaching the framework over the hole in the ceiling to support beams for the ceiling;

gasket means between the framework and the ceiling for sealing the framework to the ceiling around the hole;

a light-diffusing panel held by the framework;

sealing means between the light-diffusing panel and the framework for sealing the perimeter of the light diffusing panel to the framework whereby the framework and panel cover seal the hole in the ceiling, thereby thermally insulating the room from the atmosphere on the other side of the panel, while permitting light to be transmitted therethrough; and

a light-channeling means attached at one end to the ceiling around the opening on the side opposite the framework and at the other end around the light translucent material of the roof membrane, said light-channeling means comprising an on-site custom constructed light tube having an internal light reflective surface, said tube being formed of a cloth-like fabric coated at least on one side with light-reflective material, the fabric of the light tube being fixedly attached to rafters and ceiling joists, in a manner that provides the shortest path of travel for the light entering at the roof membrane to the light diffusing panel, which may be symmetrically located anywhere in the ceiling regardless of the location of roof support beams wherein said light tube of said light channeling means includes at least one zipper therein for access into said light tube for cleaning when necessary.

4,733,506

SOLAR ENERGY CONTROLLABLE ROOF STRUCTURE

Olav J. Gunnarshaug, Tonstadgrend 5, N-7075 Tiller, Norway

PCT No. PCT/NO86/00010, § 371 Date Sep. 25, 1986, § 102(e) Date Sep. 25, 1986, PCT Pub. No. WO86/04632, PCT Pub. Date Aug. 14, 1986

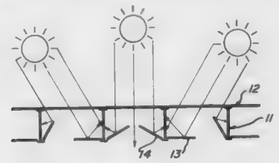
PCT Filed Jan. 31, 1986, Ser. No. 913,663

Claims priority, application Norway, Jan. 31, 1985, 850371

Int. Cl.[4] E04D *13/18;* **F24J** *2/00*

U.S. Cl. 52—22 **7 Claims**

1. A roof structure for transparent roofs, consisting of a number of support girders, wherein at least a part of each girder includes a sheet-formed solar panel which is operatively connected to a heat exchanger for a medium for heat transference, characterized by the fact that the solar panel is connected to a side surface of the girder and that the solar panels are



designed for receiving a fluid that can transfer heat, and that in the space between two girders is placed at least one element means, said element means having an upward-facing reflecting side and including means for moving it between various positions in relation to the solar panel and the opening between adjacent girders.

4,733,507

ISOLATION HUT

Luc Doublet, Seclin, France, assignor to S.A. Doublet Festitub, Pont-A-Marcq, France

Filed Sep. 15, 1986, Ser. No. 906,903

Claims priority, application France, Oct. 14, 1985, 85 15540

Int. Cl.[4] E04H *1/12*

U.S. Cl. 52—63 **20 Claims**

1. An isolation hut, to be used as a polling-booth during elections or other events, which is made from a sheet of basic folding material such as cardboard, pasteboard or light-weight multilayer material, said isolation hut comprising a plurality of lateral walls and a front access aperture, said lateral walls and said access aperture being adjacent to one another and forming between them a plurality of vertical corner edges, the isolation hut further comprising:

a self-supporting frame structure obtained by folding said basic folding sheet material constituting said lateral walls and said front access aperture, and

a plurality of frame posts for stiffening said self-supporting structure, said frame posts being disposed at the vertical edges formed by folding precut areas in said basic folding sheet material, wherein said self-supporting frame structure is reinforced by a desk-forming member extending between said lateral walls and comprising a bracing member between the adjacent and opposite lateral walls, said bracing member being supported in its horizontal position by the corner frame posts disposed between said first lateral wall and said other lateral wall.

4,733,508

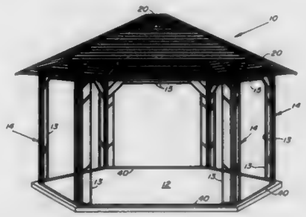
MULTI-SIDED BUILDING CONSTRUCTION

Kenneth A. Greenblatt, 335 S. Pasadena Ave., Azusa, Calif. 91702

Filed Nov. 3, 1986, Ser. No. 926,099

Int. Cl.[4] E04B *1/60*

U.S. Cl. 52—90 **17 Claims**



1. A multi-sided building structure assembly comprising:

a predetermined number of wall sections of generally equal outside dimension, each of said wall sections including first and second generally identical sections;

the same number of generally triangularly configured roof panels, each of said roof panels having first and second sides and a truncated apex edge having a surface;

the same number of generally identically configured bracket members, each of said bracket members having first means for interconnecting the upper ends of adjacent ones of said first and second sections in a predetermined angular relation for forming each of said wall sections, and second means for connection to adjacent ones of said roof panel sides adjacent the lower ends of said roof panels at each corner of the side opposite said truncated apex edge; and

a roof center hub support member having the same number of generally bar-shaped sections interconnected to form a regular geometrical configuration having a number of sides equal to said predetermined number, each of said sections having an outer surface disposed at a given angle to the plane of said support member for connection to said apex edge surface in surface abutting relation, the angle of said outer surfaces corresponding to the pitch of the roof panels.

4,733,509

MOVABLE PARTITION SYSTEM FOR CLEAN ROOM

Yoshihiko Takahashi, Komatsu, Japan, assignor to Comany Co., Ltd., Ishikawa, Japan

PCT No. PCT/JP85/00353, § 371 Date Feb. 19, 1987, § 102(e) Date Feb. 19, 1987, PCT Pub. No. WO86/07619, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 21, 1985, Ser. No. 32,457

Int. Cl.[4] F04B *5/58*

U.S. Cl. 52—126.5 **1 Claim**

1. A movable partition system for maintaining cleanliness and air tightness comprising a ceiling device in which a ceiling surface maintaining cleanliness and in which a reverse surface of the ceiling allows and facilitates walking and working thereon, a floor device maintaining cleanliness and a partition device and, partition wall displaying cleanliness and airtightness, wherein,

(I) said ceiling device is characterized in that:

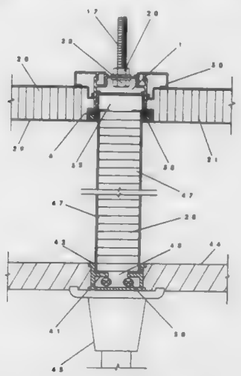
(a) steel backing members **18** provided as beams are fixed after being arranged parallel in a longitudinal direction, each of said steel backing members **18** being integrally formed by partially connecting a pair of large elongated steel lip channel members back to back with a slide slit **19** left therebetween to form a through aperture;

(b) a large steel hanger bolt **17** with a threaded portion passes through said slide slit **19** and is fixed to said steel backing member **18** by means of nuts **20**;

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(c) a first nut **20** is set at the lower end of said hanger bolt **17** passing through said slide slit, and other nut **20** is set at a position above and slightly spaced part from said first nut **20**, thereby enabling level adjustment;

(d) an elongated steel ceiling system bar **1** is secured to said hanger bolt **17** by inserting a second nut **20** set at the end of said hanger bolt **17** into a large aperture **12** opened in an upper raised portion **10** formed on said ceiling system bar **1**, where sliding said second nut **20** is slid along the edge of an elongated aperture **13** while making said hanger bolt **17** vertical and turning said another one of said nuts **20** to fix said ceiling system bar **1** to said hanger bolt **17**, said ceiling system bar **1** having a hollow inner space with downward facing opening and a substantially rectangular cross-sectional configuration, said ceiling system bar **1** having, at free ends of its opposite side wall portions, support projections **5** projecting therefrom outwardly and perpendicularly to a small extent, said ceiling system bar **1** having a pair of elongated F-shaped frame projections each having a F-shaped cross-sectional configuration in a rectangular form with a short leg portion, said configuration being outwardly and perpendicularly extending from the free ends of said support projections **5** such as to form a symmetrical arrangement, and each having a first recess **7** facing outwardly and formed in a position corresponding to the upper portion of said F-shaped configuration



and a second recess **8** formed thereunder, said recesses being fully charged with airtight material **23**, said ceiling system bar **1** having elongated engaging walls **9** extending upwardly and vertically to a small extent from said opposite side wall portions corresponding left and right sides of said rectangular cross-sectional configuration, said ceiling system bar **1** having said upper raised portion **10** in a form of an elongated rectangular box-like projection upwardly projecting from a portion corresponding to a bottom side of said rectangular cross-sectional configuration to a level corresponding to a height of said engaging walls **9**, and said ceiling system bar **1** further having rectangular fitting channels **11** formed between said engaging walls **9** and said upper raised portion **10**, elongated slanted walls **14** formed by slightly slantingly cutting and removing inner edges of said downward facing opening and inner wall portions equal to a small extent in a widthwise direction, elongated semi-circular grooves **15** having a semi-circular cross-sectional shape formed by cutting inner wall portions inside said slanted walls **14**, and frame receiving portions **16** formed at further inner positions such as to extend therefrom inwardly and perpendicularly to a small extent;

(e) a ceiling panel **21** encircled by a steel plate is slantingly lifted upwardly between said ceiling system bars while one of the opposite sides of said ceiling panel **21** is being positioned above the other, and is engaged with and hooked on said ceiling system bars **1** while being leveled, said ceiling panel **21** being charged with a reinforcement member, a heat insulating or sound insulating material **28**, and said ceiling panel **21** having hook frames **22** having a cross-sectional configuration in a form of rectangular hooks symmetrical in the vertical direction formed by inwardly turning said steel plate, which forms a panel surface **29**, over the full width of said panel along the opposite ends surfaces thereof which contact said ceiling system bars **1** and thereafter outwardly turning said steel plate;

(f) said hook frames **22** are engaged with and hooked on said F-shaped frame projections **6** without leaving any gap therebetween, and a ceiling cover **24** is fitted into said downward facing opening of said ceiling system bar **1** such as to align said panel surface **29** with a decorative surface **27** of said ceiling cover **24**, said ceiling cover **24** in the form of an elongated member made of metal having a generally U-shaped cross-sectional configuration, said ceiling cover **24** having insertion extensions **25** corresponding to the opposite sides of said U-shaped cross-sectional configuration, said insertion extensions **25** being fitted into said downward facing opening of said ceiling system bar **1**, said ceiling cover **24** having elongated semi-circular protrusions **26** having a semi-circular cross-sectional shape formed on the outer surfaces of said insertion extensions **25** at the free ends thereof to extend outwardly, said semi-circular protrusions **26** outwardly being brought into contact with said semi-circular grooves **15** of said ceiling system bar **1** in the outward directions at a time of fitting, and said ceiling cover **24** having said decorative surface **27** having a width equal to a distance between outer surfaces of said pair of F-shaped frame projections **6** and formed by perpendicularly and outwardly extending the portion corresponding to the bottom side of said U-shaped cross-sectional configuration over an entire length of said ceiling cover **24**;

(g) aluminium members **2** in the form of elongated frame members made of soft metal such as aluminium are laterally disposed on the reverse side of the ceiling above said ceiling panel **21** such as to be perpendicular to said ceiling system bars **1** and are thereafter fixed to form an accommodation frame **3**; and

(h) said ceiling system bar **1** and said ceiling panel **21** are connected to each other by fitting a panel holder **30** in a form of an elongated member made of metal from the reverse side of the ceiling onto said ceiling system bar **1** and said ceiling panel **21**, said panel holder **30** having a panel holding extension **31** narrowly formed by inwardly and perpendicularly bending a free end of one of left and right side wall portions corresponding to a generally U-shaped cross-sectional configuration of said panel holder **30**, said panel holder **30** further having a first fitting extension **32** corresponding to the other side wall portion, an upper holding extension **33** outwardly projecting perpendicularly from the outer surface of said fitting extension **32** to a small extent at a position spaced apart from a free end of said fitting extension **32** and at a distance corresponding to a height of said upper raised portion **10**, an elongated second fitting extendion **34** perpendicularly extending from a inner surface of said panel holder corresponding to the bottom side of said U-shaped cross-sectional configuration to a slightly smaller extent than a height of said fitting extension **32**, said first fitting extension **32** and said second fitting extension **34** being fitted into said fitting channel **11** of said ceiling system bar **1**, said upper holding extension **33** being brought into contact with said upper raised portion **10**, and said panel holding extension **31** being brought into contact with said panel surface **29** of said ceiling panel **21**,

(II) said floor device is characterized in that:

(a) a floor system bar **40** is disposed on a support foot **43** and embedded in a floor such as to be upwardly open and face

one of said ceiling system bars **1**, said floor system bar **40** having elongated receiving projections **41** inwardly and perpendicularly extending from inner surfaces of said wall portions of said floor system bar **40** at positions generally corresponding to centers of opposite sides of a U-shaped configuration to an extent about one third a distance between said inner surfaces, said floor system bar **40** having semi-circular grooves **15** having a semi-circular cross-sectional shape and formed in the inner surface of said side wall portions in positions immediately above those of said receiving projections **41** over an entire length of said floor system bar, said floor system bar **40** having lips **42** formed by perpendicularly and outwardly extending the free ends of said side wall portions to a small extent, a floor surface **44** and surfaces of said lips **42** being aligned with each other, the distance between the opposite inner surfaces of said floor system bar at an opening thereof being equal to that between the inner surfaces of frame extensions **36** of a ceiling frame **35** which is described later; and

(b) a floor cover **45** is fitted into said floor system bar **40**, said floor cover **45** in a form of an elongated thin metal frame member having a generally U-shaped cross-sectional configuration with an opening downward facing, said floor cover **45** having elongated semi-circular protrusions **26** having a semi-circular cross-sectional shape and formed on an outer surfaces of left and right side wall portions of said floor cover at free ends thereof, said semi-circular protrusions **26** being fittingly brought into contact with said semi-circular grooves **15** of said floor system bar **40** in an outward directions, a floor cover surface **46** being alinged with the surfaces of said lips **42** and said floor surface **44**,

(III) said ceiling cover **24** fitted and fixed in said ceiling system bar **1**, said ceiling frame **35** is fitted and fixed to said downward facing opening thereof without leaving any gap, providing a lighting fixture **39** in said ceiling frame **35** without leaving any gap therebetween, said ceiling frame **35** in the form of an elongated metal member having a generally U-shaped cross-sectional configuration with an opening facing downwardly, said ceiling frame **35** having said frame extensions **36** corresponding to opposite sides of said U-shaped cross-sectional configuration, and elongated semi-circular protrusions **26** having a semi-circular cross-sectional shape and formed on its outer surfaces, said elongated semi-circular protrusions being brought into contact with said semi-circular grooves **15** of said ceiling system bar **1** in an outward directions at a time of fitting, a bottom frame portion **37** of the ceiling frame **35** corresponding to a bottom side of said U-shaped cross-sectional configuration and being brought into contact with said support projections **5** at the same time, said ceiling frame **35** further having joint cover extensions **38** formed by outwardly and perpendicularly extending a free ends of said frame extensions **36** to a position which corresponds to the outer surfaces of said F-shaped frame projections **6** at the time of fitting, open front surfaces of said joint cover extensions **38** being aligned with said panel surface **29** at the same time while reverse surfaces of said joint cover extensions **38** are brought into contact with said short leg portions of said F-shaped frame extensions, and

(IIII) said partition device is characterized in that:

(a) after said ceiling frame **35** has been mounted in said ceiling system bar **1** and after said floor cover **45** in a corresponding position and has been removed from said floor system bar **40**, an upper end of a partition wall **47** is inserted into said frame extensions **36**, moved downwardly while being maintained to be vertical to fit a lower end of said floor system bar **40**, and brought into contact at the lower end with said receiving projections **41**, a thickness of said partition walls **47** being set to be equal to a distance between inner surfaces of said frame extensions **36**;

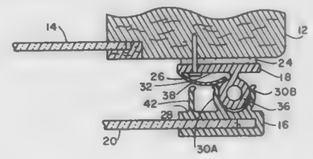
(b) and, a lower attachment fixture **49** is set between said receiving projections **41** of said floor system bar **40** with gaps equal to a thickness of frame members being left between said lower attachment fixture **49** and said lips **42**, and a door frame **48** having a thickness equal to that of said partition wall **47** is fitted and installed in an equivalent manner with regard to said partion wall **47**.

4,733,510

FRAMED PANEL ASSEMBLY

David G. Werner, Oshkosh, Wis., assignor to R & H Partners, Little Chute, Wis.

Filed Jul. 31, 1985, Ser. No. 761,171
Int. Cl.[4] **E06B** *3/26*
U.S. Cl. 52—202 **7 Claims**



1. A framed panel assembly for attachment to a surface, said framed panel assembly comprising:

(a) a panel assembly frame having a first perimeter, said frame having means for receiving a panel, and having a first retainer means attached to a face of said frame and extending about said frame;

(b) an adapter, to cooperatively attach said frame to said surface, said adapter having a second perimeter, and a second retainer means for joining with said first retainer means, said adapter extending about said assembly frame in joined relationship therewith; and

(c) a strip, said strip having first and second edges, said first edge thereof being attached to one of said frame and said adapter, the other of said frame and said adapter contacting said strip upon assemblage of said assembly,

said frame comprising a first base member and said first retainer means, said first retainer means extending from said first base member, said adapter comprising a second base member and said second retainer means, said second retainer means extending from said second base member, one of said first and second retainer means having a bulbous portion, said bulbous portion being attached to the corresponding one of said first and second base members, said second edge of said strip being disposed for engagement against said bulbous portion upon assemblage of said assembly.

4,733,511

GRAVITY CLOSING FIRE-RATED CEILING ACCESS DOOR

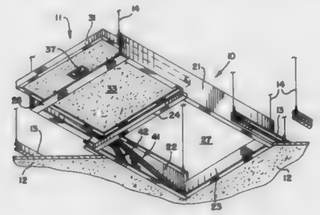
James C. Muth, Milwaukee, Wis., assignor to Milcor Incorporated, Lima, Ohio

Filed Mar. 25, 1986, Ser. No. 843,498
Int. Cl.[4] **E06B** *5/00;* **E05F** *1/02*
U.S. Cl. 52—204 **16 Claims**

1. An access door assembly for a ceiling, comprising a door frame adapted to be mounted in a ceiling, said frame forming a door opening, a moveable door panel positioned within said frame and having forward and rearward ends, a plurality of tracks on said frame, rollers on said forward end and on said rearward end of said door panel and engaging said tracks for mounting said door panel for movement between an open

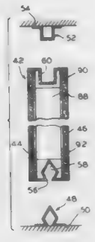
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position and a closed position relative to said frame, said tracks being sloped throughout their lengths and thereby always



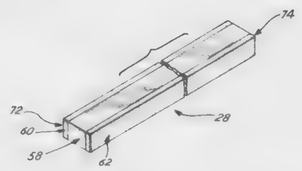
gravity actuating said door panel to roll on said rollers to said closed positions where said door panel closes said opening.

4,733,512
MODULAR STRUCTURE, STUD THEREFOR, AND METHOD OF CONSTRUCTION
Donald L. Kiselewski, 4705 Holly Dr., Palm Beach Gardens, Fla. 33410
Division of Ser. No. 774,663, Sep. 11, 1985, Pat. No. 4,648,228, which is a division of Ser. No. 470,160, Feb. 28, 1983, Pat. No. 4,551,961. This application Sep. 16, 1986, Ser. No. 907,785
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—238.1 **5 Claims**



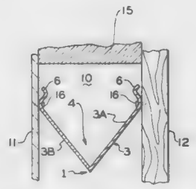
1. An interior wall, comprising:
a stud having a pair of panels secured thereto, said stud being disposed between said panels and interiorly thereof and said panels each extending above and below said stud at the top and bottom thereof, said panels cooperating with said stud to define top and bottom retainer receiving recesses;
first retainer means including a first portion secured to said stud at the bottom thereof inwardly of said panels in said bottom recess, said first portion of said first retainer means extending downwardly from said stud to a point adjacent the bottom of said panels so as to be substantially entirely concealed within said bottom recess, said first retainer means including a second portion secured to a floor;
said first portion of said first retainer means including an opening leading to said bottom recess, said second portion of said first retainer means including means for cooperating with said first portion thereof in snap-fit and totally hidden fashion after insertion through said opening to maintain said wall in a selected position relative to said floor; and
second retainer means including a first portion secured to said stud at the top thereof inwardly of said panels in said top recess, said first portion of said second retainer means extending upwardly from said stud to a point adjacent the top of said panels so as to be substantially entirely concealed within said top recess, said second retainer means including a second portion secured to a ceiling;
said first portion of said second retainer means including an opening leading to said top recess, said second portion of said second retainer means including means for cooperating with said first portion thereof in slide-fit and totally hidden fashion after insertion through said opening to maintain said wall in a selected position relative to said ceiling;
said first and second retainer means comprising the only retainer means for said interior wall.

4,733,513
TYING BAR FOR CONCRETE JOINTS
Ernest K. Schrader, 1255 Magnolia Dr., Walla Walla, Wash. 99362, and Robert F. Oury, Rte. 1, 100 Freeman Rd., Gilberts, Ill. 60136
Filed Oct. 21, 1986, Ser. No. 921,594
Int. Cl.[4] F04B *1/48;* **E01C** *11/14;* **E04F** *15/14*
U.S. Cl. 52—396 **26 Claims**



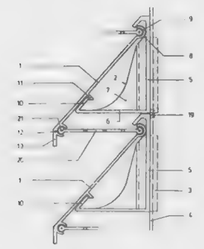
1. An improved dowel or tying bar for transferring stresses across a joint between concrete structures and accommodating for shrinkage or expansion the concrete structures, the joint defining an axis, the improved bar having sides and a first and second end, the sides of the bar embedded in the concrete structures and arranged across the joint in a direction substantially perpendicular to the axis defined by the joint, and the bar further having a resilient facing attached to at least one side of the bar to provide for movement of the concrete structures in relationship to the bar in a direction substantially perpendicular to the resilient facing and substantially aligned with the joint axis.

4,733,514
BUILDING CONSTRUCTION WITH MELTABLE INSULATION AND RESERVOIR TROUGH THEREFOR
Thomas L. Kelly, c/o Kelly Energy System, Inc., P.O. Box 2583, Waterbury, Conn. 06723
Filed Apr. 8, 1986, Ser. No. 849,306
Int. Cl.[4] E04B *1/94*
U.S. Cl. 52—317 **14 Claims**



1. A building structure comprising a pair of spaced confronting structural members, a pair of spaced uprights between the structural members and cooperating therewith to collectively define an interior compartment, a partition having a body formed of imperforate material and mounted within the interior compartment to extend generally horizontally therein and providing an imperforate sealing member for the interior compartment, the body of the partition being elongated and defining an upwardly opening cavity, and meltable insulation received within the compartment above the partition, the meltable insulation being of low heat capacity and which, when subjected to heat, undergoes a phase change transition from a solid to a flowable molten mass of decomposed combustible insulation, the cavity of the partition serving to receive and contain the flow of insulation melt in the event of fire.

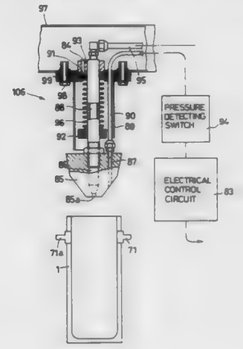
4,733,515
FIXING ARRANGEMENT FOR SHUTTER BLADES
Hans Schmidlin, Aesch, Switzerland, assignor to Eltreva AG, Aesch, Switzerland
PCT No. PCT/EP86/00173, § 371 Date Nov. 24, 1986, § 102(e) Date Nov. 24, 1986, PCT Pub. No. WO86/05573, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 22, 1986, Ser. No. 937,201
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510461
Int. Cl.[4] E06B *7/08*
U.S. Cl. 52—473 **19 Claims**



1. A bracket for use in supporting a louver slat on a facade, the facade having a groove extending perpendicularly to the louver slat for receiving the bracket, comprising:
a first leg;
a second leg connected to the first leg and projecting at an angle from the first leg, the first and second legs being adapted to hold a portion of the louver slat;
a filler piece projecting beyond one end of the first leg; and
means for infinitely adjusting the bracket along the groove comprising a pair of spaced members attached to the first leg and adapted to be received in the groove, the spaced members being adapted to be displaced away from one another when the filler piece of a contiguous bracket is inserted therebetween, whereby the spaced members, when displaced, compressively engage the sides of the groove and thereby hold the bracket at a desired location along the groove.

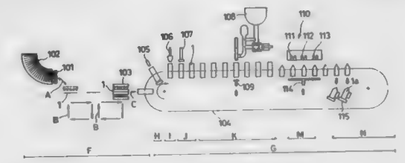
4,733,516
APPARATUS FOR FILLING BAGS
Yozo Araki, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan
Division of Ser. No. 837,092, Mar. 5, 1986, Pat. No. 4,674,266. This application Nov. 6, 1986, Ser. No. 927,756
Claims priority, application Japan, Jun. 15, 1983, 58-107284; Oct. 5, 1983, 58-186314; Oct. 5, 1983, 58-186315; Nov. 28, 1983, 58-223508
Int. Cl.[4] B65B *57/02*
U.S. Cl. 53—84 **2 Claims**

1. An apparatus for filling bags with a material and for sealing them, characterized by comprising:
a pair of chain conveyors disposed in parallel vertical planes;
grippers for bags held on said chain conveyors;
nozzles for sealing openings of said bags gripped by said grippers and for introducing compressed air thereinto;
a pressure detecting device for measuring the pressure within said bags;
filling devices for filling said bags with the material; and



control means for receiving an output from said pressure detecting device and for controlling said filling devices thereby.

4,733,517
APPARATUS FOR FILLING BAGS
Yozo Araki, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan
Division of Ser. No. 837,092, Mar. 5, 1986, Pat. No. 4,674,266. This application Nov. 6, 1986, Ser. No. 927,804
Claims priority, application Japan, Jun. 15, 1983, 58-107284; Oct. 5, 1983, 58-186314; Oct. 5, 1983, 58-186315; Nov. 28, 1983, 58-223508
Int. Cl.[4] B65B *3/12*
U.S. Cl. 53—84 **2 Claims**



1. An apparatus for filling bags with a material and for sealing them, characterized by comprising:
a pair of chain conveyors disposed in parallel vertical planes;
a plurality of carriers held between said chain conveyors;
a plurality of grippers for the bags disposed on each of said carriers;
a plurality of filling nozzles, having valves, for feeding the material to said bags gripped by said grippers;
a storage tank for storing the material;
a plurality of feeding pipes and return pipes for connecting said filling nozzles to said storage tank;
metering cylinders equipped with reciprocating pistons;
three-way valves each disposed in a respective said storage tank, said metering cylinder and said feeding pipe;
a link mechanism for actuating said three-way valves and said pistons in said metering cylinders; and
actuating devices for the valves of said filling nozzles.

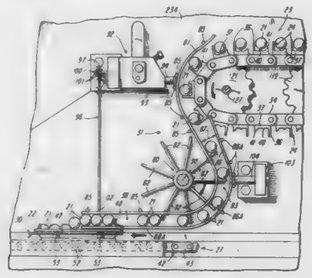
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,518

APPARATUS FOR PACKAGING ARTICLES AND METHOD OF MAKING SUCH APPARATUS

Carl P. Griesdorn, Cincinnati, Ohio, assignor to Planet Products Corporation, Cincinnati, Ohio

Filed May 30, 1985, Ser. No. 739,247
Int. Cl.[4] B65B *19/34*
U.S. Cl. 53—444 **32 Claims**



31. In a method of making an apparatus for packaging articles of roughly equal size in package means therefor, said method comprising the steps of providing first conveyor means for said articles, attaching on said first conveyor means a plurality of receptacles each for receiving and supporting an individual one of said articles, providing second conveyor means for sequentially moving a plurality of package means in a first plane for receiving said articles, and providing transfer means for transferring a predetermined number of said articles from said first conveyor means into associated package means, the improvement in said method wherein initially each of said receptacles provides the total support and movement of an associated one of said articles including movement in a vertical transfer zone during a first portion of substantially vertically downward movement between said first and second conveyors before said transfer means provides total support thereof, said step of providing transfer means comprises providing means of said transfer means which maintains said articles separate from each other until said articles are in a second plane disposed above and parallel to said first plane, said transfer means operating to accumulate articles in said second plane until said predetermined number have been accumulated, said steps of providing first and second conveyor means comprise providing said first and second conveyor means with portions thereof in parallel facing relation, and said method comprising the further step of providing drive means for operating said conveyor means in a continuous non-indexing manner to thereby continuously package said predetermined number of articles in an associated package means.

4,733,519

METHOD AND SYSTEM FOR FORMING FLOPPY DISK ENVELOPES

Bruce Harper, San Jose, and Horace N. Kemp, Walnut Creek, both of Calif., assignors to Xidex Corporation, Santa Clara, Calif.

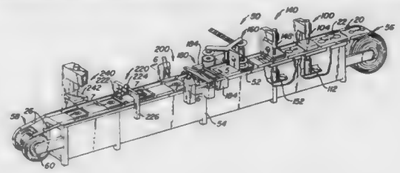
Continuation-in-part of Ser. No. 734,621, May 15, 1985, Pat. No. 4,630,427. This application Sep. 24, 1986, Ser. No. 911,187
Int. Cl.[4] B65B *43/10*
U.S. Cl. 53—456 **7 Claims**

1. A method for forming a floppy disk envelope, said method comprising:

immobilizing an envelope blank composed of a thermoplastic having a primary flap joined to a secondary flap along a first edge and to three sealing flaps along the other three edges;

simultaneously impressing four orthogonal fold lines in the blank along the four edges of the primary flap, with a reciprocating die mechanism having profile of a pair of adjacent arcuate sections to form. said fold lines having a profile including a pair of arcuate sections having first and second radii in the range from about 0.02 to 0.04 inches respectively and joined by a thinned hinge section;

simultaneously folding the secondary and sealing flaps upward along the fold lines to define a receptacle for receiving a disk media;



folding the secondary flap downward onto the disk media, whereby the primary and secondary flaps are spaced apart by a distance equal to the sum of the radii to provide sufficient internal clearance for the disk media; and

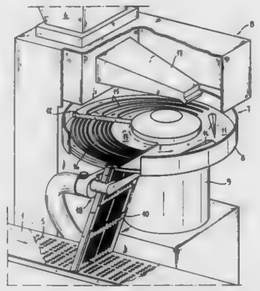
folding and sealing the sealing flaps onto the primary flap.

4,733,520

SUPPLY DEVICE WITH AN ECCENTRIC VIBRATING CYLINDRICAL CONTAINER FOR THE SUPPLY OF PRODUCTS TO BE PACKAGED PARTICULARLY BY MACHINES FOR BLISTER PACKAGING

Umberto Rabbi, Bologna, Italy, assignor to I.M.A. Industria Macchine Automatiche-S.p.A., Ozzano Emilia, Italy

Filed Jul. 17, 1987, Ser. No. 74,770
Claims priority, application Italy, Sep. 22, 1986, 3509 A/86
Int. Cl.[4] B65B *5/04, 47/00*
U.S. Cl. 53—559 **2 Claims**



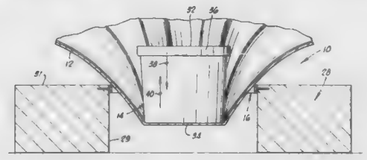
1. A supply device with a vibrating cylindrical container for the supply of products to be packaged, particularly designed for blister packaging machines, to the vibrating cylindrical container communicating with a device with multiple supply channels, characterised in that the vibrating cylindrical container has a vertical axis which is eccentric with respect to the vertical axis of the vibrator unit which supports it and has an annular base developing in a helically ascending manner from a first straight line at which point the vibrating cylindrical container communicates with the said device with multiple supply channels, followed by a portion below said annular base leading to said device with multiple supply channels, and in that respective flow stop and guide means are provided along said base with an ascending development for guiding products in multiple rows and guide means are provided along said portion for said multiple row products supply and suction means respectively for supplying the product to be packaged to the peripheral zone of the container in which the said flow stop means are located and to suction the dust and/or fragments of product below the base of the container at the opposite sides of the device with multiple supply channels.

4,733,521

COVER FORMING APPARATUS

Donald E. Weder; Erwin H. Weder; Herbert A. Weder, all of Highland, Ill., and Franklin J. Craig, Valley Park, Mo., assignors to Highland Supply Corporation, Highland, Ill.

Filed May 20, 1986, Ser. No. 865,206
Int. Cl.[4] B65B *11/00*; A01G *9/02*
U.S. Cl. 53—580 **16 Claims**



1. A cover forming apparatus for forming a sheet of material about a flower pot having an upper end, a lower end and an outer peripheral surface to produce a cover extending generally about the outer peripheral surface of the flower pot comprising:

a cover former having an object opening formed through a portion thereof adapted to receive a portion of the flower pot, the object opening being shaped generally in the shape of the outer peripheral surface of the flower pot, the cover former having portions forming resilient contactors, the contractors being resiliently engagable with portions of the sheet of material and adapted for pressing the engaged portions of the sheet of material against the outer peripheral surface of the flower pot when the flower pot with the sheet of material disposed near the flower pot are passed through the object opening, the sheet of material being formed by the cover former into the cover for the flower pot extending generally about the outer peripheral surface of the flower pot, the contactors cooperating to form the object opening, the sheet of material being disposable generally over the object opening and the flower pot being positionable generally above the portion of the sheet of material disposed generally over the object opening, the flower pot being movable to a position engaging the sheet of material and movable through the object opening, the flower pot generally engaging the sheet of material and moving the engaged portion of the sheet of material and at least a portion of the remaining portion of the sheet of material through the object opening along with the flower pot as the flower pot is moved through the object opening, the contactor portions being positioned for resiliently engaging the sheet of material and pressing the engaged portions of the sheet of material against the flower pot generally about the outer peripheral surface of the flower pot for forming the sheet of material about the outer peripheral surface of the flower pot.

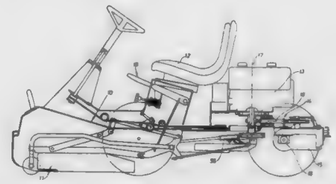
4,733,522

MOWER

Rolf A. G. Johansson, Partille, Sweden, assignor to Husqvarna Aktiebolag, Sweden

Filed Sep. 15, 1986, Ser. No. 907,420
Claims priority, application Sweden, Sep. 27, 1985, 8504492
Int. Cl.[4] A01D *34/64*
U.S. Cl. 56—17.4 **8 Claims**

1. A riding mower comprising a chassis, a driving mechanism for the wheels of said mower, a front mounted cutting attachment provided on said mower and having rollers thereon, said cutting attachment having at least one cutting blade and a casing surrounding said cutting blade, means including an operating device for movably fastening said cutting attachment to said chassis and for moving said cutting attachment from a lower cutting position to an upper noncutting position and vice versa, the front part of said chassis being shaped as a protective hood covering the cutting attachment when it is in said lower position supported by said rollers, a



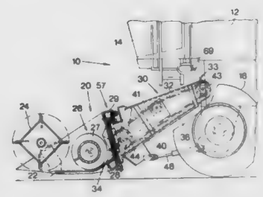
guard enclosing the cutting attachment and said rollers and located in front of and spaced from said casing, said guard being secured to the front part of said chassis and following the movement of said cutting attachment so that loose objects in the path of movement of the cutting blade of said mower will be deflected harmlessly.

4,733,523

HEADER FLOTATION SYSTEM FOR AN AGRICULTURAL MACHINE

Alfons W. Dedeyne, Roeselare; Roger C. Deroo, and Guy H. J. Osselaere, both of Zedelgem, all of Belgium, assignors to New Holland Inc., New Holland, Pa.

Filed Apr. 29, 1987, Ser. No. 43,896
Int. Cl.[4] A01D *34/28, 75/28*
U.S. Cl. 56—209 **11 Claims**



1. A harvester comprising:

a mobile base unit adapted for movement over the ground;

a transversely extending crop harvesting header supported from the base unit for allowing pivotal movement about a generally fore-and-aft axis of the machine;

a lateral flotation system for pivoting the header about the generally fore-and-aft axis and including a two way hydraulic actuator means extending between the header and the base unit for pivoting the header in the one or the other direction and positioning the header in a nominal position intermediate opposed extreme positions prior to starting flotation operation; a pressure source coupled by a pair of pressure fluid supply lines to the hydraulic actuator means; and energy storage means connected to the hydraulic actuator means;

said energy storage means being in the form of a hydropneumatic accumulator coupled to each one of the pressure fluid supply lines and pressurized at a pressure greater than the working pressure of the hydraulic actuator means for pivoting the header, such that, when the header is positioned at a nominal position and meets an obstruction, said header is permitted to temporarily pivot from said

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nominal position for moving over said obstruction, this pivotal movement resulting in the gas in one hydro-pneumatic accumulator being temporarily compressed by the flow of pressure fluid out of the actuator means to store energy, this pressure fluid subsequently being released back to the actuator means to restore the header to its nominal position upon the header clearing the obstruction, the gas volume in the other hydro-pneumatic accumulator remaining unchanged during this pivotal movement away from and back to the nominal position, whereby said other hydro-pneumatic accumulator remains inoperative under this condition.

4,733,524

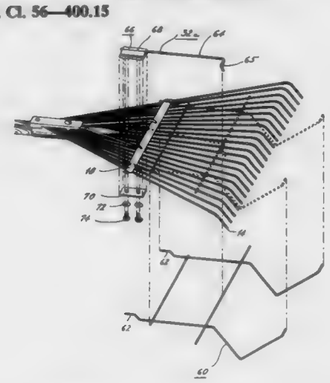
SKIMMER ELEMENT FOR LAWN RAKE

Arthur C. Forbes, 333 Summit Ave., Jenkintown, Pa. 19046

Continuation-in-part of Ser. No. 814,365, Dec. 30, 1985, Pat. No. 4,667,461. This application Mar. 30, 1987, Ser. No. 31,587

Int. Cl.[4] A01D *7/00*

U.S. Cl. 56—400.15 **8 Claims**



1. A runner apparatus for a lawn rake, said rake having a plurality of tines and a tine reinforcement plate, to support the tines of the rake above the substrate to be cleared, comprising:

a self-attaching skimmer element having at least one skid to glide along the surface of the substrate, at least one attachment member to seat against the tine reinforcement plate, and a cross brace; and

a restraint arm having a hook, which arm cooperates with the attachment member to retain the self-attaching skimmer element against the rake through engagement of said hook with said cross brace.

4,733,525

CUTTING MACHINE UTILIZABLE IN AGRICULTURE, VITICULTURE AND ABORICULTURE

Roger J. P. Pellenc, and Georges Roman, both of Pertuis, France, assignors to Etablissements Pellenc & Motte, Pertuis, France

Continuation of Ser. No. 670,831, Nov. 13, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 20,247

Claims priority, application France, Nov. 14, 1983, 83 18167

Int. Cl.[4] A01D *49/00*

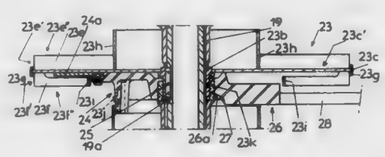
U.S. Cl. 56—503 **27 Claims**

1. A cutting machine, for use in agriculture, viticulture, and arboriculture, comprising a cutting tool including:

(i) a rotatable circular cage having radially extending teeth bounding indentations in its periphery,

(ii) a member taking part in the cutting action and disposed within said cage and extending radially outwardly over at least a part of said indentations, said teeth and said member coacting for cutting of material introduced into said indentations, and

(iii) motor means coupled to said cage for rotating it.



4,733,526

SEPARATION OF GAS MIXTURE

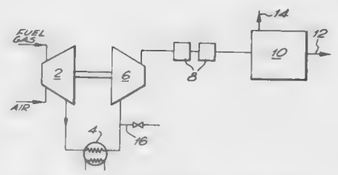
Michael E. Garrett, Woking, England, assignor to The BOC Group plc, Windlesham, England

Filed Mar. 4, 1986, Ser. No. 836,029

Claims priority, application United Kingdom, Mar. 4, 1985, 8505521

Int. Cl.[4] F02C *6/00*

U.S. Cl. 60—39.02 **6 Claims**



1. A method of producing nitrogen comprising the steps of burning a fuel gas with air in the combustion chamber of a gas turbine to form a gaseous mixture comprising nitrogen, oxygen and combustion products, the oxygen concentration of the gaseous mixture being less than 20% by volume, reducing the temperature of the gaseous mixture, compressing the gaseous mixture in a compressor, and physically separating the compressed gaseous mixture by pressure swing adsorption to obtain a nitrogen-rich product, wherein energy developed by the turbine is employed to drive the compressor.

4,733,527

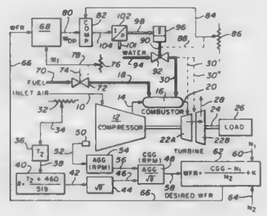
CONSTANT NO_x CONTROL FOR GAS TURBINE

Harry A. Kidd, Shinglehouse, Pa., assignor to Dreser Industries, Inc., Dallas, Tex.

Filed Mar. 12, 1987, Ser. No. 24,817

Int. Cl.[4] F02C *7/00, 9/00*

U.S. Cl. 60—39.05 **10 Claims**



1. A system for automatically maintaining substantially constant nitrogen oxide emissions from a gas turbine burning a gaseous or liquid fossil fuel injected through at least one fuel input valve by the use of variable quantities of water injected in the combustor through a water input valve, the system comprising:

a. means for determining a corrected rotational speed, CGG, of said gas generator according to the formula

$$CGG = \frac{AGG}{\sqrt{\theta}} \quad (1)$$

where AGG=the actual rotational speed of said gas generator,

$$\theta = \frac{T_2 + 460}{519},$$

the gas generator air inlet temperature correction factor, and T_2=compressor inlet temperature, and

b. means coupled to said determining means for automatically varying the water/fuel ratio, WFR, by changing the volume of water input through said water valve to said gas generator with variation in load, inlet temperature and turbine speed according to the formula

$$WFR = \frac{CGG - N_1}{N_2} + K \quad (2)$$

where N_1=minimum corrected gas generator speed for WFR=0.0, N_2=(corrected gas generator speed for WFR=1.0)$-N_1$ and K=constant thereby maintaining a substantially constant emission of oxides of nitrogen from said gas turbine.

4,733,528

ENERGY RECOVERY

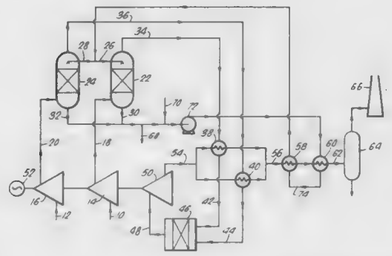
Alwyn Pinto, Middlesbrough, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 703,531, Feb. 20, 1985. This application May 30, 1986, Ser. No. 868,748

Claims priority, application United Kingdom, Mar. 2, 1984, 8405591; Jun. 4, 1984, 8417016; Jun. 4, 1984, 8417017; Oct. 9, 1984, 8425508; Jun. 4, 1985, 8513997; Jun. 18, 1985, 8515392

Int. Cl.[4] F02C *3/28*

U.S. Cl. 60—39.12 **13 Claims**



1. A process for the recovery of energy by the production of shaft power from a fuel gas comprising:

carbon dioxide; and

at least one combustible gas selected from:

methane;

hydrogen; and

carbon monoxide; said fuel gas having a composition such that its calorific value is below 1100 BTU/scf (41 MJ.m^{-3}) and containing at least 20% by volume of carbon dioxide; said process comprising:

(a) contacting said gas with an aqueous solution of an absorbent for carbon dioxide, whereby carbon dioxide is absorbed from said gas into said absorbent solution and the resultant carbon dioxide depleted gas is saturated with water vapor;

(b) separating the saturated carbon dioxide-depleted gas from said absorbent, so as to give a saturated carbon dioxide depleted gas having a calorific value of 15 to 1100 BTU/scf (0.6 to 41 MJ.m^{-3});

(c) regenerating said absorbent by heating, and returning the regenerated absorbent to step (a);

(d) compressing air in a compressor;

(e) combusting said carbon dioxide-depleted gas with said compressed air in a combustion zone;

(f) expanding the resultant combustion products in an expander driving said compressor and producing the shaft power; and

(g) recovering heat from the turbine exhaust gas by indirect heat exchange and using said recovered heat to heat the absorbent in the regeneration thereof.

4,733,529

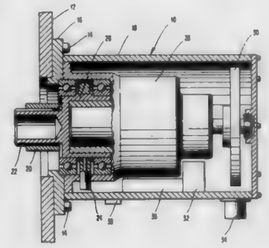
PERFORMANCE ENVELOPE EXTENSION DEVICE FOR A GAS TURBINE ENGINE

Neil M. Nelson, Winterhaven; William A. Sponzilli, Sarasota, and Quitman W. Lott, Lakeland, all of Fla., assignors to CEF Industries, Inc., Haines City, Fla.

Filed Sep. 26, 1986, Ser. No. 911,870

Int. Cl.[4] F02C *7/00*

U.S. Cl. 60—39.091 **15 Claims**



1. An apparatus for controlled uniform cooling of a gas turbine engine having a spool, comprising:

a motor;

a gearset engaged with said motor;

overridable coupling means engaging said gearset with a turbine accessory shaft which is connected to the spool;

means for sensing engine operation;

means for sensing when the engine has been shutdown;

means for controlling the motor to rotate the spool for a predetermined period after the sensing means determines that the engine has been shutdown;

a housing for containing the apparatus; and

means for detachably attaching the housing to an engine accessory pad of a gas turbine engine.

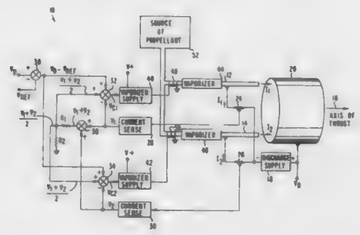
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4,733,530

EMISSION CURRENT CONTROL SYSTEM FOR MULTIPLE HOLLOW CATHODE DEVICES

John R. Beattie, Westlake Village, and Donald J. Hancock, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 4, 1986, Ser. No. 892,559
Int. Cl.[4] H05H *1/00*
U.S. Cl. 60—202 8 Claims



1. A system for controlling the respective emission currents from a plurality of cathodes in accordance with an input signal comprising:

a cathode power supply generating a supply voltage, said supply being conductively coupled to each of said cathodes by separate conductors for providing cathode current flows thereto;

a plurality of current sensing means conductively coupled to respective ones of said conductors for sensing the respective cathode currents, each of said sensing means generating a sensing output signal which has a magnitude proportional to sensed cathode current;

means for averaging whereby the magnitudes of said output signals are averaged, said averaging means generating an averaging output signal having a magnitude proportional to the average of said sensing output signals;

reference potential means producing a reference output signal having a magnitude proportional to the difference between said supply voltage and said input signals;

a plurality of flow regulator means each one of which is operably connected between a source of material to be ionized and a respective one of said cathodes for regulating a flow of said material through said cathode;

a plurality of regulator control means each one of which has a control output signal the magnitude of which controls a respective one of said flow regulators, each of said regulator control means being responsive to the magnitudes of respective ones of said sensing output signals, and to said averaging output signal and said reference output signal.

4,733,531

LIQUID-PROPELLANT MANAGEMENT SYSTEM WITH CAPILLARY PUMPING VANES

R. K. Grove, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

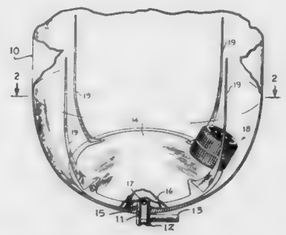
Filed Mar. 14, 1986, Ser. No. 839,831
Int. Cl.[4] F02K *9/00*; E03B *11/00*; F17D *1/00*
U.S. Cl. 60—259 4 Claims

1. In a liquid-propellant management system for a space vehicle, said system comprising:

(a) a hollow tank defining a volume for storage of liquid propellant, said tank having a first opening and a second opening, said first opening being connectable to a first line through which said liquid propellant can be expelled from said tank to thrusters for maneuvering said space vehicle, said second opening being connectable to a second line through which pressurized gas can be introduced into said tank to effect expulsion of said liquid propellant from said tank via said first line to said thrusters;

(b) a hollow trap of generally lenticular configuration positioned within said tank, said trap having a porous inlet window for said liquid propellant and an exit port for said liquid propellant, said trap being disposed in a polar region of said tank and being secured to said tank so that said exit port of said trap is aligned with said first opening of said tank, said inlet window having pores dimensioned to permit passage of said liquid propellant therethrough, said pores maintaining a barrier of said liquid propellant on said inlet window by surface tension when liquid propellant is not passing therethrough, said barrier substantially precluding passage of said gas therethrough, whereby substantially gas-free liquid propellant can pass through said exit port of said trap and through said first opening of said tank to said first line; and

(c) a liner positioned within said trap, said liner being secured to an interior wall of said trap so as to define a first volume and a second volume within said trap; said first volume being bounded by a first side of said liner, a corresponding first portion of said interior wall of said trap and said porous inlet window of said trap; said second volume being bounded by a second side of said liner, a corresponding second portion of said interior wall of said trap and said exit port of said trap; said liner having a porous window for passage of said liquid propellant therethrough from said first volume into said second volume within said trap, said porous window of said liner serving as a barrier to preclude passage of said gas therethrough when said porous window is wetted by said liquid propellant; said system further comprising a vane, a proximal end of said vane being attached to an exterior surface portion of said trap at a position spaced apart from said inlet window, a distal end of said vane extending into said volume within said tank outside said trap beyond said polar region of said tank, said vane having an elongate edge that is spaced apart from an interior wall portion of said tank by a capillary distance so that liquid propellant collected between said interior wall portion of said tank and said elongate edge of said vane is pumped by capillary action to said position on said exterior surface portion of said trap spaced apart from said inlet window of said trap, whereupon said liquid propellant spreads over said exterior surface portion of said trap to said inlet window of said trap for entry into said first volume within said trap.



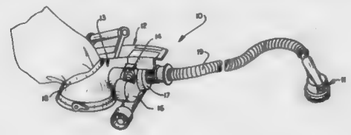
4,733,532

FLUID POWER TRAIN FOR SMALL APPLIANCES

Joseph M. Prahl, East Cleveland, and Werner W. Kochte, Ravenna, both of Ohio, assignors to The Scott Fetzer Company, Westlake, Ohio

Filed Aug. 9, 1985, Ser. No. 764,838
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—407 11 Claims

1. A matched pump and turbine motor set operating in the incompressible domain and developing a high power level comprising a pump which produces an output pressure that is inversely interdependent on its output flow and produces a maximum of output power as the product of its pressure and flow when its flow is constrained to pass through a predetermined optimum area, the turbine motor having a rotor of the impulse type and an inlet flow path for fluid entering the turbine motor, the flow path having an effective area normal to



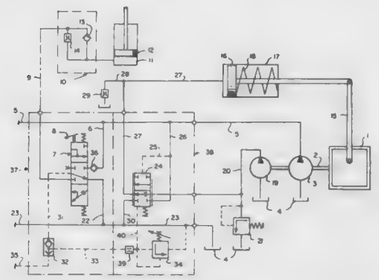
the entering flow sufficiently close in size to the optimal area that when pumping fluid through the turbine motor the pump is induced to operate substantially at its maximum output power level, and means coupling an inlet and an outlet of the pump and motor for fluid flow therebetween.

4,733,533

CONTROLS FOR POWER DRIVE ASSEMBLIES

Horst Deininger, Horstein/Alzenau, and Walter Kropp, Sulzbach am Main, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,982
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412871
Int. Cl.[4] F15B *11/16, 11/20*
U.S. Cl. 60—431 14 Claims



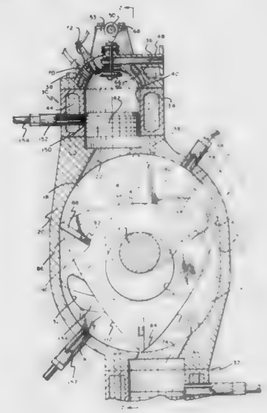
1. A power drive assembly and control therefor comprising a primary energy source, a hydrostatic pump driven by said energy source, a consumer of hydrostatic energy connected to and receiving fluid under pressure from said pump, a multiway valve between the pump and consumer for controlling the flow therebetween, said multiway valve providing a throttling effect in its intermediate position, a control pressure dependent valve having a first control pressure chamber connected between the pump and multiway valve and a second spring biased control chamber connected between the consumer and multiway valve whereby the first control chamber acted upon by the pressure in front of the multiway valve and the second control chamber is acted upon by pressure beyond the multiway valve, a fluid passage in said valve controlled by differential pressure in said first and second chambers, said passage connecting a control pressure inlet and outlet, a source for control pressure connected to said control pressure inlet, a control cylinder connected to the control pressure outlet, a biasing spring in said control cylinder acting in opposition to control fluid delivered from said control pressure dependent valve, an adjusting element on the primary energy soure and a connection between said adjusting element and a moving element of the control cylinder on the side opposite the connection with the control pressure valve and wherein the fluid passage of the control pressure dependent valve receive fluid from the connection between the multiway valve and consumer of hydrostatic energy for delivery to the operating cylinder.

4,733,534

INTERNAL COMBUSTION ENGINE AND OUTPUT MOTION TRANSDUCER

Albert A. Southard, R.R. #3, Council Grove, Kans. 66846

Filed Sep. 29, 1986, Ser. No. 912,573
Int. Cl.[4] F02B *71/04*
U.S. Cl. 60—595 18 Claims



1. In a method of converting a rotary motion to a linear reciprocating motion and vice versa, the steps comprising establishing and maintaining liquid fluid communication between first and second variable volume chambers during a predetermination portion of a rotary motion cycle, and varying the volume of the first chamber as a function of the position of a linearly movable piston in a cylinder partially bounding such chamber, while concurrently varying the volume of the second chamber as the latter is caused to orbit a central axis as a function of the position of a rotor mounted for eccentrically orbiting the central axis within a cavity bounded by a trochoidal wall, with the second chamber being bounded by the rotor and the trochoidal with which it is in sliding engagement, and with the rotor being mechanically coupled to rotary shaft coincident with the central axis.

4,733,535

APPARATUS FOR DETERMINING THE EXHAUST VALVE TIMING OF AN ENGINE SUPERCHARGED BY A TURBO-COMPRESSOR

Maurice Le Creurer, Taveray, and Marcel Sedille, Paris, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly S/Seine, both of, France

Filed May 2, 1986, Ser. No. 858,752
Claims priority, application France, May 2, 1985, 85 06674
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—605.1 3 Claims

3. An internal combustion engine comprising:

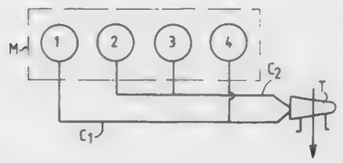
a plurality of cylinders having an ignition order, each cylinder having inlet and exhaust valves and an exhaust pipe, at least one turbo-compressor having a turbine which communicates with the exhaust pipes of the cylinders and is driven by the exhaust gases of the engine, and a timing means for determining the instant of the opening of the exhaust valves of the various cylinders, the timing means being so arranged that an advance of the opening of the exhaust valves of the various cylinders is determined in relation to the length of an exhaust pipe portion between

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each cylinder and the preceding cylinder in the ignition order;

wherein said advance of the exhaust valve opening determined in relation to the length of the exhaust pipe portion between each cylinder and the preceding cylinder in ignition order is selected to allow waves of exhaust blasts of each cylinder reach the preceding cylinder, in the ignition order, with a stagger in time which is roughly constant relative to an upper dead centre condition of said preceding cylinder for a given operating speed of the engine; and

wherein the timing means is a camshaft and wherein the



stagger is represented by a variation $\Delta\alpha$ of the angular position of a cam carried by the camshaft and controlling a corresponding exhaust valve of a given cylinder, this stagger is chosen in the following manner:

$$\Delta\alpha=(L/C)\times 6N$$

in which:

L is the length of the exhaust pipe portion between the given cylinder and the preceding cylinder in the ignition order;

C is the velocity of sound, and

N is the speed of the engine in rpm in respect of which an optimum result is desired.

4,733,536

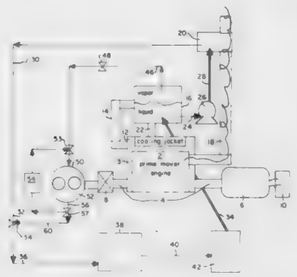
INTEGRATED MECHANICAL VAPOR RECOMPRESSION APPARATUS AND PROCESS FOR THE COGENERATION OF ELECTRIC AND WATER-BASED POWER HAVING A RECIRCULATION CONTROL SYSTEM FOR PART-LOAD CAPACITY

Francis A. DiBella, Roslindale; Frederick E. Becker, Reading, and John C. Balsavich, Jr., Foxboro, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 921,966, Oct. 22, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,251

Int. Cl.⁴ F01K *23/10*

U.S. Cl. 60—618 **23 Claims**



1. An apparatus for the cogeneration of electric power and fluid-based power to be provided to an electric load and fluid power loads respectively, designed to make use of a maximum amount of generated heat, comprising:

(a) an engine for converting chemical energy stored in fuel to heat energy and shaft work, said engine operable to produce shaft work deliverable to a rotatable main engine shaft and to produce hot exhaust gas;

(b) a cooling jacket for the engine, said cooling jacket, during operation of the engine, containing an energy transfer fluid which exchanges heat with said engine and circulates through said cooling jacket and other portions of the apparatus;

(c) an electric generator connected to a first end of the main engine shaft;

(d) a gearbox connected to a second end of the main engine shaft, said gearbox having individually selectable forward and reverse gears;

(e) operatively connected to said gearbox, a positive displacement dual-function compressor and expander, having a high pressure port and a low pressure port;

(f) separator means connected to said cooling jacket for separating the energy transfer fluid into liquid phase and vapor phase portions;

(g) heat exchange means for providing heat exchange between the hot exhaust gas of the engine and the liquid energy transfer fluid;

(h) means for conducting liquid energy transfer fluid from the separator means to the heat exchange means;

(i) means for conducting the energy transfer fluid from the heat exchange means to a fluid power load;

(j) means for conducting the vapor phase of the energy transfer fluid from the separator means to the low pressure port of the dual-function compressor and expander; and

(k) means for connecting the high pressure port of the dual-function compressor and expander to a fluid power load.

17. A method for the cogeneration of electric power and fluid-based power to be provided to an electric load an a fluid power load, respectively to make use of a maximum amount of generated heat comprising the steps of:

(a) providing:

(i) an engine, a cooling jacket having energy transfer fluid for cooling said engine, and a rotatable main engine shaft having two ends;

(ii) an electric generator connected to a first end of the main engine shaft;

(iii) a gearbox connected to a second end of the main engine shaft, said gearbox having individually selectable forward and reverse gears; and

(iv) a positive displacement dual-function screw machine compressor and expander, having a high pressure port and a low pressure port, said screw machine being insensitive to erosion and corrosion by said energy transfer fluid, said screw machine being operatively connected to said gearbox;

(b) converting the chemical energy stored in fuel to shaft work and heat energy by combusting said fuel in said engine;

(c) operating said electric generator with said shaft work;

(d) heating said energy transfer fluid in the cooling jacket with a first portion of said heat energy;

(e) providing exhaust gases from said engine, said exhaust gases being heated with a second portion of said heat energy;

(f) separating said energy transfer fluid into a liquid phase portion and a vapor phase portion;

(g) bringing said liquid phase portion of said energy transfer fluid into heat exchange relation with said hot exhaust gases to provide heated vapor phase energy transfer fluid;

(h) delivering said heated vapor phase energy transfer fluid to a fluid power load;

(i) conducting said vapor phase portion to said energy transfer fluid to the low pressure port of the dual-function compressor and expander;

(j) compressing said vapor phase of the energy transfer fluid with said dual-function compressor and expander to provide a high pressure vapor phase; and

(k) conducting said high pressure vapor phase of the energy transfer fluid to a fluid power load.

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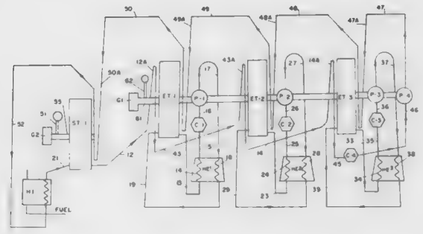
TURBINE POWER PLANT WITH STEAM AND EXHAUST TURBINE SYSTEMS

Demos Papastavros, 2429 NE. 184th Ter., N. Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 710,708, Mar. 11, 1985, abandoned. This application Jan. 2, 1987, Ser. No. 148

Int. Cl.⁴ F01K *23/04*

U.S. Cl. 60—655 **5 Claims**



1. In a turbine power plant having a closed loop steam turbine system and a closed loop exhaust turbine system;

a closed loop steam turbine system which comprises the combination of:

a steam turbine having a fluid inlet and fluid outlet mounted on a shaft;

a generator means operatively connected to said shaft;

a condenser having a fluid inlet and a fluid outlet and a cooling means between its inlet and outlet;

a pump having a fluid inlet and fluid outlet and a pressurizing and circulating means between its inlet and outlet, said pump mounted on a shaft of the exhaust turbine system;

a heater having a fluid inlet and fluid outlet which uses an external fuel source to superheat fluid flowing between its inlet and outlet;

a fluid conduit means operatively connecting the following in a closed loop cycle, the outlet of said heater to the inlet of said steam turbine, the outlet of said steam turbine to the inlet of said condenser, the outlet of said condenser to the inlet of said pump, the outlet of said pump to the inlet of said heater;

said fluid conduit means operatively connecting the outlet of said steam turbine to the inlet of said condenser is designed to provide exhaust heat energy to said exhaust turbine system as the working fluid flows from said steam turbine to said condenser;

said fluid conduit means operatively connecting the outlet of said pump to the inlet of said heater is designed to receive heat energy from said exhaust turbine system and from the hot exhaust of said steam turbine as the working fluid flows from said pump to said heater;

a closed loop exhaust turbine system which comprises the combination of:

a first, second, and third turbines each having a fluid inlet and outlet and each mounted on a common shaft;

a generator means operatively connected to said shaft;

a first, second, and third pump each having a fluid inlet and outlet, and a pressurizing and circulating means between said inlets and outlets all connected to said common shaft;

a first, second, and third condensers each having a fluid inlet and outlet and a cooling means between their inlets and outlets;

a first, second, and third heat exchangers each having

a first fluid passageway arrangement having a fluid inlet and outlet at opposite ends and a second fluid passageway arrangement having a fluid inlet and outlet at opposite ends, wherein the fluid flow in said second passageway arrangement is opposite to the fluid flow in said first passageway arrangement allowing for a heat exchange relationship;

a fluid conduit means operatively connecting the following in a closed loop fluid cycle, the outlet of said first exhaust turbine to the inlet of said first fluid passageway arrangement of said first heat exchanger, the outlet of said first fluid passageway arrangement of said first heat exchanger to the inlet of said first condenser, the outlet of said first condenser to the inlet of said first pump, the outlet of said first pump to the inlet of said second fluid passageway arrangement of said first heat exchanger, the outlet of said second fluid passageway arrangement of said first heat exchanger to the inlet of said first exhaust turbine; said first exhaust turbine receiving heat energy to operate from the exhaust of said steam turbine system;

a fluid conduit means operatively connecting the following in a closed loop fluid cycle, the outlet of said second exhaust turbine to the inlet of said first fluid passageway arrangement of said second heat exchanger, the outlet of said first fluid passageway arrangement of said second heat exchanger to the inlet of said second condenser, the outlet of said second condenser to the inlet of said second pump, the outlet of said second pump to the inlet of said second fluid passageway arrangement of said second heat exchanger, the outlet of said second fluid passageway arrangement of said second heat exchanger to the inlet of said second exhaust turbine; said second exhaust turbine receiving heat energy to operate from the exhaust of said steam turbine system;

a fluid conduit means operatively connecting the following in a closed loop fluid cycle, the outlet of said third exhaust turbine to the inlet of said first fluid passageway of said third heat exchanger, the outlet of said first fluid passageway of said third heat exchanger to the inlet of said third condenser, the outlet of said third condenser to the inlet of said third pump, the outlet of third pump to the inlet of said second fluid passageway of said third heat exchanger, the outlet of said second fluid passageway of said third heat exchanger to the inlet of said third exhaust turbine, said third exhaust turbine receiving heat energy to operate from the exhaust of said steam turbine system.

4,733,538

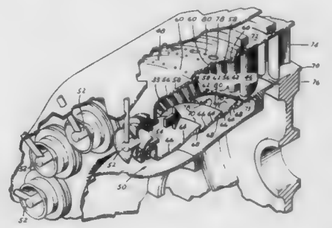
COMBUSTION SELECTIVE TEMPERATURE DILUTION

John W. Vdoviak, Marblehead, and Barry Weinstein, Georgetown, both of Mass., assignors to General Electric Company, Lynn, Mass.

Continuation-in-part of Ser. No. 947,919, Oct. 2, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,924

Int. Cl.⁴ F02C *1/00*

U.S. Cl. 60—752 **4 Claims**



1. In a gas turbine engine having a hot gas flowing in an annular path partially defined by inner and outer liners of a combustor and inner and outer vane shrouds, said combustor including at its upstream end a plurality of injectors for admitting an original mixture of air and fuel to the upstream end of

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said combustor for burning of said mixture in said combustor, the improvement comprising:

a plurality of circumferentially spaced-apart stationary turbine vanes disposed in said hot gas flow path downstream of said combustor, each of said vanes extending radially across said hot gas flow path, the spacing between said vanes forming a gap therebetween;

a first plurality of circumferentially spaced-apart dilution apertures disposed in said combustor downstream of said injectors, upstream of said turbine vanes and in axial alignment with leading edges of said turbine vanes, for admitting dilution air into said combustor for mixing with said original mixture to promote partial mixing thereof; and

a second plurality of circumferentially spaced dilution apertures for admitting dilution air into said combustor to promote partial mixing with the original mixture, each of said second apertures being smaller in size than said first apertures and each being disposed equidistantly between adjacent ones of said first apertures and in circumferential alignment therewith and in axial alignment with gaps between said vanes;

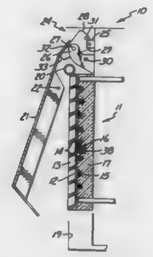
said first and second apertures being axially located in a secondary combustion zone of said combustor and upstream of said turbine vanes to induce partial mixing of said dilution air with said hot gases for generating a preselected circumferential temperature gradient in said hot gas for providing a flow of hot gas at a relatively higher temperature through said gaps and a flow of hot gas at relatively lower temperature upon said turbine vanes; said first and second apertures terminating at substantially an inner surface of said combustor and being located upstream of said vanes at a position such that dilution air from said first apertures flows over a full length of said leading edges of said vanes.

4,733,539

ICE CUBE MAKER WITH NEW FREEZE AND HARVEST CONTROL

Marvin H. Josten, Garner; Terry L. Merrill, Mason City; Kenneth W. Schneider, Mason City, and Robert F. Utter, Mason City, all of Iowa, assignors to Schneider Metal Manufacturing Co., Mason City, Iowa

Filed Dec. 4, 1986, Ser. No. 937,931
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—73 29 Claims



1. A method of making ice cubes, comprising the steps of

(a) sensing the size of ice frozen upon an evaporator;

(b) initiating a hot gas defrost of the evaporator upon the sensing of a predetermined size of ice, and thereby and thereafter harvesting the ice from the evaporator;

(c) dropping the ice off of the evaporator and against a curtain;

(d) opening the curtain with the dropping ice;

(e) changing the mode of a photoelectric emitter-receiver with the curtain during said opening; and

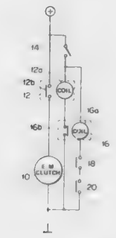
(f) terminating the hot gas defrost and restarting a freeze cycle in response to the mode changing, and freezing a subsequent quantity of ice.

4,733,540

CONTROL SYSTEM FOR VEHICULAR AIR CONDITIONING COMPRESSOR

Yukio Sakurai, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Dec. 10, 1986, Ser. No. 940,496
Claims priority, application Japan, Dec. 11, 1985, 60-276943
Int. Cl.[4] F25B *27/00*; B60H *1/32*
U.S. Cl. 62—133 15 Claims



1. A control system for an air conditioning compressor of an air conditioning system for a vehicle, said control system comprising:

first means for detecting overheat condition of a fuel system of the vehicle;

second means for detecting abrupt vehicle acceleration including

a pressure responsive switch adapted to close in response to an intake manifold vacuum of the engine being below a predetermined level; and

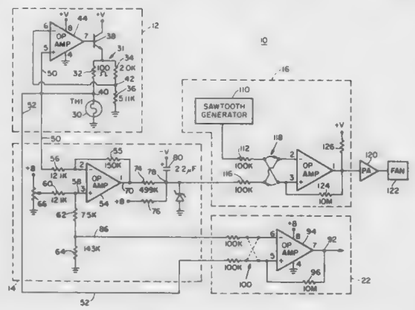
means for stopping operation of said air conditioning compressor for a first predtermined time upon detection of both said overheat condition and said abrupt vehicle acceleration.

4,733,541

CONSTANT COOLING CIRCUIT AND SYSTEM

Raouf A. Ismail, Concord, and Suresh Madhavan, Framingham, both of Mass., assignors to Cambridge Aeroflo Inc., Shirley, Mass.

Filed Sep. 9, 1986, Ser. No. 905,169
Int. Cl.[4] F24F *7/00*; H02B *1/00*
U.S. Cl. 62—186 18 Claims



1. A circuit for monitoring the heat dissipation capacity of a cooling medium, comprising:

means for defining the initial heat dissipation capacity of the cooling medium by imparting a first level of power to a temperature-senstive element immersed in the cooling medium to maintain the temperature of said element at a predetermined temperature;

means for sensing a change in temperature of said element; and

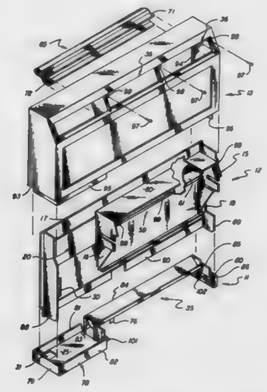
means, responsive to said means for sensing, for restoring the temperature of said element to said predetermined temperature by altering the power imparted to said element until said predetermined temperature is achieved at a second level of power.

4,733,542

CABINET FOR AIR CONDITIONING SYSTEM

Robert R. Blair, Dallas, Tex., assignor to Enviromaster International Corporation, Rome, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,599
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 15 Claims



1. A universal air conditioner enclosure for housing component parts of an air conditioning system, comprising a cabinet formed of interlocking molded plastic sections in which a base section, a front cover section, and a back panel section combine to form a self-standing enclosure, wherein

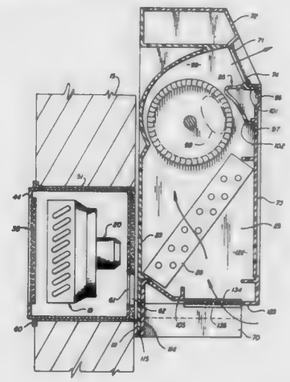
the back panel section has spaced vertical walls molded integral with the back panel section and which coact with the cover section to define an air passage connecting an inlet vent and an outlet vent, and which also define an equipment cabinet adjacent the air passage, and a volute shaped upper wall in the air passage molded integral with the back panel section between the spaced vertical walls to form a rotor casing for housing a cylindrical fan rotor leading to the outlet vent, and wherein said front cover section includes a pair of horizontal retaining members on the inside thereof, and a V-shaped one-piece resilient guide vane removably supported by its ends in a biased condition in said retaining members so as to be removably supported upon the inside of the cover section within the air passage adjacent to the rotor casing, said V-shaped guide vane being interchangeable with similar members of different size so as to accommodate cylindrical fan rotors of different diameters, and all of the equipment contained in said enclosure being accessible for maintenance or repair simply by removal of only the front cover section.

4,733,543

PACKAGED AIR CONDITIONER

Robert R. Blair, Dallas, Tex., assignor to Enviromaster International Corporation, Rome, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,595
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 11 Claims



1. In a package terminal air conditioning unit that is formed of an interior unit disposed within a building, a separate exterior unit disposed outside the building, and connecting duct means connecting the interior unit to the exterior unit, in which the interior unit comprises a cabinet, an indoor heat exchanger coil, and a cylindrical fan which includes a cylindrical fan rotor, means mounting the rotor in the cabinet, and a volute shaped member; said exterior unit comprises an outside heat exchanger coil and an outside cabinet separated from said indoor cabinet and housing said outdoor heat exchanger; and said connecting duct means comprises a pair of refrigerant lines passing between the two cabinets for connecting the two heat exchanger coils, a compressor, and an expansion valve to complete an air conditioning circuit; the improvement wherein said compressor is contained in the indoor cabinet of the interior unit so that the exterior unit is kept as small and light as possible, and has a relatively small power requirement as compared with the interior unit; said indoor cabinet is molded of a synthetic resin and is formed of a base section, a back section, and a removable front cover section that interlock to form an equipment compartment that houses said compressor and an adjacent air duct that connects an inlet vent and an outlet vent with the indoor heat exchanger coil situated therebetween; both of which compartments are opened by removal of only the front cover section;

said back section having an integral molded volute-shaped casing that forms a part of the air duct for housing the cylindrical fan rotor and integral support means for mounting the indoor heat exchanger coil in said air duct;

said base section including means for mounting the compressor in said equipment compartment and;

said front cover section including a guide vane removably mounted therein that is positioned in said air duct adjacent the fan for directing the air therethrough.

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ORNAMENTAL JEWELRY MEMBER

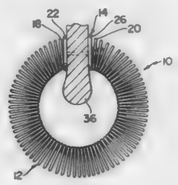
Bartholomeo P. Londaro, 69 Carriage Dr., Lincoln, R.I. 02865

Filed Mar. 23, 1987, Ser. No. 38,621
Int. Cl.[4] A44C *5/00, 7/00*
U.S. Cl. 63—12 4 Claims

1. An ornamental jewelry member comprising an elongated, resiliently flexible, ornamental, helically wound wire coil spring element having opposite first and second ends, a first

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substantially circular end plate secured to said first end, a substantially cylindrical jewelry post secured to said first end plate, a second substantially circular end plate secured to said second end, and a jewelry clutch secured to said second end plate, said clutch having an aperture therein, said post being



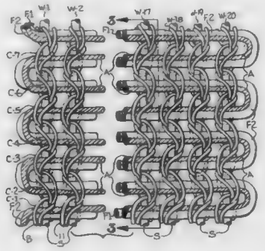
dimensioned to be received through an aperture in an earlobe of a wearer and being receivable in said aperture in said clutch for frictionally securing said post in said clutch to releasably join said first and second ends and to thereby secure said jewelry member on said earlobe.

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RAVEL RESISTANT WARP KNIT ELASTIC TAPE AND METHOD

Paul L. Weinle, Charlotte, and Ivan E. Hinshaw, Badin, both of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Jun. 4, 1987, Ser. No. 58,143
Int. Cl.[4] D04B 7/16
U.S. Cl. 66—202 **12 Claims**



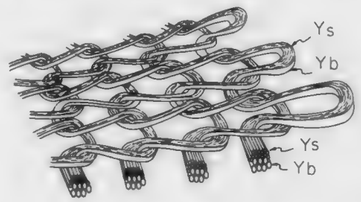
1. A ravel resistant warp knit elastic tape including
(a) yarns forming a plurality of parallel and walewise extending knit stitch loop chains forming successive courses perpendicular to the wales of said elastic tape,
(b) an elastomeric yarn inlaid in and extending along selected ones of said parallel stitch loop chains and providing longitudinal stretchability to said elastic tape,
(c) filling yarn extending back and forth across said elastic tape and being held in said stitch loop chains, and
(d) a thermoplastic heat fusible binder yarn extending alongside said filling yarn and being positioned against said stitch loop chains of successive courses and being fused thereto to prevent unraveling of said stitch loop chains across the entire width of the elastic tape.

4,733,546

KNITTED FABRIC FOR CLOTHING

Kazuhiro Toda, Otsu, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 583,501, Feb. 24, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,827
Int. Cl.[4] D04B 7/16
U.S. Cl. 66—202 **24 Claims**



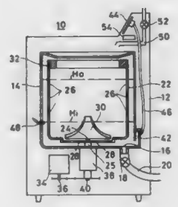
1. A knitted fabric specially adapted for use in clothing which comprises a layered structure having at least a first, inner yarn layer and a second, outer yarn layer,
wherein said first yarn layer is to be disposed facing a wearer's body, and said second yarn layer is to be disposed on the side further from the wearer's body;
wherein each yarn layer is further comprised of a plurality of fibers, said fibers each being at least one denier and consisting essentially of non-hygroscopic fibers,
wherein the inter-fiber spaces between neighboring individual non-hygroscopic fibers of the first yarn layer are larger than the interfiber spaces between the neighboring individual non-hygroscopic fibers of said second yarn layer, whereby perspiration in contact with said first yarn layer moves through said first yarn layer and into said second yarn layer by capillary action.

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WASHING MACHINE

Kunioki Honda, Shiga, Japan, assignor to Sanyo Electric Co., Ltd, Japan

Division of Ser. No. 733,977, May 14, 1985, Pat. No. 4,662,193. This application Jan. 23, 1987, Ser. No. 6,724
Claims priority, application Japan, May 18, 1984, 59-100824; May 18, 1984, 59-100825
Int. Cl.[4] D06F 33/02
U.S. Cl. 68—12 R **2 Claims**



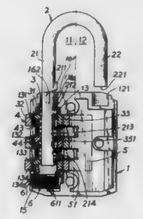
1. A washing machine comprising,
an outer tub,
an inner tub defined by at least a side wall being disposed within said outer tub, said inner tub provided with water-expelling holes within the side wall,
a motor for rotating said inner tub,
water level variation detecting means for detecting variations of a water level between said outer and inner tubs,
means for counting the time required for a changing rate of an output of said water level variation detecting means to become substantially constant after the rotation of said inner tub is started, and
motor control means for controlling time of energizing said motor and rotating said inner tub based upon said time being counted by said counting means.

4,733,548

ANTI-SENSING LOCKING MECHANISM FOR COMBINATION PADLOCK

Chong-Kuan Ling, P.O. Box 53-58, Taipei, Taiwan

Filed Feb. 24, 1987, Ser. No. 18,173
Int. Cl.[4] E05B 37/02
U.S. Cl. 70—25 **6 Claims**



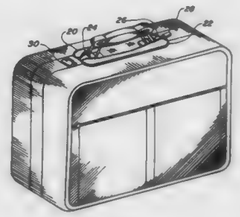
1. A locking mechanism for a combination padlock comprising:
a casing including a vertical cylindrical hole longitudinally formed on a left portion of the casing, a plurality of horizontal dial slots transversely formed on the left portion of the casing to intersect the vertical cylindrical hole to form plural collars adapted for mounting a plurality of dials therein, a spring socket formed under said vertical cylindrical hole for inserting a compression spring therein, a latching socket formed on a right portion of said casing, a right projection socket and a rear projection socket apart from said right projection socket at an angle of 90 degrees formed on the top portion of the left portion of said casing, and a longitudinal key groove formed across the plural collars of said casing;
a shackle having a first leg formed with a plurality of projections longitudinally formed on the first leg and a second leg shorter than said first leg having a latching end operatively inserted into said latching socket on said casing, an uppermost projection of said shackle operatively engaging with either said right or said rear projection socket of said casing;
a plurality of sleeves rotatably mounted on said shackle each including at least one coupling key having a half height of the height of a dial and an individual setting key formed on a central outer perimeter of each sleeve, each key having a central angle less than 36 degrees around a center of said sleeve, and an annular extension formed on a central circumference of a bore inside said sleeve having a sleeve slot projectively relative to said individual setting key, said annular extension operatively engaging each said projection of said shackle except said uppermost projection under said annular extension and operatively allowing free passing of said projections through said sleeve slot formed on said annular extension, all said sleeves being superimposedly inserted in said vertical cylindrical hole and having the lowest sleeve retained by a retainer as normally tensioned by said compression spring inserted in said spring socket, each said setting key operatively moving along said longitudinal key groove formed on said collars of said casing; and
a plurality of dials each including ten numerals formed on the outer perimeter of each dial having a notch formed between every two neighboring numerals and ten recesses circumferentially formed on an upper half circumference of a bore of each dial operatively engaging with said keys of said sleeve, whereby upon the rotation of each dial to synchronously rotate the engaged sleeve to deviate the sleeve slot of each said sleeve from said projection of said shackle, each projection of said shackle is engaged under the annular extension of each said sleeve to thereby lock said shackle in said casing, and upon the rotation of said shackle at an angle from its locking position and upon the depression of said shackle downwards to force said projections downwardly on said annular extensions to uncouple said sleeves from said dials, said dials can be optionally rotated for setting a new combination.

4,733,549

THEFT PREVENTING LUGGAGE HANDLE ATTACHMENT

Franklin W. Baker, 6265 S. LaBrea Ave., Los Angeles, Calif. 90056

Filed May 8, 1987, Ser. No. 47,276
Int. Cl.[4] E05B 67/38
U.S. Cl. 70—68 **8 Claims**



1. A theft prevention attachment for a handle attached to luggage comprising:
(a) a resilient sheath, having an inside and an outside split in the middle into two pieces, completely enclosing the luggage handle such that no gripping surface is available for lifting the luggage;
(b) means for attaching said sheath to the luggage on the inside surface maintaining the nonsubsistant gripping surface thereupon;
(c) a two part interlocked fastener comprising a sliding device with a manual tab having an aperture therein, one part joined to each sheath piece separated by the sliding device with the manual tab pulled along between the pieces allowing the handle to protrude beyond the sheath when opened, for gripping, while maintaining its inaccessible integrity when closed;
(d) a lock attached to the aperture in said manual tab of the sliding device for restraining the manual tab in a locked position; and,
(e) a lock hasp in the form of an extended loop affixed to said luggage adjacent to the sheath distending outwardly with said lock penetrating therethrough defining a restraint, preventing the opening of the sheath detering theft of the luggage when left unattended.

4,733,550

APPARATUS FOR FORMING A DOMED BOTTOM IN A CAN BODY

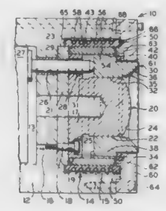
Arthur E. Williams, Greenbrier, Tenn., assignor to Precision Products of Tennessee, Inc., Springfield, Tenn.

Continuation-in-part of Ser. No. 823,553, Jan. 29, 1986, abandoned. This application Feb. 20, 1987, Ser. No. 17,059
Int. Cl.[4] B21D 22/00
U.S. Cl. 72—348 **9 Claims**

1. Apparatus for forming an inwardly extending dome in the bottom wall of a metallic one-piece can body having a beveled peripheral edge bordering the bottom wall comprising:

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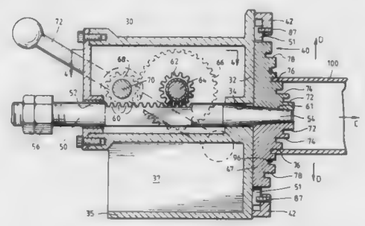
(a) a domer housing comprising a cavity having a longitudinal front-to-rear axis and a front end opening,
(b) a doming die within said cavity having a longitudinal front-to-rear axis, a peripheral side surface, and a front outer convex surface for engaging the bottom wall of a can body to form a dome therein,
(c) a pressure ring supported coaxially around said peripheral side surface for axial movement relative to said doming die, said pressure ring having a circumferential outer surface member and a front annular beveled surface adapted to engage the beveled peripheral edge bordering the bottom wall of a can body while said doming die is forming a dome in said bottom wall,
(d) pressure-absorbing plunger means within said domer housing for engaging and moving axially with said pressure ring,
(e) securing means supporting said doming die normally coaxially within said cavity for limited radial movement of said doming die and said pressure ring relative to said domer housing and said plunger means,



(f) a segmented ring having a plurality of circumferentially arranged segments within said housing surrounding said pressure ring and having an inner surface normally in bearing engagement with said outer surface member,
(g) abutment means in said cavity adapted to engage said inner surface of said segmented ring to limit the radial movement of said segmented ring to a normal central position coaxial of said cavity,
(h) said pressure ring being radially movable relative to said abutment means, whereby in a radially extended position an extended portion of said outer surface member projecting radially outward beyond said abutment means moves radially outward segments of said segmented ring engaged by said extended portion, and
(i) spring means surrounding said segmented ring to bias said inner surfaces of said segments toward said abutment means to urge said pressure ring and said doming die to said normal central coaxial position.

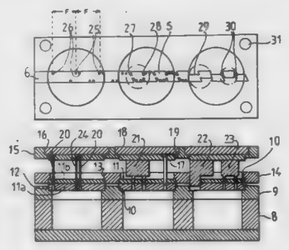
4,733,551
PIPE EXPANDER
Warren E. Bryant, West Heidelberg, and Terrence E. Stanley, Briar Hill, both of Australia, assignors to W.E.B. Tooling Pty Ltd., West Heidelberg, Australia
Filed Sep. 25, 1986, Ser. No. 912,049
Claims priority, application Australia, Oct. 10, 1985, PH02941
Int. Cl.[4] B21D *41/02*
U.S. Cl. 72—393 **8 Claims**

1. A pipe expander head, said pipe expander head having a plurality of segments, resilient coupling means for coupling the segments together, said segments being adapted to be forced radially outwardly with respect to one another in order to expand a work piece, said segments each having a plurality of stepped part-circular expanding portions which form annular expanding portions when the segments are coupled together, said annular expanding portions comprising a plurality of radial annular surfaces extending in a generally radial direction of said expander head and a plurality of adjacent axial annular surfaces extending in a generally axial direction so as to form a corresponding plurality of steps therewith, a plurality of annular recesses of preselected length extending in a generally axial direction between axial annular surfaces of adjacent annular expanding portions, each said recess extending from a radial annular surface of one said annular expanding portions and



having a radially inner wall extending along its length so as to form a continuation of the axial annular surface of said one annular expanding portion so that the axial thickness of said expander head is reduced by an amount proportional to the sum of the lengths of the walls of each recess.

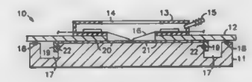
4,733,552
MULTI-STATION PUNCH/DIE PRESS FOR PROGRESSIVE STRIP STOCK OPERATIONS AT VARIABLE INDEX LENGTH
Michel E. Lefils, 2 rue George Huchon, 94300 Vincennes, France
Continuation-in-part of Ser. No. 568,703, Jan. 6, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 840,789
Claims priority, application France, Jul. 21, 1982, 82 12701
Int. Cl.[4] B21D *43/00, 37/04*
U.S. Cl. 72—405 **17 Claims**



1. A press assembly for manufacturing a plurality of different parts, comprising:
means for guiding a continuous strip of stock through the press assembly and means for stepwise advancing the continuous strip of stock in successive steps of an indexing length, said means for advancing being settable for selecting said indexing length from a plurality of indexing lengths, successive portions of the continuous strip stock to be formed as successive parts, the parts remaining connected in the strip;
upper and lower jaws mounted for relative movement toward and away from one another;
a bed-plate firmly secured to the upper jaw, the bed-plate having means for receiving at least two of any of a plurality of interchangeable punch holders for punches; and,
a frame firmly secured to the lower jaw, the frame having means for receiving at least two of any of a plurality of interchangeable die holders for dies in alignment with the punch holders, the respective receiving means of the bed-plate and the frame defining at least two fixed work stations at a fixed spacing unrelated to said indexing length, the respective receiving means being so dimensioned that corresponding sets of punches and dies are mountable at a spacing equal to a multiple of said indexing length at any position within each fixed work station as required to place said sets at said spacing equal to said multiple of said indexing length, in respective punch holders and die holders, the sets being easily relocatable in positioning on each said work station to equal said multiple of said indexing length notwithstanding the fixed spacing of the work stations, whereby the press assembly can manufacture parts of any characteristic length by choosing the indexing length, spacing said sets at said multiple and stepwise advancing the continuous strip stock past the successive work stations between relative movement of the upper and lower jaws.

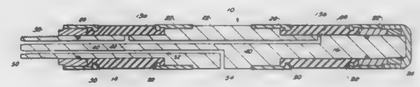
17. A method for producing an indefinite number of identical successive parts in a continuous strip progressing along a path, the parts having a characteristic length along the path, comprising the steps of:
providing a press having upper and lower jaws with receiving means disposed immovably at fixed locations along the path, the receiving means defining regularly spaced fixed stations, each of the stations having means for receiving tool holders along the path such that bringing together the jaws brings together the tool holders;
choosing the characteristic length of the parts independently of a distance between the regularly spaced fixed stations;
mounting punch and die sets on the tool holders at the characteristic length of the parts, the punch and die sets defining successive operations proceeding toward a finished part, whereby the tools sets are placed irregularly on individual ones of the tool holders but regularly at said characteristic length along the path; and,
repeatedly advancing the strip along the path in an increment equal to the characteristic length and then reciprocating the jaws, whereby parts of any characteristic length can be produced regardless of the fixed regular spacing of the receiving means.

4,733,553
METHOD AND APPARATUS FOR LOW PRESSURE TESTING OF A SOLID STATE PRESSURE SENSOR
Lee E. Folk, Phoenix; William B. Newton, Scottsdale, and Robert P. Rossman, Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Aug. 25, 1986, Ser. No. 899,848
Int. Cl.[4] G01L *27/00*
U.S. Cl. 73—4 V **4 Claims**



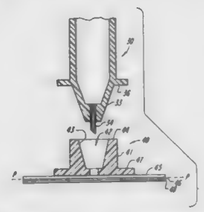
1. A low pressure testing apparatus for testing a solid state pressure sensor comprising:
a central plate having a first surface and a second surface, said central plate defining an opening therein extending from said first surface to said second surface;
probe means for probing said solid state pressure sensor, said probe means having a first surface, a second surface coupled to said first surface of said central plate, and contacts being disposed in the opening defined by said central plate;
housing means for providing a vacuum seal, said housing means being coupled to said first surface of said probe means;
vacuum means for removing atmosphere from said low pressure testing apparatus; and
positioning means for positioning said solid state pressure sensor in contact with said probe means, said positioning means being coupled to said second surface of said central plate.

4,733,554
HYDRO PRESSURE THREAD TESTER
Richard Lazes, 2748 Orchid, New Orleans, La. 70119
Continuation-in-part of Ser. No. 698,030, Feb. 4, 1985, Pat. No. 4,617,823. This application Dec. 11, 1985, Ser. No. 807,756
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—46 **5 Claims**



1. An apparatus for testing the connection between a segment of pipe and a coupling comprising:
a. a cylindrical body member adapted to be inserted inside one end of said pipe segment, said body member having provided therein a plurality of hydrostatically operated pressure resistant first sealing means that are spaced apart and that contact at each end thereof means for preventing the extrusion of said first sealing means during testing, said preventing means arranged annularly of said cylindrical body member between said first sealing means and the first end portion of clamping means provided internally and longitudinally of said cylindrical body member, thereby forcing said first sealing means laterally outwardly of said cylindrical body and into contact with the inner surface of said pipe segment and coupling being tested, thereby sealing off the interior of said pipe segment so as to isolate a test fluid introduced under pressure to the area surrounding the connection between said pipe and said cylindrical body member and between said spaced apart first sealing means;
b. a cylindrical nipple-like second pressure resistant sealing means arranged at one end of said cylindrical body member that threadably engages exposed interior threads of said coupling; and,
c. means for admitting test fluid under pressure into the annular space created between said hydrostatically activated first sealing means and said cylindrical nipple-like second sealing means, said means for admitting test fluid including a first fluid passageway provided longitudinally of said cylindrical body member for introducing said testing fluid under pressure into said annular space.

4,733,555
PRESSURE ENTRY AND TEST SYSTEM
Stephen H. Franks, 5 N. Mill St., Hopkinton, Mass. 01748
Filed Apr. 13, 1987, Ser. No. 37,600
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—49.3 **15 Claims**



1. An improved system for the pressure testing of a sealed package, such system comprising

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a pressure monitoring pressure unit including a probe with an end connector, and

an entry device for establishing pressure-tight communication between the pressure unit and a sealed package, wherein the entry device comprises

(i) a connector body adapted to sealingly couple with said end connector, and

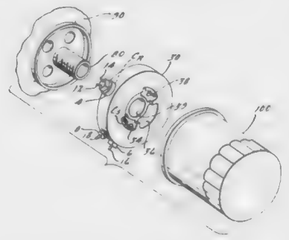
(ii) a package engaging portion extending from said connector body and having a face with an adhesive coating thereon for sealingly adhering to said package so as to affix the entry device in a pressure-tight manner thereto.

4,733,556

METHOD AND APPARATUS FOR SENSING THE CONDITION OF LUBRICATING OIL IN AN INTERNAL COMBUSTION ENGINE

Allen H. Meitzler, Ann Arbor, and George S. Saloka, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1986, Ser. No. 945,278
Int. Cl.[4] G01N *33/30*
U.S. Cl. 73—64 **10 Claims**



1. A system for sensing the condition of the lubricating oil of an engine during engine operation and providing an operator indication when the oil needs to be restored to an acceptable condition, comprising:

means exposed to the flow of oil through the lubrication system of said engine and having an electrical capacitance value that is dependent on the dielectric constant of said lubricating oil;

means located so as to be isolated from said flow of lubricating oil but located proximate to said exposed capacitance means so as to be exposed to the same thermal temperatures as said exposed capacitance means and having an electrical capacitance value that is dependent on the dielectric constant of a reference medium that includes a quantity of oil in a predetermined reference volume;

means connected to said exposed capacitance means and said isolated capacitance means for comparing the respective electrical capacitance values and providing an output signal corresponding to the difference between said capacitance values.

4,733,557

METHOD AND SYSTEM FOR DETERMINING VAPOR PRESSURE OR COMPOSITION OF HYDROCARBON LIQUIDS

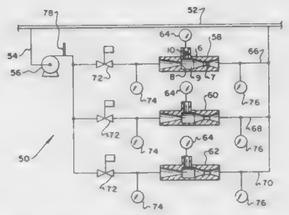
Lloyd A. Baillie, and James L. Skinner, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 22, 1986, Ser. No. 921,919
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—64.2 **11 Claims**

1. A method for determining the vapor pressure of a liquid composition of crude oil and natural gas liquids at a given temperature comprising the steps of:

causing the liquid composition to flow through eductor means while measuring the total pressure of the liquid at a location in said eductor means which comprises the minimum pressure point of fluid flow in said eductor means for a plurality of selected pressure differentials measured acorss said eductor means, said plurality of selected pressure differentials including at least one selected pressure differential which corresponds to a value which is known to provide the vapor pressure of said liquid composition;

determining the slope of a curve represented by the locus of the total pressure of the fluid at said minimum pressure



point in said eductor means as a function of the selected pressure differential across said eductor means which produces said total pressure, respectively; and

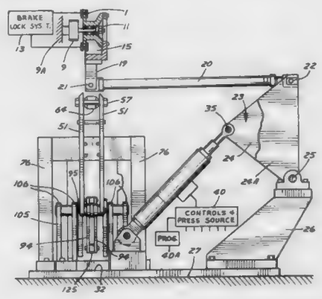
determining the intercept of said curve with a curve representing the relationship of total pressure at said minimum pressure point in said eductor means versus the pressure differential across said eductor means for a degassed liquid composition, which intercept comprises the bubble point pressure of said liquid composition.

4,733,558

BRAKE TORQUE LOADING LINKAGE FIXTURE

Glen C. Grenier, Chanhassen, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Nov. 20, 1986, Ser. No. 933,017
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **9 Claims**



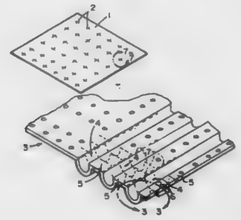
1. A loading linkage for a spindle assembly having a hub and having a braking torque applying means, said spindle assembly being loaded in a plane lying along the axis of the spindle assembly and in a direction perpendicular to such axis, and also being held from rotation at selected times, including a linkage having bell crank means for applying the load in said plane as the bell crank is moved about a first pivot, and means for applying a torque load tending to rotate the hub relative to the axis of said spindle assembly, wherein the improvement comprises the means for applying a torque load to said hub including an actuator movable with the means for applying the load in said plane about substantially the same axis as said first pivot.

4,733,559

THERMAL FLUID FLOW SENSING METHOD AND APPARATUS FOR SENSING FLOW OVER A WIDE RANGE OF FLOW RATES

Harry E. Aine, and Barry Block, both of Los Altos, Calif., assignors to Harry E. Aine and Barry Block, both of Philo, Calif.

Division of Ser. No. 556,800, Dec. 1, 1983, Pat. No. 4,633,578.
This application Aug. 4, 1986, Ser. No. 892,111
Int. Cl.[4] G01F *7/00, 1/68*
U.S. Cl. 73—195 **6 Claims**



1. In a method for sensing the flow of fluid within a channel, the steps of:

disposing a heater in heat exchanging relation with the fluid in the channel for heating the fluid flowing in the channel;

disposing first and second thermal sensors in heat exchanging relation with the heater and with the flow of fluid in the channel;

said first thermal sensor being disposed upstream of said second thermal sensor so that flow of fluid in the channel will cool the first thermal sensor more than said second thermal sensor;

disposing a third thermal sensor in said channel in heat exchanging relation with the fluid in said channel and substantially out of heat exchanging relation with said heater for sensing the ambient temperature of the fluid in said channel;

employing the output of said third thermal sensor to control the temperature of said heater to a predetermined elevated temperature relative to the ambient temperature of the fluid as sensed by said third thermal sensor;

comparing the output of said first and second thermal sensors to derive an output representative of the rate of fluid flow in said channel for flow rates up to a certain predetermined first flow rate; and

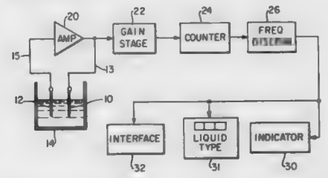
measuring an electrical quantity which is a function of the electrical power dissipated in said heater to derive a second output representative of the rate of fluid flow in said channel for a second flow rate above said first flow rate.

4,733,560

LIQUID SENSING SYSTEM

Naim Dam, Oakland Gardens, N.Y., assignor to Introtek International, Inc., Deer Park, N.Y.

Continuation of Ser. No. 544,574, Oct. 24, 1983, abandoned.
This application Aug. 13, 1986, Ser. No. 898,753
Int. Cl.[4] G01F *23/22*
U.S. Cl. 73—304 C **7 Claims**



1. A system for detecting the presence or absence of a liquid in a volume comprising:

sensor means having a pair of electrically conductive passive electrodes which are spaced apart by and extend from electrical insulating means for insertion into said volume,

electronic oscillator means comprising an amplifier in amplifier means having an input and an output, one of said electrodes of said sensor means being electrically coupled to said amplifier input and the other to said amplifier output, said spaced apart electrically conductive electrodes of said sensor means and the space therebetween forming a sole feedback circuit signal path between said output and said input of said amplifier means, said feedback circuit in the absence of a liquid in the space between said two electrodes of said sensor means being open to provide substantially no feedback signal to said amplifier means so that said oscillator means will be non-oscillatory and said feedback circuit being closed to provide a positive feedback signal when liquid is present in said space due to a change in phase of the signal path between said two electrodes to cause said oscillator means to oscillate and thereby indicate the presence of a liquid in the space between said two electrodes; and

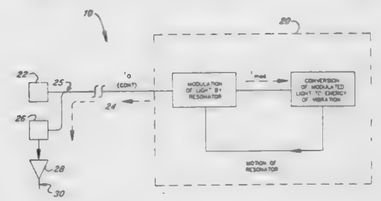
the amplifier is connected to counter means, a frequency discriminator means and indicator means for producing an output control signal.

4,733,561

SELF-OSCILLATING, OPTICAL RESONANT SENSOR

Anthony C. Gilby, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Jul. 21, 1986, Ser. No. 888,555
Int. Cl.[4] G01H *1/00*
U.S. Cl. 73—579 **30 Claims**



1. Apparatus to drive a mechanical resonator from a source of optical power, comprising:

(a) means for communicating said optical power to the mechanical resonator; (and)

(b) optical interferometric means for conversion of the optical power to (vibration) vibratory motion of the resonator(.); and

(c) resonator means for modulation of said optical power.

4,733,562

METHOD AND APPARATUS FOR ULTRASONIC SCANNING OF AN OBJECT

Ulrich Saugeon, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,590
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525179
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—626 **22 Claims**

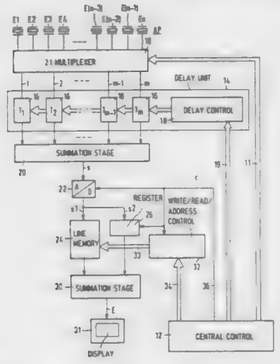
1. A method for scanning an object by means of ultrasound

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signals, using for reception an ultrasonic transducer array comprising a number (N) of transducer elements lying side by side which form a reception aperature, said reception aperture being divided into a number (p) of individual sub-arrays, each sub-array having a plurality of transducer elements which, after sequential emission of ultrasonic transmission signals into the object, receive incoming echo signals and where at least for some of the transducer elements, the output signals delivered therefrom upon reception of the echo signals can be time-delayed, said method comprising the following steps in the named order:

(a) sending a first ultrasonic transmission signal into the object to be examined along a given scanning direction;

(b) composing the incoming echo signals received from said first ultrasonic transmission signal with a first sub-array of the reception aperture in a processing circuit to form a first sum signal, which sub-array is directed to a plurality of focuses along said given scanning direction;



(c) sending a second ultrasonic transmission signal along the same given scanning direction into the object to be examined;

(d) composing the incoming echo signals received from said second ultrasonic transmission signal with a second sub-array of said reception aperture in substantially the same processing circuit as was used in step (a) to form a second sum signal, which second sub-array has different transducer elements from said first sub-array and is likewise directed to said same plurality of focuses along said same given scanning direction;

(e) superpositioning at least said first and said second sum signals on each other to form a received signal, said superpositioning beginning after completing the composition of said first sum signal but not necessarily after the end of the composition of said second sum signal; and

(f) processing and thereafter displaying said processed received signal as a line which is representative of scanning of said object along said given scanning direction.

4,733,563

FLUID PRESSURE TRANSMITTER FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES

Gianmario Nava, Ponte Lambro, and Pietro Tedesco, Grandola Ed Uniti, both of Italy, assignors to Kent-Tieghi S.p.A., Lenno, Italy

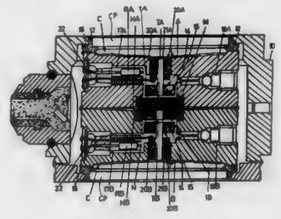
Filed May 7, 1986, Ser. No. 860,486

Claims priority, application Italy, Jul. 9, 1985, 21496 A/85

Int. Cl.⁴ G01L *7/08, 9/10*

U.S. Cl. 73—706 **11 Claims**

1. A fluid pressure transmitter for use in potentially explosive atmospheres comprising a measuring transducer body provided with sensor means, said transducer body having therein at least one measuring chamber containing elements selected from the group consisting of electrical elements and electronic transducing elements in a part of said measuring chamber, said part of said measuring chamber being defined between a measuring diaphragm and at least one flameproof joint means for preventing sparks or flames from leaving said part of said measuring



chamber, said flameproof joint means comprising a cylindrical body force-fitted in a bore formed in said transducer body, said bore having substantially the same diameter as the cylindrical body, an outer periphery of said cylindrical body being provided with at least one axially extending groove forming at least one interstice with an inner surface of said bore, said interstice being so dimensioned as to prevent sparks or flames from leaving said part of said measuring chamber through said interstice.

4,733,564

PRESSURE GAUGE WITH A CAPSULE CLOSED BY A RESILIENT MEMBRANE

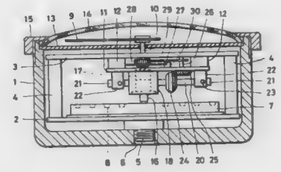
André Gorgé, Moutier, Switzerland, assignor to Charles Gorge, S.A., Moutier, Switzerland

Filed Jul. 15, 1986, Ser. No. 885,881

Claims priority, application Switzerland, Jul. 19, 1985, #5810333

Int. Cl.⁴ G01L *7/10*

U.S. Cl. 73—715 **2 Claims**



1. A pressure gauge comprising, in combination:

a cylindrical cap-shaped casing;

a capsule formed by

a cylindrical low cap fixed to the bottom of said casing and being substantially coaxial therewith, and by

a circular resilient membrane substantially parallel to the bottom of said casing and tightly sealing said cap;

a graduated dial having equidistant divisions, being located in the upper part of said casing, and being parallel to the bottom thereof and coaxial therewith;

an indicating pointer movable over said dial, around the center thereof;

a toothed rack reliably following the displacements of the central point of said membrane in a direction perpendicular thereto;

a first arbor parallel to the bottom of said casing;

a first pinion on said first arbor, meshing with said rack;

a first angular gear on said first arbor;

a second arbor perpendicular to the bottom of said casing;

a second angular gear on said second arbor meshing with said first angular gear;

a toothed sector on said second arbor;

a shaft carrying said pointer, and

a second pinion on said shaft, meshing with said toothed sector.

4,733,565

Patent Not Issued For This Number

4,733,566

PRESSURE TRANSDUCER APPARATUS

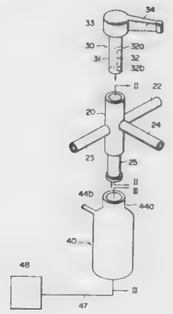
Yousuke Moriuchi, and Tadashi Kohsai, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,732

Claims priority, application Japan, Aug. 30, 1985, 60-132646[U]

Int. Cl.⁴ G01L *7/08, 9/00*

U.S. Cl. 73—756 **2 Claims**



1. A fluid pressure transducer apparatus comprising:

(A) a fluid pressure transducer means including:

(A-i) a fluid pressure detection means, having a detection surface of a fluid pressure, for converting a fluid pressure into an electrical signal, and

(A-ii) a chamber, formed on said detection surface, for storing a fluid; and

(B) a path means, selectively communicating said chamber with a fluid pressure measurement portion, for transmitting a fluid pressure of the measurement portion to said detection surface, said path means including:

(B-i) a cylindical member having a first port communicating with said chamber and a plurality of second ports arranged on a surface substantially perpendicular to an axis of said cylindrical member, said first port being arranged on an upper portion of said cylindrical member, and

(B-ii) a stop cock arranged in said cylindrical member to be slidable with respect to an inner surface of said cylindrical member, said stop cock having a path defined therein and handle means for slidably rotating said stop cock in said cylindrical member through a predetermined angle so that said path communicates said first port with only one of said plurality of second ports and no other second ports communicate with each other, said stop cock further having an annular groove communicating with said first port and a substantially vertical groove communicating said annular groove and said second ports one at a time.

4,733,567

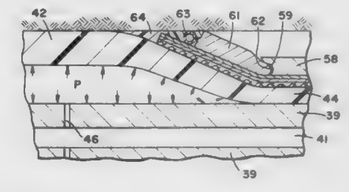
METHOD AND APPARATUS FOR MEASURING IN SITU EARTHEN STRESSES AND PROPERTIES USING A BOREHOLE PROBE

Shosei Serata, 1229 - 8th St., Berkeley, Calif. 94710

Filed Jun. 23, 1986, Ser. No. 877,405

Int. Cl.⁴ G01N *33/24*

U.S. Cl. 73—784 **9 Claims**



1. A method for determining the material properties and initial stress field in ground media surrounding a borehole, comprising the steps of:

inserting a stress-properties probe into said borehole,

expanding an outer portion of said probe under increasing high fluid pressure to impinge upon and deform the borehole wall until the ground media fractures at a pair of mutually perpendicular fracture planes propagating in the maximum and minimum principal stress directions, while simultaneously measuring the diameter expansion of said probe at angular increments thereabout to detect initiation of said pair of fractures and their angular orientation,

relieving said high fuild pressure to close said factures,

re-expanding said outer portion of said probe under increasing high fluid pressure to re-open said fracture planes,

continuously monitoring the diametrical changes of said outer portion of said probe and said fluid pressure to determine the first fluid pressure levels at which said pair of fracture planes are first opened and the fluid pressure levels at which said pair of fracture planes are re-opened, and

comparing said first and second pressure levels and the diametrical deformation of said outer portion of said probe to determine the magnitude and orientation of the maximum and minimum principal stresses of the ground media and material properties of the ground media.

3. An apparatus for measuring material properties and ambient stresses in ground media surrounding a borehole, including;

a tubular cylindrical member adapted to contain high pressure fluid in the range of 10,000 psi, and to expand elastically in

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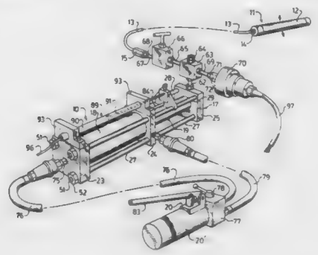
response to said pressure; a pair of end cap assemblies joined to said cylindrical member to limit expansion of the ends thereof and to contain said high pressure fluid; diameter measuring means for determining the expansion of the outer surface of said cylindrical member as a function of loading pressure; wherein the opposed ends of said cylindrical member are tapered in diameter, said end cap assemblies are received and secured about said tapered ends; further including a large plurality of bridging blocks arrayed annularly about said tapered ends, each block extending generally longitudinally with respect to said cylindrical member, said array of bridging blocks being disposed to contain said high pressure fluid at the junction of said end cap assemblies and the expandable cylindrical member of said apparatus; means for joining said bridging blocks to each of said end cap assemblies with limited rotational freedom to permit the bridging blocks to pivot outwardly in umbrella fashion as said cylindrical member expands under high inflating pressure, each end cap assembly including a steel cylinder secured about the distal portion of each of said tapered ends; wherein said means for joining said bridging blocks to said end cap assembly includes an outwardly flared groove in the proximal end surface of each of said steel cylinders, said bridging blocks each including a rounded end adapted to be received in said groove in smoothly rotatably fashion to permit the bridging blocks to pivot outwardly in umbrella fashion as said cylindrical member expands under high inflating pressure; and a pair of concentric, sleeve-like layers of high strength steel cables secured about each of said tapered ends to prevent extrusion of said cylindrical member through said array of bridging blocks under high inflating pressure.

4,733,568

BOREHOLE DILATOMETER INTENSIFIER

Robert Koopmans, R.R. 2, Acton, Ontario, Canada L7J 2L8, ande Robin W. Hughes, 65 Waterford Drive, Weston, Ontario, Canada M9R 2N7

Filed Feb. 18, 1986, Ser. No. 830,354
Claims priority, application Canada, Sep. 9, 1985, 490229
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—784 **6 Claims**



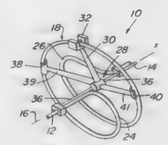
1. A pressure intensifier for use with a borehole dilatometer head having an expandable body portion defining an internal cavity, the intensifier comprising, in combination:
- a housing having positioned therein first and second axially aligned interconnecting cylinders, said first cylinder being of larger diameter than said second cylinder;
- connecting means for establishing fluid communication between said second cylinder and said internal cavity;
- a piston having a head portion and a rearwardly directed plunger portion, the piston being mounted for linear reciprocation of the head portion within the first cylinder so as to define a first chamber of variable volume ahead of the head portion, the plunger portion being mounted for simultaneous linear reciprocation within the second cylinder so as to define, together with said internal cavity and said connecting means, a second chamber of variable volume rearwardly of said plunger portion;
- means for introducing a first substantially non-compressible working liquid into said first chamber;
- means for introducing a second substantially non-compressible working liquid into said second chamber;
- means for pressurizing the first working liquid within the first chamber so as to displace the head portion linearly in the rearward direction from an initial forward position, thereby pressurizing the second working liquid within the second chamber;
- first transducer means for measuring the linear displacement of the piston and for providing an electrical signal indicative thereof, and second transducer means for measuring pressure changes of the second working liquid and for providing an electrical signal indicative thereof, said first and second transducer means each providing an analog electrical signal; and
- means for returning the head portion to said initial forward position, said returning means including means for substantially removing the first working liquid from the first chamber;
- wherein the first transducer means is a linear variable differential transformer having a body and a core-rod portion, the body being affixed to the housing and the core-rod portion being rigidly attached to the head portion.

4,733,569

MASS FLOW METER

Newton D. Kelsey, Dallas, Tex.; Martin Kane, Atlantic City, N.J., and Wayne Pratt, Scottsdale, Ariz., assignors to K-Flow Division of Kane Steel Co., Inc., Millville, N.J.

Filed Dec. 16, 1985, Ser. No. 809,658
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **14 Claims**



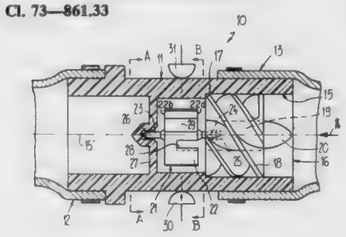
1. An apparatus for measuring the mass flow of a fluid stream comprising: a conduit having an inlet end and an outlet end, each said end fixed with respect to one another and positioned substantially along a single axis; a substantially free-floating continuous flow tube forming at least one loop spiraled between said inlet and said outlet ends, whereby the continuous flow tube is substantially free of restrictions or constraints along its spiraled length offset from the single axis, and said loop being symmetrical about said single axis between said fixed inlet and outlet ends; a driving transducer imparting an oscillation to said loop in a direction perpendicular to the flow within said loop and parallel to the single axis; and means for sensing the deflections of said loop in response to the reaction of the flow to the oscillation of said driving transducer, said sensing means positioned in opposite radial directions from said driving transducer along the periphery of said loop.

4,733,570

FLOWMETER

Paulus J. Peters, Balgoy, Netherlands, assignor to Bieo AG, Pfaffikon, Switzerland

Filed Dec. 4, 1986, Ser. No. 941,800
Claims priority, application Switzerland, Dec. 12, 1985, 5298/85
Int. Cl.[4] G01F *1/10*
U.S. Cl. 73—861.33 **3 Claims**



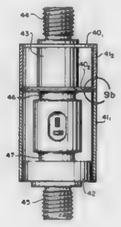
1. A flowmeter for measuring flowing media comprising:
- a rotor having blades and an axis of rotation;
- means for rotatably and coaxially mounting said rotor within a substantially cylindrical bore;
- a screw shaped stream distributor coaxially and stationarily mounted within said bore upstream of said rotor;
- said blades having concave loaded surfaces;
- said stream distributor dividing the incident medium into partial flows and imparting to the partial flows a spin;
- said partial flows having a spin impinging on said concave loaded surfaces of said blades;
- a light source for transmitting a light beam to a light receiver;
- said light beam being repeatedly momentarily interrupted by the rotating rotor;
- said light beam crossing said axis of rotation substantially orthogonally;
- each of said concave loaded surfaced being curved exclusively about axes of curvature parallel to said axis of rotation;
- each of said blades having side edges and comprising a slot extending parallel to said axis of rotation and beginning at one of said side edges;
- and said slot forming a passage for briefly transmitting said light beam from said light source to said light receiver when said rotor is rotating.

4,733,571

LINEARIZATION OF COLUMN-TYPE LOAD CELL

Alfred N. Ormond, 4010 Hermitage Dr., Hacienda Heights, Calif. 91745

Filed Oct. 24, 1986, Ser. No. 922,946
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.65 **7 Claims**



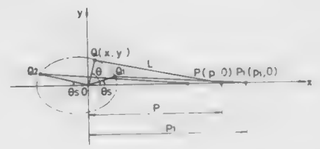
1. In a column-type load cell having a column means for linearizing the electrical output signal from axial and cross strain gauges mounted on the column comprising a recessed portion provided in said column, with recesses on opposite sides thereof, which provide a portion of the column with an H-shaped cross section, whereby said portion provides a web between flanges, said gauges being mounted on said web, an improvement comprising a pair of spaced reduced cross section portions defined in the column continuously around a periphery of the column and arranged bracketing said recessed portion for forming means for adjustment of the linearization effect of said recessed portion in the load cell by modifying the cross section of the reduced cross section portions defined in said column.

4,733,572

LINER RECIPROCATING MOTION DEVICE AND OPTICAL CARD TRANSPORTING DEVICE WHICH EMPLOYS THE SAME

Koichi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 18, 1986, Ser. No. 886,907
Claims priority, application Japan, Nov. 27, 1985, 60-264943; Dec. 5, 1985, 60-272420
Int. Cl.[4] F16H *21/20*; F16C *3/28*
U.S. Cl. 74—44 **3 Claims**



1. A linear reciprocating uniform motion device, comprising:
- an object being slideable exclusively in a prescribed direction;
- cam groov formed on a closed curve;
- a linking rod having a first end connected to said object and a second end engaged with said cam groove;
- a crank arm being rotatable in the interior of said closed curve, one end of said crank arm being connected to the second end of said linking rod; and
- means for rotating said crank arm to move the second end of said linking rod along said cam groove with a prescribed angular velocity so as to give said object a linear reciprocating uniform motion and given an acceleration and deceleration at the neighborhood of the position where the direction of the motion of said object is to be reversed, wherein a lenght L of said linking rod is determined by the following equation;

$$L=max\{P_1-S_c(\theta-\theta_s)/(180-2\theta_s)\}\sin\theta$$

where P_1 is a starting point of the uniform motion of said object; S_c is a stroke for a segment of the uniform motion of said object; θ is a rotation angle of said crank arm, θ_s is a rotation angle of said crank arm at a segment of the acceleration and deceleration, $\theta_s \leqq \theta \leqq 180-\theta_s$, and $0<\theta_s<90$, and wherein a locus Q of the second end of said linking rod is determined by the following equations,

$$y=x \cdot \tan\theta,$$

$$(x-p)^2+y^2=L^2,$$

$$P=P_1-S_c(\theta-\theta_s)/(180-2\theta_s),$$

$$L=max\{P_1-S_c(\theta-\theta_s)/(180-2\theta_s)\}\sin\theta,$$

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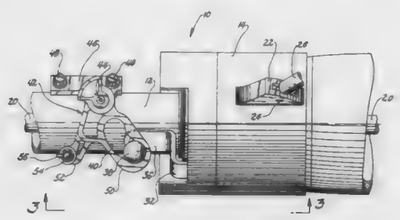
where (x,y) are coordinates for each point Q of the second end of said linking rod, P is a point of the motion of said object, P_1 is a starting point of the uniform motion of said object, S_c is a stroke for a segment of the uniform motion of said object.

4,733,573

TRANSMISSION SHIFT CONTROL MECHANISM

Richard L. Kramer, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1986, Ser. No. 866,378
Int. Cl.[4] B60K *20/06*
U.S. Cl. 74—473 SW **3 Claims**



3. A transmission shift control comprising; steering column means; steering column mounted shift bowl means rotatably mounted on said steering column means and including a manual shift lever and arm means having ball means disposed thereon, said manual lever being movable to a plurality of equally angularly spaced positions; transmission shift control cable means; actuator lever assembly means pivotally mounted on said steering column means and including first and second arm members, said first arm member having a cam slot continuously engaged by said ball means, and said second arm member having connecting means for connecting said actuator lever assembly means to said transmission shift control cable means; said actuator lever assembly means being pivoted by cooperation of said ball means and said cam slot in response to rotary movement of said shift bowl means, and said second arm member and said connecting means being operable to transmit substantially linear movement to said transmission shift control cable means to position said transmission shift cable means to a plurality of substantially linearly spaced positions corresponding to respective ones of the angularly spaced positions with a spacing between two of said linearly spaced positions being substantially greater than other spacings between other of said linearly spaced positions; and power transmission means being selectively shiftable to a plurality of operating positions in response to the linear movement of said transmission shift control cable means.

4,733,574

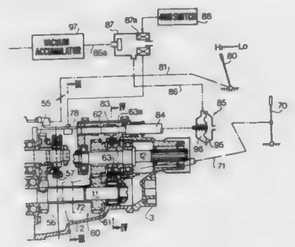
POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Shintaro Uchiyama, Tokorozawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,835
Claims priority, application Japan, Sep. 26, 1985, 60-213327
Int. Cl.[4] B60K *20/00, 20/02, 20/04, 20/06*
U.S. Cl. 74—473 R **10 Claims**

1. In a power transmission system for a four-wheel drive motor vehicle, having a main transmission and a sub-transmission operatively connected to an input shaft of the main transmission, the main transmission having a gearshift lever, a shifter arm operatively connected to the gearshift lever, and shifter rail arms selectively engageable with the shifter arm for selecting one of speed gears of the main transmission, the sub-transmission including reduction gear trains and a clutch operable to select the transmitting speeds for transmitting the output of an engine to the input shaft, and a transfer device for transmitting the output of the main transmission to auxiliary drive wheels of the vehicle, the transfer device including a transfer clutch, the improvement comprising:

an ultra-low speed position provided in a shift pattern of the gearshift lever, for selecting a low speed gear by combining a first speed of the main transmission and a low speed range of the sub-transmission;



first means responsive to the movement of the gearshift lever to the ultra-low speed position for providing the first speed of the main transmission;

second means responsive to said movement of the gearshift lever for operating the clutch of the sub-transmission to provide the low speed range of the sub-transmission;

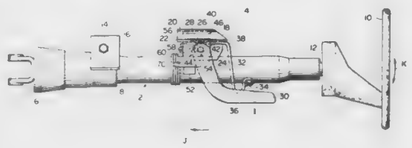
third means responsive to said movement of the gearshift lever for operating the transfer clutch to engage it so as to provide four-wheel drive, whereby an ultra-low speed with four-wheel drive is established.

4,733,575

VEHICLE TILT STEERING COLUMN DEVICE INCLUDING A BENDING BRACKET TYPE ENERGY ABSORBING MEANS

Shuji Nakamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 17, 1987, Ser. No. 39,433
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **7 Claims**



1. A tilt steering column device including a bending bracket type energy absorbing means for a vehicle, comprising:

(a) a column tube assembly including a lower column tube and an upper column tube which are mutually mounted such that said upper column tube can move axially frontward with respect to said lower column tube when said upper column tube receives an excessively large frontward force;

(b) lower support bracket means for so supporting said column tube assembly at said lower column tube that said column tube assembly can tilt around a tilt center, said lower support bracket means being fixed to a vehicle body;

(c) tilt-lock means for locking/unlocking a tilting position of said column tube assembly, said tilt-lock means being fixed to said vehicle body and including means having an elongate hole and a lock bolt slidably passing through said elongate hole, said tilt-lock means comprising means for so supporting said column tube assembly at said upper column tube that said column tube assembly can tilt around said tilt center when said lock bolt is loosened and that a tilting position of said column tube assembly is locked when said lock bolt is tightened;

(d) return spring means for so supporting said column tube assembly that said column tube assembly does not freely rotate downward due to gravity when said lock bolt is loosened, said return spring means comprising a spring engaging said tilt lock means and said column tube assembly;

(e)

(e-1) an energy absorbing bending bracket for absorbing energy by a permanent deformation thereof when said upper column tube moves axially frontward with respect to said lower column tube, said energy absorbing bending bracket having one end fixed to said upper column tube,

(e-2) an attachment fixed to an other end of said energy absorbing bending bracket, and means including said lock bolt for releasably supporting said attachment by said tilt-lock means such that relative movement of said attachment with respect to said tilt-lock means during tilting of said column tube assembly is accomplished by loosening said lock bolt,

(e-3) a collar fixed to said attachment; and

(f)

(f-1) a guide bracket fixed to said upper column tube, said guide bracket including an inclined surface, an angle defined between said inclined surface and an axis of said column tube assembly being smaller than an angle defined between the direction of an initial portion of the movement of said upper column tube due to said excessively large frontward force and said axis of said column tube assembly,

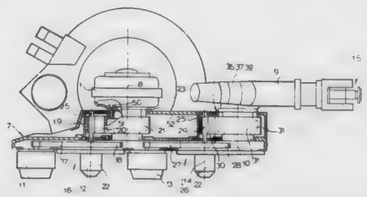
(f-2) a holding support fixed to said guide bracket, said collar being vertically held between said holding support and said guide bracket, said guide bracket being positioned relative to said tilt-lock means such that said collar slides along said inclined surface of said guide bracket during said axially frontward movement of said upper column tube.

4,733,576

MULTI-PURPOSE INDUSTRIAL ROBOT

Ernst Zimmer, Friedberg, and Karl L. Binder, Kissing, both of Fed. Rep. of Germany, assignors to Kuka Schweissanlagen and Roboter GmbH, both of Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP85/00689 § 371 Date Aug. 27, 1986, § 102(e) Date Aug. 27, 1986, PCT Pub. No. W086/04009, PCT Pub. Date Jul. 17, 1986
PCT Filed Dec. 10, 1985, Ser. No. 915,070
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447701
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—665 L **11 Claims**



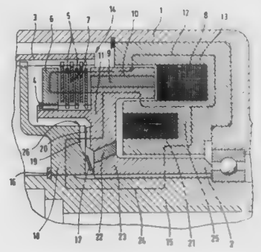
1. Industrial robot for various purposes comprising a stand, a rocker arm oscillatingly supported thereon, an outrigger oscillatingly supported on the rocker arm, and a firstr and second drive for oscillating said arm and outrigger, respectively, whereby a drivemotor of said second drive for oscillating the outrigger is located on the rocker arm, and the rocker arm is at least approximately balanced statically with respect to an oscillation axis by the weight of the outrigger wherein the improvement comprises the drive motor for the first drive being arranged on the rocker arm and a first and second off-drive member of the first and second drives being supported rotatably about said oscillation axis on the rocker arm and connected non-rotatably to the stand, said first and second drives being completely encased in a housing defining said rocker arm and only said off-drive members being directed outwardly through said housing and along the axis of rotation of the off drives and said first and second off-drive members being wheel flanges with a centering means for being screwed to the stand and outrigger, respectively.

4,733,577

ELECTROMAGNETICALLY ACTUATED LOCKING CLUTCH FOR DIFFERENTIAL GEARS OF MOTOR VEHICLES

Walter Griesser, Friedrichshafen, and Friedrich Schreiner, Kehlen-Reute, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP85/00563, § 371 Date Jun. 25, 1986, § 102(e) Date Jun. 25, 1986, PCT Pub. No. WO86/02981, PCT Pub. Date May 22, 1986
PCT Filed Oct. 25, 1985, Ser. No. 882,909
Claims priority, application European Pat. Off., Nov. 6, 1984, PCT/EP84/00352
Int. Cl.[4] F16H *1/44.5*
U.S. Cl. 74—710.5 **8 Claims**



1. An electromagnetically actuated sliplimiting clutch for the differential gear of a motor vehicle including the following features:

a first torque-transmitting connecting member of the differential gear non-rotationally supporting inner disks,

a second connecting member non-rotationally supporting outer disks,

said inner and outer disks comprising a sliplimiting friction clutch for said differential gear,

a first toroidal coil fastened to a housing and interacting with a rotatable annular first armature closing said sliplimiting friction clutch,

characterized by

said first connecting member non-rotationally supported a first claw section (**20**),

said second connecting member non-rotationally supporting a second claw section (**19**),

said claw sections (**19, 20**) form a sliplimiting claw clutch (**26**) for said differential gear,

a second toroidal coil (**21**) fastened to the housing and interacting with a rotatable annular second armature (**18**) closing said sliplimiting claw clutch (**26**),

a spring (**17**) opening said sliplimiting claw clutch (**26**),

wherein said first and second toroidal coils are alternatively independently energized to alternatively engage said friction clutch or said claw clutch.

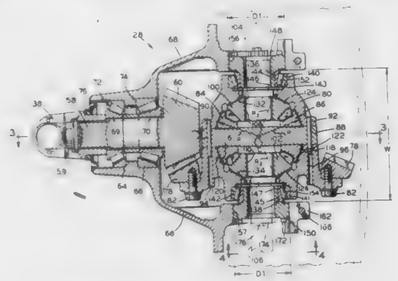
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,578

BEVEL GEAR DIFFERENTIAL WITH CONICAL SPHERICAL GEAR SEATS

Jack G. Glaze, Fort Wayne, and Terry L. Oster, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 31, 1986, Ser. No. 947,982
Int. Cl.[4] F16H *1/40, 1/39*
U.S. Cl. 74—713 11 Claims



1. A differential assembly comprising:
a casing means adapted to be rotatably driven about an axis of rotation and defining a chamber therein;
at least two pinion gears retained within said chamber and having an axis of rotation perpendicular to and interesting the axis of rotation of said casing means;
at least two side gears retained within said chamber and having an axis of rotation parallel to the axis of rotation of said casing means, said side gears engaging said pinion gears to form a differential gear mechanism, each of said side gears being mounted on and operatively connected to a separate shaft member;
each of said pinion gears having a back surface defined by a spherical surface having a generating center point lying on the axis of rotation of said pinion gear;
each of said side gears having a back surface defined by a single conical surface extending substantially from the teeth thereof to the respective shaft member and having an axis of generation aligned with the axis of rotation of said side gears;
said chamber in said casing means defining at least two spherical surface portions adapted to receive and support said back surfaces of said pinion gears; and
said chamber further defining at least two conical surface portions adapted to receive and support said back surfaces of said side gears.

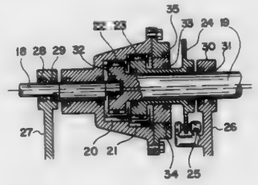
4,733,579

ORBITING RING-GEAR PLANETARY DRIVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 750,787, Jul. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 747,889, Jun. 24, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 891,124
Int. Cl.[4] F16H *1/28, 57/10*
U.S. Cl. 74—804 6 Claims

1. An apparatus for transmitting power comprising in combination:
(a) a first shaft rotatably and coaxially disposed about a first axis;
(b) a second shaft rotatably and coaxially disposed about said first axis;
(c) a rotating member including at least three internal ring-gears coaxially and rigidly coupled to each other, said rotating member connected to said first shaft wherein said rotating member is rotatable about a second axis parallel to and off-set from said first axis and orbiting about said first axis when said first shaft rotates, whereby a rotating motion of said first shaft produces an orbiting motion of said rotating member about said first axis;
(d) a first gear nonrotatably mounted on said second shaft, said first gear disposed within and engaging one of said at least three internal ring-gears; and



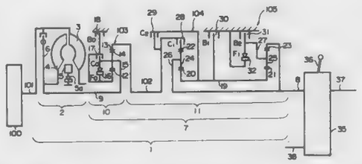
(e) at least two gears rotatably mounted on said second shaft, each of said at least two gears including a brake means for restraining from rotation, each of said at least two gears disposed within and engaging each of said at least three internal ring-gears excluding said one of said at least three internal ring-gears.

4,733,580

METHOD OF CONTROLLING A TRANSMISSION OF A VEHICLE IN TWO DIFFERENT MODES ACCORDING TO REQUIREMENTS FOR POWER AND ECONOMY

Seitoku Kubo; Yutaka Taga; Shinya Nakamura, and Hideki Yasue, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 9, 1985, Ser. No. 764,175
Claims priority, application Japan, Aug. 10, 1984, 59-168539; Aug. 24, 1984, 59-176299; Oct. 3, 1984, 59-207545; Oct. 3, 1984, 59-207546; Oct. 3, 1984, 59-207547; Oct. 18, 1984, 59-219090; Jun. 25, 1985, 60-138200
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—866 17 Claims



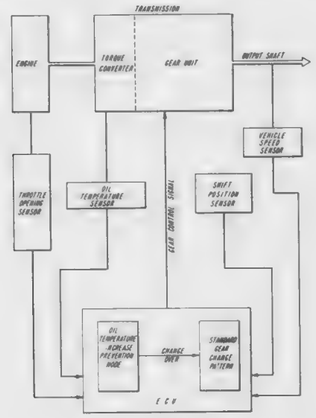
1. A method of controlling a transmission of a vehicle, said transmission comprising a gear mechanism for providing a series of more than two speed stages having gradually decreasing reduction gear ratios from a lowest speed stage of a largest reduction gear ratio to a highest speed stage of a smallest reduction gear ratio, comprising the steps of:
detecting a driver's operation of the vehicle to discriminate between the driver's intention to drive the vehicle with a preference for power and a preference for economy performance,
shifting said gear mechanism in a first mode among said series of speed stages according to a first shift pattern suitable for powerful operation of the vehicle when the discriminated driver's intention is to drive the vehicle with preference on power performance, and
shifting said gear mechanism in a second mode among a sub-series of speed stages which lacks at least one intermediate speed stage in said series of speed stages according to a second shift pattern suitable for economical operation of the vehicle when the discriminated driver's intention is to drive the vehicle with preference on economy performance,
wherein, when said first and second shift patterns are expressed in a diagram having an abscissa coordinate for vehicle road speed and an ordinate coordinate for throttle opening, the spacing between each two adjacent speed stage shift lines along the abscissa in said second shift pattern is substantially the same as that in said first shift pattern, with the interval between a speed stage shift line for upshifting from the lowest speed stage to an adjacently higher speed stage and a speed stage shift line for upshifting to the highest speed stage from an adjacently lower speed stage in said second shift pattern being substantially smaller than that in said first shift pattern by an amount corresponding to the reduction of the number of the speed shift lines.

4,733,581

AUTOMATIC TRANSMISSION PROVIDED WITH MODE PREVENTING INCREASE IN OIL TEMPERATURE

Hiromi Hasegawa, Obu, and Toshiaki Ishiguro, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 29, 1986, Ser. No. 912,372
Claims priority, application Japan, Sep. 30, 1985, 60-216398
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—864 5 Claims



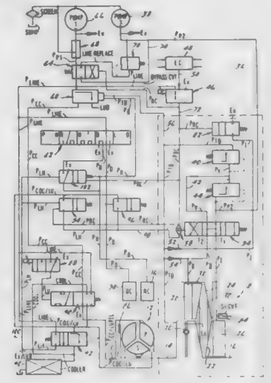
1. An automatic transmission driven by an output shaft of an engine and provided with a torque converter, a plurality of gear-change steps, a plurality of gear-change patterns which select said gear-change steps as are determined by the rotational speed of the output shaft and throttle opening of the engine, an automatic gear means for automatically changing said gear-change steps on the basis of said gear-change patterns, and a transmission oil temperature sensor which generates a transmission oil temperature signal comprising an oil temperature increase prevention mode which automatically shifts gears on the basis of a gear-change pattern of said mode, and which is one of a plurality of gear-change patterns, in which downshift points are shifted to a gear-change based on a speed higher than a standard gear-change pattern when said oil temperature signal is above a level of a signal corresponding to a given temperature; and a control means for determining when oil temperature has increased to a given temperature on the basis of said oil temperature signal, and generating a control signal so as to change said mode to said oil temperature increase preventive mode.

4,733,582

CONTROL VALVE SYSTEM FOR A CONTINUOUSLY VARIABLE BELT DRIVEN TRANSMISSION FOR MOTOR VEHICLES

Ulrich Eggert, Cologne, and Hermann Staffel, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 21, 1986, Ser. No. 887,852
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602137
Int. Cl.[4] B60K *41/12, 41/16, 41/18*
U.S. Cl. 74—867 5 Claims



1. A hydraulic valve system for controlling a continuously variable drive ratio automotive vehicle transmission adapted to shift continuously between different drive ratios and having first and second control pulleys driveably connected by an endless traction belt, a displacement cylinder associated with each pulley, the location of the belt on each pulley being radially variable in response to hydraulic fluid pressure in the associated cylinder to shift between the drive ratios, comprising:
first and second hydraulic fluid pumps;
electronic control means for producing an electrical control signal
a ratio pressure control valve coupled to the electronic control means for producing ratio control pressure whose magnitude varies in accordance with the control of the electronic control means;
a bypass valve means subject to the control of the ratio control pressure for opening and closing communication between the discharge of the first and second pumps when a drive ratio change is required;
ratio control valve means subject to the control of the ratio control pressure and hydraulically connected to the discharge of the first pump for selectively opening hydraulic communication between the discharge of the first pump and the first and second displacement cylinders in accordance with the required drive ratio.

4,733,583

LUG WRENCH

Robert W. Lewis, Box 158, Garden Valley, Calif. 95633

Filed Jan. 22, 1986, Ser. No. 820,961
Int. Cl.[4] B25G *1/00;* B25B *13/06*
U.S. Cl. 81—177.2 16 Claims

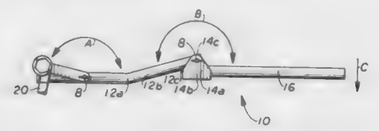
1. A lug wrench comprising, in combination:
a shaft having a socket at one end adapted to overlie and drive a nut on and off a lug,
a moment arm bar having an inside end and an outside end,
a yoke attached to said shaft, extending radially therefrom, an end of said yoke remote from said shaft pivotally con-

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nected by pivot means to said moment arm bar in the region between the middle and the outside end of said moment arm bar, said pivot means pivotable about an axis parallel to the rotational axis of said socket allowing said shaft to pivot between a first position and a second position, said first position including said shaft lying approximately midway along the length of said moment arm bar enabling a first torque upon tightening the nut, and said second position including said shaft lying near the outside end of said moment arm bar enabling enhanced torque upon loosening the nut, the second-position allowing for greater torque for loosening the nut than the first-position for tightening the nut,

and moment arm multiplier means including a rotation-limiting hinge having stop means for limiting rotation of said hinge, said hinge pivotally connected to the inside end of said moment arm bar and pivotable about an axis parallel to the rotational axis of said socket, said moment arm multiplier means for enabling loosening of the nut with enhanced torque in excess of said moment arm bar alone to free difficult fasteners when said multiplier means is unfolded by pivotally rotating said multiplier means relative to said moment arm bar to lengthen the lever arm with respect to said moment arm bar,

wherein said multiplier means is folded over said moment arm bar when said shaft is in said first position whereby said shaft is substantially midway along the length of both said moment arm bar and said multiplier means for tightening and speed turning the nut.



4,733,584

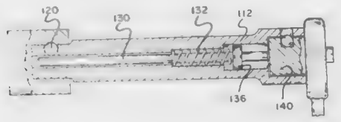
SOCKET WRENCH EXTENSION

Richard Karge, 6512 Browning Rd., Pennsauken, N.J. 08110

Filed May 12, 1986, Ser. No. 861,682

Int. Cl.[4] B25B *13/00*

U.S. Cl. 81—177.85 **2 Claims**



1. A locking socket wrench extension comprising:

an elongated extension member having an axially aligned opening adjacent one end thereof adapted to receive the driving stud of a ratchet wrench or similar tool;

the end of said extension member remote from said one end including a socket drive stud thereon;

a socket retaining means including a socket engaging ball carried by said socket drive stud, said retaining means including a transverse slot formed in the wall of said socket drive stud, said ball being contained within said slot and being movable between a locking position wherein a portion of said wall lies outside of said slot and said socket drive stud and an unlocking position wherein said ball moves inwardly toward the center of said socket drive stud;

an elongated bore within said extension member and coaxial therewith, the forward end of said bore intersecting said slot and the rear end thereof extending into said driving stud opening;

an elongated pin located within said bore and being capable of limited axial movement, the forward end of said pin being adapted to move said ball into said locking position when said pin moves forwardly, said ball moving into said unlocking position when said pin moves rearwardly, said pin entering said opening when said pin moves rearwardly into said unlocking position and being adapted to be moved forwardly when a wrench driving stud is inserted into said driving stud opening to engage said pin to thereby move said ball into said locking position, and

spring means within said extension member biasing said pin rearwardly.

4,733,585

FEEDING DEVICE FOR A TOOL SLIDE OF A MACHINE TOOL

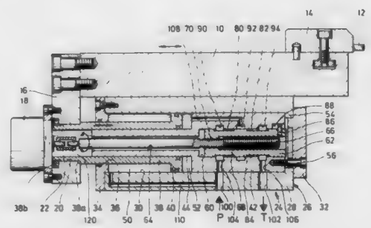
Helmut F. Link, Aichwald, and Walter Grossmann, Baltmannsweiler, both of Fed. Rep. of Germany, assignors to Index-Werke Komm.-Ges. Hahn & Tessky, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,240

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 8606976[U]

Int. Cl.[4] B23B *21/00*

U.S. Cl. 82—21 A **7 Claims**



1. A feeding device for a tool slide of a machine tool including an electro-hydraulic amplifier having a cylinder housing, in which a piston is guided with a piston collar for longitudinal movement, said piston being provided with an axial channel and a hollow piston rod penetrating an end wall of the cylinder housing and having a free end portion outside said cylinder housing, an electromotor with a housing and a rotatable drive shaft, said housing being fixed to the free end portion of the piston rod, said cylinder housing having a first cylinder chamber between said end wall and said piston collar, a second cylinder chamber adjacent the side of the piston collar remote from the first cylinder chamber and a third cylinder chamber on the side of the second cylinder chamber remote from the piston collar, control valve means comprising a valve housing and a valve member in said valve housing, said control valve means being fixedly disposed in said third cylinder chamber, a threaded spindle extending through the hollow piston rod and the axial channel of said piston, said spindle being connected to the drive shaft of said electromotor and in operative connection with said valve member.

4,733,586

METHOD OF AND APPARATUS FOR MAKING A CAPILLARY-ACTION NIB FOR A PEN OR MARKER

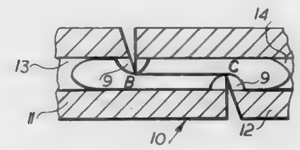
Christoph Manusch, Hanover, and Günter Scholz, Garbsen, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft AG, Hanover, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 43,159

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614230

Int. Cl.[4] B26D *3/00*

U.S. Cl. 83—39 **11 Claims**



1. A method of making writing nibs for capillary-action pens and markers, comprising the steps of:

notching an elongated nib blank pointed at opposite ends at locations on opposite sides of a longitudinal median plane through said blank to form end flanks of nibs to be formed from said blank; and

thereafter cutting said blank along a parting plane running from one of said notches to the other of said notches, thereby forming two of said writing nibs by a division of said blank.

4,733,587

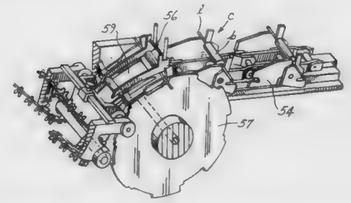
MECHANISM FOR BODY CENTERING AND LEAD TRIMMING

Daniel W. Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 6, 1986, Ser. No. 871,724

Int. Cl.[4] B26D *1/24*

U.S. Cl. 83—411 R **3 Claims**



1. A sequencing and inserting machine for electrical components each having a body with axially extending leads comprising:

conveyor means having spaced notch means for supporting the leads of the components and for transporting the supported components in spaced relation,

rotatable disc means including a pair of axially spaced wheels each having a plurality of recessed shoulders for receiving the leads of the components,

means for displacing said disc means in timed relation to said conveyor means so that the supported components will be sequentially lifted off of said notch means and transferred to the recessed shulder of said spaced wheels,

means for holding said components in said recessed shoulders as said disc means is displaced to a trimming lead location, said holding means including means for centering said components between said wheels, and means for trimming said leads when a component is at said trimming location.

4,733,588

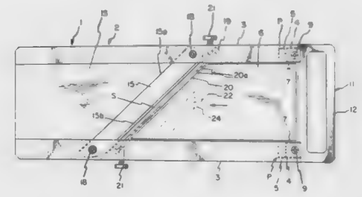
GUIDE REGULATOR PLATE FOR VEGETABLE PREPARING DEVICES

Keiji Yamamoto, 7-7-31, Nishimi Iwakuni-shi, Yamaguchi-ken, Japan

Filed Sep. 30, 1986, Ser. No. 913,474

Int. Cl.[4] B26D *1/03*

U.S. Cl. 83—857 **1 Claim**



1. A guide regulator plate for vegetable preparing devices wherein a guide regulator plate adapted to guide a vegetable toward a blade fixed to a body frame of a vegetable preparing device is supported pivotably on said body frame so that the length of a projecting portion of said blade can be regulated, comprising pivotable member-supporting recesses each of which is provided at the left or right end portion of said body frame and opened in the end surface of said end portion, and each of which is substantially in the shape of the letter "C" in its front elevation, pivotable supporting pins projecting from the left and right side surfaces of said guide regulator plate and formed so that said pins can be inserted into said recesses from their end openings, and left and right holding portions of a holder, which are formed so that said holding portions can be inserted in the portions of said recesses which are on the rear side of said supporting pins to thereby enable said holding portions to close said openings of said recesses.

4,733,589

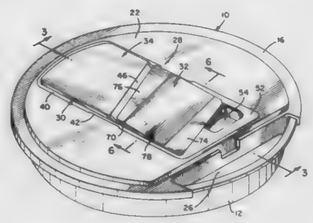
FOOD SLICER

Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Jul. 17, 1986, Ser. No. 887,409

Int. Cl.[4] B02C *11/04*; B26D *1/02*

U.S. Cl. 83—858 **5 Claims**



1. A food slicer comprising a slicer body and an infeed ramp, said slicer body including a pair of longitudinally aligned platforms, said platforms comprising an upper receiving platform and a lower infeed platform, said platforms having adjacent inner edges at a spacing defining a slot of predetermined height therebetween, a slicer blade along the inner edge of said upper platform, said infeed ramp being removably receivable on said lower platform and including an upper working surface and plural spaced edges selectively alignable with and over the

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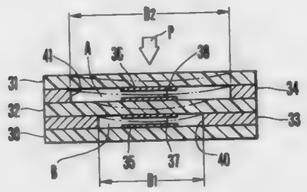
slot-defining inner edge of said lower platform to reduce the effective height of the slot, said ramp edges comprising a pair of parallel opposed edges of different heights whereby the height of the slot will vary in accord with the ramp edge aligned over the inner edge of the lower platform, said working surface including a planar section at and inward of each edge of said parallel edges, each of said planar sections lying in a plane disposed generally parallel to the plane of said infeed platform and being of equal height with the corresponding edge, and said working surface further including an inclined section between and connecting said planar sections.

4,733,590

KEYBOARD SWITCH APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Keisuke Watanabe, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 21, 1985, Ser. No. 800,559
Claims priority, application Japan, Dec. 4, 1984, 59-255097
Int. Cl.⁴ G10H *1/34*
U.S. Cl. 84—1.1 **13 Claims**



1. A keyboard switch apparatus for an electronic musical instrument, comprising:
- a first layer;
- a second layer disposed at a distance from said first layer and having elasticity;
- a third layer disposed between said first and second layers at a distance therefrom and having elasticity;
- a first switch comprising conductors respectively formed on opposite surfaces of said second and third layers;
- a second switch comprising conductors respectively formed on opposite surfaces of said first and third layers, said second and third layers being sequentially deformed by an actuator interlocked with a key depression to sequentially close said first and second switches, said first switch having a closing timing different from that of said second switch;
- means for generating a signal corresponding to a key depression speed by detecting the difference between the timings of closure of said first and second switches; and means for generating a musical tone signal of an instrument in response to said signal.

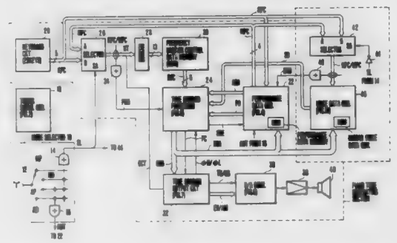
4,733,591

ELECTRONIC MUSICAL INSTRUMENT

Makoto Kaneko, and Susumu Kawashima, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 17, 1985, Ser. No. 735,365
Claims priority, application Japan, May 30, 1984, 59-109838; Mar. 20, 1985, 60-56336; Mar. 20, 1985, 60-56337
Int. Cl.⁴ G10L *1/00*
U.S. Cl. 84—1.01 **5 Claims**

1. An electronic musical instrument comprising:
- musical tone designating means for designating a musical tone to be produced;
- human voice data designating means for human voice data associated with the designated musical tone;
- multiplexing means for time-divisionally processing the designated musical tone and the human voice data; and means for producing the musical tone and the human voice in accordance with an output from said multiplexing means; means for generating an envelope of the designated musical tone wherein the envelope comprises digital waveshape data;
- a digital/analog converter having a digital input terminal, an analog output terminal and a power source terminal; and a power source circuit having a control input terminal and a power source supply terminal connected to the power source terminal, the digital input terminal of said digital-/analog converter being adapted to receive the digital waveshape data representing the envelope of the designated musical tone, and the control input terminal being adapted to receive a control signal corresponding to a frequency of the designated musical tone;
- wherein the digital waveshape data comprises n bits, and further comprising:



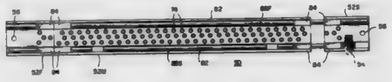
converting means for converting n-bit digital waveship data to m-bit (where m n) digital waveshape data;
- a digital/analog converter for converting the m-bit digital waveshape data generated from said converting means to an analog signal; and
- gate means arranged at an output side of said digital/analog converter
- said converting menas including means for selecting out of said n-bit digital waveshape data m-bit data consisting of consecutive m bits beginning with the bit which is next to consecutive "0"s within top 1 bits of the n-bit digital waveshape data and downward bits therefrom, and
- said gate means including control means for controlling on ON time of a gate in accordance with the number of said consecutive "0"s.

4,733,592

PLAYER PIANO TRACKER BAR AND METHOD

Kenneth B. Caulkins, 4218 Jessup Rd., Ceres, Calif. 95307

Filed Oct. 7, 1986, Ser. No. 916,097
Int. Cl.⁴ G10F *5/04*
U.S. Cl. 84—151 **20 Claims**



1. A musical apparatus comprising a tracker bar having:
- (a) a registry member with a series of passages for registering to paper holes from a player piano tape, said passages being spaced in a lengthwise direction, each passage extending from a first opening on a first side of said registry member through a second opening of a second side of said registry member; and
- (b) an interface member having a base with first and second sides and a plurality of tubes extending from said second side of said base, said first side of said base bieng fixed to said second side of said registry member, said interface member having a plurality of ducts therein, each duct extending from said first side of said base through to an open end of a corresponding one of said tubes and each duct communicates with a corresponding one of said passages to define a flow path from each of said first openings to a corresponding open end of one of said tubes; and

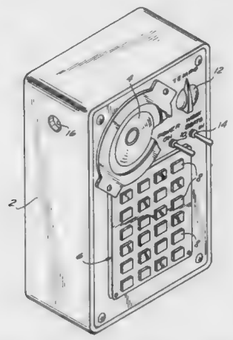
wherein said tubes include at least 3 rows extending lengthwise, each row spaced froeach other row in a width direction perpendicular to said length direction, and wherein said interface member is made of plastic and said tubes are integral with said base, and wherein each of said tubes has a tubular outer surface, and wherein the boundary between said second side of said registry member and said first side of said base of said interface member is the only boundary between different pieces which bounds any of said flow paths.

4,733,593

MIXED METER METRONOME

Peter Rothbart, 115 Troy Rd., Ithaca, N.Y. 14850

Filed Mar. 19, 1987, Ser. No. 28,187
Int. Cl.⁴ G10B *15/00*
U.S. Cl. 84—484 **13 Claims**



1. A metronome comprising means for producing beat indications and means for actuating said indication producing means, said actuating means comprising a programmable memory the program of which represents a sequence of beats and the relative frequency of said beats, keyboard means operatively connected to said memory for programming it, and control means for operatively connecting said memory to said indication producing means to cause the latter to produce beats in accordance with said memory program.

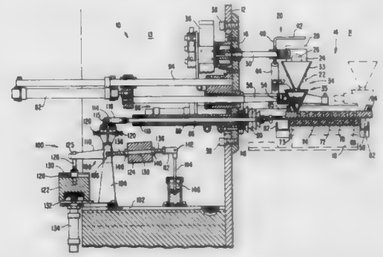
4,733,594

FILLING ARRANGEMENT

Walter Bajohr, Troisdorf, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,327
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527169
Int. Cl.⁴ F42B *33/02;* **B67C** *3/26;* **G01F** *11/10*
U.S. Cl. 86—31 **22 Claims**

1. A filling arrangement for dangerous substances, especially exposives, which comprises a loading arrangement containing a measuring slide plate and a displacement arrangement guided through a protective wall which displaces the guiding plate backwards and forwards between two end positions; the displacement arrangement comprising a force transfer arrangement with a push rod guided through the protective wall connected with the measuring slide plate, the force transfer arrangement being drivable in both directions by at least a first weight and a second weight, each of which drives the force transfer arrangement in a different rotational direction and at least a part of the first weight being uncoupleable from the force transfer arrangement; said second weight acting to move said push rod forward through said protective wall when at least a part of said first weight is uncoupled from the force



transfer arrangement and said first weight acting to move said push rod backwards through said protective wall when said at least a part of said first weight is coupled to said force transfer arrangement.

4,733,595

MUZZLE ARC SUPPRESSOR FOR ELECTROMAGNETIC RAILGUN

Charles E. Oberly, Urbana, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1987, Ser. No. 3,169
Int. Cl.⁴ F41F *1/02*
U.S. Cl. 89—8 **7 Claims**



1. A railgun, comprising:
- (a) a pair of generally parallel electrically conductive rails having a breech end and a muzzle end;
- (b) an electrically conductive projectile for being propelled along a path defined by the rails;
- (c) a varistor electrically connecting the rails; and,
- (d) means for triggering the varistor to substantially reduce its resistance, thereby permitting conduction of substantial current between the rails through the varistor.

4,733,596

ADD-ON MISSILE CONTAINER FOR MILITARY VEHICLES

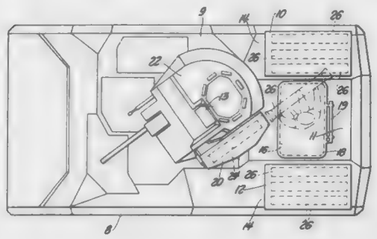
Robert A. Crow, III, Rochester, and John Korpi, Livonia, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 30, 1987, Ser. No. 8,999
Int. Cl.⁴ F41F *9/04*
U.S. Cl. 89—34 **10 Claims**

1. In association with a military vehicle that includes a hull having a front end and a rear end, a missile launcher carried externally of the hull forwardly from the hull rear end, and a hatch opening in the hull top wall behind the launcher near the hull rear end: the improvement comprising at least one missile container positioned externally of the hull on the hull top wall

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outboard from the hatch opening, and a cover for the container; said container being located alongside the hatch opening but behind the missile launcher such that a person can stand in the hull with his upper torso extending through the hatch opening and reach the container without interference from the missile launcher; said cover having a hinged connection with the associated container, whereby the cover has an open position displaced upwardly and outwardly away from the hatch opening; a missile-support rack structure normally located



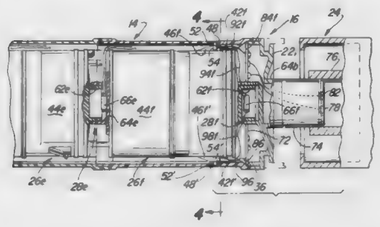
within the container; and means responsive to opening movement of the cover for raising the rack structure out of the container to a position wherein the missiles are located one above another in near adjacency to the hatch opening, whereby a person stationed in the hull can reach out from the hatch opening and remove a missile from the rack structure; said rack structure having missile-engagement means (54) that orients the missiles parallel to the cover hinge axis, whereby a person standing in the hull can manually grip a missile at two spaced points along the missile length.

4,733,597

SEQUENTIAL LAUNCHING SYSTEM

Theadore E. Upham, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Apr. 6, 1987, Ser. No. 34,765
Int. Cl.[4] F41F 5/02; B64D 1/04
U.S. Cl. 89—1.51 **8 Claims**



1. In a sequential launching system of the type comprising a launch tube having a breech end and a muzzle end, a closed bulkhead at the breech end of said tube, a plurality of generally cylindrical containers to be launched from said tube and being disposed in end-to-end relationship within said tube between said bulkhead and said muzzle end, a separate propulsion means for each container with a first propulsion means for acting between said bulkhead and the aft end of the adjacent container and an additional propulsion means for acting between each adjacent pair of containers, whereby said containers may be launched sequentially, the improvement which comprises:

means for allowing ambient air to flow to the aft end of each container,

and wherein:

each of said propulsion means includes a piston and a piston chamber, said piston being in slideable mating relation with said chamber,

means for producing expanding gas in said chamber for launching the container which is forward of the respective propulsion means,

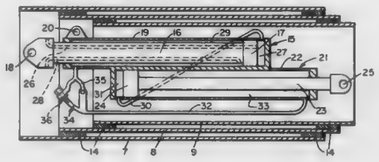
said chamber having a smaller cross-sectional area than that of said tube.

4,733,598

TELESCOPIC JIB

Gordon Innes, Letchworth, and Robert B. Bishop, Pirton, Nr Hitchin, both of England, assignors to The 600 Group PLC, Middlesex, England

Filed Jun. 19, 1986, Ser. No. 876,221
Claims priority, application United Kingdom, Jun. 21, 1985, 8515782
Int. Cl.[4] F15B 11/18
U.S. Cl. 91—168 **3 Claims**



1. In a hydraulically operated telescoping boom structure for a crane or the like wherein said structure includes at least a boom base member pivotably mounted on a platform for movement about a horizontal axis, and includes at least one intermediate boom member slidably received in said base boom member as well as a head boom member slidably received in the intermediate boom member, and also includes hydraulic means for moving said members in a predetermined sequence during extension and in inverse order during retraction, the improvement to said hydraulic means comprising:

a first fluid motor having a motor part (16) connected to said boom base member (7) and another motor part (19) movable relative to said motor part (16) and connected to said intermediate boom member (8),

a second fluid motor having a motor part (22) connected to said first fluid another motor part (19) and said second fluid motor having another motor part (23) connected to said head boom member (9),

said first fluid motor having an extension chamber (27) connected to a source of incompressible fluid pressure, and said second fluid motor having an extension chamber (31) connected to said first fluid motor extension chamber by a pressure line (30),

said first fluid motor having a retraction chamber (29) connected to a return line (28) associated with a reservoir for said fluid pressure source, said second fluid motor having a retraction chamber (33) connected to said first fluid motor retraction chamber by an intermediate return line (32),

said first and second fluid motor extension chambers having cross sectional areas of substantially similar size and said second retraction chamber having a smaller cross sectional size than of that of said first retraction chamber,

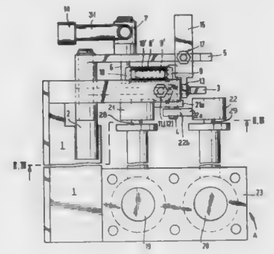
valve means (34) in said intermediate return line (32) responsive to back pressure in said intermediate return line to prevent fluid from flowing back to said fluid pressure source through said first retraction chamber until a predetermined back pressure has been exceeded in said second fluid motor retraction chamber.

4,733,599

APPARATUS FOR CONTROLLING THE FLOW OF A PRESSURE FLUID IN A MOTOR

Siegbert Knieschek, Köflach, Austria, assignor to Ing. Waldhauser Maschinenfabrik GmbH & Co. KG, Maria Lankowitz, Austria

Continuation of Ser. No. 636,909, Aug. 2, 1984, abandoned. This application Jan. 15, 1987, Ser. No. 5,330
Claims priority, application Austria, Aug. 2, 1983, 2792/83
Int. Cl.[4] F01L 31/00
U.S. Cl. 91—250 **4 Claims**



1. A device for controlling a motor operated with a pressure medium and having a variable-volume compartment for the pressure medium, said device comprising:

a flow-control unit having a pair of flow-control elements each displaceable between a flow-opening state and a flow-blocking state and connected to said compartment;

means defining a main pivot on said unit;

a cantilever arm having one end swingable about said pivot

a rocker arm having one end swingable about said pivot relative to said unit and said cantilever arm;

a telescoping rod pivotally connected at a first pivot at one end to said cantilever arm and at a second pivot at an opposite end to said rocker arm and including:

two telescopingly mutually guided rod parts, and

a compression spring surrounding said rod parts and guided thereby while urging said parts apart, whereby said telescoping rod tends to swing said rocker arm by a snap action into extreme positions to opposite sides of said cantilever arm upon displacement of said cantilever arm relative to said rocker arm so that said rod passes through a dead center position in which said first and second pivots are aligned with said main pivot;

respective pawls swingably mounted on said unit and engageable with said rocker arm for respectively retaining said rocker arm in respective onés of said extreme positions until one of said pawls retaining said rocker arm is disengaged therefrom, said pawls each being positioned to be engaged by said cantilever arm to be disengaged from said rocker arm when said cantilever arm is displaced so that said rod passes through said dead center position when said rocker arm is retained by a pawl so that the latter pawl releases the rocker arm and the rocker arm snaps by the force of said spring into its other extreme position and engagement by the other of said pawls;

means on said rocker arm operatively connected with said elements for switching over the said states thereof upon snapping of said rocker arm between said extreme positions; and

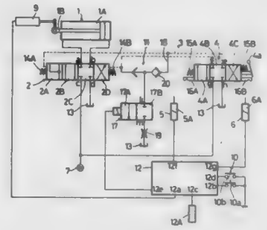
means for connecting a moving member of said motor with said cantilever arm.

4,733,600

APPARATUS FOR CONTROLLING CARGO HANDLING POSITION

Nobuo Masano, Ryugasaki, Japan, assignor to Toyo Unpanki Co., Ltd., Osaka, Japan

Filed Mar. 2, 1987, Ser. No. 20,735
Claims priority, application Japan, May 9, 1986, 61-70334
Int. Cl.[4] F15B 9/09
U.S. Cl. 91—358 A **1 Claim**



1. An apparatus for controlling cargo handling position, comprising a cargo handling valve for controlling a cargo handling device such as a hydraulic cylinder, a control valve connected to said cargo handling valve through a fluid pressure circuit adapted to provide said cargo handling valve with hydraulic pressure for changing the position of a valve spool therein, a retainer for holding said control valve in a position adapted to spontaneously let fall a boom, another retainer for holding said control valve in a position adapted to hold said boom in an uppermost position, a position sensor for detecting the rise and fall of said cargo handling device, a presetting unit for presetting the uppermost and lowermost stop positions of said cargo handling device, a shock absorber for reducing the hydraulic pressure applied through the fluid pressure circuit, and a controller for controlling said retainers and said shock absorber on the basis of signals taken from said position sensor and said presetting unit, said controller having a function of storing the signals taken from said presetting unit, a function of comparatively evaluating the signals taken from said presetting unit and those taken from said position sensor, a function of controlling said shock absorber by feeding a control signal thereto for effecting a hydraulic pressure drop on the basis of the result of said comparative evaluation, and a function of controlling said retainers by feeding signals thereto for releasing said retainers when said shock absorber has been fed with said control signal.

4,733,601

COMBINED SERVO CONTROL AND JACK UNIT

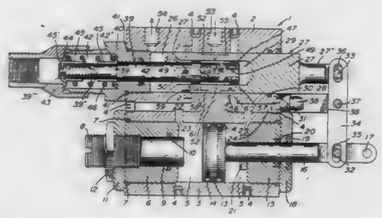
Roland Neirynck, 2291 Louis Veuillot Street, Montreal, Canada H1N 2N5

Filed Sep. 15, 1986, Ser. No. 907,378
Int. Cl.[4] F15B 9/10
U.S. Cl. 91—374 **1 Claim**

1. A servo control jack unit comprising: a rigid casing having a longitudinal piston chamber opening at first and second ends of said casing; a piston axially slidable in either direction located in said chamber; a piston rod fixed to said piston at one end and projecting outwardly of said first end of said casing at its other outer end; a first collar threadedly, sealingly engaged in said piston chamber at said second end of said casing; a setscrew threadedly, centrally engaged in said first collar, and engageable with said piston; a lock nut threaded around the external portion of said setscrew; a longitudinal servo valve chamber in said casing, spaced apart from said piston chamber, generally parallel to the latter and opening at said first and second ends of said casing; a spool extending into said servo valve chamber from said second end of said casing; a second collar threadedly, sealingly engaging said servo valve chamber

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at said second end of said casing, said second collar having an outwardly-opening large diameter bore through which extends the outer portion of said spool; biasing means located in said large diameter bore of said collar to maintain said spool in centered position; actuating means to move said spool to either axial direction from said centered position; a sleeve member extending into said servo valve chamber from the first end of said casing; said sleeve member having a sliding fit with said servo valve chamber and including an inner cylindrical portion opened only at one end and closely surrounding the inner portion of said spool; said sleeve member further having an external outer end; a mechanical direction reversible linkage means pivotally secured to said first end of said casing, to said outer end of said sleeve member and to the outer portion of said piston rod; said casing further having, in one wall thereof, a fluid inlet port and a fluid outlet port, each communicating with said servo valve chamber; separate first and second channels formed in said casing between said servo valve member and said piston chamber and respectively communicating with said servo valve chamber on opposite sides of said piston; said inner cylindrical portion of said sleeve member being formed with a first pair of orifices, including an entry orifice and an exit orifice, and a second pair of inwardly-spaced orifices, also including an entry orifice and an exit orifice; said first pair of orifices communicating with said first channel and said second pair of orifices communicating with said second channel; said inner cylindrical portion of said sleeve member and the contiguous inner portion of said spool being cooperatively constructed and arranged to selectively direct an incoming flow of fluid from said inlet port into one or the other of said entry



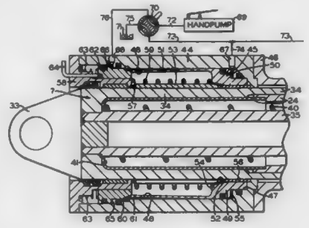
orifices upon actuation of said spool, and to direct the return flow of fluid into one or the other of said exit orifices; then along one of two paths to said outlet port; said exit orifices having a smaller cross-sectional area than that of said entry orifices; said inner portion of said spool being formed with a first and a second circumferential boss at the inner end and intermediate area, respectively, thereof; said inner portion of said spool being further provided with an axial passage extending from the inner end thereof to slightly beyond said second boss; a pair of transversely-registering, longitudinally-extending slots provided in said spool beyond said second boss and communicating with said axial passage; a transverse pin fixed to said inner cylindrical portion of said sleeve member at its ends and freely extending through said slots to limit relative displacement of said spool and sleeve member; both said bosses having a sliding fit with the inner surface of said inner cylindrical portion of said sleeve member; said bosses defining a sealed space between themselves, said inlet ports communicating with said sealed space; each said pair of said orifices being blockable by the corresponding said boss; both said entry orifices being closer to said sealed space than the paired said exit orifices; said exit orifice of said first pair of orifices, said axial passage and said slots constituting one of said paths for the returning fluid; said exit orifice of said second pair of orifices and said servo valve chamber constituting the other more direct one of said paths for the returning fluid; both orifices of each said pair being spaced closely enough together to be completely blocked by the corresponding said boss; whereby said piston responds at variable speed and with gradual action to spool actuation without hydraulic shock or cavitation.

4,733,602

HYDRAULIC BRAKE ACTUATOR WITH PARKING BRAKE

Eric G. Smith, Burlington, and Chuck Crawford, Stoney Creek, both of Canada, assignors to WABCO Ltd., Stoney Creek, Canada

Filed Mar. 17, 1986, Ser. No. 840,342
Int. Cl.[4] F15B *15/26*
U.S. Cl. 92—21 MR **15 Claims**



1. A brake actuator device comprising:
(a) a body;
(b) a push rod;
(c) a sleeve member disposed on said push rod so as to be axially slidable thereon;
(d) a parking brake piston engageable with said push rod to effect movement of said push rod relative to said sleeve member to a brake aplication position in response to the supply of fluid under pressure thereto;
(e) a locking piston member movable to a locking position in response to said supply of fluid under pressure to said parking brake piston following movement of said push rod to said brake application position, said locking piston having wedging engagement with said sleeve member in said locking position to force said sleeve member into tight engagement with the periphery of said push rod and accordingly lock said push rod against further axial movement relative to said sleeve;
(f) first spring means acting on said locking piston member in opposition to said fluid pressure thereat, for preventing said movement of said locking piston member to said locking position, until the fluid pressure effective at said locking piston member exceeds a predetermined value;
(g) a bore in said body in which said locking piston member is operative;
(h) an annular recess formed in said bore;
(i) a plurality of elongated fingers projecting longitudinally from the periphery of said locking piston member; and
(j) an outturned latching tab formed on at least one of said fingers, so as to enter said recess in said locking position of said locking means.

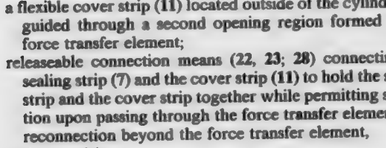
4,733,603

AXIALLY CONTRACTABLE ACTUATOR

Mirko Kukolj, 5490 Braelawn Dr., Burnaby, British Columbia, Canada V5B 4R7

Continuation-in-part of Ser. No. 553,530, Nov. 21, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 600,978
Int. Cl.[4] F01B *19/00*
U.S. Cl. 92—92 **44 Claims**

1. An actuator for contracting along an axis from an elongated state to a contracted state, comprising:
an impermeable enclosure which is elongated along the axis in the elongated state;
means for introducing pressurized fluid into the enclosure;
the enclosure having a plurality of closed areas surrounded by at least four substantially non-extensible sides which are connected together to form a network-shaped structure, the sides being substantially parallel with the axis in the elongated state and adjacent connected sides being at a substantial angle with the axis in the contracted state to enlarge said areas as the actuator contracts, portions of the enclosure within each said area bulging outwardly, at least



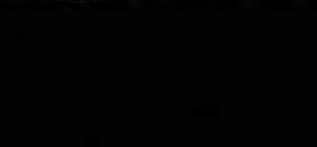
in the contracted state, and being deformable to permit contraction of the enclosure from the enlongated state to the contracted state, the structure having an exterior arc length in the contracted state which is less than the length of the structure in the elongated state.

4,733,604

AXIALLY SLIT PRESSURE CYLINDER WITH REINFORCED SEALING STRIP

Reinhard Lipinski, Plochingen, Fed. Rep. of Germany, assignor to PROMA Produkt-und- Marketing Gesellschaft mbH, Plochingen, Fed. Rep. of Germany

Filed Feb. 11, 1987, Ser. No. 13,451
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631514
Int. Cl.[4] F01B *29/00*
U.S. Cl. 92—88 **24 Claims**



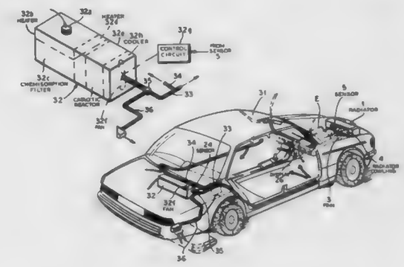
1. Axially slit pressure cylinder having a cylinder structure (1) formed with an elongated axial slit (5) therein;
a piston (4) guided in the pressure cylinder structure;
an externally projecting force transfer element (6) connected to the piston and extending through said slit;
a flexible sealing strip (7) including sealing lips thereon (9) guided through a first opening region formed in the force transfer element (6) to seal the interior of the cylinder against the outside;
sealing surfaces (10) formed in the interior of the cylinder and positioned in engagement by the sealing lips (9) of the sealing strips;
a flexible cover strip (11) located outside of the cylinder and guided through a second opening region formed in the force transfer element;
releaseable connection means (22, 23; 28) connecting the sealing strip (7) and the cover strip (11) to hold the sealing strip and the cover strip together while permitting separation upon passing through the force transfer element, and reconnection beyond the force transfer element,
and comprising,
a stiffening strip means (13) located in the interior of the cylinder and joined to the flexible sealing strip (7), said stiffening strip means having a higher strength and stiffness than the flexible sealing strip;
engagement surfaces (14) located close to the sealing surfaces (10) and positioned adjacent the sides of the slit (5) in the interior cylinder, forming abutment and support surfaces for the stiffening means and being positioned in at least approximate radial alignment with said stiffening strip means, and
wherein the engagement surfaces (14) are formed with an inner relief recess (16), remote from the longitudinal slit (5).

4,733,605

PROCESS AND DEVICE FOR PURIFYING POLLUTED AIR

Heinz Hölter, Reisenstrasse 39 - 41, 4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Holter, Gladbeck, Fed. Rep. of Germany

PCT No. PCT/EP84/00286, § 371 Date Jun. 11, 1985, § 102(e) Date Jun. 11, 1985, PCT Pub. No. WO85/01704, PCT Pub. Date Apr. 25, 1985
PCT Filed Sep. 18, 1984, Ser. No. 752,179
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336903; Nov. 10, 1983, 3340667; Nov. 29, 1983, 3343128; Feb. 24, 1984, 3406709; Jun. 20, 1984, 3423848; Jun. 28, 1984, 3422778; Aug. 25, 1984, 3431373; Aug. 25, 1984, 3431372
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—2.11 **19 Claims**



1. A filter system for the removal of contaminants from air to be delivered to an automotive vehicle passenger compartment, comprising, in combination with the radiator of the vehicle through which air is displaced by a fan driven by the vehicle engine:
means forming a chemisorption filter receiving contaminated air to be filtered and partially heating said air while filtering same;
heating means downstream of said chemisorption filter for further heating said air;
means containing a catalyst mass traversed by the air heated by said heating means and disposed downstream of said heating means for further purifying the air;
means downstream of said catalyst mass for cooling the air upon passage thereof through said catalyst mass, all of said means collectively forming an air purifier connected to said comparment for supplying said compartment with purified air; and
a sensor located behind said radiator and contacted by the air displaced therethrough by said fan for detecting contaminant levels in the external air before it is admitted to said chemisorption filter, for controlling the on/off operation of said air purifier.

4,733,606

CLOSURE DEVICE

Klaus Frestadius, and Matti Purhonen, both of Helsinki, Finland, assignors to Temet OY, Helsinki, Finland

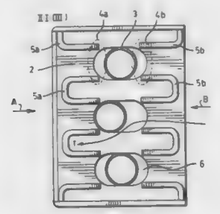
Filed May 14, 1987, Ser. No. 50,149
Claims priority, application Finland, May 15, 1986, 862040
Int. Cl.[4] F24F *11/00*
U.S. Cl. 98—119 **8 Claims**

1. A closure device comprising a frame (1) provided with at least one flow-through passage (2), a closure means (3)

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mounted displaceably for each passage, a counter part (*4a, 4b*) formed in the frame for each closure means, the closure means being displaceable between an open position (I) permitting a normal air flow and a closure position (II) caused by a pressure shock, in which closure position the closure means is pressed against the counter part so as to close the respective passage, characterized in that

the passage (2) is formed between substantially U-shaped



elements/partial elements (*5a, 5b*) opening towards each other in the direction of flow,

the element/partial element (*5a* and *5b* respectively) positioned on the incoming side of a flow (A or B) being arranged to function as a flow guiding element, and

the element/partial element (*5a* and *5b* respectively) positioned on the exhaust side of the flow (A or B) being arranged to function as a suppressing element for the pressure shock.

4,733,607

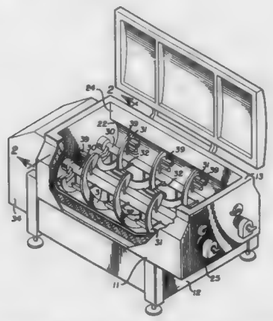
FOOD PROCESSING MACHINE

Leonard J. Star, P.O. Box 90, Dunkirk, N.Y. 14048, and Jesse J. Tapscott, 3219 Broken Twig, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 784,956, Oct. 7, 1985, abandoned. This application May 27, 1987, Ser. No. 54,618

Int. Cl.[4] B01F *7/08*

U.S. Cl. 99—348 **12 Claims**



1. In a batch mixer for food products and the like having a horizontally elongated body and at least one ribbon agitator therein affixed to a rotatable shaft extending lengthwise of said body, said body having at least one arcuate trough conforming to said ribbon agitator over a portion of its length, the improvement comprising:

a plurality of scrapers each having a scraper body with a broad face substantially normal to the radius of said ribbon and facing away from said rotatable shaft, said broad face terminating at two opposed and relatively sharp edges along the scraper body generally parallel to the rotatable shaft, one of which is the leading edge and the other of which is the trailing edge depending on the direction of rotation of the rotatable shaft,

attachment and forcing means for attaching each of said scraping bodies to the ribbon for rocking motion of the scraper body about an axis parallel to said rotatable shaft and for forcing the leading edge of the scraper body into scraping engagement with the arcuate trough upon rotation of said shaft in either direction.

4,733,608

MACHINE FOR MAKING CREPES

Leon Merdy, 107 Victoria Avenue, Chelmer, Queensland 4068, Australia

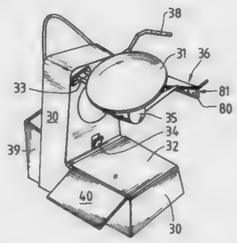
PCT No. PCT/AU86/00046, § 371 Date Oct. 21, 1986, § 102(e) Date Oct. 21, 1986, PCT Pub. No. WO86/05070, PCT Pub. Date Sep. 12, 1986

PCT Filed Feb. 26, 1986, Ser. No. 934,558

Claims priority, application Australia, Feb. 27, 1985, PG9494

Int. Cl.[4] A47J *37/10;* **A21B** *1/42*

U.S. Cl. 99—423 **14 Claims**



1. A machine for manufacturing cooked foodstuffs in the form of crepes and the like, characterized in that, said machine includes a first hot plate (**31**) in the form of a disc rotatable about its central axis and having an upwardly directed cooking surface which is inclined to the horizontal and has a concave shape adapted to form a pre-made food mixture poured thereon into a disc-like configuration during rotation, heating means (**33**) associated with said first hot plate to heat said hot plate (**31**) so as to cause at least one side of said disc-like mixture to be cooked, and said first hot plate (**31**) is adapted for automatic movement to an inverted position when said one side is cooked so as said foodstuff is released therefrom.

4,733,609

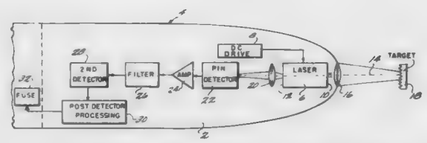
LASER PROXIMITY SENSOR

Frank E. Goodwin, Burke; Michael S. Hersman, Fairfax, and Anthony R. Slotwinski, Reston, all of Va., assignors to Digital Signal Corporation, Springfield, Va.

Filed Apr. 3, 1987, Ser. No. 33,742

Int. Cl.[4] F42C *13/02;* **F41G** *7/26*

U.S. Cl. 102—213 **20 Claims**



1. In an airborne vehicle having a nose, a proximity detector comprising:

laser diode means having front and rear facets, for generating a main laser signal, and for directing a first portion of said main laser signal out of said front facet as a source beam, and for directing a second portion of said main laser signal out of said rear facet as a local oscillator beam;

first focusing means, coupled to said vehicle nose and having an effective focusing field, for focusing said source beam on a target, and for focusing a return beam reflected from said target into said laser diode means through said front facet;

said laser diode means receiving said return beam and directing it out of said rear facet in optical alignment with said local oscillator beam;

detector means for optical heterodyne detecting said return and local oscillator beams emerging from said rear facet, and for providing a detection signal corresponding to the coherently detected beams; and

processing means for receiving the detector means detection signal, and for providing an output signal having a perturbation when said target enters said effective focusing field of said focusing means.

4,733,610

3-NITRO-1,2,4-TRIAZOL-5-ONE, A LESS SENSITIVE EXPLOSIVE

Kien-Yin Lee, and Michael D. Coburn, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 30, 1987, Ser. No. 9,165

Int. Cl.[4] F42B *3/00*

U.S. Cl. 102—332 **6 Claims**

1. A method for providing explosive chemical energy to an object, said method comprising the step of detonating the composition of matter which comprises 3-nitro-1,2,4-triazol-5-one.

4,733,611

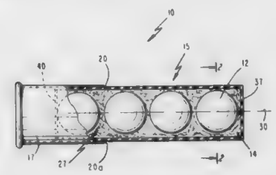
MULTIPLE PROJECTILE CARTRIDGE FOR HANDGUNS

Michael R. Janay, 12350 Barbee Rd., Bristow, Va. 22013, and Richard R. Reuschling, P.O. Box 1121, Manassas, Va. 22110

Filed Dec. 15, 1986, Ser. No. 943,144

Int. Cl.[4] F42B *11/00*

U.S. Cl. 102—439 **11 Claims**



1. A small caliber multiple projectile ammunition round or cartridge, comprising a base containing a primer assembly and a predetermined charge of explosive powder; a frangible casing having an interior cylindrical chamber closed at opposite ends thereof, and a shot column within the chamber comprising a plurality of laterally identical spherical projectiles disposed adjacent and spaced from each other in the casing in a single row having a longitudinal axis generally coincident with the longitudinal axis of said cartridge, each projectile having a diameter less than the diameter of the chamber, said projectiles being substantially entirely embedded within a filler material which maintains each projectile spaced from and out of contact with the casing and with adjacent projectiles, said filler material being a wax mixed with a granulated material.

4,733,612

SABOT PROJECTILE, ESPECIALLY ARROW PROJECTILE

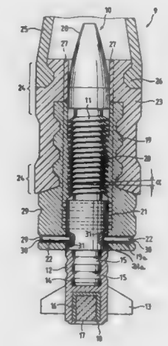
Hanspeter Sigg, Jestetten, Fed. Rep. of Germany, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jun. 29, 1987, Ser. No. 67,165

Claims priority, application Switzerland, Jul. 7, 1986, 02732/86

Int. Cl.[4] F42B *13/16*

U.S. Cl. 102—521 **11 Claims**



1. A sabot projectile for firing from a weapon barrel having a predeterminate course of rifling twist, comprising:

a projectile body possessing external thread means;

a sabot possessing internal thread means;

said projectile body being threadably connected by said external thread means with the sabot by means of said internal thread means thereof;

a sabot jacket connected with said sabot;

a hood member mounted at said sabot jacket;

said projectile body being rotatably mounted at said sabot;

said external thread means of said projectile body and said internal thread means of said sabot having a thread course substantially corresponding to the predeterminate course of the rifling twist of the weapon barrel; and

said external thread means of the projectile body having a thread pitch angle approximately corresponding to a predeterminate sliding friction angle prevailing between the projectile body and the sabot.

4,733,613

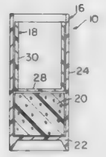
ADJUSTABLE VOLUME SHOT WAD STRUCTURE AND METHOD OF ASSEMBLING THE SAME

Stephen J. Bilsbury, Godfrey, and Peter F. Grelle, Edwardsville, both of Ill., assignors to Olin Corporation, Stamford, Conn.

Filed Jun. 27, 1986, Ser. No. 879,683

Int. Cl.[4] F42B *7/08*

U.S. Cl. 102—532 **19 Claims**



1. An improved shot wad structure, comprising:

(a) an outer wad cup having a bottom portion capable of

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obturating combustion gases produced when a shotshell containing said wad structure is fired and a sidewall portion which together with said bottom portion defines a pocket open at one end;

(b) an inner wad cup having a bottom and sidewall which define a cavity open at one end for receiving and supporting a column of shot, said inner cup being movably insertable into said pocket of said outer cup to any one of a number of different depths therein at which any one of a corresponding number of different volumes of space is defined within said outer cup for containing a column of shot having any one of a number of different shot load sizes, said inner cup being capable of withstanding compressive forces generated by acceleration of the column of shot when a shotshell containing said wad structure is fired; and

(c) a plastic wad insert disposed within said pocket of said outer cup between said bottom portion thereof and said bottom of said inner cup when inserted therein, said wad insert being formed of a foam material which is non-resilient and one-way crushable for permitting insertion of said inner cup into said pocket of said outer cup to said any one of said number of different depths therein, said crushed material having sufficient compressive strength to support said inner cup at said any one of said different depths within said pocket of said outer cup.

4,733,614

CONTINUOUSLY ADVANCING MACHINE FOR WORKS ON A RAILWAY TRACK

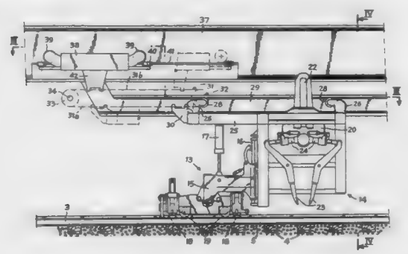
Gérard Molr, Forbach, and Frédéric Lorscheider, Bening les Saint Avold, both of France, assignors to Societe Anonyme styled: Framafer, France

Filed Feb. 4, 1985, Ser. No. 698,116

Claims priority, application France, Feb. 6, 1984, 84 01771

Int. Cl.⁴ E01B *27/17*

U.S. Cl. 104—7.1 **9 Claims**



1. A continuously advancing machine for works on a railway track, comprising:

a main chassis provided with members for rolling on the track and an auxilliary mobile chassis supporting working members such as ballast tamping and track lifting/shifting units, the mobile chassis being mobile and being adapted to move in translation along the main chassis under the action of drive means so as to advance, during the works, step by step with respect to the track while the machine progresses continuously, a mobile counterweight which is coupled to the drive means of the mobile chassis so as to execute movements of translation parallel to those of the mobile chassis but in opposite direction, the respective quantities of movement of the counterweight and of the mobile chassis including its working members being equal and opposite, the counterweight having a mass equal to the total mass of the mobile chassis and of the members that it supports, and its speed of translation is equal in modulus to that of the mobile chassis.

6. A continuously advancing machine for works on a railway track, comprising:

a main chassis provided with members for rolling on the track and an auxiliary mobile chassis supporting working members such as ballast tamping and track lifting/shifting units, the mobile chassis being mobile and being adapted to move in translation along the main chassis under the action of drive means so as to advance, during the works, step by step with respect to the track while the machine progresses continuously, a mobile counterweight which is coupled to the drive means of the mobile chassis so as to execute movements of translation parallel to those of the mobile chassis but in opposite direction, respective quantities of movement of the counterweight and of the mobile chassis including its working members being equal and opposite, the counterweight has a mass less than the total mass of the mobile chassis and the members that it supports, and its speed of translation is greater in modulus than that of the mobile chassis, the moduli of the speeds being inversely proportional to the masses.

4,733,615

CARRIER RAIL FOR OVERHEAD CONVEYORS

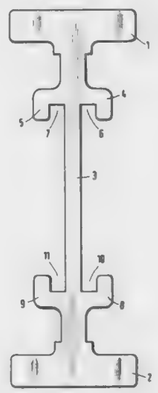
Hans-Hermann Volkstorf; Edwin Feldmeier, both of Rheinfelden, Fed. Rep. of Germany, and Marc Walti, Grenchen, Switzerland, assignors to Rene Blaser, Lucerne, Switzerland

Filed Mar. 11, 1986, Ser. No. 838,374

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 8508070

Int. Cl.⁴ B61B *3/02*; E01B *25/22*

U.S. Cl. 104—110 **1 Claim**



1. A symmetrical, double T carrier rail for overhead conveyors comprising:

an upper solid and a lower solid flange connected together by a solid web; and

two opposed pairs of angled profiles integrally formed with said web at right angles thereto with one pair disposed on each side of said web, each angled profile being spaced interiorly from said upper and lower flanges, each of said angled profiles and said web cooperatively defining a groove therebetween, and wherein said grooves on the same side of said web face each other.

4,733,616

TRACK-BOUND SELFPROPELLED CAR CONVEYOR

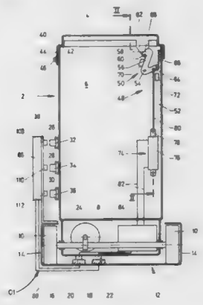
Roland Kurtz, Frankfurt am Main, Fed. Rep. of Germany, assignor to Buro Patent AG, Glarus, Switzerland

Filed Feb. 4, 1986, Ser. No. 826,135

Claims priority, application Switzerland, Feb. 12, 1985, 632/85

Int. Cl.⁴ B65G *35/00*

U.S. Cl. 104—296 **10 Claims**



1. In a conveyor comprising a track-bound car, a drive motor for displacing said track-bound car supplied with a drive current from a drive-current source having a voltage sufficient to drive said motor and connected to current-carrying rails along said track, and a container in said track-bound car closable by means of a cover, said car having current-takeoff means riding on said rails, said cover being lockable by means of a latch of a locking mechanism containing at least one electromagnet on said car, the improvement wherein an unlocking signal generator is positioned fixedly along said track, and at a position along said track for said track-bound car at which said container is to be unlocked, said unlocking signal generator having a voltage less than that of said source and insufficient to drive said motor in the absence of voltage from said source, connected electrically with to said rails, in order to supply an unlocking current to said locking mechanism for unlocking said container without driving said motor upon cutoff of said source.

4,733,617

DRIVING DEVICE FOR RAIL VEHICLES HAVING FRICTION AND COG DRIVES

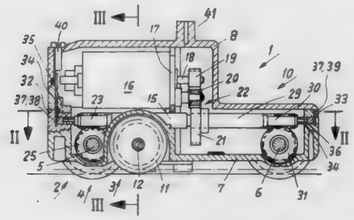
Hanspeter Boeniger, Widen, Switzerland, assignor to Georg Utz AG., Bremgarten, Switzerland

Filed Aug. 30, 1985, Ser. No. 771,032

Claims priority, application Switzerland, Sep. 4, 1984, 04210/84

Int. Cl.⁴ A63H *19/02*; B61C *15/02*

U.S. Cl. 105—29.2 **21 Claims**



1. In a drive device for a rail vehicle having both friction and cog drives and supported on drive wheels, a single drive shaft drivingly connected to a drive motor and disposed in the longitudinal direction of the vehicle, a plurality of friction drive axles for said friction drive and a friction drive gear fixed on each said friction drive axle, a cog drive axle for said cog drive and a cog drive gear fixed on said cog drive axle, said drive wheels mounted only on said friction drive axles, said drive shaft being above and extending over all of said friction and cog drive axles and underneath said drive motor, and a plurality of angular gear drives drivingly connecting said drive shaft with said friction and cog drive gears.

4,733,618

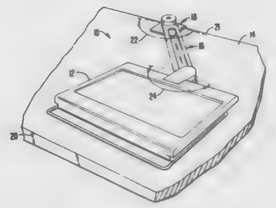
APPARATUS FOR SUPPORTING EQUIPMENT ON AN ELEVATED SURFACE

Joseph F. Sarro, San Anselmo; Gene Tepper, Sausalito, and Theodore L. Renteria, San Jose, all of Calif., assignors to The Sarro Company, San Francisco, Calif.

Filed Apr. 7, 1986, Ser. No. 849,158

Int. Cl.⁴ A47B *11/00*

U.S. Cl. 108—140 **16 Claims**



1. An apparatus for movably supporting equipment on a work surface elevated from the ground level, said surface located adjacent to a location for an operator who operates the equipment, so that said equipment is movable towards and away from the operator while being supported by the surface, said apparatus comprising:

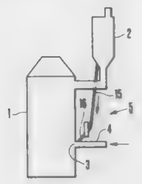
a support member adapted for supporting equipment, said member being movably supported by said surface so that equipment supported by the support member is movable to a location on the surface adjacent to the operator for convenient operation of the equipment, and so that the equipment supported by the support member is movable to desired locations on the surface away from the operator when the equipment is not being operated, thereby freeing the portion of the work surface adjacent to the operator when the equipment is not being operated; and

a restraining member for restraining the movement of said support member on the surface to prevent the support member and the equipment thereon from falling off the surface, so that the equipment remains supported by the surface through the support member when the support member and the equipment thereon are at said location on the surface adjacent to the operator and when the support member and the equipment thereon are moved to locations on the surface away from the operator;

wherein the restraining member is elongated and the support member is connected to the restraining member slidably along the length of the restraining member, so that the distance between the support member and the location is adjustable and so that the length of the restraining member restricts the movement of the support member on the surface.

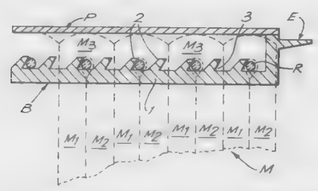
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,619
POWDER FEEDER
Sadahiko Maeda; Yasumasa Idei, both of Ube; Toshihiro Inatani, Chiba; Mitsuo Sumito, Chiba; Takao Hamada, Chiba, and Shunji Hamada, Chiba, all of Japan, assignors to Ube Industries, Hyogo, Japan
Filed Dec. 1, 1986, Ser. No. 936,208
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—229 8 Claims



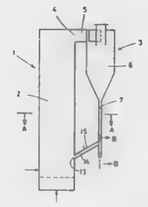
1. A powder feeder, comprising:
a cylinder body connected to a gas blow pipe for fluidizing a powder at its bottom portion;
a porous plate crossing the lower portion of said cylinder body above a gas blow hole;
partitioning means for vertically dividing the interior of said cylinder body into a powder supply side and a delivery side and for communicating the supply and delivery sides with each other at its upper portion;
a powder supply pipe connected to the lower portion of said cylinder body at the supply side to be inclined downward toward a connecting portion; and
a powder delivery pipe connected to the lower portion of said cylinder body at the delivery side to be inclined downward in a delivery direction.

4,733,620
HEAT CHAMBER LINING
Michael K. Robbins, Parma Heights, Ohio, assignor to Schaefer Brothers Incorporated, Cleveland, Ohio
Filed Jun. 8, 1987, Ser. No. 59,415
Claims priority, application United Kingdom, Aug. 1, 1986, 8618852
Int. Cl.[4] F23M *5/00*
U.S. Cl. 110—336 19 Claims



1. A wall of a heat chamber having an insulating lining, the lining being formed of at least one row of modules of heat insulating material, each module being supported on a module rod extending through the module, elongate hanger means being present towards or adjacent the ends of the module rods, the elongate hanger means having releasable engaging means spaced apart along the hanger means, each engaging means being arranged to engage a module rod so as to support each module under compression individually; and wherein the releasable engaging means comprises a row of saw teeth like sockets extending along one edge of the hanger means.

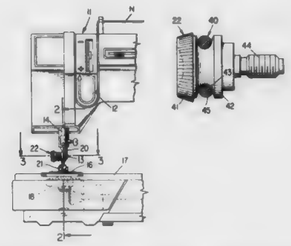
4,733,621
APPARATUS AND METHODS FOR OPERATING A FLUIDIZED BED REACTOR
Markku Kostamo, and Martti Puhakka, both of Varkaus, Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland
Filed May 8, 1987, Ser. No. 47,308
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 20 Claims



1. A method of operating a circulating fluidized bed reactor having a separator for removing entrained solid particles from the flue gas comprising the steps of:
(a) conducting particles separated in said separator for flow from said separator into a chamber;
(b) fluidizing said separated particles in said chamber;
(c) dividing the particles in said chamber into separate particle streams; and
(d) introducing said separate particle streams into the fluidized bed reactor at different inlets thereto to distribute the separated particles substantially evenly along said fluidized bed reactor.

4,733,622
THREAD END HOLDER FOR SEWING MACHINE WITH THREAD WINDING BOBBIN
Robert H. Larsen, Middletown, and Jan Szostak, Lincroft, both of N.J., assignors to SSMC Inc., Shelton, Conn.
Filed Feb. 24, 1987, Ser. No. 17,951
Int. Cl.[4] D05B *29/12, 59/00, 63/00*
U.S. Cl. 112—240 4 Claims
1. A needle thread end holder for a sewing machine having

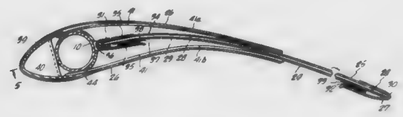
a presser foot supporting presser bar, a presser foot securing thumb screw carried by said presser bar, said presser foot securing thumb screw formed with an annular groove, and a flexible "O" ring accommodated in stretched condition in said



annular groove and adapted to apply a limited frictional resistance to a thread introduced into said annular groove beneath said "O" ring.

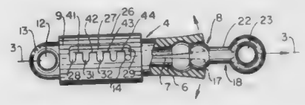
4,733,623
Patent Not Issued For This Number

4,733,624
FLEXIBLE WING RIB SAIL
Mark S. Belvedere, Reseda, Calif., assignor to Worldly Innovations, Inc., Cupertino, Calif.
Continuation of Ser. No. 591,435, Mar. 20, 1984, Pat. No. 4,649,848. This application Sep. 9, 1986, Ser. No. 905,675
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—103 17 Claims



1. A sail apparatus for attachment to a cylindrical mast, the apparatus comprising:
(a) a sail comprising a flexible sheet material having a sock portion for enclosing the mast, the sail also having a trailing edge and a main portion extending rearwardly thereto from a trailing end of the sock;
(b) a flexible batten for stiffening the sail, the flexible batten extending toward the trailing edge of the sail from a point within the sock;
(c) batten locating means for locating the forward end of the batten proximate the mast as the sail pivots around the mast; and
(d) means for stiffening the sock to define a smooth aerodynamic shape of the sail, including the sock, the stiffening means comprising:
(i) a flexible rib member, the rib member extending from proximate the mast along one side of the sock;
(ii) rib locating means for locating a leading end of the rib member against a side of the mast;
(iii) means for holding a trailing end of the rib member against the batten proximate the trailing end of the sock, whereby the rib member in a portion thereof proximate the holding means is maintained proximately tangent to the batten and the direction of curvature of the rib member corresponds to the curvature of the batten as the batten flexes together with sail; and
(iv) means for permitting the rib member to curve away from the batten between the holding means and the rib locating means.

4,733,625
QUICK RELEASE COUPLING DEVICE FOR ANCHOR ROPES
William W. Allen, 17421 Del Mar Way, Penn Valley, Calif. 95946
Filed May 4, 1987, Ser. No. 45,401
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 7 Claims



1. A quick release coupling device adapted to control between minimum and maximum limits the separation force sustainable by the coupling device, comprising:
(a) an elongated barrel member having inner and outer peripheries and an eye at one end to which a line may be connected and at the opposite end being open with the inner periphery of the barrel being formed with a recess spaced from the open end;
(b) a release member coupled to the barrel member and including a stem having a camming ball at one end seated in said recess in the inner periphery of the barrel and an eye on the other end projecting from the open end of the barrel whereby tension applied in a direction to separate said eyes imposes a radially outwardly directed force on said barrel tending to expand the diameter thereof adjacent said open end;

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(c) means mounted on the barrel exteriorly thereof and selectively adjustable to control expansion of the barrel adjacent the open end thereof in response to said radially outwardly directed force whereby the amount of tension applied on said eyes to effect a predetermined expansion of said barrel sufficient to release said camming ball from said recess is controlled by controlling the amount of said radially outwardly directed force required to effect expansion of the barrel, and

(d) a radially outwardly projecting lock stud fixed on said barrel cooperatively interconnected with said means mounted on said barrel exteriorly thereof to selectively lock said means in adjusted position.

4,733,626

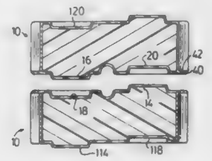
FLOTATION SYSTEM

Ferdinand M. Svirklys, Toronto, and Peter G. Lancucki, Scarborough, both of Canada, assignors to Dominion A1-Chrome Corporation, Toronto, Canada

Continuation of Ser. No. 701,997, Feb. 15, 1985, Pat. No. 4,655,156. This application Nov. 7, 1986, Ser. No. 927,866

Int. Cl.⁴ B63B *35/38*

U.S. Cl. 114—267 **5 Claims**



1. A modular flotation unit useful for vertical assembly with other like flotation units to provide floating structures of desired buoyancy, comprising

upper and lower generally planar surfaces each of which has a periphery;

nesting means associated with said surfaces to permit multiples of said flotation units to be stacked in face-abutting relation one on another in vertical alignment while inhibiting lateral movement of stacked units one with respect to another,

said nesting means comprising a symmetrically-arranged pair of diagonally-spaced protrusions and pair of diagonally-spaced depressions on said upper surface and a symmetrically-arranged pair of diagonally-spaced protrusions and pair of diagonally-spaced depressions on said lower surface, said depressions being complimentarily-shaped with respect to said protrusions and the symmetrical arrangement on said upper surface being complimentary with the symmetrical arrangement on said lower surface, said symmetrical arrangement on both said upper and lower surfaces being located wholly within and spaced inwardly from the periphery of the respective upper and lower surfaces; and

fastening means associated therewith to permit said multiple of stacked flotation units to be stably joined one to another in a vertical stack of at least two face-abutted units.

4,733,627

CONTROL HANDLE FOR SMALL BOATS

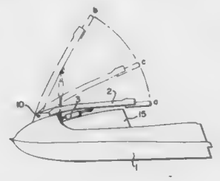
Hiroshi Nishida, Higashi, Japan, assignor to Kawasaki Judogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 4, 1985, Ser. No. 794,557

Claims priority, application Japan, Nov. 5, 1984, 59-233479

Int. Cl.⁴ B63B *35/00*

U.S. Cl. 114—270 **8 Claims**



1. Apparatus for use with a small boat including a hull, a control handle, and pivot means connecting the handle to the hull, said pivot means enabling said handle to be pivoted between a lowered position, an upright position and an intermediate position, said apparatus comprising a mechanism adapted to be connected between said handle and said hull adjacent said pivot means, said mechanism including resistance means effective for resisting movement of said handle to said upright position, and means for canceling said resistance means, said resistance means comprising a hydraulic cylinder and piston adapted to be connected between said handle and said hull.

4,733,628

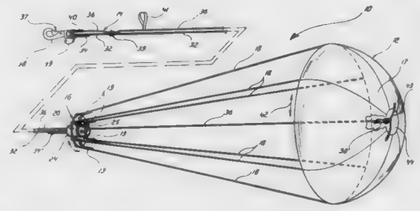
RECOVERABLE SEA ANCHOR AND METHOD

Joseph W. Baughman, Summersville, W. Va., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 13, 1987, Ser. No. 14,576

Int. Cl.⁴ B63B *21/48*

U.S. Cl. 114—311 **5 Claims**



1. A recoverable sea anchor for a vessel comprising:

a flexible shroud configured to assume a generally concave configuration having an outer periphery while in use;

a coupling rotatable through 360°;

shroud attachment means joining the outer periphery of the shroud and the coupling;

a means for connecting and thereby mooring the coupling and shroud to the vessel rotatable through 360° and permitting swiveling action through an arc of at least 10°, including an attachment means, a mooring line operably connecting the coupling and the attachment means and a trip line operably connecting the attachment means with a center portion of the shroud, the trip line being configured to pass unattachably through the coupling whereby the coupling is capable of rotational motion about an axis defined by the trip line, the operable connection between the attachment means and the shroud center and between the attachment means and the coupling being configured for accommodating rotational motion of the shroud relative to the attachment means without fouling or windup of the trip or mooring lines.

4,733,629

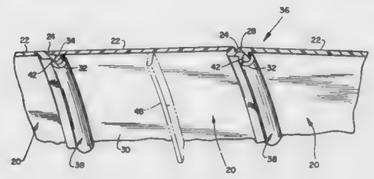
PLASTIC LOCKSEAM TUBING AND METHOD FOR MAKING

Frederic G. Hunt, Columbus, and Robert D. McVay, deceased, late of Columbus, both of Ohio (by Laird R. Daubenspeck, executor), assignors to United McGill Corporation, Groveport, Ohio

Continuation of Ser. No. 687,144, Dec. 28, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 933,361

Int. Cl.⁴ B63B *5/24*

U.S. Cl. 114—357 **20 Claims**



1. A plastic lock seam spiral tube assembly comprising: a strip made from polyethylene material, formed as an essentially planar elongate strip of constant with, said width being at least several inches, having a thickness greater than 1 mm., having straight edges along its length and with formations along each side edge of said planar strip, disposed essentially normal to the planar aspect of such strip and both formations projecting from the same side of said strip; one of said formations constituting a stem strip integral with the planar strip and including an integral substantially circular bead at its terminal edge, said stem strip being inset from the associated edge of said planar strip to define a short planar edge flange substantially the thickness of and on said strip; the other of said formations constituting a lateral flange integral and parallel with the planar strip and stepped offset in the direction of said formation's projection a distance substantially equal to the thickness of said planar strip and integral with the end of said step flange, said other formation providing a C-shaped channel with internal channel formation complementing the shape of said bead and with the dimension between the legs of the C-shaped formation substantially equal to the thickness across said bead stem; said strip being disposed in a helical spiral configuration so that said projected bead is disposed in said C-shaped channel and the legs of said C-shaped channel encompass said bead and engage said bead stem strip to interlock the edges of said planar strip in a helical tube and said short planar edge flange is disposed in and along the step of said stepped lateral flange on the other of said edge formations; whereby one of the inner or outer surfaces of the helical spiral tube is essentially laminar along the length of the tube and the other of said surfaces has a helical projection formation resulting from the channel shaped formation along its length.

13. A spiral plastic tube made from a strip of plastic material with longitudinal edge constructions providing a bead formation along one edge of the strip and a complementarily shaped groove formation along the opposite edge of the strip, which can enable an interlocked helical seam, in the spiral tube, wherein said strip of plastic material consists solely of high-molecular-weight high density polyethylene.

4,733,630

COATING THICKNESS REGULATING DEVICE FOR ELONGATE ARTICLE COATING SYSTEM

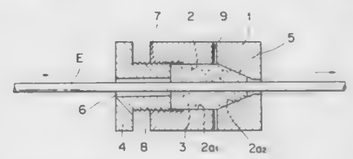
Yoshinobu Sugimoto, and Yoshifumi Mizuguchi, both of Numazu, Japan, assignors to Yazaki Corporation, Japan

Filed Feb. 14, 1986, Ser. No. 829,602

Claims priority, application Japan, Feb. 15, 1985, 60-19029[U]; Feb. 15, 1985, 60-19030[U]; May 20, 1985, 60-73578[U]

Int. Cl.⁴ B05C *11/02*

U.S. Cl. 118—109 **15 Claims**



1. A coating thickness regulating device in an elongate article coating system, comprising

a block having a cavity therewithin having openings at opposite ends thereof, said cavity including a straight inlet section and tapered outlet section to permit passage of said elongate article coated with fresh paint thereon and traveling longitudinally therethrough, said coated elongate article extending from outside said block through said straight inlet section and through said tapered outlet section to outside said block;

a nonwoven metal fabric of elastic and abrasion-resistant fiber packed within said cavity to wrap said coated elongate article; and

means for compressing said nonwoven metal fabric from the straight inlet section toward the tapered outlet section.

4,733,631

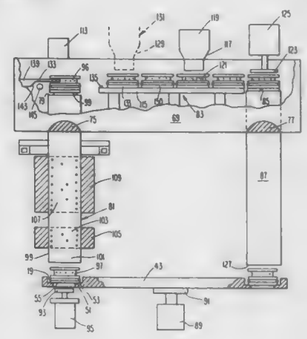
APPARATUS FOR COATING SUBSTRATE DEVICES

David Boyarsky, Cherry Hill, N.J., and Robert T. Vaughan, Cheltenham, Pa., assignors to Denton Vacuum, Inc., Cherry Hill, N.J.

Filed Sep. 30, 1986, Ser. No. 913,714

Int. Cl.⁴ C23C *16/00*

U.S. Cl. 118—719 **13 Claims**



1. An arrangement for coating substrates which are held by individual carrier means and which carrier means are continuously step moved into and out of a coating chamber, comprising in combination: sealing devices respectively fitting on associated ones of said carrier means; first vertical elongated cavity means having first and second ends and having sidewall

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means and having apertures in at least one section of said sidewall means, said first vertical elongated cavity means designed to have said carrier means with said sealing devices fit therein to provide a substantial seal to prevent gasses from passing between said carriers and said sidewall means; means for loading said carrier means designed and disposed to move said carrier means into said first vertical elongated cavity means whereby a train of said carrier means is moved through said first vertical elongated cavity means; vacuum pump means disposed to be in close proximity to said at least one section of said first elongated cavity means to create a vacuum in said at least one section to thereby degas substrates held by said carrier means located in said at least one section; transport means designed and disposed to move said carrier means which have passed through said first elongated cavity means; and vacuum chamber coating means designed to house said transport means, said vacuum chamber coating means further designed to house means to materially coat said substrates, said means to materially coat disposed with respect to said transport means to materially coat said substrates which are being moved by said transport means; and means to remove said carrier means from said transport means and from said vacuum chamber coating means.

4,733,632

WAFER FEEDING APPARATUS

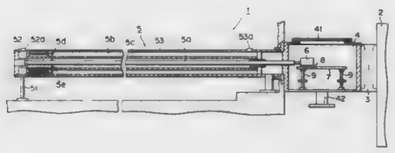
Tadahiro Ohmi, Sendai; Hiromi Kumagai, Tokyo, and Yoshiaki Yanagi, Sagamihara, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,362

Claims priority, application Japan, Sep. 25, 1985, 60-211643; Oct. 1, 1985, 60-218452; Oct. 14, 1985, 60-228349; May 9, 1986, 61-106487

Int. Cl.⁴ B05C *13/02*

U.S. Cl. 118—729 **8 Claims**



1. A wafer feeding apparatus comprising:

a movable arm section;

an electrostatic chuck transporting mechanism having a movable support member attached to said arm section and movable in a direction different from that in which the arm is movable and moving mechanism for moving the support member;

an electrostatic chuck attached to said support member of said electrostatic chuck transporting mechanism and having a plurality of electrodes located in a manner to be electrically isolated from each other and each having a wafer attraction section and an insulating film formed on the wafer attraction section; and

means for applying a direct-current voltage across the electrodes to electrostatically attract a semiconductor wafer to the wafer attraction sections of the electrodes through the insulating film.

4,733,633

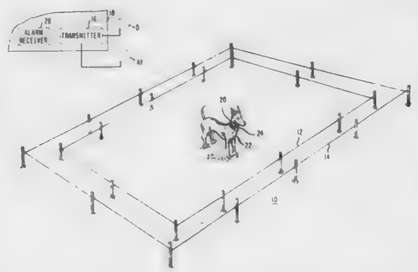
ELECTRONIC CONFINEMENT ARRANGEMENT FOR ANIMALS

Robert G. Yarnall, Sr., and Robert G. Yarnall, Jr., both of P.O. Box 356, Kimberton, Pa. 19442

Filed Nov. 20, 1986, Ser. No. 932,608

Int. Cl.⁴ A01K *15/00*

U.S. Cl. 119—29 **32 Claims**



1. An arrangement for confining at least one animal to a designated area comprising:

(a) a transmitter located at a base station capable of generating a first signal (D) and second signal (AT);

(b) a first signal-emitting wire responsive to said first transmitted signal and a second signal-emitting wire responsive to said second transmitted signal, said first and second wires disposed in a concentric arrangement as an inner wire and an outer wire, respectively, so as to define said designated area;

(c) a receiver capable of being attached to the animal and responsive to both said first and said second transmitted signals, said receiver including:

(i) a deterrent circuit responsive to said first transmitted signal for producing as an output a deterrent signal which is applied to the animal; and

(ii) an alarm trigger circuit responsive to the presence of said second transmitted signal for producing and broadcasting to an alarm receiver only after said second transmitted signal is received by said alarm trigger circuit an alarm activation signal; and

(d) said alarm receiver placed at a predetermined location capable of receiving and detecting the presence of said broadcast alarm activation signal and producing as an output an escape alarm signal.

4,733,634

AUTOMATIC HOME PET FEEDER

Herbert M. Hooser, Nakamura-so, 1-10 Wakaba-cho, Shinjuku-ku, Tokyo 160, Japan

Filed Jan. 14, 1987, Ser. No. 3,365

Int. Cl.⁴ A01K *5/02*

U.S. Cl. 119—51.12 **8 Claims**

1. An automatic home pet feeder comprising:

(a) a cabinet having a pair of front apertures therethrough;

(b) a feeding station disposed at a lower portion of said cabinet below said front apertures;

(c) a pair of hoppers disposed in an upper portion of said cabinet, one of said hoppers is for storing food while other of said hoppers is for storing water;

(d) a pair of vertical outlet tubes, each of which extends from the bottom of each of said hoppers;

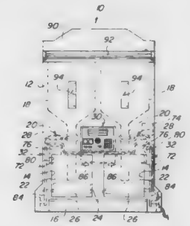
(e) a pair of pivotable doors, each being disposed in one of said front apertures of said cabinet;

(f) a pair of guide assemblies mounted within said cabinet, each of said guide assembles to be normally disposed under one of said outlet tubes, one of said trays capable of receiving food from one of said hoppers while other of said trays capable of receiving water from other of said hoppers;

(h) a pair of electrically-operated solenoid valves, each of said solenoid valves disposed in each of said outlet tubes responsive to a periodic electrical signal for sequentially opening and closing each of said outlet tubes for a predetermined time interval to allow food and water from said respective hoppers to drop into said, respective trays;

(i) an automatic timer unit in said cabinet for controlling said periodic sequential electrical signal to said solenoid valves; and

(j) means for simultaneously opening said doors and forwardly moving said trays after food and water drop into said respective trays, said means responsive to an electrical signal received caused by a pet stepping upon said feeding station.



4,733,635

HEAT GENERATOR FOR AUTOMOBILE VEHICLES

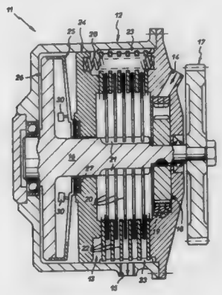
Denis Menard, Courbevoie, and Jean Herbulot, Franconville, both of France, assignors to 501 Valeo, Paris, France

Filed Jul. 30, 1986, Ser. No. 890,643

Claims priority, application France, Jul. 30, 1985, 85 11598

Int. Cl.⁴ F22B *3/06;* **F24C** *9/00*

U.S. Cl. 122—26 **6 Claims**



1. Heat generator for motorized automobile vehicle comprising an enclosure, mechanical friction means in said enclosure adapted to be driven by the motor of said vehicle and operable with a variable clamping force, means for circulating a heat transfer liquid in said enclosure, and means for varying the clamping force of said friction means in inverse proportion to the speed at which said friction means are driven by said motor.

4,733,636

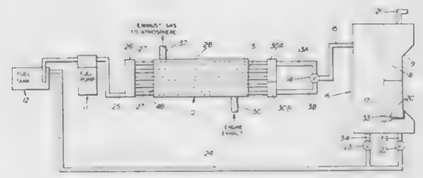
SURFACE TENSION BOILER

William B. Harris, and Richard R. Davison, both of Texas A&M University Chemical Engineering Dept., College Station, Tex. 77843

Filed Nov. 7, 1986, Ser. No. 927,964

Int. Cl.⁴ F22B *27/00*

U.S. Cl. 122—39 **29 Claims**



1. A vaporizer for vaporizing liquid fuels having improved heat transfer and controls for vaporization of liquid fuels in response to varying degrees of fuel vapor demands comprising:

(a) a heat exchanger means formed from multiple chambers having opposing surfaces composed of inert material at least at said surfaces with small but effective passages formed therebetween and said opposing surfaces being in small but effective passage relationship of sufficient length for the surface tension between a liquid fuel and said opposing surfaces of said multiple chambers to spread the liquid fuel over said opposing surfaces of said multiple chambers for maintaining said liquid fuel in relatively constant and thin liquid relationship to said opposing surfaces of said multiple chambers of said heat exchanger until said liquid fuel is completely vaporized, before its exit therefrom,

(b) a means for delivering liquid fuel to said heat exchanger means,

(c) a means for delivering heat to said heat exchanger means for vaporizing said liquid fuel therein;

(d) a means for controlling the flow of vaporized liquid fuel from said vaporizer means, and

(e) a means for controlling the flow of said liquid fuel to said heat exchanger means.

4,733,637

PURE STEAM GENERATOR

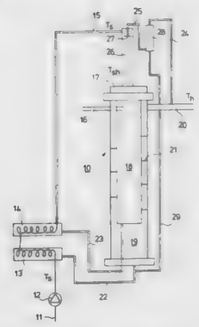
Esko Huhta-Koivisto, Espoo, Finland, assignor to Santasalo-Sohlberg Oy, Finland

Filed Feb. 5, 1987, Ser. No. 10,917

Claims priority, application Finland, Feb. 5, 1986, 860524

Int. Cl.⁴ F23M *7/04;* **F22B** *1/06*

U.S. Cl. 122—488 **8 Claims**



1. In a pure steam generator, comprising

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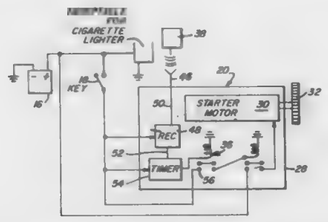
a feed line coupled to said pure steam generator for conducting feed water thereinto,
a heating steam input coupled to said pure steam generator for conducting heating steam thereinto,
heat exchange apparatus situated within the pure steam generator for effecting heat exchange between the heating steam and the feed water introduced thereinto, whereby pure steam is generated,
a separation space situated in a lower part of said pure steam generator, through which the generated, pure steam flows,
a centrifugal separator coupled with said separation space through which the pure steam flows from said separation space,
a pure steam output connected with said centrifugal separator,
the improvement comprising the combination of
a circulation line coupled with said pure steam output and with said pure steam generator, for circulating pure steam from said pure steam output to said pure steam generator,
means provided in said circulation line for separating out any feed water flowing therethrough,
whereby flow of feed water into said pure steam output is prevented when a pressure drops occurs in said output,
a bypass line coupled with said feed water separating means for conducting the separated feed water away from said feed water separating means, and
a waste water line coupled with said separation space for conducting waste water out from said generator,
with said bypass line coupled with said waste water line.

4,733,638

AUTOMOTIVE ANTI-THEFT STARTING SYSTEM

Lyle V. Anderson, 4260 S.E. 20th Pl., Apt. #1-301, Cape Coral, Fla. 33904

Filed Aug. 14, 1986, Ser. No. 896,241
Int. Cl.[4] B60R *25/04*
U.S. Cl. 123—198 B **10 Claims**



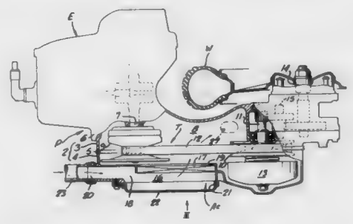
1. A security starting system for a motor vehicle having a passenger compartment with an ignition switch therein and an engine compartment with an engine including a starter motor housing for protectively enclosing a starter motor controlled by a relay as part of a starter circuit for starting the engine of the motor vehicle, said security starting system comprising:
transmitting means operative to transmit an electromagnetic signal in response to actuation thereof; receiving means operative to receive said electromagnetic signal transmitted by the transmitting means and to produce an electrical signal during times in which the receiving means receives the electromagnetic signal; and
including a timer in said starter motor housing and an antenna connected to said receiving means in said starter motor housing and extending remotely to said starter motor housing for delivering the electromagnetic signal transmitted by said transmitting means; and
switch means responsive to said electrical signal for controlling a period of time when said relay may be energized for operating said starter motor to start the engine of the motor vehicle by closing of the ignition switch.

4,733,639

AIR INTAKE SYSTEM

Mikihiro Kobyama, and Goroei Wakatsuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 824,001
Claims priority, application Japan, Jan. 29, 1985, 60-15070
Int. Cl.[4] F02F *1/34*
U.S. Cl. 123—198 E **7 Claims**



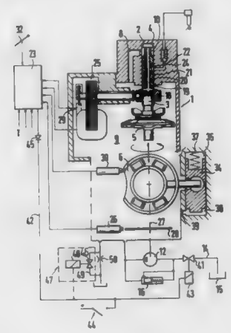
1. A power unit having an engine with an air intake and a transmission, comprising:
a power unit case enclosing the transmission and including an air collection chamber and a transmission chamber;
a cleaner element in said power unit case between said air collection chamber and said transmission chamber;
an air inlet to said power unit case; and
an air outlet from said power unit case connected to the air intake of the engine, one of said air inlet and said air outlet being on one side of said cleaner element and the other of said air inlet and said air outlet being on the other side of said cleaner element.

4,733,640

FUEL INJECTION PUMP

Helmut Laufer, Gerlingen, and Max Straubel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1986, Ser. No. 857,665
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516456
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—198 D **13 Claims**



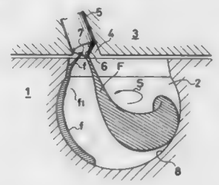
1. A fuel injection pump for internal combustion engines comprising a fuel supply chamber arranged to supply fuel provided by a fuel feed pump to a pump work chamber, said pump work chamber being defined by a pump piston disposed within a cylinder bore of the fuel injection pump, said feed pump communicating via an intake line with a fuel supply tank from which said fuel is drawn, the pressure in said fuel supply chamber being controllable in accordance with at least one operating parameter of the internal combustion engine via at least one valve means, said at least one valve means being controlled by signal means indicating occurrence of a special operating state of the engine to vary fuel supply to the pump work chamber from the fuel supply chamber, said signal means including an electric control unit arranged to control a fuel injection quantity regulating member associated with said pump piston for determining a fuel injection quantity deliverable by each supply stroke of said pump piston, said at least one valve means being disposed in said intake line and being controllable to assume selectively variable valve opening positions for a duration of said special operating state, said at least one valve means being actuatable in a closing direction to restrict fuel flow and thus to effect a pressure drop in the fuel supply chamber, whereby control of said fuel injection quantity is provided in an engine emergency when a failure of normal injection control occurs.

4,733,641

DIRECT INJECTION TYPE DIESEL ENGINE

Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,501
Claims priority, application Japan, Aug. 13, 1985, 60-176933
Int. Cl.[4] F02B *3/06*
U.S. Cl. 123—276 **5 Claims**



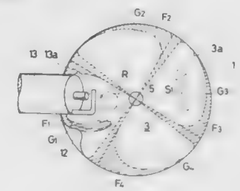
1. A direct injection type Diesel engine, comprising:
a combustion chamber having an inner wall surface formed at the head of a piston reciprocated in a cylinder of said Diesel engine; and
fuel injection nozzle means mounted on a cylinder head of said Diesel engine at a position offset from the center of said combustion chamber, said fuel injection nozzle means being provided with a main nozzle hole for injecting a main fuel spray and an auxiliary nozzle hole for injecting an auxiliary fuel spray,
said main nozzle hole being arranged and exposed to said inner wall of said combustion chamber and being directed toward the downstream side of fuel swirl with said chamber with respect to the location of said fuel injection nozzle means, said fuel swirl being generated in said combustion chamber in a manner to let said main fuel spray flow and evaporate on said inner wall surface of said combustion chamber along the stream of said swirl,
said auxiliary nozzle hold being arranged and exposed to said inner surface of said combustion chamber at a position adjacent thereto, so as to allow said auxiliary fuel spray to collide with said inner wall surface of said combustion chamber at said position adjacent to said auxiliary nozzle hole, a portion of said auxiliary fuel spray being atomized so as to be scattered toward the inner area of said combustion chamber, while a residual part of said auxiliary fuel spray flows and evaporates along said inner wall surface of said combustion chamber, and
wherein said fuel injection nozzle means injects fuel only through said auxiliary nozzle hole while keeping said main nozzle hole closed when said Diesel engine is under low load.

4,733,642

COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 939,989
Claims priority, application Japan, Dec. 10, 1985, 60-276024
Int. Cl.[4] F02B *19/08*
U.S. Cl. 123—276 **18 Claims**



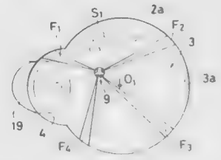
1. A combustion chamber arrangement for an internal combustion engine, comprising:
a combustion chamber defined in the top of a piston in the axial direction of said piston and within which fuel may swirl;
a protuberance extending radially inward from a peripheral wall surface of said combustion chamber, said protuberance including a surface area configured to reverse the flow of a portion of the fuel swirl along said peripheral wall surface;
fuel injection nozzle means for supplying atomized fuel toward a peripheral wall of the combustion chamber in the general area of and on the upstream side of said protuberance in the direction of fuel swirl in said combustion chamber and also toward the other peripheral walls of said combustion chamber; and
spark plug means located in said general area and on the upstream side of said protuberance in the direction of said swirl to accelerate ignition of atomized fuel supplied thereto.

4,733,643

COMBUSTION CHAMBER ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,450
Claims priority, application Japan, Nov. 30, 1985, 60-270287; Dec. 13, 1985, 60-278878
Int. Cl.[4] F02B *19/10*
U.S. Cl. 123—276 **12 Claims**



1. A combustion chamber arrangement for an internal combustion engine employing fuel having high volatility and a low centane number, comprising a piston having a combustion

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chamber therein and defined by a primary recess in a top portion thereof extending along an axial direction, said piston further having a semispherically recessed portion defined by a secondary recess in a portion of a peripheral wall of said combustion chamber in a direction along the depth of said piston in a radially outward direction, fuel injection nozzle means for only supplying said fuel into said secondary recess under light engine load conditions and for supplying said fuel into both said primary and secondary recesses under heavy engine load conditions, said fuel injection nozzle means being located close to said secondary recess, and spark plug means located within said secondary recess for promoting firing of the supplied fuel.

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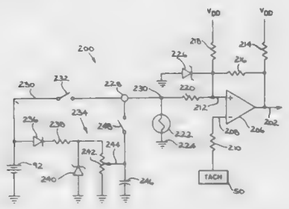
ENGINE OVERSPEED CONTROL CIRCUIT WITH DEFEAT DETECTION

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 866,163, May 22, 1986, Pat. No. 4,712,527. This application Jul. 23, 1987, Ser. No. 76,786

Int. Cl.⁴ F02D *45/00*

U.S. Cl. 123—352 **8 Claims**



1. Overspeed control circuitry for an internal combustion engine, comprising:

disable means comprising engine speed responsive means responsive to engine speed above a given speed and disabling said engine to prevent running of said engine above said given speed;

defeat means operable by the engine operator to defeat said disable means and permit running of said engine above said given speed and leaving a permanent record of said defeat for subsequent detection.

4,733,645

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Josef Hain, Leonberg, and Karl-Friedrich Russeler, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,541

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517974

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—502 **3 Claims**

1. A fuel injection pump for internal combustion engines, comprising:

a housing (4);

a fuel feed pump (16) that pumps fuel into a suction chamber (2) of said housing in proportion to rpm;

an injection onset adjusting device (43) actuated in accordance with the fuel supply pressure (p_f) in the suction chamber;

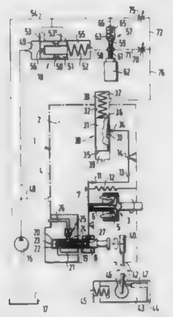
a pressure control valve (18) that controls the pressure in the suction chamber (2) said pressure control valve including;

a movable wall (51) actuated on one end by the supply pressure (p_f) and on the other end by a restoring spring (52) in a restoring chamber (55) and

a differential pressure dependent on fuel supply pressure, a pressure valve (57) including a pressure chamber (59) which communicates with said restoring chamber (55) of the pressure control valve (18) and which varies the fuel pressure in the suction chamber additionally in a function of at least one operating variable, in particular the engine temperature;

a governor lever (7) actuating an injection quantity adjusting member (8) of the fuel injection pump and

an adaptation device (30) which includes an adaptation control member (31), movable by supply pressure on one end and by a restoring pressure on the other end for the full-load stop for establishing a maximum permissible full-load supply quantity, the restoring force at the control member being generated by an adaptation spring (38) and a pressure (p_a) in the adaptation chamber (37) of the adaptation device which pressure p_a is made to differ from the supply pressure and an adjustable full-load stop operative by said adaptation device, the pressure (p_a) in the adaptation chamber (37) of the adaptation device (30) is made to differ from the pressure (p_b) in the restoring chamber of the pressure control valve and in the pressure chamber (55) of the pressure valve by means of a first throttle device (70), and when the pressure valve (57) is closed in order to increase the pressure in the suction chamber (2), the pressure (p_b) in the restoring chamber (55) of the pressure control valve (18) and the pressure (p_a) in the adaptation chamber (37) of the adaptation device (30) are adjustable by means of a second throttle device (75) in a fuel return line (54).



4,733,646

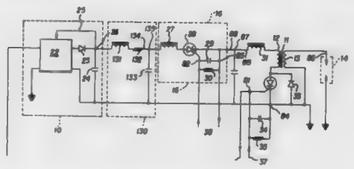
AUTOMOTIVE IGNITION SYSTEMS

Shimichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 30, 1986, Ser. No. 857,299

Int. Cl.⁴ F02P *3/09*

U.S. Cl. 123—597 **21 Claims**



1. An automotic ignition system comprising:

a spark plug means;

ignition transformer means having a primary winding and a second winding said second winding being connected to said spark plug means;

a DC-DC voltage conveter means having a first capacitor for storing a regulated voltage;

a ignition capacitor means electrically connected to said prmary winding of said ignition transformer means for providing energy to said spark plug means;

charging means means for charging said ignition capacitor means from said first capacitor;

discharge means for discharging said ignition capacitor means to said primary winding of said ignition transformer means;

control means for operating said charging means and said discharging means in proper timed sequence during a demanded firing duration; and

said control means having a detecting means for detecting the on-off state of said discharging means.

4,733,647

BOW HAVING LIMBS WITH FORKS THAT ARE FASTENED TO A HANDLE

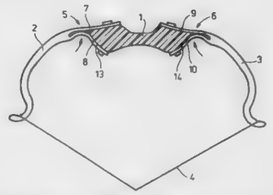
Claus Mattheck, Leimersheim, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,609

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502617

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—23 R **7 Claims**



1. A bow for use with a cord or in crossbows, comprising:

a handle having two ends; and

a pair of bow limbs, each bow limb emanating from a respective end of said handle and including a first end and a second end having a pair of tines acting as springs, a substantial portion of the tines being unconnected, each bow limb additionally including a respective tine-integral portion to which the respective tines are affixed, said tine-integral portions being spaced apart from said handle, said second ends of said bow limbs being fastened to the handle, and said cord being tensioned between said first ends of said bow limbs.

4,733,648

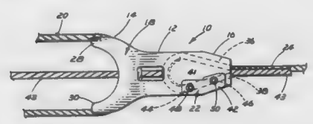
COMPOUND BOW CABLE ANCHOR

Dan J. Martin, Walla Walla, Wash., assignor to Martin Archery, Walla Walla, Wash.

Filed Sep. 16, 1986, Ser. No. 907,787

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—86 **20 Claims**



1. A compound bow cable anchor for a compound archery bow of the type having one end of an inside cable attached to a tip of a bow limb by means of a double ended yoke cable, the cable anchor comprising:

a body having a longitudinal dimension and a lateral dimension;

yoke means on the body for receiving an intermediate section of a yoke cable and for exerting tension in a longitudinal direction on said body; and

clamp means on the body for attachment to one end of an inside cable, the clamp means comprising:

a surface across which an intermediate section of an inside cable is adapted to be engaged, at least a portion of the surface being substantially laterally oriented relative to the body and substantially perpendicularly oriented relative to said longitudinal dimension; and

at least one clamping element movable relative to the body and inside cable between clamping and unclamping positions, the clamping element being located to engage a portion of an inside cable received by the anchor which is displaced from the lateral portion of the surface.

4,733,649

PROCESS AND APPARATUS FOR MULTIPLE LAP CUTTING OF SOLID MATERIALS

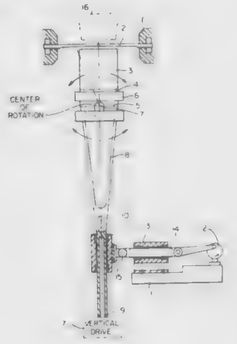
Dieter Regler, Markt; Alfred Moritz, Burghausen, and Klemens Mühlbauer, Burgkirchen, all of Fed. Rep. of Germany, assignors to Heliotronic Forschungs- und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH, Munich, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,589

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419046

Int. Cl.⁴ B28D *1/02*

U.S. Cl. 125—16 R **8 Claims**



1. A process for multiple lap cutting of a solid workpiece having a substantially flat surface, comprising the steps of:

reciprocatingly moving a set of blades;

providing relative movement of said set of blades and said workpiece toward each other such that said set of blades, under pressure, initially cuts said substantially flat surface and then cuts downwardly through a cutting zone in a cutting plane in said workpiece;

supplying said cutting zone with a suspension of a lapping abrasive from above the blades; and

subjecting the workpiece to an oscillating motion about an axis of rotation located beneath the workpiece and perpendicular to the cutting plane such that said oscillating motion is in the range of 0.1°–3° in each direction from a resting position.

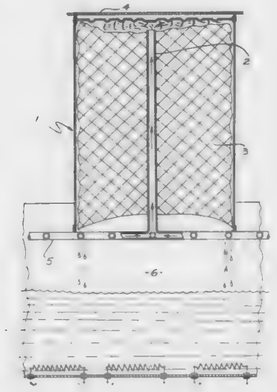
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,650

SYSTEM FOR COLLECTION OF FATS AND OILS

Kenneth O. Triggs, 29/345 Victoria Place, Drummoyne, New South Wales 2047, Australia

Filed Apr. 16, 1986, Ser. No. 852,530
Claims priority, application Australia, Apr. 16, 1985, IH/00174
Int. Cl.[4] E01C *19/45*
U.S. Cl. 126—343.5 A 9 Claims



1. An apparatus, adapted to remove a solidified block of fats from a container having an open end, comprising:
a hollow rod upon which the open end of the container of fats is placed with the rod inserted into the block of fats contained therein to reach the bottom of the container;
a holding means to retain the container over said rod; and,
means to pass compressed air or steam through said rod so as to force the block of fats out of the container, or the container away from around said block of fats.

4,733,651

PORTABLE CURLING IRON

William Schawbel, and Thaddeus Zaborowski, both of Cambridge, Mass., assignors to The Schawbel Corporation, Cambridge, Mass.

Filed Sep. 27, 1985, Ser. No. 781,262
Int. Cl.[4] A45D *1/02*
U.S. Cl. 126—409 23 Claims



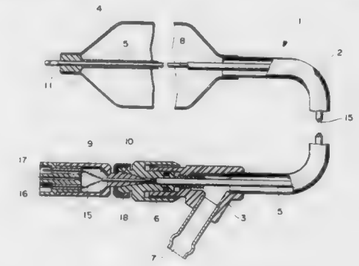
13. A portable heating appliance having a member to be heated, comprising:
first and second burner means for heating said member;
fuel supply means for supplying fuel to said first and second burner means; and
means for terminating the flow of fuel to said second burner means when a predetermined temperature is reached; and said portable heating appliance is a portable curling iron.
23. A portable heating appliance having a member to be heated, comprising:
burner means for heating said member;
fuel a portable container for supplying fuel to said burner means said container including fuel delivery valve means for controlling the flow of fuel from said container, said fuel delivery valve means including control means for preventing the flow of fuel when in a first position and for permitting the flow of fuel when in a second, different position, and first biasing means for biasing said control means to said first position;
actuator means for actuating said fuel delivery valve means in response to user actuation to start the flow of fuel from said container, said actuator means including plunger means which pushes in said control means from said first position to said second position against the force of said biasing means to open said fuel delivery valve means so that the latter permits the flow of fuel to said burner means; and
regulator means for maintaining a substantially constant flow rate of fuel to said burner means.

4,733,652

INTRA-AORTIC BALLOON

Adrian Kantrowitz, Pontiac; Paul S. Freed, Bloomfield Hills; Avi Bar-Lev, Farmington Hills, all of Mich.; Sadahiko Mushika, Tokyo, and Akira Suzuki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Akira, Japan

Continuation of Ser. No. 815,030, Dec. 31, 1985, abandoned.
This application Jul. 15, 1987, Ser. No. 73,843
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 D 5 Claims



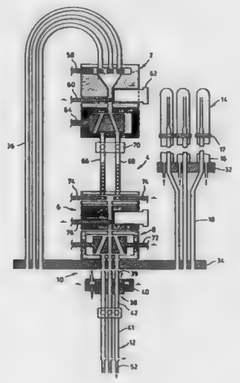
1. An intra-aortic balloon apparatus comprising:
a first connector having a gas supply port;
a tubular first catheter having a proximate end and a distal end, the proximate end being fixedly secured to said first connector;
a balloon having a proximate end and a distal end, the proximate end being fixedly secured to the distal end of said first catheter;
a central tubular member inserted in said first catheter and defining therein a passageway extending the length thereof and having a distal end projecting from the distal end of said first catheter and a proximate end extending through said first connector, the distal end of said balloon being fixedly secured to the distal end of said central tubular member;
a second catheter freely insertable into the passageway of said central tubular member and having a distal end, a proximate end, and a length between said distal end and proximate ends thereof being longer than that of said central tubular member, the distal end being provided with a pressure transducer;
a second connector having a proximate end to which the proximate end of said second catheter can be fixedly secured for feeding a signal produced by the pressure transducer to the outside of the apparatus;
means for sealing said passageway in said central tubular member to retain fluid within said passageway;
said balloon, said central tubular member and said first catheter being insertable into the aorta of a patient; and
said second catheter being insertable into said passageway in said central tubular member with said pressure transducer being projectable into the aorta from the distal end of said central tubular member.

4,733,653

RADIOTHERAPY APPARATUS

Philip K. M. Leung, Agincourt, and Henry P. J. Webb, Toronto, both of Canada, assignors to The Ontario Cancer Institute, Toronto, Canada

Filed Nov. 25, 1985, Ser. No. 802,200
Int. Cl.[4] A61M *37/04;* A61N *5/10;* G21F *5/02*
U.S. Cl. 128—1.2 15 Claims



1. In a system for intracavitary radiography comprising a chain of radioactive balls separated by non-radioactive spacer balls, an applicator tube, means to transport the balls pneumatically through a tube to and from the applicator tube, and means to sort the balls from the chain into radioactive and spacer balls, the improvement wherein the ball chain comprises a plurality of radioactive balls separated by non-radioactive spacer balls of radiographically transparent material of lower density and surface hardness than the radioactive balls, whereby battering of the radioactive balls by the spacer balls is avoided, and the spacer balls are distinguished from the radioactive balls by lack of radioactivity.

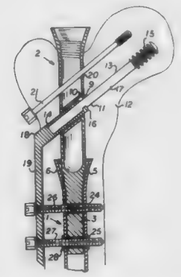
4,733,654

INTRAMEDULLAR NAILING ASSEMBLY

James F. Marino, 2620 St. Tropez, La Jolla, Calif. 92037

Filed May 29, 1986, Ser. No. 867,971
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YY 10 Claims

1. In combination with an intramedullary fixation nail designed for the fixation of femoral fractures, said nail having an axial head cavity shaped and dimensioned to receive an extracting tool, a modification kit which comprises:
at least one pin; and
a tubular nail extension having a distal end shaped and dimensioned to be axially inserted and secured into said axial head cavity, and at least one transversal bore dimensioned to engage said pin.

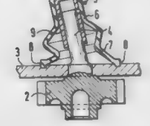


4,733,655

ELECTRIC MASSAGE APPLIANCE

Henri Smal, Blegny, Belgium, assignor to S.A. Faco, Herstal, Belgium

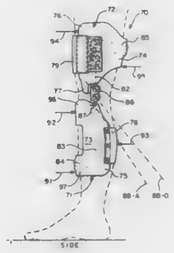
Filed Sep. 10, 1986, Ser. No. 905,836
Claims priority, application Luxembourg, Sep. 20, 1985, 86 084
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—61 1 Claim



1. A massaging device comprising:
a plate formed with a multiplicity of holes;
respective fingers having bases rotatably journaled in said holes and extensions inclined to the respective bases and projecting from one side of said plate;
means on another side of said plate opposite said one side from which said extensions project for driving said fingers in an alternating approach and separating manner and including intermeshing gears each affixed to a respective one of said bases and rotatable to cause the respective extension to orbit an axis of the respective gear; and
a respective elastic cap fitted over each of said extensions and having a rounded crown receiving the tip of the respective extension and a bellows portion extending between the crown and said one side of the plate from which said extensions project and completely surrounding the respective extension, said extensions being rotatable in the respective caps so that said caps are orbited by said extensions without causing said caps to rotate relative to said plate, said massaging device further comprising a respective rigid sleeve received in each cap and interposed between each cap and the respective extension, said extensions being rotatable in the respective sleeves.

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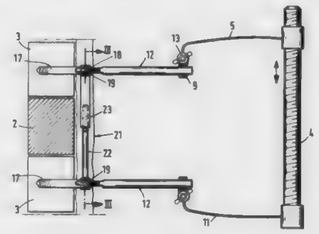
4,733,656
KNEE STABILIZER
Stuart H. Marquette, 8604 A Via Mallorca, La Jolla, Calif. 92037
Filed Feb. 13, 1984, Ser. No. 579,728
Int. Cl.[4] A61F 5/01
U.S. Cl. 128—80 C 2 Claims



1. A knee stabilizer for providing anterior-posterior, medial-lateral and rotational stab ility, including stabilization of the knee against displacement of the anterior cruciate ligament, comprising:
- a relatively rigid anterior tibial shell conformed to the shape of the leg proximate the knee, said tibial shell comprising vertically spaced first and second superior and distal anterior pressure points for applying pressure to the tibia and further comprising a strap for spanning the posterior of the leg to provide a third, posterior pressure point betwen the anterior pressure points;
- a relatively rigid posterior femural shell conformed to the shape of the thigh proximate the knee, said femural shell comprising a fourth, posterior pressure point proximate the knee and further comprising a strap for spanning the anterior of the thigh to provide a fifth, anterior pressure point above the fourth, posterior point; and
- the shells being suspended by a closed rigid band system comprising a pair of uprights extending one on the lateral side of the knee and one on the medial side of the knee and rigidly connecting the tibial and femural shells, each upright having a pivotal construction proximate the knee for substantially tracking flexion of the knee, and further comprising a femural band section attached on opposite sides to the uprights and spanning the posterior side of the femural shell for reinforcing the fourth pressure point, and still further comprising a tibial band section attached on opposite sides to the uprights and spanning the anterior side of the tibial shell for reinforcing the second pressure point.

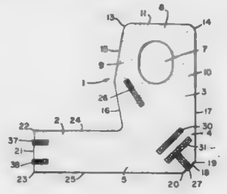
4,733,657
APPARATUS FOR ALIGNING A SPINAL COLUMN HAVING DAMAGED VERTEBRAE
Patrick Kluger, Fichtenstr.5, 3590 Bad Wildungen, Fed. Rep. of Germany
Filed Apr. 16, 1985, Ser. No. 723,856
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414374
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YM 5 Claims

1. Apparatus for straightening a spinal column having damaged vertebrae comprising two spaced support bolts inserted into the vertebrae on opposite sides of the damaged vertebrae, extension rods detachably connected to said support bolts to extend in axial alignment therefrom away from the vertebrae, a sleeve mounted on each said rod remote from the respective said support bolts, an arm for each rod, means connecting each arm to its respective rod via the associated sleeve to provide angular adjustment of the arm relative to the rod about two mutually perpendicular axes, a guide shaft remote from said bolts and said vertebrae, said arms respectively having ends distant from said sleeves, said end of one of the arms being fixed to said guide shaft while said end of the other of the arms is displaceable on said guide shaft axially thereof to permit relative adjustment of said arms and thereby of said rods and



said support bolts to effect alignment of the spinal column, and turnbuckle means connected to said support bolts proximate the vertebrae to extend perpendicularly thereof, said turnbuckle means being adjustable in length for applying blocking force on said bolts to stabilize the position thereof produced by the relative adjustment of the arms on said guide shaft.

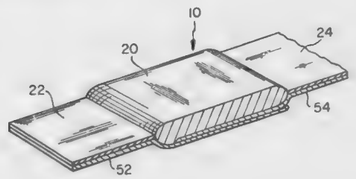
4,733,658
SURGICAL SLING
James Ruthven, Jr., 42 Howard St., Rockland, Mass. 02370
Filed Jul. 9, 1987, Ser. No. 71,637
Int. Cl.[4] A61F 5/40
U.S. Cl. 128—94 10 Claims



1. A reversible surgical sling for either injured arm, wrist, or hand of a patient formed by folding a one-piece, flexible member, having a first and second side and having a predetermined thickness, wherein said one-piece flexible member, in layout, comprises:
- a vertical portion having a free end;
- a horizontal portion having a free end;
- a corner portion connecting said vertical portion to said horizontal portion at an approximate right angle;
- a head-receiving opening formed in said vertical portion for mounting said flexible member over the head of the patient from either the first or second side of said flexible member to orient said vertical portion of said flexible member in front of the chest of the patient and to orient said horizontal portion to extend under the arm and on the same side of the patient as the injured arm, wrist, or hand;
- first fastener means connected to said first side of said corner portion of said flexible member;
- second fastener means connected to said first side of said vertical portion of said flexible member for coupling with said first fastener means to form a first fold of said flexible member abut the right arm for immobilizing the injured arm, wrist, or hand in an upwardly inclined position wherein the right hand is approximately above the heart of the patient;

- third fastener means connected to said first side of said horizontal portion of said flexible member;
- fourth fastener means connected to said second side of said corner portion of said flexible member for coupling with said third fastener means to form a second fold of said flexible member about the right elbow for providing right elbow support;
- fifth fastener means connected to said second side of said corner portion of said flexible member;
- sixth fastener means connected to said second side of said vertical portion of said flexible member for coupling with said fifth fastener means to form a first fold of said flexible member about the left arm for immobilizing the injured arm, wrist, or hand in an upwardly inclined position wherein the left hand is approximately above the heart of the patient;
- seventh fastener means connected to said second side of said horizontal portion of said flexible member; and
- eighth fastener means connected to said first side of said corner portion of said flexible member for coupling with said seventh fastener means to form a second fold of said flexible member about the left elbow for providing left elbow support.

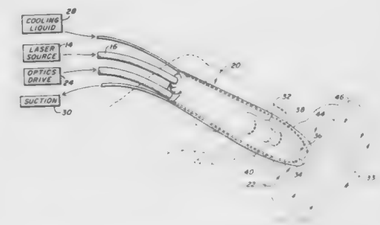
4,733,659
FOAM BANDAGE
Martin I. Edenbaum, Princeton Junction, N.J., and Borys Rybalka, Philadelphia, Pa., assignors to Seton Company, Norristown, Pa.
Continuation-in-part of Ser. No. 819,686, Jan. 17, 1986. This application Dec. 23, 1986, Ser. No. 942,092
Int. Cl.[4] A61L 15/00
U.S. Cl. 128—156 16 Claims



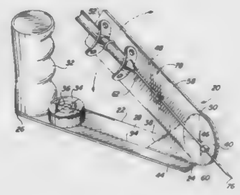
1. A foam bandage for application to a wound area of the body comprising a laminate having a liquid permeable foam layer and a liquid permeable porous pressure sensitive layer, said liquid permeable porous pressure sensitive layer adapted to adhere to the body.

4,733,660
LASER SYSTEM FOR PROVIDING TARGET SPECIFIC ENERGY DEPOSITION AND DAMAGE
Irving Itzkan, Boston, Mass., assignor to Medical Laser Research and Development Corporation, Malden, Mass.
Continuation of Ser. No. 638,419, Aug. 7, 1984, abandoned. This application Dec. 10, 1986, Ser. No. 940,195
Int. Cl.[4] A61B 17/36
U.S. Cl. 128—303.1 12 Claims

1. A system for use in living tissue or cells in the medical treatment of certain conditions by the selective necrosis of a target material including blood vessels, melanin bearing, or other naturally or artificially pigmented tissues or cells, said system comprising:
- means including a laser for generating a beam of laser radiation;
- a housing;
- laser beam applying means within said housing, in communication with said laser beam generating means, for controlling the dosimetry of laser radiation applied to the target material, said applying means including:
- means within said housing for directing the beam of laser radiation along an optical path within said applying means;
- means within said housing, positioned along the optical path, for focusing the beam of laser radiation onto the target material as a focused spot of laser radiation having a desired shape, dimension and intensity;
- scanning means, within said housing and coupled to said directing means and to said focusing means, for automatically causing the laser beam to deviate from its optical path in such a way that the focused spot of laser radiation is moved at a rate in a desired pattern within an area containing the target material; and
- means for controlling the rate at which the scanning means moves the focused laser radiation spot, and the intensity of the radiation in the focused laser spot, thereby controlling the laser energy absorbed by the target material by regulating a dwell time of the focused laser spot to produce a thermal diffusion into the target material, which causes necrosis of the target material while tissues and cells other than the target material are substantially unaffected.



4,733,661
GUIDANCE DEVICE FOR C.T. GUIDED DRAINAGE AND BIOPSY PROCEDURES
Aubrey M. Palestrant, 6800 N. 47th St., Paradise Valley, Ariz. 85253
Filed Apr. 27, 1987, Ser. No. 42,728
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—303 B 20 Claims



1. A hand-held guidance device for allowing a user to accurately place a catheter within the body of patient, the catheter having a tip and a longitudinal axis, said guidance device comprising in combination:
- a. a base adapted to be manually supported by the user, said base having first and second opposing ends and having a longitudinal axis extending therebetween, said base also having an upper surface;
- b. level means secured to said base for indicating to the user

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whether the longitudinal axis of said base is lying in a horizontal plane;

c. a needle support arm pivotally coupled to said base adjacent the first end of said base for pivotal movement about a pivot axis;

d. protractor means disposed proximate to the first end of said base for indicating the relative angular relationship between said needle support arm and said base; and

e. needle guide means secured to said needle support arm for supporting the catheter at a predetermined desired angle relative to said base, said needle guide means supporting the catheter for sliding movement along the longitudinal axis of the catheter in order to permit the user to guide the catheter into the patient's body at said predetermined desired angle while the user manually supports said base.

4,733,662

TISSUE GRIPPING AND CUTTING ASSEMBLY FOR SURGICAL INSTRUMENT

Allen H. DeSatnick, Marblehead; Herbert D. Marcus, Winchester, and Paul A. Torrie, Marblehead, all of Mass., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 20, 1987, Ser. No. 4,650
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **9 Claims**



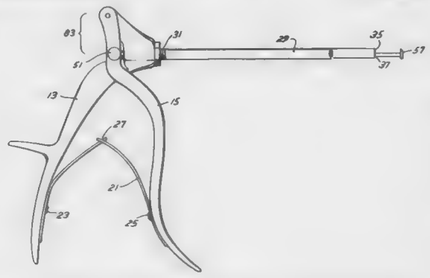
1. In a surgical instrument for use in surgical procedures involving tissue cutting, a sheathed blade assembly comprising an elongate sheath and a plurality of elongate surgical blades longitudinally received within said sheath for reciprocal guided movement therein, said blades comprises a cutting blade and a gripping blade, said gripping blade including a leading end with a working head having gripping means thereon for gripping engagement with tissue, said cutting blade including a leading end with a working head having cutting means thereon for the cutting of tissue engaged by said gripping means, said sheath having forward and rear end portions, said forward end portion terminating in an open forward blade-passing end, each said blade working head being completely retractable into said sheath, positioning means external of said sheath for reciprocation of said blades relative to said sheath and selective extension and retraction of the working head of each blade relative to the open forward end of the sheath for a selective exposure of the working heads of said blades beyond said forward end, means for selectively retaining said gripping blade with the working head thereof exposed beyond the forward end of the sheath independently of said cutting blade, said blades including following end portions extending rearward of said sheath, said blade following end portions, upon reciprocation of said blades, being selectively extensible forwardly into the sheath and retractable rearwardly from the sheath, said means for retaining said gripping blade with the working head thereof exposed being defined by a laterally enlargement of the following end portion of said gripping blade, said sheath having a generally constant internal transverse dimension along at least the rear end portion thereof, said lateral enlargement defining a transverse blade dimension greater than said internal transverse dimension of the rear end portion of the sheath whereby extension of the following end portion of the gripping blade into the sheath will effect a releasable frictional fixing of said gripping blade within said sheath, the lateral enlargement of the following end portion of the gripping blade being defined by a pair of rearwardly extending elongate sections, at least one of said sections diverging laterally outward from the other section and incorporating a degree of resilient flexiblity for a selective lateral flexing of said one section toward the other section upon extension of said sections into the sheath, means limiting the forward extension of the following end portion of the gripping blade in to the sheath, and blade control means engaged between said cutting blade and said gripping blade for a selective reciprocation of said gripping blade in response to reciprocation of said cutting blade, said positioning means external of said sheath for reciprocation of said blades being engaged solely with said cutting blade.

4,733,663

MEDICAL INSTRUMENT FOR REMOVING BONE

Daniel K. Farley, 601 E. Lake Shore Dr., Barrington, Ill. 60010

Filed Jul. 2, 1986, Ser. No. 881,395
Int. Cl.[4] A61B *17/16*
U.S. Cl. 128—312 **9 Claims**



1. A medical instrument for cutting and removing bone comprising:

a stationary tubular barrel member having a proximal end and distal end, wherein said distal end comprises a first working area, said first working area including a first cutting surface and a first stop surface, said first cutting surface and said first stop surface formed on opposite sides of the perimeter of said distal end wherein both said surfaces lie within a first plane substantially perpendicular to the axis of said tubular member,

a solid cylindrical shaft member positioned coaxially within said barrel and arranged for reciprocal motion therein, said shaft member having a distal end and a proximal end, including a recess formed adjacent said distal end, said shaft member further comprising a plate member having a perimeter which is sized to substantially mate with the circumference of said barrel member to close said barrel member when said shaft member is reciprocated into said barrel, said plate member having a second work area, said second work area comprising a second cutting surface and a second stop surface, said second cutting surface and said second stop surface on the proximal face of said plate member formed on opposite sides of the perimeter thereof, said second cutting surface being formed by a concavity in the proximal face of said plate member such that both said second plane perpendicular to the axis of said shaft member, said first plane and said second plane being substantially parallel such that said first and second stop surfaces are in face confronting relationship and make full contact when said slidable shaft member is reciprocated to its full extent with respect to said barrel member, said full contact stopping the extent of reciprocation of said shaft member such that said first and second cutting surfaces are disposed in a cutting relationship while substantially avoiding direct force contact when said slidable shaft member is reciprocated to its full extent within said barrel member, and

a lever means attached to the proximal end of both said barrel member and said shaft member for reciprocally translating said slidable shaft member within said barrel member causing said second working area associated with said slidable shaft member to reciprocate with respect to said first working area associated with said barrel member,

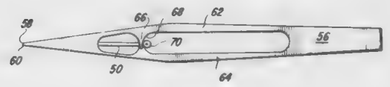
thereby biting and severing any said bone positioned in the recess between said first and second cutting surfaces and causing both said severed bone and said recess to reciprocate into said barrel thereby capturing bone severed by said cutting surfaces within said recess.

4,733,664

SURGICAL CLIP, APPLIER, AND METHOD

Wolff M. Kirsch, Albuquerque, N. Mex.; Zhu Y. Hua, Shanghai, China, and Robert B. Cushman, Cedar Crest, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 556,917, Dec. 1, 1983, Pat. No. 4,586,503. This application Oct. 15, 1985, Ser. No. 787,101
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 R **10 Claims**



1. The combination of:

(a) a surgical slip comprising

a plastically deformable bridge portion,

a pair of spaced arms extending generally parallel in one direction from opposite ends of said bridge,

a tang extending from said bridge in a direction opposite that of said arms, for deforming said bridge so as to bring said arms together around apposed tissues,

a neck connecting said tang to said bridge,

said neck being breakable upon application of a predetermined tensile force to said tang,

said bridge being deformable by application to the tang of less than said predetermined tensile force, and

a pair of shoulders on said bridge portion, one on either side of said neck, said shoulders being defined by bearing surfaces having an obtuse angle B between them; and

(b) a tool for deforming said clip, comprising

means for gripping and applying tension to said tang, and

a pair of spaced stationary jaw faces adapted to engage said clip shoulders respectively, wherein said jaw faces are generally flat, and lie at an obtuse angle A with respect to one another, wherein said angles initially are defined by the relationships

$120° \leqq A < 180°$

$B \leqq 180°$, and

$A < B$,

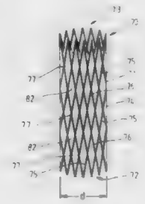
whereby said jaws initially engage said shoulders at contact points sufficiently widely spaced that the forces developed thereat in reaction to application to said tang of less than said predetermined tensile force cause plastic deformation of said bridge and consequent closure of said arms, and whereby, once the obtuse angle between the shoulders becomes equal to the angle between the jaws, the contact points between the jaws and the arms move closer to one another, whereafter increasing tang tension does not further deform the bridge, but instead results in breakage of said neck.

4,733,665

EXPANDABLE INTRALUMINAL GRAFT, AND METHOD AND APPARATUS FOR IMPLANTING AN EXPANDABLE INTRALUMINAL GRAFT

Julio C. Palmaz, San Antonio, Tex., assignor to Expandable Grafts Partnership, San Antonio, Tex.

Filed Nov. 7, 1985, Ser. No. 796,009
Int. Cl.[4] A61M *29/00*
U.S. Cl. 128—343 **28 Claims**



1. A method for implanting a prosthesis within a body passageway comprising the steps of:

disposing the prosthesis upon a catheter;

inserting the prosthesis and catheter within the body passageway by catheterization of said body passageway; and

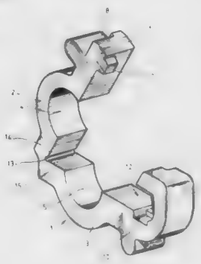
providing controllable expansion of the prosthesis at a desired location within the body passageway by expanding a portion of the catheter associated with the prosthesis to force the prosthesis radially outwardly into contact with the body passageway, by deforming a portion of the prosthesis with a force in excess of the elastic limit of the portion of the prosthesis, to implant the prosthesis within the body passageway.

4,733,666

SURGICAL CLIP FOR CHOLANGIOGRAPHY

Leo C. Mercer, Jr., El Paso, Tex., assignor to Texas Tech University Health Sciences Center, Lubbock, Tex.

Filed Jan. 13, 1986, Ser. No. 818,651
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—346 **3 Claims**



1. A surgical clip of one-piece integral construction for hollow linear organ structures comprising:

two arms axially displaced from each other at one end and rotatably connected to each other at the other end;

said arms having substantially flat planar surfaces except for a single generally semi-circular recessed groove located on each said arm, the generally semi-circular recessed groove of one arm facing the generally semi-circular recessed groove of the other arm in a coplanar relationship, enabling the connecting of said axially displaced ends to produce a surgical clip having a generally circular

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passageway extending through said surgical clip substantially normal to the plane of the clip's rotation;

one of said axially displaced ends possesses a single lug and a single slotted groove; and

the other said axially displaced end possesses a single recessed groove and a single inward facing flange;

said lug and slotted groove being insertable into a gap between said recessed groove and said flange, enabling said lug and slotted groove to be locked into position between said recessed groove and said flange, enabling the connection of one axially displaced end of one arm to the axially displaced end of the other arm;

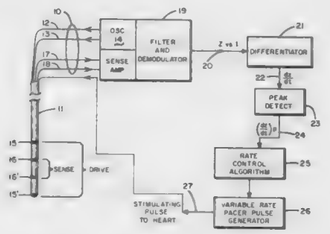
said surgical clip enabling the application of an axially distributed compressive force against said hollow linear organ structure and wherein said surgical clip is composed of a biocompatible material and is absorbable.

4,733,667

CLOSED LOOP CONTROL OF CARDIAC STIMULATOR UTILIZING RATE OF CHANGE OF IMPEDANCE

Arthur L. Olive, Stacy; Brian D. Pederson, St. Paul, and Rodney W. Salo, Fridley, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Aug. 11, 1986, Ser. No. 895,241
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 PG **7 Claims**



1. An adjustable rate cardiac pacemaker comprising in combination:

sensing means for sensing intracardiac impedance on a beat-by-beat basis and producing a time varying signal representation thereof;

differentiating means coupled to said sensing means for forming the first derivative of said time varying signal;

peak detecting means coupled to said differentiating means for detecting the peak amplitude of the differentiated signal on each beat and producing a time varying control signal in relation thereto; and

variable rate pulse generating means coupled to receive said time varying control signal.

4,733,668

METHOD AND APPARATUS FOR COMPENSATION DURING ULTRASOUND EXAMINATION

Kenneth R. Torrence, Huntington Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.

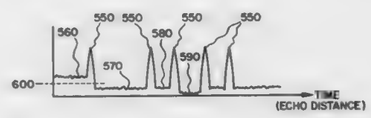
Filed Sep. 4, 1979, Ser. No. 72,717
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660 **11 Claims**

6. Apparatus for compensation of an echo ultrasound examination system comprising:

a gain controlled amplifier connected to amplify echo signals received from a body;

a time-gain compensation ramp generator connected to control the gain of the amplifier receiver; and

means for identifying signal signatures characteristic of body tissue types having varying attenuation levels in scattered echo signals returned from said tissue types and for controlling the slope of a time-gain compensation ramp produced by said generator in response to the identification.

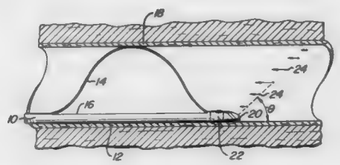


4,733,669

BLOOD FLOW MEASUREMENT CATHETER

Jerome Segal, San Mateo, Calif., assignor to Cardiometrics, Inc., Mountain View, Calif.

Filed May 24, 1985, Ser. No. 737,650
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—663 **32 Claims**



1. A catheter comprising an elongate body for extending through a blood vessel to a proximal end exterior of a person's body, said elongate body having proximal and distal extremities;

an elongate portion of said body near the distal extremity thereof being movable between a first position substantially parallel to the axis of said body and a second position along an arcuate path having an apex and extending outwardly from said first position;

means carried by said body for causing movement of said elongate portion between said first position and said second position, so that in said second position, said elongate portion contacts a side wall of said blood vessel and forces said body against an opposite side wall of said blood vessel and a transducer carried by said elongate body and positioned proximate a side wall of said blood vessel when said elongate portion is in said second position.

4,733,670

DEVICE FOR CARDIAC OUTPUT MONITORING

Carl V. Hays, Barrington, Ill., and Mark Lukasiewicz, New York, N.Y., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 786,445, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 586,612, Mar. 6, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 873,602
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—693 **6 Claims**

1. A single electrode assembly for cardiac output or other hemodynamic parameters output monitoring, comprising:

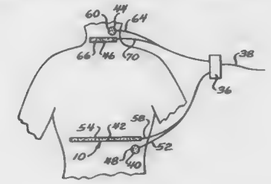
a first pair of electrodes consisting of a first spot injection electrode adapted to be placed adjacent the xiphoid process with a backing and means, including a relatively small conductive strip on the backing, for injecting a first signal into the patient's body at the xiphoid process and

a first elongated strip electrode adapted to be placed adjacent the xiphoid process with means, including an elongated first backing and an elongated conductive strip on the elongated first backing, for sensing the first signal when received at the xiphoid process; and

a second pair of electrodes consisting of a second spot electrode adapted to be placed adjacent the neck with means, including a backing and a small conductive strip on the backing, for injection of a second signal into the patient's body at the neck, and

a second elongated strip electrode adapted to be placed adjacent the neck with means, including an elongated second backing and an elongated conductive strip on the elongated second backing, for sensing the second signal when received at the neck; and

a single connector assembly including a plurality of leads respectively connected to all the above electrodes at one end and commonly connected to a single connector at the other end and cable means attached to the connector for coupling both pairs of the electrodes to a monitoring apparatus.

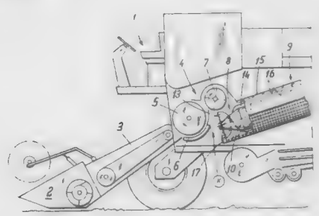


4,733,672

SEPARATING AND CLEANING ARRANGEMENT FOR A SELF-PROPELLED HARVESTER THRESHER

Franz Tophinke, Harsewinkel, Fed. Rep. of Germany, assignor to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,801
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535427
Int. Cl.⁴ A01F *12/00*
U.S. Cl. 130—27 T **9 Claims**



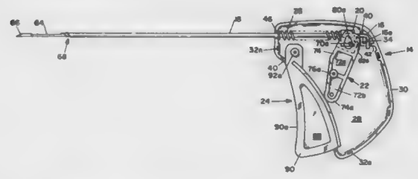
1. A separating and cleaning arrangement for a self-propelled harvester thresher, comprising a stationary housing extending in a traveling direction and provided with an inlet and outlet opening; and a rotor driveably supported in said housing, said rotor having a casing and a shaft surrounded by said casing and having two ends; and means for supporting said rotor in said housing and including a bearing arranged on each of said ends of said shaft, a sleeve having an outer axially extending surface which is convexly spherical along its longitudinal length and also embracing said bearing which is arranged on one of said ends of said shaft being a front end as considered in a traveling direction, and a holder arranged so that said sleeve is supported with said outwardly convexly spherical outer surface in said holder.

4,733,671

TISSUE NEEDLE

Donald N. Mehl, 3794 Williston Rd., Minnetonka, Minn. 55343

Filed Mar. 17, 1987, Ser. No. 26,889
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—754 **3 Claims**



1. A tissue needle for extraction of biopsy tissue comprising:

a. stationary stylet means affixed in a handle and including a sharp tip;

b. movable cannula means extending into said handle, including a configured cutting edge, for sliding coaxially over and about said stylet means;

c. means affixing said cannular means to a linkage bar pivotally mounted in said handle;

d. actuator trigger bar means pivotally mounted in said handle and in cam engagement with said linkage bar; and,

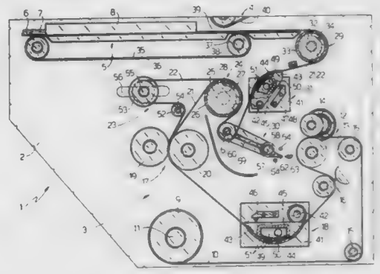
e. return compression spring positioned on said cannula and between the pivoting linkage arm and the handle.

4,733,673

METHOD AND DEVICE FOR FEEDING STRIP PAPER ON A DUAL-ROD CIGARETTE MANUFACTURING MACHINE

Riccardo Mattei, and Bruno Belvederi, both of Bologna, Italy, assignors to G.D. Societa' per Azioni, Bologna, Italy

Filed Feb. 10, 1986, Ser. No. 827,519
Claims priority, application Italy, Feb. 26, 1985, 3348 A/85
Int. Cl.⁴ A24C *5/14, 5/18, 5/20*
U.S. Cl. 131—84.1 **8 Claims**



1. Method of feeding strip paper on a dual-rod cigarette manufacturing machine (1), the said rods (6, 7) being formed by feeding, via respective conveying means (35, 36), a first and a second paper strip (21, 22) along a respective forming fixture (8) designed to fold each said strip (21, 22) crosswise about a respective layer of tobacco, the said strips (21, 22) being pro-

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duced by cutting longitudinally in half a strip of paper (10) twice as wide as the said strips (21, 22); characterised by the fact that it comprises stages consisting in:

regulating a first (35) of the said conveyor means (35, 36) in such a manner as to feed the respective said first strip (21) at a given theoretical speed;

feeding the said strips (21, 22) to the respective conveying means (35, 36) by means of a feed device (24) common to both strips (21, 22);

controlling, via respective adjustable brake means (43), the tension of each of the said two strips (21, 22) extending between the said common feed device (24) and the respective said conveying means (35, 36), in such a manner as to maintain the tension of both said strips (21, 22) constantly equal to a given tension value;

controlling the said common feed device (24) in such a manner as to feed both the said strips (21, 22) at the same speed at which the said first strip (21) is actually fed by the said first conveying means (35);

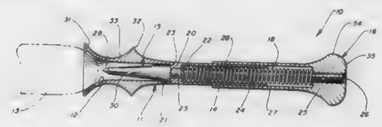
controlling a second (36) of the said conveying means (35, 36) in such a manner as to feed the respective said second strip (22) at the same speed at which the said second strip (22) is fed by the said common feed device (24).

4,733,674

CIGAR VENTILATING DEVICE

Henry A. Sielck, 7049 Wilson Ter., Morton Grove, Ill. 60053, and Edward R. Anton, 110 Harvey Ave., Grayslake, Ill. 60030

Filed Jan. 22, 1987, Ser. No. 6,240
Int. Cl.[4] A24F *13/24*
U.S. Cl. 131—255 **8 Claims**



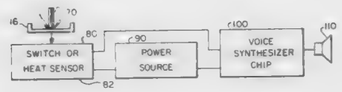
1. A cigar ventilating device, comprising: support body means, guide socket means at a forward end of said support body means for receiving an end portion of a cigar, piercing means within said forward end of said support body means, actuating means connected to said piercing means to control movement of said piercing means in a forward piercing direction to enter and form a hole in a cigar end portion positioned in said guide socket means and then in an opposite rearward retracting direction to withdraw from the hole so formed, spring means for urging said piercing means and said actuating means in said rearward retracting direction, interengageable stop means associated with said piercing means and said support body for limiting movement of said piercing means and said actuating means in said rearward retracting direction, said actuating means being at a rearward end of said device and being engageable by the thumb of a user to move said piercing means in said forward actuating direction against the action of said spring means, an elongated projectile having a forward end portion forming said piercing means and having a rearwardly facing annular shoulder at the rear end of said piercing means, said support body means having a central passage receiving said projectile and including an annular portion which projects inwardly into said passage to provide forwardly and rearwardly facing annular shoulders, said interengageable stop means being formed by said rearwardly facing annular shoulder of said projectile and said forwardly facing annular shoulder of said body means, and said spring means comprising a coiled compression spring around a rearward portion of said projectile and having a forward end engaged with said rearwardly facing annular shoulder of said body means.

4,733,675

MESSAGE TRANSMITTING ASHTRAY

Charles Destro, 6 Poplar St., Massapequa, N.Y. 11758

Filed Mar. 12, 1986, Ser. No. 838,802
Int. Cl.[4] A24F *19/10*
U.S. Cl. 131—270 **5 Claims**



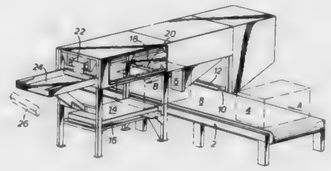
1. The message transmitting ashtray comprising:
(a) a base;
(b) an ashtray carried by said base;
(c) means for activating message transmission carried by said base, which coacts with said ashtray; and
(d) a display which coacts with said means for activating, whereby a message is transmitted and wherein said means for activating is a heat sensor.

4,733,676

SLICED BALE CONDITIONING

Cedric J. Fisk, Chard, and Edward J. Allen, Andover, both of England, assignors to W. H. Dickinson Engineering Limited, Winchester, England

Filed Apr. 30, 1986, Ser. No. 857,328
Int. Cl.[4] A24B *7/12, 7/14, 3/04*
U.S. Cl. 131—290 **5 Claims**



1. Apparatus for slicing and processing tobacco bales, comprising a conveyor (2), a lift device (16) arranged adjacent the conveyor, first means (6) for moving a bale from the conveyor onto the lift device; at least one slicing blade (20) arranged adjacent the lift device, so as to engage the upper portion of a bale placed thereon; means for advancing the bale so as to cut a horizontal slice from the top of the bale; second means (22) for ejecting the slice after it has been cut; and control means arranged to retract the slicer blade whilst the slice is being ejected, and to then actuate the lift to raise the bale by the height of a further slice whilst the second means is retracted over the top of the bale in preparation for its engagement with the next slice, the control means also being arranged to lower the lifting device slightly, as the blade enters the bale on its cutting stroke, so as to assist the shearing of the bale along the cutting plane, in advance of the blade.

4,733,677

HAIR FIXATIVE COMPOSITION CONTAINING CATIONIC ORGANIC POLYMER AND POLYDIORGANOSILOXANE MICROEMULSIONS

Ronald P. Gee, and Gretchen S. Kohl, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 4, 1986, Ser. No. 926,760
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—7 **20 Claims**

1. A clear, hair fixative composition suitable for application to hair without subsequent rinsing which composition consists essentially of

(A) an aqueous microemulsion of a polydiorganosiloxane which conforms generally to the formula

$$QMe_2SiO(MeRSiO)_ySiMe_2Q$$

wherein Me denotes a methyl radical; R independently denotes methyl, ethyl, vinyl, or phenyl radicals with the proviso that at least 90 percent of R radicals are methyl, and Q denotes hydroxy, methyl, ethyl, vinyl, or phenyl; and y has an average value from 20 to 2000, wherein the polydiorganosiloxane droplet size of said microemulsion is less than 100 nm in diameter, and

(B) a water-soluble, cationic, organic polymer containing amine or ammonium groups in the polymer chain or joined to the polymer chain,

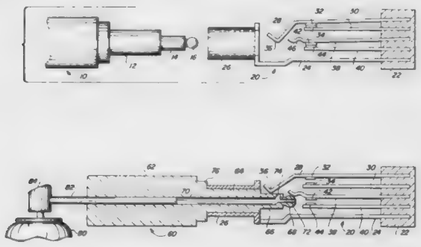
in a suitable aqueous carrier, wherein the weight ratio of polydiorganosiloxane to organic polymer in the composition is within the range of 1:20 to 2:1.

4,733,678

PATCH BAY JACK CLEANING TOOLS

Charles S. Bolois, 5444 Simpson Ave., North Hollywood, Calif. 91607

Filed Feb. 14, 1986, Ser. No. 829,321
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—115 R **10 Claims**



1. A kit of tools for cleaning the contacts of an electrical jack having a cylindrical large barrel contact, a small barrel contact, and a tip contact for respective physical contact with the large barrel, small barrel, and tip of an electrical plug inserted into said jack, said electrical jack also having first and second pairs of breaking contacts which open when said plug is inserted into said jack, said tools comprising:

a burnishing tool having a handle portion, a large barrel portion, a small barrel portion, and a tip portion, said burnishing tool for insertion into said jack to cause said large barrel portion to contact said cylindrical large barrel contact, said small barrel portion to contact said small barrel contact, and said tip portion to contact said tip contact, said large barrel portion, said small barrel portion, and said tip portion having burnishing surfaces thereon, said burnishing tool being rotatable by said handle to cause said burnishing surfaces to clean said cylindrical large barrel contact, said small barrel contact, and said tip contact; and

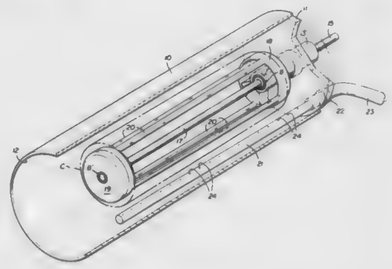
an injection tool having a handle portion, a large barrel portion, a small barrel portion, and a tip portion, said injection tool for insertion into said jack to cause said first and second pairs of breaking contacts to open, said injection tool having a channel disposed therein through said handle, said large barrel portion, and said small barrel portion, said channel being specifically arranged and configured to be supplied with pressurized solvent from an extended spray tube connected to the spray head of an aerosol spray can of solvent, said tip portion of said injection tool having a first hole through the end thereof leading from said channel for directing said solvent onto said second pair of breaking contacts, said small barrel portion of said injection tool having a second hole therethrough leading from said channel for directing said solvent onto said first pair of breaking contacts.

4,733,679

PAINT ROLLER COVER CLEANER

John S. Dolcater, 5421 SW. 94th Ave., Cooper City, Fla. 33328

Filed Nov. 20, 1986, Ser. No. 932,609
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—138 **5 Claims**



1. A paint roller cleaner comprising:

an elongated hollow housing having an end wall at one end and an opening at the opposite end;

an elongated shaft removably mounted in said end wall and extending along the inside of said housing and terminating short of said opening, said shaft being slidably removable from said end wall and removable from said housing through said opening;

a support for a paint roller cover mounted on said shaft for rotation with respect to said shaft, said support having means for slidable insertion into and frictional engagement with a paint roller cover;

said housing, said shaft and said support being free of any obstruction to the insertion and removal of said shaft and said support with a paint roller cover thereon as a unit into and out of said housing through said opening toward and away from said end wall,

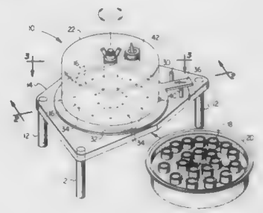
and means inside said housing for spraying water onto a paint roller cover on said support.

4,733,680

DISPENSER APPARATUS

Larry G. Mosier, 10007 Cedardale, Houston, Tex. 77055

Filed May 19, 1986, Ser. No. 864,475
Int. Cl.[4] B65B *3/06*
U.S. Cl. 141—31 **12 Claims**



1. Apparatus for simultaneously filling a plurality of liquid receptacles comprising:

a base having a plurality of base apertures oriented in said base to correspond to a pattern of receptacles placed

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therebeneath having capillary size diameters which prevent liquid from flowing by the force of gravity through said base apertures until air is selectively released into the filler tank;

leg members supporting said base to position said apparatus over a plurality of said receptacles;

filler tank secured to said base for retaining liquid;

a rotatable slide cover disposed between said filler tank and said base for dispensing liquid through selected ones of said base apertures, said slide cover being interchangeable to provide differing arrangements of apertures therein corresponding the desired number and arrangement of receptacles to be filled.

4,733,681

COMBINATION DEVICE OF UMBRELLA AND GOLF BALL RETRIEVER

Ching C. Lee, No. 281, Cherng Der Road, Taipei, Taiwan

Continuation-in-part of Ser. No. 737,345, May 23, 1985, Pat. No. 4,659,125. This application Dec. 9, 1985, Ser. No. 806,901

Int. Cl.[4] A45B *3/00, 21/00;* **A63B** *71/00;* **A47J** *45/00*

U.S. Cl. 135—16 **2 Claims**



1. A combination umbrella and golf ball retriever comprising:

an umbrella having a hollow tubular member serving as a main strut thereof, said tubular member being provided with a grip at an end thereof to serve as a handle for said umbrella;

a golf ball retriever formed of a plurality of telescopically nested tubular members of successively smaller diameters fitted one inside another, the smallest of said tubular members having a golf ball retriever head installed at an end thereof;

said umbrella handle and said main strut serving as a socket pipe telescopically accommodating said telescopically nested tubes of said golf ball retriever therewithin so that said umbrella handle and said umbrella when in a closed condition form an elongated handle for said golf ball retriever; and

releasable locking means arranged between each contiguous pair of said telescopic tubular members of the umbrella and the golf ball retriever whereby each of said members may be released to telescopically move relative to the next larger member and may be locked in a position to which it is moved.

4,733,682

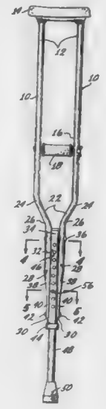
TUBULAR CRUTCH CONSTRUCTION

Nathan L. Ellena, Woodland Hills, Calif., assignor to Guardian Products, Inc., North Hollywood, Calif.

Filed Dec. 16, 1986, Ser. No. 942,211

Int. Cl.[4] A61H *3/02*

U.S. Cl. 135—69 **7 Claims**



1. In a crutch of the type having a pair of tubular bow members, said bow members having upper ends connected by an underarm support, said bow members having spaced apart upper portions, angled sections between two bend points and parallel lower portions each terminating in a lower end, a carrier tube supported between said lower portions by fastener means spaced along said carrier tube, a crutch leg telescopable within said carrier tube, and means for releasably locking said leg to said carrier tube at a selected relative extension therefrom, the improvement wherein said lower portions are progressively crushed along said lower portions between said upper and lower carrier tube ends from a cylindrical tubular shape through one or more intermediate partially crushed sections to a substantially fully flattened double walled state, said fastener means including upper fastener means securing said carrier tube to each of said bow members at a location significantly upwardly of both said partially crushed and fully flattened sections, and lower fastener means securing said carrier tube to each of said fully crushed lower ends;

said lower fastener means consisting of two lower rivets, each rivet passing through both said walls of one of said crushed lower end and the wall of said carrier tube, said lower rivets each having a substantially flat rounded rivet head external to said fully crushed lower ends such that the lower portions of the bows are substantially protected against catching on staircase edges and the like.

4,733,683

AUTOMATIC RETRACTABLE BOX AWNING FOR RECREATIONAL VEHICLES AND THE LIKE

Carlo M. Pozzi, Ticino, Switzerland, assignor to Fiamma S.p.A., Cardano Al Campo, Italy

Filed Aug. 5, 1986, Ser. No. 893,572

Claims priority, application Italy, Oct. 25, 1985, 83620 A/85; Oct. 25, 1985, 83621 A/85; European Pat. Off., Dec. 21, 1985, 85116451-7

Int. Cl.[4] E04H *15/08;* **E04F** *10/06*

U.S. Cl. 135—89 **20 Claims**

1. A retractable awning assembly for use on recreational vehicles and the like comprising:

a rectangularly shaped rollable fabric awning;

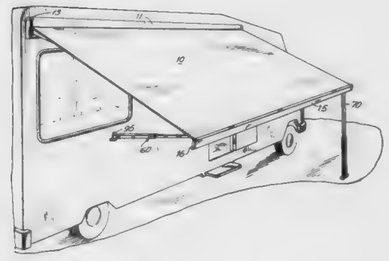
a roller having a length slightly greater than the width of the rectangularly shaped awning to which one end of the awning is attached and around which the awning is capable of being wound;

an elongated box-like housing slightly longer than the length of the roller in which the roller is rotatably mounted and which fully encloses the roller and awning when wound around the roller, except for an opening at the front of the housing through which the awning travels when being extended and retracted;

a roller operating mechanism for causing rotation of the roller which alternatively effects movement of the awning from a position at which it is fully wound around the roller to a position at which it is partly or fully extended and reverse movement;

a front bar to which the end of the awning opposite the end attached to the roller is attached, the front bar having a longitudinally extending channel therein and being releasably secured to the opening on the housing through which the awning travels to complete the enclosure of the roller and awning when wound around the roller;

a pair of articulated, folding support arms for supporting the front bar which has the front end of the awning attached and for supporting the sides of the awning when the awning is in an extended position, the support arms being



pivotally attached at one end thereof to the housing and pivotally attached at the opposite end thereof to the front bar, with the folded support arms being capable of storage in the channel within the front bar when the awning is retracted and the front bar is releasably secured to the housing;

a pair of telescoping support legs for further supporting the front bar which has the front end of the awning attached when the awning is in an extended position and for supporting the extended support arms and stabilizing the extended awning by alternatively being anchored to the ground or releasably secured to the side of the vehicle to which the awning is mounted, the support legs being pivotally and rotationally mounted at their upper end to the front bar, with the telescoped support legs being capable of storage in the channel within the front bar when the awning is retracted and the front bar is releasably secured to the housing; and

a security lock mechanism for releasably securing the front bar to the housing to prevent the inadvertent detachment of the front bar from the housing and the unwanted unrolling of the awning from the roller, especially when the vehicle to which the awning assembly is mounted is being driven.

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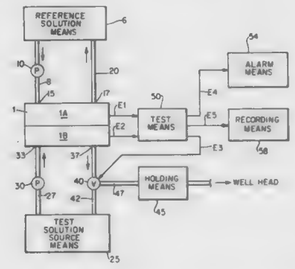
MEANS AND METHOD FOR TESTING THE HOMOGENEITY OF A SOLUTION

John D. Marrelli, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,280

Int. Cl.[4] G01N *21/21, 21/85*

U.S. Cl. 137—2 **12 Claims**



10. A method controlling the application of a solution to a well comprising the steps of:

providing a solution from a source;

providing a reference solution;

receiving the reference solution in a first chamber;

returning the reference solution from the first chamber to the reference means;

means for receiving the solution in a second chamber, providing the solution from the second chamber;

providing a first signal in accordance with incident light, on a first signal means spatially related to the first chamber;

providing a second signal in accordance with incident light, on a second signal means spatially related to the second chamber;

providing light equally to both chambers in a manner so that the light passes through the solutions in both chambers to be incident upon the first and second signal means;

polarizing the light prior to the light being incident on the first and second signal means,

said polarizing step includes:

polarizing the light with a rotatable polarizing filter, and

polarizing the light with a fixed polarizing filter and said rotatable polarizing filter and said fixed polarizing filter being spatially arranged with both chambers so that both chambers are between the two polarizing filters, and

further comprising the step of rotating the rotatable polarizing filter;

using control means connected to the well, to the solution means and to the second chamber means to provide the solution from the second chamber either to the well or to the solution source in accordance with a control signal, and

providing the control signal to the control means in accordance with the first and second signals from the first and second signal means, respectively.

4,733,685

CYCLIC FLOW DISTRIBUTOR

Dan Bron, 36 Palmach St., Haifa, Israel

Filed Oct. 9, 1986, Ser. No. 917,109

Claims priority, application Israel, Oct. 10, 1985, 76641

Int. Cl.[4] F16K *11/10*

U.S. Cl. 137—119 **8 Claims**

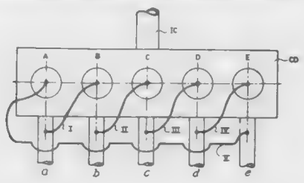
1. A cyclic flow distributor comprising:

a body member provided with a plurality of n inlet chambers open towards one of the faces of said body member and connected in parallel to an inlet plenum connectable to a

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common supply line, and an identical plurality of n outlet chambers open towards said face of said body member, each outlet chamber separately connectable to at least one consumer line and being arranged in proximity to, and forming a functional pair with, an inlet chamber, said pair of chambers being separated by a partition;

a cover plate fixedly attachable to said face of said body member, provided with a plurality of n control chambers open towards one of the faces of said plate, the size and location of said control chambers being such that, in assembly, each control chamber is substantially aligned with one of said n inlet chamber/outlet chamber pairs;



at least one elastically deformable diaphragm interposed, in assembly, between said body member and said cover plate and tightly clamped therebetween at least along perimetric strips determined by the outlines of said control chambers, thus defining a plurality of n independent diaphragm portions, each of which is capable of independent reaction to pressure;

a plurality of n control passageways, leading from one each of said n outlet chambers into one each of said control chambers, the arrangement being such that the outlet chamber of each of said pairs of chambers communicates via its passageway with the control chamber of another pair of chambers.

4,733,686

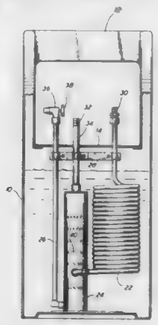
APPARATUS FOR REMOVING WATER VAPOR FROM COMPRESSED AIR

William E. Cosselmon, Jr., 2826 Downs Rd., P.O. Box 207, Weedsport, N.Y. 13166

Filed Feb. 4, 1987, Ser. No. 10,627

Int. Cl.[4] F16T *1/34*

U.S. Cl. 137—203 **7 Claims**



1. A manually transportable device for selective connection in a line between an air compressor and a pneumatically operated tool for rapid condensation and removal of water vapor from the compressed air by transfer of heat from the compressed air to a chilled liquid, said device comprising, in combination:

(a) a continuous length of hollow tubing extending from an upper, inlet end, adapted for connection to an air compressor, downwardly through a helically coiled section, to a lower, outlet end;

(b) a manifold section having a lower portion directly communicating with said outlet end of said hollow tubing;

(c) an outlet tube extending upwardly from and communicating directly with an upper portion of said manifold to an upper end adapted for connection to a pneumatically operated tool;

(d) manually transportable container means adapted to hold a quantity of chilled liquid in which said hollow tubing and manifold are immersed at a level below said inlet and outlet ends;

(e) a water purge tube having a first end connected to and communicating directly with said lower portion of said manifold at a position below said outlet end of said hollow tubing within said liquid, and extending to a second end outside said liquid; and

(f) valve means at said second end of said purge tube selectively movable to an open position to remove water condensed from the water vapor in the compressed air from the bottom of said manifold.

4,733,687

VALVE ACTUATOR FOR SLIDE EXHAUST BRAKE SYSTEMS

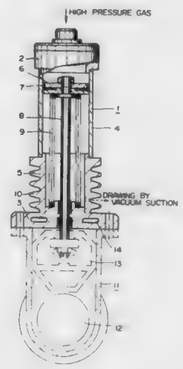
Kazunori Takigawa, Numazu, and Ryoichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Shimizucho, Japan

Filed May 27, 1986, Ser. No. 867,486

Claims priority, application Japan, Jun. 6, 1985, 60-85410[U]

Int. Cl.[4] F16K *49/00*

U.S. Cl. 137—338 **5 Claims**



4. A valve actuator for a slide exhaust brake system having an exhaust gas passage for placement in communication with an exhaust system and having a plate valve member selectively slidable into said exhaust gas passage, said valve actuator comprising:

a piston rod connected to said plate valve member;

a piston member connected to said piston rod at an end thereof remote from said plate valve member;

a bottom wall mounted to said exhaust brake system, said bottom wall including an aperture exending therethrough, said piston rod extending through said aperture such that the plate valve member is disposed on one side of said bottom wall and such that said piston member is disposed on the opposite side of said bottom wall;

a coil spring surrounding said piston rod and extending between said piston member and said bottom wall for urging said piston member away from said bottom wall, such that said spring is in a compressed condition when said plate valve member is in said exhaust passage;

a cylindrical wall formed from a first metal material having one end fixed to said bottom wall and substantially surrounding said piston rod and said coil spring, said cylindrical wall having a length generally equal to the length of the coil spring in the compressed condition, the cylindrical wall having its outer circumference formed with a plurality of a radiation fins;

a cylinder body fixed to the end of said cylindrical wall opposite said bottom wall, said cylinder body substantially surrounding said piston member and having a length substantially equal to the sliding distance of said piston member, said cylinder body being formed from a second metal material;

a packing disposed intermediate said piston member and said cylinder body; and

a head wall fixed to the end of said cylinder body opposite said cylindrical wall, whereby the cylindrical wall insulates the cylinder body, the piston member and the packing from heat generated by said exhaust brake system, and enables a substantially shortened cylinder body.

4,733,688

MIXER VALVE

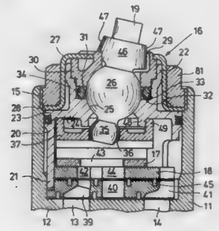
Werner Lorch, Schramberg, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

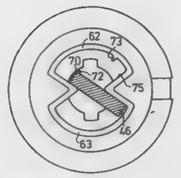
Filed May 13, 1985, Ser. No. 733,518

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419209

Int. Cl.[4] F16K *11/06*

U.S. Cl. 137—454.6 **22 Claims**





21. A mixer valve comprising

a valve casing having a plurality of bores,

an integral and partitioned valve cartridge interchangeably mounted in said valve casing, said valve cartridge having a substantially tubular casing which is closed on the outside by a cup-shaped sleeve and on the inside by a removably mounted cartridge base, said cartridge base having a plurality of bores which are adapted for connection with bores of said valve casing,

a fixed control disk and a movable control disk mounted in said valve cartridge in operative association with an operating element having stop faces for limiting the movement of said mixer valve in the maximum temperature position when said mixer valve is completely open,

a transmitting element for converting the movement of said operating element into movement of said movable control disk, and

a cap nut radially fixing said sleeve in said valve casing.

4,733,689

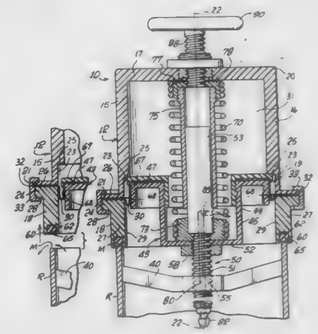
FLUID PRESSURE ACTIVATED VALVE

Lee Osnas, 8853 S. Fowler, Fowler, Calif. 93623

Filed Sep. 8, 1986, Ser. No. 904,601

Int. Cl.[4] F16K *31/12*

U.S. Cl. 137—494 **13 Claims**



1. A fluid pressure actuated valve adapted to be seated in sealing relation about the mouth of a pipe in normally fluid sealing relation thereto comprising:

a movable valve body having an upper portion and a lower portion, said upper and lower portions being joined at their respective circumferential edges and defining an interior region;

a pedestal, a threaded axially depending mounting rod affixed on said pedestal and secured within said pipe, the pedestal and threaded axially depending mounting rod operable to secure said valve body in its normally seated position about the mouth of said pipe;

means forming a fluid impermeable flexible seal secured at its peripheral edge between said upper and lower portions, a portion of said seal being secured on said pedestal;

means for resiliently holding said valve body in fluid sealing relation against the pipe; and

means for delivery of fluid under pressure to said interior region of the upper portion of the valve body so as to act against the resilient means to unseat said valve body against the action of said resilient means and urging it to an unseated position above the mouth of the pipe.

4,733,690

HYDRAULIC VALVE

Rudolf Brunner, Wankstrasse 23, D-8011 Baldham, Fed. Rep. of Germany

Continuation of Ser. No. 742,329, Jun. 7, 1985, abandoned. This application May 8, 1986, Ser. No. 861,748

Claims priority, application European Pat. Off., Jun. 15, 1984, 84106877.8

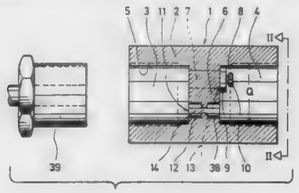
Int. Cl.[4] F16K *15/02*

U.S. Cl. 137—513.7 **6 Claims**

1. A hydraulic valve having a housing (2, 2', 2'') in which a housing partition (6, 6', 6'') formed with a passage means (7) therethrough is provided between an inlet bore (3) and an outlet bore (4) aligned therewith, said passage means having associated therewith a valve seat for a non-return flap valve element (9) adapted to close in one flow direction, said housing containing at least one flow channel (11) bypassing said passage means for performing at least one further valve function, characterized in that to afford ample space for several valve

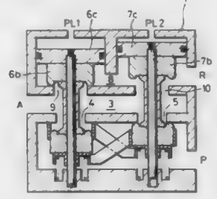
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functions without affecting one another, said flow channel (11) for said further valve function is eccentrically located on one side of said housing partition (6, 6a, 6') while said passage means (7) is eccentrically located on the other side of said housing partition, both eccentric positions being within the cross-sectional area (Q) of said housing defined by the aligned



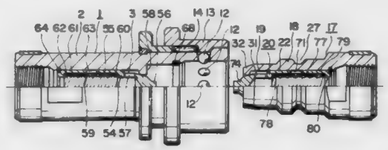
bores (3, 4), further characterized in that within said flow channel (11) is located a means (12, 19, 26) effecting throttling action therein in the direction of flow blocked by said non-return valve, and further characterized in that said flap valve element occupies not more than half of the cross-sectional area (Q).

4,733,691
SOLENOID VALVE
Mitsufumi Kishimoto, Kobe, Japan, assignor to Konan Electric Co., Ltd., Nishinomiya, Japan
Filed May 5, 1987, Ser. No. 47,229
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—596.16 **1 Claim**



1. A solenoid valve wherein two valve members are provided in a valve case including a fluid supply chamber to be connected to IN port, a fluid chamber to be connected to OUT port and a discharge chamber to be connected to a discharge port, said valve members respectively include the first valve bodies adapted to open and close the openings between said supply chamber and said fluid chamber and the second valve bodies adapted to open and close the openings between said fluid chamber and said discharge chamber, and when one of the first and second valve bodies of the respective valve members is open, the other may be switched to be closed, said solenoid valve being characterized in including annular opening and closing members slidably fitted around the respective first valve bodies of said two valve members and synchronizing members coupled to said annular opening and closing members and adapted to be synchronized with the movement of the other valve member and that said annular opening and closing members are so formed that they are spaced from the relative opening in the operative position and seated against the relative opening in the inoperative position to partly enclose the first valve body of the valve in the operative position and to allow the space between the relative opening and the first valve body to be isolated from the fluid supply chamber.

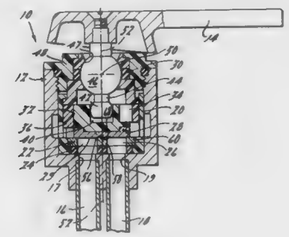
4,733,692
TUBE COUPLING
Naoyuki Kotake, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd, Tokyo, Japan
Filed May 30, 1986, Ser. No. 868,995
Claims priority, application Japan, May 30, 1985, 60/81545[U]
Int. Cl.[4] F16L *29/00*
U.S. Cl. 137—614.03 **1 Claim**

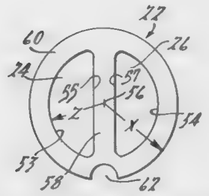


1. A tube coupling of the type having a socket and a plug, each having a fluid flow passage extending therethrough, and valve means mounted in the flow passage through at least one of the socket and plug for axial movement between a first position for closing said flow passage and a second position for opening said flow passage, said valve means being normally biased towards said first position by spring means when said socket and plug are disconnected, and adapted to be moved to said second position when the socket and plug are coupled together, characterized in that at least those portions of said socket and plug which will be exposed to fluid during the use are formed of fluoi carbon resin, said spring means being disposed in said flow passage and comprising bellows made of fluorocarbon resin having continuous helically extending pleats.

4,733,693
MIXING VALVE
Alfons Knapp, Biberach, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.
Continuation of Ser. No. 768,580, Aug. 23, 1985, Pat. No. 4,672,999, which is a continuation-in-part of Ser. No. 513,109, Jul. 12, 1983, Pat. No. 4,576,202. This application Nov. 5, 1986, Ser. No. 927,539
Claims priority, application Italy, Jul. 16, 1982, 67906 A/82; Jan. 28, 1983, 67906 A/83; Mar. 7, 1983, 67253 A/83
Int. Cl.[4] F16K *11/078*
U.S. Cl. 137—625.17 **3 Claims**

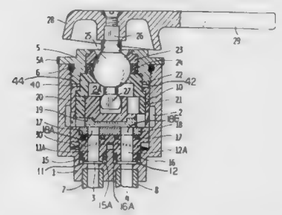
1. A flow control mixing valve characterized by
a housing structure;
said housing having a first port and second port;
each port having a radially outer arcuate shaped periphery of common radius with a common center point;
each port having a planar valve seat at an end thereof surrounding each port;
a movable valve plate having a circular planar valving surface having an arcuate periphery and abutting said valve seat and movable to a closed position so that said plate has its arcuate periphery displaced radially outwardly of said arcuate periphery of each port;
each port having an outer edge that is semi-circular in shape and positioned within a circle having a radius less than the radius of the circular planar valving surface of said movable valve plate;
each port having an inner edge that is substantially linear in shape and spaced from each other such that the planar valve seat adjacent both inner edges forms a bridge between said first and second ports;
said planar valving surface being slidably movable within a plane on said valve seat to an open position so that a portion of its radially outer arcuate shaped periphery is selectively displaced radially inwardly from the respective arcuate periphery of a selection of one of said first, second, and both ports to uncover a corresponding portion of a selection of one of said respective first, second, and both ports in varying ratios; and





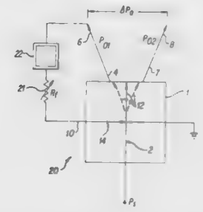
a control means for slidably moving said planar valving surface within a plane over said valve seat and ports.

4,733,694
MIXING VALVE WITH HYDRAULIC RESPONSIVE MOVABLE FIELD
Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.
Filed Jan. 3, 1986, Ser. No. 816,147
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[4] F16K *11/078, 25/00*
U.S. Cl. 137—625.17 **8 Claims**



1. A mixing valve for a faucet characterized by:
a faucet body having a cartridge receiving chamber and fluid inlets;
a replaceable cartridge in the chamber of the faucet body having an axially movable bottom that moves in response to hydraulic pressure from at least one said inlet;
a fixed plate mounted on the cartridge movable bottom;
a movable plate housed on top of said fixed plate;
means operably connected to the movable plate for moving said plate relative to the fixed plate so as to regulate water flow and mixing proportions from said fluid inlets;
the cartridge bottom being provided with a first seal means operating between the cartridge bottom and the fluid inlets of the faucet body;
the cartridge bottom being provided with a second seal means interposed between the cartridge bottom and the fixed plate with the total working area within the second seal means being smaller than the total working area within the first seal means such that hydraulic pressure trying to separate the fixed plate from the cartridge bottom is overcome by the hydraulic pressure biasing the cartridge bottom against the fixed plate and to apply a compressive force between the fixed and movable plates.

4,733,695
FLUIDIC SET-POINT PRESSURE SENSOR
George Mon, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 13, 1987, Ser. No. 111,848
Int. Cl.[4] F15C *3/00*
U.S. Cl. 137—829 **4 Claims**



1. A fluidic set-point pressure sensor for converting the absolute pressure of a pressurized fluid to a differential pressure indicating the pressure of the pressurized fluid relative to a predetermined set-point pressure, comprising:
input means, connected to receive said pressurized fluid for directing a jet of fluid along a first centerline at a velocity determined by said absolute pressure;
output means, disposed downstream from said input means, including first and second outlets separated by a splitter which is disposed asymmetrical to said first centerline such that at least a greater portion of said jet directed along said first centerline is received at the first outlet;
control means for deflecting the jet towards the second outlet in accordance with the jet velocity such that as the jet velocity increases from zero, the deflection of the jet increases to a maximum value and then decreases, so that the differential pressure generated by the jet between the first and second outlets increases to a maximum positive value and then decreases to a negative value, the differential pressure being equal to zero when the absolute pressure of the pressurized fluid is equal to the predetermined set-point pressure, the differential pressure becoming positive whenever said absolute pressure fall below said set-point pressure and becoming negative whenever said absolute pressure rises above said set-point pressure, said control means including first and second control fluid inlets respectively disposed on opposite sides of the jet, said first fluid inlet being disposed on the same side of the centerline of said first outlet and a resistive fluid communications means having one end connected to said first outlet and a second end connected to said first inlet forming a feedback path of the portion of said jet flowing into said first outlet.

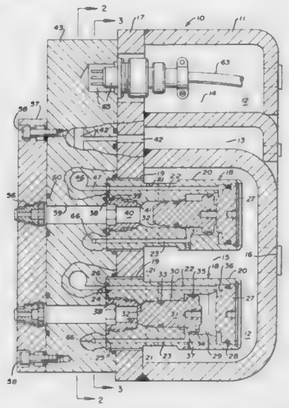
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,696

PILOT OPERATED COOLANT CONTROL VALVES

Daniel Baun, 696 McClurg, Boardman, Ohio 44512

Filed Jul. 27, 1987, Ser. No. 78,260
Int. Cl.[4] F16K *11/22*
U.S. Cl. 137—883 5 Claims



1. An improvement in pilot operated coolant control valves in a manifold assembly for supplying a coolant under pressure, the improvement comprises in combination forming the coolant control valves as removable assemblies positioned within an apertured body member closing said manifold, independent pilot control valves positioned in a pilot valve mounting plate removably secured against said apertured body member, each of said coolant control valve assemblies consisting of a cylindrical valve body apertured inwardly of one end, a pilot valve chamber within said cylindrical valve body, a valve element movably positioned within said pilot valve chamber, a valve seat in said valve body, means for closing one end of said apertured valve body, sealing means on said valve element, a pilot air passageway and a vent air passageway within said cylindrical valve body member communicating with said pilot control valves and the atmosphere respectively, a coolant chamber in said manifold, apertures in said cylindrical valve body communicating with said coolant chamber, a solenoid coil in said pilot control valve for moving a solenoid plunger therein when energized, secondary valve elements on the ends of said solenoid plunger, a pilot air supply chamber within said manifold, means communicating between said pilot control valve and said pilot air supply chamber, oppositely disposed passageways communicating with said pilot air chamber to maintain said valve element closed against said valve seat stopping the flow of coolant when said solenoid coil is de-energized, a spring for moving said plunger to seal said pilot air passageway whereby coolant pressure moves said valve element supplying said coolant to a spray means in communication with said coolant supply valve, an electrical circuit in communication with said solenoid coil for energizing the same.

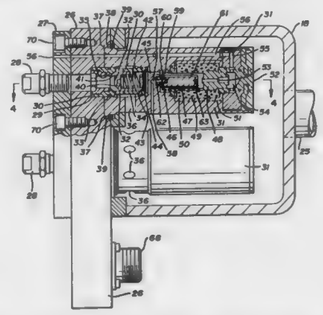
4,733,697

PILOT OPERATED COOLANT CONTROL VALVES IN MANIFOLD ASSEMBLY

Daniel Baun, 696 McClurg Rd., Youngstown, Ohio 44512

Filed Sep. 10, 1987, Ser. No. 95,008
Int. Cl.[4] B05B *1/14*
U.S. Cl. 137—884 5 Claims

1. In pilot operated coolant control valves in a manifold assembly for supplying a coolant to a rolling mill and having apertured body members closing said manifold wherein said coolant control valves are formed as removable cartridges positioned in registry with said apertures in said body members; the improvement wherein each of said removable cartridges consists of a cartridge body having a cavity therein communicating with one end thereof, a cylindrical valve body in said cavity, a valve seat in said cylindrical valve body, a valve element movably disposed in said cylindrical valve body, spring means urging said valve element toward said valve seat, openings in said cylindrical valve body adjacent said valve seat for receiving coolant from said manifold by way of openings in said cartridge body so as to urge said valve element away from said valve seat, a pilot valve chamber in said cartridge body adjacent said cavity and a passageway establishing communication between said cavity and said pilot valve chamber and between said pilot valve chamber and the exterior of said cartridge body and said manifold, a secondary valve seat in said passageway, a solenoid coil in said cartridge body, a sole-



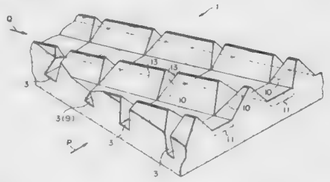
noid plunger in said solenoid coil and a valve element on said solenoid plunger movable toward and away from said secondary valve seat, a longitudinally extending groove in a surface of said solenoid plunger forming a part of said passageway, said solenoid coil arranged to move said said solenoid plunger and valve element away from said secondary valve seat when energized so as to open said passageway, spring means positioned between said solenoid coil and said solenoid plunger urging said plunger toward said secondary valve seat so as to close said passageway when said solenoid coil is de-energized whereby fluid pressure in said manifold moves said valve element away from said valve seat to establish communication for said coolant through said cavity, the cylindrical valve body, and said valve seat to a spray nozzle downstream with respect thereto.

4,733,698

HEAT TRANSFER PIPE

Yoshiyuki Sato, Isehara, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 9, 1986, Ser. No. 905,188
Claims priority, application Japan, Sep. 13, 1985, 60-203678; Sep. 13, 1985, 60-203679
Int. Cl.[4] F28F *1/40*
U.S. Cl. 138—38 1 Claim



1. A heat transfer pipe having formed in an inner surface portion thereof:

a plurality of first internal grooves formed in parallel with each other and having a generally rectangular cross sectional shape; and

a plurality of second internal grooves formed in parallel with each other and crossing said first internal grooves, said second internal grooves having a cross section which is generally in the shape of an inverted trapezoid;

and further comprising the following portions defined by said first and second internal grooves;

tunnel portions formed in portions where said first internal grooves cross said second internal grooves, said tunnel portions each having a space;

discontinuous projecting portions formed at portions crossing the portions between said first internal grooves, said discontinuous projecting portions being parallel to said second internal grooves and each having a generally triangular cross section; and

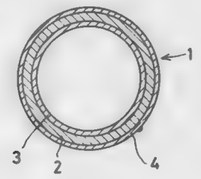
opening portions of said first internal grooves formed in intermittent portions of said projecting portions.

4,733,699

COMPOSITE PIPE, PROCESS FOR PRODUCING THE SAME, AND HEAT PIPE USING THE SAME

Ryosuke Hata, Osaka, Japan, assignor to Sumitomo Electric Industries Ltd., Japan

Filed Dec. 19, 1985, Ser. No. 811,164
Claims priority, application Japan, Dec. 21, 1984, 59-271593
Int. Cl.[4] F16L *9/18*
U.S. Cl. 138—145 1 Claim



1. A composite pipe comprising an aluminum pipe, a protective layer provided on the interior of said aluminum pipe and formed from a material selected from the group of a paint, adhesive tape, and plastic tape, a lead pipe having its outer periphery in contact with said protective layer, and a further protective layer on the outer periphery of said aluminum pipe formed by a lead pipe.

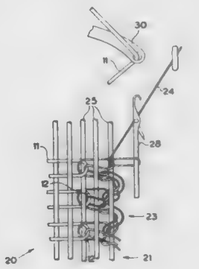
4,733,700

WOVEN FABRIC

John D. Griffith, Boldon, England, assignor to Bonas Machine Company Limited, Sunderland, England

Continuation of Ser. No. 600,952, Apr. 16, 1984. This application Oct. 23, 1986, Ser. No. 924,181
Claims priority, application United Kingdom, Apr. 20, 1983, 8310710
Int. Cl.[4] D03D *5/00*
U.S. Cl. 139—383 R 5 Claims

1. A woven fabric which has been woven or a needle or rapier loom so as to have plural loops of weft yarn woven between plural warp yarns, the loops of weft yarn having terminal ends located inboard of the outermost warp yarn defining the edge of the fabric opposite to the fabric edge whereat weft insertion has taken place, successive weft yarn loops being secured to one another by a knitted catch thread construction comprising a string of knitted stitches knitted from at least one thread fed externally of the warp yarns and having at least two stitches per one weft loop, the knitted catch thread construction being drawn into the fabric by said weft loops so as to be woven with the warp yarns located between



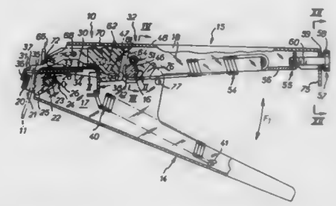
the terminal ends of the weft loops and said outermost warp yarn and being wrapped about said outermost warp yarn.

4,733,701

TOOL FOR TIGHTENING AND CUTTING CLAMPS

Francois Loisel, Maromme; Marc Gosse, Cleres; Patrick Hauchard, Deville Les Rouen, and Jean C. Auger, Le Trait, all of France, assignors to Legrand, Limoges, France

Filed Jul. 30, 1986, Ser. No. 894,657
Claims priority, application France, Jul. 30, 1985, 85 11595
Int. Cl.[4] B21F *9/02*
U.S. Cl. 140—93.2 17 Claims



1. Tool for tightening and cutting clamps comprising two handles, a pivot for pivoting said handles to each other, one of said handles being a tightening handle and having at its end grasping means for grasping the clamp to be cut and the other of said handles being a cutting handle and having at its end a movable cutter, elastic means for opposing pivoting movement of said grasping and cutting handles towards each other, actuator means for applying thrust to said cutter, and elastic return means for opposing movement of said cutter, wherein said actuator means defines the pivot for pivoting said handles to each other and a curved slot in said cutting handle by which said cutting handle is fastened to said pivot and in which said pivot is movable parallel to itself and transversely relative to the axis of the pivot.

4,733,702

APPARATUS FOR FORMING AND PACKAGING UNSTABLE PRODUCTS

John Anderson, III, Wilmington, and David R. Knowlton, Ipswich, both of Mass., assignors to The Gillette Company, Boston, Mass.

Division of Ser. No. 620,220, Jun. 13, 1984, Pat. No. 4,651,503. This application Sep. 12, 1986, Ser. No. 906,706
Int. Cl.[4] B65B *3/10*
U.S. Cl. 141—105 17 Claims

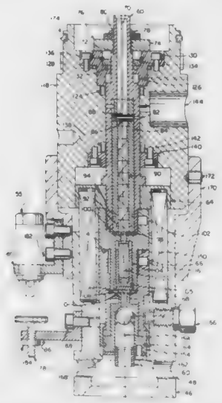
1. A filling head for receiving pressurized supplies of an

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aqueous surfactant and a foaming agent, for intimately mixing said aqueous surfactant and said foaming agent and for ejecting said mixture in a still liquid form into a suitable container for the dispensing thereof, said mixture thereafter forming a delayed foaming gel in said container, said filling head comprising;

a housing member having a longitudinal wall, a longitudinal bore, and a first port through said longitudinal wall to said longitudinal bore,

a spool assembly disposed in said bore of said housing member, said spool assembly being translatable within said bore between a nonfilling position and a filling position, said spool assembly having a throughgoing channel, a longitudinal wall and a second port through the longitudinal wall of said spool assembly to said throughgoing channel, said throughgoing channel having a downstream end, and



said first and second ports being offset from one another and not in fluid communication when said spool assembly is in said nonfilling position and being aligned with one another and in fluid communication when said spool assembly is in said filling position,

static mixer means disposed within said filling head for intimately mixing said aqueous surfactant and said foaming agent;

metering means for introducing metered dosages of said pressurized aqueous surfactant into said throughgoing channel;

first valve means for establishing and interrupting the flow of said pressurized foaming agent into said throughgoing channel, said first valve means being located upstream of said static mixer means; and

second valve means located downstream of said static mixer for selectively opening the downstream end of said channel in response to the correct positioning of a container to be filled with said mixture.

4,733,703

COMBINATION TOOL CHEST/WORKBENCH

Eugene D. Cimino, 215 Pochet La., Schaumburg, Ill. 60193

Filed Apr. 16, 1986, Ser. No. 852,743

Int. Cl.[4] B25H *1/12*

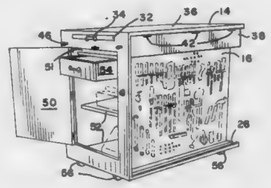
U.S. Cl. 144—285 **8 Claims**

5. A combination tool chest and workbench comprising:

a top member forming a substantially planar top surface;

at least one storage bin;

means for rotatably mounting said bin on an edge of said top member between a top position above said top surface and a storage position beneath and substantially adjacent to said top member;



said storage bin including a bin cover openable when said storage bin is in said top position; and

means for holding said bin in said storage position

4,733,704

WORKBENCH

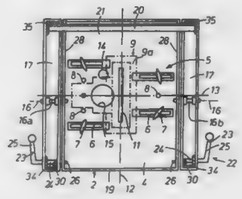
Robert Wolff, Im Kiesacker 12, 5446 Engeln, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 855,460, Apr. 24, 1986, abandoned. This application Aug. 29, 1986, Ser. No. 901,798

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538529; Apr. 29, 1986, 8611721[U]

Int. Cl.[4] B27C *9/02*

U.S. Cl. 144—286 R **34 Claims**



1. A workbench comprising a trestle means, a supporting panel means for supporting a workpiece, said supporting panel means having a first end and a second end, clamping means for rigidly attaching a manually operated machine tool on an underside of the supporting panel means, means provided in a portion of the supporting panel means for enabling a portion of the machine tool to extend above a top side of the supporting panel means, means for mounting said supporting panel means on said trestle means so as to enable said supporting panel means to be pivoted about a pivot axis through an angle of 180° from an operative position to a machine tool mounting position, and retaining means, provided on said trestle means, for locking said supporting panel means in the operative position with the first end of said supporting panel means resting on a portion of the trestle means and the second end of said supporting panel means elastically bent in an upward direction by said retaining means, and for retaining said supporting panel means in the mounting position.

4,733,705

TIRE SHOE

Alvin S. Dwiggins, Rte. 1, Box 211, Amity, Ark. 71921

Filed May 27, 1986, Ser. No. 866,712

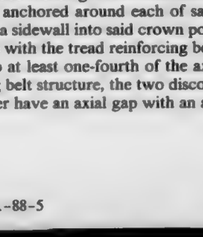
Int. Cl.[4] B60C *11/02*

U.S. Cl. 152—177 **7 Claims**

1. A tire shoe for replacing or changing the tread of a conventional tire having a tread, a pair of sidewalls and a pair of beads, which shoe comprises:

(a) an annular body defined by a circular tread portion, a pair of radially extending opposed sidewall portions, the sidewall portions terminating in a pair of circumferential bead portions;

(b) the body being configured and sized for attachment around a conventional tire mounted on the rim of a wheel and inflated to an operating pressure so as to cause the sidewalls of the tire to bulge outwardly and assume an axially inwardly directed configuration toward each other, whereby the sidewall portions of the body may be disposed in snug engagement against the corresponding sidewalls of the tire and extending radially therealong for a substantial distance across the radial width of the sidewalls of the tire, with the bead portions of the body being disposed beyond the maximum outward bulge of the tire sidewalls so that the sidewall portions of the body assumes a corresponding axially inwardly directed configuration towards each other;



(c) the tread portion of the body including an inner surface which is spaced from and defines an annular space with the exterior surface of the tire tread when the shoe is in its position of attachment around the tire;

(d) each sidewall portion of the body being sectioned to define a plurality of flaps for permitting the shoe to be attached to or removed from the tire;

(e) the flaps including means for detachably securing same together;

(f) a separate inflatable air bladder disposed within the annular space for urging the shoe radially outwardly of the tire to cause the sidewall portions of the body to tightly embrace the sidewalls of the tire; and

(g) whereby the shoe is maintained in its position of attachment around the tire by detachably securing the flaps together and inflating the bladder.

4,733,706

PNEUMATIC TIRE

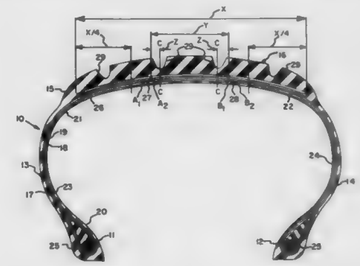
Georges J. Schmit, Bridel, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 607,884, May 7, 1984, abandoned. This application Aug. 25, 1986, Ser. No. 900,465

Int. Cl.[4] B60C *11/06, 9/02, 9/28*

U.S. Cl. 152—209 R **7 Claims**

1. A radial aircraft tire having a pair of annular bead portions, each annular bead portion containing an annular bead core, a sidewall extending radially outwardly from each bead portion, and a crown portion extending between the sidewalls with a ground-engaging tread portion extending circumferentially thereabout, said tread portion having axially spaced apart circumferentially extending straight grooves therein, said tire further comprising a carcass consisting of two reinforced radial carcass layers and a tread reinforcing belt structure disposed radially outwardly of the carcass layers in said crown portion, each of said carcass layers comprising two discontinuous plies of radial reinforcing cords with one of said discontinuous plies being anchored around each of said cores and extending through a sidewall into said crown portion in overlapping relationship with the tread reinforcing belt structure by a distance equal to at least one-fourth of the axial width of the tread-reinforcing belt structure, the two discontinuous plies of each carcass layer have an axial gap with an axial width of no greater than 10 percent of the axial width of said tread reinforcing belt structure therebetween, the carcass layers being arranged such that the axial gap between the discontinuous plies of each layer is axially offset from and does not overlap with the axial gap between the discontinuous plies of the other



carcass layer, and the axial gaps between the discontinuous plies of each carcass layer being axially spaced apart from the grooves in said tread portion by a distance equal to at least 3 percent of the axial width of said tread reinforcing belt structure.

4,733,707

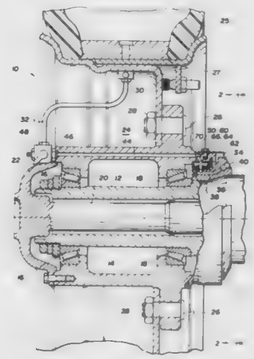
VEHICLE WHEEL END ASSEMBLY

Fred L. Goodell, Grosse Ile, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corporation, Livonia, Mich.

Filed Mar. 18, 1985, Ser. No. 712,420

Int. Cl.[4] B60C *29/00;* **B65D** *69/00;* **F16J** *15/16*

U.S. Cl. 152—417 **21 Claims**



1. A vehicle wheel end assembly adapted for use with an automated system for controlling tire pressurization comprising:

a spindle mounted in fixed relation to the vehicle;

a hub mounted for rotation on the spindle and adapted to carry a wheel, said hub having an inboard portion spaced radially from the spindle, and an internal air passage extending from the inner radial surface of said inboard portion to the outboard end of said hub;

a collar mounted concentrically on the spindle in axial alignment with and spaced radially from the inboard portion of the hub, said collar having an internal air passage extending from the outer radial surface of the collar to its inboard end; and

rotary seal means, interposed in the radial space between the

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collar and the inboard portion of the hub, for communicating the internal air passages in the collar and the hub, said rotary seal means including lip members which are biased into a sealing position against an adjacent one of the radially spaced collar and hub;

wherein said rotary seal means comprises first and second annular sealing rings axially spaced from one another;

wherein said rotary seal means further includes spacer means, disposed between said first and second sealing rings for maintaining the axial spacing therebetween; and

wherein said spacer means comprises an annular member having axial undulations.

11. A kit for retrofitting a vehicle wheel end assembly for use with an automated system for controlling tire pressurization, said wheel end assembly being of the type having a spindle mounted in fixed relation to the vehicle and a hub mounted for rotation on the spindle and having an internal air passage extending between the outboard end of the hub and the inner radial surface of an inboard portion of the hub which is radially spaced from the spindle, said kit comprising:

an adapter collar mountable on the spindle proximate the inboard end thereof and in radially spaced relation to the hub, said collar having an internal air passage extending between its outer radial surface and inboard portion for transmitting pressurized air; and

rotary seal means, adapted to be interposed in the radial space between collar and the hub, for communicating the internal air passages in the collar and the hub, said rotary seal means including lip members biased into a sealing position against an adjacent one of the radially spaced collar and hub;

wherein said rotary seal means comprises first and second annular sealing rings axially spaced from one another;

wherein said rotary seal means further includes spacer means, disposed between said first and second sealing rings for maintaining the axial spacing therebetween; and

wherein said spacer means comprises an annular member having axial undulations.

4,733,708

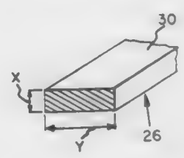
USE OF FLAT WIRE AS A REINFORCEMENT IN THE BELT PACKAGE OF A PNEUMATIC TIRE

David A. Kindry, Clinton; Jerold R. Buenger, Hartville; Roger D. Emerson, Cuyahoga Falls; Richard M. Oblath, Akron, and Roger A. Fleming, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 745,386, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 584,206, Feb. 27, 1984, abandoned. This application Sep. 3, 1986, Ser. No. 903,166

Int. Cl.⁴ B60C *09/18*

U.S. Cl. 152—527 **14 Claims**



1. A pneumatic tire having a tread reinforcing structure comprising:

(a) a first belt ply comprising side by side steel cables, said steel cables being oriented at an angle of between 15° and 25° with respect to the mid-circumferential centerplane of the tire;

(b) a second belt ply disposed radially outwardly of said first belt ply and comprising side by side flat steel wires, said flat steel wires having a thickness in the range of 0.18 mm to 0.51 mm and a width in the range of 0.9 mm to 5.1 mm and having a ratio of width to thickness in the range of 3 to 9, said flat steel wires being disposed at an angle in the range of 30° to 45° with respect to the mid-circumferential centerplane of the tire; and

(c) a third belt ply disposed radially outwardly of the second belt ply and comprising side by side steel cables, said steel cables being oriented at an angle of between 15° and 25° with respect to the mid-circumferential centerplane of the tire, the first and third belt plies both extending axially outwardly of the second belt ply on both sides of the mid-circumferential centerplane of the tire.

4,733,709

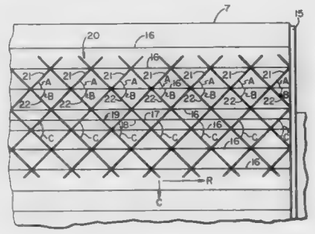
RADIAL TIRE WITH A REINFORCED BUTT SPLICE CARCASS PLY AND METHOD OF MAKING

Bruce D. Lambillotte, Akron, and Jimmie L. Scott, Stow, both of Ohio, assignors to General Tire, Inc., Akron, Ohio

Filed Jul. 25, 1986, Ser. No. 889,559

Int. Cl.⁴ B29D *30/20*; **B60C** *9/09*

U.S. Cl. 152—548 **11 Claims**



1. A radial tire, comprising:

(a) a carcass ply with opposing ends which are in abutting relation, the carcass ply reinforced with radially oriented parallel cords;

(b) a reinforcement strip disposed in juxtaposed relation over the abutting opposing ends of the carcass ply, the strip having two sets of strands of polymeric material in cross-hatched relation, the strands of each set being parallel and the strands of the two sets being oppositely disposed relative to adjacent reinforcement cords of the carcass ply and at angles (A, B) thereto of substantially 45°, so that the strands pantograph in response to radial or circumferential forces exerted on the tire.

4,733,710

VEHICULAR SHADE

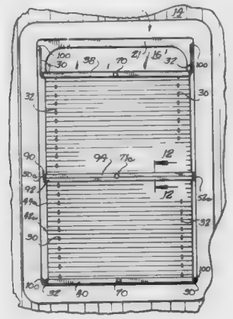
Richard K. Haines, 2317 W. Lexington Ave., Elkhart, Ind. 46515

Filed Oct. 9, 1985, Ser. No. 785,800

Int. Cl.⁴ E06B *3/94*

U.S. Cl. 160—84.1 **17 Claims**

1. A window shade construction for a window having a generally rectangular window frame, said shade construction comprising: a pair of flexible cords running from top to bottom of said window and attached adjacent respective top and bottom ends of said window frame; substantial portions of said cords being locatable in a parallel and spaced apart condition adjacent and parallel to opposite lateral sides of said frame; a shade structure comprising a header movable toward and away from either of said ends of the frame, and a pleated shade member having one end coupled to said header; cord receiving means for mounting said shade member to said pair of cords generally at opposite sides thereof for relative slideable movement so as to be expandable and collapsible in accordion-like fashion relative to said cords; and mounting means coupled to said header for mounting said header for slideable movement along said cords and for directing said cords through said header and into said relative slideable engagement with said pleated shade member; said mounting means including engaging means for maintaining sufficient frictional engagement of said header with said cords for permitting said header to be set at a desired orientation along said cords relative to said window and for holding of said header in said desired orientation and against unintended movement relative to said cords in response to vibration or the like; wherein said cord receiving means for mounting said pleated shade members to said cords comprises a plurality of aligned through apertures in respective segments of said pleated shade member and adjacent each of opposite lateral edges thereof; and further including a second header connected to an end of said shade member opposite from said first-mentioned header; wherein each of said headers comprises an elongate, hollow, open-ended member, and wherein said mounting means comprises an end cap affixed to either end of each of said headers, each said end cap having a through aperture for receiving one of said cords therethrough to thereby direct exposed portions of said cords along and closely adjacent to respective sidewalls of said window frame for attachment adjacent top and bottom corners thereof to substantially avoid accidental snagging of or other contact with the cords; wherein said engaging means further includes a pair of second through apertures formed in a surface of each of said headers which faces said pleated shade member, each of



said second through apertures being aligned with the respective through apertures at one side of said pleated shade member for directing said cord from one of said end caps to said pleated shade through apertures and thereby defining said frictional engagement between said header and said cords as said cords extend interiorly of said header from each said end cap to each said second through aperture therein; and wherein said engaging means are further defined by said cords being respectively disposed extending through said hollow interior of each header and directed from each of said end caps thereof to the through aperture adjacent the opposite end of each said header to thereby further enhance said frictional engagement between each said header and each of said cords; and wherein said pleated shade member includes a first, upper section and a second, lower section; said construction further including at least one intermediate header slideably engaged with said cords intermediate said first and second mentioned headers and engaging respective facing end portions of the first and second pleated shade member sections; each of said pleated shade member sections thereby being respectively extendable and collapsible in response to corresponding movement of one or more of said headers for alternately covering or exposing any desired portion of said window, up to and including substantially the entire window.

4,733,711

FOLDING BLIND, COMPOSITE FOLDING BLIND AND COUPLING STRIP THEREFORE

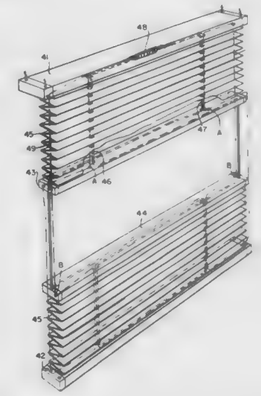
Siegfried Schön, 3, Kwadestraat, 4871 NH Etten-Leur, Netherlands

Filed Sep. 12, 1986, Ser. No. 906,391

Claims priority, application Netherlands, Sep. 20, 1985, 8502591

Int. Cl.⁴ E06B *3/94*

U.S. Cl. 160—84.1 **17 Claims**



1. A folding blind comprising first and second main beams disposed in generally parallel relation, the two main beams being fixed relative to each other to define a space of fixed area therebetween, first intermediate beam means and second intermediate beam means, the two intermediate beam means being disposed between the main beams in generally parallel relation to each other and to the main beams, cord means tensioned between said main beams in slidable, frictional engagement with said first and second intermediate beam means for guiding said intermediate beam means between positions of relative displacement therebetween, and pleated panel means responsive to positioning of said intermediate beam means for defining at least one blinding space of variable area within said space of fixed area.

4,733,712

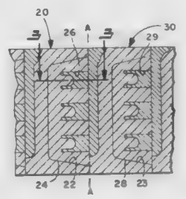
METHOD OF CASTING MULTIPLE ARTICLES

Roger L. Koppenhofer, Saginaw, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 25, 1986, Ser. No. 890,197

Int. Cl.⁴ B22C *9/02*, *9/20*

U.S. Cl. 164—16 **10 Claims**



1. A method of casting articles formed of hardenable cast iron:

(a) forming a plurality of green sand molds each with a front and back vertical face;

(b) forming a recess in the front face of one of said molds;

(c) chemically bonding sand and forming a mold piece insert

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having a plurality of precision mold cavities therein and disposing said mold piece insert in said mold recess with said cavities open to said front face;

(d) forming a down-runner in the back face of another of said sand molds and disposing said molds in front-to-back parting line arrangement and partially overlapping each of said mold cavities with said runner;

(e) pouring molten hardenable cast iron into said down runner and filling said cavities; and,

(f) cooling and solidifying said molten hardenable cast iron and crumbling said sand molds about said mold piece insert and removing said cast articles from said mold piece insert.

4,733,713

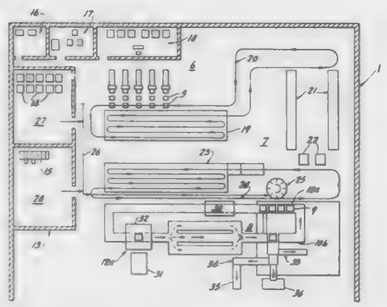
PLASTIC PATTERN CASTING SYSTEM AND METHOD OF CASTING

Peter G. Kohler, Kohler, Wis., assignor to Kohler General Corporation, Sheboygan Falls, Wis.

Filed May 3, 1985, Ser. No. 730,300

Int. Cl.⁴ B22C *9/04, 25/00*; B22D *47/02*

U.S. Cl. 164—18 **6 Claims**



1. The method of casting different parts comprising, continuously operating a casting line with a casting container adapted to receive and individually support each of said cast parts, on-line forming and processing one-time patterns for direct on-line forming of one-time patterns for introduction into said casting line, pre-forming of one-time patterns for said parts, inventorying a plurality of selected ones of said preformed one-time patterns, and interposing of said inventoried preformed one-time patterns with said on-line formed patterns for continuous production of parts including different parts on a priority demand basis without interruption of operation of the casting line.

2. A casting system comprising, a pattern forming station adapted to form a plurality of individual destructible patterns of a part from a plastic material, an assembly station for interconnecting of said individual destructible patterns to a runner and sprue to form pattern clusters, a series of flasks each adapted to receive at least one cluster, means for filling of each flask with sand to totally embed the pattern cluster with said sprue exposed, means for introducing molten metal into said sprue, said patterns being totally destroyed by and replaced by said molten metal to form a duplicate part of said pattern, a casting line for sequentially transferring said flasks through said means to fill each flask with sand and said means to introduce molten metal into said sprue, an inventory unit including a plurality of different plastic destructible patterns corresponding to finished parts, and means for selectively introducing said destructible patterns from said pattern forming station and from said inventory unit to provide a continuous production of different pattern duplicate parts on said casting line.

4,733,714

METHOD OF AND APPARATUS FOR CASTING

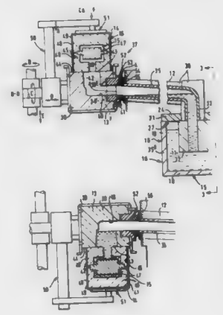
Robert A. Smith, Newbury, United Kingdom, assignor to Cosworth Research & Development Limited, Worcester, United Kingdom

Continuation of Ser. No. 16,218, Feb. 19, 1987. This application Feb. 24, 1987, Ser. No. 17,703

Claims priority, application United Kingdom, Feb. 21, 1986, 8604386

Int. Cl.⁴ B22D *23/00*

U.S. Cl. 164—130 **31 Claims**



1. A method of making a casting comprising the steps of, at a casting station, feeding molten metal from a primary source of molten metal into a mould cavity through an ingate below the top of the mould cavity, placing the cavity out of feeding relationship with the primary source comprising causing relative movement between the cavity and the primary source to change the orientation of the cavity relative to the direction of gravity to prevent flow of molten metal from the cavity towards the primary source and to permit of flow of metal from a secondary source to the cavity, the cavity being continuously connected to the primary source during said change of orientation, and separating the cavity from the primary source, maintaining the primary source at the casting station, transferring the mould cavity to a cooling station spaced from the casting station and, at the cooling station, permitting molten metal to flow to the cavity from the secondary source whilst the metal in the cavity solidifies.

10. An apparatus for making a casting comprising a primary source for molten metal, a mould having a mould cavity, feed means to feed molten metal, in use, from the primary source into the mould cavity through an ingate below the top of the mould cavity, when the mould is at a casting station, means for placing the mould cavity out of feeding relationship with the primary source comprising means to cause relative movement between the cavity and the primary source to change the orientation of the mould cavity relative to the direction of gravity to prevent flow of molten metal from the cavity towards the primary source and to permit of flow of metal from a secondary source to the cavity, means continuously to connect the cavity with the primary source during said change of orientation, means to separate the cavity from the primary source, means to maintain the primary source at the casting station and means to transfer the mould cavity to a cooling station spaced from the casting station whereat molten metal may flow to the cavity from the secondary source whilst the metal in the cavity solidifies.

4,733,715

CEMENTED CARBIDE SLEEVE FOR CASTING APPARATUS

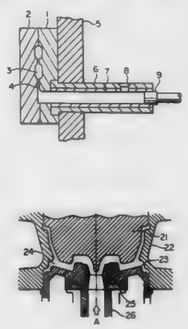
Masayuki Matsuzaki, Chiba, and Tomihachi Kumehara, Kumagaya, both of Japan, assignors to Hitachi Carbide Tools, Ltd., Narita, Japan

Filed Mar. 19, 1987, Ser. No. 28,102

Claims priority, application Japan, Mar. 20, 1986, 61-40616[U]; Mar. 6, 1987, 62-52634

Int. Cl.⁴ B22D *17/10, 18/04*

U.S. Cl. 164—306 **6 Claims**



1. A sleeve assembled in a casting apparatus through which a molten metal is fed into a die cavity, wherein at least that part of said sleeve on which said molten metal impinges or flows fast under high pressure is made of cemented carbide consisting essentially of a hardening phase of tungsten carbide or tungsten carbide with at least part thereof being substituted by at least one carbide of an element selected from the Groups IV, V and VI of the Periodic Table, and 10–20 weight % based on said cemented carbide of a binder phase comprising cobalt, nickel, and chromium, a ratio by weight of chromium to said binder phase being 0.1–0.2.

4,733,716

BUSHING IN CONTINUOUS CASTING DIP FORMING APPARATUS

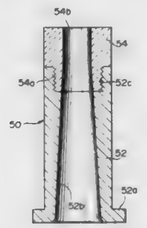
Haruo Tominaga, Sakura; Teruyuji Takayama, Chiba, and Tetsuo Yamaguchi, Yokohama, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Continuation of Ser. No. 736,617, May 21, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 921,870

Claims priority, application Japan, May 30, 1984, 59-110126; Jun. 11, 1984, 59-86244[U]

Int. Cl.⁴ B22D *11/00*

U.S. Cl. 164—418 **3 Claims**



1. An apparatus for continuously forming a cast rod comprising:

(a) a crucible for holding a molten metal therein and having a bottom wall defining the bottom surface of the crucible;

(b) a tubular bushing mounted in the bottom wall of said crucible; and

(c) means for passing a core wire into and through said crucible through said bushing, thereby accreting said molten metal on said core wire, so that the accreted molten metal is solidified to form a clad around said core wire to form a cast rod, said bushing having a head portion for engaging with the core wire passing therethrough, said head portion having an internal bore therethrough for passing said core wire therethrough, a peripheral surface defining said internal bore being adapted for sliding contact with said core wire, and said head portion having one end disposed at the bottom surface of the crucible in contact with molten metal therein and said head portion is the only part of said bushing positioned so as to be able to come into contact with the molten metal, further said head portion being made of ceramic material containing a major proportion of at least one selected from the group consisting of zirconia, silicon carbide and silicon nitride, whereby the bushing is not corroded by the molten metal, wherein said bushing comprises a tubular body and a tubular engaging member threadably connected to one end of said tubular body in coaxial relation thereto, said engaging member serving as said head portion and being made of said ceramic material, said tubular body having an internal bore coaxial with the bore of said engaging member and smoothly continuous therewith.

4,733,717

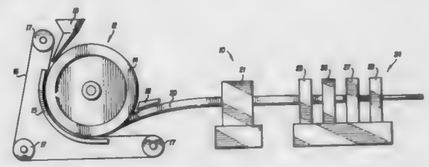
METHOD OF AND APPARATUS FOR CASTING AND HOT-FORMING COPPER METAL AND THE COPPER PRODUCT FORMED THEREBY

E. Henry Chiu; Robert H. Ogletree, and Frank M. Powers, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Feb. 24, 1986, Ser. No. 831,865

Int. Cl.⁴ B22D *11/06*; B21B *1/46, 13/22*

U.S. Cl. 164—476 **9 Claims**



1. In a method of continuously casting and hot-forming copper containing as much as from about 20 ppm to about 200 ppm impurities wherein the copper is cast into a cast copper bar in a mold, extracted from the mold and hot-formed at a hot-forming temperature by a plurality of sequential compressions, the improvement comprising the steps of:

cooling the cast copper bar while in the casting mold to a first temeprature below which the bar is hot-formed whereby the cast copper bar is solidified into a sound casting;

extracting the sound casting from the casting mold;

preheating the sound casting to a second temperature higher than the first temperature and prior to said hot-forming step; and

hot-forming the preheated sound casting into a hot-formed copper product with no or substantially no cracking of the bar.

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4,733,718

HEAT EXCHANGER BODIES MADE OF PLASTIC

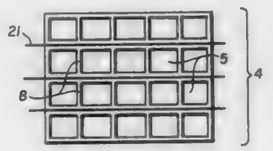
Hartmut Schikowsky, Darmstadt; Heinz Gross, Muehltal; Herbert Helm, Weiterstadt; Klaus E. Poehlmann, Darmstadt; Karl-Heinrich Schanz, Muehltal, and Heinz Vetter, Rossdorf, all of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,530

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 8419977[U]; Oct. 4, 1984, 8429157[U]

Int. Cl.[4] F28D *17/00*

U.S. Cl. 165—4 6 Claims



1. A heat accumulator body for a regenerator, said heat accumulator body being made of plastic and comprising a stack composed of a plurality of extruded hollow chamber panels with plane smooth outer walls and webs that join the outer walls into a single piece, said plurality of hollow chamber panels lying on one another with their outer walls in surface contact, said plurality of hollow chamber panels being joined in the area of their front sides with adjacent hollow chamber panels in the stack and not being joined in at least a part of the in-between area, said plurality of hollow chamber panels being heat welded to one another in the area of the front sides.

4,733,719

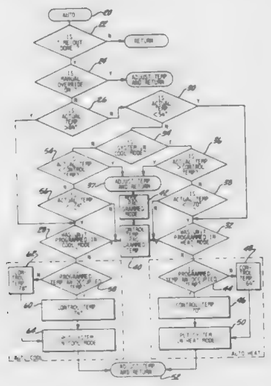
ELECTRONIC THERMOSTAT WITH A STORED PROGRAM OF DESIRED TEMPERATURES AND PREDETERMINED MAXIMUM AND MINIMUM TEMPERATURES

Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 602,221, Apr. 19, 1984, Pat. No. 4,635,208. This application Sep. 19, 1986, Ser. No. 909,769

Int. Cl.[4] F23N *5/20*

U.S. Cl. 165—12 14 Claims



1. A thermostat for use in a building having a heating means and a cooling means, the thermostat operable in a heating mode to generate an energizing signal for the heating means and operable in a cooling mode to generate an energizing signal for the cooling means, the thermostat comprising:

means for measuring the ambient temperature within the building;

programming means for selectively storing either a program of temperatures for the building over a repetitive time cycle in a heating mode or a program of temperatures for the building over a repetitive time cycle in a cooling mode;

a clock for generating signals representative of the present time;

means connected to said means for selectively storing a program of temperatures and said clock for generating a programmed temperature signal for the present time;

means connected to said programming means for initially setting a control temperature equal to the programmed temperature and setting a mode to the programmed mode upon storing a program of temperatures;

means for comparing the ambient temperature with the control temperature;

means operable only in said heating mode for generating an energizing signal for said heating means if said actual temperature is less than said control temperature;

means operable only in said heating mode if said actual temperature is greater than a first predetermined temperature for entering said cooling mode and setting said control temperature equal to said programmed temperature if programmed in said cooling mode and for entering said cooling mode and setting said control temperature equal to a first temperature having a predetermined relationship to said programmed temperature if programmed in said heating mode;

means operable only in said cooling mode for generating an energizing signal for said cooling means if said actual temperature is greater than said control temperature; and

means operable only in said cooling mode if said actual temperature is less than a second predetermined temperature, said second predetermined temperature being less than said first predetermined temperature, for entering said heating mode and setting said control temperature equal to said programmed temperature if programmed in said heating mode and for entering said heating mode and setting said control temperature to a second temperature having a predetermined relationship to said programmed temperature if programmed in said cooling mode.

4,733,720

WATER COOLING MEANS FOR INSERTABLE COMPONENT PARTS GROUPS IN DEVICES OF POWER ELECTRONICS

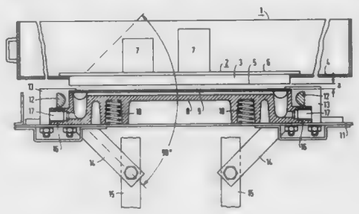
Gustav Havranek, Purkersdorf, and Helmut Rumpler, Sieding, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 2, 1987, Ser. No. 9,500

Claims priority, application Austria, Feb. 28, 1986, 518/86

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—80.4 5 Claims



1. In a water cooling means for insertable component parts groups in devices of heat generating power electronics wherein water is used as a coolant to remove excess generated heat, the water being separated from the electronics parts by a metallic carrier element, the improvement comprising:

fashioning a carrier element independently from a cooling member;

said cooling member being water permeated and being mounted on resilient elements to be urged into thermal transfer contact with said carrier element;

said cooling member and said carrier element having heat transmission surfaces precisely matable with one another; and

said cooling member being displaceable by a device acting thereon opposite to a force of said resilient elements, thereby permitting said cooling member to be selectively spaced from said carrier element.

4,733,721

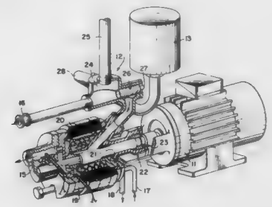
APPARATUS AND METHOD FOR HEATING A FLUID

Tadeusz Piotrowski, St. Maur, France, and Rene Rothen, Aire, Switzerland, assignors to Euroburner Establishment, Vaduz, Liechtenstein

Filed Sep. 19, 1984, Ser. No. 652,117

Int. Cl.[4] F28D *11/02*

U.S. Cl. 165—89 21 Claims



1. An apparatus for supplying a heated fluid to a heat consumption circuit, wherein said apparatus comprises:

(a) a heat exchanger means for heating said fluid;

(b) means for pumping said heated fluid to said heat consumption circuit, wherein said pump means is integral with said heat exchanger means and forms a single integral assembly therewith; and

(c) a reservoir for storing said fluid, wherein said reservoir is mounted on said assembly and is adapted to supply said fluid to said heat exchanger means and said pumping means, wherein said assembly comprises:

(i) a rotatable drum for circulating said fluid within said assembly;

(ii) a heating wall for heating said fluid;

(iii) a cylindrical housing, encasing said heat exchanger means and said pump means, wherein said cylindrical housing comprises an exterior circular crown having electrical resistance elements therein for heating said heating wall; and

(iv) cooling means, inside said cylindrical housing for selectively cooling said fluid.

4,733,722

SHELL- AND TUBE-TYPE HEAT EXCHANGERS AND THEIR PRODUCTION

Murray K. Forbes; Robert Harwood, both of West Midlands, and Stephen H. Carter, Peterborough, all of England, assignors to Serck Industries Limited, Birmingham, England

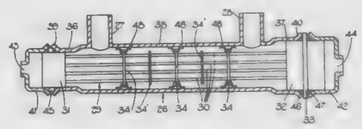
Division of Ser. No. 442,766, Nov. 18, 1982, abandoned. This application May 19, 1986, Ser. No. 865,175

Claims priority, application United Kingdom, Nov. 20, 1981, 8134972

Int. Cl.[4] F28F *9/22, 9/06*

U.S. Cl. 165—159 9 Claims

1. A heat exchanger comprising a hollow casing through which a first fluid is passed, and a tubestack received within the casing and including a plurality of tube elements through which a second fluid is passed for heat exchange with said first fluid, the tubestack also including at least one baffle, extending transversely to the tube elements and a flexible annular member provided around the whole periphery of said at least one baffle, the flexible annular member having a base portion defining an annular groove which embraces an outer edge part of said baffle and which sealingly engages in a fluid-tight manner



said outer edge part of the baffle and a pair of circumferentially continuous arm portions which extend in opposite axial directions from the base portion and which, in use, resiliently sealingly engage in a fluid-tight manner an internal surface of the hollow casing, a free end of each arm portion being curved radially inwardly of the baffle, such that the engagement of the arm portions with the casing internal surface further enhances the sealing engagement between the annular groove and the baffle edge part.

4,733,723

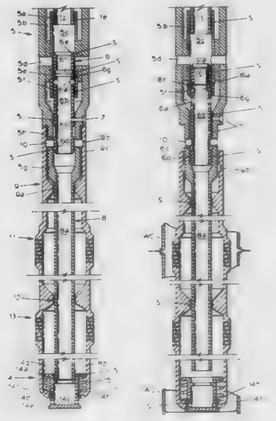
GRAVEL PACK ASSEMBLY

Stephen R. Callegari, Sr., 419 Orangewood Dr., Lafayette, La. 70503

Continuation of Ser. No. 886,731, Jul. 18, 1986, abandoned. This application Jul. 10, 1987, Ser. No. 71,983

Int. Cl.[4] E21B *43/04, 34/06, 34/12*

U.S. Cl. 166—51 21 Claims



1. Apparatus for use on the lower end of a pipe string suspended in a well, release a gravel screen assembly, treat and gravel pack a well, the apparatus comprising:

(a) a circulation control valve assembly with means to secure to the upwardly continuing pipe string and lower attachment means to secure to a packer;

(b) a packer secured to the lower end of said circulation control valve assembly;

(c) a crossover/release assembly secured to the lower end of said packer, having means to releasably secure to a gravel screen assembly;

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(d) a gravel screen assembly releasably secured to said crossover/release assembly;
(e) first valve means, open until actuated to close, situated at the lower end of said gravel screen assembly;
(f) first fluid communication means, extending from said pipe string to and through said first valve means, arranged to be closed by an object delivered down the bore of said pipe string to said crossover/release assembly;
(g) second fluid communication means, closed until actuated to open, extending from the well bore outside and circulation control valve assembly to an opening inside said said gravel screen assembly after release of said gravel screen assembly;
(h) third fluid communication means, closed until actuated to open, extending from the bore of said pipe string to the well through an opening in the side of said crossover/-release assembly;
(i) actuator means situated in said crossover/release assembly, responsive to closure of said first communication means and fluid pressure in the bore of said pipe string, to release said gravel screen assembly from said crossover/-release assembly and to open said first and said second fluid communication means in a single actuation;
(j) second valve means situtated in said circulation control valve assembly, arranged to close said second fluid communication means in response to one direction of axial movement of said pipe string relative to said packer and to open said second fluid communication means in response to axial movement of said pipe string, in the opposite direction, relative to said packer.

4,733,724

VISCOUS OIL RECOVERY METHOD

Ricardo L. Cardenas, Houston, and Robert B. Alston, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 30, 1986, Ser. No. 947,933
Int. Cl.[4] E21B *43/24, 47/06*
U.S. Cl. 166—252 **18 Claims**

1. In a steam stimulation method for recovering petroleum from a subterranean, viscous petroleum containing formation having some water filled flow channels and very low gas saturation, penetrated by at least one injection well, said formation having low stem injectivity, the improvement for preconditioning the formation to increase the receptivity of the formation to steam which comprises:
(a) introducing a predetermined quantity of a gaseous phase treating fluid heated to a temperature above the temerature at which the treating fluid would condense at formation conditions, into the formation via the injection well, said treating fluid comprising a mixture of at least one non-condensable gas which is insoluble in formation petroleum and at least one non-condensable gas which is soluble in the formation petroleum, at a pressure equal to 50 to 95% of the fracture pressure of the formation which produces a treating fluid injection rate which accomplishes displacement of water from the water saturated flow channels of the formation;
(b) leaving the injected treating fluid in the formation flow channels from which water was displaced for a period of time sufficient to allow absorption of the oil soluble gas from the treating fluid into the petroleum, which causes reduction in the petroleum viscosity; and
(c) thereafter injecting steam into the formation via the injection well; and
(d) recovering petroleum from the formation.

4,733,725

SINGLE WELL TEST FOR EVALUATING CO_2 INJECTION

Kenneth R. Pittaway; J. Scott Moore, and James C. Albright, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 7, 1986, Ser. No. 882,990
Int. Cl.[4] E21B *49/00*
U.S. Cl. 166—252 **15 Claims**

11. A process for obtaining data useful to evaluate the effectiveness of or to design an enhanced recovery process, the recovery process involving mobilizing and moving hydrocarbons through a hydrocarbon bearing subterranean formation from an injection well to a production well by injecting a fluid comprising CO_2 into the injection well, said process comprising sequentially steps of:
(a) determining an initial hydrocarbon saturation in a volume in the formation near a well bore penetrating the formation;
(b) injecting sufficient of the fluid comprising CO_2 into the well bore to mobilize and move hydrocarbons from said volume in the formation;
(c) injecting relatively fresh water into said well bore and dissolving substantially all residual CO_2 remaining in said volume in said volume in said formation;
(d) injecting sufficient water having a sufficient salinity for good log response into the well bore to displace substantially all of said relatively fresh water of step (c) from said volume in the formation; and
(e) logging the well bore to determine a final water saturation and a final hydrocarbon plus water saturation in said volume in the formation.

4,733,726

METHOD OF IMPROVING THE AREAL SWEEP EFFICIENCY OF A STEAM FLOOD OIL RECOVERY PROCESS

Bassem R. Alameddine, Carrollton, and Lloyd G. Jones, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 27, 1987, Ser. No. 30,791
Int. Cl.[4] E21B *43/24, 43/26*
U.S. Cl. 166—263 **12 Claims**

7. A method for recovering oil from a subterranean, oil-containing formation underlying an overburden that creates a vertical overburden pressure on said formation, said oil-containing formation penetrated by an injection well and production well, the method comprising:
(a) injecting steam into the formation via the injection well and recovering fluids including oil from the formation via the production well until steam breakthrough occurs at the production well;
(b) throttling fluid flow from said production well and continuing injection of said steam without interrupting the injection rate until the bottomhole injection pressure is greater than the true vertical pressure created by the overburden thereby causing the formation to fracture horizontally; and
(c) continuing to inject steam into the injection well at a low rate and recovering oil from the production well until the amount of oil recovered is unfavorable.

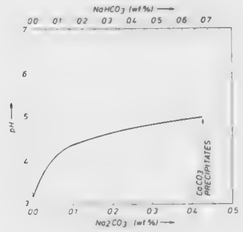
4,733,727

OIL RECOVERY WITH WATER CONTAINING CARBONATE SALT, CO_2, AND SURFACTANT

Andrew H. Falls, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 7, 1986, Ser. No. 928,212
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **9 Claims**

1. In an oil recovery process in which CO_2, aqueous liquid and a preferentially water-soluble, anionic surfactant are injected into a subterranean reservoir to displace oil toward a production location at an injection pressure and rate of fluid production such that the CO_2 is pressurized to at least more than the fluid pressure in the reservoir, an improvement for reducing the extent to which the surfactant is absorbed on the reservoir rocks, comprising:



including within the aqueous phase of said injected fluid an amount of monovalent cationic carbonic acid salt which is effective for increasing the pH of the solution at the conditions within the reservoir to an extent which reduces the level of the adsorption of the surfactant.

4,733,728

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Odawara; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 798,786
Claims priority, application Japan, Dec. 6, 1984, 59-256450
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

1. A micellar slug for use in the recovery of oil, consisting essentially of a surfactant and an aqueous medium, which may contain an inorganic salt, said surfactant contaqining, as essential constituents,
(a) at least one internal olefin sulfonate having 10 to 26 carbon atoms; and
(b) 0.1 to 100 parts by weight, based on 100 parts by weight of said internal olefin sulfonatae, of at least one ether sulfonate having the general formula:

$$R^1\text{-}O\text{-}(R^2O)_m\text{-}(R^3O)_n\text{-}R^4\text{-}SO_3X \quad (I)$$

wherein R^1 represents an alkyl or alkenyl phenyl group having 12 to 26 carbon atoms or an alkyl or alkenyl group having 10 to 24 carbon atoms, R^2 represents C_2H_4 or C_3H_6, R^3 represents C_2H_4 or C_3H_6, R^4 represent C_2H_4, C_3H_6, or $CH_2CH(OH)CH_2$, $n>0$, $m>0$, and $n+m=0$ to 15, and X represents an alkali metal or an alkaline earth metal;
said micellar slug containing no lower alcohol as a cosurfactant.

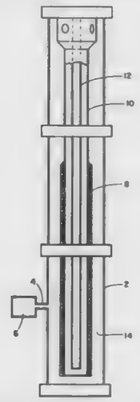
4,733,729

MATCHED PARTICLE/LIQUID DENSITY WELL PACKING TECHNIQUE

Claude T. Copeland, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 905,355, Sep. 8, 1986, abandoned. This application Feb. 4, 1987, Ser. No. 11,392
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—276 **25 Claims**

1. A method of packing a well, a portion of which penetrates an earth formation at an angle to the vertical, comprising:
(a) injecting into the wellbore a slurry of particles in a liquid, the slurry having a particle density to liquid density ratio of no greater than about 2 to 1, and the particles having a coating of adhesive; and
(b) straining the particles out of the slurry so as to produce a packed mass of the particles adjacent the formation,



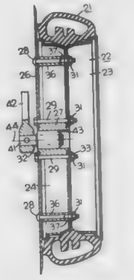
which packed mass will allow flow of fluids between the formation and wellbore, while substantially preventing particulate material from the formation passing therethrough and into the wellbore.

4,733,730

PLANTER GAUGE WHEEL

David L. Murray, Lee's Summit, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Jun. 5, 1986, Ser. No. 870,982
Int. Cl.[4] A01B *29/06, 35/28*
U.S. Cl. 172—519 **6 Claims**



1. A combined gauge wheel and slicing disc for agricultural equipment comprising:
a wheel rim,
a disc coaxially secured to said wheel rim for rotation therewith and having an earth penetrating portion extending radially outward of said rim, said disc being closely adjacent to one lateral edge of said wheel rim and
a zero pressure pneumatic tire mounted on said rim including
a flexible tread wall and
a flexible sidewall having
an axially extending annular projection coaxial with said rim,
an axial facing annular sealing surface on said annular projection, said annular sealing surface being spaced radially outward from said rim a distance greater than

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the radial width of said annular sealing surface and said annular projection extending axially from said sidewall a distance less the radial thickness of said sidewall, said annular sealing surface being in sealing engagement with said disc, the radially outer edge of said sealing surface lying radially inward in relation to the circumference of said tread wall and said sealing surface being on the part of said sidewall which tends to bulge axially outward the greatest as said tread wall flexes during engagement with the earth during operation of said equipment, whereby said outer edge remains in sealing engagement with said disc during such operation.

4,733,731

AIR-OPERATED REVERSIBLE PERCUSSIVE ACTION MACHINE

Khaim B. Tkach, ulitsa Frunze, 67, kv. 272; Alexandr D. Kostylev, ulitsa Derzhavina, 19, kv. 70; Konstantin K. Tupitsyn, ulitsa Frunze, 57a, kv. 115, all of Novosibirsk; Mikhail J. Bondar, ulitsa Zhukovskogo, 23a, kv. 4, Odessa; Vladimir I. Tarasenko, ulitsa Gaidara, 22, kv. 26, Odessa, and Igor I. Reznikov, Proletarsky bulvar, 14, kv. 23, Odessa, all of U.S.S.R.

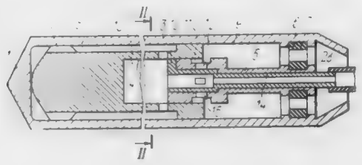
PCT No. PCT/SU85/00049, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO86/00357, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 20, 1985, Ser. No. 844,177

Claims priority, application U.S.S.R., Jun. 20, 1984, 3790258

Int. Cl.⁴ B25D *9/00*

U.S. Cl. 173—91 **3 Claims**



1. An air-operated reversible percussive action machine predominantly for making holes in the ground, comprising:

a housing having front and rear portions;

a reciprocating hammer positioned in the housing and provided with a cavity and a first port through which the cavity communicates with a chamber of the housing;

a stepped tube secured to the rear portion of the housing and having an interior, the stepped tube having a larger diameter step with a second port and an end face at a free end of said tube, the larger diameter step being positioned in the cavity of the hammer so as to alternately close the first port of the hammer and provide communication with the second port;

a sleeve positioned within the interior of the tube, the sleeve having a third port communicable with a compressed air line, the sleeve being capable of turning relative to the tube to assume one of two positions, in one of which the second port of the tube is closed, and in the other position, the second port of the tube communicates with the compressed air line through the third port;

at least one first projection in the form of a sector of a circle formed on the end face of the larger diameter step;

at least one radial projection arranged on a respective end of the sleeve so as to abut against a side wall of said at least one first projection of the tube when the sleeve is rotated, whereby said sleeve-assumes one of said two positions;

at least one additional annular elongated projection provided about the circumference on the end face of the larger diameter step and spaced from the at least one first projection; and

the at least one first projection having a length greater than the length of the at least one additional projection, wherein the sleeve is capable of moving relative to the tube in an axial direction thereof for a distance greater than the length of the at least one additional projection and less than the length of the at least one first projection.

4,733,732

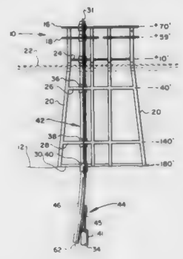
SUBMUDLINE DRIVEPIPE WHIPSTOCK METHOD AND APPARATUS

Samuel C. Lynch, Houston, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 761,733, Aug. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 565,680, Dec. 27, 1983, abandoned. This application Jul. 13, 1987, Ser. No. 72,951

Int. Cl.⁴ E21B *7/136, 7/06, 7/20*

U.S. Cl. 175—9 **11 Claims**



1. A method of installing a replacement well conductor from a fixed structure above a body of water to replace an abandoned well conductor previously installed from said structure along a predetermined path through said body of water so as to penetrate the substratum below the floor of said body of water comprising the steps of:

(a) severing said abandoned conductor at a predetermined depth below the floor of said body of water, said depth being such that the upper end of said abandoned conductor will yield under lateral pressure;

(b) retrieving the portion of said abandoned conductor extending above said depth;

(c) positioning means in fixed engagement with the upper end of the remaining portion of said abandoned conductor for deflecting the path of said replacement conductor; and

(d) directing said replacement conductor along said predetermined path through said body of water until interaction with said deflecting means causes said replacement conductor to advance into the substratum in the direction of said deflected path so as to bypass said abandoned conductor and also causes the application of lateral pressure to the end of said abandoned conductor sufficient to cause the end of said abandoned conductor to shift position.

4,733,733

METHOD OF CONTROLLING THE DIRECTION OF A DRILL BIT IN A BOREHOLE

William B. Bradley, and John E. Fontenot, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Feb. 11, 1986, Ser. No. 828,392

Int. Cl.⁴ E21B *7/04*

U.S. Cl. 175—45 **10 Claims**

1. A method for controlling directional drilling of a bit on the lower end of a drill string, comprising the steps of:

measuring bending moments in two orthogonal planes on a portion of said drill string closely adjacent said bit;

measuring the inclination and orientation headings of said bit during said bending moment measurements;

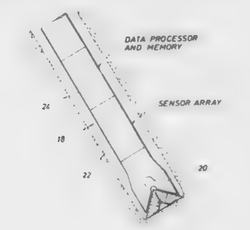
measuring the penetration rate of said bit into a rock formation;

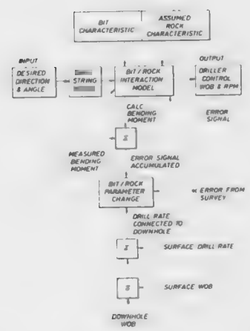
developing a bit-rock directional well interaction model and comparing said measured moments and headings with said model in a downhole microprocessor to derive error signals; and

controlling said bit direction in response to said error signals.

6. A system for controlling directional drilling of a bit on the lower end of a drill string, comprising:

means to measure the magnitude and direction of bending moments in two orthogonal planes on a portion of said drill string in close proximity to said bit;





means to measure the inclination and orientation headings of said bit during said bending moment measurements;

means to measure the penetration rate of said bit into a rock formation;

means to develop a bit-rock directional well interaction model and compare said measured moments and headings with said model to develop an error signal; and

means responsive to said error signal to control the direction of said bit.

4,733,734

METHOD AND IMPROVEMENT TO DRILLING TOOLS COMPRISING WATER PASSAGES PROVIDING GREAT EFFICIENCY IN CLEANING THE CUTTING FACE

Christian Bardin, Bois Colombes, and Henri Cholet, Le Pecq, both of France, assignors to Institut Francais du Petrole, France

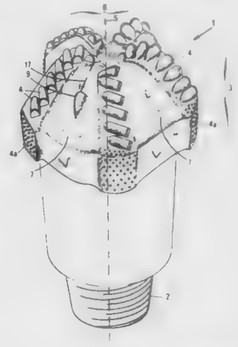
Filed Jun. 27, 1985, Ser. No. 749,285

Claims priority, application France, Jul. 27, 1984, 84 10127

Int. Cl.⁴ E21B *10/18*

U.S. Cl. 175—65 **10 Claims**

1. A method for improving the scavaging of cuttings from a drill tool rotating, in operation, about an axis of the tool, said tool comprising a body having a first end adapted for connection to rotary drive means and having a second end providing a cutting face, said second end having water passages, a zone of said second end surrounding said axis forming the central part of the tool, said tool comprising at least one nozzle wherein said nozzle is positioned in and in fluid communication with a water passage for producing a flow oriented towards the central part of the tool, the vector of the speed of flow obtained by the orthogonal projection on a plane perpendicular to the axis of the tool in the central part of the tool being different from zero at any point on said central part, said vector forming an effective speed vector.



4,733,735

ROTARY DRILL BITS

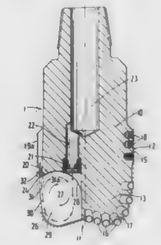
John D. Barr, Cheltenham; John M. Fuller, Penzance, and Malcolm R. Taylor, Gloucester, all of England, assignors to NL Petroleum Products Limited, Gloucestershire, England

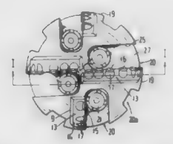
Filed Sep. 29, 1986, Ser. No. 913,101

Claims priority, application United Kingdom, Oct. 1, 1986, 8524146

Int. Cl.⁴ E21B *10/60*

U.S. Cl. 175—393 **28 Claims**



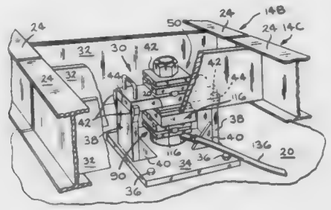


1. A rotary drill bit comprising a bit body providing a leading face, a gauge region, and an annulus on the side of the gauge region remote from the leading face, a number of blades on the leading face, each blade having an outer surface which, in use, faces the surface of the formation being drilled and a front surface facing in the direction of normal forward rotation of the bit, a number of cutting elements mounted along each blade, a delivery passage in the bit body for supplying drilling fluid to a number of openings in the leading face of the bit, and

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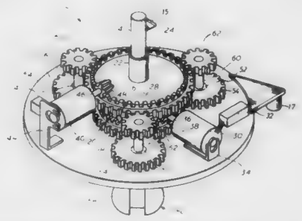
at least one exit passage for returning said drilling fluid past the gauge region to the annulus, at least one of the aforesaid openings being located in a region adjacent the front surface of a blade which region is bounded, when the bit is in use, partly by a surface portion of the bit body and partly by a surface portion of the formation being drilled, at least part of said surface portion of the bit body which defines the aforesaid region being smoothly and concavely curved and the cutting elements being so disposed that said surface portion of the formation being drilled is also concavely curved, whereby said region is enclosed by a continuous periphery without re-entrant portions, the opening being so oriented with respect to the said surface portions as to promote a vortex flow of drilling fluid around said region, with part of the periphery of the vortex extending across the cutting elements on the blade, said exit passage being so located that fluid may escape from the periphery of the vortex into said exit passage and thence to said annulus.

4,733,736
LOAD CELL ASSEMBLY
Mark S. Holtgreven, and Leonard T. Holtgreven, both of Findlay, Ohio, assignors to Holtgreven Scale and Electronics Corporation, Findlay, Ohio
Filed Aug. 3, 1987, Ser. No. 80,770
Int. Cl.[4] G01G *21/24, 3/14*
U.S. Cl. 177—255 **19 Claims**



1. A load cell assembly for weighing, calibrating and similar applications comprising, in combination,
- a first alignment assembly having a first top member, a first intermediate member and a first bottom member, first pivot means disposed between said top member and said first intermediate member for permitting pivoting motion between said just recited members generally about a first axis, and second pivot means disposed between said first intermediate member and said first bottom member for permitting pivoting motion between said just recited members generally about a second axis normal to said first axis;
- a second alignment assembly having a second top member, a second intermediate member and a second bottom member, third pivot means disposed between said second top member and said second intermediate member for permitting pivoting motion between said just recited members generally about a third axis and fourth pivot means disposed between said second intermediate member and said second bottom member for permitting pivoting motion between said just recited members generally about a fourth axis normal to said third axis, and
- a load cell extending from said first top member to said second bottom member.

4,733,737
DRIVABLE STEERABLE PLATFORM FOR INDUSTRIAL, DOMESTIC, ENTERTAINMENT AND LIKE USES
Reza Falamak, P.O. Box 770188, Houston, Tex. 77215
Filed Aug. 29, 1985, Ser. No. 770,729
Int. Cl.[4] B62D *57/00*
U.S. Cl. 180—7.1 **10 Claims**

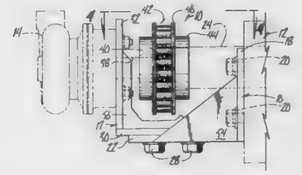


5. A drivable, steerable platform comprising:
- a frame member disposed essentially in a frame member plane;
- a first shaft rotatably mounted on said frame member and essentially normal to said frame member plane;
- a first drive gear attached to said first shaft and disposed essentially parallel to said first member plane;
- a second shaft rotatably and concentrically mounted relative to said first shaft;
- a second drive gear attached to said second shaft and disposed essentially parallel to said frame member plane;
- each of said first and second drive gears comprising fixedly attached drive teeth and fixedly attached control teeth;
- a first driving mechanism in meshed relation with the drive teeth of said first drive gear and operable to drive said first drive gear;
- a second driving mechanism in meshed relation with the drive teeth of said second drive gear and operable to drive said second drive gear; and
- at least three wheel assemblies which each include a wheel steering control shaft in rotatably relation to and extending normally downward from said frame member, a wheel drive control shaft rotatably and concentrically mounted relative to said wheel steering control shaft, a steering control gear co-rotatably attached to said wheel steering control shaft and in meshed relation with the control teeth of one of said drive gears, a drive control gear attached in co-rotatable relation to the wheel drive control shaft and in meshed relation with the control teeth of the other said drive gear, a wheel axle, means for coupling said wheel steering control shaft to said wheel axle, means for coupling said wheel drive control shaft to said wheel axle, and at least one wheel mounted on said wheel axle.

4,733,738
TRACTOR SPRAY PUMP SUPPORT
Neil Rowe, Rte. #1, Box 104, Garwin, Iowa 50632
Filed Oct. 14, 1986, Ser. No. 918,311
Int. Cl.[4] B60D *1/08*
U.S. Cl. 180—53.1 **9 Claims**

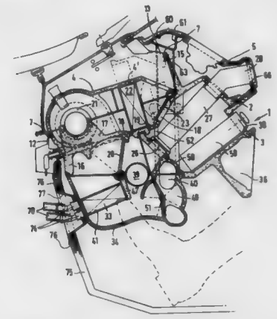
1. A tractor spray pump support comprising,
- a tractor having a PTO shaft extending rearwardly from the tractor frame,
- a pump support bracket extending below said PTO shaft and connected to said tractor frame, said bracket extending beyond the outer end of said PTO shaft and providing a pump support,
- a spray pump mounted on said pump support and having a forwardly extending shaft,
- a coupling means interconnecting said PTO and pump shaft, and

said pump support bracket including two L-shaped members having overlapping horizontally extending legs and oppositely disposed upstanding legs, the upstanding leg of one



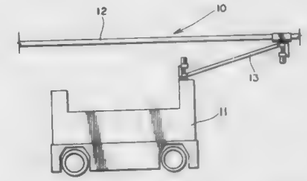
of said members being secured to said tractor frame, and the upstanding leg of said other L-shaped member being connected to and supporting said spray pump.

4,733,739
MOTOR VEHICLE SCUTTLE-DASH INSTUMENT PANEL COMPONENT OF PLASTICS MATERIAL HAVING AN INTEGRATED VENTILATING AND HEATING UNIT
Siegfried Lorenz, Fechen; Erich Altdorf, Cologne, and Hans Vogt, Overath, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 2, 1985, Ser. No. 803,746
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447185
Int. Cl.[4] B62D *25/14*; B60K *37/00*
U.S. Cl. 180—90 **23 Claims**



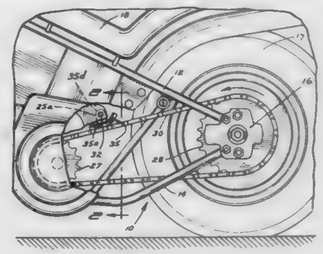
1. A motor vehicle instrument panel of plastics material having an integrated ventilating and heating unit, comprising:
- a first part extending between inner walls of a bodywork of a motor vehicle, having integrally formed hollows and walls adapted to receive components of the ventilating and heating unit;
- a second part extending between said inner walls and having hollows and walls corresponding in shape and location to the hollows and walls of the first part;
- components of the ventilating and heating unit received by said hollows and walls of said first part and said second part; and
- a covering component which engages at least one of said first part and said second part and covers a component of the ventilating and heating unit therein;
- both the first part and the second part having a peripheral surface in a substantially horizontal junction plane and being securely adhesively joined to one another at such peripheral surface and thereby together forming a substantially box-shaped transverse support member fixedly attached to said inner walls of the bodywork structure by means of lateral flanges approximately in said junction plane, each of which lateral flanges is received in an approximately horizontal guide channel in a corresponding one of said inner walls, certain space within said guide channels not being filled by said flanges and being filled with adhesive to form a positive connection between said flanges and said inner walls, the transverse support member cooperating with the bodywork structure as a structural member.

4,733,740
AUTOMATED GUIDED VEHICLE SYSTEM
Michael F. Bigowsky, Girard, and James P. Freed, Uniontown, both of Ohio, assignors to Custom Technologies, Inc., Beloit, Ohio
Filed May 6, 1986, Ser. No. 860,106
Int. Cl.[4] B62D *1/26*
U.S. Cl. 180—168 **12 Claims**



1. A system for determining the location of a vehicle comprising a track system, an arm of a fixed length connected at one end of the vehicle and at the other end to said track system and being movable longitudinally along said track system, means to determine the longitudinal position of said other end of said arm along said track system, means to determine the longitudinal and lateral position of the vehicle with respect to the other end of said arm, and means to determine the angular orientation of the vehicle with respect to the longitudinal direction of said track system, thereby longitudinally, laterally and angularly locating the vehicle.

4,733,741
WEAR PLATE FOR A MOTORCYCLE
Daniel L. Swanson, 7415 Edgebrook Dr., St. Louis Park, Minn. 55426
Filed Sep. 2, 1986, Ser. No. 902,573
Int. Cl.[4] B62K *11/02*
U.S. Cl. 180—219 **2 Claims**



1. In combination with a motorcycle motor housing and a drive chain, a device to protect the motor housing from wear by the chain, comprising
- a plate member upwardly bent at its longitudinally rearward end, and a wear resistant member attached along the bottom of said plate member,
- an ear upstanding from a side edge portion of said plate member,

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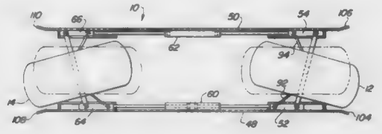
means for mounting said ear to the motor housing such that said wear resistant member is positioned above said chain and below said motor housing so that said wear resistant member prevents upward movement of a portion of said chain to protect the motor housing without thereby tensioning said chain.

4,733,742

TWO-WHEELED STEERABLE VEHICLE

Norman V. Frye, R.R. #5, Box #60, Davenport, Iowa 52806

Filed Apr. 20, 1987, Ser. No. 40,392
Int. Cl.[4] B60K *17/358;* **B62D** *61/02*
U.S. Cl. 180—223 **7 Claims**



1. In a ground vehicle having a fore-and-aft body including transversely spaced apart, right and left, fore-and-aft supports, steerable wheel structure, comprising: right and left transversely spaced apart carriers disposed closely adjacent the right and left supports, respectively; right and left means mounting the right and left carriers respectively on the supports for selective fore-and-aft movement of the carriers relative to the supports and relative to each other; right and left transversely coaxial shafts extending respectively from outer ends adjacent to the respective carriers toward each other to respective inner ends proximate to each other; right and left means respectively connecting the shaft outer ends to the carriers for fore-and-aft movement with the respective carriers and including articulate connections of the outer ends to the respective carriers for enabling fore-and-aft swinging of the shafts relative to the respective carriers; a sleeve coaxially received by the shafts and spanning the shaft inner ends; means interconnecting the sleeve and shafts for rotation of said sleeve and said shafts in unison while enabling relative axial movement of the shafts with respect to the sleeve as the shaft inner ends move axially toward and away from each other in response to fore-and-aft movement of either or both the carriers; a wheel coaxially journaled on the sleeve; means operative between the wheel and sleeve to hold the wheel against axial shifting relative to the sleeve; and link means articulately interconnecting one of said left and right carriers to the proximate portion of the sleeve for controlling the axial position of the sleeve and wheel means as either or both of the carriers move fore and aft.

4,733,743

DRIVING ARRANGEMENT FOR A TRACK-ADJUSTABLE MOTOR VEHICLE BEARING AXLE HAVING SELECTIVELY DRIVABLE WHEELS

Heinz Weiss, Bensheim, and Herbert Gelb, Hockenheim, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Dec. 12, 1986, Ser. No. 941,248
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543871
Int. Cl.[4] B60K *17/30*
U.S. Cl. 180—255 **12 Claims**

1. A driving arrangement for at least one wheel mounted on a bearing axle of a vehicle body, comprising:

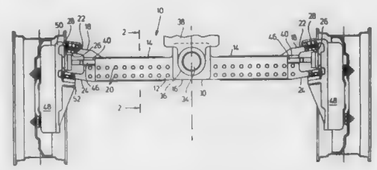
a driving means;

a bearing axle having a housing for said driving means, a bridge integrally formed with said housing and pivotally mounted to the vehicle body, and a pair of half-axles, said half-axles being axially adjustably attachable to said bridge in a plurality of positions;

a swivel housing swivellably mounted at each end of said bearing axle;

a wheel rotatably supported by each said swivel housing;

gearing means disposed substantially within each asid swivel housing and drivably connected to the corresponding wheel;



rotatable telescopic input shafts for drivably coupling the driving means to each of the gearing means; and

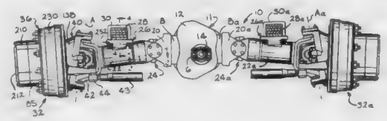
a clutch disposed substantially within each said swivel housing and selectively engaging and disengaging the corresponding input shaft and gearing means depending upon a degree and direction of relative rotation between said input shaft and said wheel.

4,733,744

STEERABLE DRIVING AXLE

Jack G. Glaze, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 2, 1986, Ser. No. 904,020
Int. Cl.[4] B60G *19/06;* **B62D** *7/06*
U.S. Cl. 180—256 **17 Claims**



1. A steerable driving axle assembly for use with a wheeled vehicle comprising:

a differential assembly adapted to be attached to a vehicle frame member, said differential assembly having an input shaft adapted to be connected to a source of motive power and having a pair of output shafts;

a pair of axle drive shafts, each of said axle drive shafts defining a rotating axis and having an inner end coupled to a separate one of said output shafts by a separate universal joint assembly;

a pair of axle tubes, each of said axle tubes surrounding a separate one of said axle drive shafts and defining a longitudinal axis generally coaxial with said rotating axis of said axle drive shaft;

means for attaching an inner end of each of said axle tubes to said differential assembly for pivotal movement of said axle tube relative to said differential assembly solely about a generally horizontal axis perpendicular to and intersecting said lognitudinal axis of said axle tube, said attaching means further including means for preventing rotation of said axle tube relative to said differential assembly about said longitudinal axis of said axle tube;

a pair of wheel assemblies, each of said wheel assemblies including a rotatable wheel member and a mounting portion for rotatably supporting said wheel member;

each of said axle drive shafts having an outer end coupled to drive a separate one of said wheel members by a separate universal joint assembly;

each of said axle tubes having an outer end pivotally coupled to said mounting portion of said wheel assembly by a king pin mounting arrangement to enable pivotal movement of said mounting portion relative to said axle tube solely about a king pin axis and to prevent rotation of said mounting portion relative to said axle tube about said longitudinal axis of said axle tube, whereby each of said axle tubes provides a single connecting link between said differential assembly and a respective one of said mounting portions which permits pivotal movement of said mounting portion relative to said differential assembly about said horizontal axis and said king pin axis but prevents rotation of said mounting portion relative to said differential assembly about said longitudinal axis of said axle tube;

steering means coupled to each of said mounting portions of said wheel assemblies for controlling the movement of said wheel assemblies about said king pin axes; and

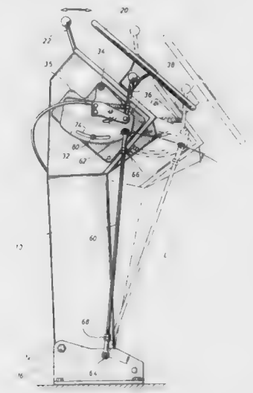
spring means for resiliently supporting each of said axle tubes relative to a vehicle frame member.

4,733,745

ADJUSTABLE CONTROL ATTACHMENT FOR AN EARTH MOVING VEHICLE

George T. Lumpkins, Katy, Tex., assignor to Machinery Distribution, Inc., Houston, Tex.

Filed May 14, 1986, Ser. No. 862,955
Int. Cl.[4] B60K *29/00*
U.S. Cl. 180—315 **9 Claims**



6. An adjustable control attachment for an earth moving vehicle having hydralic control valves and having a control console pivotally connected to a vehicle support bracket for forward and backward movement and supporting a steering wheel comprising,

said console being a rigid member pivotally connected to the support bracket,

first and second pivot plates, and one of the plates pivotally attached to each side of the control console,

a control lever shaft fixedly connected to and movable with each pivot plate,

a plurality of control levers pivotally mounted on each shaft,

a push-pull type flexible control cable connected to each control lever and adapted to be connected to one of the hydraulic control valves,

a cable supporting bracket fixedly connected to each of the pivot plates and positioned parallel to said lever shaft and connected to and supporting the control cables,

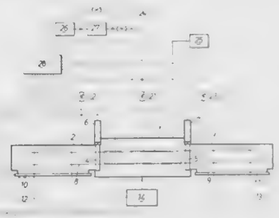
a control actuating rod pivotally connected between the vehicle support bracket and each of the pivot plates for rotating the pivot plates and said control levers when the control console is pivoted relative to the support bracket.

4,733,746

VACUUM TREATING METHOD AND APPARATUS

Hiroyoshi Nozaki, Sayama; Hiroo Ebisawa, Iruma, and Hirofumi Hara, Hino, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,934
Claims priority, application Japan, Jun. 17, 1985, 60-131528; Jun. 17, 1985, 60-131529
Int. Cl.[4] B05C *11/00;* **C23C** *14/00;* **B01J** *19/08, 19/12*
U.S. Cl. 118—50.1 **4 Claims**



1. A vacuum treating apparatus, comprising:

a vacuum treating chamber;

a pair of preliminary vacuum chambers capable of charging and discharging materials to be treated and being arranged on both sides, respectively, of the vacuum treating chamber;

a pair of shutters disposed between the vacuum treating chamber and both the preliminary vacuum chambers so as to switch communication and disconnection between the vacuum treating chamber and both the preliminary vacuum chambers;

a pair of transfer means disposed between both the preliminary vacuum chambers and the vacuum treating chamber so as to alternately move the materials to be treated from one and then the other of said preliminary vacuum chambers into the vacuum treating chamber;

a suction means connected in common to the vacuum treating chamber and both the preliminary vacuum chamber through switching valves; and

control means for controlling operations of said shutters, transfer means, suction means and switching valves; said control means having functions of controlling said shutters, transfer means, suction means and switching valves such that when the material to be treated is under vacuum treatment within the vacuum treating chamber, one of the preliminary vacuum chambers which waits in a vacant state for the material under treatment is reduced in pressure to a level lower than a degree of vacuum required for vacuum treatment whereas the other preliminary vacuum chamber which receives a new material to be treated is reduced its pressure from atmospheric pressure, and after termination of the vacuum treatment, the vacuum treating chamber and both the preliminary vacuum chambers are brought into communication with each other for conducting shifting of materials to be treated therebetween.

4,733,747

SYSTEM AND METHOD FOR ELIMINATING WAVE FORM DISTORTION IN MULTI-UNIT SEISMIC SOURCE PROSPECTING

Michael D. McCormack, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 863,480, May 15, 1986. This application Aug. 17, 1987, Ser. No. 85,820
Int. Cl.[4] G01V *1/00*
U.S. Cl. 181—107 **9 Claims**

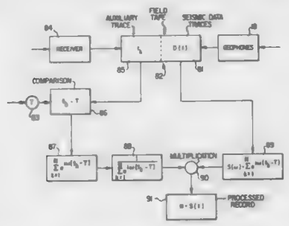
1. A system for removing wave form distortion from a composite seismic record generated by an array of seismic sources simultaneously fired by means of a common signal and adapted

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to initiate acoustic pulses of substantially equivalent wave form in a medium, wherein such distortion is caused by lack of simultaneity in the time of initiation of such pulses, the system comprising:

(a) means respectively responsive to such pulse initiation by each of such sources for generating a series of signals representative thereof;

(b) means for recording such pulse initiation signals;



(c) means for comparing the time of occurrence of each of such signals with a preselected reference time having a fixed relation to the time of occurrence of the common firing signal so as to obtain a corresponding number of time difference values:

(d) means for utilizing such time difference values to construct an inverse operator in the frequency domain of the form:

$$\frac{1}{\sum_{k=1}^{N} e^{i\omega(t_k - T)}}$$

where

ω=frequency

T=a reference time occuring a fixed interval after the receipt of a common firing signal

t_k=the measured pulse initiation time of the k-th source unit

N=number of source units;

(e) means for determining the Fourier transform of the composite seismic record;

(f) means for multiplying the inverse operator with such Fourier transform to form a resultant product; and

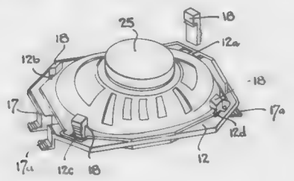
(g) means for determining the inverse Fourier transform of the resultant product so as to produce a corrected composite seismic record.

4,733,748

LOUDSPEAKER MOUNTING DEVICE FOR CAR RADIO

Pasco C. Ponticelli, Jr., 7455 Owensmouth Ave., Canoga Park, Calif. 91303

Filed Mar. 6, 1987, Ser. No. 22,773
Int. Cl.[4] H05K *5/00;* **H04R** *7/22*
U.S. Cl. 181—141 **5 Claims**



1. A mounting system for use in mounting a loudspeaker having a rim on a wall of a vehicle comprising:

a loudspeaker mounting frame having a plurality of similar slots formed at predetermined positions around the periphery thereof,

each of said slots having a beveled tooth member therein,

a plurality of L-shaped brackets each of said brackets having a longitudinal arm with transverse serrations formed therein and a transverse arm,

each of said L-shaped brackets being pressed into a separate one of said slots with the serrations thereof ratcheting past the beveled tooth members to a position whereat the transverse arms of the brackets are in firm retentive engagement against the rim of the loudspeaker,

hinged stop members formed in said slots adjacent to the tooth members, said stop members being adapted to be bent to permit the L-shaped brackets to be moved sideways opposite the stop members and removed from the slots,

U-shaped lugs mounted in opposing relationship on said vehicle wall,

first and second pairs of leg portions extending outwardly from opposite ends of said frame, each of said leg portions having a transversely serrated surface, and

a second pair of brackets, each of said second pair of brackets having a flat upstanding wall portion, a pair of similar flat arms extending normally from said wall portion, the surfaces of said arms having transverse serrations formed therein, said arms being separated from each other in opposing relationship and a post extending from said wall portion between said arms,

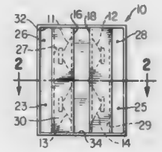
the posts of said brackets being adapted to fit snugly under the U-shaped lugs with the serrated surfaces of the arms of said second pair of brackets in mating engagement with the serrations on corresponding leg poritons of said frame, thereby retaining the frame on the vehicle wall.

4,733,749

HIGH OUTPUT LOUDSPEAKER FOR LOW FREQUENCY REPRODUCTION

Raymond J. Newman, and David E. Carlson, both of Niles, Mich., assignors to Electro-Voice, Inc., Buchanan, Mich.

Filed Feb. 26, 1986, Ser. No. 834,403
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—144 **15 Claims**



1. A loudspeaker system comprising:

a speaker enclosure having an opening in a front wall,

a speaker manifold mounted within said enclosure and communicating with said opening,

said manifold comprising a pair of substantially parallel side walls, a back wall, and top and bottom walls, defining a manifold chamber, the wall opposite said back wall being substantially open to define a manifold opening and to permit said communicating, said manifold opening being substantially in alignment with said front wall opening, and

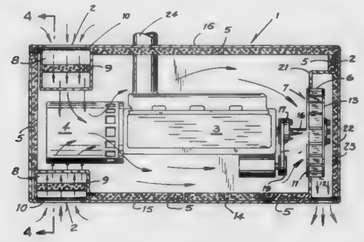
a pair of speaker units, each mounted in a respective one of said side walls, said speaker units being connected to produce sound waves in phase, said speaker units also having axial sound directions substantially in alignment within said manifold chamber, whereby the sound outputs from said units combine and produce improved low-frequency response in the combined sound exiting from said enclosure opening.

4,733,750

ACOUSTIC ENCLOSURE FOR MARINE ENGINE GENERATOR SET

Randall J. Poirier; Scott J. Haugstad, both of Sheboygan, and Martin W. Heinrich, Cedar Grove, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Feb. 11, 1987, Ser. No. 13,488
Int. Cl.[4] F01N *1/10;* **H02K** *5/24*
U.S. Cl. 181—202 **4 Claims**



1. An enclosure for an engine generator set comprising:

means for absorbing sound inside the enclosure;

a cooling air inlet formed in a wall of the enclosure for admitting external air into the enclosure;

a cooling air outlet formed in a wall of the enclosure for expelling air from the interior of the enclosure;

fan means for drawing cooling air into the inlet through the enclosure and exhausting the air through the outlet, said fan means including:

a radial discharge propeller cage having an axial and which is positioned over the cooling air outlet and extends outside of the enclosure, said propeller cage being substantially radially coextensive with the cooling air outlet so as to make the cooling air outlet as large as the propeller cage and close off the outlet with the propeller cage; and

a plate fixed to the axial end of the propeller cage outside of the enclosure, said plate being radially continuous for at least the extent of the fan so that it is at least substantially as large as the cooling air outlet;

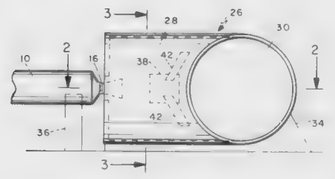
wherein the plate covers the cooling air outlet to reflect sounds coming from the enclosure through the cooling air outlet back through the outlet and back into the enclosure to be absorbed by the sound absorbing means inside the enclosure.

4,733,751

ROCKET EXHAUST DISRUPTER

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 27, 1985, Ser. No. 814,138
Int. Cl.[4] B64F *1/26*
U.S. Cl. 181—217 **8 Claims**



1. An apparatus for disrupting a supersonic exhaust gas plume emanating from a rocket motor nozzle, comprising:

a disrupter body having a central through bore with a longitudinal axis, the central through bore having an inlet opening at one axial end and an outlet at the opposite axial end;

a support structure for supporting the disrupter body spaced from a rocket motor nozzle with the longitudinal axis of the central through bore substantially in alignment with a central longitudinal axis of the rocket motor nozzle;

the inlet opening of the central bore being positioned closest to the rocket motor nozzle, the inlet opening having an area less than the cross-sectional area of an exhaust gas plume ejected from the rocket motor nozzle at the inlet opening;

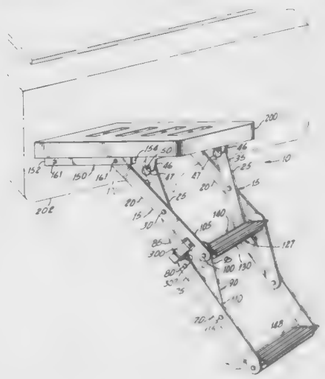
the disrupter body being shaped for directing exhaust flow both through the central bore and around the disrupter body and for causing an exhaust gas shock wave normal to the central longitudinal axis of the rocket motor nozzle and spaced between the rocket motor nozzle and said disrupter body.

4,733,752

EXTENSIBLE LADDER FOR BOATS

Robert Z. Sklar, 11321 SW. 49th Pl., Davie, Fla. 33330

Filed Jul. 14, 1987, Ser. No. 73,108
Int. Cl.[4] B60R *3/02*
U.S. Cl. 182—86 **19 Claims**



1. In a swim/dive platform having top and bottom surfaces and a ladder secured to a surface of said platform, the improvement wherein said ladder comprises at least one pair of opposed linkages, each of said pair of linkages including at least first and second elongated link elements, the first link element including first and second end portions and the second link element including third and fourth end portions, and a first pivotal means mounting said link elements for movement relative to each other, said first pivotal means disposed substantially midway of the length of the first element, at least a first support pivotally interconnecting said second end portions of each of the first of said pair of opposed linkages for maintaining said linkages in spaced apart relationship, translatable and slidable means secured to said first end portions of each of the first of said link elements, each of said second link element and the bottom of said platform including coacting means for pivotally securing said ladder to said platform, said platform and said ladder being so constructed for stowage of said ladder in the contracted position on the bottom surface of said platform.

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4,733,753

LUBRICATOR WITH CHANNEL WHICH COMMUNICATES RESERVOIR WITH OIL DROP HOLE

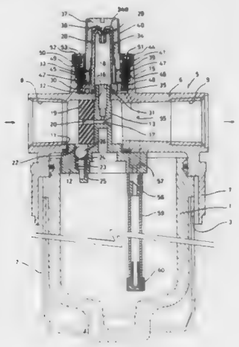
Kouichi Miyake, Kani, Japan, assignor to CKD Kabushiki Kaisha, Aichi, Japan

Filed Jan. 16, 1987, Ser. No. 3,938

Claims priority, application Japan, Jan. 24, 1986, 61-9471[U]; Feb. 24, 1986, 61-25316[U]

Int. Cl.[4] F16N 7/34

U.S. Cl. 184—55.1 1 Claim



1. A lubricator comprising:

an oil cup opened upwardly;

a cover through which an air conduit including an orifice extends substantially in a horizontal direction and which is received on upper side of said oil cup;

a supply hole formed in upper side of said cover and extending to said orifice;

a transparent oil drop cylinder including a drop hole extending through an upper side thereof and mounted on said cover so as to overlay said supply hole;

a transparent adjusting cap adapted to be fit around said oil drop cylinder and integrally provided with a needle valve downwardly projecting from a center of the upper side in alignment with said drop hole, said cap being adjustable axially of said oil drop cylinder in order to control an aperture of said drop hole; and

an air-tight channel adapted to communicate an oil reservoir within said oil cup with said drop hole through a space defined between an upper surface of said oil drop cylinder and said adjusting cap;

wherein a pressure differential produced between a pressure acting upon the oil surface within said oil cup and a pressure within said orifice provides a suction effect under which a quantity of oil within said oil cup flows through said channel to said space defined between an upper surface of said oil drop cylinder, then drops through said drop hole into said oil drop cylinder and is finally atomized through said supply hole into the air stream flowing through said orifice.

4,733,754

DRIVE-IN SERVICE ESTABLISHMENT

Richard Acosta, 6214 Madeleine, San Antonio, Tex. 78229

Filed May 3, 1985, Ser. No. 730,675

Int. Cl.[4] E04H 3/04

U.S. Cl. 186—53 2 Claims

1. A service establishment for dispensing food or other commodities to customers in automobiles comprising:

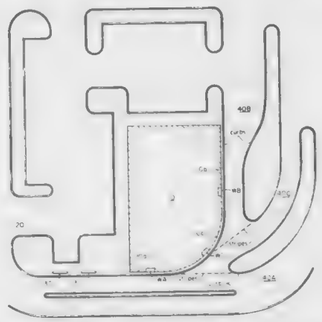
(a) a building having first and second nonparallel walls joined together by a curved wall;

(b) a central dispensing station for dispensing commodities located approximately medial said curved wall;

(c) a first dispensing station located on said first wall;

(d) an automobile ingress lane by which all automobiles can access either said first or central dispensing stations, said ingress lane having a width which will accommodate only a single automobile at a time.

(e) first and central egress lanes, said first egress lane being parallel to said first wall and accessible from said first dispensing station, and said central egress lane being generally tangential, at least initially, to a portion of said curved wall and accessible from at least said central dispensing station, said egress lanes having a width which



will accommodate only a single automobile at a time, said curved wall having an area immediately adjacent thereto at said central dispensing station for accommodating a single automobile to receive commodities from said central dispensing station, said area being disposed out of the path of said first egress lane, whereby, automobiles at either said first or central dispensing stations may egress via their respective egress lanes by proceeding in a substantially straight-forward direction even though an automobile is parked at the other dispensing station, thereby facilitating traffic flow through the service establishment.

4,733,755

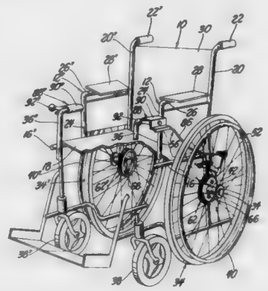
ANTI-ROLLING DEVICE FOR WHEELCHAIR

Donald L. Manning, 4002 Normanwood Dr., Orchard Lake, Mich. 48033

Filed Jun. 22, 1987, Ser. No. 64,661

Int. Cl.[4] B60T 1/06

U.S. Cl. 188—2 F 1 Claim



1. A wheelchair of the type including an occupant supporting frames (12 and 14) having seat (18) and back (30) portions, arm rests (28) extending forwardly from said back portion and disposed above the seat portion, axle shaft means (32—32') secured to and projecting laterally outboard of each side of said frame, a pair of main wheels (34—34'), each wheel including a hub (42—42') having axially spaced spoke flanges (44 and 46—44' and 46'), two sets of spokes (48 and 50—48' and 50') respectively connected at their radially inner ends to said flanges and at their outer ends to a wheel rim (52—52'), each hub respectively rotatably mounted on the outwardly projecting portion of said axle shaft means and a mechanism (56 and 88—56' and 88') for selectively locking said wheels against undesired rearward rotation, the improvement in said mechanism comprising:

A. ratchet gear members (62 and 62') concentrically disposed about said axle shaft means intermediate said frame and the axially inner hub flanges (44 and 44');

B. plate members (58 and 58') concentrically disposed about the wheel hubs intermediate the hub flanges (44—44'); each plate member (58—58') includes radial slot (60—60') which enables the plate to be concentrically mounted on the wheel hub;

C. fastener means (66–68') for securing the plate and gear members in clampingly abutting relation with the axially inner hub flanges;

D. pawl elements (74–80 and 74'–80') pivotally mounted on said frames and adapted to engage the ratchet gear members to prevent said wheels from rotating in a rearwardly direction; and

E. means (92, 92', 84, 86, 84' and 86') for selectively retaining said pawl elements out of engagement with said ratchet gear elements to allow rearward rotation of said wheels.

4,733,756

BRAKE ADJUSTERS

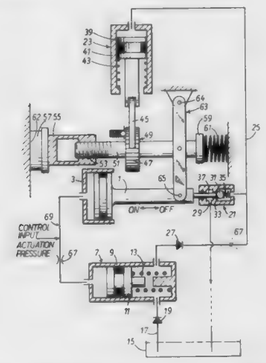
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries, Birmingham, England

Filed Aug. 8, 1986, Ser. No. 894,837

Claims priority, application United Kingdom, Aug. 13, 1985, 8520282

Int. Cl.[4] F16D 55/08, 65/56

U.S. Cl. 188—170 10 Claims



1. A brake actuating and adjuster system comprising a brake actuator member and a pump, means for applying brake actuation pressure to said pump and to said brake actuator member to operate said pump and control the application of a brake, respectively, an adjuster actuator and an adjuster control valve connected to said pump for receiving pressure fluid therefrom upon operation thereof, said adjuster control valve controlling the flow of pressure fluid between exhaust and the connection between said adjuster actuator and said pump, said pressure fluid acting on said control valve to hold it closed, and means responsive to the movement of the brake actuator member to a predetermined release position to open the adjuster control valve against the pressure of said pressure fluid and relieve to exhaust any fluid pressure in the connection between said pump and said adjuster actuator.

4,733,757

BRAKE DEVICE FOR VEHICLES

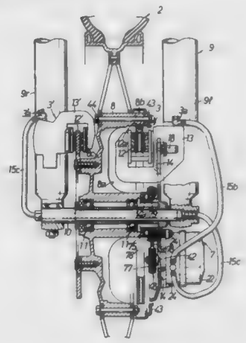
Tsutomu Hayashi, Tokyo; Takeshi Kawaguchi, and Tetsuo Tsuchida, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,390

Claims priority, application Japan, May 26, 1984, 59-106916; Oct. 26, 1984, 59-225396

Int. Cl.[4] B60T 8/02

U.S. Cl. 188—181 A 2 Claims



1. A brake device for vehicles comprising a master cylinder, a disc brake actuated by an output hydraulic pressure from the master cylinder to apply a brake force to a wheel, an antilock control unit incorporating an inertia type wheel angular deceleration sensor driven by said wheel through a transmission device and controlling the output hydraulic pressure of said master cylinder in response to an output from the sensor, wherein said disc brake is housed in an annular recess formed on the wheel and open to one side of said wheel, a brake caliper of said disc brake and said antilock control unit are supported on a fixed panel disposed so as to close an opening of said annular recess, and wherein said transmission device is housed in said annular recess, wherein said wheel has a hub, and said annular recess is provided on the hub, and further comprising an outboard type disc brake disposed on a side of the wheel opposite to said one side at which said annular recess is opened, and wherein said outboard type disc brake has an input port which is connected to an output hydraulic chamber of said antilock control unit through a hydraulic conduit, the hydraulic conduit passing through a hollow portion provided in an axle of said wheel.

4,733,758

TUNABLE ELECTRORHEOLOGICAL FLUID MOUNT

Theodore G. Duclos, Raleigh; Douglas A. Hodgson, and J. David Carlson, both of Cary, all of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Aug. 18, 1986, Ser. No. 897,262

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.[4] B60G 17/10; F16F 15/03; F16M 5/00

U.S. Cl. 188—267 18 Claims

1. A vibration attenuating mount or the like of the fluid inertia type, comprising:

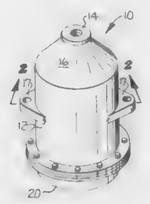
housing means, formed in part of resilient elastomeric material, having a plurality of variable volume fluid chambers and a plurality of flow passageways interconnecting said chambers;

electrorheological fluid means disposed within said cham-

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bers and said passageways for during operation of said mount generating inertia forces effecting abrupt changes in the dynamic stiffness of the mount at certain excitation frequencies;

adjustable means for adjustably varying said frequencies at which said changes occur, said adjustable means including



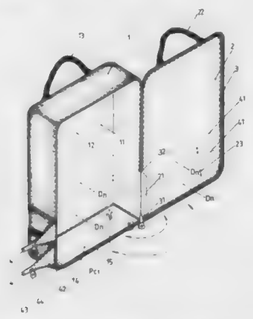
valve means disposed in series with at least one of said passageways for controlling the flow of said fluid therethrough, said valve means having a plurality of parallel flow paths extending therethrough, the combined cross-sectional flow areas of said flow paths being substantially greater than the cross-sectional flow area of said one of said passageways.

4,733,759

EXPANDABLE LUGGAGE CASE

Liu Shih-Chen, No. 133-135, Sec. 5, Chung-Hwa Market, Taipei, Taiwan

Filed Mar. 3, 1987, Ser. No. 21,351
Int. Cl.[4] A45C *7/00*
U.S. Cl. 190—18 A **6 Claims**



1. An adjustable size luggage case comprising:

a substantially rectangular body having end walls, side walls, a top wall extending between the end walls and further extending between the side walls, a lower periphery being defined extending about the saide walls and end walls opposite of the top wall, the said side walls, end walls and top wall defining an interior storage space therebetween;

at least one gusset secured to and extending around the lower periphery, such that a lowermost gusset is provided, each of said gussets having respective side walls and end walls, an upper periphery and a lower, opposite periphery and each of said respective gussets further having a first collapsed position, wherein the gussets further having a first collapsed position, wherein the gusset is closed and a second expanded position, wherein the gusset is opened;

a bottom wall extending between the end walls of the lowermost gusset and further extending between the side walls of the lowermost gusset;

at least the top wall, the bottom wall and at least one of the side walls of the body and the gusset having a single continuous access opening formed therein, so that at least one of the end walls may be pivoted outwardly from the remainder of the body, whereby access to the interior storage space is provided;

an access opening zipper means formed about the access opening for selective opening and closing of the access opening;

a fastener assembly means positioned on each of said gussets, each of said fastener assembly means having a respective slider and a pair of fastener elements including a base end and a distal end;

one of the pair of each fastener elements connected to the upper periphery of each gusset;

the other of the pair of each fastener elements connected to the lower opposite periphery of each gusset;

a bridging flap positioned on each of said gussets, said bridging flap having one end integral with one of the side walls of the said gusset and further having a second opposite end;

a male connector element secured to each respective slider;

a female connector element secured to another of the said end walls of the gusset being separated from the said one of the side walls of the gusset by the access opening to removably receive and secure therein the male connector element, whereby the male and female connector elements are removably secured to each other;

the base end of each of the fastener elements positioned on a respective bridging flap and the distal end of each of the fastener elements disposed on the said another of said end walls of the gussets, said distal ends extending beyond the female connector;

wherein the movement of the slider along the fastener elements selectively fastens the pair of fastener elements of each respective fastener assembly means to the other fastener element of the same pair, moving the gusset into its first collapsed position and further selectively unfastens the one of fastener elements of each respective fastener assembly means from the other fastener element of the same pair, moving the gusset into its second expanded position; and

further wherein, when the male and female connector elements are connected to one another, the bridging flap extends over the access opening, and the second opposite end of the flap is removably secured to the other of said end walls of the respective gusset.

4,733,760

AUTOMOTIVE VEHICLE DRIVE WHEEL SLIPPAGE CONTROL DEVICE DETECTING VEHICLE ROAD SURFACE CONDITION AND MODIFYING WHEEL BRAKING OPERATION ACCORDING THERETO

Takafumi Inagaki; Kazumasa Nakamura, and Hiroharu Miyazaki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 28, 1986, Ser. No. 889,614
Claims priority, application Japan, Aug. 1, 1985, 60-170300
Int. Cl.[4] B60K *41/20*
U.S. Cl. 192—3 R **7 Claims**

1. An automotive vehicle driven wheel slippage control device, comprising:

(a) a means for determining the rotational speed of a driven wheel of said automotive vehicle;

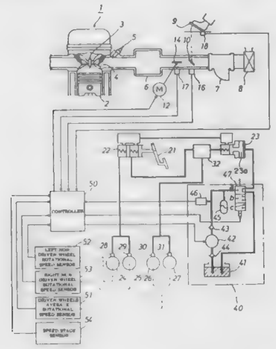
(b) a means for determining the presence of a condition of acceleration slippage by utilizing as a parameter the rotational speed of said driven wheel as determined by said determining means therefor;

(c) a means for determining the value of a parameter representing the condition of the road surface on which said automotive vehicle is being operated;

(d) a means for operating a braking device provided to said driven wheel; and:

(e) a means for controlling said braking device operating

means and for setting braking conditions for said driven vehicle wheel, when acceleration slippage is determined by said determining means therefore, said braking conditions being varied according to the current value of said parameter representing road surface condition.



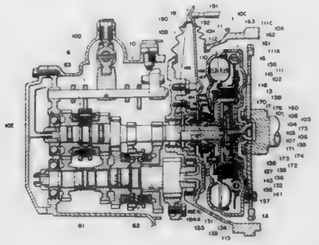
5. An automotive vehicle driven wheel slippage control device according to claim 1, further comprising a means for throttling down the engine of said automotive vehicle during acceleration slippage.

4,733,761

POWER DELIVERY SYSTEM

Shiro Sakakibara, Anjo, Japan, assignor to Aisin-Warner Limited, Japan

Filed Nov. 28, 1984, Ser. No. 675,875
Int. Cl.[4] F16H *45/02*; F16D *13/44*
U.S. Cl. 192—3.25 **12 Claims**



1. A power delivery system comprising:

an input shaft for transmitting the driving force of an engine;

a driven output shaft;

a fluid coupling for transmitting the driving force from said input shaft to said output shaft, said fluid coupling having a fluid coupling casing connected to and rotatably driven by said input shaft, and a turbine member provided in said fluid coupling casing for being driven by fluid responsive to the rotation of said fluid coupling casing;

a power cut-off clutch for selectively coupling said turbine member with said output shaft, said power cut-off clutch being provided in said casing and having a clutch plate connected to said turbine member, said clutch plate being mounted concentrically with and radially inward of said turbine member, and a clutch disk connected to said output shaft;

a servomechanism for selectively coupling said power cut-off clutch, said servomechanism having biasing means fixed to said fluid coupling casing to rotate therewith for biasing said clutch plate into engagement with said clutch disk to transmit driving force from said turbine member to said output shaft;

a first thrust bearing provided between said biasing means and said clutch plate and clutch disk set; and

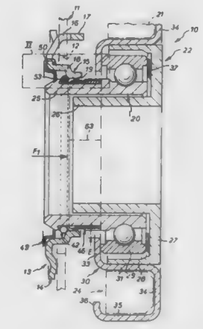
a second thrust bearing provided between said clutch plate and clutch disk set and said fluid coupling casing.

4,733,762

COUPLABLE/DECOUPLABLE CLUTCH RELEASE BEARING ASSEMBLY

Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Oct. 8, 1986, Ser. No. 916,805
Claims priority, application France, Oct. 9, 1985, 85 14934
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 **16 Claims**



1. Clutch release bearing assembly comprising a clutch release bearing including a drive part, and a coupling part adapted to be attached to a clutch release device of a clutch and to couple such a clutch release device to said clutch release bearing, an annular retaining groove on said coupling part, fastening means operative in traction and between said coupling part and said drive part for coupling said coupling and drive parts together in an axial direction away from the clutch release device and towards said clutch release bearing, said fastening means comprising a radially elastically deformable annular coupling member partly engaged in said annular retaining groove, and a substantially transverse drive bearing surface on said drive part, said drive bearing surface being adapted to bear axially against said coupling member in said axial direction, another groove in said drive part, and an annular decoupling member adapted to decouple said clutch release bearing from the clutch release device, said decoupling member being axially movable in said other groove, said other groove having one transverse flank on which is defined said drive bearing surface, said decoupling member having engagement means for releasably coupling said decoupling member to said coupling member in the course of decoupling of said parts to permit movement of said coupling member with said decoupling member in said axial direction, said engagement means comprising at least one radially elastically deformable axial drive tang on said decoupling member having a free end radially outward of the periphery of said decoupling member.

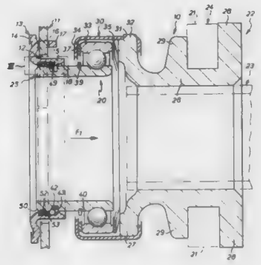
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COUPLABLE/DECOUPLABLE CLUTCH RELEASE BEARING ASSEMBLY

Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Oct. 8, 1986, Ser. No. 916,749
Claims priority, application France, Oct. 9, 1985, 85 14933
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 **27 Claims**



1. Clutch release bearing assembly comprising a clutch release bearing including a drive part, and a coupling part adapted to be attached to a clutch release device of a clutch and to couple such a clutch release device to said clutch release bearing, an annular retaining groove on one of said coupling and drive parts, fastening means operative in traction and between said coupling part and said drive part for coupling said coupling and drive parts together in an axial direction away from the clutch release device and towards said clutch release bearing, said fastening means comprising a radially elastically deformable annular coupling member partly engaged in said annular retaining groove, and a substantially transverse drive bearing surface on the other of said coupling and drive parts, said coupling member being adapted to bear axially against said drive bearing surface, another groove in said other part, and an annular decoupling member adapted to decouple said clutch release bearing from the clutch release device, said decoupling member being axially movable in said other groove, said other groove having one transverse flank on which is defined said drive bearing surface, said decoupling member having an annular decoupling groove releasably couplable with said coupling member in the course of decoupling said coupling and drive parts to permit movement of said decoupling member with said coupling member in said axial direction.

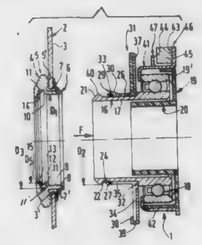
4,733,764

CLUTCH RELEASE BEARING ASSEMBLY

Cecilio Martinez Corral, and Carlos Lopez Perez, both of Madrid, Spain, assignors to Fraymon S.A., Murcia, Spain

Filed Oct. 8, 1986, Ser. No. 916,802
Claims priority, application France, Oct. 9, 1985, 85 14924
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 **10 Claims**

1. A clutch release bearing assembly comprising a coupling part adapted to couple a clutch release bearing to a clutch release device of a clutch, a substantially axial bush attachable to the clutch release device, an engagement bearing surface at an end of said bush, the clutch release bearing including a drive part having an annular groove defined by two flanks, a decoupling part slidably mounted on said drive part, fastening means operative in traction between said coupling part and said drive part for coupling said parts in an axial direction away from the clutch release device toward said clutch release bearing and comprising an annular fastening ring, said fastening ring being disposed around the axis of the assembly and being elastically deformable in a radial direction, said fastening ring being partly engageable with a bearing surface on said coupling part and with a bearing surface on said drive part, said bearing surface on said drive part being formed by one of said two flanks of said groove on said drive part, the other of said two flanks of said groove being movable axially relative to said one flank and forming part of said decoupling part, and a transverse abutment member for said decoupling part on said clutch



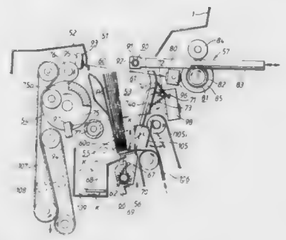
release bearing, said decoupling part having positioning means, said positioning means being radially inwardly elastically deformable and having an outside diameter when unstressed which is greater than the inside diameter of said engagement bearing surface on said bush, and said positioning means being adapted to bear on said engagement bearing surface during assembly so as to urge said decoupling part towards said transverse abutment member.

4,733,765

CASH HANDLING MACHINE FOR HANDLING MIXTURES OF NOTES AND COINS INTRODUCED TOGETHER

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,773
Claims priority, application Japan, Nov. 14, 1985, 60-255286; May 22, 1986, 61-117953
Int. Cl.[4] G07F *7/04*; B07C *5/02*
U.S. Cl. 194—206 **12 Claims**



1. A cash handling machine comprising:
a housing having an aperture;
single cash receiving means for receiving both bank notes and coins inserted in said aperture;
bank note feeding means connected to said single cash receiving means for taking out bank notes from said single cash receiving means and for directing said bank notes;
coin feeding means connected to said single cash receiving means for receiving coins from said single cash receiving means and for directing said coins;
bank note conveying means for conveying bank notes directed by said bank note feeding means;
bank note sorting means for sorting bank notes conveyed by said bank note conveying means according to type of bank notes;

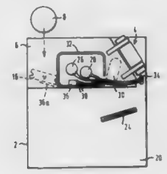
coin conveying means for conveying coins directed by said coin feedings means; and
coin sorting means for sorting coins conveyed by said coin conveying means according to type of coins.

4,733,766

COIN CHECKING APPARATUS

Mark Roberts, Berkshire, and Adrian Lewis, Middlesex, both of England, assignors to Mars, Inc., McLean, Va.

Filed Dec. 4, 1985, Ser. No. 805,114
Claims priority, application United Kingdom, Dec. 5, 1984, 8430700
Int. Cl.[4] G07D *5/00*
U.S. Cl. 194—240 **22 Claims**



1. Apparatus with low average power consumption for checking the validity of coins, comprising:
a coin entry through which coins are inserted into the apparatus;
a coin passageway for receiving coins from the coin entry and for directing coins through the apparatus, said coin passageway having a first portion comprising a coin impact surface which is hit by substantially all coins inserted into the apparatus as they begin to travel along the coin passageway;
electrically powered coin checking circuitry adapted to check the validity of coins as they pass along said coin passageway, said circuitry having a quiescent state and a coin validity checking state;
a vibration transmission means for establishing a vibration transmission path;
a coin arrival sensing means comprising a piezoelectric element for generating an electrical signal in response to vibration, said piezoelectric element mounted in a position isolated from the direct impact of coins, both the piezoelectric element and the coin impact surface being firmly mounted to the vibration transmission means so that when a coin hits the coin impact surface, vibrations resulting from the coin hitting the coin impact surface are transmitted through the vibration transmission means to the piezoelectric element which then produces an electrical signal;
and switching means operable by said electrical signal to power up the electrically powered coin checking circuitry from the quiescent state to the coin validity checking state.

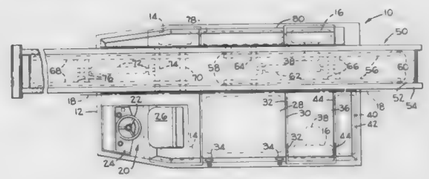
4,733,767

LOW PROFILE AIRCRAFT BELT LOADER

James M. Anderson, Windermere, and William C. Dean, Orange City, both of Fla., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 586,519, Mar. 5, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 869,815
Int. Cl.[4] B65G *41/00*
U.S. Cl. 198—304 **1 Claim**

1. An aircraft belt loader comprising:
a frame having a longitudinal center line;
a steerable wheel on each side of said center line for supporting the front end of said frame;
a drive wheel on each side of said center line for supporting the rear end of said frame;
an electric motor connected to drive each of said drive wheels;
a battery pack connected to power said electric motors and supported on said frame on one side of said center line;
a hydraulic compartment including a hydraulic reservoir, pump and drive motor positioned on the other side of said center line;
said hydraulic compartment, battery pack, electric motors and drive wheels having covers with upper surfaces in substantially the same plane;
said wheels on said other side and said hydraulic compartment being laterally spaced from said battery pack and said wheels on said one side to define a channel depressed relative to said upper surface's and extending the length of said loader;



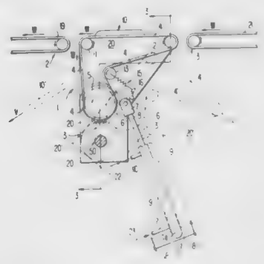
a belt conveyor aligned with and receivable within said channel;
rear link means having a forward end pivotally attached to said vehicle frame and a rearward end pivotally attached to said conveyor;
a rear hydraulic ram pivotally attached to said frame within said channel and to said rear link means;
a front link means having a rear end and a front end, said rear end being pivotally attached to said frame within said channel adjacent the rear link means;
roller means connecting the front end of said front link means to said conveyor; and
a front hydraulic ram pivotally attached to said frame within said channel and to said front link means.

4,733,768

SELECTIVE EJECTION CONVEYORS

Agostino Aquino, 182 Cumberland Ave., Paterson, N.J. 07502, and Nicholas Polifroni, 16 Edgewater Rd., Cliffside Park, N.J. 07010

Continuation-in-part of Ser. No. 772,398, Sep. 4, 1985. This application Dec. 4, 1985, Ser. No. 804,437
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—369 **16 Claims**



1. A diverting device for selectively diverting articles from a conveyor belt path to another location which is below the conveyor belt path, comprising:
a drive means,

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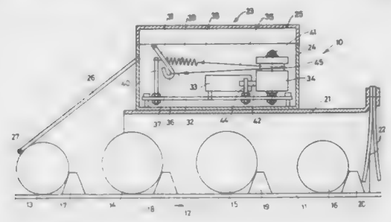
a plurality of support members rotatably connected to said drive means,
a conveying means operatively attached to each support member,
said conveying means including a chain slidably supported along a portion of a path of travel over a support surface and
an actuating means for selectively moving each support member between a first position and a second position,
such that articles are diverted from the conveyor belt path to the other location which is below the conveyor belt path when said support member is in said second position, wherein
said drive means is in driving relationship with a driven member supported by each support member while said support member is in said first position and while said support member is in said second position, and said drive means is in driving engagement with said driven member at all times;
said actuating means includes a member movable between two positions;
said conveying means includes a guide ridge supporting a chain;
said guide ridge is connected to said support member;
said chain forms a continuous loop;
said drive means includes a rotatable shaft;
said rotatable shaft being located outside said continuous loop, such that said chain can be replaced without disassembly of said support member from said rotatable shaft;
each driven member includes driven gear; each said driven gear is driven by a respective one of a plurality of driving gears fixed to said rotatable shaft, and
adjacent support members are closely nested such that a gap exists between adjacent support members sufficient to replace the chains without removal of any support plate from said rotatable shaft.

4,733,769

DEVICE FOR COUNTING MOVING OBJECTS, SUCH AS EGGS

Jacques De Deyne, Maldegem, Belgium, assignor to Elite N.V., Maldegem, Belgium

Filed Feb. 24, 1987, Ser. No. 17,709
Claims priority, application Belgium, Feb. 26, 1986, 8600482
Int. Cl.⁴ G06M *7/00*
U.S. Cl. 198—503 **7 Claims**



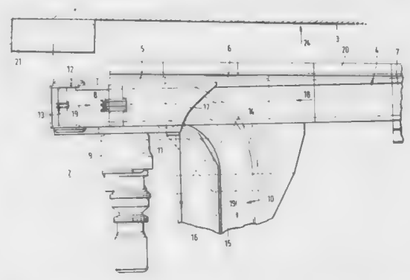
1. A device for counting moving objects, such as eggs lying on a moving conveyor belt, comprising a lever which can be moved by the moving objects, a signalling element for generating a detectable signal as a response to a movement of the lever, and also a coupling and resetting mechanism for transmitting the movement of the lever to the signalling element and for automatically resetting both the lever and the signalling element during a decrease in the size of the portion of a moving object which is in contact with the lever, after a preceding increase thereof and the associated generation of a signal, the coupling and resetting mechanism comprising an essentially cylindrical drum which is rotatable about a shaft and which is provided with means for operating the signalling element and also a cord, looped round the drum, one end of which is attached to an extension piece of the lever and the other end is attached to an elastically deformable element for tensioning the cord around the drum, the cord being able to slip over the outside surface of the drum with friction.

4,733,770

TRANSFER STATION

Ulrich Temme, Waltrop, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Lunen, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,123
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623411
Int. Cl.⁴ B65G *47/76*
U.S. Cl. 198—599 **8 Claims**



1. A transfer station for transferring mineral material from a longwall conveyor to a roadway loading conveyor, the longwall conveyor having a conveyor chain drive drum mounted in a drive frame which extends over the loading conveyor, the loading conveyor having two straight portions joined by a curved portion, wherein one straight portion of the loading conveyor extends in the direction of the longwall conveyor and transports mineral material in the opposite direction to that in which the longwall conveyor transports mineral material, the longwall conveyor extending over the loading conveyor in the region of its curved portion, the free end of said one straight portion of the loading conveyor being positioned beyond the drive frame of the longwall conveyor, and wherein means are provided for laterally delivering large pieces of mineral material from the longwall conveyor to the loading conveyor, said means extending over the conveying run of the longwall conveyor in the region of overlap with the loading conveyor.

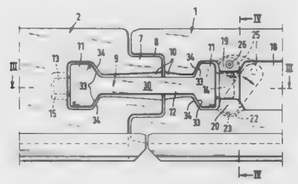
4,733,771

CONNECTION DEVICES FOR INTERCONNECTING THE PANS OF SCRAPER-CHAIN CONVEYORS

Dieter Gründken, and Manfred Redder, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia GmbH, Lunen, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,606
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628207
Int. Cl.⁴ B65G *19/28*
U.S. Cl. 198—735 **18 Claims**

1. Means for connecting together two adjacent channel sections of a scraper-chain conveyor, the channel sections each comprising a pair of side walls and a floor plate connected therebetween; the connection means at least including a coupling member having a central shank and enlarged heads at opposite ends of the shank, laterally-open compartments provided in end regions of side walls of the adjacent channel sections and shaped to receive the coupling member, a projection provided on at least one of the heads, an opening defined between wall portions adjoining one of the compartments, a locking plate, means in the wall portions for locating the locking plate for swivelling to overlap the projection and to free



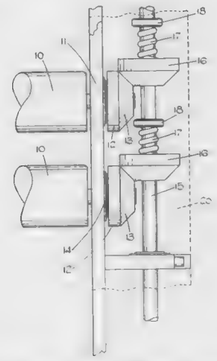
the projection and a detachable locking element for securing the locking plate in the position overlapping the projection to retain the coupling member in the compartments.

4,733,772

POWER AND FREE ROLLER CONVEYOR

Michael S. Potter, Birmingham, England, assignor to Sponmech Limited, Stourbridge, England

Filed Dec. 24, 1985, Ser. No. 812,965
Claims priority, application United Kingdom, Jan. 10, 1985, 8500592
Int. Cl.⁴ B65G *13/02*
U.S. Cl. 198—781 **3 Claims**



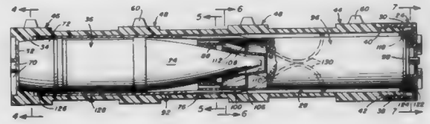
1. A power and free roller conveyor including a support, a plurality of rollers rotatably mounted on said support, an input drive shaft extending substantially perpendicularly of said rollers, and a plurality of friction drive arrangements between said shaft and respective ones of said rollers, each of said friction drive arrangements being independently adjustable and comprising a pair of frictionally interengaged drive and driven wheels mounted one on said roller and one on said drive shaft respectively for non-slipping rotation therewith, means for mounting one of said pair of interengaged wheels to its associated one of said rollers and said drive shaft such that the said wheel is non-rotatable relative to, while at the same time is permitted limited axial travel relative to the associated one of said rollers and said drive shaft on which it is mounted, biasing means urging said one wheel into frictional engagement with the other one of said pair of interengaged wheels, and adjustment means for varying the axial force applied by said biasing means to said one wheel to regulate the driving torque applied thereby to said other wheel such that said first and second frictionally engaged wheels constitute a single clutch-like structure through which substantially the entire torque is delivered from said shaft to each of said rollers through one of the friction drive arrangements and such that the amount of torque transmitted through each of said friction drive arrangements to the associated roller may be independently adjusted.

4,733,773

AMMUNITION CONTAINER SYSTEM

Vincent S. LaBianca, Cranston, and Richard Anterni, Barrington, both of R.I., assignors to Dart Industries Inc., Deerfield, Ill.

Filed Jun. 30, 1986, Ser. No. 880,434
Int. Cl.⁴ B65D *81/00*
U.S. Cl. 206—3 **30 Claims**



1. For use in storing a projectile and case, said projectile having a base end and a leading end portion, said case having a base and projectile-receiving open end; a shell container system comprising an elongate housing having an elongate chamber longitudinally therein, said chamber being defined by a peripheral wall and having a closed inner end and an open outer end, a cap removably mounted over said open outer end for selectively closing said chamber, a projectile seat within said chamber adjacent the closed inner end for receiving and seating the base end of a chamber-received projectile, a projectile support slidably positioned within said chamber for engagement about the leading end portion of the chamber-received projectile, said projectile support having an outer peripheral wall slidably engaging the peripheral wall of said chamber for a centering of the support therein, said support having an inner annular periphery including a portion configured to engage and surround the leading end portion of the projectile, and a projectile carrier for the projectile slidably positioned within said chamber, said projectile carrier including a projectile engaging member for engaging and supporting the projectile at the base end thereof, said projectile carrier including elongate strap means extending forwardly from the projectile engaging member to generally parallel and project beyond the leading end portion of the projectile, said projectile support including passage means receiving said strap means therethrough for stabilizing the projectile relative to said strap means, said strap means projecting forwardly of said projectile support and terminating in a handle, the inner annular periphery of said projectile support including a recessed shoulder forwardly directed toward the open outer end of the chamber for receiving and seating the open end of a chamber-received case positioned with the base end thereof at the open outer end of the chamber, a case plug slidably receivable within the open end of the chamber-received case for engagement therewith on the recessed shoulder of said projectile support.

17. For use in the storing of a shell projectile and case, said projectile having a base end and a leading end portion, said case having a base and a projectile-receiving open end; a shell container system comprising an elongate housing having an elongate chamber longitudinally therein, said chamber being defined by a peripheral wall and having a closed inner end and an open outer end, a cap removably mounted to the housing over the open outer end of said chamber for a selective closing of said chamber, a projectile support slidably positioned within said chamber for engagement about the leading end portion of a chamber-received projectile, said projectile support having an outer peripheral wall slidably engaging the peripheral wall of the chamber for a centering of the support therein, said support having an inner annular periphery including a portion configured to engage and surround the leading end portion of the projectile, said inner annular periphery of the support including a recessed shoulder forwardly directed toward the

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open outer end of the chamber, a case plus slidably receivable within the open end of chamber-received case, said case plug being slidably received within said projectile support and seated on said recessed shoulder, said case plug defining a rearwardly opening compartment for reception and enclosure of the forward portion of the leading end portion of the projectile, a projectile carrier received within said chamber inward of said projectile support for engagement with said projectile, said projectile carrier projecting forwardly of said support and including handle means for a forward drawing of said projectile carrier and the projectile therewith, and a case carrier received within said chamber at the open outer end thereof, said case carrier including forwardly directed handle means retained within the mounted cap forward of the open end of the chamber.

27. A projectile carrier comprising an annular ring engageable about the base portion of a projectile, a pair of elongate straps extending in laterally spaced parallel relation to each other from diametrically opposed portions of said ring, said straps terminating in enlarged loop handles, and means slidably received on said straps adjacent said loop handles for maintaining said straps in laterally spaced parallel relation and confining the forward portion of a projectile therebetween.

29. A case plug for the selective closing of the open mouth of a shell case prior to assembly with a projectile and for the retention of the charge therein, said case plug comprising a front wall, an annular skirt extending peripherally from said front wall, and a pair of laterally spaced finger grips integral with said front wall and radially inward of said skirt, said front wall, between said finger grips, being outwardly formed, relative to the opposite side of said front wall, to define a compartment aligned between said finger grips.

30. A cap for selective locking engagement with a housing, said cap including a top panel having transparent window means therethrough, a peripheral skirt extending rearwardly from said cap top panel for sealed locking engagement with the housing, an information indicia member within said cap skirt and in rearward underlying relation to said top panel, and means mounting said indicia member for adjustment relative to said top panel for selective exposure of the information indicia through said window means, said top panel and skirt defining a rearwardly directed opening, said cap confining said indicia member for access thereto solely through the rearwardly directed opening prior to locking engagement of the cap with said housing, said indicia bearing member comprising a planar ring, a retaining ring engaged with said top panel about said indicia ring, spring means resiliently engaged between said retaining ring and said indicia ring for biasing said indicia ring against the top panel of the cap and allowing for manual retraction of said indicia ring from said top panel for rotation relative thereto, and positioning means on said top panel and indicia ring for fixing said indicia ring relative to said top panel at adjusted positions of said indicia ring relative to said top panel.

4,733,774

GLUE PATTERNED SUBSTRATE FOR POUCHED PARTICULATE FABRIC SOFTENER LAUNDRY PRODUCT

Vernon S. Ping, III, Cincinnati, and Eric E. Beard, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

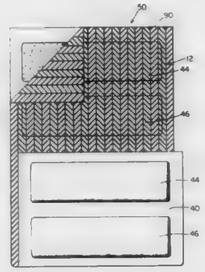
Filed Jan. 16, 1987, Ser. No. 5,802
Int. Cl.[4] C11D *17/00;* **D06M** *13/46*
U.S. Cl. 206—0.5 **10 Claims**

1. A through-the-wash and dryer laundry product comprising:

(a) a water-permeable, water-insoluble substrate;

(b) a particulate fabric softener adapted for release in the dryer upon melting at dryer operating temperatures, said softener enclosed within a pouch made of the substrate; wherein

(c) the substrate has on its surface a water-insoluble, spaced-apart glue pattern adapted to reduce fabric softener staining when the product is used in the dryer wherein said



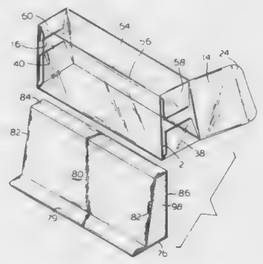
glue maintains its integrity through the laudering process and has a solubility in 49° C. water of less than 10%.

4,733,775

TRANSPARENT RECTANGULAR PACKAGING OF SWIM GOGGLES AND THE LIKE

Barry R. Fireman, Sharon, Mass., assignor to Aqua Leisure Industries Inc., Avon, Mass.

Filed Jul. 8, 1986, Ser. No. 883,323
Int. Cl.[4] A45C *11/04*
U.S. Cl. 206—5 **12 Claims**



1. A display package for goggles and the like comprising:

a transparent outer container formed by a one-piece unitary blank cut of plastic and folded into a substantially trapezoidal condition;

a support member snuggly and slidably fitting in said container and formed from one-piece unitary blank of material softer than said container and folded into a substantially trapezoidal condition, said support member independent from said transparent outer container and said support member capable of receiving print and said support member for keeping said goggles in a fixed position against said support member;

a substantially trapezoidal foam plastic backing member contained in said support member; and

means on the vertical right-side edge and left-side edge of said support member for receiving the straps of said goggles and the like and securing them to said support member.

4,733,776

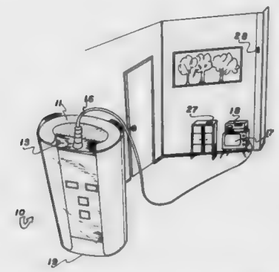
PROTECTIVE DEVICE FOR REMOTE CONTROL UNIT

Keith Ward, 121 Cameron Way, San Francisco, Calif. 94124

Filed Jul. 8, 1985, Ser. No. 752,676
Int. Cl.[4] B65D *85/38*
U.S. Cl. 206—305 **2 Claims**

1. A protective device for an electronic apparatus having

pressure responsive, manually actuatable controls, comprising; a housing assembly incuding a continuous curved sidewall defining a cavity therein dimensioned to receive the apparatus, said sidewall formed of resilient, shock absorbing material and dimensioned to substantially circumscribe and enclose the apparatus; means for enabling manual access to and manipulation of the controls portion of the apparatus directly through a closed portion of the housing assembly, including an opening



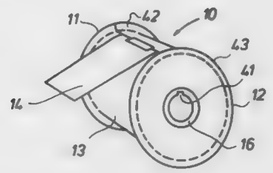
extending from the cavity to the exterior of said housing and adapted to be disposed in general registration with the controls portion of the apparatus, a transparent web member adapted to be secured across said opening, means for releasably securing said web member across said opening, said web member being formed of elastic, deformable material sufficiently pliable to permit manual impingement on the controls portion of the electronic apparatus directly through said web member to effect actuation of the controls portion thereby.

4,733,777

LIGHT-TIGHTLY PACKAGED ROLL OF LIGHT SENSITIVE MATERIAL

Danny Van Gcyte, Wilrijk, and Dirk Peeters, Kontich, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Jan. 13, 1987, Ser. No. 3,060
Claims priority, application European Pat. Off., Jan. 20, 1986, EP86200080
Int. Cl.[4] B68D *85/38*
U.S. Cl. 206—316 **6 Claims**



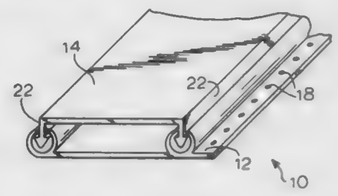
1. A light-tightly packaged roll of light-sensitive strip material wound on a hollow tubular supporting core, which comprises a generally annular opaque end cover for each end face of said roll, said end covers having their inner margins light-tightly affixed to the opposite end edges of the core and leaving the interior opening of the core unobstructed while the outer diameter thereof exceeds the diameter of said roll and thus projecting at their outer margins radially beyond the peripheral limits of the roll continuously around the roll periphery, and an opaque circumferential cover wound around at least the outermost convolution of the coiled strip material while leaving a leader section projecting outside and wound cover, said circumferential cover having a dimension parallel to the roll axis exceeding the width of said strip material to provide marginal extensions at both ends of the roll, said marginal extensions being flared angularly outwardly of said roll generally parallel to the radially projecting margins of the end voers, the mutually facing sides of said marginal extensions and radially projecting margins being adhesively sealed together.

4,733,778

REUSEABLE CARRIER TAPE

Hugo Boeckmann, Arlington Heights, Ill.; Steven Ausnit, New York, N.Y., and Robert S. Nocek, Stamford, Conn., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 25, 1986, Ser. No. 913,131
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—332 **14 Claims**



1. A carrier tape comprising:

an elongated base strip;

an elongated cover strip substantially coextensive in length with said base strip;

a plurality of component cavities spaced longitudinally along one of said strips;

at least one of said strips being formed with an integral, longitudinally extending continuous profile; and,

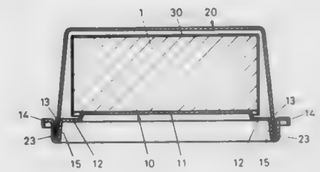
longitudinally extending continuous surfaces on the other of said strips contoured to engage said profile to secure said cover strip to said base strip in a releasable mechanical bond whereby selected ones of said cavities may be selectively uncovered to permit removal of the contents of said cavities.

4,733,779

PACKAGE FOR PASTE-LIKE PRODUCTS AND WRAPPER BLANK FOR USE WITH THE PACKAGE

Hans Hubmann, Neuhausen am Rheinfall, and Erwin Heller, Wil, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jan. 27, 1987, Ser. No. 7,399
Claims priority, application Switzerland, Jan. 27, 1986, 311/86
Int. Cl.[4] B65D *25/00, 85/74*
U.S. Cl. 206—509 **9 Claims**



1. A package for paste-like products comprising: a first tray member of a rigid material having an upper surface including a centrally disposed portion constituting a substantially flat support surface and a continuous indented portion surrounding said support surface; a continuous indented furrow provided in said indented protion of said upper surface adjacent the periph-

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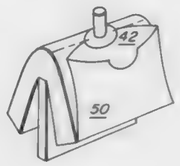
eral edge of said lower tray member and surrounding said support surface; a slab of a paste-like product disposed on said support surface; an upper cover tray member formed of a rigid material covering slab of product with the lower edge portion of said upper cover tray member extending into said furrow and with said furrow and said upper tray member being shaped such that said lower edge portion of said upper cover tray member frictionally engages the walls of said furrow to form a clamping retainer for said upper tray member; and a layer of flexible wrapper material at least partially wrapped around said slab and forming an intermediate layer between said slab and said upper tray member.

4,733,780

BLOCK-SEALED FLEXIBLE SADDLE BAGS

Harold A. Jessen, 31 Annadea Rd., Brockton, Mass. 02402

Filed Jul. 8, 1987, Ser. No. 70,901
Int. Cl.[4] B65D *30/20, 33/00*
U.S. Cl. 206—554 **10 Claims**



1. Paired flexible bags which comprise:
a first seamless side-gussetted bag joined to a second seamless side-gussetted bag at their upper edges along a common release line, each bag having an outer wall and a facing wall;
a common aperture formed only in the outer walls, the aperture intersected by the release line;
a suspension portion integrally formed at the release line, the suspension portion characterized by a hole formed in said facing walls and the bags being releasably secured to said suspension portion.

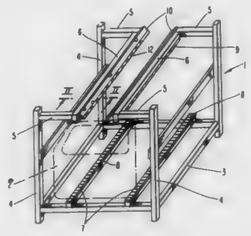
4,733,781

STACKING CONTAINER FOR SHAPED PARTS, IN PARTICULAR STAMPED SHEET METAL PARTS

Karl Gerlach, Odenwaldstrasse 22, D-6096 Raunheim, Fed. Rep. of Germany

PCT No. PCT/EP85/00469, § 371 Date May 9, 1986, § 102(e) Date May 9, 1986, PCT Pub. No. WO86/02056, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 14, 1985, Ser. No. 865,814
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435941
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 **8 Claims**

1. A stacking container for shaped parts such as stamped sheet metal parts, comprising:
a frame including vertically spaced upper and lower holding ledges, each ledge containing a row of spaced apart profile notches for receiving upper and lower edges of shaped parts, and
a safely ledge disposed adjacent to and along said upper ledge and including a stop surface, said safely ledge being pivotably mounted about a horizontal axis extending parallel to said upper holding ledge for vertical movement between
a lower position in which said stop surface is disposed higher than a lower edge of said notches of said upper holding ledge and lower than a floor of said notches of said upper ledge in overlying relation to a portion of a shaped part to prevent such shaped part from rising out of said notches of said lower holding ledge, and



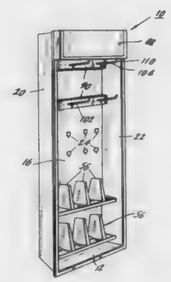
an upper position wherein said stop surface is raised from said lower position sufficiently to permit such shaped part to be raised out of said notches of said lower holding ledge.

4,733,782

VENDING MODULE HAVING A SELECTABLE CONFIGURATION AND A WIRE HOOK ADAPTOR

Ronald J. Spezial, RiverVale, and William Prendergast, Park Ridge, both of N.J., assignors to Trans-World Manufacturing Corporation, East Rutherford, N.J.

Filed Dec. 5, 1986, Ser. No. 938,642
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—57.1 **18 Claims**



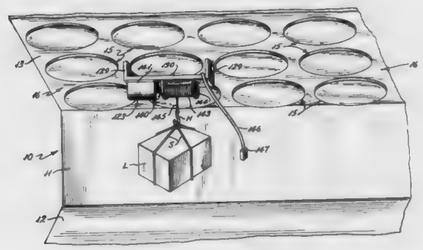
1. An interface adaptor for enabling mounting of wire hooks in a back panel of an article-supporting case, said wire hooks being of the type which are suitable to be mounted solely in wire hook mounted holes of predetermined size and spacing, said back panel being of the type which lacks said wire hook mounting holes and having instead back panel mounting openings each of which is formed of a main hook opening and a centering slot which depends downwardly from said main hook opening, said interface adaptor comprising:
a planar front plate having a plurality of said wire hook mounting holes for insertion of the wire hooks thereinto;
back panel hook means for connecting said interface adaptor to said back panel of said case, said hook means comprising a plurality of hooks each of which includes a top plate, a lip which depends downwardly from said top and a web located generally centrally with respect to said top and said lip, said web being receivable in the slot of the back panel mounting openings; and
spacer and connecting means for connecting said back panel hook means to said front plate and for spacing said hook means from said front plate to provide a space between said back panel and said front plate, the wire hooks being supported exclusively by said front plate and being partially disposed in the space between the back panel and the front plate.

4,733,783

MULTIDIRECTIONAL MATERIAL HANDLING SUPPORT AND SHUTTLE SYSTEMS

Charles E. Benedict, Tallahassee, Fla., and Raymond L. Lancaster, Huntsville, Ala., assignors to Benedict Engineering Company, Inc., Tallahassee, Fla.

Filed Mar. 25, 1986, Ser. No. 843,970
Int. Cl.[4] B66C *19/00*
U.S. Cl. 212—205 **23 Claims**



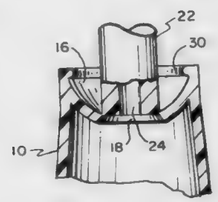
15. A multidirectional support and transfer system for moving articles between spaced locations within an are a comprising a plurality of support means having first and second sides, said first sides being in substantially co-planar relationship with each other, said support means being mounted in spaced relation to each other thereby defining intersecting open passageways therebetween which generally surround each of said support means, said open passageways forming a network of positive guide routes between spaced locations, carriage means having at least one base portion mounted in facing relationship with said first side of said support means and having at least one outwardly extending portion extending into spaced relationship with the second side of said support means, means mounted to said carriage means for movably engaging said support means, and said carriage means being of such size and configuration as to be movable into any position along said passageways between said support means.

4,733,784

CONTAINER AND APPLICATOR FOR FLUIDS

Robert Bennett, Easton, Conn., assignor to R.J.S. Industries, Inc., Marlboro, N.J.

Filed Nov. 17, 1986, Ser. No. 931,543
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—32 **4 Claims**



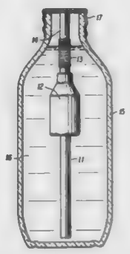
1. A container and applicator for fluids comprising:
a vertical plastic container having a hollow interior chamber adapted to store fluid, the container having upper and lower ends, the lower end being sealed;
a downwardly extending bowl shaped plastic member disposed in the upper end of said container, said member having an exposed upper surface and having an opening in the bottom which flares outwardly and extends downwardly through said member into said chamber;
a vertical prong shaped plastic element which extends upwardly from said member and has a vertical bore extending upwardly from the lower end of said element to a point intermediate the ends of said element, the lower end of said element being secured to the upper surface of said member in the region of said opening to seal off said opening in a leak proof manner, said element, when manually pivoted about said opening, breaking away from said container and at the same time breaking the seal to expose said opening whereby said element can be removed from said container;
vertical bristles secured in said bore and extending out of the lower end of said element through said opening and into said container whereby when said element is broken away from said container, said element with said bristles can be removed from said container and said element can be used as a handle to repeatedly dip said bristles in the fluid to charge said bristles with fluid for repeated application as desired by a user; and
a horizontal annular lip secured to the inner periphery of said member adjacent the upper end of said container for enabling excess fluid on the bristles to be wiped off when the bristles are moved over the lip.

4,733,785

BUOYANT ADVERTISING STRAW FOR BEVERAGE BOTTLES

Dan B. Turner, Jr., 1103 Cary Ave., and Richard Doucet, Jr., P.O. Box 802 (2nd St.), both of Jennings, La. 70546

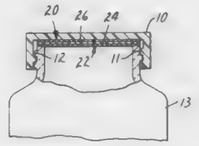
Filed Jul. 18, 1986, Ser. No. 886,834
Int. Cl.[4] B65D *83/00;* **A47G** *21/18*
U.S. Cl. 215—229 **1 Claim**



1. In combination a consumer beverage container having a cap and a constricted circular cross-sectional opening portion, a consumer beverage drinking straw having a geometrically compressible hollow buoyant miniature of the beverage container external shape in a vertical plane and having a horizontal elliptical cross-section secured about the entire exterior of the straw and being compressible by and for passage through the container constricted opening and which once inside the container expands to a size as to not accidentally pass freely through the container opening without applying and axial pulling force on the straw which due to the constriction of the container opening will compress the hollow buoyant miniature container permitting withdrawl of the straw and mini container from the beverage container, and an advertising message on the exterior of the mini container defining the geometric form and portion of the logo of the beverage processor of the container in which the hollow mini container and straw was supplied to a consumer.

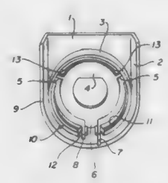
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,786
CONTAINER AND INNERSEAL CAPABLE OF INDICATING HEAT TAMPERING
Jeffrey O. Emslander, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Nov. 7, 1986, Ser. No. 928,803
Int. Cl.[4] B65D *51/00*
U.S. Cl. 215—230 18 Claims



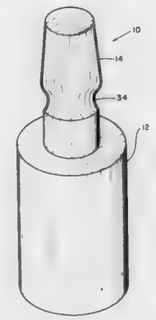
18. A container having a tamper-indicating innerseal comprising:
(a) a facing layer, and
(b) a thermally sensitive layer adhered to said facing layer, said thermally sensitive layer capable of changing its appearance upon application of a sufficient amount of heat thereto
wherein said thermally sensitive layer is formed of randomly dispersed, equiaxed, irregularly shaped particles of thermoplastic polymer, said particles being spaced from one another to provide a network of micropores therebetween, said particles being connected to each other by fibrils which radiate from each particle to the adjacent particles.

4,733,787
TAMPER EVIDENT OVERCAP
Norman D. Knopf, West Windsor; Heinz P. Meyer, Somerville, both of N.J., and Abraham Leibson, Buckingham, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Jun. 2, 1986, Ser. No. 869,480
Int. Cl.[4] B65D *47/10*
U.S. Cl. 215—251 8 Claims



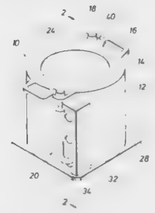
1. On a container with a primary cap, a tamper evident overcap fitting over and surrounding the primary cap, with a top connected at its outer edge to the top edges of an inner wall and an outer wall, said top edges of said inner and outer walls are covergent over a substantial portion of the outer edge of said top, said top including an integrated handle connected to the top by easily breakable attachment means and to the outer wall by secure attachment means; said outer wall extending from the top to the surface of the container and provided with one or more weakened areas adjacent to the secure attachment means extending at least part of the distance from said secure attachment means to the lower edge of the outer wall and wherein at least one of the weakened areas of the outer wall extends from the secure attachment to the lower edge of the outer wall; and said inner wall is provided with locking means for engagement with the container.

4,733,788
DRIPLESS FINGERNAIL POLISH BOTTLE
Joseph S. D'Amico, 19 Craigwood Cir., Russellville, Ark. 72801
Filed Feb. 25, 1987, Ser. No. 18,436
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—295 3 Claims



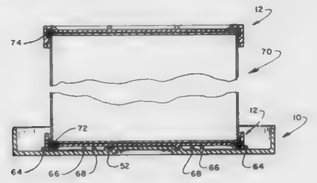
1. A new and improved liquid container designed to prevent liquid spillover from fouling threadably engageable container neck and closure threads, said container including liquid collection means comprising a well formed in a peripheral portion of said neck, said well is defined by an interior neck portion concentrically contained within and integrally attached to an exterior neck portion with threads formed on said exterior neck and further including a roughened surface on an exterior part or said interior neck portion, said roughened surface slowing a rate of liquid movement into said well, thereby to reduce the rate of liquid flow into said well, said liquid collection means capturing and retaining liquid spillover.

4,733,789
SHIPPING CONTAINER
Gerald W. Olson, Rt. 1, Box 845 S-6, Rosharon, Tex. 77583
Filed Oct. 24, 1986, Ser. No. 922,678
Int. Cl.[4] B65D *8/14, 85/20*
U.S. Cl. 220—8 12 Claims



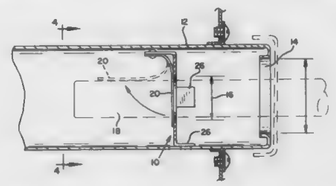
1. A shipping container, comprising:
(a) an inner component defining a first tubular body closed at one end by a base plate;
(b) an outer component defining a second tubular body adapted for receiving said first tubular body of said inner component therein, said second tubular body being open at one end and partially closed at the other end by a ring plate mounted on said other end of said second tubular body;
(c) said ring plate extending inwardly to partially close said other end of said second tubular body and terminating at a central opening circumscribed by said ring plate;
(d) take up bolt means mounted on said ring plate for locking said inner component within said outer component; and
(e) angle bracket means mounted on said base plate, said angle bracket means including at least one aperture extending through one side of said angle bracket means for engagement by said take up bolt means for effecting locking engagement of said inner component and said outer component.

4,733,790
COMBINATION DRIP PAN AND CONTAINER LID
Donald P. Stein, Rte. 1, Box 432 Fall River Rd., Idaho Springs, Colo. 80452
Filed Jul. 14, 1981, Ser. No. 283,272
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—23.83 10 Claims



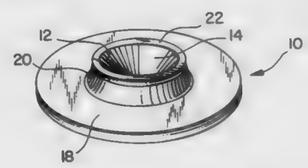
1. A combination drip pan and container lid, comprising:
a container lid adapted to fit over the top or bottom of a container to form a seal therewith, the container lid having a base, a side wall integrally connected to the base around the periphery thereof, and a flange extending normally outwardly from a central portion of the base, and
a drip pan having a bottom wall, a side wall integrally connected to bottom wall and extending vertically outwardly therefrom, and means defining a groove in an upper surface of the bottom wall, the groove being adapted to receive and reversibly seat the flange of the lid so as to reversibly retain the lid in fixed relationship relative to the drip pan when the flange is received and seated in the groove.

4,733,791
REPLACEMENT FILL PIPE RESTRICTOR
Karl F. Sinclair, 516 Sechkalou Dr. Ste. 106, Vancouver, Wash. 98668
Filed Sep. 8, 1986, Ser. No. 904,967
Int. Cl.[4] B67D *5/04*
U.S. Cl. 220—86 R 4 Claims



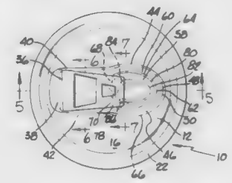
1. A replacement restrictor for replacing fill pipe restrictors in fuel tanks within a designated size range of fill pipes comprising; a rigid ring having a center opening and an outer diameter smaller than the inside diameter of the designated size range of fill pipes, a spring biased flap connected to the rigid ring and covering the center opening, and multiple fastening tabs provided on the periphery of the ring and projected outwardly thereof, said tabs being adjustable outwardly of the periphery of the ring to adjust the dimension of the restrictor to the dimension of the inside wall of a selected fill pipe within the designated range of fill pipes, said outwardly projected tabs further determining the outer dimension of the replacement restrictor at a position spaced inwardly of the fill pipe inlet to inhibit removal of the replacement restrictor, and fastening means for fastening the tabs to the inside wall of the fill pipe.

4,733,792
FLOATING LID WITH BREW FEATURE
Gerald S. Wasserman, East Brunswick; Karl C. Kramer, Dunellen, and Slawko Yadlowsky, Manville, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.
Division of Ser. No. 849,651, Apr. 9, 1986. This application Jun. 5, 1987, Ser. No. 58,426
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—216 5 Claims



1. A lid which comprises:
a buoyant lid body havinq an aperture surrounded by upwardly extending walls, said walls forming a chamber.

4,733,793
SYSTEM FOR FORMING AN OPENING IN A CONTAINER END MEMBER
Bruce A. Moen, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.
Filed May 1, 1987, Ser. No. 45,369
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—269 23 Claims



1. A container end member or the like for sealed association with a container member to provide a sealed container and which is provided with a system for forming an opening therein comprising:
a one piece metallic end member having a cylindrical peripheral rim wall portion and a central axis;
an annular outer rim portion on said metallic end member for sealed association with the container member;
a central end wall portion integrally connected to said rim portion and extending generally transversely to said central axis and having an outer surface and an inner surface;
a severable tab portion in and integrally connected to said central end wall portion;
a hinge portion integral with said central end wall portion and having spaced apart ends;
severable score line groove means having ends adjacent to said spaced apart ends of said hinge portion and defining said severable tab portion so that said severable tab portion may be severed from said central wall portion in response to applied axially inwardly directed forces and form an outlet opening in said central end wall portion;
retaining means comprising said hinge portion for retaining

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said severed tab portion attached to said central end wall portion;

force applying means for applying said axially inwardly directed forces on said severable tab portion; said force applying means comprising:

an integral plastic member formed from a relatively rigid plastic material;

an attachment means portion integral with said plastic member for securing said plastic member to said central end wall portion;

said plastic member having an elongated body portion having an abutment end portion at one end thereof and a handle portion at the other end thereof; and

a pivot means portion integral with said attachment means portion and said elongated body portion for pivotally mounting said elongated body portion on said central end wall portion so that when an axially outwardly directed opening force is applied to said handle portion, said elongated body portion will pivot about said pivot means portion so that said abutment end portion will apply said inwardly directed force to said severable tab portion to sever said severable tab portion along said severable score line groove means and form said outlet opening in said central end wall portion.

4,733,794

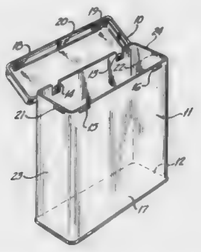
HINGED PLASTIC CONTAINER

John R. Kent, Lower Makefield, Pa., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jun. 23, 1983, Ser. No. 507,325

Int. Cl.[4] B65G *65/00*

U.S. Cl. 220—306 **10 Claims**



1. In a container comprising a thin-walled, semi-rigid tubular body member of rectangular cross-section having a closed bottom portion, front and rear walls, and opposing side walls defining one open end,

a shallow walled rectangular lid member having depending front, rear and opposing side walls adapted to telescope closely over the walls of the body member when in a closed position, and

hinge means securing the rear wall of the lid member to the rear wall of the body member adjacent the open end thereof whereby said lid member is pivotable between open and closed positions,

the improvement comprising

lid latching means comprising one or more first projections on the outside of the front wall of the body member adjacent the open end thereof,

cooperating one or more second projections on the depending front wall of the lid member adjacent the lip thereof adapted to override and engage said first projections when the lid is pivoted from an open to a closed position, and

a further projection on the outside of each side wall of the body member adjacent the open end thereof having an interference fit with the depending side walls of the lid member whereby when said lid member is pivoted from an open to a closed position, compressive forces are exerted on the side walls of the body member by the lid member.

4,733,795

STEAM PRESSURE COOKING POT WITH A SEAL SECURING THE INSIDE SPACE OF THE POT AGAINST A DROP IN PRESSURE

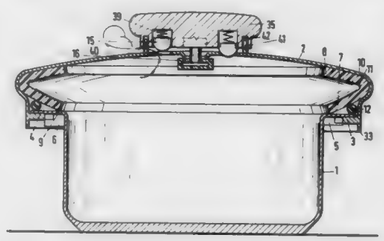
Hans-Georg Boehm, Kellergrundweg 13, 6242 Kronberg/Ts., Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 50,639

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618269

Int. Cl.[4] B65D *45/00*

U.S. Cl. 220—316 **11 Claims**



1. Steam pressure cooking pot consisting of a container accomodating the product to be cooked, a cover with safety valve capable of being placed thereupon, a locking (closing) means clamping container and cover to one another in the closed condition, and a seal disposed between cover and container securing the inside space of the pot against a drop in pressure in the closed condition, with a sealing lip of the seal pointing radially inwardly lying against the cover or the container which, upon pressing down the cover in the direction toward the container, lifts off the sealing emplacement on the cover or on the container and with the cover or container, upon subsequent movement of the cover into the opening condition, executing a relative movement toward the sealing lip,

characterized by the fact that there is disposed ' radially outside the rim of the sealing lip (7; 21; 64), between the sealing lip (7; 21; 64) and the cover (2; 18) or the container (1; 17; 50), a slide (glide) element (12; 100) that acts as a levered support for the lifting movement of the sealing lip (7; 21; 64).

4,733,796

CIGARETTE PACKAGE

Dale A. Halverstadt, Macon, Ga.; Walter L. Tucker, Louisville, Ky.; Josef F. Klingler, Wilmette, and James L. Meier, Des Plaines, both of Ill., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 18, 1987, Ser. No. 51,340

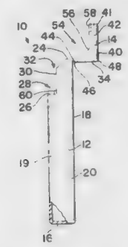
Int. Cl.[4] B65D *43/14, 51/04*

U.S. Cl. 220—339 **5 Claims**

1. A cigarette package comprising:

(a) a container for cigarettes having a planar bottom wall; a planar back wall extending perpendicularly upwardly from the bottom wall terminating at a top edge; a planar front wall spaced from and substantially parallel to the back wall extending perpendicularly upwardly from the bottom wall terminating at a top edge at a lower elevation than the top edge of the back wall; two spaced apart substantially parallel side walls extending perpendicularly upwardly from the bottom wall and being mutually perpendicular to and integrally joining the front and back walls, each of the side walls being formed with a notched out area at the top end thereof, the edges of the side wall defining the notched out area extending from the side edge of the back wall at the top terminal edge of the back wall to the side edge of the front wall at the top terminal edge of the front wall wherein the top edge of the back wall, the top edge of the front wall and the edges of each of the side walls defining the notched out area cooperate to define an open container top; and,

(b) a cover movable from a first position away from the open container top to a second position closing the open container top having a top wall hinged along the rear side edge to the top edge of the back wall of the container; a front wall extending downwardly from the front edge of the top wall a distance substantially equal to the difference in elevation between the top edge of the container back wall and top edge of the container front wall, terminating at a bottom edge; two spaced apart substantially parallel



side walls extending perpendicularly downward from the cover top wall integrally joined to the side edges of the cover top wall and side edges of the cover front wall, each of the cover side walls being formed with a notched out area at the bottom end thereof complementary in shape and size to the notches formed in the container side walls, the bottom edge of the cover side wall defining the notched out area extending from the side edge of the cover top wall to the side edge of the cover front wall at the bottom terminal edge of the cover front wall wherein when the cover is in the second position the bottom terminal edge of the cover front wall longitudinally abuts the top terminal edge of the container front wall, and the notch defining edges of the cover side walls abut the notch defining edges of the container side walls; and, lock means for releasably holding the cover in the second position.

4,733,797

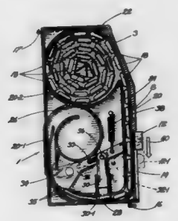
DOSAGE SEALING, MONITORING AND DISPENSING ASSEMBLY

Terry M. Haber, 25011 Castlewood, Lake Forest, Calif. 92630

Filed Sep. 22, 1986, Ser. No. 909,559

Int. Cl.[4] G07F *11/00*

U.S. Cl. 221—8 **16 Claims**



1. An assembly for storing and dispensing dosage units, said assembly having at least one cartridge comprising:

means in which to receive a supply of the units to be dispensed;

a dispensing orifice through which the units are delivered to the user;

means for advancing the units from said supply to said dispensing orifice;

actuator means located at a manually accessible position to be operated by the user;

plunger means adapted for reciprocal movement whereby to remove individual units into said dispensing orifice; and

lever arms means connected at a first end thereof to said actuator means and at an opposite end thereof to said advancing means, said plunger means being interconnected to said lever arm means intermediate the first and opposite ends thereof, such that the operation of said actuator means simultaneously causes the advancement of units to a position below said plunger means and above said dispensing orifice and the reciprocal movement of said plunger means for delivering units to the user via said orifice.

4,733,798

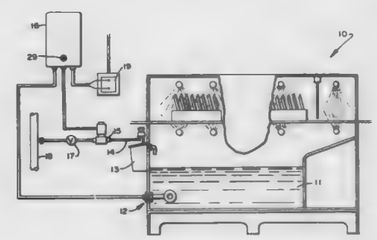
METHOD AND APPARATUS FOR CONTROLLING THE CONCENTRATION OF A CHEMICAL SOLUTION

Daniel F. Brady, Eagan; Spencer B. Larson, Cottage Grove; David B. Ziegler, Eden Prairie, and Charles B. Johnson, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Feb. 5, 1986, Ser. No. 826,205

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—23 **12 Claims**



1. An apparatus for controlling the concentration of a detergent solution comprising:

(A) means for providing a concentration signal representing the concentration of the solution comprising a primary coil and a secondary coil, wherein when the coils are immersed in the solution the solution provides an electrical coupling between the coils;

(B) means for changing the concentration of the solution; and

(C) means for controlling the concentration changing means comprising:

(1) means for comparing the concentration signal with a reference signal representing a preselected desired concentration and generating an error signal representing the difference therebetween; and

(2) means for activitating the concentration changing means in response to the error signal, wherein the concentration changing means comprises means for increasing the concentration of the solution and wherein the activating means comprises:

(a) timing means for:

(i) continuously activating the concentration increasing means when the error signal indicates that the concentration of the solution is less than a preselected percentage of the desired concentration;

(ii) not activating the concentration increasing means when the error signal indicates that the concentra-

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tion of the solution is substantially equal to the desired concentration; and

(iii) periodically activating the concentration increasing means when the error signal indicates that the concentration of the solution is between the desired concentration and the preselected percentage of the desired concentration, wherein the rate at which the concentration increasing means is activated is directly related to the difference between the actual concentration and the desired concentration, whereby overshoot is substantially eliminated; and

(b) alarm means for determining whether the concentration increasing means has been continuously activated for an excessive period of time.

4,733,799

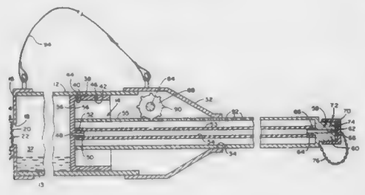
WATER CANNON TOY OR LIKE DEVICE

Darrell D. Wiskur, Rte. 7, Harrison, Ark. 72601

Filed Feb. 24, 1986, Ser. No. 832,352

Int. Cl.⁴ A63H *3/18*

U.S. Cl. 222—79 **7 Claims**



1. A water gun toy comprising a body having a handle member fixed thereto adapted to be grasped by a user and a body chamber internally of said body;

a piston positioned within said body chamber and slidable relative thereto, said piston and said body chamber defining a liquid receiving reservoir,

a tubular piston rod having an inner end fixed to said piston and an outer end projecting from said body in the opposite direction from said user;

tubular conduit means positioned within said tubular piston rod, one end of said conduit means in fluid communication with said reservoir and the other end extending through said tubular piston rod to an orifice at said outer end thereof for ejecting liquid from said reservoir; and

actuating means operatively connected to the piston rod operable for causing relative sliding movement of said piston within said body chamber to cause liquid in said reservoir to be ejected through said conduit means and orifice;

said actuating means including a hand crank rotatably mounted on said body, said crank including a crank shaft projecting within said body adjacent to said piston rod, a toothed gear fixedly mounted on said crank shaft, and means including tooth contacting surfaces formed along a length of said piston rod engageable with said toothed gear whereby rotation of said hand crank causes axial movement of said piston rod and said piston in said body chamber to change the volume of said reservoir.

4,733,800

TUBE AND A METHOD AND A DEVICE FOR MANUFACTURING OF THE TUBE

Carl-Axel Björkengren, Åkarp, and Lennart Mansson, Lund, both of Sweden, assignors to AB Akerlund & Rausing, Sweden

Filed Sep. 19, 1985, Ser. No. 777,634

Claims priority, application Sweden, Oct. 2, 1984, 8404921

Int. Cl.⁴ B65D *35/08;* **F16L** *00/00*

U.S. Cl. 222—107 **14 Claims**



1. A packaging tube, comprising:

(a) a tubular body of a body laminate containing a metal foil and at least one layer of a plastics material superposed thereon, said tubular body having interior and exterior faces and defining a lengthwise direction;

(b) a breast having a discharge opening secured to one end of said tubular body; and

(c) an elongated strip of a strip laminate attached to said tubular body and extending generally in said lengthwise direction along said tubular body, said strip laminate including a metal foil and at least one layer of a plastics material superposed thereon, said strip having two oppositely-directed faces, one face of said strip confronting a face of said body, said strip having dead-fold characteristics, the width of said strip being less than the circumference of said tubular body,

the thickness of the metal foil of the tubular body being within the interval 5 to 40 microns, the metal foil of the body being considerably thinner than the metal foil of the strip, the thickness of the metal foil of the strip being within the interval 40 to 200 microns.

4,733,801

METHOD OF AND MEANS FOR MANUFACTURE OF A DISPENSER FOR VISCOUS OR SEMI-VISCOUS MATERIALS

John F. Scammell, 7 The Common, Beaumont, S.A. 5066, Australia

PCT No. PCT/AU86/00036, § 371 Date Oct. 20, 1986, § 102(e) Date Oct. 20, 1986, PCT Pub. No. WO86/04856, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 13, 1986, Ser. No. 939,125

Claims priority, application Australia, Feb. 19, 1985, PG9357

Int. Cl.⁴ B65D *35/08;* **A23P** *1/00*

U.S. Cl. 222—107 **8 Claims**

1. The method of manufacturing a dispenser for viscous or semi-viscous materials in which the dispenser is in the form of a tube having an end closure and extending from the perimeter thereof a generally tubular wall adapted after filling to be closed at its other end and including a cap attached by a hinge to the end closure to seal the end closure, and in which method an elongated core is projected into the hollow of a die and has its outer end stabilized by engaging an aligning face on the core with a mating aligning face on the die, characterised by the steps of:

(a) positioning a core (2) in the die (1) to define between them a wall cavity (13) communicating with an end closure cavity (12) in turn communicating through a hinge strap cavity (14) with a cap cavity (15),

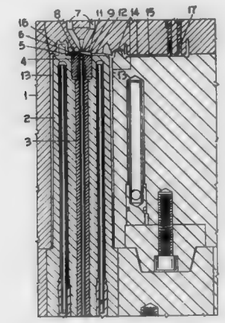
(b) stabilizing the core (1) in the die (2) by positioning an axially movable aligning member which is (4) slidable in the core to bring an aligning face (5) on the aligning member (4) into engagement with a mating aligning face (6) on the die (1) whereby to prevent core shift of the end of the core (2) in the die (1),

(c) injecting flowable plastic material through a central duct (7) formed through the die (1) to the face of the aligning member (4),

(d) selectively distributing the flow by means of channels (11) in the end face of the aligning member (4) into the end closure cavity (12) between the core (2) and the die (1) and down the wall cavity (13) and through a hinge strap cavity (14) to the cap cavity (15) to stabilise the core (2) in the die (1), and

(e) withdrawing the aligning member (4) from its engagement with the die (1) while continuing flow to form a membrane in the end closure between the aligning face (5) of the end closure (2) and the aligning face (6) in the die (1) whereby the end closure (20) and the wall (22) of the tube, and the hinge strap (24) and the cap (23), are formed while the core (2) is stabilised by the aligning member (4), and the closing membranes in the end closure (20) are formed when the aligning face (5) on the aligning member (4) is withdrawn from the aligning face (6) of the die (1).

3. A die and core assembly for the manufacture of a dispenser for viscous or semi-viscous materials in which a hollow



in a die (1) has projecting into it a core (2) to form between them a tubular wall cavity (13) at an end closure cavity (12) and including a cap cavity (15), said tubular wall cavity (13) extending from the perimeter of the end closure cavity (12) to form the wall (22) and end closure (20) of an elongated hollow body of the dispenser, said cap cavity (15) communicating with the end closure cavity (12) by a hinge cavity (14) whereby a cap (20) is attached to the body by a hinge strap (24), characterised in that said core is substantially stationarily positioned in said die (1) throughout the moulding operation to define the said cavities (12,13,14,15) further characterised by an aligning member (4) on a stem (3) extendng through the core (2) in an axial direction of the core (2) and guided by the core (2) to be axially movable therein, an aligning face (5) on the said aligning member (4) sloping in relation to the axis of the core (2), a mating aligning face (6) on the die (1) for engaging the sloping aligning face (5) on the core (2) to axially align the core (2) in the die (1) during the initial moulding process but disengaging the said aligning faces (5,6) during the continuation of the moulding process after the core (2) is aligned in the die (1) by injected moulding material, further characterised by channels (11) in the ends of the aligning member (4) between a central injection duct (7) and the end closure cavity (12) arranged to selectively direct the flow of moulding material into the said cavities (12, 13,14,15).

4,733,802

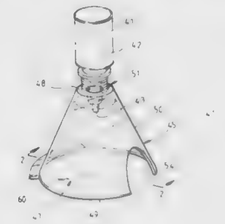
EYE DROP DISPENSING SYSTEM

Gerald M. Sheldon, 11538 S. Lou-Al Ct., Houston, Tex. 77024

Filed Nov. 5, 1986, Ser. No. 927,324

Int. Cl.⁴ B67D *5/06*

U.S. Cl. 222—181 **10 Claims**



1. An eye drop dispensing system for dispensing eye drops upon an eye drop user, comprising:

a reservoir adapted to store the eye drop solution;

a nozzle associated with the reservoir in fluid communication therewith; and

a support structure adapted to support the nozzle and reservoir above the eye in a spaced relation therefrom, the support structure including a truncated, substantially cone-shaped member having upper and lower ends and a sloping wall surface therebetween; the upper end including means for releasably securing the reservoir and nozzle to the truncated cone-shaped member; the lower end adapted to be disposed on a bony structure surrounding the eye; the sloping wall surface extending between the upper and lower ends including a single opening therein, the opening extending from a location approximately intermediate the upper and lower ends of the support structure to and through the lower end of the support structure, the opening being adapted to permit a finger of the eye drop user to be inserted therethrough to retract the lower eyelid open and to maintain the lower eyelid in its open position while an eye drop is being dispensed and to overcome the eye drop user's eyelid-blink reflex.

4,733,803

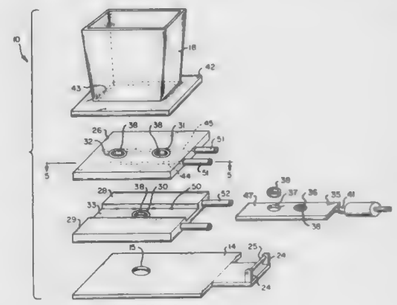
PARTICULATE DISPENSING APPARATUS

Charles W. Sisson; Duane R. Kerr, and Russell H. Mosier, all of Hanford, Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed Jun. 23, 1986, Ser. No. 877,615

Int. Cl.⁴ F16K *3/36;* **B65B** *43/42;* **B67C** *3/00*

U.S. Cl. 222—276 **3 Claims**



1. A particulate dispensing device adapted to be mounted

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over a can line for dispensing metered amounts of particulate material into cans, which comprises

a mounting plate having an opening therethrough;

a metering unit mounted on said mounting plate, said metering unit comprising

(a) a support block having substantially flat upper and lower surfaces, secured on said mounting plate, said support block having a central discharge opening therein aligned with the opening in said mounting plate, and having a longitudinal channel with a substantially flat bottom wall extending across the upper surface thereof over said discharge opening,

(b) a loading plate secured on the upper surface of said support block extending over said channel and having a pair of longitudinally spaced loading openings extending therethrough communicating with said channel, and

(c) an elongated slide dispenser having substantially flat upper and lower surfaces slidably mounted for reciprocatory longitudinal movement in said longitudinal channel, said slide dispenser having a pair of metering openings extending therethrough spaced apart by a distance equal to one-half the distance between said loading openings, with said metering openings being positioned so that one of said metering openings registers with the discharge opening when the other metering opening registers with a loading opening,

actuating means associated with said slide dispenser to effect longitudinal reciprocatory movement of the slide dispenser in said longitudinal channel;

can sensor means mounted adjacent the opening in said mounting plate;

valve means operatively associated with said can sensor means and said actuating means to control movement of said actuating means, and

at least one conduit means extending longitudinally into the metering unit parallel to said longitudinal channel communicating with a plurality of openings in the metering unit adjacent said slide dispenser, said conduit means being adapted to convey a lubricating fluid under pressure to at least one of the surfaces of the slide dispenser said conduit means includes a pair of substantially parallel longitudinal bores in said support block adjacent the bottom wall of said channel, said bottom wall of the channel having a plurality of openings therein communicating with said longitudinal bores in said support block, and means for introducing a lubricating fluid under pressure into said longitudinal bores in said support block, and said conduit means also includes a pair of substantially parallel longitudinal bores in said loading plate, with the bottom surface of the loading plate having a plurality of apertures therein above said channel communicating with said longitudinal bores in said loading plate, and means for introducing a lubricating fluid under pressure into the longitudinal bores in said loading plate.

4,733,804

LIQUID DISPENSING CONTAINER HAVING RIBBED CONSTRUCTION

William A. Slat, Brooklyn, Mich., and Richard C. Darr, Seville, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Sep. 22, 1986, Ser. No. 909,872

Int. Cl.[4] B65D *1/42, 1/46*

U.S. Cl. 222—465.1 **8 Claims**

1. A plastic blow molded container for holding liquids, comprising: a hollow body portion having bottom and top ends; said body portion having first and second pairs of generally flat side walls extending between the bottom and top ends of the body portion; one of said pairs of side walls having a longer horizontal extent than the other pair to provide the body portion with a horizontally elongated rectangular shape between its bottom and top ends; a bottom wall that closes the bottom end of the body portion; a top closure that closes the top end of the body portion has a central handle and also has a dispensing spout located adjacent one of the shorter side walls in a remote relationship to the other shorter side wall; a unitary valve that is pressed onto the dispensing spout to provide dispensing of liquid contents with the container supported on said one shorter side wall; at least one rib extending horizontally around the body portion of the container along each wall and projecting inwardly toward the interior of the body portion; said rib including curved rib portions along the pair of longer side walls to maintain the flatness thereof when the container is filled with liquid; said rib having a relatively shallow rib portion along the one shorter side wall adjacent to and



on one side of the central handle and the dispensing spout to prevent excessive compression of the one shorter side wall as the unitary valve is pressed onto the dispensing spout; the rib having a relatively deep rib portion along the other shorter side wall on the opposite side of the central handle and dispensing spout from the shallow rib portion to maintain the flatness thereof with the filled container supported on the one shorter side wall for the liquid dispensing through the unitary valve; and the shallow and deep rib portions extending horizontally along the pair of shorter side walls of the body portion at the same elevation as each other.

4,733,805

HELMET HOLDING DEVICE FOR MOTORCYCLES

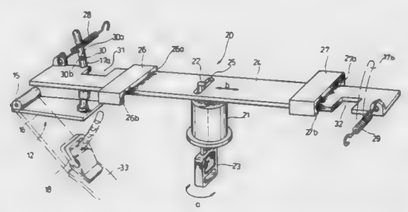
Takuma Sawada, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 922,638

Claims priority, application Japan, Oct. 25, 1985, 60-237669

Int. Cl.[4] B62J *7/00*

U.S. Cl. 224—39 **6 Claims**



1. A helmet holding device for a motorcycle including a stay member mounted on the rear portion of a frame of the motorcycle,

a trunk which is mounted on the stay member and has a bottom plate extending rearwardly of said stay member, and

a helmet holder attached to the portion of said bottom plate extending rearwardly of said stay member for suspending and holding a helmet, said helmet holder comprising a swinging member swingably pivoted to the undersurface of said bottom plate and a hook member which extends upwardly from the free end of said swinging member for protruding through a hole formed through said bottom plate, said hook member having at least one locking notch.

4,733,806

CASE

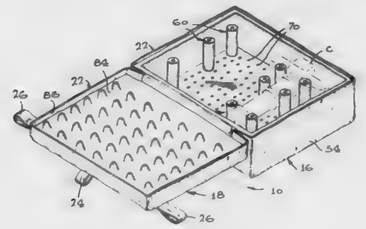
Conrad B. Sloop, 9092 Bermuda Dr., Huntington Beach, Calif. 92646

Division of Ser. No. 134,183, Mar. 26, 1980, Pat. No. 4,323,180.

This application Mar. 24, 1982, Ser. No. 361,428

Int. Cl.[4] A45C *11/48*

U.S. Cl. 224—202 **2 Claims**



1. An instrument case comprising:

a case part forming a rigid bottom wall having a multiplicity of holes; and

a plurality of pylon devices, each having a fastener insertable through a hole in said rigid bottom wall and fastenable in place thereat;

said holes are closer together than the width of each pylon device, so that two of said pylon devices cannot be mounted in a pair of adjacent holes, whereby to enable the mounting of pylons close to the ideal positions for pressing with moderate forces against an instrument to hold it.

4,733,807

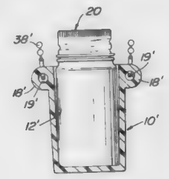
CONTAINER FOR MEDICINALS

Robert E. Porter, 700 Church Rd., and Richard Reube, 1001 Orvilla Rd., both of Hatfield, Pa. 19440

Filed Jun. 14, 1982, Ser. No. 388,270

Int. Cl.[4] B65D *85/56*

U.S. Cl. 224—202 **10 Claims**



1. A container for medicinals such as pills or the like comprising:

a holder defining an internal chamber and having an open top,

a bottle for containing the medicinal and having an open top,

a cap threadedly engageable with the top portion of the bottle for tightly closing and opening the top of said bottle,

said internal chamber of said holder being adapted to receive the bottle therein with the cap projecting beyond the open end of the holder,

said holder having means on the internal wall thereof for engaging the outer surface of said bottle at a location below said cap so as to hold said bottle in said internal chamber with a frictional force that can be readily overcome by a manual pulling force applied by the user to both said bottle and said holder to cause a separating movement thereof whereby said bottle can be easily removed from said holder for access to the medicinal contained therein,

and a chain means attached to said holder and adapted to extend around the neck of the user to support the holder and bottle near the chest area of the user.

4,733,808

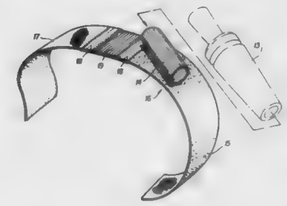
HUNTING CALL HOLDER

Dan B. Turner, Jr., 1103 Cary Ave., and Richard Doucet, Jr., P.O. Box 801 (2nd St.), both of Jennings, La. 70546

Filed Aug. 27, 1986, Ser. No. 900,761

Int. Cl.[4] A45F *3/14*

U.S. Cl. 224—219 **3 Claims**



1. The combination of a fowl call having a major and minor axis mounted in a fowl call holder attachable about the wrist of a hunter comprising a flexible wrist strap having a major and minor portion, each having a major and minor axis, an elastic expandable strip stitched at each end to said flexible wrist strap, an elastic call encircling strap loop secured to the major portion of said wrist strap and resiliently and snugly engaging about said fowl call and being oriented on said wrist strap at an angle to the major axis of said flexible wrist strap with the major axis of said call encircling strap loop positioned to thereby place the mouth piece of the call accessible to the mouth of the hunter so that the hunter when in a kneeling position is free to maintain both hands on a shot gun while actuating the call and complemental VELCRO adhesive surfaces on the major and minor portions of the flexible strap to engage one another and secure the strap about the wrist of the hunter with only minor expansion of the strap about the wrist permitted by said elastic expandable strip between said major and minor portions of said wrist strap.

4,733,809

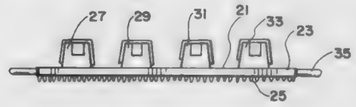
REMOVABLE SKI RACK FOR MOTOR VEHICLES

Mark S. Pursell, 302 New Jersey Ave., Phillipsburg, N.J. 08865

Filed Jul. 24, 1986, Ser. No. 888,720

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—329 **18 Claims**



1. A removable ski rack for motor vehicles having two independently mounted systems, each system of which comprises:

(a) a vehicle mounting means to mount the ski rack to the roof of a motor vehicle, which includes a first strap of adequate length to substantially traverse the width of a motor vehicle with a bottom surface adapted to overlie the roof of the motor vehicle, roof fasteners on each end

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of said first strap to securely attach the vehicle mounting means to the vehicle, and a first set of at least one of a male-hook or female-loop type filamentary fastening members located on at least a portion of the upper surface of said first strap;

(b) a ski holder mounting means, which includes a second strap having a second set of at least one of a male hook or female-loop type filamentary fastening members located on at least a portion of the bottom surface of said second strap, said second set being of opposite gender to said first set said ski holder mounting means being mounted on the upper surface of said second strap and overlying said second set of fastening members, and said first set of fastening members being directly opposite said second set of fastening members, said ski holder mounting means being detachably affixed to the vehicle mounting means by mating said fastening members; and,

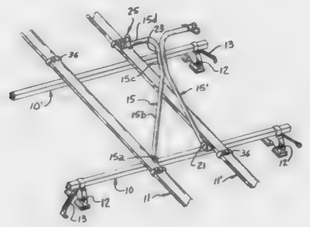
(c) a plurality of ski holders having bottom surfaces mounted directly on the upper surface of said ski holder mounting means, said ski holders having ski locking mechanisms to detachably lock skis into said ski holders.

4,733,810

FOLDABLE BICYCLE SUPPORT DEVICE

Joseph V. Graber, Middleton, and Jeffrey G. Romenesko, Madison, both of Wis., assignors to Graber Products, Inc., Madison, Wis.

Filed Apr. 23, 1987, Ser. No. 41,546
Int. Cl.[4] B60P *3/06*
U.S. Cl. 224—329 **6 Claims**



1. A foldable bicycle support device comprising,

(a) first and second cross frame members,

(b) first and second wheel receiving channels extending crosswise of said first and second cross frame members in laterally spaced relation to each other,

(c) first and second hinge brackets each having a base portion and a leg portion extending transverse to the base portion,

(d) first means attaching the base portion the first hinge bracket and the first wheel receiving channel to said first cross member with the leg portion of the first hinge bracket extending transverse to the first cross member, second means attaching the base portion of the second bracket and the second wheel receiving channel to the first cross member with the leg portion of the second hinge bracket extending transverse to the first cross member, said first and second wheel receiving channels being laterally spaced apart on said first cross member and the leg portions of the first and second hinge brackets being disposed between the first and second wheel receiving channels,

(e) first and second tubular bicycle support members each having a flattened lower end portion disposed alongside the leg portion of the respective first and second hinge bracket; a converging portion that extends in converging relation toward an upright medial plane intermediate the first and second wheel receiving channels; an intermediate portion disposed adjacent said upright medial plane, and an upper end portion that extends from the intermediate portion laterally outwardly toward said wheel receiving channels from said upright medial plane,

(f) first and second pivot means extending through and pivotally connecting the flattened lower end portions of the first and second bicycle support members to the leg portions of the respective first and second hinge brackets to support the first and second bicycle support members for pivotal movement about a pivot axis paralleling the first cross member member between a lower and a raised position,

(g) means rigidly connecting the intermediate portions of the first and second bicycle support members to each other whereby the first and second bicycle support members form a laterally stable assembly, said assembly can be moved as connected between said lower and raised positions,

(h) the first and second bicycle support members each having means on their lower end portion engageable with the respective first and second hinge bracket for limiting raising of the bicycle support members when they are disposed at a preselected acute angle to a horizontal plane through the first and second wheel receiving channels, and

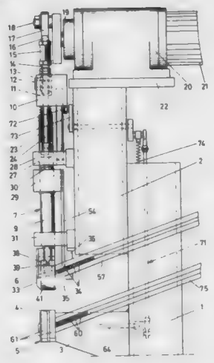
(i) first and second bicycle frame clamp means on the upper end portion of the respective first and second bicycle support members, for engaging a bicycle frame to support bicycle in a generally upright plane in the respective first and second wheel receiving channels.

4,733,811

MACHINE FOR ATTACHING BUTTONS, RIVETS, OR SIMILAR TO GARMENTS

Herbert Birkhofer, and Hans-Otto Höffler, both of Braunschweig, Fed. Rep. of Germany, assignors to Schaeffer Scovill Verbindungstechnik GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,068
Int. Cl.[4] B25C *5/00;* **B27F** *7/00*
U.S. Cl. 227—105 **7 Claims**



1. A machine for attaching fastener parts to garments, said machine being adapted to receive said fastener parts in an upright position from the discharge exit of a guide channel supplied by a magazine and to transfer said fastener parts to a horizontal attachment position, said machine comprising:

fastener part engaging means including a sliding surface extending from said discharge exit to said attachment position, said sliding surface being configurated to form a segment of a circle, said sliding surface being tangential to said discharge exit and to said attachment position;

a guide rail concentric with said sliding surface and spaced outwardly thereof;

a transport finger shiftable along said sliding surface toward and away from said attachment position;

means supporting and driving said transport finger;

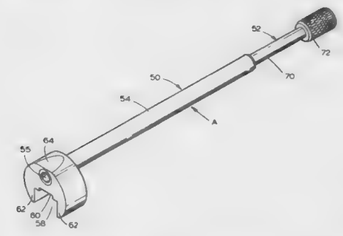
spring means urging said transport finger outwardly toward said guide rail, whereby said transport finger is effective to shift a fastener part toward said attachment position when said transport finger is moved in one direction and is effective to move past a stationary fastener when the finger is moved in the opposite direction.

4,733,812

INSTALLATION TOOL FOR ROOF GUTTERS

Don Lewis, 2813 Headland, St. Charles, Mo. 63301, and Roy E. Evans, 1709 Seven Pines Dr., St. Louis, Mo. 63146

Filed May 13, 1987, Ser. No. 49,279
Int. Cl.[4] B25C *1/02*
U.S. Cl. 227—147 **15 Claims**



1. A tool for installing on a support structure a roof gutter formed from a sheet metal trough and brackets extended across the open upper end of the trough to reinforce it, said tool comprising: a nail guide having a bore large enough to receive a gutter nail and being configured to fit over a bracket of the gutter said nail guide having a downwardly opening cutout to receive the bracket of the gutter so as to align the bore and a nail within it with a portion of the gutter that is determined by the bracket; and a nail driver extended into the bore and beyond one end of the bore for delivering, when struck, an impact to the nail so as to drive the nail through the roof gutter and into the support structure.

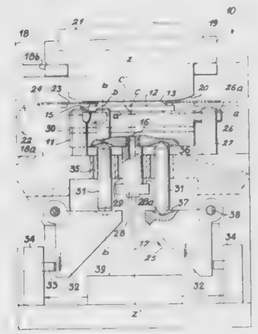
4,733,813

METHOD AND APPARATUS FOR SOLDERING ELEMENTS ON THE CORRESPONDING PADS OF A WAFER, IN PARTICULAR A WAFER HAVING HIGH-DENSITY INTEGRATED CIRCUITS

Michel Le Meau, Saint Georges; Jean-Pierre Boiteau, Villeveque, and Jean-Yves Vernon, Avrille, all of France, assignors to Bull S.A., Paris, France

Filed Oct. 1, 1986, Ser. No. 914,061
Claims priority, application France, Oct. 1, 1985, 85 14587
Int. Cl.[4] B23K *20/00, 20/10, 20/26*
U.S. Cl. 228—1.1 **14 Claims**

1. An apparatus for the bonding of elements to respective pads on a surface of a wafer, the pads being arranged along a predetermined line on said surface, comprising a bonding tool having a soleplate located at a fixed predetermined position; a non-rotating bench for supporting said wafer; at least three rods having first ends engaging said bench for supporting the bench for oscillation about a central point thereof, the rods having respective longitudinal axes which intersect the wafer surface at respective predetermined fixed points located within an area of the wafer surface between said predetermined line of pads and said central point; and rod actuator means engaging second ends of said rods for moving the rods along said longitudinal axes and for moving said bench vertically from a rest position which is remote from said soleplate to an operating position at which the soleplate engages the wafer surface, the rod actuating means being formed to enable the rods to be independently moved so as to apply forces to said predetermined fixed points on said wafer surface for oscillating said bench about said central point so as to cause said soleplate to exert sequentially on said elements a required force for bonding the elements to the pads.

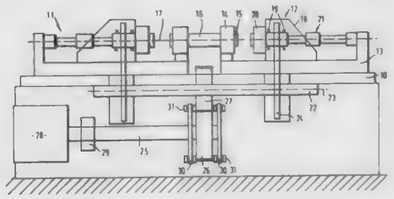


4,733,814

FRICTION WELDING APPARATUS

Robert D. Penman, 15 Steeple Close, West Canford Heath, Poole, Dorset BH17 9BJ, England

PCT No. PCT/GB86/00107, § 371 Date Oct. 28, 1986, § 102(e) Date Oct. 28, 1986, PCT Pub. No. WO86/05134, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 923,839
Claims priority, application United Kingdom, Mar. 2, 1985, #502401
Int. Cl.[4] B23K *20/12*
U.S. Cl. 228—2 **4 Claims**



1. Apparatus for simultaneously friction welding two members to the ends of an intermediate component (**16**), in the required angular orientation relative to one another about a common longitudinally extending axis (**17**), comprising:

a bed (**10**);

means (**14**) for holding said intermediate component (**16**) stationary relative to said bed;

two head assemblies (**11**, **12**), each adapted to be fixed relative to said bed and comprising a holder (**20**, **40**) for a respective one of said members, bearing means (**19**) supporting said holder for rotation about said axis, and means (**21**) for applying a force along said axis to said holder (**20**, **40**) so that said member is brought into engagement with said intermediate component under said force;

a lay shaft (**22**) supported for rotation about its axis (**23**), extending lengthways of said bed;

transmission means (**24**) connecting each of said holders with said lay shaft, and establishing a positive connection therebetween so that said holders remain in a fixed angular orientation relative to one another about said axis (**17**);

means (**28**, **25**, **26**, **27**, **29**) for driving said lay shaft, and

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means (30, 31) for braking said lay shaft, said means for braking said lay shaft (22) acting thereon substantially at the centre thereof, equidistant between said transmission means (24).

4,733,815

PROCESS FOR GUIDING SHEETS TO BE BUTT-WELDED TOGETHER AND APPARATUS WITH MEANS FOR CONVEYING AND GUIDING SHEETS OR STRIPS TO BE BUTT-WELDED TOGETHER

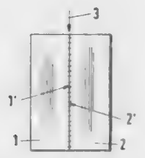
Joseph Sturm, Duisburg, Fed. Rep. of Germany, assignor to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Feb. 19, 1987, Ser. No. 16,598

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3605946

Int. Cl.[4] B23K *26/08, 37/00*

U.S. Cl. 228—4.1 **8 Claims**



1. An apparatus for conveying and guiding sheets to be butt-welded comprising conveying means for each of the sheets disposed laterally one beside the other and vertically offset in relation to one another, the conveying means moving the sheets together at an acute angle in the same horizontal plane, the conveying means forming conveying planes which lie at an acute angle relative to one another and which run together in a common horizontal plane upstream of the welding apparatus, and at least one guide means in the exit zone of the conveying planes and extending along the conveying path, the guide means having guide surfaces which lie in the same vertical plane and extend to immediately in front of the welding device and to which the edges of the strips or sheets are guided from opposite sides.

8. A welding apparatus comprising a laser welder, means for conveying thereto two sheets to be butt-welded, and a vertical guide, the conveying means comprising two sets of rollers whose axes are at an acute angle to the direction of conveying advance, each roller set defining a plane with the planes of the two sets forming an angle, the apparatus further including means for bringing sheets conveyed in the two planes into a common plane adjacent the welder, the vertical guide being positioned immediately upstream of the welder and including means for bringing the sheets into full lateral contact.

4,733,816

METHOD TO PRODUCE METAL MATRIX COMPOSITE ARTICLES FROM ALPHA-BETA TITANIUM ALLOYS

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1986, Ser. No. 936,679

Int. Cl.[4] B23K *20/00, 31/00*

U.S. Cl. 228—190 **12 Claims**

1. A method for fabricating a titanium alloy composite consisting of at least one filamentary material selected from the group consisting of silicon carbide, silicon carbide-coated boron, boron carbide-coated boron, and silicon-coated silicon carbide, and an alpha-beta titanium alloy which comprises the steps of:

(a) providing a rapidly solidified foil of said alloy;

(b) fabricating a preform consisting of alternating layers of at least one of said filamentary materials and said foil; and

(c) applying heat at a level about 100° to 300° C. below the beta transus temperature of said alloy and a pressure of



about 1.5 to 15 ksi for about 0.2 to 24 hours to consolidate said preform.

4,733,817

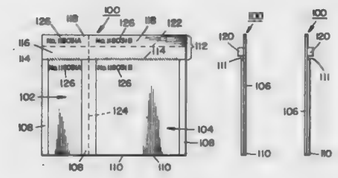
ENVELOPE SYSTEM WITH MULTIPLE POCKETS

Kenneth R. Makowka, 19 Stirrup Place, Wilton, Conn. 06897

Filed Feb. 5, 1987, Ser. No. 11,911

Int. Cl.[4] B65D *27/00*

U.S. Cl. 229—69 **33 Claims**



1. An envelope system made of a material for the placement of contents therein comprising:

at least two pockets detachably connected to form an envelope system;

each pocket having a securely closed periphery except for an opening means thereof through which contents can be placed into the pocket, and closing means which is adapted to close and secure the opening after the contents are placed into the pocket, the closing means providing a completely closed pocket after the closing means is closed and secured over the opening;

the closing means of each pocket having two portions, a main portion having a securing means for securing the closing means to the envelope material over the opening of the pocket and a detachable end portion which can be removed from the main portion of the closing means as a receipt;

the closing means of a first pocket having first indicia on its end portion identifying the first pocket, the first indicia also being on the first pocket or the main portion of the closing means associated with the first pocket; and

the closing means of each other pocket in the envelope system having at least a portion of the first indicia of the first pocket on its respective end portion, at least a portion of the first indicia also being on each other pocket or the main portion of the closing means associated with each other pocket in the envelope system, identifying said each other pocket as being part of the same envelope system whereby all pockets even though detached from one another can be readily identified as being from the same envelope system and detachable receipts are provided for each pocket.

4,733,818

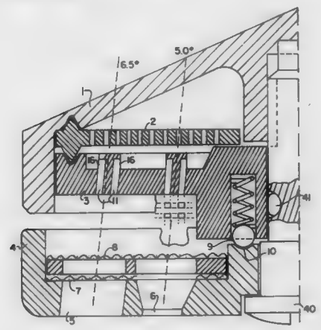
SHOWERHEAD WITH MEANS FOR SELECTING VARIOUS FORMS OF OUTPUT STREAMS

Elie P. Aghnides, deceased, late of New York, N.Y.; by Chemical Bank, Administrator, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,158

Int. Cl.[4] B05B *1/12, 1/16*

U.S. Cl. 239—428.5 **1 Claim**



1. In a showerhead:

showerhead means having a centerline and a row of a given number of orifice means,

each orifice means defining at least one orifice for directing at least one streamlet downstreamwardly,

said row being a circle having its center located on said centerline,

said showerhead means also having a second circular row concentric with the first row and also having said given number of orifice means,

the orifice means in each row being equally angularly spaced from each other along the row, and the orifice means in one of said rows being staggered angularly about said centerline from the orifice means in the other of said rows, and

rotatable means downstream of said showerhead means and rotatable about said centerline into at least three angular positions,

said rotatable means including screen means for mixing the water of said streamlets with air only once while the streamlets are passing the rotatable means, when said rotatable means is in one of its angular positions,

said rotatable means including screen means for mixing the water of said streamlets with air first and second times while the streamlets are passing the rotatable means, when said rotatable means is in another one of said angular positions of said rotatable means,

said rotatable means including means for allowing the streamlets to pass said rotatable means in the form of a spray without any substantial mixing when said rotatable means is in still another one of its angular positions,

said rotatable means including two concentric rows of holes through which said streamlets pass,

said rotatable means also including two separate screen means one above the other,

said rotatable means including a lost-motion connection between said two separate screen means and including means for providing four different types of output streams by selectively rotating said rotatable means,

said rotatable means being selectively operable to provide two types of streams while said connection is in its lost-motion mode, to provide a third type of stream when the lost-motion connection is operated in one direction, and to provide a fourth type of stream when said connection partially traverses the lost-motion mode after providing the third type of stream.

4,733,819

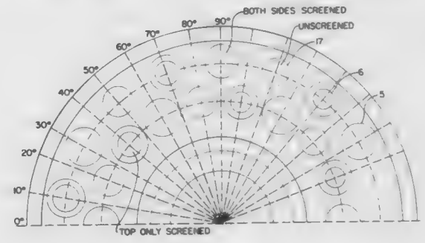
SHOWERHEAD WITH MEANS FOR SELECTING VARIOUS FORMS OF OUTPUT STREAMS

Elie P. Aghnides, 795 Fifth Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 269,158, Jun. 1, 1981. This application Aug. 11, 1983, Ser. No. 522,294

Int. Cl.[4] E03C *1/084;* **B05B** *1/18*

U.S. Cl. 239—428.5 **15 Claims**



1. In a device for producing bubbly streams over a range of water pressures:

means for receiving water from a source and producing an output comprising jets of water,

first means which when in the path of said jets breaks up said jets, offers resistance thereto, and mixes the resulting water with air to produce a bubbly jet of a first cross-section when the air pressure is in the higher part of said range,

second means which when in the path of said jets breaks up said jets, offers resistance thereto in a lesser amount than that offered by said first means, and mixes the resulting water with air to produce a bubbly jet of a second cross-section, that is smaller than said first cross-section, when the water pressure is in the lower part of said range, and

means operable for selectively causing said jets to either impinge only on said first means or only on said second means.

4,733,820

VIBRATING ELEMENT FOR USE ON AN ULTRASONIC INJECTION NOZZLE

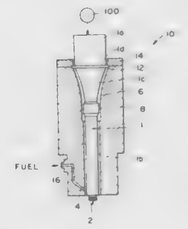
Masami Endo, Kawasaki; Kakuro Kokubo, Atsugi; Hideo Hirabayashi, Yachiyo; Yoshinobu Nakamura, Urawa, and Daijiro Hosogai, Kawajima, all of Japan, assignors to Ton Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1985, Ser. No. 807,133

Claims priority, application Japan, Dec. 11, 1984, 59-260065

Int. Cl.[4] B05B *3/14*

U.S. Cl. 239—102.2 **1 Claim**



1. A vibrating element for use with an ultrasonic injection nozzle typically having an ultrasonic vibrating means and a liquid supply passage means for supplying liquids comprises:

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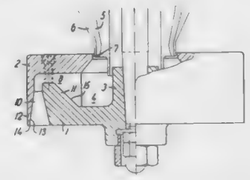
a body having a first and second end and a longitudinal dimension;
said first end being in fluid communication with the liquid supply passage means;
an exterior peripheral wall defining said body intermediate said first and second end;
a multi-stepped edged portion being formed on said exterior peripheral wall, each step defining an edge having an external cross-sectional dimension, said external cross-sectional dimension being perpendicular to the longitudinal dimension of said body, the external cross-sectional dimension of each said edge portion being the same, each said edge being adapted to severe and atomize said liquid;
whereby the liquid supplied from the passage means is atomized from said edges as said liquid cascades over successive edges when said body is driven by the ultrasonic vibrating means.

4,733,821

ATOMIZER WHEEL FOR USE IN A SPRAY DRYING APPARATUS

Arnold N. Jensen, Målov, and Jan Pisecky, Tåstrup, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Oct. 21, 1985, Ser. No. 789,909
Claims priority, application Denmark, Oct. 26, 1984, 5122/84
Int. Cl.⁴ B05B *3/10, 3/02;* **B01D** *1/16*
U.S. Cl. 239—224 **6 Claims**



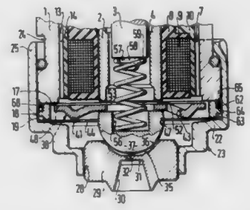
1. An atomizer wheel for a spray drying apparatus, comprising:
(a) an inner, cup-shaped wheel member (1) defining a central hub (3) for connection to rotary drive means, and
(b) an outer, cup-shaped wheel cover (2) of larger diameter than the wheel member, inverted with respect thereto, and overlying the wheel member to successively define therewith in a radially outward direction;
(1) an annular liquid supply chamber (4) surrounding the hub and having an inlet opening (7),
(2) a plurality of discrete, radially oriented, circumferentially spaced, elongate ejection ducts (8) having lengths extending over a substantial portion of the radius of the wheel and in open communication with the supply chamber through inlet portions having decreasing cross-sectional areas in a radially outward direction away from the supply chamber, and
(3) a continuous annular concentric discharge slot (10) substantially perpendicular to the ejection ducts and having an upper end merging smoothly with outer ends of the ducts and a lower, outlet end having an outer wall (12) outwardly inclined to the wheel axis at an angle no greater than 15°,
(c) the lengths of the ejection ducts imparting a radial velocity to liquid being atomized, due to centrifugal force, of the same order of magnitude as a tangential velocity imparted to the liquid by the rotation of the wheel, and such radial velocity thereafter being transformed into an axial velocity component during the spreading of the liquid into a coherent film on the outer wall of the discharge slot.

4,733,822

FUEL INJECTION VALVE WITH COMPENSATION SPRING

Peter Romann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 860,935
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522225
Int. Cl.⁴ F16K *31/06;* **F02M** *51/06*
U.S. Cl. 239—585 **3 Claims**



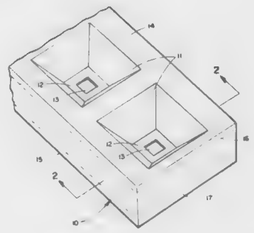
1. An electromagnetically actuatable valve for fuel injection systems of internal combustion engines, comprising a valve housing of ferromagnetic material having an inner bore with an end face, a nozzle holder clamped to said housing having a portion which surrounds a portion of said housing, said nozzle holder having an inwardly directed step that forms a shoulder opposite said end face of said housing, a core of ferromagnetic material, a magnetic coil attached to said core actuating a valve element cooperating with a valve seat, a flat armature which activates said valve element, a spacer ring having a collar, said spacer ring positioned between said end face of said housing and said shoulder of said nozzle holder, a guide diaphragm having an outer face surface in contact with said spacer ring and said shoulder of said nozzle holder and an inner portion in contact with said flat armature, resilient means positioned to rest between said spacer ring collar and said end face of said valve housing which also engages a bore surface of said nozzle holder means clamped to said housing.

4,733,823

SILICON NOZZLE STRUCTURES AND METHOD OF MANUFACTURE

Herbert A. Waggener, Lincolnshire, and Joseph C. Zuercher, Wilmette, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Continuation of Ser. No. 661,005, Oct. 15, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 922,643
Int. Cl.⁴ A62C *31/02;* **G01D** *15/18*
U.S. Cl. 239—601 **2 Claims**



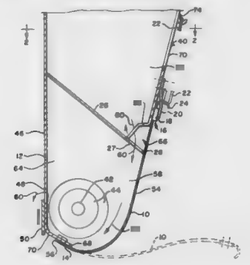
1. A nozzle comprising:
a unitary nozzle body formed of a p type monocrystalline silicon having a substantially square entrance aperture of a first cross-sectional area which tapers to a second substantially square cross-sectional area which is smaller than the first cross-sectional area of said entrance aperture; and
a membrane of n type monocrystalline silicon having a thickness of 10 microns or less formed within said second cross-sectional area, said membrane having a singular substantially square exit aperture therein, said exit aperture having a first cross-sectional area which is smaller than said second cross-sectional area of said entrance aperture and which tapers from said second cross-sectional area of said entrance aperture to a second cross-sectional area of said exit apeture, said exit aperture first cross-sectional area being smaller than said second cross-sectional area thereof, said cross-sections being substantially parallel to the (100) planes of the monocrystalline silicon and said entrance and exit apertures being substantially concentric.

4,733,824

PARTICULATE MATERIAL DISTRIBUTOR, HAVING A TENSIONED FLEXIBLE COVER FOR CLEAN-OUT APERTURE BELOW HOPPER

Frederick Alexander, Private Bag 2502, Banket, Zimbabwe

Continuation-in-part of Ser. No. 635,245, Jul. 27, 1984, abandoned. This application Jul. 31, 1986, Ser. No. 891,150
Int. Cl.⁴ A01C *15/00*
U.S. Cl. 239—650 **4 Claims**



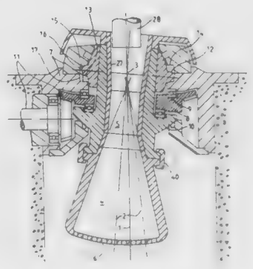
1. A hopper, comprising:
wall means defining a box having two opposite end walls, a front wall, a bottom wall and a rear wall, said box enclosing in a lower portion thereof a dispensing mechanism which is constructed and arranged to direct fluent material, when contained in said hopper, towards means defining an outlet aperture from said box through said wall means in said lower portion;
said two opposite end walls having respective front edges which are convexly curved as seen in side elevation
a normally-closed clean-out aperture being defined between said curved front edges of said two opposite end walls, and between an upper edge provided on said bottom wall meanss a lower edge provided on said bottom wall means, so that said curved front edges, said upper edge and said lower edge define the perimeter of said aperture;
a normally-closed, openable cover means for said clean-out aperture, said cover means comprising at least one sheet of deformably flexible inert non-metallic material secured along one edge thereof, to said box along one of said upper edge and said loer edge of said aperture; and
means for releasably securing each said sheet of said cover means to said box along the other of said lower edge and said upper edge with said cover means tensioned into wrapped sealing engagement with both said curved front edges of said end walls, thereby normally closing said clean-out aperture.

4,733,825

CENTRIFUGAL GRINDING MILLS

John M. Boyes; William R. Rayner, and Charles H. Warman, all of Sydney, Australia, assignors to Research and Development Party Ltd., North Sydney, Australia

Filed Jul. 24, 1985, Ser. No. 758,424
Claims priority, application Australia, Jul. 24, 1984, PG6185
Int. Cl.⁴ B02C *17/14*
U.S. Cl. 241—19 **21 Claims**



1. A centrifugal grinding mill comprising:
(a) a grinding chamber of substantially circular cross-section with respect to an axis of symmetry and constrained to have nutating motion about a relatively stationary axis, said axis of symmetry and said relatively stationary axis intersecting at a point of nutation symmetry;
(b) support means for supporting said grinding chamber;
(c) a feed passage in communication with and directed towards said grinding chamber;
(d) driving means for driving said grinding chamber about said relatively stationary axis; and
(e) constraint means for determining the form of nutating motion of said axis of symmetry of said grinding chamber;
(f) said grinding chamber being adapted to carry a grinding charge, said point of nutation symmetry being disposed relative to said grinding chamber so that nutating motion of said grinding chamber during operation of the grinding mill causes said grinding charge to dilate and to perform a tumbling motion within said grinding chamber, said grinding chamber having an inner surface configured to exert pressure on said grinding charge limiting its dilation and providing effective containment thereof, said surface exerting pressure on said grinding charge in a direction away from said point of nutation symmetry.

4,733,826

IMPACT CRUSHING MACHINE

Keiji Komori, Yokohama, and Yoshinaga Takayama, Tokyo, both of Japan, assignors to Nara Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 870,034, Jun. 3, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 86,198
Claims priority, application Japan, Jun. 5, 1985, 60-122253
Int. Cl.⁴ B02C *13/282*
U.S. Cl. 241—52 **1 Claim**

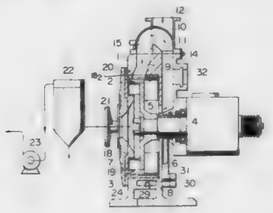
1. An impact crusher comprising
a cylindrical casing,
a rotatable plate having first and second sides and an axis mounted in said cylindrical casing,
means for rotating said plate at high speed about said axis,
impact pieces disposed on said first side of said plate in a radial direction,
classifying blades disposed on said second side of said plate,
a first pipe passage for the supply of material to be crushed connected to said casing and terminating facing an inward zone relative to said radial direction of said impact pieces,

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a discharge outlet of fine powder being formed in said casing,

said discharge outlet being connected to a suction blower through a filter,

said casing having an inner-circumferential surface having a size relationship with said rotatable plate to provide an external clearance to said rotatable plate, which provides means to conduct the crushed material discharged from the external circumference of said impact pieces to the external circumference of said classifying blades while guiding the crushed material by the inner-circumferential surface of said casing,



a discharge outlet of coarse powder is formed in a portion of said casing facing the external circumference of said classifying blades,

said discharge outlet of coarse powder being connected to said first pipe passage for the supply of material by means of a second pipe passage, and

a classifying adjustment ring, having a circular groove engaged by a portion of said classifying blades with a small clearance therebetween, is disposed adjacent said classifying blades, the area of air passage between said classifying blades being adjusted by means of said classifying adjustment ring, thereby enabling the flow speed of air to be adjusted.

4,733,827

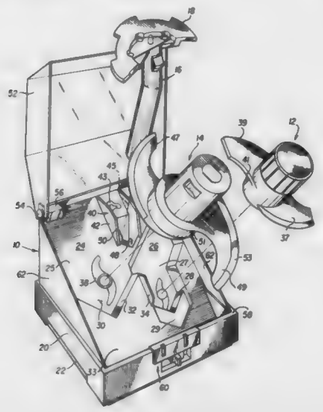
ROTARY FOOD PROCESSOR TOOL STORAGE CONTAINER

James E. Williams, Stamford, Conn., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Oct. 15, 1986, Ser. No. 918,938

Int. Cl.[4] A47B *81/00*

U.S. Cl. 241—101.2 **5 Claims**



1. A rotary food processor tool storage container for storing and protecting specially configurated food processor tools and accessories comprising:

an upstanding enclosed hollow base having an inclined support member thereon,

first and second sloping, side-by-side open pockets positioned in said inclined support member separated by an upstanding partition positioned between said sloping open pockets,

said first pocket adaped to store a dough blade rotary food processor tool and said second pocket adapted to store a metal blade rotary food processor tool, said partition laterally separating the metal blade of said metal blade rotary food processing tool from said dough blade food processor tool,

said first and second open pockets each having shelves adapted to accommodate the nesting of the side surface of a hub portion below one blade of the associated rotary tool which is adapted to be stored thereon,

each of said pockets having a sloping lower-blade-support surface, the sloping lower-blade-support surface of said first pocket for storing said dough blade tool is at a lower level than said sloping lower-blade-support surface of said second pocket for storing said metal blade tool, and

the planes of said lower-blade-support surface are parallel and are inclined to the horizontal at an angle in the range from about 40° to about 50° and

said shelves, respectively, of said first and second pockets being defined by walls oriented generally perpendicular to the plane of the lower-blade-support surface of the respective open pocket,

an elevated support extending upwardly from said inclined support member and having an open channel therein extending downwardly into said hollow base adapted to receive support therein a detachable stem from a rotary food processing tool, said elevated support being positioned above said first and second pockets on said inclined support member, and

a transparent lid pivotally mounted on said inclined support member for covering said storage container when said lid is closed thereon and permitting viewing of the rotary tools positioned thereon.

4,733,828

MINERAL BREAKER

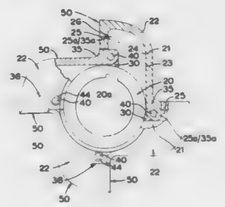
Alan Potts, Nottingham, United Kingdom, assignor to MMD Design & Consultancy Limited, England

Continuation of Ser. No. 814,015, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 570,633, Jan. 13, 1984, abandoned. This application Jan. 30, 1987, Ser. No. 14,135

Claims priority, application United Kingdom, Jan. 20, 1983, 8301549; Jul. 6, 1983, 8318297

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—236 **8 Claims**



1. In a mineral breaker including a breaker drum having an axis and a plurality of breaker teeth projecting radially from the drum and arranged in circumferentially extending groups of teeth spaced along the axis of the drum, each of said breaker teeth having a leading face, and further including a plurality of opposed breaker teeth positioned so that on rotation of the drum mineral lumps to be broken are gripped between the leading face of the teeth on the drum and a pair of said opposed teeth to thereby break the mineral lump gripped therebetween by a snapping action, the improvement of each of the breaker teeth in each circumferentially extending group comprising a radially extending projection enveloped by a tooth sheath, each projection having a forwardly facing recess into which a trailing end of its immediately preceding tooth sheath is received for restraining radial outward movement of said trailing end, each sheath having a leading wall provided with an opening through which said trailing end of its preceding tooth sheath passes to enter said recess.

4,733,829

AUTOMATIC INSPECTING APPARATUS FOR YARN JOINING DEVICE

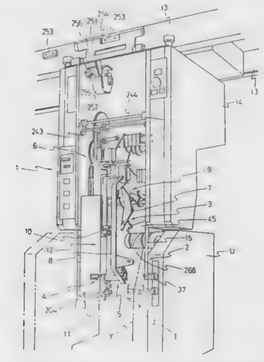
Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Division of Ser. No. 808,851, Dec. 13, 1985, Pat. No. 4,703,651. This application Apr. 23, 1986, Ser. No. 854,832

Claims priority, application Japan, Dec. 17, 1984, 59-266933

Int. Cl.[4] B65H *54/20, 54/22*; C01L *5/04*

U.S. Cl. 242—35.6 R **7 Claims**



2. Yarn removal method for removing and inspecting a yarn joint portion in a winder, said method comprising the steps of:

winding said yarn by means of a winding unit for winding-up said yarn from a yarn feeding bobbin onto a take-up package along a linear yarn travelling path,

joining said yarn by means of a yarn joining device which is located in a position deviated from the yarn traveling path and which performs a yarn joining operation while keeping the yarn bent during the joining operation, and

sampling said yarn by means of a yarn sampling mechanism which cuts and removes a sample yarn having a joint portion included therein from said yarn joining device,

characterized in that said yarn sampling mechanism cuts said yarn prior to the completion of the yarn joining operation while the yarn is kept bent, to thereby take said sample yarn is said bent condition out of the winding unit.

4,733,830

FISHING REEL

William J. Hollander, 5412 Valhalla Dr., Boulder, Colo. 80301

Filed Sep. 23, 1985, Ser. No. 779,156

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.5 R **7 Claims**

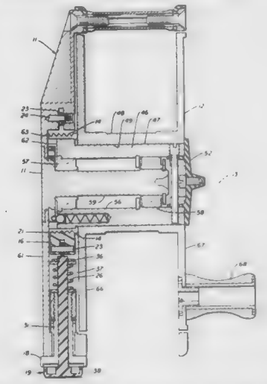
1. In a fishing reel having a support and a spool for holding a fishing line, said spool being mounted on said support for rotation about an axis in opposite directions for letting out and winding up respectively of said line, the improvement comprising:

means providing a circular braking surface positioned coaxially with said axis and secured for rotation with said spool;

a brake member mounted on said support for movement to and from said surface;

a lever secured to said brake member and having a pivot arcuately spaced therefrom relative to said axis of rotation;

a spring biasing said brake member to said surface whereby the frictional retarding force applied by said brake member to said surface increases and decreases depending upon the direction of rotation of said spool;



a manually engageable screw carried by said support and connected to said spring for selectively setting said pressures and the amount of drag; and

a manually engageable plunger mounted concentrically of said screw and connected to said braking member and being manually engageable for applying selective added pressure of said brake member against said surface to provide selective braking of said spool in addition to said drag.

4,733,831

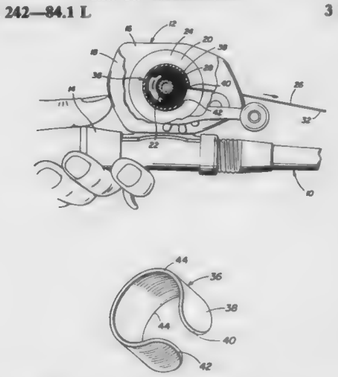
ANTI-BACKLASH ATTACHMENT FOR FISHING REEL

Clinton A. Runyon, 174 Emerite Dr., Lafayette, La. 70506

Filed Aug. 6, 1986, Ser. No. 893,886

Int. Cl.[4] A01K *89/00*

U.S. Cl. 242—84.1 L **3 Claims**



1. In combination with a bait casting reel of the type including a rotary spool upon which a first quantity of line is wound in excess of that amount of line to be unwound from the spool during a bait casting operation, an anti-backlash attachment for said spool, said attachment including a partial cylindrical clip including spaced apart ends and constructed of resilient mate-

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rial and of appreciably greater than 180° and less than 360° in angular extent, said spool having a central portion thereof about which said quantity of line is wound, the axial extent of said clip being at least slightly less than the axial extent of said central portion, said clip being openable and radially engageable about said spool and a second quantity of line thereon less than the first quantity with said clip at least lightly frictionally engaged with the outer convolutions of said second quantity of line and said line including a free end portion comprising a third quantity of said line extending outward between the spaced ends of said clip and being windable on said spool over said clip, said clip including uninterrupted opposite longitudinal edges, said ends including uninterrupted convexly rounded end edges each merging smoothly into the corresponding ends of said opposite side longitudinal edges.

4,733,832

CABLE WINDING DEVICE

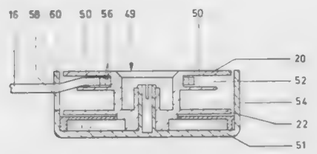
Reinhard Napierski, Talstrasse 18, D-6361 Niddatal 1, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,471

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534956; Nov. 12, 1985, 3540012

Int. Cl.⁴ B65H *75/48*

U.S. Cl. 242—107.6 **9 Claims**



1. A device for winding a cable, said device comprising housing including a feed and discharge guide for the cable and a cable drum which is rotatably mounted in the housing and to which one end of the cable is fastened, said cable drum including at least two separate winding chambers separated by a radially extending, intermediate partition, the end of the cable being fastened to the cable drum in said first winding chamber and said first winding chamber including at least one deflector means, mounted radially outwardly of said partition, for, when the winding has filled the first winding chamber, deflecting the cable over the outer radial edge of the intermediate partition into the second winding chamber, said at least one deflector means comprising a guide member provided on the housing which controls winding of the cable onto the drum in the first winding chamber above the intermediate partition, said guide member comprising a surface of the feed and discharge guide, and the feed and discharge guide being disposed radially outwardly of the second winding chamber and extending from a point located outwardly of the first winding chamber approximately half the width of the cable from the intermediate partition to the area radially outwardly of the second winding chamber.

4,733,833

VEHICLE DOCKING SYSTEM

Gordon J. Shepherd, Lindacre House, Hall Lane, Mobberley, Cheshire, England

Filed Aug. 13, 1984, Ser. No. 640,343

Claims priority, application United Kingdom, Aug. 17, 1983, 8322176

Int. Cl.⁴ B64F *1/18*

U.S. Cl. 244—114 R **11 Claims**

1. A vehicle docking system comprising load responsive means disposed along the path of travel on the ground followed by a vehicle to a docking point; a visual display coupled to and receiving signals from the load responsive means providing vehicle position information to the vehicle operator dependant upon the load sensed by said load responsive means, the visual display comprising a plurality of columns of indicators, one indicating the desired path of the vehicle and two



other indicator columns one on each side of said one column which when actuated indicate divergence of the vehicle to a side of the desired vehicle path, said indicators that indicate divergence being connected to an responding to load responsive means off the desired path of travel of the vehicle.

4,733,834

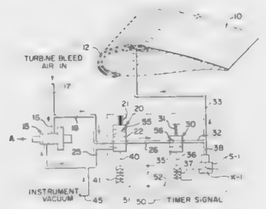
DEICER CONTROL SYSTEM

Ronald W. Phillips, II, Mogadore, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 24, 1986, Ser. No. 832,187

Int. Cl.⁴ B64D *15/00*

U.S. Cl. 244—134 R **6 Claims**



1. A system for controlling inflatable units for deicers comprising inflatable units that are operative upon flexing to break ice accumulated thereon

a suction regulating valve, a suction line connected to said regulating valve,

a pressure source connected to said regulating valve for creating a suction in said suction line,

valve means operative for interconnecting said suction line and said pressure source to said inflatable units for controlling the condition of said inflatable units, said valve means operative in a first mode for maintaining a vacuum on said inflatable units, said valve means operative in a second mode for maintaining a continuous flow of pressurized air to said inflatable units, and said valve means operative in a third mode for locking said inflatable units in a distended condition without the further flow of pressurized air thereto.

4,733,835

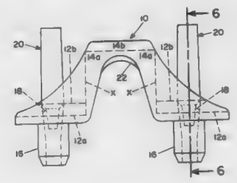
CABLE GUIDE FOR BICYCLES

Raphael Schlanger, New Rochelle, N.Y.; David Irwin, Newtown, and Thomas C. Patterson, Westport, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.

Filed Apr. 21, 1986, Ser. No. 854,433

Int. Cl.⁴ F16B *15/00*

U.S. Cl. 248—71 **3 Claims**



1. A cable guide for affixing a brake cable or the like to a tube of a bicycle frame comprising a body including two base portions, each having and upwardly facing surface and having a concave undersurface adapted to seat on the frame tube in spaced-apart relation longitudinally thereof from the other base portion, and each base portion having at least one hole extending therethrough, a ferrule portion extending up from the base portion and adapted to receive the cable, the ferrule portion including in end profile inverted generally U-shaped portions extending upwardly from each base portion and a top connecting portion joining the upper parts of the U-shaped portions, the ferrule portions adapted to receive the cable in substantially parallel relationship to the base portions with the top connecting portion overlying the cable and the base portions underlying it, and a split sleeve portion extending down from each base portion in alignment with the hole and adapted to extend through a hole in the frame tube, and a mandrel adapted to be received through the hole in each base portion and to extend through the sleeve and to expand the legs of the sleeve outwardly into tight engagement with the wall of the hole in the tube and expand the ends of the split sleeve outwardly within the tube, whereby the expanded sleeves retain the guide on the frame tube.

4,733,836

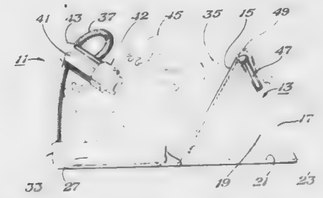
NURSING BOTTLE HOLDER

Robert J. Barnes, 937 Springdale, Bedford, Tex. 76021

Filed Jul. 21, 1986, Ser. No. 887,810

Int. Cl.⁴ A47D *15/00*

U.S. Cl. 248—106 **4 Claims**



1. An apparatus for placement on a level surface for bottle feeding an infant, comprising in combination:

a compartment having a closed position and an open position, the compartment having a flat base for placing on the level surface, a front wall located on a forward edge of the base which inclines upwardly relative to the base at an acute angle when the compartment is in a closed position, a rear wall which extends from the upper edge of the front wall downward to the base when the compartment is in the closed position, and closed ends at each side edge of the front wall, rear wall and base, defining a container for storage of articles relative to infant feeding;

a horizontal support;

mounting means for securing the horizontal support to the forward edge of the base for locating the horizontal support coplanar with the base and intersecting the front wall at an obtuse angle, for supporting the infant generally on his side with his back in contact with the front wall at the junction of the horizontal support and the front wall;

a flexible stem having a free end and carried by the apparatus for positioning the free end in front of the infant; and

retainer means attached to the free end of the neck for holding a bottle in front of the infant in a position to allow the infant to drink from the bottle while supported generally on his side by the front wall.

4,733,837

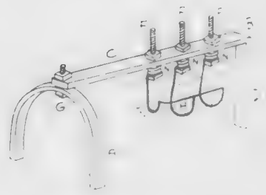
NURSING BOTTLE SUPPORT

Everardo M. Aguirre, La Perpetua 1688, J. del Country S.H., 44210 - Guadalajara, Jal., Mexico

Filed Jun. 23, 1986, Ser. No. 877,429

Int. Cl.⁴ A47B *15/00*

U.S. Cl. 248—106 **16 Claims**



1. A nursing bottle support, comprising:

an articulated tripod having three legs;

first screw means for adjusting said one leg relative to said other two legs;

a framework hanging under said tripod and arranged for supporting a nursing bottle for feeding a baby, one of said legs of said tripod being adjustable relative to the other two legs in a horizontal direction by turning about a substantially vertical axis so that said legs of said tripod are adjustably movable away from the skin of the baby to be fed with the nursing bottle and so that the framework is still able to support the nursing bottle for feeding the baby without moving downwardly towards the baby; and

second screws means for adjusting a distance between said framework and said tripod, said framework including at least two J-shaped vertically parallel hooks, each hook having a hooked end and a top stem end with a ring-shaped portion being disposed horizontally from said top stem end, said ring-shaped portion being sized to cooperate with said second screw means for supporting said framework, one of said hooks being arranged for grasping a neck of the nursing bottle and another of said hooks being arranged for receiving a body of the nursing bottle.

4,733,838

TRANSPORTABLE COMPUTER

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Oct. 22, 1985, Ser. No. 790,302

Claims priority, application Netherlands, Oct. 22, 1984, 8403202; Oct. 22, 1984, 8403201; Dec. 24, 1984, 8403925; Dec. 24, 1984, 8403924

Int. Cl.⁴ A47B *9/00*

U.S. Cl. 248—124 **11 Claims**

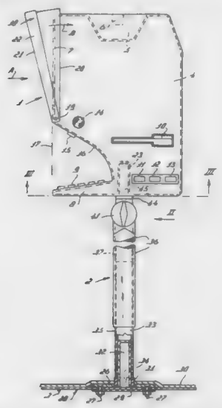
1. A computer of a type which is portable and transportable by a person of ordinary strength, comprising:

a. at least one housing having a base constructed so that the

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computer can be used in an operative position and provides means for the computer to be detachably combined with and secured to a part of a vehicle;

b. a support comprising at least one securing means for securing the computer to the vehicle's floor, said support being permanently affixed to the vehicle floor of the vehicle's cab; and



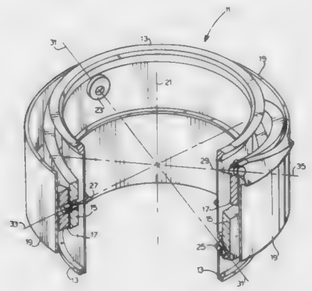
c. said support further comprises a height adjustment means for selectively adjusting the height of the computer with respect to the floor of the vehicle cab and pivot means arranged so that the computer is adapted to be pivoted about an upward axis and also about a substantially horizontal axis.

4,733,839

NONORTHOGONAL GIMBAL

James D. Gehris, Rancho Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 24, 1986, Ser. No. 934,467
Int. Cl.[4] F16M *11/12*
U.S. Cl. 248—180 **5 Claims**



1. A gimbal comprising:

a first shell;

a second shell encircling and being rotatively attached to the first shell by a first pair of pivots so that the first shell can rotate relative to the second shell about a first axis of rotation;

a third shell encircling and being rotatively attached to the second shell by a second pair of pivots so that the second shell can rotate relative to the third shell about a second axis of rotation;

a fourth shell encircling and being rotatively attached to the third shell by a third pair of pivots so that the third shell can rotate relative to the fourth shell about a third axis of rotation; and

two of the three axes of rotation being nonorthogonal, and the remaining axis of rotation being orthogonal to the plane containing the two nonorthogonal axes of rotation; whereby

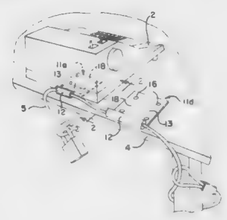
the first shell is free to rotate relative to the fourth shell.

4,733,840

TIE-DOWN SECURITY SYSTEM AND SECURITY PLATE

Michael D'Amore, Lake Villa, Ill., assignor to Acco World Corporation, Wheeling, Ill.

Filed Jul. 25, 1986, Ser. No. 890,704
Int. Cl.[4] E05B *73/00*
U.S. Cl. 248—205.3 **11 Claims**



1. A fastener for use in a device for anchoring one or more items against removal comprising:

a base having a center area,

means for fixing said base to an item that is to be secured against removal,

a rigid member having a portion permanently attached to said base adjacent said center area and a free end spaced from said center area, said bendable member being bendable away from a plane defined by said base, and

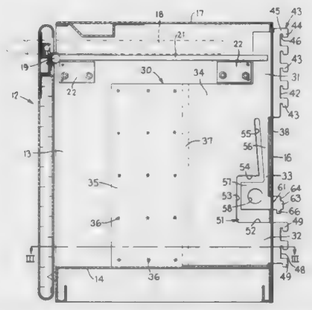
means for attaching said bendable member free end to an anchor.

4,733,841

HANGER BRACKET FOR CABINET

Harold R. Wilson, Holland, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed Aug. 8, 1986, Ser. No. 894,970
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—222.1 **13 Claims**



1. In combination, a shelflike furniture component having a pair of horizontally spaced vertically-extending end panels each having a vertically extending rear edge, a bracket structure fixed to each end panel and projecting rearwardly from the rear edge thereof, and a pair of substantially parallel uprights each having a row of vertically spaced elongated slots formed in a wall thereof for engagement with said bracket structures to thereby fixedly mount said furniture component on said uprights in a cantilievered relationship, each said bracket structure including a plurality of rearwardly-projecting downwardly-opening L-shaped rigid hooks disposed in vertically spaced relationship and being insertable through individual slots formed in the respective upright for fixedly attaching the furniture component to the uprights, the improvement wherein at least one of said bracket structures comprises:

a one-piece bracket member fixedly attached to said end panel and projecting rearwardly thereof, said one-piece bracket member being formed from a thin sheetlike metal plate of substantially uniform thickness, said sheetlike metal plate being substantially vertically oriented and positioned in close proximity to the respectively adjacent end panel;

said bracket member having a front part which is of a generally vertically-oriented platelike configuration which directly overlies and is fixedly secured to the respectively adjacent end panel at a location which is spaced forwardly a substantial distance from said rear edge;

said bracket member having a transition part which is integrally fixed to a rearward end of said front part and projects horizontally sidewardly therefrom in a direction away from said adjacent end panel, said transition part being spaced forwardly a substantial distance from said rear edge;

said bracket member including a horizontally-elongated cantilvered spring part of a generally vertically-oriented platelike configuration which is fixed to and projects rearwardly from the transition part in approximately parallel relationship to the adjacent end panel, the spring part being sidewardly spaced from the adjacent end panel by a small clearance space therebetween so that the spring part can be resiliently horizontally sidewardly deflected in either direction relative to the adjacent end panel substantially about the transition part, said spring part termianting in a free end which is located in the vicinity of said rear edge;

said spring part in the vicinity of the free end thereof defining thereon said plurality of rearwardly-projecting L-shaped rigid hooks, said hooks projecting outwardly beyond said free end and being substantially vertically coplanar with said spring part;

whereby the hooks associated with said one bracket structure can be sidewardly resiliently displaced relative to the respectively adjacent end panel and relative to the other bracket structure so as to permit the bracket structures to properly sidewardly align with the slots in the uprights.

4,733,842

MULTI-PURPOSE CLAMP

William W. Wilkerson, 1610 Gershwin Ave., St. Paul, Minn. 55119

Filed Sep. 5, 1986, Ser. No. 904,552
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—231.5 **15 Claims**

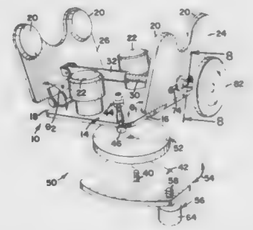
1. A multi-purpose clamp for clamping an attachment to a support structure, said clamp comprising:

(a) a first rigid panel having first and second edges, said edges being parallel and spaced apart, and a face and backside;

(b) a second rigid panel hingedly attached to the first edge of said first rigid panel and having a face;

(c) a third rigid panel hingedly attached to the second edge of said first rigid panel and having a face;

(d) an adjusting means for changing and holding the angular orientation of said second rigid panel with respect to said third rigid panel from a first position wherein the sum of the opposing angles between said second rigid panel and said first rigid panel, and said third rigid panel and said first rigid panel is substantially greater than 180°, to a second position wherein said sum of the opposing angles is substantially less than 180°; and



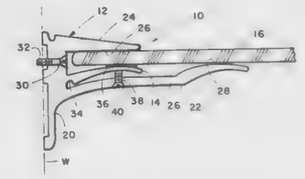
(e) opposing grips attached to the said faces of said second and third rigid panels.

4,733,843

FLEXIBLE GLASS SHELF BRACKET

Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Mar. 23, 1987, Ser. No. 29,238
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—250 **14 Claims**



1. A cantilever shelf support bracket having a laterally oriented throat for receiving a rear portion of a shelf comprising:

a lower support member forming a throat bottom;

an upper support member forming a throat top;

a vertical bracket mounting plate forming a throat inner end;

lower connecting means for joining said lower support member to said mounting plate;

upper connecting means for joining said upper support member to said mounting plate;

said lower connecting means being a hinge member rotatable about a horizontal transverse axis, said upper connecting means being rigid;

said hinge member being a reduced thickness portion of said one of said lower and upper connecting means;

a lower support platform rigidly attached to said mounting plate;

said lower support platform extending from said mounting plate behind said lower support member and terminating in an outer support means for supporting an inserted shelf; and

adjusting means between said lower support platform and said lower support member for rotatably adjusting said lower support member about said lower connecting means.

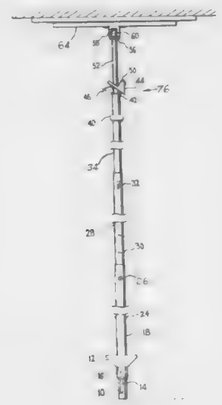
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,844

SHEET ROCK SUPPORT DEVISE

John Molloy, Box 3482, Stamford, Conn. 06902

Filed Feb. 10, 1987, Ser. No. 13,024
Int. Cl.[4] E04G *25/00*
U.S. Cl. 248—354.1 7 Claims



1. A temporary support device for use in installing an overhead sheetrock panel for aiding the installer in positioning and attaching a sheetrock panel to overhead structure, said temporary support device comprising:

a horizontally extending platform element upon which a panel of sheetrock can be supported temporarily,

an elongated support rod adapted for being positioned generally vertically and having upper and lower ends,

resilient connection means connecting said horizontally extending platform element in generally perpendicular relationship to said upper end of said elongated support rod for permitting said elongated support rod to be tilted somewhat away from vertical while said horizontally extending platform element remains horizontal,

a tubular support column having top and bottom ends,

said lower end of said elongated support rod being received in said top end of said tubular support column in telescoping relationship therein for permitting said elongated support rod to be moved upwardly and downwardly relative to said tubular support column,

a manually releasable one-way friction clutch assembly carried by said tubular support column and frictionally engageable with said elongated support rod for allowing said elongated support rod to be moved freely upwardly for extending said elongated support rod upwardly relative to said tubular support column while normally frictionally gripping said elongated support rod for preventing said elongated support rod from moving downwardly relative to said tubular support column,

a vertically elongated, floor-engaging member adapted to rest upon a floor,

said vertically elongated, floor-engaging member being in telescoping relationship with said bottom end of said tubular support column for permitting said bottom end of said tubular support column to be moved upwardly and downwardly relative to said floor-engaging member,

a compression spring having first and second ends,

said first end of said compression spring being seated down against said floor-engaging member for thrusting downwardly upon said floor-engaging member, and

said second end of said compression spring being seated up against said tubular support column for thrusting upwardly upon said tubular support column,

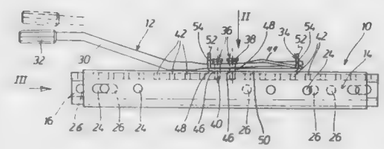
whereby an installer of overhead sheetrock can place a panel of sheetrock up against the overhead structure and then while holding said panel up against said overhead structure with a first hand can use a second hand to grasp said temporary device for positioning said floor-engaging member in a suitable position below said panel and then can use said second hand to exert a thrust upwardly on said elongated support rod to position and place said horizontally extending platform element up against the panel for temporarily supporting the panel and while holding said horizontally extending platform element up against the panel with said second hand, can now release said first hand from holding said panel for now grasping said tubular support column with said first hand for thrusting downwardly on said tubular support column for compressing said compression spring, whereupon releasing both of said installer's hands allows the compressed compression spring simultaneously to thrust down upon said floor-engaging member and to thrust upwardly upon said tubular support column for causing said friction clutch assembly to be in friction gripping relationship with said elongated support rod for transmitting the upward thrust of the compressed compression spring through said elongated support rod to said horizontally extending platform element for applying the upward thrust of the compressed compression spring through said horizontally extending platform element to the sheetrock panel for temporarily holding and pressing the sheetrock panel up against the overhead structure until said friction clutch assembly is manually released.

4,733,845

LOCKABLE SLIDING RAIL GUIDE ARRANGEMENT FOR MOUNTING A SEAT

Reinhard Maiwald, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to Grammer Sitzsysteme GmbH, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,623
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532419
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 4 Claims



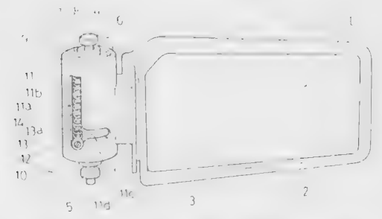
1. A sliding rail guide arrangement with locking device for a vehicle seat, comprising an outer rail of substantially C-shaped configuration including at least one substantially C-shaped end portion having at lest one aperture formed therein, an inner rail guided in the outer rail slidably therein and having a plurality of locking openings formed therein, a locking lever having at least one locking portion thereon, mounting means including a base portion having first and second ends and first and second limb portions which project away from the respective ends of the base portion in the same direction relative thereto, at least one of said limb portions of said mounting means having a mounting opening therethrough and a portion of said locking lever disposed in said mounting opening for mounting said lever on said mounting means movable relative thereto between a first position in which said inner and outer rails are locked relative to each other and a second position permitting relative sliding movement of said inner and outer rails, said base portion of said mounting means mounted to said outer rail and having at least one aperture aligned with said at least one aperture in said substantially C-shaped end portion of said outer rail and said locking portion on said locking lever positioned to extend through said aperture in said base portion of said mounting means and through said at least one aperture in said outer rail to engage into a respective one of said locking openings formed in said inner rail to lock said inner rail in said outer rail in said first position of said locking lever.

4,733,846

DOOR MIRROR ANGLE CONTROL DEVICE FOR CAR

Mikio Kakinuma, Abikoshi, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 760,919
Claims priority, application Japan, Apr. 8, 1985, 60-051989[U]
Int. Cl.[4] B60R *1/06;* A47G *1/24*
U.S. Cl. 248—479 11 Claims



1. An angular positioning control device for a mirror comprising:

a cylinder means having a longitudinal cylinder axis,

a supporting means for supporting said cylinder means so that said cylinder axis is positioned at the desired angle relative to the vertical,

an arm disposed generally about said cylinder means,

a mirror case secured to said arm for supporting the mirror and rotatable with said arm about said cylinder axis,

said arm having a slot therethrough defining a cam guide path, and

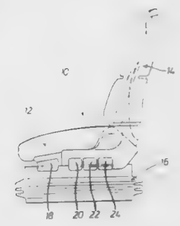
a cam follower secured to and positioned at least partially outside of said cylinder means and riding in said cam guide path when said mirror case is moved relative to said cylinder axis.

4,733,847

SPRUNG VEHICLE SEAT

Johann Grassl, Schwandorf, Fed. Rep. of Germany, assignor to Grammer Sitzsysteme GmbH, Amberg, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,438
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517505
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—550 4 Claims



1. A sprung vehicle seat comprising a base frame; a seat carrier frame displaceable in relation to the base frame; a gas spring disposed between said seat carrier frame and said base frame; a valve assembly for adjusting the pressure in the gas spring in dependence on the weight of the seat occupant and the desired seat height, said valve assembly comprising a first valve means for adjustment of said seat to the weight of said occupant, a second valve means for said height adjustment which is operably independent and separate from said first valve means and an actuating member for manually actuating said second valve means; an actuator means for the purposes of weight adjustment, adapted to be connected to the seat carrier frame and operable in dependence on the seat height to actuate said first valve means; and operatively disposed between said seat carrier frame and said actuator means, a coupling means adapted to couple said actuator means to said seat carrier frame to a plurality of different positions for seat height adjustment; and a belt winding means operatively disposed between said seat carrier frame and said actuator means.

4,733,848

LATCH FOR DECK MOUNTED ELECTRIC OUTBOARD

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 22, 1986, Ser. No. 944,651
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—642 7 Claims



1. A latching device for holding an outboard motor apparatus having a motor support member in a retracted position on a boat deck, comprising:

an arm member including an inner end pivotally mounted for movement relative to the deck, and a free outer end;

a head member pivotally mounted to the outer end of said arm member and movable between a latched and unlatched position, said head member including a portion for receiving the motor support member in an over-center relationship therewith such that said support member provides a biasing force against said head member to bias said head member in said over-center relationship; and

safety lock means operable to hold said head member in said over-center latched relationship, said safety lock means including a latch means on said head member engageable with an abutment means on said arm member.

4,733,849

MOLD FOR PRODUCING GRID PLATES FOR LEAD BATTERIES

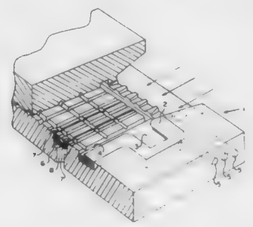
Hans-Joachim Golz, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,320
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433583
Int. Cl.[4] B22D *25/04, 27/04*
U.S. Cl. 249—60 8 Claims

1. A mold for producing grid plates for lead batteries, wherein said grid plates have grids, and frames and plate lugs which are thicker than the grids of said plates, and wherein said mold is comprised of two mold halves made of a base material and including mold portions which are made from a material having a higher thermal conductivity than the base

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material of the mold wherein the regions of the mold halves which are used to cast the grids are formed of the base material, and the regions of the mold halves which are used to cast the frames and plate lugs are made from the material of higher thermal conductivity.

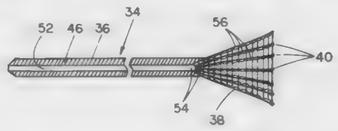


4,733,850

APPARATUS AND METHOD FOR ENABLING ATRAUMATIC PASSAGE OF A SEVERED TENDON THROUGH A TENDON SHEATH OR OTHER ENCLOSED SPACE

James S. Thompson, 112 Upnor Rd., Baltimore, Md. 21202

Filed Jan. 20, 1987, Ser. No. 4,662
Int. Cl.[4] A61F *13/00;* **A61B** *17/00*
U.S. Cl. 254—134.4 **15 Claims**



1. An apparatus for enabling the placement of a severed tendon to a position to be repaired, comprising:

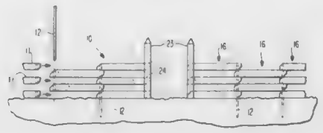
an elongated hollow tube having a first section and a second section connected together; said tube having openings at both ends; said first section of said tube being semi-rigid and flexible; said second section of said tube being flared and being readily collapsible; said first section of said tube adapted to be connected to a source of suction; a portion of the severed tendon adapted to be received inside said second section; the suction causing said second section to collapse about the tendon, whereby the tendon is firmly held in place in said collapsed second section; said tube being of a size so as to readily be received inside of a passage in the body.

4,733,851

STOR-A-WAY FENCES

Paul J. Weiss, 56 S. Walnut St., Wilkes-Barre Township, Luzerne County, Pa. 18702

Filed Jan. 27, 1987, Ser. No. 6,770
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—60 **4 Claims**



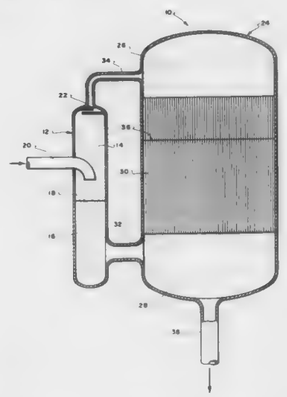
1. A storable fence, comprising, in combination, a plurality of fence sections pivotally joined together, each said fence section comprising a plurality of horizontal fence rails spaced one above another, and a plurality of fence posts for connection of said fence sections together, each fence rail having a cut angled corner angled from a horizontal face of the rail, and each fence rail having an opening transversly there through it at each end thereof located at the edge between the angled cut off face and the horizontal face for fence posts to extend there through.

4,733,852

GAS-LIQUID SEPARATOR

Lyle E. Glasgow, Westlake Village, and Robert M. Hansen, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 2, 1987, Ser. No. 56,828
Int. Cl.[4] C21B *3/04, 7/14;* **C21C** *7/00*
U.S. Cl. 266—227 **10 Claims**



1. An apparatus for separating a gas from a liquid metal containing the same in a zero gravity environment comprising:

a first closed vessel separated into a gas and liquid zone by a gas de-entrainment means;

means for introducing liquid metal containing entrained gas into said first vessel for impingement upon said gas de-entrainment means;

a second closed vessel separated into a gas and liquid zone by a plurality of elongated tubes for capillary containment of a body of liquid metal;

the gas zone of the first and second vessels being in fluid communication with one another and the liquid zone of said first and second vessels being in fluid communication with one another; and

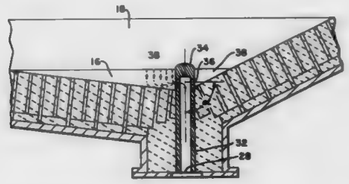
means for withdrawing liquid metal from the liquid zone of said second vessel, whereby when liquid metal containing entrained gas is impinged upon said gas de-entrainment means said liquid metal passes through the de-entrainment means and flows into said second vessel and the entrained gas is separated and flows into the gas storage space of said second vessel displacing the body of liquid metal contained in the plurality of tubes in said second vessel.

4,733,853

MOLTEN METAL TAPHOLE DESIGN TO IMPROVE YIELD AND CLEANLINESS

Uday B. Pal, Monroeville, and William F. Knauss, Jr., Pittsburgh, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Feb. 17, 1987, Ser. No. 15,418
Int. Cl.[4] C21C *5/42*
U.S. Cl. 266—272 **6 Claims**



1. A taphole structure for refractory-lines vessels containing molten metal having an overlying slag layer and wherein the taphole extends through the sidewall of the vessel at the top portion thereof whereby rotation of the vessel from an upright position to an inclined position will cause molten metal to flow through the taphole; said taphole structure comprising:

a refractory member of generally tubular configuration extending through the sidewall of said vessel and having a sealed closed-end portion impervious to the flow of liquid metal while extending into molten metal in the vessel during tapping, and

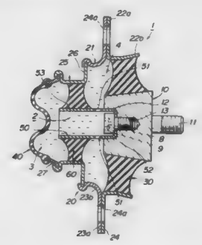
sidewall openings in said tubular refractory member closely adjacent its sealed closed end which extends into the vessel whereby molten metal will not flow directly into the end of the tubular refractory member but rather will flow into the refractory member through said sidewall openings with an irrotational flow, whereby slag will not materially vortex into the taphole, the vessel can be rotated to a greater angle with respect to vertical during tapping, and a greater number of slag-free metal can be tapped from the vessel even when said sealed closed end touches a slag-metal interface in the vessel during tapping.

4,733,854

FLUID SEALED MOUNTING

Yasuo Miyamoto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 619,239, Jun. 11, 1984, abandoned.
This application Jul. 3, 1986, Ser. No. 881,563
Claims priority, application Japan, Jun. 10, 1983, 58-104737; Jun. 10, 1983, 58-104738; Jan. 19, 1984, 59-5997[U]
Int. Cl.[4] F16F *9/04*
U.S. Cl. 267—140.1 **17 Claims**



1. A liquid-sealed mounting comprising:

(a) a base;

(b) an attachment adapted to be connected to a source of vibrations;

(c) a first elastic member connected to said base and to said attachment;

(d) a liquid chamber defined at least partly by said base, said attachment, and said first elastic member, and filled with a liquid;

(e) a partition including a second elastic member and dividing said liquid chamber into first and second chambers, said second elastic member being connected to said base and to said attachment, said partition and said first elastic member defining said first chamber, and a diaphragm connected to said base and cooperating with said partition to define said second chamber, displacement of liquid of said first chamber being effected by a first piston area composed of said first elatic member and a portion of said attachment connected thereto exposed to liquid in said first chamber and a second piston area composed of said second elastic member and a portion of said attachment connected thereto exposed to liquid in said first chamber; and

(f) orifice means providing communication only between said first and second chambers;

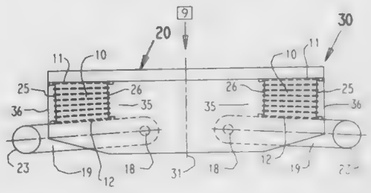
(g) said first and second piston areas each having a different area relative to each other for acting on the liquid in said first chamber to displace the liquid therein, said elastic members being deformable in response to relative displacement of said base and said attachment to effect displacement of a volume of liquid between said first and second chambers, through said orifice means, determined by the difference between said piston area acting upon liquid in at least said first chamber.

4,733,855

TAPERED RUBBER SPRING UNITS

Paul J. Balczun, Erie, and James W. Sherrick, Edinboro, both of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Dec. 22, 1986, Ser. No. 944,092
Int. Cl.[4] F16F *7/00;* **B60G** *11/22*
U.S. Cl. 267—294 **5 Claims**



1. A rubber compression spring unit comprising (a) a stationary beam located in a horizontal plane; (b) a pivot arm vertically spaced from said stationary beam; and (c) at least two non preloaded spring block elements securedly interposed to and between said stationary beam and said pivot arm, each spring block element comprises a plurality of layers of rubber affixed to at least two rigid end plates and to at least one rigid intermediate plate wherein said spring block has a general rectangular configuration having a length along a longitudinal axis and width along a secondary axis perpendicular to said longitudinal axis;

said spring block element has a first side and a second side wherein said layers of rubber are tapered along the longitudinal axis such that said first side is from about 70 to about 98 percent of height of said second side; wherein said block elements are spaced horizontally and positioned so that said first side of said block elements are next to each other and said second side of said block elements are located on the outside periphery of said spring unit.

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4,733,856

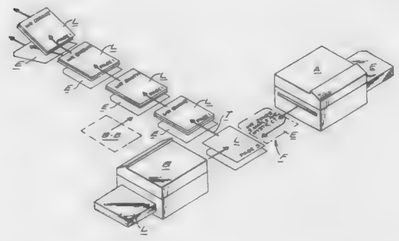
MECHANISM FOR FORMING PERSONALIZED ENVELOPES AND INSERTS

William H. Gunther, Jr., Mystic, Conn., assignor to Gunther International, Ltd., Mystic, Conn.

Continuation of Ser. No. 800,970, Nov. 22, 1985, abandoned, which is a continuation of Ser. No. 627,214, Jul. 2, 1984, abandoned. This application Jul. 31, 1987, Ser. No. 80,395

Int. Cl.[4] **B41F** *13/54;* **B65B** *11/48*

U.S. Cl. 270—1.1 **4 Claims**



1. A mechanism for forming a personalized letter assembly having a personalized insert assembly and a personalized envelope assembly comprising conveyor means, first means for printing a blank envelope assembly with a name, second means for printing a blank insert assemoly with the same name, means for feeding a blank insert assembly and a blank envelope assembly separately to said printing means, means for directing each printing means to print the same name on the letter and the envelope assemblies, said printing means operatively associated with said directing means, each of said printing means mounted adjacent said conveyor means, a stack of said blank insert assemblies and a stack of said blank envelope assemblies adjacent each of said printing means, means operatively associated with said stacks for feeding the blank insert assemblies one-by-one and for feeding the blank envelope assemblies one-by-one separately from their respective stacks to their respective printing means, means for activating said directing means to direct each printing means to print the same name on the insert and envelope assemblies, means adjacent said conveyor means for placing each envelope assembly on said conveyor means, means operatively associated with said placing means for inverting each of said printed envelope assemblies before being placed on said conveyor means so that the printed name thereon faces said conveyor means, means operatively associated with said conveyor means for placing each insert assembly over said envelope assembly, and means operatively associated with said conveyor means for folding said envelope assembly around said insert assembly to form said letter assembly.

4,733,857

COPIER WITH SORTING FUNCTION

Ronald F. Feldeisen; Michael J. Langdon, both of Fairport, and Sukumaran K. Menon, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 615,007, May 29, 1984, abandoned. This application Jul. 20, 1987, Ser. No. 73,862

Int. Cl.[4] **B65H** *29/00*

U.S. Cl. 271—296 **4 Claims**

1. A copier having copy sheet processing stations arranged to produce copy sheets along a processing path with one of their long edges being the leading edge thereof, comprising:

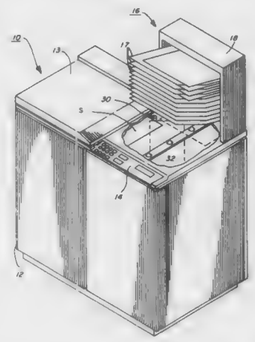
means for orienting each copy sheet exiting from the processing horizontal plane and in a direction toward one side of the copier,

first means in said path of movement for changing the direction of movement of the copy sheets approximately 90° and to transport the sheets toward the rear end of the copier while in said generally horizontal plane,

second means for changing direction of movement of copy sheets from the generally horizontal plane upwardly in a generally vertical plane,

a sorter having a plurality of vertically stacked sheet collecting trays positioned adjacent said rear end of the copier, and having sheet unloading portions projecting toward the front end of the copier and sheet loading openings toward the rear of the copier, and

transport means arranged between said second means and said sheet openings for conveying sheets from second means to said trays during a copying/sorting run,



so that said copy sheets are desirably so processed in said copier in the direction of movement of the shortest dimensions of said copy sheets, and then are rotated and transversely stacked in said sorter overlying said copier, over an area of the rear of said copier, within the perimeter of the horizontal dimensions of said copier per se, with the longest dimensions of said copy sheets extending along the rear of said copier and the shortest dimensions of said copy sheets extending partially towards the front of said copier, to provide a highly compact integral copier/sorter yet convenient front unloading of the sorted copy sheets.

4,733,858

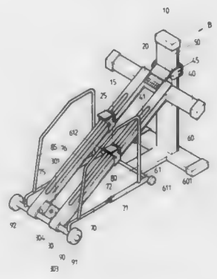
MULTI-PURPOSE EXERCISER

Chuang S. Lan, No. 66, Lane 244, Shin Shu Rd., Shin Juang Shyh, Taipei Hsien, Taiwan

Filed May 23, 1986, Ser. No. 866,205

Int. Cl.[4] **A63B** *21/00*

U.S. Cl. 272—70 **2 Claims**



1. A multi-purpose exerciser comprising:

a base;

an upright stand fixedly mounted on said base; a pair of contractible rods connected at one end to said base and at the other end to a supporting rod;

an adjusting bracket slidably mounted on said upright stand;

a cross rod connected with said adjusting bracket;

two racks slidably connected at one end with said cross rod and at the other end with said supporting rod;

two frames respectively mounted on said two contractible rods;

two cylinders respectively disposed within said two racks, each said cylinder having a piston connected with a sliding rod; and a throttling valve connecting said two cylinders;

two pedals respectively mounted on said two racks and rigidly connected with said sliding rods.

4,733,859

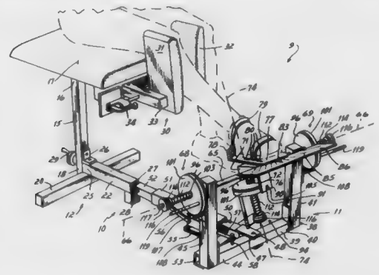
EXERCISE APPARATUS

Ronald W. Kock, Wyoming, and Charles E. Schuster, Fairfield, both of Ohio, assignors to Bio-Mechanisms, Inc., Fairfield, Ohio

Filed Oct. 9, 1986, Ser. No. 917,660

Int. Cl.[4] **A63B** *23/04*

U.S. Cl. 272—96 **28 Claims**



1. An apparatus for exercising muscles associated with movement of the head, comprising:

(a) movement restricting means for restricting movement of the head to rotation about a first axis, a second axis and a third axis, each of said axes lying mutually perpendicular to one another;

(b) first resistance means connected to said movement restricting means for applying an adjustable first torque to the head as it is rotated about said first axis;

(c) second resistance means connected to said movement restricting means for applying an adjustable second torque to the head as it is rotated about said second axis, and

(d) third resistance means connected to said movement restricting means for applying an adjustable third torque to the head as it rotates about said third axis, said first, second, and third torques being adjustable independently of one another.

4,733,860

UPPER TORSO ENGAGEMENT MEANS AND ROTARY TORSO EXERCISE APPARATUS

Clay J. Steffee, Lake Helen, Fla., assignor to Nautilus Sports, Lake Helen, Fla.

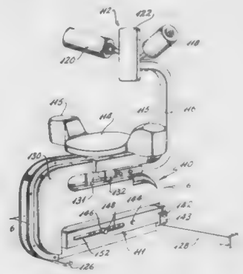
Filed Jul. 1, 1986, Ser. No. 880,881

Int. Cl.[4] **A63B** *21/00*

U.S. Cl. 272—134 **4 Claims**

1. In an apparatus for exercising torso rotation muscles said apparatus having means for supporting a user's body in a generally upright seated position and including a rotatable upper torso engagement means and a fixed lower torso engagement means having a seat portion, said user body supporting means allowing rotational movement of said upper torso engagement means relative to said lower torso engagement means about an axis extending longitudinally of a user's body along a line passing through the user's body and adjacent and generally coincident to the spine; and resistance means operatively connected to said upper torso engagement means for imposing force resisting movement of said upper torso engagement means about said axis; said upper torso engagement means having a stanchion pivotal about a support axis and connected at one end to the resistance means, with left and right side bars mounted in fixed relation to one another and on a depending end of said stanchion, the improvement comprising:

means, integral with said upper torso engagement means, for immobilizing shoulder muscles of said user in order to restrict undesired shoulder and arm movement during said torso rotation muscles exercising, said shoulder muscles immobilizing means comprising a backrest means for



pressing engagement with said user's back during said torso rotation muscles exercising and side bars extending outwardly from said backrest means,

said backrest means being elongated in the direction of the users spine from generally said stanchion depending end and upwardly toward the user's head, and each said side bar being angled upward from said depending end at an angle from horizontal of from 10°–40° and toward said user at a subtended angle of from 120°–160°, said backrest being elongated sufficiently and each of said side bars being angled relative thereto sufficiently to fit comfortably in the crook of each elbow of a user seated in said body supporting means, back pressed against said backrest means, so as to immobilized said shoulder muscles during said exercising.

4,733,861

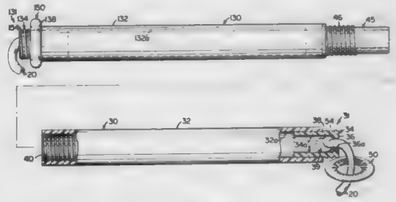
MULTI-USE EXERCISE DEVICE

Hugh V. Plunkett, III, 300 Stonebridge Blvd., St. Paul, Minn. 55105

Filed Nov. 29, 1985, Ser. No. 803,112

Int. Cl.[4] **A63B** *21/02*

U.S. Cl. 272—137 **9 Claims**



1. An exercise apparatus, comprising:

an elastic flexible line having a length sufficient for an operator to use said line as a jump rope;

a pair of rigid handles including a first handle and a second

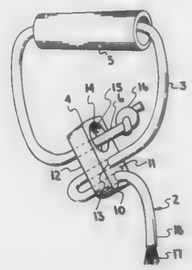
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handle each having a line receiving end and a longitudinally displaced handle attching end, each of said handles including means for releasably attaching said handle with the other of said handles at said handle attaching ends to form a composite handle with said line receiving ends longitudinally displaced;

means for rotatatably securing ends of said line to said line receiving ends; and

means for releasably holding said line in a folded position so as to create loops at opposite ends of the folded line, said means for releasably holding said line including means surrounding said line and having an inside dimension sized for said surrounding means to freely pass along said line and resistively pass along said folded line.

4,733,862
ELASTIC RESISTANCE EXERCISER
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Apr. 20, 1987, Ser. No. 40,095
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 **7 Claims**



1. An elastic resistance exerciser comprising:

an elongated elastic member formed into a loop at each end;

a generally tubular handle threaded onto each loop of the elastic member;

a self-locking size adjusting means, slidable along the elastic member closing each loop, in which each loop size self-locking adjusting means is a block having three holes therethrough; the elastic member passing slidably through a first hole, entering a first side of said block and exiting a second side, then bent back to pass slidably through a second hole from the second side to the first side of the block, then passing through a tubular handle and being formed into a loop by again entering the second side of the block, passing through a third hole, then provided with an enlargment which precludes withdrawal back through the third hole.

4,733,863
CONFECTIONERY GAME
Victor Novotny, 67 Hudson St., New York, N.Y. 10013
Filed Mar. 24, 1986, Ser. No. 843,303
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 R **24 Claims**

1. A confectionery guessing game comprising:

one or more edible confectionery pieces, each of said pieces comprising a flavor material;

a package for said confectionery;

a mark identifying said flavor material, said mark being included with said package; and

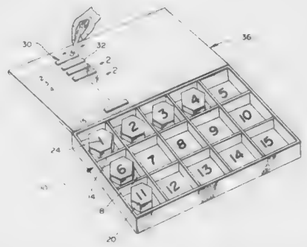
a removable obscuring means covering from view an answer code identifying said flavor material.

14. A method of playing a game comprising:

(i) choosing a confectionery piece containing a flavor material, said confectionery held in a package having a mark identifying said flavor material incorporated with said package;

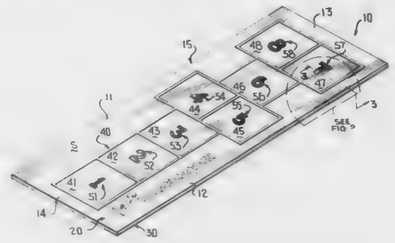
(ii) tasting said confectionery;

(iii) guessing the identity of said flavor material; and



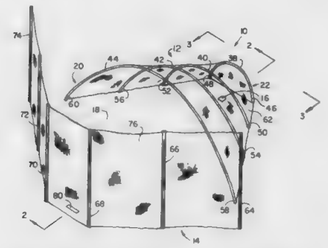
(iv) checking the correct identity of said flavor material by removing an obscuring means hiding from view an answer code identifying said flavor material.

4,733,864
PARLOR GAME
Ronald C. Casteel, 3336 Columbus Rd., Macon, Ga. 31204
Filed Jan. 12, 1987, Ser. No. 14,004
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—1 A **15 Claims**



1. A parlor game which is readily portable, transportable, safe and capable of being roller from a generally flat uni-planar playing position to a generally roller tubular transporting and storing position and is particularly adapted for use by sight-impaired or blind individuals comprising a generally flexible carpet of a predetermined peripheral outline, said carpet having top and bottom faces, said top face being defined by a mass of carpet fibers over the entire area defined by said peripheral outline, said carpet fibers being one of a first predetermined relatively vivid color and texture particularly discernible by respective sight-impaired and blind individuals, said carpet fibers generally defining an upper surface of said carpet, first flock means upon said carpet upper surface for delineating a plurality of first areas of a first predetermined configuration between which individuals can move within the particular parameters of the associated parlor game, second flock means upon said carpet upper surface for delineating a plurality of second areas of second predetermined different configurations within at least a plurality of said first areas, and said first and second flock means being one of a second predetermined relatively vivid color and texture readily distinguishable by at least one of color and texture from said carpet fibers whereby said first and second areas are readily distinguishable from each other by sight-impaired and blind individuals.

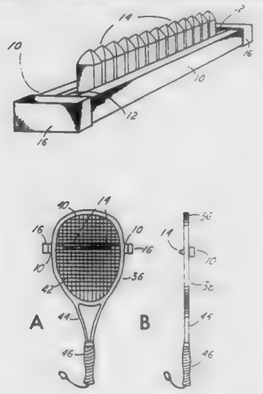
4,733,865
BASEBALL BATTING PRACTICE APPARATUS
Lawrence Reed, 13641 Hart Dr., Cerritos, Calif. 90701
Filed Mar. 23, 1987, Ser. No. 28,869
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—26 A **14 Claims**



1. A baseball batting practice system comprising a batting cage extending over a batting position on a flat, playing surface and having a plurality of upright support means each of which have standards on opposite sides of said batting position adapted for mounting relative to said flat playing surface and which span a predetermined distance at the level of said playing surface, and said distance spanned by said standards increases among said support means proceeding forward from said batting position and wherein said support means increase in length and height proceeding forward from said batting position and said batting cage forms an open end at its forward extremity remote from said batting position and a closed end at its rearward extremity proximate to said batting position, and an upright, vertically oriented retaining screen disposed in a concave arc in front of said open end of said batting cage, and spaced a predetermined distance therefrom and wherein said ends of said retaining screen are spaced apart a distance greater than the greatest distance spanned by said standards of said support means, said height of said retaining screen is greater than the greatest height of said support means, and said retaining screen has indicia dividing said retaining screen throughout into at least four horizontal bands located vertically one above another.

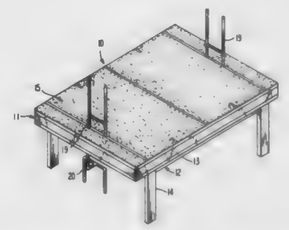
4,733,866
PORTABLE STRING ALIGNER FOR RACKETS
Jacob F. Herbert, 635 Circlewood Dr., Paradise, Calif. 95969
Filed Nov. 7, 1986, Ser. No. 928,190
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 R **7 Claims**

1. A portable string aligner comprising: an elongated rectangular base member having a T-shaped retainer groove located therein, said retainer groove having a bottom surface; a plurality of spacing pegs removably fitted within said retainer groove, said spacing pegs comprising T-shaped members having lower portions that correspond to the shape of the retainer groove, said spacing pegs extending above the surface of the base member so that they can be inserted between the crossing strings of a racket and thereby align the strings, said spacing pegs having a bottom surface that contacts the bottom surface of the retainer groove and the bottom surface of both the retainer groove and the spacing pegs having positioning means located thereon for selectively positioning the spacing pegs in the retaining groove; said aligner further comprising an end cap fitted over each end of the base member so as to prevent the spacing pegs from sliding out of the retaining groove and a



track filler positionable between the spacing peg and one of the end caps for preventing movement of the spacing pegs.

4,733,867
FINGER FOOTBALL/FINGER RUGBY GAME
Kelvin P. Kemp, 1237 2nd St., Hermosa Beach, Calif. 90254, and Kerry E. Kemp, 312 Winnipeg Pl., Long Beach, Calif. 90814
Continuation-in-part of Ser. No. 812,078, Dec. 23, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,716
Int. Cl.[4] A63F *7/06*
U.S. Cl. 273—94 **1 Claim**



1. A finger football and finger rugby game device comprising:

a reversible table surface having a football playing field on one side and a rugby playing field on the opposite side,

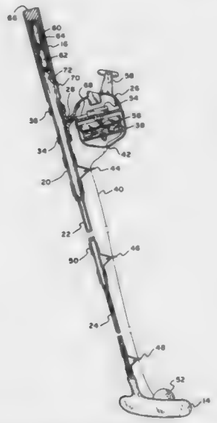
each of said playing fields comprising a green colored carpeting material having a plurality of transverse line divisions marked thereupon for use in playing a game,

a pair of goal posts attached at each end of said reversible table surface, and

a supporting table for holding said reversible table surface and in which the length of said supporting table is less than the length of said reversible table surface whereby the ends of said table surface and said goal posts mounted on said table surface extend beyond said supporting table.

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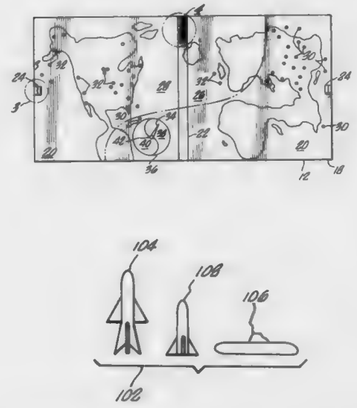
4,733,868
GOLF PRACTICE CLUB
Amy Selden, 514 Sycamore Ter., Cinnaminson, N.J. 08077
Filed Dec. 23, 1986, Ser. No. 945,919
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—194 R **7 Claims**



1. A portable golf practicing device comprising:
a golf club including a head at one end thereof, a handle at the other end and a shaft extending between said head and said handle;
said shaft being comprised of a plurality of telescoping sections each of which has a lower end and an upper end, said telescoping sections being movable between a collapsed condition and an extended condition;
a spinning reel mounted on said shaft adjacent said handle, said spinning reel including a spool of line therein and payable therefrom and including means for rewinding said line into said reel after it has been paid out;
a plurality of eyelets positioned along said shaft, each eyelet being mounted on a different telescoping section and adjacent the lower end thereof, said line passing from said reel and through said eyelets, and
a golf ball secured to the free end of said line.

4,733,869
DISARMAMENT GAME APPARATUS
Jeff Dapper, 6239 Sultana, Temple City, Calif. 91780; Rudy DePooter, 1 Trail Ridge Cir., Pomona, Calif. 91766, and Anthony Poplawski, 540 S. Catalina #507, Los Angeles, Calif. 90020
Filed Apr. 14, 1986, Ser. No. 851,714
Int. Cl.[4] A63F *3/00, 3/02*
U.S. Cl. 273—236 **7 Claims**

3. A game apparatus for first and second players, the game to be played in rounds, the apparatus comprising:
(a) a supply of tokens, the supply comprising a plurality of visually distinguishable different kinds of tokens, the tokens of each kind being of equal mass, the mass of each kind being in a predetermined ratio to the mass of the other kinds corresponding to a numerical point value associated with each kind;
(b) a scale for balancing a first set of the tokens corresponding to the first player against a second set of the tokens corresponding to the second player, the scale indicating the relative mass between the sets;
(c) means for permitting transactions of the tokens whereby the mass of at least one of the sets of the tokens is changed;
(d) means for limiting the transactions according to the indication of the scale;
(e) a game board having eastern and western cartels mapped thereon, respective cartels each including a plurality of site designations representing corresponding locations for weapons controlled respectively by the Union of Soviet Socialist Republics and the United States of America; and

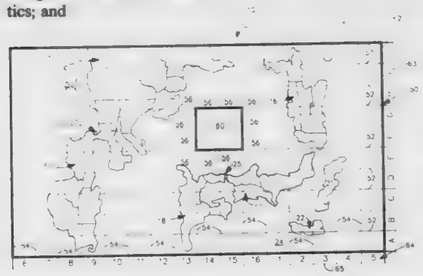


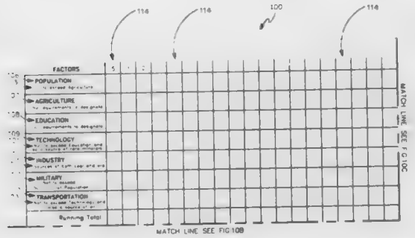
(f) round selection means for randomly determining for each round whether the round will be an arming round wherein tokens are added to the board or a disarming round wherein tokens are taken from the board and added to the scale.

4,733,870
STRATEGY GAME EMPHASIZING ECONOMICAL AND POLITICAL DEVELOPMENT
Ed Rinehart, 3311 Santa Rosa St., Colorado Springs, Colo. 80909
Filed Sep. 3, 1986, Ser. No. 903,399
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—278 **20 Claims**

1. A game apparatus for use by a plurality of players in playing a game as a sequence of rounds and scored by total point factors obtained by each player, comprising:
a game board with an upper surface organized in a map format having a plurality of geographic regions separated by boundary lines into a plurality of territories indexed to be distinguishable from one another and having a grid-work on the upper surface formed by a plurality of first and second lines intersecting one another to define a matrix of sectors;
designation means for indicating that a resource characteristic is associated with some of said territories;
first chance means for allocating one of said territories to each of said players to define a home base for a respective player;
a plurality of scoresheets, there being a respective scoresheet for each respective player, each of said scoresheets organized as a chart having a plurality of rows each of which is indexed with a developmental category and adapted to receive point factor allocations obtained by the respective player, said rows having a plurality of sequential columns adapted to receive point factor allocations for each row on successive rounds of play, some of said developmental

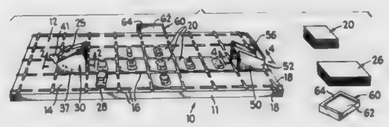
categories being correlated to said resource characteristics; and





chance event means carrying instructions for affecting the players' point factor allocations on a respective round of play with respect to at least one of said categories.

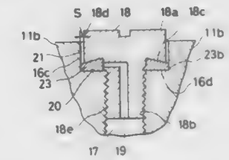
4,733,871
ITEM JUMPING GAME
Thomas P. McQueeny, Chicago, and Wayne A. Kuna, River Forest, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 23, 1986, Ser. No. 821,766
Int. Cl.[4] A63F *9/02*
U.S. Cl. 273—399 **15 Claims**



4. A game comprising in combination:
a plurality of items divided by means distinguishing the items into two or more sets of two or more items each;
the items being alignable upon a playing surface to form a line extending from one end defined by one of the items to another end defined by another of the items;
an article capable of being launched from adjacent the one end to beyond the other end;
means for launching the article from adjacent the one end to beyond the other end;
a landing ramp placeable adjacent the other end;
the landing ramp having a near end adjacent the other end of the line of items and a far end spaced from the near end; and
the landing ramp having a generally upstanding back stop wall adjacent the far end.

10. A method of playing a game comprising the steps of:
providing two or more players with a plurality of distinguishable items divided into two or more sets of two or more items each;
allocating some of the items to each player;
designating an order the players will follow with respect to each other;
each player in turn placing one of the player's allocated items on a playing surface generally in line, or transverse to, any item, or line of items, already on the playing surface;
placing an item at an end of a line of two or more items already on the playing surface that is of the same set as the item at the opposite end of the line; and
attempting to launch an article over the line of items on the playing surface from a proximal end of the line to the distal end.

4,733,872
FUSIBLE PACKING FOR A SUPPLY PORT OF AN ACCUMULATOR
Nobuyuki Sugimura, 308 Mabase, Shimizu-shi, Shizuoka-ken, Japan
Filed Jun. 16, 1986, Ser. No. 874,566
Int. Cl.[4] F16J *15/02;* **F16L** *9/00*
U.S. Cl. 277—26 **6 Claims**



1. A fusible packing arrangement disposed in an accumulator at a threaded gas supply port thereof comprising:
a recessed portion defined at the top portion of said gas supply port;
a bolt consisting of a bolt head having a diameter smaller than the inside diameter of said recessed portion and a shank threadably fitted to the threaded inner wall of said gas supply port so that there are defined an annular space between the lower face of said bolt head and the bottom face of said recessed portion and also an annular clearance between the outer periphery of said bolt head and the inner side wall of said recessed portion;
an inner passage extending between the gas passage of the accumulator and said annular space for allowing gas flow therethrough; and
a temperature responsive fusible packing fitted into said annular space so as to play both roles as a gas packing and a role as a temperature responsive fuse for preventing bursting of the accumulator from occurring in case of fire or the like.

4,733,873
MECHANICAL SEAL
Akira Takenaka; Masanori Hatanaka; Kuniharu Suzuki; Junichi Ito; Yoshifumi Yamada, and Hironori Yoshida, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd. and Aisin Seiki Kabushiki Kaisha, both of, Japan
Filed Sep. 25, 1985, Ser. No. 779,913
Claims priority, application Japan, Sep. 25, 1984, 59-199750
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—96.1 **6 Claims**

1. A mechanical seal for preventing leakage of fluid, said seal comprising:
(a) a rotary shaft;
(b) a seat ring having an annular sliding contact surface; and
(c) a follower ring having an annular sliding contact surface

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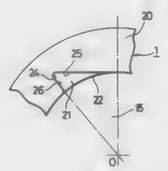
in sliding contact with said sliding contact surface of said seat ring, one of said seat ring and said follower ring being rotated by said rotary shaft, and the other ring allowing said rotary shaft to rotatably pass therethrough, wherein sliding contact between said sliding contact surfaces prevents said fluid from leaking from the outside to the inside of said sliding contact surfaces, so as to maintain fluid-tightness at an outer peripheral portion of an outer one of said follower ring and said seat ring, and wherein

(d) at least one of said sliding contact surfaces has formed therein a plurality of recesses, each of which is defined by a forward edge and a rear edge, each of said recesses opening only to an inner circumferential surface of said one of said rings, said forward edge being inclined from said inner circumferential surface to an outer end extending radially outwardly and circumferentially from the intersection of said forward edge and said inner circumferential surface in a direction of relative motion between said seat ring and said follower ring, said intersection within each recess being defined by an acute angle, said rear edge extending radially inwardly from the radial and circumferential outer end of said forward edge along a radial line extending through substantially a center of said rotary shaft, said forward edge being longer than said rear edge and the rear edge and forward edge intersecting at an acute angle.

6. A mechanical seal for preventing leakage of fluid, said seal comprising:

(a) a rotary shaft;

(b) a seat ring having an annular sliding contact surface; and



(c) a follower ring having an annular sliding contact surface in sliding contact with said sliding contact surface of said seat ring, one of said seat ring and said follower ring being rotated by said rotary shaft, and the other ring allowing said rotary shaft to rotatably pass therethrough, wherein sliding contact between said sliding contact surfaces prevents said fluid from leaking from the outside to the inside of said sliding contact surfaces, so as to maintain fluid-tightness at an outer peripheral portion of an outer one of said follower ring and said seat ring, and wherein

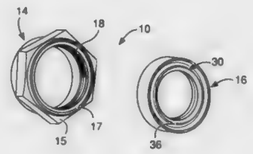
(d) at least one of said sliding contact surfaces has formed therein a plurality of recesses, each of which is defined by a forward edge and a rear edge, each of said recesses opening only to an inner circumferential surface of said one of said rings, said forward edge being inclined from said inner circumferential surface to a rear side extending radially outwardly and circumferentially from the intersection of said forward edge and said inner circumferential surface in a direction of a relative motion between said seat ring and said follower ring, said intersection within each recess being defined by an acute angle, said rear edge extending radially inwardly from the radial and circumferential outer end of said forward edge at least partially along a radial line extending through substantially a center of said rotary shaft, said forward edge being longer than said rear edge and the rear edge and forward edge intersecting at an acute angle, said rear edge being forwardly bulged in the direction of relative motion between said seat ring and said follower ring to an extent that it is not subjected to thermal deformation.

4,733,874

NUT AND SEAL ASSEMBLY

Bruce Fournier, 27510 Loma Prieta Way, Los Gatos, Calif. 95030

Filed Jun. 12, 1985, Ser. No. 744,035
Int. Cl.⁴ F16J *15/16, 15/32*
U.S. Cl. 277—110 **7 Claims**



1. A new and improved nut with seal assembly for preventing liquid leakage around an output shaft extending from a housing, said assembly comprising: A retainer nut, having a rear face in abutting engagement with said housing, and an extended front portion including a cylindrical cavity therein, concentrically positionable over said output shaft;

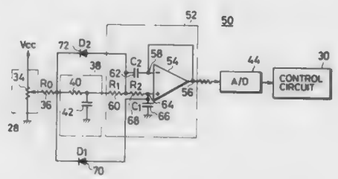
A seal member having a rigid annular member for frictional engagement in said cavity, a flexible annular gasket member secured to one end of said rigid member, said gasket member including a skirt member axially extending toward said rear face and including lip means extending radially inward from said skirt, and spring means surrounding said skirt to bias said lip means into sealing contact with said shaft.

4,733,875

VEHICLE HEIGHT CONTROL APPARATUS

Toshiyuki Azuma; Seiji Yamashita, both of Osaka; Koichi Hikichi, Tokyo, and Morio Sato, Kanagawa, all of Japan, assignors to NEC Home Electronics Ltd., Osaka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Apr. 21, 1986, Ser. No. 853,958
Claims priority, application Japan, Apr. 22, 1985, 60-85670
Int. Cl.⁴ B60G *17/04*
U.S. Cl. 280—6 H **5 Claims**



1. A vehicle height control apparatus, receiving a vehicle height signal and controlling height using a pressurized fluid, said apparatus comprising:

pressure sensing means for producing a pressure signal waveform in dependence upon fluid pressure;

pressure signal compression means for amplitude compressing a rising portion of the pressure signal waveform more than a falling portion of the pressure signal waveform, a time constant of the falling portion of said pressure signal waveform being shorter than a time constant of the rising portion of said pressure signal waveform, causing the pressure to increase by a first speed during the rising portion and causing the pressure to decrease by a second speed faster than said first speed during the falling portion; and

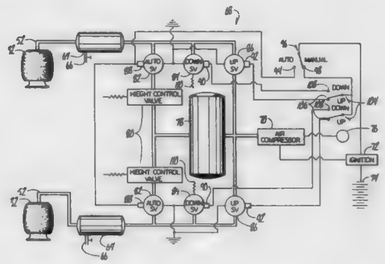
height control means for controlling vehicle height in dependence upon the compressed waveform and the vehicle height signal.

4,733,876

SUSPENSION AND LEVELING SYSTEM FOR A VEHICLE

Merle J. Heider, 203-12th St., SW.; Dale J. Heider, 1108-8th Ave., SW., and Leon J. Heider, R.R., all of Humboldt, Iowa 50548

Filed Dec. 17, 1986, Ser. No. 942,606
Int. Cl.⁴ B60G *17/04*
U.S. Cl. 280—6 H **10 Claims**



1. A suspension system for a vehicle, said vehicle having a vehicle frame with forward and rearward ends and opposite lateral sides, said vehicle also having a vehicle cab and at least one axle extending transversely of said vehicle frame and having opposite axle ends positioned adjacent said opposite sides of said frame; ground engaging wheels being mounted on said axle, said suspension system comprising:

an elongated spring means having a first end attached to said vehicle frame and a second end;

bag means having an upper end, a lower end and flexible walls enclosing a bag compartment whereby said bag compartment is capable of continuously expanding and contracting in vertical size between expanded and retracted positions in response to the introduction of fluid to and removal of fluid from said bag compartment so as to adjust the vertical distance between said upper and lower ends of said bag means;

first securing means attaching said upper end of said bag means to said vehicle frame;

second securing means attaching said second end of said spring means and said lower end of said bag means to said axle whereby the vertical distance of said axle below said frame is controlled by the position of said bag compartment between said expanded and retracted positions;

a pressurized fluid source;

first fluid conduit means connecting said fluid source to said bag means;

a height control valve in said first fluid conduit means and having a first position providing fluid communicating from said fluid source to said bag means for introducing pressurized fluid to said bag means and having a second position permitting fluid to exit from said bag means;

sensing means connected between said frame and said axle for sensing the relative distance therebetween, said sensing means being connected to said height control valve for moving said height control valve to said first position in response to sensing a relative distance less than a predetermined distance between said axle and said frame and for causing said height control valve to move to said second position in response to sensing a relative distance greater than said predetermined distance;

an automatic fluid valve in said first fluid conduit between said fluid pressure source and said bag means; said automatic fluid valve being movable between an open position permitting fluid communication between said fluid source and said bag means and a closed position closing fluid communication between said fluid source and said bag means;

first electrical power means connected to said automatic fluid valve for causing said automatic fluid valve to move to its said open and closed positions;

manually operable electrical control means located remote from said bag means, said height control valve, and said axle;

first electrical connection means connecting said electrical control means to said first electrical power means for controlling movement of said automatic fluid valve between its said open and closed positions;

second fluid conduit means connecting said pressurized fluid source to said bag means;

second valve means in said second fluid conduit means and being selectively movable to an up condition providing fluid communication from said pressurized fluid source to said bag means and to a down condition permitting fluid to escape from said bag means;

second electrical power means connected to said second valve means for causing said second valve means to move between said up and down conditions;

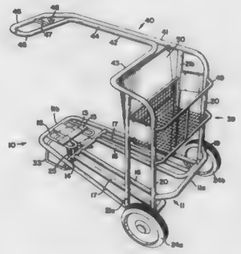
second electrical connection means connecting said electrical control means to said second electrical power means for selectively controlling movement of said second valve means between its said up and down conditions.

4,733,877

CART APPARATUS WITH IMPROVED HANDLE

Eugene R. Pastien, Moundsview, Minn., assignor to Smarte Carte, Inc., White Beark Lake, Minn.

Filed Jun. 3, 1987, Ser. No. 57,754
Int. Cl.⁴ B62B *3/12*
U.S. Cl. 280—33.99 R **7 Claims**



1. An improved multipurpose luggage cart having a lower frame defining a broad support surface suitable for carrying a plurality of luggage items, the lower frame being disposed about a longitudinal axis and extending between longitudinally spaced froward and trailing ends, comprising:

(a) first and second primary support wheels coaxially mounted to said lower frame adjacent said trailing end and at oppositely disposed sides thereof;

(b) a caster, rotatable about a vertical axis, mounted to the lower frame along its longitudinal axis and adjacent the forward end thereof, wherein said primary support wheels and said caster movably support the lower frame and cart on a floor surface;

(c) a pair of upright spaced-apart support members mounted to said lower frame adjacent its trailing end and rising generally vertically upward therefrom; and

(d) an upper frame comprising first and second frame members, said first member extending over said lower frame in a direction parallel to said longitudinal axis, said second member being configured to include a portion proximate

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said trailing end spaced apart from said first member, an intermediate portion proximate to and parallel with said first member, and a handle portion proximate said forward end.

4,733,878

FOUR-WHEEL STEERING SYSTEM FOR VEHICLE

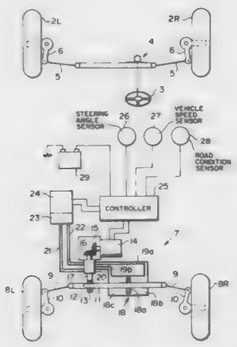
Hirotaka Kanazawa; Masaki Watanabe; Shigeki Furutani; Yoshihiro Watanabe; Teruhiko Takatani; Shunsuke Kawasaki; Noritaka Yasuda, and Akihiro Watanabe, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jun. 16, 1986, Ser. No. 874,687

Claims priority, application Japan, Jun. 17, 1985, 60-131175; Jun. 29, 1985, 60-143443; Jul. 11, 1985, 60-152919; Apr. 18, 1986, 61-90216

Int. Cl.[4] B62D *6/02*

U.S. Cl. 280—91 22 Claims



1. A four-wheel steering system for a vehicle comprising a steering member, a front wheel turning mechanism for turning the front wheels in response to operation of the steering member, a rear wheel turning mechanism including means for sensing a vehicle condition and a rear wheel steering ratio determining means for determining the rear wheel steering ratio which is the ratio of the turning angle of the rear wheels to the turning angle of the front wheels where the steering ratio determining means has at least a predetermined first rear wheel steering ratio characteristic as a function of said vehicle condition and a second rear wheel steering ratio characteristic as a function of said vehicle condition which is shifted in an algebraically positive direction as compared with the first rear wheel steering ratio characteristic, and an actuator for turning the rear wheels according to the sensed vehicle condition and the rear wheel steering ratio determined by the rear wheel steering ratio determining means, characterized by a road condition detecting means for detecting conditions of the road surface which can affect the road gripping force of the wheels and a rear wheel steering ratio selecting means which receives an output of the road condition detecting means and outputs the first rear wheel steering ratio characteristic to the actuator when the detected road condition is such that the road gripping force of the wheels is high and the outputs the second rear steering ratio characteristic to the actuator when the detected road condition is such that the road gripping force of the wheels may be weakened.

4,733,879

DEVICE FOR FIXING A MUD FLAP TO THE FENDER FOLD OF A MOTOR VEHICLE

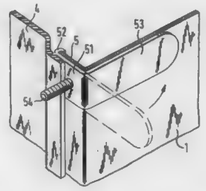
Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Division of Ser. No. 857,137, Apr. 29, 1986, Pat. No. 4,688,814, which is a division of Ser. No. 602,503, Apr. 20, 1984, Pat. No. 4,605,238. This application May 15, 1987, Ser. No. 49,986

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315341

Int. Cl.[4] B62B *9/14*

U.S. Cl. 280—154.5 R 5 Claims



1. A device for fixing a mud flap to a motor vehicle body having a fender with a fender fold of predetermined width disposed substantially transversely to said fender, said fender fold having a free edge, said motor vehicle body having a body portion adjacent said fender fold, said device comprising:

a bracket with

a central part having a first end and a second end, said central part having a length from said first end to said second end at least substantially equal to said width of said fender fold,

a bracket section, at said first end of said central part, said bracket section including a bent portion cooperating with said central part for engaging substantially only the free edge said fender fold,

a holding section, at said second end of said central part, adapted to be bent into engagement with said body portion adjacent said fender fold and adhesive means for bonding said holding section to said body portion, said bracket section and said holding section, in use, cooperating to fix said bracket to said motor vehicle body with said central part disposed over said fender fold; and

at least one fixing member which is supportingly engageable of a mud flap, said fixing member being fixable to said central part of said bracket.

4,733,880

RIDABLE ARM EXERCISE BICYCLE

Donald Wilbelm, III, 864 Beechwood Dr., Colma, Calif. 94015

Filed Mar. 17, 1987, Ser. No. 26,935

Int. Cl.[4] B62M *1/00*

U.S. Cl. 280—234 5 Claims

1. A cycle for providing simultaneous exercise to the arms and legs of a user straddling said cycle, said cycle comprising in combination:

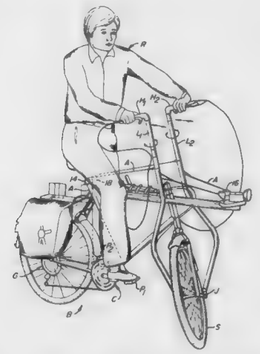
a frame;

a seat on the upper portion of said frame;

first and second bicycle cranks mounted to said frame below said seat, each crank rotated about an axis transverse of said frame, said cranks including a first crank and pedal for engagement with the left foot of a user on one side of said frame and a second crank and pedal for engagement with the right foot of the user on the other side of said frame, said cranks being in opposed relation relative to their rotation about said axis;

first and second handles for movement towards and away from the user on said frame for permitting the user to apply power to said handles at least on the away movement; and,

first and second sheaves below said seat; and



first continuous running rigging extending between each said handle and over one of said sheaves to each said crank for permitting handle movement away from said user to apply upward force to said cranks.

4,733,881

BICYCLE FRAME WITH SUPPLEMENTAL STEP OR PLATFORM FOR PERFORMING FREESTYLE MANEUVERS

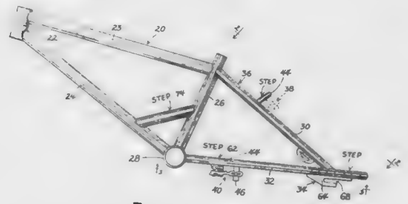
Clifford F. Mueller, Arlington Heights, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Division of Ser. No. 866,794, May 23, 1986, Pat. No. 4,666,175. This application Apr. 23, 1987, Ser. No. 42,280

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] B62J *25/00*

U.S. Cl. 280—291 3 Claims



1. In a freestyle bicycle for performing freestyle maneuvers having a frame of the type including a tubular top tube having front and rear ends, a tubular seat tube having top and bottom ends with the top end secured to the rear end of said top tube, a tubular head tube having top and bottom ends with the top end secured to the front end of said top tube, a tubular down tube having top and bottom ends with the top end secured to the bottom end of said head tube, a pair of chain stay tubes having front and rear ends, a pair of seat stay tubes having top and bottom ends with the top ends secured to the top end of said seat tube. a bottom bracket secured to the bottom ends of said seat and down tubes and the front ends of said chain stay tubes, two rear fork dropout ends secured to the rear and bottom ends, respectively, of said chain stay and seat stay tubes, the improvement wherein: a diagonal member is secured between the down and seat tubes to provide a step or platform for performing freestyle maneuvers.

4,733,882

PUSH ROD FOR BABY CARRIAGE

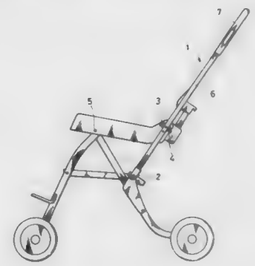
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jun. 5, 1987, Ser. No. 58,507

Claims priority, application Japan, Jun. 16, 1987, 61-140506

Int. Cl.[4] B62B *7/08*

U.S. Cl. 280—47.37 R 3 Claims



1. A push rod for a baby carriage, which push rod is turnably attached at its lower end to the baby carriage body so that it can be switched between back-to-face and face-to-face push states, comprising

a pair of lower rods (6) extending along the right and left sides of the baby carriage body and turnably attached at their lower ends to the baby carriage body,

a handle (7) in the form of an inverted U-shape having a widthwise extending connecting portion (8) and a pair of legs (9) extending downward from the opposite ends of said widthwise extending connecting portion, said legs (9) receiving the upper portions of said lower rods (6) so that said legs (9) are vertically slidable on said lower rods (6),

a transverse rod (11) extending along the widthwise extending connecting portion (8) and supported by said handle (7) so that it is vertically movable,

a transverse rod urging spring (14) constantly urging said transverse rod (11) to move downward,

a pair of sliders (16) fixedly attached to the opposite ends of said transverse rod (11) and received in said lower rods (6) so that they are vertically movable,

a pair of connecting members (20) having their upper portions disposed to overlap said sliders (16) and received in said lower rods (6) so that they are vertically movable,

a pair of connecting member urging springs (31) constantly urging said connecting members (20) to move downward,

a pair of hooks (3) fixedly attached to said connecting members (20) so that they are vertically movable, said hooks being arranged so that when they are in the lower position they engage engagement pins installed on the baby carriage body to fix the back-to-face or face-to-face push state of said push rod but when they are in the upper position they are disengaged from said pins,

said pair of sliders (16) being respectively formed with receiver recesses (19) opposed to said connecting members (20),

said pair of connecting member (20) being each formed with a plurality of vertically aligned engagement holes (21) and a communication opening (22) continuously vertically extending through said engagement holes (21),

said pair of lower rods (6) being each formed with a plurality of vertically aligned locking holes (39) and a guide opening (40) continuously vertically extending through said locking holes (39),

a pair of fitting members (23) movably received in said receiver recesses (19) and having heads adapted to fit in said engagement holes (21),

a pair of fitting member urging springs (24) constantly

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urging said fitting members (23) to move in the direction to fit in said engagement holes (21),

a pair of operating levers (10) provided on the pair of legs (9) of said handle (7) so that they are turnable between a first position and a second position,

each of said operating levers (10) being shaped to extend through said communication opening (22) and said guide opening (40) and having a holder portion (45) capable of pressing the head of said fitting member (23) and a locking pin (48) capable of fitting in said locking holes (39),

wherein when said operating lever (10) is in said first position, said locking pin (48) fits in said locking hole (39) and said fitting member (23) fits in said engagement hole (21), and

wherein when said operating lever (10) is in said second position, said locking pin (48) is disengaged from said locking hole (39) and said holder portion (45) presses said fitting member (23) out of said engagement hole (21).

4,733,883

SUSPENSION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE WITH ANTI-DIVE CONTROL DURING DECELERATION

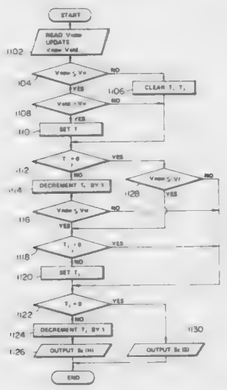
Fukashi Sugasawa; Junsuke Kuroki, and Yohsuke Akatsu, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 13, 1985, Ser. No. 744,380

Claims priority, application Japan, Jun. 14, 1984, 59-122827

Int. Cl.[4] B60G *17/08*

U.S. Cl. 280—707 **20 Claims**



1. A suspension control system for an automotive vehicle comprising:

a vehicular suspension system having variable damping characteristics at least between a first harder suspension mode and a second softer suspension mode;

a vehicle speed sensor producing a vehicle speed signal representative of vehicle speed;

a controller for detecting vehicle speed drop across a predetermined value which is representative of a substantially low vehicle speed to produce a control signal for operating said suspension system into said first mode, said controller varying said predetermined value between a first greater value indicative of a deceleration threshold and a second smaller value indicative of a vehicle stopping threshold, said controller detecting vehicle deceleration amount to use said first greater value when said vehicle deceleration amount is greater than a given value and, otherwise to use said second value so as to operate said suspension into said first mode when said vehicle decelerates rapidly across said first greater value and to operate said suspension into said first mode when said vehicle is substantially at a standstill.

4,733,884

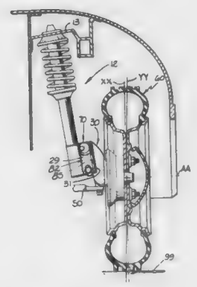
CAMBER ADJUSTMENT DEVICE

Craig R. Pettibone, Lafayette, and Jimmy D. Berry, Longmont, both of Colo., assignors to Specialty Products Company, Longmont, Colo.

Continuation-in-part of Ser. No. 893,153, Sep. 15, 1986, which is a continuation-in-part of Ser. No. 692,825, Jan. 18, 1985, Pat. No. 4,615,845. This application Jul. 2, 1987, Ser. No. 65,725

Int. Cl.[4] B62D *17/00*

U.S. Cl. 280—661 **11 Claims**



1. A camber adjustment assembly for adjusting the camber of a wheel in a vehicle suspension system of the type ordinarily including a generally vertically extending strut assembly having an upper end attached to a vehicle frame assembly and having a pair of strut flanges positioned in parallel relationship with one another and projecting laterally outwardly from a lower end portion of the strut assembly; a wheel knuckle assembly mounted on the strut assembly and having a mounting portion positioned between the two strut flanges with a first hole therein adapted to closely, axially slidingly receive a first bolt therein which also passes through a first pair of coaxially aligned holes in the strut flanges in close axially sliding relationship and with a second hole therein adapted to closely, axially slidingly receive a second bolt which also passes through a second pair of coaxially aligned holes in the strut flanges in close axially sliding relationship, the first and second holes in the wheel knuckle mounting portion being vertically spaced apart, the first and second bolt holes in the wheel knuckle mounting portion and the first and second pair of holes in the strut flanges having axes positioned in substantially perpendicular relationship with the axis of rotation of a wheel supported on the wheel knuckle assembly, the camber adjustment assembly comprising:

(a) parallel laterally extending slot means provided in said pair of strut flanges by lateral extension of said first pair of holes therein;

(b) cam bolt means having a central longitudinal axis for providing adjustable pivotal movement of said wheel knuckle about said axis of said second hole in said wheel knuckle mounting portion, said cam bolt means being received in said parallel slot means in said strut flanges and in said first hole in said wheel knuckle with said central longitudinal axis thereof positioned coaxially with said axis of said first hole in said wheel knuckle assembly and being adjustably laterally movable in said parallel slot means in a first relatively loosened state of said cam bolt means and being relatively fixed with respect to said parallel slot means in a second relatively tightened state of said cam bolt means;

(c) cam plate means mounted on at least one of said strut flanges and adapted to coact with said strut flange and said cam bolt for causing said relative lateral displacement of said cam bolt in said strut flange parallel slot means during rotational movement of said cam bolt means about said cam bolt means central longitudinal axis in said first relatively loosened state;

(d) whereby the chamber of a wheel mounted on said wheel knuckle assembly is adjustable through rotation of said cam bolt means about said cam bolt means central longitudinal axis.

4,733,885

VEHICLE EQUIPPED WITH RETRACTABLE RELIEF SUPPORT WHEELS

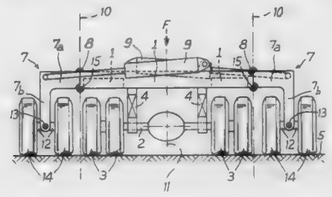
Georges M. Charles, St Vallier, France, assignor to Potain Poclain Materiel (P.P.M.), Montceau-Les-Mines, France

Filed May 9, 1983, Ser. No. 492,781

Claims priority, application France, May 12, 1982, 82 08274

Int. Cl.[4] B62D *61/12*

U.S. Cl. 280—767 **9 Claims**



1. A vehicle comprising a chassis on which are mounted the left and right main wheels of at least one set of main wheels, and comprising also at least one set of left and right relief wheels mounted on supports, said supports being mounted on the chassis and provided with means to adjust their position with respect to said chassis, and being adapted to occupy the two following positions:

a first position in which the left and right relief wheels are placed next to and beyond the median longitudinal plane of the chassis, said left and right main wheels being respectively placed in rolling configuration on the ground, the supports being also immobilized with respect to the chassis, and,

a second position in which the said supports and the said relief wheels mounted therein, are substantially within the maximum gauge of the chassis resting on the ground solely by its main wheels, wherein the main wheels of said set of main wheels are connected to the chassis via a soft suspension, whereas the relief wheels of said sets of left and right relief wheels are only connected to their respective supports via rigid elements.

4,733,886

SEAT BELT

Yoshihiro Yokote, Yokohama, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,715

Claims priority, application Japan, Oct. 30, 1985, 60-167407[U]

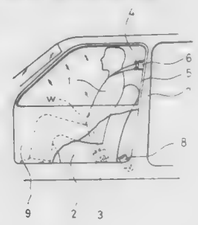
Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **10 Claims**

1. A seat belt comprising:

a webbing adapted for restraint of the upper torso of an occupant, connected retractably at the inboard end thereof to a retractor provided on the central side of the room of a vehicle and fastened at the outboard end thereof to a latch member releasably engageable with a first member mounted on the sash of an associated door;

a second member provided within the room of the vehicle at an outer and lower location thereof, to which the latch member with the outboard end of the webbing fastened thereto is releasably engageable; and



means for automatically preventing further release of the webbing out of the retractor in response to engagement of the latch member with the second member.

4,733,887

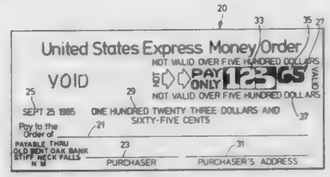
SECURE FINANCIAL DOCUMENT

William H. Mowry, Jr., Ionia, N.Y., assignor to The Standard Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 794,986, Nov. 4, 1985. This application Dec. 15, 1986, Ser. No. 941,416

Int. Cl.[4] B42D *15/00*; G09F *7/00*

U.S. Cl. 283—58 **13 Claims**



1. A financial instrument having an amount printed on the face thereof in which the digits making up the amount are printed in a negative pattern and formed by a series of rows of printed dots which define the outlines for said digits and in which the area beneath said amount is preprinted with an intelligible message which is visible through the open areas of said digits.

4,733,888

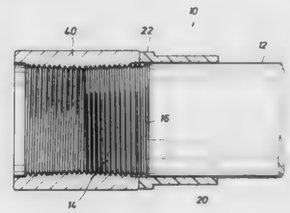
PROTECTOR FOR THREADED CONNECTIONS

Lester W. Toelke, 204 Lisa La., Bellville, Tex. 77418

Filed Dec. 10, 1986, Ser. No. 939,955

Int. Cl.[4] F16L *57/00*

U.S. Cl. 285—4 **15 Claims**



1. Apparatus for protecting a pipe, the apparatus comprising a thread protector having an elongate sleeve of deformable non-metallic plastic material sized to fit about the exterior and

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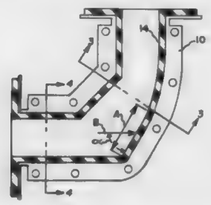
over all of the threads of a male threaded pipe end, said sleeve terminating at an end located circumferential shoulder thereabout, a peripheral face on said shoulder for abutting a pipe coupling threadedly engaged with the male threads on the end of the pipe, and wherein said sleeve is of sufficient length so that said sleeve extends beyond the pipe threads on the pipe when the pipe is threaded to a pipe coupling and wherein said sleeve, relative to the pipe threads, has an interference fit therewith, and also including an encircling end located sealant receiving space beneath said sleeve and adjacent to said circumferential shoulder such that said apparatus protects the male pipe threads before and after installation.

4,733,889

WEAR RESISTANT PIPE

Edwin L. Haines, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 2, 1987, Ser. No. 20,303
Int. Cl.[4] F16L *9/14*
U.S. Cl. 285—16 **10 Claims**



1. A wear resistant pipe segment which alters the direction of flow of particulate matter of an erosive nature comprising:
an inlet and exit portions that are circular in cross-section;
a connecting portion that is a closed U-shape in cross-section wherein the curved portion is on the inside of the bend and the outer surface of the bend lies on a plane or planes which are inclined at an angle or angles of at least 35°, but not more than 65° with reference to the direction of incoming flow;
said connecting portion having a cross-sectional area through an impingement surface of at least 1.25 times the cross-sectional area of the inlet portion;
said connecting portion being contoured smoothly to join with the exit portion; said pipe segment being constructed of an elastomeric material.

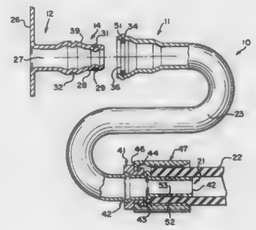
4,733,890

FORMED FLUID COUPLING APPARATUS

Gerrard N. Vyse, Bedford, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation of Ser. No. 629,059, Jul. 9, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 896,070
Int. Cl.[4] F16L *13/00, 33/20*
U.S. Cl. 285—174 **4 Claims**

1. Apparatus adapted to extend between and be connected to a first component and to a hose, said first component including an insert part of a quick-connect coupling and having an annular insert groove in the outer periphery thereof, said apparatus comprising an elongated thin walled metal tube formed by a substantially constant thickness circular wall, said tube having first and second ends, first coupling means on said first end, said first coupling means comprising a one-piece receptacle part of said coupling, said receptacle part being mechanically formed on and integral with said tube and having an annular receptacle groove formed on the interior surface of said wall, said first coupling means further comprising an expandable split metal snap ring carried by said receptacle groove, said receptacle groove having a larger diameter than the unexpanded diameter of said ring whereby said ring may be expanded outwardly in said receptacle groove, said ring being engageable within said insert and receptacle grooves and forming a permanently locked connection of said receptacle part with said insert part, an O-ring seal engaging said interior surface of said wall inwardly of said snap ring, second coupling



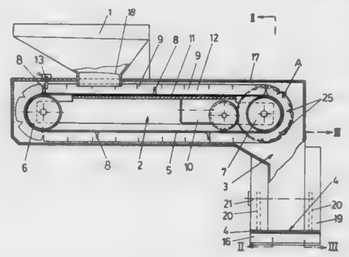
means mechanically formed on and integral with said second end, said second coupling means being adapted to be rigidly secured to said hose, and an elongated portion of said tube between said first and second ends being shaped to extend between the first component and the hose.

4,733,891

GRIT SPREADER FOR MOTOR VEHICLES

Franz Cervinka, Oberleitenweg 35, A-6370 Kitzbühel, Austria

PCT No. PCT/AT85/00035, § 371 Date Jun. 4, 1986, § 102(e) Date Jun. 4, 1986, PCT Pub. No. WO86/02321, PCT Pub. Date Apr. 24, 1986
PCT Filed Sep. 26, 1985, Ser. No. 881,042
Claims priority, application Austria, Oct. 9, 1984, 3189/84
Int. Cl.[4] B61C *15/10*
U.S. Cl. 291—27 **10 Claims**



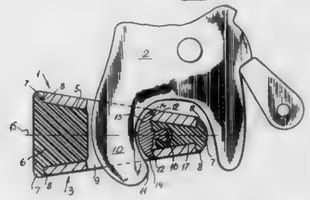
1. Grit spreader for motor vehicles for spreading gritting material in front of a wheel of the vehicle, under the control of the operator of the vehicle, comprising
a supply container for gritting material having a supply outlet,
a housing defining a closed dispersion channel divided by an intermediate transition portion thereof into a first section extending generally horizontally and joined with the supply outlet, and a second section forming a continuation of the first section at the transition portion and extending generally downwardly therefrom to a spreader outlet which is adapted to be located adjacent a wheel of the vehicle for spreading gritting material in front of the wheel,
an endless conveyor disposed on a pair of deflection pulleys in the first section, including an upstream supply pulley adjacent the supply outlet, and a downstream discharge pulley at the transition portion and overlying the second section, each pulley having an upper deflection part and a lower deflection part,
the conveyor defining an upper conveying run and a lower return run extending between an upstream conveyor supply end at the supply pulley and a downstream conveyor discharge end at the discharge pulley, in which the upper run is separated from the lower run and positioned to receive gritting material from the supply outlet and to convey such gritting material to the discharge end while maintaining the gritting material out of contact with the lower run,
a plurality of spaced apart successive transverse webs provided on the conveyor to define a continuous line of successive individual chambers between corresponding pairs of successive webs, such that each chamber is formed between a leading web and a trailing web,
a drive unit arranged to drive the conveyor for conveying the upper run towards the discharge end, and
a follow-up control, for operation while the drive unit is driving the conveyor and in response to the vehicle operator initiated shut off of the drive unit, for delaying the actual stopping of the drive unit until the next successive web reaches the adjacent upper deflection part of the discharge pulley, whereby to assure complete discharge of the gritting material from the downstream chamber thereahead and retention of the gritting material in the next successive chamber.

4,733,892

KEEPER FOR VEHICLE DOOR LATCH AND METHOD OF MAKING SAME

Frank Kleefeldt, Heiligenhaus, and Kurt Raffelsiefer, Velbert, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,055
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623311
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **7 Claims**



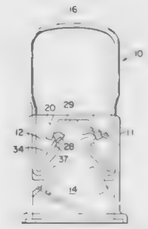
1. In combination with a motor-vehicle door post and with a latch fork displaceable in an inward direction toward and an outward direction away from the post on closing and opening of the respective door, a keeper comprising:
a U-section sheet-metal frame having flanges secured to the door post and formed with a throughgoing passage open transversely of the directions and having relative to the directions an outer edge;
an incompressible but elastomeric damper insert received in the frame, having a throughgoing passage aligned with that of the frame, engaging inward and outward laterally past the frame, and formed with a groove opening inward at the outer frame-passage edge; and
a hard metallic abutment of mushroom section having a central outwardly flared stem snugly received in the groove and tabs outwardly overreaching and overlying the outer frame-passage edge and defining an inwardly convex surface, the fork having an arm engaging through the aligned passages and having an outwardly concave surface engaging outward against the surface of the abutment in a closed and latched position of the door, the stem and groove being so dimensioned that the abutment is elastically prestressed outward against the outer frame-passage edge.

4,733,893

TRANSPARENT SECURITY SEAL

George W. Davis, Warren, and Frank P. Aadahl, Bound Brook, both of N.J., assignors to Inner-Tite Corporation, Springfield, N.J.

Filed Apr. 2, 1987, Ser. No. 33,996
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—320 **9 Claims**



1. A seal for utility meters and the like comprising:
a generally hollow, transparent, pendular body having two opposed openings in its upper surface leading into a central cavity extending vertically from the upper surface of the body to its lower surface, two opposed shoulders intermediate the top and bottom surfaces of the body extending laterally into the cavity and two opposed catches located in the upper portion of the body in the central cavity;
an opaque, locking member inserted into the central cavity and fixedly connected to the body, the locking member having two opposed frangible fingers cooperating with the catches of the body to form recesses facing downwardly into the cavity at opposite sides of the locking member; and
a generally U-shaped fastening shackle, each end of which is reversibly bent to form a tang, one end of the shackle being inserted through one of the openings along the top surface of the body down into the central cavity so that the bend of the tang rests on one of the opposed shoulders and the tip of the tang is secured in one of the downwardly facing recesses adjacent a frangible finger, the other end of the shackle being insertable through the other opening and likewise securable in the downwardly facing recess on the opposite side of the locking member to lock the seal.

4,733,894

ENERGY ABSORBING VEHICLE BUMPER

Ronald C. Lamparter, Grosse Pointe Shores, Mich., assignor to Transpec Inc., Troy, Mich.

Filed Oct. 16, 1986, Ser. No. 919,501
Int. Cl.[4] B60R *19/08*
U.S. Cl. 293—120 **8 Claims**

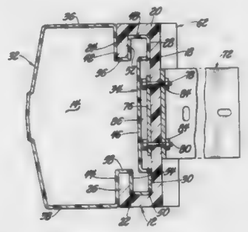
1. An energy absorbing vehicle bumper system of the type including a beam member (12) adapted to span the front end of a vehicle, bracket means (72 and 74) for mounting said beam to the vehicle, and energy absorbing means (14 and 16) supported upon said beam on the side thereof opposite from the bracket means, the improvement comprising:
A. said beam (12) having a generally C-shaped cross-section and including
(1) a vertical wall portion (18);

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(2) a pair of horizontal leg portions (**20** and **22**) projecting forwardly from the upper and lower edges of the vertical wall portion and each leg portion respectively terminating in an inwardly extending lip (**24** and **26**) portion whereby said leg and lip portions respectively coact with the vertical wall to define upper and lower inwardly opening channels (**28** and **30**);

B. each energy absorbing means (**14** and **16**) comprising a hollow, rigidified and deflectable structural member being supported upon said beam such that the major portion of said structural member projects forwardly of said beam, said structural member including

(1) a first portion (**32**) disposed forwardly of the beam;



(2) a second portion (**34**) disposed within the C-shaped beam and projecting into said upper and lower beam channels;

(3) upper and lower transversely extending and outwardly opening grooves formed between said first and second portions (**32** and **34**) and adapted to respectively receive the upper and lower beam lips (**24** and **26**) to retain the energy absorbing means to the beam (**12**);

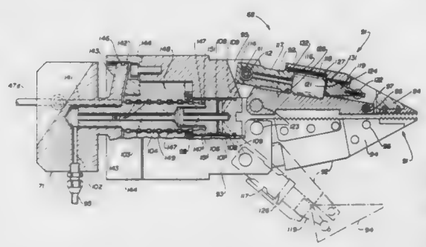
(4) an end portion (**70**) extending transversely and rearwardly beyond the beam member (**12**) such that the transversely outer end of said beam abuts against an inner wall (**64**) of said end portion.

4,733,895

ELECTROMECHANICAL MANIPULATOR ASSEMBLY

Graham S. Hawkes, Oakland, Calif., assignor to Deep Ocean Engineering Incorporated, Oakland, Calif.

Division of Ser. No. 466,606, Feb. 15, 1983, Pat. No. 4,607,998.
This application Apr. 3, 1986, Ser. No. 847,695
Int. Cl.⁴ B66C *1/44*
U.S. Cl. 294—88 **5 Claims**



1. A jaw assembly for a remote manipulator apparatus including a pair of opposed jaw means each formed with a gripping surface for gripping an object therebetween, at least one of said jaw means being movably mounted with respect to the other of said jaw means, and drive means displacing the movable one of said jaw means to effect gripping and release of said object, wherein the improvement in said manipulator apparatus comprises:

said movable one of said jaw means being formed with a base member having a portion of said gripping surface thereon, said base member being displaceable by said drive means into gripping engagement with said object to grip said object between said base member and said other of said jaw means, and said movable one of said jaw means further having a tip member pivotally mounted to said base member and having a portion of said gripping surface thereon, said tip member being displaceable by said drive means into gripping engagement with said object to grip said object between said tip member and said other of said jaw means; and

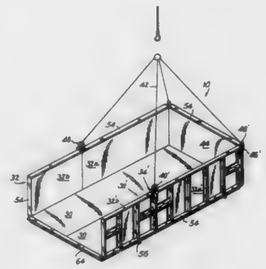
said drive means including three members, said three members being a fluid cylinder and two pistons mounted in said cylinder to contain a working fluid in said cylinder, at least two of said three members being movable with respect to a remaining member upon pressurizing said working fluid in said cylinder, and one of the two movable members being connected to and pivotally displacing said tip member with respect to said base member and said other of said jaw means until the portion of said gripping surface on said tip member engages said object, and the other of the two movable members being connected to and pivotally displacing said base member toward said other of said jaw means until the portion of said gripping surface on said base member engages said object.

4,733,896

LIFT CONTAINER AND METHOD FOR USING SAME

Richard A. Klein, Pittsburgh, Pa., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Mar. 11, 1986, Ser. No. 838,381
Int. Cl.⁴ B65D *19/06*; B66B *9/20*; E04G *21/16*
U.S. Cl. 294—67.1 **16 Claims**



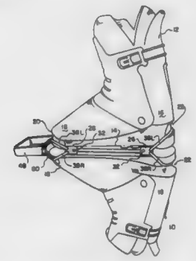
10. A box-like container adapted for quick assembly and disassembly, comprising a container having at least a floor and two sides, said container having several component parts all sized to pass through an opening of predetermined size which is too small to pass the container in its assembled form, said parts including a plurality of panels constitituting the floor and sides of said container, bracket means for joining pairs of said panels at right angles, and quick connect-disconnect means in the form of wedge bolts and co-operative slots in appropriate component parts for securing said panels and said bracket means together in the assembled container, each panel having a rectangular facing with a marginal reinforcing backing frame, and a stiffening means secured across at least one end of said container for bracing the sides relative to the floor of said container.

4,733,897

BOOT HANDLE

Roy L. Schuetzeberg, 3206 67th St., Lubbock, Tex. 79413

Filed Apr. 3, 1987, Ser. No. 34,857
Int. Cl.⁴ B65D *71/00*
U.S. Cl. 294—162 **3 Claims**



1. A carrier for a pair of ski boots, said boots being a right and left boot, each of said boots having:

a. a heel and a toe,

b. a flat rigid sole,

c. a toe notch across the toe for ski bindings, and

d. a heel notch across the heel for ski bindings;

wherein the improved carrier comprises:

e. two distal notch pieces,

f. two handle notch pieces,

g. each notch piece being:

i. rigid,

ii. of general rectangular shape with

iii. a notch side,

iv. an elastic side opposite the notch side, and

v. two straight sides connecting the notch side and elastic side,

h. the notch side on each notch piece adapted to fit one of the notches of the boots,

j. an elastic assembly having a distal and handle end,

k. the elastic sides of the two distal notch pieces rotatably connected to the distal end of the elastic assembly,

l. the elastic sides of the two handle notch pieces rotatably connected to the handle end of the elastic assembly,

m. a handle,

n. two tension members on each side of the handle,

o. each of said tension members attached to one of the straight sides of one of the handle notch pieces, and

p. a strap connected to the handle end of the elastic assembly.

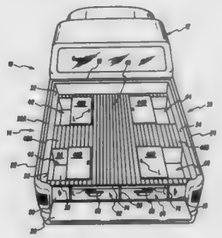
4,733,898

PICKUP-BED SECURE STORAGE UNIT

Scottie D. Williams, P.O. Box 927, Abilene, Tex. 79604

Filed Mar. 9, 1987, Ser. No. 23,615
Int. Cl.⁴ B62D *33/04*
U.S. Cl. 296—24 R **5 Claims**

1. A combination storage unit and liner assembly for mounting onto the bed of a pickup tuck in nesting engagement with the side panels and end panel of the truck bed comprising a bottom panel for engaging the load-bearing surface of the truck bed, first and second side panels extending upright from said bottom panel, each side panel having a flange portion extending transversely with respect to the side panel for engaging the top surface of one of the truck bed side panels, an auxillary load bed panel being vertically spaced with respect to said bottom panel and extending substantially in parallel relation therewith, a plurality of inner panels extending vertically between the bottom panel and the auxillary load bed panel, said inner panels partitioning the space between the bottom panel and auxillary load bed panel thereby defining a pocket; a



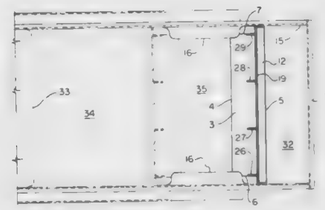
pull drawer being disposed within said pocket and being movable into and out of said pocket.

4,733,899

PICKUP TRUCK-BED DIVIDER DEVICE

Orbrie L. Keys, 2175 Decoto Rd. #65, Union City, Calif. 94587

Filed Mar. 2, 1987, Ser. No. 20,389
Int. Cl.⁴ B60P *3/34*
U.S. Cl. 296—24 R **4 Claims**



1. A portable divider device for dividing a pickup truck bed having a flat floor and spaced side walls into at least two smaller compartmetns without use of tools or modification of the truck bed and without attachment to the truck bed so that the divider device may be freely applied to compartmentalize the truck bed or removed to restore the truck bed to its non-compartmentalized condition, comprising:

(a) an elongated support plate having first and second elongated edges intercepted by opposite end edges and adapted to extend transversely across and lie flat on said flat floor of said truck bed but unattached thereto with said end edges next adjacent said truck bed side walls; and

(b) a baffle plate having a height less than its length mounted perpendicularly on said elongated support plate and extending longitudinally therealong whereby when said support plate is placed flat on said flat floor of the truck bed and extending thereacross said baffle plate extends vertically to a height less than the depth of said truck bed and transversely across the truck bed but unattached thereto to divide the interior of the truck bed into at least two smaller compartments.

4,733,900

ENGINE COVER CONSOLE

William J. Fluharty, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Feb. 20, 1987, Ser. No. 16,848
Int. Cl.⁴ B60R *7/04*
U.S. Cl. 296—37.8 **21 Claims**

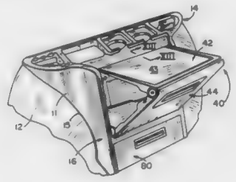
1. A console for a vehicle, said console comprising:

a housing having a generally horizontal upper portion and a

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gernerally vertical lower protion with said lower portion including a recess formed therein;

a retractable and extendable table and means for pivotally mounting said table to said housing for storage within said recess, said table comprising a pair of panels of said panels pivotally coupled to said first panel and defining a table



surface when said panels are pivoted to an open position wherein said first panel is pivotally coupled at a lower end portion to said housing; and

means for securing an edge of said second panel to an edge of said housing adjacent said recess for holding said second panel in a generally horizontal position for use of the table.

4,733,901

VEHICLE BODY STRUCTURE WITH A REAR LUGGAGE COMPARTMENT

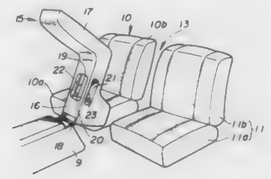
Yoshikito Okuyama, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 21, 1986, Ser. No. 854,099

Claims priority, application Japan, Apr. 22, 1985, 60-60067[U]

Int. Cl.⁴ B60N *1/06*

U.S. Cl. 296—37.16 **23 Claims**



9. A structure for a seat arrangement of a vehicle comprising:

means defining a space of an interior of the vehicle;

a seat arrangement located at a rear part of the vehicle, said seat arrangement having a clearance between uppermost and lower most portions thereof defining an opening which allows access to said space;

a console member; and

a member movably connected to said console member and movable into and out of said opening, said member substantially filling said clearance and forming an armrest for said seat arrangement when said member is disposed in said opening, said member allowing access to the interior space through said opening when said member moves out of said opening.

4,733,902

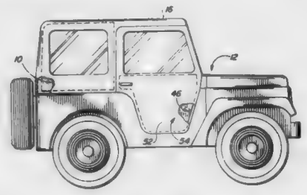
INSULATIVE LINER ASSEMBLY FOR JEEP-TYPE VEHICLES

John Rabb, Van Nuys, Calif., assignor to Derek Don Blatt, Van Nuys, Calif.

Filed May 4, 1987, Ser. No. 45,418

Int. Cl.⁴ B62D *25/00*

U.S. Cl. 296—39 A **20 Claims**



1. An improved insulative liner assembly for jeep-type motor vehicles, said liner assembly comprising, in combination:

(a) a top thermally insulative panel adapted to fit below the roof canopy of a jeep-type vehicle;

(b) means connected to the front and rear of said top panel to releasably secure said top panel to the transverse support beams in a jeep-type vehicle;

(c) a pair of thermally insulative rear side panels secured to the rear side margins of said top panel and adapted to depend therefrom; and,

(d) means connected to the lower portions of said rear side panels for releasably connecting said rear side panels to the interior side frame of a jeep-type vehicle, said assembly being capable of blocking wind, noise and cold from the interior of a jeep-type vehicle.

4,733,903

SWIVELLABLE SEAT FOR MOTOR VEHICLES

Roy M. Bailey, The Sportsmans Inn, Ivybridge, Nr. Plymouth, South Devon, PL21 OBQ, United Kingdom

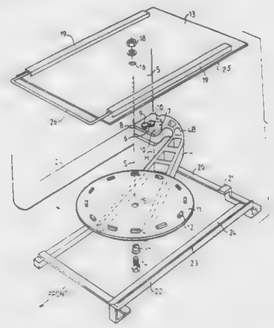
PCT No. PCT/GB85/00192, § 371 Date Jan. 7, 1986, § 102(e) Date Jan. 7, 1986, PCT Pub. No. WO85/05081, PCT Pub. Date Nov. 21, 1985

PCT Filed May 8, 1985, Ser. No. 824,003

Claims priority, application United Kingdom, May 8, 1984, #411632

Int. Cl.⁴ B60N *1/04*

U.S. Cl. 296—65 R **6 Claims**



1. A swivellable seat for a motor vehicle comprising:

a seat bearing for supporting a seat for rotation about a swivel axis, said seat bearing including a bearing plate concentric with the swivel axis and a swivel plate attachable to the seat and resting upon said bearing plate for rotation relative thereto about said swivel axis,

a cantilevered support arm mounted at one end thereof to said bearing plate of said seat bearing and including a hinge at the other end thereof for mounting to a door pillar of the vehicle body so that said cantilevered support arm is pivotal about a hinge axis substantially parallel to and spaced from said swivel axis and is movable angularly about the hinge axis between a first position in which said seat bearing is inboard, corresponding to a stowed positon of the seat, and a second position in which said seat bearing is outboard of a door opening of the vehicle, and a third position in which the seat bearing is outboard of the vehicle and displaced rearwardly relative to the door opening.

4,733,904

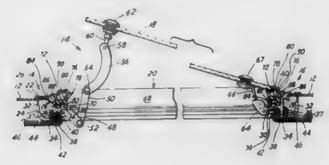
SUN ROOF

Steven A. Snyder, Sturgis, Mich., assignor to Sparkomatic Corporation, Milford, Pa.

Filed Jun. 23, 1981, Ser. No. 256,703

Int. Cl.⁴ B60J *7/195*

U.S. Cl. 296—213 **17 Claims**



1. A sun roof assembly for a vehicle comprising:

substantially continuous ring shaped frame means defining an opening therein,

a cover for covering said opening, said cover defining a shape and having perimeter dimensions substantially the same as the shape and dimensions of said ring shaped frame means,

hinge means mounting said cover for movement between opening and closing positions relative to said opening,

a flexible generally ring shaped member also substantially defining the shape and perimeter dimensions of said cover, said flexible ring shaped member including,

a base member having an upper wall and bottom wall, and

tubular bulb means positioned on the upper wall of said base member and extending substantially continuously around the top of said base member, said bulb means being hollow and having upper interior and exterior walls,

mounting means for mounting said base member on said frame means,

said tubular bulb means being sized relative to said frame means and cover and sufficiently flexible such that when said cover is closed, said upper interior wall of said tubular bulb means is compressed by said cover against said upper wall of said base member in a substantially vertical direction to compress the flexible material in said upper wall of said base member also in a substantially vertical downward direction, but when the cover is opened, said bulb means springs upwardly to a level above the elevation of the vehicle roof in which it is installed and said upper interior wall and upper wall of said base member are separated.

4,733,905

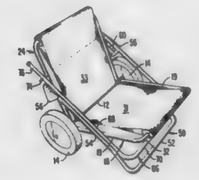
COMBINATION CHAIR AND CART

Kenneth N. Buickerood, Redwood City, Calif., and Edgar J. Garroni, 3713 Encline Way, Belmont, Calif. 94002, assignors to Edgar J. Garroni, Belmont, Calif.

Filed Apr. 20, 1987, Ser. No. 40,412

Int. Cl.⁴ A47C *13/00*

U.S. Cl. 297—129 **11 Claims**



1. A combination chair and cart unit comprising: a shaft having ground engaging wheels mounted thereon at the ends thereof; first and second U-shaped elements each having a pair of generally rigid sides and a crosspiece interconnecting first ends of the sides, the second ends of the sides being rotatably mounted on the shaft; a flexible sheet secured at the ends thereof to and extending between the crosspieces of the first and second elements and passing partially about the shaft, said sheet having a pair of parts normally extending outwardly from said shaft and being in operative position angularly disposed relative to each other; third and fourth U-shaped elements, each of the third and forth elements including a pair of generally rigid sides and a crosspiece at first ends of the sides; means pivotally connecting the sides of the third element with respective sides of the first element; means pivotally connecting the sides of the fourth element with respective sides of the second element, said fourth element being movable from a first location extending upwardly and away from the second element to a second location extending downwardly and along the third element when the third element is in a position extending forwardly and downwardly from the first element; and means coupling the adjacent ends of the third element with the ends of the fourth element when said fourth element is in the first and second operative locations thereof.

4,733,906

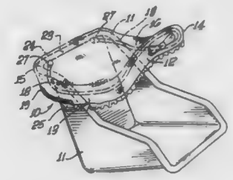
SUNSHADE FOR INFANTS FOR ATTACHMENT TO A CAR SEAT

Carol S. Davis, 539 Mt. Crest, Duarte, Calif. 91010, and Nancy R. Impastato, 1164 Glentana St., Covina, Calif. 91722

Filed Jun. 11, 1986, Ser. No. 872,847

Int. Cl.⁴ A47C *7/10*

U.S. Cl. 297—184 **7 Claims**



1. An infant seat and sunshade comprising:

an infant seat having right and left sides and an upper edge, said infant seat including a back formed with an outwardly directed flange at the upper edge thereof;

a generally rectangular fabric shade having a front which is cantilevered over the infant seat, two sides, a back, and a back edge which extend around the outwardly directed flange of the back of said infant seat;

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a generally U-shaped support bar having two arms extending from a base, said support bar being held at its base to said fabric shade near the front thereof, both arms of said bar being held near the sides of the fabric shade and the ends of the support bar extending only slightly past the sides of the shade along the back, said support bar being made from a stiff but bendable material, said bar being shaped to require that its arms be moved outwardly to be placed over the infant seat to which it is applied so that said bar frictionally engages the right and left sides of the infant seat;

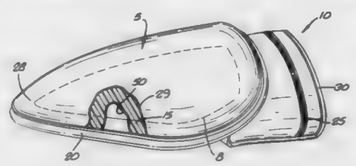
an elastic cord affixed to said fabric shade along the back thereof, at the back edge and extending from the back along each of the sides and terminating at a midpoint of each side of said fabric shade, said U-shaped support bar being inward with respect to said elastic cord whereby the support bar is urged inwardly to provide pivot points with the right and left sides of the infant seats at each edge thereof at a point downward from the upper edge of the infant seat, and the elastic cord pulls the back edge inwardly over the outwardly directed flange and against the back of the infant seat, and the front edge of the support bar is held up by tension in the fabric between the top of the infant seat and the front of the support bar and by the frictional engagement of the U-shaped support bar at the pivot points.

4,733,907

BICYCLE CUSHION SEAT COVER WITH AERODYNAMIC SHAPED BAG

Ernest S. Fellenbaum, 1234 11th St., Santa Monica, Calif. 90401

Continuation of Ser. No. 874,044, Jun. 13, 1986, abandoned.
This application Aug. 25, 1987, Ser. No. 89,918
Int. Cl.[4] B62J *1/18*
U.S. Cl. 297—188 **3 Claims**



1. A combined bicycle seat cover and travel bag which is configured for rider comfort, aerodynamic efficiency, and ease of installation and use, comprising:

a seat cover assembly of a generally flat triangular configuration narrowed to a tongue at its forward end and having both its forward and rearward extremities smoothly curved, including an open-celled foam cushion member whose rearward end portion has a thickness between one inch and one and one-half inches and whose forward tongue portion has a thickness between one quarter inch and one inch, a top cover liner made of vinyl and pulled tightly over said cushion, and a bottom cover liner adapted to engage the bicycle seat;

a small, firm exterior trim member extending about the entire periphery of said seat cover assembly and attached to said top and bottom cover liners;

a stretchable front under flap member extending transversely beneath said tongue portion of said seat cover assembly with its edges secured to said exterior trim member, and having an under trim member secured to its rearward edge, said front under flap member and said under trim member being adapted to be placed underneath and thereby grip the tongue portion of the bicycle seat;

a stretchable back under flap member extending transversely beneath the rearward end portion of said seat cover assembly with its edges secured to said exterior trim member, and having a transversely extending back strap secured to its forward edge, said back under flap member and said back strap being adapted to be placed underneath and thereby grip the rearward end portion of the bicycle seat;

an adjusting strap disposed intermediate to said under trim member and said back strap, having respective end portions secured to said exterior trim member at respective sides of said seat cover assembly, said adjusting strap being adapted to be passed beneath the bicycle seat and having a fine adjusting means cooperating therewith;

a travel bag extending rearwardly from said seat cover assemblyl, said travel bag having a closed forward end secured to the rearward portion of said exterior trim member, having a closed rearward end, having an exterior bag trim member which extends transversely about said rearward end thereof for maintaining the shape of the bag, and having a transversely extending zipper in its upper surface intermediate its length for gaining access to the bag; and

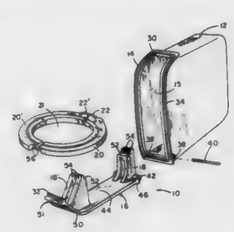
the maximum width of said bag being substantially no greater than the maximum width of said seat cover assembly and the forward end of said travel bag being smoothly curved to provide a smooth aerodynamic action when the bicycle is moving.

4,733,908

BEVERAGE CONTAINER HOLDER AND VEHICLES

Ronald A. Dykstra, Rockford, and Carl W. Flowerday, Holland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Apr. 18, 1985, Ser. No. 725,831
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—194 **11 Claims**



1. A beverage container holder for a vehicle, comprising:

a housing having a recess for storage of the holder;

a container holder member including a pair of arcuate members which unfold in a plane orthogonal to the movement of said container holder member with respect to said recess for defining a container supporting opening, means coupling at least one end of said arcuate members together for controlling the unfolding of said members; and

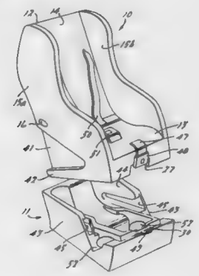
means for coupling said housing and said container holder member for moving said container holder member in a generally vertical plane into and out of said recess, said coupling means including means for pivoting said container holder member from a first position for storage in said recess to a second position where said holder member can be unfolded to support a beverage container.

4,733,909

MULTI-MODE CHILD RESTRAINT SYSTEM

Arthur W. Single, II, Plymouth, and Thomas J. Bryans, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 685,691, Dec. 24, 1984. This application Jun. 19, 1986, Ser. No. 876,327
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] A47C *1/08*
U.S. Cl. 297—250 **7 Claims**



1. A child restraint system comprising:

(A) a child seat comprising:

a seating unit having a seat portion having a seating surface and a bottom, a back portion extending upwardly from said seat portion, and a pair of side walls extending forwardly from said back portion, said back portion, seat portion and side walls each being unitary with the others; and

means for propping said seating unit in a reclined position, said means comprising a prop pivotably mounted under the seating surface of said seating unit within a concavity defined by said seat portion thereof, said prop being releasably engagable in a first position substantially entirely within said concavity and being releasably engagable in a second position in which it extends below the bottom of said seat portion in such location that said means and a bottom rear portion of said seating unit together support said seating unit in a rearwardly reclined position; and

(B) a bolster means for supporting said child seat, which bolster means is releasably engagable with said child seat, wherein said prop is adapted to releasably engage the seating unit to the bolster by abutting against a surface of said bolster, said prop being spring biased downwardly into such abutment with said bolster.

4,733,910

ARTICLE OF FURNITURE

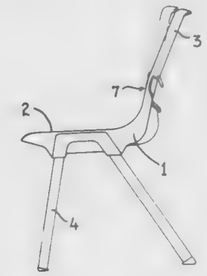
James W. Brennan, Bankstown, Australia, assignor to Sebel Furniture Ltd., Bankstown, Australia

Filed Mar. 17, 1986, Ser. No. 840,348
Claims priority, application Australia, Mar. 18, 1985, PG9777
Int. Cl.[4] A47C *5/12, 7/44*
U.S. Cl. 297—300 **8 Claims**

1. A moulded plastic chair having a seat and a backrest moulded as a single shell with said backrest being connected to said seat by a resilient hinge means at least a portion of which is moulded together with said shell;

wherein said backrest is movable by the action of said hinge means between a rest position adopted by the backrest in the absence of a sitter, and a rearwardly inclined position into which said backrest is resiliently urged by rearward movement of the back of a sitter;

wherein said chair is provided with two pairs of mating stop surfaces, one of said stop surface pairs limiting the forward motion of said backrest in said rest portion of said stop surface pairs limiting the rearward motion of said backrest in said rearwardly inclined position; and



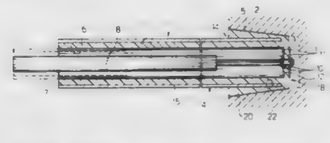
wherein said hinge means includes a recess facing towards the rear of said backrest, and an insert located in said recess, each stop surface pair being formed by a corresponding portion of said recess and a cooperating portion of said insert.

4,733,911

SUPPORT COLUMN FOR A HEIGHT-ADJUSTABLE SEAT, AND A SEAT COMPRISING SAID COLUMN

Renato Fulcheri, Turin, Italy, assignor to Press S.p.A., Cuneo, Italy

Filed Dec. 12, 1986, Ser. No. 940,967
Claims priority, application Italy, Dec. 23, 1985, 68102 A/85
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—345 **11 Claims**



1. A support column (1, 30, 40) for connecting a seat in a height-adjustable manner, in particular for office use, to a support base (2), said support column comprising a tubular support element (4) provided at one end with a Morse taper (5) enabling it to be connected with said support base (2), and at the opposite end with a bush (6) arranged to cooperate with a raising element (7) of the seat so as to guide vertical sliding of the raising element, and a raising mechanism (8) housed inside said tubular support element (4) for operating said raising element to provide vertical movement of the seat, said tubular support element (4) including a coupling element (14) constructed of plastics material and which is arranged to connect the tubular support element (4) to said support base (2), said coupling element (14) including said Morse taper (5) as a portion thereof and provided externally thereon for engaging with the support base, and a strengthening element formed of a piece of unworked cylindrical metal tube (15) which is simply cut to size and fitted to said coupling element (14).

4,733,912

INERTIA SENSITIVE SEAT HINGE MECHANISM

Tyrone R. Secord, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Oct. 30, 1986, Ser. No. 925,073
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 **8 Claims**

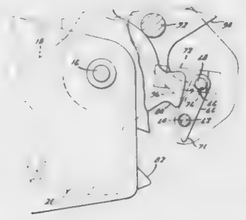
1. In an inertia sensitive seat hinge mechanism for supporting a seat back and a seat bottom which permits said seat back to

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be rotated relative to said seat bottom under normal operating conditions but which restricts rotation of said seat back when said hinge mechanism is exposed to an acceleration above a predetermined level in a predetermined direction, said seat hinge of the type having an upper hinge structure for supporting said seat back and a lower hinge structure for supporting said seat bottom, said upper hinge structure rotatable with respect to said lower hinge structure about a pivot pin, an inertia sensing means comprising:

quadrant means operatively connected to said lower hinge structure for defining a stop surface and an actuator biasing surface spaced from said stop surface,

an inertia sensitive actuator in the form of a generally straight elongated lever, said actuator defining pivot means adjacent one end thereof, engagement means at the other end thereof, and a projecting finger in close proximity with said pivot means, said pivot means located vertically below and horizontally displaced from said lower hinge structure pivot pin, said actuator mounted for limited rotation such that the center of gravity of said actuator is vertically above and horizontally displaced from said pivot means and said actuator being mounted relative to said quadrant means such that when said seat back is in a folded rearward position, said quadrant actuator biasing surface acts on said projecting finger portion to bias said actuator engagement means to a position of engagment with said stop surface and wherein when said seat back is rotated from said folded rearward position, said actuator biasing surface relieves said bias to permit said actuator engagment means to move out of engagment with said stop surface due to gravity or to remain in said position of engagment due to the influence of said acceleration on said actuator.



4,733,913

HEADREST

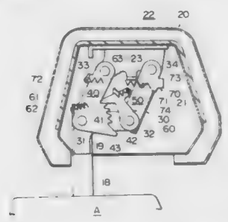
Tomoyoshi Tateyama, Yamato, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase and Ikeda Kinzokukogyo Co., Ltd., Yamato, both of, Japan

Filed Dec. 11, 1985, Ser. No. 807,601

Claims priority, application Japan, Dec. 12, 1984, 59-188437[U]

Int. Cl.⁴ A47C *7/38*

U.S. Cl. 297—409 **7 Claims**



1. A headrest whose position can be adjusted by moving its body forward and rearward in a horizontal plane in relation to a seat back of a seat comprising:

a support stay in an upper portion of the seat back of the seat;

a headrest body located at an upper portion of the support stay;

a link mechanism including a first forward swing link member and a second rear swing link member located between the headrest body and a support means for supporting the headrest body swingably in relation to the support stay;

a lock mechanism located inside the headrest body, between the support stay and the support means for allowing said support means to freely swing in accordance with movement of the headrest body in one direction and to limit swinging movement of the support means against movement in another direction of the headrest body, said lock mechanism including a sector having a plurality of teeth provided on one of the swing link members, said lock mechanism utilizing a pivot shaft of the attached swing link member for its rotation center, and a click member movably attached to one of the support stay and headrest body, the click member having a click engageable with the teeth of the sector;

a lock release mechanism for releasing the lock mechanism when the headrest body is at a stop end of a moving stroke; and

a bracket fixed to the headrest body through a headrest frame on which the upper portions of the forward and rear swing link members are pivoted, respectively;

wherein base portions of the link members are pivoted on the upper end of the support stay and are erected parallel to each other from the upper end of the support stay; and

the sector of the lock mechanism is integrally formed on one of the forward and rear swing link members.

4,733,914

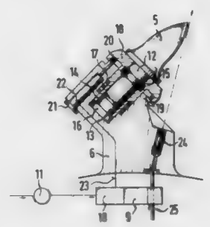
APPARATUS TO DELIVER HIGH PRESSURE LIQUID FROM NOZZLES ON A SHEARER DRUM FOR A MINING MACHINE

Wilhelm J. Kogelmann, Boalsburg, Pa., assignor to Gerb. Eickhoff Maschinenfabrik und Eisengiesserei, Bochum, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,966

Int. Cl.⁴ E21C *25/12, 25/60*

U.S. Cl. 299—81 **7 Claims**



1. A shearer drum apparatus for mining machine used in underground mining, said apparatus including a shearer drum rotatable about an axis, cutter picks and groups of nozzles spaced about the periphery of said shearer drum, a plurality of control valves each connected to one of said groups of nozzles, a line for conducting high-pressure liquid coupled to each of the plurality of control valves, a resilient mounting receiving a cutter pick of said cutter picks which is associated with the nozzles of each group, and transducer means engaged with said resilient mounting means to respond to downward and outward movement of the cutter pick relative to the shearer drum due to changes to the cutting pressure as the cutter pick moves into and out of contact with the mine face for producing a control signal to actuate the control valve of one of said groups of nozzles.

4,733,915

DEVICE FOR SUPPLYING FLUID AT TOOLS FOR BREAKING SOLID MATERIAL

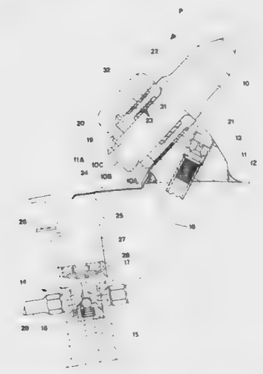
Jan-Gunnar Hedlund, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed May 2, 1986, Ser. No. 859,022

Claims priority, application Sweden, May 3, 1985, 8502160

Int. Cl.⁴ E21C *35/22, 25/12*

U.S. Cl. 299—81 **9 Claims**



1. Apparatus for breaking solid materials comprising a movable tool carrier, a cutting tool mounted on said tool carrier, said tool being moved forwardly into cutting relationship with said solid materials in response to forward movement of said carrier, means constraining said tool against rearward retraction relative to said carrier, a nozzle carried by said tool carrier and oriented to eject fluid toward a cutting zone of said cutting tool, a fluid conduit for supplying fluid to said nozzle, valve means arranged to selectively open and close said fluid line, valve control means comprising a strain gauge sensor arranged to sense compression strain of said tool during a cutting operation, and means operatively connected to said strain gauge sensor and said valve means for opening said valve means to supply fluid to said nozzle in response to said strain gauge sensor sensing a compression strain in said tool.

4,733,916

BENDING LINE ALONG OVERLAPPING LAYERS IN FOLDING BOX

Gerhard Seufert, Hans-Sachs-Strasse 3, 6054 Rodgau 5, Fed. Rep. of Germany

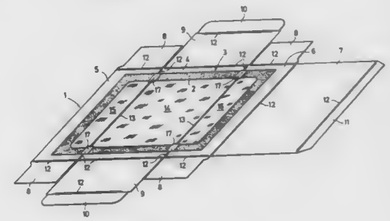
Filed Jun. 24, 1986, Ser. No. 877,898

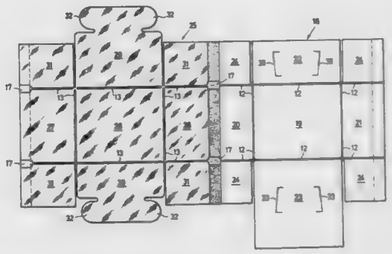
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523416; Feb. 20, 1986, 3605413

Int. Cl.⁴ B65D *25/54*

U.S. Cl. 229—162 **24 Claims**

1. A folding box consisting of a first cut-to-size blank from non-transparent material, and a second cut-to-size blank from transparent stiff plastic foil, which extends over at least one box edge, a bending line provided in the plastic foil, second blank overlapping and being glued to the first cut-to-size blank on an inside surface of said first blank, wherein the overlap between the first and the second cut-to-size glanks exists also at at least one end of the bending line, and the bending line is continued in the first cut-to-size blank by a corresponding groove line, the bending line and groove line being approximately the same width and wherein a box edge of two box walls is formed by said bending line and said groove line, characterized in that the second blank is thinned-down to a fraction of the thickness of remaining portions of the second blank in an area along the bending line and directly adjacent to





the bending line at the overlap between the first and the second blanks, the thinned-down area of the second blank extending over the entire width of the overlap.

4,733,917

ARRANGEMENT FOR SUPPLYING FIBRES TO A FILLING TOOL OF A BRUSH-MAKING MACHINE

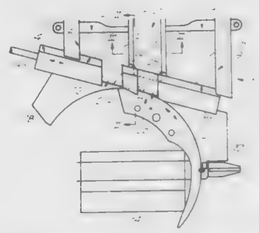
Lionel Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boucherie, naamloze vennootschap, Izegem, Belgium

Filed Jun. 6, 1986, Ser. No. 871,324

Claims priority, application Belgium, Jun. 28, 1985, 60732

Int. Cl.⁴ A46D *1/08*

U.S. Cl. 300—7 **17 Claims**



1. An apparatus for loading a supply of fiber into the removal opening of a bundle remover of a filling tool of a brush making machine, comprising:

a fiber magazine having a plurality of fiber channels for holding several units of fiber and having a discharge end;

means for removing one unit of fiber from the fiber magazine comprising a slide reciprocably movable between the discharge end of the fiber magazine and the removal opening of the bundle remover and having a plurality of

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loading spaces, each loading space being adapted to receive the unit of fiber; and

means for inserting each removed unit of fiber into the removal opening of the bundle remover at a substantially uniform pressure, the inserting means comprising a pusher attachment selectively reciprocally movable in the direction of the removal opening of the bundle remover and positioned relative to the removal opening of the bundle remover such that a loading space of the slide is movable between the pusher attachment and the removal opening of the bundle remover, whereby, when a loading space having fibers therein is moved between the pusher attachment and the removal opening, the pusher attachment is moved toward the removal opening to push the fibers in the loading space into the bundle remover.

4,733,918

SUSPENSION STRUT ASSEMBLY

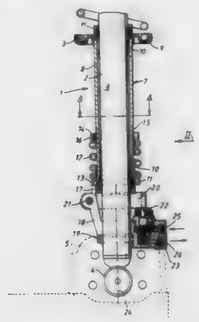
Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 29, 1986, Ser. No. 868,034

Claims priority, application United Kingdom, May 29, 1985, 8513526

Int. Cl.⁴ B60T *8/18*

U.S. Cl. 303—22 R **8 Claims**



1. A suspension strut assembly for a vehicle comprising a telescopic damper including a body, a main suspension spring coaxially surrounding said damper body, a tubular support also coaxially surrounding the damper body and including an abutment for one end of said main suspension spring, said support being mounted on the damper body and being guided thereon for axial movement relative to the damper body in response to the loading on said main suspension spring, a brake pressure control valve assembly, said valve assembly including a valve body mounted on the side of said damper body and being relatively immovable with respect thereto and a valve control member extending from said valve body, and means, separate from said abutment for said main suspension spring coupling said support to said control member and to said damper body, said coupling means being constructed and arranged that part of the load on the main suspension spring is transmitted through it and said support to said valve control member and the remainder of said load is transmitted through said coupling means and said support to the damper body whereby the suspension spring load exerted on said control member is independent of any change in position, during use, of said main suspension spring relative to said damper body.

4,733,919

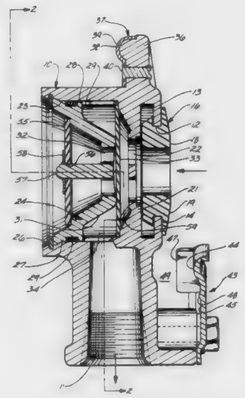
INTEGRATED PRESSURE EXHAUST VALVE AND FLUID COUPLING

John D. Jacobs, Brea, and Karl Dabritz, Bellflower, both of Calif., assignors to HWP Group, Inc., Montebello, Calif.

Filed Mar. 10, 1987, Ser. No. 24,339

Int. Cl.⁴ B60T *8/00*

U.S. Cl. 303—28 **13 Claims**



1. An integrated pressure exhaust valve and pneumatic coupling moiety comprising:

a hollow body having a pneumatic pressure inlet port on one face of the body, an exhaust opening on the opposite face of the body, and a pneumatic pressure outlet port at an end of the body;

an elastomeric seal having an approximately flat annular face around the inlet port;

a wing at one end of the body having an arcuate locking surface substantially concentric with the inlet port;

a pocket at the opposite end of the body from the wing, having an arcuate locking surface substantially concentric with the inlet port and complementary with the locking surface on the wing so that a second coupling moiety having an identical seal, wing and pocket can be assembled in locking and sealing engagement with the integrated valve and coupling moiety by placing the seals in face to face engagement and twisting one moiety relative to the other moiety for engaging the respective wings and pockets;

a membrane dividing the interior of the body between the inlet port and the outlet port, and including a plurality of apertures through the membrane for permitting air flow therethrough;

a generally circular plug sealed in the exhaust opening and having a plurality of apertures between the interior and exterior of the plug for exhausting pneumatic pressure from within the body, a face of the plug being spaced apart from the membrane; and

a circular, elastomeric, diaphragm in the body between the membrane and plug, the diaphragm having a sufficiently large diameter for alternatively blocking the apertures through the plug or the apertures through the membrane.

4,733,920

MOTOR VEHICLE BRAKE ANTILOCKING SYSTEM

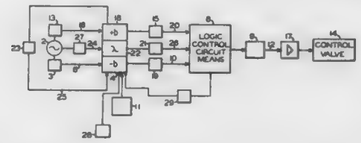
Helmut Panabecker, Hemmingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,819

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440244

Int. Cl.⁴ B60T *8/02*

U.S. Cl. 303—106 **15 Claims**



1. A motor vehicle fluid pressure responsive braking system antilocking mechanism, which prevents locking of an individual brake on such motor vehicle by providing a respective antilock control signal to a plurality of respective solenoid control valves, secured to such motor vehicle in a position to control fluid pressure response to a respective brake cylinder associated with each respective wheel on such motor vehicle, said braking system antilocking mechanism comprising:

(a) a plurality of wheel velocity sensing means secured to such motor vehicle in a position for sensing rotational velocity of such each respective wheel;

(b) a first signal generating means, connected to each of said plurality of sensing means, for generating a first signal having a value that is at least representative of a deceleration of such each respective wheel;

(c) a signal evaluating and detection means connected to receive said first signal for (1) evaluating said first signal with respect to a first threshold value which is larger than a normally favorable value in a controlled braking application on such motor vehicle; and (2) detecting when a respective wheel velocity is beginning to separate from a wheel vehicle reference velocity;

(d) a logic control circuit means, connected to receive a signal from said first signal evaluating and detection means for generating an antilock control signal, according to a preset program, when said first signal value exceeds said threshold value;

(e) an antilock control signal transmitting means, connected to said logic control circuit means and to such respective solenoid control valves, for transmitting said antilock control signal to such respective solenoid control valves to thereby adjust fluid pressure response in such respective brake cylinder; and

(f) decrement means, connected to said signal evaluating and detection means, for decreasing said first threshold value in stages when said respective wheel velocity separates from said vehicle reference velocity.

4,733,921

HYDRAULIC ANTI-SKID SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, England

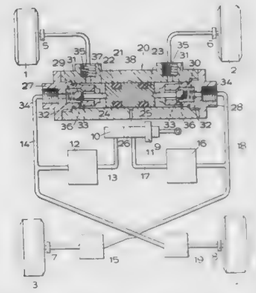
Filed Mar. 13, 1987, Ser. No. 25,507

Claims priority, application United Kingdom, Mar. 20, 1986, 8606953

Int. Cl.⁴ B60T *8/50*

U.S. Cl. 303—111 **13 Claims**

1. An hydraulic anti-skid braking system for a vehicle of the four wheel type comprising a supply of brake applying fluid, a first brake on a first front wheel, a second brake on a second front wheel, first skid sensing means for sensing the behaviour of said first front wheel, second skid sensing means for sensing the behaviour of said second front wheel, a first modulator for modulating the supply of fluid from said supply to said first brake in response to a skid signal from said first skid sensing means, a second modulator for modulating the supply of fluid from said supply to said second brake in response to a skid signal from said second skid sensing means, and a valve assembly incorporating a pressure-responsive member responsive to



differential pressures applied to both said first and second brakes, and said valve assembly also incorporating restrictor means operative to restrict the rate of pressure increase applied to the one of said brakes which is at a higher pressure, and means for initiating operation of said restrictor means in response to movement of said pressure-responsive member.

4,733,922

VALVE ASSEMBLY FOR BRAKE FLUID PRESSURE CONTROL

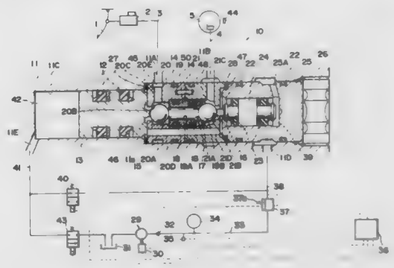
Takumi Nishimura, Chiryu; Tadao Saito, Nagoya; Nobuyasu Nakanishi, and Noboru Noguchi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 4, 1986, Ser. No. 870,520

Claims priority, application Japan, Jun. 5, 1985, 60-084713[U]

Int. Cl.⁴ B60T *8/42*

U.S. Cl. 303—113 **3 Claims**



1. A valve assembly for brake fluid pressure control in a system having a brake master cylinder and a wheel brake cylinder, comprising:

a body having an inlet port connected to the brake master cylinder, an outlet port connected to the wheel brake cylinder, and a cylinder bore communicating the inlet and outlet ports;

a first seat member having an axially extending bore and a seat surface and fitted securely in the cylinder bore in sealed relation with respect to a wall surface of the cylinder bore;

a second seat member having an axially extending bore and a seat surface and fitted securely in the cylinder bore in

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sealed relation with respect to the wall surface of the cylinder bore and adjacent to said first seat member;

a third seat member having a seat surface, a first end portion fitted into the bore of said first seat member in sealed relation therewith and a second end portion fitted into the bore of said second seat member in sealed relation therewith for forming first and second valve chambers inside said first and second seat member, respectively;

first and second valve elements accommodated in said first and second valve chambers, respectively;

first and second passageway means arranged in parallel each for connecting the inlet port to the outlet port through the first and second valve chambers in secession;

a spring for urging the first valve element to contact with the seat surface of said first seat member to cut off said first passageway means, and for urging the second valve element to separate from the seat surface of said third seat member to open said second passageway means and bring said second valve element into contact with the seat surface of said second seat member for cutting off said first passageway means;

a pressure reducing piston for separating the first valve body from the seat surface of said first seat member against said spring; and

a by-pass piston for separating the second valve element from the seat surface of said second seat member and bringing said second valve element into contact with the seat surface of said third seat member against said spring;

said third seat member having an outer diameter smaller than an inner diameter of said first and second seat members and being provided with first and second annular grooves formed in its outer periphery and fitted with seal rings for providing a seal between the outer periphery of said third seat member and wall surfaces of the axially extending bores of said first and second seat members, respectively;

first and second passages constituting said first passageway means being formed respectively in said first and second seat members, said first and second passages extending axially of said first and second seat members and being offset by equal distances from a central axis thereof;

said first and second seat members being further provided with respective first and second holes opposing each other at relative angular positions when said first and second passages are in communication with each other;

said first and second seat members being joined to each other by a pin press fitted into said first and second holes, said first, second and third seat members, said first and second valve elements and said spring constituting a unitary assembly by means of said pin.

4,733,923

MOVABLE STORAGE UNIT CONTROL SYSTEM

Dean L. Dahnert, Fort Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Sep. 8, 1986, Ser. No. 904,541
Int. Cl.[4] H01H *47/00*; A47B *53/00*
U.S. Cl. 312—201 **3 Claims**

1. A storage system comprising

a plurality of movable storage units,

reversible motor means mounted to said movable units, respectively, for driving each unit selectively in one direction or the opposite direction to open an aisle between a pair of said units,

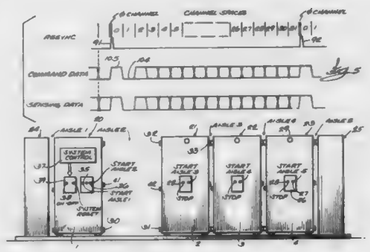
motor control circuit means for each unit connected to said motor means on the unit,

controller means including processor means on the units, respectively, and conductors interconnecting said controller means,

start switch means on each unit for selecting opening of an adjacent aisle, said start switch means connected to said interconnected controller means on the same unit and manually operable to activate one of said processor means in said controller means to produce command signals to which the processor means in at least one other controller means responds by providing command signals to said motor control circuit means for causing said circuit means to turn on one or more motor means for driving one or more units in directions that result in opening the selected aisle,

tape switch means mounted to at least one side of each of said movable units and extending over substantially the length of the unit, said tape switch means comprising an elongated support composed of flexible insulating material and elongated conductive strips constituting switch contacts mounted to said support in spaced relation to provide normally open switch contacts,

test circuit means for conducting test pulses that are caused to be generated by said processor means at a predetermined frequency back to said processor means, said test circuit means including test circuit switch means, said processor means responding to said test circuit switch means becoming nonconducting so as to interrupt said pulses by commanding said motor control circuit means to deactive said motor means to stop movement of the unit,



safety sweep bar means mounted to the sides of said movable storage units and a plurality of normally closed safety sweep switches arranged for being opened in response to said bar means encountering an obstruction when the unit on which said bar means is mounted is moving,

said safety sweep switches being connected in series with each other in said test circuit means so that if any sweep switch opens said test pulses applied to said sweep switches will not return to said processor means,

one pair of corresponding ends of said strips in said tape switch means being connectable to an electric power source and a circuit loop connected across the other pair of corresponding ends, said circuit loop including optoisolator means for controlling said test circuit switch means in said test circuit means during a safety sweep test pulse so that said test circuit switch means remains conducting as long as said loop is conducting and becomes nonconducting when said contacts in said tape switch are in contact and said loop is short circuited and nonconducting, said optoisolator having the light emitting diode thereof connected in said circuit loop and the photosensitive transistor thereof connected in said test circuit means.

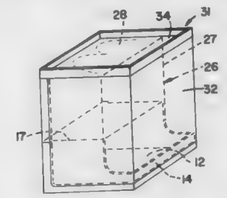
4,733,924

COMBINATION PACKING CASE AND DESK

Donald C. Lewis, 1815 Clement Ave., Alameda, Calif. 94501

Filed Sep. 27, 1982, Ser. No. 424,394
Int. Cl.[4] A47B *83/00*
U.S. Cl. 312—237 **14 Claims**

1. A combination packing case and desk, including; a shelf unit adapted to support and retain a plurality of articles during shipping, an outer casing including an opening dimensioned to receive said shelf unit therein, said outer casing being adapted to be separable from and removably secured about said shelf unit to form a fully enclosed case therewith, said outer casing including base end means for supporting said outer casing on a floor surface, and means at an end of said outer casing opposed to said base end means to secure and retain said shelf unit on



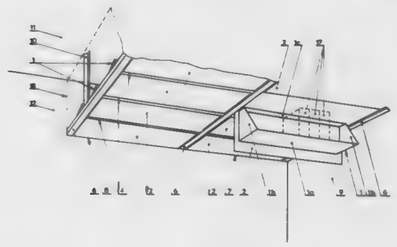
said outer casing in supporting fashion, said shelf unit being variably positionable from the shipping position within said outer casing to a display position on said outer casing.

4,733,925

DEVICE FOR THE SUSPENDED ARRANGEMENT OF JUXTAPOSED INDIVIDUAL TILTING COMPARTMENTS

Gilbert Duran; Yves Clement, both of 48 rue des Abbesses, 75018 Paris, and Michel Garcia, 2 place de l'Hotel de Ville, 47800 Miramont de Guyenne, all of France

Filed May 8, 1986, Ser. No. 860,892
Claims priority, application European Pat. Off., Nov. 5, 1985, 85450025.3
Int. Cl.[4] A43F *5/08*
U.S. Cl. 312—248 **12 Claims**



1. A device for suspended arrangement of juxtaposed individual tilting compartments comprising:

two stationary support rails;

means for horizontally mounting said support rails;

a plurality of horizontally aligned shelving compartment units arranged between said support rails each compartment unit comprising a rectangular, normally horizontal panel, and a fixed axle extending between said stationary support rails,

means, connected to said stationary support rails, for mounting each of said compartment units between said stationary support rails in an articulated fashion around said axle;

means for locking said compartment units wherein said panel is aligned in a horizontal position and limiting rotation of said compartment units to an alignment where said panel is substantially vertically arranged, connected to each compartment unit;

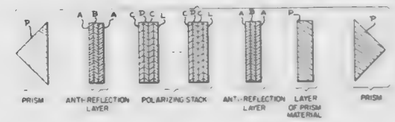
wherein said panels are coplanar and arranged side by side at a very small distance.

4,733,926

INFRARED POLARIZING BEAMSPLITTER

Alan Title, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 10, 1986, Ser. No. 929,114
Int. Cl.[4] G02B *5/30*
U.S. Cl. 350—1.1 **25 Claims**



1. A method of fabricating a polarizing beamsplitter for separating s and p components of an infrared beam, said method comprising the steps of:

(a) forming a coating on a surface of a first prism, said coating comprising a stack of substantially identical pairs of thin-film layers, each pair of thin-film layers comprising a first layer of relatively high refractive index and a second layer of relatively low refractive index, one of said first and second layers of each pair of thin-film layers being a Herpin equivalent layer consisting of a triad of sub-layers, said Herpin equivalent layer having an equivalent refractive index that is related to the refractive index of the other of said first and second layers so that the p component of said beam is substantially undeviated and unreflected in passing through each pair of thin-film layers, and

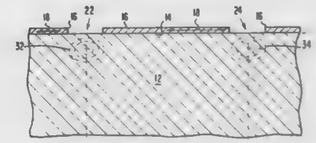
(b) bonding a surface of a second prism to said coating.

4,733,927

STRESS WAVEGUIDES IN BULK CRYSTALLINE MATERIALS

Deborah J. Jackson, Port Hueneme, and Marion D. Clark, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 14, 1984, Ser. No. 671,523
Int. Cl.[4] G02B *6/10, 6/12*
U.S. Cl. 350—96.12 **37 Claims**



1. An optical waveguide device comprising:

a body of bulk, substantially optically transparent, crystalline material having a first predetermined surface;

a first zone comprising predetermined areas of said surface defining said bulk crystalline material underlying said first zone areas; a second zone comprising areas of said surface immediately adjacent to said first zone; and

means for providing substantial levels of compressive stress in said bulk crystalline material under said first zone sufficient to produce at least one single mode stress waveguide therein, said means including a thin layer of heat-treated material under substantial stress on the order of 10^{10} to 10^{11} dynes per square centimeter or more bonded to said surface and covering only one of said zones.

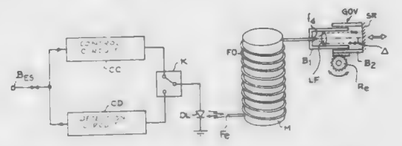
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4,733,928

DEVICE WITH CIRCULATING OPTICAL DELAY LINE

Luigi d'Auria, Sceaux, and Guy Chevalier, Champlan, both of France, assignors to Thomson CSF, Paris, France

Filed Sep. 10, 1985, Ser. No. 774,440
Claims priority, application France, Sep. 21, 1984, 84 14566
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 7 Claims



1. A circulating optical delay line device comprising:
an optical fibre having an optical path of a predetermined length, and configured to form an optical delay line;
optoelectric means, optically coupled to said optical fiber for emitting a pulse of light and for detecting and photoelectrically converting a received light pulse into an electric signal, said optoelectronic means being a single semiconductor element constituted by a semiconductor laser diode for emitting light at a given wavelength and having photo detecting properties for light of the same wavelength, said laser diode being optically coupled to a first end of said optical fibre;
means for generating an electric signal for controlling the emission of said emitted light pulse;
means for receiving said electric signals from said optoelectronic means;
reflecting means, coupled to a second end of said optical fibre for reflecting a light pulse emitted by said diode and carried through said fiber back through said fiber to said optoelectronic means for detection therein, so that said emitted light pulse is converted into an electric signal following an outward and return travel on said predetermined length of the optical fibre, and wherein said reception means comprises an amplifier for amplifying the electric signal resulting from the photoelectric conversion to produce an amplified electric signal; and
means for selectively reinjecting said amplified electric signal into said generating means to repeat an elementary cycle incorporating the emission of a light pulse, an outward and return travel of said light pulse over said predetermined length of the optical paths of the optical fibre, and connection and conversion of said light pulse into an electric signal a given number of times, thereby multiplying a time lag by said given number of times.

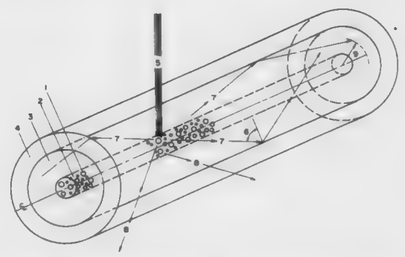
4,733,929

DIFFUSER FIBER INCIDENT ENERGY CONCENTRATOR AND METHOD OF USING SAME

David C. Brown, 4751 State Rte. 34, Winfield, W. Va. 25213

Filed Feb. 5, 1986, Ser. No. 826,304
Int. Cl.[4] G02B 6/26; F21V 7/04
U.S. Cl. 350—96.15 18 Claims

1. An incident radiant energy concentration device comprising an optical wave guide element having an edge and a length dimension, and being a cylindrical optical wave guide, diffuser means coaxialy located within said optical wave guide to convert incident radiation energy within said wave guide to effect capture of energy in guided modes of said wave guide and by cumulative propagation of trapped energy along said wave guide length dimension and effect a concentration of incident radiation energy at the device's edge.

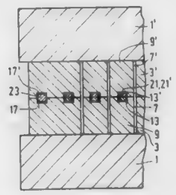


4,733,930

METHOD OF MANUFACTURING A PLURALITY OF OPTICAL COMPONENTS

Petrus J. W. Severin; Adrianus P. Severijns, and Johannes A. M. Steenbakkers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1986, Ser. No. 921,983
Claims priority, application Netherlands, Oct. 28, 1985, 8502908
Int. Cl.[4] G02B 6/29; H01S 3/30; B31F 5/00
U.S. Cl. 350—96.15 6 Claims



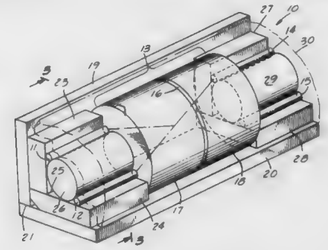
1. A method of manufacturing a plurality of optical components, wherein a face (5) of a block of material (3) is cemented to a carrier (1) and curved grooves (13) are provided in a second face (11) of the block which is situated opposite the first face, the centres of curvature (15) of said grooves being situated at the side of the second-face which faces the first face, after which optical fibres (19) are secured in a number of the grooves so that they follow the curvature of the groove, a side portion of said fibres which is situated furthest from the first face being subsequently ground off, a flat ground face (21) thus being formed on each fibre, after which directional couplers are formed by arranging the ground faces of the fibres thus ground against one another, the parts to be arranged on one another being aligned with respect to one another by means of wire-shaped elements (23) which are arranged in the grooves (17) which are not occupied by ground optical fibres, characterized in that the block of material (3) is shaped as a bar which, after having been cemented to the carrier (1), is divided, using cuts (7) which extend transversely of its longitudinal direction, into a number of slices (9) which are separately cemented to the carrier, after which each slice is provided with at least one groove (13, 17) which extends parallel to the cuts, the slices being detached from the carrier at a later stage.

4,733,931

OPTICAL FIBER COUPLER AND METHOD OF MAKING

Robert J. Fan, Reseda, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Oct. 25, 1985, Ser. No. 791,456
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 4 Claims



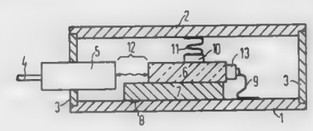
1. A coupler for optical signals, comprising:
a housing having a 90-degree groove;
a cylindrical lens system including a semi-reflective film intercepting the lens system optical axis, said lens system being positioned in the first housing 90-degree groove intermediate the ends of said groove;
first and second means located in the housing 90-degree groove located respectively at the two ends of said lens system each, of said means having a 90-degree groove parallel to the 90-degree groove in said housing;
first and second cylindrical positioners located respectively in the 90-degree grooves of said first and second means;
optical fibers located in the interstices between the cylindrical positioners and 90-degree grooves of said means; and
a quantity of encapsulation material unitarily securing the optical fibers, cylindrical positioners, means and housing.

4,733,932

HOUSING FOR AN OPTOELECTRONIC CIRCUIT MODULE

Ferdinand Frenkel, Augsburg; Herbert Prussas, Reichertshausen, and Lothar Rapp, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,192
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531746
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—96.20 13 Claims



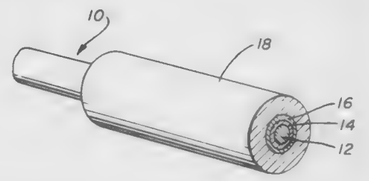
1. A housing for an optoelectronic circuit module useful in a glass fiber communications system, wherein:
first and second optical components which transmit or receive a luminous flux beam are mutually positioned inside said housing so as to establish a luminous flux path therebetween, the amount of flux conducted by said flux path between said optical components being reduced by relatively slight movement between said mutually positioned optical components, said flux path being conducted in a vacuum or a gas;
said first optical component being attached to said housing via a first support, and said second optical component being attached to said housing via a second support, said first support being installed in a wall of said housing or inside said housing and said second support being rigidly attached to a section of said housing which is inside said housing;
said second support being subjected to high temperature variations during operation of said circuit module;
at least said inside section of said housing attached to said second support is comprised of a first material which is weldable and has a first linear thermal expansion coefficient;
at least that section of said second support which is attached to said inside section of said housing is comprised of a second material which is weldable and has a second linear thermal expansion coefficient which differs from said first linear thermal expansion coefficient by an amount which will cause said relatively slight movement to develop between said optical components which will reduce the amount of flux conducted by said flux path; and
at least one optoelectronic component installed inside said housing, said component being capable of producing increases in temperature of said second support due to waste heat during its operation; and
a relatively small point-like spot weld between said second support and a relatively large section of said housing which is adjacent to said second support for attaching said second support to said inside section of said housing, which weld provides said rigid attachment of said second support to said housing in a manner which reduces the amount of movement which can develop between said optical components due to said difference between said first and second thermal expansion coefficients, thereby minimizing said reduction in the amount of flux conducted by said flux path.

4,733,933

FIBER OPTIC STRUCTURE AND METHOD OF MAKING

Joseph L. Pikulski, Newberry Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 572,734, Jan. 20, 1984. This application Jan. 20, 1987, Ser. No. 5,047
Int. Cl.[4] G02B 6/36, 6/12, 6/16; H01J 5/16
U.S. Cl. 350—96.20 28 Claims



6. A fiber optic structure comprising:
at least one optical fiber; and
at least one metallic body deposited on a respective part of said fiber for rigidizing said respective part of said fiber encased within said at least one metallic body so that said fiber may be acted upon and positioned for optical purposes, said at least one metallic body having a radial thickness at least on the order of 0.003", and being processed at an exterior surface area so as to make said respective part of said fiber encased within, optically accessible at said surface.

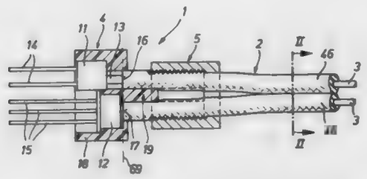
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,934

CONNECTOR FOR A FIBER OPTIC CABLE

Thomas Wais, Neckarsulm, and Werner G. Schrott, Heilbronn, both of Fed. Rep. of Germany, assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 5, 1986, Ser. No. 859,575
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517368
Int. Cl.[4] G02B 6/36; H01J 5/16
U.S. Cl. 350—96.20 16 Claims



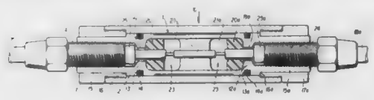
1. Cable connector for a fiber optic cable comprising a cable fastening part and a cable seating part, said cable fastening part being in the form of a sleeve having an internal thread, said cable seating part housing at least one electro-optic transducer therein and having at least one cable seating hole for receiving at least one jacketed optic fiber, said cable seating hole being parallel to an external thread on the cable seating part, said cable seating part having one or more slots parallel to and communicating with said cable seating hole such that when said cable fastening part is screwed onto said cable seating part, the internal thread of said sleeve partly cuts into the jacket of said cable through said one or more slots, thereby fixing the cable.

4,733,935

SYMMETRICAL CONNECTOR FOR OPTICAL FIBER CABLES IN A HOSTILE ENVIRONMENT

Ronald L. Gandy, Culpeper, Va., assignor to The Rochester Corporation, Culpeper, Va.

Filed Feb. 8, 1985, Ser. No. 699,550
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 28 Claims



1. A connector for joining optical fiber cables together, and to related components, comprising an assembly of elements which includes:

a tubular outer housing open at both ends; an inner member slidingly received in said housing from either end;

said inner member having an axial bore to receive one of said cables to introduce an optical fiber into a space within the housing;

means for anchoring said cable to said inner member and for sealing engagement between said cable and inner member to prevent entry of fluid into the inner space, through said bore;

sealing means between said inner member and housing to prevent entry of fluid into the inner space through the peripheral space therebetween;

a free piston means in said axial bore for equalizing pressure between said inner space and the exterior of said connector;

removable cap means secured to one end of the housing to prevent removal of the inner member from said one end, and;

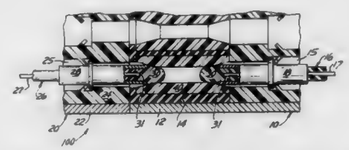
removable closure means for the other end of the housing including sealing and anchoring means for another cable to introduce an optical fiber from said another cable into said inner space and to prevent entry of fluid into said inner space from said other end.

4,733,936

FIBER OPTIC CONNECTOR ASSEMBLY

John H. Mikolaicyk, and Andrew Matzkin-Bridger, both of Oneonta, N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Jun. 28, 1985, Ser. No. 750,370
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 10 Claims



1. In a fiber optic cable connector, means for effecting axial alignment of a pair of abutting generally cylindrical fiber optic cable termination sleeves in light transmission relationship, comprising:

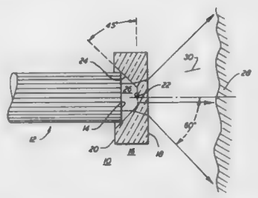
an elongated, generally cylindrical member including a bore having a central portion and two end portions, said central portion having a diameter less than that of each said end portion with each said end portion defining a frusto-conically shaped entranceway sized to receive a corresponding one of said pins, said pins being inserted therein and each said termination pin including a lens having a focal point, each said lens being generally frusto-conically shaped about a primary axis with the primary axis of each said lens and said member being in register when the lenses are received within the entranceway and the angle defining the frusto-conical surface of each said entranceway and respective lens conforming identically both axially and radially.

4,733,937

ILLUMINATING SYSTEM FOR ENDOSCOPE OR BORESCOPE

Raymond A. Lia, Auburn, N.Y., and Jane Anderegg, W. Vancouver, Canada, assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Oct. 17, 1986, Ser. No. 920,159
Int. Cl.[4] G02B 23/26
U.S. Cl. 350—96.26 10 Claims



1. An optical illuminating lens for use in an endoscope or borescope in which a round fiber optic bundle carries light through the endoscope or borescope to a distal end thereof, the lens having a front surface and a compound rear optical surface

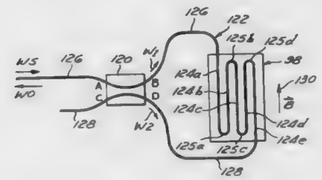
formed of a substantially flat central circular surface portion of smaller diameter than said fiber optic bundle defining a central portion of the lens and a flared surface surrounding said central circular surface portion and having a significantly sharper incidence angle, with respect to light from the fiber optic bundle, than said circular surface portion, the flared surface extending back from said circular surface portion out beyond the diameter of said bundle and defining an outer portion of the lens; the rear surface fitting against said bundle with the lens central portion centered thereof, such that the outer portion distributes the light from said bundle as a ring of light and said central portion distributes said light as a spot to fill in the center of said ring, thus creating an overall generally flat distribution.

4,733,938

MAGNETO-OPTIC ROTATOR

Herve C. Lefevre, and Ralph A. Bergh, both of Palo Alto, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 319,421, Nov. 9, 1981, Pat. No. 4,615,582. This application Feb. 13, 1986, Ser. No. 829,421
Int. Cl.[4] G02B 6/16
U.S. Cl. 350—96.29 2 Claims



1. A magneto-optic rotator, comprising:

a series of portions of optical fiber, said fiber portions oriented to cause Faraday rotation of a lightwave propagating therethrough upon exposure to a magnetic field; and

means for optically interconnecting said fiber portions to provide a continuous optical path for propagation of said lightwave serially through each of said fiber portions, said interconnecting means reversing the direction of propagation of said lightwave from the perspective of a fixed observer as it serially propagates from one of said series of fiber portions to the next adjacent one of said series of fiber portions such that the propagation direction of said lightwave reverses relative to the direction of said magnetic field to cause said Faraday rotation to be in one direction for said one of said series of fiber portions and in the opposite direction for said next adjacent one of said series of fiber portions from the perspective of said lightwave, said interconnecting means including means for transforming the polarization of said lightwave including an amount sufficient to cause the Faraday rotations in said fiber portions to be additive from the perspective of a fixed observer.

4,733,939

RADIATION-RESISTANT OPTICAL CONDUCTOR

Atsushi Utsumi, and Hiroyuki Hayami, both of Itami, Japan, assignors to Mitsubishi Metal Co.,, Tokyo and Dainichi-Nippon Cables, Ltd., Amagasaki, both of, Japan

Filed Aug. 8, 1985, Ser. No. 763,734
Claims priority, application Japan, Aug. 18, 1984, 59-171714; Aug. 18, 1984, 59-171715; Aug. 18, 1984, 59-171716
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.30 8 Claims

1. A radiation-resistant optical conductor which comprises a core composed of a pure silica glass which is prepared via an ultrahigh temperature of at least 3,000° C. and has an OH group content of from 0.1 to 300 ppm, and a cladding layer formed on the core, the cladding layer being composed of a



silica glass which contains boron element and fluorine element as a dopant.

4,733,940

LONG WAVELENGTH OPTICAL FIBER COMMUNICATION AND SENSING SYSTEMS

Matthijs M. Broer, Cokesbury, and Kenneth L. Walker, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 20, 1985, Ser. No. 778,065
Int. Cl.[4] G02B 6/18
U.S. Cl. 350—96.31 34 Claims



1. A waveguide, comprising:

an optical fiber which is capable of transmitting electromagnetic radiation of wavelength, λ, greater than about 2 μm but less than or equal to about 11μm, said fiber being single mode and characterized by an equivalent step index, relative refractive index difference, Δ_e, at said wavelength, λ, characterized in that

said optical fiber includes material which is substantially transparent to said electromangetic radiation of wavelength λ, said Δ_e is chosen so that

$$\Delta_e < \left[\frac{2.990 \times 10^{-4}\lambda^2 + 0.350 \times 10^{-2}\lambda - 0.573 \times 10^{-2}}{1 + 0.128\lambda}\right]^2$$

and $\Delta_e \geqq 0.391\times10^{-4}\lambda^2 - 0.487\times10^{-3}\lambda + 0.411\times10^{-2}$, and said fiber is dispersion shifted so that the total dispersion suffered by said electromagnetic radiation of wavelength λ within said fiber is less than or equal to about 10 ps/km-nm.

4,733,941

OPTICAL FIBRE COMPRISING A SYNTHETIC RESIN CLADDING AND METHOD OF AND DEVICE FOR MANUFACTURING SUCH AN OPTICAL FIBRE

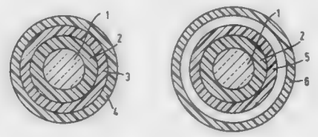
Dirk J. Broer; Grietje N. Mol, and Cornelis M. G. Jochem, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,008
Claims priority, application Netherlands, Sep. 3, 1985, 8502402
Int. Cl.[4] B05D 3/06
U.S. Cl. 350—96.33 6 Claims

1. An optical fibre having a synthetic resin cladding, com-

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prising a glass fibre, a first cladding layer of a synthetic rubber and a subsequent cladding layer of a synthetic resin the molecules of which are oriented mainly in the longitudinal direction of the glass fibre, characterized in that the oriented synthetic



resin is formed from a curable synthetic resin composition which comprises one or more oligomeric compounds the molecules of which comprise reactive groups and the molecular weight of which is smaller than 5000.

4,733,942

OPTICAL FIBER COATED WITH AN ORGANOPOLYSILOXANE CURABLE WITH ACTINIC RAYS

Yoshinori Hida; Shobei Kozakai; Seiji Katayama, and Noriyuki Meguriya, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Chiyoda, Japan

Filed Nov. 12, 1986, Ser. No. 930,002

Claims priority, application Japan, Nov., 1985, 60-259275

Int. Cl.⁴ G02B *6/00*

U.S. Cl. 350—96.34 **3 Claims**

1. A coated optical fiber which comprises:

(a) a fused quartz glass-made optical fiber base; and

(b) a coating layer on the optical fiber base formed of a coating material comprising, as the principal ingredient thereof, an organopolysiloxane represented by the average unit formula

$$(R^1)_a[(R^3O)_n(R^4)_{3-n-m}(R^5O)_mSi-R^2-]_b SiO_{(4-a-b)/2},$$

in which the groups denoted by R^1 and R^4 are each, independently from the others, a substituted or unsubstituted monovalent hydrocarbon group, R^2 is a divalent hydrocarbon group having 2 to 4 carbon atoms or an oxygen atom, R^3 is a monovalent organic group having 4 to 25 carbon atoms and 1 to 3 ethylenically unsaturated groups, R^5 is a monovalent hydrocarbon group free from aliphatic unsaturation having 1 to 18 carbon atoms or an organosilyl group represented by the general formula

$$-SiR^6_2-O)_pSiR^6_3,$$

R^6 being a monovalent hydrocarbon group having 1 to 9 carbon atoms and p being zero or a positive integer, a is a positive number in the range from 1.6 to 2.2, b is a positive number in the range from 0.02 to 0.5 with the proviso that a+b is in the range from 1.8 to 2.2, n is 1, 2 or 3, m is zero, 1 or 2 with the proviso that n+m is 1, 2 or 3 and R^3 has at least two ethylenically unsaturated groups when n is 1.

4,733,943

PICKUP FOR OPTICAL DISC

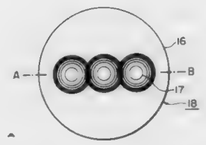
Shinichi Suzuki; Takashi Suemitsu, and Nobuyuki Kataigi, all of Yamanashi, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,880

Claims priority, application Japan, Nov. 17, 1982, 57-200360; May 23, 1983, 58-90433

Int. Cl.⁴ G02B *27/44, 5/18*

U.S. Cl. 350—162.16 **6 Claims**



1. A light source for an optical pickup comprising:

a semiconductor laser; and

a micro Fresnel lens comprising three circular gratings arranged in a linear array, portions of adjacent ones of said gratings overlapping one another, each of said gratings comprising a plurality of concentric bands, each of said bands having a rectangular cross section, a distance between said bands increasing toward a center of the respective grating, said gratings being disposed in an output light path of said semiconductor laser.

4,733,944

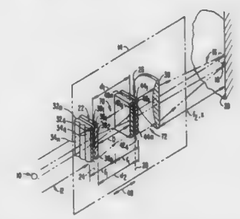
OPTICAL BEAM INTEGRATION SYSTEM

Theodore S. Fahlen, San Jose; Sheldon B. Hutchison, Santa Clara, and Timothy McNulty, San Jose, all of Calif., assignors to XMR, Inc., Santa Clara, Calif.

Filed Jan. 24, 1986, Ser. No. 822,363

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—167 **20 Claims**



1. An optical beam integration system responsive to an input beam of radiant energy from a radiant energy source, the input beam having a nonuniform beam intensity profile characteristic, comprising:

a first crossed lenticular cylindrical lens means having a first predetermined focal length and aligned in a plane substantially orthogonal to the input beam;

a second crossed lenticular cylindrical lens means having a second predetermined focal length and positioned at a distance from the first crossed lenticular cylindrical lens means and on an opposite side of the first crossed lenticular cylindrical lens means from the source, the second crossed lenticular cylindrical lens means being aligned in a plane substantially orthogonal to the input beam and in a plane parallel to the plane of the first crossed lenticular cylindrical lens means; and

a focusing lens having a preselected focal length and interposed between the second crossed lenticular cylindrical lens means and a work plane at a separation from the work plane;

the input beam refracting sequentially through the first and second crossed lenticular cylindrical lens means and the focusing lens onto the work plane;

whereby the input beam is homogenized so as to produce an image in the work plane having a relatively uniform intensity profile characteristic.

4,733,945

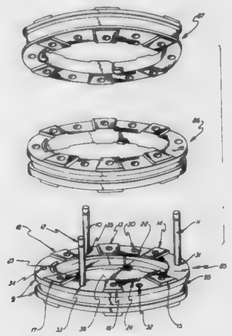
PRECISION LENS MOUNTING

John J. Bacich, Brookfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 15, 1986, Ser. No. 818,925

Int. Cl.⁴ G02B *7/02*

U.S. Cl. 350—253 **27 Claims**



1. A precision lens mounting assembly comprising:

a plurality of lens cells;

a plurality of lenses corresponding to said plurality of lens cells;

said lens cells each having an inner diameter, an outer diameter, a top surface and a bottom surface;

flexure means disposed within the inner diameter of each of said plurality of lens cells to hold an individual lens in a predetermined spatial relation at a datum temperature to said inner diameter, said top surface and said bottom surface;

said flexure means returning said individual lens to said predetermined spatial relation following temperature excursions away from then back to said datum temperature;

the outer diameter of said plurality of lens cells being substantially equal to each other and substantially concentric about the optical axis of their respective individual lenses;

the upper and lower surfaces of each lens cell having three or more precision surfaces disposed on a plane substantially perpendicular to the optical axis of said individual lens, said plane having a predetermined spatial relation to the vertex of said individual lens; and

said plurality of lens cells forming a stack of lens cells substantially in contact at said precision surfaces.

4,733,946

BARS FOR REFLECTORS

Giuliano Cossetti, Tolmezzo, Italy, assignor to Selma Italiano SpA, Tolmezzo, Italy

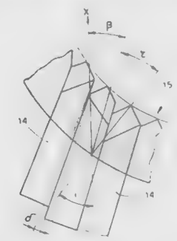
Continuation of Ser. No. 686,414, Dec. 26, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 21,577

Claims priority, application Italy, Dec. 27, 1983, 83524 A/83

Int. Cl.⁴ G02B *6/00, 5/126, 00/00;* **B29D** *11/00*

U.S. Cl. 350—321 **7 Claims**

1. A matrix for making a mold which is to make a curved reflector having a radius of curvature, comprising a plurality of bars, each of said bars having a lengthwise axis, a faceted end face and a plurality of lateral faces, at least one of said lateral faces of each bar being tapered with respect to the lengthwise axis of the bar; wherein the axis of each bar varies



progressively according to the radius of curvature of the curved reflector so that essentially all of the light from a single source incident from a direction which forms a reference angle with respect to the radius of curvature on the curved reflector is reflected in the same direction.

4,733,947

MULTICOLOR LIQUID CRYSTAL DISPLAY PANEL

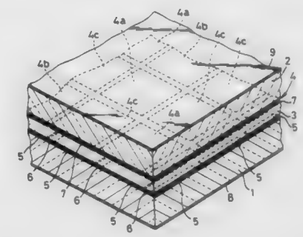
Takashi Ota, Komaki, and Mikio Kariya, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 23, 1985, Ser. No. 790,540

Claims priority, application Japan, Oct. 26, 1984, 59-162490[U]

Int. Cl.⁴ C03C *3/22;* **G02F** *1/13*

U.S. Cl. 350—334 **8 Claims**



1. A multicolor liquid crystal display panel comprising:

a first and a second transparent subtrate sheet of glass, wherein at least one of said first and second sheets of glass is formed of a transparent glass ceramic having a major crystalline phase of crystals of a $Li_2O—Al_2O_3—SiO_2$ system, said crystals comprising beta-eucryptite crystals having a crystal grain size which is not greater than 0.1 microns;

a color filter layer forming a plurality of picture elements;

an electrode layer having picture-element electrodes corresponding to the picture elements; and

a liquid crystal layer, the transmittance of light through which is locally varied by application of an electric field thereto through the picture-element electrodes;

wherein said color filter layer, said electrode layer and said liquid crystal layer are interposed between the first and second sheets of glass.

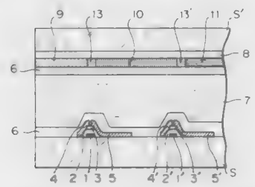
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,948

COLOR LIQUID CRYSTAL DISPLAY WITH LIGHT INTERCEPTING MEMBER

Nobuko Kitahara, Tama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1985, Ser. No. 809,769
Claims priority, application Japan, Dec. 20, 1984, 59-267303
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—339 F 9 Claims



1. A color liquid crystal display panel provided with a first substrate having thin film transistors arranged in rows and columns, a gate wire connecting commonly the gates for the thin film transistors the columns, a source wire connecting commonly the sources for the thin film transistors, a second substrate having a common electrode opposed to said display electrodes and a color filter, and a liquid crystal interposed between said first substrate and said second substrate, comprising a light intercepting film provided on said second substrate at a position confronting with said thin film transistors.

4,733,949

LIQUID CRYSTAL DISPLAY DEVICE

Hidetoshi Abe, Katsuta; Akio Mukoh, Mito; Teruo Kitamura, Katsuta; Norimasa Kamezawa, Mito; Yasuo Hanawa, Katsuta, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 396,032, Jul. 7, 1982, abandoned. This application Dec. 12, 1985, Ser. No. 808,255
Claims priority, application Japan, Jul. 8, 1981, 56-105691
Int. Cl.[4] G02F 1/13; C09K 19/54, 19/30, 19/22
U.S. Cl. 350—350 R 25 Claims

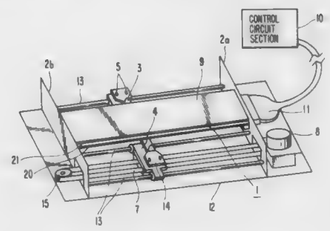
1. A liquid crystal display device comprising upper and lower substrates, each of said substrates having an electrode and an orientation controlling film formed on a surface thereof, a layer of liquid crystal composition interposed between said substrates, and a sealing means disposed at the periphery of said substrates, the improvement wherein the aforesaid liquid crystal composition is a liquid crystal composition having a T_g of −90° C. or lower, the liquid crystal composition including an organic compound having a T_g of −90° C. or lower, added to a liquid crystal material base, the organic compound having a T_g of −90° C. or lower being a liquid crystalline substance, said liquid crystalline substance acting to improve the response time of the liquid crystal composition, as compared to that of the liquid crystal material base, to thereby provide a response time of said liquid crystal display device that is 0.5 seconds or less at a temperatue as low as −30° C.

4,733,950

DISPLAY DEVICE USING ELECTRO-OPTIC PLATE AND A MEMBRANE SWITCH

Yoneharu Takubo, Neyagawa; Yasutaka Horibe, Ibaraki; Nobue Yamanishi, Kashiwara; Eiji Fujii, Osaka, and Hideyuki Okinaka, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 4, 1986, Ser. No. 939,438
Claims priority, application Japan, Dec. 6, 1985, 60-275317; Dec. 17, 1985, 60-283474
Int. Cl.[4] G02F 1/055
U.S. Cl. 350—392 19 Claims



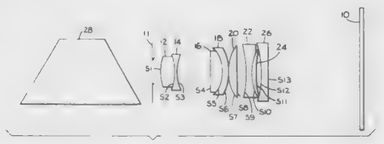
1. A display apparatus comprising:
two polarizers disposed in parallel with each other and having their axes of polarization aligned;
a light-transmitting ceramic plate having an electrooptic effect placed in parallel with and between said two polarizers;
a transparent flexible sheet facing a surface of said ceramic plate with a predetermined gap therebetween and having a plurality of transparent striped electrodes on a surface facing said surface of said ceramic plate;
means for applying a voltage signal to said striped electrodes; and
a pressure application head extending in a direction perpendicular to said striped electrodes and movable in a direction parallel to said striped electrodes, said pressure application head being either always or intermittently pressed onto said flexible sheet so as to allow said striped electrodes to be locally in contact with said surface of said ceramic plate.

4,733,951

ZOOM LENS HAVING MAGNIFICATION FACTORS IN THE RANGE OF 6.5X TO 14X FOR MICROGRAPHIC APPLICATIONS

Gerhardt H. Pareigat, Hugo, Minn., assignor to Minnesota Mining and Manufacturing Company, St.Paul, Minn.

Filed Apr. 1, 1987, Ser. No. 33,052
Int. Cl.[4] G02B 15/14
U.S. Cl. 350—423 4 Claims



1. A variable focal length lens systems for use in micrographic projectors and printers comprising lenses according to the following Table:

ELEMENT	SURFACE	RADIUS OF CURVATURE	THICKNESS	SEPARATION
	S1	19.146		
12			7.60	
	S2	−21.208		
14			1.50	
	S3	28.652		
				16.75
	S4	−216.043		
16			6.00	
	S5	−13.501		
18			2.00	
	S6	−33.758		
				0.20
	S7	27.871		
20			4.90	
	S8	−354.527		
				4.075
				−17.336
	S9	−65.515		
22			2.30	
	S10	28.767		
24			4.48	
	S11	−312.853		
				2.30
	S12	−29.315		
26			2.50	
	S13	Plano		

ELEMENT	TOLERANCE	INDEX OF REFRACTION	DECENTRATION	TILT
12	0.050	1.69350	0.012	0.046
14	0.050	1.78590		
	0.050			
16	0.100	1.48749	0.012	0.086
18	0.100	1.83500		
	0.050			
20	0.100	1.48749	0.025	0.070
22	0.100	1.77250	0.035	0.059
24	0.100	1.78470		
	0.050			
26	0.100	1.64000	0.025	0.054

wherein the radius of curvature is expressed as positive for surfaces convex to the direction of light and negative for surfaces concave to the direction of light, the radii, thickness, separation, tolerances for the thicknesses of the elements and decentration are expressed in millimeters and tilt is expressed in degrees.

4,733,952

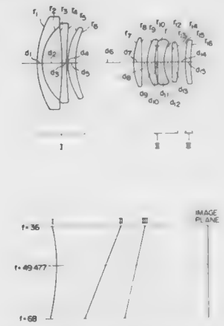
SMALL ZOOM LENS

Yoshisato Fujioka, Higashikurume, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,684
Claims priority, application Japan, Mar. 27, 1985, 60-62968
Int. Cl.[4] G02B 15/177
U.S. Cl. 350—426 2 Claims

1. A small zoom lens composed, in order from an object side, of a first unit having a negative refracting power, a second unit having a positive refracting power and a third unit having a positive refracting power, in which in zooming from a short focal length side to a long focal length side, said first unit is first moved toward an image on an optical axis, and halfway moved conversely toward the object to correct a variation in focal position, said second unit is moved toward the object on the optical axis to effect a variable power, and said third unit is moved toward the object with an amount different from that of the second unit to effect a variable power, the zoom lens being fulfilled with the following various conditions:
(1) $0.6\ fT < |f_1| < 0.85fT$
(2) $d_{2.3}w < d_{2.3}T$
(3) $bfw < bfT$
(4) $0.01 < f_2/f_3 < 0.2$ ($f_2 > 0$, $f_3 > 0$)
(5) $r_3R > 0$

where,
f_1: focal length of the first unit
f_2: focal length of the second unit
f_3: focal length of the third unit
fT: composite focal length of the entire system in the longest focal length
$d_{2.3}w$: lens space between the second and third units in the shortest focal length



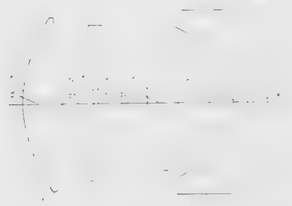
$d_{2.3}T$: lens space between the second and third units in the longest focal length
bfw: backfocus of the entire system in the shortest focal length
bfT: backfocus of the entire system in the longest focal length
r_3R: radius of curvature of the spherical surface on the image side of the third unit lens.

4,733,953

COLOR CORRECTED PROJECTION LENS

Yoshiharu Yamamoto, Toyonaka; Yasuo Nakajima, Ibaraki, and Syusuke Ono, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 3, 1986, Ser. No. 825,269
Claims priority, application Japan, Feb. 6, 1985, 60-21257
Int. Cl.[4] G02B 13/18, 9/34
U.S. Cl. 350—432 6 Claims



1. A color corrected projection lens for producing on a screen an enlargement of an image appearing on a cathode-ray tube (CRT), comprising, sequentially from the screen end:
a first unit for correcting spherical aberration, coma and distortion, which is made of bi-convex element having a positive power at least one surface of which is an aspheric surface, the surface of said first unit directed toward the screen end being strongly convex;
a seond unit for mainly correcting longitudinal chromatic abberation, which i made of a bi-concave element having a negative power and disposed at or in the vicinity of an entrance pupil position of said lens;

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a third unit for correcting astigmatism and distortion, which is made of a bi-convex element having a positive power; and

a fourth unit having a negative power and having a concave surface directed toward the screen end which is strongly concave, at least said strongly concave surface of said fourth unit being an aspheric surface.

4,733,954

MICROSCOPE SUPPORT

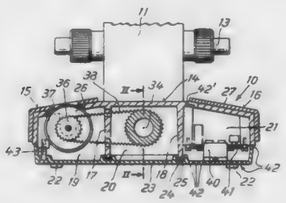
Guenter Reinheimer, Biebertal; Karl Wieber, Asslar-Berghausen; Robert Lisfeld, Ulm-Allendorf, and Walter Voigt, Linden, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 869,692

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520475

Int. Cl.⁴ G02B *21/06, 21/24, 21/28*

U.S. Cl. 350—523 **5 Claims**



1. A microscope support, comprising:

a base having a central portion and respective side portions integral with the central portion;

a base plate covering the bottom of said base;

an upright member for supporting a microscope, extending upwardly from the central portion of the base;

means, mounted on the upright, for focussing the microscope;

partition means, within the base and cooperating with said base plate, for defining a central receiving chamber in the central portion and side receiving chambers in each of the side portions of the base, said partition means comprising separating walls and a thermally insulating seal disposed between the separating walls and the base plate;

elements of an optical illuminating system disposed within the central receiving chamber;

electrical and electronic components of the illuminating system disposed in a first of the side receiving chambers;

means, associated with said first side receiving chamber, for conducting heat generated by said electronic components away from said components, said heat conducting means being in direct contact with said components; and

an adjustment mechanism for said optical illuminating system mounted on one of said side portions at a finger access distance from said focussing means.

4,733,955

REFLECTIVE OPTICAL TRIPLET HAVING A REAL ENTRANCE PUPIL

Lacy G. Cook, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 14, 1986, Ser. No. 851,325

Int. Cl.⁴ G02B *17/06, 23/06*

U.S. Cl. 350—620 **9 Claims**

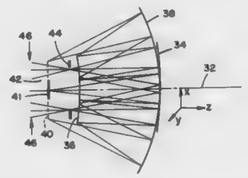
1. An all-reflecting, non-relayed optical system having means defining at least three mirrors for imaging distant objects, said optical system having an optical axis and an aperture stop, comprising:

means defining a primary mirror for receiving radiation from said objects;

means defining a secondary mirror for receiving radiation reflected from said primary mirror means;

means defining a tertiary mirror for receiving radiation reflected from said secondary mirror means;

means defining an image plane for receiving radiation reflected from said tertiary mirror means for forming an image of said distant object;



means defining an entrance pupil disposed in front of said primary mirror means, said pupil means enabling admission of said radiation to impinge on said primary mirror means; and wherein

said pupil means is coincident with the aperture stop of said optical system.

4,733,956

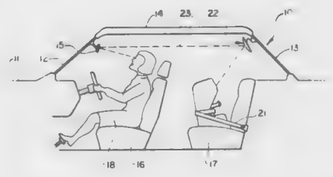
MIRROR SAFETY SYSTEM FOR VIEWING THE REAR SEAT OF AN AUTOMOBILE

Frank A. Erickson, 2527 Lofty View Dr., Torrance, Calif. 90505

Filed Nov. 28, 1986, Ser. No. 935,780

Int. Cl.⁴ B60R *1/04, 1/08;* **G02B** *7/18, 5/10*

U.S. Cl. 350—624 **1 Claim**



1. In an automobile having a front and a rear seat and a front and rear window joined at their upper edges by a roof structure so as to define a closed compartment intended to be occupied by passengers, the improvement which comprises:

a safety optical system for viewing said rear window;

a rear facing mirror carried on said front window;

a front facing mirror carried on said rear window;

an optical axis established from said front seat to said rear seat via said rear facing mirror and said front facing mirror;

said front facing mirror having adjustment means for movably aligning with respect to said rear facing mirror for viewing a selected area of said rear seat;

said front facing mirror is convex and said rear facing mirror is substantially flat;

said front facing mirror comprises:

a backing plate mounting said convex mirror from one side;

a base having a suction cup removably carried on said rear window;

an elongated pliable band of fixed length having opposite ends attached to said backing plate and said base respectively permitting relative movement between said backing plate and said base and serving as a shock absorber;

said adjustment means includes a screw fastener selectively coupling one end of said band to said base;

said backing plate includes a display area carrying indicia thereon; and

said display area being unobscured by said base for visual observation through said rear window.

4,733,957

REARVIEW MIRROR ADJUSTABLE IN TWO PLANES

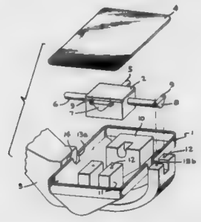
Dieter Losch, Nuremberg, Fed. Rep. of Germany, assignor to Gebr. Buhler Nachfolger GmbH, Nuremberg, Fed. Rep. of Germany

Filed Sep. 25, 1986, Ser. No. 912,369

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536645

Int. Cl.⁴ B60R *1/06;* **G02B** *7/18*

U.S. Cl. 350—636 **3 Claims**



1. In a rearview-mirror for vehicles which is adjustable in two planes and includes a mirror housing accommodating the mirror glass therein, the mirror housing being supported for swivel movement relative to a support to be rigidly connected to a vehicle, the mirror being adjustable by a universal joint having a pair of joint shafts and a drive housing incorporating adjusting drives connected to the pair of joint shafts, the joint shafts being driven directly by the adjusting drives and being relatively independently rotatable; the improvement comprising means connecting a first joint shaft of said pair of joint shafts to the mirror housing whereby when said first joint shaft is driven the mirror housing will be swivelled relative to the drive housing, and means connecting a second joint shaft of said pair of joint shafts of the universal joint to said support such that when said second joint shaft is driven the drive housing will be swivelled together with the mirror housing relative to the support.

4,733,958

FORWARD-LENS, LATERAL FIELD REFLECTOR

Robert E. Gorsich, 6409 Ashford Ct., Lisle, Ill. 60532

Filed Apr. 15, 1985, Ser. No. 723,504

Int. Cl.⁴ G02C *7/14*

U.S. Cl. 351—158 **4 Claims**



1. In the combination of eyeglasses and a visual-field image reflector attached to the eyeglasses to extend vision, the improvement for extending vision into an impaired lateral visual field comprising eyeglasses with lens, a light-transmitting reflector, means attaching the reflector to the eyeglasses and positioning the reflector adjacent the nasal portion of the eyeglasses and forward of the eyeglass lens for an eye having impaired lateral vision and with the reflector being inclined relative the lens for the impaired eye to reflect lateral field image to a functioning portion of the retina of the eye having the impaired lateral visual field and with central field images being tramsmitted to the impaired eye through the light-transmitting reflector, and in which the reflector includes color tinting means having two different areas of color tint with the lateral field images being reflected from one of the areas in a first color and central field images being transmitted through both of the areas in a second color.

4,733,959

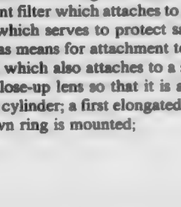
APPARATUS AND METHOD FOR TINTING HYDROPHILIC CONTACT LENSES

Eric R. Claussen; William C. Hoffman, and Lawrence A. Smith, all of Denver, Colo., assignors to Optatint, Inc., Englewood, Colo.

Filed May 1, 1985, Ser. No. 729,457

Int. Cl.⁴ G02C *7/04;* **D06P** *5/00*

U.S. Cl. 351—177 **12 Claims**



1. A method for tinting hydrophilic contact lenses, comprising the steps of:

(a) placing a lens within an apparatus comprising a base having at least one post whose remote end is shaped for receiving and positioning the lens, and at least one cap which when placed in communication with the post and the lens, masks one or more predetermined areas of the lens;

(b) placing the cap in communication with the post and the lens;

(c) immersing the lens-containing apparatus in an activated dye solution bath containing one or more dyes;

(d) removing the lens-containing apparatus from the dye solution bath after the lens has attained the desired color; and

(e) placing the lens-containing apparatus in a fixing solution wherein the lens is tinted permanently.

4,733,960

LENS ADAPTER FOR CREATING PHOTOGRAPHICALLY REPRODUCED DESIGNS WITH TURNABLE MIRROR TUBE

Carolyn Bennett, 123 E. 4th St., Media, Pa. 19063

Continuation-in-part of Ser. No. 771,787, Sep. 10, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,036

Int. Cl.⁴ G02B *27/08*

U.S. Cl. 353—1 **7 Claims**

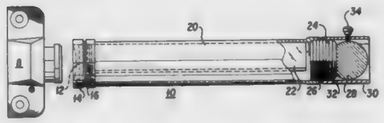
1. A photographic accessory, for creating special photographic effects by means of a unique kaleidoscope arrangement, comprising the following elements:

a first transparent filter which attaches to a lens of a standard camera and which serves to protect said lens; a close-up lens which has means for attachment to the first transparent filter and which also attaches to a stepdown ring that adapts said close-up lens so that it is able to connect the lens to a first cylinder; a first elongated cylinder on which said step down ring is mounted;

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a second cylinder, that is smaller than the first cylinder, that is located inside the first cylinder and that is mounted by means of needle bearings within said first cylinder so that it is turnable within the first cylinder and which contains on its inside surface a plurality of oblong mirrors that are slanted toward each other so that they form an enclosure within the second cylinder;

a second transparent filter which attaches to the end of the first cylinder located at the opposite end from the camera



attachement end and which has a housing that connects the first cylinder containing the second cylinder to a cup or holder for housing interchangeable design producing means that are constructed to permit light from outside the accessory to shine through the design producing means and to project patterns from the design producing means so that the patterns are reflected by the slanted mirrors that are housed within the second cylinder and projected on the film inside an attached camera.

4,733,961

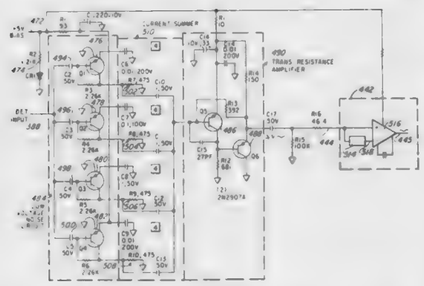
AMPLIFIER FOR INTEGRATED LASER/FLIR RANGEFINDER

John A. Mooney, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 472,534, Mar. 7, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 768,920

Int. Cl.[4] G01C *3/08;* **H03F** *3/68*

U.S. Cl. 356—5 **4 Claims**



1. In an integrated laser/FLIR rangefinder having a combined laser/FLIR detector, a low voltage noise amplifier circuit for connection to the detector, the low voltage noise amplifier circuit comprising: a plurality of identical transistor amplifier circuits, with each single transistor amplifier circuit having an input coupling capacitor electrically connected between the single transistor amplifier and the combined laser/FLIR detector whereby the input coupling capacitors allow independent dc biasing without balancing adjustments or matching transistors, a current summing circuit connected to the plurality of transistor amplifiers for summing the outputs of the plurality of transistor amplifiers, a trans-resistance amplifier connected to the current summing circuit for maximizing high frequency response and producing a low impedance signal, a delay line and a difference amplifier, the delay line being opeatively connected to the junction of the trans-resistance amplifier and a positive terminal of the difference amplifier, and to a negative terminal of the difference amplifier whereby said difference amplifier combines the non-delayed output of the trans-resistance amplifier with the delayed output of the delay line for producing an analog signal representative of a laser return for digitalization.

4,733,962

JET VELOCITY MEASURING APPARATUS

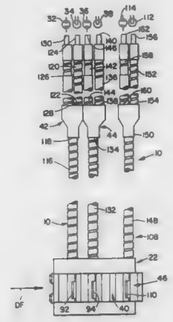
Roger C. Brendemuehl, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

PCT No. PCT/US86/00149, § 371 Date Mar. 17, 1986, § 102(e) Date Mar. 17, 1986, PCT Pub. No. WO87/04524, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 24, 1986, Ser. No. 847,653

Int. Cl.[4] G01P *3/36, 5/22;* **H01J** *5/02*

U.S. Cl. 356—28 **10 Claims**



7. A jet velocity measuring apparatus for measuring the velocity of a fluid stream, said apparatus measuring the time delay between primary electronic signals generated by a first photosensitive device as a result of a first beam of light from a light source being reflected by a portion of the surface of the stream and secondary electronic signals generated by a second photosensitive device as a result of a second beam of light from a light source being reflected downstream by substantially the same portion of the surface of the stream, said apparatus comprising in combination:

a housing disposed adjacent to the fluid stream, said housing having a first face;

a first bifurcated fiberoptic bundle secured to said housing adjacent to said first face for transmitting the first beam of light from the light source to the portion of the surface of the stream and back towards the first photosensitive device;

a second bifurcated fiberoptic bundle secured to said housing and terminating adjacent to said first face and downstream relative to said termination of said first fiberoptic bundle, said second fiberoptic bundle transmitting the second beam of light from the light source to substantially the same portion of the surface of the stream when this portion of the surface of the stream has flowed downstream away from the first beam of light, said second fiberoptic bundle transmitting the reflected second beam of light back along said second fiberoptic bundle towards the second photosensitive device;

a third fiberoptic bundle secured to said housing adjacent to said first face and further downstream relative to said termination of said second fiberoptic bundle, said third fiberoptic bundle transmitting a third beam of light from the light source to substantially the same portion of the surface of the stream when this portion of the surface of the stream has flowed further downstream past said termination of said second fiberoptic bundle, said third fiberoptic bundle transmitting the reflected third beam of light back along said third fiberoptic bundle towards a third photosensitive device thereby increasing the sensitivity of

the measuring apparatus when measuring a relatively fast flowing stream; and

debris-deflecting means disposed adjacent to said first face of said housing for deflecting debris from said first face of said housing thereby inhibiting accumulation of debris on said first face which could otherwise impede transmission of the first and second beams of light towards and away from the fluid stream.

4,733,963

METHOD OF MEASURING A SOUND PRESSURE DISTRIBUTION IN A SOLID BODY DUE TO A ULTRASONIC PROBE BY USING PHOTOELASTICITY

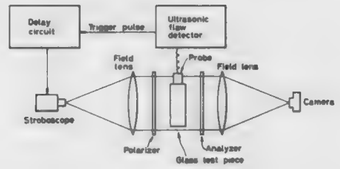
Kazuhiro Date, and Heihachi Shimada, both of Sendai, Japan, assignors to Krautkramer Foerster Japan Co., Ltd., Japan

Filed Nov. 7, 1986, Ser. No. 928,818

Claims priority, application Japan, Nov. 9, 1985, 60-251804

Int. Cl.[4] G01L *1/24;* **G01N** *21/00*

U.S. Cl. 356—35 **9 Claims**



1. A method for determining a sound pressure distribution in a solid body, comprising:

launching into the solid body an ultrasonic pulse waveform;

directing light from a stroboscopic light source into the solid body during a time when the pulse waveform is propagating in the solid body, through a linear polarization device having a principal axis which is aligned at a first predetermined angle;

generating a first image of the light passing through the body with the principal axis at the first predetermined angle;

generating a second image of the light passing through the solid body with the principal axis offset at about 45° from the predetermined first angle; and

combining the first and second images to produce a synthesized image.

4,733,964

DEVICE FOR JOINING LIGHT WAVES

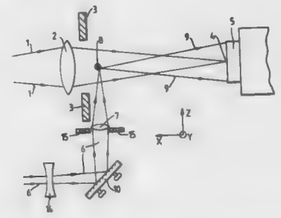
Gudmunn Slettemoen, Tiller, Norway, assignor to Conspectum A/S, Trondheim, Norway

Filed Apr. 2, 1986, Ser. No. 847,281

Claims priority, application Norway, Apr. 12, 1985, 851471

Int. Cl.[4] G01B *9/025*

U.S. Cl. 356—35.5 **8 Claims**



1. A device for joining an object wave and a reference wave for interferometric analysis, where the object wave passes through an aperture before reaching a picture detector, comprising:

object wave imaging optics having an imaging aperture for imaging said object wave; and

a reflector having a convex reflective surface positioned in the path of said object wave in said imaging aperture to reflect said reference wave so as to cover said picture element, said reflector being smaller than said imaging aperture.

4,733,965

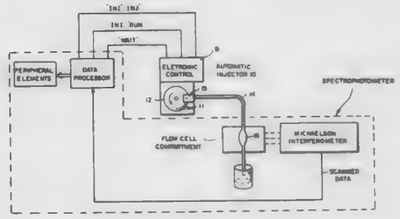
AUTOMATED SYSTEM FOR SPECTRO-PHOTOMETRIC ANALYSIS OF LIQUIDS

Guy W. Inman, Jr., Greenville; Charles H. Powell, Jr., Winterville, and Guy W. Martin, Jr., Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 205,621, Nov. 10, 1980, abandoned. This application Apr. 29, 1983, Ser. No. 490,179

Int. Cl.[4] G01J *3/42*

U.S. Cl. 356—326 **9 Claims**



1. A system for automatically providing a spectrophotometric analysis of a plurality of fluid samples comprising

a spectrophotometer, including

a low pressure flow cell for accepting a plurality of successive fluid samples;

means for scanning fluid samples injected into said flow cell to provide scanned data; and

means for processing said scanned data;

automatic injection means, including

means for storing a plurality of fluid samples without exposure to the atmosphere; and

means for injecting said stored fluid samples successively at a pressure slightly higher than atmospheric pressure and without exposure to the atmosphere into said low pressure flow cell, said successive samples being retained in said flow cell substantially at atmospheric pressure; and

control means for controlling the operations of said spectrophotometer and said automatic injection means, said control means including

means for preventing the scanning of a fluid sample which is being injected into said flow cell until said injection has been completed; and

means for causing said injecting means to inject the next successive fluid sample into said flow cell and for causing said processing means to process the scanned data of said previously injected fluid sample substantially simultaneously with the injection of said next successive fluid sample.

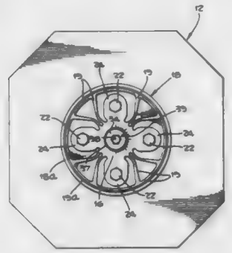
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4,733,966

TUNING MECHANISM FOR DITHER FREQUENCIES IN A RING LASER GYROSCOPE

Alfred L. Butler, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 1, 1986, Ser. No. 846,856
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 12 Claims



1. In an inertial navigation system, including a plurality of ring laser gyros, each dithered about a gyro spring system at a dither frequency, the improvement comprising:

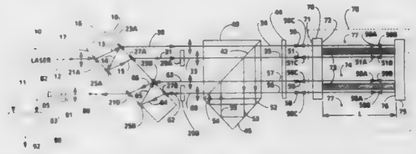
means for adjusting the stress force orthogonal to the center of the rotational plane of each of the ring laser gyros in each gyro spring system after the gyro spring system is operational to tune said dither frequency of each gyro to a desired frequency for minimizing mechanical frequency interference among the gyros.

4,733,967

APPARATUS FOR THE MEASUREMENT OF THE REFRACTIVE INDEX OF A GAS

Gary E. Sommargren, Madison, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Mar. 19, 1987, Ser. No. 27,644
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—361 35 Claims



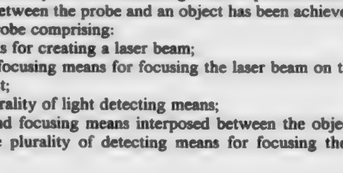
1. An apparatus for the measurement of the refractive index of a gas comprising a differential plane mirror interferometer means for producing a pair of measurement beams and a pair of reference beams from an input beam having a pair or orthogonally polarized components; a gas-tight refractive index cell means comprised of a first hollow cylindrical tube member, a window affixed to a first end of said first tube and a mirror affixed to the opposite end of said first tube, said window, mirror and tube interior comprising a first sealed volume, said gas to be measured surrounding said first tube in said cell means, said cell means being optically aligned with said interferometer means for enabling said pair of reference beams produced by said interferometer means to pass inside of said first sealed volume and said pair of measurement beams produced by said interferometer means to pass outside of said first tube in said gas surrounding said first tube and back to said interferometer means after said measurement beams and said reference beams traverse said cell means; said window being affixed to said first end closest to said interferometer means; said interferometer means producing an output beam having a pair of orthogonally polarized components from said beams which have traversed said cell means, said output beam components traversing the same optical path length except for the optical path difference in said cell means; means optically aligned with said interferometer means output beam for receiving said beam and measuring any phase variation between said output beam components; and means operatively connected to said phase variation measuring means for converting said measured phase variation into an output signal representing the refractive index parameter being measured.

4,733,968

DATUM SENSING USING OPTICAL GRATING

Laurence J. Robinson, Royston, and Robert M. Pettigrew, Foxton, both of England, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,007
Claims priority, application United Kingdom, Jul. 19, 1985, 8518290
Int. Cl.[4] G01B *11/02*
U.S. Cl. 356—374 5 Claims



1. Apparatus for detecting a datum or reference position in a range of movement of a member, the apparatus comprising a light source, grating means movable with the member; the grating means including a first grating comprising first and second grating halves having parallel lines which are symmetrically arranged on respective sides of a central axis with the lines increasing in pitch in directions extending away from the central axis, a second grating comprising third and fourth grating halves respectively identical to the first and second grating halves but with the third and fourth grating halves being separated by a spacing, whereby light from the light source illuminates the first and second gratings to cause the generation of interference images of the first and third gratings and the generation of interference images of the second and fourth gratings, said interference images varying in light intensity with movement of the member, and detector means for detecting the intensity of the interference images, for generating individual signals representative of the intensity of the interference images and for generating a difference signal representative of the difference between the said individual signals, said difference signal passing through zero at the datum position of the member.

4,733,969

LASER PROBE FOR DETERMINING DISTANCE

Steven K. Case; Robert E. Keil, both of St. Louis Park, and John Konicek, Minneapolis, all of Minn., assignors to CyberOptics Corporation, Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 904,882
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—375 18 Claims

1. A laser probe for indicating when a predetermined distance between the probe and an object has been achieved, the laser probe comprising:

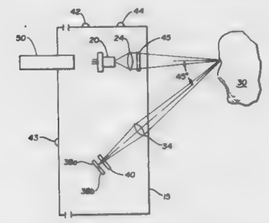
means for creating a laser beam;

first focusing means for focusing the laser beam on the object;

a plurality of light detecting means;

second focusing means interposed between the object and the plurality of detecting means for focusing the light reflected from the object toward the plurality of detecting means; and

comparison means connected to the detecting means for



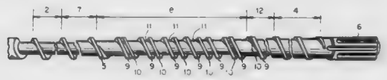
determining when a predetermined proportion of light is focused on at least two of the detecting means, said comparison means including means for indicating that the predetermined proportion has been detected.

4,733,970

EXTRUDER SCREW

Lucien D. Yokana, Princeton, N.J., assignor to Sterling Extruder Corporation, South Plainfield, N.J.

Filed Sep. 9, 1985, Ser. No. 774,196
Int. Cl.[4] B29B *1/06*
U.S. Cl. 366—79 11 Claims



1. An extruder screw having a helical flight of predetermined outside diameter for extruding thermoplastic materials, comprising:

(a) a feed section having a constant screw root diameter;

(b) a compression section which includes:

(i) a first transition portion immediately following said feed section, wherein the screw root diameter increases in the direction of extruder throughput;

(ii) a barrier flighted portion immediately following said first transition section wherein said flight splits to form a first main flight of non-increasing screw root diameter and a second barrier flight of such a pitch that said barrier flight and the main flight in front of it are separated by a decreasing distance along the screw in the direction of extruder throughput such that material flows backward over said barrier flight; and

(iii) a second transition portion following said barrier flighted section wherein the screw root diameter increases in the direction of extruder throughput; and

(c) a metering section immediately following said compression section and having a constant screw root diameter.

4,733,971

PROGRAMMABLE WEIGHT SENSITIVE MICROINGREDIENT FEED ADDITIVE DELIVERY SYSTEM AND METHOD

William C. Pratt, Canyon, Tex., assignor to Micro Chemical, Inc., Amarillo, Tex.

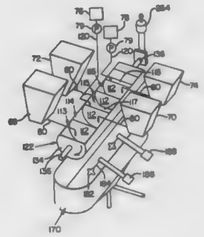
Filed Feb. 26, 1986, Ser. No. 833,904
Int. Cl.[4] B01F *15/04*
U.S. Cl. 366—141 94 Claims

67. A method of dispensing and delivering microingredient feed additives into a livestock feed ration shortly before delivering the feed ration to the livestock for consumption, comprising the steps:

storing separately multiple said additives in concentrate form;

dispensing predetermined weights of selected said additive concentrates into a liquid carrier with no substantial intermixing of the additive concentrates before they enter the liquid carrier;

intermixing the additive concentrates in the liquid carrier to dilute, disperse, and suspend them and form a liquid carrier-additive slurry;



directing the slurry to a receiving station while maintaining the suspension and dispersion of the additives until delivered into a feed ration; and

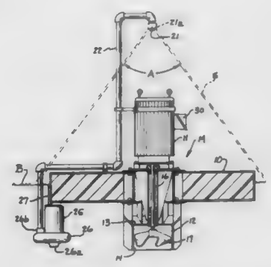
determining the predetermined weights by the step of weighing at least all of the dry additives dispensed before dispensing any of the selected and weighed dry additives into the liquid carrier.

4,733,972

FLOATING MIXER APPARATUS WITH FOAM DISPERSING SPRAY

Ronald J. Weis, So. Beloit, Ill., assignor to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed Jul. 9, 1987, Ser. No. 71,317
Int. Cl.[4] B01F *7/22*
U.S. Cl. 366—270 3 Claims



1. A floating mixer apparatus including float means for buoyantly supporting the mixer apparatus in a water treatment basin, mixer drive motor means mounted on the float means and extending upwardly therefrom, pump casing means mounted on the float means and having an upper intake opening below the float means and a lower discharge outlet, and propeller means in the pump casing means for pumping liquid from the upper intake opening downwardly through the lower discharge outlet, foam dispersing spray means including spray nozzle means mounted above the mixer drive motor means for discharging liquid in a downwardly directed generally conical spray pattern outwardly of the mixer drive motor means, and auxiliary pump means for pumping liquid from the basin to the spray nozzle means.

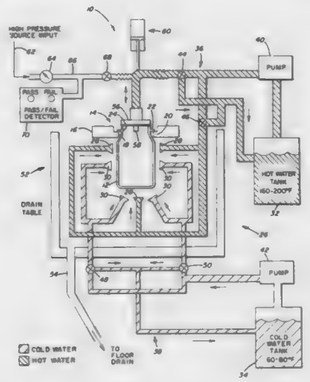
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,973

METHOD AND APPARATUS FOR TESTING GLASSWARE

David R. Machak; Ronald A. Puvak, and Russell D. Southwick, all of Butler, Pa., assignors to American Glass Research, Inc., Butler, Pa.

Filed May 12, 1986, Ser. No. 862,113
Int. Cl.[4] G01M 25/72
U.S. Cl. 374—5 20 Claims



1. Glassware testing apparatus for producing a thermal shock stress on glassware comprising,

a test station,

holder means for stationarily supporting a glassware container at said test stand,

a fluid reservoir,

a plurality of nozzles positioned in a selected array at said test station around the container,

conduit means connecting said nozzles with said reservoir for conveying fluid under pressure from said reservoir to said nozzles to direct a spray of fluid from said nozzles over substantially the entire surface of the container,

temperature differential means for heating a first portion of the fluid in said reservoir to an elevated temperature above a second portion of the fluid in said reservoir,

first control means for directing a flow of the first portion of the fluid through said conduit means into the container to fill the container with heated fluid to an overflow condition to rapidly increase the temperature of the glassware,

second control means for directing the second portion of the fluid at a lower temperature than the first portion of the fluid from said reservoir to selected nozzles for spraying fluid upon the container outer surface following heating thereof by the overflow of heated fluid out of the container, and

said first control means interrupting the flow of fluid at an elevated temperature to the container prior to actuation of said second control means for directing fluid at a lower temperature upon the container to induce a thermal shock stress on the container.

4,733,974

TRANSFORMER LIFE CONSUMPTION INDICATOR

Richard E. Hagerman, Penfield, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

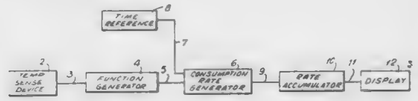
Filed Jul. 29, 1986, Ser. No. 891,654
Int. Cl.[4] G01K 3/04
U.S. Cl. 374—103 2 Claims

1. A transformer life consumption indicator for indicating the consumption of electrical transformer life, where life is dependent on temperature comprising;

temperature means for generating an analog electrical signal representative of the temperature of the transformer,

function generator means ,including a programmable read only memory, responsive to the said temperature means signal for generating a binary output signal proportional to the antilog of the reciprocal of the absolute temperature, this output signal being proportional to the instantaneous life consumption,

time reference means,



consumption rate generator means responsive to the said time reference means and to the instantaneous life consumption signal from the said function generator means for generating a pulse signal proportional to the consumption rate,

consumption rate accumulator means responsive to the signal from the consumption rate generator means for integrating the consumption rate generator pulse signal to produce an output indication of actual life consumed, and

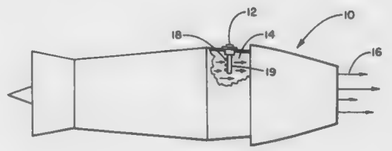
display means for displaying an indication of actual life consumed.

4,733,975

UNITIZED HIGH TEMPERATURE PROBES

Frederick J. Komanetsky, Port St. Lucie, and John A. Selstad, Indiantown, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 3, 1986, Ser. No. 882,101
Int. Cl.[4] G01K 1/16, 13/12
U.S. Cl. 374—144 12 Claims



1. An instrumentation probe for holding and shielding static sensors in a flow stream, the instrumentation probe comprising:

(a) a probe body, aerodynamically shaped to be non-disruptive of the flow stream and manufactured from a single piece of metal;

(b) multiple kiel heads protruding into the flow stream in order to shield static sensors, the kiel heads formed as an integral part of said probe body and having smooth transitioning outer surfaces connecting said kiel heads to said probe body;

(c) an instrumentation cavity formed within said probe body,

(d) static sensors positioned within said instrumentation cavity and said kiel heads;

(e) a mounting flange forming a part of said probe body for mounting said instrumentation in the flow stream; and

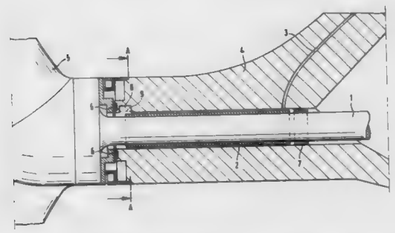
(f) an exit area for sensor leads to facilitate connection of said sensors to data recording means.

4,733,976

PROPELLER SHAFT BEARING ARRANGEMENT

Torbjörn Henriksson, Helsinki; Kari Laukia, Espoo; Heikki Sipilä, Turku; Markus Hjerppe, Vaasa, and Esa Rane, Helsinki, all of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Filed Mar. 3, 1987, Ser. No. 22,257
Claims priority, application Finland, Mar. 6, 1986, 860951
Int. Cl.[4] F16C 3/00, 33/72; F01M 9/00; B63H 1/15
U.S. Cl. 384—97 15 Claims



1. A method for preventing leaks in a propeller shaft bearing arrangement including a plain bearing, which is lubricated with oil or water and which supports the propeller shaft extending through an opening in the body of a hull, and packing members for keeping the lubricant in the lubrication space and for preventing water from entering the bearing arrangement, said method comprising the step of equalizing pressure vibrations occurring in the lubricant by means of arranging, in the lubrication space, a medium possessing a high compressibility, which medium by means of changes in volume receives and equalizes said pressure vibrations.

4. A propeller shaft bearing arrangement, which arrangement includes a plain bearing, which is lubricated with oil or water and which supports the propeller shaft extending through an opening in the body of a hull, and packing members for keeping the lubricant in the lubrication space and for preventing water from entering the bearing arrangement, which arrangement further comprise, in order to equalize pressure vibrations occurring in the lubricant, one or several pressure equalizers attached to walls of the lubrication space, which equalizers comprise a medium possessing high compressibility arranged within a closed space, for example in a tube or a flexible sac.

4,733,977

SEAL FOR ROLLERS

Leo Eisenmann, Elfershausen, and Georg Rudloff, Grafenrheinfeld, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,162
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503344
Int. Cl.[4] F16C 33/78
U.S. Cl. 384—477 9 Claims

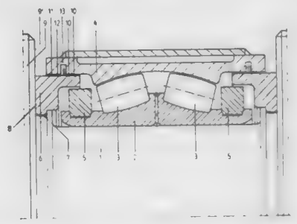
1. A sealed bearing arrangement for use with a roller such as a driven roller in a continuous casting plant or the like wherein a shaft rotates with the roller and lengthens a predetermined amount in use under the influence of heat, said bearing arrangement comprising:

a bearing for supporting the shaft, said bearing having a housing, said roller and shaft being axially movable with respect to said housing, and

a sealing ring adjacent to the roller which rotates with the roller, the sealing ring having an L-shaped cross-section, said L-shape being formed by

(i) a first portion which is mounted closely adjacent the roller so as to prevent entry of unwanted material between the sealing ring and the roller, and extends radially outward, away from the axis of the shaft, and

(ii) means defining a second portion which extends axially and parallel to the axis of the shaft, from a radially outward part of the first portion to a location closely adjacent the bearing housing, so as to prevent entry of



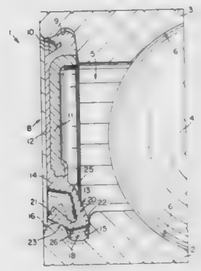
unwanted material between the sealing ring and the bearing housing, while permitting axial movement of said sealing ring with respect to said housing, as said shaft lengthens said predetermined amount and thereby moves axially with respect to said housing under the influence of heat.

4,733,978

CONTACT TYPE FLEXIBLE SEAL FOR BEARINGS

Franco Colanzi, and Angelo Vignotto, both of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed May 28, 1986, Ser. No. 867,579
Int. Cl.[4] F16C 33/76; F16J 15/34
U.S. Cl. 384—482 3 Claims



1. A sealing device for sealing the space between relatively rotatable members comprising a rigid support element and an annular elastomeric sealing element having an internal radial annular lip extending radially and axially from an annular root portion of said elastomeric element, said annular lip having a radial section of generally V-shaped cross section with a vertex located obliquely with respect to said annular root portion of the elastomeric element and said annular lip comprising a first and a second portion of reduced cross section, said first portion corresponding to said root portion and said second portion to said vertex of the V-shaped cross section, said first and second portions of reduced cross section dividing said annular lip into first and second sections operable to engage with corresponding first and second sealing surfaces on one of said members and having sufficient flexibility to hingedly connect said sections to one another and to said root portion, said first section being tapered and extending between said root portion and said vertex and said second section being tapered and extending upwardly from said vertex.

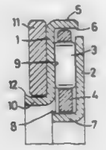
VOL 1088 ISS 5 MR 29 1988 UMI

4,733,979

THRUST ROLLER BEARING ASSEMBLY

Kenji Tsuruki, Fukuroi, Japan, assignor to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Division of Ser. No. 937,280, Dec. 3, 1986. This application Jun. 17, 1987, Ser. No. 64,027
Int. Cl.[4] F16C *19/30*
U.S. Cl. 384—620 3 Claims



1. A thrust roller bearing assembly comprising a thrust roller bearing of a non-separable type and an annular shim, said bearing including an outer race having an inwardly extending flange at outer edge thereof, an inner race having an inwardly extending flange at inner edge thereof, a retainer disposed between said outer race and said inner race, and rollers retained by said retainer,

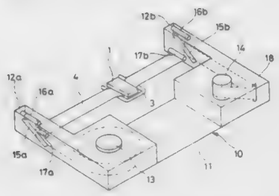
said outer race being formed with a cylindrical portion at inner edge thereof projecting away from said bearing to support said shim, said cylindrical portion being formed with means engaging said shim to prevent it from coming off said outer race

4,733,980

PRINTER

Takashi Tosa, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 16, 1986, Ser. No. 942,188
Claims priority, application Japan, Jan. 30, 1986, 61-10949[U]
Int. Cl.[4] B41J *35/06, 35/28*
U.S. Cl. 400—207 3 Claims



1. In a printer of the heat-sensitive transfer type having a platen for holding a printing paper thereon, a printing head supported on a carriage movable along the platen in a horizontal plane, an ink ribbon cassette for supplying an ink ribbon to a printing position in contact with the printing head for thermally transferring ink from the ink ribbon to the printing paper,

the improvement comprising:

said ink ribbon cassette being arranged horizontally and provided with a supply spool having the ink ribbon wound on its core with its width oriented in an upright direction perpendicular to the horizontal direction, a take-up spool for winding the ink ribbon on its core with its width oriented in the upright direction, and guide means including a first sloped guide roller for guiding the ink ribbon from the supply spool and turning it to run upward in the upright direction, a first reversing roller for reversing the ink ribbon to run from upward to downward in the upright direction, a first turning tensile roller for turning the downward running ink ribbon from the first reversing roller to run in the horizontal direction toward the printing position and for tensioning the same, a second turning tensile roller for turning the horizontal running ink ribbon from the printing position to run upward in the upright direction and for tensioning the same, a second reversing roller for reversing the ink ribbon to run from upward to downward in the upright direction, and a second sloped guide roller for turning the downward running ink ribbon so that its width is oriented in the upright direction and guiding the ink ribbon to the take-up spool; and

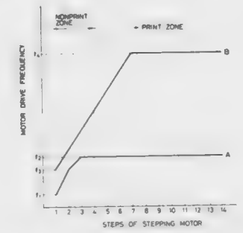
ink ribbon peeling means around the printing head carried together on the carriage with the printing head for sequentially peeling off the portion of the ink ribbon which has been used for printing from the printing paper.

4,733,981

MOTOR CONTROL SYSTEM OF PRINTER

Minoru Takeuchi, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 7, 1986, Ser. No. 893,978
Claims priority, application Japan, Aug. 8, 1985, 60-174840
Int. Cl.[4] B41J *21/08*
U.S. Cl. 400—292 2 Claims



1. In a method for operating a motor control system for a printer having a print head, a stepping motor for moving the print head by driving the motor at drive frequencies applied by a motor driver, in conjunction with head energization signals applied by a head driver to the print head for printing on a record sheet, wherein a first drive frequency (f1) is a relatively low frequency corresponding to starting up of the motor to move the print head from the condition of being stopped, a second drive frequency (f2) corresponds to the motor being driven above the frequency where smooth rotation of the motor can be maintained without transients, a slow-up zone corresponds to the zone wherein the drive frequency is increasing from an initial frequency for starting up the motor to a final frequency wherein the motor is driven at a constant frequency for the desired printing speed of the print head,

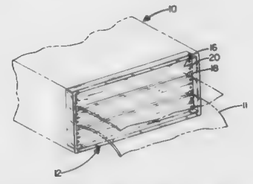
the improvement comprising starting up the motor to move the print head from the condition of being stopped at an initial, third drive frequency (f3) that is close to a maximum frequency limit within which the motor is self-startable, said third drive frequency being higher than the first drive frequency and less than the second drive frequency, increasing the drive frequency applied to the motor through the slow-up zone up to a final, fourth drive frequency (f4) which is a high frequency higher than the second drive frequency, in conjunction with applying head energization signals to the print head to commence printing at a time when the drive frequency is higher than the second drive frequency but still increasing in the slow-up zone, whereby the printing speed can be increased by commencing printing while the drive frequency of the motor is being increased through the slow-up zone.

4,733,982

ADAPTIVE PAPER SLOT DEVICE FOR AN ACOUSTIC SILENCER ENCLOSURE

Bret Starkweather, 15416 Bryant Ave. South, Burnsville, Minn. 55337

Filed Feb. 11, 1987, Ser. No. 13,632
Int. Cl.[4] B41J *29/08*
U.S. Cl. 400—690 2 Claims



1. In an acoustic sound attenuating device for an impact paper printer, the combination of:

(a) a sound attenuating enclosure for an impact printer having an access opening for paper feed;

(b) an open frame sized to fit said opening in said sound attenuating enclosure, said frame being secured to said enclosure by attachment means;

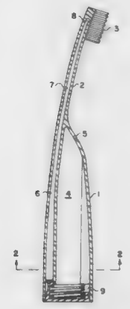
(c) a set of generally parallel bars sized to fit across said open frame and close the majority of the opening in said frame excepting at least one slot between two adjacent bars, said bars being vertically slideably attached to said frame to provide adjustment, said bars formed with a generally U-shaped cross-section filled with sound absorbing material, with said bars being oriented with respect to said frame to locate said sound absorbing material on the side of the frame facing said enclosure.

4,733,983

DISPENSER TOOTHBRUSH

Michael Hertrampf, Schäfereiweg 7, 3007 Gehrden 1, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,451
Int. Cl.[4] A46B *11/02*
U.S. Cl. 401—146 45 Claims



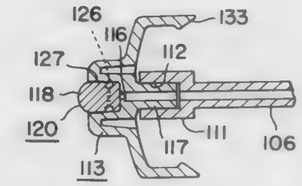
1. A dispenser toothbrush comprising a handle containing a storage chamber for toothpaste, one end of the handle being provided with a stem through which a duct leads from the storage chamber to a dispenser adjacent to a brush arranged at the free end of the stem remote from the storage chamber, a valve capable of closing off the storage chamber from the duct, and an actuating device provided at the other end of the handle which serves to actuate a means for altering the volume between the valve and the dispenser, the means being located between the storage chamber and the duct, the means and the valve being cooperatively arranged at said other end of the handle such that the valve closes only when the means is actuated, the duct running substantially the entire length of the dispenser toothbrush and being of sufficient narrowness such that the resistance to the flow of toothpast in the duct substantially prevents the flow of toothpaste from the dispenser to the storage chamber.

4,733,984

AEROSOL APPLICATOR AND METHOD

Yoshio Katsuda; Masuo Matsumoto, both of Hyogo; Yoshihiro Minamite, Osaka; Kazunori Hoshino; Yukio Hachinohe, both of Kanagawa, and Iwao Yazawa, Tokyo, all of Japan, assignors to Dainihon Jochugiku Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00408, § 371 Date Apr. 26, 1985, § 102(e) Date Apr. 26, 1985, PCT Pub. No. WO85/00992, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 24, 1984, Ser. No. 732,822
Claims priority, application Japan, Aug. 26, 1983, 58-131880[U]; Dec. 20, 1983, 58-195902[U]; Feb. 19, 1984, 59-29306; Mar. 5, 1984, 59-41749
Int. Cl.[4] B05C *17/00;* A47L *13/00*
U.S. Cl. 401—190 2 Claims



1. An application apparatus comprising:

an aerosol container;

an application prop disposed along an external longitudinal side of said container;

a non-absorbent applicator part disposed on a longitudinal surface of said application prop which is not facing said container;

a guide chamber formed between said application prop and an inner surface of said applicator part;

irregular surface means on said applicator part in contact with at least one opposing surface of said application prop, said irregular surface means being in fluid communication with said guide chamber; and

a guide inlet communicating between said guide chamber and an outlet stem of said container to enable any contents of said container to pass from inside of said container through said guide inlet to said guide chamber;

wherein any contents in said guide chamber can exude across said irregular surface means to an outer surface of the applicator part.

4,733,985

BINDER MECHANISM

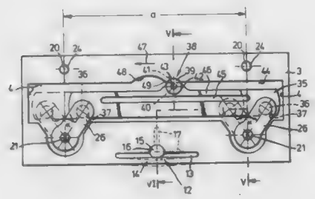
Helmut Moosmüller, deceased, late of Mönchweiler, Fed. Rep. of Germany (by Marita Moosmüller, legal representative), assignor to Fa.marmos Büro-und Organsations-mittel, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,942
Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519486
Int. Cl.[4] B42F *3/04, 13/00;* F16B *21/00, 21/09*
U.S. Cl. 402—27 12 Claims

1. A binder mechanism for loose-leaf binders, comprising a support, at least two operationally upright two-piece binder yokes mounted on said support, each yoke including a fixed yoke rod part and a pivotal yoke part which is rotatable about its axis and a crank arm secured to each pivotal yoke part, a

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connecting link disposed in said support and pivotably connected at its respective ends to respective crank arms, said support having a cavity open at its underside and extending beyond each binder yoke, said crank arms having mounting bushings into which said pivotal yoke parts are engaged, said support having receiving openings in which said mounting bushings are engaged, said crank arms and said connecting link



being disposed in said cavity, and releasable detent means in said support effective to hold said pivotal yoke parts in a closed position, said detent means comprising a roller rotatably mounted on said connecting rod movable therewith, a detent depression disposed in the wall of said support along the cavity, means biasing said roller in a direction toward engagement with the detent depression and being movable into the depression in an operable position of said binder mechanism.

4,733,986

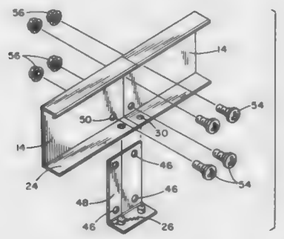
SPLICE PLATE FOR CABLE TRAY

James M. Kenning; William K. McErlane, both of Cincinnati, Ohio, and Barry R. Schuster, Union, Ky., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 763,739, Aug. 8, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,935

Int. Cl.⁴ F16B *5/02*

U.S. Cl. 403—306 **3 Claims**



1. A connecting assembly joining together a first cable tray siderail and a second cable tray siderail in longitudinal end to end relationship, said first siderail and said second siderail each including a middle portion and a bottom portion, each middle portion and each bottom portion having at least one hole adjacent the end to be joined, said assembly comprising:

a generally L-shaped splice plate having a flat portion and a bottom flange;

a plurality of openings in the flat portion, each of said openings being positioned in registration with a respective hole in the middle portion of said first siderail and said second siderail;

a plurality of connectors, each connector passing through a respective one of said holes in the middle portion of said first siderail or said second siderail and a respective one of said openings in said flat portion; and

a plurality of studs pre-positioned on said bottom flange, each stud protruding upwards and being fittingly received through a respective one of said holes in the bottom portion of said first siderail and said second siderail.

4,733,987

SPRING CLIP

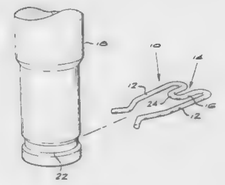
Peter N. Tomlinson, 315 Endford Road, Mondeo, Johannesburg, Transvaal, and Klaus Tank, 9 Warbleton Avenue, Essexwold, Johannesburg, Transvaal, both of South Africa

Filed Feb. 11, 1987, Ser. No. 13,348

Claims priority, application South Africa, Feb. 27, 1986, 86/1471

Int. Cl.⁴ B25G *3/18;* **F16B** *21/00*

U.S. Cl. 403—326 **2 Claims**



1. A spring clip for engaging a grooved section in the shank of a cutter pick and for securing said cutter pick to a mining machine drum, the spring clip being constructed of spring steel wire and comprising:

a first leg and a second leg parallel to and spaced from each other, such that a constant spacing between said legs is provided along a substantial length of said legs; and

a bight portion integral with and extending between said first and second legs to connect said legs together;

wherein said first and second legs are provided with end portions remote from said bight portion which are outwardly splayed, and intermediate portions of a length substantially equal thereto located between said end portions and said bight portion which are inwardly directed and in opposition to each other such that a spacing between said inwardly directed intermediate portions of said legs is less than the constant spacing between said legs where said legs are spaced in parallel arrangement; and

wherein said bight portion includes a generally U-shaped re-entrant bearing portion extending in the same direction as said parallel-spaced legs and terminating at a point between said bight portion and said intermediate portions.

4,733,988

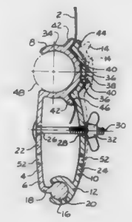
CLAMP FOR A SHEET

Clifford G. Kelly, P.O. Box 141, Surrey, British Columbia, Canada V3T 4W4

Filed Oct. 7, 1986, Ser. No. 916,244

Int. Cl.⁴ F16B *7/04, 2/18*

U.S. Cl. 403—373 **9 Claims**



1. A clamp to receive a protective sheet and retain that sheet in position over an object, the clamp comprising:

a first member having first and second ends;

a second member having first and second ends;

a hinge joining the first and second members at their first ends;

the first and second members being spaced from each other at a portion intermediate the first and second ends;

clamping means extending between the two intermediate portions to force the two intermediate portions towards each other;

a first arcuate portion of the second end of the first member and having an outer surface;

a plurality of projections extending radially outwardly from the outer surface of the first arcuate portion;

a second arcuate portion of the second end of the second member and having an inner surface that corresponds to the outer surface of the first arcuate portion;

a plurality of recesses in the inner surface of the second arcuate portion, each recess to receive a projection on the outer surface of the first arcuate portion;

whereby said second arcuate portion may be inserted into the first arcuate portion to clamp the sheet therebetween, the plurality of projections cooperating with the plurality of recesses to assist in the clamping action.

4,733,989

SELF-HEALING BENTONITE SHEET MATERIAL COMPOSITE DRAINAGE STRUCTURE

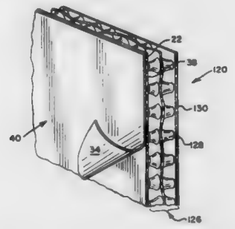
Todd D. Harriett, Elk Grove Village, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 676,279, Nov. 29, 1984, Pat. No. 4,656,062, which is a continuation-in-part of Ser. No. 604,990, Apr. 27, 1984, Pat. No. 4,534,926, which is a continuation-in-part of Ser. No. 443,225, Nov. 22, 1982, Pat. No. 4,534,925. This application Mar. 4, 1986, Ser. No. 816,266

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.⁴ E02B *11/00;* **E02D** *31/02*

U.S. Cl. 405—43 **10 Claims**



1. A composite drainage structure capable of directing water longitudinally away from a potential area of water flow and incapable of transverse water penetration comprising:

drainage means for receiving water and channeling the water to a predetermined area, said drainage means including a first, generally planar, water-penetrable sheet material, and second, generally planar water-impermeable sheet material spaced from said first sheet material;

channel means disposed between said first and second sheet materials of said drainage means for channeling water longitudinal within said drainage means to said predetermined area; and

a cohesive layer of a water-swellable clay composition secured to said water-impermeable layer of sheet material.

4,733,990

ERECTING/LYING-DOWN DAM OR SLUICE GATE MADE OF FLEXIBLE SHEET

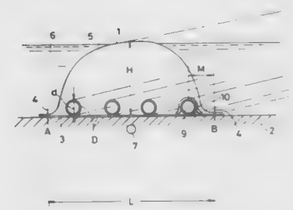
Yoshiomi Tsuji; Ichiro Maruyama, and Hiroshi Takuma, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 880,663, Jun. 30, 1986. This application Jul. 14, 1987, Ser. No. 73,197

Claims priority, application Japan, Aug. 21, 1985, 60-184875; Aug. 21, 1985, 60-184876

Int. Cl.⁴ E02B *7/20, 7/02*

U.S. Cl. 405—115 **21 Claims**



1. A collapsible dam or sluice gate which is expandable upon fluid supply therein and deflatable upon fluid discharge therefrom comprising:

means for supporting said dam or gate disposed along a bottom of a river or the like having a plurality of corrugations formed integrally on an upper surface of said supporting means;

a cover made of a flexible sheet which can expand and deflate;

means for attaching said cover to said supporting means; and

means for defining a lower interior surface, disposed along said upper surface of said supporting means corrugations so that said lower interior surface means has a corrugated shape and, upon discharge of said fluid, said cover is deflated to a position substantially near said corrugated shape of said lower interior surface means, and the length of a floating portion of said cover during deflation is therefore minimized.

4,733,991

ADJUSTABLE RISER TOP JOINT AND METHOD OF USE

Roderick J. Myers, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 1, 1986, Ser. No. 936,579

Int. Cl.⁴ E02D *21/00;* **B63B** *35/44;* **E21B** *7/128*

U.S. Cl. 405—195 **14 Claims**

1. A riser section for use as a top joint of a production riser to adjustably position a wellhead tree in a fixed location relative to a well on an ocean floor while permitting relative movement between said fixed well-head tree and a deck of a floating platform or the like above which said wellhead tree is mounted, said deck having an upper surface and a lower surface, said riser section comprising:

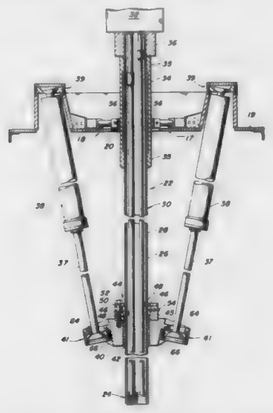
a generally cylindrical pipe length having a first internal diameter and a first external diameter;

a series of generally annular protrusions that are generally equally spaced from one another and extend outwardly from said first external diameter;

said series of annular protrusions extending through an opening in the deck of said platform both above said upper surface and below said lower surface thereby affording a first plurality of connection points for said wellhead tree

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above the upper surface of said deck and a second plurality of connection points for riser tensioner means below



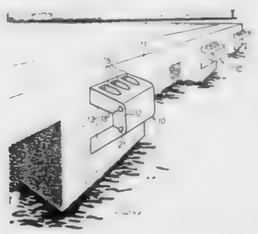
the lower surface of said deck such that the deck of said platform may move relative to said fixed wellhead tree.

4,733,992

FENDER

Bengt Dehlén, Trelleborg, Sweden, assignor to Trelleborg AB, Trelleborg, Sweden

PCT No. PCT/SE86/00087, § 371 Date Oct. 7, 1986, § 102(e) Date Oct. 7, 1986, PCT Pub. No. WO86/05828, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 3, 1986, Ser. No. 925,636
Claims priority, application Sweden, Mar. 29, 1985, 8501567
Int. Cl.[4] E02B *3/22*
U.S. Cl. 405—215 15 Claims



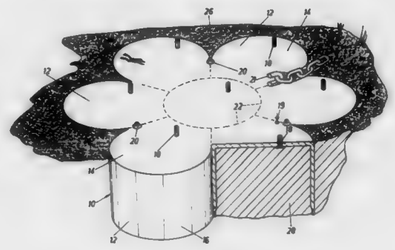
1. A fender which is elongate and, in the mounted state, has an essentially U-shaped cross section, the legs (13) of said U-shaped cross section having attachments (14, 16) for anchoring to a base (11) and forming, together with the web (12) of said U-shaped cross-section, the energy-absorbing fender part which consists of elastomer material, characterized by a longitudinal slot (17) serving as a fold line and reducing elongation stress, said slot being formed on the inside of said U-shaped cross section between the web (12) and legs (13) thereof and having, adjacent said inside, opposing supporting surfaces (18) and, further, having a width and shape such that said slot, when the fender is folded to U-shaped cross section during mounting of the fender, is closed so that said supporting surfaces (18) will mutually abut.

4,733,993

SUBSEA FOUNDATION ELEMENT AND APPLICATIONS THEREOF

Bo A. Andréasson, Gothenburg, Sweden, assignor to J & W Offshore AB, Sweden

Filed Jun. 6, 1986, Ser. No. 882,927
Claims priority, application PCT Int'l Appl., Nov. 7, 1985, PCT/SE85/00442; Sweden, Nov. 9, 1984, 8405613-4
Int. Cl.[4] E02D *23/02;* B63B *21/27*
U.S. Cl. 405—224 9 Claims



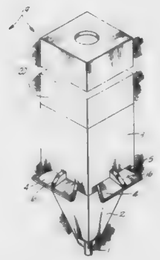
1. An improved anchor element, preferably for subsea use, comprising means for evacuation of the water entrapped inside said element to allow said anchor element to penetrate into and be embedded in the sea bottom strata, the improvement comprising said element consisting of a plurality of open bottom cells each comprising an upper surface and a surrounding dependent wall, said cells being affixed to each other with said walls forming a continuous outer wall for said element and said upper surfaces defining a roof, said cells having means for evacuating said cells to penetrate down into the sea bed and be embedded therein at a level wherein said roof is substantially level with the mudline so that the element will form an anchor unit/floor in said sea bed with said roof providing an area for work, connection and installation of equipment, and the like, said roof having a width at least equal to the length of said cell walls.

4,733,994

DRIVEN PILE WITH TRANSVERSE BROADENING IN SITU

Johan H. Simanjuntak, Jalan Tanah Abang II/23, Jakarta, Indonesia

Continuation of Ser. No. 698,103, Feb. 4, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 934,620
Claims priority, application Indonesia, Apr. 6, 1984, 10,005
Int. Cl.[4] E02D *5/74*
U.S. Cl. 405—244 14 Claims



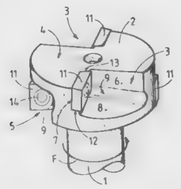
1. A pile assembly for supporting a structure after the pile assembly is driven into a soil stratum, the assembly comprising:
a reinforced concrete pile element having a rectangular cross section and comprising an end and an inner wall defining a passageway for a mandrel;
a pyramidally-shaped pile toe mounted to the end of the pile element, the toe comprising a metal housing with a rectangular upper portion and four interior walls, the walls being joined to form a tapered bottom portion, each wall defining an aperture between the upper and lower portions;
a movable actuator substantially enclosed by the metal housing and having a bottom portion and a pyramidal cross sectional area greater than the cross sectional area of the passageway; and
a trapezoidally-shaped plate corresponding to each of said apertures, each plate having a short side adjacent the actuator and a long side adjacent the corresponding aperture;
the actuator having a first position in the housing so that each of the trapezoidally-shaped plates may be positioned interior to the metal housing and having a second position such that the bottom portion of the actuator is adjacent the interior walls of the bottom portion and bear against the short side of each of the trapezoidally-shaped plates and thereby extend each plate at least partially from the respective aperture to a point external to the metal housing.

4,733,995

MILLING CUTTER FOR MACHINING T-SHAPED GROOVES

Gilbert Aebi, Trelex, Switzerland, assignor to Stellram S.A., Nyon, Switzerland

Filed Aug. 25, 1986, Ser. No. 899,962
Claims priority, application Switzerland, Sep. 13, 1985, 3985/85
Int. Cl.[4] B23C *5/08, 5/10, 5/22*
U.S. Cl. 407—34 4 Claims



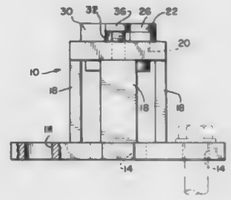
1. Cutting tool for machining T-shaped grooves, comprising a shaft having a first end adapted to be fixed to the spindle of a machine for driving said shaft in rotation, and a second end comprising a disc-shaped head; said head comprising a peripheral region and first and second surfaces directed toward and away from said shaft, respectively, first recesses opening on said peripheral region and said first face of said disc, second recesses angularly offset from said first recesses and opening on said peripheral regions in said second face of said disc, each said recess comprising a seating adapted to receive a removable, indexable cutting insert; each of said first and second recesses comprising first, second and third uniplanar surfaces all adjacent to one another, said first and second surfaces extending axially of said disc-shaped head, and said first surface comprising said seating, said first and second surfaces together forming a right angle, each of said first and second surfaces extending to said peripheral region of said disc-shaped head.

4,733,996

DRILL GUIDE FIXTURE, FOR DIRECTING DRILLS ORTHOGONALLY INTO TUBES IN TUBESHEETS

Michael C. Catapano, 49 Bayberry La., Middletown, N.J. 07748

Filed Dec. 11, 1986, Ser. No. 940,742
Int. Cl.[4] B23B *49/02*
U.S. Cl. 408—79 15 Claims



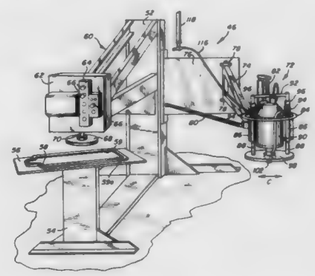
1. A drill guide fixture, for directing drills orthogonally into tubes in tubesheets, comprising:
first means defining a base;
second means defining a platform; wherein
said base and said platform lie in parallel planes;
said base has a plurality of mounting holes formed therein; and
said platform has an aperture formed therethrough, parallel with said mounting holes, in which to accommodate a guide bushing for a drill for drilling a given tube in a given tubesheet; wherein
said mounting holes are so positionally formed as to assure alignment thereof with tubes in said given tubesheet, other than said given tube, to accommodate fasteners for said fixture in said mounting holes and said other tubes.

4,733,997

METHOD OF PRODUCING CHAIR MATS AND THE LIKE INVOLVING EDGE TRIMMING

John R. Ford, Elk Grove Village, and Robelino C. Gutierrez, Bartlett, both of Ill., assignors to Tenex Corporation, Elk Grove Village, Ill.

Filed Jun. 18, 1985, Ser. No. 745,946
Int. Cl.[4] B23C *1/26, 1/04;* B27C *5/02*
U.S. Cl. 409—84 19 Claims



1. A method of trimming the edge of a generally planar workpiece, comprising the steps of:
providing a work table for positioning the workpiece;
providing a router head including a router blade engageable with the edge of the workpiece;
relatively rotating the work table and router head about an axis extending generally perpendicular to and through the plane of the workpiece; and
guiding the router blade along the edge of the workpiece

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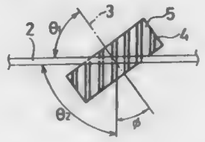
during said relative rotation and controlling biasing forces applied to the workpiece edge by the router blade.

4,733,998

METHOD AND APPARATUS FOR MACHINING THE SIDE EDGE SURFACE OF A WEB PLATE

Shingo Kurisu; Shunji Omori; Hiroyuki Takenaka; Tsuneo Egawa, all of Hiroshima; Takuro Mitsunaga, and Nobuo Kiyama, both of Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,309
Claims priority, application Japan, Oct. 24, 1983, 58-197577
Int. Cl.⁴ B21B *15/00*; B23C *3/12*
U.S. Cl. 409—132 **5 Claims**



1. A method of machining a longitudinally extending side edge surface of a web plate having an upper and lower surface, comprising:

providing a rotary cutter having cutting edges on a radially outer peripheral surface of said cutter which are at a predetermined angle with respect to the rotary axis of said cutter;

orienting said cutter with respect to said web plate by having the rotary axis of said cutter inclined at a first angle for forming a second angle between the cutting edges and the longitudinal corner edge of the longitudinally extending side edge of said web plate to be machined, said second angle lying in a plane containing said longitudinally extending side edge surface and being within the range of 55 degrees to 125 degrees, and;

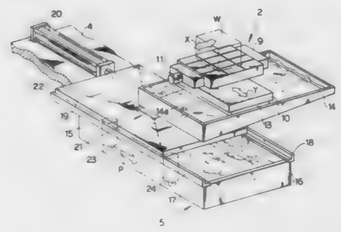
rotating said rotary cutter in rotation, while moving said cutter and said web plate relative to each other for moving the longitudinally extending side edge surface of said web plate into contact with said radially outer peripheral surface of said cutter and past said cutter, whereby the longitudinally extending side edge surface of a web plate is machined.

4,733,999

CUTTING OIL SORTING APPARATUS

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,183
Claims priority, application Japan, Dec. 16, 1985, 60-281002
Int. Cl.⁴ B23Q *11/10*
U.S. Cl. 409—136 **4 Claims**



1. A machine tool including a spindle head (1), a XY-table (2) placed under the spindle head (1) and a base (4), and a cutting liquid sorting apparatus, the cutting liquid sorting apparatus comprising:

a tray (14) having at its bottom a discharge port (14*a*);

a support (13) placed in the tray (14) for supporting the XY table (2);

a receiver (19) having a means defining an opening (21) at its bottom and formed in the shape of a dish for receiving water soluble cutting liquid and oily cutting liquid from the discharge port (14*a*) of the tray (14);

a first tank (15) for containing the water soluble cutting liquid;

a second tank (16) for containing the oily cutting liquid, the first tank (15) and the second tank (16) being arranged in a side-by-side manner;

a pair of rails (17, 18) arranged over the first and second tanks (15, 16); and

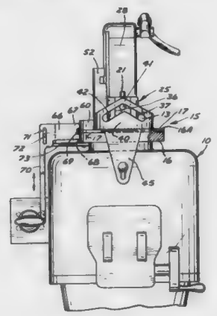
a hydraulic cylinder type actuator (20) for moving the receiver (19) slidably along the rails (17, 18) between a first position in which the water soluble cutting liquid flows from the receiver (19) into the first tank (15) through the opening (21) and a second position in which the oily cutting liquid flows from the receiver (19) into the tank (16) through the opening (21).

4,734,000

POWER DRAWBAR WRENCH

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Mar. 9, 1987, Ser. No. 23,794
Int. Cl.⁴ B23C *5/26*; B23B *31/10*
U.S. Cl. 409—233 **15 Claims**



1. A drawbar operating wrench for mounting onto a machine tool and for centrally tightening of the drawbar thereof, which drawbar has one end which protrudes from the machine tool and is adapted to be rotated, said drawbar operating wrench comprising:

a mounting block adapted for being mounted on the machine tool adjacent the one end of the drawbar;

an actuator member mounted on the mounting block for rotational movement centered on the axis of said drawbar;

a motor slideably mounted relative to said block and being guided for movement generally parallel to the axis of the drawbar, said motor being moveable between first and second positions, said motor in its second position operatively engaging said drawbar for rotating said drawbar and in the first position clearing said drawbar;

means operatively connecting said motor and said actuator member so that upon movement of said actuator member the motor is moved in a selected direction from a reference position and is moved toward its second position and thus toward said drawbar;

interlock means coupled to said actuator member to prevent movement of said actuator member when the machine tool is powered; and

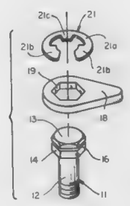
means coupled to said actuator member for energizing the motor after the actuator member has moved the motor to its second position engaging said drawbar.

4,734,001

LOCKING FASTENER

Bruce A. Bennett, 15 Chestnut Ave., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 755,907, Jul. 17, 1985, abandoned. This application Jul. 18, 1986, Ser. No. 888,011
Int. Cl.⁴ F16B *39/10*
U.S. Cl. 411—119 **15 Claims**



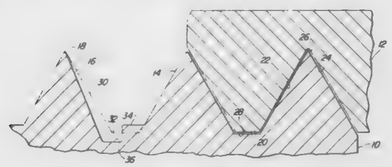
1. A fastener comprising a threaded part having an external surface of non-circular contour and a bearing surface, a locking plate having an opening in which the surface of non-circular contour is received to prevent rotation of the threaded part, a groove formed in the surface of non-circular contour and spaced from the bearing surface, and a retainer clip mounted in the groove to retain the locking plate on the threaded part, the bottom wall of the groove being of smaller dimension than the retainer clip and the locking plate having a thickness less than the distance between the bearing surface and the groove so that the clip is free to rotate within the groove.

4,734,002

LOCKING THREAD FORM FOR MALE FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024

Filed Jul. 11, 1986, Ser. No. 884,791
Int. Cl.⁴ F16B *39/30*
U.S. Cl. 411—311 **4 Claims**



1. A threaded fastener having a non-standard external threadform thereon for engagement with a standard female thread form to form a prevailing torque fastener combination comprising:

an elongated body having a longitudinal axis of rotation;

a threadform on said body defining leading and trailing helical flanks which intersect to define crests and valleys;

the leading flank lying at a standard angle which matches the angle of the standard female threadform,

the trailing flank lying at a steeper angle than the leading flank to produce a gap when threaded together with a standard female threadform,

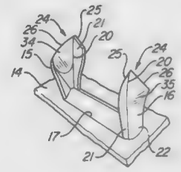
the threadform on said body throughout its length defining a standard and uniform crest diameter and a nominal valley diameter which noninterferingly mates with the crests of said standard female threadforms, the valley over at least a portion of said body being formed as a step to define an elevated portion of greater than nominal diameter immediately adjacent said leading flank which interferes with the crests of said standard female threadforms and which is adapted to be deformed by said standard female threadforms so as to permit threading of male and female components, and a depressed portion of a diameter approximately equal to or less than the nominal diameter immediately adjacent said trailing flank.

4,734,003

WOOD JOINT CONNECTOR PLATE

Glenn C. Smith; James R. Needham, both of 2914 E. Katella, Orange, Calif. 92667, and William T. Turnbull, 1307 W. Sixth St., Suite 114, San Clemente, Calif. 91720

Filed Dec. 22, 1986, Ser. No. 944,192
Int. Cl.⁴ F16B *15/00*
U.S. Cl. 411—468 **5 Claims**



1. In a connector plate, for connecting abutting wood members, formed of a thin, rigid metal sheet with a substantial number of struck-out, narrow, elongated openings, each having a longitudinal axis, and with the material struck-out of each of the openings being bent perpendicularly to the sheet to form a pair of opposed, reverse-oriented mirror-image teeth, with the teeth each having a base integral with the sheet at the opposite, narrow ends of the openings and a free tip including an apex, and with each tooth of each pair having an inner face which faces towards its opposing tooth, and an outer face, the improvement comprising:

each tooth being bent along its length, about a bend line from the base to the apex of the free tip, that is transversely offset relative to the longitudinal axis of its opening to divide the tooth into a narrow and a wide strip portion along the length of the tooth;

the free tip of each tooth being formed in an asymmetrical V-shape, with a short leg terminating the narrow strip portion and a considerably longer leg terminating the wide strip portion, and the apex aligned with the bend line;

each tooth being twisted around the bend line, at a gradually increased degree of twist along the length of the tooth so that the tip short leg extends inwardly towards its opposing leg generally parallel to, but transversely offset from, the longitudinal axis of the opening, and the tip long leg extends in an outwardly direction away from the opposing tooth, at an acute angle relative to the longitudinal axis of the opening;

whereby when the plate is pressed against a face of a wood member for embedding the teeth into the wood member, each tooth intertwines with and tightly interlocks with the twisting fibers of the wood member to resist withdrawal therefrom.

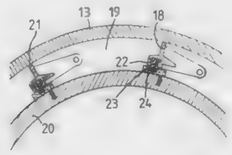
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,004

SLUICE DEVICE

Lennart Stenström, Huddinge; Lennart Wahlström, Tumba, and Torsten Malmgren, Huddinge, all of Sweden, assignors to Alfastar AB, Tumba, Sweden

PCT No. PCT/SE86/00063, § 371 Date Oct. 17, 1986, § 102(e) Date Oct. 17, 1986, PCT Pub. No. WO86/04832, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 14, 1986, Ser. No. 929,197
Claims priority, application Sweden, Feb. 18, 1985, 8500754
Int. Cl.[4] B01J *3/02*
U.S. Cl. 414—217 13 Claims



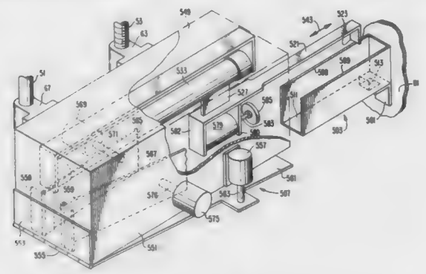
1. A sluice device for use in a device for heat stabilization and placeable between zones having different pressure conditions, comprising a drum rotatable in an opening in a housing, in a clockwise or anticlockwise direction, wherein flaps are arranged for radial displacement and are distributed along the circumference of the drum, in that each flap has a first portion for sealing against the housing, and in that a second portion of the flap, adjacent to the drum, comprises an elongated sealing member extending in the longitudinal direction of the drum and having a portion which may be displaced between two positions relative the drum, such that the flap due to the pressure difference is brought in sealing abutment against the inside of the housing, regardless of the positive or negative pressure difference between said zones.

4,734,005

VENDING MACHINE FOR VIDEO CASSETTES

Marvin Blumberg, 7105 Broxburn Dr., Bethesda, Md. 20817

Continuation-in-part of Ser. No. 756,955, Jul. 19, 1985, Pat. No. 4,668,150. This application Nov. 6, 1986, Ser. No. 927,585
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—273 12 Claims



1. A machine for automatically dispensing a selected container from a store of containers and for automatically storing a container returned to the machine, said machine comprising:

(a) an array of storage bins for storing a plurality of containers, said bins being arranged in a plurality of vertically-stacked, horizontal rows, with a horizontal passage between adjacent ones of said horizontal rows and a vertical passage connecting the horizontal passages, each bin having a bottom for supporting a container, and each container being stored in a respective one of said bins;

(b) carriage means mounted for movement relative to said bins for transporting a container between a first machine position for dispensing a selected container and for receiving a returned container, and a second machine position corresponding to one of said bins, said carriage means including a bottom platform with a free end adjacent said array and an opposite end pivotally attached to said carriage means for pivoting about a horizontal axis so that the height of said free end can be selectively adjusted to be above or below the bottom of said one bin depending on whether a container is being inserted into or withdrawn from said one bin, respectively;

(c) a controllable arm mounted to said carriage means for movement therewith between said first and second machine positions and for movement relative to said carriage means along a horizontal path transverse to said horizontal passages, said controllable arm presenting first and second vertical surfaces; and

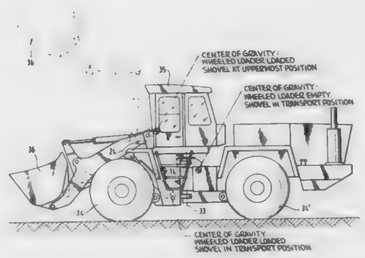
(d) control means responsive to an input signal which corresponds to one of said bins for moving said carriage means between said first and second machine positions and for moving said controllable arm along said horizontal path at said second machine position for one of removing a selected container from, or inserting a returned container into said one bin, the first vertical surface of said controllable arm being disposed for pushing a selected container out of its associated bin and into said carriage means when said controllable arm is controlled to move in one direction along said horizontal path, and the second vertical surface of said controllable arm being disposed for pushing a returned container from said carriage means into said one bin when said controllable arm is controlled to move in the opposite direction along said horizontal path.

4,734,006

WHEELED BUILDING AND CONSTRUCTION MACHINE OF THE MECHANICAL SHOVEL, BULLDOZER OR THE LIKE TYPE, HAVING ARTICULATED STEERING

Adolf Krob; Detlef Seidel; Peter Kohn; Paul Kohn, all of Konz, and Wolfgang Serwe, Welschbillig, all of Fed. Rep. of Germany, assignors to Zettelmeyer-Baumaschinen GmbH, Konz, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,686
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511336
Int. Cl.[4] B66C *1/10*
U.S. Cl. 414—719 4 Claims



1. A front-end loader which includes a front carriage and a rear carriage, said front carriage being pivotally connected to said rear carriage so as to be pivotable with respect thereto about a vertical axis,

said front carriage including:

a front frame,

a front axle,

a pair of front wheels mounted on said front axle,

a pair of front suspension systems mounting said front frame about said front axle, each of said front suspension systems including a front pivoting lever, which supports said axle and is pivotally connected at one end thereof to said front frame, and an upwardly extending front hydraulic cylinder, which is pivotally connected at one end to said front pivoting lever and at its other end to said front frame,

a shovel,

an articulated arm mechanism connected between said shovel and said front frame for lifting said shovel between a lowermost operating position and an uppermost operating position, and

a first limit switch attached to said front frame which is activated when said articulated arm mechanism lifts said shovel to its uppermost operating position,

said rear carriage including:

a rear frame,

a rear axle,

a pair of rear wheels mounted on said rear axle,

a pair of rear suspension system mounting said rear frame above said rear axle, each of said rear suspension systems including a rear pivoting lever, which is pivotally connected at one end to said rear frame, and an upwardly extending rear hydraulic cylinder, which is pivotally connected at one end to said rear pivoting lever and at its other end to said rear frame,

and wherein said front-end loader also includes:

a storage tank for hydraulic fluid, and

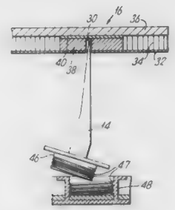
a fluid conduit system for supplying hydraulic fluid from said storage tank to said front and rear hydraulic cylinders, said hydraulic fluid system including a pump; a magnetic directional valve and a pressure control valve for controlling the supply of hydraulic fluid to said rear hydraulic cylinders, said magnetic directional control valve being connected to said first limit switch so as to cause hydraulic fluid to flow to said rear hydraulic cylinders and cause them to expand when said articulated arm is in its uppermost operating position; and at least one transverse stabilizing valve for controlling the flow of hydraulic fluid from said front hydraulic cylinders, thus retarding contraction thereof when subjected to heavy contractive loads.

4,734,007

FAN CASING AND FAN BLADE LOADING/UNLOADING

Derick A. Perry, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 21,348, Mar. 3, 1987, abandoned. This application Sep. 9, 1987, Ser. No. 96,297
Int. Cl.[4] F01D *5/30, 21/00*
U.S. Cl. 415—9 10 Claims



1. A fan assembly for a turbofan gas turbine engine comprising a fan rotor, a plurality of fan blades and an annular fan casing,

the fan blades being removably secured to the fan rotor, the fan blades having tips at their radially outer extremity and root portions at their radially inner extremity,

the fan casing being arranged coaxially with the fan rotor and surrounding the fan blades, the fan casing having an interior surface and an exterior surface, the fan casing having a slot, the slot being formed on the interior surface of the fan casing, the fan casing having a plug, the plug being removeably secured in the slot to form a continuation of the interior surface of the fan casing,

the slot in the fan casing being in substantially the same plane as the fan blades, the slot in the fan casing being dimensioned so as to receive the tip of a fan blade,

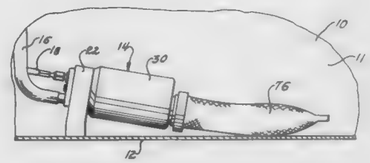
the tips of the fan blades being alignable with the slot in the interior surface of the fan casing, and the tips of the fan blades being insertable into the slot in the interior surface of the fan casing to allow loading or unloading of the fan blades.

4,734,008

PUMP IMPELLER

Robert A. Roth, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1986, Ser. No. 876,776
Int. Cl.[4] F04D *5/00*
U.S. Cl. 415—53 T 2 Claims



1. An impeller for a vapor separating fuel pump,

said fuel pump including

an electric motor having a rotatable armature shaft portion,

a first pump body defining a cavity for reception of said impeller and wherein said impeller is rotatable about an axis of said first pump body,

a second pump body abutting said first pump body and closing said cavity,

means on said first and second second pump bodies defining a pair of generally cylindrical depressions centered on said axis in a pair of opposite walls of said closed cavity,

means on one of said first and said second pump bodies defining a vapor discharge slot extending therethrough to the corresponding one of said cylindrical depressions and,

means on said first and said second pump bodies defining a pair of annular seal surfaces on respective ones of said opposite walls of said closed cavity around corresponding ones of said cylindrical depressions and in parallel planes perpendicular to said axis,

said impeller comprising:

a ring-like body in said closed cavity centered on said axis and defining a cylindrical outer surface and a cylindrical inner surface and a pair of annular side surfaces disposed in parallel planes perpendicular to said axis,

each of said annular side surfaces being juxtaposed a corresponding one of said pair of annular seal surfaces whereby said closed cavity is separated into a generally cylindrical vapor collection chamber centered on said axis and bounded at opposite ends by said cylindrical depressions and a substantially annular low pressure pumping chamber radially outboard of said vapor collection chamber and connected thereto by the clearance spaces between said impeller side surfaces and said annular seal surfaces,

a plurality of open-vane pump vanes extending radially out from said outer cylindrical surface and disposed in said low pressure pumping chamber,

a plurality of fan blades extending radially in from said inner cylindrical surface and disposed in said vapor collection

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chamber and operative to blow vapors in said vapor collection chamber out through said vapor discharge slot when rotation of said impeller commences,

said fan blades being separated by open spaces therebetween through which the portions of said vapor collection chamber on opposite sides of said impeller communicate, and

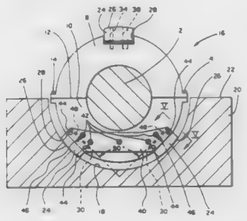
means on said impeller drivingly connecting said impeller to said motor armature shaft portion.

4,734,009

METHOD AND APPARATUS FOR ALIGNING TURBINE ROTORS

Ira J. Campbell, East Bradford, and Philip W. Ketterer, Norristown, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1987, Ser. No. 31,801
Int. Cl.[4] F04D *29/20*
U.S. Cl. 415—170 R **9 Claims**



1. Apparatus for aligning a turbine rotor centrally within a reference bore, each end of the rotor being supported by a respective journal bearing including an upper half and a lower half joined together by a bearing shell for mounting within a spherical bore of a bearing pedestal, comprising:

first bearing support means, rigidly attached to the upper half of each journal bearing, for supporting the bearing within its associated spherical bore; and

second bearing support means adjustably attached to the lower half of each journal bearing, said second bearing support means including a pair of bearing support pads each of which have a male spherical surface adapted to conform to the spherical bore to a first predetermined percentage of contact therebetween, and means for coupling said pair of pads in a fixed relationship relative to the spherical bore, said coupling means being attached to the bearing shell.

4,734,010

DAMPING ELEMENT FOR INDEPENDENT TURBOMACHINE BLADES

Josef Bättig, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

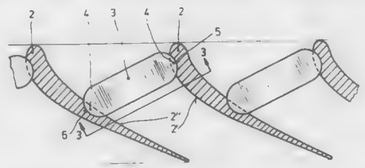
Filed May 8, 1986, Ser. No. 860,827
Claims priority, application Switzerland, May 31, 1985, 2309/85
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—196 R **5 Claims**

1. A turbomachine, comprising:

a plurality of free-standing blades mounted in a rotor, each of said blades having a semicircular recess on the suction side of the blade and a semicircular recess on the pressure side of the blade;

an elastically deformable platelet having a longitudinal axis and a semicircular support at each longitudinal end;

the semicircular supports of said platelet being supported in the semicircular recesses of adjacent blades such that the supports are located in a plane extending substantially perpendicularly to the longitudinal extent of the blades and the longitudinal axis of said platelet extends at an angle to the circumferential direction of the rotor; and



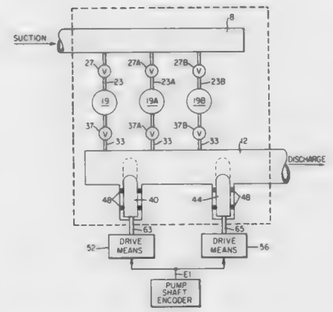
said platelet having a double curvature such that when said platelet is mounted between adjacent blades, said platelet curves toward the center of the rotor.

4,734,011

PULSATION DAMPENER FOR RECIPROCATING PUMPS

Russell W. Hall, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 1, 1986, Ser. No. 892,544
Int. Cl.[4] F04B *11/00*
U.S. Cl. 417—2 **8 Claims**



1. A pumping system comprising:

suction means for receiving a fluid,

a plurality of cylinder means connected to the suction means for compressing the fluid, each cylinder means having a piston;

a pump shaft connected to the pistons in the plurality of cylinder means;

drive means for rotating the pump shaft so as to move the pistons in the plurality of cylinder means;

a discharge manifold connected to the plurality of cylinder means in a manner so as to discharge the compressed fluid from the plurality of cylinder means; and

affecting means connected to the discharge manifold and to the pump shaft means for affecting the discharging of the compressed fluid in accordance with the number of cylinder means and the rotational frequency of the pump shaft, and wherein the affecting means includes:

two compensating pistons which enter the discharge manifold, and

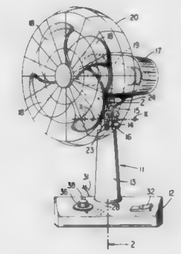
means for driving one compensating piston at a first fundamental frequency and the other compensating piston at a second harmonic frequency, both compensating piston frequencies being related to the number of cylinder means and to the rotational frequency of the pump shaft.

4,734,012

BLOWER SPEED CONTROL

Allan M. Dob, Clifton, and John W. Wurst, Far Hills, both of N.J., assignors to SSMC Inc., Shelton, Conn.

Filed Apr. 17, 1987, Ser. No. 39,404
Int. Cl.[4] F04B *49/10*
U.S. Cl. 417—32 **5 Claims**



1. A control circuit adapted to be coupled with an alternating current power source for varying the speed of operation of a blower drive motor in predetermined proportion to changes in temperature of a medium being impelled by said blower, said control circuit including:

a triac arranged in series with the blower drive motor for regulating the time during each cycle of said alternating current power source that current is supplied to said blower motor,

a voltage comparator having an output applied as a signal influencing firing of said triac,

means generated by current alternation of said power source for applying voltage in a sawtooth shaped wave form to one input of said voltage comparator,

means including a temperature responsive element arranged in a path of said medium being impelled by said blower for applying a voltage level proportional to the temperature of said medium to the other input of said voltage comparator,

said voltage comparator serving to generate said signal on said output upon each instance of said sawtooth shape wave form voltage exceeding said voltage influenced by said temperature responsive element.

4,734,013

ROTARY PRESSURE INTENSIFIER

Viljo K. Valavaara, Don Mills, Canada, assignor to V-Tech Industries Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 829,919, Feb. 18, 1986, abandoned. This application Mar. 11, 1987, Ser. No. 24,790
Int. Cl.[4] F04B *17/00, 1/18;* **F01B** *3/00*
U.S. Cl. 417—225 **13 Claims**

1. A pressure intensifier for a fluid medium and comprising:

a stationary low pressure cylinder block portion defining two ends;

stationary high pressure cylinder block portions located at respective ends of said low pressure cylinder block;

at least three piston assemblies, said piston assemblies being disposed along mutually parallel axes equiangularly disposed with respect to a central axis of said intensifier and radially equidistant therefrom, each said piston assembly comprising:

low pressure cylinder means in said low pressure cylinder block portion;

a pair of axially aligned and opposed high pressure cylinders coaxially disposed with said low pressure cylinder means in said high pressure cylinder block portions;

low pressure piston means disposed within said low pressure cylinder means for axial movement therein; and,

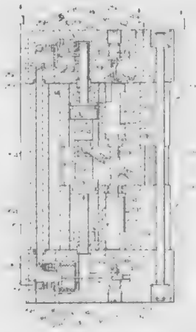
a pair of high pressure pistons disposed within respective ones of said high pressure cylinders for axial movement therein, each said pair of high pressure pistons being linked to said low pressure piston means for conjoint axial movement therewith;

low pressure fluid supply means for the supply of low pressure fluid to said low pressure cylinder means of each said piston assembly;

low pressure fluid discharge means for the discharge of low pressure fluid from said low pressure cylinder means of each said piston assembly;

movable low pressure valve means in said low pressure cylinder block portion and disposed along a central axis thereof within said mutually parallel axes of said piston assemblies, and being movable within said low pressure block portion, said valve means being coupled to said low pressure cylinder means of each said piston assembly and adapted to control the supply of low pressure fluid to said low pressure cylinder means of each said piston assembly from said low pressure fluid supply means and to control the discharge of low pressure fluid from said low pressure cylinder means of each said piston assembly to said low pressure fluid discharge means;

valve drive transmission means operatively coupled to each of said piston assemblies between said two high pressure pistons of each said piston assembly, and disposed within said mutually parallel axes of said piston assemblies whereby movement of said piston assemblies in response



to supply of low pressure fluid will cause movement of said low pressure valve means, and simultaneously synchronize movement of said piston assemblies;

high pressure fluid supply means for supplying fluid to said high pressure cylinders; and,

high pressure fluid collector means for receiving high pressure fluid from said high pressure cylinders.

13. A pressure intensifier for a fluid medium and comprising:

at least three piston assemblies, said piston assemblies being disposed along mutually parallel axes equiangularly disposed with respect to a central axis of said intensifier and radially equidistant therefrom, each said piston assembly comprising:

at least one low pressure cylinder;

at least one axially aligned and opposed high pressure cylinder coaxially disposed with said low pressure cylinder;

a low pressure piston disposed within said low pressure cylinder for axial movement therein; and

a high pressure piston disposed within said high pressure cylinder for axial movement therein, said high pressure piston being connected to said low pressure piston for conjoint axial movement therewith;

low pressure fluid supply means for the supply of low pressure fluid to said low pressure cylinder of each said piston assembly;

low pressure fluid discharge means for the discharge of low

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pressure fluid from said low pressure cylinder of each said piston assembly;

a swash plate operatively interconnecting said pistons of said piston assemblies and comprising a ball connected to said swash plate and movably supported in a fixed cup formed in said intensifier;

low pressure valve means comprising a low pressure fluid supply passage, and a plurality of low pressure transfer passages, said passages opening as ports in said fixed cup and said transfer passages communicating with respective ones of said low pressure cylinders, and recesses in the surface of said ball for permitting fluid transfer between respective pairs of said ports in said cup for controling the supply of low pressure fluid to said low pressure cylinder of each said piston assembly from said low pressure fluid supply means and the discharge of low pressure fluid from said low pressure cylinder of each said piston assembly to said low pressure fluid discharge means;

high pressure fluid supply means for supplying fluid to said high pressure cylinders; and

high pressure fluid collector means for receiving high pressure fluid from said high pressure cylinders.

4,734,014

SHOE-AND SOCKET JOINT BETWEEN SWASH PLATE AND PISTONS OF SWASH PLATE TYPE COMPRESSOR

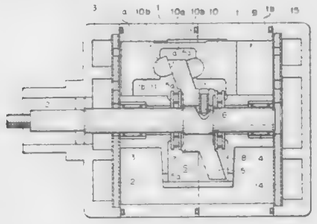
Hayato Ikeda; Mitsuru Hasegawa, and Hiroshi Onomura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jun. 26, 1987, Ser. No. 67,636

Claims priority, application Japan, Jul. 1, 1986, 61-101012

Int. Cl.[4] F04B *1/16, 1/18, 3/00*

U.S. Cl. 417—269 **5 Claims**



1. A shoe-and-socket joint incorporated into a swash plate type compressor for transmitting an axial force from a rotating swash plate supported on a drive shaft to a piston of the compressor, which piston applies an axially reciprocal compression effect to a refrigerant containing a lubricating oil component within a cylinder bore of the compressor, comprising:

a shoe having a flat contact face in sliding contact with said swash plate and a spherical body provided with a substantially spherical contact face arranged opposite to said flat contact face; and,

a socket in the shape of a spherically recessed face formed in said piston and in sliding contact with said substantially spherical contact face of said spherical body of said shoe, said spherically recessed face of said socket of said piston having a radius 20 to 150 microns larger than that of said spherical contact face of said spherical body of said shoe.

4,734,015

AXIAL-FLOW FAN

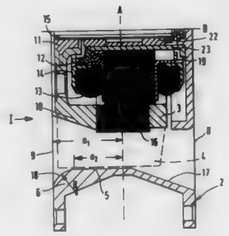
Guenter Wrobel, Villingen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 516,733, Jul. 25, 1983, abandoned. This application Jun. 26, 1987, Ser. No. 67,389

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227698

Int. Cl.[4] F04D *25/08, 29/44*

U.S. Cl. 417—354 **32 Claims**



1. An axial-flow fan comprising a drive motor means, a scroll plate means surrounding an impeller means having a hub, an inner contour of said scroll plate means having a cylindrical configuration in a vicinity of an axial median plane of the fan and extending towards an inlet side of the fan and with an outlet side of the scroll plate means formed into a polygonal profile circumscribing an impeller diameter and accompanied by formation of corner areas, and a central, coaxial core means formed by the drive motor means, the impeller hub and a mounting flange for the drive motor means, said core means having an annular surface reduced in diameter towards the inlet side, the annular surface having an axial length at least about one-third of a length of the hub, and with respect to the axial median plane, the scroll plate means being asymmetrical in the corner areas and being cylindrical over a longer distance from the axial medial plane to the inlet side than to the outlet side and wherein the impeller means has an outside edge which extends from the inlet side of the fan into the corner areas.

4,734,016

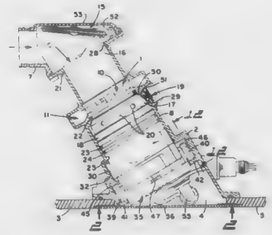
PLUG-IN TYPE PUMP ASSEMBLY

Thomas Sailer, Amherst, Ohio, assignor to Lear Siegler, Inc., Elyria, Ohio

Filed Nov. 13, 1986, Ser. No. 929,770

Int. Cl.[4] F04B *35/00*

U.S. Cl. 417—360 **29 Claims**



1. In combination, a pump assembly and a receiver therefor, said pump assembly comprising a pump housing having an inner end and an outer end, pivotal handle means mounted on said outer end, and cam means on said handle means for pivotal movement therewith, and said receiver having a bore for receipt of said pump assembly, and lug means engageable by said cam means, said pump assembly being rotatable in opposite directions upon insertion of said pump assembly to a non-operating position extending part way into said receiver for receipt of said cam means within slot means in said lug means and removal therefrom, and said handle means being pivotal between closed and open positions when said cam means is received within said slot means in said lug means to cause a camming action of said cam means against said lug means to respectively push said pump assembly further into said receiver to an operating position and pull said pump assembly back out to said non-operating position.

4,734,017

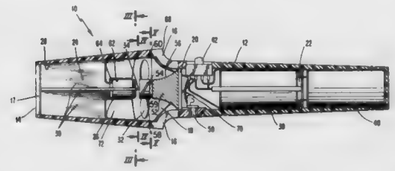
AIR BLOWER

Mark R. Levin, 10032 Beacon Pond La., Burke, Va. 22015

Filed Aug. 7, 1986, Ser. No. 894,053

Int. Cl.[4] F04B *17/00, 35/04*

U.S. Cl. 417—366 **14 Claims**



1. A hand-held air blower, comprising:

a tubular housing having a cavity, an open end and peripheral air inlets spaced from said open end;

dividing wall in said housing cavity, said wall dividing said cavity into a rear closed compartment and a forward open compartment, said forward compartment including said open end and said peripheral air inlets;

a motor mounted in said forward compartment;

a fan mounted on said motor, said fan driven for rotation by said motor about the axis of said tubular housing, said fan mounted for drawing air into said forward compartment through said peripheral air inlets and for blowing the air out through said open end of said housing;

a power supply in said rear compartment, said power supply electrically connected to said motor;

wherein said dividing wall has a substantially frustoconical face directed toward said forward compartment, said face including a central disc-shaped surface perpendicular to the axis of said housing and a concave peripheral surface surrounding said disc-shaped surface, said concave peripheral surface aligned with said peripheral air inlets for guiding air from said peripheral air inlets to said fan.

4,734,018

VACUUM PUMP WITH PLURAL LABYRINTH SEAL PORTIONS

Minoru Taniyama, Ibaraki; Masahiro Mase, Tochigi, and Takashi Nagaoka, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

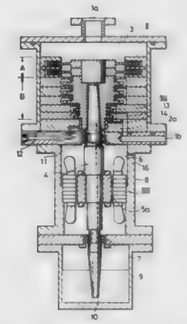
Filed Dec. 29, 1986, Ser. No. 947,282

Claims priority, application Japan, Dec. 27, 1985, 60-292727

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—423 R **5 Claims**

1. A vacuum pump having a casing provided with an inlet port and an outlet port, a plurality of pump stages provided in said casing, a driving means connected to a shaft of said pump stages, bearings supporting said shaft, and a means for supplying a lubricating oil to said bearings, a gas sucked from said inlet port being discharged from said outlet port, comprising a narrow gap sealing means formed by the portion of said shaft which is between said pump stages and the upper bearing and a stationary member opposed to said portion of said shaft, and comprising a first seal portion for circulating a part of a discharge gas from said pump stages to the rear surface of said pump final impeller, a second seal portion for supplying a purge gas to said first seal portion, and a third seal portion for supplying said purge gas toward said bearing; a means for supplying a part of said discharge gas to said first seal portion; and a means for supplying said purge gas to said second and third seal portions, and wherein said means for supplying a part of said discharge gas to said first seal portion comprises an annular groove for discharge gas, which is provided in said



stationary member, and a discharge gas passage formed in said stationary member and communicated with said annular groove so that said discharge gas flows circularly from the first seal portion to the discharge gas passage via said rear surface of said pump final impeller, said means for supplying said purge gas to said second and third seal portions comprising an annular groove for purge gas, which is provided in said stationary member, and a purge gas passage communicated with said annular groove for purge gas and used to supply said purge gas from the ouside to the same annular groove.

4,734,019

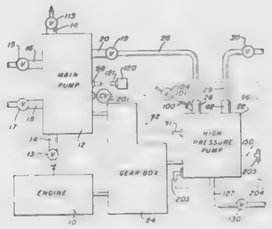
PUMPING SYSTEM

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Dec. 5, 1986, Ser. No. 938,402

Int. Cl.[4] F04B *39/00;* **F01D** *25/16*

U.S. Cl. 417—440 **14 Claims**



1. In a liquid pumping system including

an engine,

a main pump having a plurality of discharges,

a high pressure centrifugal pump having a drive shaft and an impeller means mounted on said drive shaft,

drive means for driving both said main pump and said high pressure pump from said engine at the same time,

main conduit means connecting a discharge of said main pump to the inlet of said high pressure pump, and

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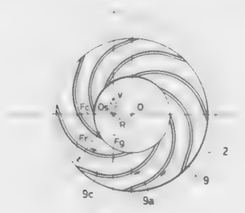
valve means controlling the flow through the discharge of said high pressure pump,
the improvement comprising
flow control means including
a main control valve for controlling the flow through said main conduit means and being movable between an open flow control condition and a closed flow control position, and
means for selectively introducing air into the inlet of said high pressure pump for air binding said impeller means thereof when said main control valve is in said closed flow control position, said air binding rendering said high pressure pump incapable of pumping any liquid thereby eliminating the hydraulic horsepower requirement for said high pressure pump,
said means for selectively introducing air into the inlet of said high pressure pump comprising a second conduit means having its one end open to atmosphere and its other end communicating with the inlet of said high pressure pump, said flow control means including a second control valve for controlling flow through said second conduit means and being movable between an open flow control position in which air at atmospheric pressure is introduced into the inlet of said high pressure pump and a closed flow control position.

4,734,020

SCROLL TYPE COMPRESSOR WITH SPIRAL OIL FEEDING GROOVES IN THRUST BEARING

Tsutomu Inaba; Masahiro Sugihara, and Norihide Kobayashi, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,110
Claims priority, application Japan, Dec. 16, 1985, 60-284616
Int. Cl.[4] F04C *18/04, 29/02;* F16C *33/10*
U.S. Cl. 418—55 2 Claims





1. A scroll type compressor which comprises in combination:
(a) a stationary scroll and an orbiting scroll, each of which is constructed with a base plate and a wrap plate in a spiral form projectively provided on the surface of said base plate, both said scrolls defining a compression chamber by being mutually combined in an offset relationship;
(b) a main shaft which holds a shaft for said orbiting scroll provided at a side opposite to the wrap plate of said orbiting scroll by offsetting said shaft for said orbiting scroll for a predetermined quantity to cause said orbiting scroll to perform the orbiting motion, said main shaft being rotatably received in a main bearing;
(c) a thrust bearing which holds the surface of said base plate of said orbiting scroll at the side opposite to the surface where said wrap plate is provided, said thrust bearing having a center point O and a center opening for receipt of said shaft for said orbiting scroll;
(d) a bearing support means in which said main bearing and said thrust bearing are provided;
(e) a rotation-preventing mechanism which:
(i) prevents said orbiting scroll from rotating on and around its axis and
(ii) causes the same to revolve around said main bearing;
(f) an oil path which:
(i) is bored in and through said main shaft to define an oil-feeding port;
(ii) is open to an oil sump where the bottom end of said main shaft is immersed; and
(iii) feeds lubricating oil to said main bearing and said thrust bearing; and
(g) a plurality of oil feeding grooves formed in the surface part of said thrust bearing in point symmetry with respect to the center point O of said thrust bearing, said oil feeding grooves being in the form of involute curves projecting from the center point O of said thrust bearing.

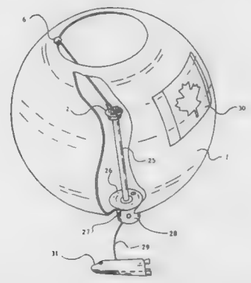
2. A scroll type compressor which comprises in combination:
(a) a stationary scroll and an orbiting scroll, each of which is constructed with a base plate and a wrap plate in a spiral form projectively provided on the surface of said base plate, both said scrolls defining a compression chamber by being mutually combined in an offset relationship;
(b) a main shaft which holds a shaft for said orbiting scroll provided at a side opposite to the wrap plate of said orbiting scroll by offsetting said shaft for said orbiting scroll for a predetermined quantity to cause said orbiting scroll to perform the orbiting motion, said main shaft being rotatably received in a main bearing;
(c) a thrust bearing which holds the surface of said base plate of said orbiting scroll at the side opposite to the surface where said wrap plate is provided, said thrust bearing having a center point O and a center opening for receipt of said shaft for said orbiting scroll;
(d) a bearing support means in which said main bearing and said thrust bearing are provided;
(e) a rotation-preventing mechanism which:
(i) prevents said orbiting scroll from rotating on and around its axis and
(ii) causes the same to revolve around said main bearing;
(f) an oil path which:
(i) is bored in and through said main shaft to define an oil-feeding port;
(ii) is open to an oil sump where the bottom end of said main shaft is immersed; and
(iii) feeds lubricating oil to said main bearing and said thrust bearing; and
(g) a plurality of oil feeding grooves formed in the surface part of said thrust bearing in point symmetry with respect to the center point O of said thrust bearing, said oil feeding grooves being in the form of straight lines tangential to said center opening in said thrust bearing.

4,734,021

MACHINE FOR BUILDING A DOME OR SPHERE

Paul T. Maddock, 35 Waterloo Street, Kitchener, Ontario, Canada N2H 3T8

Filed Jun. 17, 1986, Ser. No. 875,192
Claims priority, application Canada, May 23, 1986, 509853
Int. Cl.[4] E04G *21/04*
U.S. Cl. 425—60 6 Claims



1. A machine for producing independent of the ground, an outer wall of a circular structure of generally spherical shape said machine comprising an extruder connected to a radial arm that is rotatably mounted on a top of a column, said column having a bottom supported by a base affixed to said column, with a support assembly located beneath said base, said base having a periphery with a ramped track thereon, said arm and extruder being rotatable about a longitudinal axis of said column, said column being stationary relative to said base, said base containing a sealed passageway interconnecting said support assembly and said column, an interior of said column providing a pathway for electrical power and control cables and pipes carrying fluid material continuously from said support assembly through said base to a top of said column and through said arm to said extruder, said extruder being capable of extruding a wall from said fluid material which hardens on extrusion as said extruder travels around said longitudinal axis in a spiral path, said extruder initially travelling around said ramped track to form a first layer of said wall thereon, said extruder continuously moving along its own produced track in a spiral path to deposit successive layers, with each layer deposited forming a track for said extruder to deposit a subsequent layer, thus forming a wall on said base in the shape of a circular structure, said base being movable in any direction relative to the ground during formation of the circular structure, without interfering with said formation.

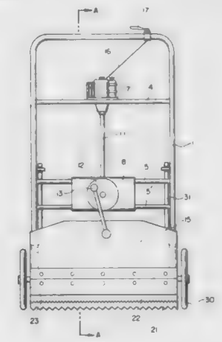
4,734,022

FLOOR-CONCRETE GRADER

Yoshinobu Shimabukuro, 33-15, 1-chome, Ohnakacho, Shuri, Naha-shi, Okinawa-ken, Japan

Filed Oct. 20, 1986, Ser. No. 920,534
Claims priority, application Japan, Oct. 21, 1985, 60-233418
Int. Cl.[4] B28B *1/08;* E04G *21/10*
U.S. Cl. 425—62 3 Claims

1. A vibrating grading device comprising:
a frame having a handle;
a plurality of mutually facing vertically spaced plates supported by said frame and vertically vibratable with respect to said frame;
a driving means fixed on said frame for vertically vibrating said plates; and



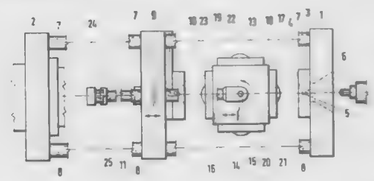
a rotatable wheel mounted on said frame for movably supporting said frame on a floor surface.

4,734,023

INJECTION MOLDING MACHINE

Wolfgang Neuch, Lahr-Sulz, and Kurt Schmidts, Schwanau, both of Fed. Rep. of Germany, assignors to Klöckner Ferromatik Desma GmbH, Malterdingen and BASF Aktiengesellschaft, Ludwigshafen, both of, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,085
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620175
Int. Cl.[4] B29C *45/16*
U.S. Cl. 425—130 5 Claims



1. In an injection molding machine which is used with at least two melting and injector units, said injection molding machine comprising
a fixed die platen which mounts a first one-half mold part of an injection mold,
fixed spars,
a movable die platen which has a rear face facing away from said fixed die platen and a front face facing said fixed die platen, said movable die platen being movable on said fixed spars toward and away from said fixed die platen, said movable die platen including a second one-half mold part of an injection mold on its front face, and
a prismatic support base which is rotatably mounted between said fixed die platen and said movable die platen and which is movable toward said fixed die platen, said prismatic support base having an axis which is perpendicular to said fixed spars and having side surfaces which extend in parallel with said axis and which support a set of one-half mold parts of injection molds, each of said one-half mold parts on said prismatic support base being cooperable with said second one-half mold part on said movable die platen to provide an operable injection mold,
the improvement wherein said injection molding machine includes movable spars which extend through said movable die platen from first ends spaced away from said rear

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face of said movable die platen to second ends spaced away from said front face of said movable die platen, said movable spars being movable with said movable die platen; wherein said prismatic support base is rotatably mounted between the second ends of said movable spars; wherein a drive means is connected to said first ends of said movable spars to move said movable spars with respect to said movable die platen; and wherein said movable die platen includes at least one runner which extends from a side surface thereof to the one-half mold part thereon, each said runner being cooperable with a melting and injector unit to enable plasticized material to flow to the one-half mold part thereon.

4,734,024

APPARATUS FOR SHAPING A SPHERICAL BODY

Yasunori Tashiro, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Aug. 9, 1986, Ser. No. 900,074

Claims priority, application Japan, Jan. 16, 1986, 61-6925; Feb. 11, 1986, 61-27587

Int. Cl.⁴ A21C *3/10*

U.S. Cl. 425—132 **8 Claims**



1. An apparatus for forming a shaped body composed of an outer covering layer and an inner filling, comprising:

supply means for continuously supplying a cylindrical body composed of an outer layer of a plastic material and a central filling longitudinally in a downstream direction;

a cutter assembly disposed downstream of said supply means having at least three ciircumferentially disposed cutter members arranged in sliding contact with each other so as to form a central opening which is openable for receiving a leading part of said cylindrical body and closable for shaping the received part into a shaped body and severing it from the remainder of said cylindrical body; and

means for slidably moving said cutter members inwardly and outwardly of said central opening relative to each other in a direction transverse to the downstream direction of said cylindrical body so as to open and close said central opening of said cutter assembly to form each such shaped body,

wherein said cutter members each are formed with at least two sliding surfaces, which are planar and oriented parallel to the downstream direction, and along which the adjacent sliding surfaces of the adjacent cutter members are slidable, said two sliding surfaces of each cutter member having a predetermined width and being arranged to converge inwardly toward said central opening to a tapered portion having a progressively decreasing width which is less than the width of said sliding surfaces, whereby as said cutter members are moved inwardly, said central opening is closed by the inwardly moving tapered portions of said cutter members forming a progressively decreasing contact area with the plastic outer layer of said cylindrical body so as to smoothly close the plastic outer layer over the inner filling of the resulting shaped body.

4,734,025

INJECTION MOLDING MACHINE DWELL CONTROL SYSTEM

Hideaki Kawamura; Nobuyuki Kiya, and Keiji Sakamoto, all of Hachioji, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

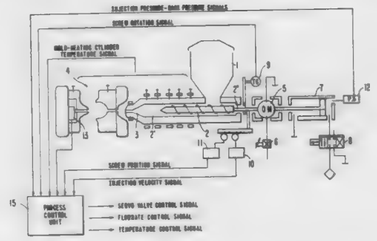
PCT No. PCT/JP85/00496, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01456, PCT Pub. Date Mar. 13, 1986

PCT Filed Sep. 4, 1985, Ser. No. 863,377

Claims priority, application Japan, Sep. 4, 1984, 59-185049

Int. Cl.⁴ B29C *45/77*

U.S. Cl. 425—145 **8 Claims**



1. A dwell control system of an injection molding machine in which raw material chips in a hopper are fed into a cylinder by a screw rotated by a first electric motor and the raw material inside the cylinder is injected into a mold by movement of the screw, comprising:

an injection shaft having a screw;

injection shaft moving means for moving said injection shaft longitudinally inside the cylinder, said injection shaft moving means having a torque limit function;

means for setting a final target position for said injection shaft moving means;

means for commanding a predetermined position beyond the target position after said injection shaft has reached the final target position; and

means for limiting pressure received by said injection shaft when the command for moving said injection shaft to the predetermined position beyond the final target position is received, said pressure limiting means comprising means for setting the torque limit function of said injection shaft moving means.

4,734,026

DEVICE FOR THE PREFORMING AND TRANSFER OF A BANDEROLE IN A CONTAINER THERMOFORMING INSTALLATION

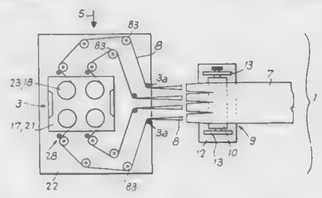
Jean-Claude Hautemont, Gif sur Yvette, France, assignor to Erca Holding, Les Ulis, France

Filed Jun. 8, 1987, Ser. No. 59,594

Claims priority, application France, Jun. 9, 1986, 86 08295

Int. Cl.⁴ B29C *51/16, 51/18*

U.S. Cl. 425—302.1 **21 Claims**



1. In a device for the pre-forming and transfer of a banderole in a container thermoforming installation which comprises a

molding unit equipped with a plurality of vertical cylindrical forming chambers, open at their top part and having at their lower part an opening adapted to be closed by a bottom element movable with respect to the molding unit, in such a way as to be capped over by the corresponding molding chamber which is movable with said molding unit between a high position, called thermoforming position and a low position called container stripping position, the improvement comprising:

a master-band supporting roller mounted in fixed bearings,

a cutting unit for cutting the master-band longitudinally into individual bands, which unit is mounted on a first supporting table remote laterally from the molding unit,

at least one guiding roller of adjustable position for every individual band,

a pre-winding unit for pre-winding the banderoles, which unit is placed under the molding unit which rests on it, and is mounted on a second supporting table which is vertically movable between a position corresponding to the thermoforming position and a position corresponding to the stripping position of the molding unit, said pre-winding unit comprising a plurality of vertical cylindrical pre-winding chambers, each one in alignment with one of the forming chambers, so that the vertical wall of the pre-winding chamber defines an outline which is homothetic to that of the forming chamber, yet slightly smaller than the outline of the latter, so as to constitute with its upper edge, an annular holding shoulder member which also defines the bottom opening of the forming chamber,

a banderole introduction and cutting unit for every pre-winding chamber, of which part of the vertical side wall is constituted by the inner face of a support-plate of the introduction and cutting unit which further comprises a vertical access slot provided in said support-plate and issuing obliquely into the pre-winding chamber, a cutter adapted to cooperate with a counter-blade for cutting the back end of the banderole introduced at least partly into the pre-winding chamber, and one pair of introduction rollers placed upstream of the cutter and of said slot and adapted to pinch the individual band and to drive same at a pace equal to the length of one banderole,

a shaping member comprising a rod which traverses the pre-winding chamber and forms with the vertical wall thereof a narrow annular pre-winding and guiding chamber, and of which the upper part, on the one hand, constitutes at least part of the bottom plate and has a cross-section of similar but smaller shape than that of the vertical wall of the forming chamber, so that the distance between the vertical wall of the forming chamber and the peripheral face of the upper end of the shaping member is at least equal to the thickness of a banderole, and on the other hand, is adapted to penetrate into the forming chamber and to apply said banderole and keep it applied against the vertical side wall of said forming chamber, and

transfer means provided in the pre-winding and guiding chamber, and adapted to support said banderole until this has been transferred to the forming chamber by a relative movement between said transfer means and said forming chamber, device wherein:

the shaping member and the transfer member are joined together, and the distance between the upper end of the shaping member and the transfer member is, on the one hand, at least equal to the axial distance between the bottom of the access slot and the central part of the forming chamber and, on the other hand, less than the distance between the upper end of the forming chamber in thermoforming position and the lower end of said forming chamber in stripping position;

the assembly of the elements constituting the banderole introduction and cutting unit is joined to the pre-winding unit by means of the support-plate and is permanently associated with the access slot of the pre-winding chamber;

the first supporting table of the unit for longitudinally cutting the master-band into individual bands is mounted for moving synchronous with the vertical displacements of the second supporting table of the pre-winding unit and the molding unit, and

a tension roller is provided on the path of the master-band between its supporting roller and the longitudinal cutting unit, said tension roller being applied against the master-band so as to compensate the length variations of the unrolled portion of the master-band which are due to the displacements of the longitudinal cutting unit during the vertical displacement of the banderole pre-winding unit.

4,734,027

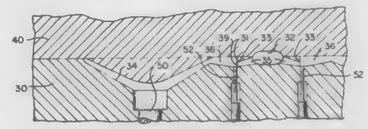
MOLD FOR INJECTION MOLDING OF SUCTION CUPS

William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.

Filed Jun. 8, 1987, Ser. No. 59,621

Int. Cl.⁴ B29C *45/40*

U.S. Cl. 425—556 **6 Claims**



1. An improved mold for injection molding suction cups of the type wherein plastic is injected through a runner into a mold cavity defined by at least two mold sections having mating faces which can be moved apart to open the mold cavity and the cavity is shaped to define a suction cup having a head and a cup shaped body which body has an outer circumferential edge between its top surface and its bottom surface and wherein the improvement comprises

(a) a slot adjacent to the mold cavity, shaped and positioned to define a tab when plastic is injected into the mold cavity and slot, said tab being attached to the outer circumferential edge of the molded suction cup, and said slot further having a cutting edge,

(b) a plunger sized and positioned within a mold section so as to be substantially parallel to the cutting edge of the slot, and be able to extend into and retract from the slot and push a tab formed in the slot from the slot, and

(c) a gate within a mold section through which plastic flows from the runner into the slot and mold cavity, said gate having an opening extending from a cutting edge adjacent to the slot to the runner and said gate being positioned so that the cutting edge is at least as wide as the opening of said gate at said cutting edge.

4,734,028

ADAPTER FOR CONVERTING AN OIL BURNER HEAD FOR BURNING OF PULVERIZED COAL

Joseph E. Musil, Ely, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Sep. 22, 1986, Ser. No. 909,881

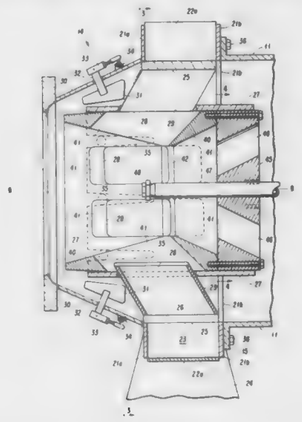
Int. Cl.⁴ F23C *5/28*

U.S. Cl. 431—175 **12 Claims**

1. In a burner head means forming a primary air passage in the burner head including a portion of generally circular configuration in cross-section having a plurality of openings uniformally circularly disposed about its periphery, and a manifold effective to envelope said primary air passage means, the manifold having inlet means for connection to a source of pulverized coal and air, a plurality of internal coal and air passages downstream of the inlet effective to divide incoming coal and air into a plurality of discrete streams thereof, and a manifold coal and air outlet opening from each coal and air

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passage, the manifold outlet openings each being in communication with a duct means having an outlet discharging into one



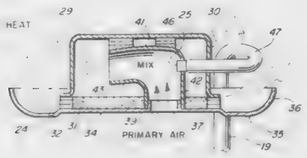
of said openings about the periphery of the primary air passage means.

4,734,029

BURNER FOR CAMPSTOVE

Duncan Newman, Toronto, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 21, 1986, Ser. No. 887,443
Int. Cl.[4] F23D *11/44*
U.S. Cl. 431—211 16 Claims



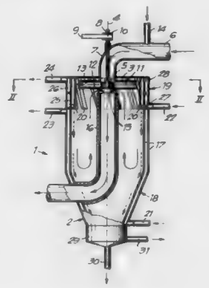
1. A burner assembly for a campstove comprising a burner pan, a plurality of burner rings mounted on the pan for permitting fuel and air to flow therethrough, a burner box mounted on said burner rings and providing a fuel and air mixing chamber above said burner rings, an aspirator tube extending upwardly from an opening in the burner pan into the mixing chamber, and a fuel tube which extends into said aspirator tube for permitting fuel and air to enter said mixing chamber whereby a fuel and air mixture within the mixing chamber can flow through said burner rings and liquid fuel within the mixing chamber can flow by gravity through the burner rings and be collected by the burner pan.

4,734,030

APPARATUS FOR THE TREATMENT OF FLUE GASES

Lucien Fenaux, Rijksweg 57, 8720 Kuurne, Belgium

PCT No. PCT/BE86/00001, § 371 Date Sep. 22, 1986, § 102(e) Date Sep. 22, 1986, PCT Pub. No. WO86/04257, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 21, 1986, Ser. No. 916,482
Claims priority, application Belgium, Jan. 22, 1985, 2/60595
Int. Cl.[4] F23J *3/00*; F23C *9/00*
U.S. Cl. 432—72 10 Claims



1. An apparatus for removing dust from flue gases, comprising:
- a substantially upright vessel having a top and a generally cylindrical wall;
- means for cooling the inner surface of the wall;
- an inlet port substantially centrally located in the top of the vessel, the inlet port for introducing flue gases into the vessel;
- fan means provided in the vessel for forcing the introduced flue gases radially outwardly toward the inner surface of the generally cylindrical wall;
- a number of hollow cooling fins provided on the inner surface of the generally cylindrical wall, the hollow cooling fins being traversed by a cooling liquid and extending helically on the inner surface of the vessel in the same direction as the direction of rotation of the fan means; and
- an outlet port for outletting the dedusted flue gases and having an inlet opening located substantially centrally of the vessel and spaced relatively closely below the fan means for forcing the introduced flue gases, whereby flue gas is introduced through the inlet port into the vessel and is forced radially outwardly by the fan means into contact with the inner wall surface of the vessel so that dust and flue gas separated during contact of the flue gas with the inner wall surface and the dedusted flue gases are outletted through the outlet port.

4,734,031

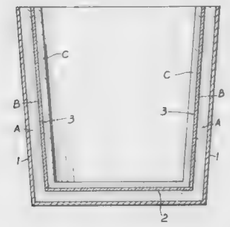
VESSEL FOR HOLDING HIGH TEMPERATURE BULK MATERIALS

John T. Hughes, Worcester, United Kingdom, assignor to Micropore International Limited, Droitwich, England

Filed Oct. 30, 1986, Ser. No. 924,875
Claims priority, application United Kingdom, Oct. 30, 1985, 8526669
Int. Cl.[4] F27D *1/00*; F27B *14/00*
U.S. Cl. 432—264 6 Claims

1. In a combination comprising a furnace, a vessel for high receiving temperature bulk material from said furnace, and a means for receiving the high temperature bulk material from said vessel, the improvement wherein said vessel comprises:
- an outer casing defining side walls and a base;
- a permanent refractory lining covering the inner surface of the side walls and the base of the casing;

- an expendable layer of relatively rigid boards of compacted microporous thermal insulation material covering essentially the entire inner surface of the permanent refractory lining in the regions of the side walls and the base of the casing and in contact therewith, said microporous thermal insulation material having a lattice structure in which the average interstitial dimension is less than the mean free path of air molecules; and



- an expendable layer of non-porous refractory material having a lower thermal capacity than said permanent refractory lining covering the inner surface of the layer of microporous thermal insulation material in the regions of the side walls and the base of the casing and defining a continuous surface for receiving the high temperature bulk material, and in contact with said rigid boards.

4,734,032

ORTHODONTIC TRACTION APPLIANCE

Irvin S. DeWoskin, St. Louis County, Mo., assignor to Orthoband Company, Inc., Barnhart, Mo.

Filed Sep. 22, 1986, Ser. No. 910,410
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—5 10 Claims



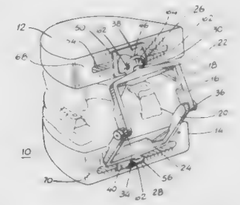
1. An orthodonic traction appliance comprising:
- supporting means to be worn by a patient having portions which are positioned adjacent the sides of the patient's head as said support means is worn;
- extensions secured to said support means positioned to extend forward adjacent opposite sides of the head as the support means is worn, each extension having a forward end,
- a clasp at the forward end of each extension;
- tension means releasably secured to each extension by the respective clasp each extending forward from the forward end of the respective extension as said support mean is worn;
- each said tension means comprising a strap,
- each said tension means having means at its forward end for attachment to an orthodonic face bow,
- said clasp comprising a body secured to the respective extension at the forward end of the extension having an opening therein through which the respective strap is inserted from the outside with the strap extending forward from the respective extension;
- said clasp further comprising gripping means having a gripper for engagement with the strap inserted through the opening from the outside of the body to grip the strap against an edge of the clasp body at the opening,
- means mounting the gripper means on the body for movement of said gripper between an open position on the outside of said body allowing for insertion of the strap from the outside of the body into the opening and for pull-out of the strap from the opening and a closed position in engagement with the strap inserted through the opening from the outside of the body for gripping the strap against said edge of the opening,
- said gripper being so arranged as to be subject to being moved out to its open position by the strap when the strap is subjected to pull resulting from pull on the face bow exceeding a predetermined value thereby to release the strap.

4,734,033

FLEXIBLE DENTAL MODEL ARTICULATOR

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Filed Jan. 30, 1987, Ser. No. 9,232
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—60 25 Claims

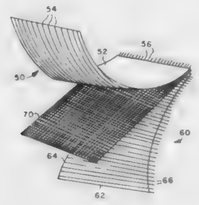


1. An articulator for correlating the casts of a dental model, each of the casts including a mounting, said articulator comprising in combination:
- (a) a pair of resiliently flexible brackets, each said bracket terminating at one end;
- (b) means for pivoting the one end of one bracket with the one end of the other bracket about a common pivot axis;
- (c) means for interconnecting each of the casts with another end of one bracket of said pair of brackets, said interconnecting means including a ball and socket joint and wherein one of the ball and socket of said ball and socket joint is defined by the mounting and wherein the other of the ball and socket of said ball and socket joint is formed by said bracket;
- (d) a groove formed within a surface of said ball and socket joint; and
- (e) each bracket of said pair of brackets including a base member having opposed ends and a pair of arms, each arm of said pair of arms depending from one of said opposed ends to form a junction therebetween, each of said opposed ends and each of said arms having a reduced cross section at the respective one of said junctions for encouraging flexing of each bracket of said pair of brackets at said junctions and a web disposed at each of said junctions for interconnecting the respective ones of said opposed ends and said arms for discouraging flexing in the plane of said webs;

whereby, flexing of the brackets at each of said junctions is encouraged after the angular relationship between each cast and the interconnected one of said pair of brackets has been fixed after registration of the casts relative to one another and during correlation of the casts.

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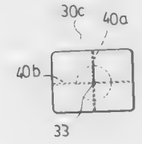
4,734,034
CONTACT SENSOR FOR MEASURING DENTAL OCCLUSION
William L. Maness; Robert F. Golden; Michael H. Benjamin, and Robert M. Podoloff, all of Boston, Mass., assignors to Sentek, Incorporated, Cambridge, Mass.
Filed Mar. 29, 1985, Ser. No. 717,532
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—68 **23 Claims**



1. Apparatus for measuring a person's dental occlusion, comprising:
a thin, flexible sensor, including:
a plurality of flexible, generally parallel electrodes supported by a thin flexible backing sheet to provide a set of row electrodes;
a second plurality of flexible, generally parallel electrodes supported by a thin flexible backing sheet to provide a set of column electrodes;
a resistive layer between the row and column electrode sets made of a substantially homogeneous resistive material whose resistance changes as a function of the pressure applied thereto;
means for positioning the row and column electrodes so that the two electrodes sets face one another separated by the resistive layer so as to form a thin, flexible sensor with the electrodes oriented so that the electrodes of one set cross the electrodes of the other set at an angle to create a plurality of intersections where row electrodes cross over column electrodes;
said means for positioning being such as to allow insertion of the sensor into the person's mouth so that the facing electrode sets are between the person's upper and lower teeth; and
terminal means for applying signals to each of the electrodes; and
means connected to the terminal means for sensing the resistance between the respective row and column electrodes at each intersection and for providing an output in response thereto representative of the contacting points of the patient's bite.

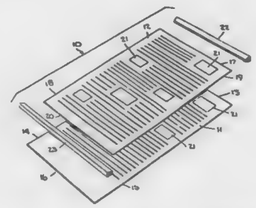
4,734,035
ENDODONTIC STOP POSITIONER
Fat-Hing Cheng, and Chun-Hong Chan, both of 4th Floor, No. 301-63, Section 3, Hsitun Road, Taichung, Taiwan
Filed Jul. 8, 1986, Ser. No. 883,105
Claims priority, application Taiwan, Apr. 9, 1986, 75203071
Int. Cl.[4] A16C *5/02*
U.S. Cl. 433—102 **1 Claim**

1. An endodontic stop positioner comprising
at least one metal wire; and
a positioning body having a penetrating hole through which a reamer or file used to measure the root canal length of a tooth can pass, said positioning body being slidably along the reamer or file, said metal wire being installed in said positioning body and arranged to intersect with the penetrating hole of the positioning body; wherein said positioning body comprises
a hard member and a soft member, said soft member being laid on or embedded in said hard member with the penetrating hole passing through both the hard member and the soft member so that the reamer of file located in the penetrating hole is subject to a retaining force effected by the soft member for facilitating the positioning of the positioning body along the reamer;



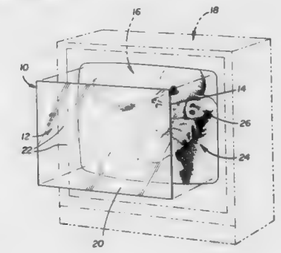
thereby, in an X-ray, the intersection point between said metal wire and the reamer or file can be clearly indicated for accurately measuring the root canal length of the tooth.

4,734,036
METHOD AND DEVICE FOR LEARNING A LANGUAGE
Helene Kasha, P.O. Box 5564, Hamden, Conn. 06518
PCT No. PCT/US85/02347, § 371 Date Jul. 30, 1986, § 102(e) Date Jul. 30, 1986, PCT Pub. No. WO86/03321, PCT Pub. Date Jun. 5, 1986
Continuation-in-part of Ser. No. 676,824, Nov. 30, 1984, abandoned. This PCT application Nov. 26, 1985, Ser. No. 929,198
Int. Cl.[4] G09B *19/08*
U.S. Cl. 434—157 **31 Claims**



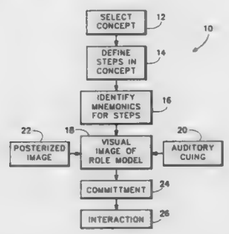
1. A method for aiding a student to learn symbolic indicia, the method comprising:
providing a first opaque sheet legibly marked with symbolic indicia in a predetermined format;
providing a second opaque sheet marked with other symbolic indicia representing a translation of corresponding indicia on the first sheet, the other indicia on the second sheet being more familiar to the student than the indicia on the first sheet, and the indicia marked on the second sheet being in substantial registry with the corresponding indicia marked on the first sheet;
joining corresponding edge portions of the two sheets together, one on top of the other to form an upper sheet and a base sheet contiguous to the upper sheet, such that the materials on the upper sheet are substantially in registry with the materials on the base sheet and so that the upper sheet can be lifted to expose momentarily all of the materials on the base sheet and then be lowered, so that reading of the upper sheet text can be immediately resumed;
lifting the upper sheet rapidly while focusing on specific indicia thereon to briefly expose the corresponding indicia on the base sheet, such that the corresponding indicia on the base sheet are selectively viewed without changing the location of focus; and
immediately lowering the upper sheet to resume study thereof.

4,734,037
MESSAGE SCREEN
J. Patrick McClure, 372-E Bel Marin Keys Blvd., Novato, Calif. 94947
Filed Feb. 21, 1986, Ser. No. 832,464
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 **9 Claims**



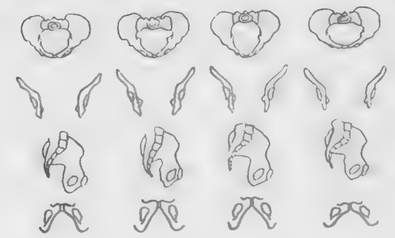
1. An article of manufacture, comprising:
a transparent sheet having a message thereon, said sheet having a first side adapted to be attached facing a plate which is normally viewed by a viewer and a second side facing said viewer, said message being arranged to be readably intelligible from said second side, said message being of a construction sufficient so that it is not liminally visible to said viewer when viewed from a normal viewing distance from said second side under normal viewing conditions but being of a construction sufficient to have a subliminal effect upon said viewer when viewed from said normal viewing distance from said second side under said normal viewing conditions.

4,734,038
SYSTEM AND METHOD FOR PSYCHO ACTUALIZED LEARNING
Larry W. Dennis, Portland, Oreg., assignor to Turbo Management System, Portland, Oreg.
Filed Mar. 23, 1987, Ser. No. 29,257
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 **15 Claims**



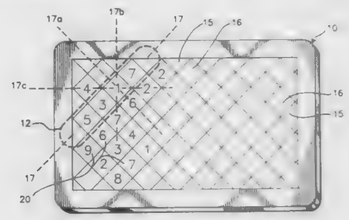
1. A method for modifying human behavior of a person comprising:
selecting the particular behavior to be modified;
defining the steps to be taken to effectuate the modification;
assigning a mnemonic device for each step to promote mental identification of the step; and
providing a visual image of a role model for behavioral emulation wherein the role model acts out the defined steps.

4,734,039
PELVIMETRY PHANTOM
Eric Thompson, 25556 Meadow Mont., Valenca, Calif. 91355
Filed Nov. 3, 1986, Ser. No. 925,981
Int. Cl.[4] G09B *23/00*
U.S. Cl. 434—274 **17 Claims**



1. An anatomically correct pelvimetry phantom of a selected pure or mixed anatomical type comprising a replica of at least part of the anterior section of the bony pelvis and a replica of at least part of the posterior section of the bony pelvis and connection means for separably connecting said sections to form a complete replica of the bony pelvis of a pure or a mixed anatomical type.

4,734,040
MEMORY ENHANCEMENT DEVICE AND METHOD
Larry J. North, 988 E. S. Union Ave. #12, Midvale, Utah 84047, and Vaughn W. North, 2486 E. 1037S South, Sandy, Utah 84092
Filed Mar. 9, 1987, Ser. No. 23,572
Int. Cl.[4] A47B *41/00*
U.S. Cl. 434—433 **8 Claims**



1. A method for storing a serial string of confidential numbers and/or letters in public view without compromising the confidentiality thereof while providing a memory device to enable a person having knowledge of the numbers or letters to recognize and recall the same, said method comprising the steps of:
forming a matrix of graphic boxes in vertical and horizontal array having empty spaces within the boxes for later placement of alphanumeric symbols therein, each box having an alignment with other boxes along at least two diagonals within the matrix as part of at least two rows of boxes in linear array;
placing at least one serial string of confidential alphanumeric symbols in a sequential linear array of boxes along at least one of the aligned diagonals of the matrix;
filling in the remaining empty boxes with random numbers to disguise the identity and location of the stored confidential symbols.

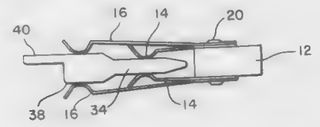
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,041

ELECTRICAL POWER CONNECTOR

Richard A. Bruchmann, Blaine, and Michael D. Halvorsen, Coon Rapids, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 22, 1987, Ser. No. 65,201
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—637 10 Claims



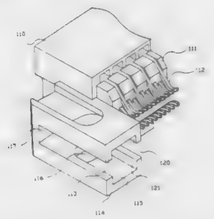
1. An electrical power connector comprising a coacting mating plug and female receptacle, the male plug comprising a blade having first and second thickness tiers with a rounded front end and a rounded shoulder transition between the tiers, the trailing edge of the blade extending from one surface of the second tier and adapted for delivery of electrical power, the female receptacle comprising a bar of conductive material having a first and second pair of parallel rows of multipoint spring contacts, the first row pair adapted to mate with the first tier of the mating male plug, the second row extending past the first row and adapted to mate with the second tier of the male plug portion.

4,734,042

MULTI ROW HIGH DENSITY CONNECTOR

John D. Martens, Plano, and J. Preston Ammon, Dallas, both of Tex., assignors to Augat Inc., Mansfield, Mass.

Filed Feb. 9, 1987, Ser. No. 12,587
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—62 12 Claims



1. A multi row connector adapted for electrical connection to contact pads disposed on opposed sides of one edge of a printed circuit board, comprising:

an insulator having an underside, a central region and first and second sets of contact cavities formed therein in symmetrical disposition about said central region of said insulator, and wherein each of said first and second sets of contact cavities are formed as plural rows of contact cavities in symmetrical disposition about said central region;

a first and second plurality of contacts disposed in said plural rows of contact cavities of said first and second sets, respectively, and wherein said first and second plurality of contacts include contact ends extending out from said underside of said insulator, said contacts ends of said first and second plurality of contacts adapted for surface mounting to the contact pads disposed on the opposed sides of the one edge of the printed circuit board;

a first spacing block disposed adjacent said underside of said insulator coacting with said contact ends of said first plurality of contacts to properly space and position said contact ends of said first plurality of contacts in a single row for surface mounting to the contact pads disposed on one side of the one edge of the printed circuit board; and

a second spacing block disposed adjacent said underside of said insulator coacting with said contact ends of said second plurality of contacts to properly space and position said contact ends of said second plurality of contacts in a single row for surface mounting to the contact pads disposed on the opposed side of the one edge of the printed circuit board, and wherein

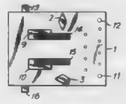
said first and second spacing blocks in combination with said insulator form a slot adjacent said underside of said insulator for insertion of the printed circuit board.

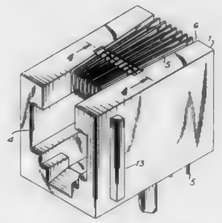
4,734,043

MODULAR JACK

Donald R. Emert, Etters, and John D. Walden, Mechanicsburg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 828,248, Feb. 11, 1986, abandoned.
This application Jul. 14, 1987, Ser. No. 73,880
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—65 11 Claims





1. An electrical connector adapted to be mounted on a circuit board comprising:

an insulating housing;

a plurality of electrical conductors disposed in side-by-side, spaced-apart relationship, said conductors having terminal portions which extend downward from a bottom surface of said housing and are adapted for electrical control to said circuit board; and

at least two legs projecting from said bottom surface of the housing, each of said legs being adapted to fit snugly into a corresponding mounting hole on said circuit board, each said leg having a cross section perpendicular to its long axis, said cross section being diamond-shaped having a major axis substantially perpendicular to a minor axis, the length of said major axis being greater than the diameter of the corresponding mounting hole in the circuit board and the length of the minor axis being somewhat less than the diameter of the corresponding mounting hole in the circuit board.

4,734,044

CONNECTORS FOR USE WITH PIEZOELECTRIC POLYMERIC FILM TRANSDUCERS

Peter F. Radice, 438 Springhouse Rd., King of Prussia, Pa. 19406

Filed Apr. 18, 1986, Ser. No. 853,584
Int. Cl.[4] H01L *41/04*
U.S. Cl. 439—78 10 Claims

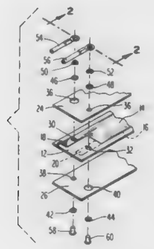
3. A piezoelectric transducer assembly, comprising:

(a) a film of piezoelectric polymer,

(b) electrode means on opposite faces of the film, each electrode having a lead portion defining respective upper and lower leads,

(c) non-conductive reinforcing means on opposite faces of the film adjacent said leads and at least partially overlapping said leads,

(d) aligned openings disposed through each of said leads, said film and said reinforcing means,



(e) conductive means disposed through each of the aligned openings and in electrical contact with the lead associated with the opening in which the conductive means is disposed,

(f) terminal means attached to each of the conductive means for connecting the lead associated with the conductive means to an electrical circuit, and

(g) secondary conductor means for providing electrical contact between one of said conductive means and its associated lead.

4,734,045

HIGH DENSITY CONNECTOR

John L. Hawkins, San Juan Capestrano, Calif., assignor to Masterite Industries, Inc., Torrance, Calif.

Filed Mar. 27, 1987, Ser. No. 31,044
Int. Cl.[4] H01R *23/70*
U.S. Cl. 439—79 7 Claims



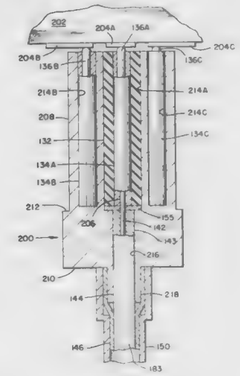
1. A high density connector for connecting multiple circuits between printed circuit boards and the like, said connector consisting of inter-engaging, mating first and second connector bodies formed of an electrical insulating material, one of said bodies including at least one connection face having uniform width and height undulations forming alternating flattened-peaks and valleys of limited width with the peaks and valleys having an electrically conductive coating thereon to form longitudinally spaced, transversely offset contacts at said peaks and valleys, said second connector body including a connection face bearing mirror image undulations to said at least one connection face of said first connector body of similar uniform width and height and forming alternating, flattened peaks and valleys of limited width with said peaks and valleys of said undulating connection face of said second body being electrically conductively coated to form mirror image longitudinally separate and transversely offset contacts to those on said first connector body and wherein the connection faces of said bodies are in contact with each other with electrical circuits completed between abutting contacts, and wherein the longitudinal center to center distance between longitudinally adjacent contacts is less than the peak to valley distance between those contacts to increase the electrical creapage path between longitudinally adjacent contacts of said mating first and second bodies.

4,734,046

COAXIAL CONVERTER WITH RESILIENT TERMINAL

Michael F. McAllister, Clintondale, and Alfred Mack, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 652,985, Sep. 21, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,992
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—101 16 Claims



1. A coaxial connector comprising:

an electrically conducting probe having a resilient electrically conducting pin extendable therefrom, said pin serving as a first terminal of said connector;

a housing enclosing said probe, said housing including an electrically conducting surface region extending continuously transversely of a longitudinal axis of said pin thereby adapting said connector to mate with an assembly having plural electrical contacts disposed on a continuous surface parallel to said transverse surface region, there being at least one pin-shaped contact spaced apart from said probe and parallel thereto and extending toward said continuous assembly surface from said transverse housing surface region to serve as a second terminal of said connector, a spacing between said probe and said one pin-shaped contact being equal to a spacing between a corresponding set of terminal contacts on said assembly, said first terminal and said second terminal extending an equal distance from the transverse surface region of said housing toward said continuous assembly surface, said housing having an elongated shape extending along the longitudinal axis of said pin from the transverse surface region of said housing;

means for insulating said probe from said second terminal; and

means in said housing for directing an inner conductor of a coaxial transmission line to said first terminal and an outer conductor of said transmission line to said second terminal, said housing including electrically conducting means

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extending therefrom for contacting said assembly to establish a predetermined gap width between said assembly surface and said surface region for improved coupling of a signal from said assembly to said connector; and wherein said one pin-shaped contact extends within a portion of said housing and back from said transverse housing surface region, said portion of said housing extending transversely of a longitudinal axis of said housing to envelop said one-pin shaped contact to facilitate handling of said connector.

4,734,047

SHAPE MEMORY ACTUATOR FOR A MULTI-CONTACT ELECTRICAL CONNECTOR

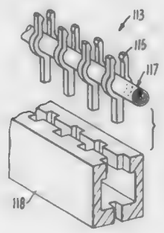
John F. Krumme, Woodside, Calif., assignor to Beta Phase, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 797,652, Nov. 13, 1985, Pat. No. 4,643,500, which is a continuation-in-part of Ser. No. 801,516, Nov. 26, 1985, Pat. No. 4,621,882, which is a continuation of Ser. No. 609,747, May 14, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 66,529

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.⁴ H01R *13/20*

U.S. Cl. 439—161 **6 Claims**



1. A multi-contact zero insertion force electrical connector comprising:

a plurality of pairs of opposed electrical contacts;

means for supporting said pairs in parallel rows along an elongated dimension of the connector;

means for supporting each contact of said opposed pairs of contacts for movement to positions toward and away from one another;

integral operating means in operative contact with said pairs of electrical contacts to push them apart from one another, said integral operating means including an axially elongated hollow split tube of shape-memory alloy having a martensitic state and an austenitic state, said tube capable of being deformed when said alloy is in said martensitic state, said tube capable of recovering said deformation when said alloy is in the austenitic state, said tube having less curvature when said alloy is in the austenitic state, said integral operating means including insulating means surrounding said tube to insulate said tube from the contacts;

resilient means in operative contact with said tube, said resilient means capable of biasing and deforming said tube when said alloy is in its martensitic state, said biasing being overcome by said tube when said alloy is in its austenitic state; and

means for selectively heating said tube to cause said alloy to translate to its austenitic state.

4,734,048

DISTRIBUTOR HOUSING FOR COMMUNICATION CABLES

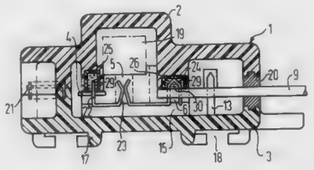
Wolfgang Giebel, Planegg; Hans Laar, and Josef Schramm, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,376

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524637

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 439—201 **20 Claims**



1. In a distributor housing for communication cables with contact elements for incoming and outgoing conductors of the cables, said housing having an area in which the connections are effected being divided in a longitudinal direction into a top and bottom component to allow accessibility when forming contacts between the conductors and the contact elements of a connecting unit which is integrated in a base component of the housing, the improvements comprising contacting elements being arranged in the top component of the distributor housing and being positioned in accordance with the contact elements which are arranged in the base component so that closing the housing causes an automatic forming of a contact between a conductor and its contact element; and the top component having a plurality of recesses aligned with the contact elements, said recesses receiving protective caps so that simultaneously with the forming of the contact between a wire and a contact element, a protective cap encloses the contact with the closing of the top component onto the bottom component.

4,734,049

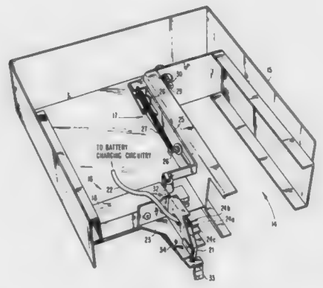
MECHANICAL LATCH MECHANISM FOR COMBINATION PORTABLE TRANSCEIVER AND CHARGING UNIT

David L. George, Indianapolis, and Raymond G. Benson, Jr., Plainfield, both of Ind., assignors to Uniden Corporation of America, Indianapolis, Ind.

Filed Apr. 9, 1986, Ser. No. 849,766

Int. Cl.⁴ H01R *13/15*

U.S. Cl. 439—259 **15 Claims**



1. A latch mechanism for a combination portable transceiver and charging unit, comprising:

a housing mounted inside the charging unit, said housing defining a receptacle arranged for receiving the portable transceiver;

a first mating connector adapted to interconnect in a mating fashion with a second mating connector on said portable transceiver; and

a latch means mounted to said housing and operably connected to said first mating connector, said latch means for effecting an electrical connection between the portable transceiver and charging unit by mating of said first and second mating connectors upon insertion of the portable transceiver into said receiving receptable in the charging unit, said mating being accomplished perpendicularly to the axis of insertion of the portable transceiver into the charging unit, said latch means including a release lever pivotally and slidably connected to said housing, said release lever including a handle portion and an arm extending on opposite sides of the lever pivot point, said arm having a contact surface for contacting said housing after an initial pivotal movement of said handle portion of said release lever, said contact surface positioned relative to the pivot point of said release lever so as to provide a greater mechanical advantage during initial movement of said lever than at subsequent times, said latch means further having a stop means for limiting the pivotal movement of said release lever to a predetermined amount, said release lever thereby allowing the electrical separation of said first and second mating connectors to be accomplished by successive pivotal and lateral movement of said release lever.

4,734,050

UNIVERSAL CONNECTION UNIT

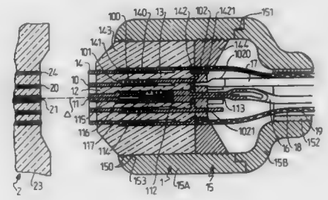
Jean-Jacques Negre, Nanterre, and Jean Kertesz, Andresy, both of France, assignors to Societe Nouvelle de Connexion, France

Filed May 30, 1986, Ser. No. 868,865

Claims priority, application France, Jun. 7, 1985, 85 08656

Int. Cl.⁴ H01R *13/28*

U.S. Cl. 439—289 **7 Claims**



1. A universal connection unit with a coaxial structure comprising:

two complementary connection elements called a male element and a female element;

each said connection element comprising:

at least one peripheral sleeve having a planar outer end surface, said sleeve forming a connection mass and

a central core including a contact having a planar outer end surface, said core electrically isolated from said at least one peripheral sleeve;

said at least one sleeve and said contact of said male element being mounted moveably in translation in the direction of the longitudinal axis of said male element;

said at least one sleeve and said contact of said male element being mechanically independent; and

said contact planar outer end surface and the planar outer end surface of said at least one sleeve of said female element having substantially identical electric sections and dimensions in a plane perpendicular to the longitudinal axis of said connection unit as those of said male elements;

wherein electric connection between said two connection elements is ensured by bringing into flush abutment the planar outer end surfaces of said respective peripheral sleeves and contacts.

4,734,051

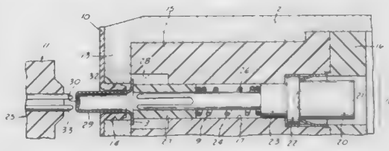
ELECTRICAL CONNECTOR BUTT CONTACT

Edgar Burns, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Feb. 2, 1987, Ser. No. 9,936

Int. Cl.⁴ H01R *25/00*

U.S. Cl. 439—289 **5 Claims**



1. A contact for use in a releasable electrical connector, comprising:

a generally cylindrical body having an enlarged circular flange, a hollow tubular portion extending from one face of the flange, and a pin extending from the opposite flange face;

coil spring means received on said pin contacting a hub extending from the flange;

an insulative sleeve received on the pin outwardly of the coil spring means and having one end abutting against said spring means; and

a cylindrical metal shell having a closed end and an open end abutting against the other end of said insulative sleeve.

4,734,052

ELECTRICAL CONNECTOR

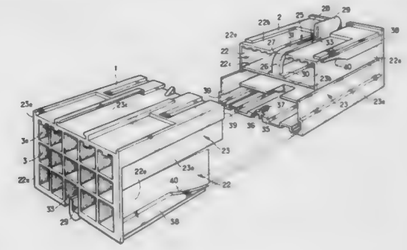
Bertrand Vandame, Villepreux, France, assignor to Precision Mecanique Labinal, Bois D'Arcy, France

Filed Jul. 1, 1986, Ser. No. 880,888

Claims priority, application France, Jul. 4, 1985, 85 10219

Int. Cl.⁴ H01R *13/28*

U.S. Cl. 439—293 **31 Claims**



1. An electrical connector comprising:

a first element adapted to receive at least one electrical contact and adapted to be connected to a second substantially identical element by displacement of said first and second elements toward each other along an engagement axis, wherein said first element comprises:

(i) a male portion; and

(ii) a female portion, wherein said male portion is adapted to engage a female portion on said second element substantially identical to said female portion on said first element, wherein said female portion of said first element is adapted to receive a male portion of said second element substantially identical to said male portion of said first element,

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wherein said male and female portions of said first element together comprise means for displacing said first and second elements in diverging directions substantially perpendicular to said engagement axis in response to said first and second elements being displaced toward each other along said engagement axis so that said male portion of said first element engages said female portion of said second element and said female portion of said first element receives said male portion of said second element, wherein said first and second elements are adapted to be positioned in a normal assembly position in which an electrical contact housed in said first element is adapted to engage an electrical contact housed in said second element, wherein said connector further comprises means for displacing said first and second elements into said normal assembly position after said first and second elements are displaced in said diverging direction by said male and female portions.

4,734,053

ELECTRICAL CONNECTOR

Akira Imai, Yokohama, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

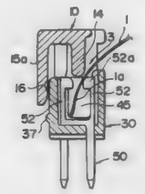
PCT No. PCT/US85/02073, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/03345, PCT Pub. Date Jun. 5, 1986

Continuation of Ser. No. 879,222, May 30, 1986, abandoned. This PCT application Oct. 24, 1985, Ser. No. 70,635

Claims priority, application Japan, Nov. 29, 1984, 59-252772

Int. Cl.⁴ H01R *9/07*

U.S. Cl. 439—329 **20 Claims**



1. An electrical connector for interconnecting a plurality of conductors on a flexible film substrate to conductors on a printed circuit board, the connector comprising:

an insulative housing having side walls, end walls and a floor which forms an outwardly facing opening, the side walls having a plurality of laterally spaced channels therealong, extending from the opening to the floor;

a plurality of contacts mounted within the housing, each contact comprising contact arms extending upwardly from a base portion and a tail portion extending from the base portion in the opposite direction as said contact arms, each contact being located within the housing with the contact arms within one of said channels, the contact arms being symmetrical about an axial centerline which is defined by a direction along the length of the contact arms, and having an inner contacting edge and an outer edge which is spaced from an adjacent surface of the channel, each of the contact arms of the contact being deflectable outwardly towards the adjacent surface of the channel, and the tail portion extending through an aperture in said housing floor; and

a plug cap portion having an extending projection which is insertable into the insulative housing between the contact arms of the laterally spaced contacts, the plug cap portion having means allowing the plug cap portion to be movable relative to the housing between a first position allowing an access for the flexible film substrate into the housing between the extending projection and the contact arms, to a position where an end of the flexible film substrate abuts the base portions of the contacts, and a second position in which the extending projection cams the conductors on the flexible film substrate between the extending projection and one of the contact arms.

4,734,054

PLUG CONNECTOR

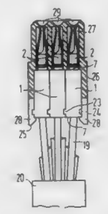
Karl Steffinger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 875,970

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1985, 3524374

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 439—399 **7 Claims**



1. A plug connector, comprising:

contact elements each having in a longitudinal extension direction at one end a conductor terminal section means for connection to a wire conductor and at an opposite end a contact section means for contact-making with a counter-contact element;

an insulating strip having a plurality of U-shaped chambers formed by a base and respective lateral walls, each chamber receiving one of said contact elements;

each chamber extending substantially only over a length of the conductor terminal section means of each contact element so as to encompass substantially only the conductor terminal section means and the contact section means of each contact element extending beyond the chamber and free of the strip;

said conductor terminal section means comprising at least one contacting slot means into which a respective wire conductor can be inserted from an open side of the chambers for contacting the wire;

means interacting with the conductor terminal section means of each contact element for retaining the contact element in the chamber both in a direction perpendicular to the chamber base and in a longitudinal direction of extension of each chamber; and

insulating housing means joined to the insulating strip for receiving the free contact section means of each contact element.

4,734,055

CORD BUSHING

Hisataka Misu, Osaka, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Dec. 30, 1981, Ser. No. 335,924

Int. Cl.⁴ H01R *13/58*

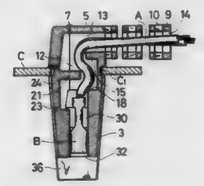
U.S. Cl. 439—456 **13 Claims**

3. A cord bushing comprising:

a first main member portion adapted to accommodate a portion of a cord and to retain terminals connected to said cord;

a second main member portion hingedly connected to said first main member portion to permit said second main member portion to mate with said first main member portion; and,

retaining means included on said second main member portion and hingedly connected thereto by a resilient hinge, whereby when said first main member portion mates with



said second main member portion, said retaining means first bears against said cord and then resiliently pivots outwardly from said cord about said hinge.

4,734,056

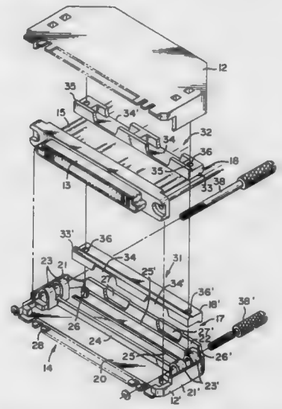
ELECTRICAL CONNECTOR FOR FLAT CABLE OR WIRE BUNDLES

Carlo Bertini, and Aldo Bruni, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 716,899, Mar. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 591,352, Mar. 19, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 6,289

Int. Cl.⁴ H01R *13/58*

U.S. Cl. 439—460 **9 Claims**



1. An electrical connector for receiving, alternatively, conductors in groups of different sizes comprising an insulating housing including two shells (12, 12') each having a mating face (14) and a conductor receiving face (17), a conductor locating member (18) having first and second conductor locating faces (31, 32), of differing shapes, the conductor locating member (18 or 18') being receivable between the housing shells (12, 12') when the shells (12, 12') are assembled together, in either of two positions in which first and second conductor locating faces (31 and 32) extend, transversely of, and in locating engagement with, alternative groups of conductors extending through the conductor receiving face (17) into the housing (12, 12') and terminated by terminals at the mating face (14), characterized in that, the connector is for receiving conductors groups either as flat cable or a bundle, and comprises a second conductor locating member (18') identical to the first (18), the first conductor locating faces (31) each being formed with a cable engaging rib (33) extending along only a first edge thereof in a plane parallel to the conductor group, the housing shells (12, 12') being formed with guiding posts (26, 26') and the conductor locating members (18, 18') formed with sockets (36, 36'), the first and second conductor locating members (18, 18') being locatable in the housing (12, 12') by sliding receipt of the posts (26, 26') either with the first faces (31) adjacent and the first edges remote from each other so that the ribs (33) are offset from each other spaced longitudinally of a flat cable which is thereby trapped between the conductor locating members (18, 18') in a non-rectilinear manner in a flat cable locating condition of the connector or with the second faces (32) adjacent with the openings (34, 34') together defining a bundle receiving aperture in a bundle receiving condition of the connector.

4,734,057

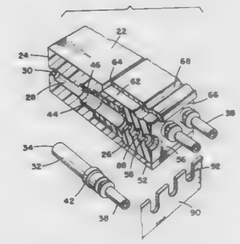
CONNECTOR ASSEMBLY

Rocco Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Mar. 2, 1987, Ser. No. 20,662

Int. Cl.⁴ H01R *13/40*

U.S. Cl. 439—589 **16 Claims**



1. A connector assembly comprising:

a housing including a front wall and an aft end and having a plurality of side by side mutually isolated bores formed therein extending between said aft end and said front wall and terminating at an entry aperture in said front wall;

a plurality of elongated contacts, each of said contacts including a first end positioned adjacent the entry aperture in said front wall and a second end adapted to be attached to an associated wire lead;

retainer means fixed to said housing engageable with each of said contacts to prevent withdrawal thereof from its associated bore;

seal means mounted on said aft end of said housing for sealingly engaging the wire leads;

dielectric spacer means intermediate said retainer means and said seal means encircling each of said contacts and having a terminal end nearer said aft end of said housing than said second end of each of said contacts to thereby assure high surface resistivity between said contacts positioned in adjacent bores; and

latch means for integrally joining said housing, said seal means and said contacts.

4,734,058

HIGH DENSITY SHIELDED MODULAR CONNECTOR FOR STACKING PRINTED CIRCUIT BOARDS AND METHOD OF MAKING THEREOF

Myron Pavlacka, Frankfort, Ill., assignor to Amphenol Corporation, Wallingford, Conn.

Filed May 8, 1986, Ser. No. 849,633

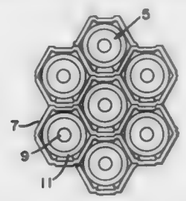
Int. Cl.⁴ H01R *13/658*

U.S. Cl. 439—607 **7 Claims**

1. An EMI shielded interconnect for electrically connecting vertically stacked printed circuit boards, said interconnect comprising a housing having a plurality of passages extending vertically therethrough in a matrix arrangement, said housing

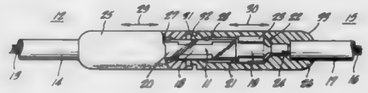
VOL 1088 ISS 5 MR 29 1988 UMI

being made up of a plurality of stamped corrugated sheets of shielding material which have been bonded to each other in an



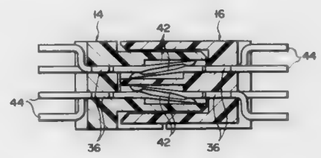
interfit manner, and each passage in said housing having a respective contact engageably received therein.

4,734,059
IN-LINE FUSE HOLDER
Simeon A. Melugin, Capistrano Beach, Calif., assignor to Lamcor, Inc., Anaheim, Calif.
Filed May 30, 1986, Ser. No. 868,677
Int. Cl.[4] H01R *13/68*
U.S. Cl. 439—621 **14 Claims**



1. An in-line holder for a fuse having a conductive end portion coupled to a fuse holder body comprising:
- a conductor having an electrically conductive portion and an insulating portion disposed about said electrically conductive portion;
- a conductive fuse end holder having a first electrically conductive end connectable to said electrically conductive portion of said conductor, and a second electrically conductive end connectable to the conductive end portion of the fuse; and
- a first flexible member disposed about a part of said insulating portion of said conductor, and about said conductive fuse end holder and about the entire conductive end portion of the fuse, said first flexible member having:
- an aperture for the insertion of a portion of the fuse including the conductive end portion in electrical and mechanical contact with said fuse end holder;
- a resilient inwardly directed portion for engaging the fuse body to provide a moisture seal to the conductive end portion of the fuse, said inwardly directed resilient portion being spaced remotely from the conductive fuse end holder; and
- a second flexible member about a second end of the fuse having an aperture at one end and also a conductive fuse end holder attached to a conductor, and wherein the ends of the respective flexible members remote from their respective fuse end holders provide engaging circumferential cuff and groove formations for enhancing the sealability to the fuse, and said second flexible member provides a resilient inwardly directed portion for engaging the fuse, with said first and second flexible members being selectively movable between a position wherein the fuse is substantially covered thereby, and a withdrawn position wherein the fuse is at least partly visible, the moisture seal being retained in both positions.

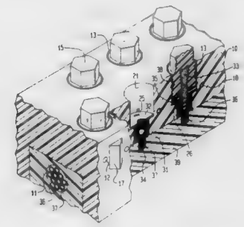
4,734,060
CONNECTOR DEVICE
Kenji Kawawada, and Akira Shimada, both of Tokyo, Japan, assignors to Kel Corporation, Tokyo, Japan
Filed May 23, 1986, Ser. No. 866,485
Claims priority, application Japan, Jan. 31, 1986, 61-17831
Int. Cl.[4] H01R *13/28*
U.S. Cl. 439—660 **7 Claims**



1. A connector device comprising:
- a pair of connector bodies engaged with each other;
- a plurality of contact members provided in each of said connector bodies;
- a plurality of guide surfaces formed in each of said connector bodies;
- a contact section for each of said contact members extending between said guide surfaces along an engaging direction of connectors of said device, said contact section having a free distal end which is elastically deformable and guided by said guide surfaces, and opposing contact sections being parallel to and in contact with each other when said connectors are engaged;
- a contact projection formed on the distal end of said contact section, wherein an inclined portion is formed on said contact section closer to a proximal end thereof than said contact projection; and
- a flat contact portion formed on said contact section contiguous with the end of said inclined portion, said flat contact portion resting on a back surface of said connector body to prevent deformation of said flat contact portion and allowing said inclined portion alone to be elastically deformed;
- said connectors being engaged with each other, said contact projections abutting with each other and said contact sections being elastically bent by each other so that said projections climb over each other, abut against said inclined portions, slilde along said inclined portions, and are pushed up by said inclined portions, thereby elastically bending said contact sections, said contact projections being brought into contact with said contact sections by an elastic force of said contact sections.

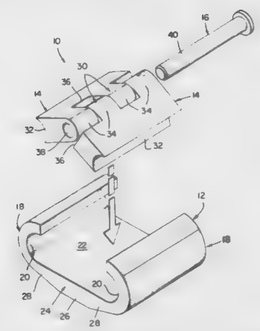
4,734,061
TELECOMMUNICATIONS TERMINAL BLOCK
Herbert E. Randall, Jr., Long Pond, Pa., and Richard J. Schmieder, Sr., Warren, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Dec. 31, 1986, Ser. No. 948,148
Int. Cl.[4] H01R *9/24*
U.S. Cl. 439—709 **13 Claims**

1. A terminal block comprising:
- (a) a body of dielectric material having a plurality of open cells in the upper surface thereof, each of said cells having firmly embedded therein to form the cell floor an electrically conductive insert comprisng one member of a threaded couple;
- (b) a plurality of plugs of dielectric material each closely accommodated in a respective one of said cells, thereby forming a narrow annular space between the respective walls of each said plug and cell, each of said plugs having firmly embedded therein at its lower end the other member of said threaded couple, said couple members being in interactive engagement whereby the lower end of said plug may be displaced toward compression contact with said cell floor;
- (c) sealing means contacting each respective plug completely about the circumference thereof and extending outwardly across said annular space, thereby preventing access to the floor of said cell from said body upper surface;



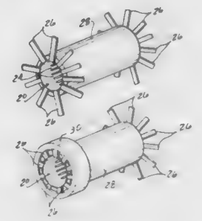
- (d) a plurality of bores in said body communicating between the exterior of said body and the interior of each respective cell closely adjacent its floor; and
- (e) a stub cable comprising a plurality of electrical conductors extending from the exterior of said body to the interior thereof where each respective conductor of said cable terminates in a conductive connection with a separate one of said cell inserts, thereby establishing an electrical circuit between each of the exterior ends of said conductors and the respective cell floors.

4,734,062
ELECTRICAL CONNECTOR
Kazuhiro Goto, Markham, Canada, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 4, 1986, Ser. No. 937,774
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[4] H01R *11/01*
U.S. Cl. 439—783 **3 Claims**



1. An electrical connector for electrically connecting two electrical conductors, said connector comprising:
- conductive, elongated, C-shaped body means having parallel, inwardly facing conductor-receiving channel means on each longitudinal side of and attached to intervening wall means; and
- a pair of conductive toggle block means pivotally joined together along one side and each having outwardly facing, conductor-receiving channel means along an opposite side, said toggle block means having a combined width greater than the space between conductors disposed in respective said channel means in said body means, said toggle block means adapted to be forced into said body means with said outwardly facing channel means facing and cooperating with respective said channel means is said body means to grip and electrically interconnect conductors which may be disposed therebetween.

4,734,063
RADIALLY RESILIENT ELECTRIC SOCKET
Joseph J. Koch, 35724 Jefferson Ave., Mt. Clemens, Mich. 48045; Richard N. Koch, 22564 Statler, St. Clair Shores, Mich. 48081, and Peter H. Vandekerkhof, Richmond, Mich., assignors to Joseph J. Koch, Mt. Clemens and Richard N. Koch, St. Clair Shores, both of, Mich.
Continuation-in-part of Ser. No. 824,116, Jan. 30, 1986, Pat. No. 4,657,335. This application Apr. 10, 1987, Ser. No. 36,906
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—844 **11 Claims**



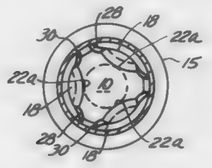
8. A barrel terminal comprising a hollow cylindrical sleeve, a plurality of elongate contactor strips located within said sleeve and extending in straight line paths between respective first circumferential locations on said sleeve adjacent a first end of said sleeve to respective corresponding second circumferential locations on said sleeve adjacent the opposite end of said sleeve, each first circumferential location on said sleeve bing angularly displaced about the axis of said sleeve from its corresponding second circumferential location, first means fixedly securing said strips in mechanical and electrical contact with said sleeve at said first locations, and second means fixedly securing said strips in mechanical and electrical contact with said sleeve at said second locations, at least one of said first and said second means comprising reversly bent tab portions integrally connected to said strips and lying in face-to-face engagement with the exterior of said sleeve at circumferentially spaced locations, at one end of said sleeve and an annular collar fixedly clamping said tab portions against the exterior of said sleeve.

4,734,064
ELECTRICAL SOCKET CONTACT WITH CONVEX ENGAGING TINES
Anthony W. Knapp, Laurens, and Joseph M. Buck, Binghamton, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.
Filed Aug. 29, 1986, Ser. No. 902,355
Int. Cl.[4] H01R *13/187*
U.S. Cl. 439—852 **5 Claims**

1. An electrical socket contact for receiving a pin contact, said socket comprising an elongated cylindrical body formed from electrically conductive material and having a forward end comprised of at least two elongated spring tines, substantially identical in configuration, for receiving the pin, the socket characterized in that each spring tine extends as a cantilever from the body to a free end and has a convex cross-section adjacent its free end for engaging the pin contact, the tines

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collectively and uniformly transition from the convex cross-sections into concave cross-sections adjacent to the body from



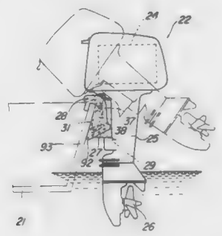
which the tines extend, and the free ends cooperating to form a tulip-shaped entry for guiding the pin contract.

4,734,065

SYSTEM FOR STABLE RUNNING OF MARINE PROPULSIONS

Ryoji Nakahama; Katsuji Hirade, and Takashi Koike, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jun. 4, 1986, Ser. No. 870,458
Claims priority, application Japan, Jun. 5, 1985, 60-121700
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—1 **16 Claims**



1. In a marine propulsion unit for a watercraft having an outboard drive having a propulsion unit driven by an engine, means for supporting said outboard drive for tilting movement about a generally horizontally extending tilt axis, means for sensing an abnormal movement of said outboard drive about said tilt axis, and means for slowing said propulsion unit for only a predetermined time period without stopping said engine in response to a sensed abnormal movement.

4,734,066

TROLLING MOTOR ELEVATING APPARATUS

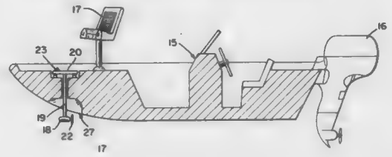
Dennis F. Burgess, Box 142, Henrietta, N.C. 28076

Continuation-in-part of Ser. No. 901,632, Aug. 29, 1986. This application Apr. 17, 1987, Ser. No. 39,454
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—6 **11 Claims**

1. A trolling motor drive apparatus for a fishing boat and operable by the foot of a fisherman, said apparatus comprising:

a. a trolling motor housing including a submersible electrically operated motor for driving a propeller rotatably supported by said housing;

b. motor housing support means carried on a fishing boat hull for supporting said motor for movement toward and away from the hull of the boat, said motor housing support means including rod means extending from said motor housing, sleeve means including a bore for rotatably receiving said rod means, said sleeve means including external rack means and said housing support means including drive gear means in meshing engagement with said rack means, housing means having a bore for axially slidably receiving said sleeve means, and actuating means rotatably supported by the boat hull and non-rotatably connected with said rod means for pivoting said motor housing about a substantially vertical axis;



c. drive means carried in the boat for moving said housing support means, said drive means drivingly connected with said drive gear means to selectively cause said sleeve to move telescopically into and out of said housing; and

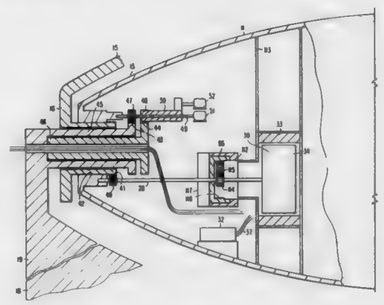
d. foot operable control means carried on the boat for selectively controlling said drive means to change the position of the motor housing relative to the boat hull.

4,734,067

HYDRO-ROTOR

Francisco Elias-Reyes, 2715 U.S. 31 South, Greenwood, Ind. 46142

Filed Sep. 16, 1986, Ser. No. 907,811
Int. Cl.[4] B63H *1/26*
U.S. Cl. 440—48 **18 Claims**



16. A hydro-rotor comprising:

a hollow tank having a pair of opposite tapered ends and a longitudinal axis;

a helical flight movably mounted to said tank and extending therearound; and,

means connected to said flight and said tank and operable in a first state wherein said flight rotates around said tank and a second state wherein said flight and said tank rotate simultaneously about said longitudinal axis.

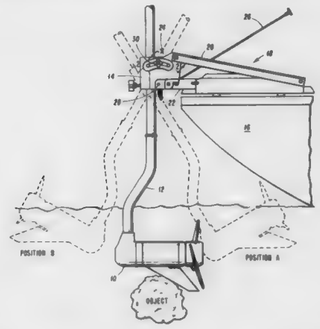
4,734,068

MOUNTING STRUCTURE FOR ELECTRIC TROLLING MOTORS

James R. Edwards, Dubuque, Iowa, assignor to The Eska Company, Dubuque, Iowa

Filed Jul. 11, 1986, Ser. No. 884,536
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—56 **9 Claims**

1. A mounting structure for an outboard motor for boats comprising a mounting assembly for attachment to the boat, a bracket for supporting the motor which bracket is pivotally connected to the mounting assembly so as to provide for pivotal movement of the motor fore and aft, an arcuate slot in the mounting assembly vertically spaced from the pivotal connection with the bracket, a thrust member extending through the slot and operatively connected to the bracket, and means biasing the thrust member to a normal operating position in which



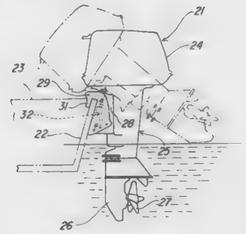
the motor is held in its normal operating position, the thrust member being moveable in the slot from the normal operating position to allow the motor supporting bracket to pivot about its pivotal connection with the mounting assembly if the motor strikes an underwater object.

4,734,069

AUTOMATIC TRIM CONTROLLER FOR MARINE PROPULSION UNIT

Toshihiko Uenage, and Yoshihide Hirano, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Apr. 3, 1986, Ser. No. 847,486
Claims priority, application Japan, Apr. 4, 1985, 60-70041
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **12 Claims**



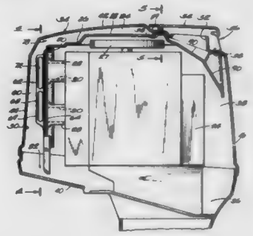
1. In a watercraft comprising a hull, a propulsion unit adapted to be submerged in the water for propelling said hull, means for mounting said propulsion unit upon said hull for pivotal movement about a generally horizontally extending trim axis for adjusting the trim angle of said propulsion unit, power means for pivoting said propulsion unit about said trim axis for adjusting said propulsion unit trim angle, the improvement comprising means for controlling said power means to control the trim angle to achieve maximum watercraft speed for a given speed of said propulsion unit comprising means for sensing a rate of change in velocity of the watercraft, and means for operating said power means for adjusting said trim angle in response to a sensed rate of change in velocity to maximize the speed of the watercraft for a given propulsion unit speed.

4,734,070

MARINE PROPULSION DEVICE AIR INTAKE SYSTEM

Martin J. Mondek, Wonder Lake, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 26, 1986, Ser. No. 879,032
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—88 **24 Claims**



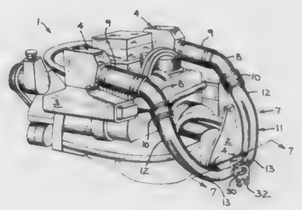
1. A marine propulsion device comprising a propulsion unit including a rotatably mounted propeller, and an engine drivingly connected to said propeller and including a flywheel and an air intake, a cowl assembly surrounding said engine and including an air inlet and an upper interior surface, and wall means for conducting incoming air from said air inlet to said engine air intake and, at the same time, for isolating the incoming air from said engine, said wall means engaging such interior surface and including a portion spaced from said interior surface and cooperating with said interior surface to define a passage spaced from said engine and communicating between said air inlet and said engine air intake.

4,734,071

MARINE ENGINE EXHAUST ASSEMBLY

Alvin R. Zemlicka, Elkhart Lake; Francis Bertram, Malone, and Jay L. Menzel, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 13, 1987, Ser. No. 37,646
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—89 **11 Claims**



1. A marine engine exhaust assembly (7) adapted for connection to the dual water-exhaust discharge means (4) of a boat-mounted marine internal combustion engine (1), comprising, in combination:

(a) a pair of generally parallel upper intermediate tubular elbows (8) connectable at their forward upper ends to said engine,

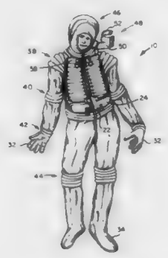
(b) a tubular bullhorn (11) having a pair of upper legs (12) connected at their forward upper ends to the lower rearward ends of said elbows, the lower portions of said legs merging through bends (13) into transversely extending lower pipes (14) having water-exhaust discharge portions,

(c) water-exhaust separator plates (25) disposed in said respective lower pipes and with said plates forming separate water and exhaust passages in said pipes, said separator

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plates having upstream leading edges (28) disposed adjacent said bends,
(d) a gimbal housing (33) connected rearwardly of said bullhorn to said lower pipes and with said housing having front and rear ends and having a pair of elongated water-receiving pockets (38) disposed in communication with the said lower pipe discharge portions, said housing furthermore having drain holes (37) disposed generally intermediate said housing ends and communicating between said pockets and the housing exterior,
(e) and water flow path control means associated with said elbows, said bullhorn, said separator plates and said gimbal housing to minimize exhaust back pressure at a connected engine.

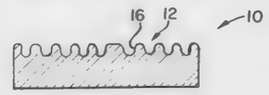
4,734,072
ANTI-EXPOSURE SUIT
Abraham L. Lastnik, Framingham, Mass., assignor to Multi-Tech Corporation, Natick, Mass.
Continuation of Ser. No. 566,679, Dec. 29, 1983, abandoned.
This application Feb. 24, 1986, Ser. No. 833,652
Int. Cl.[4] B63C *9/08*
U.S. Cl. 441—105 **6 Claims**



1. A survival suit comprising:
an outer layer of lightweight gas and liquid impervious material adapted to cover substantially the entire body of a wearer;
an inner layer of lightweight gas and liquid impervious material disposed within the outer layer and adapted to cover substantially the entire body of a wearer;
said inner and outer layers selectively inter-connected to form a gas and liquid tight gas inflatable bladder therebetween; at least one of said layers having a highly reflective bladder facing surface to minimize radiant heat loss;
means defining pockets selectively disposed on the suit and adapted to receive buoyant material to assure that a suit wearer floats in a upwardly facing orientation; and
means providing a foaming reaction for producing a buoyant material for injection of said material into selected ones of said pockets.

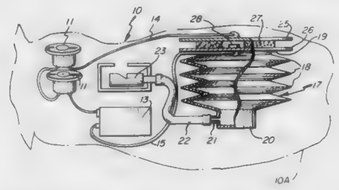
4,734,073
METHOD OF MAKING A THERMIONIC FIELD EMITTER CATHODE
Bernard Smith, Ocean, and Louis E. Branovich, Howell Township, Monmouth County, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 10, 1986, Ser. No. 919,959
Int. Cl.[4] H01J *29/04, 9/04*
U.S. Cl. 445—50 **6 Claims**

1. Method of making a thermionic cathode for use in millimeter wave/microwave high power electron tubes from tungsten and iridium powders, said method including the steps of:
(A) mixing the tungsten and iridium powders in the ratio of 80 parts by weight tungsten powder to 20 parts by weight iridium powder,
(B) isostatically pressing and compressing the powders to a porosity of about 50 percent,
(C) sintering the resulting cathode in dry hydrogen at temperatures of about 1500° C. to about 2200° C. for about 2 hours to about 16 hours to a desired density of about 72 to about 78 percent,
(D) impregnating the cathode with copper filler material at about 1100° C. to about 1150° C.,



(E) cooling the cathode and then machining the face of the cathode surface to provide a spiral surface finish with microscopic sharp symmetrical protrusions,
(F) removing the bulk of the copper filler material by firing at about 1400° C.,
(G) acid etching to remove the remaining residual copper,
(H) cleaning the cathode and then firing at about 1100° C.,
(I) impregnating the cathode with an active material in an inert atmosphere at about 1500° C. to about 1600° C., and
(J) cleaning the cathode of any residue of impregnated material.

4,734,074
ANIMATED NOVELTY DEVICE
Benjamin Kinberg, 200 Fifth Ave., New York, N.Y. 10010, and Robert Hudson, 103 Valley St., Seekonk, Mass. 02771
Filed Feb. 9, 1987, Ser. No. 12,638
Int. Cl.[4] A63H *3/31, 3/38*
U.S. Cl. 446—184 **2 Claims**



1. An animated novelty device comprising
a body simulating an animated creature having a head portion with eyes, voice means for creating a voice associated with said animated creature,
said means for creating said voice being disposed within the body of said animated creature,
an electric circuit connected to said voice means,
said electric circuit including a light means simulating the eyes of said animated creature,
a power source connected in said circuit for energizing said light means,
and a switch means disposed in said circuit for opening and closing said circuit,
said switch means being connected to said voice means whereby said switch means and voice means are actuated simultaneously to energize said light means and to sound said voice means,
said switch means including a pair of spaced apart contact disc plates,
a contact button axially connected to one of said contact disc plates,
a resilient spacer disposed about said contact button and disposed between said disc plates,

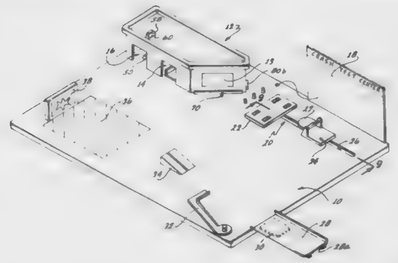
said disc plates having a peripheral portion extending beyond the peripheral portion of said spacer,
and said body having a resilient portion opposite said switch means which can be readily deformed to actuate said switch means and associated voice means whereby said switch means is actuated by the application of either an axial or non-axial force applied thereto,
and said resilient portion of said body assuming its normal position when the applied force is removed.

4,734,075
EDUCATIONAL PLUSH TOY
Doo S. Park, 12-408 Hanshin-Gongyoung, Apt. Group 1, Shinbanpo, Kang-Namgu, Seoul, Rep. of Korea
Filed Jun. 9, 1986, Ser. No. 872,222
Int. Cl.[4] A63H *3/14*
U.S. Cl. 446—321 **14 Claims**



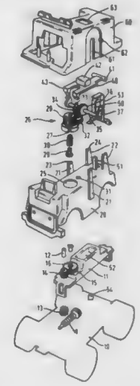
1. A plush toy, comprising:
(a) costume means for being a sculputural representation of a first item, said costume means being defined by:
i. a hollow base portion;
ii. a hollow head portion attached to said base portion; and
iii. a filled snout portion attached to said head portion;
(b) a second sculptural element comprising a solid manipulable figure of a second item adapted to fill the hollow portions of said costume means; and
(c) stuffing means attached to said costume means and insertable in said base portion or said head portion.

4,734,076
TOY VEHICLE PLAY SETTING
Samuel M. Goldstein, Los Angeles; Timothy S. Engle, Manhattan Beach; Walter A. Kristkeitz, Los Angeles, and Eric C. Ostendorff, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 26, 1985, Ser. No. 802,130
Int. Cl.[4] A63H *17/44*
U.S. Cl. 446—423 **6 Claims**



1. In a play setting for use with a toy vehicle having a component rotatable between a first position having a simulated damaged body panel surface and a second position having a normal body panel surface, the combination comprising:
a supporting surface;
means on said surface for retaining said toy vehicle in a predetermined position, said retaining means including cage means for holding said toy vehicle, said cage means being pivotable;
means adjacent said retaining means for engaging said rotatable component, said engaging means including a pivotable arm member having a friction pad for engaging said rotatable component upon pivoting of said cage means relative to said arm member for pivoting said component from said first position to said second position for simulating the repair of said vehicle; and
means responsive to relative movement between one of said engaging means and said toy vehicle for enabling rotation of said component from one of said first and second positions to the other of said first and second positions.

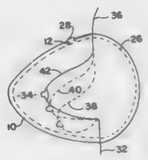
4,734,077
SELF POWERED TOY VEHICLE WITH AUXILIARY TRANSMISSION FOR OPERATING ANCILLARY DEVICE
Christopher J. C. Taylor, 55 Crescent Lane, London SW4 9PT, and Christopher C. Wiggs, 64 Goldsborough Crescent, Chingford, London E4, both of United Kingdom
Filed Jun. 5, 1985, Ser. No. 741,210
Claims priority, application United Kingdom, Jun. 5, 1984, 8414242
Int. Cl.[4] A63H *29/22*
U.S. Cl. 446—462 **4 Claims**



1. A model vehicle having a chassis carrying an electric motor driving an axle through a horizontal worm and gear, a cover for the motor and a power take-off comprising a lower pinion engaged with the worm driving a second pinion on the exposed face of the cover via a shaft passing through the cover, including a take-off gear rotatably supported on the exposed face of the cover, an end surface of said take-off gear having pins of a dog-clutch, said second pinion driving said take-off gear.

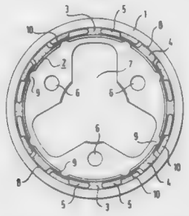
VOL
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4,734,078
LIQUID BRASSIERE
James O. Moreau, 5233 Seminary Rd., Alexandria, Va. 22311
Filed Aug. 6, 1986, Ser. No. 893,729
Int. Cl.[4] A41C *3/00*
U.S. Cl. 450—38 19 Claims



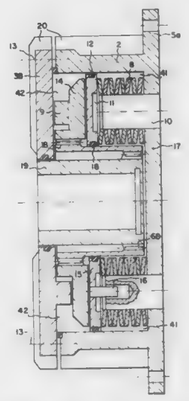
1. A brassiere which comprises in combination: a liquid; and a means for maintaining said liquid in close proximity to a woman's breasts such that said liquid provides bouyancy and support to said breasts.

4,734,079
APPARATUS FOR SUPPRESSING TORSIONAL VIBRATIONS AND RADIALLY ACTING FLEXURAL VIBRATIONS OF ROTARY SHAFTS
Adalbert Viets, Saarbrucken, Fed. Rep. of Germany, assignor to Tschan GmbH, Neunkirchen-Saar, Fed. Rep. of Germany
Filed Aug. 28, 1986, Ser. No. 900,910
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3531115
Int. Cl.[4] F16F *15/12*
U.S. Cl. 464—17 8 Claims



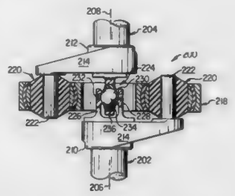
1. Apparatus for suppressing torsional vibrations and flexural vibrations of a rotary shaft, which is arranged coaxially to the shaft, said apparatus comprising an internal pot constructed as a flange for fixing said pot to the rotary shaft, an outer rotating ring, elastic damping elements arranged between said pot and said ring, said damping elements including a plurality of first damping elements integral with the pot and the rotating ring and a plurality of second damping elements integral with the pot and non-integral with the rotating ring, and a plurality of circumferentially distributed slots in said pot for permitting an elastic expansion of at least part of the pot under increased centrifugal force action whereby said second damping elements press against said ring for transferring force thereto when said centrifugal force action reaches a pre-determined level.

4,734,080
ROTARY-ELASTIC, OSCILLATION-DAMPING SHAFT COUPLING
Curt Kronert, Mulheim/Ruhr, Fed. Rep. of Germany, assignor to Machinenfabrik Stromag G.m.b.H., Fed. Rep. of Germany
Continuation of Ser. No. 629,930, Jul. 11, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 924,164
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325214; Jan. 4, 1984, 3400127; Mar. 7, 1984, 3408286
Int. Cl.[4] F16D *3/80;* F16F *15/16*
U.S. Cl. 464—26 11 Claims



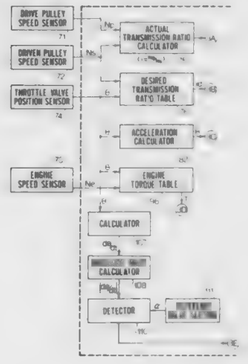
1. An oscillation damping shaft coupling comprising:
a cylindrical primary part having a first plurality of teeth for engaging and being driven by complementary teeth of a shaft hub, and a second plurality of teeth, said primary part being concentric with said hub;
a secondary part forming a housing shaped to receive said primary part and said shaft hub and forming a fluid-tight chamber therewith, said secondary part including a first plurality of axially-extending projections extending into said chamber;
an annular coupling disk having a third plurality of teeth meshing with said second plurality of teeth, a second plurality of axially-extending projections meshing with said first plurality of projections, and a first, radially extending bearing surface, said coupling disk being axially slidable relative to said secondary and primary parts such that said second and third pluralities of teeth slide relative to each other;
an annular supporting disk having a second radially extending bearing surface opposing said first surface and extending between and forming a fluid-tight seal with said primary and secondary parts, thereby dividing said chamber into two parts, said supporting disk being slidable between said primary and secondary parts; and
resilient means extending between said secondary part and said supporting disk for urging said supporting disk against said coupling disk such that said first and second set of projections are held in meshing contact with each other, said resilient means including elongate bolt means extending between said secondary part and said supporting disk for preventing relative rotation between said supporting disk and said resilient means, whereby torsional stress at a predetermined level applied to said primary and secondary parts causes slippage between said first and second pluralities of axial projections, thereby urging said coupling disk against and displacing said supporting disk such that fluid is forced thereby to flow between said chamber parts solely through said meshing teeth of said hub, primary part, and coupling disk, said meshing teeth being shaped to provide a throttling action to fluid passing therebetween, thereby damping axial movement of said coupling disk and said support disk.

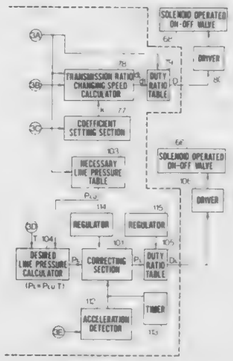
4,734,081
CONSTANT VELOCITY ELASTOMERIC BEARING JOINT
William D. Neathery, Fort Worth; Willem Broekhuizen, Arlington, and Ernst C. Schellhase, Fort Worth, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.
Division of Ser. No. 794,800, Nov. 4, 1985. This application Jan. 23, 1987, Ser. No. 6,687
Int. Cl.[4] F16D *3/28;* B64C *27/35*
U.S. Cl. 464—71 2 Claims



1. A constant velocity joint for joining a driving member to a driven member for joint rotation, the driving member rotating about a first axis and the driven member rotating about a second axis, the first and second axes being capable of misalignment, comprising:
a rigid disk shaped carrier defining an axis of symmetry and having at least six apertures formed therethrough about the periphery thereof, each of the apertures centered on an aperture axis parallel to and spaced from the axis of symmetry, the walls of the apertures defining spherical surfaces centered on a first center along the axis of the aperture midway through the carrier;
at least three elastomeric bearing assembly pairs, each of said pairs comprising a driving elastomeric bearing assembly and a driven elastomeric bearing assembly, each of said elastomeric bearing assemblies being received in one of the apertures in the rigid carrier, said elastomeric bearing assemblies including:
(a) a spherical elastomeric bearing having an outer spherical surface secured to the wall of the aperture and an inner spherical surface concentric with the outer spherical surface, the center of curvature of the spherical surfaces coincident with the first center when the spherical elastomeric bearing is undeformed;
(b) a rigid section having an outer spherical surface concentric with and attached to the inner spherical surface on the spherical bearing and having an inner cylindrical surface;
(c) a cylindrical elastomeric bearing having an outer cylindrical surface secured to the inner cylindrical surface of the rigid intermediate section, the cylindrical elastomeric bearing having an inner cylindrical surface centered along the aperture axis;
means for securing the inner cylindrical surface of the cylindrical elastomeric bearing of each of said driving elastomeric bearing assemblies around the circumference of the rigid carrier to the driving member so that the center axis of the inner cylindrical surface is parallel to and spaced from the first axis;
means to secure the inner cylindrical surface of the cylindrical elastomeric bearing of each of said driven elastomeric bearing assemblies to the driven member with the center axis of the inner cylindrical surface parallel to and spaced from the second axis;
the elastomeric bearing assemblies being deformable axially along their center axis, radially perpendicular to their center axis, and about their center of curvature, permitting torque to be transferred from the driving member to the driven member with constant velocity, the rigid carrier being oriented relative to the driving and driven members to ensure a constant velocity motion; and
said rigid carrier having a center aperture centered generally on the axis of symmetry and one of said members having an extension comprising a spherical surface centered within the center aperture and the other of said members having a ring comprising an inner spherical surface concentric with the spherical surface on the extension, said constant velocity joint further including a spherical thrust elastomeric bearing secured between said ring and said extension to transmit axial thrust loads between the driving member and driven member.

4,734,082
SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION
Kazunari Tezuka, Asaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1986, Ser. No. 928,984
Claims priority, application Japan, Nov. 18, 1985, 60-258138
Int. Cl.[4] F16H *11/04*
U.S. Cl. 474—28 8 Claims





1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine having a throttle valve to driving wheels of a motor vehicle through a clutch, the transmission having a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley including a hydraulically shiftable disc and a second hydraulic cylinder for

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operating the disc of the driven pulley, and a belt engaged with both pulleys, the control system having a line pressure control valve having ports and a shiftable spool, a transmission ratio control valve having ports and a shiftable spool, a first hydraulic circuit having a pump for supplying oil regulated by the line pressure control valve via said line pressure control valve to the first hydraulic cylinder and to said second hydraulic cylinder, the improvement in the system comprising:

a second hydraulic circuit for supplying the oil to adjacent an end of the line pressure control valve so as to shift the spool of the line pressure control valve;

control valve means provided in the second hydraulic circuit for controlling the amount of the oil supplied to adjacent the end of the line pressure control valve;

first means for detecting opening degree of said throttle valve of said engine and for producing a first signal dependent on said opening degree;

second means responsive to the first signal for producing a second signal representing changing rate of throttle opening degree;

third means responsive to the second signal exceeding a predetermined magnitude for detecting a potential rapid acceleration for producing a third signal;

fourth means responsive to the third signal for controlling said control valve means to increase the line pressure for a predetermined time so as to prevent slipping of the belt at the rapid acceleration.

4,734,083

FRONT DERAILLEUR FOR A BICYCLE

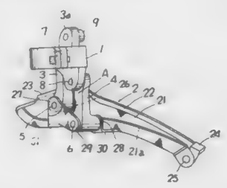
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 6, 1987, Ser. No. 34,942

Claims priority, application Japan, Apr. 11, 1986, 61-54897[U]

Int. Cl.⁴ F16H *7/18*

U.S. Cl. 474—78 **5 Claims**



1. A front derailleur for a bicycle for shifting a driving chain from one gear to another of a multistage front chain gear assembly having a plurality of axially spaced generally parallel gears, comprising:

a linkage mechanism comprising (i) a fixing member, (ii) a chain guide having an inner guide plate and an outer guide plate generally parallel to one another, and (ii) a linkage means supported to said fixing member and movable in a predetermined direction, said predetermined direction being adapted to be oriented axially relative to said front chain gear assembly,

said inner guide plate comprising an elongate urging portion on its inner side surface closest to said outer guide plate, said urging portion being swollen in a direction toward said outer guide plate, said urging portion contacting said driving chain when said chain guide is moved in said predetermined direction to shift said driving chain from one gear to another of said multistage front chain gear assembly, and

said inner guide plate having a mounting means positioned above said urging portion and another mounting means positioned below said urging portion, said linkage means being connected to said inner guide plate at both of said mounting means.

4,734,084

DERAILLEUR FOR A BICYCLE

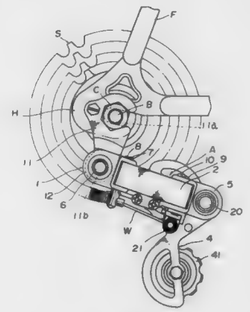
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 27, 1985, Ser. No. 813,922

Claims priority, application Japan, Dec. 29, 1984, 59-280808

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—80 **3 Claims**



1. A derailleur for a bicycle for shifting a driving chain from one sprocket to another of a multistage sprocket assembly mounted on a frame of said bicycle to thereby change the bicycle speed, comprising:

a linkage mechanism comprising a fixing member having a base member and a bracket member formed of an elastic material by which said fixing member is fixed to said bicycle frame, a pair of linkage members pivoted swingably to said fixing member by said base member, and a movable member having a chain guide and pivoted to said linkage members; and

said bracket member comprising a displacement means for elastically displacing said linkage mechanism axially of said multistage sprocket assembly with respect to said bicycle frame responsive to said linkage mechanism being subjected to a force greater than a resistance against speed change by shifting said driving chain.

4,734,085

V BELT

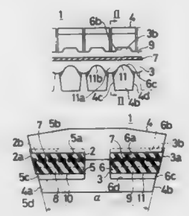
Takashi Takashima, Osaka, and Keizo Nonaka, Hyogo, both of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Sep. 3, 1986, Ser. No. 903,346

Claims priority, application Japan, Sep. 4, 1985, 60-196310

Int. Cl.⁴ F16G *5/16*

U.S. Cl. 474—242 **17 Claims**



1. A V belt which is wound round at least two pulleys, comprising an endless load carrier having cogs with alternations of cog peak and cog valley at its underside and a plurality of blocks with slots in which said load carrier is fitted, said load carrier and said blocks being engaged with each other in a lengthwise direction of the belt by engagement of a curved concave part which is a cog valley between adjoining cogs of said load carrier with a curved convexed surface which extends over the whole slot under surface of the block, said curved convexed surface being at least the same size as said curved concaved surface of the load carrier, and cog peaks of the load carrier being positioned above the lowermost position of a curved convexed part of the slots of adjoining two blocks in a rectilinear state and being compressed and deformed in a state where it was wound round a pulley.

4,734,086

ENDLESS POWER TRANSMISSION BELT STRUCTURE

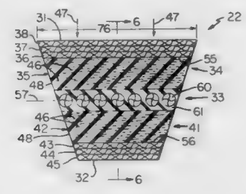
David G. Fisher, Rochester Hills, Mich., and Jerry W. Hill, Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 599,916, Jul. 29, 1975, Pat. No. 3,987,684. This application Jun. 16, 1976, Ser. No. 697,089

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.⁴ F16G *5/16, 5/08*

U.S. Cl. 474—262 **1 Claim**



1. An endless power transmission belt structure having a longitudinal dimension and a trapezoidal cross-sectional outline at each position along said longitudinal dimension, said belt structure being made primarily of elastomeric material and comprising a pair of oppositely arranged surfaces disposed in spaced relation to define an outside and inside surface of said belt structure: a load-carrying section arranged midway between said outside and inside surfaces; a tension section having a plurality of layers including a layer means providing transverse rigidity adjoining said load-carrying section and a fabric layer disposed remote from said load-carrying section and adjoining said layer means; a compression section having a plurality of layers including a layer means providing transverse rigidity adjoining said load-carrying section and a fabric layer disposed remote from said load-carrying section and adjoining said layer means of said compression section; each of said layer means allowing longitudinal flexibility while providing transverse rigidity greater than its longitudinal rigidity and being free of shear planes parallel to said load-carrying section from said load-carrying section to its respective fabric layer; the innermost fabric layer in each of said tension and compression sections having an inside surface which is located at least 25% of one-half the thickness of the belt structure away from a central plane bisecting said load-carrying section when viewing the belt structure in cross-section.

4,734,087

HIGH LOAD TRANSMISSION BELT

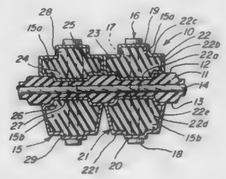
Hiroshi Takano, Miki; Shinichi Takagi, Nishinomiya; Kiyokazu Wada, Miki; Sadaichi Konishi; Nobuo Okumura, both of Kobe; Tomizo Kanaoka, and Kouji Matsuo, both of Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Nagata, Japan

Filed Mar. 31, 1987, Ser. No. 32,868

Claims priority, application Japan, Mar. 31, 1986, 61-48854[U]; Jun. 9, 1986, 61-87705[U]; Jun. 12, 1986, 61-90332[U]

Int. Cl.⁴ F16G *1/10, 1/22*

U.S. Cl. 474—270 **29 Claims**



1. A power transmission belt structure comprising:

a flexible belt;

a plurality of blocks secured to said flexible belt seriatim longitudinally thereof; and

heat conducting means formed of a material having substantially greater thermal conductivity than that of said blocks and being disposed between said flexible belt and blocks for conducting away from the flexible belt heat generated as a result of power transmission operation of said belt structure.

4,734,088

APPARATUS FOR MAKING BAGS

Fritz Achelpohl, and Helmut Simon, both of Lengerich, Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,177

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531457

Int. Cl.⁴ F16H *55/48*

U.S. Cl. 493—194 **15 Claims**

1. Apparatus for making bags from a two-ply web of thermoplastic material by transversely cutting the web at longitudinally spaced intervals, said apparatus comprising:

a frame;

feed means supported by said frame for intermittently moving web in a web movement direction and in a web movement plane;

welding means supported by said frame for welding together the two plies of thermoplastic material when the web is stopped, the welding being accomplished along a weld line extending transversely to the direction of web movement;

cutting means supported by said frame for severing a bag from the web along a cutting line spaced downstream from and substantially parallel to said weld line, said cutting means including a severing knife positioned below the web movement plane and supported and guided for movement in a transverse direction relative to the web movement direction;

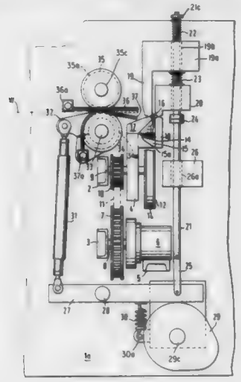
said welding means being operable to deflect the stopped web downwardly toward the severing knife a distance sufficient to weld the plies of the web and to enable the severing knife to sever the web in a transverse direction relative to the web movement direction,

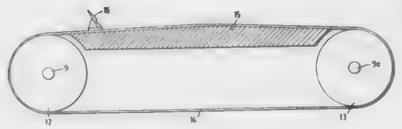
clamping means positioned on an opposite side of said severing knife from said welding means for clampingly engaging the web while welding thereof only takes place by said welding means,

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carrying means for carrying said severing knife, and

convex beam means positioned below an upper run of said carrying means for carrying said severing knife in upward





and downward directions relative to the web movement plane to cause cutting of the web to take place along a predetermined length of the severing knife.

4,734,089

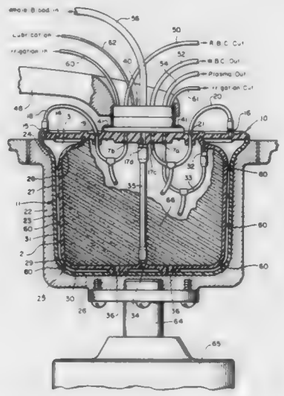
CENTRIFUGAL BLOOD PROCESSING SYSTEM

Herbert M. Cullis, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 687,290, May 14, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,779

Int. Cl.[4] B04B *11/00*

U.S. Cl. 494—27 **26 Claims**



1. A centrifugal blood processing system comprising, in combination:

a stationary base;

a rotor drive assembly rotatably mounted to said base for rotation along a predetermined axis;

a rotor assembly including at least one blood processing chamber, said rotor assembly being rotatably mounted with respect to said base for rotation about said axis;

means including a flexible umbilical cable segment for establishing fluid communication with said blood processing chamber, one end of said cable segment being fixed with respect to said base along said axis at one side of said rotor assembly, the other end of said cable segment being attached on said axis in rotationally locked engagement to said rotor assembly;

means for causing said umbilical cable to rotate about said axis with said motor drive assembly; and

drive means for rotating said rotor assembly and said rotor drive assembly in the same direction with a speed ratio of 2:1 to prevent the umbilical cable from becoming completely twisted during rotation of said rotor.

4,734,090

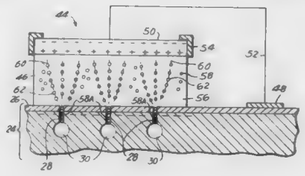
ELECTRICAL TRANSDERMAL DRUG APPLICATOR

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Filed Jul. 18, 1986, Ser. No. 888,151

Int. Cl.[4] A61N *1/30*

U.S. Cl. 604—20 **29 Claims**



1. A transdermal applicator system for passing at least one drug for delivery to the systemic circulation system of a patient through the skin having a plurality of sweat ducts opening at the stratum corneum, comprising, in combination,

a drug reservoir containing a colloidal suspension having at least one drug for delivery to the body of the patient, said colloidal suspension comprising a fluid medium and generally large, as compared to the size of molecules, particles in said medium, said medium and said particles being of different permittivities, said reservoir being capable of being placed in electrical contact with the skin of the patient,

voltage means for imposing electrostatic field lines upon said medium so as to create a non-uniform electrostatic field in said medium when said drug reservoir is placed on the skin,

said particles migrating in accordance with the principle of dielectrophoresis so as to pass through the skin into the systemic circulation system.

4,734,091

FILTERED MANIFOLD APPARATUS AND METHOD FOR OPHTHALMIC IRRIGATION

William J. Boyle, Greensburg, Pa., and Thomas F. Irish, West Berlin, N.J., assignors to Atlantic Optical Systems, Inc., Leechburg, Pa.

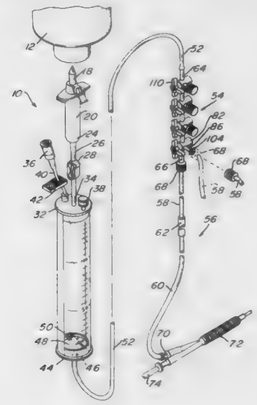
Continuation of Ser. No. 700,485, Feb. 11, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 88,986

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—54 **16 Claims**

1. For use in association with a reservoir of sterile fluid, disposable initially sterile apparatus for sequential sterile administrtion of fluid to a plurality of recipient sites, comprising:

conduit means operatively engageable with the reservoir to provide a flow path for fluid from the reservoir to a distribtuion manifold; a filter assembly in fluid communication with the reservoir and said distribution manifold, whereby fluid from the reservoir is filtered prior to distribution; said filter assembly providing filtration of particulates above about 0.22 microns in diameter and allowing for flow rates of at least about 25 millimeters/minute; a distribution manifold, said distribution manifold having a passage therethrough, said conduit means being in fluid communication with an end of said passage; a plurality of capped outlet ports in fluid commu-



nication with said passage at spaced locations therein; respective valves operatively associated with said outlet ports; and cap members removably operatively associated with said outlet ports to initially maintain said outlet ports in sterile condition; said valves having selectable operative positions wherein sterile fluid may selectively be directed through said central passage, blocked from movement through said central passage, or directed through the outlet port associated with the valve means, whereby said outlet ports may be used sequentially without adversely affecting the sterility of the unused outlet ports; and means for conducting fluid from a selected port to a recipient site.

4,734,092

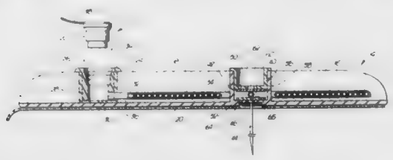
AMBULATORY DRUG DELIVERY DEVICE

Donald L. Millerd, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Feb. 18, 1987, Ser. No. 15,931

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—67 **26 Claims**



1. Ambulatory drug delivery apparatus, comprising:

a housing;

a fluid reservoir in said housing comprising an extended conduit adapted for storing a fluid to be delivered and having an inlet end and an outlet end,

pump means in communication with said inlet end for pressurizing a driving fluid and introducing said pressurized driving fluid into said conduit;

fluid delivery means in communication with said outlet end for delivering fluid from said conduit upon said introduction of pressurized driving fluid;

movable indicator means disposed in said conduit between said driving fluid and said fluid to be delivered; and

attachment means for attaching said housing to a user's body.

4,734,093

REMOTE CONTROLLED CATHETER HAVING A MICRO-BALLOON

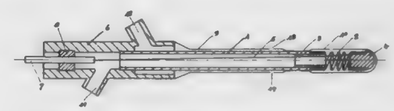
Philippe Bonello, Grand-Saconnex, and Maurice Jeanmonod, Meyrin, both of Switzerland, assignors to Sarcem S.A., Meyrin, Switzerland

Filed Nov. 10, 1986, Ser. No. 929,082

Claims priority, application Switzerland, Nov. 21, 1985, 04961/85

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—95 **3 Claims**



1. A remote controlled catheter comprising a frame element having fluid passages therethrough, a tube supported by the frame element and in fluid communication therewith, said tube extending forwardly from the frame element, a tubular covering surrounding the tube and sealed at its rear end to the frame element and sealed at its forward end to a forward end portion of the tube, means for injecting liquid through the frame element and between the tube and the tubular covering, the tubular covering being laterally pierced to permit said liquid to escape from the catheter, a coil spring having spaced coils supported on the forward end of the tube and extending forwardly of the tube, a flexible pulling member connected to the coil spring forwardly of the forward end of the tube and extending through the tube and frame element, means supported within the frame element for adjustably exerting tension of the flexible pulling member thereby to deflect the spring laterally, an inflatable micro-balloon sealed to the forward end of the tube and surrounding the spring, and means for applying a fluid under pressure through one of the passages in the frame element and the tube and out the forward end of the tube into the micro-balloon to inflate the micro-balloon.

4,734,094

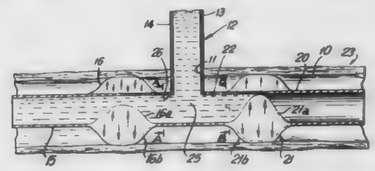
CATHETER AND METHOD FOR CHOLANGIOGRAPHY

Erwin T. Jacob, Hanof str 19, Savyon, Israel, and Burton Bronsther, 114 Cedar Ave., Hewlett Bay Park, N.Y. 11557

Filed Jun. 9, 1986, Ser. No. 871,819

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—284 **5 Claims**



1. A cholangiography catheter adapted to be inserted in the

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common bile duct of a patient in order to introduce and retain contrast liquid in the location of said bile duct in order to take X-ray pictures of the bile duct;

the catheter being a flexible and resilient tubular member of "T" shape and having a perpendicular branch and first and second opposite branches forming drain lumens, the three branches joining at a common point;

said catheter having means for closing both said bile duct and said drain lumens comprising

a first balloon connected in said first branch and a second balloon connected in said second branch, each balloon comprising a section of the branch wall and consisting of an inner flexible wall and an outer flexible wall forming between them an interior space, said balloons being individually expanded by the introduction therein of air and collapsed by the withdrawal therefrom of said air;

a first air channel in said perpendicular branch and said first branch leading to the interior space of said first balloon, a second air channel in said perpendicular branch and said second branch leading to the interior space of said second balloon;

the said air channels each leading from the perpendicular branch to separate outside controlled sources of air;

wherein, to take an X-ray picture, the second balloon is expanded so said outer wall completely closes the bile duct and said inner wall completely closes said first drain lumen and the firt balloon is partially expanded, the contrast liquid is introduced between the balloons and the first balloon is then expanded so said outer wall completely closes the bile duct and said inner wall completely closes said second drain lumen and thereby temporarily retain the contrast liquid in the bile duct and drain lumen.

4,734,095

SELF-CENTERING ARTIFICIAL INTROAOCULAR LENS

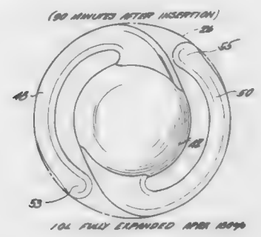
Steven B. Siepser, 866 Downingtown Pk., West Chester, Pa. 19380

Continuation of Ser. No. 770,405, Aug. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 520,187, Aug. 4, 1983, Pat. No. 4,556,998. This application Feb. 5, 1987, Ser. No. 11,254

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **19 Claims**



1. An artificial intraocular lens for surgical implantation to replace a damaged natural lens in an otherwise functional eye of a patient, comprising: a dome-shaped central disc portion, haptic loops formed on said central portion, for centering said central portion after implantation; said central portion being composed of a dry, solid hydrophilic material capable of hydration by the natural fluid present in the eye to expand after implantation to provide an optically correct lens; said central portion having a cross-sectional dimension substantially less than that of the natural lens wherein said haptic loops are configured such that said central portion is centered upon implantation and remains centered during expansion thereof; thus improving the vision of the patient.

4,734,096

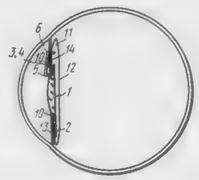
INTRAOCULAR PROSTHETIC LENS

Nikolai M. Sergienko, and Zoya F. Veselovskaya, both of Kiev, U.S.S.R., assignors to Gosudarstvenny Institut Usovershenstvovania Vrachei, Kiev, U.S.S.R.

Filed Feb. 5, 1987, Ser. No. 11,313

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **1 Claim**



1. An intraocular prosthetic lens, comprising:

an optic lens having a principal plane, an anterior surface, and a posterior surface;

a first supporting element secured on said optic lens and shaped as a loop;

a second supporting element, secured on said optic lens diametrically opposite with respect to said first supporting element and having a first and a second rod, both featuring a vacant end;said first and said second rods having a first bend spaced somewhat apart from said anterior surface of said optic lens; past said first bend said first and second rods are parallel to each other and are facing towards said posterior surface of said optic lens; said first and said second rods have a second bend coplanar with said principal plane of said optic lens, past which bend said vacant ends of said first and said second rod are directed oppositely to each other.

4,734,097

MEDICAL MATERIAL OF POLYVINYL ALCOHOL AND PROCESS OF MAKING

Tatsuzo Tanabe, Sapporo, and Masao Nambu, Yokohama, both of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 421,913, Sep. 23, 1982, abandoned. This application Mar. 28, 1985, Ser. No. 716,840

Claims priority, application Japan, Sep. 25, 1981, 56-150549; Oct. 8, 1981, 56-159506

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.⁴ B29C *35/16*

U.S. Cl. 623—11 **11 Claims**

1. The process of preparing a product suitable for medical use composed of a water-insoluble hydrogel having a high water content which comprises preparing an aqueous solution containing not less than 6 weight percent of a polyvinyl alcohol having a degree of hydrolysis of not less than 97 mole percent and an average polymerization degree of not less than 1100, pouring said aqueous polyvinyl alcohol solution into a desired shape of a vessel or mold, freeze-molding said poured aqueous polyvinyl alcohol solution at a temperature below −5° C., and thereafter partially dehydrating the resultant molded product without appreciable thawing thereof to a dehydration percentage of not less than 5 weight percent.

4,734,098

METHOD FOR BLEACHING COTTON

Robert B. Wilson, Greenville, S.C., assignor to Crucible Chemical Company, Greenville, S.C.

Filed Nov. 22, 1985, Ser. No. 800,727

Int. Cl.⁴ D06L *3/02, 3/14*

U.S. Cl. 8—111 **17 Claims**

1. A method for bleaching cotton substrates comprising the steps of:

(a) immersing unbleached cotton substrate in an aqueous solution of hydrogen peroxide at pH 4.5–11 at 15°–90° C. to saturate the cotton substrate with the aqueous solution of hydrogen peroxide;

(b) removing the thus-saturated cotton substrate from the aqueous solution of hydrogen peroxide and removing from the substrate aqueous hydrogen peroxide solution in excess of 50–500% pick-up by weight;

(c) transferring the resulting cotton substrate saturated with 50–500% by weight of aqueous hydrogen peroxide solution to a bath of an inert high boiling organic heating medium, maintained at a temperature between 100° C. and the boiling point or decomposition point of the organic heating medium, for 5 sec-20 min; and

(d) removing the cotton substrate from the high boiling organic heating medium and separating entrained organic heating medium from the cotton substrate.

4,734,099

ELASTOMERIC SILICONE DEPILATORY

Guy Cyprien, L'Hay les Roses, France, assignor to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Mar. 5, 1986, Ser. No. 836,471

Claims priority, application France, Mar. 5, 1985, 85 03178

Int. Cl.⁴ A61K *7/155*

U.S. Cl. 8—160 **9 Claims**

1. A process for the removal of unwanted hair from predetermined skin area, comprising the steps of (a) applying to said skin area an effective depilating amount of a coating of a curable organopolysiloxane composition comprising (i) a diorganopolysiloxane polymer containing at least 2 vinyl radicals bonded to silicon atoms per molecule and having a viscosity of at least 50 mPa.s at 20 C., (ii) a diorganopolysiloxane polymer containing at least 3 hydrogen atoms bonded to silicon atoms per molecule and having a viscosity of at lesat 50 mPa.s at 20 C., (iii) a filler, and (iv) a metal catalyst wherein components (i)–(iv) are present in amounts sufficient to produce a composition which is effective for the removal of hair; (b) permitting said organopolysiloxane composition to crosslink into a silicone elastomer and embed unwanted hair therein; and (c) stripping the silicone elastomer and embedded hair from said skin area, whereby said skin area is essentially depilated.

4,734,100

PROCESS FOR PRINTING OR DYEING CELLULOSE-CONTAINING TEXTILE MATERIAL

Hans-Ulrich Berendt, Allschwil, and Martin Kuhn, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1987, Ser. No. 46,963

Claims priority, application Switzerland, May 16, 1986, 1990/86

Int. Cl.⁴ D06P *1/52, 3/66*; C09B *62/00*

U.S. Cl. 8—477 **17 Claims**

1. A process for printing or dyeing cellulose-containing textile material with reactive dyes by printing or dyeing the textile material with a foamed, aqueous preparation and fixing the dyes through the action of heat, the preparation containing a reactive dye, a foaming agent, a fixing alkali, a homopolymer or copolymer of acrylamide or methacrylamide or a graft polymer which is obtainable from an addition product of an alkylene oxide onto an at least trihydric aliphatic alcohol having 3 to 10 carbon atoms and acrylamide or methacrylamide, wherein the preparation additionally contains the acid ester of a homopolymer having an average molecular weight of 300 to 3,500 of an ethylenically unsaturated aliphatic monocarboxylic or dicarboxylic acid and a polyethylene glycol, a terminal hydroxyl group of the glycol having been etherified with an aliphatic monoalcohol having at least 4 carbon atoms.

4,734,101

RED BENZOTHIAZOLE MONOAZO DYE FOR POLYESTER FIBER, MIXED DYE CONTAINING THE SAME, AND METHOD OF DYEING POLYESTER FIBER USING THE SAME

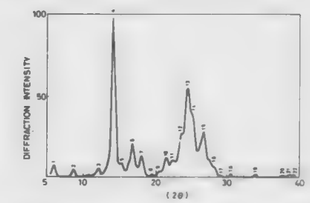
Kiyoshi Himeno; Junji Yoshihara, and Masateru Ishida, all of Kitakyu..hu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,964

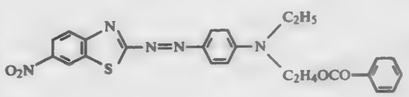
Claims priority, application Japan, Dec. 30, 1985, 60-298484

Int. Cl.⁴ C09B *29/04, 67/22*

U.S. Cl. 8—524 **9 Claims**



1. A monoazo dye for polyester fiber represented by formula (I)



(I)

and having a crystal modification characterized by an X-ray diffraction spectrum (CuKα) showing a very strong peak at an angle of diffraction (2θ) of about 14.2°, a strong peak at about 24.5°, and four weak peaks at about 16.9°, 23.6°, 25.3°, and 26.8°.

4,734,102

PROCESS FOR CONCENTRATING A SUSPENSION

Henricus A. C. Thijssen, Son (N.B.), and Gerardus J. Arkenbout, Zeist, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast Naturuwetenschappelijk Onderzoek, The Hague, Netherlands

Division of Ser. No. 756,939, Jul. 19, 1985, which is a continuation of Ser. No. 506,336, Jun. 21, 1983, abandoned. This application Feb. 4, 1987, Ser. No. 11,066

Claims priority, application Netherlands, Jun. 22, 1982, 8202517

Int. Cl.⁴ B01D *9/00, 9/04*

U.S. Cl. 23—296 **12 Claims**

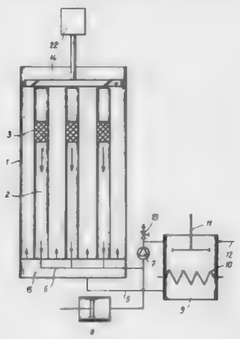
1. A process for concentrating a suspension, comprising the steps of:

(a) providing a closed, hollow cylindrical column having a central axis therethrough, said column having an interior with a cross-section, perpendicular to said axis, that is constant along said axis, and said column having at least one tube axially disposed therein, extending from one end of said column toward the opposite end thereof, said at least one tube having an outer wall of constant diameter and at least one filter in said wall near said opposite end, forming the only direct communication between the interior column and the interior of the tubes;

(b) supplying suspension to one end of the column;

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(c) removing concentrated suspension at said opposite end of the column;
(d) removing liquid passed through said filter from the interior of each said tube;
(e) controlling the relative rates of supplying suspension and removing concentrated suspension for maintaining a packed bed of concentrated suspension in said interior that



extends axially from a position between said filter and said one end toward said opposite end; and
(f) imparting pressure to the liquid of said suspension for urging said liquid through said packed bed toward said filter, whereby the presence of the packed bed results in a liquid pressure differential between said one end and said filter, said pressure differential imparting a force on the packed bed toward said opposite end.

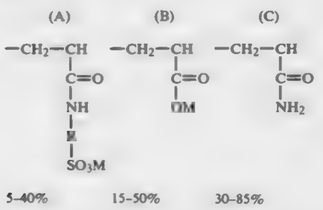
4,734,103

VISCOSITY/DRAG REDUCING ADDITIVE FOR HIGH SOLIDS BLACK LIQUOR

Dodd W. Fong, Naperville; Daniel V. Diep, Aurora, and Ralph W. Kaesler, Barrington, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 22, 1987, Ser. No. 76,440
Int. Cl.[4] C10L *1/24, 1/32*
U.S. Cl. 44—51 **2 Claims**

1. A high solids black liquor having the property of reduced turbulent flow/drag comprising a high solids black liquor which has a solid content of at least 60% by weight and which contains a few parts per million of a water soluble terpolymer containing the following repeating units in the following mole percentages:



wherein R is a lower alkyl group having from 1–6 carbon atoms, M is H, NH_4 or alkali metal, said terpolymer having a Reduced Specific Viscosity of at least 25, said terpolymer being present in an amount sufficient to reduce the viscosity of the black liquor.

4,734,104

COATED ABRASIVE PRODUCT INCORPORATING SELECTIVE MINERAL SUBSTITUTION

David E. Broberg, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 721,869, Apr. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 608,480, May 9, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 852,096
Int. Cl.[4] C09C *1/68*
U.S. Cl. 51—295 **16 Claims**

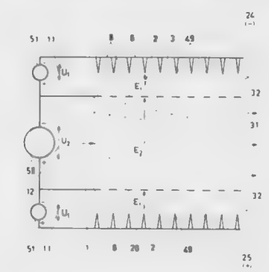
1. A coated abrasive product having a specified nominal grade of abrasive granules firmly adherently bonded to a sheet backing, the particle size of said granules ranging from fine to coarse, said granules consisting essentially of at least two types of mineral, one of said types being present as a minor portion and demonstrably superior to an equivalent grade of the other (inferior) type in the abrading operation for which said coated abrasive product is intended to be used, most of said superior mineral being concentrated in the coarse portion, whereby said coated abrasive product significantly outperforms a coated abrasive product that is identical except that either (a) it contains only inferior mineral or (b) the same minor amount of superior mineral is distributed throughout the fine to coarse particle size range in the same proportions as is the inferior mineral.

4,734,105

PROCESS AND DEVICE FOR THE REMOVAL OF SOLID OR LIQUID PARTICLES IN SUSPENSION FROM A GAS STREAM BY MEANS OF AN ELECTRIC FIELD

Baldur Eliasson, Birmenstorf; Marcel Escudier, Mönthal; Michael Hirth, Unterentfelden, and Jakob Keller, Dottikon, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Dec. 17, 1985, Ser. No. 809,787
Claims priority, application Switzerland, Dec. 21, 1984, 6130/84
Int. Cl.[4] B03C *3/08, 3/01, 3/41*
U.S. Cl. 55—5 **27 Claims**



1. A process for the removal of solid or liquid particles in suspension in a gas stream loaded with said particles and having a flow direction and cross-section, comprising the steps of:
charging the suspended particles in a bipolar manner approximately half positively and half negatively;
applying a homogeneous electric field independent of said charging step transverse to the flow direction to produce a migration of the charged suspended particles so that the charged suspended particles move toward and concentrate in a neutralization zone spatially separate from the charging of the suspended particles where said charged suspended particles agglomerate and coagulate and at least partially neutralize their respective charges, whereby both suspended particle-enriched and suspended particle-depleted partial gas streams are formed; and

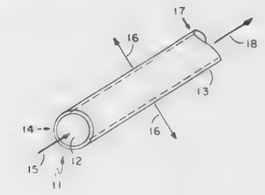
separating the suspended particle-enriched and suspended particle-depleted partial gas streams from each other.
12. A device for the removal of solid or liquid particles in suspension in a gas stream having a flow direction, comprising:
means for charging approximately one half of the particles suspended in the gas stream positively, and the other half negatively;
means for applying a homogeneous electric field unaffected by and independent of said means for charging transverse to the flow direction of the gas stream including the charged particles so that in a neutralization zone spatially separate from said means for charging a particle enrichment in a partial gas stream occurs and outside the neutralization zone an associated partial stream of cleaned gas occurs; and
means for branching off and withdrawal of a selected one of the particle-enriched partial gas stream and the associated partial stream of cleaned gas.

4,734,106

GAS SEPARATING

Arye Gollan, Newton, Mass., assignor to A/G Technology Corporation, Needham, Mass.

Filed May 8, 1985, Ser. No. 731,992
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **7 Claims**



1. A method of gas separating with membranes having a skin side and a non-skin side which method includes the steps of,
directing a feed gas having a plurality of components tangentially along the non-skin side of said membrane to cause a component of said feed gas to permeate through said membrane,
and withdrawing the permeated gas component.

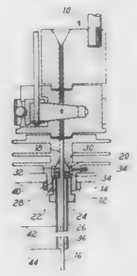
4,734,107

METHOD AND DEVICE FOR THE DIRECT ON-COLUMN INJECTION OF SAMPLES CONTAINING HIGH BOILING POINT AND/OR MEDIUM VOLATILE COMPOUNDS

Sorin Trestianu, Bruxelles, Belgium; Fausto Munari, Milan, Italy; Giovanni Ostan, Milan, Italy, and Carlo Saravalle, Milan, Italy, assignors to Carlo Erba Strumentazione S.p.A., Milan, Italy

Filed Jan. 8, 1986, Ser. No. 817,195
Claims priority, application Italy, Feb. 21, 1985, 19601 A/85
Int. Cl.[4] B01D *15/08*
U.S. Cl. 55—67 **21 Claims**

1. A method for the direct non-vaporizing on-column injection of samples containing high boiling point and/or medium volatile components dissolved in volatile solvents, by means of an apparatus for gas chromatographic analysis comprising an oven which houses a gas chromatography column whose upstream end is fitted directly, or by a precolumn, to a non-vaporizing direct on-column injector, the method characterized in that:
(a) the oven temperature is maintained at least 50° C. above the solvent boiling point;
(b) the sample and solvent are injected at a point along a tract of the column, or precolumn, within the oven while being cooled by a cooling system in operation during injection wherein the cooling system maintains the tract of the column or precolumn at a temperature sufficiently low to maintain therein the high boiling point and/or medium



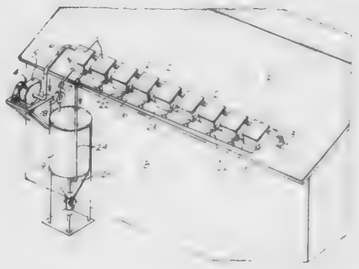
volatile compounds to be analyzed, and wherein the tract of the column or precolumn is cooled for at least 10 cm along the length thereof.

4,734,108

GAS SCRUBBING APPARATUS AND PROCESS

James P. Cox, and Kelly K. Cox, both of 246 E. Bartlett Rd., Lynden, Wash. 98264

Filed May 31, 1985, Ser. No. 739,647
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—84 **42 Claims**



1. A process for scrubbing polluted gas which comprises providing a predetermined gas flow path having therein two closely-spaced, resilient vibratory sheet means disposed in generally parallel relationship and generally parallel to such gas flow path for forming a narrow slit between the sheet means, moving gas through such slit and thereby effecting vibration of the vibratory sheet means, and supplying scrubbing liquid to such polluted gas moving through such gas flow path.

4,734,109

EFFLUENT TREATMENT APPARATUS AND METHOD OF OPERATING SAME

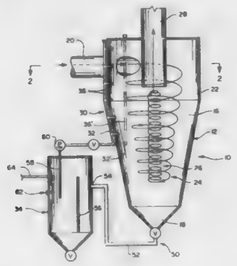
James P. Cox, 246 E. Bartlett Rd., Lynden, Wash. 98264

Continuation of Ser. No. 336,762, Jan. 4, 1982, abandoned. This application Sep. 6, 1985, Ser. No. 773,416
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—92 **55 Claims**

1. A method for scrubbing a gaseous effluent stream with a liquid, said method comprising the steps of:
a. introducing a gaseous effluent stream to be conditioned to a treatment zone of a gas liquid scrubber; and,

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b. spraying a conditioning-effective amount of a liquid conditioning agent into the gaseous effluent stream within said treatment zone in conditioning interaction therewith through at least one fluid injection nozzle having a flexible discharge tube with an effective length at least equal to the characteristic wavelength for flexural resonant thereof



when liquid conditioning agent issues therefrom under force-coupled conditions and corresponding to at least one harmonic wavelength of the coupled liquid stream comprised of the liquid conditioning agent as the same is conducted through said tube so as to scrub the gaseous effluent stream.

4,734,110

METHOD AND APPARATUS FOR REMOVING SOLIDS FROM PRESSURIZED PROCESS SYSTEM

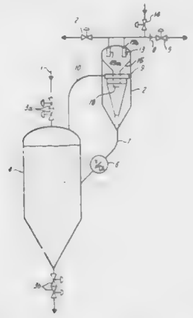
Ulrich Premel, Gummersbach, and Ralf U. Hartermann, Wiehl, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach and VEW Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 720,038, Apr. 5, 1985, abandoned. This application Mar. 5, 1987, Ser. No. 21,974

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3412930

Int. Cl.⁴ B01D *46/04*

U.S. Cl. 55—96 **11 Claims**



1. A method of removing dust-like or dust containing solid material from a process system pressurized by a process gas; said method including the steps of:

conveying solid material together with process gas to a solid material receiving tank;

closing off said solid material receiving tank filled with said solid material from said process system and relieving the pressure of said process gas in said pressurized solid material receiving tank to a nearly normal pressure via filter cartridges of sintered material extending longitudinally in a cartridges tank, the process gas entering said filter cartridges from a mantle surface thereof and leaving the filter cartridges at one end thereof practically free of solid material;

removing said solid material from said solid material receiving tank; pressurizing said solid material receiving tank via said filter cartridges with process gas from said process system to the pressure of said process system, said process gas for pressurizing entering said filter cartridges at said one end thereof and leaving it through said mantle surface thereof, while at the same time cleaning said filter cartridges;

connecting said solid material receiving tank to said process system after equalizing said pressure via said filter cartridges and conveying said solid material from said process system into said solid material receiving tank; and

successively repeating the aforementioned steps.

4,734,111

PROCESS AND APPARATUS FOR CLEANING STYRENE-POLLUTED SPENT AIR

Rainer Hoffmann, Blumenstr. 7, and Günter Hanisch, Burgstr. 65, both of D-7527 Kraichtal-Menzingen, Fed. Rep. of Germany

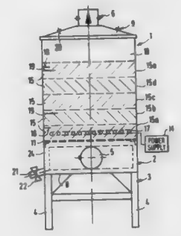
PCT No. PCT/EP85/00696, § 371 Date Aug. 19, 1986, § 102(e) Date Aug. 19, 1986, PCT Pub. No. WO86/03689, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 12, 1985, Ser. No. 905,339

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447274

Int. Cl.⁴ B01D *46/00*

U.S. Cl. 55—97 **18 Claims**



1. Process for the cleaning of spent air, which has been polluted by solvent vapours occurring during plastic processing, comprising removing the spent air by suction and humidifying the spent air and then passing the spent air through a filter of bark having microorganisms, the filter being temperature controlled to a temperature above room temperature.

4,734,112

LIQUID MEMBRANE

Koichi Okita; Shinichi Toyooka; Shigeru Asako, and Katsuya Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,602

Claims priority, application Japan, Sep. 28, 1984, 59-205329

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 55—158 **11 Claims**

1. A liquid membrane comprising a solvent, an active species capable of enhanced transport of a specific gas, and a support for maintaining a liquid body which has a mixture of said solvent and active species dissolved therein, wherein said support is a porous polytetrafluoroethylene film, one surface of which is hydrophobic and the other surface of which is hydrophilic.

4,734,113

ATTACHMENT DEVICE FOR AIR CLEANER CASE IN ENGINES

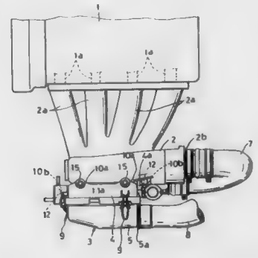
Akinobu Takagi, Kanagawa, and Yohji Kurotobi, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,672

Claims priority, application Japan, May 14, 1985, 60-70031[U]

Int. Cl.⁴ B01D *46/10*

U.S. Cl. 55—504 **9 Claims**



4. In combination with an air cleaner, an attachment device for attaching said air cleaner case in a vertical attitude on a vertical portion of an intake manifold of an engine for supplying air cleaned within said air cleaner to said intake manifold, comprising, upper and lower attachment means on said air cleaner, upper and lower seat means on said intake manifold for engaging said upper and lower attachment means, respectively, and connecting means requiring only vertical movement for connecting said attachment means to said seat means.

4,734,114

CONTROLLING METHOD OF AIR SEPARATOR

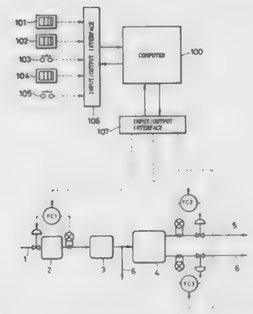
Yasuo Tasaka, and Tadashi Satono, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 931,999

Claims priority, application Japan, Nov. 22, 1985, 60-261040

Int. Cl.⁴ F25J *3/04*

U.S. Cl. 62—37 **4 Claims**



1. A method of controlling an air separator comprising:

calculating a product quantity that can be collected by use of a predetermined maximum raw air quantity that can be supplied and by use of an operating condition of a bubble tower;

comparing an input value of a necessary product quantity with said product quantity that can be collected;

setting said necessary product quantity as a product formation quantity when said necessary product quantity is smaller than, or equal to, said product quantity that can be collected;

outputting said product formation quantity as a set value for a product formation quantity adjusting device;

calculating a necessary raw air quantity by use of said set value for said product formation quantity adjusting device and said operating condition of said bubble tower;

outputting said necessary raw air quantity as a set value for a raw air quantity adjusting device;

setting said product quantity that can be collected as said product formation quantity when said necessary product quantity is greater than said product quantity that can be collected;

outputting said product formation quantity as a set value for a product formation quantity adjusting device; and

outputting said maximum raw air quantity as a set value for a raw air quantity adjusting device.

4,734,115

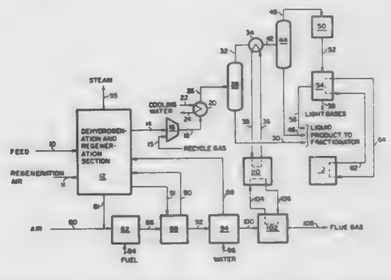
LOW PRESSURE PROCESS FOR C_3^+ LIQUIDS RECOVERY FROM PROCESS PRODUCT GAS

Lee J. Howard, Emmaus, and Howard C. Rowles, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 24, 1986, Ser. No. 843,322

Int. Cl.⁴ F25J *1/02*

U.S. Cl. 62—40 **13 Claims**



1. A process for the separation and recovery of C_3^+ liquid hydrocarbons from a process product stream having high concentrations of lighter components, which comprises the steps of:

(a) compressing said process product stream to a pressure of about 75 to 250 psia, unless already compressed to a pressure of about 75 to 250 psia;

(b) cooling said compressed product stream thereby condensing a first portion of the C_3^+ hydrocarbons in the product stream;

(c) separating out the first portion of condensed C_3^+ hydrocarbons from the product stream;

(d) further cooling the remaining product stream by heat exchange with a circulating refrigerant produced by an absorption refrigeration cycle, said absorption refrigeration cycle utilizing low level recovered heat from the process generating the process product stream, thereby condensing a second and large portion of the C_3^+ hydrocarbons in the product stream;

(e) separating out the second and large portion of condensed C_3^+ hydrocarbons from the product stream;

(f) drying the remaining product stream in a drier to remove any impurities which would freeze out in a low temperature recovery unit; and

(g) feeding the dried remaining product stream to a low temperature recovery unit thereby cooling the dried remaining product stream, condensing at least a portion of any remaining C_3^+ hydrocarbons, separating out and removing said portion of said C_3^+ hydrocarbons, and

VOL 1088 ISS 5 MR 29 1988 UMI

removing a waste stream consisting essentially of lighter components.

4,734,116

METHOD AND APPARATUS FOR GENERATING AN ICE CRYSTAL SUSPENSION

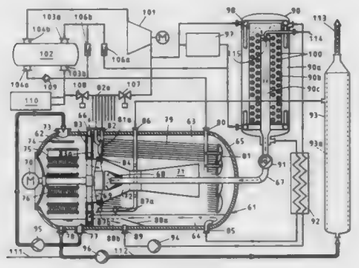
Christian Ehrsam, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 15, 1987, Ser. No. 38,856

Claims priority, application Switzerland, Apr. 23, 1986, 1646/86-1

Int. Cl.⁴ B01D *9/04*

U.S. Cl. 62—532 **20 Claims**



1. A method of generating an ice crystal suspension comprising the steps of

compressing a flow of water vapor;

admixing a water-soluble additive having a lower boiling point than water with the compressed vapor to obtain a mixture of water and additive;

cooling the mixture in heat exchange relation with a flow of coolant to a triple point thereof;

condensing the cooled mixture and at least partially freezing the mixture to obtain a heterogeneous mixture of ice particles and liquid; and

thereafter freeze-drying at least a portion of the mixture of ice particles and liquid at the triple point thereof to form an ice crystal suspension.

4,734,117

OPTICAL WAVEGUIDE MANUFACTURE

Peter J. Pilon, Nepean, and Richard S. Lowe, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 745,778, Jun. 17, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 42,567

Claims priority, application Canada, Mar. 19, 1985, 476844

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.⁴ C03P *37/018*

U.S. Cl. 65—3.12 **6 Claims**

1. A method of manufacturing optical waveguides comprising:

depositing a layer of particulate silica on an outer surface of a fused silica cylindrical support tube having a central bore;

drying the deposited silica;

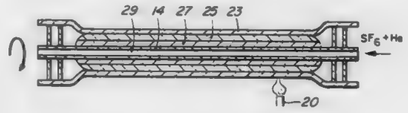
consolidating the dried, deposited silica;

depositing another layer of particulate silica on the dried consolidated silic. to form a preform having a porous outer layer;

placing said preform having a porous outer layer within a second fused silica tube, and drying and fluorine doping said preform having a porous outer layer by passing a fluorine-containing gas through said second fused silica tube and around said preform having a porous outer layer to form a preform having a doped porous outer layer;

consolidating said preform having a doped porous outer layer to form a preform having a doped outer layer and heating said second fused silica tube to collapse it onto said preform having a doped outer layer;

etching away the fused silica cylindrical support tube by



passing a mixture of hexafluoride and helium through the central bore, resulting in a tubular preform composite;

collapsing said composite tubular preform into a rod preform; and

heating said rod preform to a drawing temperature and drawing it into an optical waveguide, said waveguide having a core and a cladding derived from deposited silica, with the cladding being doped with fluorine.

4,734,118

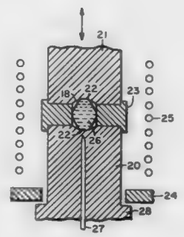
PROCESS TO MOLD PRECISION GLASS ARTICLES

Jean-Pierre Marechal, Grez-sur-Loing, France, and Richard O. Maschmeyer, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 643,412, Aug. 22, 1984, abandoned, which is a continuation of Ser. No. 515,662, Jul. 20, 1983, Pat. No. 4,481,023, which is a continuation of Ser. No. 316,861, Oct. 31, 1981, abandoned. This application Apr. 10, 1986, Ser. No. 850,180

Int. Cl.⁴ C03B *11/00*

U.S. Cl. 65—102 **9 Claims**



1. A method of molding a precision glass optical transmission element comprising:

providing a ring-like member having first surface portions defining a first cavity extending therethrough;

providing first and second and mold means having molding surface portions cooperable with said first surface portions defining opposed end portions for said first cavity to form an enclosed mold cavity of fixed volume;

providing a glass preform to be molded to said mold cavity when open; and

pressing the glass preform while it is hot enough to reform and while it is in contact with said molding surface portions and the ring-like member surface portions, to form said optical element within said enclosed mold cavity while maintaining a free surface on such element not constrained by any surface of the mold cavity upon completion of said pressing.

4,734,119

NOVEL PHOSPHORUS COMPOUNDS FOR PROTECTING CULTIVATED PLANTS FROM THE PHYTOTOXIC ACTION OF HERBICIDES

Peter J. Diel, Riehen, and Ludwig Maier, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

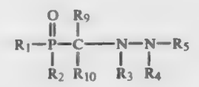
Filed Nov. 8, 1984, Ser. No. 669,412

Claims priority, application Switzerland, Nov. 15, 1983, 6135/83; Jun. 6, 1984, 2748/84

Int. Cl.⁴ A01N *57/04;* **C07C** *125/065;* **C07F** *9/02, 9/28*

U.S. Cl. 71—86 **6 Claims**

1. A composition for protecting a cultivated plant of cereal, maize, rice or sorghum from the phytotoxic action of a haloacetanilide herbicide, containing an inert carrier and an effective safening amount of a compound of the formula



wherein

R_1 and R_2 are each independently hydroxy, C_1–C_4alkyl, phenyl, naphthyl, C_1–C_4alkoxy, C_2–C_4alkenyloxy, C_2–C_4alkynyloxy, C_2–C_4haloalkoxy containing 1 to 5 halogen atoms, C_2–C_8alkoxyalkoxy, C_1–C_4cyanoalkoxy, phenyl-C_1–C_4-alkyl, halophenyl-C_1–C_4-alkyl, cyanophenyl-C_1–C_4-alkyl, nitrophenyl-C_1–C_4-alkyl, C_1–C_4-alkylphenyl-C_1–C_4-alkyl, phenyl-C_1–C_4-alkoxy, halophenyl-C_1–C_4-alkoxy, cyanophenyl-C_1–C_4-alkoxy, nitrophenyl-C_1–C_4-alkoxy, C_1–C_4-alkylphenyl-C_1–C_4-alkoxy, naphthyl-C_1–C_4-alkoxy, halonaphthyl-C_1–C_4-alkoxy, cyanonaphthyl-C_1–C_4-alkoxy, nitronaphthyl-C_1–C_4-alkoxy or C_1–C_4-alkylnaphthyl-C_1–C_4-alkoxy,

R_3 is $—COCX_1X_2—R_6$ or an alkenoyl radical which is substituted by 1 to 3 halogen atoms and contains 2 to 4 carbon atoms in the alkenyl moiety,

R_4 is hydrogen or a substituent as defined for R_3, or is a $—COOR_7$ or $—COR_8$ radical or a C_1–C_4alkyl or C_2–C_4alkenyl radical, or is a phenyl-C_1–C_4-alkyl radical which is unsubstituted or substituted in the phenyl ring by halogen, cyano, nitro or C_1–C_4alkoxy,

R_5 is hydrogen or a C_1–C_4alkyl, C_2–C_4alkenyl or C_2–C_4alkynyl radical,

R_6 is hydrogen, halogen or a C_1–C_6alkyl radical,

R_7 is a C_1–C_4alkyl radical or a phenyl-C_1–C_4-alkyl radical which is unsubstituted or substituted in the phenyl ring by halogen, cyano, nitro or C_1–C_4alkoxy,

R_8 is a C_1–C_4alkyl, C_2–C_4alkenyl, or C_2–C_4alkynyl radical, or is a phenyl or phenyl-C_1–C_4-alkyl radical which is unsubstituted or substituted by halogen, cyano, nitro or C_1–C_4alkoxy,

R_9 is hydrogen, C_1–C_4alkyl, or phenyl which is unsubstituted or substituted by halogen, cyano, nitro or C_1–C_4alkoxy,

R_{10} is hydrogen or C_1–C_4alkyl and

X_1 and X_2 are each halogen or one of X_1 and X_2 is also hydrogen.

4,734,120

DIPEPTIDES CONTAINING C-TERMINAL PHOSPHINOTHRICIN, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Heinz Kehne, Hofheim am Taunus; Klaus Bauer, Rodgau, and Hermann Bieringer, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

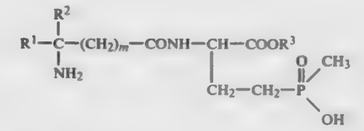
Filed Dec. 12, 1986, Ser. No. 940,959

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544376

Int. Cl.⁴ A01N *57/26;* **C07F** *9/02*

U.S. Cl. 71—87 **4 Claims**

1. A compound of the formula I



(I)

in which

R^1 and R^2 independently of one another denote hydrogen, (C_1–C_{12})-alkyl, (C_3–C_8)-cycloalkyl, phenyl, benzyl or phenethyl, it being possible for the groups mentioned to be substituted in turn by halogen, NH_2, OH, SH, NO_2, (C_1–C_4)-alkoxy, (C_1–C_4)-alkylthio, CF_3, (C_1–C_4)-alkoxycarbonyl, COOH or $CONH_2$, or

R^1 and R^2 together denote an alkylene chain of 2–7 carbon atoms,

R^3 denotes hydrogen or (C_1–C_{12})-alkyl and

m denotes 0, 1, 2 or 3,

and the salts thereof with bases and acids.

3. A composition for controlling weeds, which contains an effective amount of the compound of the formula I as claimed in claim 1 in combination with an herbicidally acceptable carrier.

4. A process for controlling undesirable plant growth, which comprises applying an effective amount of a compound of the formula I as claimed in claim 1 to the plants to be controlled and/or to the area to be treated, using the pre-sowing, pre-emergence or post-emergence technique.

4,734,121

CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Kell, Freinsheim; Rainer Becker, Bad Durkheim; Norbert Goetz, Worms; Dieter Jahn, Edingen-Neckarhausen; Wolfgang Spiegler, Worms, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 543,236, Oct. 18, 1983, Pat. No. 4,668,275. This application Nov. 24, 1986, Ser. No. 933,902

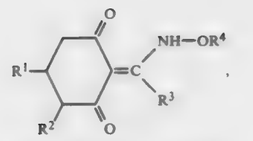
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239071

Int. Cl.⁴ A01N *43/00;* **C07D** *317/54*

U.S. Cl. 71—88 **6 Claims**

1. A cyclohexane-1,3-dione derivative of the formula

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(I)

where R^1 is hexahydrobenzo-1,3-dioxolyl, R^2 is hydrogen, methoxycarbonyl, ethoxycarbonyl, methyl or cyano, R^3 is C_1–C_4-alkyl and R^4 is C_1–C_3-alkyl, C_3–C_4-alkenyl, C_3–C_4-haloalkenyl containing 1 to 3 halogen substituents, or propargyl, or a salt thereof.

6. A process for combating the growth of unwanted plants, wherein the unwanted plants and/or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a cyclohexane-1,3-dione derivative of the formula I as defined in claim 1.

4,734,122

SUBSTITUTED 5-ACYLAMINO-1-PHENYLPYRAZOLES COMPOSITION CONTAINING THEM, AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring; Jörg Stetter, both of Wuppertal; Otto Schallner, Monheim; Ludwig Eue, Leverkusen; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

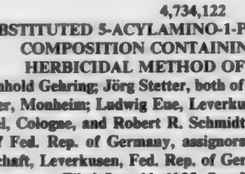
Filed Jun. 11, 1985, Ser. No. 743,459

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423582

Int. Cl.[4] **A01N** *43/56;* **C07D** *231/40*

U.S. Cl. 71—92 **9 Claims**

1. A 5-acylamino-1-phenylpyrazole of the formula



in which

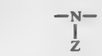
R is cyano or aminocarbonyl, or alkoxycarbonyl, alkenyloxycarbonyl, alkinyloxycarbonyl, alkylaminocarbonyl, alkenylaminocarbonyl or alkinylaminocarbonyl, each of which has up to 4 carbon atoms in the individual alkyl, alkenyl or alkinyl parts,

R^1 is alkyl, alkenyl, alkinyl, alkoxyalkyl or alkylthioalkyl each of which has up to 6 carbon atoms in the individual alkyl or alkenyl or alkinyl parts, or is halogenoalkyl having 1 to 6 carbon atoms and 1 to 9 identical or different halogen atoms or is cycloalkyl having 3 to 7 carbon atoms, or aryl which has 6 to 10 carbon atoms and is optionally substituted by halogen, cyano, nitro, and/or alkyl, alkoxy, alkylthio or alkoxycarbonyl, each of which has up to 4 carbon atoms in the individual alkyl parts, or in the case in which Y represents the

group, also may be hydrogen,

X represents oxygen or sulfur,

Y represents oxygen, sulfur or the



group,

Z is hydrogen or alkyl, alkoxy, alkenyl or alkinyl, each of which has up to 4 carbon atoms, or is aryl which has 6 to 10 carbon atoms and is optionally substituted by those substituents mentioned in the case of R^1,

R^2 is hydrogen or the radical



and

R^3, R^4, R^5, R^6 and R^7 each independently is hydrogen, fluorine, chlorine, bromine, iodine or nitro, or alkyl, alkoxy, alkylsulphonyl or alkoxycarbonyl, each of which has up to 4 carbon atoms in the particular alkyl parts, or is $—(X')_n—R^8$,

X′ is oxygen, sulphur, sulphinyl or sulphonyl,

n is 0 or 1, and

R^8 is halogenoalkyl having up to 4 carbon atoms and up to 9 halogen atoms,

with the provisos that

(1) at least one of R^3, R^4, R^5, R^6 and R^7 is $—(X')_n—R^8$,

(2) when R is aminocarbonyl or alkoxycarbonyl and Y is oxygen, then R^5 is not haloalkyl, and

(3) when R is cyano and Y is oxygen, then n is 1.

8. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,734,123

NOVEL SULFONAMIDES AND METHOD OF MAKING

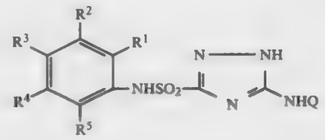
William T. Monte, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1986, Ser. No. 860,159

Int. Cl.[4] **A01N** *43/653;* **C07D** *401/12, 249/12, 249/14*

U.S. Cl. 71—92 **11 Claims**

1. A compound having the formula



wherein Q is H or COX, X represents H, C_1–C_4 alkyl or phenyl, R^1 through R^5 individually represent H or from 1 to 3 substituents chosen from C_1–C_4 alkyl or halo substituted alkyl, halo, $—NO_2$, —Ar, —OAr, $—CF_3$, $—OCF_3$, $—OCF_2CF_2H$, $—OCF_2CCl_2H$, $—OCH_2CF_3$, $—SO_2CF_3$, $—SO_2CF_2CF_2H$, $—SO_2CF_2CCl_2H$, $—SO_2R^6$, $—COOR^6$, —CONH 2, $CONHR^7$, $—CONR^7(R^8)$, $—SO_3R^7$, and $—SO_3CH_2CF_3$, $—SR^6$, $—OR^7$, $—CR^6R^6R6$, and $—NR6R6$, wherein Ar represents substituted or unsubstituted phenyl or pyridyl wherein the substituents are haol, C_1–C_4 alkyl or C_1–C_4 haloalkyl, R^6 represents H, phenyl or C_1–C_4 alkyl, and R^7 and R^8 individually represent C_1–C_4 alkyl.

4,734,124

TETRAZOLINONE HERBICIDES

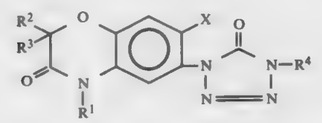
Jun H. Chang, Princeton Junction, and John W. Lyga, Basking Ridge, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 3,449, Jan. 15, 1987, abandoned. This application Apr. 16, 1987, Ser. No. 40,681

Int. Cl.[4] **A01N** *43/84;* **C07D** *413/04*

U.S. Cl. 71—92 **9 Claims**

1. Compound of the formula



in which R^1 is H, alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, haloalkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylsulfonyl, aralkyl, alkylthioalkyl, hydroxy or alkoxy;

R^2 and R^3 are independently H of alkyl;

X is H, Cl or F;

R^4 is alkyl, haloalkyl, alkenyl or alkynyl.

6. An herbicidal composition comprising an herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

4,734,125

5-ACYLAMIDO-1-ARYL-PYRAZOLES, COMPOSITION CONTAINING THEM AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

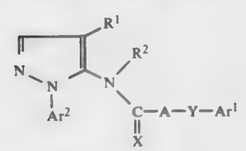
Filed Jan. 8, 1987, Ser. No. 1,471

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600950

Int. Cl.[4] **A01N** *43/56;* **C07D** *231/38*

U.S. Cl. 71—92 **11 Claims**

1. A 5-acylamido-1-arylpyrazole of the formula



in which

R^1represents hydrogen, nitro, fluorine, chlorine, bromine or iodine,

R^2 represents hydrogen or straight-chain or branched alkyl having 1 to 12 carbon atoms,

X represents oxygen or sulphur,

Y represents oxygen, sulphur, a sulphinyl group or a sulphonyl group,

A represents a straight-chain or branched, optionally singly or multiply, identically or differently, halo-substituted alkylene bridge having 1 to 6 carbon atoms,

Ar^1 represents phenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidyl, 4-pyrimidyl, 5-pyrimidyl, 3-pyridazinyl, 4-pyridazinyl, pyrazinyl or s-triazinyl, each optionally substituted by at least one of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkoxy carbonyl having 1 to 4 carbon atoms in each of the alkyl parts, in each case straight-chain or branched haloalkyl or haloalkoxy having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms in each case, or a $—S(O)_m—R^4$ radical,

R^4 represents amino, in each case straight-chain or branched alkyl, alkylamino, dialkylamino or haloalkyl having 1 to 4 carbon atoms in each of the individual alkyl parts and, in the case of haloalkyl, having 1 to 9 identical or different halogen atoms and

m represents a number 0, 1 or 2 and

Ar^2 represents phenyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, each optionally substituted by those substituents mentioned for Ar^1.

10. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,734,126

FUNGICIDAL AND PLANT GROWTH-REGULATING NOVEL SUBSTITUTED 1-HYDROXYALKYL-AZOLYL DERIVATIVES

Graham Holmwood; Erik Regel, both of Wuppertal; Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

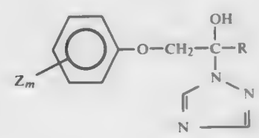
Continuation of Ser. No. 458,086, Jan. 14, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 683,891

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202601

Int. Cl.[4] **C07D** *249/08;* **A01N** *43/653;* **A61K** *31/41*

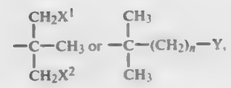
U.S. Cl. 71—92 **11 Claims**

1. A substituted 1-hydroxyalkylazolyl derivative of the formula



in which

R is



X^1 is hydrogen, fluorine, chlorine or bromine,

X^2 is fluorine, chlorine or bromine,

Y is methoxy, ethoxy, methylthio, ethylthio, trifluoromethoxy, vinyl, phenyl or phenyl substituted by a radical selected from the group consisting of fluorine, chlorine and methyl, or is phenoxy or phenoxy substituted by a radical selected from the group consisting or fluorine. chlorine, methyl and phenyl, or is phenylthio or phenylthio substituted by a radical selected from the group consisting of fluorine, chlorine and methyl, and,.

n is 0, 1 or 2,

Z is a halogen atom or an alkyl, cycloalkyl, alkoxy, alkylthio, halogenalkyl, halogenoalkoxy, halogenoalkylthio, optionally substituted phenyl, optionally substituted phenoxy, optionally substituted phenylalkyl or optionally substituted phenylalkoxy group, and

M is 0, 1, 2 or 3,

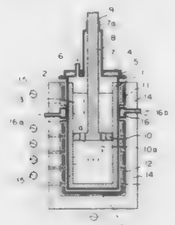
or an addition product thereof with an acid or metal salt.

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4,734,127
PROCESS AND APPARATUS FOR REFINING ALUMINUM

Toshiaki Iuchi, Shizuoka; Kaoru Sugita, Fuji; Eikichi Sagisaka, Shimizu; Norio Tuchihashi; Terumi Kanamori, both of Shizuoka, and Masaharu Sugiyama, Numazu, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,998
Int. Cl.[4] C22B *21/06*
U.S. Cl. 75—10.11 8 Claims



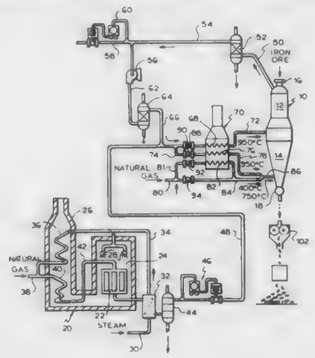
1. In a process for refining aluminum using a segregation solidification process under an atmosphere of positive pressure inert gas and including the steps of pouring molten aluminum into a vessel, heating said vessel to maintain the molten aluminum at an appropriate temperature, partially crystallizing said molten aluminum by a cooling surface area located in said vessel to form primary crystals of aluminum onto said cooling surface area, scraping off the refined and solidified aluminum from said area to form a heap on the bottom of said vessel, tamping the deposited heap to press out the impure liquid existing within the heap of the solidified aluminum upwardly of the level of the tamped aluminum, removing the liquid existing above the thus tamped heap of aluminum, and taking out said tamped aluminum from said vessel, the improvement comprising maintaining an appropriate temperature of the molten aluminum in said vessel by means of a plurality of electric heater means arranged around the periphery of said vessel in vertically superposed relationship to each other, cooling a narrow peripheral portion of the inner surface of said vessel beneath the level of the molten aluminum therein by peripheral cooling means arranged around the periphery of said vessel between adjacent two heater sections to crystallize the molten aluminum onto said peripheral portion of the inner surface of said vessel, scraping off refined and solidified aluminum on said peripheral portion by scraping and tamping means having a cross-sectional configuration substantially complementary to that of the inner surface of said vessel, tamping the heaped aluminum by said scraping and tamping means, and deenergizing some of said heater sections located at positions around the solidified heap of aluminum.

4,734,128
DIRECT REDUCTION REACTOR WITH HOT DISCHARGE

Jorge-Octavio Becerra-Novoa, Apodaca; Ronald-Victor-Manuel Lopez-Gomez, San Nicolas de los Garza; Carlos Dominguez-Ahedo, San Pedro Garza Garcia, and Leobardo Chapa-Martinez, San Nicolas de los Garza, all of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Sep. 23, 1985, Ser. No. 779,390
Int. Cl.[4] C21B *13/02*
U.S. Cl. 75—35 9 Claims

1. A process for producing hot sponge iron from a particulate iron ore in a vertically arranged, moving bed reactor having a reduction zone in the upper portion thereof forming part of a reducing gas loop through which a reducing gas is circulated and a modifying zone in the lower portion thereof for adjusting at least one of the properties of temperature and of carbon content of the sponge iron formed in said reduction zone, which process comprises supplying ore to be reduced to the upper portion of said reducing zone, circulating a first gas stream largely composed of carbon monoxide and hydrogen through said loop, heating said first gas stream before it enters said reducing zone and cooling and de-watering it after it leaves said reducing zone, feeding to said loop a second gas stream comprising make-up gas largely composed of carbon monoxide and hydrogen, removing from said loop a portion of the circulating gas as a third gas stream, heating and then

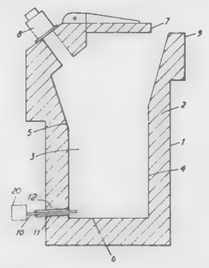


mixing said third stream with a fourth stream of a carbon-containing gas having a temperature below that of said third stream to form a hot carburizing gas mixture causing said mixture to flow upwardly through the modifying zone of the reactor with said mixture having been blended so as to be effective to modify the carbon composition of the sponge iron passing therethrough to between 1% and 4% by weight and to adjust the temperature of the sponge iron to between 600° C. and 900° C., and removing modified hot sponge iron at the bottom of said reactor.

4,734,129
RECOVERY OF METALS FROM THEIR ALLOYS WITH LEAD USING CONSUMMABLE LANCE AND APPARATUS

Robert P. Knight, Strood, England, assignor to Britannia Refined Metals Limited, Gravesend, England

Filed Jun. 10, 1986, Ser. No. 872,916
Claims priority, application United Kingdom, Jun. 10, 1985, 8514587
Int. Cl.[4] C22B *11/00, 30/06, 11/12*
U.S. Cl. 75—63 14 Claims

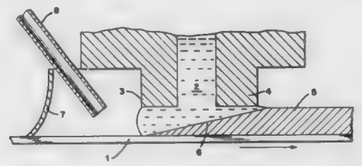


1. A method of recovering a metal selected from the noble metals and bismuth from an alloy containing lead and the metal comprising melting the alloy in a furnace having an interior and an exterior, injecting into the melt a stream of oxygen-containing gas thereby oxidizing the lead to form a lead oxide slag which stream is cooled by an annular shroud of a coolant gas, and removing the slag from the surface of the melt, wherein the oxygen-containing gas and a first coolant gas are injected into the melt through an elongate, consumable lance formed of a first elongate tube for the oxygen-containing gas and a second elongate tube, located annularly about the first tube, for the first coolant gas, wherein the consumable lance extends lengthwise of itself from the interior to the exterior of the furnace through a lance guide tube provided in a wall of the furnace and is capable of being fed lengthwise from the exterior to the interior of the furnace through the guide tube as the lance is consumed in the furnace, and wherein a stream of a second gas is injected through the guide tube into the furnace to seal the lance.

4,734,130
METHOD OF PRODUCING RAPIDLY SOLIDIFIED ALUMINUM-TRANSITION METAL-SILICON ALLOYS

Colin M. Adam, Morristown, N.J.; Kenji Okazaki, Lexington, Ky.; David J. Skinner, Flanders, N.J., and Robert G. Corey, Murrells Inlet, S.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 10, 1984, Ser. No. 639,300
Int. Cl.[4] C22C *1/04*
U.S. Cl. 75—68 A 5 Claims



1. A method for producing aluminum alloy, comprising the steps of:

(a) a carbothermically reducing an aluminous material containing oxides of Al, Si, and transition metals to provide a reduced material;

(b) producing with said reduced material an alloy consisting essentially of the formula $Al_{bal}TM_dSi_e$, wherein "TM" is at least one element selected from the group consisting of Fe Co, Ti, V, Ni, Zr, Cu, Mg and Mn, "d" ranges from about 2–20 wt %, "e" ranges from about 2.1–20 wt % and the balance is aluminum and incidental impurities;

(c) placing said alloy in the molten state; and

(d) rapidly solidifying said alloy at a quench rate of at least about 10^6 K/sec to produce a rapidly solidified alloy in which the microstructure is at least about 50% composed of a microeutectic and/or microcellular structure.

4,734,131
PERMANENT-MAGNETIC MATERIAL

Tomohisa Arai; Naoyuki Sori; Seiki Sato, and Nobuo Uchida, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 21, 1987, Ser. No. 75,996
Claims priority, application Japan, Jul. 23, 1986, 61-173200
Int. Cl.[4] C22C *29/14*
U.S. Cl. 75—244 9 Claims

1. A permanent-magnet material having a composition represented by the following formula;

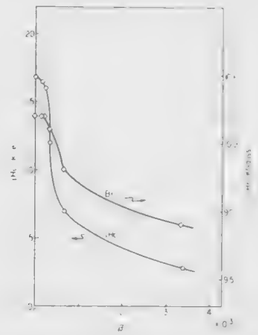
$$R(Co_{1-X-Y-\alpha-\beta}Fe_XCu_YM_\alpha M'_\beta)_A$$

(wherein X, Y, α, β, and A respectively represent the following numbers:

$0.01 \leqq X$, $0.02 \leqq Y \leqq 0.25$, $0.001 \leqq \alpha \leqq 0.15$,

$0.0001 \leqq \beta \leqq 0.001$, and $6.0 \leqq A \leqq 8.3$,

providing that the amount of Fe to be added should be less than 15% by weight, based on the total amount of the composition, and R, M, and M′ respectively represent the following constituents:



R: At last one element selected from the group of rare earth elements,

M: At least one element selected from the group consisting of Ti, Zr, Hf, Nb, V, and Ta, and

M′: B or B+Si).

4,734,132
LIPOPHOBICATING SOLUTION FOR ELECTROPHOTOGRAPHIC PLATES FOR OFFSET PRINTING CONTAINS PHYTIC ACID AND AT LEAST TWO DICARBOXYLIC ACIDS

Hajime Yoshida, Nagoya, Japan, assignor to Nikken Chemical Laboratory Co., Ltd., Nagoya, Japan

Filed Sep. 9, 1986, Ser. No. 905,261
Claims priority, application Japan, Oct. 1, 1985, 60-218962
Int. Cl.[4] B41M *5/00;* C09D *5/20*
U.S. Cl. 106—2 18 Claims

1. A lipophobicating solution for an electrophotographic plate for offset printing, comprising:

(a) an effective amount of phytic acid to prevent oily ink from sticking to nonimage areas of said electrographic plate;

(c) at least about 60 mol % by weight, compared to said phytic acid, of a mixture of two or more dicarboxylic acids selected from those represented by the formula $HOOC—(CH_2)_n—COOH$ (where n is 1 to 6) and phthalic acid;

(c) water; and

(d) a basic salt as a pH adjustor.

4,734,133
FAST-SETTING CEMENTS FROM SUPERPHOSPHORIC ACID

Fawzy G. Sherif, Stony Point, and Antoinette G. Ciamei, White Plains, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 15, 1986, Ser. No. 863,284
Int. Cl.[4] C04B *9/04, 35/04*
U.S. Cl. 106—85 8 Claims

1. A process for preparing a dry fast-setting magnesium phosphate cementitious composition capable of setting to a hardened mass at ambient temperatures following the addition of water thereto comprising adding unfiltered superphosphoric acid to a mixture of a magnesium-containing compound and an aggregate with cooling to form a dry powder, said dry powder

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being maintained at room temperature or below during the addition of the acid.

4,734,134

CEMENT SLURRIES, UNAFFECTED BY SALTS OF MAGNESIUM, FOR CEMENTING WELLS TRAVERSING SALT FORMATIONS, AND RELATED CEMENTING PROCESSES

Rüdiger O. Padtberg, and Alfred Garnier, both of St. Etienne, France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jun. 4, 1986, Ser. No. 870,599

Claims priority, application France, Jun. 14, 1985, 85 09095

Int. Cl.⁴ C04B *22/16*

U.S. Cl. 106—90 **8 Claims**

1. Cement slurries unaffected by the presence or absence of soluble salts of magnesium, for cementing wells traversing or susceptible of traversing salt formations, containing mixing water, a cement, at least 18% NaCl by weight of water and an admixture compatible with magnesium consisting of more than 0.5% H_3PO_4 by weight of dry cement and more than 0.25% of hydroxyethylenediphosphonate (HEDP) by weight of dry cement.

4,734,135

METHOD FOR MANUFACTURE OF AQUEOUS SUSPENSION OF SOLID ORGANIC PEROXIDE

Nobuyuki Satomi, Aichi; Kazuo Matsuyama, Gamagori, and Takeshi Komai, Aichi, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,504

Claims priority, application Japan, Oct. 12, 1982, 57-177527

Int. Cl.⁴ C09K *3/00;* **C07C** *179/00*

U.S. Cl. 106—287.23 **8 Claims**

1. A method for the manufacture of an aqueous suspension of a solid organic peroxide, characterized by the steps of mixing a solid organic peroxide selected from the group consisting of peroxydicarbonates and diacylperoxides having a difference of at least 5° C. between the melting point and the thermal decomposition temperature thereof, with a protective colloid, a surface active agent, and water at a temperature higher than the melting point and lower than the thermal decomposition temperature of said organic peroxide thereby forming an aqueous emulsion of said organic peroxide and subsequently cooling said aqueous emulsion.

4,734,136

HEAT RESISTANT YELLOW PIGMENTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

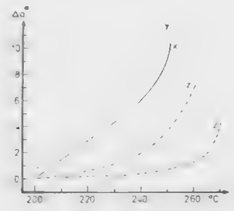
Wilfried Burow, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,226

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 3539306

Int. Cl.⁴ C04B *14/00*

U.S. Cl. 106—304 **12 Claims**



1. Heat resistant iron oxide yellow pigments containing aluminium compounds of the formula $(AlO)_x\ PO_4\ (OH)_{x-3}$ where x is a value from 3 to 10.

4,734,137

PROCESS FOR PREPARATION OF ORGANIC PIGMENTS

Shigekazu Kasahara; Takashi Saito, and Fumio Arai, all of Toyama, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

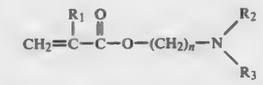
Filed May 7, 1986, Ser. No. 860,423

Claims priority, application Japan, May 10, 1985, 60-97864

Int. Cl.⁴ C09B *67/10*

U.S. Cl. 106—308 M **6 Claims**

1. A process for the preparation of organic pigments, which comprises dissolving at least one organic pigment in an aprotic polar solvent in the presence of a caustic alkali and water, and adding to the solution an acid having an acrylic resin dissolved therein to effect neutralization and reprecipitation; said acrylic resin being a polymer obtained by homopolymerizing a monomer represented by the following general formula or copolymerizing said monomer with another monomer copolymerizable therewith:



wherein R_1 represents a hydrogen atom or a methyl group, R_2 and R_3 independently represent hydrogen atom or an alkyl group, or R_2, and n is an integer of and R_3 are bonded together to form a nitrogen-containing hetero ring at least 1, said polymer being soluble in an acidic aqueous solution.

4,734,138

METHOD OF REMOVING COATING AND RESTORING WOOD

Roger L. Ely, Corvallis, and Marvin B. Langenberg, Springfield, both of Oreg., assignors to Research Chemical, Springfield, Oreg.

Division of Ser. No. 733,987, May 13, 1985, Pat. No. 4,652,393, which is a continuation-in-part of Ser. No. 528,989, Sep. 2, 1983, abandoned. This application Feb. 17, 1987, Ser. No. 14,939

Int. Cl.⁴ C11D *7/12;* **B08B** *7/00*

U.S. Cl. 134—27 **11 Claims**

1. A method of removing a coating selected from oil-and water-based paints, stains, varnishes, clear resins, and enamels from a surface comprising:

(a) applying to said surface a composition consisting essentially of an aqueous solution of the following components by approximate weight: 5 to 15% alkali metal hydroxide, 0.5% sodium bicarbonate, 0.1 to 5% ethylene glycol, 0.05 to 1% glycerol, and 0.2 to 3% xanthan gum; and

(b) removing said composition from said surface, together with said coating.

2. The method of claim 1, including the additional step of application of an aqueous solution of oxalic acid to said surface, said oxalic acid solution containing from about 2% to about 6% by weight oxalic acid.

4,734,139

THERMOELECTRIC GENERATOR

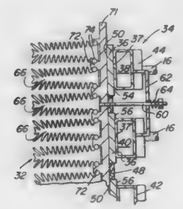
Wallace Shakun, Atlanta; John H. Bearden, Marietta, and David R. Henderson, Conyers, all of Ga., assignors to Omnimax Energy Corp., Philadelphia, Pa.

Filed Jan. 21, 1986, Ser. No. 820,047

Int. Cl.⁴ H01L *35/28*

U.S. Cl. 136—210 **14 Claims**

1. A thermoelectric generator unit comprising: a hot side heat exchanger including a plate having extruded retention posts projecting from one surface of said plate, a plurality of fins adapted for contact with a heating source, said fins positioned between two of said retention posts, a plurality of retention rods adapted to be inserted between said retention posts and the base of said fins to retain said fin in thermal contact with said plate surface upon insertion of said retention rod between said engaging surface of said post and said corresponding fin; a plurality of thermoelectric semi-conductor modules in thermal contact with the opposite side of the hot side heat exchanger plate from said contact with said fins, said



modules arranged in a grid pattern so that heat flow is directed into each of said modules from said hot side heat exchanger, said modules being connected electrically so as to combine their electrical output; and a cold side heat exchanger in thermal contact with said plurality of modules acting as a heat sink on the opposite side of said module from said hot side heat exchanger plate so as to produce a thermal gradient across said modules.

4,734,140

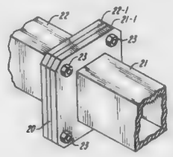
HEAT TREATMENT OF ELECTROMAGNETIC SHIELDING COMPOSITION

Wen-Shian V. Tzeng, Reading, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Continuation of Ser. No. 762,962, Aug. 6, 1985, Pat. No. 4,678,716. This application Nov. 24, 1986, Ser. No. 934,003

Int. Cl.⁴ C21D *1/00*

U.S. Cl. 148—126.1 **16 Claims**



1. A method of forming electrically conductive particles for use as a conductive filler in a resin matrix for electromagnetic shielding use said method comprising,

heating an aluminum-silicon-alloy core silver plated particle for from about 2 to about 8 hours at a temperature range from about 150° C. to about 300° C.

4,734,141

CRASH BAG PROPELLANT COMPOSITIONS FOR GENERATING HIGH QUALITY NITROGEN GAS

Richard V. Cartwright, Sussex County, N.J., and Steven J. Hardwick, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 27, 1987, Ser. No. 30,802

Int. Cl.⁴ C06G *35/00*

U.S. Cl. 149—35 **32 Claims**

9. A gas-generating propellant composition comprising, in combination,

(a) an alkali or alkaline earth metal azide component, and

(b) an active amount of an oxidizer complex of the formula

$$M_{(a)}M_{(b)}{}'X_{(c)}$$

wherein M is defined as copper or iron; M′ is defined as chromium, molybdenum or tungsten; X is defined as an electronegative element selected from the group consisting of oxygen, sulfur, and chlorine;

(a) has a value within the range of about 1–5;

(b) has a value within the range of about 0.7–3.0; and

(c) has a value within the range of about 4–12.

4,734,142

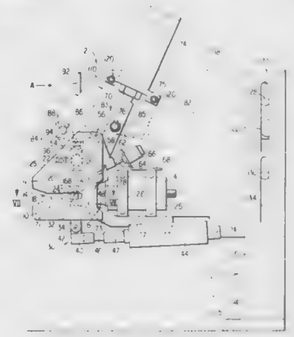
BAG SEALING DEVICE

Kenneth W. Creswell, Glen Burnie, Md., assignor to Vac Pac Manufacturing Co., Inc., Baltimore, Md.

Filed Aug. 21, 1986, Ser. No. 898,525

Int. Cl.⁴ B31B *1/64, 19/60;* **B32B** *31/16*

U.S. Cl. 156—73.1 **16 Claims**



15. A method for sealing material, comprising the steps of:

providing a device comprising an ultrasonic sealing means, including an ultrasonic sealing horn having a sealing surface for imparting ultrasonic energy to material to be sealed;

guide means associated with said sealing means for guiding said material along a guide path into contact with said sealing horn;

anvil means associated with said guide means for pressing said material into sealing position against said sealing horn; and

clamping means pivotally connected to said guide means for clamping said material beside said sealing horn, said clamping means being movable between a first position in which said clamping means clamps said material beside said sealing horn so that said material is wrapped around and stretched across said sealing surface during sealing of said material, and a second position in which said clamping means is clear of said guide path to facilitate passage of said material through said guide means;

introducing material to be sealed into contact with said sealing horn; and

actuating said anvil means, clamping means and sealing means to effect formation of a seal.

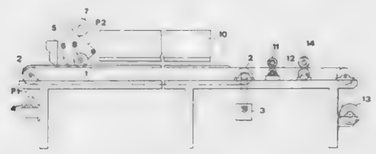
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,143

PROCESS FOR THE PRODUCTION OF A CONTINUOUS COMPOSITE RIBBON INCLUDING AN ACRYLATE RESIN FILM TO BE USED IN SAFETY LAMINATED GLASS PANELS

Massimo Meoni, Ariccia, Italy, assignor to Societa Italiana Vetro Siv S.p.A., Chieti and Polivar S.p.A., Rome, both of, Italy

Filed Jul. 25, 1985, Ser. No. 758,973
Claims priority, application Italy, Jul. 31, 1984, 48672 A/84
Int. Cl.⁴ B29C *39/12, 35/08*
U.S. Cl. 156—102 **5 Claims**



1. A method of producing safety glass, comprising the steps of:

polymerizing in the form of a continuous ribbon, a mixture of polymerizable monomers including:

(A) one part by weight of a composition of polymerizable monomers including 60 to 97 parts by weight acrylic or methacrylic ester, 0 to 2 parts by weight acrylic or methacrylic acid, 0 to 5 parts by weight N-2-vinylpyrrolidone, 0 to 5 parts by weight acrylic or methacrylic acid ester including glycidyl groups;

(B) 0.16 to 1.2 parts by weight of a plasticizer selected from the class consisting of adipic acid, isophthalic acid, phthalic acid, sebacic acid, epoxy derivatives and polyester derivatives; and

(C) an effective amount of a catalyst of the azo or peroxy series, between a pair of transparent films of plastic material inert to said polymerizing and transparent to infrared and visible ultraviolet light by exposing said polymerizable mixture between said films to a first irradiation with light in the infrared and visible ultraviolet spectrum range and then subsequently exposing said polymerizable mixture between said films to a second irradiation with light in the infrared spectrum range absent light in said visible ultraviolet range, the amount of visible ultraviolet irradiation to which said polymerizable mixture is exposed being no more than about 10% of the total irradiation, the mixture of polymerizable monomers being irradiated for a total of 45 minutes to 3 hours, so as to form a covered elastomeric polymerized resin sheet;

removing both of said films from said covered elastomeric polymerized resin sheet to form an uncovered elastomeric polymerized resin sheet;

bonding said uncovered elastomeric polymerized resin between two sheets of glass adjacent top and bottom surfaces of said uncovered polymerized resin sheet to form a safety glass.

4,734,144

BANDED-TIRE BUILDING METHOD

Edward G. Markow, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

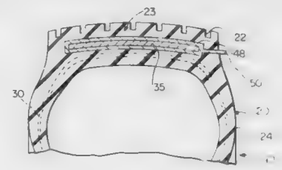
Filed Apr. 25, 1985, Ser. No. 727,322
Int. Cl.⁴ B29D *30/06*
U.S. Cl. 156—123 **4 Claims**

1. A method of fabricating a banded tire comprising the steps:

impregnating the layers of a reinforcing band with a preselected resin to form an uncured laminated band;

positioning the uncured laminated band as a breaker assembly around an uncured tire carcass;

limiting curing of the band and the carcass for the same time period only, wherein the band and carcass are co-cured in situ; and



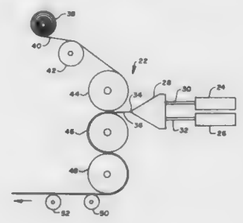
applying an impermeable plastic film around the surface of the band, before the positioning step, to protect rubber at the band-rubber interface from contamination by the resin.

4,734,145

METHOD FOR MAKING A MAGNETIC TRANSDUCER HEAD CLEANING CARD

Victor Monia, Santa Clara, Calif., assignor to Visa Technologies, Inc., Mountain View, Calif.

Division of Ser. No. 704,613, Feb. 22, 1985. This application Sep. 22, 1986, Ser. No. 909,613
Int. Cl.⁴ B29C *47/06*
U.S. Cl. 156—244.11 **5 Claims**



1. In a method of producing a head cleaning card for holding solvent for cleaning transducer heads of a magnetically-encoded-card reading machine, providing a layer of material which is generally rigid at ambient conditions, and heat bonding the layer of material onto a layer of fabric capable of releasably holding solvent and capable of changing color when said solvent is consumed.

4,734,146

METHOD OF PRODUCING A COMPOSITE SINE WAVE BEAM

Ronald G. Halcomb, Tulsa, and Theodore K. Vogt, Claremore, both of Okla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 31, 1986, Ser. No. 845,913
Int. Cl.⁴ B32B *31/00;* **E04C** *3/30*
U.S. Cl. 156—148 **30 Claims**

20. A process for producing a composite structural beam which comprises the steps of

providing a longitudinally extending mandrel having four sides including a pair of opposite sides of like predetermined matching configuration and a pair of opposite flat sides,

braiding the entire circumference of said mandrel with a tow material,

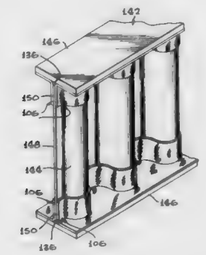
cutting the braided material on the mandrel along a predetermined longitudinal line on each side of the mandrel, and forming four like quadrants of braided material, each having an L-shaped cross-section, one leg of said L-shaped quadrants extending longitudinally and having said predetermined configuration, the other leg of such L-shaped quadrants extending longitudinally in flat form,

removing said quadrants from said mandrel,

providing a tool formed of two like half portions, said half portions each having a side of the same predetermined configuration, and capable of being nested together along said predetermined configured sides, and including a first groove adjacent opposite edges of the configured side of each tool half portion and extending longitudinally in a predetermined configuration corresponding to the predetermined configuration of said one leg of said L-shaped quadrants, and a second flat groove communicating with said first groove and disposed at an angle thereto, said first and second grooves together forming a pair of L-shaped grooves extending along opposite longitudinal edges of said tool half portions,

placing an L-shaped quadrant of braided material in each of said L-shaped grooves along opposite edges of each of said tool half portions, with said one configured leg of the L-shaped quadrants of braided material in contact with the first configured groove of said L-shaped groove of said tool half portions, and said other leg of the L-shaped quadrants in contact with the second groove of said L-shaped groove,

placing a sheet of flexible composite material formed of fiber reinforced heat curable resin material in contact with the



configured side of each tool half portion and overlying the configured leg of the L-shaped braided quadrants extending along opposite edges of each tool half portion, said flexible composite sheet thereby assuming the configuration of the configured side of said tool half portion and of the configured legs of said L-shaped quadrants,

assembling the tool half portions, with the configured sides thereof containing said composite sheets and the braided quadrants thereon, nested together in face-to-face contact, and with the opposite edge portions of said composite sheets sandwiched between the adjacent configured legs of the L-shaped braided quadrants,

placing a cap sheet of fiber reinforced partially cured resin over the other flat legs of said L-shaped braided quadrants disposed in the flat grooves extending along the opposite longitudinal edges of said tool half portions, and

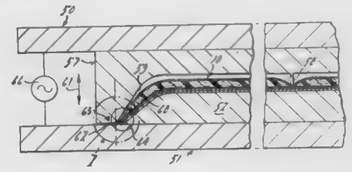
curing the composite sheets on the configured side of the tool half portions and the cap sheets under heat and pressure to form a composite structural beam, said braided quadrants being bonded to said composite sheets and to said cap sheets, said cured composite sheets and the bonded configured legs of said L-shaped quadrants adjacent opposite edges of said sheets forming the web of said composite beam, and said cured cap sheets and the bonded flat legs of said braided quadrants forming the flanges of said beam, said web and flanges connected at their junctures by said braided quadrants.

4,734,147

METHOD FOR MAKING A SURFACE MOUNTED TRIM PIECE

Ronald D. Moore, Grosse Pointe, Mich., assignor to Chivas Products Limited, Sterling Heights, Mich.

Continuation of Ser. No. 520,941, Aug. 8, 1983, abandoned, which is a division of Ser. No. 268,794, Jun. 1, 1981, Pat. No. 4,411,944. This application May 21, 1986, Ser. No. 870,288
Int. Cl.⁴ B29C *53/04*
U.S. Cl. 156—212 **8 Claims**



1. A method for making a trim piece assembly for attachment to a vehicle surface comprising a contoured support member having a contoured shape including a central portion and side portions extending to said vehicle surface at an acute angle and terminating at an edge, a pad, and a flexible covering, comprising the steps of:

selecting a die having upper and lower die halves;

placing said pad and said cover upon said support member and between the die halves so that said pad is disposed intermediate said cover and said support member and so that said cover extends at least slightly outwardly of said edge;

compressing, between the upper and lower die halves, said assembly of said support member, pad, and cover at said side portions adjacent said edge;

applying heat energy to the face of said side portions adjacent said edge for effecting a bond between said cover and said face side of said side portions contiguous to said edge but leaving a portion of the cover extending at least slightly outwardly of said edge with such outwardly extending portion of said cover not being bonded to said support member;

the die selecting step being carried out by selecting a die in which said lower die half has a first formed die portion which closely mates with said side portions of said contoured support member and said upper die half has a second formed die portion defining an acute angle with the first formed die portion so the second formed die portion only contacts said cover adjacent the edge of the support member where said bond is effected; and

trimming said cover contiguous and slightly beyond said edge without enveloping said edge so that, upon attachment of said trim piece to said surface, said outwardly extending unbonded portion of said cover engages said surface substantially at the termination of said cover.

4,734,148

PROCESS FOR MAKING A DETACHABLE PLASTIC BAG PAD

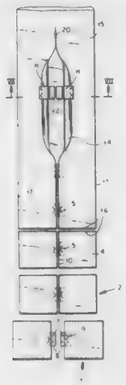
Armin Meyer, Cologne, Fed. Rep. of Germany, assignor to Elmo M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Division of Ser. No. 749,872, Jun. 27, 1985, Pat. No. 4,690,280. This application Jul. 7, 1986, Ser. No. 882,272
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424748
Int. Cl.⁴ B65D *30/00, 33/02, 33/08*
U.S. Cl. 156—251 **5 Claims**

2. In a process for making of a stack of interlocking detachable bags formed from a double-layered plastic foil strip comprising two walls, a front wall and a back wall, at least one

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handle-shaped incision associated with one of said walls adjacent an upper filling opening, wherein said bags are attached together by at least one interlock piece attached to one of said walls, said process in which two bags are formed side-by-side comprising cutting the upper layer of said plastic foil strip centrally lengthwise, unfolding both of the adjacent upper strip edges of said upper layer, applying reinforcing pieces to



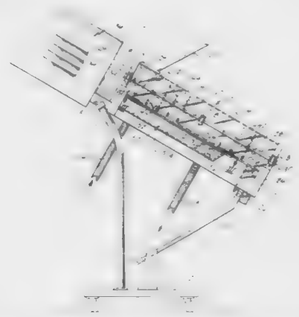
the exposed inner sides of said upper layer of said plastic foil strip, cutting the lower layer of said plastic foil strip lengthwise centrally, putting therein handle-shaped incisions, and performing transverse bag-forming cutting and welding operations, applying one of said reinforcing pieces to one of said walls with said interlock piece projecting, stacking said bags, and thereafter placing said interlock weld joint into each of said interlock pieces of said detachable bags.

4,734,149

APPARATUS FOR HEATSEALING GELATIN CAPSULES CONTAINING A MEDICAMENT

Charles F. Brown, Joanna, S.C., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 20, 1987, Ser. No. 28,821
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—381 **9 Claims**



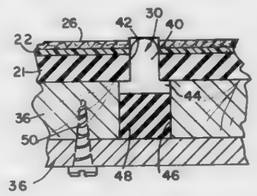
1. Improved apparatus for heat-treating gelatin capsules containing a medicament to seal the telescoped cap and body portions thereof comprising a housing defining an elongate generally cylindrical passageway extending in sloping downward direction and having an inlet at its upper end portion for receipt of a plurality of gelatin capsules and an outlet at its lower end portion for discharging a plurality of gelatin capsules therefrom; capsule-conveying means comprising an elongate shaft extending along the longitudinal cylindrical axis of the passageway and mounted on the housing for rotation about said axis, a plurality of generally circular conveyor plates supportably mounted in spaced relation along the shaft and extending generally radially outwardly thereof for rotation therewith, each of said conveyor plates including a ramp portion extending to communicate with the top surface of the next adjacent plate thereto in the direction of the housing passageway outlet to define a generally Archimedean screw-shaped path for the passage of gelatin capsules through the housing passageway from said inlet to said outlet, air-distributing means attached to said housing and having a first section communicating with said passageway along a first portion of its length, first conduit means for connecting said first section of said air-distributing means to a source of pressurized heated air to discharge heated air into the passageway adjacent the inlet of the passageway for circulation in said path to heat capsules passing therealong, said air-distributing means including a second section communicating with said passageway and adjacent the outlet of the passageway and having an air outlet for discharging heated air from the passageway and air-distributing means, and a flexible porous material enclosing the periphery of said plurality of plates to enclose the same during rotation of the shaft and plates to convey the capsules along said path.

4,734,150

SHOE SUBSTRATE REINFORCING MACHINE

Albert I. Morse, and Douglas H. Crowell, both of Beverly, Mass., assignors to DVSG Patentverwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,285
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 156—578 **6 Claims**



1. A machine for depositing powder in a selected configuration, fusing the powder into a laminate and pressing the fused laminate against a shoe substrate, comprising:

means for supporting a family of shoe substrates to which a fused laminate is to be adhered, each said shoe substrate having a selectively configured shape which is to be accurately positioned on said supporting means to properly receive the substrate, said supporting means including;

a layer of surface material, onto which the shoe substrate is placed;

an underlying layer of resilient material disposed beneath said layer of surface material;

at least two locater pins, each extending through an opening formed in said layer of surface material; and

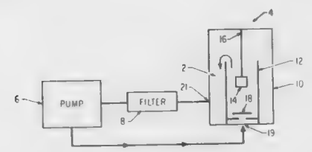
a pad of selectively compressible material supporting each said pin whereby said locater pins are pushed downwardly to a position flush with said layer of surface material when the fused laminate is pressed onto the shoe substrate.

4,734,151

NON-CONTACT POLISHING OF SEMICONDUCTOR MATERIALS

Neil A. Ives, Hermosa Beach, and Martin S. Leung, Manhattan Beach, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Feb. 6, 1987, Ser. No. 12,109
Int. Cl.[4] H01L *21/306;* **B44C** *1/22*
U.S. Cl. 156—637 **2 Claims**



1. A method for polishing a flat surface of a semiconductor material comprising the steps of:

a. placing the surface to be polished into a center tube of a polishing vessel which consists of the center tube and a concentric outer tube;

b. pumping a polishing solution selected from a mixture of 2% bromine in methanol through a baffled inlet of the center tube, thereby creating laminar flow conditions on the surface to be polished;

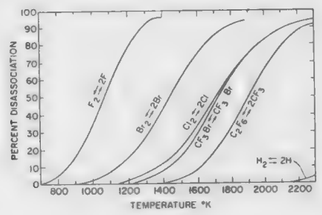
c. recirculating excess polishing solution from an outlet in the outer tube through a filter and into the center tube.

4,734,152

DRY ETCHING PATTERNING OF ELECTRICAL AND OPTICAL MATERIALS

Michael W. Geis, Acton; Nikolay N. Efremow, Melrose, and Stella W. Pang, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 945,081, Dec. 22, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 73,905
Int. Cl.[4] H01L *21/306;* **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00*
U.S. Cl. 156—646 **24 Claims**



23. A method for anisotropic etching of substrate material through openings formed in a mask comprising the steps of:

(a) providing a source of gas containing radicals which, when heated, dissociate said radicals being capable of volatilizing said substrate material but not said mask material;

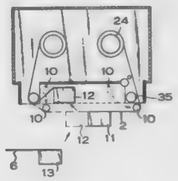
(b) heating said gas to dissociate said radicals and directing said heated gas toward said openings to volatilize said material using a rhenium or irridium hot metal tube having a proximal end coupled to said gas source and an open distal end facing said openings.

4,734,153

APPARATUS FOR WINDING MAGNETIC TAPE INTO CASSETTES

Toyohide Kubo, Tokushima, Japan, assignor to AWA Engineering Co., Ltd., Tokushima, Japan

Filed Sep. 26, 1986, Ser. No. 911,983
Claims priority, application Japan, Oct. 9, 1985, 60-225889; Oct. 9, 1985, 60-225890
Int. Cl.[4] B31F *5/06;* **B65H** *21/00*
U.S. Cl. 156—502 **2 Claims**



1. An apparatus for winding magnetic tape into a cassette having a rotatable hub therein around which hub leader tape is wound and to which leader tape the magnetic tape is attached and an internal tape guide over which tape guide the magnetic tape is guided to the hub once the magnetic tape is attached to the leader tape and wound into the cassette, said apparatus comprising:

extraction guide means for withdrawing leader tape from the cassette and for tracking and guiding the magnetic tape directly therefrom to the hub in the cassette after the magnetic tape is attached to the leader tape and during the time in which the magnetic tape is wound into the cassette; and

movable frame means connected to said extraction guide means for moving the extraction guide means between a first standby position adjacent the leader tape of the cassette to a second winding position at which the leader tape is withdrawn from the cassette and displaced off of said internal tape guide so as to extend directly from said extraction guide means to the hub,

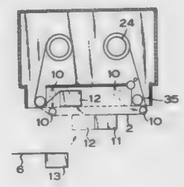
the magnetic tape after being attached to the leader tape when the extraction guide means is in the second winding position being wound directly onto the hub without contacting the internal tape guide as the hub is rotated.

4,734,154

APPARATUS FOR WINDING MAGNETIC TAPE INTO CASSETTES

Toyohide Kubo, Tokushima, Japan, assignor to Awa Engineering Co., Ltd., Tokushima, Japan

Filed Sep. 26, 1986, Ser. No. 911,985
Claims priority, application Japan, Oct. 9, 1985, 60-225889; Oct. 9, 1985, 60-225890
Int. Cl.[4] B31F *5/06;* **B65H** *21/00*
U.S. Cl. 156—502 **2 Claims**



1. An apparatus for winding magnetic tape into a cassette having a cassette case in which cassette case leader tape extends between rotatable reel hubs, and an openable guard panel

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for covering the tape extending between the reel hubs, said apparatus comprising:

positioning means for holding the cassette case;

tape retaining means for holding the leader tape positioned adjacent the guard panel when opened for preventing contamination of the leader tape with foreign particles in the air when the leader tape is so held,

said tape retaining means comprising a first and a second tape retainer having attachment surfaces extending parallel to rotational axes of the reel hubs so as to substantially cover a front cavity of the cassette and on which surfaces the leader tape is held, and a third tape retainer for holding a leading end of the magnetic tape;

cutting means for cutting the leader tape held by the first and the second tape retainers, one cut end of the leader tape being held on the attachment surface of the first tape retainer while another cut end of the leader tape is being held on the attachment surface of the second tape retainer;

separating means for moving one of said first and said second tape retainers positioned adjacent the guard panel along a path to another position also adjacent the guard panel so as to separate said one cut end of the leader tape from said another cut end of the leader tape while still preventing the leader tape from being contaminated, the cut end of the leader tape held on the attachment surface of said one of said first and said second tape retainers being maintained in the same parallel orientation relative to a reference plane initially extending therethrough as said one of said first and said second tape retainers is moved along said path;

splicing means for joining the leading end of the magnetic tape to one of the cut ends of the leader tape after said cut ends of the leader tape are separated; and

winding means for rotating one of said reel-hubs to wind a predetermined length of the magnetic tape joined to the leader tape into the cassette,

said cutting means also for cutting the magnetic tape after being wound into the cassette so as to form a trailing end thereof, and said splicing means also for joining the trailing end of the magnetic tape to the other of the cut ends of the leader tape.

4,734,155

METHOD AND DEVICE FOR MANUFACTURING A LAMINATED MATERIAL

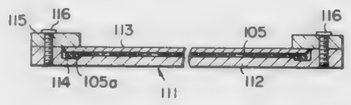
Kazuyoshi Tsunoda; Kenji Tonoki; Haruki Yokono; Hisao Kono, all of Yuki; Ryoji Yokoyama, Musashino, and Kazuo Kobayashi, Shimodate, all of Japan, assignors to Hitachi Chemical Co., Ltd., Japan

Continuation of Ser. No. 692,565, Jan. 18, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 37,850

Claims priority, application Japan, Jan. 19, 1984, 59-8290

Int. Cl.[4] B30B *15/32*

U.S. Cl. 156—583.1 **3 Claims**



1. A plate assembly for applying high pressing force uniformly over a plate material such as a stack of sheet material to be pressed together to become a laminate plate material, comprising a base plate member formed with a shallow chamber space at a central portion thereof while an annular peripheral portion thereof being left to provide an annular land portion surrounding said shallow chamber space, an annular seal member placed in said shallow chamber space so as to extend along and adjacent said annular land portion, a cover plate member mounted in said shallow chamber space with an annular peripheral portion thereof being placed to extend along and adjacent an inner peripheral portion of said annular land portion in continuous sealing engagement with said annular seal member, thereby confining a thin pressure chamber in said shallow chamber space as peripherally blocked by said annular seal member, an annular retainer member having an annular outside half portion engaged with said land portion of said base plate member and an annular inside half portion engaged with an annular peripheral portion of said cover plate member, and means for fastening said annular retainer member to said annular land portion of said base plate member, said thin pressure chamber being adapted to be filled with oil.

4,734,156

METHOD FOR FORMING ELECTRICALLY CONDUCTIVE CIRCUITS ON A BASE BOARD

Yamahiro Iwasa, Hachiosi, Japan, assignor to Asahi Chemical Research Laboratory Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,716

Claims priority, application Japan, Sep. 29, 1985, 60-216041

Int. Cl.[4] H01L *21/306*

U.S. Cl. 156—632 **7 Claims**



4. A method for forming electrically conductive circuits on a base board comprising the steps of:

(a) attaching a copper layer on one side of the base board;

(b) etching the copper layer to form a first electrically conductive circuit layer;

(c) coating a plating-resistant resist on the same side of the base board except on certain portions of the first circuit layer which are required to be electrically connected to another circuit layer to be subsequently formed on the first circuit layer;

(d) coating an electrically conductive copper paste receptive to metal plating on the same side of the base board in a manner as to electrically connect said portions of the first circuit layer, except on certain regions of said portions of the first circuit layer which are to be subsequently processed with a metal plating;

(e) heating the base board to harden the conductive copper paste;

(f) cleansing the coated base board; and

(g) immersing the base board in a metal plating solution to form a metal plating on the electrically conductive copper paste and on said regions of the first circuit layer, to thereby form a second electrically conductive circuit layer on the first circuit layer, thus providing at least two layers of circuits electrically connected to each other on one side of the base board.

4,734,157

SELECTIVE AND ANISOTROPIC DRY ETCHING

Susanna R. Carbaugh, Manassas; Hung Y. Ng, Brooklyn; Murty S. Polavarapu, and David Stanasolovich, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 769,647, Aug. 27, 1985, abandoned, and a continuation of Ser. No. 769,832, Aug. 27, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 27,458

Int. Cl.[4] B44C *1/22;* **H01L** *21/308;* **C23F** *1/12*

U.S. Cl. 156—643 **26 Claims**

1. An anisotropic gas plasma process carried out in a reactive ion etching mode using an etchant gas for selectively patterned etching of an elemental silicon-containing layer overlying a covalent silicon-containing layer, which layers form a surface of a semiconductor device, wherein the etchant comprises a gaseous chlorofluorocarbon capable of supplying CFx and chlorine ions in admixture with 20–65% of ammonia by volume at a pressure of from 60 to 100 millitorr.

2. The process of claim 1 wherein the chlorofluorocarbon is $CClF_3$.

15. An anisotropic gas plasma process carried out in a reactive ion etching mode using an etchant gas for patterned selective etching of an elemental silicon-containing layer overlying a covalent silicon-containing layer, which layers form a surface of a semiconductor device, wherein the etchant comprises CCl_2F_2 in admixture with 20–65% of ammonia by volume at a pressure of 60 to 100 millitorr.

4,734,158

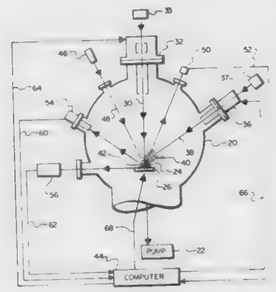
MOLECULAR BEAM ETCHING SYSTEM AND METHOD

Harry P. Gillis, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 16, 1987, Ser. No. 26,072

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **26 Claims**



16. A method of etching a semiconductor substrate, comprising the steps of:

generating and directing an ion beam onto a portion of the substrate to be etched, and

generating and directing a substantially ion-free chemical radical beam onto substantially the same portion of the substrate.

4,734,159

EVAPORATION APPARATUS

Theodore F. Korenowski, Branford, Conn., assignor to TFK Company, Inc., Branford, Conn.

Continuation of Ser. No. 757,530, Jul. 22, 1985, Pat. No. 4,600,474. This application Apr. 14, 1986, Ser. No. 851,732

Int. Cl.[4] B01D *1/30*

U.S. Cl. 159—16.1 **10 Claims**

10. An apparatus for utilizing a heated gas stream to evaporate a volatile component from a liquid solution comprising:

means for feeding said gas stream from a source of heated gas;

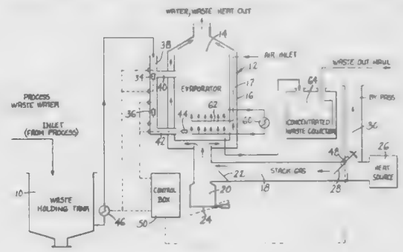
container means having an inner chamber to hold said liquid solution for evaporation of said volatile component and an outer chamber connected to said gas stream feeding means forming a gas channel substantially surrounding said inner chamber through which at least a portion of said gas stream flows to supply heat to said inner chamber and evaporate said volatile component of said liquid solution:

means for feeding said liquid into said inner chamber;

upper and lower liquid level control means for controlling the quantity of liquid solution fed into said inner chamber to establish a liquid level therein;

sparger means for agitating said liquid solution in said inner chamber;

sump means below said container means and connected to said gas feeding means to receive any condensate from said gas stream and any liquid leaking from said inner chamber, said sump means including dam means to prevent the condensate and leaking liquid from flowing back through the gas stream feeding means to the source of the gas stream, said sump means further having discharge means to allow draining thereof when the received condensate and leaking liquid exceed a predetermined amount;



means for combining and venting the evaporated volatile component from said inner chamber and said gas stream from said outer chamber for discharge; and

means for removing said liquid solution from said inner chamber.

4,734,160

METHOD OF TWO-STAGE PEROXIDE BLEACHING OF MECHANICAL OR SEMI-MECHANICAL PULP

Steve Moldenius, Taby, Sweden, assignor to Sunds Defibrator AB, Sundsvall, Sweden

PCT No. PCT/SE83/00462, § 371 Date Aug. 17, 1984, § 102(e) Date Aug. 17, 1984, PCT Pub. No. WO84/02366, PCT Pub. Date Jun. 21, 1984

Continuation of Ser. No. 639,140, Aug. 17, 1984, abandoned. This PCT application Dec. 16, 1983, Ser. No. 818,064

Claims priority, application Sweden, Dec. 17, 1982, 8207236

Int. Cl.[4] D21C *9/16*

U.S. Cl. 162—71 **7 Claims**

1. A method of two-stage peroxide bleaching of mechanical or chemi-mechanical pulp to provide both high strength and brightness, said method comprising:

(a) performing in a first stage at 40°–95° C. a hyperalkaline peroxide bleaching at a initial pH of 13 or higher, as measured in the bleaching liquor at 24° C. before mixing into the pulp, thus imparting an increase in density, strength and surface smoothness to the pulp,

(b) after said first bleaching stage, draining of the waste bleaching liquor, washing of the pulp with water, addition of peroxide and adjusting the pH of the pulp suspension to 1 to 2 units lower than the initial pH of the bleaching liquor in the first stage, and

(c) finally bleaching the pulp in a second peroxide bleaching stage having an initial pH at the adjusted pH of step (b), thus achieving the desired brightness increase and retaining the pulp strength and surface smoothness, with a substantially lower consumption of peroxide in the second stage than in the first stage.

VOL 1088 ISS 5 MR 29 1988 UMI

4,734,161

PROCESS FOR A TWO STAGE PEROXIDE BLEACHING OF PULP

Bernard Dubreux, Francheville Le Bas, France, assignor to Atochem, France

Filed Apr. 7, 1986, Ser. No. 849,157
Claims priority, application France, May 29, 1985, 85 08291
Int. Cl.[4] D21C *9/16*
U.S. Cl. 162—78 9 Claims

1. A two-stage hydrogen peroxide bleaching treatment of chemical pulp at a temperature of about 90°–100° C. comprising:

a. subjecting said pulp in a first bleaching stage to hydrogen peroxide and at least about 3 grams/l of bath of a metal ion sequestering agent selected from nitrogen containing sequestering agents or derived from polyphosphoric or polyphosphonic acids at a pH of about 8.5 to 9.5 so that hydrogen peroxide of about 0.3 to 2.5 wt. % relative to dry pulp weight is consumed; and

b. subjecting said pulp in a second bleaching stage to hydrogen peroxide and to at least about 3×10^{-3} gram-atoms per 100 grams of dry pulp of magnesium in the form of magnesium hydroxide and a pH of at least about 11 so that additional hydrogen peroxide is consumed in said second stage and about 2 to 5 weight % of hydrogen peroxide per weight of dry pulp is consumed during the two stages and wherein said magnesium is present only in said second stages.

4,734,162

HARDWOOD PULP HAVING A TACTILE SENSE OF SOFTNESS, AND TISSUE PAPER WEBS THEREOF

Robert S. Ampulski, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 766,063, Aug. 14, 1985, Pat. No. 4,634,499, which is a continuation-in-part of Ser. No. 490,926, May 2, 1983, abandoned. This application Sep. 5, 1986, Ser. No. 904,529
Int. Cl.[4] C13K *1/02, 13/00;* D21C *3/06*
U.S. Cl. 162—84 18 Claims

13. Pulp from hardwood fiber sources having a high tactile sense of softness, said pulp comprising hardwood cellulosic fibers having between about 6% and about 8% xylan by weight on a dry pulp basis, between about 80% and about 92% glucan by weight on a dry pulp basis, and an amount of mannan such that a weight ratio of xylan to mannan is between about 2.5 and about 3.7.

4,734,163

METHOD OF AND APPARATUS FOR PRODUCING GYPSUM FIBER BOARDS (PLASTERBOARD)

Kurt Eberhardt, Bad Hersfeld; Heinrich Blackert, Bebra; Gerald Forbert; Josef Steinkuhl, both of Bad Hersfeld; Horst Hose, Kassel, and Friedrich Bahner, Rotenburg A.D.F., all of Fed. Rep. of Germany, assignors to Babcock BSH Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,398
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419558
Int. Cl.[4] D21H *3/78*
U.S. Cl. 162—181.3 9 Claims

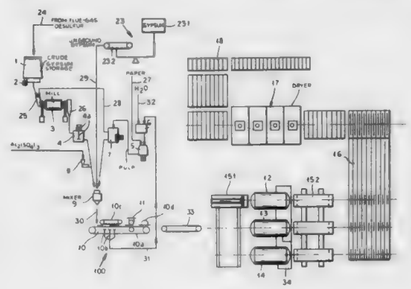
1. A method of producing gypsum fiber boards, comprising the steps of:

(a) combining water, calcium sulfate dihydrate and fiber material to form a mash and adjusting the pH of said mash to a value of at most 7;

(b) forming the mash into shaped boards with a moisture content of less than 40 weight-percent;

(c) heating the shaped boards in a pressure vessel in a saturated steam atmosphere to a temperature between 120° and 160° for a period between 3 and 50 minutes; and

(d) releasing steam from said pressure vessel at a rate such that the pressure therein is reduced by at most 1 bar per minute and cooling the shaped boards within the pressure vessel to a temperature of at most 100° C., said shaped boards being clamped between formed elements during said steam release step.

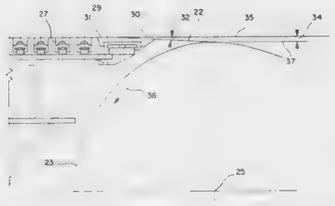


4,734,164

HORIZONTAL WEB-FORMING APPARATUS WITH CURVED NOSE FORMING BOARD

Jeffery C. Irwin, Clinton, Wis.; John H. Schamell, Roscoe, Ill., and Jay A. Shands, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Jul. 3, 1986, Ser. No. 881,999
Int. Cl.[4] D21F *1/06, 1/36*
U.S. Cl. 162—348 9 Claims



1. In an apparatus for forming a web from a stock jet stream, including a former for projecting the stock stream from its slice, a single, substantially horizontally arranged, looped forming wire, a breast roll and a forming board, each mounted within the looped forming wire with the forming board directly adjacent the breast roll, the improvement comprising:

the forming board includes a curved shoe having a place of impingement of the stock stream, a substantially curved nose surface and a substantially planar downstream surface diverging therefrom;

the breast roll is mounted with its upper peripheral surface disposed beneath a plane extending along the downstrem surface;

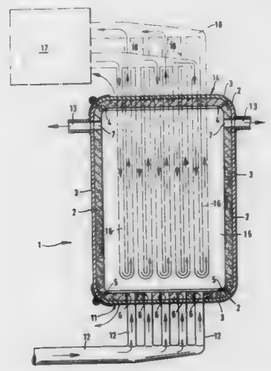
the forming wire extends between the upper peripheral breast roll surface and the nose surface at a small angle of about 1° to about 10° relative to the plane along the downstream surface; the former slice is positioned over the breast roll to project the stock stream onto the forming wire over the forming board at a small angle of about 0° to about 2° thereto at the place of impingement.

4,734,165

METHOD FOR THE PRODUCTION OF COKE

Hartmut Bauer; Dietrich Wagener, both of Essen, and Egmar Wunderlich, Mülheim/Redes, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,218
Claims priority, application Fed. Rep. of Germany, May 6, 1985, 3516225; May 6, 1985, 3516226; May 6, 1985, 3516227
Int. Cl.[4] C10B *51/00*
U.S. Cl. 201—44 15 Claims



1. A method of producing coke from coal, said method comprising:

introducing coal to be coked into a pressure sealed container;

conducting a gas through said container in direct and/or indirect heat exchange with said coal and thereby heating said coal to a temperature of approximately 250° C.;

thereafter conducting a gas through said container in indirect heat exchange only with said coal and thereby heating said coal from a temperature of approximately 250° C. to a temperature of approximately 600° C. at which lump coke is formed; and

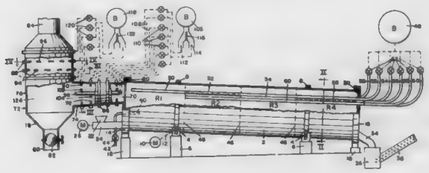
thereafter conducting a gas through said container in direct and/or indirect heat exchange with said lump coke and thereby heating said lump coke from a temperature of approximately 600° C. to a temperature between approximately 1100° and 133° C., thereby forming refined coke.

4,734,166

FURNACE FOR THE SELECTIVE INCINERATION OR CARBONIZATION OF WASTE MATERIALS

James F. Angelo, II, P.O. Box 55275, Little Rock, Ark. 72225

Filed Feb. 5, 1987, Ser. No. 10,996
Int. Cl.[4] C10B *1/10;* F27B *7/36*
U.S. Cl. 202—100 6 Claims



1. A combustion device for selectively incinerating, or carbonizing a carbonaceous feed material by a process of controlled devolatilization, comprising:

a. an elongated cylindrical kiln inclined slightly from the horizontal and having an upper end and a lower end,

b. means operable to introduce a solid carbonaceous feed material into the upper end of said kiln, means for rotating said kiln to move the feed longitudinally through said kiln in the form of a tumbling bed in a lower portion thereof, and means to discharge remaining solid material from the lower end thereof,

c. means operable to elevate the temperature of said feed material in the kiln to either incineration or carbonizing temperature, only until the desired temperature is obtained,

d. means located in an upper portion of the kiln to introduce air into the full length of said kiln into the upper portion thereof only, so as to flow in a generally helical vortex flow around the interior periphery thereof in the same peripheral direction throughout the full length of the kiln, or alternatively in alternately opposite peripheral directions in longitudinally successive zones of the kiln,

e. draft inducing means operable to create a draft in said kiln toward an outlet end thereof, and

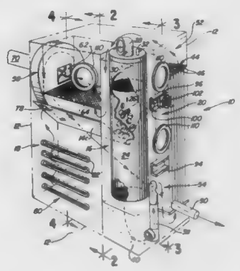
f. afterburner means interconnected to the draft outlet of said kiln, and operable to produce combustion of combustible gaseous or solid components entrained in said draft.

4,734,167

DISTILLATION APPARATUS

Richard W. Goeldner, Freeport, Fla., assignor to Mechanical Equipment Company, Inc., Destin, Fla.

Continuation of Ser. No. 746,981, Jun. 19, 1985, abandoned. This application Jun. 11, 1986, Ser. No. 873,857
Int. Cl.[4] C02F *1/04;* B01D *1/28*
U.S. Cl. 202—176 11 Claims



1. A compact and energy efficient water distillation unit, comprising:

a substantially rectangular housing including a deaerator chamber, a heater chamber, and an evaporator chamber having a portion disposed above the heater chamber, said chambers being separated by shared interior walls;

a deaerator supported in the deaerator chamber and including an input for feed water;

a passage between the deaerator chamber and evaporator chamber for feeding deaerated water into the evaporator chamber;

a heater supported in the heater chamber, said heater chamber communicating with the evaporator chamber to add heat to the unit;

an evaporator supported in the evaporator chamber and spaced from at least one wall in the evaporator chamber to define a downcomer space therebetween, said evaporator including vertical tubes therethrough;

a demister suported in the evaporator chamber;

a vapor compressor having an input and an output, said input drawing water vapor through the demister; and

a duct between the compressor output and the evaporator.

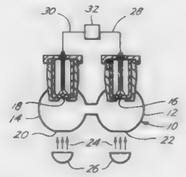
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,168

METHOD OF MAKING N-SILICON ELECTRODES

John O'M. Bockris, College Station, Tex.; Marek Szklarczyk, Piaseczno, Poland, and Aliasgar Q. Contractor, College Station, Tex., assignors to Texas A & M University, College Station, Tex.

Division of Ser. No. 521,402, Aug. 8, 1983, Pat. No. 4,501,804. This application Nov. 30, 1984, Ser. No. 676,875
Int. Cl.[4] H01L *21/02*; C25D *7/12*
U.S. Cl. 437—141 6 Claims



1. The method of preparing an improved photoanode comprising;
- depositing a dopant agent selected from the group consisting of platinum, palladium, nickel, cobalt, gold, rhodium, ruthenium and tellurium in island form onto at least one surface of an n-silicon body;
- forming a layer of silicon dioxide on said one surface of said body; and
- dispersing the dopant into said silicon dioxide layer to thereby render the layer electrically conductive.

4,734,169

PROCESS FOR PRODUCING HEXAFLUOROACETONE HYDRATE

Kazuma Yokoi; Takao Iida, and Toshimasa Sagawa, all of Kitaibaraki, Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,650
Claims priority, application Japan, Jul. 31, 1986, 61-181098
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—79 8 Claims

1. A process for producing hexafluoroacetone hydrate, which comprises electrolytically oxidizing 2-substituted hexafluoroisobutanoic acid represented by the following formula:

$(CF_3)_2C(OH)COOC(CF_3)_2COOH$

in an electrolytic solution composed of an aqueous solution of (1) a nickel salt and (2) hydrochloric acid, hydrobromic acid or an alkali metal salt or an alkaline earth metal salt thereof.

4,734,170

ELECTROLYSIS OF AQUEOUS SOLUTION OF SODIUM CHLORIDE

Yoshio Oda; Manabu Suhara, both of Yokohama, and Eiji Endo, Yamato, all of Japan, assignors to Asahi Glass, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 884,289, Mar. 7, 1978, abandoned, which is a continuation of Ser. No. 719,920, Sep. 2, 1976, abandoned. This application May 10, 1983, Ser. No. 491,347
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[4] C25B *1/16, 1/26*
U.S. Cl. 204—98 9 Claims

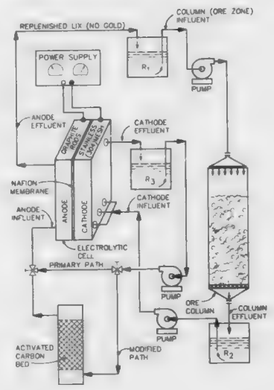
1. In a method of subjecting an aqueous sodium chloride solution to electrolysis to produce chlorine and sodium hydroxide in an electrolysis cell which is partitioned by a diaphragm into an anolyte compartment and catholyte compartment, the improvement which comprises a diaphragm which is a fluorinated polymeric cation exchange membrane having a water permeability under electrolysis conditions of from 2 to 3.5 moles/Faraday; and containing carboxylic acid groups as the ion exchange groups.

4,734,171

ELECTROLYTIC PROCESS FOR THE SIMULTANEOUS DEPOSITION OF GOLD AND REPLENISHMENT OF ELEMENTAL IODINE

Jack W. Murphy, Laramie, Wyo., assignor to In-Situ, Inc., Laramie, Wyo.

Continuation-in-part of Ser. No. 598,706, Apr. 10, 1984, Pat. No. 4,557,759. This application Dec. 6, 1985, Ser. No. 806,043
Int. Cl.[4] C22B *11/04*; C25B *1/24*
U.S. Cl. 204—111 14 Claims



1. A process for the recovery of gold from a gold-containing material comprising:
- (a) leaching the gold-containing material with a lixiviant containing iodide and iodine in concentrations sufficient to solubilize gold;
- (b) separating pregnant lixiviant containing gold in solution and iodine from the leach residue;
- (c) conducting said pregnant lixiviant to the cathode of an electrolysis cell;
- (d) reducing substantially all the iodine in said pregnant lixiviant to iodide at said cathode and simultaneously reducing and precipitating gold;
- (e) conducting the lixiviant of step (d) to the anode of said electrolysis cell; and
- (f) oxidizing iodide to iodine at said anode in quantities sufficient to regenerate the lixiviant.

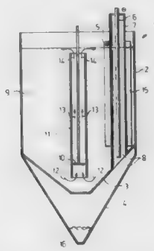
4,734,172

METHOD FOR SELECTIVELY RECOVERING LEAD FROM COMPLEX SULPHIDIC NON-FERROUS METAL CONCENTRATES

Lars A. Hedström, Ursviken; Nils F. R. Lindström, Skellefteham, and Kenneth A. S. Sjöberg, Boliden, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 5, 1986, Ser. No. 904,010
Claims priority, application Sweden, May 9, 1985, 8504140
Int. Cl.[4] C25C *1/14*
U.S. Cl. 204—117 3 Claims

1. A method for selectively recovering lead from a complex lead-containing sulphidic concentrate in a electrolytic cell comprised of at least one anode and at least one cathode and an electrolyte containing chloride ions, the method being conducted at a temperature beneath the boiling point of the concentrate-containing electrolyte and at a pH of less than 7 and comprising the steps of:
- (a) forming a suspension of the concentrate in an electrolyte having a chloride concentration of greater than about 2 molar;
- (b) agitating the suspension so as to cause the suspension to flow into contact with or closely adjacent to the surfaces of said at least one anode; and



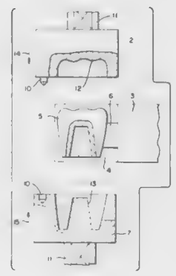
- (c) maintaining the anodic current density at a high level in the range of from about 200 to about 400 A/m^2 to convert sulphur from the concentrate into elemental sulphur and to precipitate selectively lead at the cathode in the absence of chloride gas emission from the electrolytic cell.

4,734,173

METHOD AND APPARATUS FOR THE MANUFACTURE OF DENTAL PROTHESES

Herbert Walter, Flourn-Winzeln; Erich Körber, Tübingen, and Josef Gentischer, Remshalden, all of Fed. Rep. of Germany, assignors to Herbert Walter, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,840
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544123
Int. Cl.[4] B23H *7/22, 7/30, 9/12*
U.S. Cl. 204—129.1 8 Claims



5. A method for manufacturing dental prostheses, from solid material by means of an electroerosion process, comprising the steps of:
- preparing a model of the prosthesis, the model having both an outer surface and an inner surface, the inner surface serving to be fitted on a supporting surface of a tooth;
- preparing a first template electrode from the model to include a negative impression of a part of the outer surface of the model;
- preparing a second template electrode from the model to include a negative impression of a part of the inner surface of the model; and
- aligning both template electrodes and using them in an electroerosion process to excavate the prosthesis from a solid metal block, the template electrodes being applied to the metal block from opposite sides, such that at least a part of the outer surface of the prosthesis is formed by the first template electrode, and the inner surface of the prosthesis is formed by the second template electrode, thereby producing the prosthesis from the remaining part of the block between the template electrodes.

4,734,174

ELECTROCHEMICAL FORMATION OF THIN-FILM ELECTRODES

Joseph J. Venis, Jr., Hanover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 17, 1986, Ser. No. 942,865
Int. Cl.[4] C25F *3/14*
U.S. Cl. 204—129.5 19 Claims

1. A method for forming a predetermined pattern of thin-film transparent electrodes on a substrate, comprising the steps of:
- providing a starting film comprising silver electrode material on a first substrate, said starting film being substantially transparent to visible light;
- providing a pattern-forming surface on a second substrate, said pattern-forming surface defining conductive areas and insulated areas, the insulated areas corresponding to a predetermined electrode pattern to be defined on said first substrate;
- bringing the starting film of silver electrode material on said first substrate and the pattern-forming surface of said second substrate into confronting relationship, with a non-aqueous electrolyte therebetween, said non-aqueous electrolyte comprising an organic solvent having therein a conductive salt capable of supporting an electrolytic reaction therebetween;
- passing an electrical current between the conductive areas of said pattern-forming surface and the silver starting film, to electrochemically remove areas of silver electrode material from said first substrate corresponding to the conductive areas of said pattern-forming surface, while leaving on said first substrate areas of silver electrode material corresponding to the insulated areas of said pattern-forming surface, thereby to define said predetermined pattern of thin-film transparent electrodes on said first substrate.

4,734,175

PROCESS FOR REGENERATING AN ELECTROLESS COPPER PLATING BATH

Werner D. Bissinger, Sindelfingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1987, Ser. No. 33,387
Claims priority, application European Pat. Off., Apr. 11, 1986, 86105002.9
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—130 15 Claims

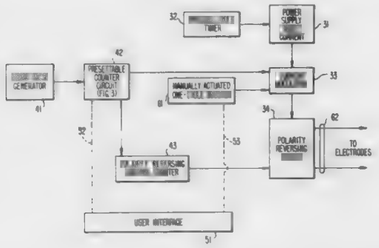


1. A process for regenerating a complexing agent in an electroless copper plating bath, comprising the steps of:
- withdrawing the bath solution containing the complexing agent from the electroless plating bath;
- reducing the copper content in the withdrawn bath solution

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to a value below 20 mg/l by electrolysis, the anodic current density i_+ not exceeding 100 A/m^2;
acidifying the bath solution thus obtained by precipitating the complexing agent and recovering same;
dissolving the recovered complexing agent in an alkaline electrolyte solution; and
returning the solution to the electroless copper plating bath.

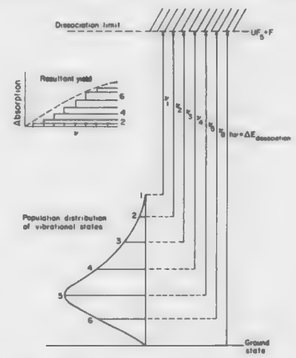
4,734,176
PULSED ION GENERATOR FOR WATER PURIFICATION SYSTEM
Joseph A. Zemba, Jr., Merritt Island, and Paul Taylor, Cocoa, both of Fla., assignors to Pure-N-Simple, Fla.
Filed Jan. 27, 1987, Ser. No. 7,110
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 **17 Claims**



1. For use with an ionization apparatus for a water purification system, ionizing electrodes of which are arranged to be coupled in the water flow path of the system for providing a controlled quantity of ions in response to the coupling of ionization potentials thereto, an arramgement for controllably coupling ionizing potentials to said electrodes comprising in combination:
first means for providing a source of ionization potential to be coupled to said electrodes; and
second means, coupled between said first means and said electrodes, for controllably modulating the duration of application of said ionization potential to said electrodes, said second means including means for controllably varying the duty cycle of the modulation of the duration of application of said ionization potential to said electrodes.

4,734,177
LASER ISOTOPE SEPARATION
C. Paul Robinson; Reed J. Jensen, both of Los Alamos, N. Mex.; Theodore P. Cotter, Munich, Fed. Rep. of Germany; Keith Boyer, and Norman R. Greiner, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Nov. 26, 1975, Ser. No. 636,343
Int. Cl.[4] B01D *59/34*
U.S. Cl. 204—157.2 **7 Claims**

1. In a process for separating isotopes which comprises (1) irradiating a gaseous compound containing a mixture of isotopes with differing excitation energy levels with radiation of a first frequency which will selectively excite molecules of the compound containing a first isotopic species but not those molecules containing other isotopic species, and (2) subjecting the excited molecules to physical or chemical processes or a combination thereof whereby the first isotopic species contained in said excited molecules is separated from the isotopic species contained in the unexcited molecules, the improvement consisting of adiabatically expanding said gaseous compound to form a highly cooled supersaturated gas in which spectrum simplification has occurred, flowing said supersaturated gas through a region wherein said supersaturated gas behaves as a continuous medium, irradiating said supersaturated gas in said region with said first frequency radiation, irradiating said supersaturated gas in said region with radiation having a second frequency sufficient to induce photochemical reaction in those molecules selectively excited by said first frequency

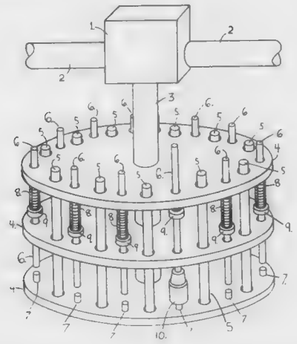


radiation, and separating the reaction product produced thereby containing the first isotopic species from those molecules containing other isotopic species before substantial condensation occurs.

4,734,178
PROCESS FOR DEPOSITION OF A WEAR-RESISTANT COATING ONTO A CUTTING TOOL MADE FROM A CARBON-CONTAINING MATERIAL
Alexei G. Gavrilov, Domodedovo, Moskovskoi; Galina K. Galitskaya, Moscow; Viktor P. Zhed, Moscow; Elena I. Kurbatova, Moscow, and Andrei K. Sinelschikov, Moscow, all of U.S.S.R., assignors to Vsesojuzny Naucho-Issledovatelsky Instrumentalny Institut, Moscow, U.S.S.R.
Filed Nov. 7, 1986, Ser. No. 929,066
Int. Cl.[4] C23C *14/22*
U.S. Cl. 204—192.38 **12 Claims**

1. A process for deposition of a wear-resistant coating onto a cutting tool made from a carbon-containing material comprising the following steps:
(a) placing said cutting tool into a saturated solution of a salt containing a cation selected from the group consisting of Na, K, Ag, Ca, Ga, Tl, La, Ce, Ta in a contacting zone for a period of from 5 to 10 minutes;
(b) removing said cutting tool from the contacting zone and evaporating the solvent from said saturated solution on the cutting tool to crystallize the salt on the surface of said cutting tool;
(c) placing said cutting tool having the salt crystallized on the surface into a vacuum chamber provided with cathodes;
(d) energizing an arc discharge in said vacuum chamber to evaporate a cathode material of at least one Group IVA, VA or VIA element of the Periodic Table;
(e) heating said cutting tool by bombardment with ions of said evaporated cathode material to a temperature at which decomposition of said salt occurs to decompose the crystals of said salt;
(f) switching-off said arc discharge and maintaining said cutting tool for from 15 to 30 seconds at said temperature at which decomposition of said salt occurs;
(g) re-energizing said arc discharge and heating said cutting tool by bombardment with ions of the evaporated cathode material to a temperature of carbidization of said evaporated cathode material;
(h) introducing a gas reactant into said vacuum chamber and reacting the ions of the evaporated cathode material with said gas reactant to form the wear-resistant coating on the cutting tool.

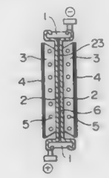
4,734,179
BULLET PLATING CAROUSEL
Gary L. Trammel, 5540 Walnut Ave., Long Beach, Calif. 90805
Filed Nov. 21, 1986, Ser. No. 939,444
Int. Cl.[4] C25D *17/06*
U.S. Cl. 204—199 **3 Claims**



1. A machine for jacketing bullet cores with electroplated metal, comprising a carousel, a motorized agitator and a supporting frame, said carousel including at least two parallel non-electrically conductive plates spaced apart and affixed to a rod passing through the centers of said plates, anodes spaced apart and mounted around the peripheral edge of said carousel, cathode pins and riser pins in line with each other and located around the peripheral edge of said carousel between but not touching said anodes, said bullet cores being placed between and contacting said cathode pins and said riser pins, said bullet cores being held in place by said cathode pins and said riser pins, said motorized agitator being attached to said supporting frame and connected to said rod, thereby suspending said carousel in an electroplating bath, said carousel being continuously reciprocated clockwise to counterclockwise in said electroplating bath by said motorized agitator to effect circulation of said bath to increase the efficiency of metal electrodeposition onto said bullet cores when direct current electricity is conducted from said bullet cores through said electroplating bath to said anodes.

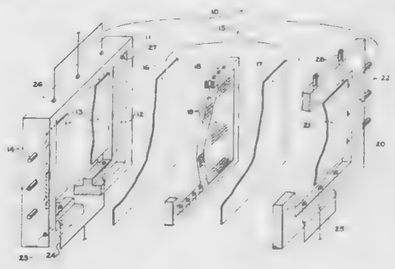
4,734,180
BIPOLAR ELECTROLYZER AND UNIT CELL
Masatoshi Sato, Zama, and Keiji Miyoshi, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Oct. 22, 1986, Ser. No. 921,480
Claims priority, application Japan, Oct. 23, 1985, 60-235292
Int. Cl.[4] C25B *9/04, 13/04*
U.S. Cl. 204—254 **16 Claims**

1. A bipolar electrolyzer comprising:
a plurality of bipolar unit cells each constructed of an anode-side pan-shaped body and a cathode-side pan-shaped body, each pan-shaped body including a hooked flange, frame wall, and partition wall, corresponding anode-side and cathode-side pan shaped bodies being disposed back to back;
rod-shaped frames inserted between the hooked flange and the frame wall in each pan-shaped body; and



an anode and a cathode which are welded to a corresponding partition wall through electrically conductive ribs, said plurality of unit cells being arranged in series.

4,734,181
ELECTROCHEMICAL CELL
Robert A. Cipriano, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 7, 1984, Ser. No. 697,505
Int. Cl.[4] C25B *9/00, 15/08*
U.S. Cl. 204—257 **7 Claims**



1. An apparatus for carrying out an electrochemical reaction which comprises
a first frame like member having an anode within its central portion, two opposite sides of said frame like member including means to introduce and withdraw a fluid from said frame interior,
a second frame like member having a cathode within its central portion, two opposite sides of said frame like member including means to introduce and withdraw a fluid from said frame interior,
a third frame like member matingly abuttingly sealable to and between each of said aforedescribed first and second frame like members, said third frame like member having a foraminous material within its central portion and a pair of cationic membranes on each side of said foraminous material defining with said frame a central compartment whose minimal thickness is that of the foraminous material,
said foraminous material being of a non-structural nature capable of sustaining repeated flexure within said frame and compression between said membranes,
Each said frame having in opposite frame members mean to introduce and withdraw, respectively, a fluid, from said so defined compartment,
said frames abuttingly and sealably aligned in alternating sequence to provide at least one combination of an anode containing frame abutting a frame including the pair of membranes which sealably abuts a cathode containing frame,
each combination or series of combinations being associated with a plate abuttingly sealable with each last frame of

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said combination, therewith to form a fluid tight body into which and from which three distinct fluids may be fed, acted upon within the respective compartments and withdrawn therefrom,

means to introduce into each chamber defined by said frames and membranes a different fluid to be acted upon within its respective chamber, said means being interior of said frames and being capable of applying to each said fluids a pressure independent of the others fluids,

means exterior of said frames to provide electrical power to the anode and cathode of said frames.

7. An electrolytic cell system utilizing the apparatus of claim 1 wherein the anode compartment contains an electrolyte, the cathode compartment contains an electrolyte, and the intermediate compartment contains a spacer of foraminous material and an aqueous solution of an ionizable compound which is electrochemically converted therein.

4,734,182

METHOD FOR PRODUCING AN ELECTROLYTIC CELL CATHODE

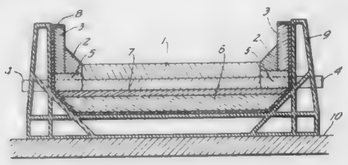
Jan Hvistendahl, Farsund, Norway, assignor to Mosal Aluminum, Elkem a/s & Co., Norway

Filed Oct. 16, 1986, Ser. No. 919,791

Claims priority, application Norway, Nov. 1, 1985, 854361

Int. Cl.⁴ C25C *3/08, 7/00*

U.S. Cl. 204—290 R **21 Claims**



1. A method for producing an electrolytic cell cathode wherein said cell cathode has an inner cell area formed by a bottom area and a side area, said method comprising the steps of:

(a) first, forming a layer of carbon material onto a form, said form having outer dimenisons and shape comparable to said inner cell area said layer of carbon material having a bus bar;

(b) second, placing over at least a portion of said layer of carbon material a refractory insulating material to form a shell; and

(c) third, casting concrete over said shell thereby forming said electrolytic cell cathode.

4,734,183

SPUTTERING CATHODE ON THE MAGNETRON PRINCIPLE

Peter Wirz, Waldernbach; Gudrun Przybilla, Alzenau; Karl-Heinz Schuller, Obertshausen, and Bernd Cord, Alzenau-Albstadt, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

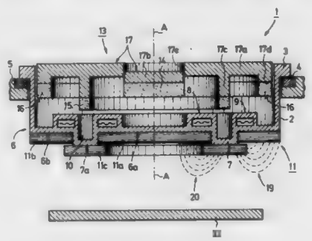
Filed Aug. 15, 1986, Ser. No. 896,939

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624150

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—298 **5 Claims**

1. Sputtering cathode comprising a target including at least one piece composed of a material to be sputtered, a magnetic system disposed in back of said target and spread out substantially in one plane said magnetic system comprising at least three permanent magnetic units of alternately different polarity lying one inside the other and self contained to form at least two magnetic tunnels of arcing lines of force which tunnels lie one inside the other and closed on themselves, each of said magnetic units having one pole facing toward and one pole facing away from said target, wherein the poles of the magnetic units facing away from the target are joined together by a magnetic yoke of soft magnetic material which magnetic yoke forms a field of magnetic flux with each of said magnetic units wherein the strength of the magnetic flux between the magnetic yoke and at least one magnetic unit varies relative to



the magnetic flux between the magnetic yoke and the rest of the magnet units, wherein a mechanical adjusting means is provided for varying said magnetic flux produced between said magnetic yoke and said at least one magnetic unit and said magnetic flux produced between the magnetic yoke and the rest of the magnetic units.

4,734,184

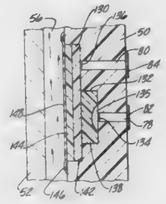
SELF-ACTIVATING HYDRATABLE SOLID-STATE ELECTRODE APPARATUS

Peter Burleigh; Bruce Burgess, and Ricky Hendershot, all of Ann Arbor, Mich., assignors to Diamond Sensor Systems, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 770,697, Aug. 29, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 21,520

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—409 **5 Claims**



1. An electrode assembly comprising:

a planar base member;

an elongated flow channel formed partially through the depth of the base member and opening to one surface thereof;

a plate member fixed to the surface of the base member which has the flow channel formed therein to close off the open side of the flow channel;

a first well of increased depth relative to the depth of the flow channel, formed in the base member along a portion of the length of the flow channel;

a second well of increased depth relative to the depth of the first well formed in the base member along a portion of the length of the first well;

an outer, planar, gas and water permeable, hydrophobic membrane layer formed over the entire surface of the first well and contacting the edges of the flow channel adjacent the first well so as to effectively form a portion of the wall of the flow channel over the first well;

an intermediate, planar, gas and water permeable, hydrophilic electrolyte membrane layer containing a pH buffer underlying the outer planar membrane, within the first well;

an inner, planar gas and water permeable hygroscopic electrolyte membrane layer conaining a pH buffer underlying the intermediate layer within the first well;

a conductive reference electrode passing through the thickness of the base member from the side opposite that containing the first well, at a point spaced from the second well, having one end in conductive contact with the underside of said inner planar electrolyte layer;

a conductive active electrode extending through the thickness of the base from the side opposite to that containing the wells at the area of the second well, so that one of its ends extends to the second well;

an active, inner, water permeable, electrolyte layer formed within the second well with one of its surfaces in contact with the active electrode surface which extends to the second well;

an active, outer, water permeable, polymeric pH sensitive layer filling the remaining volume of the second well so as to contact said active inner electrolyte layer and said inner planar hygroscopic electrolyte layer contained within the first well;

means for introducing aqueous fluid samples into the flow channel for measuring the content of carbon dioxide gas dissolved in the fluid; and

signal receiving means adopted to be connected to the ends of the active and reference electrodes opposite to the ends of those electrodes contacting the electrolyte layers;

whereby the assembly, when hydrated by an aqueous fluid sample, is capable of electrochemical interaction with the carbon dioxide content of an aqueous fluid sample such that an electric potential difference is generated between said electrodes as a function of the carbon dioxide content, for measurement by said signal receiving means.

4,734,185

CRACKING PROCESS USING ZEOLITE AND SILICOALUMINOPHOSPHATE MOLECULAR SIEVE

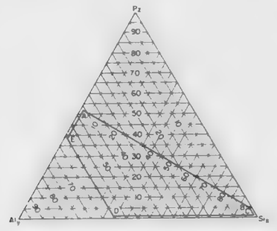
Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights; Mark T. Staniulis, Peekskill; Gary N. Long, Putnam Valley, and Jule A. Rabo, Armonk, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 675,283, Nov. 27, 1984, and a continuation-in-part of Ser. No. 772,616, Sep. 4, 1985, which is a division of Ser. No. 675,285, Nov. 27, 1984, which is a continuation-in-part of Ser. No. 490,952, May 2, 1983, Pat. No. 4,512,875. This application Sep. 5, 1985, Ser. No. 772,858

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ C10G *11/04, 11/05*

U.S. Cl. 208—114 **25 Claims**



1. The process for cracking a crude oil feedstock to produce lower boiling hydrocarbons comprising contacting at effective catalytic cracking conditions at a temperature between about 400° F. and about 1300° F. a crude oil feedstock with a conversion catalyst comprising an effective cracking amount of at least one zeolitic aluminosilicate and an effective amount of at least one silicoaluminophosphate molecular sieve characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a partial pressure of 500 torr and a temperature of 20° C. wherein said silicoaluminophosphate is a microporous crystalline silicoaluminophosphates having pores which are uniform and having nominal diameters of greater than about 3 Angstroms and whose essential empirical chemical composition in the as-synthesized and anhydrous form is

$$mR:(Si_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from 0.02 to 0.3; "m" represents the moles of "R" present per mole of $(Si_xAl_yP_z)O_2$; "x", "y" and "z" represent the mole fractions of silicon, aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of the ternary diagram which is FIG. 1.

4,734,186

HYDROFINING PROCESS

Stephen L. Parrott; Simon G. Kukes, and Karlheinz K. Brandes, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 843,489, Mar. 24, 1986, Pat. No. 4,687,757. This application May 18, 1987, Ser. No. 50,449

Int. Cl.⁴ C10G *45/04, 45/00*

U.S. Cl. 208—251 H **28 Claims**

1. A process for hydrotreating a hydrocarbon-containing feed stream comprising the step of simultaneously contacting a substantially liquid hydrocarbon-containing feed stream, which also contains compounds of nickel, vanadium and sulfur, with a free hydrogen-containing gas and a catalyst composition comprising alumina as support material, at least one compound of titanium, at least one compound of molybdenum and at least one compound of aluminum, under such hydrotreating conditions as to produce a hydrocarbon-containing stream having a reduced level of at least one of nickel, vanadium and sulfur,

wherein said catalyst composition is prepared by a process comprising the steps of:

(A) impregnating a support material consisting essentially of alumina with a solution comprising water, at least one compound titanium and at least one compound of aluminum;

(B) heating the material obtained in step (A) under such conditions as to at least partially dry said material obtained in step (A),

(C) impregnating the at least partially dried material obtained in step (B) with a solution containing water and at least one compound of molybdenum;

(D) heating the material obtained in step (C) at a first temperature so as to at least partially dry said material obtained in step (C);

(E) heating the at least partially dried material obtained in step (D) at a second temperature, which is higher than said first temperature, so as to activate said at least partially dried material obtained in step (D).

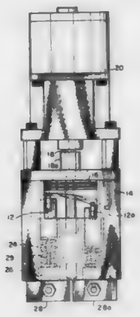
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4,734,187

CONSTANT SUCTION GRADIENT PUMP FOR HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

William Visentin, 11910 Butternut St., Palm Beach Gardens, 33410, and William T. Casey, Jr., 1370 Birkdale Dr., West Palm Beach, both of Fla. 33414

Filed Jun. 13, 1986, Ser. No. 874,189
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—101 19 Claims



15. In a HPLC system of the type having a HPLC detector, a constant suction pump comprising:

a plurality of sources of solvent;

a plurality of valves, one for each of said sources of solvent, said valves controlling the flow of solvent from said sources;

a pump having an inlet side connected to draw solvent from said sources through said valves and an outlet side through which the solvents flow to said HPLC detector;

electromechanical means for driving said pump; and

means for providing constant suction on the inlet side of said pump, said constant suction means comprising:

first and second plunger assemblies, each said plunger assembly displaceable for alternately drawing and pumping solvent; and

means for compensating the displacement of said plunger assemblies when said first and second plunger assemblies simultaneously draw solvent, thereby providing constant suction, said compensating means further comprising:

a rotatable, disk-shaped cam having a gradient profile divided into first and second profile sections, said first profile section having a constant gradient and said second profile section having a variable gradient, said second profile section being divided into first, second and third portions and said first and second portions having a gradient approximately one-half of the gradient of said third portion, said third portions located between said first and second portions;

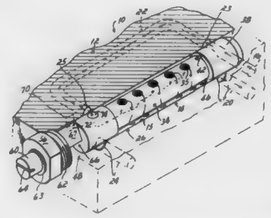
wherein said first and second plunger assemblies ride the profile of said cam, said first and second plunger assemblies each pumping solvent when riding said first profile section and drawing solvent at a first rate when riding the third portion of said second profile section and drawing solvent at a second rate when riding the first and second portion of said second profile section.

4,734,188

FILTER FOR HOT MELT ADHESIVE

David L. Burdette, Jr., Norcross, and David J. Byerly, Lawrenceville, both of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 15, 1986, Ser. No. 919,025
Int. Cl.[4] B01D *29/02, 35/30*
U.S. Cl. 210—107 8 Claims



1. Apparatus for filtering hot melt adhesive, comprising:

annular filter means having an outer filtering portion, an inner flow channel, a first end formed with a first flow passageway communicating with said outer filtering portion and a second end formed with a second flow passageway inlet communicating with said inner flow channel;

a manifold formed with a main passageway and a conduit, said manifold having an adhesive inlet, a filtered adhesive outlet and a drain each connected to said main passageway, said annular filter means being rotatably carried within said main passageway of said manifold with said first end being positioned at said adhesive inlet, said second end being positioned at said drain and said conduit extending between said first and second ends;

rotatable means carried by said annular filter means for rotating said annular filter means between a filtering position and a backflushing position, said rotatable means in a first position being effective to interconnect said adhesive inlet with said conduit to direct hot melt adhesive therethrough and into said second flow passageway at said second end of said annular filter means, the hot melt adhesive flowing through said second flow passageway into said inner channel of said annular filter means and then through said outer filtering portion thereof for filtering impurities from the hot melt adhesive, the filtered hot melt adhesive flowing along said main passageway into said filtered adhesive outlet for discharge from said manifold;

said rotatable means when in a second position being effective to interconnect said adhesive inlet to said first flow passageway at said first end of said annular filter means for directing hot melt adhesive through said first flow passageway to said outer filtering portion of said annular filter means, the hot melt adhesive flowing inwardly from said outer filtering portion into said inner flow channel of said annular filter means for dislodging filtered impurities from said outer filtering portion and transmitting the impurities into said drain for discharge from said manifold.

4,734,189

APPARATUS FOR ASSISTING IN THE REMOVAL OF TRASH FROM SWIMMING POOLS

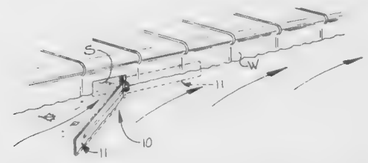
Cornelius D. Page, Jr., Lincolnton, N.C., assignor to PPL, Inc., Lincolnton, N.C.

Filed Dec. 17, 1986, Ser. No. 943,652
Int. Cl.[4] E04H *2/20*
U.S. Cl. 210—169 13 Claims

1. Apparatus for assisting in the removal of trash from the surface of water in a swimming pool equipped with a skimmer including at least one skimmer opening having top and bottom walls in the side of the swimming pool at water level to permit the skimmer to withdraw water and surface trash from the swimming pool, said apparatus comprising

(a) deflector means for deflecting water and surface trash into the skimmer opening in the side of the swimming pool, said deflector means comprising an elongate member having a thin planar portion adapted to extend into the swimming pool at an acute angle to the side of the swimming pool with a lower portion of the deflector member below the surface of the water and the remaining portion thereof above the suface of the water,

(b) an extensible member positioned within the skimmer opening in the side wall of the swimming pool when in use with opposite ends of said extensible member contacting



the top and bottom of the skimmer opening to securely hold said extensible member within the skimmer opening, and

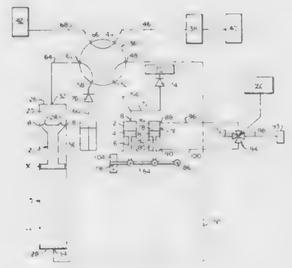
(c) mounting means on said extensible member and said deflector member for mounting said deflector member on said extensible member in proper angular position relative to the skimmer opening, said mounting means permitting adjustment of the angular position of said deflector member relative to the side of the swimming pool to deflect more or less water and surface trash into the skimmer opening or to position said deflector member in an inoperative, nonhazardous position against the sidewall of the swimming pool.

4,734,190

SAMPLE DISPENSING SYSTEM FOR LIQUID CHROMATOGRAPHY

Scott P. Fulton, Brookline, and Douglas B. Tiffany, Danvers, both of Mass., assignors to W. R. Grace & Co., Lexington, Mass.

Filed Apr. 17, 1987, Ser. No. 40,440
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 18 Claims



1. A system for applying a sample solution to a liquid chromatographic column comprising:

(a) a piston container;

(b) a first piston adapted to move along the axis of said piston container sealingly contacting the side walls of said piston container;

(c) a first passageway for the introduction and removal of driving solution to and from said piston container;

(d) means for moving said first piston in said piston container;

(e) means for presetting the amount that said first piston will move in said piston container;

(f) a piston cylinder;

(g) a second piston adapted to move along the axis of said piston cylinder sealingly contacting the side walls of said piston cylinder and dividing said piston cylinder into a sample solution chamber and a driving solution chamber, said piston cylinder having two ends, a sample solution chamber end and a driving solution chamber end;

(h) a second passageway for the introduction and removal of sample solution to and from said sample solution chamber;

(i) a third passageway for the introduction and removal of driving solution to and from said driving solution chamber;

(j) a driving solution reservoir;

(k) a sample solution reservoir;

(l) a chromatographic column;

(m) pumping means for pumping driving solution from said driving solution reservoir into said driving solution chamber through said third passageway and for pumping a driving solution from said driving solution reservoir onto said chromatographic column;

(n) a first valve means (A) interconnecting said pumping means with said driving solution chamber; (B) interconnecting said driving solution chamber with said piston container; (C) interconnecting said piston container with said sample solution reservoir; (D) interconnecting said sample solution reservoir with said sample solution chamber; (E) interconnecting said sample solution chamber with said chromatographic column; and (F) interconnecting said chromatographic column with said pumping means, wherein said pumping means is connected to said first valve means via a first conduit; said third passageway of said driving solution chamber is connected to said first valve means via a second conduit; said first passageway of said piston container is connected to said first valve means via a third conduit; said second passageway of said sample solution chamber is connected to said first valve means via a fourth conduit; said sample solution reservoir is connected to said first valve means via a fifth conduit; and said chromatographic column is connected to said first valve means via a sixth conduit.

4,734,191

APPARATUS FOR THE INTERMITTENT AERATION OF LIQUIDS

Karl H. Schüssler, Philipp-Reis-Strasse 18, D-6460 Gelnhausen, Fed. Rep. of Germany

Continuation of Ser. No. 732,640, May 10, 1985, Pat. No. 4,631,134. This application Sep. 23, 1986, Ser. No. 910,497
Claims priority, application European Pat. Off., Sep. 12, 1984, 84710032; Apr. 10, 1985, 85104359
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—220 12 Claims

1. A device for the aeration of a liquid in an aeration tank having a water surface, comprising:

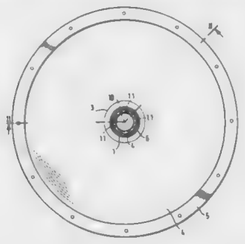
an air supply;

a supporting body having a center of gravity with an aeration face having first perforations therein, a central portion having air inlet means connected to said air supply and a periphery being disposed slightly higher than said center of gravity;

a diaphragm of flexible, airtight material covering said supporting body and being attached thereto in airtight fashion about said periphery, said diaphragm having second perforations being out of alignment with said first perforations;

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wherein air is fed from said air supply into said central portion of said supporting body, through said first perforations, between said diaphragm and said supporting body,



outwards towards said periphery through said second perforations and with decreasing pressure into said liquid to be aerated.

4,734,192

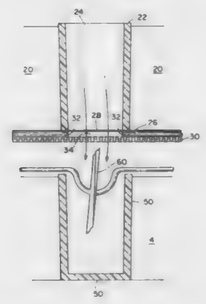
MULTIWELL MEMBRANE FILTRATION APPARATUS

Helena M. Champion, Swampscott, Mass.; Joseph J. Pierog, Salem, N.H., and Joseph E. Peters, Carlisle, Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 555,421, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 394,225, Jul. 1, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,687

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—335 **9 Claims**



1. A filtration apparatus able to retain liquid for extended periods of time comprising:

a plate having a thickness and a plurality of apertures extending through the thickness of the plate;

filtration means comprising a member selected from the group consisting of a microporous membrane and an ultrafiltration membrane disposed over one end of each of said apertures such that a plurality of wells each having a discrete filtering area are formed;

a hydrophobic fabric attached to said filtration means adjacent to said filtering areas and spaced apart from said filtering areas, said filtering areas and hydrophobic fabric defining spaces where liquid can be retained, said hydrophobic fabric positioned to prevent liquid placed in said wells from passing through said filtration means and said hydrophobic fabric by capillary action and gravity flow;

operably connected means for applying a differential pressure across said filtering areas and said hydrophobic fabric for effecting passage of said liquid sequentially through a said filtering area, said filtration means, a said space and said hydrophobic fabric;

a second plate defining a plurality of chambers, only one chamber being associated with each of said apertures, and operably connected means for providing that only one said chamber receives all liquid passing through the associated aperture.

4,734,193

APPARATUS FOR CONTINUOUSLY SEPARATING LIQUID PHASES OF DIFFERENT DENSITY

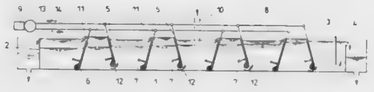
Vilim Cvitas, Leonding; Karl Faltejsek, Linz; Reinhart Hanke, and Gottfried Klinar, both of Leoben, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 15, 1986, Ser. No. 907,380

Claims priority, application Austria, Sep. 25, 1985, 2798/85

Int. Cl.[4] B01D *17/032*

U.S. Cl. 210—242.3 **7 Claims**



1. Apparatus for continuously separating liquid phases comprising: a basin for receiving mixed phase liquids and in which the phases separate to upper and lower layers, said basin having an imperforate bottom and sides and further having first and second outlets in opposite sides thereof for the upper and lower layers, respectively, said outlets determining opposite, horizontal, parallel flow directions for the upper and lower layers; a plurality of partition walls within the basin, said partition walls being transverse to the flow direction and spaced apart in the flow direction, said partition walls having opposite end edges in sealing contact with respective sides of the basin, and drive means for moving the partition walls relative to the basin such that adjacent partition walls can be lifted and lowered in an opposite sense and such that adjacent partition walls can be moved toward and away from each other, said partition walls having lower edges which, in the lowered position of the respective partition wall, sealingly engage the bottom of the basin and which, in the raised position of the respective partition wall, are spaced from the bottom of the basin to provide a free flow cross-section for the lower layer.

4,734,194

COMBINED FILTER AND VALVE MECHANISM

Andrew Kalman, Portage; Melvin C. Tyler, Schoolcraft; William E. VerMeulen, Scotts, and Thomas M. Boersma, Augusta, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 25, 1986, Ser. No. 843,941

Int. Cl.[4] B01D *35/02;* **F16K** *21/00*

U.S. Cl. 210—390 **13 Claims**

13. A combined valve and filter mechanism comprising:

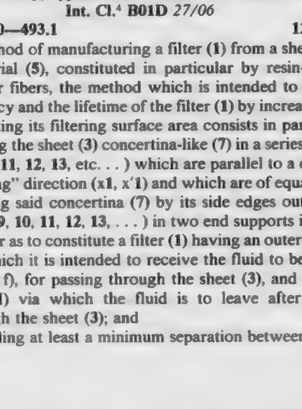
a valve body having means defining a discharge port;

a valve member;

a valve seat member having a surface defining a valve seat and means defining an opening therethrough, said valve seat member being connected to said valve body with there being means defining an open internal passageway connecting said means defining an opening to said means defining a discharge port, said valve member being adapted to sealingly engage said valve seat to close one axial end of said means defining an opening and thereby block said means defining an open internal passageway;

a foraminous filter element connected to one axial end to said valve member and being slidably received in said means defining an opening with a generally fluid-tight fit, said filter element being open at its other axial end and communicating with said means defining an open internal passageway so that filtrate is free to flow from within said filter element through said means defining an open internal passageway to said means defining a discharge port when said filter element projects outwardly from said valve seat;

means to move said valve member between an open position wherein said valve member is spaced from said valve seat and said filter element is exposed and a closed position wherein said valve member sealingly engages said valve seat and said filter element is slidably received within said means defining an opening; and



egress means separate from said filter for allowing the egress of the contents of the vessel, whereby said egress means functions as the main means for egress for the contents of the vessel when the valve is in the fully-opened position, said filter functions as the only means of egress for the contents of the vessel when the valve is in an intermediate position and when said valve is in the fully-closed position, said egress means and said filter do not contact the contents of the vessel.

4,734,195

FILTER CARTRIDGE HAVING A HONEYCOMBED OUTER SURFACE, AND METHOD OF MANUFACTURE

Robert Lhuillier, Longpont Sur Orge, France; Michael Selesnick, Nextown, Pa.; Jean Vieville, Antony, and John Wolfe, Flancourt Catelon, both of France, assignors to A.R.E. S.A.R.L., Massy, France

PCT No. PCT/FR85/00203, § 371 Date Mar. 3, 1986, § 102(e) Date Mar. 3, 1986, PCT Pub. No. WO86/00822, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 24, 1985, Ser. No. 855,746

Claims priority, application France, Jul. 25, 1984, 84 11801

Int. Cl.[4] B01D *27/06*

U.S. Cl. 210—493.1 **12 Claims**

1. A method of manufacturing a filter (1) from a sheet (3) of filter material (5), constituted in particular by resin-impregnated paper fibers, the method which is intended to increase the efficiency and the lifetime of the filter (1) by increasing and by distributing its filtering surface area consists in particular:

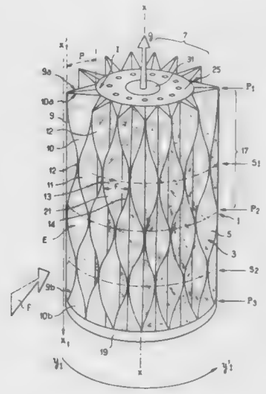
in shaping the sheet (3) concertina-like (7) in a series of folds (9, 10, 11, 12, 13, etc. . .) which are parallel to a common "folding" direction (x1, x'1) and which are of equal depth;

in holding said concertina (7) by its side edges outside the folds (9, 10, 11, 12, 13, . . .) in two end supports in such a manner as to constitute a filter (1) having an outer face (E) via which it is intended to receive the fluid to be filtered (along f), for passing through the sheet (3), and an inner face (I) via which the fluid is to leave after passing through the sheet (3); and

in providing at least a minimum separation between at least some portions of adjacent outer folds (9, 10, 11, 12, 13, . . .;

said method being characterized by the following combination:

firstly at least two adjacent folds (9, 10), (11, 12), (13, 14) of the outer face are clamped together at at least two levels (p1, p2, p3) at different heights along the sheet (3) in the "folding" direction (x1, x'1) said at least two adjacent



folds (9, 10), (11, 12), (13, 14) thus providing facing intermediate portions situated between two clamping points; and

secondly said two intermediate portions between said clamping points said at least two adjacent folds (9, 10), (11, 12), (13, 14) are separated so as to provide at least one honeycomb cell (21) in the outer face (E) of the filter (1) between said at least two adjacent folds (9, 10), (11, 12), (13, 14).

4,734,196

PROCESS FOR PRODUCING MICRO-POROUS MEMBRANE OF ULTRA-HIGH-MOLECULAR-WEIGHT ALPHA-OLEFIN POLYMER, MICRO-POROUS MEMBRANES AND PROCESS FOR PRODUCING FILM OF ULTRA-HIGH-MOLECULAR-WEIGHT ALPHA-OLEFIN POLYMER

Koichi Kono; Shoichi Mori; Kenji Miyasaka, and Jyoichi Tabuchi, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,916

Claims priority, application Japan, Feb. 25, 1985, 60-34576; Feb. 25, 1985, 60-34577; Feb. 25, 1985, 60-34578

Int. Cl.[4] C08J *9/28;* **B29C** *55/12, 43/00*

U.S. Cl. 210—500.36 **6 Claims**



1. A micro-porous membrane of ultra-high-molecular-weight alpha-olefin polymer having a weight-average molecular weight of about 5×10^5 or greater, said micro-porous membrane having holes 0.01 to 1 micrometer in average pore size. with a void ratio of from about 30 to 90% and being orientated such that the linear draw ratio in one axis is greater than two and the areal draw ratio is greater than 10.

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4,734,197

JET AERATOR HEADER ASSEMBLIES AND METHODS FOR USE THEREOF IN TOTAL, PARTIAL, AND NON-BARRIERED OXIDATION DITCHES

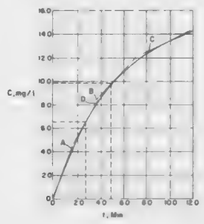
John H. Reid, c/o Reid Engineering Co., 1211 Caroline St., Fredericksburg, Va. 22401

Continuation-in-part of Ser. No. 433,638, Sep. 30, 1982, which is a continuation-in-part of Ser. No. 361,205, Mar. 24, 1982, Pat. No. 4,455,232, which is a continuation-in-part of Ser. No. 75,412, Sep. 14, 1979, Pat. No. 4,394,268, which is a continuation-in-part of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,955, Jan. 19, 1976, abandoned, and a continuation-in-part of Ser. No. 621,740, Jun. 18, 1984, which is a continuation-in-part of Ser. No. 355,150, Mar. 5, 1982, Pat. No. 4,460,471, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 795,238, Nov. 5, 1985, which is a continuation-in-part of Ser. No. 282,592, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547. This application Mar. 14, 1986, Ser. No. 839,588

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—629 **23 Claims**



1. A jet aerator header assembly that is installd within and removable from, a deep oxygen contact duct which is mounted beneath and in flow communication with an endless channel, containing mixed liquor in translational movement, of a total, partial, or non-barriered oxidation ditch having a surface and a downflow pump, whereby at least a portion of said liquor flows through said duct, said assembly comprising:

A. a liquid header;

B. an air header;

C. a plurality of jet aerators which are flow connected to said liquid header and to said air header, said jet aerators being selectively oriented with respect to flow directions of said mixed liquor after said installation within said duct;

D. stiffening means for rigidly connecting said liquid header, said air header, and said jet aerator;

E. connecting means between said liquid header and a liquid supply line, said connecting means having sufficient length to extend from said surface to said contact duct;

F. connecting means between said air header and an air supply line; and

G, means for selectively installing said headers, said jet aerators, and said stiffening means within said contact duct.

11. A method for controllably and independently pumping and aerating a stream of mixed liquor flowing through a deep oxygen contact duct of a partial, total, or non-barriered oxidation ditch comprising an endless channel, said contact duct having an inlet end and a discharge end and an axis therebetween, comprising the following steps:

A. providing a jet aerator header assembly at said inlet end;

B. providing at least one jet aerator mid-duct header assembly between said inlet end and said discharge end, each said header assembly comprising:

(1) a liquid header,

(2) an air header which is disposed adjacent to said liquid header,

(3) a plurality of jet aerators which are flow connected to said liquid header and to said air header,

(4) means which rigidly attach said headers to said plurality of jet aerators, and

(5) means respectively connecting said liquid and air headers to liquid and air supply means;

C. operating said at least one mid-duct header assembly to provide:

(1) oxygen transfer from air bubbles to said mixed liquor stream to create a base level of dissolved oxygen in said mixed liquor stream, and

(2) a minimum circulation velocity within said endless channel; and

D. selectively operating said inlet header assembly to provide the additional amount of dissolved oxygen in said mixed liquor that is required for treatment of a stream of inflowing wastewater.

4,734,198

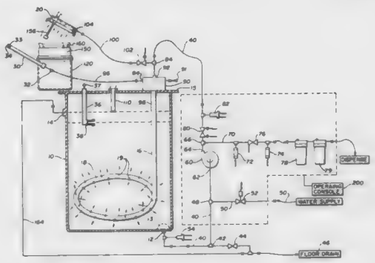
DIALYSIS SOLUTION MIXING SYSTEM

William H. Harm, Columbia Heights; Larry E. Fuller, Minnetonka; Earnest R. Caine, Bloomington; Raymond F. Cracauer, Minneapolis; Louis C. Cosentino, Wayzata, and F. Jesus Martinez, Plymouth, all of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Filed Feb. 6, 1984, Ser. No. 577,387

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—647 **25 Claims**



6. A blending system for preparation of hemodialysis solution from a diluent of water and from dry chemicals comprising:

(a) a dialysis solution tank;

(b) diluent means for supplying water into said tank;

(c) level sensing means within said tank for determining when said tank is charged with diluent and for controlling the flow of diluent into said tank;

(d) delivery means for conveying liquid within said tank to a source of a predetermined quantity of dry chemicals having the amount of chemicals required to make up the hemodialysis solution;

(e) said delivery means including solubilizing means to direct said diluent onto said dry chemicals so as to form a slurry of chemicals and diluent;

(f) level sensing means for controlling the introduction of diluent into said source of dry chemicals;

(g) pickup wand means for conveying said slurry and diluent from said chemical source to said dialysis solution tank;

(h) dialysis solution tank mixing means for receiving and mixing said chemicals within said tank from said pickup wand means; and

(i) dialysis solution delivery means for delivering mixed dialysis solution from said dialysis solution tank for dialysis including filters, pressure sensors, monitors for determining the concentration of said dialysis solution and valves controlled by outputs of said sensors and monitors.

4,734,199

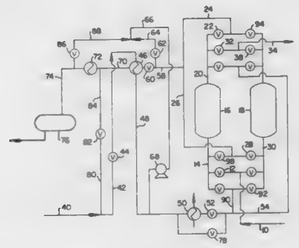
LIQUID PHASE ADSORPTION PROCESS

Moez M. Nagji, Yonkers, and Olaf Nifontoff, Stony Point, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 19, 1986, Ser. No. 932,370

Int. Cl.[4] B01D *15/00*

U.S. Cl. 210—674 **8 Claims**



1. An adsorption process comprising the steps of:

(a) providing an adsorption system comprising at least a first and second fixed adsorbent bed containing adsorbent particles and having void space not occupied by the adsorbent particles:

(b) passing as a feedstock into the first of said adsorbent beds a mixture of at least two molecular species in the liquid phase of which at least one is selectively absorbed by the absorbent particles, and recovering from the bed a product having a lower concentration of the adsorbed species than the feedstock:

(c) terminating the passage of feedstock into said first adsorbent bed at a time when the adsorbent therein retains sufficient capacity to adsorb the desired amount of the molecular species from the feedstock contained within the first said adsorbent bed, and directing the flow of the said feedstock in the liquid phase into the second of said fixed adsorbent beds, said second bed at the beginning of passage of feedstock thereinto containing in the void space a liquid purge medium different from the feedstock in step (b);

(d) recovering said liquid purge medium from the void space of said second bed by displacement as a result of the passage of feedstock thereinto and passing said displaced liquid purge medium directly to the said first bed after the passage of feedstock into said first bed has been terminated in accordance with the process step (c) above, whereby the feedstock in the void space of said first bed is purged therefrom and

(e) continuing the flow of feedstock into said second bed in the same manner as into said first bed in (b) and recovering a product of essentially the same composition as is recovered in step (b).

4,734,200

PROCESS FOR REMOVAL OF FLUORIDE AND PHOSPHORUS-TYPE CONTAMINANTS FROM ACIDIC WASTEWATER

W. Wes Berry, Lakeland, Fla., assignor to Advanced Separation Technologies Incorporated, Lakeland, Fla.

Filed Apr. 4, 1986, Ser. No. 848,130

Int. Cl.[4] C02F *1/42*

U.S. Cl. 210—677 **20 Claims**

1. A process for treating an acidic process waste water containing SiF_6^{2-} comprising (i) contacting said waste water with a strong base ion exchange resin and loading said SiF_6^{2-} onto the resin and (ii) removing phosphate ions from said waste water after removing said fluoride-containing ions from the waste water, said phosphate ions being removed by raising the pH of said waste water to between about 5.0 and 7.0 and then



contacting said waste water with a strong base ion exchange resin and loading said phosphate ions onto said resin.

4,734,201

DEIONIZED WATER SUPPLYING SYSTEM

Mituru Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 766,293, Aug. 16, 1985, abandoned, and a continuation-in-part of Ser. No. 766,295, Aug. 16, 1985, Pat. No. 4,644,969. This application Jul. 31, 1986, Ser. No. 891,338

Claims priority, application Japan, Aug. 20, 1984, 59-171595; Aug. 20, 1984, 59-125348; Sep. 25, 1984, 59-143511

Int. Cl.[4] C02F *1/42*; F16K *11/02, 31/126*

U.S. Cl. 210—685 **14 Claims**



1. A deionized water supply system, comprising:

a deionized water supply tank;

a deionized water supply pipe connected to said supply tank for supplying deionized water;

a deionized water circulating pipe connected to said supply tank;

a three-ported pneumatically-operated water control valve including:

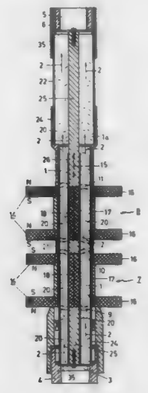
air actuating means having an air cylinder, an air piston within said air cylinder, and a piston shaft connected to said piston;

a valve portion for controlling the flow of water and operated by said air actuating means, said valve portion comprising a valve cylinder, a pair of stationary valve seats within said valve cylinder so as to face each other in a parallel manner, an obturator positioned between said stationary valve seats, a valve shaft connecting to said obturator, a first port, a second port and a third port;

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an intermediate cylinder mounted between said air cylinder and said valve cylinder;
an intermediate valve shaft serially connected between said piston shaft and said valve shaft;
a first bellows having one end hermetically mounted to an upper portion of said intermediate valve shaft and another end hermetically mounted to the inner wall of said intermediate cylinder; and
a second bellows having one end hermetically mounted to a lower portion of said intermediate valve shaft and another end hermetically mounted to the inner wall of said intermediate cylinder, whereby said first and second bellows form a space isolating said piston shaft from said valve shaft, said three-ported valve having only two states of communication among said first, second and third ports, said two states being alternative and including a first state defined by said first port communicating with said second port and communication between said first and third ports being blocked, and a second state defined by said first port communicating with said third port and communication between said first and second ports being blocked;
a first branch pipe connected between said first port and said deionized water supply pipe;
a second branch pipe connected between said third port and said deionized water circulating pipe;
whereby deionized water flows from said deionized water supply pipe to said second port via said first branch pipe when said valve is in said first state and the deionized water flows from said deionized water supply pipe to said deionized water circulating pipe via said first branch pipe and said second branch pipe when said valve is in said second state; and
a polishing unit connected to said deionized water supply pipe for purifying downstream water flowing in said deionized water supply pipe.

4,734,202
METHOD AND APPARATUS FOR CONDITIONING WATER
Guido Mach, Rudolf Waisenhorngasse 27, A-1235 Vienna, Austria
Filed Mar. 27, 1986, Ser. No. 845,117
Claims priority, application Austria, Mar. 29, 1985, 945/85
Int. Cl.[4] C02F *1/48, 1/50*
U.S. Cl. 210—695 **15 Claims**



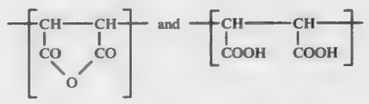
1. A method for conditioning water, comprising:
subjecting the water to a magnetic field treatment by causing it to flow through at least one magnetic field; and
subjecting the water, in combination with the magnetic field treatment, to an oligodynamic treatment performed without external current supply by disconnectedly disposing metal pieces of at least one oligodynamically active metal in the flowing water, the metal pieces having dimensions and shapes which allow them to be moved by the flowing water, wherein the at least one magnetic field surrounds a vertical flow section and the metal pieces are movably disposed within the vertical flow section, and wherein the water is caused to flow upwardly through the vertical flow section and has a flow rate which is adjusted so that the oligodynamically active metal pieces constantly move.

4,734,203
COPPER CHELANTS/DISPERSANTS AND THEIR APPLICATIONS FOR BOILER INTERNAL TREATMENT
Mei-Jan L. Lin, Naperville, and Frederick J. Sibert, Chicago, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Filed Mar. 3, 1987, Ser. No. 21,076
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—698 **5 Claims**

1. A method of chelating and transporting copper ions, sulfides and oxides in boiler water which comprises adding to said water an effective liquid chelant amount of a chelant selected from the group consisting of rubeanic acid and a water-soluble polymer of (piperazine methyl-para-hydroxysulfonic acid)$_n$, and (piperazine methyl-para-hydroxybenzoic acid)$_n$, and their alkali metal salts, wherein the polymers have an n value of 2–20, to chelate and transport said copper in said boiler water.

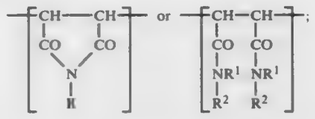
4,734,204
POLYMALEIC ANHYDRIDE DERIVATIVES
Frank Lamb, Stockport, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Aug. 30, 1985, Ser. No. 770,898
Claims priority, application United Kingdom, Sep. 11, 1984, 8422904
Int. Cl.[4] B01D *17/04*
U.S. Cl. 210—708 **6 Claims**

1. A method for demulsifying a water-in-oil emulsion which comprises
admixing an effective amount of the partial ester reaction product obtained by reacting a polymer or copolymer containing recurring structural units selected from the group consisting of



and

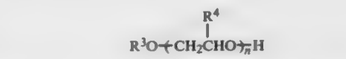
or said copolymer which additionally contains recurring structural units



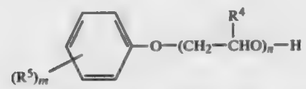
or

where R represents a straight or branched alkyl having 4 to 14 carbon atoms, R^1 and R^2 are the same or different and represent a straight or branched chain alkyl having 1 to 12 carbon atoms, or R^1 and R^2 together with the nitrogen atom to which they are attached form a 5- or 6-membered heterocyclic ring which is pyrrolidine, piperidine or morpholine,

or said copolymer which additionally is a copolymer of maleic anhydride with one or more ethylenically unsaturated monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, itaconic acid, aconitic acid, ethyl acrylate, methyl methacrylate, ethyl crotonate, glycidyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, dimethyl itaconate, acrylonitrile, acrylamide, N-hydroxymethylacrylamide, N,N-dimethylacrylamide, N-acrylamidoglycolic acid, vinyl acetate, vinyl sulfonic acid, allyl sulfonic acid, 4-styrenesulfonic acid, vinyl phosphonic acid, styrene phosphonic acid, allyl alcohol, allyl acetate, styrene, alpha-methylstyrene, ethylene, propylene, hexene, 2,4,4-trimethylpent-1-ene, N-acrylamidopropane sulfonic acid and mixtures thereof,
with an alkoxylated alcohol of the formula



where R^3 is a straight or branched chain alkyl having 1 to 18 carbon atoms, R^4 is hydrogen or methyl and n is an integer from 1 to 20;
with an alkoxylated alkyl phenol of the formula



wherein R^4 is hydrogen or methyl, n is an integer from 1 to 20, R^5 is a straight or branched chain alkyl having 1 to 12 carbon atoms and m is an integer from 1 to 3;
with a polyalkylene glycol of the formula

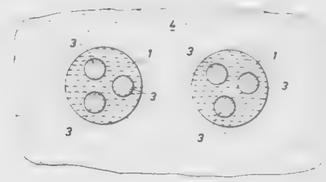


wherein R^4 is hydrogen or methyl and p is an integer from 3 to 30; or
with a mixture thereof,
where from 25 to 75% of the acid or anhydride groups in the polymer or copolymer are esterified;
into said emulsion with agitation, and then
allowing the water and oil to separate upon standing.

4,734,205
HYDROPHOBICALLY ASSOCIATING POLYMERS FOR OILY WATER CLEAN-UP
Donald F. Jacques, Belle Mead, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Sep. 8, 1986, Ser. No. 905,073
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—708 **2 Claims**

1. A method of breaking oil-in-water emulsions or the clean-up of oily waste water which comprises the steps of:
a. treating the emulsion or waste water stream with an ionic chemical under suitable agitation conditions to neutralize the charge on the oil droplets, wherein said ionic chemical is a cationic polymer selected from the group consisting of melamine-formaldehyde resin, polyepichlorohydrins, poly-3-methacrylamidopropyltrimethylammonium chloride and copolymers with acrylamide, poly-2-methacrylatoethyltrimethylammonium chloride and copolymers with acrylamide, and diallyl dimethylammonium chloride and copolymers with acrylamide;
b. adding a water soluble or water dispersible hydrophobically functionalized copolymer comprising a water soluble portion and an oil soluble or hydrophobic portion under suitable agitation conditions to form particles; wherein the hydrophobically functionalized copolymer comprises 0.1 to 10 mole percent of a hydrophobic monomer elected from the group consisting of alkylacrylamide and alkyl(meth) acrylate with an alkyl group of from 4 to 20 carbon atoms and 90 to 99.9 mole percent of a water soluble monomer selected from the group consisting of acrylic acid and salts of acrylic acid.
c. allowing sufficient time for the particles to separate by gravity or by accelerated means.

4,734,206
METHOD FOR SEPARATING COAL PARTICLES FROM AN AQUEOUS SLURRY
Eric J. Clayfield, Marietta, Ga., and Peter Sant, Bebington, England, assignors to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 642,307, Aug. 20, 1984, abandoned. This application Jun. 25, 1986, Ser. No. 880,343
Claims priority, application United Kingdom, Aug. 23, 1983, 8322626
Int. Cl.[4] C02F *1/54*
U.S. Cl. 210—727 **18 Claims**



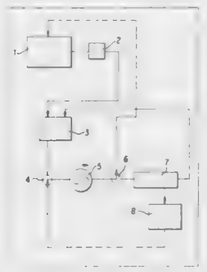
1. A process for separating coal particles from an aqueous slurry of coal in water comprising
(a) forming a volume of a multiple emulsion of oil in water;
(b) adding multiple emulsion to an aqueous slurry of coal in water, and forming a mixture of multiple emulsion and aqueous slurry;
(c) agitating the mixture of the multiple emulsion and the aqueous slurry to form agglomerates of coal particles and a remaining slurry mixture; and
(d) separating the agglomerates of coal particles from the remaining slurry mixture.

4,734,207
PURIFICATION OF OILS CONTAINING SOLID MATTERS IN SUSPENSION
Enzo Calloni, Monza; Maurizio Valente, and Alfonso Raiola, both of Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy
Filed Sep. 8, 1986, Ser. No. 904,355
Claims priority, application Italy, Sep. 13, 1985, 22145 A/85; Apr. 15, 1986, 20080 A/86
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—765 **5 Claims**

1. A process comprising: purifying oils selected from the group consisting of perfluoropolyether oils, and silicone oils, and oils based on hydrocarbons, from different impurities and in particular solid matters in suspension which can be filtered only with difficulty on conventional filters, by providing a

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filter of the tangential-flow type, wherein the pores of the filter element have a diameter below 0.4 micron, feeding the oil to be



filtered to the said filter at high speed sufficient to avoid formation of solid deposits on the surface of said element.

4,734,208

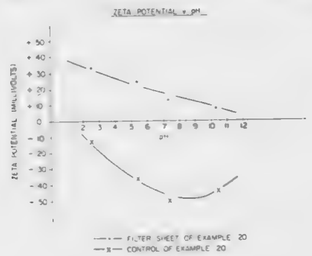
CHARGE-MODIFIED MICROFIBER FILTER SHEETS

David B. Pall, Roslyn Estates; Peter J. Degen, and Irving B. Joffee, both of Huntington, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 312,723, Oct. 19, 1981, Pat. No. 4,523,995. This application Mar. 28, 1985, Ser. No. 716,970

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—767 **26 Claims**



1. A filter sheet exhibiting a positive zeta potential over a pH range of from about 3 to about 10 comprising:

a mat of inorganic microfibers normally having a negative zeta potential substantially uniformly coated with a cured, precipitated cationic thermosetting binder resin or polymer, said binder resin or polymer being present in an amount sufficient to impart said positive zeta potential to said filter sheet and to bond said microfibers together thereby imparting tensile strength to said filter sheet.

12. A method for the filtration of particulates from a fluid medium comprising passing said medium through the filter sheet of claim **1**.

4,734,209

METAL DEACTIVATORS

Emyr Phillips, Sale, and Brian Holt, Stretford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

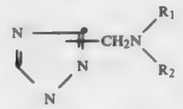
Filed Apr. 2, 1985, Ser. No. 718,907

Claims priority, application United Kingdom, Apr. 4, 1984, 8408817

Int. Cl.[4] C10M *133/42*

U.S. Cl. 252—47 **3 Claims**

1. A composition comprising a functional fluid and, as metal deactivator, a metal deactivating proportion of an N-substituted compound of the formula I

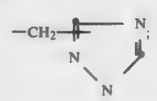


I

in which R_1 and R_2 are the same or different and each is C_1–C_{20} alkyl, C_3–C_{20} alkenyl, C_5–C_{12} cycloalkyl, C_7–C_{13} aralkyl, C_6–C_{10} aryl, or R_1 and R_2, together with the nitrogen atom to which they are each attached form a 5-, 6- or 7-membered heterocyclic residue, or R_1 and R_2 is each a residue of formula II:

$$R_3X[(alkylene)O]_n(alkylene)— \quad II$$

in which X is O, S or N, R_3 is hydrogen or C_1–C_{20} alkyl, "alkylene" is a C_1–C_{12} alkylene residue and n is O or an integer from 1 to 6; or R_1 has its previous significance and R_2 is a residue of formula III:



III

or R_2 is a residue of formula III as defined above and R_1 is a resiude of formula IV:

$$—[alkylene]_n—N(R_4)—A—[N(R_4)_2]_m \quad IV$$

wherein m is zero or 1 and, when m is zero, A is a residue of formula III and, when m is 1, A is alkylene or C_6–C_{10}-arylene, and alkylene and n have their previous significance and R_4 is a residue of formula III, as hereinabove defined.

4,734,210

ADDITIVES FOR LUBRICANT COMPOSITIONS

Hugo Camenzind, Fribourg, and Paul Dubs, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 22, 1986, Ser. No. 888,910

Claims priority, application Switzerland, Jul. 30, 1985, 3291/85

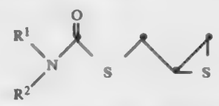
Int. Cl.[4] C10M *133/00*

U.S. Cl. 252—47.5 **8 Claims**

1. A lubricant composition which comprises

(a) a lubricant, and

(b) 0.05 to 5% by weight, based on component (a), of at least one compound of formula I



(I)

wherein R^1 and R^2 are each independently C_1–C_{24}-alkyl, C_1–C_{24}alkyl which is interrupted by one or more identical or different members selected from —O—, —S— and/or



and/or which contains one or more oxo and/or thiono groups; or C_3–C_{24}alkenyl, C_2–C_4hydroxyalkyl, C_5–C_8cycloalkyl, phenyl or phenyl which is substituted by one or two C_1–C_{12}alkyl, C_1–C_4alkoxy, C_2–C_{24}alkoxycarbonyl and/or nitro groups; or naphthyl, C_7–C_{10}aralkyl, furan-2-ylmethyl or tetrahydrofuran-2-ylmethyl, or R^1 and R^2, together with the nitrogen atom to which they are attached, form a 5- or 6-membered mononuclear aliphatic heterocyclic ring which, in addition to the N atom, may contain one or two additional N, O and/or S atoms as ring members and/or one or two oxo and/or thiono groups as substituents, or form an indolinyl, 1,2,3,4-tetrahydroquinolinyl or 1,2,3,4-tetrahydroisoquinolinyl radical which radicals are unsubstituted or substituted by 1 to 3 methyl groups, and R^3 is hydrogen or C_1–C_8alkyl.

4,734,211

RAILWAY LUBRICATING OIL

Steven Kennedy, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 28, 1986, Ser. No. 834,605

Int. Cl.[4] C10M *133/16, 129/74*

U.S. Cl. 252—51.5 A **6 Claims**

1. A method of reducing silver wear in marine and railway diesel engines by lubricating the internal portion thereof with a lubricating oil composition with a TBN of at least 5 containing an additive amount, sufficient to provide silver wear inhibition in marine and railway diesel engines having silver bearings, of a polyhydroxy compound having at least two hydroxyl groups selected from the group consisting of C_8 to C_{22} fatty acid esters of alcohols of from 1 to 12 carbon atoms having at least two unesterified hydroxyl groups and mixtures thereof of said esters, a mixture of said polyhydroxy compound and chlorinated C_8 to C_{22} fatty acids and derivatives thereof comprising esters of alcohols of from 1 to 25 carbon atoms and amides of amines of from 1 to 25 carbon atoms.

4,734,212

LUBRICATING OIL COMPOSITIONS CONTAINING BIS-MANNICH BASE DEPOSIT INHIBITORS AND A PROCESS FOR THEIR PREPARATION

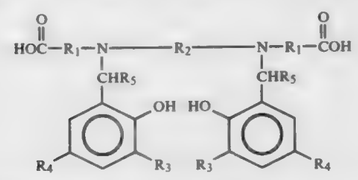
James J. Harrison, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1986, Ser. No. 846,768

Int. Cl.[4] C10M *129/26, 133/04*

U.S. Cl. 252—51.5 R **7 Claims**

1. A lubricating oil composition comprising an oil of lubricating viscosity and a lubricating oil degradation deposit inhibiting effective amount of a compound of the Formula I:



I

wherein R_1 is independently alkylene of from 1 to 4 carbon atoms; R_2 is alkylene of from 2 to 6 carbon atoms; R_3 and R_4 are independently hydrocarbyl of from 1 to 30 carbon atoms with the proviso that the sum of all R_3 and R_4 hydrocarbyl carbon atoms is sufficient to render the compound of formula I oil-soluble; R_5 is independently selected from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms, phenyl and phenyl substituted with 1 to 2 substituents selected from hydroxy and alkyl of from 1 to 6 carbon atoms; and salts thereof.

4,734,213

HAZE-FREE POLYMER ADDITIVES FOR FUELS AND LUBRICANTS

Phillip W. Brewster, and Clinton R. Smith, both of Camlachie, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 3,780, Jan. 16, 1987, which is a continuation of Ser. No. 709,680, Mar. 8, 1985, abandoned, which is a continuation of Ser. No. 278,179, Jun. 29, 1981, abandoned. This application May 19, 1987, Ser. No. 51,529

Int. Cl.[4] C10M *145/00*

U.S. Cl. 252—52 R **3 Claims**

1. A substantially free haze oil solution concentrate composition comprising a mineral hydrocarbon oil of lubricating viscosity and from about 0.1 to 50 wt. % based on the total weight of said composition of a viscosity index improving hydrogenated copolymer of butadiene or isoprene with 20 to 70 wt. % of copolymerized stryene, the copolymer having an M_n of 20,000 to 200,000 wherein said composition has been treated at a temperature of about 50° C. to 150° C. with from about 0.75 to 25% by weight based on the weight of said concentrate with an oil soluble alkyl hydroxy benzene compound, said compound having 1 to 3 C_2–C_{20} alkyl groups and 1–3 hydroxy groups.

4,734,214

PROCESS FOR THE PREPARATION OF HIGH ABSORPTIVE SODIUM TRIPOLYPHOSPHATE HEXAHYDRATE

Daniel Joubert, Trevoux, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Continuation of Ser. No. 741,943, Jun. 6, 1985, abandoned. This application Mar. 5, 1987, Ser. No. 22,125

Claims priority, application France, Jun. 8, 1984, 84 09002

Int. Cl.[4] C01B *25/41;* **C11D** *3/075, 7/16, 11/02*

U.S. Cl. 252—135 **6 Claims**

1. A process for the preparation of sodium tripolyphosphate hexahydrate having high adsorption characteristics and having a pore volume of at least 0.70 cm^3/gram comprising the following steps:

(i) spraying water or an aqueous medium over a first fraction of anhydrous sodium tripolyphosphate wherein at least 55% of the first fraction of anhydrous sodium tripolyphosphate is comprised of phase 1 tripolyphosphate;

(ii) separately spraying water on aqueous medium over a second fraction of anhydrous sodium tripolyphosphate wherein the second fraction of anhydrous sodium tripolyphosphate consists essentially of phase 2 tripolyphosphate, and said second fraction contains not more than 10% of phase 1 tripolyphosphate and has been purified of calcium and magnesium values, and wherein the spraying operations of steps (i) and (ii) create seeds of hexahydrates so that the first and second fractions remains in essentially anhydrous form and the seeds are sufficient to promote the formation of hexahydrates of sodium tripolyphosphate, wherein such seeds are formed with water sprayed in a percentage of from 0.1 to 3% by weight based on the anhydrous sodium tripolyphosphate or with a suspension of sodium tripolyphosphate, as said aqueous medium, sprayed in a percentage of from 0.2 to 3% by weight relative to anhydrous sodium tripolyphosphate,

(iii) intimately admixing said first and said second sprayed fractions, said intimate admixture comprising from 40 to 60% of phase 1 tripolyphosphate;

(iv) suspending the resulting admixture in water or an aqueous medium, and thence;

(v) drying the resulting suspension by atomization to produce hexahydrated sodium tripolyphosphate.

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4,734,215

CLEANING COMPOSITION CONTAINING HYDROCARBON MIXTURES

Ruediger Prigge, Neu Wulmstorf, Fed. Rep. of Germany, assignor to Shell Oil Company, Houston, Tex.

Filed May 13, 1986, Ser. No. 862,878
Claims priority, application Denmark, May 13, 1985, 3517170
Int. Cl.[4] C11D *3/44*
U.S. Cl. 252—162 **8 Claims**

1. A water-incompatible cleansing composition which consists essentially of

(a) from 85 to 97 parts by weight of a hydrocarbon component having an atmospheric initial boiling point of at least 150° C. and an atmospheric end boiling point below 320° C. and consisting essentially of aliphatic and cyclo-aliphatic compounds, and

(b) from 3 to 15 parts by weight of one or more alkylated aromatic compounds selected from alkylated xylene, toluene, and benzene compounds having at least one alkyl group with from 8 to 18 carbon atoms.

4,734,216

COMPOSITION AND METHOD FOR FLOCCULATING AND REMOVING SOLIDS SUSPENDED IN WATER

David W. Kelly, Toronto; Stewart N. Paul, and John E. Waller, both of Mississauga, all of Canada, assignors to Dearborn Chemical Company, Limited, Mississauga, Canada

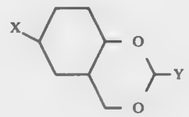
Filed Aug. 19, 1986, Ser. No. 897,905
Claims priority, application Canada, Jan. 23, 1986, 500477
Int. Cl.[4] C02F *5/12*
U.S. Cl. 252—181 **20 Claims**

1. A composition of matter for treating water to flocculate and remove solids suspended therein comprising:

(a) a tannin-based flocculant with a modified tannin produced by reacting a condensed tannin with an amino compound and an aldehyde; and

(b) an inorganic flocculant selected from the group consisting of inorganic flocculants comprising aluminum, iron, or mixtures thereof.

7. The composition of matter of claim 1 wherein the first component is a product of a process including the steps of (i) forming an aqueous reaction mixture of the tannin, the amino compound and the aldehyde under slightly acidic conditions where the pH is less than 7 and where the molar ratio of the primary amine from the amino compound to the tannin repeating unit is from about 1.5:1 to 3.0:1; (ii) heating the reaction mixture at a temperature of from about 150° to 200° Fahrenheit until the reaction product forms which has an intermediate viscosity within the range of the system key intermediate viscosity range, said system key intermediate viscosity range being determined through each reactant system as the narrow intermediate viscosity range which permits the resulting product to have a long shelf life, said system key intermediate viscosity range being within the range of from about 2 to 100 cps when measured at a 180° Fahrenheit on a Brookfield LVT viscosimeter; and (iii) terminating the reaction when the intermediate viscosity has reached the conditions specified in step (ii) and adjusting the solids content of the liquid to about 20 to 60 percent by weight and adjusting the pH to a value of less than 3.0.



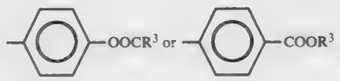
wherein

X=H and Y=R^1

or

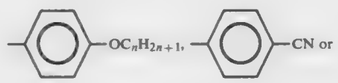
X=R^2 and Y=R^3

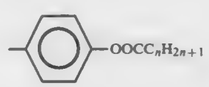
and

R^1 = 

R^2 = C_nH_{2n+1}

R^3 = 





wherein n=1 to 10.

4,734,217

LIQUID CRYSTALLINE 2,6-DISUBSTITUTED-TRANS-1,3-DIOXADECALINS

Dietrich Demus; Horst Zaschke; Carsten Tschierske, all of Halle, and Maike Hettrich, Berlin, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

Filed Sep. 26, 1985, Ser. No. 780,489
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 2684130; Oct. 16, 1984, 2684122
Int. Cl.[4] C09K *19/34, 19/32;* G02F *1/13;* C07D *319/08*
U.S. Cl. 252—299.61 **40 Claims**

1. Liquid crystalline 2,6-disubstituted trans-1,3-dioxadecalins of the general formula

wherein

X=H and Y=R^1

or

X=R^2 and Y=R^3

and

R^1 =

R^2 = C_nH_{2n+1}

R^3 =

wherein n=1 to 10.

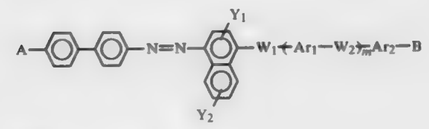
4,734,218

DICHROIC AZO DYESTUFFS AND LIQUID CRYSTAL COMPOSITION CONTAINING SAID DYESTUFFS

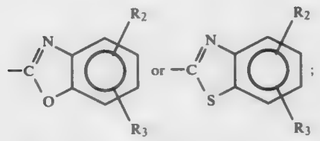
Keisuke Takuma; Kimitoshi Kato; Hiroshi Aiga, all of Ohmuta; Yasuyuki Yamada, and Tsutomu Nishizawa, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP85/00644, § 371 Date Jul. 18, 1986, § 102(e) Date Jul. 18, 1986, PCT Pub. No. WO86/03215, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 19, 1985, Ser. No. 889,932
Claims priority, application Japan, Nov. 20, 1984, 59-243375; Nov. 26, 1984, 59-248195; Dec. 20, 1984, 59-267295; Jan. 17, 1985, 60-6204; Jan. 30, 1985, 60-14441; May 31, 1985, 60-116587; Jun. 11, 1985, 60-125131
Int. Cl.[4] C09B *31/02, 31/16;* C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299.61 **17 Claims**

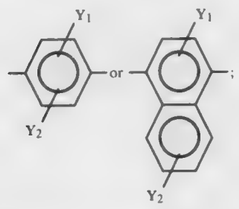
1. A dichroic azo dyestuff represented by the following formula:



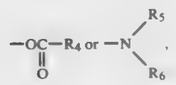
wherein A is —CN, —$COOR_1$,



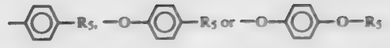
R_1 is alkyl, alkoxyalkyl, phenyl, cyclohexyl, or phenyl or cyclohexyl which are substituted with alkyl or alkoxy at the p-position thereof; R_2 and R_3 are individually hydrogen alkyl, cycloalkyl, alkoxy, alkoxyalkoxy, cycloalkyloxyalkoxy, aryloxyalkoxy, aryl, halogen, cyano or dialkylamino; Y_1 and Y_2 are individually hydrogen, halogen, alkyl, alkoxy, cyano or hydroxyl; Ar_1 and Ar_2 are individually



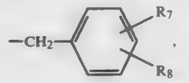
W_1 and W_2 are individually —N=N— or —N=CH—, but W_1 is —N=N— when W_2 is —N=CH—, m is 0 or 1, but m is 0 when W_1 is —N=CH—; and B is hydroxyl, alkoxy, alkoxyalkoxy, p-alkylbenzyloxy,



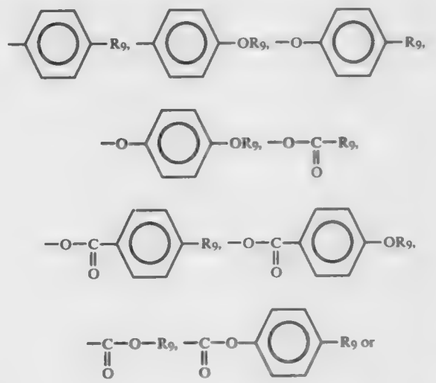
but B is hydrogen, halogen, cyano,



when W_1 or W_2 is —N=CN—, R_4 is alkyl, phenyl or cyclohexyl unsubstituted or substituted with alkyl or alkoxy at the p-position thereof, R_5 is hydrogen or alkyl, R_6 is alkyl or

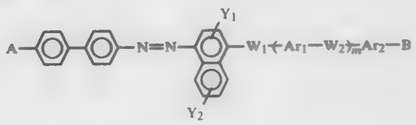


R_7 and R_8 are individually hydrogen, halogen, hydroxyl, cyano, alkyl, dialkylamino, alkoxy, alkoxyalkoxy,

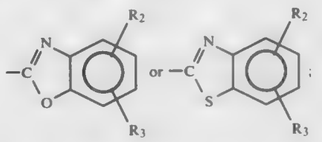


and R_9 is hydrogen or alkyl.

16. A liquid crystal composition containing, in a form dissolved in a liquid crystal, at least one of dichroic azo dyestuffs represented by the following formula:



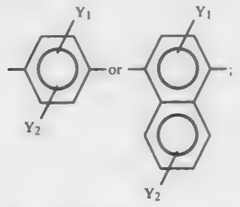
wherein A is —CN, —$COOR_1$,



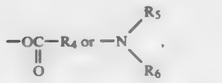
R_1 is alkyl, alkoxyalkyl, phenyl, cyclohexyl, or phenyl or cyclohexyl which are substituted with alkyl or alkoxy at the p-position thereof; R_2 and R_3 are individually hydrogen, alkyl, cycloalkyl, alkoxy, alkoxyalkoxy, cycloalkyloxyalkoxy, ary-

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loxyalkoxy, aryl, halogen, cyano or dialkylamino; Y_1 and Y_2 denote individually hydrogen; halogen, alkyl, alkoxy, cyano or hydroxyl; Ar_1 and Ar_2 are individually



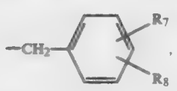
W_1 and W_2 are individually —N=N— or —N=CH—, but W_1 is —N=N— when W_2 is —N=CH—, m is 0 or 1, but m is 0 when W_1 is —N=CH—; and B is hydroxyl, alkoxy, alkoxyalkoxy, p-alkylbenzyloxy,



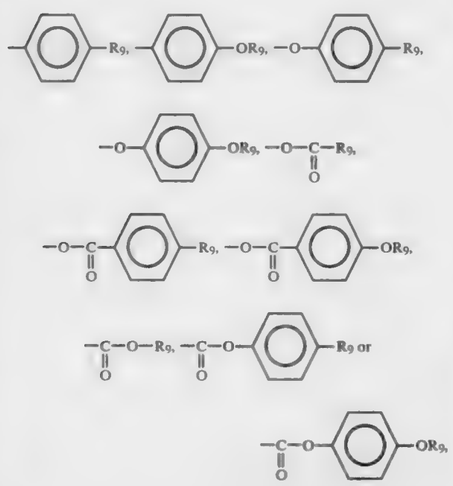
but B is hydrogen, halogen, cyano,



when W_1 or W_2 is —N=CN—, R_4 is alkyl, phenyl or cyclohexyl unsubstituted or substituted with alkyl or alkoxy at the p-position thereof, R_5 is hydrogen or alkyl, R_6 is alkyl or



R_7 and R_8 are individually hydrogen, halogen, hydroxyl, cyano, alkyl, dialkylamino, alkoxy, alkoxyalkoxy,



and R_9 is hydrogen or alkyl.

4,734,219

STABILIZATION OF AQUEOUS ACIDIC SCRUBBING LIQUORS

Guenter Herrmann, Heidelberg, and Ekhart Lucas, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 886,603

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526412

Int. Cl.[4] C09K *15/02;* C07C *51/31, 51/42*

U.S. Cl. 252—400.54 4 Claims

1. A process for stabilizing an aqueous acidic scrubbing liquor resulting from the oxidation of cyclohexane with molecular oxygen or with a gas containing molecular oxygen in the liquid phase at from 130° to 200° C. and under a pressure from 5 to 25 bar and scrubbing the oxidation mixture thus obtained with water and separation of an aqueous acidic scrubbing liquor so as to prevent the formation of hydrogen-containing gases, which process comprises adding a water-soluble vanadium compound to the scrubbing liquour and heating the scrubbing liquor to a temperature from about 50° to 130° C.

4,734,220

FUSIBLE ELECTROCONDUCTIVE MIXTURES

Friedrich Jonas, Aachen, and Rolf Dhein, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1987, Ser. No. 16,597

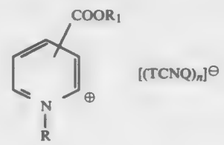
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607668

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—500 3 Claims

1. A fusible mixture of high electroconductivity consisting of

(a) 0.5 to 99% by weight, relative to the total weight of the mixture, of a TCNQ complex of the formula



(I)

in which

R and R_1 independently of each other stand for an optionally substituted aliphatic, cycloaliphatic or araliphatic radical having 1 to 30 C atoms and

n is 1, 2 or 3 or any fraction between these numbers and

(b) 99.5 to 1% by weight, relative to the total weight of the mixture of one or more of the following liquid organic compounds: N-methylpyrrolidone, N-methylcaprolactam, γ-butyrolactone, caprolactone, dipentyl ether, diethylene glycol dimethyl ether, triethylene glycol dimethyl ether, 1,4,7,10,13-pentaoxacyclopentadecane, 1,4,7,10-tetraoxacyclododecane, dimethyl sulphoxide, diethyl sulphoxide, tetramethylene sulphone tetramethylurea and/or propylene carbonate.

4,734,221

DETERGENT COMPOSITIONS

Robert J. Edwards; Paul D. Hardman, both of Merseyside; Melvin Scott, Cheshire; Carey J. Walsh, and Peter Winterbotham, both of Merseyside, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 727,495, Apr. 26, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 5,366

Claims priority, application United Kingdom, May 11, 1984, 8412048; Oct. 26, 1984, 8427160

Int. Cl.[4] C11D *1/29, 1/37, 3/43, 17/08*

U.S. Cl. 252—544 23 Claims

1. A homogeneous foaming isotropic liquid detergent composition consisting essentially of

(a) from 60 to 80% by weight of an active detergent system consisting essentially of

(i) from 20 to 65% by weight of a water-soluble monovalent salt of a C_3–C_{12} dialkyl ester of sulphosuccinic acid in which the alkyl groups may be the same or different,

(ii) from 12 to 55% by weight of a monovalent salt of a C_{10}–C_{18} alkyl ether sulphate, the ratio of (i) to (ii) being from 4:1 to 0.5:1, and

(iii) optionally a nonionic detergent, in an amount not exceeding 15% by weight of the whole composition,

(b) from 5 to 20% by weight of a C_2–C_3 mono- or polyhydric alcohol,

(c) from 0 to 12% by weight of urea, and

(d) water and minor ingredients to 100%,

the ratio of alcohol (b) to water being less than 1.10 and exceeding a critical value r which is selected for the given active detergent system as the value of said ratio below which separation in two phases occurs, said value r being at least 0.45 and being dependent on the total active detergent concentration.

4,734,222

COMPOSITION AND METHOD FOR CLEANING SOFT AND HARD CONTACT LENSES

Lynn Winterton, Roswell, and Kai C. Su, Alpharetta, both of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,986

Int. Cl.[4] C11D *1/75, 3/33*

U.S. Cl. 252—546 9 Claims

1. A heterogeneous composition for cleaning a contact lens comprising

a contact lens cleaning effective amount of an ocularly acceptable, water-soluble, particulate organic compound selected from sodium p-aminosalicylate, amphetamine sulfate, arginine glutamate, bismuth sodium tartarte, calcium disodium edetate, calcium lactate, citric acid, disodium edetate, ephedrine hydrochloride, ephedrine bitartrate, a sugur, D-glucuronic acid, heparin sodium, mannitol, N-methylglucamine, sodium citrate, sodium succinate, tartaric acid, and trisodium ededate monohydrate,

said particulate compound having a particle size between about 1 micron and below about 750 microns and substantially devoid of soft contact lens tearing irrregularities,

which compound, in aqueous solution at a concentration between about 3 and 20% by weight, is isosmotic with isotonic sodium chloride; and

a predominantly non-aqueous, water-miscible, substantially non-ionic, ocularly acceptable, organic liquid suspending medium which is substantially a non solvent for said particulate compound and is selected from polypropylene glycol, polyethylene glycol, polyethoxylated alkanols of 6–20 carbons, polysorbates, tyloxapol, polyethoxylated alkylphenols, polyethoxylated polypropylene glycols, polyethoxylated fatty acids, polyethoxylated fatty acid amides, polyethoxylated amines, ethoxylated monoglycerides of fatty acids, and higher alkyl amine oxides;

said compound being dispersed in said suspending medium.

4,734,223

DETERGENT COMPOSITIONS

Peter Winterbotham, Merseyside, United Kingdom, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 727,498, Apr. 26, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 5,365

Claims priority, application United Kingdom, May 11, 1984, 8412045

Int. Cl.[4] C11D *1/29, 1/37, 3/43, 17/08*

U.S. Cl. 252—548 17 Claims

1. A homogeneous foaming detergent composition in gel form consisting essentially of

(a) from 60 to 80% by weight of an active detergent system consisting essentially of

(i) from 20 to 65% by weight of a water-soluble monovalent salt of a C_3–C_{12} dialkyl ester of sulphosuccinic acid in which the alkyl groups may be the same or different,

(ii) from 12 to 55% by weight of a monovalent salt of a C_{10}–C_{18} alkyl ether sulphate, the ratio of [i] to [ii] being from 4:1 to 0.5:1, and

(iii) optionally a nonionic detergent, in an amount insufficient to cause instability of the composition,

(b) from 2 to 10.5% by weight of a C_2–C_3 mono- or polyhydric alcohol, and

(c) water and minor ingredients to 100%,

the ratio of alcohol (b) to water being below a critical value g which is selected for the given active detergent system as the value of said ratio above which separation into two phases occurs, said value being in the range of from 0.25 to 0.41 and being dependent on the total active detergent concentration.

4,734,224

DRY NEUTRALIZATION PROCESS FOR DETERGENT SLURRIES

John H. Barrett, Phoenix; John O. Hudson, Scottsdale, both of Ariz., and Charles W. Lutz, Princeton, N.J., assignors to The Dial Corporation, Phoenix, Ariz.

Filed Sep. 15, 1986, Ser. No. 907,945

Int. Cl.[4] C11D *11/04, 1/22*

U.S. Cl. 252—558 10 Claims

1. A process for the neutralization of mixed organic and inorganic acids resulting from the sulfonation of detergent alkylates comprising the steps of contacting said acids with a dry alkali metal carbonate, the weight ratio of carbonate to acids being at least 0.9 to 1, subjecting the resulting mixture to a mulling/smearing mechanical action, and subsequently adding water to said mixture, the weight ratio of water to acids being from 0.6–1.5 to 1, while continuing the said mechanical action to produce a water-dispersible reaction product which is substantially completely neutralized.

4,734,225

D-MANNITE DERIVATIVES AS STARTING PRODUCTS FOR THE SYNTHESIS OF PHOSPHOLIPIDS

Hansjörg Eibl, Bovenden, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V., Gottingen, Fed. Rep. of Germany

PCT No. PCT/DE83/00123, § 371 Date Mar. 5, 1984, § 102(e) Date Mar. 5, 1984, PCT Pub. No. WO84/00362, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 6, 1983, Ser. No. 598,292

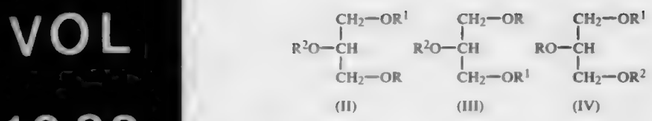
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225225; Oct. 27, 1982, 3239858

Int. Cl.[4] C07C *43/00;* C07F *9/00;* A61K *31/00*

U.S. Cl. 260—386 4 Claims

1. Glycerol derivatives of the general formula II, III or IV

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(II) (III) (IV)

wherein

when R^1 and R^2 are the same, they signify a substituted or unsubstituted straight-chained or branched alkyl, alkenyl or alkynyl group with 6 to 24 carbon atoms, the substituents being cycloalkyl radicals with 3 to 6 carbon atoms, aryl radicals, benzyloxy, allyloxy, mesyloxy and/or halogen substituents, and

when R^1 and R^2 are different, R^1 signifies a substituted or unsubstituted straight-chained or branched alkyl group with 1 to 9 carbon atoms, and R^2 signifies a substituted or unsubstituted straight-chained or branched alkenyl group with 10–24 carbon atoms and with 1 or more double bonds, the substituents in each case being cycloalkyl radicals with 3 to 6 carbon atoms, aryl radicals, benzyloxy, allyloxy, mesyloxy and/or halogen substituents, or substituted or unsubstituted cycloalkyl radicals with 3 to 6 carbon atoms, aryl radicals, benzyloxy, allyloxy, mesyloxy and/or halogen substituents, and R^1 can also be trityl; and

R is a hydrogen atom or the radical



wherein X=O, NH or NR^3 and, when X=O, R^3 signifies H, alkyl, alkenyl or alkynyl with 1 to 18 carbon atoms, haloalkyl with 2 to 14 carbon atoms, 2-amino-2-carboxyethyl, dihydroxypropyl, pentahydroxyhexyl, amino alkyl with 2 to 14 carbon atoms, N-methylaminoalkyl with 2 to 14 carbon atoms, N,N-dimethylaminoalkyl with 2 to 14 carbon atoms, N,N,N-trimethylaminoalkyl with 2 to 14 carbon atoms, N-[N′,N′,N′-trimethyl)-aminoethyl]-N,N-dimethylaminoethyl, when X=NH, R^3 signifies H, alkyl or alkenyl with 1 to 10 carbon atoms, haloalkyl with 2 to 6 carbon atoms, hydroxyethyl, dihydroxypropyl, aminoalkyl, and when X=NR^3, R^3 signifies alkyl, alkenyl with 1 to 10 carbon atoms, bis-chloroethyl, and whereby, when R is not a hydrogen atom, one of the radicals R^1 or R^2 in formulae II, III or IV can also be a hydrogen atom.

4,734,226

METHOD FOR REFINING GLYCERIDE OILS USING ACID-TREATED AMORPHOUS SILICA

Perry M. Parker, Finksburg, and William A. Welsh, Fulton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 28, 1986, Ser. No. 823,217
Int. Cl.⁴ C11B *3/10, 3/04*
U.S. Cl. 260—420 **21 Claims**

1. A process for the removal of trace contaminants, which are phospholipids and associated metal ions, from glyceride oils by adsorbing said trace contaminants onto organic acid-treated amorphous silica to yield glyceride oils having commercially acceptable levels of said trace contamiannts, comprising:

(a) selecting a glyceride oil with a phosphorus content in excess of about 1.0 ppm,

(b) selecting an adsorbent comprising a suitable amorphous silica which has been treated with an organic acid selected from the group consisting of citric acid, acetic acid, ascorbic acid, tartaric acid and solutions thereof, in such a manner that at least a portion of said organic acid is retained in the pores of the silica to achieve a total volatiles content of at least about 10%,

(c) contacting the glyceride oil of step (a) and the adsorbent of step (b),

(d) alowing said trace contaminants to be adsorbed onto said adsorbent, and

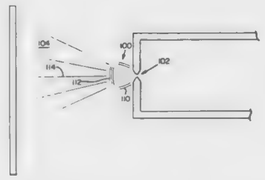
(e) separating the resulting phospholipid- and metal ion-depleted glycerides oil from the adsorbent.

4,734,227

METHOD OF MAKING SUPERCRITICAL FLUID MOLECULAR SPRAY FILMS, POWDER AND FIBERS

Richard D. Smith, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 528,723, Sep. 1, 1983, Pat. No. 4,582,731. This application Mar. 12, 1986, Ser. No. 838,932
Int. Cl.⁴ B29B *9/10*
U.S. Cl. 264—13 **15 Claims**



1. A method of producing relatively short, ultra-fine fibers comprising:

forming a solution including a supercritical fluid solvent and a dissolved polymer;

rapidly expanding said solution through a nozzle having an orifice of predetermined diameter in the range of 10–100 μm into a low pressure region having a pressure substantially below the critical pressure of said solvent and a temperature substantially below the melting point of said polymer;

maintaining said solution and said nozzle at a temperature above, but close to, the melting point of said polymer and simultaneously above the critical point of the solvent;

selecting a nozzle length in relation to solution pressure such that the polymer precipitates as a liquid out of solution within the nozzle so that the polymer forms fibers upon discharge from the nozzle; and

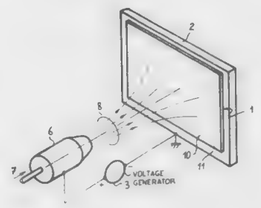
collecting the fibers thus formed.

4,734,228

PROCESS AND DEVICE FOR PREPARING A PIEZOELECTRIC MATERIAL

Francois Micheron, and Jean P. Le Pesant, both of Gif sur Yvette, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 13, 1986, Ser. No. 873,892
Claims priority, application France, Jun. 14, 1985, 85 09072
Int. Cl.⁴ B29C *71/04*
U.S. Cl. 264—22 **17 Claims**



1. A process for preparing a product having piezoelectric properties as a result of dipolar orientation of an object made of polar dielectric material and adapted to acquire said piezoelectric properties when the object is subjected to an electrical field of determined amplitude in order to obtain the said dipolar orientation, the electrical field being generated between two surface zones of the object which are brought to different respective electric potentials, said process further comprising exposing at least one of the said surface zones to a jet of electrically charged droplets of a first polarity, selecting the duration of said exposure so that the charged droplets are accumulated on each exposed surface zone to increase the potential difference between said surface zones up to the said determined electrical field amplitude.

8. Apparatus for manufacture of a product having piezoelectric properties as a result of dipolar orientation of an object having at least two opposed surfaces and made of polar dielectric material which material acquires said piezoelectric properties when subjected to an electric field of determined amplitude, said apparatus comprising:

means for exposing at least one surface zone of a first surface of the object to a jet of electrically charged droplets of a first polarity for at least a time sufficient for the charged droplets accumulating on said surface zone to increase a potential difference between said opposed surfaces up to said determined amplitude, wherein said means includes;

a high voltage D.C. source,

generator means coupled to said high voltage D.C. source for emitting said charged droplets, said high voltage D.C. source charging said droplets emitted by said generator means to a first determined potential of said first polarity, said generator means located to face said surface zone, and

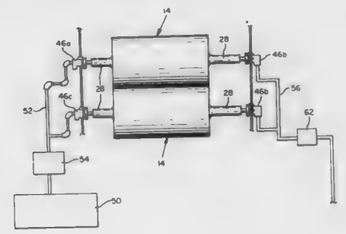
conductive support means maintained at a second potential and engaged with another surface of said object.

4,734,229

METHOD FOR CALENDERING TEMPERATURE-CRITICAL THERMOPLASTIC MATERIAL USING A TWO-PHASE HEAT TRANSFER MEDIUM

Peter E. Johnson, and James Young, both of Corvallis, Oreg., assignors to Entek Manufacturing Inc., Lebanon, Oreg.

Continuation-in-part of Ser. No. 670,267, Nov. 13, 1984, abandoned. This application May 8, 1986, Ser. No. 861,047
Int. Cl.⁴ B29C *43/24, 43/46, 43/58*
U.S. Cl. 264—40.6 **3 Claims**



1. A method for calendering temperature-critical plastic material comprising:

(a) directing the material through a pair of driven rolls having outer surfaces which are separated from one another;

(b) introducing wet steam into cavities located in said rolls;

(c) maintaining the pressure of said steam at a constant level where said steam remains in a saturated state;

(d) continuously removing from said cavities steam and any condensate which accumulates therein above a certain level which is above the bottoms of said cavities; and

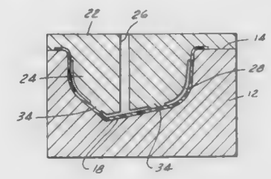
(e) wherein said cavities are arranged to permit rapid energy transfer between said steam and the outer surace of said rolls to maintain the outer surface of the rolls at a desired temperature.

4,734,230

METHOD AND APPARTUS FOR FORMING COMPOSITE PRODUCTS

Richard D. Rhodes, Jr., Dover, and Frank J. Preston, Hampton, both of N.H., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed Jul. 24, 1986, Ser. No. 889,016
Int. Cl.⁴ C08G *18/14;* **B29C** *45/14*
U.S. Cl. 264—46.4 **2 Claims**



1. In a method for blocking holes for the escape of foam material through a load supporting insert of a composite plastic part including the insert and a layer of foam bonded to the insert by reaction injecting foam precursors in a mold cavity in part bounded by the insert the improvement comprising:

providing a plastic injection molding press including a cavity platen with a mold surface and marginal edges defining an open-ended cavity;

covering the cavity platen with a deformable sheet of polymeric material extending across the marginal edges to cover the open end of the cavity;

providing a die cover having outboard extensions defining insert openings through a load supporting insert to be formed with respect to the die cover during an injection molding process;

aligning the die cover with the deformable sheet of polymeric material and advancing the die cover against the sheet to force it against the mold surface of said cavity platen to conform the sheet to the insert means while defining a closed injection mold space;

injecting plastic into the mold space to further conform the deformable sheet to the mold surface and to bond the deformable sheet to an insert shaped around the insert means to form openings therethrough with a covering segment of the deformable sheet for preventing flow of foam material through the openings in a subsequent foam molding operation.

4,734,231

PROCESS FOR THE PREPARATION OF FIBERBOARDS

Kiyozi Morita, Gunma; Masami Ando, Takasaki, and Mitito Yamasaki, Gunma, all of Japan, assignors to Gunei Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1986, Ser. No. 854,547
Claims priority, application Japan, Dec. 23, 1985, 60-290060
Int. Cl.⁴ B29C *67/22, 67/16, 43/20;* **B27N** *3/02*
U.S. Cl. 264—45.3 **6 Claims**

1. A process for the preparation of a fiberboard, consisting essentially of the steps of:

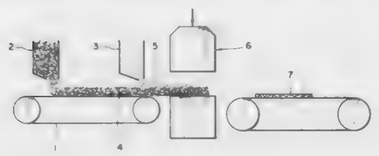
providing a layer of loose fibers;

forming at least one layer of expandable phenol resin particles adjacent to at least one of the upper and lower surfaces of said fiber layer, the amount of said particles being 10–150 parts by weight per 100 parts by weight of said loose fiber; and

heating said layer of loose fibers and said at least one layer of expandable phenol resin particles under 0.5–30 Kgf/cm^2

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pressure at 120°–200° C. for 0.5–30 minutes to cause said expandable phenol resin particles to expand and to fill the



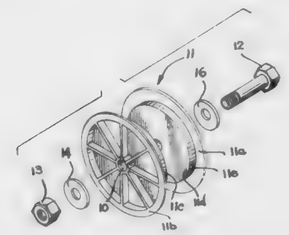
void space within said fiber layer, thereby consolidating said layer of loose fibers.

4,734,232

METHOD FOR FABRICATING SOLID TIRE HAVING POLYURETHANE FOAM CORE

Bruce J. Hoesman, 30514 Rhine Dr., Ranchos Palos Verdes, Calif. 90274

Filed Mar. 17, 1987, Ser. No. 26,790
Int. Cl.[4] B29C *67/22*
U.S. Cl. 264—46.6 **13 Claims**



1. A method for fabricating a solid tire having a tire casing filled with a microcellular polyurethane foam forming a core comprising the steps of:

installing a jig on the tire casing, said jig simulating the wheel hub with which the tire is to be used, said jig having two similar halves which are placed on opposite sides of the casing flush against each other and against the opposite outer surfaces of said casing, said jig being centered on the casing, the halves thereof being clamped flush against each other and in tight abutment against the opposite outer surfaces of the casing, said jig having a fill hole in one of the halves thereof which provides fluid communications between the interior of the casing and the exterior of the jig,

forming a plurality of vent holes in a circle along the high point on the outer casing wall against which said one of the halves of said jib abuts,

supporting the tire in a substantially horizontal position with the vent holes facing upwardly,

filling said casing through said fill hole with an amount of a liquid flexible microcellular polyurethane foam forming mixture composed of polyol and isocyanate such that said polyurethane foam, expanding in response to the chemical reaction of the mixture of said polyol and isocyanate, will completely fill said casing,

plugging said fill hole to contain the polyurethane foam within the casing, and

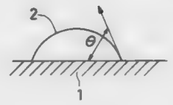
removing said jig from said casing a predetermined time period after the casing has been filled, while the polyurethane foam is still expanding, such that the polyurethane foam expands both towards the center of the casing and outwardly tightly against the casing so that it any remaining air is vented out through the vent holes to avoid the formation of air pockets in the casing.

4,734,233

CERAMIC WIRING SUBSTRATE AND PROCESS FOR PRODUCING THE SAME

Gyozo Toda, Hino; Takashi Kuroki, Yokohama; Shousaku Ishihara, Chigasaki; Tsuyoshi Fujita, Yokohama, and Naoya Kanda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,088
Claims priority, application Japan, Jan. 27, 1986, 61-13809
Int. Cl.[4] C04B *33/32;* **H05K** *3/12*
U.S. Cl. 264—61 **8 Claims**



1. A ceramic wiring substrate comprising a conductive layer provided on a ceramic substrate, said conductive layer being produced by sintering a conductive paste comprising 85 to 97% by weight of a tungsten powder and 15 to 3% by weight of a sintering additive (for conductive metal) having a composition falling within the range surrounded by the lines connecting points A, B, C, D, E, F, G, H, I, J, K, L, M and N and the lines connecting points O, P, Q, R and S in a triangular composition diagram,

provided that said points A through N and O through S represent the following compositions, respectively:

	SiO_2 (wt %)	Al_2O_3 (wt %)	MgO (wt %)
A	46	41	13
B	41	22.5	36.5
C	47	17	36
D	51	12	37
E	56	5	39
F	60	5	35
G	67	5	28
H	71	9	21
I	75	12	13
J	80	12	8
K	84	10	6
L	90	7.5	2.5
M	95	5	0
N	80	16	4
O	51	26	23
P	50.5	23	26.5
Q	55.5	18	26.5
R	63	15	22
S	64	20	16

5. A process for producing a ceramic wiring substrate, comprising the steps of:

conducting printing on a ceramic green sheet with a conductive paste comprising 85 to 97% by weight of a tungsten powder and 15 to 3% by weight of a sintering additive (for conductive metal) having a composition falling within the range surrounded by the lines connecting points A, B, C, D, E, F, G, H, I, J, K, L, M and N and the lines connecting points O, P, Q, R and S in a triangular composition diagram; and

sintering the resulting ceramic green sheet having a printing thereon at 1550° to 1700° C. in a reducing atmosphere,

provided that said points A through N and O through S represent the following compositions, respectively:

	SiO_2 (wt %)	Al_2O_3 (wt %)	MgO (wt %)
A	46	41	13
B	41	22.5	36.5
C	47	17	36
D	51	12	37

-continued

	SiO_2 (wt %)	Al_2O_3 (wt %)	MgO (wt %)
E	56	5	39
F	60	5	35
G	67	5	28
H	71	9	21
I	75	12	13
J	80	12	8
K	84	10	6
L	90	7.5	2.5
M	95	5	0
N	80	16	4
O	51	26	23
P	50.5	23	26.5
Q	55.5	18	26.5
R	63	15	22
S	64	20	16

4,734,234

PREPARATION OF VERY STRONG AND VERY HEAT-STABLE CERAMIC MOLDINGS OF SILICON NITRIDE

Hans-Josef Sterzel, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,325
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504145
Int. Cl.[4] C04B *35/58*
U.S. Cl. 264—66 **4 Claims**

1. A process for the production of compact, pore-free moldings of silicon nitride by sintering amorphous silicon nitride powder which comprises: compressing amorphous silicon nitride powder in the absence of sintering assistants in a first stage at from 1200° to 1350° C. and from 50 to 600 kp/cm^2 to give a compact glassy molding; and converting the compact glassy molding in a second stage to crystalline silicon nitride at a temperature of from 1400° to 1800° C. without the use of pressure.

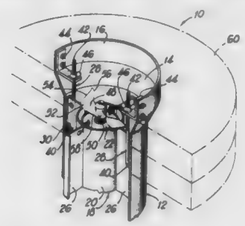
4,734,235

AERATOR

H. Ken Holyoak, Box 449, Alapaha, Ga. 31622

Filed Nov. 24, 1986, Ser. No. 934,441
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—91 **15 Claims**

1. An aerator for agitating and spraying water in a pond or the like for oxygenating the water, comprising a housing member having an inlet disposed below water level and an outlet disposed above water level, said housing member being generally hollow for conducting water therethrough, a bracket means disposed in said housing said bracket means having a central portion with wing means extending radially outwardly from said central portion for maintaining said bracket means in a generally central position with respect to said housing member and having adjustment means operatively connected thereto for vertically adjusting said bracket means with respect to said housing, a motor means having a propeller means mounted thereon and having a power source, said motor



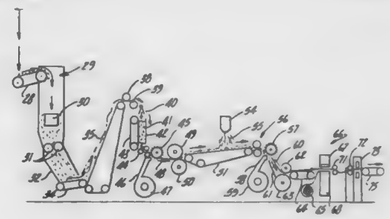
means being disposed in said bracket means for agitating the water upon activation of said motor means.

4,734,236

METHOD FOR FORMING FIBER WEB FOR COMPRESSION MOLDING STRUCTURAL SUBSTRATES FOR PANELS

Alfred L. Davis, Thomson, Ga., assignor to Sheller-Globe Corporation, Toledo, Ohio

Division of Ser. No. 803,282, Dec. 2, 1985, Pat. No. 4,612,224. This application Jul. 7, 1986, Ser. No. 882,688
Int. Cl.[4] B29C *43/26, 43/30*
U.S. Cl. 264—112 **9 Claims**



1. A method for forming a compression moldable panel substrate, including the following steps:

(a) forming a layer of substantially evenly distributed random oriented natural fibers;

(b) covering an upper surface of the layer of natural fibers with a relatively thin layer of generally evenly distributed, randomly oriented synthetic plastic fibers;

(c) conveying the layers of natural fibers and plastic fibers to an upper end of an open blending chamber and gravity dropping the fibers into the blending chamber for loosely mixing such fibers together and forming a relatively thick mat of substantially evenly distributed natural fibers and plastic fibers;

(d) depositing an uncured, resinous molding powder material upon at least one of the surfaces of the relatively thick mat;

(e) re-mixing the fibers and simultaneously mixing and evenly distributing the molding material within the fibrous mass comprising the mat to form the mat into a relatively wide and thick web;

(f) rapidly needling the relatively wide and thick web for mechanically interlocking the fibers to each other by the rapid movement of needles transversely through the relatively wide and thick web; and

(g) removing the needled web so that it may later be cut to size and to a shape and used in a compression molding process which includes the application of heat and pressure upon the needled web, within a mold to form a relatively stiff, board-like structural substrate for panels.

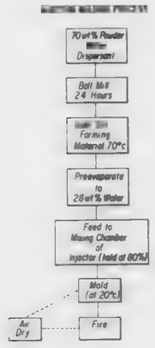
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,237

PROCESS FOR INJECTION MOLDING CERAMIC COMPOSITION EMPLOYING AN AGAROID GELL-FORMING MATERIAL TO ADD GREEN STRENGTH TO A PREFORM

Anthony J. Fanelli, Rockaway, and Robert D. Silvers, Pompton Lakes, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 15, 1986, Ser. No. 863,288
Int. Cl.[4] C04B *35/64*; B29C *45/72*; B22F *1/00*
U.S. Cl. 264—122 **14 Claims**



1. A method of forming an article comprising the steps of:
(a) forming a mixture comprising
(1) powders selected from the group consisting of metal powders, ceramic powders, and mixtures thereof,
(2) an agaroid gel-forming material having a gel strength, measured at a temperature between 0° C. and about 22° C. on a gel consisting essentially of about 4 wt % of the agaroid gel-forming material and water, of at least about 500 g/cm^2, and
(3) an agaroid gel-forming material solvent;
(b) heating the mixture to a first temperature above the gel point of the agaroid gel-forming material to solubilize the agaroid gel-forming material, said first temperature being in the range from 80° C. to 100° C.;
(c) supplying the mixture to a mold; and
(d) molding the mixture at a second, cooler temperature at or below the gel point of the agaroid gel-forming material to produce a self-supporting article comprising the powders and a gel comprising the agaroid gel-forming material, said second, cooler temperature being in the range from 15° C. to 45° C.

14. A composition of matter comprising powder selected from the group consisting of metal powder, ceramic powder and mixtures thereof and, mixed therewith, an agaroid gel-forming material having a gel strength, measured at a temperature between 0° C. and about 22° C. on a gel consisting essentially of about 4 wt % of the agaroid gel forming material and water, of at least about 500 g/cm^2.

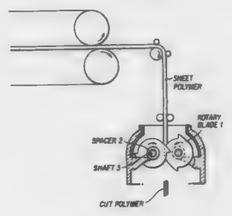
4,734,238

PROCESS FOR PRODUCING POWDER OF CATIONIC POLYMER

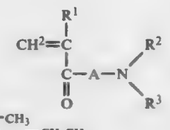
Teruhiko Sugimori; Hideaki Habaru; Ken-ichi Inukai, all of Ohtake, and Akihisa Furuno, Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd.; Nitto Chemical Indutry Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,840
Claims priority, application Japan, Mar. 20, 1985, 60-54239
Int. Cl.[4] B29B *9/04*; C08F *2/10*
U.S. Cl. 264—144 **9 Claims**

1. A process for producing powder of a cationic polymer by spreading in a layer on a movable carrier an aqueous solution containing a vinyl monomer comprising mainly at least one monomer selected from the group consisting of a compound represented by Formula (I):



Formula (I)



R^1: —H or —CH_3
R^2, R^3: —CH_3 or —CH_2CH_3
A: —O—C_nH_{2n}— (n = 2 to 3), —NH—C_nH_{2n}— (n = 2 to 3) or —OCH_2CHCH_2—, OH

a salt thereof and a derivative thereof quaternized with an alkylating agent in an amount of 75 to 90% by weight, and carrying out continuous polymerization, which comprises:
(a) carrying out polymerization of said aqueous solution, with being made a layer with a thickness of 40 mm or less, and after substantial completion of polymerization, peeling off the resulting hydrous polymer from the carrier under such a hot state that the central portion of the hydrous polymer is at a temperature not lower than the Vicat softening point of said hydrous polymer, and
(b) cutting said polymer under the hot state that the central portion of the hydrous polymer is at a temperature not lower than the Vicat softening point of said hydrous polymer by a shearing stress into rods or dice, followed further by crushing, if necessary, into sizes of 20 mm or less.

4,734,239

PROCESS FOR THE PRODUCTION OF WATER-INSOLUBLE FIBERS OF CELLULOSE MONOESTERS OF MALEIC ACID, SUCCINIC ACID AND PHTHALIC ACID, HAVING AN EXTREMELY HIGH ABSORBABILITY FOR WATER AND PHYSIOLOGICAL LIQUIDS

Michael Diamantoglou, Erlenbach, and Gerhard Meyer, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnheim, Netherlands

Continuation of Ser. No. 597,104, Apr. 2, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 837,311
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312022
Int. Cl.[4] D01F *2/02*
U.S. Cl. 264—187 **11 Claims**

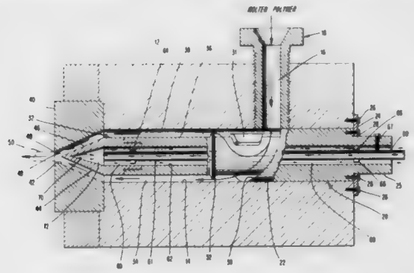
1. Process for the production of water-insoluble fibers of cellulose monoesters of maleic acid, succinic acid or phthalic acid having an extremely high absorption ability of water and physiological liquids, comprising, in order:
(a) preparing a solution of activated cellulose in dimethylacetamide or 1-methyl-3-pyrrolidon,
(b) reacting the so-dissolved cellulose while extensively maintaining average degree of polymerization of 300–800, with a dicarboxylic acid anhydride in a mol ratio from 1 : 0.20 up to 1 : 4 at 20° to 120° C. and in the presence of a known esterification catalyst, over a period from 5 minutes to 20 hours to obtain a degree of esterification,
(c) spinning the obtained cellulose monoester solution by means of wet spinning into a coagulation agent to form water-insoluble fibers of cellulose monoesters of maleic acid, succinic acid, or phthalic acid, and converting said fibers partially or completely into corresponding fiber-shaped salts of the cellulose monoesters of phthalic acid, maleic acid, or succinic acid in a substantially organic solvent by reaction with alkali metal hydroxide and/or alkali metal alcoholate or ammonia or primary or secondary amine.

4,734,240

MELT-EXTRUSION OF POLYMER WHICH IS CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE TO FORM LARGE SHAPED ARTICLES EXHIBITING IMPROVED POLYMERIC ORIENTATION

Tai-Shung Chung; Sunil K. Garg, both of Summit, and Daniel Palangio, Woodbridge, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 24, 1986, Ser. No. 822,091
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—211.13 **16 Claims**



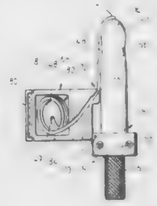
1. A process of melt-extrusion for the formation of a solid elongated shaped article having a cross-sectional area of at least 7×10^{-4} square inch, a minimum thickness of at least 30 mils, and a polymeric orientation substantially in the direction of its length which exhibits improved polymeric orientation uniformity throughout the interior thereof comprising:
(a) providing in a laterally confined zone a moving stream of molten polymer which exhibits an anisotropic melt phase,
(b) passing said stream of molten polymer which exhibits an anisotropic melt phase through a converging die to produce an elongated extrudate while providing at the interior of said stream of molten polymer while present in said converging die at least one enclosed cooling zone wherein a cooling fluid is circulated whereby the portion of the molten polymer adjacent to said cooling zone is cooled and the melt viscosity thereof is increased while maintaining said polymer in the molten state, and
(c) subjecting the resulting elongated extrudate outside the extrusion die to the cooling of its exterior and to a draw-down of approximately 1.5:1 to 10:1 while forming said solid elongated shaped article,
whereby the increased melt viscosity at the interior of said stream of molten polymer created in step (b) contributes to the uniformity of the polymeric orientation which is imparted in steps (b) and (c).

4,734,241

METHOD FOR PROTECTING A PRE-FORMED PROJECTING APPENDAGE DURING PLASTIC MOLDING

Frank J. Gerow, Houston, Tex., assignor to Synergist Limited, Houston, Tex.

Division of Ser. No. 654,782, Sep. 26, 1984, Pat. No. 4,623,116.
This application Jul. 29, 1986, Ser. No. 891,352
Int. Cl.[4] B29C *45/14, 33/00*
U.S. Cl. 264—254 **13 Claims**



9. A method of injection molding a generally cylindrical sleeve-like penile prosthesis from a thermoplastic or thermosetting molding material formed by utilizing a male mold core and a pair of female mold halves in which the prosthesis has encased in a wall therein a selected length of a preformed resilient tubing, the remaining length and free end of the tubing extending from the molded prosthesis to form a length of free tubing projecting therefrom, comprising the steps of:
anchoring one end of the tubing at a selected position on the mold core,
positioning a first portion of the tubing adjacent at least a portion of the mold core and between at least one of the female mold halves,
isolating the remaining length and free end of the tubing that extends beyond a predetermined location on the inner surface of at least one of the female mold halves for permitting the tubing to exit the surface of the molded prosthesis,
storing said isolated remaining length and free end of the tubing in a protected enclosure adjacent the mold core and disposed in at least one of the pair of female mold halves for protecting said remaining length and free end of said tubing during subsequent molding steps,
injecting the molding material into the closed female mold halves for forming said prosthesis around said mold core and embedding said first portion of the tubing within a wall of the molded prosthesis,
removing the prosthesis from the mold core, and
freeing the remaining length and free end of the tubing from said enclosure for forming a length of free tubing projecting from the molded prosthesis.

4,734,242

METHODS FOR PRODUCING PLASTIC MOLDED ARTICLES

Donald R. Gleave, and Nigel F. Gamble, both of Leicester, United Kingdom, assignors to Donald Rowland Gleave and Silkjet Limited, Leicester, England

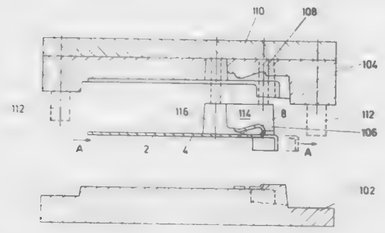
Filed Jun. 5, 1986, Ser. No. 871,100
Int. Cl.[4] B29C *45/33, 45/36, 45/44*
U.S. Cl. 264—318 **2 Claims**

1. A method of molding a clipboard having a flat board portion and having an integrally formed resilient U-shaped clip portion, said method comprising the following steps:
(a) providing first and second mold parts that define, respectively, portions of the rear and front planar surfaces of the flat board portion,
(b) locating a third mold part on sturds provided in said second mold part, such third mold part defining a for-

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wardly facing surface of the rear leg of the U-shaped clip portion and a rearwardly facing surface of the front leg of the U-shaped clip portion, which clip portion surfaces diverge toward the base of the U-shaped clip portion, and the base having outer and inner surfaces defined by the first and second mold parts, and third mold part respectively,

(c) mating said mold parts to form a cavity for the clipboard, the first and second mold parts also defining rear and front facing surfaces of said rear and front legs of said U-shaped portion respectively,



(d) injecting plastic material into the mold cavity so formed,

(e) separating the first and second mold parts so that the molded clipboard itself moves the third mold part away from the second mold part on the studs provided,

(f) forcibly sliding the molded clipboard in a direction parallel the plane of the board to separate it from the third mold part by elastically deforming the clip portion toward an open condition, said clipboard assuming a relaxed closed condition after being so separated from the third mold part.

4,734,243

INJECTION MOLDING MACHINE AND METHOD

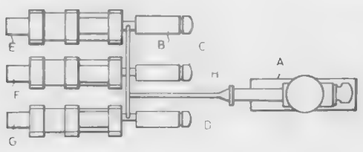
Tadahiko Kohama, Nishio; Susumu Shibata, Okazaki; Shogo Izawa, Tokai; Takami Noda, Nagoya, and Atsuo Teraoka, Hiroshima, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and The Japan Steel Works, Ltd., Tokyo, both of, Japan

Filed Jul. 25, 1986, Ser. No. 889,473

Claims priority, application Japan, Jul. 25, 1985, 60-165477

Int. Cl.⁴ B25B *7/00*

U.S. Cl. 264—328.8 **3 Claims**



1. An injection molding process, utilizing a stationary plasticizing device having a screw extruder; a plurality of parallel stationary injection devices each respectively having an openable and closable first valve at an injection nozzle and an openable and closable secons valve at an inflow inlet and having a plunger for injecting plasticized material; a plurality of spaced, parallel molds aligned with the respective injection devices; and a pipe having heating means including branches connected to the inflow inlets of the respective injection devices; wherein said method comprises the steps of:

driving said screw extruder;

applying compressive forces to the respective molds;

closing said first valves and opening said second valves of said injection devices;

supplying said plasticized material from said plasticization device to said injection devices;

opening said first valves and closing said second valves; and

shifting said plungers as to supply said plasticized material to said molds.

4,734,244

BLOW MOLDING METHOD AND MOLD WITH MEANS TO POSITION AN INSERT

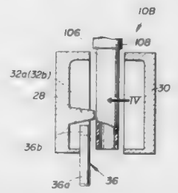
Junichi Ono, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 23, 1985, Ser. No. 812,011

Claims priority, application Japan, Feb. 27, 1985, 60-27730[U]

Int. Cl.⁴ B29C *49/48, 49/04*

U.S. Cl. 264—515 **13 Claims**



1. A method for molding a hollow plastic object which has an insert embedded therein, comprising the following steps:

(a) preparing a mold which includes first and second halves, each having a recessed inner surface leaving a side wall, a projection integrally formed on the inner surface of the first half at a position near a recess formed at a portion of said side wall;

(b) positioning an axial end of said insert adjacent said projection so that a surface of said projection faces said axial end of said insert;

(c) extruding a parison from an extruder die into a space defined between said first and second halves;

(d) coupling said first and second halves together, confining said parison in an enclosed cavity defined by the coupled first and second halves; and

(e) feeding pressurized air into the parison to swell the parison in the enclosed cavity, causing softened plastics of the parison to be lined on the recessed inner surfaces of the coupled halves while said projection prevents inward axial movement of said insert during cooling of the molded object.

4,734,245

METHOD OF PRODUCING BIAXIALLY ORIENTED FILM OF THERMOPLASTIC RESIN

Masao Takashige; Hidenobu Takeichi, and Takeo Hayashi, all of Chiba, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

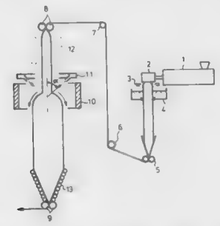
Filed Jan. 29, 1986, Ser. No. 823,547

Claims priority, application Japan, Jan. 30, 1985, 60-17637; Jan. 30, 1985, 60-17638; Jan. 30, 1985, 60-17639

Int. Cl.⁴ B29C *55/28*

U.S. Cl. 264—564 **15 Claims**

1. In a method of producing a biaxially oriented film of thermoplastic resin wherein a tubular thermoplastic resin film is fed into a heating zone and simultaneously stretched in both its longitudinal and transversal directions by a tensile force in the feeding direction and an internal pressure, the improvement comprising said thermoplastic resin being selected from the group consisting of a polyamide and a saponified material of an ethylene vinyl acetate copolymer and said tubular thermoplastic resin film being contacted by blowing air at room temperature against and about a stretching starting point in said heating zone so that the temperature distribution of said film is stabilized at the stretching starting point, said blowing



air being supplied from an upstream side of said stretching starting point at a predetermined air blowout angle relative to the longitudinal direction of said film.

4,734,246

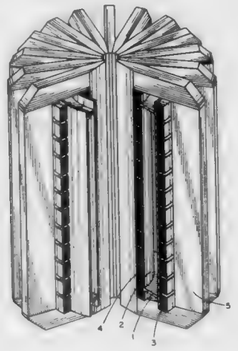
ELONGATED TOROID FUSION DEVICE

Tihiro Ohkawa, La Jolla; Ming Chu, San Diego; Peter A. Politzer, Encinitas, and Reagan W. Moore, San Diego, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jan. 28, 1985, Ser. No. 695,875

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—133 **7 Claims**



1. A device for achieving ignition of a plasma with ohmic heating comprising:

means for defining a toroidal plasma chamber, and confining gas therein, and

means including electrically conductive coils for generating plasma within said chamber and for confining and shaping such plasma substantially into and filling a predetermined single region of said chamber without an axisymmetric internal separatrix and ohmically heating the confined plasma to ignition, said predetermined region being toroidal with a major axis defining an axial direction parallel thereto and a transaxial direction perpendicular to said axis and having an axial cross section with an elongation, k, greater than 4, where k is the ratio of the maximum axial dimension of said cross section to the maximum transaxial dimension of said cross section.

6. A device according to claim 1 wherein said means for generating and confining said plasma comprises a tokamak having a safety factor q greater than 1.

4,734,247

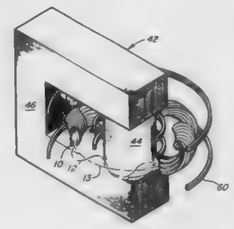
HELICAL SHAPING METHOD AND APPARATUS TO PRODUCE LARGE TRANSLATIONAL TRANSFORM IN PINCH PLASMA MAGNETIC CONFINEMENT

Michael J. Schaffer, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Aug. 28, 1985, Ser. No. 770,314

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—133 **1 Claim**



1. A method for generating and magnetically confining plasma in a pinch with translational transform comprising:

generating plasma,

shaping and positioning said plasma into a helicoid of substantially D-shape in cross sections perpendicular to a guiding axis with the relatively flat portion of the D-shape nearest said guiding axis and the relatively convex portion of the D-shape farther from said guiding axis with the plasma wound substantially helically about said guiding axis,

passing current through said plasma to form a reverse field pinch with a respective set of nested closed magnetic surfaces enclosing and defining a magnetic axis substantially helically wound about said guiding axis, and

applying a magnetic field through said plasma in the direction of said magnetic axis.

4,734,248

CONDUIT ASSEMBLY FOR USE IN A NUCLEAR REACTOR

Charlton Dunn, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1986, Ser. No. 885,363

Int. Cl.⁴ G21C *13/00*

U.S. Cl. 376—203 **19 Claims**

1. In a pool-type nuclear reactor, a metal duct assembly for interconnecting the discharge duct of the pump and the inlet coolant duct of a reactor core in said pool-type nucler reactor, said duct assembly comprising:

an upper first tubular section adapted for connection to the discharge duct of said pump,

a lower second tubular section adapted for connection with the coolant inlet duct of said reactor core,

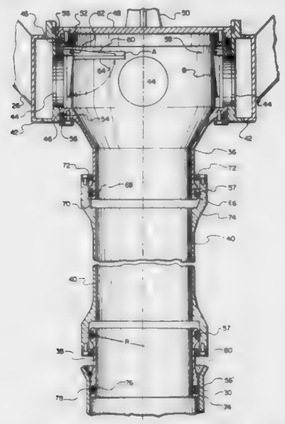
a third intermediate tubular section for interconnecting the other two sections,

first and second joint means for respectively connecting one end of the intermediate section with an adjoining end of the upper section, and an opposite end of the intermediate section with an adjoining end of the lower section, each of said joint means comprising a male portion on one of said sections having a ridge adjacent and end thereof, a circumferential groove located in the ridge, the other adjacent section having a female portion adjacent its end with an inside diameter greater than that of said ridge for receiving said male portion, and

a first seal means located in each circumferential groove, said seal means being radial compressible and having an

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unrestrained outside diameter greater than that of the inside diameter of the female portion such that it is maintained in contact therewith, said seal means comprising a split cylindrical ring having overlapping ends.

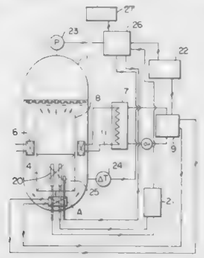


4,734,249

NUCLEAR REACTOR START-UP METHOD

Motoaki Utamura, Kitaibaraki; Yasuhiro Masuhara, Hitachi; Atsuo Yamanouchi, Mito; Koichi Kotani, and Masanori Naitoh, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,460
Claims priority, application Japan, Sep. 21, 1983, 56-173055
Int. Cl.[4] G21C *7/00*
U.S. Cl. 376—214 **7 Claims**



1. A method of starting up a boiling water nuclear reactor in a cold shut-down condition, comprising the steps of:

i. forming a map of an output E-vs-subcooled temperature in accordance with the output E of the nuclear reactor core, and with the subcooled temperature $\Delta T(P)$ of coolant at a reactor core inlet, which is a function of the pressure P of the coolant and which is determined by the following equation:

$$\Delta T(P)=T_B-T_C \quad (1)$$

where T_B is the boiling point of coolant under a predetermined pressure (saturation temperature), and

T_C is the actual temperature of the coolant under the predetermined pressure;

ii. plotting outlet quality curves $x(E, \Delta T)$ on the map which outlet quality curves are determined by the following equation on the map:

$$x=m_V/m_T \quad (2)$$

where m_V is the mass of vapor passing through the reactor core outlet per unit time, and

m_T is the total mass of coolant passing said through the reactor core outlet per unit time;

iii. determining critical quality curves among a group of outlet quality curves on the map, the critical quality curves being obtained by the following equations:

$$x(E, \Delta T)=x_{c1} \quad (3)$$

$$X(E, \Delta T)=x_{c2} \quad (4)$$

where $x_{c1}>x_{c2}$,

the critical guality curves defining boundaries along which first and second instabilities occur;

iv. selecting one of the outlet quality curves, corresponding to a boiling initiation curve which is obtained from the following equation:

$$x(E, \Delta T)=0 \quad (5);$$

v. determining a minimum subcooled temperature $\Delta T'min$ which is crossing point between the boiling initiation curve of equation (5) and the critical quality curve of equation (4) relating to the second instability; and

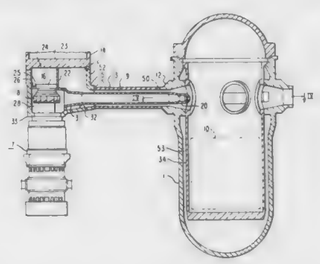
vi. starting increase of the output E of the nuclear reactor core from zero output at a point having a subcooled temperature of the coolant at the nuclear reactor core inlet which satisfies the following condition: $\Delta T<\Delta T'min$, between the critical quality curves of equation (3) and equation (4) on the map.

4,734,250

CONCENTRIC PIPE LOOP ARRANGEMENT FOR PRESSURIZED WATER NUCLEAR REACTORS

Luciano Veronesi, O'Hara Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 594,059, Mar. 28, 1984. This application Sep. 30, 1986, Ser. No. 913,629
Int. Cl.[4] G21C *1/01*
U.S. Cl. 376—292 **13 Claims**



1. In a nuclear reactor primary coolant system having a reactor vessel, a steam generator, and a reactor coolant pump, a pipe loop arrangement comprising:

a first pipe connecting an outlet of said reactor vessel with an inlet of said steam generator whereby hot reactor coolant is ducted to said steam generator;

a second pipe substantially concentrically mounted within said first pipe forming an annulus therebetween;

means for flow connecting a steam generator outlet with an inlet to said pump;

means for flow connecting an outlet of said pump with said second pipe; and,

means for flow connecting said second pipe with inlets to said reactor vessel whereby cooled reactor coolant is ducted from said steam generator to said reactor vessel comprising a hollow Y-shaped transition piece welded at one end to said second pipe and having two other ends each slidingly engaged with a respective inlet to said reactor vessel whereby said second pipe is maintained in said concentric arrangement with said first pipe; and,

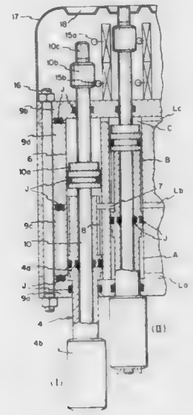
means for smoothing the flow of hot reactor coolant around said transition piece and into said first pipe.

4,734,251

MULTI-GRIPPER HANDLING APPARATUS WITH INDIVIDUAL FORCE LIMITER

Paul Blum, Saint-Nom-La-Bretèche, France, assignor to Transnucleaire, Paris, France

Filed Jan. 22, 1987, Ser. No. 5,891
Claims priority, application France, Jan. 22, 1986, 86 01268
Int. Cl.[4] G21C *19/32*
U.S. Cl. 376—261 **4 Claims**



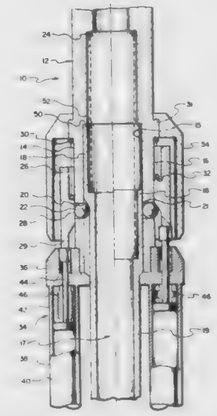
1. Handling apparatus for an assembly of nuclear fuel rods comprising a handling head including a plurality of gripper assemblies, each gripper assembly configured to engage and manipulate a single fuel rod, means to control the gripping and thrust forces transmitted to each fuel rod within predetermined parameters to avoid damage to said rods, said handling head further including a block portion with means defining a plurality of cylinders extending therethrough in vertical, parallel orientation, upper and lower plate members extend across the upper and lower surfaces of said block and sealingly secured thereto, passage means within said head and selectively interconnecting said cylinders with sources of pressurized fluid, first and second piston assemblies extending into each cylinder selectively movable between positions within said cylinder and with respect to each other in response to the introduction of pressure fluid through a preselected passage in said head, said first piston assembly including a piston rod extending coaxially through a piston and through both said upper and said lower plate members, said second piston assembly including a coaxial sleeve portion positioned beneath said piston and encircling a portion of said piston rod for relative movement therebetween, said sleeve and said piston rod both reciprocally and coaxially extending through said lower plate member, and gripping means carried by said sleeve and including a plurality of gripping fingers mounted within said gripping means and movable between gripping and non-gripping positions, said fingers being resiliently urged to a gripping position and movable to a non-gripping position by relative movement of said piston rod and said sleeve.

4,734,252

NUCLEAR REACTOR SHUTDOWN CONTROL ROD ASSEMBLY

Konstantin Bilibin, North Hollywood, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 7, 1986, Ser. No. 894,224
Int. Cl.[4] G21C *7/12*
U.S. Cl. 376—336 **15 Claims**



1. In a nuclear reactor having a reactor core and a reactor coolant flowing therethrough, a temperature responsive, self-actuated nuclear reactor shutdown control rod assembly, comprising:

an upper drive line terminating at its lower end with a substantially cylindrical wall member having inner and outer surfaces, said wall member having a plurality of circumferentially disposed openings adjacent a lower end thereof;

a lower drive line having a lower end adapted to be attached to a neutron absorber, said lower drive line having a substantially cylindrical upper end, an upper portion of the upper end having a diameter greater than a lower portion of the upper end of said lower drive line, said upper portion having a diameter less than that of the inner surface of said wall member of said upper drive line, said upper portion fitting within said wall member in the vicinity of the openings, said lower drive line having a recess formed on an outer surface thereof and interconnecting said upper portion and said lower portion thereof;

a ring movable disposed about the outer surface of the wall member of said upper drive line, said ring having a first portion with an inside diameter slightly larger than the outside diameter of said wall member, and a second portion with an inside diameter greater than that of the first portion so as to form a space between said wall member and said ring;

thermal actuation means adapted to be in heat exchange relationship with coolant in an associated reactor core and in contact with said ring, said actuation means being mounted externally of said lower drive line and secured to said wall member of said upper drive line, said actuator means providing for upward movement of said ring when reactor coolant temperature is increased; and

a plurality of balls located within the openings in said upper drive line, each of said balls having a diameter greater than the thickness of the wall member of said upper drive line, the balls being normally retained radially inwardly by the first portion of said ring so that a portion of each ball protrudes radially inwardly beyond the inner surface of said upper drive line into the lower portion of the upper

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end of said lower drive line and adjacent the recess formed on the outer surface of said lower drive line to provide vertical support for said lower drive line at the recess;

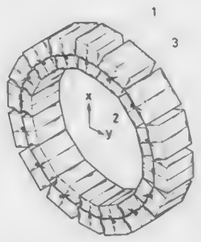
whereby when reactor coolant approaches a predetermined design temperature said actuation means moves said ring sufficiently so that the balls move radially out from said recess and into said space formed by the second portion of said ring thereby removing said vertical support for said lower drive line such that the lower drive line moves downwardly and inserts an associated neutron absorber into an associated reactor core resulting in automatic reduction of reactor power.

4,734,253

PREPARATION OF SINTERED MAGNETS

Kazuo Sato, and Shinichi Yamashita, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 29,955
Claims priority, application Japan, Mar. 25, 1986, 61-066499
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—30 **14 Claims**



1. A process for preparing a sintered magnet, comprising the steps of:

(a) press molding a magnetic powder into a compact in an applied magnetic field, said compact having coordinates (X/Sx, Y/Sy, Z/Sz) where Sx, Sy and Sz are predetermined factors of shrinkage occurring in a magnetization direction and directions perpendicular to the magnetization direction upon subsequent sintering, and

(b) sintering the compact into a sintered magnet having a major axis and an axis of easy magnetization oriented at an angle to the major axis, the sintered magnet having coordinates (X, Y, Z) with X axis aligned with the axis of easy magnetization of the sintered magnet.

4,734,254

ENHANCED MACHINING ANNEAL RESISTANT COPPER ALLOY

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Dec. 15, 1986, Ser. No. 941,849
Int. Cl.[4] C22C *9/00*
U.S. Cl. 420—497 **4 Claims**

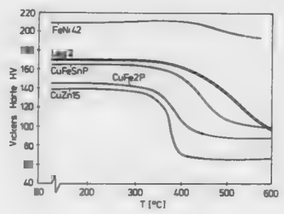
1. An enhanced machining, anneal resistant, oxygen-free, copper-based alloy consisting essentially of at least 0.02% by weight silver, from 25 to 100 parts per million sulfur, and the balance copper.

4,734,255

USE OF A COPPER-TITANIUM-COBALT ALLOY AS THE MATERIAL FOR ELECTRONIC COMPONENTS

Wolfgang Duerrschnabel, Bellenberg; Franz J. Puckert, Illerrieden, and Heinrich Stueer, Voehringen, all of Fed. Rep. of Germany, assignors to Wieland-Werke AG, Ulm, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,944
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3511999
Int. Cl.[4] C22C *9/06*
U.S. Cl. 420—492 **9 Claims**



1. A supporting or connecting element of an electronic device, said element being made of an alloy consisting of:

Ti	0.05–0.6 wt. %
Co	0.05–0.6 wt. %
Cu and unavoidable impurities	balance

wherein the weight ratio of Ti/Co is from 1.0 to 1.5.

4,734,256

WETTING OF LOW MELTING TEMPERATURE SOLDERS BY SURFACE ACTIVE ADDITIONS

Howard H. Liebermann, Succasunna, and Debasis Bose, Randolph, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 21, 1986, Ser. No. 854,455
Int. Cl.[4] C22C *11/06*
U.S. Cl. 420—571 **5 Claims**



1. A rapidly solidified lead base solder alloy in strip form comprising between about 4 and about 17 weight percent tin, the improvement comprising adding to said alloy a surfactant consisting of at least one member selected from the group consisting of about 0.01 to 0.5 weight percent tellurium, about 0.01 to 0.5 weight percent selenium plus about 0.1 to 0.5 weight percent antimony, and mixtures thereof, to promote wetting of substrates by said alloy.

4,734,257

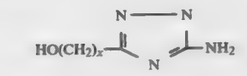
METHOD OF INHIBITING CORROSION OF NONFERROUS METALS IN AQUEOUS SYSTEMS USING 3-AMINO-5-(ω-HYDROXYALKYL)-1,2,4-TRIAZOLES

Josef Penninger, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,225
Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519522
Int. Cl.[4] C23F *11/06, 11/14*
U.S. Cl. 422—13 **16 Claims**

1. In a method of inhibiting corrosion of a nonferrous metal in contact with water at a pH of about 6 to 10, the improvement comprising adding to the water a corrosion inhibiting amount of a compound selected from the group consisting of:

(a) a 3-amino-5-(ω-hydroxy-n-alkyl)-1,2,4-triazole having the formula:



(I)

wherein x is an integer in the range of from 1 to 12;

(b) a salt of the compounds of formula (I) with an inorganic acid;

(c) a salt of the compounds of formula (I) with an organic acid; and

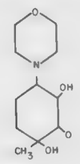
(d) mixtures thereof.

4,734,258

MORPHOLINOHEXOSE REDUCTONE AS AN OXYGEN SCAVENGER

David R. Cosper, Downers Grove, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 7, 1987, Ser. No. 82,877
Int. Cl.[4] C02F *1/20*; C23F *11/06*
U.S. Cl. 422—16 **1 Claim**



1. An improved method for scavenging dissolved oxygen from industrial waters which comprises treating said waters with at least 1 ppb of morpholinohexose reductone.

4,734,259

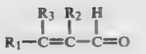
MIXTURES OF α,β-UNSATURATED ALDEHIDES AND SURFACE ACTIVE AGENTS USED AS CORROSION INHIBITORS IN AQUEOUS FLUIDS

Wayne W. Frenier, Tulsa, and Frederick B. Growcock, Broken Arrow, both of Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Nov. 22, 1985, Ser. No. 801,123
Int. Cl.[4] C23F *11/04*; C09K *3/00*
U.S. Cl. 422—16 **30 Claims**

11. A method for inhibiting the attack of aqueous corrosive fluids on ferrous metal which comprises contacting said ferrous metal with a composition consisting essentially of:

(A) an α,β-unsaturated aldehyde having the general formula:



wherein:

R_1 represents a saturated or unsaturated aliphatic hydrocarbon group containing from about 3 to about 12 carbon atoms, a substituted saturated or unsaturated aliphatic hydrocarbon group containing from about 3 to about 12 carbon atoms and also containing one or more non-interfering substituents, an aryl group, a substituted aryl group containing one or more non-interfering substituents, or a non-interfering substituent per se,

R_2 represents hydrogen, a saturated or unsaturated aliphatic hydrocarbon group containing from 1 to about 5 carbon atoms, a substituted saturated or unsaturated aliphatic hydrocarbon group containing from 1 to about 5 carbon atoms and also containing one or more non-interfering substituents, an aryl group, a substituted aryl group containing one or more noninterfering substituents, or a non-interfering substituent per se, and

R_3 represents hydrogen, a saturated or unsaturated aliphatic hydrocarbon group containing from about 3 to about 12 carbon atoms, a substituted saturated or unsaturated aliphatic hydrocarbon group containing from about 3 to about 12 carbon atoms and also containing one or more non-interfering substituents, an aryl group, a substituted aryl group containing one or more non-interfering substituents, or a non-interfering substituent per se, with the total number of carbon atoms in substituents represented by R_1, R_2 and R_3 ranging from 1 to about 16, and

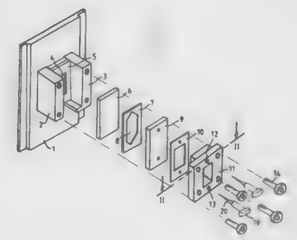
(B) a surfactant.

4,734,260

CUVETTE

Werner Lautenschläger, Leutkirch, Fed. Rep. of Germany, assignor to AGW Analysen-Geräte GmbH, Leutkirch, Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,590
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 8509640[U]
Int. Cl.[4] G01N *21/03*
U.S. Cl. 422—58 **5 Claims**



1. Cuvette for storing a liquid sample, comprising: a housing having an exterior surface and enclosing a thin sample chamber; two radiation transmitting discs disposed within said housing and delimiting mutually opposed sides of said chamber, one of said discs and said housing each being provided with two bores, said bores of said housing and said bores of said one disc being aligned and extending between the exterior surface of said housing and said chamber to provide communication between the exterior and said chamber; and two stoppers of plastic material each inserted into a respective one of said housing bores and each of said two stoppers being provided

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with a narrow longitudinal channel communicating with said chamber through its respective bore and closeable by a needle.

4,734,261
DUPLEX PIPETTE

Teruaki Koizumi; Yoshio Saito, and Osamu Seshimoto, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1986, Ser. No. 823,320
Claims priority, application Japan, Jan. 29, 1985, 60-14765; Jan. 29, 1985, 60-14766
Int. Cl.[4] G01N *1/14, 1/16, 1/26;* **B01L** *3/02*
U.S. Cl. 422—100 **4 Claims**



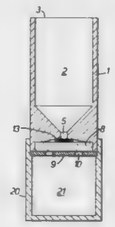
1. A duplex pipette comprising a housing, first and second cylinders separately formed in the housing and fixedly spaced from one another, first and second piston members each having a lower end portion slidably received in the first and second cylinders, respectively, and a handle portion projecting outside the housing, and first and second pipette tips respectively mounted on the lower end of the first and second cylinders, respectively by means of first and second connecting members and being in a fluid communication with the corresponding cylinders, and first and second connecting means, the first connecting means connecting the first pipette tip to the first cylinder and the second connecting means connecting the second pipette tip to the second cylinder, the connecting means being constructed and arranged so that the distance between the pipette tips can be changed, wherein the pipette tips are each in communication with a corresponding one of said first and second cylinders by way of a first passage formed in the first connecting means and a second passage formed in the second connecting means.

4,734,262
REACTION MIXTURE HANDLING DEVICE

Kenneth D. Bagshawe, 115 George St., London, W.1., United Kingdom

Filed Apr. 19, 1984, Ser. No. 598,195
Claims priority, application United Kingdom, Apr. 29, 1983, 8311750
Int. Cl.[4] B01L *11/00*
U.S. Cl. 422—101 **15 Claims**

1. A reaction mixture handling device comprising a main body providing a chamber for containing a reaction mixture, an inlet opening in the upper end of the chamber for introduction of the mixture or components thereof, an outlet opening in the lower end of the chamber, reaction mixture retaining means located in a first recess in said body below the outlet opening and being held in place to close the outlet opening by a body of filter material located in a second recess below said first recess and into which said first recess opens, at least part of the body of filter material being movable in a direction away from the outlet opening under an applied differential pressure to permit the reaction mixture retaining means to move away from the outlet opening to open the same and allow liquid to flow from the outlet opening, and channel means communicating laterally with the top of the second recess and with a side

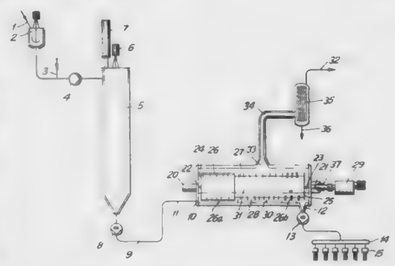


of the first recess to assist flow of liquid from the outlet opening into the body of filter material when the reaction mixture retaining member is moved away from said outlet opening.

4,734,263
APPARATUS FOR THE CONTINUOUS DEMONOMERIZATION AND POSTCONDENSATION OF POLYAMIDE 6

Luder Gerking, and Gunter Panke, both of Berlin, Fed. Rep. of Germany, assignors to Karl Fischer Industrieanlagen GmbH, Fed. Rep. of Germany

Division of Ser. No. 658,817, Oct. 9, 1984, Pat. No. 4,540,774. This application Jun. 20, 1985, Ser. No. 746,741
Claims priority, application European Pat. Off., Oct. 7, 1983, 83730095
Int. Cl.[4] B01F *7/10;* **B01J** *14/00*
U.S. Cl. 422—135 **8 Claims**

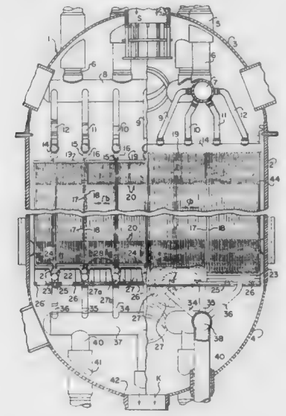


1. A reactor for carrying out demonomerization and post-polymerization having a cylindrical wall with a horizontal axis, and which has a top and a bottom portion in which polymer melt can be placed, an interior rotor in the form of a cage arranged concentrically around said reactor axis and rotatably movable around said axis, said cage having around its periphery ring-shaped elements which are capable of partly dipping into melt which is placed in said reactor; said ring-shaped elements being inclined toward a plane perpendicular to the reactor axis wherein the inclination differs from the inclination of each adjacent element by a fixed angle, said ring-shaped elements thereby forming a screw-line, said ring-shaped elements being capable of propelling melt through the reactor at a desired speed proportional to said angle; said reactor also having weirs fixed at the bottom portion of the cylinder and located between said ring-shaped elements, said weirs being capable of preventing melt from flowing straight along the bottom of the reactor without being raised above the surface of the melt by the ring-shaped elements; said reactor thereby providing means for simultaneously removing volatiles, mixing polymer melt and controlling and achieving substantially uniform retention time for said melt in the reactor.

4,734,264
CATALYTIC REACTOR FOR THE PRODUCTION OF METHANOL, AMMONIA, SYNTHESIS GAS AND HIGHER ALCOHOLS

Frohmut Vollhardt, Oberhausen, and Hans-Dieter Krämer, Dinslaken, both of Fed. Rep. of Germany, assignors to MAN Gutehoffnungshautte GmbH, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 913,112
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534402; Feb. 22, 1986, 3605792
Int. Cl.[4] F28D *7/00;* **B01J** *8/02*
U.S. Cl. 422—148 **6 Claims**



1. A vertical reactor for catalytic exothermic and endothermic reactions, especially for the production of methanol, ammonia, sythesis gas, and higher alcohols, comprising:
- a jacket (**2**) defining a space and having a vertical longitudinal direction, said jacket having a tranverse central plane(Q) lying on said longitudinal axis and extending in a first transverse direction, and a second transverse direction extending transversely to said first transverse direction;
- a lid (**3**) connected to a top end of said jacket and closing a top end of said space;
- a floor (**4**) connected to a bottom end of said jacket and closing a bottom end of said space;
- an effluent pipe (**42**) connected to said floor and communicating with said space for the effluent of gases that have reacted in said space;
- an entry pipe (**43**) connected to said lid and communicating with said space for the entry of gases to react in said space;
- a plurality of discharge pipes (**6**) connected to and supported by said lid, said discharge pipes extending into said space;
- a plurality of feed pipes (**40**) connected to said floor, said feed pipes extending into said space;
- two spaced apart curved collecting pipes (**7, 8**) each connected to at least one of said pipes and positioned on opposite sides of said transverse central plane, said collecting extending substanially in said second transverse direction;
- two distributing pipes (**37, 38**) each connected to at least one of said feed pipes;
- a plurality of upper supporting headers (**14**) extending below said collecting pipes in said second transverse direction and being spaced from each other in said first transverse direction;
- a plurality of upper intermediate ducts (**9, 10, 11, 12**) connected between said upper supporting headers and said collecting pipes with each upper supporting header being connected to one of said collecting pipes through a plurality of said upper intermediate ducts;
- a plurality of lower supporting headers (**23**) extending in said second transverse direction and being spaced from each other in said first transverse direction;
- a plurality of lower intermediate ducts (**34, 35, 36**) connected between said distributing pipes and said lower supporting headers, each lower supporting header being connected to one of said distributing pipes by plurality of intermediate ducts;

said upper supporting headers being spaced above said lower supporting headers in said space;
- a plurality of primary heat exchanger pipes (**17, 18**) connected between said upper and lower supporting headers, said primary heat exchanger pipes extending parallel to said longitudinal direction and being spaced from each other in said first and second tranverse directions, each of said upper supporting headers being connected to one of said lower supporting headers by a plurality of primary heat exchanger pipes which are spaced from each other in said second transverse direction;
- a plurality of upper secondary headers (**19**) each connected between a pair of primary heat exchanger pipes which are connected to an adjacent pair of upper supporting pipes;
- a plurality of lower secondary headers (**24**) each connected between a pair of primary heat exchanger pipes which are connected to an adjacent pair of lower supporting headers;

said upper secondary headers being adjacent upper ends of said primary heat exchanger pipes and said lower secondary headers being adjacent lower ends of said primary heat exchanger pipes;
- a plurality of secondary heat exchanger pipes (**20**) connected between said upper and lower secondary headers with each upper secondary header being connected to one of said lower secondary headers by plurality of said secondary heat exchanger pipes;

said primary and secondary heat exchanger pipes being spaced apart from each other in said first and second transverse directions to form a regular grid of heat exchanger pipes all extending parallel to said longitudinal axis; and
- catalyst floor means (**27**) for defining a catalyst floor near and above said supporting headers, said catalyst floor being spaced above said flow of said jacket for supporting a catalyst bed above said catalyst floor through which said primary and secondary heat exchanger pipes extend for an even distribution of heat exchange through said catalyst bed by said regularly spaced heat exchanger pipes;

said heat exchanger pipes being supported between said discharge and said feed pipes for permitting removal of said grid of heat exchanger pipes as a unit from said jacket.

4,734,265
GAS GENERATOR FOR SAFETY BELT TIGHTENING EQUIPMENT OF A VEHICLE

Karl E. Nilsson, Ottobrunn; Rüdiger Lang, Munich, and Wolfgang Buhl, Baldham, all of Fed. Rep. of Germany, assignors to Bayern Chemie Gesellschaft für Flugchemische Antrieb mit beschränkter Haftung, Fed. Rep. of Germany

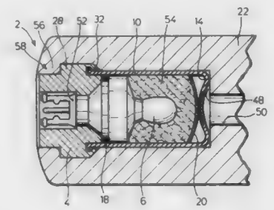
Filed Jul. 10, 1985, Ser. No. 753,665
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425836
Int. Cl.[4] G05D *16/00;* **B01J** *1/00;* **B60R** *21/26*
U.S. Cl. 422—165 **10 Claims**

1. A gas generator for a vehicle safety system, comprising a thick-walled tubular outer jacket defining a bore having an open end and at least a first stepped abutment surface, an annular ignition carrier secured against axial displacement in said outer jacket bore, said carrier having an edge lip engaged with said at least a first stepped abutment surface for fixing said carrier against axial movement in one direction of said outer jacket, said outer jacket having an edge union extending radially inwardly at said open end for retaining said carrier in said outer jacket against axial movement in an opposite direction, a

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primer connected to said carrier in said outer jacket bore and extending into a thin-walled propellant vessel which is also fastened to said ignition carrier and having an opening closed by said ignition carrier, said vessel containing propellant charge and having a vessel edge forming a collar engaged with said carrier adjacent said at least a first abutment surface of said outer jacket, said edge lip of said ignition carrier being engaged over said collar of said propellant vessel and being held in contact with said at least a first abutment surface of said outer jacket by said edge union, said ignition carrier including an annular groove for receiving said collar of said propellant vessel, said edge lip of said carrier forming a radially outer side wall of said annular groove.

10. A method of manufacturing a gas generator used particularly for a vehicle safety system which comprises an outer jacket defining a bore and having an open end and including an

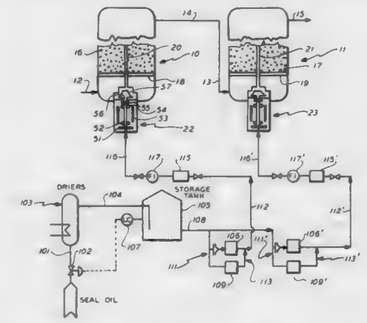


abutment surface in said bore, comprising filling a thin walled propellant vessel with a propellant charge, the vessel having an open end with an outwardly extending collar edge, connecting a pedestal primer to an ignition carrier which has an axially extending edge lip, engaging the collar edge of the propellant vessel in an annular groove disposed radially inwardly of the edge lip of the ignition carrier with the primer extending into the propellant vessel, deforming the edge lip radially inwardly and around the collar edge, inserting the combined ignition carrier with primer and propellant vessel into the bore of the outer jacket through the open end of the bore until the deformed edge lip of the ignition carrier engages against the abutment surface of the outer jacket bore, and deforming the outer jacket around the open end of the bore radially inwardly to press and hold the ignition carrier edge lip against the abutment surface.

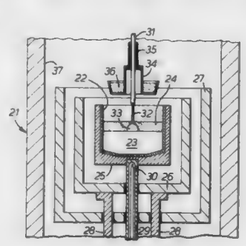
4,734,266
PUMP SEAL OIL SYSTEM
Roger P. Van Driesen, Titusville, and Bhaven Chakravarti, Bloomfield, both of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.
Filed Dec. 20, 1985, Ser. No. 811,489
Int. Cl.[4] F04D *29/08*
U.S. Cl. 422—225 **12 Claims**

1. In a process for circulating a fluid in a reactor by a reactor pump having an impeller which is in contact with the reactor fluid, wherein the reactor pump includes a seal oil for sealing the interior of the pump from the reactor, wherein the improvement comprises:

introducing a seal oil into the reactor pump and circulating the seal oil through the interior of the reactor pump, said seal oil in the interior of the reactor pump being at a pressure greater than the pressure in the reactor; reducing the pressure of a portion of the seal oil for flow from the interior of the reactor pump for admixture with reactor fluid; and controlling the rate of flow of seal oil introduced into the reactor pump to maintain a pre-determined rate of flow, without changing the rate of flow in response to changes in the difference in pressure between the pressure of the seal oil in the interior of the reactor pump and the pressure in the reactor.



4,734,267
APPARATUS FOR GROWING COMPOUND SEMICONDUCTOR SINGLE CRYSTALS
Masakatu Kojima, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jul. 6, 1983, Ser. No. 511,279
Claims priority, application Japan, Jul. 15, 1982, 57-122118
Int. Cl.[4] B01D *9/00;* **C30B** *15/22*
U.S. Cl. 422—249 **5 Claims**



1. An apparatus for growing compound semiconductor single crystals comprising:

a crucible for containing compound semiconductor melt and inert material which does not react to the compound semiconductor melt and which is of a sufficient quantity to cover the surface of the compound semiconductor melt in order to prevent the latter from decomposition and vaporization;

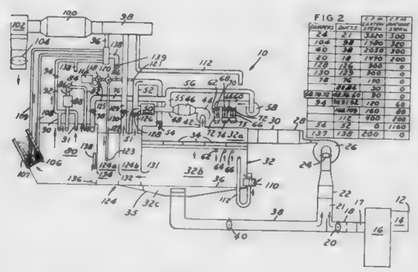
means for heating the crucible;

means for pulling single crystals from the compound semiconductor melt, said pulling means designed to have a seed crystal attached thereto to initiate crystal growth;

means mounted for movement independent of movement of said means for pulling single crystals for collecting a portion of melted inert material through movement into contact therewith to permit the single crystal growth yet not uncover the surface of the compound semiconductor melt; and

a high-pressure housing in which the apparatus structural elements are contained and which is designed to be filled with inert gas under high pressure.

4,734,268
CLEAN AIR SYSTEM
Robert M. Redding, Brighton; Sava Stefanovic, Southfield, and Badruddin K. Rangwala, Farmington Hills, all of Mich., assignors to Elotrade AG, Switzerland
Filed Apr. 14, 1986, Ser. No. 851,174
Int. Cl.[4] A61L *2/18, 2/20, 2/24;* **B65B** *55/18*
U.S. Cl. 422—292 **8 Claims**



1. A clean air system comprising:

a turret chamber,

a carton sterilizing chamber, and

a filling chamber, each of said chambers having machine components;

sterilant generator means for generating a sterilant in particulate form,

a source of air under pressure,

a plurality of air ducts communicating with each other, said source of air under pressure, and each of said chambers,

means for selectively alternately supplying sterilant in a particulate form to selected ones of said air ducts and to said carton sterilizing chamber,

heater means in one of said air ducts for heating said air to mix with said particulate sterilant to provide sterilant in a vapor form,

a plurality of dampers mounted in selected ones of said ducts, and

means for simultaneously resetting said dampers for varying air flows in respective ones of said ducts for mixing said sterilant with air for sterilizing the machine components in all of said chambers in said vapor form.

4,734,269
VENOUS RESERVOIR BAG WITH INTEGRAL HIGH-EFFICIENCY BUBBLE REMOVAL SYSTEM
Rolf W. Clarke, Balboa Island; David P. Balding, Mission Viejo, and Lucas S. Gordon, Laguna Beach, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Jun. 11, 1985, Ser. No. 743,693
Int. Cl.[4] A61M *1/00, 1/14, 1/34;* **B01D** *19/00*
U.S. Cl. 422—310 **24 Claims**

1. A liquid-gas bubble separator comprising:

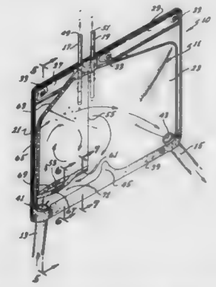
a container having an inlet, an outlet, and a flow channel extending between the inlet and the outlet;

a filter element extending from one side of the flow channel only part way across the flow channel to define a bypass passage in the flow channel which bypasses the filter element, said filter element permitting the passage of liquid and inhibiting the passage of gas bubbles;

said filter element dividing said flow channel into an upstream portion and a downstream portion, said upstream portion being located between said inlet and said filter element and said downstream portion being located between said filter element and said outlet;

said filter element being positioned and arranged in said container so as to define a flow passage around said filter element leading from the upstream portion to the downstream portion, said bypass passage being open to fluid flow in both directions;

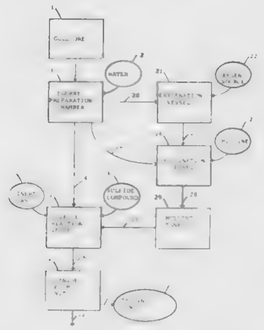
said filter element being constructed and arranged so as to provide a slight negative pressure in said bypass passage and a vortex-like flow within said filter element when liquid flows therethrough so as to recirculate some of a



liquid which has passed through said filter element back to said upstream portion of said flow channel when the filter element is substantially clean to essentially close the bypass passage to flow therethrough directly from said upstream portion to said downstream portion; and

a first vent leading from the upstream portion to the exterior of the container.

4,734,270
SULFIDE TREATMENT TO INHIBIT MERCURY ADSORPTION ONTO ACTIVATED CARBON IN CARBON-IN-PULP GOLD RECOVERY CIRCUITS
Freddie J. Touro, 61 Park Timbers Dr., New Orleans, La. 70114, and Delbert A. Lipps, 948 Cahoula St., Mandeville, La. 70448
Filed Apr. 11, 1986, Ser. No. 850,677
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] C01G *7/00*
U.S. Cl. 423—29 **22 Claims**



1. A process for treating a mercury-contaminated, precious metal-containing ore slurry comprising:

(a) reacting sulfide anions in an aqueous ore slurry of a mercury and precious metal-containing carbonaceous ore, said sulfide anions being added in an amount equal to at least about 30 times the stoichiometric amount required to react with said mercury contained in said ore slurry and being provided by a sulfide compound that is a member

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selected from the group consisting of sodium sulfide, sodium hydrosulfide, and hydrogen sulfide; and

(b) conducting a simultaneous cyanide leach and carbon-in-pulp adsorption of said precious metal from said carbonaceous ore in said sulfide-containing ore slurry.

4,734,271

PROCESS FOR THE PRODUCTION OF HIGH-GRADE TITANIUM DIOXIDE BY SULFATE METHOD

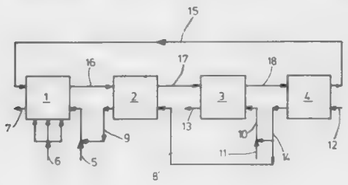
Gabriël Deneckер; Werner Verboeven, both of Kalmthout; Joël Leuridan, Antwerpen, and Domien Sluyts, Stabroek, all of Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 25, 1986, Ser. No. 878,277

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524053

Int. Cl.⁴ C22B *34/12*

U.S. Cl. 423—82 **12 Claims**



1. In the improved process for the production of high-grade titanium dioxide by the sulfuric acid digestion method wherein:

(a) ilmenite, or titanium-containing slag is reacted with concentrated sulfuric acid,

(b) the reaction product from (a) is dissolved in water or aqueous sulfuric acid,

(c) the insoluble raw-material fraction is separated from the solution from (b) to recover a sulfuric-acid-containing titanylsulfate black solution rich in foreign metal salts, and

(d) titanyl sulfate is hydrolyzed with subsequent separation of precipated titanium oxide hydrate followed by washing with water and drying the improvement comprises extracting titanyl sulfate from the black solution before the step (d) with an organic medium containing an organophosphorus compound of the formula

$$R_m(R^1O)_n P{=}O$$

wherein

R represents linear or branched alkyl groups

R_1 represents alkyl groups as in R or aryl groups or alkyl substituted aryl groups

m is an integer, 1, 2 or 3 and

n is an integer, 1 or 2 or is zero

with the proviso that the sum of m and n is 3 and the organophosphorus compound contains a total of at least 12 carbon atoms

and contacting the organic medium before or during the extraction with a sulphuric acid solution or a metal salt containing sulphuric acid solution to produce a titanyl sulfate-rich organic phase and a foreign metals-rich aqueous phase, separating the organic phase from the aqueous phase and re-extracting titanyl sulfate from the organic phase with water or a dilute aqueous sulfuric acid or titanyl sulfate containing solution.

4,734,272

PHOSPHO-GYPSUM RECOVERY PROCESS

Eddie K. Wilson, Sr., 8294 Dogwood Rd., Germantown, Tenn. 38138, and Silvio J. Spigolon, 1800 Randolph Pl., No. 4, Memphis, Tenn. 38119

Continuation-in-part of Ser. No. 634,965, Jul. 27, 1984, Pat. No. 4,608,238, and Ser. No. 551,051, Nov. 11, 1983, abandoned. This application Aug. 25, 1986, Ser. No. 899,987

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.⁴ C01F *1/00, 5/10, 25/16*

U.S. Cl. 423—178 **12 Claims**

1. In a process for treating phospho-gypsum waste product which is produced in the manufacture of phosphoric acid by the wet-acid process in which suitable phosphate rock is treated with sulfuric acid to product phosphoric acid and in which a mixture of phospho-gypsum waste product and carbonaceous material is heated to produce gaseous SO_2, P_2O_5 containing materials and HF containing materials, the improvement which comprises drying a mixture of phospho-gypsum waste product and carbonaceous material, removing a first gaseous stream containing water, acids and fluorine, separating the fluorine from said first gaseous stream by reacting with lime or limestone to produce fluorspar, recovering the fluorspar, calcining the dried phospho-gypsum under reducing conditions to produce a second gaseous stream containing SO_2, CO_2, O_2 and N_2 with substantially no fluorine values, and utilizing the said second gaseous stream in a sulfuric acid manufacturing plant.

4,734,273

PROCESS FOR THE SELECTIVE REMOVAL OF TRACE AMOUNTS OF OXYGEN FROM GASES

Weston W. Haskell, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1986, Ser. No. 946,734

Int. Cl.⁴ C01B *13/00*

U.S. Cl. 423—219 **10 Claims**

10. A process for treating ethylene gas contaminated with up to about 10 parts per million by weight of oxygen to reduce the level of contamination which comprises:

(a) contacting at a temperature from about 10° to about 40° C. and a weight hourly space velocity from about 0.5 to about 3, a gas containing up to about 10 parts per million by weight of oxygen with a bed consisting essentially of coal-derived activated carbon having a surface area in the range from about 1000 to about 1800 square meters per gram, an ash content in the range from about 6.5 to about 15 percent by weight, and a moisture content in the range from about 13 to about 28 percent by weight, at a weight hourly space velocity in the range from about 0.5 to about 3.0 in order to reduce the level of contamination to 0.2 parts per million by weight or less;

(b) separating said ethylene from said activated carbon;

(c) contacting the separated ethylene with a molecular sieve drying bed to reduce the moisture content of the separated gas, and

(d)intermittently disrupting said contact of steps (a) and (c) for simultaneous regeneration of the activated carbon bed and molecular sieve drying bed by heat and/or pressure change, and

(e) passing at least a portion of the desorbed moisture from said drying bed during regeneration through said carbon bed so that the moisture content of said carbon bed is from about 10 to about 30 percent by weight on carbon upon resumption of contacting of said carbon bed with the contaminated gas.

4,734,274

STABILIZATION OF AQUEOUS ALKALI METAL ALUMINATE SOLUTIONS

Stephen J. Allenson, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Nov. 6, 1986, Ser. No. 927,563

Int. Cl.⁴ C01F *7/04*

U.S. Cl. 423—265 **14 Claims**

1. A method of stabilizing an aqueous solution of alkali metal aluminate comprising:

admixing an aqueous solution of alkali metal aluminate having a pH of at least 10 with a sufficient amount of vinyl polymer having pendant carboxylate groups to form a solution containing from 0.1 to 2.0 weight percent of an anionic vinyl polymer based on alkali metal aluminate solids, wherein said anionic vinyl polymer has an average molecular weight of at least 500,000.

4,734,275

ANTI-CURARE AGENTS

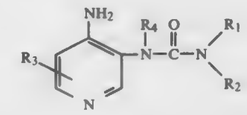
Iraj Lalezari, Scarsdale, and Francis F. Foldes, Briarcliff Manor, both of N.Y., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 524,843, Aug. 19, 1983, abandoned. This application Apr. 22, 1986, Ser. No. 855,053

Int. Cl.⁴ A61K *31/44*

U.S. Cl. 424—10 **28 Claims**

1. A method for antagonizing neuromuscular blocking effects induced by therapeutic agents and physiological disorders in mammals, which comprises administering to said mammal an antagonizing-effective amount of a compound of the formula:



wherein

R_2 and R_2 are each hydrogen, lower alkyl, lower alkenyl, lower alkynyl, aryl, aralkyl, cycloalkyl, cycloalkyl-lower alkyl or hydroxyalkyl, with the proviso that both are not hydrogen;

R_3 is hydrogen or lower alkyl; and

R_4 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, halogen or acyl; wherein the alkyl groups in alkyl per se, aralkyl, cycloalkyl-lower alkyl and hydroxyalkyl contain from 1 to 6 carbon atoms; the cycloalkyl groups in cycloalkyl per se and cycloalkyl-lower alkyl contain from 4 to 8 carbon atoms; the alkenyl and alkynyl groups contain from 2 to 6 carbon atoms; the acyl group contains from 1 to 6 carbon atoms; and the aryl groups in aryl per se and aralkyl contain from 6 to 10 carbon atoms; or a salt thereof with acid.

4,734,276

L-LYSINE PYRUVATE AND L- HISTIDINE PYRUVATE AND THEIR USE IN THERAPY OF TISSUE AND MUCOSA DAMAGE

Walter J. Ziegler, Bettingen/Basel, Switzerland, assignor to Institut Dr. Ziegler, Basel, Switzerland

Filed Oct. 18, 1985, Ser. No. 789,226

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438455

Int. Cl.⁴ C07D *233/54, 233/64, 265/00;* **C07C** *101/00*

U.S. Cl. 424—10 **8 Claims**

1. A pyruvic acid selected from the group consisting of L-lysine pyruvate and L-histidine pyruvate.

8. A method for prophylaxis and therapy of tissue damage caused by active substances contained in medicaments, food or other ingested materials which cause tissue and mucosa damage which comprises administering a pharmaceutically effective amount of at least one of L-lysine pyruvate and L-histidine pyruvate to a patient requiring such treatment.

4,734,277

BIS-QUATERNARY AMMONIUM COMPOUNDS

Robert B. Login, Oakland, N.J., assignor to Jordan Chemical Company, Folcroft, Pa.

Continuation-in-part of Ser. No. 677,738, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 519,129, Aug. 1, 1983, abandoned. This application Aug. 22, 1986, Ser. No. 909,430

Int. Cl.⁴ A61K *7/06, 7/48*

U.S. Cl. 424—70 **4 Claims**

1. In a hair conditioner composition wherein the amounts of fatty alcohol, hydroxyethyl cellulose, preservative and water constitute more than 50% of said composition, the improvement wherein the composition contains an amount of 2-hydroxypropylene-bis-1,3-(dimethyl stearyl ammonium chloride) effective to give softer and better control of the hair compared to the use of stearalkonium chloride in the conditioner.

4,734,278

PERFUMED POLYMERIC RESIN ESSENTIALLY CONSISTING OF A POLYETHER-ESTERAMIDE

Marc F. Pougalan, Noisiel, France, and Günter Holzner, Grand-Lancy, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

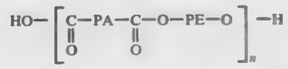
Filed Mar. 27, 1986, Ser. No. 845,103

Claims priority, application Switzerland, Apr. 4, 1985, 1483/85

Int. Cl.⁴ H61K *39/00;* **A01N** *25/00, 25/26*

U.S. Cl. 424—76.3 **6 Claims**

1. A shaped volatiles emitting body consisting essentially of a thermoplastic polyamidic resin of polyether-ester-amide type of formula



wherein PA represents the polyamide moiety and PE represents the polyether moiety, index n stands for an integer designating the multiple of the recurrent pattern, containing about 1to 60% by weight, based on the total weight of the polyamidic resin, of a volatile substance selected from a perfume, an odorizer, a deodorizer, an insecticide, an insect- or an animal-repellent or attractant.

4,734,279

COMBINATION OF IMMUNOGLOBULINS WITH THERAPEUTIC AGENTS

Wolfgang Stephan, Dreieich; Herbert Dichtelmuller, Sulzbach; Alexander Thrun, and Hans Schleussner, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,672

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426903

Int. Cl.⁴ A61K *39/395, 45/02*

U.S. Cl. 424—85 **20 Claims**

1. A pharmaceutical composition comprising a therapeutically effective amount of

(a) a therapeutic agent, wherein the agent is an antibacterial agent, tuftsin, antitrypsin, antithrombin, interferon, fibronectin, or lysozyme, and

(b) an immunoenhancing amount of a mixture of immunoglobulins IgG, IgM, and IgA.

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4,734,280
TREATMENT OR PREVENTION OF PAF ACETHER-INDUCED MALADIES
Pierre Braquet, Garches, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France
Filed Jan. 23, 1985, Ser. No. 693,716
Claims priority, application United Kingdom, Jul. 19, 1984, 8418424
Int. Cl.[4] A61K *35/78, 31/34*
U.S. Cl. 424—195.1 12 Claims

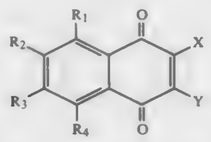
1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a ginkgolide or a pharmaceutically acceptable derivative thereof, the ginkgolide being present in an amount effective to treat a PAF Acether-induced malady.

4,734,281
METHOD FOR CONCURRENTLY EMITTING VAPORS OF SEX PHEROMONES OF DIFFERENT INSECTS
Akira Yamamoto, Niigata; Kinya Ogawa, Kanagawa, and Shigehiro Nagura, Niigata, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 9,458
Claims priority, application Japan, Feb. 5, 1986, 61-23602
Int. Cl.[4] A01N *25/34*
U.S. Cl. 424—408 3 Claims

1. A method for simultaneously controlling the rates of concurrent vapor release of a first sex pheromone compound of insects which is an aliphatically unsaturated alcohol having 10 to 12 carbon atoms in a molecule and a second sex pheromone compound of insects which is an aliphatically unsaturated acetate or aldehyde having 14 to 20 carbon atoms in a molecule, which comprises:
(a) mixing the first and the second sex pheromone compounds of insects into a liquid mixture; and
(b) enclosing the liquid mixture in a container having a wall made of a polyethylene or a copolymer of ethylene composed of at least 90% by weight of an ethylene moiety so that the first and the second sex pheromone compounds concurrently permeate the wall as a barrier and are released to the atmosphere in the form of vapor.

4,734,282
RODENTICIDAL COMPOSITIONS CONTAINING 1,4-NAPHTHOQUINONE DERIVATIVES
Thorir D. Bjornsson, and David M. Cocchetto, both of Durham, N.C., assignors to Duke University, Durham, N.C.
Filed Apr. 23, 1986, Ser. No. 854,912
Int. Cl.[4] A01N *25/08, 31/06, 31/08*
U.S. Cl. 424—410 18 Claims

1. A food composition for poisoning a rodent, which comprises a rodent foodstuff and as an active rodenticidal agent, an acute-poison or chronic-poison amount of a compound having the formula:



wherein X is Cl, Br, F, or I; Y is H, Cl, Br, F or I; and R_1–R_4 are each independently H, Cl, Br. F, I, C_1–C_6 alkyl, C_1–C_6 alkoxy, or C_1–C_6 alkoxyalkyl.

4,734,283
METHOD OF MAKING A FOOD COMPOSITION CONTAINING INOSOTOLTRIPHOSPHATE AND THE COMPOSITION
Matti Sirén, Casa Camboni, Via al Crespo, CH-6596 Gordola, Switzerland
Filed Oct. 18, 1985, Ser. No. 788,823
Claims priority, application Sweden, Oct. 23, 1984, 8405295
Int. Cl.[4] A61K *9/68, 31/66*
U.S. Cl. 424—439 36 Claims

23. A non bakery based food composition having a content of IP_3 of at least 5 mg per 100 g of the composition.

4,734,284
ETOPOSIDE PREPARATIONS
Takashi Terada, Yono; Hideyuki Ishimado, Urawa; Masaru Suzuki, Tokyo; Minoru Nakada, and Gen'iti Idzu, both of Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,362
Claims priority, application Japan, Feb. 19, 1985, 60-31203
Int. Cl.[4] A61K *9/48*
U.S. Cl. 424—455 12 Claims

1. An etoposide preparation comprising a vial or capsule and, enclosed therein, an etoposide solution composition containing etoposide and a water-soluble cellulose ether derivative or polyvinylpyrrolidone.

4,734,285
SUSTAINED RELEASE COMPOSITIONS
Daniel A. Alderman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Oct. 28, 1985, Ser. No. 791,675
Int. Cl.[4] A61K *9/22, 47/00*
U.S. Cl. 424—468 8 Claims

1. A process for providing sustained release solid tablets of a therapeutically active composition, the process comprising
(a) comminuting a substantially water-soluble hydroxypropyl methylcellulose ether, having a hydroxypropoxyl substitution of from about 7 to about 12 weight percent, a methoxyl substitution of from about 28 to about 30 weight percent, and a number average molecular weight of at least 50,000, to a relatively fine particle sized cellulose ether composition, having a 2% aqueous solution viscosity of at least 800 cps and wherein at least 90% by weight of the cellulose ether particles can pass through a 100 mesh screen; and
(b) intimately mixing an amount of the active composition in the form of a powder with a functionally effective amount of the fine particle sized cellulose ether composition; and
(c) subjecting the mixture of active composition and fine particle sized cellulose ether composition to compression conditions to form a solid tablet.

4,734,286
CROSSLINKED POLY β-ALANINE AND COMPOSITIONS CONTAINING THE SAME
Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, both of France, assignors to L'Oreal, Paris, France
Continuation of Ser. No. 513,284, Jul. 13, 1983, abandoned. This application May 16, 1986, Ser. No. 863,845
Claims priority, application Luxembourg, Jul. 13, 1982, 84268
Int. Cl.[4] A61K *9/16;* C08F *8/28, 20/56*
U.S. Cl. 424—489 4 Claims

1. A cosmetic or pharmaceutical composition comprising a water-insoluble crosslinked poly β-alanine in the form of spheres having a diameter ranging from 2 to 500 microns and being prepared by crosslinking poly β-alanine having the formula



wherein R represents hydrogen or a branching of the formula,

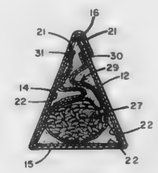


the percentage of terminal primary amide units (b) being between 5 and 35 percent relative to the total amide units of the polymer, said crosslinking being carried out with a crosslinking agent selected from the group consisting of glutaraldehyde and formaldehyde in an aqueous solution of said poly β-alanine at an acid pH.

4,734,287
PROTEIN PRODUCT BASE
Norman S. Singer; Shoji Yamamoto, and Joseph Latella, all of London, Canada, assignors to John LaBatt Limited, London, Canada
Filed May 4, 1984, Ser. No. 606,959
Int. Cl.[4] A23J *1/20;* A23D *5/00*
U.S. Cl. 426—41 54 Claims

1. Proteinaceous, water-dispersible, macrocolloid particles comprising substantially non-aggregated particles of denatured dairy whey protein having in a dry state mean diameter particle size distribution ranging from about 0.1 microns to about 2.0 microns, with less than about 2 percent of the total number of particles exceeding 3.0 microns in diameter, and wherein the majority of the said particles are substantially spheroidal as viewed at about 800 power magnification under a standard light microscope; the particles in a hydrated state forming a macrocolloid having a substantially smooth, emulsion-like organoleptic character.

4,734,288
PACKAGE FOR EXPANDABLE FOOD PRODUCT
Rolf G. Engstrom, and Douglas M. Fincham, both of Edina, Minn., assignors to E. A. Sween Company, Eden Prairie, Minn.
Continuation of Ser. No. 676,073, Nov. 29, 1984, abandoned. This application Apr. 10, 1987, Ser. No. 38,455
Int. Cl.[4] B65B *25/22, 29/08;* B65D *75/38, 81/34*
U.S. Cl. 426—107 17 Claims



1. A microwave popcorn package capable of accommodating the expansion of popcorn during exposure to microwave energy, said package comprising:
an outer container having an inner surface defined by a base and a plurality of sidewalls extending upwardly from said base to define an operable top;
an expandable food pouch disposed within said container in contact therewith but free of any connection to said container, said food pouch containing unpopped popcorn; and
a coating on at least a portion of said inner surface of said container, said coating comprising a material which is solid at room temperature and which becomes tacky when said container with said coating thereon and said expandable food pouch with popcorn therein is exposed to microwave energy at a level sufficient to pop said popcorn, said coating applied to said container relative to said pouch such that said container with said coating thereon is capable of securing said expandable food pouch to said inner surface of said container during and subsequent to exposure to said microwave energy sufficient to prevent said expandable pouch from shifting during said exposure and thereafter.

4,734,289
FOOD MATERIAL FOR PUFFING
Noriaki Yamaguchi, Jyouyou; Kiyoshi Shibuya, Nishinomiya, and Takako Kubo, Nara, all of Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan
Filed Feb. 21, 1986, Ser. No. 831,507
Claims priority, application Japan, Mar. 1, 1985, 60-40676
Int. Cl.[4] A23L *1/18*
U.S. Cl. 426—302 1 Claim

1. A process for preparing a food material for puffing containing 33.02 to 94.55% by weight of pre-gelatinized material selected from the group consisting of cereal grains, flours and starches; 0.2 to 11% by weight of ethyl alcohol and 0.25 to 16% by weight of edible fat, oil or mixtures thereof, the water content of said food material ranging between 5 and 45% by weight, which comprises the steps of:
impregnating said pre-gelatinized material having a predetermined water content with said ethyl alcohol; and
coating the material obtained with said edible fat, oil or mixture thereof, whereby pieces of said product do not adhere to each other upon puffing.

4,734,290
PROCESS FOR PREPARING A COATED-PARTICLE SALT SUBSTITUTE COMPOSITION
David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.
Filed Dec. 12, 1985, Ser. No. 808,306
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—302 6 Claims

1. A process for preparing a salt substitute cmposition which comprises coated particles and not more than a minor amount of agglomerates, each particle comprising:
(a) a core comprising potassium chloride and
(b) a coating on said core, said coating comprising maltodextrin,
and wherein the dextrose equivalent (DE) value of the combined amount of potassium chloride and maltodextrin is not more than 10 (DE) units, the potassium chloride is present in an amount from about 99 to about 60% and the maltodextrin is present in an amount from about 1 to about 40%, the percentage and units being by weight and based on the weight of said combined amount, the process comprising:
(A) providing a bed of substantially dry particles comprising crystalline, potassium chloride, to be coated in said bed;
(B) passing a flow of a gaseous medium upwardly through the bed at a velocity of at least 545 feet per minute fluidizing said bed in an expansion chamber; and
(C) introducing a fine mist spray of an aqueous solution comprising maltodextrin into said fluidized bed at no higher than about 7 inches from the bottom of said expansion chamber, but below the upper level of the fluidized bed, at an atomization pressure of at least 5 bar to form a coating of said solution onto the surface of said particles,

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said gaseous medium effecting evaporation of water from the coated particles, wherein said velocity, said pressure, and said spray location effect a particle flow path or fluidization zone comprising coated particles propelled out of said fluidized bed on a path or zone extending at least two feet above said fluidized bed and returning to said fluidized bed, the particles thereby being returned substantially dry, coated, and containing no more than a minor amount of agglomerates.

4,734,291

PROCESS FOR PREPARING SHELF STABLE AL DENTE COOKED PASTA

Stanley P. Raffensperger, Lewisburg, Pa., assignor to American Home Food Products, Inc., New York, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,624
Int. Cl.[4] A23L *3/00, 1/16*
U.S. Cl. 426—325 2 Claims

1. A process for preparing shelf stable cooked al dente pasta comprising sequentially:

A. spraying steam on freshly extruded pasta having a water content of 25% to 35% percent by weight to partially blanch the pasta which raises the water content to 45% to 55% percent by weight;

B. inserting measured amounts of said partially blanched and hydrated pasta into a container of food grade plastic;

C. adding sufficient aqueous acid solution having a pH of 2.2 to 2.4 to each container to acidulate the partially blanched and hydrated pasta to a pH of 4.6 or less and to raise the water content of the pasta to about 70% by weight;

D. sealing said containers; and

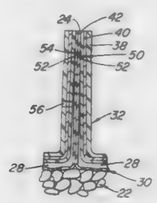
E. sterilizing said sealed container for the equivalent of about 220° F. for about 10 minutes.

4,734,292

METHOD OF FORMING VACUUM PACKAGE WITH SMOOTH APPEARANCE

I. M. Gerardus Van Boxtel, An Breda, Netherlands, assignor to Crescent Holding, N.V., Netherlands Antilles

Continuation of Ser. No. 725,462, Apr. 22, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,623
Claims priority, application European Pat. Off., May 3, 1984, 84302987.7
Int. Cl.[4] B65B *31/02*
U.S. Cl. 426—410 4 Claims



1. A method of forming a container for a packaged foodstuff, said container comprising an inner bag formed of an inner wall material which is at least gas semi-permeable, an outer bag joined to the inner bag and formed of an outer wall material which is substantially impermeable to air and a gas space therebetween, said outer bag having an upper edge and a port spaced downwardly from said upper edge, said port being in communication with said gas space, said inner bag being filled with said foodstuff, said method comprising the steps of:

providing said inner bag in said outer bag, with said inner bag having an open mouth and being filled with said foodstuff; drawing a vacuum in said inner bag; sealing said inner bag to said outer bag and sealing said inner bag closed, both in a location above said port to seal said foodstuff in said inner bag under vacuum; and thereafter introducing a gas which does not adversely effect said foodstuff into said gas space through said port; and thereafter simultaneously sealing said outer bag to said inner bag and sealing said inner bag closed in a location below said port for isolating the gas space from said port and ambient atmosphere so that said gas disposed in said gas space remains in said gas space and is in an amount sufficient to provide a smooth outer surface for said package.

4,734,293

DOUGH MOULDING AND A DOUGH MOULDING MACHINE

Josef K. Pivonka, Hingham, England, assignor to Tweedy of Burnley Limited, Lancashire, England

Division of Ser. No. 765,349, Aug. 13, 1985. This application Sep. 24, 1986, Ser. No. 911,109
Claims priority, application United Kingdom, Aug. 16, 1984, 8420829
Int. Cl.[4] A21D *6/00*
U.S. Cl. 426—502 7 Claims

1. A method of folding an elongate dough piece on a bakery dough moulding machine comprising the steps of: making at least one substantial deep incision in the dough piece with at least one blade to form at least one dough hinge between the two pieces of dough on opposite sides of each incision; conveying the dough piece with said at least one dough hinge to a dough folding station and controlling the dough piece as it travels to the dough folding station between a moving element for conveying the dough piece and a control surface on a stationary control member disposed over the path of movement of said moving element, so that the dough piece is caused to have a simple turning motion about its longitudinal axis, the length of the control surface being such that the angular displacement of the dough piece about its longitudinal axis causes said at least one dough hinge to be presented at the folding station in a desired orientation so that the dough piece can be folded on itself.

4,734,294

PROCESS FOR MAKING SHREDDED CEREALS

Albert Spiel, Yonkers, N.Y., and Aloysius Knipper, Ringwood, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 441,475, Nov. 15, 1982, abandoned. This application May 9, 1986, Ser. No. 861,757
Int. Cl.[4] A23L *1/164*
U.S. Cl. 426—620 21 Claims

1. A process for producing a shredded oat food product comprising:

(a) pressure cooking particles consisting essentially of oats with water in at least two stages to eliminate white streaks or spots in the food prodcut caused by insufficient or overgelatinization of starch, wherein the amount of water added in the first stage is limited to achieve a moisture content in the oat particles of from about 15% to abut 25% by weight, based on the weight of the oat particles at the end of said first stage and the amount of water added in the remaining stages is limited so as to produce a moisture content of from about 40% to about 50% based upon the weight of the oat particles at the end of the final cooking stage, the amount of water added in each stage being limited to avoid substantial extraction of oat gum and water soluble starches to the surfaces of the oat particles, whereby said particles are considerably free-flowing,

(b) cooling and surface drying the cooked particles so that at least substantially all of the cooked particles are discrete, individually free-flowing and non-interconnected particles,

(c) shredding the discrete, individually free-flowing particles, and

(d) forming the shreds into biscuits.

4,734,295

GLARE CONTROL

P. Dong-Guang Liu, P.O. Box 201, Newton Highlands, Mass. 02161

Continuation-in-part of Ser. No. 689,388, Jan. 7, 1985, Pat. No. 4,604,297, which is a continuation-in-part of Ser. No. 636,369, Jul. 31, 1984, Pat. No. 4,582,761. This application Apr. 14, 1986, Ser. No. 851,241
The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.
Int. Cl.[4] C03C *17/32;* C09D *3/76;* B05D *5/06, 7/26*
U.S. Cl. 427—64 18 Claims

1. A method of controlling glare from a reflective-transmissive surface comprising

providing a liquid dispersion comprising organic polymeric particles and a flattening agent,

coating the surface with said liquid dispersion,

allowing the coating to dry leaving the organic particles and flattening agent in a transparent coating at the surface, thereby creating surface irregularities that reduce reflected glare at said surface, while allowing transmission of light through the surface to permit viewing of objects behind the surface, and

then applying an inert fluid coating sufficiently thick to remove at least some, but not all, of the anti-glare effect of the surface irregularities.

4,734,296

ELECTROLESS PLATING OF THROUGH-HOLES USING PRESSURE DIFFERENTIAL

Charles H. Schramm, Fort Lee, N.J., assignor to ETD Technology, Inc., Shoreview, Minn.

Division of Ser. No. 692,880, Jan. 18, 1985, Pat. No. 4,622,917, which is a continuation of Ser. No. 423,821, Sep. 27, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,708
Int. Cl.[4] B05D *5/12, 3/04, 3/10, 1/18*
U.S. Cl. 427—97 34 Claims

1. A process for electrolessly plating flat articles having apertures defined therethrough comprising the steps of:

(a) treating the surface of the article to be plated by immersing said article into a solution containing a stannous salt;

(b) catalyzing said article by immersing it in solution for providing catalytic nucleating centers on the surface thereof;

(c) treating the catalyzed surface of said article by immersing it in an electroless solution including a salt of the metal and a reducing agent;

(d) creating a pressure difference within said electroless solution such that said solution impinges against a first surface of said article and is sucked away from the opposing surface of said article; and whereby said electroless solution flows through said apertures for providing intimate contact and exposure of the walls of said apertures to said electroless solution.

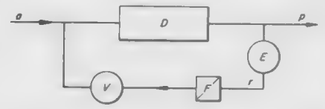
4,734,297

PRODUCTION OF SHAPED ARTICLES OF ULTRA-PURE SILICON

Serge Jacubert, Viroflay; Bernard Boudot, and Philippe Nataf, both of Paris, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Oct. 30, 1985, Ser. No. 792,740
Claims priority, application France, Oct. 30, 1984, 84 16544
Int. Cl.[4] C23C *16/24*
U.S. Cl. 427—248.1 12 Claims

1. A process for the production of shaped articles of ultra-pure silicon comprising the steps of (i) thermally decomposing-/pyrolyzing a monosilane feedstream on a red-heated silicon support member in a decompositon/pyrolysis reaction zone having a gas temperature in said zone which is maintained below about 300° C., wherein high purity silicon is deposited on the support member and a by-product reaction admixture is produced, (ii) recycling the majority of the by-product reaction admixture into said monosilane feedstream, and (iii) cooling the recycled by-product reaction admixture and filtering



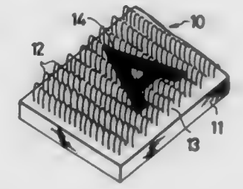
silicon powder from the recycled by-product reaction admixture prior to introducing said by-product reaction admixture into the monosilane feedstream.

4,734,298

METHOD OF PROVIDING MARKS ON SURFACE-TYPE FASTENERS

Norio Kikukawa, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 885,025
Claims priority, application Japan, Jul. 18, 1985, 60-158859
Int. Cl.[4] D06P *5/00;* B41F *17/00;* B41M *1/12;* B05D *5/00*
U.S. Cl. 427—256 13 Claims



1. A method of providing a mark on an obverse side of a surface-type fastener including a multiplicity of interlocking elements on one of opposite surfaces of a foundation fabric, said method comprising the steps of:

(a) imprinting a viscous printing paste on the other surface of the foundation fabric which is free of the interlocking elements, to produce a first printed mark thereon, the first printed mark thus produced having a reversed image of a mark to be ultimately provided;

(b) forcing the imprinted printing paste while being still viscous to penetrate the foundation fabric from the element-free other surface to the one surface on which the interlocking elements are disposed, thereby producing a second printed mark on the element-carrying one surface of the foundation fabric; and

(c) heating the printing paste to cure the same, thereby setting the configuration of the second mark.

4,734,299

SENSITIZING AGENT FOR ELECTROLESS PLATING AND METHOD FOR SENSITIZING SUBSTRATE WITH THE AGENT

Isao Matuzaki, Nagano; Kenzi Tonoki, Yuki; Takehiko Ishibashi, Oyama, and Haruki Yokono, Yuki, all of Japan, assignors to Hitachi Chemical Co. Ltd., Japan

Filed Jul. 1, 1985, Ser. No. 750,779
Claims priority, application Japan, Jun. 29, 1984, 59-136041; Jun. 29, 1984, 59-136042
Int. Cl.[4] C23C *3/02*
U.S. Cl. 427—304 6 Claims

1. A sensitizing agent which does not chemically attack copper oxide for electroless plating which consists of water or alcohol and a solution of at least one metal compound of a metal selected from the group consisting of palladium (II), silver (I), copper (I), copper (III), and nickel (II) dissolved in

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an amide; said agent having a pH in the range of 11 to 13 and the concentration of the metal compound in the agent being from 0.01 to 1.0% by weight.

4,734,300

METHODS FOR REMOVING PARYLENE COATINGS FROM PREDETERMINED, DESIRED AREAS OF A SUBSTRATE

Lydia H. Simanyi, Santa Ana; Robert A. Dunaetz, Manhattan Beach; Steven R. Feistein, Redondo Beach; Rebecca Lee, Los Angeles, and Joan L. Lum, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1986, Ser. No. 840,286

Int. Cl.⁴ B05D *3/10, 3/12*

U.S. Cl. 427—444 **6 Claims**

1. A method for removing at least one predetermined, desired area of a coating from a substrate having said coating thereon, said coating comprising at least one member selected from the group consisting of solvent-insoluble vacuum vapor-phase-deposited, polymerized para-xylylene and solvent-insoluble vacuum vapor-phase-deposited, polymerized, substituted derivatives of para-xylylene, said method comprising contacting said at least one area of the coating to be removed with a substance selected from the group consisting of tetrahydrofuran, dichloromethane, and toluene to loosen the coating on said area sufficiently to permit removal of said area of said coating by physical means.

4,734,301

ARTIFICIAL TREE

Nancy E. McKinney, 6206 Sul Ross, Dallas, Tex. 75214

Filed Mar. 24, 1986, Ser. No. 843,208

Int. Cl.⁴ A47B *37/04;* **A47G** *33/06*

U.S. Cl. 428—8 **13 Claims**



1. A trunkless artificial ornamental tree adapted for seasonal disassembled storage comprising a conic frustrum-shaped cage-like frame having a plurality of vertical frame sections which when joined together form said frame, each said vertical frame sections including a plurality of spaced parallel generally horizontally disposed rib members and a plurality of semi-vertically disposed members; means for joining said vertical frame sections together to form said frustrum shaped frame; a plurality of artificial tree branches each having a main longitudinal stem and a plurality of needles or brush-like members attached to said stem; and means for removably attaching said tree branches at predetermined spaced locations on said cage-like frame thereby to produce the appearance of an ornamental tree.

4,734,302

PROCESS FOR FORMING SIMULATED STONE AND RESULTING PRODUCT

David Baskin, 161 Lake Shore Dr., Duxbury, Mass. 02332

Continuation of Ser. No. 788,798, Oct. 18, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 6,894

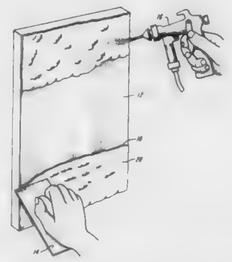
Int. Cl.⁴ B32B *5/16*

U.S. Cl. 428—15 **28 Claims**

1. A method for producing a simulated stone surface comprising,

applying a curable synthetic resin composition to a substrate,

applying a thin coating of fine particulate material to the surface of said composition to saturate the surface of the composition with the fine particulate material such that the surface is non-tacky,



contacting said coated surface in a tamping action with an implement capable of carrying particles to ensure that said coated surface is completely covered with said fine particulate material so as to produce a surface simulating stone, and

allowing the resin composition to cure.

4,734,303

DEEP-DRAW-FORMED VESSEL AND PROCESS FOR PREPARATION THEREOF

Tamio Fujiwara; Kazumi Hirota, both of Tokyo; Hiroshi Matsubayashi, Kamakura, and Tadahiko Katsura, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,741

Claims priority, application Japan, Jul. 19, 1985, 60-158028; Oct. 8, 1985, 60-222743

Int. Cl.⁴ B27N *5/02;* **B21C** *37/00;* **B21B** *45/00*

U.S. Cl. 428—35 **22 Claims**



18. A deep-draw-formed vessel comprising a bottom, a side wall and a flange formed on the top end of the side wall, which is prepared by deep-draw-forming a laminate comprising (a) a steel or iron foil having a thickness of 10 to 120 μm, (b) a plastic film formed on each surface of the steel or iron foil, said film having a thickness of 10 to 150 μm, and (c) an adhesive layer interposed between the steel or iron foil and the plastic film, said adhesive having an adhesive force of at least 600 g/15 mm of width and an elastic modulus of 200 to 9000 kg/cm².

4,734,304

HEAT-SHRINKABLE SHEET

Masahiro Tsubone; Keizo Ono, both of Koga, and Tohimasa Ito, Sowa, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jul. 10, 1987, Ser. No. 71,959

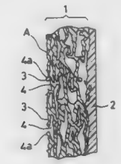
Claims priority, application Japan, Jul. 11, 1986, 60-164499

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—35 **10 Claims**

10. A container comprising a rigid substrate and, tightly contacting at least a portion of the outer surface of said substrate, a heat-shrunk sheet formed from a heat-shrinkable sheet

comprising a foamed thermoplastic resin sheet, the side of which is in contact with said rigid substrate having a convexo-



concave surface formed of open and/or collapsed cells of said foamed thermoplastic resin sheet.

4,734,305

HIGH-PRESSURE RUBBER HOSE

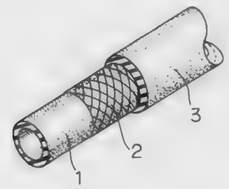
Masatoshi Sugimoto, and Kiyomitsu Terashima, both of Nagoya, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 6, 1986, Ser. No. 836,996

Claims priority, application Japan, Mar. 8, 1985, 60-046747

Int. Cl.⁴ F16L *11/00*

U.S. Cl. 428—36 **3 Claims**



1. A multi-layer high-pressure rubber hose having a reinforcing layer embedded therein, and adapted to be fastened by staking to a sleeved joint, wherein:

(a) at least an outer layer of said hose is formed of the vulcanized product of an ethylene-propylene-diene copolymer rubber (hereinafter "EPDM"),

(b) in said EPDM, the ratio of ethylene-propylene is in the range 49/51 to 56/44,

(c) the Mooney viscosity of polymer (ML_{1+4} 100° C.) of said EPDM is in the range 180–210, and the dynamic resistance to ozone is more than 1000 hours of total time until impartation of tearing, as measured using the ozone test specified by JIS K-6301, using repeated elongation from 0 to 30 percent elongation and back at 60 rpm.

4,734,306

COLD WEATHER GARMENT WITH SKIN FOAM AND METHOD OF MAKING SAME

B. Dean Lassiter, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

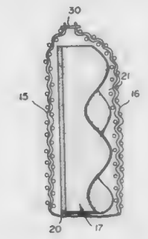
Continuation-in-part of Ser. No. 879,053, Jun. 26, 1986, Pat. No. 4,690,847. This application Mar. 30, 1987, Ser. No. 31,661

Int. Cl.⁴ B32B *3/26, 5/18, 7/08, 31/00*

U.S. Cl. 428—71 **22 Claims**

1. A cold weather garment comprising: an interior lining fabric; an outer fabric; a layer of open cell foam at least about ¼ inch thick between the interior lining fabric and the outer fabric; and the lining, foam layer, and outer fabric connected together by connecting means to form a garment; and wherein:

said foam layer has first and second major faces, said first face being flat, and disposed in abutting relationship with



the outer fabric, and at least said first face having a skin so as to enhance ease of construction and wind resistance.

4,734,307

COMPOSITIONS WITH ADHESION PROMOTOR AND METHOD FOR PRODUCTION OF FLOCKED ARTICLES

Agmund K. Thorsrud, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1984, Ser. No. 682,027

Int. Cl.⁴ B05D *1/14, 1/16;* **B32B** *33/00*

U.S. Cl. 428—90 **24 Claims**

13. An article of manufacture comprising:

(a) a substrate,

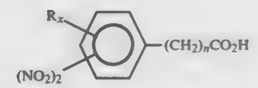
(b) adhesive thereon, and

(c) flock adhered to said adhesive; wherein said adhesive is formed from a polymer selected from one of the groups consisting of

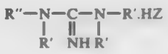
(a) acrylic, vinyl-acrylic, vinyl, urethane and styrene-butadiene latexes,

(b) acrylic homo and copolymers, polyesters, polyamides, polyurethanes, polyester polyols with diisocyanates, isocyanate prepolymer with polyamine, an epoxies with polyamines; and

(c) diisocyanate and a poymeric polyol, epoxy resins and polyamides, epoxy resins and dimercaptans, epoxy resins and polyamines, polyenes and a peroxide, polyethylene-vinyl acetate copolymer, polyethylene-ethyl acrylate copolymer, and plasticized polyvinylchloride; and wherein said adhesive contains at least one adhesive improving additive selected from the group consisting of compounds conforming to the formulae:



wherein R is a C_1 through C_6 alkyl or cycloalkyl radical or hydroxy group, n=0–5, inclusive and x=0–3, inclusive;



wherein each R′ is independently selected from hydrogen and C_1 through C_6 alkyl or cycloalkyl radical, R″ is either hydrogen or $—NR'_2$ wherein R′ is as defined above, and Z is NO_3 or XO_4 wherein X is a halogen; and mixtures of any two or more thereof.

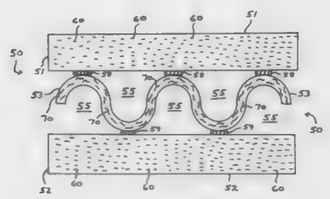
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,308

HIGH STRENGTH PAPERBOARD PANEL

Thomas L. Cline, Hanover, Pa., assignor to Corra-Board Products Co., Inc., Hanover, Pa.

Filed Oct. 27, 1986, Ser. No. 923,478
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—113 1 Claim



1. A paperboard panel construction (50), said paperboard panel structure (50) having an overlayer (51) comprised of chipboard material having relatively shorter fiber lengths (60) contained therein,

said chipboard overlayer (51) being solid and devoid of additional reinforcing fibers or fillers,

said paperboard panel structure having an underlayer (52) comprised of chipboard material having relatively shorter fiber lengths (60) contained therein,

said chipboard underlayer (52) being solid and devoid of additional reinforcing fibers or fillers,

said paperboard panel structure further having an undulating midstratum layer (53) between said overlayer (51) and underlayer (52),

wherein the upper undulation portion of said midstratum layer (53) are secured directly to said overlayer (51) by adhesive means (58),

and wherein the lower undulation portions of said midstratum layer (53) by adhesive means (59),

said paperboard panel structure providing means wherein air cells (55) are formed internally thereof such that a given panel caliper or thickness may be maintained while reducing the number of chipboard layers required for construction,

wherein said chipboard overlayer (51) and said chipboard underlayer (52) each have grain lines (G) formed therein and wherein said undulating midstratum layer (53) forms channels which are arranged at right angles (C) to the grain lines (G) formed in said overlayer (51) and said underlayer (52) to provide means for enchanced bending resistance in the overall paperboard panel construction,

wherein said undulating midstratum layer (53) has relatively longer fiber lengths (70) contained fiber therein as compared to the relatively shorter fiber lengths (60) contained in said overlayer (51) and said underlayer (52),

wherein the average fiber length (60) of said overlayer (51) and said underlayer (52) is two millimeters or less,

wherein the average fiber length (70) of said undulating midstratum layer (53) is five millimeters of more,

wherein said air cells (55) are formed between said overlayer (51) and said underlayer (52) by way of said undulating midstratum layer (53) such that the overall weight of a panel (50) is reduced while improving panel strength via the spring-like effect of said midstratum layer and by the relatively longer fiber lengths (70) contained in said midstratum layer.

4,734,309

FORM OF SOLID DIMETHYLTEREPHTHALATE

Mark S. Katzenberger, Castle Hayne; Robert E. Michel, and Roger G. Rudolph, both of Wilmington, all of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1987, Ser. No. 20,090
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—120 5 Claims



1. A block of dimethylterephthalate having needle-like crystals extending inwardly from all exterior surfaces, a uniform chemical analysis, a maximum thickness of three inches, and being easily cleavable without excessive dusting.

4,734,310

SHEET OF ARTIFICIAL LEATHER MADE OF POLYVINYL CHLORIDE, THE BACK OF WHICH IS COATED WITH A DRY ADHESIVE CAPABLE OF BEING ACTIVATED BY HEAT, AND USE OF THIS SHEET FOR THERMOCOVERING OF RIGID ARTICLES

Robert Briat, Sugny, and Léon Latour, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed May 20, 1986, Ser. No. 865,117
Claims priority, application France, May 28, 1985, 85 08086
Int. Cl.[4] D06N *7/04;* C09J *3/14, 3/16*
U.S. Cl. 428—151 9 Claims

1. A sheet of artificial leather, comprising: a sheet comprised of polyvinyl chloride one side of which is coated with a dry adhesive capable of being activated by heat, the dry adhesive consisting of the product of reaction between a substantially linear hydroxypolyurethane derived from a polyester and a partially blocked aromatic triisocyanate in a proportion such that the dry adhesive has an isocyanate value of at least 100.

8. The process of thermocovering a rigid article comprised of a material selected from the group consisting of ABS resin, polyvinyl chloride, wood, wood mixtures, wood derivatives, and polyolefins with a sheet of polyvinyl chloride one side of which is coated with a dry adhesive capable of being activated by heat, the dry adhesive consisting of the product of reaction between a substantially linear hydroxypolyurethane derived from a polyester and a partially blocked aromatic triisocyanate in a proportion such that the dry adhesive has an isocyanate value of at least 100, the process comprising:

contacting the rigid article with the side of the sheet of artificial leather which is coated with the dry adhesive while heating to a temperature effective to activate the dry adhesive to cause adhesion of the sheet to the rigid article.

4,734,311

ELASTICIZED NON-WOVEN FABRIC AND METHOD OF MAKING THE SAME

Robert C. Sokolowski, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 692,231, Jan. 16, 1985, abandoned. This application Sep. 4, 1985, Ser. No. 772,598
Int. Cl.[4] D06N *7/04*
U.S. Cl. 428—152 18 Claims

1. A fibrous elastomeric non-woven web comprising:

a plurality of textile fibers having a modulus of elasticity of about 18 to 85 grams per denier which are gathered and pleated; and

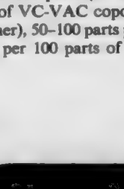
a plurality of heat shrunk elasticized fibers consisting essentially of an elasticized material with at least some of the elasticized fibers being bonded to at least some of the textile fibers.

4,734,312

PROTECTIVE COVERING FOR AUTOMOBILE BODIES

Shinpei Sugiyama, Suzuka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,246
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—157 4 Claims



1. A protective covering for protecting the surface of an automobile body during factory work, comprising a body portion made from a thin flexible material and shaped to conform to the contour of the surface to which it is applied for protection, a lining portion made from a foamed elastic material and adhered to the inside of said body portion, said lining portion forming an inner exposed surface of said protective covering, and an engaging lug formed integrally with part of the edges of said body portion and provided to engage with a convenient end portion of the surface.

4,734,313

COATED PLASTIC SHEET MADE OF PP NON-WOVEN AND ITS MANUFACTURING METHOD

Winston W. Wong, 201, Tung Hwa N. Rd., Taipei, Taiwan

Filed Sep. 16, 1986, Ser. No. 907,874
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—159 8 Claims



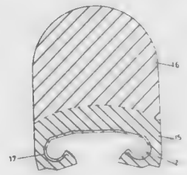
1. A water impermeable and water repellent coated plastic sheet made of a base non-woven, polypropylene (PP) sheet, an intermediate layer of a polyvinylchloride (PVC) film and an uppermost layer of polyvinyl chloride plastisol coating, said (PP) non-woven sheet being made of fiber-grade (PP) resin by melting and spray spinning, said (PVC) intermediate layer being composed of 50–100 parts (PVC) resin, 0–50 parts per 100 parts of resin of of VC-VAC copolymer (vinyl chloride-vinyl acetate copolymer), 50–100 parts per 100 parts of resin of plasticizer, 3–9 parts per 100 parts of resin of stabilizer, 0–1 parts per 100 parts of resin of lubricant, and 0–6 parts per 100 parts of resin of dye; and the PVC plastisol for the coating is composed of 60–100 parts per 100 parts of resin of PVC resin, 0–40 parts per 100 parts of resin of thermoplastic rubber, 0–100 parts of resin of stabilizer, 0–50 parts per 100 of resin of filler and 5–20 parts per 100 parts of resin of dye.

4,734,314

RUBBER LININGS

Cyril H. Inggs, Sandton, South Africa, assignor to Conveyor & Transmission Supply (Proprietary) Limited, Transvaal, South Africa

Filed Nov. 6, 1986, Ser. No. 927,750
Int. Cl.[4] B32B *3/00, 7/02, 25/00*
U.S. Cl. 428—174 4 Claims



1. A lifter bar comprising two integrally molded rubber parts forming an upper part and a lower part, said upper part having a high degree of hardness and said lower part having a degree of hardness lower than said upper part, said lower part being not more than one third of the thickness of said upper part.

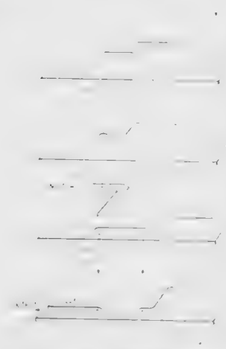
2. The lifter bar claimed in claim 1 in which the lower part has a T-shaped cavity which can fit over a metal bar.

4,734,315

LOW POWER CIRCUITRY COMPONENTS

Harry A. H. Spence-Bate, Morley, Australia, assignor to Joyce Florence Space-Bate, Australia

Filed Jun. 5, 1986, Ser. No. 870,996
Claims priority, application Australia, Jun. 5, 1985, PH0897
Int. Cl.[4] B32B *3/10, 3/00;* H01B *7/34;* H02B *1/00*
U.S. Cl. 428—209 5 Claims



1. A low power circuitry component comprising a plurality of laminae held together contiguously in a stack, each lamina carrying electrical conductors so arranged that no conductors of different said laminae cross and wherein inter-connections between conductors of different said lamine are made in a direction substantially perpendicular to a plane of the laminae and, gas ducting within the stack of laminae whereby a coolant may be caused to flow through the stack.

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4,734,316

ENAMELLINGS WITH HETEROGENEOUS STRUCTURE

Bruno Hees, Langenfeld; Hans Hoffmann, Leichlingen; Matjaz Florjancic, Stuttgart; Horst Richter, Boeblingen; Karin Roess, Stuttgart; Stauros Smernos, Stuttgart, and Otto Thaidigsmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 885,939

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525972

Int. Cl.⁴ B05D *1/00*

U.S. Cl. 428—210 **10 Claims**

1. A substrate with an enamel layer having a heterogeneous structure containing at least two different phases obtained by applying a homogeneous, alkali-containing enamel powder to the substrate followed by heating at 850° to 1,000° C. wherein the enamel powder has the composition consists essentially of

SiO_2	40–50% by weight
Al_2O_3	8–15% by weight
$Na_2O + K_2O$	4–16% by weight
$CaO + BaO$	25–35% by weight
MgO	0–3% by weight
B_2O_3	0–10% by weight.

4,734,317

BIAXIALLY ORIENTED POLYOLEFIN MULTI-LAYER FILM

Lothar Bothe, Mainz-Gonsenheim, and Guenther Crass, Taunusstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,321

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509384

Int. Cl.⁴ B32B *27/08;* **B29C** *45/16;* **B65B** *11/00*

U.S. Cl. 428—215 **17 Claims**

1. A biaxially oriented coextruded multilayer polyolefin film, comprising:

a polypropylene base layer;

a first polyolefin sealing layer positioned on one side of said base layer, and containing from about 0.5% to about 3% by weight of incorporated polydialkylsiloxane, said first sealing layer not being subject to corona treatment;

a second polyolefin sealing layer positioned on the other side of said base layer, said second sealing layer being subjected to corona treatment and being substantially free of polydialkylsiloxane at the time of said corona treatment, and said second polyolefin sealing layer having a coating of polydialkylsiloxane on its outer surface, applied subsequent to said corona treatment;

wherein said polydialkylsiloxane coating is formed by contact of said first and second sealing layers, the relative polydialkylsiloxane occupancy of said second sealing layer being not more than about 15 as determined by means of ESCA spectroscopy, wherein said multilayer polyolefin film is produced by a coextrusion process.

4,734,318

MULTILAYER PACKAGING FILM HAVING SUPERIOR SCRATCH RESISTANCE

Guenther Crass, Taunusstein; Rudolf Mauer, Mainz-Weisenau, and Lothar Bothe, Mainz-Gonsenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,163

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540215

Int. Cl.⁴ B32B *27/08, 27/32*

U.S. Cl. 428—216 **21 Claims**

1. Sealable, transparent, multilayer plastic film comprising:

a base layer comprising a propylene polymer;

on both sides of said base layer an intermediate layer comprising:

a propylene polymer,

an inorganic pigment in an amount from about 0.1 to 1.0% by weight, and

an oxyalkylamine in an amount from about 0.2 to 1.0% by weight, calculated on total weight of said two intermediate layers; and

on both of said intermediate layers, a top layer comprising a sealable thermoplastic material based on propylene polymer.

4,734,319

TRANSPARENT ELECTRICALLY CONDUCTIVE PLASTIC MOLDED ARTICLES

Toshiki Doi; Masanori Moriwaki, and Yukio Yasunori, all of Osaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jan. 20, 1987, Ser. No. 5,275

Claims priority, application Japan, Jan. 24, 1986, 61-14065; Jan. 24, 1986, 61-14066

Int. Cl.⁴ B32B *5/16, 9/00;* **B05D** *7/00*

U.S. Cl. 428—216 **8 Claims**

1. A transparent plastic molded article having excellent electrical conductivity which has, on the surface thereof, a electrically conductive coat layer (a) comprising 60–80% by weight of an electrically conductive powder consisting essentially of tin oxide having a particle diameter of not more than 0.2 μm and 20–40% by weight of a crosslinking-hardenable resin and a layer (b) comprising 0–50% by weight of an electrically conductive powder consisting essentially of said tin oxide having a particle diameter of not more than 0.2 μm and 50–100% by weight of a crosslinking-hardenable resin, said layer (b) being provided on layer (a) and the total thickness of said layers (a) and (b) being not more than 10 μm.

4,734,320

STRETCHABLE CLOTH ADHESIVE TAPE

Osamu Ohira; Katsuo Matsumoto; Hiroshi Doi; Seishi Suzuki, and Eiji Tsukahara, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 30, 1987, Ser. No. 8,724

Claims priority, application Japan, Apr. 24, 1986, 61-96442

Int. Cl.⁴ A61F *13/00, 15/00;* **A61L** *15/00;* **C09U** *7/02*

U.S. Cl. 428—231 **13 Claims**



1. A stretchable cloth adhesive tape comprising a tape support woven from warps and wefts and having stretchability in one or two directions and a pressure-sensitive adhesive layer formed on one surface of the support, the tape support being fixed by the pressure-sensitive adhesive layer partly biting into the surface of the support in a state stretched at least 3% of said support's maximum elongation upon being stretched to a limit.

4,734,321

FIBER REINFORCED PLASTICS STRUCTURES

Bronislaw Radvan, Flackwell Heath, and Anthony J. Willis, Marlow, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

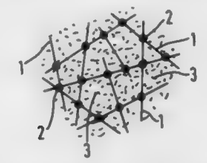
Continuation of Ser. No. 689,000, Jan. 4, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 946,167

Claims priority, application United Kingdom, Jan. 6, 1984, 8400290

Int. Cl.⁴ B32B *5/16*

U.S. Cl. 428—283 **32 Claims**

1. An air permeable sheet-like structure consisting essentially of 20% to 60% by weight of single discrete reinforcing fibres having a modulus of elasticity higher than 10,000 mega pascals, and being between about 7 and about 50 millimeters long, and 40% to 80% by weight of unconsolidated particulate plastics material, selected from the group consisting of a thermoplastic and a thermosetting plastic material, the particulate plastics material having a particle size less than about 1.5 millimeters, and in which the fibrous and plastics components are bonded into an air permeable structure with the particulate plastics material retaining its particulate form in the air permeable structure.



4,734,322

PROCESS FOR THE PREPARATION OF A GLASS BASED CELLULAR MINERAL AND VARIOUS ARTICLES MADE THEREFROM

Claude Favre, Caluire & Cuire, France, assignor to Societe Nationale Elf Aquitaine, France

Filed Feb. 4, 1986, Ser. No. 825,579

Claims priority, application France, Feb. 4, 1985, 85 01507

Int. Cl.⁴ B32B *3/26;* **C03B** *19/08*

U.S. Cl. 428—312.6 **11 Claims**

1. A process for the preparation of a porous expanded glass which comprises the steps of:

(a) providing a mixture comprising of 100 parts by weight of ground glass and 0.2 to 2 parts by weight of calcium carbonate and magnesium carbonate in a $CaCO_3$ to $MgCO_3$ weight ratio ranging from 20:80 to 80:20;

(b) placing said mixture in open refractory vessels, the rims whereof have a minimum height of 15 cm, in such a way that said vessels are filled to a minimum height of 6 to 12 cm;

(c) heating said filled vessels in a furnace until a temperature of approximately 800° C. is reached, said heating being carried out so that after a temperature of 700° C. is attained a maximum heating rate of 150° C. to 170° C. per hour is observed;

(d) maintaining said temperature of approximately 800° C. for at least half an hour; and then

(e) cooling the heated vessels at a maximum rate of 80° C. per hour with the proviso that a maximum cooling rate of 20° C. per hour is observed in the temperature range of from 600° C. to 500° C., to obtain an expanded glass having a thickness exceeding 10 cm and having a density range of from 160 to 700 kg/m^3 and a proportion of open pores of 30 to 90% by volume based on the total volume of pores.

4,734,323

VIBRATION DAMPING SOUNDPROOF SHEETS FOR USE IN VEHICLES

Junichi Sato, Kawana; Tomoyoshi Yamada, Toyohashi; Junichiro Naito, Toyokawa; Kunihisa Shigenobu, Nagoya, and Kouichi Sato, Aichi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 9, 1987, Ser. No. 36,865

Claims priority, application Japan, Apr. 22, 1986, 61-92964; Apr. 22, 1986, 61-92965; Apr. 25, 1986, 61-97186

Int. Cl.⁴ F16F *15/00;* **E04B** *1/82;* **B32B** *3/26, 25/00*

U.S. Cl. 428—317.3 **13 Claims**

1. Vibration damping soundproof sheet for use in vehicles comprising:

(A) a vibration damping layer-forming material comprising a rubber type adhesive blend, in which a tackifier, an inorganic filler, a fiberous filler and a softening agent was blended to a matrix comprising a rubber ingredient and a bituminous ingredient, and

(B) a soundproof layer-forming material comprising a



foamed rubber blend to be bonded to form on said vibration damping layer forming material, in which a foaming agent and other rubber blending agents are blended to a rubber type polymer containing from 15 to 85% by weight of 1,2-polybutadiene ingredient.

4,734,324

HEAT SEALABLE MICROPOROUS POLYPROPYLENE FILMS

David J. Hill, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 27, 1987, Ser. No. 30,801

Int. Cl.⁴ B32B *3/25*

U.S. Cl. 428—317.3 **8 Claims**

1. A gas permeable microporous film comprising a voided polyolefin matrix having, on at least one of its surfaces, a coating of a heat sealable polymer having a melting point at least 10° C. lower than that of the voided polyolefin matrix polymer.

4,734,325

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Nobutaka Yamaguchi; Masatoshi Takahashi; Kazuko Hanai; Hideaki Kosha, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1985, Ser. No. 784,076

Claims priority, application Japan, Oct. 12, 1984, 59-212603

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—323 **6 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer on one surface of the support and a backing layer on the surface of the support opposite to said magnetic layer, the backing layer containing a binder consisting essentially of a resin having a 100% modulus of 150 kg/cm^2 or less which is selected from the group consisting of thermoplastic resins, thermosetting resins and mixtures thereof and non-magnetic particles comprised of (i) carbon black having an average particle size of 0.15 to 0.5 μm, and (ii) particles of abrasive having a Mohs' hardness of 8 or more and an average particle size of 1 μm or less wherein the particles of abrasive are contained in the backing layer in an amount of 0.1 to 4 wt % based on the total weight amount of non-magnetic particles in the backing layer, with the non-magnetic particles in said backing layer being used in an amount of 40 to 300 parts by weight per 100 parts by weight of binder, wherein a polyisocyanate hardening agent is present in an amount of 5 to 40% based on the total weight amount of binder and wherein the dry thickness of the backing layer is from 1.5 to 2.5 μm and wherein the particles of abrasive are contained in the backing layer in an amount of from 0.3 to 8 parts by weight based on 100 parts by weight of the total binder.

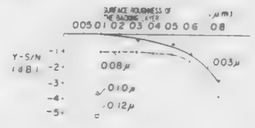
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4,734,326

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Hiroyuki Arioka, and Toshiaki Ide, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,281
Claims priority, application Japan, Jan. 31, 1984, 59-14380
Int. Cl.[4] B32B *5/16*; G11B *5/78*
U.S. Cl. 428—328 3 Claims



1. A magnetic recording medium comprising a non-magnetic substrate, a magnetic recording layer formed on one side of the substrate and a back coating layer formed on the entire length of the other side of the substrate, characterized in that the back coating layer is a coating layer comprising a particulate zinc compound consisting essentially of zinc sulfide having an average particle size of at most 0.2 μm and a resin binder.

4,734,327

COOK-IN SHRINK FILM

Stephen J. Vicik, Darien, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Dec. 29, 1986, Ser. No. 946,722
Int. Cl.[4] B23B *27/08, 27/16*
U.S. Cl. 428—332 20 Claims

1. A three layer plastic film comprising:
(a) a core layer of between about 60 and 90 wt. % hydrolyzed ethylene-vinyl acetate copolymer containing between about 28 and 40 wt. % ethylene and blended with between about 10 and 40 wt. % amide polymer having a melting point below about 420° F., said core layer providing an oxygen transmission rate through the film below about 90 cc/m^2/mil thickness/24 hrs/Atm;
(b) a first outer layer directly adhered to one side of said core layer comprising a blend of ethylene-vinyl acetate containing between about 7 and 15 wt. % vinyl acetate and between about 10 and 25 wt. % linear low density polyethylene being a copolymer of C6 to C8 olefin and ethylene; and
(c) a second outer layer directly adhered to the other side of said core layer and comprising ethylene vinyl acetate containing between about 7 and 15 wt. % vinyl acetate;
(d) said film having been irradiated at a level of between about 1 and 5 MR.

4,734,328

CRYSTALLINE RANDOM PROPYLENE COPOLYMER COMPOSITION AND COMPOSITE LAMINATE COMPRISING SAID COMPOSITION

Masaki Kohyama, Ichihara; Takeshi Muranaka, Iwakuni; Kunisuke Fukui, Hiroshima, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 792,670, Oct. 29, 1985, abandoned.
This application Mar. 23, 1987, Ser. No. 29,365
Claims priority, application Japan, Nov. 2, 1984, 59-230393; Nov. 2, 1984, 59-230394
Int. Cl.[4] C08L *23/08, 23/20*; B32B *27/06, 27/08*
U.S. Cl. 428—336 26 Claims

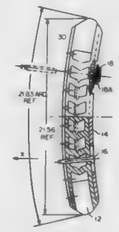
1. A crystalline random propylene copolymer composition comprising (i) a crystalline random propylene copolymer comprising 99 to 85 mole % of propylene and 1 to 15 mole % of an alpha-olefin other than propylene and (ii) a random 1-butene copolymer comprising ethylene and 1-butene, the weight ratio of the copolymer (i) to the copolymer (ii) being in the range of from 5:95 to 90:10, said random 1-butene copolymer (ii) satisfying the following conditions:
(A) it comprises 1 to 50 mole % of the ethylene component and 50 to 99 mole % of the 1-butene component,
(B) it has an intrinsic viscosity [η], measured in decalin at 135° C., of from 0.5 to 6 dl/g,
(C) it has a melting point [Tm], measured by a differential scanning calorimeter, of from 30° to 130° C.,
(D) it has a crystallinity, measured by X-ray diffractometry, of from 1 to 60%,
(E) the amount [W_1 in % by weight] of that portion of it which is soluble in boiling methyl acetate is not more than 2%, and
(F) the amount [W_2 in % by weight] of that portion of it which is soluble in a 1:1 by volume mixture of acetone and n-decane at 10° C. is less than $5\times[\eta]^{-1.2}$.

4,734,329

SHOCK ABSORBING MISSILE LAUNCH PAD

George E. Rudd, Murrysville; Joseph F. Meier, Export; John T. Siemon, Plum Borough; James O. Bowden, Trafford, all of Pa., and David F. Weir, San Ramon, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,905
Int. Cl.[4] B32B *27/00*; D02G *3/00*
U.S. Cl. 428—383 11 Claims



1. A shock absorbing missile launch pad assembly for a MX type missile located within a launch canister, said launch pad assembly comprising:
a resilient pad configured to conform to the external surface of said missile;
a low coefficient of friction laminate bonded to the outer surface of said resilient pad for providing a substantially frictionless sliding surface adjacent the inner surface of said launch canister;
a support plate bonded to the inner surface of said resilient pad, said support plate being positionable against said external surface of said missile, said resilient pad extending over all boarders of said support plate to create bumper areas; and
at least one recess defined within said support plate for receipt of a spring, a spring positioned within said recess, said spring operable to urge said launch pad assembly away from said external surface of said missile upon launch of said missile from said canister.

4,734,330

MAGNETIC RECORDING MEDIUM

Kiyokazu Oiyama; Yoshinobu Ninomiya, both of Miyagi; Hiroshi Yoshioka, and Ichiro Ono, both of Gunma, all of Japan, assignors to Sony Corporation and Shin-Etsu Chemical Co. Ltd., both of Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,285
Claims priority, application Japan, Jul. 2, 1985, 60-145362
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—411.1 8 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and a binder, said binder containing a compound represented by a following formula:

$$(CH_2CH)_i\,(Y)_j\,(CH_2CH)_k$$
$$\quad\;|\qquad\qquad\;|$$
$$\quad Cl\qquad\quad X$$

wherein X represents tertiary amine sulfonate or tertiary amine sulfuric ester, Y represents a monomer having vinyl group which is copolymerizable with vinyl chloride and i, j, k represent polymerization degrees, i being in the range from 100 to 1000 and k being in the range from 0.1 to 100; and x having a polar group equivalent in the range from 1000 to 100,000.

4,734,331

MULTILAYER STRUCTURE HAVING AT LEAST ONE POLYCARBONATE LAYER

Harold F. Giles, Jr., Cheshire, and Robert P. Hirt, Jr., Lenox, both of Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 688,196, Jan. 2, 1985, Pat. No. 4,608,311. This application Apr. 18, 1986, Ser. No. 853,566
The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—412 36 Claims

1. A multilayer structure comprising:
(i) at least one polycarbonate layer;
(ii) at least one olefin vinyl alcohol layer; and
(iii) at least one unmodified polyolefin layer;
said layers being adhered together by means of tie layers disposed therebetween said tie layers being comprised of an olefin vinyl ester copolymer.
2. The structure of claim 1 wherein said unmodified polyolefin is polypropylene.

4,734,332

METHOD FOR EFFECTING ADHESION USING LAMINATES FROM EPOXY RESINS

Madan M. Bagga, Cambridge, and Christopher H. Bull, Trumpington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 847,371, Apr. 2, 1986, Pat. No. 4,659,779. This application Jan. 12, 1987, Ser. No. 2,355
Claims priority, application United Kingdom, Apr. 2, 1985, 8508628
Int. Cl.[4] C09J *5/02*
U.S. Cl. 428—414 20 Claims

1. A method for effecting adhesion between two surfaces which comprises
(i) applying to at least one of said surfaces a composition comprising
(a) an epoxide resin,
(b) an effective amount of a nitrogen-containing latent curing agent for the epoxide resin, and
(c) as cure accelerator dispersed as a powder in a mixture of (a) and (b), an effective amount of a solid solution of a nitrogen base having a boiling point above 130° C. and a phenolic polymer which is an addition polymer of a phenol bearing an unsaturated substitutent,
(ii) placing said surfaces together with the composition positioned therebetween to form an assembly, and
(iii) heating the assembly until the composition solidifies.

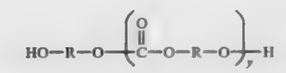
4,734,333

POSTFORMABLE ULTRAVIOLET CURABLE COATINGS

A. Frank Leo, Palatine, and Clive J. Coady, Hanover Park, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 824,561, Jan. 23, 1986, abandoned, and a continuation-in-part of Ser. No. 914,990, Oct. 3, 1986. This application Dec. 8, 1986, Ser. No. 939,091
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—423.1 6 Claims

1. A postformable ultraviolet curable highly adherent coating composition consisting essentially of: (A) from 15% to 30% of a linear acrylate-terminated polyurethane based on a polycarbonate diol, said polycarbonate diol having the formula:



in which R is alkylene having from 2–20 carbon atoms; y is at least 1; and R and y are selected to provide a molecular weight for the polycarbonate diol reactant of from 300 to 3000; (B) from 10% to 20% of acrylic acid; (C) from 30% to 60% of a monoethylenically unsaturated monomer having the rapid ultraviolet cure rate associated with acrylate monomers and having a glass transition temperature above 55° C.; (D) from 8% to 25% of a triacrylate monomer; and (E) photoinitiator rendering the composition curable with ultraviolet light.

4,734,334

MAGNETO-OPTICAL RECORDING MEDIUM

Masaaki Matsushima, Yokohama; Hiroyoshi Kishi; Takahiko Ishiwatari, both of Tokyo, and Hisaaki Kawade, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,817
Claims priority, application Japan, Nov. 5, 1983, 58-207830; Nov. 5, 1983, 58-207831; Nov. 5, 1983, 58-2107833
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—457 3 Claims

1. A magneto-optical recording medium having amorphous magnetic alloy film comprising the following composition and having a readily magnetizable axis in a direction perpendicular to the surface of the film:

$$\{(Gd_xTb_{1-x})_p(Fe_yCo_{1-y})_{1-p}\}_q(Ni_zCr_{1-z})_{1-q}$$

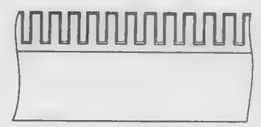
where
$0\leqq x\leqq 0.9$
$0.2\leqq y\leqq 1.0$
$0.2\leqq z\leqq 0.9$
$0.1\leqq p\leqq 0.5$
$0.8\leqq 1-q\leqq 0.95$
wherein said alloy film contains at least one of Gd and Co.

4,734,335

MULTILAYER FILM FORMED OF POLYESTER AND HAVING A CORE LAYER SUITABLE FOR THERMOPLASTIC EMBOSSING

Helmut Monzer, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst AG, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 566,898, Dec. 29, 1983, abandoned.
This application Sep. 18, 1985, Ser. No. 937,106
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248670
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—480 7 Claims



1. An embossable, biaxially stretched and heat-set multilayer film, comprising:

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two external layers comprised of a first polyester composition and, sandwiched between said external layers, a core layer comprised of a second polyester composition having a lower-melting temperature than said first polyester composition, whereby the film can be embossed at higher temperatures and substantially maintains the resulting depth of embossing in a thermal treatment which is necessary for the further processing of the film after embossing with the following provisos:

(i) that said multilayer film possess an asymmetric structure wherein said core layer is thicker than at least one of said external layers;

(ii) that said core layer thickness is from 1 to 100 microns;

(iii) that one of said external layers has a thickness which may range from 0.1 to 10 microns;

(iv) that the other external layer has a thickness which may range from 1 to 100 microns.

4,734,336

TWIN PLY PAPERS FOR INK JET PROCESSES

John F. Oliver, and Arthur Y. Jones, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1986, Ser. No. 914,212

Int. Cl.[4] B32B *21/04, 21/14, 21/06;* **D21F** *11/00*

U.S. Cl. 428—537.5 **12 Claims**

1. A twin ply uncoated paper for ink jet processes comprised of a supporting paper substrate sheet having essentially no filler additives as a first ply, and thereover as a second ply a paper sheet with filler additives attached to the fibers thereof, which filler additives are selected from the group consisting of synthetic silicas, inorganic silicates, sodium alumino-silicates, and inorganic oxides.

4,734,337

HIGHLY-OPEN LONGITUDINALLY-STIFF, EXPANDED METAL PRODUCT

John M. Patton, Ontario, Calif., assignor to Triton Group Ltd., La Jolla, Calif.

Filed Sep. 16, 1986, Ser. No. 908,174

Int. Cl.[4] E04F *13/04*

U.S. Cl. 428—595 **15 Claims**



1. An article of manufacture comprising expanded metal lath useful as a construction material to serve as a substrate and reinforcement for plaster applied thereto, the article being provided as a substantially rectangular lanced and expanded metal sheet of selected length and width dimensions, the article having a width substantially greater than an unexpanded metal sheet from which the article is manufactured, the article having unexpanded edge margins of selected width along each longitudinal edge, the article between the edge margins defining longitudinal rows of similar substantially trapezoidally shaped openings disposed transversely of the article, the article also defining between the edge margins a plurality of rib constructions which are disposed parallel to the edge margins and which extend between the ends of the article and which are spaced at regular intervals across the width of the article between selected rows of openings, each rib construction having along the length thereof a three dimensional stiffening contour which, in cross-section transversely of the length of the article, is of generally "Z" configuration having two spaced substantially parallel but non-coplanar and non-overlapping rib edge portions interconnected by a rib central portion disposed obliquely to the rib edge portions, each rib edge portion being connected to the adjacent rib central portion by a bend portion which subtends an arc of substantially less than a right angle.

4,734,338

ELECTROLUMINESCENT DEVICE

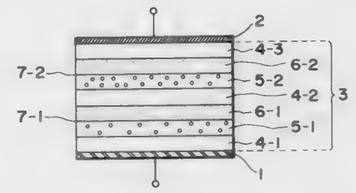
Ken Eguchi, Yokohama; Haruki Kawada, Kawasaki, and Yukuo Nishimura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 760,355, Jul. 29, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 20,172

Claims priority, application Japan, Jul. 31, 1984, 59-158809; Jul. 31, 1984, 59-158810; Jul. 31, 1984, 59-158811; Jul. 31, 1984, 59-158812; Jul. 31, 1984, 59-158813; Jul. 31, 1984, 59-158814; Jul. 31, 1984, 59-158815; Jul. 31, 1984, 59-158817; Jul. 31, 1984, 59-158818; Jul. 31, 1984, 59-158819; Jul. 31, 1984, 59-158820; Jul. 31, 1984, 59-158821; Jul. 31, 1984, 59-158822; Jul. 31, 1984, 59-158823

Int. Cl.[4] H01J *1/62*

U.S. Cl. 428—690 **56 Claims**



1. An electroluminescent device which comprises a luminescent layer and a pair of electrodes, said luminescent layer comprising a first layer comprising a relatively electron-acceptable organic compound and a compound capable of being an electron-donor to said electron-acceptable organic compound, a second layer comprising a relatively electron-donative organic compound and a compound capable of being an electron-acceptor to said electron-donative organic compound, and a third layer having electrical insulating property, said three layers being repeatedly accumulated at least twice, and at least one of the three layers being formed of a Langmuir-Blodgett monomolecular film or a Langmuir-Blodgett monomolecular layer built-up film.

4,734,339

BODY WITH SUPERHARD COATING

Herbert Schachner, Grand-Lancy; Heinz Tippmann, Le Lignon; Benno Lux, Scuol/GR, all of Switzerland; Klas G. Stjernberg, Huddinge, and Anders G. Thelin, Vällingby, both of Sweden, assignors to Santrade Limited, Luzern, Switzerland

Filed Jun. 24, 1985, Ser. No. 747,961

Claims priority, application Sweden, Jun. 27, 1984, 8403429

Int. Cl.[4] B24D *3/02;* **C04B** *31/16*

U.S. Cl. 428—701 **14 Claims**

1. Compound body comprising a core of a material taken from the group consisting of a metal, metal alloy, metal-bonded hard metal compound, ceramic or mixtures thereof, said core being at least partly covered with a layer of one or more CVD-deposited layers of polycrystalline diamond, each said CVD-deposited layer being from 0.1 to 10 μm thick and being bonded to the substrate by a layer of a material selected from the group consisting of a noble metal, a metal which forms a stable carbide and a compound with the formula $Me(C_xN_yO_zB_t)$ where Me is a metal of Group 4b through 6b of the Periodic Table, Al or Si and $0.45<x+y+z+t<2.1$.

4,734,340

DIELECTRIC THIN FILM

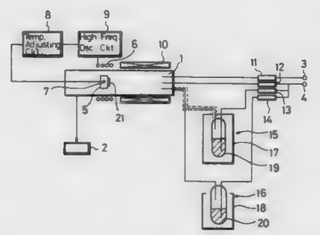
Masaki Saito, and Toshio Mori, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 885,020

Claims priority, application Japan, Jul. 16, 1985, 60-156519

Int. Cl.[4] B32B *19/00, 9/00*

U.S. Cl. 428—698 **6 Claims**



1. A high dielectric constant capacitor comprising a substrate and a thin film formed on said substrate said thin film consisting essentially of a mixture of a tantalum oxide and a titanium oxide in which the ratio of Ti to Ta is in the range from 0.1 to 4 atomic percent, said thin film being produced by chemical vapor deposition and decomposition of a tantalum alkoxide and a titanium alkoxide.

4,734,341

ELECTROCHEMICAL GENERATOR WITH LITHIUM ANODE AND LIQUID CATHODE

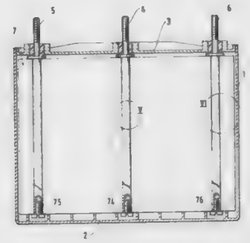
Jean-Pierre Descroix, Fontenay Sous Bois; Jean-Luc Firmin, Poitiers, and Jean-Pierre Planchat, Saint Benoit, all of France, assignors to Saft, S.A., Romainville, France

Filed Mar. 11, 1987, Ser. No. 24,705

Claims priority, application France, Dec. 12, 1986, 86 17426

Int. Cl.[4] H01M *10/50*

U.S. Cl. 429—62 **7 Claims**



1. Electrochemical generator with a lithium anode and a liquid cathode consisting of a stack of flat elements enclosed in a case, each element comprising separators and electrodes fitted with a metal collector plate, each electrode presenting at least two openings whereby it is threaded to respectively at least two parallel metal rods with metal spacers to maintain the desired interval between the plates and to ensure electrical connection between the corresponding electrodes, wherein a first of the said metal rods connected to electrodes of a first polarity totally traverses the said stack, at least one electrolyte reserve compartment being disposed as a function of height of the stack between the latter and the said case, current collector lugs emerging in this compartment, said current collector lugs comprising a neck that constitutes a fuse, the said current collector lugs being threaded onto the second of the said metal rods and belonging to collector plates of electrodes of a second polarity, and one end of each of the said rods being rigidly attached to an end wall of the said case, the other end of each of said rods being allowed free motion within the said case.

4,734,342

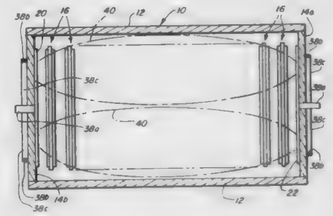
TERMINAL MEANS FOR ELECTROCHEMICAL CELLS

Harvey N. Seiger, Mayfield Heights, Ohio, assignor to Gould, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 823,792, Jan. 29, 1986, abandoned. This application Jan. 29, 1987, Ser. No. 9,033

Int. Cl.[4] H01M *2/30*

U.S. Cl. 429—152 **22 Claims**



1. In an assembly of reactive metal electrochemical cells which includes a plurality of bipolar electrodes connected in series between a pair of spaced conductive end plates, terminal means of higher conductive material than said end plates on each said end plate comprising an array of interconnected termnial segment means disposed outwardly of a center point of the respective end plate in a generally uniform pattern with respect to the area configuration of the end plate to thereby enlarge the terminal area and to provide more uniform current distribution and active metal consumption over the areas of the bipolar electrodes.

4,734,343

COMPOSITES

Claude M. Berthier, Grenoble, France, and Richard H. Friend, Cambridge, England, assignors to British Petroleum Company p.l.c., London, England

Division of Ser. No. 752,047, Sep. 9, 1985, Pat. No. 4,681,822. This application Oct. 2, 1986, Ser. No. 914,360

Claims priority, application United Kingdom, Nov. 9, 1983, 8329906; PCT Int'l Appl., Nov. 8, 1984, PCT/GB84/00382

Int. Cl.[4] H01M *6/16*

U.S. Cl. 429—192 **3 Claims**

1. A method for making an ionic/electronic composite conductor which comprises:

(i) preparing in a common solvent or solvent mixture a solution of an ionic conducting material and an electronic conducting material,

(ii) Intimately mixing the solution,

(iii) casting the solution on a substrate,

(iv) removing the solvent, and

(v) obtaining a continuous coherent film of a continuous electronic conducting material intimately mixed with a continuous ionic conducting material such that the ionic conducting material has an increased melting point over its normal melting point.

4,734,344

BATTERY SEPARATOR

Wai M. Choi, West Newton, Mass., assignor to W. R. Grace & Co., Lexington, Mass.

Filed May 19, 1986, Ser. No. 864,682

Int. Cl.[4] H01M *2/16*

U.S. Cl. 429—206 **20 Claims**

20. An alkaline battery comprising one or more positive electrodes, one or more negative electrodes, an alkaline based

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electrolyte solution and a sheet material for use as a separator or interseparator comprised of from about 30 to about 70 weight percent of the sheet material of synthetic polyolefin pulp, from about 15 to about 65 weight percent of the sheet material of inorganic alkali resistant filler, and from about 1 to about 35 weight percent of the sheet material of a long synthetic fiber, at least some of which is water swellable vinyl alcohol polymer.

4,734,345

SEMICONDUCTOR IC AND METHOD OF MAKING THE SAME

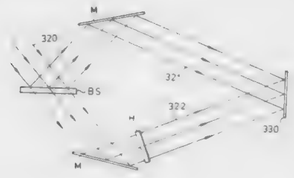
Noboru Nomura, Kyoto, and Koichi Kugimiya, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 539,317, Oct. 5, 1983, abandoned. This application May 28, 1986, Ser. No. 869,844

Claims priority, application Japan, Oct. 7, 1982, 57-177234; Oct. 7, 1982, 57-177250; May 12, 1983, 58-83023; May 27, 1983, 58-94321

Int. Cl.⁴ G03H *1/04*

U.S. Cl. 430—1 **9 Claims**



1. A method for making a semiconductor device comprising the steps of:

coating a photoresist layer on a semiconductor wafer;

producing at least two coherent beams as an exposure beam,

applying said two coherent beams onto said photoresist layer to generate an interference fringe so that a first pattern of said interference fringe having space period of 2T with respect to a minimum line width T is formed, said first pattern being formed by a holographic exposure method;

further applying one of said two coherent beams and another exposure beam onto said photoresist layer for imaging at least one other pattern having a space period of an integer times that of said first pattern whereby said first pattern is deleted in part by said other pattern;

developing said exposed photoresist to obtain a patterned photoresist layer; and

processing said semiconductor wafer by using said patterned photoresist layer, to obtain a pattern of said semiconductor wafer which is used as said gate of semiconductor device.

4,734,346

PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Masafumi Kumano, Sendai; Koichi Haga, Ohgawara, and Yasuyuki Shindoh, Sendai, all of Japan, assignors to Ricoh Co., Ltd. and Ricoh Research Institute of General Electronics Co., Ltd., both of Tokyo, Japan

Filed May 7, 1986, Ser. No. 860,714

Claims priority, application Japan, May 17, 1985, 60-106347

Int. Cl.⁴ G03G *5/082*

U.S. Cl. 430—56 **12 Claims**

1. A photosensitive material for electrophotography that comprises a photosensitive layer on an electrically conductive substrate or on an electrically conductive layer provided on a electrically non-conductive substrate, wherein said photosensitive layer consists essentially of three layers, (1) a charge transfer layer provided on said conductive substrate or on said conductive layer provided on said non-conductive substrate, (2) a first charge carrier generating layer provided on said charge transfer layer and (3) a second charge carrier generating layer provided on said first charge carrier generating layer, said charge transfer layer and second charge carrier generating layer each having a band gap wider than that of said first charge carrier generating layer, said first charge carrier generating layer being photosensitive to radiation having a relatively long wavelength and said second charge carrier generating layer being photosensitive to radiation having a relatively short wavelength.

4,734,347

ELECTROPHOTOGRAPHIC PLATE HAVING A PROTECTIVE LAYER OF A FLUORINE-CONTAINING COPOLYMER

Keiichi Endo; Akira Kageyama; Yasuo Katsuya, and Yasuki Mori, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Japan

Filed Oct. 8, 1986, Ser. No. 916,697

Claims priority, application Japan, Oct. 8, 1985, 60-224367

Int. Cl.⁴ G03G *5/14*

U.S. Cl. 430—66 **8 Claims**

1. An electrophotographic plate comprising an electroconductive layer, an organic photoconductive layer formed on the electroconductive layer, and a protective layer formed on the organic photoconductive layer, said protective layer comprising a fluorine-containing copolymer having as monomer units a fluoroolefin and at least one of an alkyl vinyl ether and a cycloalkyl vinyl ether.

4,734,348

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY CONTAINING POLYVINYL ACETAL

Tetsumi Suzuki, 8-8, Takamori 4-chome, Isehara-shi, Kanagawa; Tetsuo Murayama, 15-20, Tamagawagakuen 8-chome, Machida-shi, Tokyo, and Shinji Aramaki, Populagaoka Co-op. 10-201, 10-1, Naruse 2-chome, Machida-shi, Tokyo, all of Japan

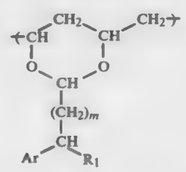
Filed Oct. 17, 1986, Ser. No. 920,728

Claims priority, application Japan, Oct. 23, 1985, 60-236964

Int. Cl.⁴ G03G *5/05*

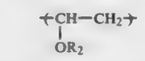
U.S. Cl. 430—96 **10 Claims**

1. A photosensitive member for electrophotography comprising at least a photoconductive layer on a conductive substrate, said photoconductive layer containing an organic photoconductive compound and a binder polymer, and said binder polymer comprising polyvinyl acetal having a repeating unit represented by the following general formula [I]:



[I]

wherein Ar represents an aryl group, R_1 a hydrogen atom, a lower alkyl group or an aryl group, and m an integer of 0 or 1–3, and a repeating unit represented by the following general formula [II]:



[II]

wherein R_2 represents a hydrogen atom or an acyl group, said

repeating unit of the general formula [I] being 40 mole % or more, and the total of said repeating units of the general formulae [I] and [II] being 60 mole % or more.

4,734,349

TONERS AND YELLOW DYE COMPOUNDS USED THEREIN

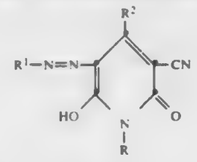
Derek D. Chapman, and Julie P. Harmon, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 22, 1986, Ser. No. 910,032

Int. Cl.⁴ G03G *9/08;* **C09B** *29/36*

U.S. Cl. 430—106 **10 Claims**

1. A powdered toner composition comprising a thermoplastic polymer blended with from about 0.5 to 10 percent by weight of a yellow dye having the formula:



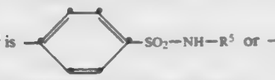
wherein:

R is —HN—R^3 or —Alk—R^4,

R^1 is the radical of a non-ionic diazo component of the benzene or naphthalene series,

R^2 is alkyl of 1 to 10 carbon atoms, phenyl or lower alkyl-substituted phenyl;

R^3 is $-SO_2-Ar$, $-SO_2-R^5$ or $-\overset{O}{\overset{\|}{C}}-R^5$.

R^4 is  $-SO_2-NH-R^5$ or $-NH-SO_2-Ar$;

R^5 is alkyl of 1 to 12 carbon atoms;

Alk is alkylene of 1 to 4 carbon atoms; and

Ar is phenyl or lower alkyl-substituted phenyl.

4,734,350

POSITIVELY CHARGED DEVELOPER COMPOSITIONS WITH MODIFIED CHARGE ENHANCING ADDITIVES CONTAINING AMINO ALCOHOLS

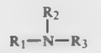
John W-P. Lin; Paul C. Julien, and Lesley P. Dudek, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1986, Ser. No. 947,080

Int. Cl.⁴ G03G *9/10*

U.S. Cl. 430—110 **27 Claims**

1. A positively charged developer composition comprising carrier particles and a toner composition containing resin particles, pigment particles, and modified charge enhancing additives comprising flow aid compositions having chemically bonded thereto, or chemiadsorbed onto the surface thereof, amino alcohol derivatives of the formula



wherein R_1, R_2 and R_3 are substituents independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, phenyl, naphthyl, substituted phenyl, substituted naphthyl, amino, heterocyclic components containing nitrogen, oxygen, or sulfur; unsaturated substituents; and aliphatic cyclic substituents, subject to the provision that at least one of the R_1, R_2 or R_3 substituents comprise a hydroxyl group.

4,734,351

LIQUID DEVELOPER FOR ELECTROSTATIC CHARGE IMAGE

Katsuji Kitatani; Hiroaki Yokoya, and Syu Watarai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

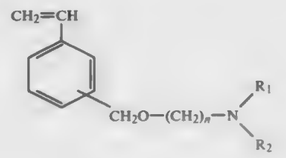
Filed Sep. 30, 1986, Ser. No. 913,277

Claims priority, application Japan, Sep. 30, 1985, 60-217316; Oct. 1, 1985, 60-218600

Int. Cl.⁴ G03G *9/18*

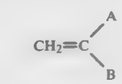
U.S. Cl. 430—114 **12 Claims**

1. A liquid developer for electrostatic charge images comprising a polymer selected from (a) a polymer containing at least one polymerizable monomer represented by the following general formula (1) as a component of the polymer, and (b) a polymer containing at least one polymerizable monomer represented by the following general formula (2) and chloromethylstyrene as copolymer components, the polymer being dispersed in a carrier liquid having an electric resistance of at least 10^9 Ω.cm and a dielectric constant of at most 3,



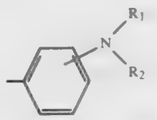
(1)

wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, an aralkyl group or a heterocyclic group, said R_1 and R_2 may form a ring with the nitrogen atom, said ring may contain carbon, oxygen, nitrogen or sulfur as a constituent element, the sum of the carbon atom numbers of R_1 and R_2 is at most 36; and n represents a positive integer of 1 to 6,

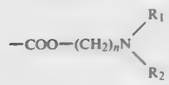


(2)

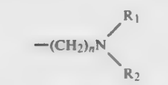
wherein A represents a hydrogen atom or a methyl group and B represents a group shown by the following general formula (3), (4), (5), (6) or (7),



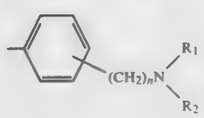
(3)



(4)



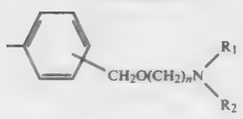
(5)



(6)

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(7)

wherein R_1 and R_2 have the same significance as defined in general formula (1), and said R_1 and R_2 may form a ring with the nitrogen atom shown in each of general formulae (3), (4), (5), (6) and (7), and the ring may contain carbon, oxygen, nitrogen, or sulfur as a constituent element.

4,734,352

POLYHYDROXY CHARGING ADJUVANTS FOR LIQUID ELECTROSTATIC DEVELOPERS

Robert D. Mitchell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1986, Ser. No. 854,610
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—115 **15 Claims**

1. An electrostatic liquid developer having improved charging characteristics consisting essentially of

(A) nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount,

(B) thermoplastic resin particles having an average by area particle size of less than 10 μm,

(C) nonpolar liquid soluble ionic or zwitterionic compound, and

(D) a polyhydroxy compound.

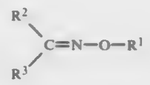
4,734,353

METHODS USING OXIMES FOR PROCESSING A SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Mitsunori Ono; Isamu Itoh, and Keiji Mihayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 637,648, Aug. 3, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 857,505
Claims priority, application Japan, Aug. 8, 1983, 58-145338
Int. Cl.[4] G03C *5/54, 5/26*
U.S. Cl. 430—236 **17 Claims**

1. A method for processing a silver halide photographic light-sensitive material after image-wise exposure to radiation comprising a support having thereon a light-sensitive silver halide emulsion layer having associated therewith a blocked photographic agent capable of releasing a photographically useful agent, which method comprises processing the photographic light-sensitive material in the presence of a non-polymeric oxime represented by the following formula (I) which has 1 to 10 carbon atoms:



(I)

wherein R^1 represents a hydrogen atom; R^2 represents a hydrogen atom, a substituted or unsubstituted methyl group or a substituted or unsubstituted ethyl group; and R^3 represents a phenyl group having at least one ortho-hydroxy group and may be further substituted, a substituted or unsubstituted hydroxylimino group, a substituted or unsubstituted pyridyl group or a substituted or unsubstituted purinyl group or R^2 and R^3 form a ring selected from cyclopentane, cyclohexane, cyclohexadiene, cycloheptane, cycloheptadiene, indane or fluorene, and each of the these rings may be substituted, wherein the compound of general formula (I) is added to a developing solution and wherein the blocked photographic agent releases a mercapto or an azole antifoggant, said blocked agent being present in the photographic light-sensitive material in an amount of from about 10^{-9} to 10^{-1} mol per mol of silver.

13. A method for processing a silver halide photographic light-sensitive material as claimed in claim 1, wherein the blocked photographic agent is present in a silver halide emulsion layer, a coloring material layer, a subbing layer, a protective layer, an interlayer, a filter layer, an antihalation layer, an image-receiving layer or a cover sheet layer.

4,734,354

FLUORESCENT BRIGHTENER IN IMAGE-RECEIVING MATERIAL FOR SILVER SALT DIFFUSION TRANSFER PROCESS

Yoshihiro Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

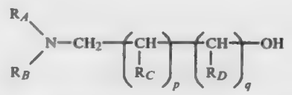
Continuation of Ser. No. 702,563, Feb. 19, 1985, abandoned. This application Jul. 18, 1986, Ser. No. 885,398
Claims priority, application Japan, Feb. 16, 1984, 59-27664
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—247 **14 Claims**

1. A process of forming an image, comprising:

imagewise exposing and development processing a silver salt diffusion transfer photographic material;

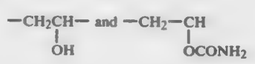
said silver salt diffusion transfer photographic material comprising a light-sensitive material containing a silver halide photographic emulsion layer and an image-receiving material comprising a support having provided thereon an image-receiving layer containing physical development nuclei;

said image-receiving layer containing gelatin, a water-soluble fluorescent brightening agent, and a water-soluble vinyl polymer having an average molecular weight of from about 10,000 to about 450,000, wherein the weight ratio of the water-soluble fluorescent brightening agent to the gelatin ranges from about 0.02/1 to about 0.5/1 and the weight ratio of the water-soluble vinyl polymer to the water-soluble fluorescent brightening agent ranges from about 0.1/1 to about 5/1; and development processing said silver salt diffusion transfer photographic material with a processing solution containing an amine compound shown by formula (A);



(A)

wherein R_A represents a hydrogen atom or a lower alkyl group containing from 1 to 4 carbon atoms, R_B represents a hydrogen atom or a lower alkyl group containing from 1 to 4 carbon atoms, R_C and R_D each represents a hydrogen atom or a hydroxyl group, and p and q each represents 0 to 1, with the proviso that p and q do not simultaneously represent 0, wherein the water-soluble vinyl polymer is polyvinyl pyrrolidone, a copolymer of vinyl pyrrolidone and vinyl acetate, or a copolymer of



4,734,355

SENSITIVITY OF PROCESSLESS RECORDING MEDIA

David F. Lewis, Monroe, Conn.; Mark L. Moskowitz, Wayne, N.J., and Steward E. Purdy, Binghamton, N.Y., assignors to GAF Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 773,487, Sep. 9, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,885
Int. Cl.[4] G03C *1/72, 1/78*
U.S. Cl. 430—270 **29 Claims**

1. A process for improving radiant energy sensitivity of an image-receptive, normally crystalline polyacetylene compound which comprises: (a) dispersing the polyacetylene microcrystals in a non-solvating liquid to form a liquid dispersion containing from about 1 to about 50% polyacetylene solids and (b) ageing said dispersion at a temperature between about −78° C. and about 12° C. for a period of from about 0.25 hour to about 30 days and completing said ageing before drying said dispersion prior to imaging with said radiant energy.

4,734,356

POSITIVE-WORKING COLOR PROOFING FILM AND PROCESS

Richard D. Bauer; John G. Buzzell, and Rusty E. Koenigkramer, all of Towanda, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1986, Ser. No. 857,311
Int. Cl.[4] G03C *5/00, 3/00, 5/04*
U.S. Cl. 430—293 **11 Claims**

1. An improved positive surprint process of making a multicolor proof by the steps:

(a) laminating to paper the tacky photopolymerizable layer of a film composed of that layer and a transparent support layer:

(b) imagewise exposing the photopolymerizable layer to UV light through a color-separation halftone-positive transparency to cause polymerization and reduce tack in the exposed areas so that toner particles will not adhere to those areas;

(c) removing the support layer without disturbing the photopolymer layer;

(d) applying process-color toner to the photopolymer layer whereby the toner adheres to the unexposed areas only;

(e) removing non-adhered toner particles to leave a positive image; and

(f) laminating to the toned photopolymer layer the photopolymerizable layer of another piece of the film and repeating steps (b)-(e) using a different color separation transparency and corresponding color toner;

the improvement characterized in that the photopolymerizable layer consists essentially of a monomer which is a diacrylate or dimethacrylate ester of bisphenol A/epichlorohydrin epoxy resin, a compatible polymeric binder, and a photopolymerization initiator.

4,734,357

SILVER HALIDE COLOR LIGHT SENSITIVE MATERIAL

Keiji Mihayashi; Hidetoshi Kobayashi, and Isamu Itoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 583,925, Feb. 27, 1984, abandoned. This application Jan. 14, 1987, Ser. No. 6,351
Claims priority, application Japan, Feb. 25, 1983, 58-31610
Int. Cl.[4] G03C *1/40*
U.S. Cl. 430—376 **12 Claims**

1. A silver halide color light-sensitive material comprising a support and a light-sensitive silver halide emulsion layer on the support, wherein a compound represented by the general formula (I):

Coup—(TIME)$_n$—FA (I)

wherein Coup represents a coupler radical capable of undergoing a coupling reaction with an oxidized product of an aromatic primary amine developing agent; TIME represents a timing group which is eliminated from Coup by the coupling reaction and, thereafter, releases FA; n is 0 or 1; and FA represents a group which is eliminated from Coup in the coupling reaction when n is 0, whereas FA is released from TIME when n is 1, and FA has adsorption properties with respect to silver halide grains and also has a substantial fogging action with respect to silver halide grains, is incorporated in the light-sensitive silver halide emulsion layer in an amount of not more than 1 mol% based on all couplers contained in said emulsion layer and other emulsion layer sensitive to the same color as said emulsion layer.

4,734,358

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

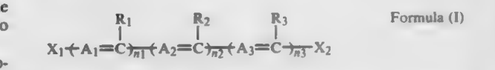
Shun Takada; Masanobu Miyoshi, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 782,066, Sep. 30, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 935,154
Claims priority, application Japan, Oct. 5, 1984, 59-209535
Int. Cl.[4] G03C *1/30, 1/34, 1/20, 1/40*
U.S. Cl. 430—550 **16 Claims**

1. A silver halide photographic light-sensitive material comprising,

a layer containing a compound represented by the following Formula (I), said layer being hardened with at least one of the compounds represented by the Formula (II) or (III), and

a silver halide photographic emulsion layer containing at least one of the cyan couplers represented by the Formula (IX) or (X);

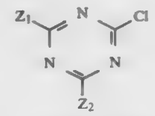


Formula (I)

wherein R_1, R_2 and R_3 each represents hydrogen, a halogen, a sulfonic acid group including the salts thereof, or a monovalent organic group; A_1, A_2 and A_3 each represents nitrogen or a



in which R_4 represents hydrogen, a halogen, a sulfonic acid group including the salts thereof or a monovalent organic group; X_1 and X_2 each represents a hydroxyl group or a —NR_5R_6 in which R_5 and R_6 each represents hydrogen, an alkyl group, an aryl group or an alkylcarbonyl group, or R_5 and R_6 may be coupled to each other to form a ring; R_1, R_2, R_3 and R_4 may also be coupled to each other to form a ring, and at least one of the groups represented by R_1, R_2, R_3 and R_4 and at least one of the groups represented by R_5 and R_6 may further be coupled to each other to form a ring; and each of n_1, n_2 and n_3 is an integer of from 0 to 3;



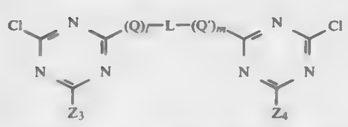
Formula (II)

wherein Z_1 represents chlorine, a hydroxy group, an alkyl group, an alkoxy group, an alkylthio group, a —OM group in which M represents a monovalent metal atom, or a —NR′R″ group and —NHCOR‴ in which R′, R″ and

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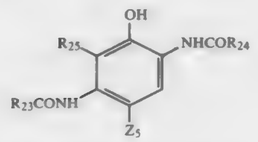
R''' each represents hydrogen, an alkyl group or an aryl group; and Z_2 has the same definition as Z_1 except it does not include chlorine;

Formula (III)



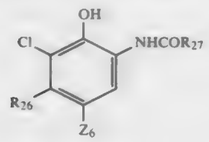
wherein Z_3 and Z_4 each represents chlorine, a hydroxy group, an alkyl group, an alkoxy group or a —OM group in which M represents a monovalent metal atom; Q and Q' each represents an —O—, —S— or —NH— group; L represents an alkylene group or an arylene group; and l and m each represents 0 or 1;

Formula (IX)



wherein R_{23} represents an alkyl group or an aryl group; R_{24} represents an alkyl group, a cycloalkyl group, an aryl group or a heterocyclic group; R_{25} represents hydrogen, a halogen, an alkyl group or an alkoxy group, and R_{25} may be coupled to R_{23} to form a ring; and Z_5 represents hydrogen or a group capable of splitting off through a reaction thereof to the oxidation products of an aromatic primary amine color developing agent;

Formula (X)



wherein R_{26} represents a normal or branch chained alkyl group having 1 to 4 carbon atoms; R_{27} represents a ballast group; Z_6 has the same definition as Z_5.

4,734,359

THERMAL RECORDING MATERIAL FOR DISPLAY AND IMAGE DISPLAY DEVICE UTILIZING THE SAME

Yoshihiro Oguchi, Yokohama; Toshikazu Ohnishi, Tokyo; Yoshio Takasu, Tama; Kozo Arahara, Tokyo; Akihiro Mouri, Kokubunji; Katsumi Kuramatsu, Kawasaki; Tsutomu Toyono, Yokohama, and Shuzo Kaneo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1986, Ser. No. 925,221

Claims priority, application Japan, Nov. 7, 1985, 60-249162; Nov. 7, 1985, 60-249163; Nov. 7, 1985, 60-249167; Nov. 7, 1985, 60-249168

Int. Cl.[4] G03C *1/68;* **B32B** *3/00;* **G01D** *9/00*

U.S. Cl. 430—945 **10 Claims**

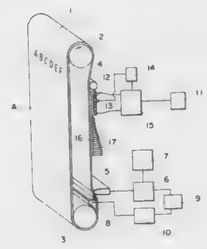
1. An image display device comprising:

a thermal recording material composed of a heat-resistance flexible sheet substrate and a polymer blend layer which is provided on said substrate and which changes from a transparent state to an opaque state and retains said opaque state when heated to a certain temperature followed by rapid cooling but returns from said opaque state to the transparent state when heated again above said temperature and then gradually cooled;

means for movably supporting said recording material; and

thermal recording means for heating said recording material according to image information; a display unit for displaying opaque record on said recording material; and image erasing means by uniformly heating and then gradually cooling the recording material, in succession, along the moving direction of said recording material.

10. An image display device according to claim 1, wherein the polymer blend layer of said recording material is selected from a group consisting of a combination of vinylidene fluoride-hexafluoroacetone copolymer and a methacrylate ester



polymer; a combination of a vinylidene fluoride copolymer and an acrylate ester polymer; a combination of polyvinyl fluoride and polymethyl acrylate, polyethyl acrylate, polymethyl methacrylate or polyethyl methacrylate; a combination of polycaprolactone and polycarbonate; a combination of polystyrene and polyvinylmethylether; a combination of a styrene-acrylonitrile copolymer and polycaprolactone; a combination of a styrene-acrylonitrile copolymer and polymethyl methacrylate; a combination of polyvinyl nitrate and polymethyl acrylate; a combination of polyvinylidene fluoride and polyvinylmethylketone; and a combination of an ethylene-vinyl acetate copolymer and chlorinated rubber.

4,734,360

COLORIMETRIC ETHANOL ANALYSIS METHOD AND TEST DEVICE

Roger C. Phillips, Palo Alto, Calif., assignor to Lifescan, Inc., Mt. View, Calif.

Continuation-in-part of Ser. No. 513,505, Jul. 12, 1983, abandoned. This application Jun. 26, 1984, Ser. No. 624,774

Int. Cl.[4] C12Q *1/26, 1/28;* **C12N** *9/96*

U.S. Cl. 435—25 **4 Claims**

1. A method for determining the concentration of ethanol in the bloodstream of a human who is suspected of having consumed ethanol, which comprises:

(a) reacting saliva of said human with a dry, room-temperature-stable test device comprising an inert support pad containing alcohol oxidase, mannitol present in an amount sufficient to stabilize the alcohol oxidase, a salt that buffers in the range of pH 6–9, a substance having peroxidase activity, and a substance which will react with hydrogen peroxide to give a compound of changed color, whereby a change of color is obtained in the presence of ethanol; and

(b) comparing any color so obtained to a standard to determine the ethanol concentration in the bloodstream of said human.

4,734,361

LOW TEMPERATURE-SENSITIVE VARIANT OF LACTOBACILLUS BULGARICUS AND A SELECTION METHOD THEREFOR

Kanchisa Murao, Higashimurayama; Tsuyoshi Takahashi, Sayama, and Tsutomu Kaneko, Higashimurayama, all of Japan, assignors to Meiji Milk Products Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 877,848

Claims priority, application Japan, Jun. 26, 1985, 60-137831; Jun. 26, 1985, 60-137832

Int. Cl.[4] C12Q *1/04;* **C12R** *1/225;* **C12N** *1/20, 1/36*

U.S. Cl. 435—34 **3 Claims**

1. A microorganism belonging to a variant *Lactobacillus bulgaricus* which is sensitive at low temperatures, and which shows an increase in lactic acid contents of 0.1% or less when the biomass thereof is inoculated on a culture medium of cow's milk, the resulting culture is incubated at 43° C. until the lactic acid content reaches a level of 0.23% to 0.28%, then cooled, and preserved at 10° C. for 7 days.

4,734,362

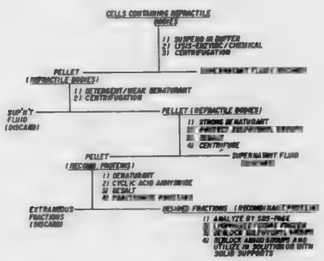
PROCESS FOR PURIFYING RECOMBINANT PROTEINS, AND PRODUCTS THEREOF

Chung-Ho Hung; Richard Thorn, both of Milford; Charles Riggin, Hopdale, and Dante Marciani, Hopkinton, all of Mass., assignors to Cambridge Bioscience Corporation, Worcester, Mass.

Continuation-in-part of Ser. No. 825,597, Feb. 3, 1986. This application Sep. 25, 1986, Ser. No. 911,455

Int. Cl.[4] C07K *3/00;* **G01N** *33/546*

U.S. Cl. 435—68 **37 Claims**



1. A process for recovering refractile body recombinant protein from microorganisms comprising:

(a) disrupting host cells containing said refractile body recombinant protein;

(b) solubilizing said refractile body recombinant protein;

(c) acid acylating free amino groups contained in said recombinant protein;

(d) separating said recombinant protein in N-acid acylated form; and

(e) recovering said recombinant protein.

4,734,363

LARGE SCALE PRODUCTION OF DNA PROBES

Nanibhushan Dattagupta, New Haven; Peter M. M. Rae, Hamden; Donald M. Crothers, Northford, and Thomas R. Barnett, East Haven, all of Conn., assignors to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Nov. 27, 1984, Ser. No. 675,386

Int. Cl.[4] C12P *19/34;* **C12Q** *1/68*

U.S. Cl. 435—91 **9 Claims**

1. A process for the production of a single strand of a nucleic acid, the processing comprising

(a) tailing a 3' end of a nucleic acid with a terminal deoxynucleotidyl transferase and a ribonucleoside triphosphate,

(b) oxidizing the product of step (a) to produce a nucleic acid with a pendant aldehyde group,

(c) reacting the product the step (b) with a solid support, said solid support containing one or more NH_2 groups,

(d) reacting the rpduct of step (c) with a primer nucleic acid to form a hybrid,

(e) extending the primer on the hybrid with DNA polymerase and a nucleoside triphosphate,

(f) denaturing the product of step (e), and

(g) separating the product of step (f) into a soluble product and an insoluble product.

4,734,364

PRODUCTION OF DEXTROSE AND MALTOSE SYRUPS USING AN ENZYME DERIVED FROM RICE

William F. Line, Greenfield, Wis.; Vinod K. Chaudhary, Manhattan, Kans.; Etzer Chicoye, Milwaukee, and Robert J. Mizerak, Waukesha, both of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 496,386, May 20, 1983, abandoned, and a continuation-in-part of Ser. No. 298,011, Aug. 31, 1981, abandoned, and a continuation-in-part of Ser. No. 263,156, May 13, 1981, Pat. No. 4,355,047, and a continuation-in-part of Ser. No. 263,154, May 13, 1981, Pat. No. 4,355,110, and a continuation-in-part of Ser. No. 141,536, Apr. 18, 1980, abandoned, and a continuation-in-part of Ser. No. 058,823, Jul. 19, 1979, abandoned. This application Jan. 16, 1986, Ser. No. 820,197

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.[4] C12P *19/22, 19/16, 19/20;* **C12N** *9/44*

U.S. Cl. 435—95 **4 Claims**

1. In the method of preparing a sugar syrup from starch which comprises saccharifying a liquified starch hydrolyzate with an enzyme system which includes an α-1,6 debranching enzyme and an α-1,4 carbohydrase at a pH of about 4 to about 5.5, and a temperature of above 55° C. to about 65° C., the improvement which comprises employing as the α-1,6 debranching enzyme a heat-stable, pullulanase derived from rice, said pullulanase being essentially free of interfering maltase and transglucosidase activity.

4,734,365

PROCESS FOR LIQUEFYING STARCH

Ryooichi Haga; Masahiko Ishida, both of Hitachi, and Masako Katsurayama, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,779

Claims priority, application Japan, Nov. 9, 1984, 59-236916

Int. Cl.[4] C12P *19/14;* **C12N** *9/28;* **C12R** *1/145*

U.S. Cl. 435—99 **6 Claims**

1. A process for liquefying starch which comprises contacting α-amylase obtained by culturing of Clostridium sp. RS-0001, FERM P-7918, with an aqueous slurry or solution of the starch at an elevated temperature at a pH value of 5.5 or lower and at a calcium ion concentration of 100 μM or lower.

4,734,366

BIOLOGICAL PROCESS FOR L-FRUCTOSE SYNTHESIS

Blaise J. Arena, Des Plaines, and Albrecht H. Bruckner, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 22, 1985, Ser. No. 693,567

Int. Cl.[4] C12N *9/04;* **C12P** *19/02;* **C12R** *1/01, 1/02*

U.S. Cl. 435—105 **6 Claims**

1. A method of making L-fructose comprising oxidizing L-mannitol with a polyoldehydrogenase from species of the genus Gluconobacter or Acetobacter, and recovering the L-fructose produced thereby.

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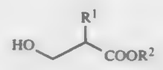
4,734,367

PROCESS TO PRODUCE ALPHA-SUBSTITUTED DERIVATIVES OF 3-HYDROXYPROPIONIC ACID

Hans G. W. Leuenberger, Bättwil; Peter K. Matzinger, Rodersdorf; Dieter Seebach, and Max F. Züger, both of Zurich, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 23, 1984, Ser. No. 674,207
Claims priority, application Switzerland, Dec. 6, 1983, 6510/83
Int. Cl.[4] C12P 7/62
U.S. Cl. 435—135 9 Claims

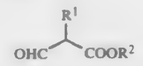
1. A process for the manufacture of optically active 3-hydroxypropionic acid derivatives of the general formula



I

wherein R^1 is selected from the group consisting of alkyl, phenyl and benzyl and R^2 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, phenyl and benzyl,

which process comprises fermentatively reducing a compound of the general formula



II

wherein R^1 and R^2 are as above.

4,734,368

PROCESS FOR THE BIOCONVERSION OF FUMARATE TO L-MALATE

Fritz Schindler, Gelsenkirchen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 592,977, Mar. 23, 1984. This application Sep. 24, 1984, Ser. No. 654,070
Int. Cl.[4] C12P 7/46; C12R 1/645, 1/665, 1/71
U.S. Cl. 435—145 30 Claims

1. A process for preparing L-malate from fumarate comprising incubating under bioconversion conditions a proliferated cell mass derived from a microorganism containing fumarase effective to convert exogenous fumarate to L-malate in an aqueous solution of fumarate, said solution containing the cell mass in a concentration of from about 0.5 to 50 g/l (calculated as dry mass) and an initial fumarate concentration of about 170–400 g per liter of liquid, calculated as fumaric acid and relative to the total volume of the solution, at least half of the fumarate being in the form of ammonium-fumarate, said incubation being maintained until the yield of L-malate, calculated as L-malic acid, reaches at least 0.9 g per gram of initial fumarate, calculated as fumaric acid.

4,734,369

TISSUE CULTURES OF LYCOPERSICON SPP.

David A. Evans, Palmyra, and William R. Sharp, Haddenfield, both of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Aug. 22, 1983, Ser. No. 525,106
Int. Cl.[4] C12N 5/00, 5/02, 1/00, 15/00
U.S. Cl. 435—240.49 15 Claims

1. A method of isolating heritable nuclear genetic variant plant strains comprising:

(a) regenerating shoots from callus cells obtained from tissue of a plant on basal medium comprising 6-benzyladenine at a concentration of at least about 10 uM, said plant being from the genus Lycopersicon;

(b) rooting said regenerated shoots on a rooting medium or directly in soil to provide plantlets;

(c) growing said plantlets into mature plants and allowing the mature plants to self-fertilize;

(d) collecting seed from said self-fertilized, mature plants;

(e) growing said seed from self-fertilized plants to provide a second generation of plants;

(f) selecting phenotypically variant plants from among said second generation of plants, said phenotypically variant plants bearing heritable nuclear genetic changes; and

(g) confirming the nature of the heritable nuclear genetic changes by observing segregation ratios of phenotypically variant to wild-type siblings in said second generation, and when said segregation ratios do not conform to an approximately 3:1 or 1:3 ratio, performing backcrosses to wild-type plants and observing the progeny.

4,734,370

ANTIBIOTIC-PRODUCING MICROORGANISM CULTURE

Josefino B. Tunac, Troy, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 607,056, May 4, 1984. This application Jul. 1, 1985, Ser. No. 750,361
Int. Cl.[4] C12N 1/20; C12R 1/04
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of Actinomadura sp. having the identifying characteristics of NRRL 15758 capable of producing antibiotic substance CL-1724-B2 in recoverable quantities under conditions of aerobic fermentation in a culture medium containing assimilable sources of carbon and nitrogen, said antibiotic substance CL-1724-B2 characterized by:

(a) a molecular weight of 1374 atomic mass units;

(b) an elemental analysis corresponding to 52.4% C, 6.26% H, 4.08% N, and 9.32% S;

(c) an ultraviolet absorption spectrum in methanol showing absorption maxima at 318 nm (a=8.12), 280 nm (a=11.16), 251 nm (a=18.64), and 204 nm (a=29.84);

(d) and infrared absorption spectrum showing peaks at 3520, 2940, 1760, 1720, 1685, 1600, 1580, 1520, 1450, 1385, 1375, 1310, 1250, 1155, 1075, 1015, 1000, 955, 900, 875, and 850 reciprocal centimeters;

(e) a 300 MHz magnetic resonance spectrum in deuterochloroform exhibiting principal signals at 0.90 (multiplet), 1.25 (singlet), 1.40 (multiplet), 1.45–2.20 (multiplet), 2.30 (multiplet), 2.40–2.90 (multiplet), 3.30–4.30 (multiplet, 4.50 (multiplet), 4.70 (doublet of doublets), 4.95 (doublet), 5.35 (singlet), 5.45 (doublet), 5.70 (multiplet), 5.80 (doublet), 5.90 (doublet), 6.25 (singlet), 6.55 (multiplet), 7.75 (singlet), 8.65 (singlet), and 12.95 (singlet) parts per million downfield from tetramethylsilane.

4,734,371

SYSTEM FOR INTRODUCING NOXIOUS GAS INTO AN EXPOSURE CHAMBER

Wolfgang Schmolke, Munich; Peter Schramel, Ismaning; Herbert Drachenberg, Munich, and Wolfgang Kern, Oberschleisheim, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH, München, Neuherberg, Fed. Rep. of Germany

Filed Apr. 28, 1986, Ser. No. 856,369
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515072
Int. Cl.[4] C12M 3/00
U.S. Cl. 435—284 7 Claims

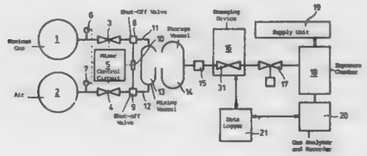
1. A system for introducing noxious gas into an exposure chamber containing plants which are to be exposed, under controlled conditions over long periods of time, to an atmospheric gas which has been given a defined composition by the introduction of the noxious gas, said system comprising in combination:

separate inlet conduits for the noxious gas and for the atmospheric gas;

a respective mass flow regulator connected in each said inlet conduit;

a respective shut-off valve connected in each said inlet conduit downstream of the respective said flow regulator;

an electronic control circuit means for controlling said flow regulators to regulate the respective flows of the atmospheric and noxious gases to be mixed, and for jointly switching said shut-off valves between open and closed positions in response to input control signals;



a premixer stage means, connected to each of said inlet conduits downstream of said shut-off valves, for homogeneously mixing atmospheric and noxious gase flowing through the respective said inlet conduits;

a buffer reservoir for the thus composed mixture of atmospheric and noxious gases connected to the outlet of said premixer stage means; and

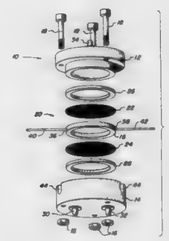
a computer controlled dosaging means, connected to the outlet of said buffer reservoir, for dosaging the mixture of atmospheric and noxious gases for the exposure chamber.

4,734,372

CELL CULTURING METHODS AND APPARATUS

M. Boris Rotman, Jamestown, R.I., assignor to Brown University Research Foundation, Providence, R.I.

Continuation-in-part of Ser. No. 463,669, Feb. 4, 1983. This application Jun. 21, 1984, Ser. No. 623,183
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] C12Q 1/29, 3/00
U.S. Cl. 435—291 14 Claims



1. A cytotoxicity assay system comprising a cell culturing vessel having a cell enclosure into which cells can be introduced and cultured;

nutrient-transporting means for transporting nutrients to the cells, the nutrient-transporting means include a source of nutrients and at least one fluid permeable membrane, connecting said source of nutrients to said cells, across which nutrients can migrate to nourish the cells within the vessel;

fluorogenic substrate-transporting means for transporting a fluorogenic substrate to the cell compartment, so that living cells within the vessel will take up said substrate and accumulate a characteristic fluorescence;

means for introducing a therapeutic agent into the cell compartment; and

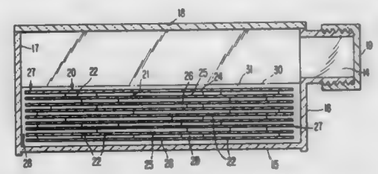
means for measuring cytotoxicity within the cell compartment, including means for detected changes in the fluorescence of the cells within the vessel.

4,734,373

APPARATUS FOR ENHANCING CELL GROWTH, PRESERVATION AND TRANSPORT

Arie H. Bartal, Habikurim Street 40, Haifa, Israel

Filed Jun. 24, 1986, Ser. No. 877,858
Int. Cl.[4] C12M 1/24
U.S. Cl. 435—296 11 Claims



1. A cell culture device comprising:

an enclosed container having interior walls and at least one opening for introducing and removing cell cultures from said container's interior;

at least one multi-planar structure mounted within the container and having a plurality of surfaces for growing cells, each surface having a plurality of pores and being mounted in spaced relationship to each other with their edges spaced from said interior walls to permit communication between the surfaces;

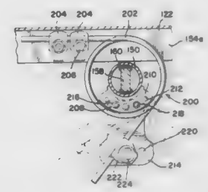
each said surface having an opening aligned with an opening in an adjacent surface with the opening on a surface interior of an adjacent surface being smaller than the opening in said adjacent surface to permit viewing and introduction and removal of cells from each surface of the multiplanar structure.

4,734,374

GERMINATION FLOOR SYSTEMS

Norman H. Andreasen, 1520 Norwood Ave., Itasca, Ill. 60143

Division of Ser. No. 687,598, Dec. 31, 1984, Pat. No. 4,698,309. This application Oct. 23, 1985, Ser. No. 790,392
Int. Cl.[4] C12C 1/04; C12M 1/00
U.S. Cl. 435—302 3 Claims



1. A germination floor assembly comprising a floor including a plurality of generally horizontal tray assemblies, said tray assemblies being mounted for pivotal movement about a horizontal support shaft;

said pivotal movement permitting said tray assemblies to be moved to an approximate vertical orientation for cleaning;

spring means operatively coupled between said tray assemblies and said shaft to create torsional force about the longitudinal axis of the support shaft to assist in effecting said movement of the tray assemblies;

said spring means includes at least one spring member disposed about a portion of the shaft,

said spring member having one end portion affixed to a respective one of said tray assemblies and having an opposite end portion affixed to a bracket rigidly carried on said

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shaft, said bracket having a plurality of holes therethrough,
adjustment means coupled to said spring means for selectively varying the position at which said opposite end portion is affixed to said bracket carried by said shaft,
said variation of said position acting to vary the torsional force of said spring means,
said adjustment means including a plate having a plurality of holes therethrough less than the number of the plurality of holes of said bracket, and a clamp affixed to said plate for clamping said opposite end portion to said plate,
and bolt assembly means for attaching said plate to said bracket through said holes, wherein the position of said plate on side bracket can be varied in dependence on the alignment of said plurality of holes of said plate with the plurality of holes in said bracket.

4,734,375

ION SPECIFIC TEST METHOD

Steven C. Charlton, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 347,265, Feb. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 153,883, May 27, 1980, abandoned. This application May 12, 1983, Ser. No. 493,969
Int. Cl.⁴ G01N *21/78, 33/52*
U.S. Cl. 436—74 **4 Claims**

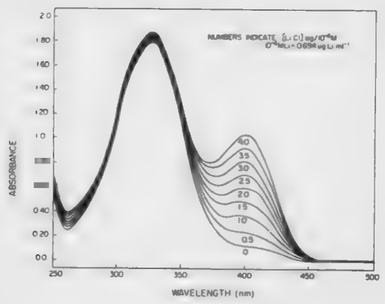
1. A method useful for the determination of a specific ion in an aqueous test sample, comprising the steps of:
(a) adding a counterion reporter substance to an aqueous test sample,
(b) contacting the counterion containing sample with a surface of a test means comprising a substantially nonpolar, nonporous, polymer carrier matrix incorporated with an ionophore capable of selectively forming a complex with a specific ion to be determined in the sample,
(c) removing any unassociated counterion from the surface of the test means, and
(d) determining a detectable optical response associated with the test means.

4,734,376

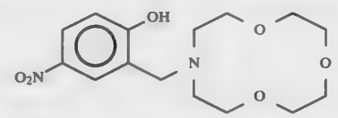
PROCESS FOR THE SPECTROPHOTOMETRIC MEASUREMENT OF LITHIUM ION EMPLOYING A CHROMOGENIC AZA-12-CROWN-4- ETHER

Gilbert E. Pacey, Oxford, Ohio, and Ken-ichi Sasaki, Nagoya, Japan, assignors to The President & Trustees of the Miami University, Miami, Fla.

Division of Ser. No. 698,019, Feb. 4, 1985, Pat. No. 4,659,815. This application Oct. 22, 1986, Ser. No. 921,459
Int. Cl.⁴ G01N *21/75, 33/20, 33/50*
U.S. Cl. 436—79 **11 Claims**



1. A process for the spectrophotometric determination of the concentration of lithium ions in an aqueous solution, said process comprising the following steps:
(a) mixing in a common vessel:
(i) a measured quantity of a lithium-ion-containing aqueous solution; and
(ii) a measured quantity of the crown ether compound



(b) combining said aqueous solution with a measured quantity of a hydroxide containing base;
(c) adding a measured amount of a water-immiscible organic solvent to said vessel whereby an aqueous phase and an organic phase are formed;
(d) agitating said vessel to extract any material soluble in said organic solvent into said organic phase;
(e) transferring a measured quantity of said organic phase into a first spectrophotometric cell and a quantity of a reagent blank into a second spectrophotometric cell;
(f) scanning said cells with ultraviolet-visible light and recording the relative light absorbance of said organic phase with respect to said reagent blank at a wavelength of approximately 400 nm; and
(g) determining the concentration of lithium ions in said aqueous solution by comparing said relative absorbance with the relative absorbance at the same wavelength or organic phases obtained by treating aqueous solutions containing known concentrations of lithium ions in accordance with steps a through f.

4,734,377

METHOD FOR INDIRECT DETECTION OF NONELECTROLYTES IN LIQUID CHROMATOGRAPHY

Sujit Banerjee, 3 Laurel Rd., RR #2, Rocky Point, Long Island, N.Y. 11778

Filed Mar. 31, 1986, Ser. No. 846,577
Int. Cl.⁴ G01N *30/06*
U.S. Cl. 436—161 **1 Claim**

1. In a method for indirect detection of nonelectrolytic analytes in liquid chromatography wherein analytes are injected into a liquid chromatographic system comprising in combination an eluent containing an additive, a chromatographic column, and a detector tuned to said additive, and wherein said analytes are detected through concentration changes of the additive induced by said analytes, the improvement comprising the step of saturating the eluent with the additive to maximize the sensitivity of detection.

4,734,378

PRECIPITATION OF INTERFERING PROTEINS IN FLUORESCENCE POLARIZATION IMMUNOASSAY FOR DIGOXIN

Philip P. Wang, Libertyville, Ill., and Gloria J. Hockerman, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 26, 1985, Ser. No. 749,344
Int. Cl.⁴ G01N *1/00, 33/533*
U.S. Cl. 436—175 **4 Claims**

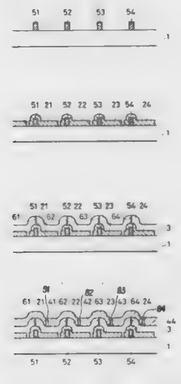
1. In a method for pretreating a test sample of biological fluid prior to a fluorescence polarization immunoassay for digoxin of said test sample wherein a precipitation reagent is employed to remove interfering proteins from the sample, the improvement comprising: intermixing said sample with a precipitation reagent comprising, in weight/volume percent, from about 3% to about 4% 5-sulfosalicylic acid in an aqueous solution having from about 40% to about 60% of a straight or branch chained organic alcohol having from 1 to 4 carbon atoms.

4,734,379

METHOD OF MANUFACTURE OF SOLAR BATTERY

Michinari Kamiyama, Yokosuka, Japan, assignor to Fuji Electric Corporate Research and Development Ltd., Japan

Filed Sep. 16, 1986, Ser. No. 908,032
Claims priority, application Japan, Sep. 18, 1985, 60-205591
Int. Cl.⁴ H01L *31/18*
U.S. Cl. 437—002 **10 Claims**



1. The method of forming a solar battery comprising the steps of:
(a) providing a substrate;
(b) depositing a conductive film on said substrate;
(c) forming a transparent electrode substantially covering said conductive film;
(d) depositing a non-crystalline material on said transparent electrode;
(e) exposing at least one site on the non-crystalline material to light of intensity sufficient to form a low resistance polycrystalline region or a void in said non-crystalline layer; and
(f) forming a metal electrode on said non-crystalline material overlying said site.

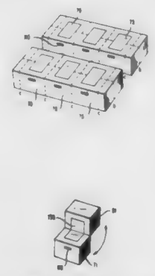
4,734,380

MULTICAVITY OPTICAL DEVICE HELD TOGETHER BY METALLIC FILM

Won-Tien Tsang, New Providence, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 482,964, Apr. 8, 1983, Pat. No. 4,622,671, which is a continuation-in-part of Ser. No. 469,891, Feb. 25, 1983, abandoned. This application May 27, 1986, Ser. No. 866,941
Int. Cl.⁴ H01L *21/304*
U.S. Cl. 437—3 **1 Claim**

1. A method for forming a plurality of semiconductor sections electrically isolated from each other but optically coupled with each other comprising the steps of depositing a plastically deformable metallic film on a portion of a surface of a semiconductor body, said film being less than 10 μm thick; scribing said semiconductor body on a surface opposite said film; and bending said semiconductor body thereby cleaving said body along crystallographic planes to form a plurality of semiconductor sections held together by said film.

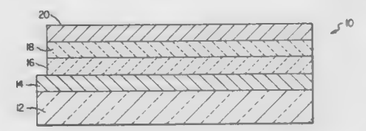


4,734,381

METHOD OF MAKING A THIN FILM CADMIUM TELLURIDE SOLAR CELL

Kim W. Mitchell, Granada Hills, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 790,709, Oct. 24, 1985, Pat. No. 4,650,921. This application Oct. 14, 1986, Ser. No. 918,250
Int. Cl.⁴ H01L *31/18*
U.S. Cl. 437—5 **8 Claims**



1. A method for making a photovoltaic cell comprising the steps of:
(a) depositing a transparent or semi-transparent conductive window layer onto a substrate;
(b) depositing a layer of cadmium telluride including phosphorus onto said window layer;
(c) depositing a layer of lead telluride onto said layer of cadmium telluride; and
(d) depositing a metallic electrode onto said lead telluride layer.

4,734,382

BICMOS PROCESS HAVING NARROW BIPOLAR EMITTER AND IMPLANTED ALUMINUM ISOLATION

Surinder Krishna, Fremont, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

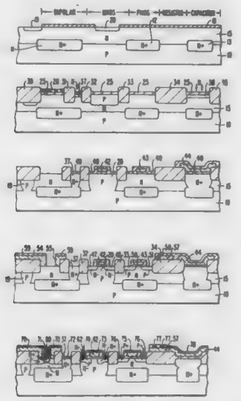
Filed Feb. 20, 1987, Ser. No. 17,387
Int. Cl.⁴ H01L *21/383, 21/425*
U.S. Cl. 437—31 **12 Claims**

1. A method of fabricating a semiconductor structure comprising:
depositing an electrically conductive layer on an underlying region of first conductivity type semiconductor material, the layer including opposite conductivity type impurity;
removing a first region of the layer extending to the underlying region to thereby provide an opening having sides;
forming a coating of selected material on the sides of the opening;
introducing opposite conductivity type impurity through the opening to thereby form a first doped region in the underlying region;
introducing first conductivity type impurity through the

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opening to thereby form a second doped region in the first doped region;

treating the structure to cause some of the opposite conductivity type impurity in the electrically conductive layer to



diffuse into the semiconductor material to thereby form a third doped region in contact with the first doped region but not the second doped region; and

providing electrical connections to each of the electrically conductive layers and the second doped region.

4,734,383

FABRICATING SEMICONDUCTOR DEVICES TO PREVENT ALLOY SPIKING

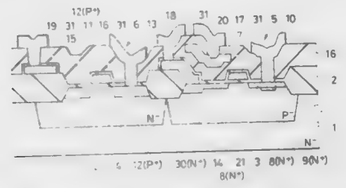
Shuji Ikeda, Koganei; Kouichi Nagasawa, Kunitachi; Makoto Motoyoshi, Fucyu; Kiyoshi Nagai, Koganei, and Satoshi Meguro, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,954

Claims priority, application Japan, Nov. 22, 1984, 59-246028; Feb. 8, 1985, 60-21673

Int. Cl.[4] H01L *21/425*

U.S. Cl. 437—42 **20 Claims**



15. A process for fabricating contacts to semiconductor regions in a semiconductor substrate, said semiconductor regions being part of a semiconductor integrated circuit device, comprising:

(a) the step of forming a first semiconductor region of first conductivity type and a second semiconductor region of second conductivity type in a main surface of a semiconductor substrate;

(b) the step of forming a first insulating film for covering said first and second semiconductor regions;

(c) the step of simultaneously forming contact holes in said first insulating film, said contact holes being formed so as to expose at least an area of each of said first and second semiconductor regions;

(d) the step of forming a second insulating film for covering a part of said main surface of said substrate, said part being the area exposed to the outside through said contact holes;

(e) the step of ion-implanting an impurity of first conductivity type into at least said first semiconductor region through said contact hole, and then annealing, said impurity being introduced into said substrate through said second insulating film, the ion-implanting and annealing being performed so as to provide a further first semiconductor region that extends deeper than said first semiconductor region;

(f) the step of removing said second insulating film; and

(g) the step of forming an electrically conductive material film in the contact holes so as to contact the area of the first and second semiconductor regions exposed to the outside through the contact holes.

4,734,384

PROCESS FOR MANUFACTURING SEMICONDUCTOR MEMORY DEVICE

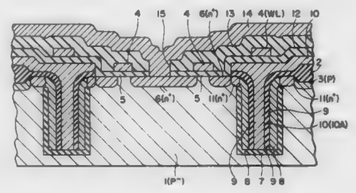
Osamu Tsuchiya, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,638

Claims priority, application Japan, May 13, 1985, 60-99575

Int. Cl.[4] H01L *21/76, 21/82*

U.S. Cl. 437—52 **22 Claims**



21. A process for manufacturing a semiconductor integrated circuit device having a semiconductor element in a trench formed in a semiconductor substrate, with an electrically conducting member of the semiconductor element being adapted to be electrically connected to a semiconductor region formed in the semiconductor substrate, comprising the steps of:

forming a relatively shallow moat in said semiconductor substrate, said relatively shallow moat having a side wall and a bottom;

forming a mask on the side wall of said relatively shallow most, said mask being formed on an oxidation impermeable film, the bottom of the relatively shallow moat being exposed through the mask;

forming a relatively deep moat, said deep moat being formed by etching the bottom of said relatively shallow moat;

forming an oxide film by thermal oxidation of the surface of said semiconductor substrate exposed in said deep moat by employing said mask;

removing said mask, thereby exposing the surface of said semiconductor substrate at the upper end of the side wall of said deep moat; and

forming said electrically conducting member in said deep moat, said electrically conducting member being adapted to be electrically connected to said semiconductor region through the surface of the semiconductor exposed by removing said mask.

4,734,385

SEMICONDUCTOR LASER ELEMENT SUITABLE FOR PRODUCTION BY A MO-CVD METHOD

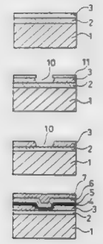
Yutaka Mihashi, Nishinomiya, and Yutaka Nagai, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 700,017, Feb. 8, 1985, Pat. No. 4,667,332. This application Mar. 23, 1987, Ser. No. 29,190

Claims priority, application Japan, Mar. 13, 1984, 59-49734

Int. Cl.[4] H01L *7/00, 21/208;* **H01S** *3/19*

U.S. Cl. 437—129 **1 Claim**



1. A method for producing a semiconductor element for a semiconductor laser device; comprising the steps of:

producing on a substrate of a first conductivity type a first cladding of said conductivity type and a current blocking layer of a second conductivity type respectively by a Metal Organic Chemical Vapor Deposition method, MO-CVD method;

etching a groove stripe in said current blocking layer so as to expose a portion of said first cladding layer; and successively producing a light guide layer of said first conductivity type, an active layer and a second cladding layer of said second conductivity type on said current blocking layer and said stripe groove by said MO-CVD method.

4,734,386

BORON NITRIDE DOPANT SOURCE FOR DIFFUSION DOPING

Yoshihiro Kubota, and Kenji Itoh, both of Gunma, Japan, assignors to Shin-Etsu Chemical Company, Ltd., Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 924,341

Claims priority, application Japan, Oct. 26, 1985, 60-240215

Int. Cl.[4] H01L *21/385*

U.S. Cl. 437—160 **1 Claim**

1. In a method of doping a semiconductor substrate to impart p-type conductivity thereto by the solid diffusion method in which solid boron nitride as a p-type source and a semiconductor substrate are heated together in a container and the semiconductor substrate doped by the boron nitride, the improvement wherein the boron nitride is a solid body of which at least the surface layer is formed by the pyrolytic chemical deposition of boron nitride.

4,734,387

GROWTH OF SEMICONDUCTORS ON A SHAPED SEMICONDUCTOR SUBSTRATE

Andrew W. Nelson, and Leslie D. Westbrook, both of Felixstowe, England, assignors to British Telecommunications plc, United Kingdom

Continuation-in-part of Ser. No. 851,314, Apr. 9, 1986, abandoned, which is a continuation of Ser. No. 571,277, Jan. 16, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,081

Claims priority, application United Kingdom, Jan. 19, 1983, 8301350; May 24, 1983, 8314376

Int. Cl.[4] B05D *5/12*

U.S. Cl. 437—234 **50 Claims**

1. A method of depositing a further semiconductor layer onto a shaped surface of a different semiconductor substrate, said shaped surface including a diffraction grating, wherein both substrate and grown material comprise indium and phosphorus, in which method the same further layer is grown from a gas mixture containing a phosphorous-compound and an organo-indium compound capable of reaction to grow said further layer by MOCVD, wherein initiation comprises heating the substrate from a temperature below the temperature at which substantial transport of the substrate occurs to the reaction temperature at which deposition growth of the substrate occurs, said growth being initiated less than 1 minute after the transport temperature is first reached.

4,734,388

GLASS FOR CATHODE RAY TUBE FACEPLATES

Robert A. Cameron, Corning, and John H. Connelly, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1986, Ser. No. 926,739

Int. Cl.[4] C03C *3/095, 3/078;* **C04B** *35/68*

U.S. Cl. 501—64 **3 Claims**

1. A glass essentially free from readily reducible metal oxides, MgO, and fluorine suitable for manufacturing faceplates for cathode ray tubes which exhibits a linear coefficient of thermal expansion (0°–300° C.) greater than 97 but less than 100×10^{-7}/°C., an annealing point of at least about 500° C., a strain point of at least about 460° C., a Log ρ at 250° C. greater than 9, a Log ρ at 350° C. greater than 7, an internal liquidus temperature below 850° C., and a liquidus viscosity of at least 100,000 poises, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of:

SiO_2	60–63	BaO	5.5–8.5	$ZrO_2 + Al_2O_3$	>4–6.25
Li_2O	0.25–0.8	CaO	1.5–4.0	Sb_2O_3	0.25–0.55
Na_2O	7.25–9.25	TiO_2	0.25–0.75	As_2O_3	0–0.25
K_2O	6–8.25	ZrO_2	4–6.25	$Sb_2O_3 + As_2O_3$	0.35–0.75
SrO	5.5–8.5	Al_2O_3	0–<2	CeO_2	0.15–0.5.

4,734,389

HIGHLY REFRACTIVE OPTICAL GLASS WITH REFRACTIVE INDICES >1.83 AND ABBE NUMBERS <25, AND WITH VERY GOOD CHEMICAL STABILITY

Danuta Grabowski, Taunusstein; Ludwig Ross, Klein-Winternheim, and Volkmar Geiler, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,066

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504625

Int. Cl.[4] C03C *3/062*

U.S. Cl. 501—73 **9 Claims**

1. Highly refractive optical glass having a refractive index n_d of 1.83–1.88, an Abbe number v_d of 22–25 and a density of 3.0–3.5, characterized by the following composition (in wt.%):

SiO_2	19–23.5
Na_2O	7–10
K_2O	4–6.5
Cs_2O	0.5–12
$Na_2O + K_2O + Cs_2O$	11.5–25.0
CaO	0.5–1.5
BaO	9–15
TiO_2	25–28
ZrO_2	2–6
Nb_2O_5	16–19
Nb_2O_5:TiO_2	0.64–0.68.

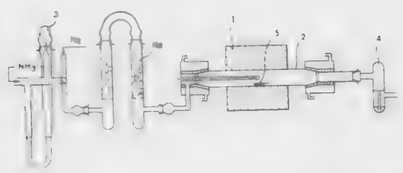
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4,734,390

NITROGEN OR OXNITROGEN COMPOUNDS HAVING A PEROVSKYTE STRUCTURE, THEIR PREPARATION AND THEIR APPLICATION TO THE MANUFACTURE OF DIELECTRIC COMPONENTS

Roger Marchand, and Yves Laurent, both of Cesson Sevigne, France, assignors to Centre National de la Recherche Scientifique (CNRS), France

Filed Nov. 4, 1985, Ser. No. 794,633
Claims priority, application France, Nov. 13, 1984, 84 17274
Int. Cl.[4] C01B *21/26*
U.S. Cl. 501—96 **15 Claims**



1. A nitrogen or oxynitrogen compound of perovskite structure, corresponding to the general formula I:

$$ABO_{3-n}N_n \quad (I)$$

in which:
the cationic lattice consists of:
a metal cation A selected from the group consisting of: Li^+, Na^+, K^+, Rb^+, Cs^+, Ag^+, Tl^+, Ca^{2+}, Ba^{2+}, Sr^{2+}, Pb^{2+}, Cd^{2+}, Ln^{3+}, Bi^{3+}, Y^{3+}, Th^{4+}, U^{4+}, trans-U^{4+}; and
a metal cation B selected from the group consisting of: W^{6+}, Re^{6+}, Mo^{6+}, Ta^{5+}, Nb^{5+}, Mo^{5+}, W^{5+}, Ti^{4+}, Zr^{4+}, Sn^{4+}, Ge^{4+}, Nb^{4+}, Ta^{4+}, Al^{3+}, Ga^{3+}, In^{3+}, Tl^{3+}, Fe^{3+}, Cr^{3+};
n=1, 2 or 3, and
the cationic charges a of the metal A and b of the metal B satisfy the equations:

$$a+b=6+n$$

$$a \geq n,$$

and the solid solutions of these compounds.

4,734,391

CATALYST FOR DECREASING THE CONTENT OF NITROGEN OXIDES IN FLUE GASES

Michael Schneider, Ottobrunn-Riemerling; Hans J. Wernicke, Geretsried; Karl Kochloefl, and Gerd Maletz, both of Bruckmühl/Heufeld, all of Fed. Rep. of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 11, 1986, Ser. No. 895,559
Int. Cl.[4] B01J *20/16*
U.S. Cl. 502—84 **10 Claims**

1. A catalyst for decreasing the content of nitrogen oxides in flue gases comprising at least one metal selected from the group consisting of titanium, zirconium, vanadium, tungsten, molybdenum and cerium in the form of one or more of their oxides and a silicate with a three-layer structure selected from the group consisting of illite and mica, the atomic ratio of the silicon in the three-layer silicate to the metal in the oxide being between 0.2 and 50.

3. A catalyst according to claim 1, wherein the metal oxides are individually present in the following ranges of concentration:
TiO_2:10–80% by weight,
WO_3 and/or MoO_3:1–25% by weight,
V_2O_5:0.1–25% by weight, and
CeO_2:1–25% by weight,
with the illite or mica accounting for the rest of the active constituents.

4,734,392

NICKEL/ALUMINA CATALYST

Keshab Ganguli, Bleiswijk; Peter Nootenboom, Oud-Beyerland, and Cornelis Lok, Rockanje, all of Netherlands, assignors to Internationale Octrooi Maatschappij, Rotterdam, Netherlands

Continuation of Ser. No. 747,440, Jun. 21, 1985, Pat. No. 4,657,889. This application Apr. 14, 1987, Ser. No. 38,132
Claims priority, application Netherlands, Jun. 21, 1984, 8401965
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] B01J *21/04, 23/74*
U.S. Cl. 502—335 **5 Claims**

1. A nickel alumina catalyst wherein the atomic ratio of nickel/aluminum is between 10 and 2, the active nickel surface area is between 90 and 150 m^2/g nickel, the average pore size, depending on the above atomic ratio, is between 4 and 20 nanometers and the nickel crystallites have an average diameter between 1 and 5 nanometers.

4,734,393

NON-CLAY OIL AND GREASE ABSORBENT

H. Edward Lowe, Cassopolis, Mich.; Ricky L. Yoder, Elkhart, and Clayton C. Nelson, Granger, both of Ind., assignors to H. Edward Lowe, Cassopolis, Mich.

Filed Jun. 20, 1985, Ser. No. 746,748
Int. Cl.[4] B01J *20/00;* C09K *3/22*
U.S. Cl. 502—404 **16 Claims**

1. A filler material for use as an oil and grease absorbent, said filler material comprising plant fiber granules, said granules including ray cells of at least 10% by weight of said granules.

4,734,394

PROCESS FOR PRODUCING MOLECULAR SIEVE CARBON FIBERS

Atushi Kosaka, Nishio; Makoto Takemura, Okazaki; Naohisa Ohyama, Nishio, and Minoru Hatano, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 720,378, Apr. 5, 1986, abandoned. This application Aug. 19, 1986, Ser. No. 898,775
Claims priority, application Japan, Apr. 26, 1984, 59-82818
Int. Cl.[4] B01J *20/30, 20/28;* D01F *9/12*
U.S. Cl. 502—434 **3 Claims**



1. A process for producing molecular sieve carbon fibers, comprising the steps of:
spinning a material selected from the group consisting of oil residue and coal residue to form green fibers having diameters in the range of 5 to 50 μm;
treating said green fibers in air at a temperature in a range of 250° to 450° C. to introduce oxygen into said green fibers so that an amount of oxygen introduced in said fibers which is in a range of 8 to 28% by weight of the total weight of said fibers after the oxygen is introduced;

cartionizing said fibers in an inactive atmosphere at a temperature of 500° to 750° C. whereby a component of said material, including oxygen atoms introduced thereto in said treating step is released from said fibers to form a number of micropores opening directly at the surface of said fibers, which micropores have diameters in the range of 0.5 nm and below and substantially no pores larger than 0.5 nm in size.

4,734,395

PRESSURE-SENSITIVE RECORDING SHEET

Yasuhiro Ogata, and Masakazu Maekawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1986, Ser. No. 871,353
Claims priority, application Japan, Jun. 6, 1985, 60-123164
Int. Cl.[4] B41M *5/22*
U.S. Cl. 503—200 **14 Claims**

1. A pressure-sensitive recording sheet comprising a base paper having coated thereon a color developer solution wherein said base paper has been sizepressed or coated with a cationic sizing agent.

4,734,396

COMPRESSION LAYER FOR DYE-RECEIVING ELEMENT USED IN THERMAL DYE TRANSFER

Daniel J. Harrison, Rochester; Kin K. Lum, Webster, and Noel R. Vanier, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,927
Int. Cl.[4] B41M *5/26*
U.S. Cl. 503—227 **20 Claims**

1. A dye image-receiving element for thermal dye transfer comprising a plastic film support having thereon, in order, a compression layer and a dye image-receiving layer, said compression layer having a compressibility greater than that of the support or the dye image-receiving layer and being coated at a coverage of at least 2.0 g/m^2.

4,734,397

COMPRESSION LAYER FOR DYE-RECEIVING ELEMENT USED IN THERMAL DYE TRANSFER

Daniel J. Harrison, Rochester; Kin K. Lum, Webster, and Noel R. Vanier, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 916,927, Oct. 8, 1986. This application Jul. 21, 1987, Ser. No. 76,432
Int. Cl.[4] B41M *5/26*
U.S. Cl. 503—227 **20 Claims**

10. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element and transferring to dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a plastic film support having thereon a dye image-receiving layer, the improvement wherein a compression layer is located between said support and said dye image-receiving layer, said compression layer having a compressibility greater than that of said support or said dye image-receiving layer, said compression layer being coated at a coverage of at least 2.0 g/m^2, and said compression layer having an elasticity of less than 500% elongation at break.

4,734,398

FOLLICULAR REGULATING PROTEIN

Gere S. diZerega, Pasadena, Calif., assignor to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 475,416, Mar. 15, 1983, abandoned. This application Mar. 9, 1987, Ser. No. 23,893
Int. Cl.[4] A61K *37/00;* C07K *15/00*
U.S. Cl. 514—2 **9 Claims**

1. A substantially purified follicular regulatory protein having the biological effect of inhibiting aromatase activity in a mammalian biological system, as defined by the extent of the conversion of androgens to estrogens in the essential absence of the inhibition of the level of FSH in said biological system.

4,734,399

GROWTH HORMONE RELEASING FACTOR ANALOGS

Arthur M. Felix, West Caldwell; Edgar P. Heimer, Sparta, and Thomas F. Mowles, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 762,891, Aug. 6, 1985, Pat. No. 4,649,131, which is a continuation-in-part of Ser. No. 653,163, Sep. 24, 1984, Pat. No. 4,622,312. This application Oct. 23, 1986, Ser. No. 922,572
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] A61K *37/43;* C07K *7/10*
U.S. Cl. 514—12 **30 Claims**

1. A peptide of the formula

1 5 10
X—R—R_1—Asp—Ala—Ile—Phe—Thr—Asn—Ser—Tyr—

15 20
Arg—R_2—Val—Leu—R_3—Gln—Leu—Ser—Ala—Arg—

25 30
R_4—Leu—Leu—Gln—Asp—Ile—R_5—R_6—Arg—Gln—

35 40
Gln—Gly—Glu—Ser—Asn—Gln—Glu—Arg—Gly—Ala—

44
Arg—Ala—Arg—Leu—Y

wherein R is desNH_2-Tyr, Tyr, D-Tyr, Ac-Tyr, His or C^{α}-Methyl-Tyr; R_1 is Ala, N-Methyl-D-Ala or D-Ala; R_2 is Lys, Ala, Leu, Val or Ile; R_3 is Ala, Leu, Val, Ile, Nle, Nval, β-Ala or α-Aib; R_4 is Lys, Ala, Leu, Val or Ile; R_5 is Met, Leu, Nle or Ile; R_6 is Asn or Ser; X is hydrogen or -COR_7; R_7 is hydrogen, C_{1-4} alkyl or halo(C_{1-4})alkyl; Y is -OR_8 or -NR_9R_{10}; R_8 is hydrogen or C_{1-5}-alkyl; R_9 and R_{10} independently equal hydrogen, C_{1-7} alkyl, C_{2-4}-alkenyl or halo(C_{1-4})alkyl; or a fragment thereof where the fragment is reduced in number by one to fifteen amino acids from the carboxyl end; or a pharmaceutically acceptable acid or base addition salt thereof.

4,734,400

SYNTHETIC VASOACTIVE INTESTINAL PEPTIDE ANALOGS

David R. Bolin, Denville; Johannes A. Meienhofer, Glen Ridge, and Iou-Iou Sytwu, Fanwood, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 658,736, Oct. 9, 1984, Pat. No. 4,605,641. This application Jun. 16, 1986, Ser. No. 874,973
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] A61K *37/24;* C07K *7/10*
U.S. Cl. 514—12 **17 Claims**

1. A peptide of the formula

1 5 10 1
X—His—Ser—Asp—Ala—Val—Phe—Thr—Asp—R—Tyr—

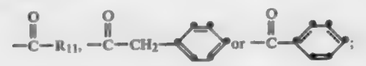
15 20
—R_2—R_3—R_4—R_5—Lys—Gln—R_6—Ala—Val—Lys—

25 28
—Lys—Tyr—Leu—R_7—R_8—R_9—Leu—R_{10}—Y

R is Asn or Ala; R_2 is Thr or Ser; R_3 is Arg, Lys or Orn; R_4 is Leu or Phe; R_5 is Arg or Lys; R_6 is Nle, Ile or Leu; R_7 is Asn

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or Thr; R_8 is Ser or Thr; R_9 is Ile or Val; R_{10} is Asn or Thr; X is hydrogen,



R_{11} is C_{1-3} alkyl; Y is $-OR_{12}$ or NHR_{12}; R_{12} is hydrogen or C_{1-3} alkyl; or with the proviso that $(Nle)^{17}$-VIP is excluded from the scope of Formula I; and the pharmaceutically acceptable acid or base addition salts thereof.

4,734,401

PROCESS FOR SPRAY DRYING AMINO ACID COMPOSITIONS

John J. Blouin, Catonsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,307

Int. Cl.[4] A23B *4/04;* **A61K** *9/10, 37/02*

U.S. Cl. 514—14 **23 Claims**

1. A process for preparing a dried, amorphous product comprising at least one amino acid, said process comprising:

(a) dissolving at least one amino acid in a solvent,

(b) driving the resulting solution in a spray drier by injecting the amino acid solution, at a temperature of about 70° to about 90° C., into said spray drier by means of an atomizing nozzle while introducing into said spray drier heated, sterile air or inert gas, while operating said spray drier such that the outlet temperature is about 95° to about 150° C., and

(c) collecting the dried, amorphous product, said product characterized by (i) being physically and chemically homogeneous, (ii) having a moisture content of up to about 7 percent, (iii) dissolving substantially instantaneously in a liquid carrier, and (iv) having a dissolution profile such that the distribution of dissolved amino acid in solution is substantially completely uniform over time.

4,734,402

FEEDS FOR DOMESTIC ANIMALS AND METHOD FOR BREEDING THEM

Kiyoshi Hashimoto, Tokyo, Tadashi Nakazawa, Yokohama; Hidemasa Hidaka, Urawas, and Toshiaki Erda, Chigasaki, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 636,347, Jul. 31, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 823,990

Claims priority, application Japan, Aug. 5, 1983, 58-144248

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—54 **3 Claims**

1. A method for increasing the weight of young domestic animals which comprises feeding said animals during their weaning period a commercially available feed containing from about 0.1 to 5 parts by weight fructooligosaccharide per 100 parts of said feed, whereby scours of said animals are substantially remedied.

4,734,403

MEMBRANE POLYSACCHARIDES WHICH ARE USEFUL AS IMMUNOSTIMULANTS

Lucien Dussourd D'Hinterland; Gérard Normier, and Anne-Marie Pinel, all of Castres, France, assignors to P.F. Medicament, Paris, France

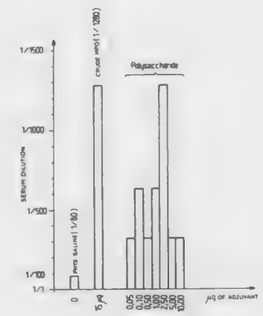
Filed Aug. 29, 1985, Ser. No. 770,737

Claims priority, application France, Sep. 10, 1984, 84 13844

Int. Cl.[4] A61K *31/71;* **C07H** *3/00*

U.S. Cl. 514—54 **5 Claims**

1. Membrane polysaccharide of bacterial origin useful as a immunostiulant and having the following quantitative analytical composition:



galactose content	66 ± 6%
content of hexoses other than galactose	<1%
hexosamine (glucosamine) content	8.5 ± 2%
amino acid content	5 ± 2%
fatty acid content	<1%
nucleic acid content	<0.005%
protein content	<0.3%

and molecular weight: 90,000 ± 10,000.

4. Pharmaceutical composition useful as an immunostimulant comprising an effective amount of the polysaccharide of claim 1, together with pharmaceutically acceptable carrier.

4,734,404

PESTICIDAL BENZOYLUREIDOARYL PHOSPHATE COMPOUNDS

Raaj Kumar, Bhopal, India, and Themistocles D. J. D'Silva, Chapel Hill, N.C., assignors to Rhone-Poulenc Nederland B.V., Amstelveen, Netherlands

Filed Jun. 6, 1986, Ser. No. 871,253

Int. Cl.[4] A01N *57/06;* **C07F** *9/18*

U.S. Cl. 514—115 **9 Claims**

1. The compound which is 1-[3,5-dichloro-4-(O-ethyl-S-propylphosphoryloxy)phenyl]-3-(2,6-difluorobenzoyl)urea.

4. The compound which is 1-[2-methyl-4-(O-ethyl-S-propylphosphoryloxy)phenyl]-3-(2,6-difluorobenzoyl)urea.

7. The compound which is 1-[2,5-dimethyl-3-chloro-4-(O-ethyl-S-propylphosphoryloxy)phenyl]-3-(2,6-difluorobenzoyl-)urea.

4,734,405

COMBINATION PRODUCT

Horst Koenig, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

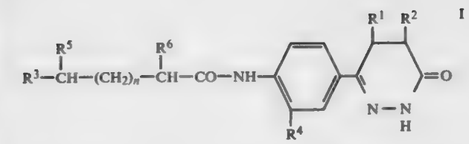
Filed Oct. 9, 1986, Ser. No. 917,175

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3535947

Int. Cl.[4] A61K *31/62*

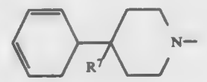
U.S. Cl. 514—161 **3 Claims**

1. An orally administrable pharmaceutical composition for treating and preventing disorders caused by platelet aggregation which comprises acetylsalicylic acid and a pyridazinone derivative of the formula I



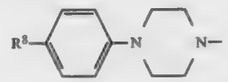
where R^1 is hydrogen or methyl, R^2 is hydrogen or, together with R^1, forms methylene or ethylene, R^3 is

(a) a group of the formula



where the dashed line may be an additional bond and, where relevant, R^7 is hydrogen or C_1–C_4-acyl, or

(b) a group of the formula



where R^8 is hydrogen or C_1–C_4-acyl, or

(c) 1,3-tetrahydroisoquinolin-2-yl, R^4 is hydrogen or, together with R^3, forms a direct bond or methylene, R^5 is hydrogen or methyl, R^6 is hydrogen or halogen and n is 0 or 1, acetylsalicylic acid being present in an amount of 30–600 parts by weight and the compound I in an amount of 5–50 parts by weight.

4,734,406

3-PYRIDYLMETHYLNAPHTHYL DERIVATIVES AND COMPOSITION CONTAINING THEM USEFUL TO INHIBIT THROMBOXANE SYNTHETASE

Hans-Hermann Lau; Wilhelm Bartmann, both of Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main, and Günther Wess, Erlensee, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

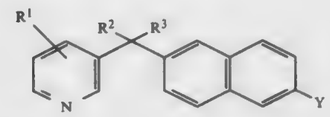
Filed Mar. 11, 1986, Ser. No. 838,547

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508903

Int. Cl.[4] A61K *31/44, 31/535;* **C07D** *213/55, 413/10*

U.S. Cl. 514—183 **4 Claims**

1. A compound of the formula I



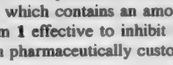
in which:

R^1 denotes hydrogen or, in the 2-, 4-, 5- or 6- position, halogen, a straight chain or branched alkyl radical having 1–6 carbon atoms, a cycloalkyl radical having 3–7 carbon atoms, a phenyl C_1–C_2-alkyl radical or a phenyl radical, each of which can be substituted 1–3 times in the phenyl nucleus by halogen, alkyl and/or alkoxy, each having 1–6 carbon atoms, or denotes a hydroxyl radical or an alkoxy radical having 1–6 carbon atoms,

R^2 denotes a hydroxyl radical, halogen, an alkoxy radical having 1–6 carbon atoms, or a phenoxy radical which can be substituted 1–3 times in the phenyl nucleus by halogen, trifluoromethyl, alkyl and/or alkoxy. each having 1–6 carbon atoms,

R^3 denotes hydrogen, a cycloalkyl radical having 3–7 carbon atoms, a straight-chain or branched alkyl radical having 1–8 carbon atoms, a straight-chain or branched unsaturated aliphatic hydrocarbon radical having up to 8 carbon atoms and up to 3 double or triple bonds, a phenyl radical which can be substituted 1–3 times in the phenyl nucleus by halogen, trifluoromethyl, hydroxyl, alkyl and-/or alkoxy, each having 1–6 carbon atoms, or denotes a 2-, 3- or 4-pyridyl radical which can be substituted in the 4- or 5- position by C_1- C_4-alkyl,

Y denotes a radical of the formula CO_2R^5,



or CH_2OH,

R^5 denoting hydrogen, a straight chain or branched alkyl radical having up to 8 carbon atoms, a straight-chain or branched unsaturated aliphatic hydrocarbon radical having up to 6 carbon atoms, a cycloaliphatic hydrocarbon radical having 3 to 7 carbon atoms, an araliphatic hydrocarbon radical having 7 to 10 carbon atoms, or a physiologically tolerated metal ion, NH_4 ion or an ammonium ion which is derived from a primary, secondary or tertiary amine, or a tetraalkylammonium ion,

R^6 denoting hydrogen, a straight chain or branched alkyl radical having 1–6 carbon atoms, a cycloaliphatic hydrocarbon radical having 3–7 carbon atoms, an araliphatic hydrocarbon radical which has 7–10 carbon atoms and can be substituted 1–3 times in the aryl nucleus by halogen, trifluoromethyl, alkyl and/or alkoxy, each having 1–6 carbon atoms, or denoting a phenyl radical which can be substituted 1–3 times in the phenyl nucleus by halogen, trifluoromethyl, alkyl and/or alkoxy, each having 1–6 carbon atoms,

R^7 denoting hydrogen, a straight chain or branched alkyl radical having 1–6 carbon atoms, or

R^6 and R^7 together denoting a $-(CH_2)_n-$group with n=3–6, or a $-(CH_2)_p-Z-(CH_2)_p-$ group with p=2 or 3,

Z being oxygen or N—R^8,

R^8 denoting hydrogen or a straight-chain or branched alkyl radical having 1–6 carbon atoms,

or a physiologically tolerated acid addition salt thereof, with the exception of the compounds of the formula I in which, when Y denotes the radicals $-CONH_2$ or $COOR^5$, with R^5 denoting hydrogen or C_1–C_6-alkyl, R^1 and R^3 represent hydrogen.

4. A composition for use in inhibiting thromboxane synthetase which contains an amount of a compound as claimed in claim 1 effective to inhibit thromboxane synthetase together with pharmaceutically customary auxiliaries and vehicles.

4,734,407

ALPHA-AMINOACYL-PENICILLINS AND CEPHALOSPORINS

Gunter Schmidt, Wuppertal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,236

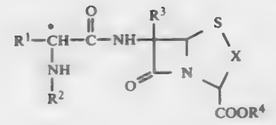
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509618

Int. Cl.[4] A61K *31/43, 31/545;* **C07D** *501/14, 499/46*

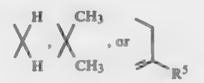
U.S. Cl. 514—196 **20 Claims**

1. A β-lactam compound of the formula

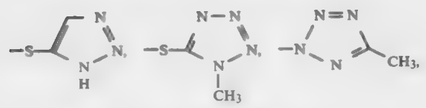
VOL 1088 ISS 5 MR 29 1988 UMI

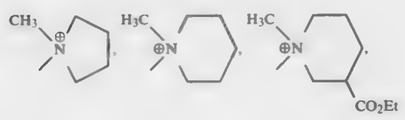


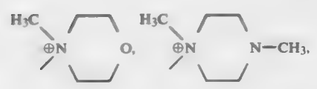
in which
X represents a radical of the fomula

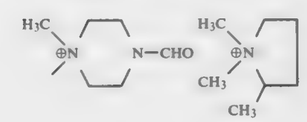


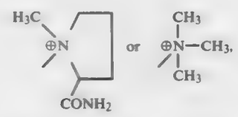
wherein
R^5 represents hydrogen, or represents halogen, azido or represents vinyl, 1-propenyl, 1-butenyl or straight-chain, branched or cyclic alkyl which has up to 10 C atoms and is optionally substituted by halogen, alkoxy or alkylthio with in each case up to 8 C atoms, halogenoalkylthio and halogenoalkoxy with in each case up to 8 C atoms, nitro, cyano, an amino group, aryl, SO_3H, SO_2NH_2, SO_2-alkyl with up to 6 C atoms, OH, SH, acyloxy or acylthio with in each case up to 7 C atoms, $OCONH_2$, carboxyl, alkoxycarbonyl with up to 8 C atoms, phenylthio, benzyloxy and/or benzylthio, by a pyridinium radical, or by a radical of the formula



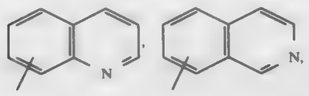




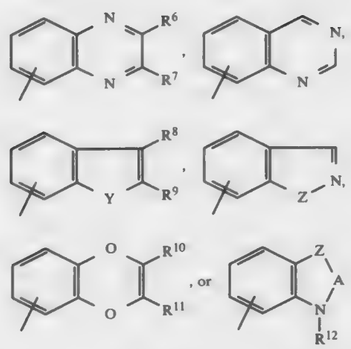




or represents alkoxy or alkylthio with up to 5 C atoms,
R^1 represents a radical of the formula



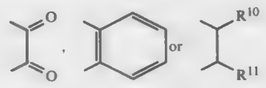
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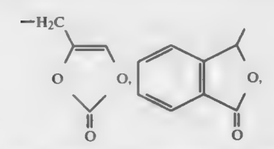
which is optionally mono-, di-, tri- or tetra-substituted by halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy or halogenoalkylthio with in each case up to 8 C atoms, nitro, cyano or phenyl,
wherein
R^6 and R^7 are identical or different and represent hydrogen, or represent C_6–C_{10}-aryl, or represent an amino group, or represent hydroxyl, or represent alkoxy with up to 8 C atoms, or represent acyl or acyloxy with in each case up to 7 C atoms, or represent alkyl with up to 12 C atoms,
R^8 and R^9 are identical or different and represent hydrogen, or represent C_6–C_{10}-aryl, or represent heterocyclyl, or represent hydroxyl, or represent an amino group, or represent alkoxy with up to 8 C atoms, or represent acyl with up to 7 C atoms, or represent acyloxy with up to 7 C atoms, or represent alkoxycarbonyl with up to 8 C atoms, or represent alkyl with up to 12 C atoms, or
R^8 and R^9 together represent the group



R^{10} and R^{11} are identical or different
and represent hydrogen, or represent alkyl with up to 12 C atoms, or represent C_6–C_{10}-aryl, or represent alkoxycarbonyl with up to 8 C atoms,
Y represents oxygen or —N—R^{12},
Z represents oxygen, sulphur or —N—R^{13},
A represents the group



and wherein
R^{12} and R^{13} are identical or different and represent hydrogen, or represent C_6–C_{10}-aryl, or represent straight-chain, branched or cyclic alkyl with up to 8 C atoms,
R^2 represents hydrogen or represents an amino-protective group,
R^3 represents hydrogen, or represents alkoxy or alkylthio with in each case up to 5 C atoms, or represents an amino group, or represents NHCHO, and
R^4 represents hydrogen, or represents a carboxyl-protective group, or represents alkali metal ions or ammonium ions, or represents a radical of the formula



$-CH_2-O-CO-C(CH_3)_3$ or $-CH(CH_3)-O-CO-O-C_2H_5$.

14. An antibacterial composition comprising an antibacterially effective amount of a β-lactam compound according to claim **1** in admixture with a pharmaceutically acceptable diluent.

4,734,408

CRYSTALLINE CEPHALOSPORIN ANTIBIOTIC SALTS AND SOLVATES

Allen S. Katner, deceased late at Indianapolis, Ind., by Ruth M.E. Katner, legal representative assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 17, 1986, Ser. No. 943,108
Int. Cl.[4] C07D *501/36;* **A61K** *31/545*
U.S. Cl. 514—206 **6 Claims**

1. Crystalline syn-7-[2-(2-aminothiazol-4-yl)-2-methoxyiminoacetamido]-3-(3-methyl-3H-imidazolo-[4,5-c]pyridinium-5-ylmethyl)-3-cephem-4-carboxylate dimethylacetamide hydrate exhibiting essentially the following X-ray diffraction pattern:

Spacing, d(A)	Relative Intensities, I/I_1
14.03	0.45
9.88	0.85
8.71	0.20
7.00	1.00
6.39	0.15
6.24	0.20
5.56	0.20
5.39	0.80
5.05	0.20
4.89	0.25
4.65	0.35
4.42	0.35
4.20	0.25
4.00	0.35
3.90	0.05
3.70	0.20
3.56	0.40
3.47	0.40
3.34	0.20
3.20	0.10
3.09	0.25
2.97	0.10
2.75	0.05
2.71	0.05.

4,734,409

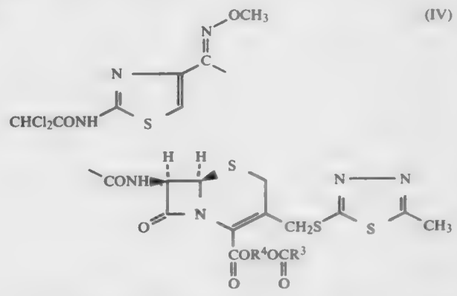
CEPHALOSPORIN DERIVATIVE, PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Shigeaki Muto, Tokyo; Chikao Yoshikumi, Kunitachi; Takao Furusho, Machida; Isamu Motokawa, Hino; Yoko Onishi, Mitaka; Akihiko Kanno, Tokyo; Takayoshi Fujii, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,135
Claims priority, application Japan, Feb. 24, 1984, 59-33972
Int. Cl.[4] A61K *31/545;* **C07D** *501/36*
U.S. Cl. 514—206 **6 Claims**

1. A cephalosporin compound represented by the formula IV:

(IV)



wherein R^3 represents an alkyl group having 1 to 6 carbon atoms and R^4 represents an alkylene group having 1 to 4 carbon atoms.

4,734,410

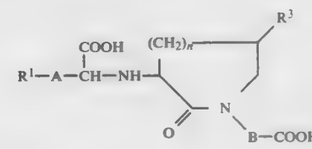
LACTAM DERIVATIVES AND THEIR USE AS HYPOTENSIVE AGENTS

Hiroaki Yanagisawa; Sadao Ishihara; Akiko Ando; Takuro Kanazaki; Hiroyuki Koike, and Yasuteru Iijima, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,041
Claims priority, application Japan, Oct. 11, 1985, 60-226044
Int. Cl.[4] C07D *225/02, 223/10;* **A61K** *31/55, 31/395*
U.S. Cl. 514—212 **27 Claims**

1. A compound of formula (I):

(I)



in which:
R^1 represents a C_1–C_{10} alkyl group, a C_3–C_8 cycloalkyl group, an aryl group or a heterocyclic group, or said alkyl group having at least one substituent selected from the group consisting of substituents (a) or said cycloalkyl, aryl or heterocyclic group having at least one substituent selected from the group consisting of substituents (a) and substituents (b);
R^3 represents a C_1–C_{10} alkyl group, a C_3–C_8 cycloalkyl group, an aralkyl group wherein the alkyl part is C_1–C_6 alkyl, an aryl group, a C_1–C_6 alkyl group having a heterocyclic substituent or a heterocyclic group, where said heterocyclic group or said heterocyclic substituent is selected from the group consisting of tetrahydrofuranyl, tetrahydrothienyl, tetrahydropyranyl, morpholinyl, furyl, thienyl, imidazolyl,

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thiazolyl, oxazolyl, isoxazolyl, oxadiazolyl, thiadiazolyl, pyridyl, quinolyl, isoquinolyl and indolyl, or said alkyl group having at least one substituent selected from the group consisting of substituents (a) or said cycloalkyl, aryl or heterocyclic group having at least one substituent selected from the group consisting of substituents (a) and (b);

A represents a single bond, a methylene group, an ethylene group or a group of formula —CO—CH_2—, —O—CH_2— or —S—CH_2—;

B represents an alkylene group having from 1 to 4 carbon atoms;

n is an integer from 1 to 3;

substituents (a) are:

hydroxy groups, C_1–C_6 alkoxy groups, an aryl group having from 0 to 3 substituents selected from the group consisting of substituents (a) and substituents (b), aralkyloxy groups where the alkyl part is C_1–C_6 alkyl and the aryl part has from 0 to 3 substituents selected from the group consisting of substituents (a) and (b), aryloxy groups, halogen atoms, nitro groups, cyano groups, carboxy groups, alkoxycarbonyl groups having a total of from 2 to 7 carbon atoms, amino groups, C_1–C_6 alkylamino groups, dialkylamino groups wherein each alkyl part is C_1–C_6 alkyl, C_1–C_6 aliphatic or carbocyclic aryl acylamino groups carbamoyl groups, alkylcarbamoyl groups where the alkyl part is C_1–C_6 alkyl, dialkylcarbamoyl groups where each alkyl part is C_1–C_6 alkyl, mercapto groups, C_1–C_6 alkylthio groups, arylthio groups, C_1–C_6 alkylsulfonyl groups and arylsulfonyl groups wherein the aryl part has from 0 to 3 C_1–C_6 alkyl substituents;

substituents (b) are:

C_1–C_6 alkyl groups and aralkyl groups wherein the alkyl part is C_1–C_6 alkyl and the aryl part has from 0 to 3 substituents selected from the group consisting of substituents (a) and substituents (b); and said aryl and said aryl part of said aralkyl, aralkyloxy, aryloxy, aryl acylamino, arylthio or arylsulfonyl is phenyl or naphthyl;

and pharmaceutically acceptable salts and esters thereof.

27. A method of treating angiotensin-induced hypertension in a mammal by administering to said mammal an effective amount of a hypotensive agent, wherein said hypotensive agent is selected from the group consisting of compounds of formula (I) and pharmaceutically acceptable salts and esters thereof as claimed in claim **1**.

4,734,411

PYRROLIZIDINE COMPOUNDS, SALTS THEREOF, PROCESS FOR THE PREPARATION OF SAME AND PHARMACEUTICAL AGENTS COMPRISING SAME

Masayasu Kurono, Mie; Yasuaki Kondo, Kasugai; Takuji Yamaguchi, Kuwana; Toshinao Usui, Gifu; Ryoichi Unno, Nagoya; Hiromoto Kimura, Kasugai; Masato Fukushima, Komaki; Mitsuru Oka, Kusugai; Shinichi Ikeda, Kusugai; Noboru Kuboyama, Kusugai; Takashi Ito, Kasugai; Seiji Miyano, Fukuoka, and Kunihiro Sumoto, Ohnojo, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

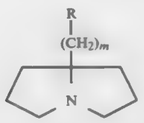
Filed Aug. 11, 1986, Ser. No. 895,099

Claims priority, application Japan, Sep. 4, 1985, 60-193834

Int. Cl.[4] **A61K** *31/55;* **C61K** *31/54;* **C07D** *521/00, 519/00*

U.S. Cl. 514—220 **9 Claims**

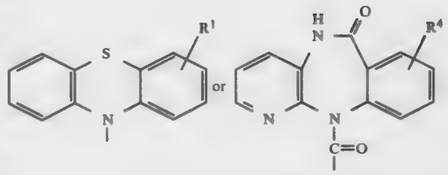
1. A pyrrolizidine compound represented by the formula



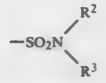
(I)

wherein

R is a radical of



R^1 is hydrogen, halogen, alkyl group, alkoxy group, alkanoyl group, trifluoromethyl radical, trimethylsilyl radical or



R^2 and R^3 are same or different and are hydrogen or alkyl group, respectively, R^4 is hydrogen, halogen, alkyl group or alkoxy group and m is an integer of 0 to 5, of a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,734,412

MEDICAMENT

Renate Kessler, Munich, Fed. Rep. of Germany, assignor to Peter M. Forrer Paliz, Basel, Switzerland

Filed Jan. 22, 1985, Ser. No. 693,431

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402507

Int. Cl.[4] **A61U** *31/55, 31/495*

U.S. Cl. 514—221 **5 Claims**

1. A medicament, comprising besides usual pharmaceutical adjuvants and carrier substances, as the active principle, a combination of

(a) at least one compound of the benzodiazepine group, and

(b) cinnarizine in a weight ratio of from 1:3 to 1:50.

4,734,413

SUBSTITUTED 1,2,4-TRIAZOLO[1,5-A]TRIAZINES AS BRONCHODILATORS

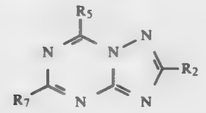
James J. Wade, St. Paul, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Mar. 2, 1987, Ser. No. 20,861

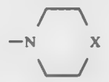
Int. Cl.[4] **A61K** *31/54, 31/535;* **C07D** *487/04, 405/04*

U.S. Cl. 514—222 **7 Claims**

5. A method for obtaining bronchodilation in a mammal, comprising administering a compound of the formula



wherein R_2 is hydrogen, lower alkyl, or phenyl; R_5 is lower alkyl; and R_7 is methoxy, methylthio or



wherein X is independently oxygen, sulfur, methylene, imido or lower N-alkylimido; or a pharmaceutically acceptable acid-addition salt thereof; said compound being administered in an amount sufficient to cause bronchodilation.

4,734,414

ANTI-INFLAMMATORY AND ANTI-ARTHRITIC PYRAZOLO-[1,5-A]-1,3,5-TRIAZINE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

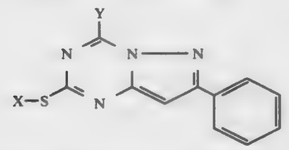
Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 741,819, Jun. 6, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 907,039

Int. Cl.[4] **A61K** *31/38, 31/44, 31/53;* **C07D** *251/72*

U.S. Cl. 514—245 **10 Claims**

1. A compound having the formula



wherein X is an alkyl group having between 1 and 8, inclusive, carbon atoms and Y is a hydroxyalkylamino group having between 2 and 8, inclusive, carbon atoms; a dialkylamino group having between 2 and 12, inclusive, carbon atoms; a carboxyalkylamino group having between 2 and 9, inclusive, carbon atoms; alkylthioalkylamino group having between 3 and 10, inclusive, carbon atoms; a thiazolidinyl group or a pyridylmethylthioethylamino group.

8. A therapeutic composition for preventing or treating inflammation and arthritis comprising an anti-inflammatory effective amount of the compound of claim **1** together with a pharmaceutically acceptable carrier substance.

10. A method of treating or preventing inflammation and arthritis in a mammal comprising administering to said mammal an anti-inflammatory effective amount of the compound of claim **1**.

4,734,415

SUBSTITUTED 4,5-DIHYDRO-6-(SUBSTITUTED)-PHENYL-3(2H)-PYRIDAZINONES AND 6-(SUBSTITUTED) PHENYL-3(2H)-PYRIDAZINONES

Ila Sircar, and James A. Bristol, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

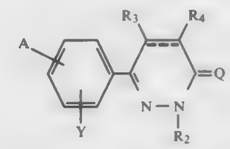
Continuation-in-part of Ser. No. 407,973, Aug. 13, 1982, which is a continuation-in-part of Ser. No. 402,488, Jul. 27, 1982, which is a continuation-in-part of Ser. No. 302,181, Sep. 17, 1981, Pat. No. 4,353,905. This application Mar. 22, 1983, Ser. No. 477,695

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.[4] **C07D** *237/04;* **A61K** *31/50*

U.S. Cl. 514—247 **34 Claims**

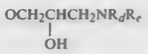
1. A compound of the formula



wherein ═══ represents a double or single bond between two carbon atoms; Q is oxygen or sulfur; R_2 is hydrogen or lower alkyl; R_3 is hydrogen, lower alkyl, or when ═══ represents a single bond, R_3 is di-lower alkyl; R_4 is hydrogen, lower alkyl or when ═══ represents a double bond, R_4 is hydrogen, lower alkyl amino, cyano, $CONR_aR_b$, hydroxy, CH_2OH or



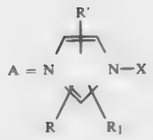
where R_a and R_b are independently H or lower alkyl, R_c is lower alkyl or phenyl, and n is zero to two; or R_3 and R_4 taken together form a ring containing one to four carbon atoms; Y is H, halogen, lower alkyl, lower alkoxy, or a group such as



where R_d and R_e are independently H, lower alkyl, $(CH_2)_nR_f$ where R_f is a benzene ring optionally substituted by halogen, hydroxy, lower alkyl, lower alkoxy, and CF_3, and n is zero to three, and A is any of the groups from a–e, and is attached to the 3- or 4-position of the phenyl ring:

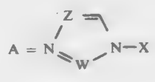
VOL 1088 ISS 5 MR 29 1988 UMI

a.



wherein R_1, R', and R are independently hydrogen or lower alkyl, CH_2OH, SCH_3, $SOCH_3$, SO_2CH_3, hydroxyalkyl, halogen, $(CH_2)_kNR''$, R''', wherein k is zero to two and R_2 and R_3 are independently hydrogen or lower alkyl, wherein lower alkyl contains one to six carbon atoms; X is a bond, or $O(CH_2)_n$ wherein n is two to five; with the proviso that when (i) X is a bond and is attached to the 4-position of the phenyl ring and (ii) Y is H, the groups R_1, R', and R cannot be H or lower alkyl;

b.



where

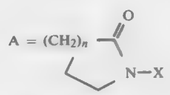
(i) W=L=Z=CH

(ii) W=Z=N and L=CH or

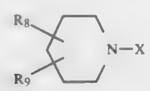
(iii) L=Z=N and W=CH

and X is a bond, $(CH_2)_n$ or $O(CH_2)_{n+1}$ wherein n is one to four;

c.



wherein n is one to three; or

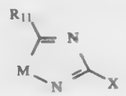


wherein R_8 and R_9 is ethylenedioxy and the pharmaceutically acceptable acid addition salts thereof; X is the same as defined in 1b, or

d.



wherein ═══ represents a double or single bond between two carbon atoms; R_{11} is hydrogen or lower alkyl; M is NH, O, or S, and X is a direct bond or



where X, M, and R_{11} are the same as defined above, and the pharmaceutically acceptable acid addition salts thereof.

4,734,416

PHARMACEUTICALLY USEFUL CARBOSTYRIL DERIVATIVES

Kazuo Banno; Takafuni Fujioka; Yasuo Oshiro, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

Filed Mar. 28, 1979, Ser. No. 24,602

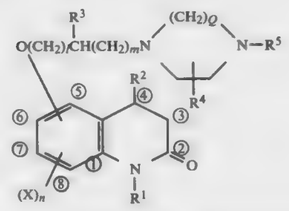
Claims priority, application Japan, Mar. 30, 1978, 53-37783

Int. Cl.[4] A61K *31/495;* **C07D** *403/02*

U.S. Cl. 514—253 **118 Claims**

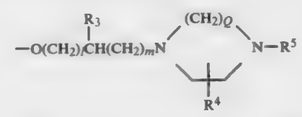
1. A carbostyril derivative represented by the formula,

(1)



wherein R^1 is a hydrogen atom, an alkyl group having 1 to 6 carbon alkynyl group having 2 to 4 carbon atoms or a phenyl alkyl group having an alkylene group having 1 to 4 carbon atoms; R^2 is a hydrogen atom; R^3 is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R^4 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; R^5 is a phenyl group which may be substituted by 1 to 3 identical or different groups selected from the group consisting of a halogen atom, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms; X is a halogen atom; n is 0 or an integer of 1 or 2; Q is an integer of 2; l and m are respectively 0 or an integer of 1 to 6, but the sum of l and m should not exceed 6; the carbon-carbon bond at the 3- and 4-positions in the carbostyril skeleton in a single or double bond; the substituted position of the side chain of

(i)



is any one of the 4-, 5-, 6-, 7- or 8-positions; or an acid addition salt thereof, with the proviso that when said side chain is substituted at the 4-position and said carbon-carbon bond at the 3- or 4-positions is a double bond, then R^2 does not exist.

4,734,417

LIPID- AND CHOLESTEROL-REDUCING DERIVATIVES OF HALO-BIPHENYL PRIMARY ALCOHOLS

Henri Cousse; André Delhon; Jean-Pierre Rieu, and Gilbert Mouzin, all of Castres, France, assignors to P.F. Medicament, Paris, France

Filed Jul. 7, 1986, Ser. No. 882,586

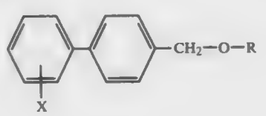
Claims priority, application France, Jul. 8, 1985, 85 10528

Int. Cl.[4] A61K *31/495;* **C07D** *295/00, 213/80*

U.S. Cl. 514—255 **8 Claims**

1. Heterocyclic ester or ether of a halo-biphenyl primary alcohol having the formula (I):

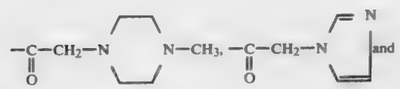
(I)

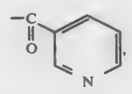


in which:

X represents a halogen atom in ortho or meta position

R represents a pyridyl methyl radical or an acyl radical selected from





and, in the event that R is salifiable, therapeutically acceptable salts thereof with inorganic or organic acids.

5. A method of lipid reduction and cholesterol reduction in a subject in need thereof which comprises the step of administering to the said subject a lipid-reducing and cholesterol-reducing amount of a compound of claim **1**.

4,734,418

QUINAZOLINE COMPOUNDS AND ANTIHYPERTENSIVES

Keiichi Yokoyama, Iwakuni; Koji Kato, Kuga; Takumi Kitahara, Ohtake; Hiroyasu Ohno, Iwakuni; Takeshi Nishina; Mikio Kumakura, both of Mobara; Akira Awaya; Takuo Nakano, both of Yokohama; Kazuyuki Watanabe, and Sakae Saruta, both of Mobara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 6, 1985, Ser. No. 805,905

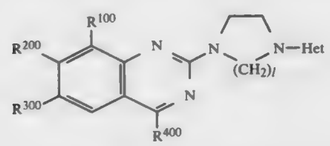
Claims priority, application Japan, Dec. 14, 1984, 59-263015; Sep. 5, 1985, 60-194968; Sep. 18, 1985, 60-204463

Int. Cl.[4] A61K *31/55, 31/505;* **C07D** *403/14, 401/04*

U.S. Cl. 514—258 **18 Claims**

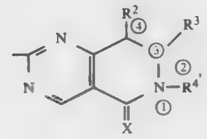
1. A quinazoline compound represented by the following formula I or a pharmacologically acceptable salt thereof:

I

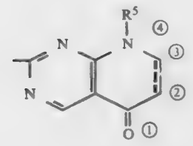


wherein R^{100} means a hydrogen atom or methoxy group, R^{200} and R^{300} denote individually a hydrogen atom or lower alkoxy group, R^{400} is a hydrogen atom or amino group, l stands for 2 or 3, and Het is represented by any one of the following formulae:

II

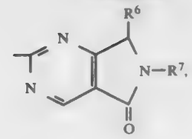


III

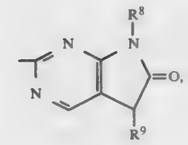


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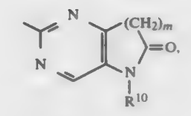
IV



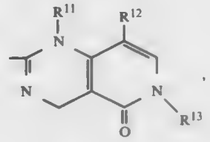
V



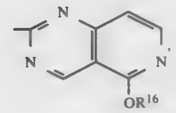
VI



VIII

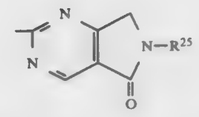


X



or

XIV



wherein,

in the formula II, either single or double bond is formed between the 3- and 4-positions, R^2 means a hydrogen atom or a lower alkyl, aralkyl in which alkyl is C_1–C_4 and aryl is phenyl, cyano or formyl group, R^3 denotes a hydrogen atom or a lower alkoxycarbonyl or phenyl group, R^4 is a hydrogen atom or a lower alkyl, lower cycloalkyl, hydroxy—substituted lower alkyl, lower alkoxy-substituted lower alkyl, lower alkoxy-substituted lower alkyl, phenyl or aralkyl in which alkyl is C_1–C_4 and aryl is phenyl and X stands for an oxygen or sulfur atom,

in the formula III, either single or double bond is formed between the 2- and 3-positions, and R^5 means a hydrogen atom or a lower alkyl group,

in the formula IV, R^6 and R^7 means individually a hydrogen atom or a lower alkyl group,

in the formula V, R^8 and R^9 mean individually a hydrogen atom or a lower alkyl group,

in the formula VI, m stands for 2 or 3, and R^{10} means a hydrogen atom or a lower alkyl group,

in the formula VIII, R^{11}, R^{12} and R^{13} mean individually a hydrogen atom or a lower alkyl group,

in the formula X, R^{16} means a lower alkyl group, and

in the formula XIV, R^{25} means a C_5–C_8 alkyl, C_4–C_7 cycloalkyl, hydroxy-substituted lower alkyl group, lower al-

VOL 1088 ISS 5 MR 29 1988 UMI

koxy-substituted lower alkyl, di(lower alkylamino)-substituted lower alkyl or aralkyl in which alkyl is C_1–C_4 and aryl is phenyl.

13. An antihypertensive preparation comprising, as an active component, an effective amount of a quinazoline compound according to claim 1 and a pharmacologically acceptable carrier therefor.

4,734,419

QUINAZOLINE DERIVATIVES, COMPOSITIONS THEREOF AND THEIR USE IN TREATING DIABETIC COMPLICATIONS

Masashi Hashimoto; Teruo Oku; Yoshikuni Ito; Takayuki Namiki; Kozo Sawada; Chiyoshi Kasahara, and Yukihisa Babe, all of Ibaraki, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

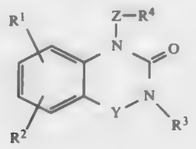
Filed Sep. 16, 1986, Ser. No. 908,005

Claims priority, application United Kingdom, Oct. 7, 1985, 8514663

Int. Cl.[4] **A61K** *31/505;* **C07C** *239/80*

U.S. Cl. 514—259 **9 Claims**

1. A compound of the formula:



in which

R^1 and R^2 are each hydrogen, halogen, lower. alkoxy or halo(lower)alkyl,

R^3 is dihalophenyl, naphthyl(lower)alkyl, phenyl(lower)alkyl substituted by one or two substituent(s) selected from the group consisting of halogen, lower alkoxy, halo(lower)alkyl and lower alkyl, or thienyl(lower)alkyl,

R^4 is carboxy or protected carboxy,

Y is carbonyl, thiocarbonyl or sulfonyl and

Z is lower alkylene, and pharmaceutically acceptable salts thereof.

9. A method for the treatment of diabetic complications which comprises administering an effective amount of a compound of claim 1 to a human or animal.

4,734,420

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Miami, Fla.

Continuation-in-part of Ser. No. 127,472, Mar. 5, 1980, Pat. No. 4,692,458. This application May 2, 1980, Ser. No. 145,773

Int. Cl.[4] **A61K** *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **57 Claims**

1. A new compound having the general formula

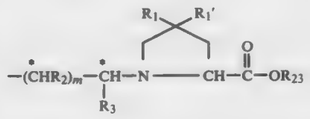
R-A-S-Z

wherein

R is hydrogen, formul, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-arginyl, L-lysyl or pyro-L-glutamyl;

A is a divalent moiety derived from methionine, cysteine, arginine, ω-nitro-arginine, lysine, ornithine, aspartic acid, asparagine, glutamic acid, glutamine, homocystein, penicillamine, norluecine, serine, β-alanine, ethionine, homoserine, isoserine, norvaline, threonine, α-aminobutyric acid, α-aminoisobutyric acid, cyclohexanylalanine, O-phosphothreonine, S-ethylcysteine, vinyl glycine or an α-methyl derivative of any of valine, leucine, isoleucine, cysteine, methionine, threonine, aspartic acid, glutamic acid, asparagine, glutamine, lysine or arginine, wherein the β-amino group of the moiety derived from β-alanine or the α-amino group of the moiety derived from each other named amino acid is in amide linkage with R when R is acyl and such moiety forms a primary amine group with R when R is H and the carboxyl group of said moiety is in thioester linkage with S;

S is a sulfur atom joined in thioester linkage to A; and Z is selected from the following:



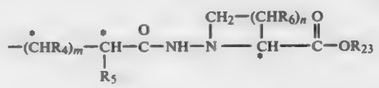
II.

wherein

(i) R_1 and R_1', are each hydrogen or halogen, and R_2 and R_3 are each hydrogen, lower alkyl or trifluoromethyl provided that only one of R_2 and R_3 may be trifluoromethyl and further provided that at least one of R_1, R_1', R_2 and R_3 must be halogen or trifluoromethyl;

(ii) R_{23} is hydrogen or lower alkyl and

(iii) m is 0 or 1;



III.

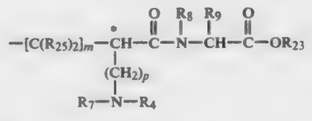
wherein

(i) R_4 and R_5 are each hydrogen, lower alkyl or phenyl-lower alkylene;

(ii) n is 1, 2 or 3;

(iii) R_6 is hydrogen or hydroxy or when n is 2, R_6 may also be halogen and

(iv) m and R_{23} are as stated in II above;



IV.

wherein

(i) R_7 is hydrogen, lower alkanoyl or amino (imino)methyl;

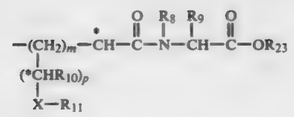
(ii) p is 0 or an integer of from 1 to 4;

(iii) R_{25} is hydrogen but when m is 1, p is 0, R_4 is hydrogen and R_7 is lower alkanoyl, R_{25} may also be lower alkyl;

(iv) R_8 is selected from hydrogen, lower alkyl and hydroxy lower alkylene and R_9 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxy phenyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene but R_8 and R_9 may together constitute a $(CH_2)_v$ bridge wherein v is 3 or 4, thus forming a 5 or 6-membered ring with the N and C to which R_8 and R_9 are respectively attached and in such instance when v is 3 one hydrogen of $(CH_2)_v$ may be replaced by OH or halogen and when v is 4, one such hydrogen may be replaced by OH;

(v) m and R_{23} are each as defined in II above, and

(vi) R_4 is as defined in III above, provided further however, that m and p may not both be 0,



V.

wherein

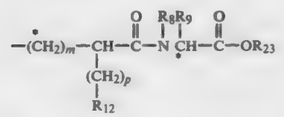
(i) R_{10} is hydrogen or lower alkyl;

(ii) R_{11} is hydrogen, lower alkyl or lower alkanoyl;

(iii) X is O or S;

(iv) m and R_{23} are as stated in II above, and

(v) R_8, R_9 and p are as stated in IV above.



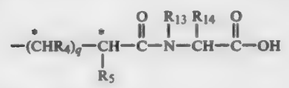
VI.

wherein

(i) R_{12} is selected from carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl and cyano;

(ii) m and R_{23} are as stated in II above; and

(iii) R_8, R_9 and p are as stated in IV above.



VII.

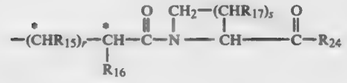
wherein

(i) R_{13} is hydrogen, lower alkyl or phenyl-lower alkylene:

(ii) R_{14} is selected from hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene;

(iii) R_4 and R_5 are each as stated in III above; and

(iv) q is 0, 1 or 2;



VIII.

wherein

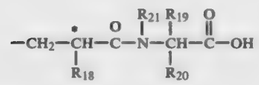
(i) R_{15} and R_{16} are each hydrogen, lower alkyl, phenyl or phenyl-lower alkylene;

(ii) r is 0, 1 or 2;

(iii) s is 1, 2 or 3;

(iv) R_{17} is hydrogen, hydroxy or lower alkyl and when s is 2, R_{17} may also be halogen;

(v) R_{24} is hydroxy, amino or lower alkoxy;



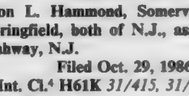
IX.

wherein

(i) R_{18} is hydrogen or lower alkyl;

(ii) R_{19} and R_{20} are each lower alkyl and may together constitute a $(CH_2)_w$ bridge wherein w is 4, to form a ring of 5-carbons with the carbon to which they are attached;

(iii) R_{21} is hydrogen or lower alkyl and may constitute with R_{19} a $(CH_2)_x$ bridge wherein x is 3, to form a five-membered ring with the N and C to which they are respectively attached;



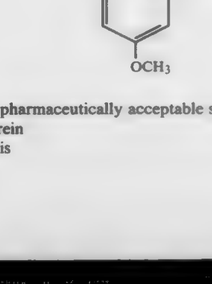
X.

wherein

(i) R_{22} is hydrogen or lower alkyl;

(ii) t is 0 or 1; and

(iii) R_{26} is selected from



wherein u is 0 or 1 and R_{23} is as defined for formula II above.



XI.

wherein

(i) z is 2 or 3;

(ii) R_{10} is as stated in V above; and

(iii) R_3 is as stated in II above.

4,734,421

ANTI-INFLAMMATORY SUBSTITUTED 2-BENZYL-MERCAPTO-IMIDAZOLE AND PYRIMIDINE DERIVATIVES COMPOSITIONS AND METHOD OF USE THEREFOR

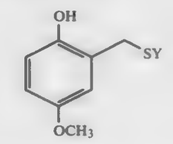
Milton L. Hammond, Somerville, and Robert A. Zambias, Springfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 29, 1986, Ser. No. 924,391

Int. Cl.[4] **H61K** *31/415, 31/505;* **C07D** *233/84, 239/38*

U.S. Cl. 514—274 **9 Claims**

1. A compound of formula (I)



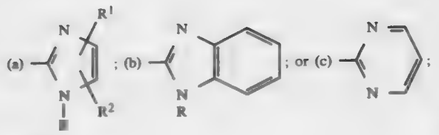
(I)

or a pharmaceutically acceptable salt thereof

wherein

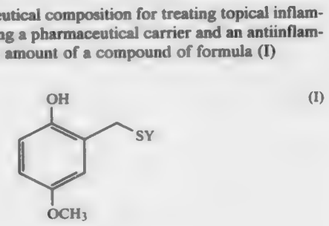
Y is

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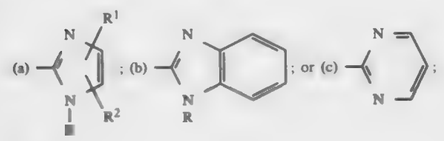
R is
(a) H;
(b) C_{1-6}alkyl;
(c) phenyl or phenyl or substituted with one or more substituents selected from a group consisting of
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) loweralkylthio;
(5) loweralkylsulfinyl;
(6) loweralkylsulfonyl;
(7) loweralkyl;
(8) loweralkanoyl;
(9) halololoweralkyl;
(10) —COOH;
(11) hydroxyloweralkyl;
(12) halo loweralkyanoyl; or
(13) loweralkanoyloxy;
R^1 and R^2 independently are
(a) H;
(b) C_{1-6}alkyl; or
(c) phenyl.

4. A pharmaceutical composition for treating topical inflammation comprising a pharmaceutical carrier and an antiinflammatory effective amount of a compound of formula (I)



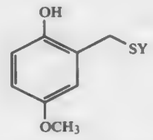
(I)

or a pharmaceutically acceptable salt thereof
wherein
Y is



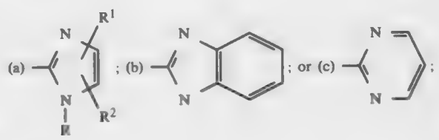
R is
(a) H;
(b) C_{1-6}alkyl;
(c) phenyl or substituted with one or more substituents selected from a group consisting of
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) loweralkylthio;
(5) loweralkylsulfinyl;
(6) loweralkylsulfonyl;
(7) loweralkyl;
(8) loweralkanoyl;
(9) halololoweralkyl;
(10) —COOH;
(11) hydroxyloweralkyl;
(12) halo loweralkyanoyl; or
(13) loweralkanoyloxy;
R^1 and R^2 independently are
(a) H;
(b) C_{1-6}alkyl; or
(c) phenyl.

7. A method of treating or decreasing topical inflammation comprising the administration to a mammalian species in need of such treatment an antiinflammatory amount of a compound of formula (I)



(I)

or a pharmaceutically acceptable salt thereof
wherein
Y is



R is
(a) H;
(b) C_{1-6}alkyl;
(c) phenyl or substituted phenyl with one or more substituents selected from a group consisting of
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) loweralkylthio;
(5) loweralkylsulfinyl;
(6) loweralkylsulfonyl;
(7) loweralkyl;
(8) loweralkanoyl;
(9) halololoweralkyl;
(10) —COOH;
(11) hydroxyloweralkyl;
(12) halo loweralkyanoyl; or
(13) loweralkanoyloxy;
R^1 and R^2 independently are
(a) H;
(b) C_{1-6}alkyl; or
(c) phenyl.

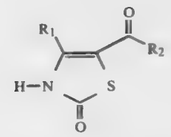
4,734,422

CARDIOTONIC AROYLTHIAZOLONES AND THE USE THEREOF

J. Martin Grisar, Wissembourg, France; Richard C. Dage, and Richard A. Schnettler, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 786,984, Oct. 15, 1985, abandoned.
This application Feb. 26, 1987, Ser. No. 21,538
Int. Cl.⁴ A61K *31/425*
U.S. Cl. 514—369 **18 Claims**

1. A method of treating heart failure in a patient in need thereof which comprises administering to the patient a cardiotonically effective amount of an aroylthiazolone of the formula



wherein
R_1 is a hydrogen or (C_1–C_4)alkyl group; and
R_2 is a phenyl or benzyl group optionally substituted with one or two members of the group consisting of (C_1–C_4)alkyl, (C_1–C_4)alkoxy, (C_1–C_4)alkylthio, (C_1–C_4)alkylsulfinyl, trifluoromethyl, cyano, amino, mono- and di-(C_1–C_4-)alkylamino, and halogen.

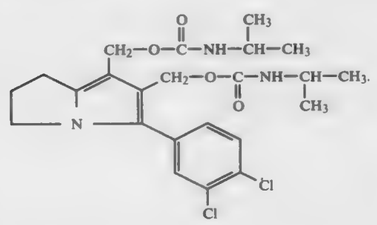
4,734,423

METHOD OF SOLID CANCER TUMOR TREATMENT USING ISOPROPYLPYRROLIZINE DERIVATIVE

Wayne K. Anderson, Williamsville, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Continuation of Ser. No. 378,189, May 14, 1982, abandoned.
This application Dec. 3, 1985, Ser. No. 804,237
Int. Cl.⁴ A61K *31/40*
U.S. Cl. 514—413 **9 Claims**

1. A method of providing treatment to a warm blooded animal in need of treatment of a solid cancer tumor of the colon or breast comprising parenterally administering to said warm blooded animal an effective solid cancer tumor inhibiting amount of an isopropylpyrrolizine of the formula:



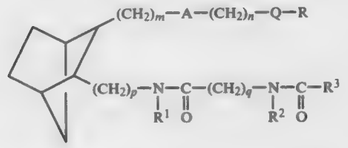
4,734,424

BICYCLOHEPTANE SUBSTITUTED DIAMIDE AND ITS CONGENER PROSTAGLANDIN ANALOGS

Steven E. Hall, Ewing Township, Mercer County, and Joyce Reid, Dayton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 24, 1986, Ser. No. 911,173
Int. Cl.⁴ C07C *177/00;* **A61K** *31/557*
U.S. Cl. 514—382 **14 Claims**

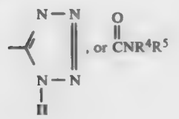
1. A compound having the structure



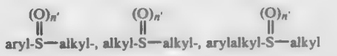
including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; Q is —CH=CH—, —CH_2—,



or a single bond; R is C_2H, C_2alkyl, C_2 alkali metal, CO_2 polyhydroxyamine salt, —CH_2OH,



wherein R^4 and R^5 are the same or different and are H, lower alkyl, hydroxy, lower alkoxy or aryl at least one of R^4 and R^5 being other than hydroxy and lower alkoxy; p is 1 to 4; R^1 is H or lower alkyl; q is 1 to 12; R^2 is H or lower alkyl; and r^3 is H, lower alkyl, lower alkenyl, lower alkynyl, aryl, arylalkyl, lower alkoxy, arylalkloxy, aryloxy, amino, alkylamino, arylamino, arylalkylamino, lower alkyl-s-, aryl-S-, arylalkyl-S-,



(wherein n' is 0, 1 or 2), alkylaminoalkyl, arylaminoalkyl, arylalkylaminoalkyl, alkoxyalkyl, aryloxyalkyl or arylalkoxyalkyl, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio;

cycloalkyl alone or as part of another group is a saturated cyclic hydrocarbon group containing 3 to 12 carbons, which is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonyl amino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups; and

aryl alone or as part of another group refers to monocyclic or bicyclic aromatic groups containing from 6 to 10 carbons in the ring portion and which is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro group, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

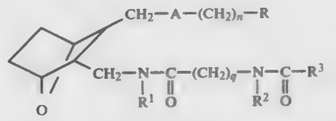
4,734,425

7-OXABICYCLOHEPTANE SUBSTITUTED HYDROXAMIC ACID PROSTAGLANDIN ANALOGS

Masami Nakane, Aichi, Japan, and Joyce Reid, Dayton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

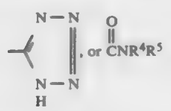
Filed Oct. 17, 1986, Ser. No. 920,006
Int. Cl.⁴ C07D *307/00, 405/06;* **A61K** *31/34, 31/41*
U.S. Cl. 514—382 **13 Claims**

1. A compound having the structure

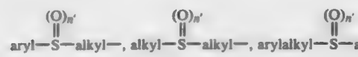


VOL 1088 ISS 5 MR 29 1988 UMI

including all stereoisomers thereof, wherein A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; R is CO_2H, CO_2alkyl, CO_2 alkali metal, CO_2 polyhydroxyamine salt, —CH_2OH,



wherein R^4 and R^5 are the same or different and are H, lower alkyl, hydroxy, lower alkoxy or aryl at least one of R^4 and R^5 being other than hydroxy and lower alkoxy; q is 1 to 12; R^1 is H or OH; R^2 is OH or H provided that one of R^1 and R^2 is OH and the other is H; and R^3 is H, lower alkyl, lower alkenyl, lower alkynyl, aryl, arylalkyl, lower alkoxy, arylalkoxy, aryloxy, alkylamino, arylamino, arylalkylamino, lower alkyl-S-, aryl-S-, arylalkyl-S-,



(wherein n' is 0, 1 or 2), alkylaminoalkyl, arylaminoalkyl, arylalkylaminoalkyl, alkoxyalkyl, aryloxyalkyl or arylalkoxyalkyl, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio;

cycloalkyl alone or as part of another group is a saturated cyclic hydrocarbon group containing 3 to 12 carbons, which is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylocarbonyl amino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups; and

aryl alone or as part of another group is a monocyclic or bicyclic aromatic group containing from 6 to 10 carbons in the ring portion and which is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

4,734,426

5,6-EPOXY-7-OXABICYCLOHEPTANE SUBSTITUTED DIAMIDE PROSTAGLANDIN ANALOGS

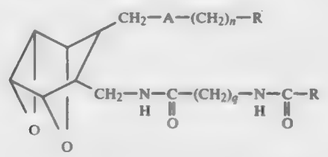
Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 24, 1986, Ser. No. 911,178

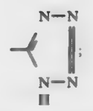
Int. Cl.[4] C07D *493/18;* **A61K** *31/34, 31/41*

U.S. Cl. 514—382 **21 Claims**

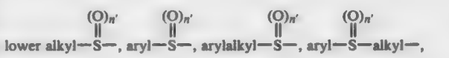
1. A compound having the structure

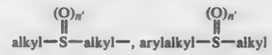


including all stereoisomers thereof, wherein A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; R is CO_2H, CO_2alkyl, CO_2 alkali metal, CO_2 polyhydroxyamine salt or



q is 1 to 12; and R^1 is lower alkyl, lower alkenyl, lower alkynyl, aryl, arylalkyl, lower alkoxy, arylalkloxy, aryloxy, alkylamino, arylamino, arylalkylamino,





(wherein n' is 0, 1 or 2), alkylaminoalkyl, arylaminoalkyl, arylalkylaminoalkyl, alkoxyalkyl, aryloxyalkyl or arylalkoxyalkyl, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcyloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio; and

aryl alone or as part of another group is a monocyclic or bicyclic aromatic group containing from 6 to 10 carbons in the ring portion, and which is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups; and

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups.

4,734,427

FUNGICIDAL PHENYLSULPHONYL IMIDAZOLES

Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Akihiko Yanagi, Tokyo, Japan; Akinori Hirashima, Wuppertal, Fed. Rep. of Germany; Wilhelm Brandes, Leichlingen, Fed. Rep. of Germany, and Paul Reinecke, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

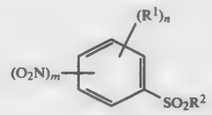
Filed Feb. 10, 1987, Ser. No. 12,988

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605714

Int. Cl.[4] A01N *43/50;* **C07D** *233/56*

U.S. Cl. 514—398 **10 Claims**

8. A method of combating fungi which comprises applying to the fungi or to their habitat a fungicidally effective amount of a phenylsulphonyl azole of the formula



in which

R^1 is alkyl with 1 to 6 carbon atoms,

m is 1 or 2,

n is 0 or 1, and

R^3 is alkyl with 1 to 4 carbon atoms.

4,734,428

AMINOETHYLIMIDAZOLE AND CYTOPROTECTIVE AND GASTRIC ANTISECRETORY COMPOSITION CONTAINING THE SAME

Gilbert G. Aubard, Palaiseau; Jacques Bure, Neuilly sur Seine; Agnès G. Grouhel, Meudon; Jean-Louis Junien, Paris; Véronique J. Lelievre, Paris; Xavier B. Pascaud, Paris, and Claude P. Roux, Paris, all of France, assignors to Jouveinal S.A., Paris, France

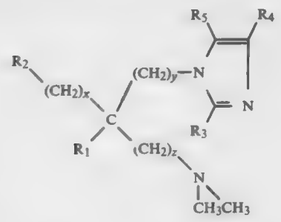
Continuation of Ser. No. 683,474, Dec. 19, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,481

Claims priority, application France, Jan. 11, 1984, 84 00351

Int. Cl.[4] A61K *31/415;* **C07D** *233/61*

U.S. Cl. 514—399 **5 Claims**

1. Aminoethyl imidazole of formula:



(I)

wherein

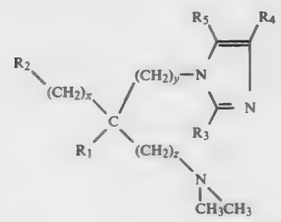
R_1 is lower alkyl,

R_2 is lower alkyl, phenyl or phenoxy, optionally substituted by halogen, lower alkoxy or phenyl,

R_3, R_4 and R_5, each represent hydrogen,

x, y and z are 0 or 1 with the proviso that y and z cannot be the same, or a pharmaceutically acceptable addition salt with an acid.

5. A pharmaceutical composition having a cytoprotective and gastric antisecretory activity, said composition comprises a pharmaceutically acceptable carrier and a therapeutically effective amount of an aminoethyl imidazole of formula:



(I)

wherein

R_1 is lower alkyl,

R_2 is lower alkyl, phenyl or phenoxy, optionally substituted by halogen, lower alkoxy or phenyl,

R_3, R_4 and R_5, each represent hydrogen,

x, y and z are 0 or 1 with the proviso that y and z cannot be the same,

or a pharmaceutically acceptable salt with an acid.

4,734,429

CYCLOALKANE[1,2-c:4,3-c']DIPYRAZOLES AND THEIR USE AS BRONCHODILATORS

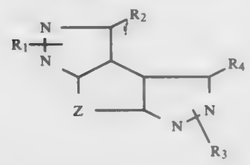
Michael E. Le Tourneau, and Norton P. Peet, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 27, 1987, Ser. No. 7,304

Int. Cl.[4] A61K *31/415;* **C07D** *231/54, 231/56*

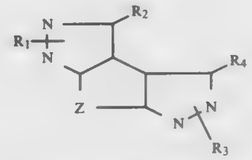
U.S. Cl. 514—406 **7 Claims**

1. A compound of the formula



wherein R_1, R_2, R_3 and R_4 are each independently selected from hydrogen or methyl with the proviso that at least one of them must be methyl and with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conjugated double bonds with the specific position of the double bonds being determined by the position of the R_1 or R_3 substituents; and Z is —(CH_2)n— wherein n is 2 or 3.

7. A method for alleviating bronchial spasm in mammals which comprises administering to a mammal in need thereof a bronchodilating amount of a compound of the formula



wherein R_1, R_2, R_3 and R_4 are each independently selected from hydrogen or methyl with the proviso that at least one of them must be methyl and with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conugated double bonds with the specific position of the double bonds being determined by the position of the R_1 or R_3 substituents; and Z is —(CH_2)n— wherein n is 2 or 3.

4,734,430

DIPYRAZOLES AND THEIR USE AS BRONCHODILATORS

Michael E. Le Tourneau, and Norton P. Peet, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

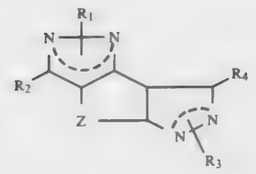
Filed Jan. 27, 1987, Ser. No. 7,305

Int. Cl.[4] A61K *31/415;* **C07D** *231/54, 231/56*

U.S. Cl. 514—406 **17 Claims**

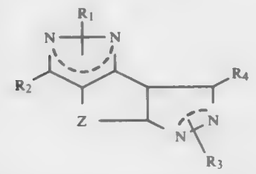
1. A compound of the formula

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wherein R_1, R_2, R_3 and R_4 are each independently hydrogen or methyl with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conjugated double bonds with the specific position of the double bonds being determined by the position of the R_1 or R_3 substituents; Z is —CH=CH— or —$[C_nH_{(2n-q)}(CH_3)_q]$— wherein n is 1, 2 or 3; q is 0, 1 or 2; and $C_nH_{(2n-q)}$ is a straight-chain alkylene.

17. A method for alleviating bronchial spasm in mammals which comprises administering to a mammal in need thereof a bronchodilating amount of a compound of the formula



wherein R_1, R_2, R_3 and R_4 are each independently hydrogen or methyl with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conjugated double bonds with the specific position of the double bonds being determined by the position of the R_1 or R_3 substituents; Z is —CH=CH— or —$[C_nH_{(2n-q)}(CH_3)_q]$— wherein n is 1, 2 or 3; q is 0, 1 or 2; and $C_nH_{(2n-q)}$ is a straight-chain alkylene.

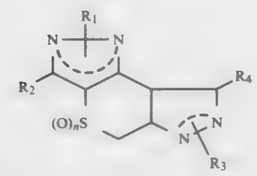
4,734,431

THIOPYRANODIPYRAZOLES AND THEIR USE AS BRONCHODILATORS

Michael E. Le Tourneau, and Norton P. Peet, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

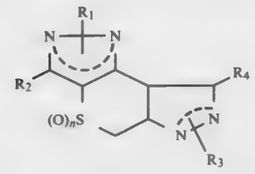
Filed Jan. 27, 1987, Ser. No. 7,308
Int. Cl.[4] A61K *31/415;* **C07D** *231/00*
U.S. Cl. 514—407 **4 Claims**

1. A compound of the formula



wherein R_1, R_2, R_3 and R_4 are each independently hydrogen or methyl with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conjugated double bonds with the specific position of the double bonds being determined by the position of the R_1 and R_3 substituents; and n is 0, 1 or 2.

4. A method for alleviating bronchial spasm in mammals which comprises administering to a mammal in need thereof a bronchodilating amount of a compound of the formula



wherein R_1, R_2, R_3 and R_4 are independently hydrogen or methyl with R_1 and R_3 being positioned on one of the nitrogens in their respective rings with the other nitrogen then being doubly bonded to the adjacent carbon; the dotted lines indicate the presence of two conjugated double bonds with the specific position of the double bonds being determined by the position of the R_1 and R_3 substituents; and n is 0, 1 or 2.

4,734,432

STABILIZED PLANT PROTECTING CARBOFURAN SUSPENSIONS

András Szegö; Viktória Péterdi; Ferenc Kováts; József Sós; István Rácz; Sándor Ángyán, all of Budapest, and Katalin Mármarosi née Kellner, Biatorbágy, all of Hungary, assignors to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Continuation of Ser. No. 512,449, Jul. 11, 1983, abandoned. This application Feb. 19, 1986, Ser. No. 831,467
Claims priority, application Hungary, Jul. 9, 1982, 2241/82
Int. Cl.[4] A01N *43/08*
U.S. Cl. 514—469 **5 Claims**



1. An insecticidal stabilized plant-protecting agent suspension which comprises:
10 to 60% by weight of carbofuran;
5 to 30% by weight of an oil phase;
0 to 10% by weight of an emulsifier;
10 to 20% by weight of an insecticidally inert carrier; and
balance water up to 100% by weight, and wherein the ratio of the carbofuran to the oil phase is linear between carbofuran:oil concentration ratio of 60%:5% and 10%:30% and the suspension is formed by high-shear mixing in a high-shear mixer rotating with a peripheral speed of 15 to 20 m/s.

3. A process for the preparation of an insecticidal, stabilized plant-protecting agent suspension which comprises:
10 to 60% by weight of carbofuran;
5 to 30% by weight of an oil phase;
0 to 10% by weight of an emulsifier;
10 to 20% by weight of an insecticidally inert carrier; and

balance water up to 100% by weight, and wherein the ratio of the carbofuran to the oil phase is linear between carbofuran:oil concentration ratio of 60%:5% and 10%:30%, which comprises the steps of:
(a) adding an oil phase to a suspension of carbofuran to form an oil-containing layer and a suspension layer containing the carbofuran in a dispersed state; and
(b) mixing together the suspension-layer and the oil-containing layer by means of a mixer having a peripheral speed of 15 to 20 m/s along with the carrier to obtain the stabilized suspension.

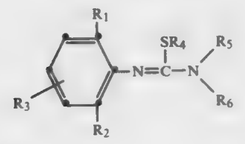
4,734,433

ISOTHIOUREAS AND INSECTICIDAL USE THEREOF

Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 676,961, Nov. 30, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 934,763
Claims priority, application Switzerland, Dec. 8, 1983, 6572/83
Int. Cl.[4] C07C *119/20;* **A01N** *37/00*
U.S. Cl. 514—508 **17 Claims**

1. A compound of the formula



wherein
R1 is C1–C5-alkyl,
R3 is hydrogen, halogen, C1–C5-alkyl, phenoxy or phenoxy which is substituted by 1 or 2 identical or different members selected from the group consisting of halogen, C1–C5-alkyl or trifluoromethyl radicals,
R4 is C1–C5-alkyl, allyl or propargyl,
R5 is C1–C5-alkyl, C3–C6-cycloalkyl, allyl or propargyl, and

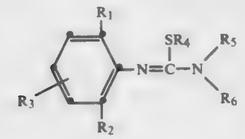
(a)

R6 is CO—R7, CO—CO—R8 or SO2—R7; and
R2 is hydrogen or C1–C5-alkyl; or

(b)

R6 is CO—OR7; and
R2 is C1–C5-alkyl;
wherein
R7 is C1–C5-alkyl, phenyl or phenyl which is substituted by 1 or 2 halogen or methyl radicals, and
R8 is C1–C10-alkoxy or di(C1–C5)-alkylamino.

13. A method for controlling plant destructive insects and representatives of the order Acarina, which method comprises applying at the locus of the plant an insecticidally effective amount of a compound of the formula



wherein
R1 is C1–C5-alkyl,
R2 is hydrogen or C1–C5-alkyl,
R3 is hydrogen, halogen, C1–C5-alkyl, phenoxy or phenoxy which is substituted by 1 or 2 identical or different members selected from the group consisting of halogen, C1–C5-alkyl or trifluoromethyl radicals,
R4 is C1–C5-alkyl, allyl or propargyl,
R5 is C1–C5-alkyl, C3–C6-cycloalkyl, allyl or propargyl, and
R6 is CO—R7, CO—OR7, CO—CO—R8 or SO2—R7; wherein
R7 is C1–C5-alkyl, phenyl or phenyl which is substituted by 1 or 2 halogen or methyl radicals, and
R8 is C1–C10-alkoxy or di(C1–C5)-alkylamino.

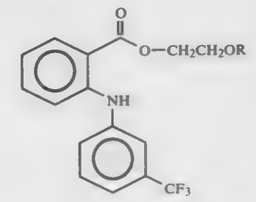
4,734,434

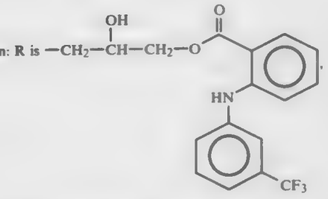
METHOD FOR THE TREATMENT OF PRURITUS AND COMPOSITION FOR THE USE THEREIN

Robert L. Procaccini, Hatfield; Kim D. Lamon, Abington, and Nicholas S. Hagen, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Mar. 11, 1986, Ser. No. 838,365
Int. Cl.[4] A61K *31/24*
U.S. Cl. 514—535 **20 Claims**

1. A method for the relief of pruritus in a human or other mammal comprising administering to a human or other mammal afflicted therewith a topical composition comprising an effective percutaneous absorption inhibiting amount of aluminum hydroxide and an effective antipruritic amount of a compound of the formula:





wherein: R is —CH_2—CH(OH)—CH_2—O—

alkyl, hydroxy alkyl, acyloxy alkyl or alkoxy alkyl; or a pharmaceutically acceptable salt thereof.

4,734,435

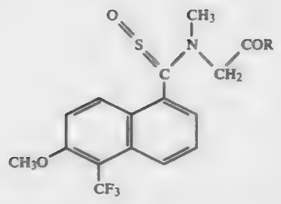
N-[[6-METHOXY-5-(TRIFLUOROMETHYL)-1-NAPHTHALENYL]-THIOXOMETHYL]-N-METHYLGLYCINE S-OXIDE AND THE AMIDE THEREOF

Eckhardt S. Ferdinandi, Princeton; Michael S. Malamas, Plainsboro; Kazimir Sestanj, Monmouth Junction, and Surendra N. Sehgal, Princeton, all of N.J., assignors to American Home Products Corp., New York, N.Y.

Continuation-in-part of Ser. No. 849,242, Apr. 7, 1986, abandoned. This application Nov. 25, 1986, Ser. No. 934,760
Int. Cl.[4] A61K *31/19, 31/165;* **C07C** *147/14*
U.S. Cl. 514—562 **5 Claims**

1. A purified compound of formula (I)

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(I)

wherein R is —OH or —NH_2 and the pharmaceutically acceptable salts thereof wherein R is —OH.

5. A method of preventing or relieving neuropathy, nephropathy, retinopathy or cataracts caused by accumulation of sorbitol in cells of a diabetic mammal, which comprises administering to said mammal an alleviating or prophylactic amount of a compound of claim 1 or the pharmaceutically acceptable salts thereof.

4,734,436

BENZOYLPHENYLUREA DERIVATIVE AND ITS USE AS AN INSECTICIDE

Akira Kurozumi, Tokyo; Satoshi Ototake, Ohmiya; Hitoshi Sato, Ageo; Satoshi Tanabe, Ageo; Tatsumi Hayaoka, Ageo, and Akio Masui, Ohmiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

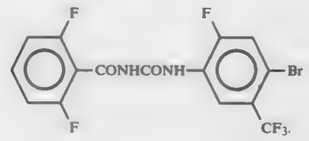
Filed Dec. 9, 1985, Ser. No. 806,601

Claims priority, application Japan, Dec. 21, 1984, 59-268435

Int. Cl.⁴ C07C *157/12, 127/22;* **A01N** *47/34*

U.S. Cl. 514—594 **2 Claims**

1. A compound of the formula:



4,734,437

GROWTH PROMOTION

David B. Anderson, Greenfield; Klaus K. Schmiegel, Indianapolis, and Edward L. Veenhuizen, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

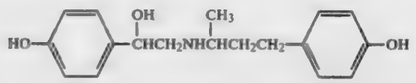
Continuation of Ser. No. 628,002, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 462,587, Jan. 31, 1983, abandoned. This application May 7, 1986, Ser. No. 860,719

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/135*

U.S. Cl. 514—653 **8 Claims**

1. A method for promoting the growth of swine comprising administering to the animal a growth promoting amount of a compound having the formula



or an acid addition salt thereof.

4,734,438

NOREPINEPHRINE POTENTIATED COMPOSITIONS AND METHOD OF USE

Frank J. Macri, 3602 Janet Rd., Silver Spring, Md. 20906

Division of Ser. No. 722,177, Apr. 10, 1985, Pat. No. 4,581,376, which is a continuation of Ser. No. 488,690, Apr. 26, 1983, abandoned. This application Mar. 27, 1986, Ser. No. 844,596

Int. Cl.⁴ A61K *31/135*

U.S. Cl. 514—653 **8 Claims**

1. A pharmaceutical composition comprising: (1) 0.1–0.01 wt % isoproterenol or a pharmaceutically aceptable salt thereof; and (2) 0.0001–0.05 wt % l-norepinephrine or a pharmaceutially acceptable salt thereof.

4,734,439

FOAM-CONTAINING POLYURETHANE(UREA) COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 672,439, Nov. 16, 1984, abandoned. This application Nov. 4, 1986, Ser. No. 926,770

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402696

Int. Cl.⁴ C08J *9/42*

U.S. Cl. 521—54 **29 Claims**

1. A process for the production of a foam-containing polyurethane(urea) composition in finely divided or particulate form comprising reacting:

(A) at least one di- and/or polyfunctional isocyanate-terminated prepolymer having an isocyanate group content of from 2 to 12% by weight,

(B) from 0 to 50% by weight based on the weight of (A) of a lower molecular weight organic di- and/or polyisocyanate, with the mixture of (A) and (B) having an isocyanate group content of 30% by weight or less,

(C) water in an amount of from two to sixty times the weight of components (A) and (B),

(D) from 0 to 5.0 equivalent % based on total isocyanate equivalents in (A) and (B) of an organic di- and/or polyamine, in the presence of

(E) from 3 to 95% by weight of a synthetic resin foam in the form of particles,

(F) from 0 to 90% by weight of lignite and/or peat, and

(G) from 0 to 90% by weight of other organic and/or inorganic fillers wherein the percents by weight of (E), (F) and (G) are based on the total moisture-free weight of components (A), (B), (D), (E), (F) and (G) and wherein the sum of components (E), (F) and (G) is from 5 to 95% by weight based on the total moisture-free weight of said components (A), (B), (D), (E), (F) and (G), said foam containing polyurethane(urea) compositions having a water-absorbability of from 33 to 97% by weight, and whereby said foam absorbs the isocyanate and any added filler uniformly both on the external surfaces of said foam and on the internal surfaces of the cells of said foam.

4,734,440

FOAMABLE COMPOSITIONS

Barry Topcik, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 889,246, Jul. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 806,157, Dec. 12, 1985, Pat. No. 4,659,746, which is a continuation-in-part of Ser. No. 684,687, Dec. 21, 1984. This application Dec. 18, 1986, Ser. No. 943,076

Claims priority, application Canada, Dec. 20, 1985, 498268; European Pat. Off., Aug. 14, 1986, 86900518.1

Int. Cl.⁴ C08J *9/10*

U.S. Cl. 521—95 **6 Claims**

1. A foamable composition comprising a polymer selected from the group consisting of a hydrolyzable ethylene/silane copolymer and a hydrolyzable ethylene/ethyl acrylate/silane terpolymer and the following components in about the following amounts per 100 parts by weight of polymer:

Component	Parts by Weight
azodicarbonamide	1 to 25
p,p'oxybis-benzene sulfonyl hydrazide	0.5 to 3.5
silanol condensation catalyst	0.02 to 0.3
an organic peroxide	0.5 to 2
a monomeric polyunsaturated acrylate ester of a polyhydric compound	0.5 to 2

4,734,441

EXPANDABLE POLYMERIC COMPOSITION AND METHOD

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 940,124, Mar. 9, 1987, Pat. No. 4,705,811, which is a division of Ser. No. 835,133, Apr. 7, 1986, Pat. No. 4,661,302. This application Jul. 9, 1987, Ser. No. 71,443

Int. Cl.⁴ C08J *9/14, 9/22*

U.S. Cl. 521—139 **3 Claims**

1. An expanded cellular polymeric composition comprising at least 50% by weight of an alkenyl aromatic polymer and from about 0.06 to about 15.0% by weight of an expansion aid comprising polyphenylene ether, said composition having a density of between about 2.0 to about 16.0 kg/m^3.

4,734,442

AMMONIA-MODIFIED POLYETHER POLYOLS AND POLYURETHANE POLYMERS PREPARED THEREFROM

Tito Viswanathan, 1818 Joyce Ct., Little Rock, Ark. 72204

Filed Jun. 5, 1987, Ser. No. 58,763

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—163 **10 Claims**

1. A method for making an ammonia-modified polyether polyol for use in the manufacture of polyurethane polymer having improved fire-resisting qualities, said method comprising:

(a) reacting a reducing sugar with an epoxide to produce a crude polyether polyol; and

(b) then reacting the polyether polyol with an effective amount of gaseous or liquid ammonia to chemically bind the ammonia to the polyol to produce an ammonia-modified polyether polyol.

4,734,443

POLYURETHANES WITH MONO-OL/DIOL HALONEOCARBYL POLYETHERS AND THEIR ESTERS

Chester E. Pawloski, Bay City; Sally P. Ginter, Sanford, and David J. Wampfler, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1986, Ser. No. 854,189

Int. Cl.⁴ C08G *18/00, 18/14*

U.S. Cl. 521—171 **22 Claims**

1. A flame-retardant, substantially non-scorching polyurethane foam prepared using a composition comprising an organic polyisocyanate, a polyahl and a flame-retarding amount of a mondiol haloneocarbyl polyether or an ester capped derivative of such polyether, said mondiol haloneocarbyl polyether being represented by the general formula:

$$H(O—R[Y)_{n'}(X)_n(Y)_{n'}]_{n''}—R^1$$

wherein

HO—R is a hydro(oxyhaloeocarbyl) moiety;

R_1 is separately at each occurrence hydrogen or $C_{1\text{-}20}$ organic moiety;

X is separtely at each occurrence halogen-containing 1,1,2,2-tetra-substituted ethoxy;

Y is separately at each occurrence 1,1,2,2-tetra-substituted ethoxy not containing halogen;

n is an integer from zero to about 20;

n' is an integer from zero to about 20; and

n'' is separately at each occurrence a number from one to about 20.

4,734,444

CURABLE MIXTURES CONTAINING N-SULFONYLAMINOSULFONIUM SALTS AS CATIONICALLY ACTIVE CATALYSTS

Andreas Henne, Neustadt; Wolfram Ochs, Wachenheim; Helmut Tesch, Birkenheide; Gunnar Schornick, Neuleiningen, and Reinhold J. Leyrer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 13,965

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604580

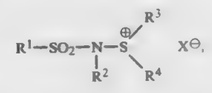
Int. Cl.⁴ C08G *59/72, 59/68*

U.S. Cl. 522—24 **10 Claims**

1. A curable mixture containing

(a) one or more compounds which, under the influence of a cationic catalyst, are convertible into a higher molecular weight compound, and

(b) an active amount as a curing catalyst of an N-sulfonylaminosulfonium salt of the formula (I)



(I)

where

R^1 is C_1–C_{18}-alkyl, 5- or 6-ring-cycloalkyl or phenyl which may be substituted by chlorine or bromine atoms, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio groups or carboxyl or alkoxy-carbonyl groups,

R^2 is C_1–C_6-alkyl, 5- or 6-ring-cycloalkyl, aliphatic C_1–C_6-acyl or substituted or unsubstituted benzoyl, R^3 and R^4 each have the same meanings as R^1 and can be identical to or different from R^1 and each other, and $X^\ominus$ is a non-nucleophilic anion.

4,734,445

LATEX COMPOSITIONS CAPABLE OF PRODUCING ELASTOMERS WITH HYDROPHILIC SURFACES

Isao Noda, Cincinnati, and Douglas F. Hager, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 18, 1986, Ser. No. 943,988

Int. Cl.⁴ C08F *83/00;* **B05C** *1/16*

U.S. Cl. 523—201 **2 Claims**

1. A latex composition which comprises:

(a) a liquid phase selected from the group consisting of water, water-miscible solvents, and mixtures thereof; and

(b) from about 5 to about 50% by weight of latex particles dispersed in said aqueous phase, said particles comprising an elastomeric hydrophobic core and an outer hydrophilic shell attached to said core, said core comprising a polymer selected from the group consisting of butadiene, isoprene styrene, and mixtures thereof, and said shell comprising moieties L-X, wherein L comprises a hydrophobic hydrocarbyl group containing one or more unsaturated bonds and X is a polyoxyalkylene hydrophilic group.

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4,734,446

POLYMERIC COMPOSITIONS COMPRISING AN OIL-SOLUBLE POLYMER AND AN OIL-SOLUBLE ACRYLATE POLYMERIZATION OF PRODUCT

Craig D. Tipton, Perry, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 826,478, Feb. 5, 1986, Pat. No. 4,654,403, which is a division of Ser. No. 715,428, Mar. 25, 1985, Pat. No. 4,594,378. This application Oct. 27, 1986, Ser. No. 923,774

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.[4] **C08L** *23/10, 23/18, 25/08, 33/06*

U.S. Cl. 524—106 **18 Claims**

1. A polymeric composition comprising a mixture, comprising:

(A) an oil-soluble polymer selected from the group consisting of a homopolymer of a non-aromatic mono-olefin having at least three carbon atoms, and a copolymer of the non-aromatic mono-olefin with an aromatic monoolefin, said polymer having a number average molecular weight of about 500 to about 100,000; and

(B) which is a mixture containing both (B-1) and (B-2), wherein

(B-1) is a nitrogen-containing ester of a carboxy-containing interpolymer derived from at least two monomers, one of said monomers being an aliphatic olefin or a vinyl aromatic monomer, the other of said monomers being (ii) at least one alpha, beta-unsaturated aliphatic carboxylic acid, anhydride or ester thereof, the interpolymer having a reduced specific viscosity of from about 0.05 to about 2, the nitrogen-containing ester being characterized by the presence within its polymer structure of the following polar groups which are derived from the carboxy group of the interpolymer:

(a) at least one carboxylic ester group having at least 8 aliphatic carbon atoms in the ester group, and

(b) at least one carbonyl-polyamino group derived from reacting a carboxy group of said interpolymer with a polyamino compound having one primary or secondary amino group and at least one tertiary amino or heterocyclic amino group; and

(B-2) is an oil-soluble acrylate polymerization product of at least one ester of the formula

$$CH_2{=}C(X){-}COOR \qquad (III)$$

wherein X is hydrogen or an alkyl or aryl group, and R is a monovalent hydrocarbyl group containing at least four carbon atoms, or an ether derivative of said hydrocarbyl group.

4,734,447

HOT-MELT ADHESIVE

Yoshiya Hattori, Kyoto, and Toshimori Sakakibara, Shiga, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Sep. 2, 1986, Ser. No. 902,654

Claims priority, application Japan, Sep. 24, 1985, 60-211665; Sep. 24, 1985, 60-211666; Oct. 18, 1985, 60-234141

Int. Cl.[4] **C08L** *23/26, 53/02*

U.S. Cl. 524—271 **4 Claims**

1. A hot-melt adhesive composition which comprises a styrene block copolymer resin selected from the group consisting of block copolymer resins of styrene and butadiene and block copolymer resins of styrene and isoprene, a tackifier and a modified polybutene which is solid at room temperature and is prepared by heat-treating a polybutene in the presence of an organic peroxide, said styrene block copolymer resin and said tackifier being kneaded together in air at a temperature of about 150° to 220° C. prior to mixing with said modified polybutene.

4,734,448

PROPYLENE POLYMER COMPOSITION

Toshikazu Kasahara, Ichihara, and Makoto Iida, Sodegaura, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Japan

Filed Jun. 30, 1986, Ser. No. 880,012

Claims priority, application Japan, Jul. 10, 1985, 60-150092; Feb. 21, 1986, 61-34966; Feb. 21, 1986, 61-34967; Feb. 21, 1986, 61-34968

Int. Cl.[4] **C08K** *5/10, 5/09;* **C08L** *53/00*

U.S. Cl. 524—317 **8 Claims**

1. A propylene polymer composition comprising

(A) 100 parts by weight of a propylene polymer or a modified polymer obtained by heat-treating said propylene polymer in the presence of an organic peroxide to a degradation degree of 1.2–80, said propylene polymer essentially consisting of the following two fractions (a) or three fractions (b) obtained by polymerization over a stereoregular catalyst:

(a)

(i) 70–95% by weight of a propylene homopolymer or a propylene-ethylene copolymer having an ethylene content of not more than 2% by weight; and

(ii) 30–5% by weight of a propylene-ethylene copolymer having an ethylene content of 10–50% by weight; or

(b)

(iii) 50–94% by weight of a propylene homopolymer having an intrinsic viscosity [η] of 0.5–2.5 dl/g;

(iv) 3–30% by weight of a propylene homopolymer having an intrinsic viscosity [η] of more than 2.5 dl/g; and

(v) 3–30% by weight of a propylene-ethylene copolymer having an intrinsic viscosity [η] of not less than 2.8 dl/g; and

(B) 0.1 to 1.5 parts by weight of an ester derived from an aliphatic saturated monocarboxylic acid of from 12 to 22 carbon atoms and a polyhydric alcohol.

4,734,449

SYNERGISTIC MIXTURES OF NICKEL-CONTAINING 2,2'-THIOBIS(ALKYLPHENOLS) AND 2-HYDROXY-4-ALKOXYBENZOPHENONES

Francois Gugumus, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 688,090, Dec. 31, 1984, Pat. No. 4,623,480. This application Aug. 7, 1986, Ser. No. 895,602

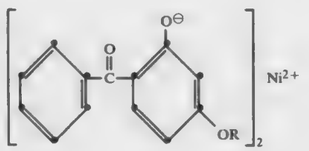
Claims priority, application Switzerland, Jan. 5, 1984, 32/84

Int. Cl.[4] **C08K** *5/13;* **C09K** *15/22, 15/26*

U.S. Cl. 524—328 **2 Claims**

1. A stabilizer composition containing at least one Ni-containing light stabilizer selected from each of class I and of class II or from each of class I and of class II':

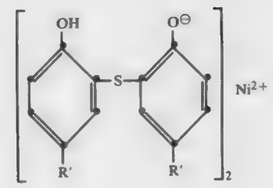
class I compounds having the formula I



(I)

in which R represents C_1–C_{12}-alkyl, and

class II or class II' compounds having the formula II or II'



or



(II)

in which R' represents C_1–C_8-alkyl and in which nickel in formula II' optionally contains an additional ligand A which is a primary or secondary C_1–C_{18}-alkylamine, triethanolamine, cyclohexyldiethanolamine, aniline, anisidine, toluidine, 1-naphthylamine, 2-naphthylamine, p-butylaniline, xylidine, p-octyloxyaniline, morpholine, hexamethyleneimine, piperazine or piperidine.

4,734,450

POLYPROPYLENE-BASE RESIN COMPOSITION CONTAINING AN INORGANIC FILLER AND 0.01 TO 0.6 WT. % OF CARBON BLACK

Yoichi Kawai, Yokohama; Masami Maki, Kawasaki; Masaru Abe, Yokohama; Sachio Yokote, Yokohama, and Katsumi Sekiguchi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 19, 1986, Ser. No. 841,265

Claims priority, application Japan, Mar. 22, 1985, 60-55944; Mar. 26, 1985, 60-59585; Mar. 26, 1985, 60-59586; Apr. 3, 1985, 60-69049

Int. Cl.[4] **C08K** *3/04, 3/00, 3/18*

U.S. Cl. 524—413 **15 Claims**

1. A polypropylene resin composition suitable for use in the production of molded articles having excellent paintability, comprising:

(a) 100 parts by weight of a crystalline ethylene-propylene block copolymer;

(b) 7 to 60 parts by weight of a thermoplastic elastomer;

(c) 3 to 30 parts by weight of an inorganic filler; and

(d) 0.01 to 0.6 weight percent, based on the total weight of the copolymer (a), elastomer (b) and filler (c), of carbon black.

4,734,451

SUPERCRITICAL FLUID MOLECULAR SPRAY THIN FILMS AND FINE POWDERS

Richard D. Smith, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 528,723, Sep. 1, 1983, Pat. No. 4,582,731. This application Mar. 12, 1986, Ser. No. 839,079

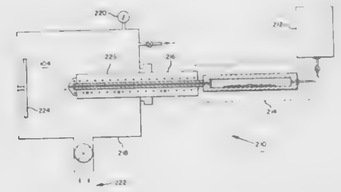
Int. Cl.[4] **B01D** *15/08;* **B29B** *9/00;* **C08K** *3/34;* **C08L** *27/12*

U.S. Cl. 524—493 **21 Claims**

16. A powder product formed by discharging a supercritical solution of a supercritical fluid solvent and a dissolved solute of a mixture of effective amounts of a solid inorganic and a polymeric material as a particulate spray into a low pressure region, said powder product comprising strand-like particles or fibers of said mixture wherein the inorganic and polymeric materials are mixed at a molecular level.

17. A product according to claim 16 in which the particles or fibers have a diameter of less than 0.2 μm and a narrow size distribution in the range of one half to one times said diameter.

(II')



18. A product according to claim 16 in which the solid inorganic material is silica and the polymeric material is a fluorinated hydrocarbon.

4,734,452

CURABLE COMPOSITION, METHOD FOR MANUFACTURING THEREOF, AND USES THEREOF

Terukuni Hashimoto, Itami; Tsugishige Iwaki, Takatsuki; Masaaki Kitatani, Suita, and Masao Nikki, Ibaraki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 4, 1986, Ser. No. 892,370

Claims priority, application Japan, Aug. 7, 1985, 60-172503; Feb. 24, 1986, 61-37218; Feb. 28, 1986, 61-41951; Mar. 14, 1986, 61-54586; Mar. 17, 1986, 61-57090; Mar. 24, 1986, 61-64231; Apr. 25, 1986, 61-94584

Int. Cl.[4] **C08K** *3/22, 3/34*

U.S. Cl. 524—533 **30 Claims**

1. A curable composition comprising (A) a monomer mixture containing as an essential component thereof a mixture of 20 to 80% by weight of an aliphatic polyfunctional (meth)acrylate and 80 to 20% by weight of an aromatic vinyl compound, (B) an inorganic filler having an average particle diameter of not more than 5 microns, and (C) a catalytic amount of a polymerization initiator, and having said inorganic filler (B) dispersed in an amount of 250 to 800 parts by weight per 100 parts by weight of said monomer mixture (A).

4,734,453

HYDROLYZED COPOLYMERS OF ALPHA-CARBAMATO-ACRYLATES

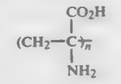
Michael J. Mullins, and Philip J. Brondsema, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 15, 1986, Ser. No. 863,624

Int. Cl.[4] **C08L** *37/00, 31/00;* **C08F** *8/18;* **C09K** *7/00*

U.S. Cl. 524—555 **5 Claims**

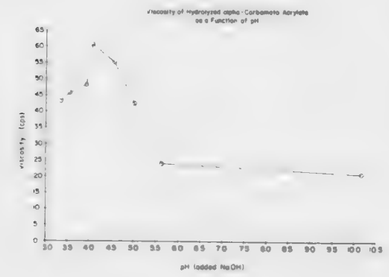
1. An adhesive composition comprising an effective amount of a polymer having recurring units of the formula IX:



(IX)

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wherein n represents the degree of polymerization.



4,734,454

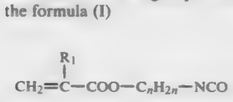
AQUEOUS COATING COMPOSITION

Tetsuo Aihara, Isehara, and Yasuharu Nakayama, Fujisawa, both of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Mar. 5, 1986, Ser. No. 836,510
Claims priority, application Japan, Mar. 8, 1985, 60-46147
Int. Cl.[4] C08F *220/36, 220/68*
U.S. Cl. 524—555 **25 Claims**

1. An aqueous coating composition which contains an aqueous solution or dispersion of a copolymer of

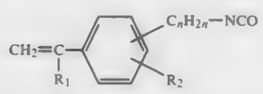
(A) 5–98 parts by weight of an ethylenically unsaturated monomer containing at least one urethane linkage and at least two non-conjugated double bonds per molecule, which is a reaction product of an isocyanate-containing unsaturated monomer and a hydroxyl-containing compound having at least two non-conjugated double bonds, in which the isocyanate-containing unsaturated monomer is selected from the group consisting of (a) monomers of the formula (I)



(I)

in which

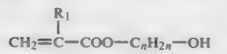
R_1 stands for a hydrogen atom or a methyl group, and n is an integer of 1 through 8, (b) monomers of the formula (II)



(II)

in which

R_1 and n are as above-defined, and R_2 stands for a hydrogen atom or a C_1–C_5 alkyl group, and (c) monomers obtained by reacting about 1 mol of a hydroxyl-containing monomer selected from hydroxyl-containing (meth)acrylic acid ester monomers of the formulae (III) and (IV)



(III)



(IV)

in which

R_1 and n are as above-defined, and a and b each denotes an integer of 0–8, provided a+b is 1–8, N-methylol(meth)acrylamide and allyl alcohol, with about 1 mol of a diisocyanate compound,

(B) 0.5–20 parts by weight of an ethylenically unsaturated carboxylic acid, and

(C) 0–94.5 parts by weight of an ethylenically unsaturated monomer or monomers other than those in said (A) and (B),

the total sum of said (A), (B) and (C) components being 100 parts by weight, said copolymer having a number average molecular weight of from about 500 to 1,000,000.

4,734,455

STABILIZERS FOR FILLED POLYOL COMPOSITIONS

Larry W. Mobley, Cohutta; James K. Jennings, Rocky Face, both of Ga., and Robert B. Turner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1986, Ser. No. 938,223
Int. Cl.[4] C08K *5/09, 3/32*
U.S. Cl. 524—710 **16 Claims**

1. An active hydrogen-containing composition comprising an active hydrogen-containing material having an equivalent weight of from about 500 to about 5,000,

(b) at least about 5 parts by weight of an inert, particulate filler per 100 parts by weight of component (a), and

(c) a stabilizing amount of a stabilizer composition comprising

(1) a carboxylic or phosphorus-containing acid containing about 8 to about 30 carbon atoms and

(2) a metal salt of a carboxylic acid containing about 8 to about 30 carbon atoms.

4,734,456

THERMOPLASTIC RESIN COMPOSITION COMPRISING STYRENIC POLYMER AND OLEFIN/UNSATURATED ACID ANHYDRIDE/UNSATURATED ACID ALKYL ESTER POLYMER

Kazuhiko Motomatsu, Hyogo; Mikio Kodama, Osaka; Hiromichi Aoki, Hyogo, and Ichiro Sato, Osaka, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Nov. 10, 1986, Ser. No. 928,357
Claims priority, application Japan, Nov. 8, 1985, 60-251789
Int. Cl.[4] C08L *51/00*
U.S. Cl. 525—74 **3 Claims**

1. A thermoplastic resin composition which consists essentially of

(A) a styrenic polymer, and

(B) a ternary polymer comprising 50 to 98.5% by weight of an olefin, 0.5 to 10% by weight of an unsaturated dicarboxylic acid anhydride and 1 to 40% by weight of an unsaturated carboxylic acid alkyl ester,

the weight proportion of (A):(B) being 100:0.5–200.

4,734,457

RUBBER COMPOSITIONS CONTAINING POLYMERIC PHENOL DERIVATIVES OF 1,3,4-THIADIAZOLE

Lester A. Doe, Jr., Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed May 7, 1987, Ser. No. 46,613
Int. Cl.[4] C08L *81/00;* **C08G** *65/38, 65/40*
U.S. Cl. 525—149 **2 Claims**

1. A stabilized composition comprising natural rubber and about 0.2 to 5 parts per hundred parts rubber of a polymeric reaction product of 4,4'-(1-methylethylidene)bisphenol and 3-hydroxymethyl-5-hydroxymethylthio-1,3,4-thiadiazolidine-2-thione wherein the molar ratio of the bisphenol to the thione is about 1:1 to 2:1.

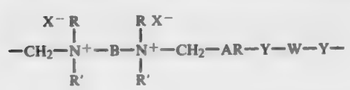
4,734,458

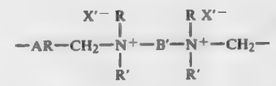
ADHESIVE COMPOSITIONS CONTAINING IONENE ELASTOMERS

Charles M. Leir, and John E. Stark, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 801,281, Nov. 25, 1985, Pat. No. 4,677,182.
This application Nov. 24, 1986, Ser. No. 918,579
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—149 **2 Claims**

1. A pressure sensitive adhesive composition comprising the ionene elastomer repeating units represented by the formula:





Wherein:

R is a lower alkyl group of 1 to 4 carbon atoms;

R′ is a lower alkyl group of 1 to 4 carbon atoms wherein R′ may be the same as or different from R, and R′ and R may be joined together with or without an additional hetero atom to form a heterocyclic ring;

X is a halogen selected from the group consisting of Cl, Br, and I;

X′ is a halogen selected from the group consisting of Cl, Br, and I and can be the same as or different from X;

B is a divalent polymeric moiety having a molecular weight of about 1,000 to about 50,000;

B′ is a divalent polymeric moiety having a molecular weight of about 1,000 to about 50,000 and may be the same as or different from B but, if B and B′ are different, at least one of B or B′ has a T_g of less than 20° C.;

AR is a phenylene or substituted phenylene radical;

Y is a divalent electron-donating sustituent; and

W is a divalent radical selected from the group consisting of (1) a $C_{2\text{-}12}$ alkylene selected from the group consisting of saturated $C_{2\text{-}12}$ alkylene, $C_{2\text{-}12}$ alkylene with one double bond, $C_{2\text{-}12}$ alkylene with more than one double bond and $C_{2\text{-}12}$ alkylene with a triple bond, (2) $-(CH_2CH_2O)_{2}-CH_2CH_2-$ when Y is oxygen or sulfur and (3) carbonyl, terephthaloyl, or adipoyl when Y is nitrogen and sufficient compatible tackifier to endow the composition with a degree of adhesive tack to provide a pressure sensitive adhesive.

4,734,459

IMPACT-RESISTANT POLYPROPYLENE COMPOSITIONS HAVING IMPROVED WHITENING RESISTANCE

Giuliano Cecchin, and Floriano Guglielmi, both of Ferrara, Italy, assignors to HIMONT Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 758,411, Jul. 24, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,745
Claims priority, application Italy, Jul. 30, 1984, 22120 A/84
Int. Cl.[4] C08F *297/08;* **C08L** *23/12, 23/08, 23/20*
U.S. Cl. 525—247 **5 Claims**

1. A polypropylene composition having high impact resistance at low temperatures, and improved whitening resistance, consisting essentially of

60–90 parts by weight of polypropylene, the isotacticity index of which is greater than 90, and

10–40 parts by weight of an ethylene-butene-1 polymeric mixture containing 50–95% by weight of polymerized ethylene, and consisting essentially of

20–95% weight of a crystalline fraction that has polyethylene-type crystallinity, and that is insoluble in xylene at room temperature, and

5–80% of an amorphous fraction that is soluble in xylene at 23° C., and that contains 40–70% by weight of polymerized ethylene.

and in which mixture the weight ratio of total polymerized ethylene to the amorphous fraction is 0.6–8, said composition being obtained by the sequential polymerization of propylene to polypropylene and subsequently copolymerizing ethylene and butene-1 in the presence of said polypropylene.

4,734,460

FLUORINE-CONTAINING ELASTOMER COMPOSITION

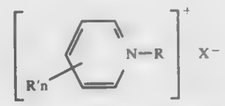
Okimasa Yamada, 3-506, Isohara 678, Isohara-machi, Kitaibaraki city, Ibaraki, Japan

Filed Jul. 11, 1986, Ser. No. 884,598
Claims priority, application Japan, Oct. 15, 1985, 60-227777
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—279 **17 Claims**

1. A fluorine-containing elastomer composition which comprises:

(a) 100 parts by weight of a fluorine-containing elastomer,

(b) 1 to 40 parts by weight of at least one of oxides and hydroxide of divalent metal, (c) 0.5 to 10 parts by weight of a polyhydroxyaromatic compound, and (d) 0.1 to 10 parts by weight of a quaternary ammonium salt compound represented by the following general formula (I):



(I)

wherein R is an aralkyl group having 7 to 20 carbon atoms, R′ is an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms or an aralkyl group having 7 to 20 carbon atoms, X^- is an anion, and n is an integer of 1 to 5.

4,734,461

METHOD FOR THE TERMINATION OF POLYMERS OBTAINED BY THE ANIONIC POLYMERIZATION OF DIENIC AND/OR VINYLAROMATIC MONOMERS, AND COMPOUNDS SUITABLE TO THAT PURPOSE

Arnaldo Roggero, San Donato Milanese, and Alberto Gandini, Milan, both of Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed Jun. 20, 1986, Ser. No. 877,016
Claims priority, application Italy, Jul. 1, 1985, 21372 A/85
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—293 **6 Claims**

1. A process for the termination of living macroanions obtained by the anionic polymerization or copolymerization of diene monomers or vinylaromatic monomers or mixtures thereof comprising introducing into the polymerization mixture either batchwise or incrementally, a coupling agent selected from the group consisting of methyl-N[cinnamylidene]-p.amminobenzoate; p.benzoylaniline-N-[cinnamylidene]; 4-carbomethoxy-cinnamaldehyde-anilido; 1,6-diaminohexane,N,N′-bis-[cinnamylidene-(4′carbomethoxy]; and ethenamine-2-phenyl-N-[benzylidene-4′ (carbomethoxy)].

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4,734,462

PREPARATION OF BLOCK POLYURETHANE-AMIDES

Hanns-Jörg Liedloff, Domat/Ems, and Hans-Joachim Schultze, Chur, both of Switzerland, assignors to Ems-Inventa AG, Switzerland

Filed Mar. 5, 1987, Ser. No. 22,289
Claims priority, application Switzerland, Mar. 20, 1986, 01122/86
Int. Cl.[4] C08G 69/48
U.S. Cl. 525—424 27 Claims

1. A method for the preparation of block polyurethane amides in a melt by the reaction of

(a) a linear polyamide having terminal carboxylic acid ester groups and which melts at not more than 210° C.; and

(b) a polyurethane having hydroxyl groups at its chain ends; at a temperature of 160° C. to 240° C., and in the presence of a trans-esterification accelerator.

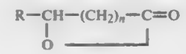
4,734,463

HYDROXY GROUP-CONTAINING MODIFIED POLYESTER WITH POLYMERIZED LACTONE MONOMERS

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Tab Semanision, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 24, 1985, Ser. No. 813,104
Int. Cl.[4] C08G 63/08, 63/18, 63/20
U.S. Cl. 525—440 6 Claims

1. A hydroxy functional urethane modified polyester resin suitable for use in a thermosetting composition, which resin has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said resin being the product of polymerization at about 50°–300° C. of a reaction mixture of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000, (ii) having a hydroxyl number between about 30 and about 300, (iii) containing between about 1 and about 10 urethane groups per molecule; wherein pendant hydroxyl terminated polycaprolactone moieties are formed and attached to the polyester precursor and wherein said lactone monomers are selected from those represented by the general formula:



in which n is at least 4, at least n+2 R's are hydrogen, and the remaining R's are substituents selected from the group consisting of alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals, and wherein said hydroxy-containing urethane modified polyester precursor is the reaction product of:

(A) urethane modified diol being the reaction product of:

(a) diol and (b) diisocyanate, wherein said diol and said diisocyanate are reacted in a molar ratio from about 4:1 to about 4:3, respectively;

(B) polyol comprising at least about 5 weight percent triol; and

(C) acid component selected from dicarboxylic acids and anhydrides thereof and wherein the reaction mixture comprises between about 10 and about 80 weight percent said hydroxy-containing urethane modified polyester precursor and between about 90 and about 20 weight percent said lactone monomers.

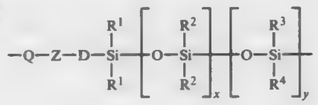
4,734,464

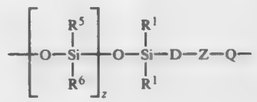
METHOD OF PREPARING MODIFIED POLYIMIDES OR POLY(AMIDE-TMIDES)

Michel Biensan, Lons, France, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Feb. 26, 1986, Ser. No. 834,175
Claims priority, application France, Mar. 1, 1985, 85 03025
Int. Cl.[4] C08F 283/04
U.S. Cl. 525—420 19 Claims

1. A method of modifying the properties of a polymeric material selected from the group consisting of polyimides, poly(amide-imides), and polyimides and poly(amide-imides) containing siloxane units of the formula

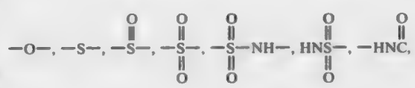




wherein

Q is a substituted or unsubstituted aromatic group;

Z is





D is substituted or unsubstituted hydrocarbylene;

R^1, R^2, R^3, R^4, R^5 and R^6 each independently is substituted or unsubstituted hydrocarbyl; and

x, y and z each independently has a value from 0 to 100;

which comprises heating said polymeric material or a polyamic acid precursor thereof to a temperature of at least about 150° C. but below the decomposition temperature of the polymeric material or precursor in the presence of polyfunctional aromatic compounds which contain at least two reactive groups selected from the group consisting of —NH_2—, —COOH, —OH and secondary amino groups with at least one of the reactive groups being —NH_2 or —COOH.

4,734,465

VULCANIZABLE COMPOSITIONS OF FLUOROELASTOMERS HAVING IMPROVED SELF-LUBRICATING PROPERTIES AND A FAST CURE RATE

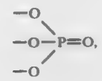
Giovanni Moggi, Milan, and Gianna Cirillo, Genova, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 688,903, Jan. 4, 1985, abandoned. This application Jul. 22, 1986, Ser. No. 888,158
Claims priority, application Italy, Jan. 6, 1984, 19046 A/84
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—340 10 Claims

1. A vulcanizable fluoroelastomeric composition consisting essentially of:

(a) 100 parts by weight of a copolymer having a base of vinylidene fluoride (40 to 84 mol%), perfluoropropene (from 15 to 30 mol%) and tetrafluorethylene (0 to 30 mol%);

(b) from 0.3 to 6 parts by weight of one or more compounds of the general formula R_nX in which n equals 2 or 3, X is a bivalent or trivalent group selected from: phosphoric esters



phosphine oxide

sulfoxide SO and sulfone SO_2, and R is an alkyl, cycloalkyl or aryl radical having from 1 to 18 carbon atoms, wherein two alkyl radicals may be taken together to form a bivalent alkylene radical;

(c) from 0.3 to 6 parts by weight of a polyhydroxy compound of the type known as vulcanizing agent for fluoroelastomers;

(d) from 0.2 to 4 parts by weight of an aminophosphine or phosphoraneamine compound of the type known as accelerating agent in the vulcanization of fluoroelastomers with the polyhydroxy compounds (c);

(e) from 1 to 20 parts by weight of one or more acid acceptors formed of metal oxides, hydrates or carbonates having a basic character, of the type known in the vulcanization of fluoroelastomers.

4,734,466

MODIFIED POLYBENZIMIDAZOLE POLYMER MEMBRANES

Andrew Kindler, Hermosa Beach, Calif.; Esther A. Bower, Flemington, N.J.; Joseph J. Rafalko, Chatham, N.J., and Michael J. Sansone, Berkeley Heights, N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 691,962, Jan. 16, 1985, Pat. No. 4,599,388. This application Jun. 25, 1986, Ser. No. 878,535
The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.
Int. Cl.[4] C08G 69/26, 69/28, 73/18; C08L 69/00
U.S. Cl. 525—433 35 Claims

1. The semipermeable membrane produced by the process comprising the steps of:

(a) preparing a solution of a polybenzimidazole polymer;

(b) reacting the polybenzimidazole polymer with a cyclic carbonate to form a substituted polybenzimidazole polymer; and

(c) producing a semipermeable membrane product from the substituted polybenzimidazole polymer solution.

4,734,467

COIL COATING PAINT COMPOSITION

Mitsuo Yamada, Osaka; Hirotoshi Umemoto, Kyoto, and Hiromichi Tamasaki, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 7, 1986, Ser. No. 893,637
Int. Cl.[4] C08L 67/00
U.S. Cl. 525—440 2 Claims

1. A coating composition for coil coating use consisting essentially of

(A) a binder component comprising a mixture of a linear polyester resin and a branched polyester resin, having a hydroxyl value of 40 to 90, said linear polyester resin cmprising (1) a polybasic acid component consisting of (a) aromatic dicarboxylic acid or its anhydride in an amount of 13.7 to 49.2 wt % based on the solids weight of said linear polyester resin, and (b) aliphatic dicarboxylic acid, and (2) a polyhydric alcohol component consisting of (a) at least one member selected from trihydric alcohol and tetrahydric alcohol in an amount of 0 to 10 wt % based on the solids weight of said linear polyester resin, and (b) dihydric alcohol, and having 1.8 to 2.2 hydroxyl groups per molecule and a number average molecular weight of 1000 to 5000, and said branched polyester resin comprising a polybasic acid component and a polyhydric alcohol component consisting of (a) at least one member selected from trihydric alcohol and tetrahydric alcohol in an amount of 3 to 40 wt % based on the solids weight of said branched polyester resin, and (b) dihydric alcohol, and having 2.3 to 4.5 hydroxyl groups per molecule, and

(B) a crosslinking component selected from melamine resin, at least part of which is a methyl methylolated melamine, and isocyanate compound.

4,734,468

EPOXY RESIN COMPOSITION

Edward J. Marx, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1986, Ser. No. 835,077
Int. Cl.[4] C08L 63/02
U.S. Cl. 525—524 16 Claims

1. A solid, solvent-free powder coating composition comprising (a) a product of blending from about 75 to about 95 weight percent, based on the weight of the epoxy blend, of a normally-solid epoxy resin having a weight per epoxide within the range of about 1500 to about 10,000, and from about 25 to about 5 weight percent of a normally-liquid epoxy resin having a weight per epoxide in the range of about 175 to about 350, and (b) an effective amount of a curing agent for the epoxy blend.

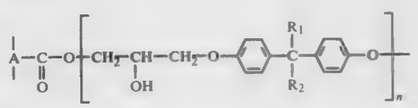
4,734,469

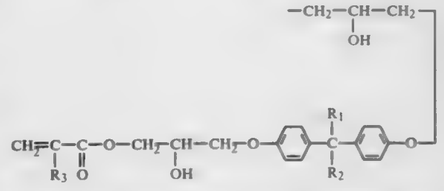
CURABLE RESINS WHICH ARE REACTION PRODUCTS OF BISPHENOL DIGLYCIDYLETHER TYPE EPOXY RESINS AND (METH)ACRYLIC ACID AND PROCESS FOR PREPARING SAME

Eiichiro Takiyama, Kamakura, and Katsuhisa Morita, Takasaki, both of Japan, assignors to Showa Highpower Co. Ltd., Tokyo, Japan

Filed May 12, 1986, Ser. No. 862,508
Claims priority, application Japan, May 14, 1985, 60-100533
Int. Cl.[4] C08F 283/00, 283/10, 224/00
U.S. Cl. 525—529 11 Claims

1. A curable copolymer resin of vinyl monomers and acryloyl- or methacryloyl-containing monomers which has pendant groups from the copolymer backbone chain with the following formula:



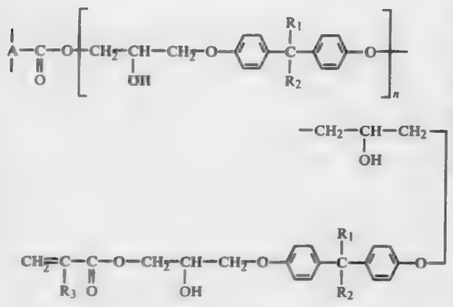


wherein A represents a backbone chain of copolymer resin consisting of copolymerized vinyl monomers and acryloyl- or methacryloyl-containing monomers, where R_1, R_2, and R_3,

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each represent a hydrogen or a methyl group, and n represents an integer of from 0 to 5.

7. A process for preparing a curable copolymer resin having the formula:



wherein A represents a backbone chain of copolymer resin consisting of copolymerized vinyl monomers and acryloyl- or methacryloyl-containing monomers, where R_1, R_2, and R_3, each represent a hydrogen or a methyl group, and n represents an integer of from 0 to 5, comprising

[A] preparing a polymer-containing reaction mixture by copolymerizing

a component (1) which contains as at least one component as unsaturated epoxy resin having (metha)acryloyl group and an epoxy group in the molecule resulting from reacting acrylic or methacrylic acid and bisphenol diglycidylether type epoxy resin in the presence of an esterification catalyst, wherein a carboxylic group of said acid exists in an amount of 25–50% equivalent based on the equivalent of an epoxide group of said bisphenol diglycidylether type epoxy resin and said bisphenol diglycidylether type epoxy resin is obtained from bisphenol and epichlorhydrin; and

a vinylmonomer (2) in the presence of a radical polymerization catalyst to form the polymer-containing reaction mixture, said polymer containing in its side chain bisphenol diglycidylether type epoxy groups, and then

[B] adding to the reaction mixture resulting from step [A] an amount of (metha)acrylic acid substantially equimolar to the epoxy group remaining in said reaction mixture to react the epoxy group and the carboxyl group.

4,734,470

BLOCK COPOLYMER AND COMPOSITIONS

Juheiji Kawabata; Toshinori Sugie, both of Takaishi; Fumihiro Kobata, Izumi; Hitoshi Izutsu, Osaka, and Manabu Chiba, Izumi-ohtsu, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,372

Claims priority, application Japan, Nov. 13, 1985, 60-252857; Mar. 5, 1986, 61-48110; May 30, 1986, 61-125232

Int. Cl.⁴ C08G *75/14*

U.S. Cl. 525—537 **6 Claims**

1. A block copolymer composed of polyphenylene sulfide segments and aromatic sulfide sulfone polymer segments and having a logarithmic viscosity [η] of 0.03 to 1.0, said logarithmic viscosity [η] being determined at 206° C. for its solution in alpha-chloronaphthalene in a polymer concentration of 0.4 g/100 ml of solution and calculated in accordance with the equation [η]=ln (relative viscosity)/polymer concentration.

4,734,471

METHOD OF CURING POLYFLUOROALKOXYPHOSPHAZENE

Susse-Chen Chang, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 3, 1986, Ser. No. 881,610

Int. Cl.⁴ C08G *79/02*

U.S. Cl. 525—538 **15 Claims**

1. A process for curing a high molecular weight substantially linear polyorganophosphazene having substituent groups bonded to phosphorus, at least a portion of said substituent groups being olefinically unsaturated groups, said process comprising contacting said polyorganophosphazene with a small effective amount of a platinum halide, haloplatinic acid or hydrates thereof or mixtures thereof.

4,734,472

METHOD FOR PREPARING FUNCTIONAL ALPHA-OLEFIN POLYMERS AND COPOLYMERS

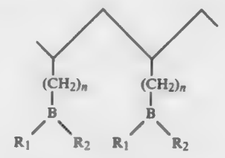
Tze-Chiang Chung, Bridgewater, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 24, 1986, Ser. No. 945,817

Int. Cl.⁴ C08F *30/06, 30/00*

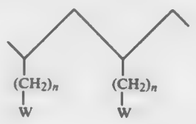
U.S. Cl. 526—239 **3 Claims**

1. A homopolymer having the formula:



wherein n=b 6 to 12 and R_1 and R_2 are alkyl or cycloalkyl groups.

2. A homopolymer having the formula:



wherein n=3 to 12 and W is a functional group consisting of OH, NH_2 and CHO groups.

4,734,473

WATER-SOLUBLE CATIONIC QUATERNARY AMMONIUM MONOMERS

Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 621,338, Jun. 15, 1984, Pat. No. 4,656,277. This application Dec. 3, 1986, Ser. No. 937,262

Int. Cl.⁴ C08F *26/12, 126/08*

U.S. Cl. 526—263 **6 Claims**

1. The homopolymer of the dimethyl sulfate quaternary ammonium salt of 1-methacryloyl-4-methyl piperazine.

4,734,474

FLUORINE-CONTAINING SULFONYL POLYMER

Masato Hamada, Yokohama, and Tetsuro Ohta, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1986, Ser. No. 831,509

Int. Cl.⁴ C08F *228/02*

U.S. Cl. 526—243 **1 Claim**

1. A fluorine-containing crosslinkable copolymer consisting essentially of:

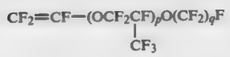
(A) fluorine-containing monomer units each having a crosslinkable sulfonyl chloride group and represented by the general formula:



wherein l is 0 or 1, m is 0, 1 or 2, and n is an integer of from 1 to 4; and

(B) monomer units of a combination of ethylenically unsaturated compounds selected from the group consisting of:

(1) 50 to 85% by mole of tetrafluoroethylene and 50 to 15% by mole of a perfluoroalkylperfluorovinyl ether represented by the formula



wherein p is 0, 1 or 2 and q is an integer of from 1 to 3,

(2) 70 to 80% by mole of vinylidene fluoride and 30 to 20% by mole of hexafluoropropylene, and

(3) 15 to 20% by mole of tetrafluoroethylene, 60 to 65% by mole of vinylidene fluoride, and 15 to 25% by mole of hexafluoropropylene,

and wherein said copolymer has a sulfonyl chloride group content of about 0.1 to about 3.0% by weight based on the total weight of (A) and (B), and an intrinsic viscosity of at least 0.01 dl/g as measured at 30° C.

4,734,475

WETTABLE SURFACE MODIFIED CONTACT LENS FABRICATED FROM AN OXIRANE CONTAINING HYDROPHOBIC POLYMER

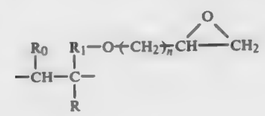
Merrill Goldenberg, Teaneck, N.J., and Karl F. Mueller, New York, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,906

Int. Cl.⁴ C08F *24/00*

U.S. Cl. 526—273 **9 Claims**

1. A contact lens possessing a wettable surface in its aqueous environment of use fabricated from a hydrophobic addition polymer incorporating between about 0.5 and about 30 percent by weight oxirane substituted units in the backbone thereof, wherein the outer surfaces of said lens contain an amount sufficient to increase the contact angle by at least 5°, of a reaction product of said oxirane substituted units of the formula:



(I)

wherein

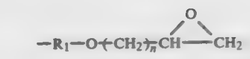
R is hydrogen or methyl;

R_1 is

or lower alkylene;

n is 1 to 4; and

R_o is hydrogen or



with a water soluble amine, alcohol, thiol, urea or thiourea, or a sulfite, bisulfite or thiosulfate.

4,734,476

PHOTO-SETTING RESIN COMPOSITION

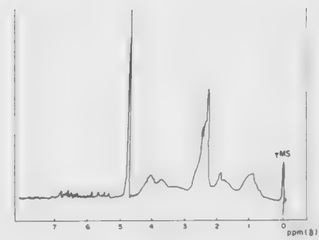
Hideo Sato, and Hiroshi Kawabata, both of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 29, 1986, Ser. No. 868,067

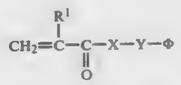
Claims priority, application Japan, Jun. 18, 1985, 60-132818; Feb. 17, 1986, 61-32251

Int. Cl.⁴ C08F *120/58, 120/60, 220/58, '220/60*

U.S. Cl. 526—304 **4 Claims**

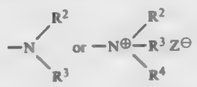


1. A photo-setting resin composition which is soluble in water or polar solvents other than water obtained by copolymerizing as effective components, a monomer expressed by the formula



[I]

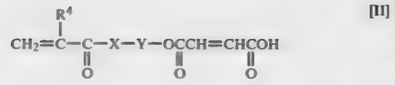
wherein R^1 represents H, CH_3 or C_2H_5; X represents —O— or —NH—; Y represents a linear chain or branched hydrocarbon group of 1 to 4 carbon atoms; Φ represents



wherein R^2, R^3 and R^4 each represent an alkyl group of 1 to 4 carbon atoms and $Z^\ominus$ represents an anion,

with 5 to 80 mole % of a monomer expressed by the formula

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[II]

wherein R^4 represents H, CH_3 or C_2H_5 and X and Y each are as defined above.

4,734,477

METHOD FOR CAST MOLDING PLASTIC SUBSTRATE

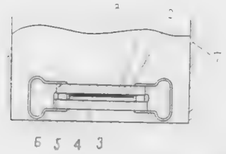
Takao Inoue; Tadashi Sakairi, both of Osaka; Mitsutoshi Aritomi; Tadao Takeyama, both of Ibaraki, and Takahiro Matsuo, Osaka, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Jul. 16, 1986, Ser. No. 886,167

Claims priority, application Japan, Jul. 16, 1985, 60-156494; May 29, 1986, 61-123968

Int. Cl.⁴ C08F *18/00*

U.S. Cl. 526—320 **9 Claims**



1. A method for obtaining a molded transparent plastic substrate by radical polymerizing a polymerizable monomeric liquid composed of at least one polyfunctional (meth)acrylate compound, the polymerization reactions consisting essentially of radical polymerization reactions, any catalyst present being a radical initiator, by a cast molding method, wherein in a first step the final shape of the plastic substrate is obtained by radical polymerizing the polyfunctional (meth)acrylate compound under cast molding conditions in a mold until the glass transition temperature of the polymerizing composition reaches 10° to 100° C., in a second step the shaped substrate as obtained in the first step is removed from the mold and in a third step the substrate is post-cured free of the restraints of a mold to obtain a substrate having a glass transition temperature of 110° C. or more and having the shape imparted by the first step.

4,734,478

WATER ABSORBING AGENT

Tsuneo Tsubakimoto; Tadao Shimomura, both of Toyonaka; Yoshio Irie, Nishinomiya; Yoshihiko Masuda, Suita; Kazumasa Kimura, Osaka, and Takumi Hatsuda, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 26, 1985, Ser. No. 748,820

Claims priority, application Japan, Jul. 2, 1984, 59-135330; Oct. 17, 1984, 59-216358; Oct. 23, 1984, 59-221325

Int. Cl.⁴ C08J *3/24*; B01J *20/26*

U.S. Cl. 527—300 **39 Claims**

1. In a water-absorbing agent comprising a water-absorbing resin powder having the molecular chains near its durface crosslinked, said resin powder being obtained by mixing 100 parts by weight of a powder of a carboxyl-containing water-absorbing resin selected from the group consisting of a hydrolyzate of a starch-acrylonitrile graft polymer, a partially neutralized product of a starch-acrylic acid graft polymer, a saponification product of a vinyl acetate-acrylic ester copolymer, a hydrolyzate of an acrylonitrile copolymer, a crosslinked product of a hydrolyzate of an acrylonitrile copolymer, a hydrolyzate of an acrylamide copolymer, a crosslinked product of a hydrolyzate of an acrylamide copolymer, a partially neutralized product of polyacrylic acid, and a crosslinked product of partially neutralized polyacrylic acid with 0.001 to 10 parts by weight of a polyhydric alcohol and heating the mixture at a temperature of at least 90° C. to react the powder of a carboxyl-containing water-absorbing resin with the polyhydric alcohol, the improvement comprising conducting the mixing of said powder of a carboxyl-containing water-absorbing resin and said polyhydric alcohol in the presence of 0.01 to 8 parts by weight of a hydrophilic organic solvent and 0 to 8 parts by weight of water.

4,734,479

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue; Masatoshi Arai, and Koji Yokoo, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,263

Claims priority, application Japan, Mar. 25, 1986, 61-66497

Int. Cl.⁴ C08G *77/06*

U.S. Cl. 528—18 **10 Claims**

1. A room temperature-curable organopolsiloxane composition which comprises:

(A) a combination of

(A-1) 100 parts by weight of a diorganopolysiloxane of which each of the silicon atoms at the molecular chain ends has a silanolic hydroxy group or two alkoxy groups directly bonded thereto,

(A-2) from 1 to 400 parts by weight of a filler,

(A-3) from 0.1 to 5 parts by weight of an alkenyloxy silane compound represented by the general formula

$$R^1_nSiX_{4-n},$$

in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, vinyl, phenyl and 3,3,3-trifluoropropyl groups, X is an alkenyloxy group represented by the general formula

$$-O-C(CH_2R^3)=CHR^2$$

R^2 and R^3 each being a hydrogen atom or an alkyl group selected from the class consisting of methyl, ethyl and propyl groups, and the subscript n is zero or 1, or a partial hydrolyzate thereof,

(A-4) from 0.01 to 10 parts by weight of an organosilane or organopolysiloxane compound having, in a molecule, at least one substituted or unsubstituted guanidino group represented by the general formula

$$-N=C(NR^4_2)_2,$$

in which R^4 is a hydrogen atom or a monovalent hydrocarbon group, and

(A-5) an alcohol compound represented by the general formula

$$R^5OH,$$

in which R^5 is a monovalent hydrocarbon group, in an amount from equimolar to 20 times by moles of the groups denoted by X in the component (A-3);

(B) an organosilane or organopolysiloxane compound having, in a molecule, at least one hydrogen atom di-rectly bonded to the silicon atom in an amount from 0.3 to 1.0 mole per mole of the alcohol compound as the component (A-5); and

(C) an organic tin compound in an amount in the range from 0.01 to 10% by weight based on the overall amount of the components (A-1) to (A-5).

4,734,480

RADIATION CURABLE RESIN

Nobukazu Kotera; Yasuo Yoshinaka; Shinpei Yamamoto; Hideyuki Ohashi, all of Ohtsu; Yoshinobu Ninomiya, and Kiyokazu Oiyama, both of Miyagi, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka and Sony Corporation, Tokyo, both of, Japan

Filed Jun. 11, 1987, Ser. No. 60,471

Claims priority, application Japan, Jun. 12, 1986, 61-136428

Int. Cl.⁴ C08G *18/38*

U.S. Cl. 528—49 **17 Claims**

1. A radiation curable resin which is a polyurethane acrylate having (meth)acryloyloxy groups at the terminal end of the molecule and in the molecular chain thereof, and containing metal sulfonate groups in the molecule in a ratio of 3.0 to 1,500 equivalent/10^6 g of the resin, said polyurethane acrylate being obtained by reaction of

(1) a copolyester having hydroxyl groups at both terminal ends of the molecule and containing metal sulfonate groups therein,

(2) a diisocyanate,

(3) a compound (A) having at least one (meth)acryloyloxy group and two hydroxyl groups,

(4) a compound (B) having at least one (meth)acryloyloxy group and one hydroxyl group, and optionally

(5) a polyol other than the above (1) or (3).

4,734,481

NOVEL ORGANOMETALLIC POLYMERS

Alfred Steinmann, Villars-sur-Glâne, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

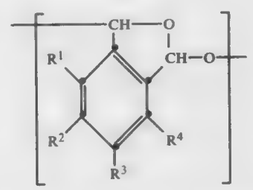
Filed Jan. 8, 1987, Ser. No. 1,312

Claims priority, application Switzerland, Jan. 16, 1986, 147/86

Int. Cl.⁴ C08G *77/00*

U.S. Cl. 528—43 **11 Claims**

1. An organometallic, end-capped polyphthalaldehyde containing the repeating unit of formula I



(I)

wherein R^1, R^2, R^3 and R^4 are each independently of the other hydrogen, halogen, cyano, nitro, carboxyl, hydroxyl, C_1–C_4alkoxy, C_1–C_4alkylthio or C_1–C_4alkoxycarbonyl, and at least one of the substituents R^1, R^2, R^3 and R^4 are a group $-Q(R^5)_3$ or $-Q(R^6)_3$, where Q is Si, Sn, Ge, CH_2—Si or O—Si, R^5 is C_1–C_{12}alkyl and R^6 is C_6–C_{10}aryl.

4,734,482

POLYIMIDE FROM ETHER DIAMINE HAVING THE INDANE STRUCTURE AND HIGH-TEMPERATURE ADHESIVE OF POLYIMIDE

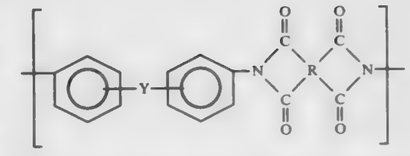
Shoji Tamai, Yokohama; Saburo Kawashima, Yokosuka; Yoshiho Sonobe, Yokohama; Masahiro Ohta, Yokohama; Hideaki Oikawa, Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,477

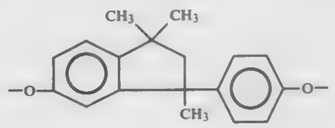
Int. Cl.⁴ C08G *63/02*; B32B *3/00*

U.S. Cl. 528—185 **7 Claims**

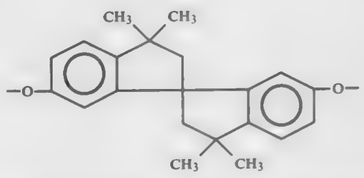
1. Polyimide having recurring units of the formula



(where Y is a divalent radical represented by the formula



or



which is an indan derivative having two oxy radicals, and Y is bonded to both phenyl radicals either in meta or in para positions, and R is a tetravalent radical selected from the group consisting of aliphatic radicals having not less than two carbons, cyclo-aliphatic radical, monoaromatic radical, condensed polyaromatic radical, and non condensed polyaromatic radical wherein aromatic radicals are mutually connected with a bond or a crosslinking function).

4,734,483

CHOLESTERIC LIQUID CRYSTAL POLYESTER FROM HYDROQUINONE, CYCLOHEXANE DICARBOXYLIC ACID AND 3-METHYL ADIPIC ACID

Tomohiro Toya; Tetsuo Satoh; Shigeki Iida, all of Yokohama; Hajime Hara, Fujisawa, and Shingo Orii, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

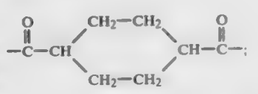
Filed Aug. 21, 1986, Ser. No. 899,076

Claims priority, application Japan, Aug. 23, 1985, 60-183905

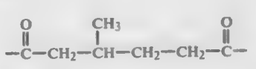
Int. Cl.⁴ C08G *63/16*

U.S. Cl. 528—194 **3 Claims**

1. A cholesteric liquid crystal polyester consisting essentially of structural units represented by the following formulae (A), (B) and (C):



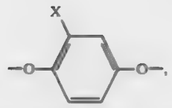
(A)



(B)

which is optically active; and

VOL 1088 ISS 5 MR 29 1988 UMI



(C)

wherein X is hydrogen, halogen, or alkyl having not more than four carbon atoms.

4,734,484

PROCESS FOR THE ISOLATION OF POLYARYLENE SULPHIDE FROM SALTS CONTAINED THEREIN

Franz Alfes; Wolfgang Alewelt, both of Krefeld; Wolfgang Eisermann, Duesseldorf, and Erhard Tresper, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,770

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535455

Int. Cl.⁴ C08G *75/16*

U.S. Cl. 528—502 **1 Claim**

1. An improved method for separating inorganic salts from a crude polyarylene sulfide reaction product which contains inorganic salts, polyarylene sulfide and an organic solvent to obtain a substantially salt-free polyarylene sulfide comprises:

(a) passing the crude polyarylene sulfide reaction product through a heated decanter centrifuge to obtain a solid salt and a clarified liquid,

(b) then passing the clarified liquid from step (a) through a heated pressure filter at a temperature greater than 180° C. wherein the filter comprises wire sieves or sinter plates heaving an adjustable pore size ranging from 10 to 200 μm to obtain a solution of polyarylene sulfide substantially salt-free.

4,734,485

METHOD OF MANUFACTURING POLYPHENYLENE ETHERS

Martin Bartmann, Recklinghausen, and Wilfried Ribbing, Dorsten, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 31,620

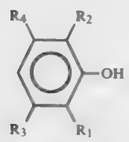
Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617187

Int. Cl.⁴ C08G *65/44*

U.S. Cl. 528—216 **8 Claims**

1. A method for preparing a polyphenylene ether, comprising:

oxidatively coupling a phenol of the formula



wherein R_3 and R_4 are H or CH_3; and R_1 and R_2 are either n- or iso-alkyl groups with 1–6 carbon atoms or R_1 is hydrogen and R_2 is a tertiary alkyl group with 4–6 carbon atoms,

with oxygen or oxygen-containing gas mixtures, in an organic solvent in the presence of a copper-amine catalyst comprising:

(a) anhydrous or hydrated CuCl or $CuCl_2$;

(b) a secondary diamine of the formula

R_b—NH—R_a—NH—R_c

wherein R_a is a C_2–C_4 alkylene group, and R_b and R_c are C_1–C_{10} secondary or tertiary alkyl groups; and

(c) morpholine; and wherein

said organic solvent is a mixture of a C_6–C_8 aromatic hydrocarbon and a C_1–C_4 aliphatic alcohol in a volumetric ratio in the range of 92.5:7.5 to 50:50.

4,734,486

POLYAMIDE COMPRISING FLUORINATED XYLYENE MOIETIES

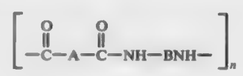
William W. Bristowe, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jan. 2, 1987, Ser. No. 145

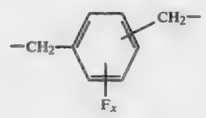
Int. Cl.⁴ C08G *69/26, 69/32*

U.S. Cl. 528—347 **7 Claims**

1. A polyamide polymer consisting essentially of the recurring units of Formula I wherein, A is a divalent alkylene or arylene radical having 4–18 carbon atoms, n is an integer greater than 1, B is a divalent alkylene or arylene radical having up to 19 carbon atoms and at least 50 mol percent fluorinated xylylene radical of Formula II, wherein x is an integer from 1 to 4 and wherein said Formulas are



I



II

4,734,487

PROCESS FOR THE MANUFACTURE OF POLYAMIDES FROM DIAMINE AND DIAMIDE UTILIZING CARBOXAMIDE AS CATALYST

Benedict S. Curatolo, Maple Heights; Robert C. Sentman, Macedonia, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 16, 1985, Ser. No. 809,687

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ C08G *69/28*

U.S. Cl. 528—336 **11 Claims**

1. A process for the manufacture of a polyamide comprising contacting at least one α,ω-diamine, at least one α,ω-diamide and a catalyst comprising a carboxamide at an elevated temperature and pressure.

4,734,488

POLYCARBONATE AND OPTICAL DISC SUBSTRATE

Masayoshi Hasuo, Yokohama; Seiichi Mukai, Kunitachi; Hiroshi Urabe; Seiji Yoshida, both of Kawasaki, and Masahiro Nukui, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

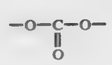
Continuation of Ser. No. 765,801, Aug. 15, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 65,136

Claims priority, application Japan, Aug. 24, 1984, 59-175079

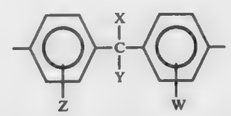
Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—196 **5 Claims**

1. A polycarbonate resin made up of carbonate bonds having the structure



and carbonate bond-constituting units which are structural units between said carbonate bonds, wherein from 25 to 100% of said carbonate bond-constituting units contain at least one pendant aromatic group and have the formula



wherein each of X and Y is a hydrogen atom, an aliphatic hydrocarbon group having from 1 to 6 carbon atoms, or an aryl or aralkyl group having from 6 to 12 carbon atoms, provided that at least one of X and Y is an aryl or aralkyl group having from 6 to 12 carbon atoms, and each of Z and W is a hydrogen atom or an aliphatic hydrocarbon group having from 1 to 6 carbon atoms, wherein said polycarbonate resin has an average molecular weight of from 10,400 to 14,000, based on the intrinsic viscosity of said polycarbonate resin at 20° C. in methylene chloride at a concentration of 6.0 g/liter, and wherein the melt flow index of said polycarbonate resin is from 0.86 to 3.2 as measured at 230° C. under a load of 5 kg in accordance with International Standards Organization Reference ISO R-1133.

4,734,489

TRISAZO COMPOUNDS USEFUL IN PRODUCING WATER-RESISTANT INK COMPOSITIONS

Shinjiro Kawasaki, Nishinomiya; Hideo Kitagawa, Kyoto; Yutaka Nishii, Moriguchi; Hideo Kawashita, Ibaraki, and Minoru Akagi, Toyonaka, all of Japan, assignors to Taoka Chemical Company, Limited and Sumitomo Chemical Company, Limited, both of Osaka, Japan

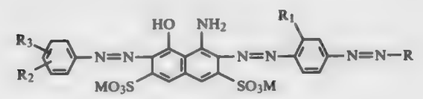
Filed Mar. 27, 1986, Ser. No. 844,589

Claims priority, application Japan, Mar. 29, 1985, 60-68260; Dec. 16, 1985, 60-283255

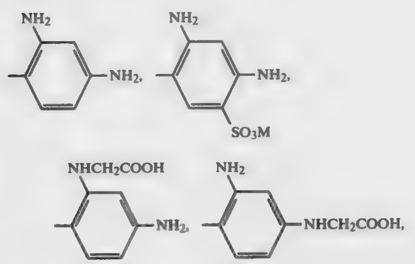
Int. Cl.⁴ C09B *31/18, 33/22, 35/46;* **C09D** *11/18*

U.S. Cl. 534—649 **13 Claims**

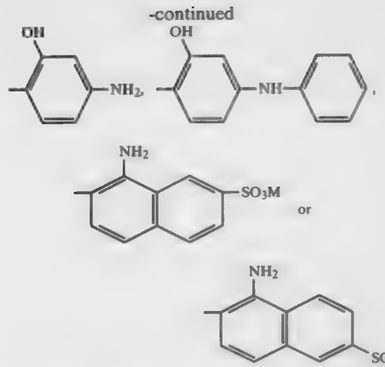
1. An azo compound of the formula:



wherein R is of the formula:

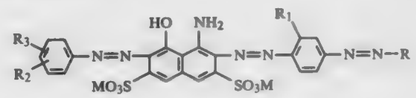


-continued

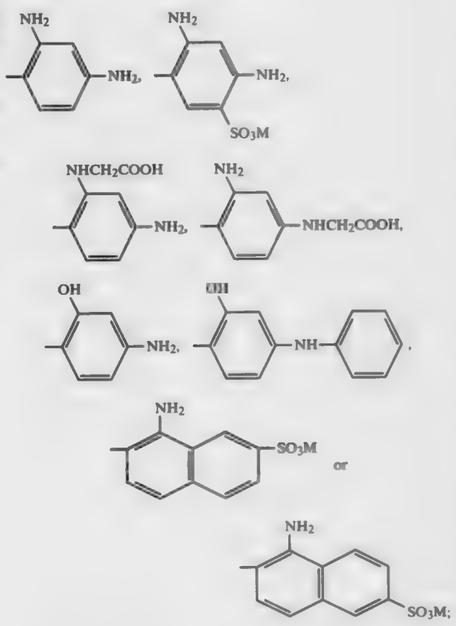


R_1 is hydrogen, methyl or —SO_3M; R_2 is hydrogen or —SO_3M; R_3 is C_4–C_{18} alkyl and M is hydrogen, an alkali metal, ammonium, monoethanol ammonium, diethanol ammonium, or triethanol ammonium, provided that when R includes —SO_3M, R_1 and R_2 are not —SO_3M, and when R does not include —SO_3M, one of R_1 and R_2 is —SO_3M.

8. A solution type composition comprising an azo compound of the formula:



wherein R is of the formula:



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R_1 is hydrogen, methyl or $—SO_3M$; R_2 is hydrogen or $—SO_3M$; R_3 is C_4–C_{18} alkyl and M is hydrogen, an alkali metal, ammonium, monoethanol ammonium, diethanol ammonium or triethanol ammonium, provided that when R includes $—SO_3M$, R_1 and R_2 are not $—SO_3M$, and when R does not include $—SO_3M$, one of R_1 and R_2 is $—SO_3M$; a hydrophilic solvent and water.

4,734,490

WATER SOLUBLE PHTHALIMIDE-AZO-ANILINE DYES AND MIXTURES THEREOF

Hansrudolf Schwander, Rieben, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

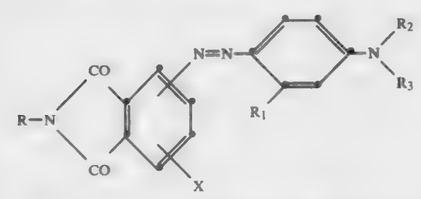
Continuation of Ser. No. 315,398, Oct. 27, 1981, abandoned. This application Aug. 28, 1986, Ser. No. 901,708

Claims priority, application Switzerland, Oct. 30, 1980, 8074/80

Int. Cl.[4] C09B *29/40;* **D06P** *1/39, 3/16, 3/24*

U.S. Cl. 534—782 **29 Claims**

1. A monoazo compound, or a mixture of such compounds with one another, of the formula:



in which R is phenyl or naphthyl which is unsubstituted or substituted by C_1–C_4-alkyl, or is cyclohexyl which is unsubstituted or substituted by C_1–C_4-alkyl, or is C_1–C_8-alkyl which is unsubstituted or substituted by cyano, phenyl or sulphophenyl, X is hydrogen or halogen, R_1 is hydrogen or methyl, R_2 is C_1–C_8-alkyl, C_1–C_4-sulfatoalkyl, C_1–C_4-sulfoalkyl or cyclohexyl and R_3 is C_1–C_4-alkyl, cyclohexyl which is unsubstituted or substituted by C_1–C_4-alkyl, or is a C_1–C_4-alkylene-C_6H_5 radical, in which the phenyl radical is unsubstituted or substituted by $—SO_3H$, with the condition that the molecule contain a sulfo group in R, R_2 or R_3 or a sulfato group in R_2.

4,734,491

DNA SEQUENCES ENCODING HYBRID LYMPHOBLASTOID-LEUKOCYTE HUMAN INTERFERONS

Marvin H. Caruthers, Boulder, Colo., assignor to University Patents, Inc., Westport, Conn.

Filed Aug. 31, 1984, Ser. No. 646,557

Int. Cl.[4] C07H *21/04;* **C12N** *15/00*

U.S. Cl. 536—27 **31 Claims**

1. A deoxynucleotide sequence encoding for a hybrid lymphoblastoid-leukocyte human interferon comprising 166 amino acids and optionally having an additional methionine attached to the ordinary first amino acid at the N-terminus with a plus strand represented by the following formula:

5'-ATG-W-X-P-Y-B-Z

wherein W is TGT or TGC; X consists essentially of deoxynucleotides encoding for amino acids 2 to 46 of human lymphoblastoid interferon (LbIF); Y consists essentially of deoxynucleotides encoding for amino acids 60 to 85 of said LbIF; Z consists essentially of deoxynucleotides encoding for amino acids 112 to 166 of said LbIF; P consists essentially of deoxynucleotides encoding for amino acids 47 to 59 of human αC-, αF-, or αI-type leukocyte interferon (LeIF) and is CAG_{47} TTC CAA AAG_{50} GCT CAG GCA ATC TCG_{55} GTT CTG CAT GAG_{59}, or CAG_{47} TTC CAA AAG_{50} ACC CAG GCA ATC TCG_{55} GTT CTG CAT GAG_{59}; B consists essentially of deoxynucleotides encoding for amino acids 86 to 111 to said αC-, αF-, or αI-type LeIF and is TCC_{86} ACT GAA CTC TAT_{90} CAG CAA CTG AAC GAT_{95} CTT GAA GCT TGC GTT_{100} ATC CAG GAG GTA GGC_{105} GTT GAA GAG ACT CCG_{110} CTT, TCC_{86} ATC GAA CTC AAT_{90} CAG CAA CTG AAC GAT_{95} ATG GAA GCT TGC GTT_{100} ATC CAG GAG GTA GGC_{105} GTT GAA GAG ACT CCG_{110} CTT, or TCC_{86} ATC GAA CTC TAT_{90} CAG CAA CTA AAC AAC_{95} CTT GAA GCT TGC GTT_{100} ATC CAG GAT GTA GGC_{105} ATG GAA GAG ACT CCG_{110} CTT; and transcriptional and translational single or multiple base substitutions, insertions and inversions; wherein A is deoxyadenyl, G is deoxyguanyl, C is deoxycytosyl and T is thymidyl.

4,734,492

MACROLIDE ANTIBIOTIC M 119

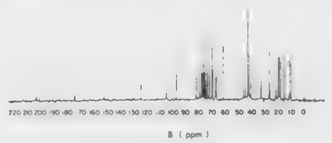
Hiroyuki Tanba; Kazuyoshi Adachi, and Tomiko Kawasaki, all of Maebashi, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,403

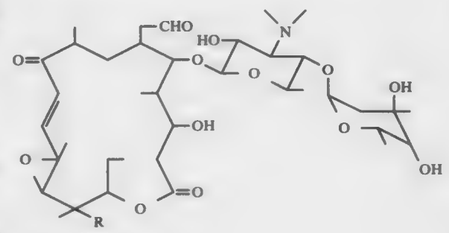
Claims priority, application Japan, Jul. 16, 1985, 60-156396

Int. Cl.[4] C07H *17/08*

U.S. Cl. 536—7.1 **1 Claim**



1. A macrolide antibiotic, M 119, of the formula:



wherein R is OH.

4,734,493

NOVEL ANTHRACYCLINE ANTIBIOTICS

Akihiro Yoshimoto, Fujisawa; Osamu Jodo, Yokohama; Yoshio Watanabe, Fujisawa; Tomoyuki Ishikura, Chigasaki; Tsutomu Sawa, Ayase; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Sanraku, Incorporated, Tokyo, Japan

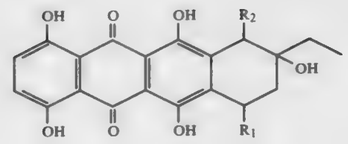
Filed Apr. 7, 1986, Ser. No. 849,229

Claims priority, application Japan, Apr. 12, 1985, 60-076777

Int. Cl.[4] C07H *15/24*

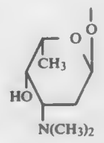
U.S. Cl. 536—6.4 **5 Claims**

1. An anthracycline antibiotic represented by the formula:



(I)

wherein R_1 represents a substituent shown by the formula:



(II)

and R_2 represents a hydroxyl group.

4,734,494

OPTICALLY ACTIVE 3-HALO CARBACEPHEMS

Tadashi Hirata, Yokohama; Yukio Hashimoto, Yamato; Ikuo Matsukuma, Yokkaichi; Shigeo Yoshiie, Sakai, and Seigo Takasawa, Hadano, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

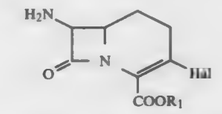
Continuation of Ser. No. 825,696, Feb. 3, 1986, abandoned, which is a continuation of Ser. No. 732,893, May 9, 1985, abandoned, which is a continuation of Ser. No. 643,101, Aug. 22, 1984, abandoned, which is a continuation of Ser. No. 518,315, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 291,129, Aug. 7, 1981, abandoned, which is a division of Ser. No. 206,639, Nov. 13, 1980, Pat. No. 4,302,541. This application Nov. 6, 1986, Ser. No. 926,889

Claims priority, application Japan, Nov. 14, 1979, 54-146488

Int. Cl.[4] C07D *487/04;* **C12P** *17/18;* **C07B** *19/02*

U.S. Cl. 540—205 **3 Claims**

1. Optically active (6R, 7S) compounds represented by the formula:



wherein R_1 represents hydrogen or a carboxyl-protecting group selected from the group consisting of: straight-chain or branched alkyl having 1 to 5 carbons, straight-chain or branched alkoxymethyl having 1 to 5 carbons, straight-chain or branched halogenated alkyl having 1 to 5 carbons, lower alkylsulfonylethyl, arylmethyl having 7 to 12 carbons, substituted arylmethyl having 7 to 20 carbons wherein the substituent is methoxy or nitro and the number of substituents on the phenyl ring is 1 to 5, and a protective group of carboxylic acid represented by the formula:



wherein R_2 is straight-chain or branched lower alkyl having 1 to 5 carbons, straight-chain or branched lower alkoxy having 1 to 5 carbons, or phenyl; and R_3 is hydrogen or straight-chain or branched lower alkyl having 1 to 5 carbons;

Hal represents a halogen atom; and pharmaceutically acceptable salts thereof.

4,734,495

PROCESS AND INTERMEDIATES FOR BETA-LACTAM ANTIBIOTICS

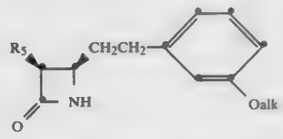
David A. Evans, Concord, and Eric B. Sjogren, Arlington, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 755,982, Jul. 17, 1985, Pat. No. 4,665,171. This application Feb. 11, 1987, Ser. No. 13,521

Int. Cl.[4] C07D *205/08, 413/04, 413/14, 409/14*

U.S. Cl. 540—364 **7 Claims**

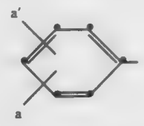
1. A compound of the formula



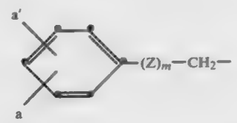
wherein R_5 is amino or an acylamino group of the formula

$R_1CONH—$

wherein R_1 is C_1–C_6 alkyl; a phenyl group or substituted phenyl group of the formula



wherein a and a' independently are hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, or halogen; or R_1 is a group of the formula



wherein Z is O or S, m is 0 or 1, and a and a' have the same meanings as defined above; or R_1 is R^o_1—O— wherein R^o_1 is C_1–C_4 alkyl, C_5–C_7 cycloalkyl, benzyl, nitrobenzyl, methoxybenzyl, or halobenzyl; and wherein alk is C_1–C_4 alkyl.

4,734,496

4-AMINO DERIVATIVES OF 2-OXO-1-AZETIDINESULFONIC ACID SALTS

Uwe D. Treuner; Theodor Denzel, both of Regensburg, and Hermann Breuer, Schoenhofen, all of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

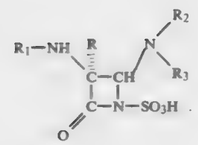
Filed May 29, 1981, Ser. No. 268,305

Int. Cl.[4] C07D *205/08, 417/14, 417/12, 403/12*

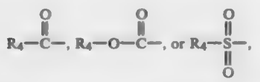
U.S. Cl. 540—355 **10 Claims**

1. A pharmaceutically acceptable salt, including inner salt, of a β-lactam having the formula

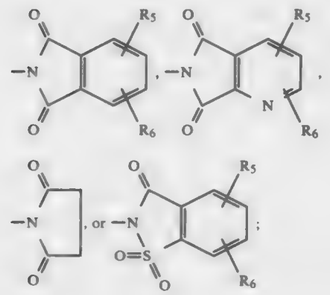
VOL 1088 ISS 5 MR 29 1988 UMI



wherein
R is hydrogen or methoxy;
R_1 is an acyl group derived from a carboxylic acid;
R_2 and R_3 are the same or different and each is

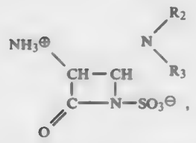


or R_2 and R_3 together with the nitrogen atom to which they are attached are

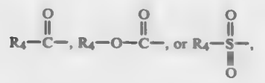


R_4 is alkyl, aryl or arylalkyl;
R_5 and R_6 are the same or different and each is hydrogen, halogen, alkyl, alkoxy, alkylthio, alkoxycarbonyl, carboxyl or a pharmaceutically acceptable carboxyl salt; and wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms and the term "aryl" refers to phenyl and phenyl substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms groups.

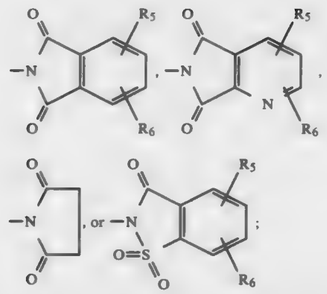
8. A β-lactam having the structural formula



wherein R_2 and R_3 are the same or different and each is



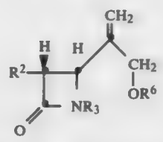
or R_2 and R_3 together with the nitrogen atom to which they are attached are



R_4 is alkyl, aryl, or arylalkyl; and R_5 and R_6 are the same or different and each is hydrogen, halogen, alkyl, alkoxy, alkylthio, alkoxycarbonyl, carboxyl or a pharmaceutically acceptable carboxyl salt; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms and the term "aryl" refers to phenyl and phenyl substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms groups.

4,734,497
INTERMEDIATES FOR PROCESS FOR CHIRAL SYNTHESIS OF 1-β-METHYL-CARBAPENEM INTERMEDIATES
Burton G. Christensen, Cliffside Park; Lovji D. Cama, Cresskill, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 703,056, Feb. 19, 1985, Pat. No. 4,617,152. This application Sep. 5, 1986, Ser. No. 889,051
Int. Cl.[4] C07D *205/08, 498/04, 7/18, 53/00*
U.S. Cl. 540—200 **4 Claims**

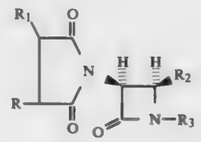
1. A composition of the formula:



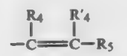
wherein R^2 is independently selected from hydrogen, linear or branched C_1–C_3 alkyl, which can be substituted with fluoro, hydroxy or protected hydroxy, R^3 is hydrogen or a protecting group and R^6 is hydrogen or a protecting group.

4,734,498
3β-SUCCINIMIDOAZETIDINONES AS CHIRAL INTERMEDIATES
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Jul. 10, 1986, Ser. No. 884,124
Int. Cl.[4] C07D *205/08, 405/14, 403/04, 409/14*
U.S. Cl. 540—364 **20 Claims**

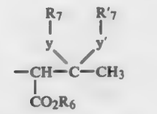
1. The compound of the formula



wherein
R and R_1 are C_1–C_5 alkanoyloxy, benzoyloxy, a mono- or di-substituted benzoyloxy group substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, cyano, nitro, amino, or C_1–C_4 alkoxy carbonyl, benzyloxy, diphenylmethoxy, or triphenylmethoxy; or one of R and R_1 is hydrogen and the other is C_1–C_5 alkanoyloxy, benzoyloxy, a substituted benzoyloxy group as defined above, benzyloxy, diphenylmethoxy or triphenylmethoxy;
R_2 is C_1–C_4 alkoxycarbonyl or a grop represented by the formula

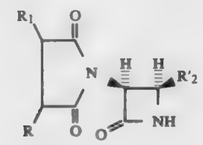


wherein
R_4 and R'_4 independently are hydrogen or C_1–C_4 alkyl, R_5 is phenyl, naphthyl, m-(C_1–C_4 alkoxy) phenyl, furyl, or protected carboxy; and
R_3 is protected-carboxymethyl, an NH protecting group or a 1-(protected carboxy)-2-propanone ketal or thioketal group represented by the formula

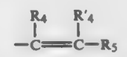


wherein R_6 is a carboxy-protecting group, y and y' are both oxygen or sulfur, and R_7 and R_7 ' when taken separately are C_1–C_4 alkyl, and when taken together are —CH_2—CH_2— or —CH_2—CH_2—CH_2— which with the oxygen or sulfur atoms to which they are bonded form a 5- or 6-membered ring.

14. The compound of the formula



wherein
R and R_1 are C_1–C_5 alkanoyloxy, benzoyloxy, a substituted benzoyloxy group substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, cyano, nitro, amino, or C_1–C_4 alkoxy carbonyl, benzyloxy, diphenylethoxy or triphenylmethoxy; or one of R and R_1 is hydrogen and the other is C_2–C_5 alkanoyloxy, benzoyloxy, substituted benzoyloxy group as defined above, benzyloxy, diphenylmethoxy or triphenylmethoxy;
R'_2 is C_1–C_4 alkoxycarbonyl, carboxy, formyl, hydroxymethyl, 2-carboxyethyl, or a group of the formula



wherein R_4 and R'_4 independently are hydrogen or C_1–C_4 alkyl, and R_5 is phenyl, naphthyl, m-(C_1–C_4 alkoxy)phyenyl, furyl or protected carboxy.

4,734,499
PREPARATION OF α,β-DIAMINOACRYLONITRILES
Eckhard Hickmann, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Sep. 19, 1985, Ser. No. 777,931
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434525
Int. Cl.[4] C07D *243/08, 241/06;* **C07C** *121/30*
U.S. Cl. 540—575 **12 Claims**

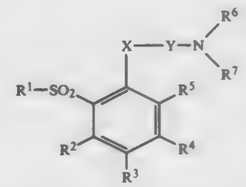
1. A process for the preparation of an α,β-diaminoacrylonitrile of the formula

$$R^3R^2NC(R^1)=C(NR^2R^3)CN \qquad I$$

where R^1, R^2 and R^3 are identical or different and independently of one another are each hydrogen or an organic group selected from the class consisting of alkyl, cycloalkyl, aralkyl of 7 to 12 carbon atoms or phenyl, each of said organic groups being unsubstituted or substituted by an inert group selected from the class consisting of nitro and alkoxy, and the organic radicals R^2 may furthermore be bonded to one another to form a 6-membered or 7-membered heterocyclic ring, or R^2 and R^3 may be bonded to one another to form a 5-membered or 6-membered heterocyclic ring, which process comprises reacting in any sequence the component (A) with the components (B), (C) and (D) as follows:
(A) an α-dicarbonyl compound of the formula R^1COCHO, where R^1 has the above meanings, or a derivative which is converted to this carbonyl compound under the reaction conditions,
(B) a salt of sulfurous acid or sulfur dioxide or a donor reagent which liberates sulfur dioxide under the reaction conditions,
(C) an amine of the formula HNR^2R^3, or an aliphatic diamine of the formula R^3HN—$(CH_2)_n$13 NHR^3, where the alkylene chain may carry a further substituent R^1, R^1 and R^3 having the above meanings and n being 2 or 3, or a derivative which is converted to such amine or diamine under the reaction conditions, and
(D) liquid or gaseous hydrocyanic acid or a donor reagent which liberates hydrocyanic acid under the reaction conditions.

4,734,500
O-AMINOALKYLENE (OR AMINOALKYLENEOXY) PHENYLSULFONE COMPOUNDS HAVING ANTI-ULCER EFFECT
Akihiro Tobe; Shinichiro Fujimori; Tomoshi Yamazaki, all of Yokohama; Mamoru Sugano, Kawasaki; Ryoji Kikumoto, and Issei Nitta, both of Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Mar. 11, 1986, Ser. No. 838,569
Claims priority, application Japan, Mar. 14, 1985, 60-51202
Int. Cl.[4] C07D *295/08, 333/50*
U.S. Cl. 544—398 **4 Claims**

1. An arylsulfone compound represented by formula (I):



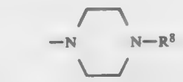
wherein R^1 is a cyclohexyl, phenyl group, or a phenyl group substituted with one member selected from the group consisting of nitro, C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen; R^2 is hydrogen; R^3 is hydrogen, halogen, cyano or carboxyl; R^4 is

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hydrogen or halogen; R^5 is hydrogen; R^1 and R^2 together may form an O-phenylene group or an O-phenylene group substituted with one member selected from the group consisting of nitro, C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen; X is an oxygen atom or a methylene group; Y is $-(CH_2)_n-$, wherein n is

$$-CH_2CHCH_2-$$
$$\quad\quad|$$
$$\quad OCO(CH_2)_mCOOH$$

wherein m is an integer of 1–3; R^6 is a hydrogen atom, a C_1–C_3 alkyl group, or an ω-alkylaminoalkyl group, wherein each alkyl group has 1–3 carbon atoms; R^7 is hydrogen or a C_1–C_3 alkyl group or NR^6R^7 is



wherein R^8 is hydrogen, C_1–C_3 alkyl, C_1–C_3 hydroxyalkyl or phenyl; or a pharmaceutically acceptable salt thereof.

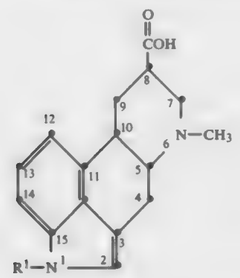
4,734,501

N-ALKYLATION OF DIHYDROLYSERGIC ACID

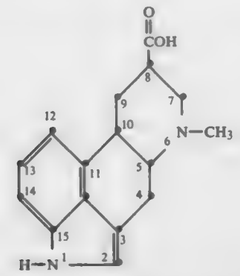
Gifford P. Marzoni, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 1, 1985, Ser. No. 782,339
Int. Cl.[4] C07D *457/04*
U.S. Cl. 546—69 **5 Claims**

1. A process for preparing a compound of the formula



wherein R^1 is C_3–C_8 alkyl, $—CH_2C_2—C_4$ alkenyl, propargyl, C_3–C_8 cycloalkyl or C_1–C_5 alkyl substituted C_3–C_8 cycloalkyl, comprising treating a compound of the formula



with a substituted benzenesulfonate of the formula



wherein R^1 is as defined above and R^2 is methyl in the presence of a suitable alkali metal hydroxide base and solvent.

4,734,502

PROCESS FOR THE PREPARATION OF 2,2,6,6-TETRAMETHYL-4-OXOPIPERIDINE

Walter M. Kruse, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Dec. 22, 1986, Ser. No. 944,835
Int. Cl.[4] C07D *211/74*
U.S. Cl. 546—242 **2 Claims**

1. In a process for the preparation of 2,2,-6,6-tetramethyl-4-oxopiperidine which comprises reacting acetone with ammonia at temperatures ranging from 5°—70° C. the improvement which comprises carrying out said reaction in the presence of catalytic amounts of active halogen compounds selected from those in the group consisting of SO_2X_2, $R—SO_2X$, $RCO—N(X)—COR$, $RCO(NHX)$, $RCH(X)CH_2—CO_2R$, $RCH(X)CH_2—CN$, $RCH(OH)—CH_2X$, and $RCO—CH_2(X)$ wherein X is chlorine or bromine and R is a group selected from alkyl, aryl, arylalkyl and alkylaryl groups having up to 22 carbon atoms wherein acetone is first reacted with ammonia in concentrations of 0.5–1.5 mol NH_3 per mol acetone at temperatures in the range of 5°–30° C., and there after with additional acetone in concentrations of 5–10 mols ace tone per mol NH_3 at temperatures of 50°–70° C.

2. A process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine which comprises reacting acetone with ammonia at temperatures ranging from 5°–70° C., the improvement which comprises carrying out said reaction in the presence of catalytic amounts of active halogen compounds selected from the group consisting of tetrachloro-1,- 4-benzoquinone, methanesulfonylchloride, sulfurylchloride, 1,3-dibromo-5,5-dimethylhydantoin, 1,3-dichloro-5,5-dimethylhydantoin, N-bromosuccinimide, trichloromelamine, trichloroisocyanuric acid, 3-chloropropionitrile, ethyl-3-chloropropionate, 1,3-dichloro-2-propanol, and N-chlorosuccinimide and their chloro or bromo equivalents wherein acetone is first reacted with ammonia in concentration of 0.5–1.5 mol ammonia per mol acetone at temperatures in the range of 5°–30° C., and thereafter with additional acetone in concentrations of 5–10 mols acetone per mol ammonia at temperatures of 50°–70° C.

4,734,503

CATALYTIC TRANSHALOGENATION OF HALOAROMATICS

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 7, 1986, Ser. No. 827,011
Int. Cl.[4] C07D *211/72*; C07C *21/24, 25/13, 17/00*
U.S. Cl. 546—345 **33 Claims**

1. A catalyst method for rearranging haloaromatic compounds according to the equation

$$C_zF_aX_bN_eL_1+C_zF_cX_dN_eL_2 \rightarrow C_zF_{a+1}X_{b-1}N_eL_1 + C_zF_{c-1}X_{d+1}N_eL_2$$

wherein:
when C_z is benzene, a+b=5; e—0; c+d=5; z=6;
when C_z is a pyridine, a+b=4; e=1; c+d=4; z=5;
when C_z is a naphthalene, a+b=7; e=0; c+d=7; z=10; and
when C_z is a biphenyl, a+b=9; e=0; c+d=9; z=12;
L_1 and L_2, alike or different, are selected from F, Cl, Br, H, CN, C_nF_{2n+1}, and C_6F_5;

X is Cl, Br, or I when C_z is a benzene; and
n is 1 to 12;
at a temperature of about 300° to 600° C., in the presence of a catalyst selected from the group consisting of:
(i) Cr_2O_3 and Al_2O_3 alone or together;
(ii) Cr_2O_3 and one or more members from the group MnO, MnO_2, P_2O_5, B_2O_3, La_2O_3, ZnO, Fe_2O_3, NiO, Pd, WO_3, CoO, V_2O_5, $CuCl_2$, CuO, PbO, Bi_2O_3, FeO, NiO, CoO, ZrO_2, TiO_2, MgO and $CrCl_3$; and
(iii) Al_2O_3 and one or more members from the group MnO, MnO_2, P_2O_5, B_2O_3, La_2O_3, ZnO, Fe_2O_3, NiO, Pd, WO_3, CoO, V_2O_5, $CuCl_2$, CuO, PbO, Bi_2O_3, FeO, NiO, CoO, ZrO_2, TiO_2, MgO and $CrCl_3$.

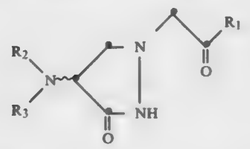
4,734,504

1-ALKYLATED DIAZOLIDINONES

Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 14, 1986, Ser. No. 862,918
Claims priority, application European Pat. Off., Apr. 28, 1986, 86303174.6
Int. Cl.[4] C07D *231/08*
U.S. Cl. 548—364 **7 Claims**

1. A compound of the formula:



wherein:
R_1 is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, perfluoro C_2 to C_4 alkyl, C_7 to C_{12} arylalkyl, C_7 to C_{12} substituted arylalkyl, phenyl, substituted phenyl, or a heterocyclic ring; a group of the formula

$$—CX_3$$

wherein X is fluoro, chloro, bromo or iodo; or a group of the formula

$$—S—R_4$$

wherein R_4 is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, phenyl, substituted phenyl, C_7 to C_{12} arylalkyl, C_7 to C_{12} substituted arylalkyl or a heterocyclic ring;
R_2 and R_3 are:
(1) each hydrogen;
(2) taken together and form a phthalimido group; or
(3) different and are either hydrogen or an amino-protecting group;
or a pharmaceutically-acceptable salt thereof.

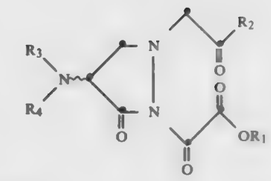
4,734,505

1-(ALKYLATED)-2-(ACYLATED)DIAZOLIDINONES

Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 14, 1986, Ser. No. 862,909
Claims priority, application European Pat. Off., Apr. 28, 1986, 86303174.6
Int. Cl.[4] C07D *231/08*
U.S. Cl. 548—364 **7 Claims**

1. A compound of the formula:



wherein:
R_1 is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, perfluoro C_2 to C_4 alkyl, C_7 to C_{12} arylalkyl, C_7 to C_{12} substituted arylalkyl, phenyl, substituted phenyl, or a heterocyclic ring; a group of the formula

$$—CX_3$$

wherein X is fluoro, chloro, bromo or iodo; or
a group of the formula

$$—S—R_5$$

wherein R_5 is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, phenyl, substituted phenyl, C_7 to C_{12} arylalkyl, $C_7$to C_{12} substituted arylalkyl or a heterocyclic ring; and
R_3 and R_4 are:
(1) each hydrogen;
(2) taken together and form a phthalimido group; or
(3) different and are either hydrogen or an amino-protecting group;
or a pharmaceutically-acceptable salt thereof.

4,734,506

4-AMINO-3-IMIDAZOLIN-2-ONE

Siegfried Maeke, Raubling-Kirchdorf; Adolf Bauer; Hubert Vogt, both of Raubling, and Helmut Wolf, Neubeuern, all of Fed. Rep. of Germany, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 581,852, Feb. 21, 1984, Pat. No. 4,623,730. This application Aug. 4, 1986, Ser. No. 911,268
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305778
Int. Cl.[4] C07D *233/88*
U.S. Cl. 548—308 **1 Claim**

1. 4-amino-3-imidazolin-2-one.

4,734,507

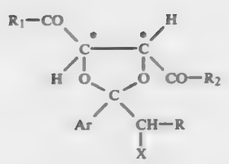
OPTICALLY ACTIVE KETALS, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN THE SYNTHESIS OF ALPHA-ARYLALKANOIC ACIDS

Claudio Giordano, Vicenza; Graziano Castaldi, Briona; Fulvio Uggeri, Codogno, and Silvia Cavicchioli, Costermano, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Filed Apr. 5, 1985, Ser. No. 720,379
Claims priority, application Italy, Apr. 6, 1984, 7204 A/84; Aug. 6, 1984, 7206 A/84; Aug. 6, 1984, 7207 A/84
Int. Cl.[4] C07D *317/16, 317/24, 317/20*
U.S. Cl. 549—450 **7 Claims**

1. Alkyl aryl-ketal having the formula

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(I)

wherein

Ar represents naphthyl or naphthyl substituted by halogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, benzyl, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, phenoxy, thienylcarbonyl or benzoyl,

R represents C_1–C_4 alkyl,

R_1 and R_2 each independently represent hydroxy, O^-M^+, OR_3 or



R_3 represents C_1–C_{24} alkyl, C_3–C_6 cycloalkyl, phenyl or benzyl,

M^+ represents the cation of an alkaline metal,

R_4 and R_5, each independently, represent hydrogen, C_1–C_4 alkyl, C_5–C_6 cycloalkyl, $(CH_2)_n$—CH_2OH wherein n equals 1, 2 or 3, or R_4 and R_5 together represent $(CH_2)_m$ wherein m equals 4 or 5, or CH_2—CH_2—R_6—CH_2—CH_2 wherein R_6 represents O, NH or N—(C_1–C_4) alkyl,

X represents chlorine, bromine, iodine, hydroxy, carboxylic acyloxy, alkylsulphonyloxy or arylsulphonyloxy,

the carbon atoms marked by an asterisk being both contemporaneously in the R or S configuration.

4,734,508

PROCESS AND INTERMEDIATES FOR PREPARING 4-SUBSTITUTED PROLINE DERIVATIVES

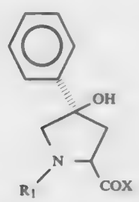
John K. Thottathil, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 1, 1987, Ser. No. 44,691

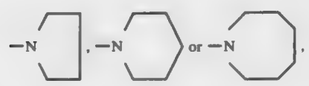
Int. Cl.[4] C07D *207/12*

U.S. Cl. 548—532 **9 Claims**

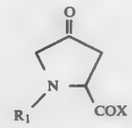
1. A process for preparing (cis)-4-hydroxy-4-phenyl proline derivatives having the structure



wherein R_1 is a nitrogen protecting group; and X is OR_2 or NR_3R_4, wherein R_2 is H or an acid protecting group and R_3 and R_4 are the same or different and are H, lower alkyl, aryl or arylalkyl or R_3 and R_4 together with the nitrogen to which they are attached form a 5-, 6- or 7-membered ring, the term alkyl or lower alkyl by itself or as part of another group refers to straight and branched chain groups having 1 to 10 carbon; the term aryl by itself or as part of another group refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino or trifluoromethyl; the term nitrogen protecting group refers to benzoyl, benzyloxycarbonyl, t-butoxycarbonyl, benzene sulfonyl, toluene sulfonyl, benzyl, benzhydryl, trityl, acetyl or trifluoroacetyl; the term acid protecting group refers to lower alkyl, phenyl-lower alkyl or a metal ion; the term 5-, 6- or 7-membered ring refers to



which process comprises reacting triphenylcerium with a 4-keto proline of the structure



in the presence of an inert organic solvent, at a temperature within the range of from about −90° C. to about −10° C. for a period of from about 0.5 to about 6 hours, employing a molar ratio of 4-keto proline to triphenyl cerium of within the range of from about 4:1 to about 1:1 depending upon the nature of X in the 4-keto proline.

4,734,509

PREPARATION OF 4(5)-HYDROXYMETHYL-5(4)-METHYLIMIDAZOLE

Jacob Herzig, Raanana; Ben Z. Weiner, Jerusalem; Stephan Cherkez, Ramat Gan, and Abraham Antebi, Bat-Yam, all of Israel, assignors to Teva Pharmaceutical Industries Ltd., Israel

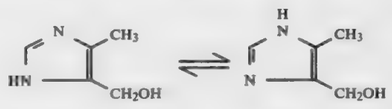
Filed Apr. 22, 1986, Ser. No. 854,537

Claims priority, application Israel, May 1, 1985, 75063

Int. Cl.[4] C07D *233/64*

U.S. Cl. 548—342 **19 Claims**

1. A process for the preparation of a 4(5)-hydroxymethyl5(4)-methylimidazole (MHI) of the tautomeric formulae



Ia Ib

which comprises the steps of:

(a) reacting 4-methylimidazole (MI) with from 1.05 to 1.1 moles of formaldehyde or an equivalent amount of paraformaldehyde per mole of MI, in a concentrated aqueous NaCl solution in the presence of a catalytically effective amount of a strong inorganic base, at a temperature from about 20° to about 60° C.;

(b) neutralizing the reaction mixture with concentrated aqueous hydrochloric acid to a pH of 8.5–8.9 to obtain a precipitate of MHI free base; and

(c) separating the precipitate thus obtained from the aqueous solution and washing it with cold water or acetone;

4,734,510

4-SUBSTITUTED-N-(PIPERIDINYL OR PYRROLIDINYL)ALKYL BENZENESULFONAMIDES

John T. A. Boyle, Cookham, and Richard S. Todd, Burnham, Near Slough, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 744,364, Jun. 13, 1985, Pat. No. 4,640,920.

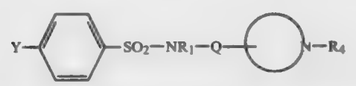
This application Oct. 9, 1986, Ser. No. 916,984

Claims priority, application United Kingdom, Jun. 14, 1984, 8415174; Dec. 19, 1984, 8432091

Int. Cl.[4] C07D *207/09, 211/28*

U.S. Cl. 548—566 **3 Claims**

1. A compound having the formula



and the salts thereof, wherein R_1 is selected from hydrogen and lower alkyl; R_4 represents lower alkyl; Q represents lower alkylene and the ring attached to Q and R_4 is selected from piperidine, pyrrolidine, piperidine substituted on at least one ring carbon atom by lower alkyl and pyrrolidine substituted on at least one ring carbon atom by lower alkyl; and Y is selected from amino, lower alkanoylamino and nitro.

4,734,511

METHOD FOR PRODUCING α,α-DIMETHYL-Δ-VALEROLACTONE

Takeshi Inagaki, Yokohama; Tuyoshi Irie, Chigasaki; Katsumi Nakamura, Yokohama, and Denzi Sato, Tochigi, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,641

Claims priority, application Japan, Oct. 17, 1985, 60-230005; Sep. 11, 1986, 61-212815

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—273 **7 Claims**

1. A method for producing α,α-dimethyl-δ-valerolactone which comprises adding 2,2-dimethyl-4-pentenoic acid to an organic solvent containing hydrogen bromide previously dissolved to carry out the addition reaction of hydrogen bromide and said acid to synthesize 2,2-dimethyl-5-bromovaleric acid, and subjcting 2,2-dimethyl-5-bromovaleric acid to ring-closure reaction by alkali treatment.

4,734,512

INTERMEDIATES FOR THE PRODUCTION OF PODOPHYLLOTOXIN AND RELATED COMPOUNDS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

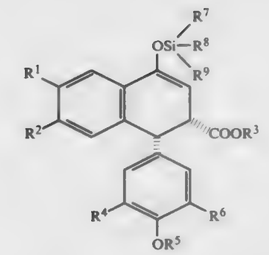
Takushi Kaneko, and Henry S. L. Wong, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 5, 1985, Ser. No. 805,484

Int. Cl.[4] C07D *317/70;* **C07F** *7/04*

U.S. Cl. 549—214 **2 Claims**

1. A compound of the formula



V

wherein R^1 and R^2 each are independently hydrogen or (lower)alkoxy, or R^1 and R^2, taken together, is methylenedioxy; R^3 is hydrogen or a carboxyl-protecting group; R^4 and R^6 each are independently hydrogen or (lower)alkoxy; R^5 is hydrogen or a phenol-protecting group; and R^7, R^8 and R^9 each are independently lower(alkyl) or phenyl.

4,734,513

METHOD OF SYNTHESIZING FORSKOLIN FROM 9-DEOXYFORSKOLIN

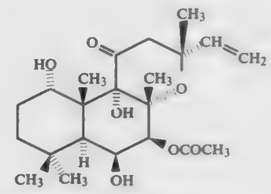
Nicholas J. Hrib, Somerville, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Mar. 31, 1986, Ser. No. 846,550

Int. Cl.[4] C07D *311/92*

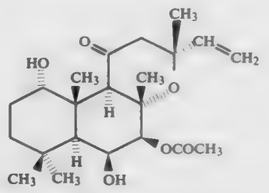
U.S. Cl. 549—389 **12 Claims**

1. A method of preparing the compound of the formula



(I)

from the compound of the formula



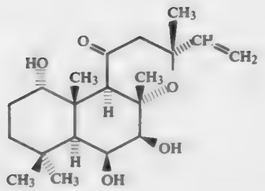
(II)

which comprises

(i) hydrolysis of compound II to afford the compound of the formula

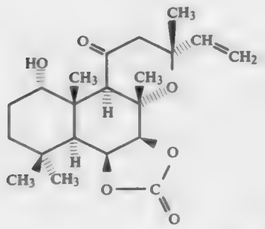
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(III)



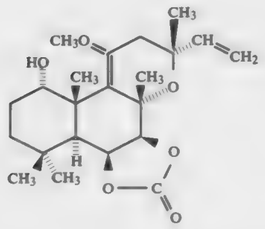
(ii) reacting compound III with 1,1'-carbonyldiimidazole to afford the carbonate ester of the formula

(IV)



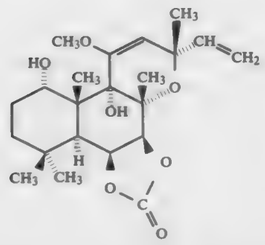
(iii) reacting compound IV with dimethyl sulfate and potassium hydride to afford the compound of the formula

(V)



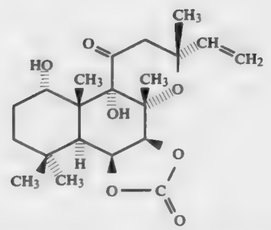
(iv) reacting compound V with a peroxy acid to afford the compound of the formula

(VI)



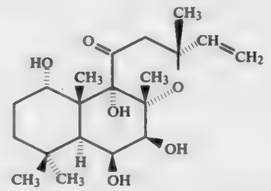
(v) hydrolysis of compound VI under an acidic condition to afford the compound of the formula

(VII)



(vi) hydrolysis of compound VII under a basic condition to afford the compound of the formula

(VIII)



(vii) acetylation of the hydroxy group at carbon-7 of compound VIII to afford compound I.

4,734,514

HYDROCARBON-SUBSTITUTED ANALOGS OF PHOSPHINE AND ARSINE, PARTICULARLY FOR METAL ORGANIC CHEMICAL VAPOR DEPOSITION

Andreas A. Melas, Burlington; Benjamin C. Hui, Peabody, both of Mass., and Jorg Lorberth, Weimar-Niederweimar, Fed. Rep. of Germany, assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 664,645, Oct. 25, 1984. This application Feb. 10, 1986, Ser. No. 828,467

Int. Cl.[4] C07F 9/70

U.S. Cl. 556—70 43 Claims

1. A compound having the structure:



wherein H is hydride and the respective identities of N, X, and Y are selected from the following table of species:

N	X	Y
arsenic	hydride	s-butyl
arsenic	hydride	i-butyl
arsenic	hydride	n-pentyl
arsenic	hydride	i-pentyl
arsenic	hydride	t-pentyl
arsenic	hydride	neopentyl
arsenic	hydride	cyclopentadienyl
arsenic	methyl	i-propyl
arsenic	methyl	n-butyl
arsenic	methyl	s-butyl
arsenic	methyl	i-butyl
arsenic	methyl	t-butyl
arsenic	methyl	n-pentyl
arsenic	methyl	i-pentyl
arsenic	methyl	t-pentyl
arsenic	methyl	neopentyl
arsenic	methyl	cyclopentadienyl
arsenic	ethyl	n-propyl
arsenic	ethyl	i-propyl
arsenic	ethyl	n-butyl

-continued

N	X	Y
arsenic	ethyl	s-butyl
arsenic	ethyl	i-butyl
arsenic	ethyl	t-butyl
arsenic	ethyl	n-pentyl
arsenic	ethyl	i-pentyl
arsenic	ethyl	t-pentyl
arsenic	ethyl	neopentyl
arsenic	ethyl	cyclopentadienyl
arsenic	ethyl	phenyl
arsenic	n-propyl	i-propyl
arsenic	n-propyl	n-butyl
arsenic	n-propyl	s-butyl
arsenic	n-propyl	i-butyl
arsenic	n-propyl	t-butyl
arsenic	n-propyl	n-pentyl
arsenic	n-propyl	i-pentyl
arsenic	n-propyl	t-pentyl
arsenic	n-propyl	neopentyl
arsenic	n-propyl	cyclopentadienyl
arsenic	n-propyl	phenyl
arsenic	i-propyl	n-butyl
arsenic	i-propyl	s-butyl
arsenic	i-propyl	i-butyl
arsenic	i-propyl	t-butyl
arsenic	i-propyl	n-pentyl
arsenic	i-propyl	i-pentyl
arsenic	i-propyl	t-pentyl
arsenic	i-propyl	neopentyl
arsenic	i-propyl	cyclopentadienyl
arsenic	i-propyl	phenyl
arsenic	n-butyl	s-butyl
arsenic	n-butyl	i-butyl
arsenic	n-butyl	t-butyl
arsenic	n-butyl	n-pentyl
arsenic	n-butyl	i-pentyl
arsenic	n-butyl	t-pentyl
arsenic	n-butyl	neopentyl
arsenic	n-butyl	cyclopentadienyl
arsenic	n-butyl	phenyl
arsenic	s-butyl	s-butyl
arsenic	s-butyl	i-butyl
arsenic	s-butyl	t-butyl
arsenic	s-butyl	n-pentyl
arsenic	s-butyl	i-pentyl
arsenic	s-butyl	t-pentyl
arsenic	s-butyl	neopentyl
arsenic	s-butyl	cyclopentadienyl
arsenic	s-butyl	phenyl
arsenic	i-butyl	i-butyl
arsenic	i-butyl	t-butyl
arsenic	i-butyl	n-pentyl
arsenic	i-butyl	i-pentyl
arsenic	i-butyl	t-pentyl
arsenic	i-butyl	neopentyl
arsenic	i-butyl	cyclopentadienyl
arsenic	i-butyl	phenyl
arsenic	t-butyl	n-pentyl
arsenic	t-butyl	i-pentyl
arsenic	t-butyl	t-pentyl
arsenic	t-butyl	neopentyl
arsenic	t-butyl	cyclopentadienyl
arsenic	t-butyl	phenyl
arsenic	n-pentyl	n-pentyl
arsenic	n-pentyl	i-pentyl
arsenic	n-pentyl	t-pentyl
arsenic	n-pentyl	neopentyl
arsenic	n-pentyl	cyclopentadienyl
arsenic	n-pentyl	phenyl
arsenic	i-pentyl	i-pentyl
arsenic	i-pentyl	t-pentyl
arsenic	i-pentyl	neopentyl
arsenic	i-pentyl	cyclopentadienyl
arsenic	i-pentyl	phenyl
arsenic	t-pentyl	t-pentyl
arsenic	t-pentyl	neopentyl
arsenic	t-pentyl	cyclopentadienyl
arsenic	t-pentyl	phenyl
arsenic	neopentyl	neopentyl
arsenic	neopentyl	cyclopentadienyl

-continued

N	X	Y
arsenic	neopentyl	phenyl
arsenic	cyclopentadienyl	cyclopentadienyl
arsenic	cyclopentadienyl	phenyl
phosphorus	hydride	t-pentyl
phosphorus	hydride	neopentyl
phosphorus	methyl	s-butyl
phosphorus	methyl	i-butyl
phosphorus	methyl	t-butyl
phosphorus	methyl	n-pentyl
phosphorus	methyl	i-pentyl
phosphorus	methyl	t-pentyl
phosphorus	methyl	neopentyl
phosphorus	methyl	cyclopentadienyl
phosphorus	ethyl	n-propyl
phosphorus	ethyl	i-propyl
phosphorus	ethyl	n-butyl
phosphorus	ethyl	s-butyl
phosphorus	ethyl	i-butyl
phosphorus	ethyl	t-butyl
phosphorus	ethyl	n-pentyl
phosphorus	ethyl	i-pentyl
phosphorus	ethyl	t-pentyl
phosphorus	ethyl	neopentyl
phosphorus	ethyl	cyclopentadienyl
phosphorus	n-propyl	i-propyl
phosphorus	n-propyl	n-butyl
phosphorus	n-propyl	s-butyl
phosphorus	n-propyl	i-butyl
phosphorus	n-propyl	t-butyl
phosphorus	n-propyl	n-pentyl
phosphorus	n-propyl	i-pentyl
phosphorus	n-propyl	t-pentyl
phosphorus	n-propyl	neopentyl
phosphorus	n-propyl	cyclopentadienyl
phosphorus	n-propyl	phenyl
phosphorus	i-propyl	n-butyl
phosphorus	i-propyl	s-butyl
phosphorus	i-propyl	t-butyl
phosphorus	i-propyl	n-pentyl
phosphorus	i-propyl	i-pentyl
phosphorus	i-propyl	t-pentyl
phosphorus	i-propyl	neopentyl
phosphorus	i-propyl	cyclopentadienyl
phosphorus	i-propyl	phenyl
phosphorus	n-butyl	s-butyl
phosphorus	n-butyl	i-butyl
phosphorus	n-butyl	t-butyl
phosphorus	n-butyl	n-pentyl
phosphorus	n-butyl	i-pentyl
phosphorus	n-butyl	t-pentyl
phosphorus	n-butyl	neopentyl
phosphorus	n-butyl	cyclopentadienyl
phosphorus	n-butyl	phenyl
phosphorus	s-butyl	i-butyl
phosphorus	s-butyl	t-butyl
phosphorus	s-butyl	n-pentyl
phosphorus	s-butyl	i-pentyl
phosphorus	s-butyl	t-pentyl
phosphorus	s-butyl	neopentyl
phosphorus	s-butyl	cyclopentadienyl
phosphorus	s-butyl	phenyl
phosphorus	i-butyl	t-butyl
phosphorus	i-butyl	n-pentyl
phosphorus	i-butyl	i-pentyl
phosphorus	i-butyl	t-pentyl
phosphorus	i-butyl	neopentyl
phosphorus	i-butyl	cyclopentadienyl
phosphorus	i-butyl	phenyl
phosphorus	t-butyl	n-pentyl
phosphorus	t-butyl	i-pentyl
phosphorus	t-butyl	t-pentyl
phosphorus	t-butyl	neopentyl
phosphorus	t-butyl	cyclopentadienyl
phosphorus	t-butyl	phenyl
phosphorus	n-pentyl	n-pentyl
phosphorus	n-pentyl	i-pentyl
phosphorus	n-pentyl	t-pentyl
phosphorus	n-pentyl	neopentyl
phosphorus	n-pentyl	cyclopentadienyl
phosphorus	n-pentyl	phenyl
phosphorus	i-pentyl	i-pentyl
phosphorus	i-pentyl	t-pentyl
phosphorus	i-pentyl	neopentyl
phosphorus	i-pentyl	cyclopentadienyl
phosphorus	i-pentyl	phenyl
phosphorus	t-pentyl	t-pentyl
phosphorus	t-pentyl	neopentyl
phosphorus	t-pentyl	cyclopentadienyl
phosphorus	t-pentyl	phenyl
phosphorus	neopentyl	neopentyl
phosphorus	neopentyl	cyclopentadienyl

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-continued

N	X	Y
phosphorus	i-pentyl	cyclopentadienyl
phosphorus	i-pentyl	phenyl
phosphorus	t-pentyl	t-pentyl
phosphorus	t-pentyl	neopentyl
phosphorus	t-pentyl	cyclopentadienyl
phosphorus	t-pentyl	phenyl
phosphorus	neopentyl	neopentyl
phosphorus	neopentyl	cyclopentadienyl
phosphorus	neopentyl	phenyl
phosphorus	cyclopentadienyl	cyclopentadienyl

4,734,515

1:2 METAL COMPLEXES OF 2-NITROSO-ACETOACETIC ACID AND BENZOYLACETIC ACID ARYLAMIDES

Peter Bitterli, Reinach; Jürgen Goldmann, Müchenstein, and Bansi L. Kaul, Biel-Benken, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

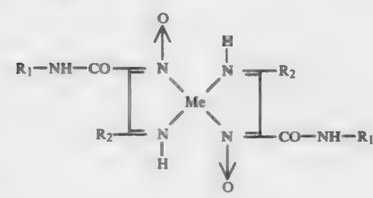
Filed Aug. 8, 1986, Ser. No. 894,401

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528517

Int. Cl.⁴ C07F *1/08, 3/06, 15/04, 15/06*

U.S. Cl. 556—32 **18 Claims**

1. A complex of the formula



wherein

each R_1 is independently a single ring or fused ring carbocyclic aromatic group free of water-solubilizing groups or a benzoimidazolyl group free of water-solubilizing groups, each R_2 is independently methyl or phenyl, and

Me is nickel, copper, cobalt or zinc.

4,734,516

PROCESS FOR THE PREPARATION OF PARTIALLY HALOGENATED 1-PROPANOLS

Robert W. Lang, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,399

Claims priority, application Switzerland, Mar. 28, 1985, 1346/85

Int. Cl.⁴ C07C *31/34, 29/64, 33/46, 67/343, 29/46, 69/96*

U.S. Cl. 558—54 **16 Claims**

1. A process for the preparation of a partially halogenated 1-propanol of the formula



(I)

comprising

reacting an aldehyde of the formula



(II)

in an inert solvent with a zinc compound of the formula



(III),

with the exception of the reaction of CF_3CCl_3 and an aldehyde of formula II in the presence of zinc, and isolating the resultant 1-propanol of formula I; wherein

y is one or two;

L is a solvent ligand selected from an N-disubstituted acid amide, an N-substituted lactam, and an organic sulfoxide; and

R is a hydrogen atom; an unsubstituted or substituted, aliphatic or aromatic, hydrocarbon radical of 1–30 carbon atoms; each of said aliphatic radicals being uninterrupted or interrupted by —C(O)— or —C(O)O—; said substituents of the R radical being selected from C_{1-18}alkyl, C_{2-18}alkenyl, C_{2-18}alkynyl, C_{6-18}aryl, C_{7-18}aralkyl, C_{7-18}alkaryl, C_{8-18}alkarylalkyl, C_{1-8}alkoxy, C_{1-8}alkylthio, C_{6-18}aryloxy, C_{7-18}aralkoxy, C_{7-18}aralkylthio, C_{6-8}aryloxy, C_{7-18}aralkoxy, C_{7-18}aralkylthio, C_{7-18}alkaryloxy, C_{8-18}alkarylalkoxy, C_{7-18}aryloxyarlkyl, C_{7-18}alkoxyaryl, C_{3-12}cycloalkyl, C_{3-12}cycloalkoxy, C_{3-12}cycloalkenyl, C_{3-12}cycloalkenyloxy, —COOH, —$CONH_2$, —$COOR^1$, —$CONHR^1$, —$CONR^1R^2$, —CN, —OH, —SH, —SO_2H, —SO_3H, —SO_2R^1, —SO_3R^1, —PO_2H, —PO_3H_2, —PO_2R^1, —PO_3R^1, —NO_2, —NH_2, —NHR^1, —NR^1R^2, F, Cl, Br, I, and —NCO; R^1 and R^2 independently being selected from C_{1-18}alkyl, cyclohexyl, phenyl, or benzyl;

said substituents on R being unsubstituted or further substituted by halogen, hydroxy, carboxy, cyano, or methoxy carbonyl.

4,734,517

N-PHOSPHONOMETHYLAMINOMETHYLBORONIC ACID DERIVATIVES

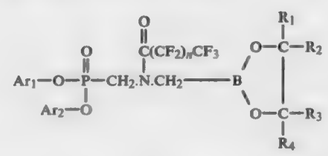
Dennis P. Phillion, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 24, 1986, Ser. No. 922,927

Int. Cl.⁴ C07F *9/00*

U.S. Cl. 558—072 **5 Claims**

1. A Compound having the formula:



wherein each of Ar_1 and Ar_2 is an aryl or a halo- or C_1 to C_4 alkyl substituted aryl group, n is an integer from 0 to 10, and R_1, R_2, R_3 and R_4 are each independently hydrogen or methyl groups.

4,734,518

PROCESS FOR COSYNTHESIS OF ETHYLENE GLYCOL AND DIMETHYL CARBONATE

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 12, 1987, Ser. No. 2,463

Int. Cl.⁴ C07C *67/02*

U.S. Cl. 558—277 **7 Claims**

1. A process for cosynthesis of ethylene glycol and dimethyl carbonate which comprises reacting ethylene carbonate and methanol in the presence of a homogeneous catalyst selected from the group consisting of bivalent sulphur and bivalent selenium compounds at a temperature of 20° to 200° C. until the desired products are formed.

4,734,519

PENTAERYTHRITOL CO-ESTERS

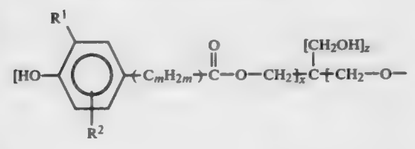
Neil Dunski, Creve Coeur, and Ali A. Bazzi, Chesterfield, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 5, 1986, Ser. No. 871,007

Int. Cl.⁴ C07C *149/20*

U.S. Cl. 560—75 **19 Claims**

1. A compound having the formula:



wherein

R^1 is methyl, ethyl, an alpha-branched acyclic alkyl group having from 3 to 10 carbon atoms, or a cycloalkyl group having from 5 to 12 carbon atoms;

R^2 is hydrogen, methyl, ethyl, an alpha-branched acyclic alkyl group having from 3 to 10 carbon atoms, or a cycloalkyl group having from 5 to 12 carbon atoms and R^2 is meta or para to R^1;

m is an integer from 1 to about 6;

n is an integer from 1 to about 10;

k is an integer from 1 to about 30;

x is 1, 2 or 3;

y is 1, 2 or 3; and

z is zero, 1 or 2;

subject to the provisos that

(a) the sum of x, y and z is 4;

(b) when z is zero, y is 1, 2 or 3 and x is 4-y;

(c) when z is 2, each of x and y is 1;

(d) when x is 2 or 3, each R^1 is selected independently of each other R^1, each R^2 is selected independently of each other R^2 and each m is selected independently of each other m; and

(e) when y is 2 or 3, each n is selected independently of each other n and each k is selected independently of each other k.

4,734,520

PROCESS FOR PRODUCING CROSSLINKING COMPONENTS FOR PAINT BINDERS AND TO THE CROSSLINKING COMPONENTS

Helmut Plum, Taunusstein, Fed. Rep. of Germany, and Willibald Paar, Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed May 29, 1986, Ser. No. 867,960

Claims priority, application Austria, May 29, 1985, 1602/85

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—115 **6 Claims**

1. Crosslinking components for crosslinking paint binders containing reactive hydroxy or primary or secondary amino groups comprising the reaction product of a first processing step wherein 1 mole of a diisocyanate is reacted in the presence of 0.1 to 0.5% b.w., calculated on the total weight of the reaction mass, of a sodium catalyst, with at least 1 mole of a CH-active alkyl ester of the general formula X—CH_2—COOR, wherein X is —COOR, —CN or CH_3—CO— and R is an alkyl radical of from 1 to 8 C-atoms; and of a second processing step wherein the free isocyanate groups of the reaction product of said first processing step are reacted with polyamines of the formula H_2N—(R—NH)$_n$—R—NH_2, wherein n is 0 to 3, or polyaminoalcohols of the formula H_2N—(R—NH)$_n$—R—OH, wherein n is 0 to 3, or HO—(R—NH)$_n$—R—OH, wherein n is 1 to 3, and R is an alkylene radical in all cases.

4,734,521

PROCESS FOR MAKING BETA, GAMMA-UNSATURATED ESTER, CARBAMATES AND SULFONAMIDES

Kevin A. Frazier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 798,547, Nov. 15, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 81,923

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—157 **18 Claims**

1. A process for the formation of β,γ-unsaturated esters, carbamates and sulfonamides wherein no salt is formed which comprises contacting a β,γ-unsaturated non-epoxide ether with an organic compound selected from the group consisting of carboxylic acids, carbamates and sulfonamides in the presence of a catalytic amount of a catalyst; the catalyst containing (1) a sulfonic acid, (2) BF_3, (3) $AlCl_3$, (4) $BF_3.(CH_3CH_2)_2O$, (5) sulfuric acid or (6) a combination thereof; and, in the presence of a promoting amount of a promoter selected from the group consisting of copper (I) salts and cobalt (II) salts under conditions sufficient to form the corresponding β,γ-unsaturated ester, carbamate or sulfonamide.

4,734,522

CARBOCYCLIC SIX-MEMBERED RING COMPOUNDS

Klaus Praefcke; Bernd Kohne; Wadi Poules, all of Berlin; Rudolf Eidenschink, Münster, and Bernhard Scheuble, Alsbach-Hähnlein, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 650,015, Sep. 13, 1984, Pat. No. 4,578,210. This application Jan. 7, 1986, Ser. No. 816,790

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332955

Int. Cl.⁴ C09K *19/06, 19/30;* **C07C** *69/66, 69/02, 147/00, 148/00, 43/00*

U.S. Cl. 560—186 **13 Claims**

1. A compound of the formula all-trans-Cy(O—COR)$_6$, Cy(OR)$_6$, Ph(SO$_2$R)$_6$, Cy(SO$_2$R)$_6$, Ph(SOR)$_6$, Cy(SOR)$_6$, Cy(SR)$_6$ or cis-1,3,5-Cy(O—COR)$_3$,

wherein Cy_6 is cyclohexane-1,2,3,4,5,6-hexayl, Cy_3 is cyclohexane-1,3,5-triyl Ph is phenyl and R is in each case alkyl of 3 to 15 C-atoms or alkyl of 3–15 C-atoms wherein one or two CH_2 groups are replaced by 0 atoms, and opposite substituents in cyclohexane compounds are in the equatorial and trans-space positions relative to one another.

4,734,523

OXALKYLATED POLYESTER-AMINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Manfred Hofinger; Willibald Böse, both of Burgkirchen; Martin Hille, Liederbach; Roland Böhm, Kelkheim, and Friedrich Staiss, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

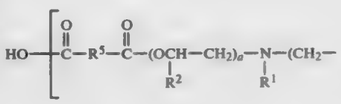
Filed Jul. 23, 1986, Ser. No. 889,316

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526601

Int. Cl.⁴ G07C *69/34;* **B01D** *17/04*

U.S. Cl. 560—196 **6 Claims**

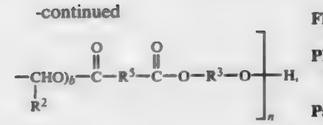
1. An oxalkylated polyester-amine of the formula



(I)

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-continued

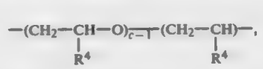


in which

R^1 is an alkyl radical or alkenyl radical having 8 to 23 carbon atoms,

R^2 is H or CH_3 and, arranged in blocks, can also assume both meanings within the chain of the polyoxalkylene radical,

R^3 denotes an alkylene radical of the formula $-(CH_2)_x-$ in which x is an integer from 1 to 6, or denotes a polyoxalkylene radical of the formula



in which R^4 is H or CH_3 and, arranged statistically or in blocks, can also assume both meanings within the chain and c denotes an integer or fractional number from 2 to 80,

R^5 is an alkylene radical of the formula $-(CH_2)_y-$ in which y denotes an integer from 1 to 8, it being possible for this alkylene radical optionally to carry 1 to 2 OH groups, or R^5 is a vinylene radical,

a and b are identical or different and denote an integer or fractional number from 1 to 15 and

n is an integer which can assume values from 2 to 50.

4,734,524

SYNTHETIC PHEROMONE 8-METHYL-2-DECANOL PROPANOATE

Paul L. Gass, Brookings, S. Dak.; James H. Tumlinson, III, Gainesville, Fla.; Philip E. Sonnet, Gainesville, Fla., and Adron T. Proveaux, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 16, 1982, Ser. No. 408,569

Int. Cl.[4] C07C *69/24*

U.S. Cl. 560—265 **3 Claims**

1. Substantially pure 8-methyl-2-decanol propanoate as the racemic mixture of its stereoisomers or as an isomeric mixture configurationally biased in favor of at least one of its 2R,8R and 2S,8R stereoisomers.

4,734,525

PROCESS FOR THE PRODUCTION OF FORMATES

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited

Filed Sep. 20, 1983, Ser. No. 533,981

Claims priority, application United Kingdom, Sep. 25, 1982, 8227416; Sep. 25, 1982, 8227417; Oct. 7, 1982, 8228687; Oct. 7, 1982, 8228688

Int. Cl.[4] C07C *67/36, 69/06*

U.S. Cl. 560—232 **15 Claims**

1. A process for the preparation of an alkyl ester of formic acid which process comprises reacting carbon monoxide with an alcohol in the presence of, as catalyst, an effective amount of (a) a compound containing a guanidine group or (b) a compound containing an amidine group and a compound containing an epoxide group.

4,734,526

FLUORIDATION AGENT FOR ORGANIC COMPOUNDS, ESPECIALLY ACETYLENIC COMPOUNDS, THE PROCESS FOR THEIR PREPARATION AND THEIR USE IN ADDITION OR NUCLEOPHILIC SUBSTITUTION REACTIONS

Patrice J. Albert, and Jack Cousseau, both of Angers, France, assignors to Universite d'Angers, Angers, France

PCT No. PCT/FR85/00175, § 371 Date Apr. 11, 1986, § 102(e) Date Apr. 11, 1986, PCT Pub. No. WO86/00294, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 27, 1985, Ser. No. 848,372

Claims priority, application France, Jun. 27, 1984, 84 10137

Int. Cl.[4] C07C *87/30*

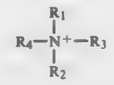
U.S. Cl. 564—282 **12 Claims**

1. A fluoridation agent having the formula:

$$Q^+[F^-,nHF]$$

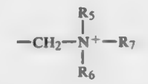
wherein

Q^+ represents (i) a cation having the formula:



wherein

R_1, R_2, R_3 and R_4 each independently represent alkyl having 1–20 carbon atoms, aryl or aralkyl, wherein the number of carbon atoms in $R_1+R_2+R_3+R_4$ is at least equal to 13, or (ii) a polymeric matrix carrying functions having the formula:



wherein

R_5, R_6 and R_7 each independently represent lower alkyl having 1–6 carbon atoms, and

n has an average value ranging from 1.5 to 2.5.

4,734,527

PROCESS FOR PREPARING 2,6-DI-TERTIARYBUTYL-4-MERCAPTOPHENOL

Richard C. Krauss, Midland, Mich., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 17, 1986, Ser. No. 920,813

Int. Cl.[4] C07C *149/36*

U.S. Cl. 568—47 **18 Claims**

16. In a process for making 4,4'-isopropylidenedithio-bis-(2,6-di-tertiarybutylphenol) by reduction of a bis(3,5-di-tertiarybutyl-4-hydroxyphenol)polysulfide in the presence of a zinc catalyst and acid, and reacting the reduction product with acetone under acidic conditions, the improvement which comprises conducting said reduction in the presence of an amount of lead which is catalytic for said reduction.

4,734,528

METHOD FOR PREPARING 3-ETHYLBENZOPHENONE

Isoo Shimizu; Yasuo Matsumura, both of Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

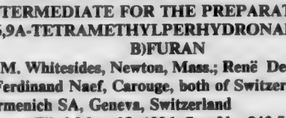
Filed Sep. 8, 1986, Ser. No. 904,473

Claims priority, application Japan, Sep. 11, 1985, 60-200809

Int. Cl.[4] C07C *45/28*

U.S. Cl. 568—309 **8 Claims**

1. A method for preparing 3-ethylbenzophenone in a high purity which consists essentially of the steps of alkylating benzene with ethylene in the presence of an alkylating catalyst comprising aluminum chloride and at a temperature within the range of about 0° C. to 175° C. to obtain an alkylated product composed mainly of unreacted benzene, ethylbenzene, polyethylbenzene and heavier substances; subjecting said alkylated product to distillation in order to recover therefrom a fraction which has a boiling point temperature with the range of 275° C. to 310° C. (in terms of atmospheric pressure); heating said recovered fraction together with a mixture of nitric acid and water at a temperature within the range of about 30° C. to 150° C., said weight ratio of 100% nitric acid to water being within the range of 1:20 to 1:1, and said weight ratio of nitric acid (as 100% acid) to said fraction being with the range of 0.03:1 to 3:1 to produce 3-ethylbenzophenone, and performing distillation to recover therefrom 3-ethylbenzophenone represented by the formula (1):



(I)

4,734,529

METHOD FOR THE ISOMERIZATION OF OXIRANES

Marion Berg, Rodenbach; Andreas Grund, Darmstadt, and Guenter Prescher, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 22, 1986, Ser. No. 944,071

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601380

Int. Cl.[4] C07C *45/51*

U.S. Cl. 568—310 **10 Claims**

1. A method for the isomerization of an oxirane selected from the group consisting of:

α epoxyalkane having 10 to 16 carbon atoms,

1,2-epoxy-3,3-dimethylbutane,

cycloalkenoxide with 6 to 12 carbon atoms,

1,2-epoxycyclododecandiene-5,9,

styrene oxide,

1-(1,2-epoxypropyl)-3,4-methylenedioxybenzene,

1,2,7,8-diepoxyoctane, and

neohexenoxide,

comprising contacting said oxirane at an elevated temperature to a catalyst system composed of an alkali iodide and the polyetyleneglycol represented by the formula:

$$HO_m-(CH_{2m}-CH_{2m}-O)_{nm}H \qquad (II)$$

wherein n is the number of recurring units of CH_2-CH_2-O such that said glycol has an average mol mass of 400 to 10,000, at a temperature of 120° to 250 ° C.

4,734,530

NOVEL HYDROPEROXIDE AND USE OF SAME AS INTERMEDIATE FOR THE PREPARATION OF 3A,6,6,9A-TETRAMETHYLPERHYDRONAPHTHO(2,1-B)FURAN

George M. Whitesides, Newton, Mass.; Renë Decorzant, Onex, and Ferdinand Naef, Carouge, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

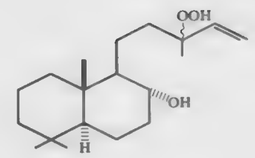
Filed Mar. 25, 1986, Ser. No. 843,529

Claims priority, application Switzerland, Mar. 26, 1985, 1313/85

Int. Cl.[4] C07C *179/03*

U.S. Cl. 568—567 **6 Claims**

1. Epimeric mixture of hydroperoxides of formula



(I)

4,734,531

SYNTHESIS OF (1-PHENYLETHYL) HYDROQUINONE

Shien-Liang Chang, Westlake, Ohio, assignor to Montedison S.p.A., Milan, Italy

Filed May 15, 1987, Ser. No. 50,118

Int. Cl.[4] C07C *39/14*

U.S. Cl. 568—744 **11 Claims**

1. In a process for forming (1-phenylethyl) hydroquinone comprising reacting styrene and hydroquinone, the improvement comprising conducting the reaction in the presence of a zeolite molecular sieve.

4,734,532

PROCESS FOR THE PREPARATION OF 4,4'-DINITRODIBENZYLS

Richard Kopp, Cologne; Gerhard Grögler; Klaus König, both of Leverkusen, and Manfred Schmidt, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

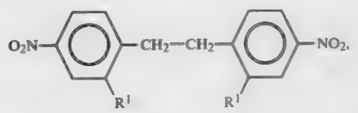
Filed Jun. 4, 1986, Ser. No. 871,018

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523204

Int. Cl.[4] C07C *79/10*

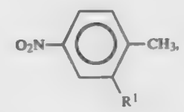
U.S. Cl. 568—931 **17 Claims**

1. A process for the preparation of 4,4'-dinitrodibenzyls of the formula



in which

R^1 represents hydrogen, alkyl, aryl, alkaryl, aralkyl or halogen, comprising reacting a 4-nitrotoluene of the general formula



in which

R^1 has the abovementioned meaning, in the presence of an organic solvent and/or diluent, with an alkali metal-alcoholate and/or an alkaline earth metal alcoholate, and then treating the resultant reaction mixture with an oxidizing agent selected from the group consisting of an aqueous solution of a hypohalous acid, an aqueous solution of a hypohalous salt, chlorine, bromine, an aqueous solution of hydrogen peroxide, an aqueous solution of a salt of hydrogen peroxide, an inorganic peracid, an organic peracid, a salt of an inorganic peracid and a salt of an organic peracid.

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4,734,533

PROCESS FOR THE PREPARATION OF (2,2)-PARACYCLOPHANE AND DERIVATIVES THEREOF

Raffaele Ungarelli, Novara; Maurizio A. Beretta, Milan; Alessandro Malacrida, Milan, and Loris Sogli, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

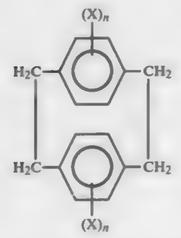
Filed Dec. 12, 1986, Ser. No. 940,772

Claims priority, application Italy, Dec. 19, 1985, 23299 A/85

Int. Cl.⁴ C07C *17/26, 25/18, 1/32, 13/28*

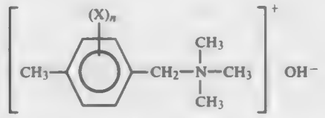
U.S. Cl. 570—201 **11 Claims**

1. A process for preparing (2,2)-paracyclophane and derivatives thereof of the formula:



(II)

wherein X is a halogen atom, an alkyl radical, an aralkyl radical, or a halo-aralkyl radical, and n is zero or an integer from 1 to 4, by the Hofmann elimination of p.methylbenzyltrimethylammonium hydroxide or derivatives thereof of the formula:



(III)

wherein X and n are the same as defined hereinabove, in an aqueous solution of an alkali metal hydroxide, characterized in that said elimination is carried out at a temperature between 50° and 150° C., and in the presence of at least a catalytic amount of a ketone having the formula:

$$CH_3—CO—CH_2—R \qquad (I)$$

wherein R is hydrogen, halogen, or an alkyl-carboxylic group containing 1 to 4 carbon atoms in the alkyl chain, the ketone concentration being from 0.1 to 200%, based on the p.methylbenzyltrimethylammonium hydroxide or derivatives thereof.

4,734,534

PREPARING CIS-OLEFINIC COMPOUNDS FROM ACETYLENIC COMPOUNDS

Ted H. Cymbaluk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 682,466, Dec. 17, 1984, Pat. No. 4,659,687. This application Feb. 5, 1986, Ser. No. 826,455

Int. Cl.⁴ C07C *17/00, 21/14, 5/09, 11/107*

U.S. Cl. 570—216 **6 Claims**

1. A process for preparing a cis-olefinic compound from an acetylenic compound comprising contacting an acetylenic compound with hydrogen under conditions suitable to give a cis-olefinic product in the presence of a catalyst prepared by contacting an alumina-supported nickel arsenate with at least one borohydride compound; wherein said at least one borohydride compound conforms to the following formula:

$$M(BH_4)_n$$

wherein M is a monovalent or divalent cation selected from the group consisting of:

NR′4, wherein each R′ is independently C_1 through C_{10} alkyl,
cycloalkyl,
aryl,
aralkyl and alkaryl;
alkali metals; and
alkaline earth metals;

wherein n=1 if M is a monovalent cation and n=2 if M is a divalent cation.

4,734,535

PREPARATION OF ALIPHATIC CHLORINE COMPOUNDS

Norbert Greif, Bobenheim, and Knut Oppenlaender, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 30,144

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611419

Int. Cl.⁴ C07C *17/33*

U.S. Cl. 570—261 **8 Claims**

1. A process for preparing an aliphatic chlorine compound of the formula

$$X—R^1—Cl \qquad I$$

where R^1 is alkylene which may be interrupted by one or more oxygen atoms and which may be substituted by halogen, alkyl or aryl, and X is hydrogen, chlorine or OR^2, where R^2 is alkyl, cycloalkyl, aryl or aralkyl, by decarboxylating the corresponding chloroformic acid ester or diester at elevated temperatures, which comprises decarboxylating in the presence of a quaternary ammonium or phosphonium salt as catalyst.

4,734,536

PROCESS FOR PRODUCING CYCLOOLEFINS

Hajime Nagahara, and Mitsuo Konishi, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 914,495

Claims priority, application Japan, Oct. 3, 1985, 60-219263; Feb. 28, 1986, 60-41981; Jul. 10, 1986, 61-160717

Int. Cl.⁴ C07C *5/11*

U.S. Cl. 585—269 **37 Claims**

1. A process for producing a cycloolefin which comprises partially hydrogenating a monocyclic aromatic hydrocarbon with hydrogen under neutral or acidic conditions in the presence of:

(i) water,

(ii) a particulate hydrogenating catalyst comprising at least 60% by weight metallic ruthenium having an average crystallite size of 200 Å or less, said catalyst being dispersed in an aqueous phase,

(iii) at least one zinc salt as a promotor, and

(iv) at least one additive particle selected from the group consisting of oxides, hydroxides and hydrates of Zr, Hf, Ti, Nb, Ta, Cr, Fe, Co, Al, Ga, and Si; and wherein said additive particle is not a support for said catalyst.

4,734,537

CONVERSIONS OF LOW MOLECULAR WEIGHT HYDROCARBONS TO HIGHER MOLECULAR WEIGHT HYDROCARBONS USING A METAL COMPOUND-CONTAINING CATALYST

Louis Devries, Greenbrae, and P. R. Ryason, Santa Rosa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 547,699, Oct. 31, 1983, Pat. No. 4,599,474. This application Jun. 27, 1986, Ser. No. 879,664

Int. Cl.⁴ C07C *2/00*

U.S. Cl. 585—415 **15 Claims**

1. A process for the production of higher molecular weight hydrocarbons from lower molecular hydrocarbons comprising the steps of:

(a) introducing into a reaction zone a lower molecular weight hydrocarbon-containing gas and contacting said gas in said zone with a metal compound-containing catalyst containing a carbide, nitride, boride or oxide of thorium under C_2+ hydrocarbon synthesis conditions such that at least 15 mole percent of the lower molecular weight hydrocarbons in said gas are converted to higher molecular weight hydrocarbons, said conditions including a temperature of greater than 1000° C. and a gas hourly space velocity of greater than 6000 hr^{-1};

(b) withdrawing from said reaction zone a higher molecular weight hydrocarbon-containing stream.

4,734,538

PROCESS FOR THE PRODUCTION OF DIENES

George L. O'Connor, Charleston; Steven W. Kaiser, South Charleston, and James H. McCain, Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 24, 1986, Ser. No. 946,483

Int. Cl.⁴ C07C *1/253*

U.S. Cl. 585—606 **64 Claims**

1. A process for dehydrating an aldehyde to a diene, which process comprises contacting the aldehyde with a non-zeolitic molecular sieve under conditions effective to dehydrate the aldehyde to the diene.

4,734,539

NAPHTHA ISOMERIZATION USING A MEDIUM PORE ZEOLITE CATALYST

Lawrence J. Lawlor, Camlachie, and William J. Murphy, Brights Grove, both of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 29, 1986, Ser. No. 924,517

Int. Cl.⁴ C07C *5/13*

U.S. Cl. 585—739 **8 Claims**

1. A method for isomerizing naphtha feed said method comprising contacting the naphtha feed with an H-offretite catalyst having a silica/alumina ratio of about 12 to 17 in the presence of hydrogen at a temperature between 200° and 400° C., a pressure of about 14.7 to 1500 psig, a space velocity in the range of 0.05 to 75 V/V/hr and a hydrogen to feed ratio on a mole/mole basis in the range of 1:1 to 20:1.

4,734,540

CATALYST FOR THE SELECTIVE HYDROGENATION OF POLYUNSATURATED ORGANICS

Mark J. Gattuso, Palatine, and Daniel L. Ellig, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 945,139, Dec. 22, 1986, Pat. No. 4,695,560, which is a continuation-in-part of Ser. No. 782,790, Oct. 1, 1985, abandoned. This application Jul. 9, 1987, Ser. No. 71,456

Int. Cl.⁴ C07C *5/05*

U.S. Cl. 585—274 **13 Claims**

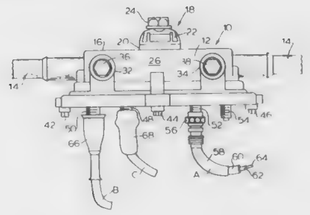
1. A process for the selective hydrogenation of polyunsaturated organic compounds to monoolefinic organic compounds comprising contacting a feed comprising at least one organic compound selected from the group consisting of dienes, polyenes, alKynes, and triple bonded nitriles in a reaction zone at selective hydrogenation conditions with a catalyst consisting essentially of an alumina support material, about 0.05 to 1.5 wt. % sulfur, and about 1.0 to 25.0 wt. % nickel, where the alumina support material is characterized by having a total pore volume greater than 1.4 but less than 2.5 cc/g, a surface area greater than 150 m^2/g, with less than 25 percent of the total pore volume being provided by pores having pore diameters of less than 150 angstroms and with over 60 percent of the pore volume being provided by pores having pore diameters greater than 600 angstroms to produce a product substantially free of polyunsaturated organic compounds.

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4,734,541
RADIO FREQUENCY DEVICE UTILIZING EMI-BLOCKING COATING AT CONNECTIONS WITH EXTERNAL LEADS

James P. Moran, Jr., Farmington, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Jan. 16, 1987, Ser. No. 3,873
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 R **47 Claims**



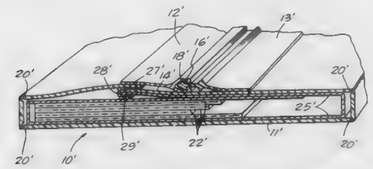
1. A radio frequency device comprising a signal processing means joined to electromagnetic transmission means, and latently susceptible, at the junction of the signal processing means and the electromagnetic transmission means, to adverse operating effects selected from one or more of electromagnetic interference, signal loss, signal attenuation, and radio frequency leakage,

wherein the improvement comprises at the junction of the signal processing means and the electromagnetic transmission means, a layer of a material which is blockingly effective against the adverse operating effects, the material having a volumetric resistivity of from about 10^{-3} to about 2,000 ohm-centimeters.

4,734,542
FLAT TUBULAR JACKET

Laurence R. Klein, Torrance, Calif., assignor to The Zippertubing Company, Los Angeles, Calif.

Continuation of Ser. No. 813,826, Dec. 27, 1985. This application Oct. 14, 1986, Ser. No. 918,144
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—36 **12 Claims**



1. A generally flat jacket for enclosing one or more ribbon cable conductors comprising:

a one piece elongated main body of supple sheet plastic with its opposite lateral edges foldable into overlapping relation with one another;

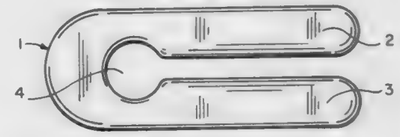
separable interlocking seam means secured along the exterior side of said lateral edges for separably holding the edges overlapped; and

the inner side of said main body being planar except for a pair of hinge grooves depressed into the planar face of the body, each groove extending continuously therealong approximately equal distances from each side of said seam means and parallel to one another and sufficiently rounded for providing hinge means for folding the body along the respective hinge grooves about 180 degrees so that opposite flat portions of the folded body may contact each other and for overlapping the opposite lateral edges of the body to form a flat jacket.

4,734,543
BRANCH-OFF ASSEMBLY

Jean-Marie E. Nolf, 6 Chausee de Namur, Hamme-Mille 5990, Belgium

Division of Ser. No. 470,710, Feb. 28, 1983, Pat. No. 4,648,924, which is a continuation of Ser. No. 281,469, Jul. 8, 1981, abandoned, which is a continuation of Ser. No. 973,614, Dec. 27, 1978, Pat. No. 4,298,415. This application Sep. 11, 1986, Ser. No. 891,227
Claims priority, application United Kingdom, Jan. 9, 1978, 631/78
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—88 R **38 Claims**

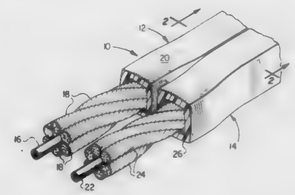


4. An assembly comprising a heat-shrinkable sleeve capable of being positioned around at least first and second elongate substrates, and a clip having at least three legs, first and second legs of which are capable of being positioned over the surface of the sleeve at the end thereof, with a third leg of the clip inside the sleeve, thereby forming, and maintaining during subsequent heat-shrinkage of the sleeve, at least two terminal conduits respectively capable of receiving the first and second substrates, the third leg comprising a sealant for sealing any gaps between the conduits.

4,734,544
SIGNAL CABLE HAVING AN INTERNAL DIELECTRIC CORE

Noel Lee, 47 West Park Dr., Daly City, Calif. 94015

Filed Oct. 29, 1986, Ser. No. 925,809
Int. Cl.[4] H01B *7/08*
U.S. Cl. 174—117 F **1 Claim**



1. A signal cable assembly comprising:

a first cable adapted to carry the positive signal between a power source and a load, said first cable comprising:

an elongated, uninsulated, rod-like solid dielectric material;

a plurality of bundles of wire strands of conductive material twisted around said dielectric material for collectively carrying said positive signal, the wire strands forming each bundle being twisted in a first direction and the bundles being twisted around said dielectric material in a direction opposite said first direction; and

insulation means extending around said bundles of wire strands; and

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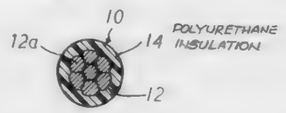
a second cable adapted to carry the negative signal between said power source and said load, said second cable comprising:
an elongated, uninsulated, rod-like solid dielectric material;
a plurality of bundles of wire strands of conductive material twisted around said dielectric material for collectively carrying said negative signal, the wire strands forming each bundle being twisted in a first direction and the bundles being twisted around said dielectric material in a direction opposite said first direction; and
insulation means extending around said bundles of wire strands;
said first and second cables being disposed in a juxtaposed parallel relationship with their respective insulation means molded together.

4,734,545

INSULATED CONDUCTOR FOR A WIRE HARNESS

Isao Susuki, Chiba, and Tomomi Hizikata, Ohmihachiman, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,400
Int. Cl.⁴ H01B *7/02*
U.S. Cl. 174—120 SR **7 Claims**



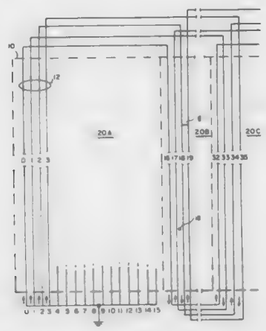
1. An insulated conductor for a wire harness comprising a conductor and an insulation with which said conductor is covered, said insulation characterized by being formed of thermoplastic polyurethane having shore D hardness of more than 50 and a thickness of less than 0.2 mm, and wherein the adherence of the insulation to said conductor is less than 2 kg/10 mm, being measured as the required force to pull 10 mm of the insulation off the conductor.

4,734,546

DIGITIZER SYSTEM WITH LOOPBACK CONDUCTOR GRID

Waldo L. Landmeier, Scottsdale, Ariz., assignor to CalComp, Inc., Anaheim, Calif.

Filed Mar. 16, 1987, Ser. No. 26,217
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—19 **27 Claims**



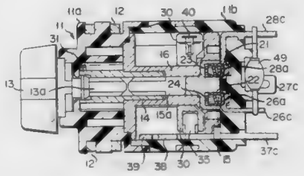
1. Apparatus for determining the position of a coil with respect to an active area, comprising:
(a) a grid of conductors defining said active area, said grid including a first group of n parallel, spaced conductors oriented in an X direction and a second group of m parallel, spaced conductors oriented in a Y direction, each of said conductors having a predetermined unexcited polarity;
(b) at least two adjacent conductors in each said group being looped through a plurality of different sections of said active area such that the unexcited polarities of said adjacent conductors are different in each of said sections;
(c) means for exciting either
i. said coil to induce electrical signals in said conductors, or
ii. selected ones of said conductors to induce electrical signals in said coil, said induced signals having a magnitude and polarity depending upon the position of said coil relative to said conductors;
(d) means for detecting the induced signals;
(e) switching means for selectively switching said conductors to either
i. said detecting means; or
ii. said exciting means; and
(f) means for selectively changing the polarities of the detected signals in aocordance with the different unexcited polarities of said adjacent conductors in said sections.

4,734,547

REVERSING SPEED CONTROL SWITCH

Hiroyuki Arai, and Touru Kasai, both of Kawasaki, Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 27, 1987, Ser. No. 7,340
Claims priority, application Japan, Aug. 5, 1985, 60-119313
Int. Cl.⁴ H01H *9/00, 21/00*
U.S. Cl. 200—1 V **5 Claims**



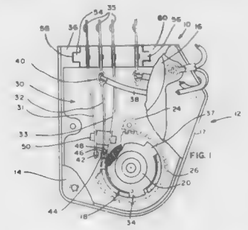
1. A reversing speed control switch comprising:
a casing;
a holding member within the casing;
movable element means within the casing for movement linearly along the holding member;
trigger actuation means outside the casing for so moving the movable element means;
power switch means having a plurality of first stationary contacts on an inner, side surface of the casing and a first movable contact on the movable element means selectively movable into contact with one of the first stationary contacts upon the movement of the movable element means for switching a power source connected to the first stationary contacts on and off in response the movement of the movable element means;
reversing actuating means having a shaft rotatably extending through the holding member and an actuator outside the casing to rotate the shaft;
reversing switch means having at least one second movable contact on an inner end face of the shaft and a plurality of second stationary contacts opposing the end face of the shaft on an inner, end surface of the casing adjacent to the inner, side surface of the casing with the plurality of first stationary contacts, the second stationary contacts being connected to the first stationary contacts for reversing the polarity of power switched on by the power switch means; and
speed control means operative between the movable element means and the holding member and connected to the first and second stationary contacts for controlling the power reversibly switched on thereby in accordance with the movement of the movable element means, whereby to provide speed control.

4,734,548

CAM OPERATED PROGRAM TIMER ASSEMBLY WITH HOUSING AND TERMINAL BLADE MOUNTING FEATURES

Ronald E. Cole, Greenwood, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Mar. 30, 1987, Ser. No. 31,566
Int. Cl.⁴ H01H *43/10, 1/00, 9/08*
U.S. Cl. 200—38 R **3 Claims**



1. In a timer having motor driven cam means and switch means responsive to said cam means both of which are disposed in a housing:
at least one combination electrical contact blade having a contact thereon and an electrical terminal extending into said housing and electrically connected to said switch means,
at least one slot in a wall of said housing receiving said electrical terminal,
a notch in said wall opening to slot, and
at least two projections lanced rom said electrical terminal, said two projections individually in planes that are at an angle to the other such that their distal ends are directed away from each other and spring biased to act as cantilevered spring members and made to squeeze inwardly and into walls of said notch.

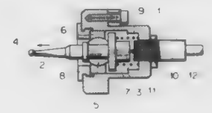
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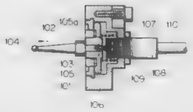
TOUCH SENSOR

Suguru Naoi, Tokyo, Japan; Minoru Akagawa, Hayward, Calif., and Hiromi Tsuda, Chiba, Japan, assignors to Rin Ei Seiki Kabushiki Kaisha, Tokyo, Japan and Intelmatec Corporation, Haywood, Calif.

Filed Nov. 24, 1986, Ser. No. 934,001
Claims priority, application Japan, Nov. 25, 1985, 60-179985[U]; Nov. 25, 1985, 60-179986[U]
Int. Cl.⁴ H01H *3/16*
U.S. Cl. 200—61.41 **2 Claims**

1. A touch sensor capable of detecting movement in any one of three dimensions comprising
a support body;
a spherical bearing held within said support body;
an elongated straight touching member comprising an outer end spherical shaped contact portion, a spherical shaped body portion movably held by said bearing, an inner end portion, and means for connecting said outer end portion, said body portion, and said inner end portion in a straight line;
spring means for normally biasing said touching member in a direction away from a detecting member; and
a switch means comprising a switch and said member normally in contact with said inner end portion of said touching member and movable in a direction away from said touching member to operate said switch for any movement of said touching member; wherein said inner end portion comprises a flat planar circular shaped surface of





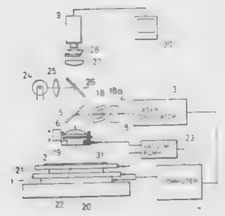
a sufficient diameter and positioned to always be be in contact with said detecting member and wherein said detecting member is elongated and is positioned to be perpendicular to said planar surface of said inner end portion.

4,734,550

LASER PROCESSING METHOD

Seiji Imamura, and Noriaki Matsumoto, both of Kanagawa, Japan, assignors to Fuji Electric Corporate Research & Development Ltd., Kanagawa, Japan

Filed Aug. 19, 1986, Ser. No. 897,830
Claims priority, application Japan, Aug. 20, 1985, 60-182573
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LT **8 Claims**



1. A laser processing method for scribing the surface of a workpiece, said method comprising:
generating a laser beam;
modifying said beam to have a substantially rectangular shape; and
scribing said surface of said workpiece with said rectangular beam to form a groove in said surface, said scribing step including periodically moving said rectangular beam relative to and along said surface, each movement of said beam causing said beam to irradiate a portion of said surface to form said groove, each of said portions overlapping an adjacent one of said portions by a predetermined amount.

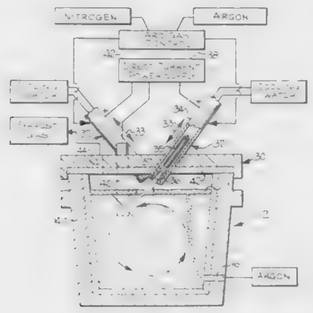
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4,734,551

METHOD AND APPARATUS FOR HEATING MOLTEN STEEL UTILIZING A PLASMA ARC TORCH

David Cheek, Liberty, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Jan. 10, 1986, Ser. No. 817,907
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—121 PY **7 Claims**



1. A method of heating molten steel utilizing a steel heating apparatus which comprises a refractory lined vessel having an open top, a removable cover adapted to overlie said top, and at least one plasma arc torch mounted so as to extend through said cover, said torch including a housing defining a forward end positioned on the under side of said cover, a rear electrode mounted within the housing, said rear electrode comprising a tubular metal member having a closed inner end and an open outer end, a front electrode comprising a tubular metal member mounted in coaxial alignment with said rear electrode and adjacent said open outer end thereof, and gas vortex generating means disposed intermediate said rear and front electrodes for generating a vortical flow gas which exits from the forward end of the torch, said method including the steps of

substantially filling the vessel with molten steel,

placing the cover so as to overlie said open top, and including positioning the forward end of the torch in spaced relation above the surface of the molten steel in the vessel, and

operating said torch to produce a plasma arc having one end thereof attached to said rear electrode, and the other end to said molten steel, and including connecting said rear electrode as the anode to a direct current power supply and connecting said molten steel as the cathode thereof, while supplying a gas which includes at least about 80% nitrogen to said gas vortex generating means such that said vortical flow of gas contains a substantial percentage of nitrogen and such that the torch may be operated at a relatively high power level, and wherein the mass flow rate of the gas supplied to said gas vortex generating means is greater than about 10 scfm and so that the gas impinges upon the surface of the molten steel.

4,734,552

INDUCTION HEATED PRESSURE WELDING

Charles A. Brolin, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

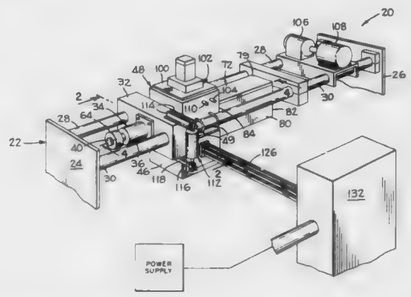
Filed Mar. 27, 1986, Ser. No. 844,656
Int. Cl.⁴ B23K *13/02*
U.S. Cl. 219—10.53 **30 Claims**

1. A method of welding two weldable surfaces together comprising the steps of:

supporting each surface with said surfaces spaced from each other;

positioning an induction heating means between said weldable surfaces;

passing an alternating current through said induction heating means to induction heat each weldable surface to bonding temperature;



removing said induction heating means from between said surfaces; and

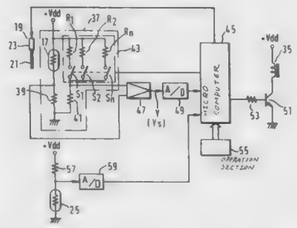
immediately forcing said heated surfaces together with sufficient force to only upset the heated portions of said weldable surfaces for welding said surfaces together.

4,734,553

COOKING APPARATUS CAPABLE OF DETECTING TEMPERATURE OF FOOD TO BE COOKED

Tomimitsu Noda, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1986, Ser. No. 942,370
Claims priority, application Japan, Dec. 27, 1985, 60-293119
Int. Cl.⁴ H05B *1/02, 6/68*
U.S. Cl. 219—10.55 B **13 Claims**



1. A cooking apparatus, for controlling a cooking operation in response to the temperature of food to be cooked, comprising:

means for detecting infrared rays from the food, including a generating means for generating a first heat signal having first and second components when the infrared detecting means receives infrared rays from the food, said first component corresponding to the temperature of the food and said second component corresponding to the actual temperature in the vicinity of the infrared detecting means, and for generating a second heat signal having only the second component when the infrared detecting means receives no infrared rays from the food;

temperature detecting means for detecting the actual temperature change in the vicinity of the infrared detecting means;

shutter means for blocking the passage of infrared rays from the food to the infrared detecting means when the actual temperature change detected by the temperature detecting means exceeds a predetermined value;

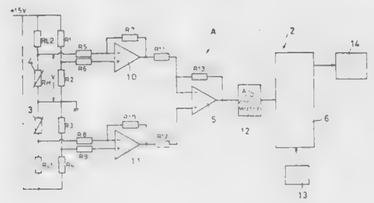
control means responsive to the shutter means and the infrared detecting means, for storing a value representative of the second component in the second heat signal from the infrared detecting means when the infrared detecting means receives no infrared rays from the food, and for substracting the stored second component value from the first heat signal of the infrared detecting means when the infrared detecting means receives infrared rays from the food for generating a temperature signal including the first component and corresponding to the temperature of the food.

4,734,554

HEATING APPARATUS WITH HUMIDITY SENSOR

Koichi Tateda, Yao; Tatsuya Tsuda, Osaka, and Yuzi Ando, Naraken, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1986, Ser. No. 828,887
Claims priority, application Japan, Feb. 15, 1985, 60-20636[U]; Feb. 15, 1985, 60-20638[U]
Int. Cl.⁴ H05B *6/68*
U.S. Cl. 219—10.55 B **19 Claims**



1. An apparatus for heating an object for a controlled heating cycle as a function of the humidity of the atmosphere surrounding the object comprising:

first sensor means, having an electrical resistance which varies with temperature for detecting the temperature of said atmosphere;

second sensor means, having an electrical resistance which varies with temperature, for detecting the vapor content of said atmosphere;

means for heating said second sensor means to a predetermined temperature at a first vapor content of the atmosphere;

means for measuring changes in temperature, as a function of changes in electrical resistance, between said second sensor means and said predetermined temperature, said changes in temperature being proportional to changes in said vapor content as compared to said first vapor content;

comparator means for comparing the temperature of said atmosphere determined by the electrical resistance of said first sensor means with said changes in temperature determined by said second sensor means and generating a heating cycle control signal related to the humidity of the atmosphere; and

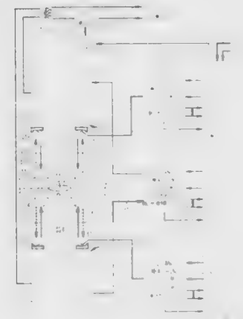
means responsive to said heating cycle control signal for heating said object for said controlled heating cycle.

4,734,555

METHOD AND APPARATUS FOR MEASURING AND CONTROLLING INDENTATION IN RESISTANCE WELDING

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Troy, N.Y.

Continuation-in-part of Ser. No. 878,713, Jun. 26, 1986, abandoned. This application May 18, 1987, Ser. No. 51,476
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—109 **40 Claims**



1. In a resistance welding system for welding at least two workpieces together, apparatus for measuring indentation occurring in at least one of said workpieces during a welding operation, said apparatus comprising:

at least one electrode assembly, comprising an electrode secured to an electrode holder, for holding at least two workpieces together and for applying a weld pulse to said workpieces, wherein the electrode situated in said one electrode assembly will abut against a surface of one of said workpieces over a contact area located on said surface during a welding operation;

means, having at least one sensing device wherein said one sensing device is secured to said one electrode assembly at a pre-defined location theroen, for determining, at least while said weld pulse is applied to said workpieces, a change in a distance separating said sensing device and a region situated on said surface, wherein said region is not substantially indented by the electrode during said welding operation; and

means, responsive to said change, for producing at least one corresponding measured value of indentation.

4,734,556

INVERTER TYPE DC RESISTANCE WELDING MACHINE

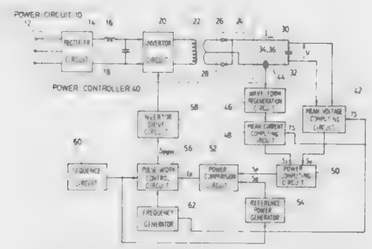
Mitsuo Namiki, Urawa, Japan, assignor to Miyachi Electronic Company, Chiba, Japan

Filed Jun. 22, 1987, Ser. No. 64,606
Claims priority, application Japan, Oct. 18, 1986, 61-247894
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—110 **5 Claims**

1. A DC resistance welding machine including a first rectifier circuit for rectifying a commercial AC voltage into a DC voltage, a circuit for converting said DC voltage into a pulse-shaped voltage having a predetermined high-frequency, a welding transformer for transforming said pulse-shaped high-frequency voltage, a second rectifier circuit for rectifying said pulse-shaped high-frequency voltage to a DC weld voltage, said DC weld voltage being applied to workpieces to be welded between electrodes so that a DC weld current for a resistance welding flows through said electrodes and said workpieces, comprising:

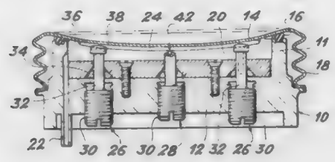
VOL 1088 ISS 5 MR 29 1988 UMI

means for detecting said DC weld voltage;
means for detecting said DC weld current;
means for computing the value of a weld power actually consumed between said electrodes on the basis of the detection values of said DC weld voltage and of said DC weld current;
means for presetting a reference weld power to any desired constant value;



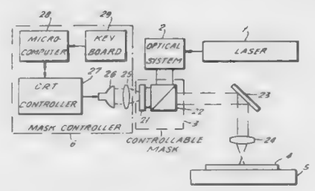
means for comparing the computed value of said actual weld power with said reference weld power to produce an error signal representative of the comparision error;
means being responsive to said error signal for controlling the pulse width of said pulse-shaped voltage at the rate of said predetermined high-frequency so as to maintain constant said weld power consumed between said electrodes.

4,734,557
DEFORMABLE MIRROR
Jean-Pascal Alfille, 1 Allée du Nivernais, 92140 Clamart, and Jean-Paul Noel, 22 bis rue des Gillons, Chatenay-Malabry 92290, both of France
Filed Jul. 9, 1986, Ser. No. 883,591
Claims priority, application France, Jul. 10, 1985, 85 10578
Int. Cl.[4] B23K *26/06*
U.S. Cl. 219—121 LQ **5 Claims**



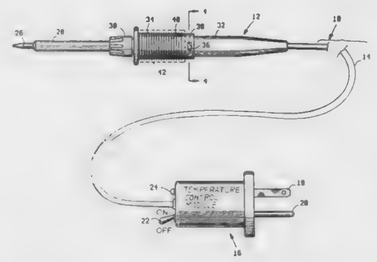
1. A deformable mirror comprising a thin reflecting disk tightly bearing on an edge of a case for defining a closed volume, means being provided in said closed volume for producing a negative pressure to deform said disk, wherein the case is provided with regulatable supports which exert substantially no pulling forces on the disk and are adjustable toward and away from the disk to set limits to which the disk can be deformed by the negative pressure.

4,734,558
LASER MACHINING APPARATUS WITH CONTROLLABLE MASK
Masakazu Nakano, and Yoihi Yoshino, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed May 14, 1984, Ser. No. 610,342
Claims priority, application Japan, May 16, 1983, 58-85268; Jul. 25, 1983, 58-135554
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LP **13 Claims**



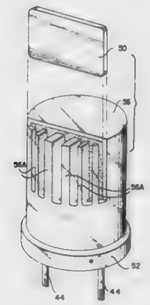
1. A laser machining apparatus, comprising:
a marking table for supporting a workpiece which is to be laser engraved;
laser means for generating a laser beam for engraving a workpiece on said marking table;
a first optical system for converting said laser beam into a parallel laser beam;
means for generating a transparent optical aperture of arbitrary pattern, said optical aperture generating means including a liquid crystal light valve controllable by an electrical or optical signal such that said optical aperature is controllable in pattern;
means for directing the parallel laser beam output from the first optical system onto said liquid crystal light valve; and
a second optical system for imaging the optical aperture generated by said liquid crystal light valve means onto said workpiece, whereby said parallel laser beam passed by said optically transparent aperture engraves said workpiece in said pattern.

4,734,559
REMOTELY ELECTRONICALLY CONTROLLED SOLDERING INSTRUMENT
William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265, and Wayne A. Murray, 13117 Sierra Hwy., Saugus, Calif. 91350
Filed Nov. 12, 1985, Ser. No. 796,958
Int. Cl.[4] H05B *1/02, 3/00;* **B23K** *3/04*
U.S. Cl. 219—241 **11 Claims**



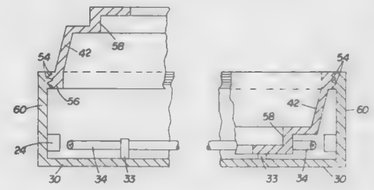
1. Hand held soldering instrument comprising: a heating element assembly having a front end portion carrying a soldering tip and a rear, base end, handle engaging portion, an enlarged diameter portion on said heating element assembly being disposed forwardly contiguously to said handle engaging portion forming a forwardly exposed, first retaining shoulder;
a handle element disposed rearwardly of said heating element assembly with its forward end disposed against said handle engaging portion;
an outer skirt element disposed concentrically over the base end portion of said heating element assembly and the forward portion of said handle element and having an inner diameter larger than said handle element thereby defining an annular, insulating space therebetween, the forward end of said outer skirt element being partially closed to form a reduced diameter collar engaging said forwardly exposed first retaining shoulder of said heating element assembly and rearwardly biasing said handle engaging portion toward the forward end of said handle element; and
axially disposed latching means carried by the rear portion of said outer skirt element and said handle element removably, axially compressively locking together said handle element and said heating element assembly.

4,734,560
VAPORIZING UNIT
John G. Bowen, Fordingbridge, England, assignor to Medical Enterprises, Ltd., Guernsey, Channel Islands
Filed Jan. 20, 1987, Ser. No. 5,146
Int. Cl.[4] A61L *9/03;* **H05B** *3/14*
U.S. Cl. 219—271 **4 Claims**



1. An electrically energized vaporizing unit for directly vaporizing medication substances, and the like, comprising: a bose; an inner housing having a generally hemi-cylindrical shape mounted on said base, said inner housing having a generally flat face; electrically energized PTC heating means mounted in the inner housing; electric circuitry mounted in the inner housing for connecting the heating means to a source of electric energy; a material contained in the inner housing for conducting heat from the heating means to the flat face thereof and which becomes at least partially molten after a particular time interval following the energization of the heating means; an outer housing mounted on said base coaxially with the inner housing and defining a slot adjacent to said flat face of said inner housing for receiving a vaporizing tablet and for supporting said tablet adjacent to said front face of said inner housing; and said outer housing including a grill adjacent to said tablet for passing vapor from said tablet, said material contained in said inner housing having a melting point corresponding to the vaporizing temperature of said tablet and said PTC heating means having a Curie point above the melting point of the material.

4,734,561
HUMIDIFIER
Molly J. Miller, 261 Commonwealth Ave., No. 2, Boston, Mass. 02116
Filed Jan. 27, 1986, Ser. No. 822,796
Int. Cl.[4] A61L *9/03*
U.S. Cl. 219—275 **2 Claims**



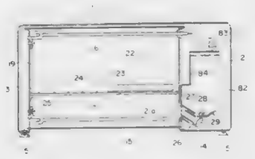
2. In an electric steam humidifier comprising a container sized defining operating volume holding a sufficient amount of water to provide steam for eight hours or more and, disposed within said container, a heating element heating said water to generate steam,
the improvement wherein
said container comprises
a base segment defining a portion only of said operating volume, and
an upper segment defining another portion of said operating volume and further defining an aperture for escape of steam from said volume,
said base segment and said upper segment intersecting in a water-tight joint,
said upper segment, in a first, operating position, extended vertically upward, away from said base segment, defining with said base segment said operating volume, said upper segment having sidewalls extending generally inwardly from said joint, said aperture for escape of steam having a diameter less than the diameter of said joint, and
said upper segment comprising a concave, rigid segment and said base segment being constructed to release from said upper segment, said upper and base segments in a first operating position, with the concavity of said upper segment facing said base segment, forming a water-tight container, and in a second storage position, with said upper segment inverted from said operating position relative to said base segment, forming a unit for compact storage,
said humidifier, with said upper segment in a second, storage position relatively closer to said rigid base segment, defining and occupying a significantly reduced volume to facilitate storage and transport.

4,734,562
ELECTRIC TOASTER OVEN
Kazunori Amano; Yoichi Sekigawa; Nobuyuki Kojima, and Shigeki Yamaguchi, all of Kamo, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan
Filed Jul. 21, 1986, Ser. No. 887,269
Claims priority, application Japan, Jul. 25, 1985, 60-164623; Oct. 3, 1985, 60-220571; Oct. 3, 1985, 60-220572; Feb. 18, 1986, 61-33630
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—413 **9 Claims**

1. An electric toaster oven for cooking an article placed on a grill in a baking chamber by heating the article with a heater or heaters disposed in the baking chamber, which comprises: a plate forming part of the wall of the baking chamber and having a normally closed heat guide opening; a baked condition detector disposed outside the baking chamber and opposite to the heat guide opening and capable of detecting the heat radiated from the article and transferred thereto through the heat guide opening to detect the baked condition of the article;

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and a damper which opens the heat guide opening only when the electric toaster oven is used as a toaster and closes the heat



guide opening automatically when the electric toaster oven is not used as a toaster.

4,734,563

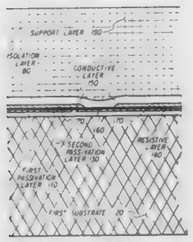
INVERSELY PROCESSED RESISTANCE HEATER

William J. Lloyd, Belmont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 687,507, Jan. 4, 1985, Pat. No. 4,616,408, which is a continuation of Ser. No. 444,412, Nov. 24, 1982, abandoned. This application Aug. 21, 1986, Ser. No. 874,735

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—543 **8 Claims**



1. A resistance heater comprising:

an electrically non-conductive, uniformly thick planar passivation wear layer having flat opposing major surfaces;

a film resistor connected to a plurality of conductors permanently covered by the uniformly thick passivation wear layer, said uniformly thick passivation wear layer protecting the film resistor from externally applied stress; and

a support layer underlying and supporting said film resistor and plurality of conductors.

4,734,564

TRANSACTION SYSTEM WITH OFF-LINE RISK ASSESSMENT

Vincent Boston, San Mateo; Elvis W. Boggan, Concord, and Einar L. Asbo, Mill Valley, all of Calif., assignors to Visa International Service Association, San Mateo, Calif.

Filed May 2, 1985, Ser. No. 730,309

Int. Cl.[4] G06K *5/00*

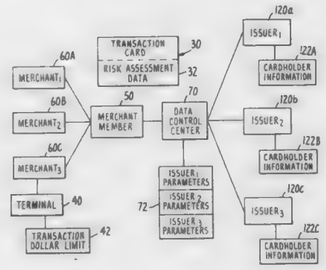
U.S. Cl. 235—380 **9 Claims**

8. A method of operating a transaction system, said transaction system including a primary processor for evaluating transactions, a plurality of transaction cards, each card carrying data identifying the cardholder and nonmonetary data based on a risk assessment of the cardholder, said system further including a terminal located at the point of the transaction and having data entry capabilities, said terminal having monetary data stored therein, said monetary data being unrelated to the risk assessment of individual cardholders, said method comprising the steps of;

entering the cardholder identification and nonmonetary data from the card into the terminal;

entering the amount of the transaction into the terminal;

deriving a transaction dollor limit based on the nonmonetary data from the card which corresponds to the risk assessment of the cardholder and the monetary data from the terminal which is unrelated to the risk assessment of the cardholder; and



comparing the amount of the transaction and the derived transaction dollor limit to determine if the transaction can be approved locally at the terminal or should be forwarded to the primary processor for further evaluation.

4,734,565

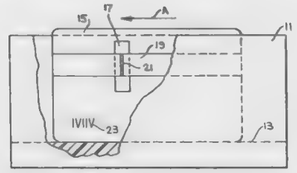
READ-ONLY OPTICAL CARD AND SYSTEM

Gerald A. Pierce, Redwood City, and James L. Buxton, East Palo Alto, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 925,197, Oct. 31, 1986, which is a continuation-in-part of Ser. No. 794,336, Nov. 4, 1985, Pat. No. 4,634,850, which is a continuation of Ser. No. 541,166, Oct. 12, 1983, abandoned. This application May 6, 1987, Ser. No. 46,952

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—454 **24 Claims**



1. An optical data read system comprising,

an optical data storage medium having optically readable digital data encoded by microscopic spots on said medium, the spots disposed in specified data cell positions, the cell positions forming a grid of perpendicular, non-overlapping rows and columns of cell positions, said columns aligned with a lengthwise direction of the medium, the spots having a reflective contrast ratio with respect to a surrounding field of said medium of at least 1.5 to 1, and

a linear CCD array capable of detecting the reflective contrast between said spots and said surrounding field, said array on the same side of said medium as a light source aligned perpendicular to said columns of cell positions and having a plurality of fixed position detector cells imaging each specified data cell position in a row of cell positions, wherein at least two detector cells image a specified data cell position with groups of detector cells simultaneously imaging a plurality of cell positions.

4,734,566

APPARATUS AND METHOD FOR RECOGNIZING OPTICAL INFORMATION

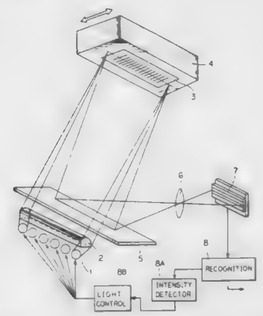
Katsumi Senda, and Toshiyasu Sakai, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 12, 1986, Ser. No. 828,742

Claims priority, application Japan, Feb. 19, 1985, 60-31709

Int. Cl.[4] G06K *7/14*

U.S. Cl. 235—455 **14 Claims**



1. A method of reading optical information from an object, comprising the steps of:

projecting a plurality of light pulses onto said object;

converting light reflected from said object into an electrical signal;

detecting a light intensity of said reflected light from said electrical signal;

adjusting a pulse width of at least one light pulse in response to the detected light intensity; and

detecting said optical information from said electrical signal.

4,734,567

LOCKING AND UNLOCKING DEVICE FOR A CARD READER

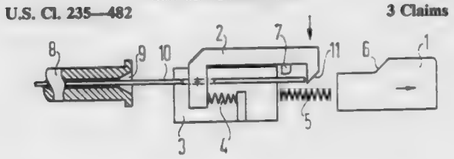
Hermann Hansbauer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,438

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533301

Int. Cl.[4] G06K *13/00*

U.S. Cl. 235—482 **3 Claims**



1. A device for locking and unlocking a card which is introduced into a card reader, comprising:

a locking lever;

a hook mounted to one end of the locking lever and being so positioned that when the card is inserted into the card reader in a read position, the hook hooks over a trailing edge of the card;

a key mounted such that it may be brought into abutting relationship with the locking lever and, when abutting therewith, causing the locking lever to be sufficiently raised as to unhook the hook from the trailing edge of the card;

a solenoid; and

a release lever fixed to the solenoid and raising the locking lever upon actuation of the solenoid.

4,734,568

IC CARD WHICH CAN SET SECURITY LEVEL FOR EVERY MEMORY AREA

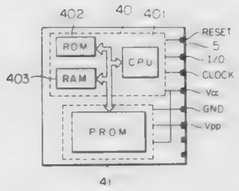
Hiroshi Watanabe, Kokubunji, Japan, assignor to Toppan Moore Company, Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 891,876

Claims priority, application Japan, Jul. 31, 1985, 60-169236

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—487 **8 Claims**



1. An IC card which can set a security level for each memory area, having at least a microprocessor and a memory, said memory comprising:

a plurality of memory areas for respectively storing data classified in accordance with kinds of data which can be written and read out from the outside;

a key code area for storing a plurality of key codes; and

security level memory means for storing a group of key code input conditions each consisting of at least one of said plurality of key codes in correspondence to each of said memory areas and each for accessing each of said plurality of memory areas; and

said microprocessor comprising means for accessing the relevant memory area to be accessed after comfirming that the key code or key codes specified by said key code input condition was/were input.

4,734,569

IC CARD

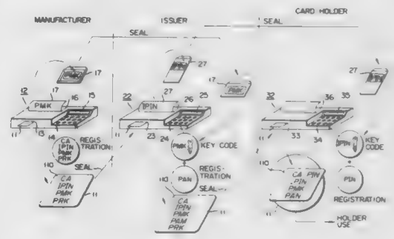
Shigeyuki Kawana, and Harumi Nakano, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,764

Claims priority, application Japan, Aug. 22, 1985, 60-184435

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—487 **8 Claims**



1. An IC card comprising:

memory means having at least one memory area for storing secret data therein;

means for reading out data stored in said memory means;

first comparator means for checking whether externally supplied data and data read out by said reading means are coincident; and

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means for substantially erasing said secret data stored in said memory means when the coincidence of data compared in said first comparator means is detected.

4,734,570

ACTIVE FOCUS DETECTING DEVICE WITH INFRARED SOURCE

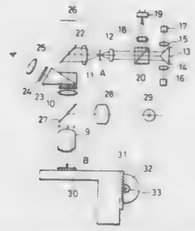
Yoshiaki Horikawa, Hachiouji; Kazuo Kajitani, Ina, and Noriyuki Miyahara, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 932,145

Claims priority, application Japan, Nov. 20, 1985, 60-260507; Dec. 17, 1985, 60-282107

Int. Cl.[4] G02B *7/11, 21/00*

U.S. Cl. 250—201 **11 Claims**



1. A focus detecting device adapted to detect a focus by using an infrared light, comprising a light source means alternately emitting alternate infrared light bundles made to pass through different courses in an optical system including therein an objective, a reducing optical system arranged between said objective and the position of an object image to be formed by said objective and having a positive refractive power to reduce a deviation of the position of an infrared light image formed in a position different with said objective to be used, a light receiving element capable of detecting the position of the infrared light image reflected from the object and having passed through said objective and reducing optical system and a signal processing means connected to said light receiving element and capable of detecting the out-of-focus deviation of the infrared light image formed alternately by the output signal from said light receiving element in accordance with said light bundles.

4,734,571

FOCUS CONDITION DETECTING DEVICE HAVING CORRELATION CALCULATION MEANS AND MEANS FOR DETERMINING THE RANGE OF SHIFTS OF IMAGE SIGNALS

Masataka Hamada, Minamikawachi; Tokuji Ishida, Daito; Toshihiko Karasaki; Toshio Norita, both of Sakai, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 30, 1986, Ser. No. 924,888

Claims priority, application Japan, Oct. 30, 1985, 60-245130

Int. Cl.[4] G01J *1/20;* **G03B** *3/00, 13/18*

U.S. Cl. 250—201 **11 Claims**

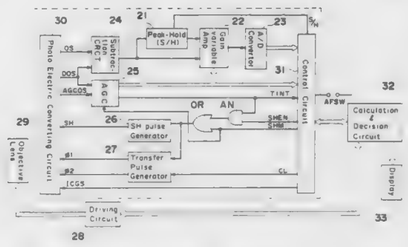
1. A focus condition detecting device for a camera having an objective lens for forming an image of an object, comprising:

optical means for forming first and second object images so that the distance between the first and second object images varies with the focus condition of the object image formed by the objective lens;

first and second image signal generating means having first and second sensors positioned to receive the first and second object images and adapted to generate first and second image signals corresponding to the light intensity distributions of the first and second object images on the first and second sensors, respectively;

preliminary correlation calculation means for effecting a preliminary correlation calculation which includes calculation of a plurality of correlation degrees between the first and second image signals with a predetermined lower accuracy by repeated shifting of the first and second image signals relative to one another and determination of a highest correlation degree among the calculated correlation degrees and of the number of the shifts providing the highest correlation degree;

principal correlation calculation means for effecting a principal correlation calculation which includes calculation of a plurality of correlation degrees between the first and second image signals with a predetermined higher accuracy by repeated shifting of the first and second image



signals relative to one another and determination of a highest correlation degree among the calculated correlation degrees and of the number of the shifts providing the highest correlation degree;

means for determining the range of the shifts for the calculation of the plurality of correlation degrees in the principal correlation calculation in accordance with the number of the shifts determined by the preliminary correlation calculation means; and

means for generating a focus condition detection signal representative of the focus condition of the object image formed by the objective lens, based on the number of the shifts determined by the principal correlation calculation means.

4,734,572

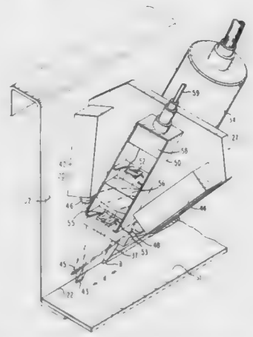
DUAL LIGHT SOURCE LOCATING AND TRACKING SYSTEM

Robert R. Gorman, Newtown, Conn., assignor to Unimation Inc., Danbury, Conn.

Filed Feb. 14, 1986, Ser. No. 829,738

Int. Cl.[4] G05B *1/00*

U.S. Cl. 250—202 **7 Claims**



1. In an automation system, the combination of,

a manipulator apparatus having an end effector means and a control means for positioning said end effector means,

a seam locating and tracking means coupled to said end effector means for transmitting information to said control means to locate the position of a seam defined by first and second surface elements,

said seam locating and tracking means including,

a light source means for simultaneously directing first and second elongated light spots onto said first and second surface elements respectively on either side of said seam,

a light sensing means including a one dimensional linear array sensor means and optical means for simultaneously directing the reflected images of said elongated light spots from said surfaces onto said linear array sensor means such that the longitudinal axes of the reflected images are essentially perpendicular to said one dimensional linear array sensor means, and

processing means for transmitting informtion indicating the simultaneous position of said reflected images on said one dimensional linear array sensor means to said control means,

said control means responding to said information by determining the location of the seam on the basis of ranging on said first and second surface elements simultaneously and deriving essentially two dimensional information from said one dimensional linear array sensor.

4,734,573

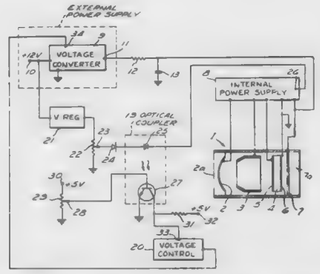
IMAGE INTENSIFIER WITH ADDITIONAL POWER SUPPLY

James M. Dill, Pompano Beach, Fla., assignor to EOL$_3$ Company, Inc., Ft. Lauderdale, Fla.

Filed Jul. 14, 1986, Ser. No. 885,036

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **14 Claims**



1. In combination with an image intensifier having a photocathode, an anode and focusing cone, a microchannel plate, and an output screen, and having an internal power supply for producing a predetermined voltage on said output screen and supplying current to said output screen,

an additional power supply operative to produce a voltage; and impedance means coupling said additional power supply to said output screen to apply the voltage from said additional power supply to said output screen at a current which is a multiple on the order of 100 times the current from said internal power supply to said output screen, said impedance means having an A.C. impdendance on the order of 1 ohm in the frequency range from about 20,000 to 25,000 Hz. for filtering out power supply noise in that frequency range.

4,734,574

LIGHT-PROJECTING AND-RECEIVING UNIT FOR USE IN A HUMAN BODY DETECTING APPARATUS FOR AUTOMATIC DOORS

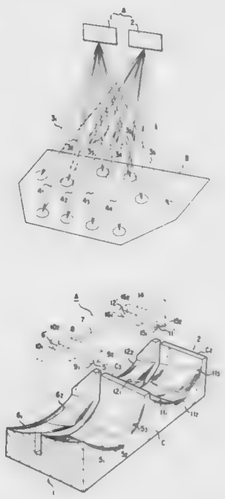
Tamotsu Tanaka, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,819

Claims priority, application Japan, Dec. 26, 1985, 60-199078[U]

Int. Cl.[4] G08B *13/18*

U.S. Cl. 250—221 **9 Claims**



1. A human body detecting apparatus, characterized in that it comprises a light projecting section consisting of at least one set of split concave mirrors and a plurality of light projecting elements, and a light receiving section consisting of at least one set of split concave mirrors and a plurality of light receiving elements; said light projecting section is arranged such that it can irradiate spot light beams equivalent in number to a product of the number of the concave mirrors and that of the light projecting elements; and said light receiving section is arranged such that it can receive at least the number of the spot light beams irradiated by the light projecting section.

4,734,575

LIGHT BARRIER UTILIZING TWO RADIATION BRANCHES EACH HAVING DIFFERENTLY POLARIZED FILTERS

Peter Wagli, Jona-wangem, and Kurt Muller, Stafa, both of Switzerland, assignors to Cerberus AG, Mannendorf, Switzerland

Filed Apr. 28, 1986, Ser. No. 856,834

Claims priority, application Switzerland, Apr. 30, 1985, 1625/85

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **10 Claims**

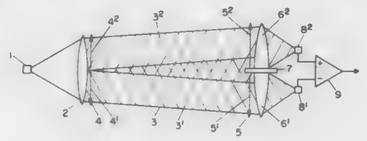
1. A light barrier system, comprising:

a source of radiation;

means for producing, from said radiation source, two radiation branches spatially offset from each other in a spatial region to define a light barrier, and including a first polarizer for producing different independent radiation polarization in the two branches;

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means for receiving the two radiation branches, comprising a sensor for each radiation branch, and including a second polarizer for filtering the radiation, so that only radiation having the same polarization as the radiation in its associated branch is received by the associated sensor, each of



said sensors producing an output signal indicative of the intensity of polarized radiation received; and

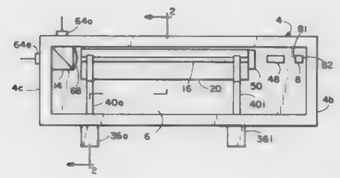
a gating circuit connected to receive the sensor outputs, and for producing an alarm signal in response to different radiation intensities being received by the two sensors.

4,734,576

ELECTRO-OPTIC SAMPLER

Agoston Agoston, Beaverton, and Cornelis T. Veenendaal, Cornelius, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1986, Ser. No. 858,413
Int. Cl.⁴ G02F *1/01*
U.S. Cl. 250—225 **18 Claims**



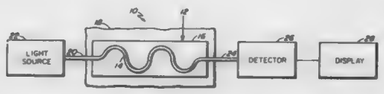
1. An electro-optic sampler comprising a body of semiconductor material that can be energized to emit light in two opposite directions, first photodetector means, second photodetector means, first and second bodies of electro-optic material defining respective waveguides for transmitting light emitted by the semiconductor device in said first and second directions to the first photodetector means and the second photodetector means respectively, and first and second pairs of electrodes associated with the first and second bodies of electro-optic material for establishing an electrical field within the respective bodies of electro-optic material.

4,734,577

CONTINUOUS STRAIN MEASUREMENT ALONG A SPAN

Nicholas C. Szuchy, Babylon, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 824,177, Jan. 30, 1986, abandoned. This application Jul. 28, 1987, Ser. No. 80,231
Int. Cl.⁴ G01N *3/00*
U.S. Cl. 250—227 **31 Claims**



1. A fiber optic load measuring system comprising:

(a) an light source;

(b) a fiber optic attenuator in optical communication with said light source, said attenuator having a selected thickness and formed to have at least one curved portion along the length thereof, said curved portion having a curve radius and a curve period, said curved portion being disposed in load transfer relation with a surface where the load is to be measured so that the curve radius and curve period are variable in response to an applied load, said curved portion being dimensioned so that light is attenuated in direct linear relation to deformation of said curved portion in response to an instantaneous applied load over a substantial range of applied load;

(c) a photodetector in optical communication with said attenuator, said photodetector being operative to receive light signals reflected by said attenuator; and

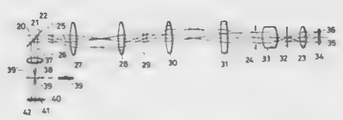
(d) a signal processor connected to said photodetector and operative to detect and measure reflected light signals attributable to the application of the instantaneous load on the surface, said processor being further operative to translate the reflected light signals to compute the instantaneous applied load.

4,734,578

TWO-DIMENSIONAL SCANNING PHOTO-ELECTRIC MICROSCOPE

Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,167
Claims priority, application Japan, Mar. 27, 1985, 60-62262; Mar. 27, 1985, 60-62263; Mar. 27, 1986, 60-62264
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 250—234 **21 Claims**



1. A two-dimensional scanning photo-electric microscope comprising:

a light source,

an objective lens for collecting light emitted from said light source onto an object to be observed;

light deflecting means disposed between said light source and said objective lens for deflecting light in a direction in which light coming from said light source travels and altering the angle of incidence of light entering into said object lens to thereby scan said object with the light,

said light deflecting means being disposed at one of a position including at a pupil position of said objective lens, at a position conjugate with said pupil position, and at a position located in the vicinity of these positions; and

a detecting optical system including photo-electric converting means which is a detector for receiving light coming from said object,

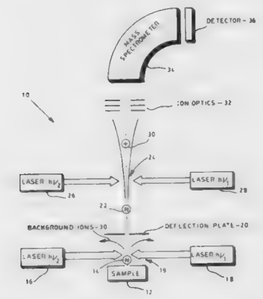
said photo-electric converting means being split by at least one interface so that a signal of a difference between output signals delivered from respective regions separated by said interface is determined by calculation to enable a differential image signal to be obtained.

4,734,579

ULTRASENSITIVE METHOD FOR MEASURING ISOTOPE ABUNDANCE RATIOS

Thomas B. Lucatorto, Washington, D.C.; Charles W. Clark, Montgomery County, Md., and Tom J. Whitaker, Benton County, Wash., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 546,052, Oct. 27, 1983, Pat. No. 4,634,864. This application Jul. 7, 1986, Ser. No. 882,508
Int. Cl.⁴ B01D *59/44*
U.S. Cl. 250—282 **22 Claims**



1. A method for measuring the isotope abundance ratio between a selected isotope and at last one other isotope having a different atomic mass or atomic number in a sample of a given chemical element, said abundance measuring method being capable of determing ultrasensitive abundance ratios, said method comprising;

producing a vapor of certain atoms/molecules of said sample of said chemical element;

preferentially ionizing said selected isotope within said vapor by Doppler-free resonant multiphoton ionization using a laser beam of at least one selected frequency to achieve said ionization, said laser frequency including a frequency offset in proportion to the intensity of said laser beam, said offset being of a value sufficient to overcome loss in abundance sensitivity due to AC Stark shifts caused by time-varying laser intensity;

injecting ions produced by said ionization into a mass spectrometer;

performing isotopic spectrum analysis of said ions by said mass spectrometer; and

detecting ions analyzed by said mass spectrometer to determined said isotope abundance ratio between said selected isotope and said at least one other isotope.

4,734,580

BUILT-IN IONIZING ELECTRODE CLEANING APPARATUS

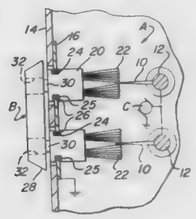
Richard D. Rodrigo, Lansdale, Pa.; Mark Blitshteyn, Edison, N.J., and Richard D. Snyder, Pennsburg, Pa., assignors to The Simco Company, Inc., Hatfield, Pa.

Filed Jun. 16, 1986, Ser. No. 874,479
Int. Cl.⁴ H01T *19/04*
U.S. Cl. 250—324 **9 Claims**

1. In combination with an extended-range, dual-polarity static eliminator having a plurality of pointed discharge electrodes adapted to be coupled to a high voltage power source and arranged in at least one row enclosed within the interior of an apertured grounded housing with the pointed tips of the electrodes spaced behind an apertured protective grille of said housing, electrode cleaning apparatus comprising:

an elongated slot in said housing corresonding to each row of pointed tips and substantially coextensive therewith,

brush means, including a base portion slidably supported within the edges of each slot and a bristle portion projecting therethrough for sweeping contact with the discharge electrodes, and



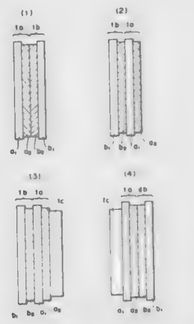
a handle positioned external to said housing for oscillating the brush means across the tips of said electrodes to effect removal of foreign particulate material therefrom when said handle is traversed across the slot.

4,734,581

AUTORADIOGRAPHIC PROCESS

Masakazu Hashiue, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 729,113, Apr. 30, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,865
Claims priority, application Japan, May 2, 1984, 59-89001; May 2, 1984, 59-89002
Int. Cl.⁴ G01T *1/10*
U.S. Cl. 250—327.2 **33 Claims**



1. An autoradiographic process for obtaining information on one or two dimensional location of radioactively labeled substances originating from an organism and resolved on a support medium, which comprises:

(1) causing a stimulable phosphor sheet comprising a stimulable phosphor, which is combined with said support medium in layers or has been integrated with said support medium, to absorb at least a portion of radiation energy emitted by the radioactively labeled substances in the support medium; and

(2) placing a photosensitive material on said stimulable phosphor sheet, and irradiating the phosphor sheet with stimulating rays to release at least a portion of the radiation energy stored in the phosphor sheet as stimulated emission, whereby the photosensitive material is exposed to the stimulated emission to obtain locational information on the radioactively labeled substances as an image on the photosensitive material.

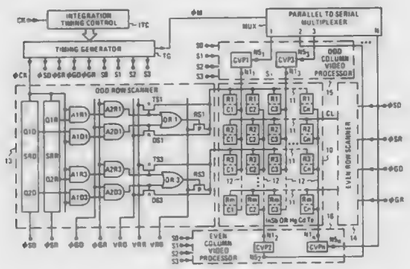
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,582

INTEGRATION TIME CONTROL FOR A RADIATION SENSITIVE CHARGE INJECTION DEVICE

Martin D. Gibbons, Camillus; Samuel C. Wang, Manlius; Kenneth J. Fuhr, Utica, and Marshall K. Quick, New Hartford, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,156
Int. Cl.[4] H01L *31/00*
U.S. Cl. 250—332 5 Claims



1. In an IR sensitive charge injection device (CID), the combination comprising:

(A) an array comprising a substrate of IR sensitive semiconductor material supporting an interfacing layer of insulating material and on which rows by n columns of pixel sites forming charge storing potential wells are arranged, each site having a conductive row gate and a conductive column gate, the charges at a site being free to flow at the interface between the column gate and row gate in the presence of a bias potential, the row gates for each row of sites being interconnected by a conductive row line and the column gates for each column of sites being interconnected by a conductive column line,

(B) a readout circuit comprising:

(a) means including a source (VRB) of row bias potentials and m controllable row bias reset switches (RS_{1-m}), for establishing said charge storing potential wells at the row gate cells and for facilitating charge exchange between column and row gates at a site,

(b) a source (VRD) of row dump potentials suitable for injecting signal charge into the substrate and m controllable row dump switches (DS_{1-m}), each dump switch being connected to couple the dump potential to an associated row site,

(c) a source (VRR) of row read potentials suitable for injecting signal charge into the substrate and transferring charge via the column line during readout, and m controllable row switches (TS_{1-m}), each row read switch being connected to couple the read potential to an associated row site,

(d) means including a clock rate ϕCK to establish equal charge integration times for all sites comprising

(1) means including a first m stage shift register (SRD) for propagating at a said clock rate ϕCK, a given logical state starting in response to a dump start pulse (ϕSD) recurring at the interval required to sequentially scan said m sites, connected to said means B(b) for sequentially dumping each site when said given logical state occurs and clocked at a given clock rate to produce sequential dump outputs (QD_{1-m}) having the duration of a clock period,

(2) means including a second m stage shift register (SRR) for propagating at said clock rate ϕCK, a given logical state starting in response to a read start pulse (ϕSR) recurring at the interval required to sequentially scan said m sites, connected to said means B(c) for sequentially reading out each site when the last recited logical state occurs, and clocked at said given clock rate to produce sequential read outputs (Q_{R1-m}) having the duration of a clock period,

(3) m fold means for ANDing/ϕCK and QD_i to obtain a sequence of single pulses for each row of the duration of the clock pulse highs ($QD_i.\phi CK$),

(4) m fold means for ANDing ϕCK and QR_{1-m} to obtain a single pulse in the scanning sequence for each row of the duration of said clock pulse highs ($QR_i.\phi CK$), and which lag said dump pulses at each pixel by an integral number of clock pulses,

(5) a source of periodic short, dump gate pulses (ϕGD) at the clock repetition rate,

(6) a source of periodic short, read gate pulses (ϕGR) at the clock repetition rate,

(7) m fold means to AND ($QD_i.\phi CK$) and (ϕGD) to obtain a short dump pulse for each row ($QD_i.\phi CK.\phi GD$), the output thereof being coupled to means B(b) for dumping,

(8) m fold means to AND ($QD_i.\phi CK$) and (ϕGR) to obtain a short read pulse for each row, ($QR_i.\phi CK.\phi GR$) delayed an integral number of clock pulses from the dump pulse for that row, the output thereof being coupled to means B(c), for readout,

(9) m fold means for ORing the outputs of means B(d)(8) or B(d)(7) coupled to said means B(a) for disconnecting a row line from said source (VRB), when either dumping or readout is occurring,

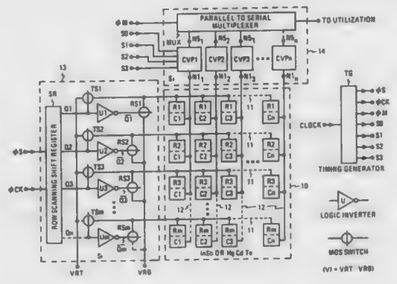
(10) timing means providing said dump start pulses ϕSD and said read start pulses ϕSR, said read start pulses being delayed in relation to said dump start pulses by a predetermined portion of the scanning interval required to sequentially scan m sites to establish a desired and equal integration time for each site.

4,734,583

READOUT CIRCUIT FOR DUAL-GATE CID IMAGERS WITH CHARGE SHARING CORRECTED FOR SUBTRACTIVE ERROR

Samuel C. Wang, Manlius; Michael L. Winn, Liverpool; Martin D. Gibbons, Camillus, and Gordon H. Danielson, Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 16, 1986, Ser. No. 919,464
Int. Cl.[4] H01L *31/00*
U.S. Cl. 250—332 7 Claims



1. In an IR sensitive charge injection device (CID), the combination comprising:

(A) an array comprising a substrate of IR sensitive semiconductor material supporting an interfacing layer of insulating material and on which m rows by n columns of pixel sites forming charge storing potential wells are arranged, each site having a conductive row gate and a conductive column gate, the charges at a site being free to flow at the interface between the column gate and row gate in the

presence of a bias potential, the row gates for each row of sites being interconnected by a conductive row line and the column gates for each column of sites being interconnected by a conductive column line,

(B) a readout circuit comprising:

(a) means including a source (VRB) of row bias potentials and m controllable row bias reset switches (RS_{1-m}), for establishing said charge storing potential wells at the row gates and for facilitating charge exchange between column and row gates at a site,

(b) a source (VRT) of row transfer potentials and m controllable row transfer switches (TS_{1-m}) for injecting signal charge into the substrate and transfering charge via the column line during readout,

(c) a shift register (SR) with complementary outputs coupled to said transfer switches and to said row bias reset switches for sequentially connecting a respective (ith), where i is a member of the series 1 to m, single row line to said source (VRT) and disconnecting said (ith) single row line from said source (VRB), the non (ith) row lines remaining connected to said source (VRB), each state thereof defining a pixel readout period,

(d) n column video processors, each jth processor where j is a member of the series 1 to n, comprising:

(1) a gain amplifier ($A1_j$) having the input thereof coupled to the (jth) column line at a first node ($N1_j$),

(2) means including a source (VCB) of column bias potentials and a controllable column bias reset switch ($S0_j$), for applying a column bias potential (VCB) to said first node ($N1_j$) for establishing said charge storing potential wells at the column gates, and for facilitating charge exchange between column and row gates at a site,

(3) means for dc restoration comprising a capacitor ($C1_j$) having one terminal coupled to the output of said gain amplifier, and the other to a second node ($N2_j$), and a switch ($S1_j$) having one terminal coupled to said second node ($N2_j$), and the other coupled to ground,

(4) means for subtractive error correction comprising a capacitor ($C2_j$) having one terminal coupled to said second node ($N2_j$) and the other coupled to a third node ($N3_j$), and a switch ($S2_j$) having one terminal coupled to said third node ($N3_j$) and the other coupled to ground,

(5) means for obtaining a signal sample comprising a capacitor ($C3_j$) having one terminal connected to ground and the other terminal providing the output terminal for said jth column video processor, and a switch ($S3_j$) having one terminal coupled to said third node ($N3_j$), and the other coupled to the column output terminal, and

(e) timing means including a timing generator for timing the operation of the scanning shift register (Q_{1-m}) and the switches, ($S0_{1-n}$ $S1_{1-n}$ $S2_{1-n}$ $S3_{1-n}$), the shift register Q_i and switches $S0_j$, $S1_j$, $S2_j$, $S3_j$, effecting the readout of the site at the ith row jth column,

said timing means dividing the readout period for each pixel site into a half period for subtractive error correction and a half period for signal sampling,

said timing means momentarily closing ythe switches $S0_j$, $S1_j$ and $S2_j$ to begin subtractive error correction, said closings resetting nodes $N1_j$, $N2_j$ and $N3_j$ to said bias VCB, ground, and ground, respectively, then opening switch $S0_j$, then opening switch $S1_j$ after settling, to finish charging capacitor $C1_j$ for dc restoration and to begin charging capacitor $C2_j$, then opening switch $S2_j$ to finish charging capacitor $C2_j$ for subtractive error correction,

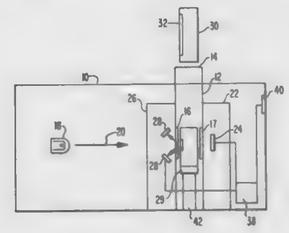
said timing means momentarily closing the switches $S0_j$ and $S1_j$ to begin signal sampling, said closings resetting nodes $N1_j$ and $N2_j$ to said bias VCB and ground, respectively, then opening switch $S0_j$, then opening switch $S1_j$ after setting to finish charging capacitor $C1_j$ for dc restoration, then closing the ith row transfer switch (TS_i) to inject signal charge into said substrate and to transfer charge to and from the column cells, then momentarily closing switch $S3_j$ to provide an output signal adjusted by the charge on capacitor $C1_j$ for dc restoration and by the charge on capacitor $C2_j$ for subtractive error correction.

4,734,584

QUANTITATIVE NEAR-INFRARED MEASUREMENT INSTRUMENT FOR MULTIPLE MEASUREMENTS IN BOTH REFLECTANCE AND TRANSMISSION MODES

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed Sep. 16, 1986, Ser. No. 907,889
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—343 7 Claims



1. An instrument for making quantitative measurements of a sample using near-infrared radiation and detectors therefor, the instrument being capable of making such measurements by either transmission through the sample or reflectance from the sample, the instrument comprising:

(a) a housing member,

(b) a sample chamber within the housing, the sample chamber having near-infrared transparent windows therein and being hollow and capable of accepting removable sample holders,

(c) a source of near-infrared radiation directed on an optical axis toward the sample chamber and normally passing through the NIR-transparent windows of the sample chamber,

(d) an NIR transmission detection means on the side of the sample chamber opposite the source of NIR radiation,

(e) an NIR reflectance detection means on the same side of the sample chamber as the source of NIR radiation,

(f) a first sample holder means for insertion into the sample chamber and adapted to hold and position a sample therein a condition specifically suited to the reflection of the NIR radiation from a surface thereof for the measurement of the magnitude of such reflection; and

(g) a second sample holder means for insertion into the sample chamber and adapted to allow transmission of the NIR radiation therethrough and to hold and position a sample therein in a condition specifically suited to the transmission of the NIR radiation through the sample and the measurement of the magnitude of such transmission.

4,734,585

PASSIVE INFRA-RED SENSOR

Ian A. Owers, Aberdour, Scotland, assignor to Racal-Guardall (Scotland) Ltd., Midlothian, Scotland

Filed Jul. 16, 1986, Ser. No. 886,038
Claims priority, application United Kingdom, Jul. 17, 1985, 8518004; Dec. 20, 1985, 8531491
Int. Cl.[4] G08B *13/18*; G01J *5/08*
U.S. Cl. 250—353 6 Claims

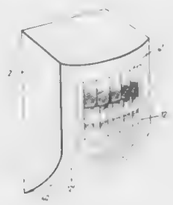
1. A passive infra-red sensor including

a housing

a window defined in said housing, and

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an infra-red detector mounted within said housing behind said window,



said window defining an alternating sequence of infra-red transmitting strips which allow infra-red radiation to pass unfocused onto the detector, and lens segments positioned for focusing infra-red radiation onto said detector.

4,734,586

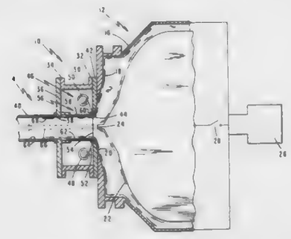
FOIL CHANGING APPARATUS

Charles E. Crist; Harry C. Ives; Gordon T. Leifeste, and Robert B. Miller, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1986, Ser. No. 836,883

Int. Cl.[4] H01J *33/04*

U.S. Cl. 250—503.1 **11 Claims**



1. A self-contained foil changer apparatus for replenishing foil material across the path of a high energy particle beam, the apparatus comprising:

a cylindrical hermetically sealed housing comprising an end plate having an aperture defining a beam passageway therethrough, one end of the housing being attachable to a high energy particle accelerator and the opposite end being attachable to a beam propagation tube;

foil supply means disposed inside the housing for storing a foil web and supporting a portion of said web across the beam passageway to form a plane perpendicular to the beam path;

a barrel assembly disposed inside the housing and comprising a longitudinally disposed cylindrical barrel being movable from an advanced position wherein said portion of the foil web is gripped between one end of the barrel and the end plate surrounding the aperture to a retracted position thereby freeing the web from contact with said end plate;

web control means extending through the housing and operably connected to the foil supply means for selectively advancing the foil web to replenish a portion across the beam passageway; and

barrel control means extending through the housing and operably connected to the barrel assembly for selectively moving the barrel to and from the advanced and retracted positions, said barrel control means comprising a lever arm transversely disposed inside the housing and pivotally secured thereto, said lever arm being also pivotally secured to the movable barrel and operator shaft means journaled through the housing and having one end portion operably connected to the lever arm, for moving the lever in either direction about its pivotal connection to impart longitudinal movement to the barrel.

4,734,587

OPTOELECTRIC DISTANCE MEASURING APPARATUS WITH A TIME DISCRIMINATOR FOR THE ACCURATE DETECTION OF ELECTRIC PULSE SEQUENCE

Rudolf Schwarte, Kreuztaler Strasse 56, D-5902 Netphen-Dreistiefenbach, Fed. Rep. of Germany

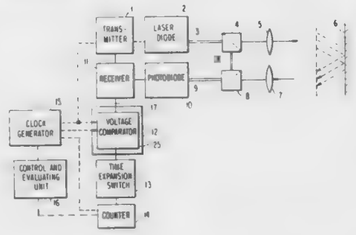
PCT No. PCT/EP85/00236, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO85/05456, PCT Pub. Date Dec. 5, 1985

PCT Filed May 23, 1985, Ser. No. 827,306

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419117

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **4 Claims**



1. In an optoelectric distance measuring apparatus comprising means for emitting light pulses; means for receiving said emitted light pulses; means directing a first portion of said emitted light pulses toward a target for reflection by said target and thereafter for reception by said light receiving means, and a second portion of said emitted light pulses directly into said light receiving means; a photodiode disposed downstream of said light receiving means, for converting said received light pulses to electric pulse signals; a primary comparator receiving said electric pulse signals emitted by said photodiode, said primary comparator having a positive and a negative pulse input; means for generating clock pulses, having a gate time controlled by said primary comparator; a counter to which said generated clock pulses are gated; said primary comparator being adapted to be connected to a source of offset voltage; a differentiating circuit connected between said photodiode and said negative pulse input of said primary comparator; and a delay line connected between said photodiode and said positive pulse input of said primary comparator; the improvement in which a minimum comparator is connected between said photodiode and said positive input of said primary comparator, said minimum comparator being adapted to regulate offset voltage from a said source thereof; and additional delay lines are respectively connected to said positive and negative pulse inputs of said comparator.

4,734,588

X-RAY COMPUTED TOMOGRAPH DETECTOR

Yoshimi Akai, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1986, Ser. No. 898,393

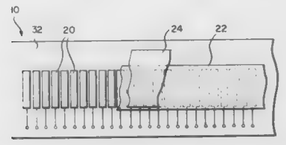
Claims priority, application Japan, Aug. 21, 1985, 60-181854

Int. Cl.[4] G01T *1/22*

U.S. Cl. 250—370 **7 Claims**

1. A detector for detecting the intensity of X-rays emitted from an X-ray source and transmitted through a subject to said detector, said detector comprising:

an arcular multi-channel scintillator element array having a plurality of polycrystalline pieces, each of said polycrystalline pieces constituting a scintillator element which emits light in accordance with X-ray incidence, said polycrystalline pieces being positioned adjacent to one another to form a receiving surface for receiving the X-rays and to form an outer surface opposite said receiving surface; and



a multi-channel photo-semiconductor element array provided on said outer surface of said multi-channel scintillator element array, said photo-semiconductor element array including a plurality of photo-semiconductor element sections having an amorphous silicon film formed on a flexible insulating film, each of said photo-semiconductor element sections detecting the intensity of light emitted from a corresponding one of said scintillator elements.

4,734,589

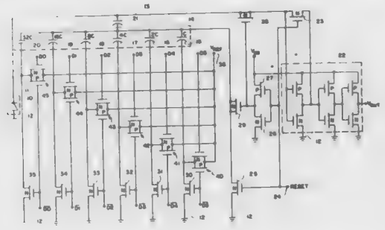
A/D PHOTODIODE SIGNAL CONVERSION APPARATUS

James H. Atherton, Ringoes, N.J., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 11, 1986, Ser. No. 940,692

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **10 Claims**



1. A photodiode signal conversion circuit comprising:

a source of circuit ground;

a photodiode having an anode and a cathode, the anode being connected to said source of circuit ground;

a plurality of capacitors, each having first and second plates, and having capacitance values of a predetermined relationship;

a sense node;

means connecting the first plates of said plurality of capacitors to said sense node;

a reference voltage source;

switching means for selectively connecting the second plates of said plurality of capacitors to either said source of circuit ground or said reference voltage source;

charging means operable to alternately charge said sense node to a threshold voltage and then allow said sense node to electrically float for a first time interval;

comparator means connected to said sense node, said comparator means having an output terminal at which is produced a characteristic signal if the voltage on said sense node is larger than the threshold voltage;

control means responsive to the output signal of said comparator means to supply control signals to said switching means, said control means being operable during the time said sense node is being charged to the threshold voltage to connect the second plates of said plurality of capacitors to said source of circuit ground, said control means further being operable after a predetermined delay during the first time interval to sequentially connect the second plates of said plurality of capacitors to said reference voltage source, and, if connection of the second plate of any one of said plurality of capacitors in production of a characteristic signal by said comparator, to reconnect the second plate of that capacitor to the source of circuit ground; and

digital output means responsive to the state of said switching means to produce a digital representation thereof, the digital representation being indicative of the light intensity at said photodiode.

4,734,590

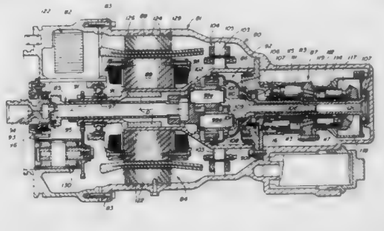
INTEGRATED DRIVE GENERATOR WITH COMMON CENTER LINE

Theodore D. Fluegel, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 30, 1986, Ser. No. 947,703

Int. Cl.[4] F16H *47/02*

U.S. Cl. 290—1 C **24 Claims**



1. An integrated drive generator system, comprising a housing mounting drive input shaft means, differential means coupled to and arranged coaxially of the drive input shaft means, generator means coupled to the differential means and including a rotor coaxially of the drive input shaft means, and hydraulic log means coupled to the differential means and arranged coaxially of the drive input shaft means.

4,734,591

FREQUENCY DOUBLER

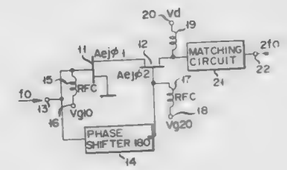
Ikuroh Ichitsubo, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 14, 1986, Ser. No. 851,161

Claims priority, application Japan, Apr. 26, 1985, 60-89975

Int. Cl.[4] H03B *19/00*

U.S. Cl. 307—219.1 **7 Claims**



1. A frequency doubler comprising:

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a first field effect transistor having a gate, a source, a drain and a current channel provided between the source and drain;

a second field effect transistor having a gate, a source, a drain and a current channel provided between the source and drain, the current channels of the first and second field effect transistors being connected in series with each other; and

means for applying across the gate and source of the first field effect transistor and across the gate of the second field effect transistor and the source of the first field effect transistor signal voltages having substantially the same voltage amplitudes and frequencies and having a phase difference of about 180 degrees;

wherein an output signal having a frequency two times that of said signal voltages is obtained from the drain of said second field effect transistor.

4,734,592

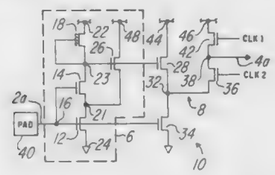
INTERFACE CIRCUIT FOR DATA PROCESSING SYSTEM

Daniel L. Essig, and Joe F. Sexton, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 547,557, Oct. 31, 1983. This application Jan. 28, 1987, Ser. No. 9,579

Int. Cl.⁴ H03K *3/29, 17/16, 19/096, 19/092*

U.S. Cl. 307—290 **6 Claims**



1. An interface circuit for a data processing apparatus comprising:

a data input for receiving an input data signal;

a digitizer circuit having an input and having an output, said input of said digitizer circuit being connected to said data input, for generating at its output a digital signal having a first logic state corresponding to said input data signal being at a voltage less than a first predetermined level, and having a second logic state corresponding to said input data signal being at a voltage greater than a second predetermined level;

an output line conditioner circuit, comprising:

a first switch means, connected between a first power supply node and an output node of said output line conditioner circuit, and connected to the output of said digitizer circuit, for connecting said first power supply node to said output node responsive to said digital signal being in its first logic state, and for isolating said first power supply node from said first power supply responsive to said digital signal being in its second logic state; and

a second switch means, connected between a second power supply node and said output node, and connected to said data input for connecting said second power supply node to said output of said output line conditioner circuit responsive to said data input being at a voltage greater than said second predetermined level; and

a line driver having an input connected to said output node of said output line conditioner for driving an output data line responsive to said voltage of said output node.

4,734,593

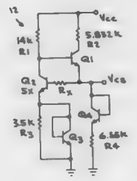
CML BIAS GENERATOR

Sasan Teymouri, Mountain View, and Sungil Lee, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 29, 1986, Ser. No. 924,655

Int. Cl.⁴ H03K *3/01, 3/26*

U.S. Cl. 307—297 **7 Claims**



1. A bias generator circuit for use with current-mode logic gates which has an output reference voltage that is substantially indepenent of supply potential and temperature variations, said generator circuit comprising:

a first transistor having its collector connected to the supply potential via a first load resistor;

a second transistor having its collector connected to the supply potential via a second load resistor and its base connected to the collector of said first transistor;

said second transistor having its emitter coupled to an output node for generating an output reference voltage and connected to the base of said first transistor via an impedance compensating resistor;

compensating means coupled to the emitter of said first transistor for minimizing variations in said output reference voltage as a function of changes in the supply potential and temperature;

said compensating means being formed of a first emitter resistor and a diode-connected third transistor, said first emitter resistor having its one end connected to the emitter of said first transistor and to the collector and base of said third transistor, the emitter of said third transistor being connected to the other end of said first emitter resistor and to a ground potential;

the value of the first emitter resistor controlling the output reference voltage for lower temperatures and the base-emitter voltage of the third transistor controlling the output reference voltage for higher temperatures;

stabilizing means coupled to the emitter of said second transistor for maintaining the output reference voltage to be balanced; and

said stabilizing means being formed of a fourth transistor and a second emitter resistor, said fourth transistor having its collector and base connected to the emitter of said second transistor and its emitter connected to one end of said second emitter resistor, the other end of said second emitter resistor being connected to the ground potential.

4,734,594

OFFSET CORRECTION FOR SENSOR WITH TEMPERATURE DEPENDENT SENSITIVITY

Richard W. Nelson, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 31, 1986, Ser. No. 948,208

Int. Cl.⁴ H03K *17/90, 3/43*

U.S. Cl. 307—309 **18 Claims**

1. An integrated circuit Hall effect device with temperature independent offset compensation, comprising:

a semiconductor chip with an epitaxial layer thereon;

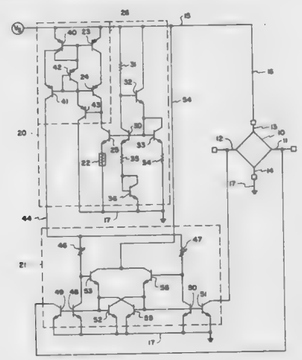
a Hall effect element formed in the epitaxial layer, said Hall effect element being operable to produce a voltage difference between first and second terminals thereof when an electric current is caused to flow between third and fourth terminals thereof and said element is subjected to a magnetic field, the voltages at the first and second terminals ideally being equal in the absence of a magnetic field, but being subject to an offset voltage which can be eliminated by causing suitable current to flow through at least one of the first and second terminals;

a voltage supply conductor;

a reference voltage conductor;

first connecting means connecting said Hall effect element through its third and fourth terminals between said voltage supply conductor and said reference voltage conductor;

a first resistor formed in said epitaxial layer;



second connecting means connecting said first resistor between said voltage supply conductor and said reference voltage conductor to result in a first current through said second connecting means which is affected by temperature in the same manner as the current through said Hall effect element; and

current control means connecting said at least one of the first and second terminals of said Hall effect element to one of said voltage supply and reference voltage conductors, said current control means being responsive to the current through said second connecting means to cause said suitable current flow through said at least one of the first and second terminals of said Hall effect element.

4,734,595

DEVICE FOR CONTROLLING AN OUTPUT CIRCUIT OF AN INTEGRATED CIRCUIT

Géard Le Roux, La Tranche, and Marius Reffray, Grenoble, both of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 17, 1986, Ser. No. 908,673

Claims priority, application France, Sep. 17, 1985, 85 13759

Int. Cl.⁴ H03K *3/26, 17/60*

U.S. Cl. 307—315 **6 Claims**

1. A device for controlling an output Darlington type circuit of an integrated circuit comprising a first and a second transistor, said first transistor having an emitter, a collector, a base, and first and second main electrodes each connected to a predetermined respective one of said emitter and said collector of said first transistor, said second transistor having an emitter, a collector, a base and first and second main electrodes each connected to a predetermined respective one of said emitter and said collector of said second transistor,

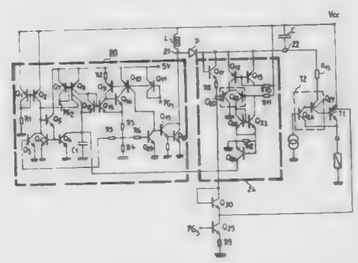
the first main electrode of the first transistor being connected to a power terminal and the second main electrode thereof being connected to a ground terminal, a load being connected between one of these main electrodes and the corresponding terminal, the base of said first transistor being connected to a second main electrode of the second transistor, the base of which receives a control current, wherein the first main electrode of the second transistor is connected to an auxiliary voltage (V_{AUX}) so that (V_{AUX}) is substantially equal to

$$V+V_{BE1}+V_{CE2}$$

where:

V_{BE1} is the base-emitter voltage of the first transistor;

V_{CE2} is the collector-emitter voltage of the second transistor at saturation; and



V is the ground potential if the load is connected to the power terminal and is equal to $V_{CC}-V_{CE1}$ if the load is connected to ground,

V_{CE1} being the collector-emitter voltage at saturation of the first transistor and V_{CC} being the voltage at the power terminal,

and wherein said auxiliary voltage (V_{AUX}) is obtained from the power terminal through a regulated DC-DC converter integrated in the integrated circuit comprising the Darlington type circuit.

4,734,596

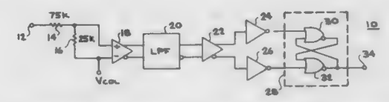
DETECTION OF DIRECT CURRENT IN THE PRESENCE OF MANCHESTER-ENCODED SIGNALS

David L. Campbell, Sunnyvale, and Ravindra D. Tembhekar, Santa Clara, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 3, 1986, Ser. No. 847,805

Int. Cl.⁴ H03K *5/153*

U.S. Cl. 307—350 **3 Claims**



1. A method for detection of a direct current (DC) component exceeding a predetermined voltage ("collision") on a single-ended signal line also having an alternating current (AC) component, comprising the steps:

(a) generating a signal representing the difference between a signal on said signal line and said predetermined voltage;

(b) removing said AC component from said difference signal by filtering;

(c) comparing said filtered signal against a zero-level and generating an occurrence signal and a non-occurrence signal having first predetermined values, respectively, if said DC component exceeds said predetermined voltage and having second predetermined values, respectively, otherwise;

(d) delaying said occurrence and non-occurrence signals by a first and a second predetermined amount, respectively, resulting in pulse-width discrimination of said signal generated at step (a); and

(e) applying said occurrence and non-occurrence signals

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delayed by said first predetermined amount and said second predetermined amount, to a set and a reset input of a S-R latch, respectively, the state of said S-R latch indicating the detection or non-detection of said DC component exceeding said predetermined voltage.

4,734,597

CMOS INVERTER CHAIN

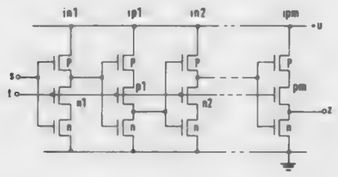
Manfred F. Ullrich, Denzlingen, and Arnold Uhlenhoff, Emmendingen, both of Fed. Rep. of Germany, assignors to Intermetall, Division of Ditti, Freiburg, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,632

Claims priority, application European Pat. Off., Dec. 7, 1985, 85115598.6; Feb. 27, 1986, 86102586.4

Int. Cl.⁴ H03K *19/20, 19/096, 19/017*

U.S. Cl. 307—481 **6 Claims**



1. A CMOS inverter chain comprising:

a plurality of inverters disposed in series in terms of signal flow;

each alternate one of said plurality of inverters being an N-inverter, each N-inverter being a CMOS inverter comprising: a first N-transistor, a first P-transistor, and an intermediate N-transistor, said intermediate N-transistor being in series with the controlled current paths of said first N- and P-transistors, an output terminal coupled to a node connecting said first P-transistor and said intermediate N-transistor, and an input terminal coupled to the gates of said first N-transistor and said first P-transistor;

each intermediate one of said plurality of inverters being a P-inverter, each P-inverter being a CMOS inverter comprising: a second N-transistor, a second P-transistor, and an intermediate P-transistor, said intermediate P-transistors being in series with the controlled current paths and said second N- and P-transistors, an output terminal coupled to a node connecting said second N-transistor and said intermediate P-transistor, and an input terminal coupled to the gates of said second N- and P-transistors;

a clock terminal coupled to the gates of all of said intermediate N- and P-transistors for applying clock signals thereto; and wherein

the input terminal of each of said inverters except the first one of said inverters is connected to the output terminal of the preceding one of said inverters.

4,734,598

CONTROLLABLE INTEGRATOR

Rolf Böhme, Bad Friedrichshall, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 706,294

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408220

Int. Cl.⁴ G06G *7/12, 7/18*

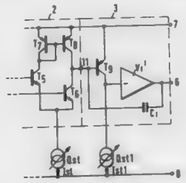
U.S. Cl. 307—491 **8 Claims**

1. A controllable integrator for a bipolar integrated filter comprising:

a voltage-current-transformer including two transistors, a converting resistor connected between the emitters of said two transistors, and two current sources each connected to a respective one of the emitters of said two transistors;

a source of supply voltage;

a current distribution multiplier including: two logarithmic diodes each having a terminal connected to a respective one of the collectors of said two transistors; a differential stage having differential inputs connected, respectively, to said terminals of said two logarithmic diodes, a current input and an output; a first controllable current source for supplying current to the current input of said differential stage; and a current mirror having an output and comprising two transistors of one conductivity type having emitters connected to said source of supply voltage and collectors connected to the output of said differential stage;



a second controllable current source having the same current as the current flowing in the first controllable current source in said current distribution multiplier; and

an integrating amplifier including: an inverting amplifier having an input and an output; an integrating capacitor connected between the input and output of said inverting amplifier; and an input circuit including an input transistor of said one conductivity type, said input transistor having a base connected to the output of said current mirror, an emitter connected to said source of supply voltage and a collector connected to the input of said inverting amplifier and to said second controllable current source.

4,734,599

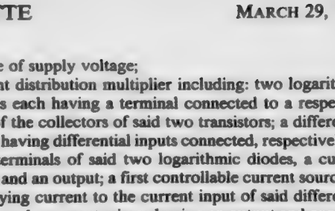
CIRCUIT FOR MULTIPLYING A PUMP CLOCK VOLTAGE

Frank J. Bohac, Jr., Laguna Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 30, 1985, Ser. No. 728,731

Int. Cl.⁴ H03K *5/01, 4/24*

U.S. Cl. 307—497 **22 Claims**



1. A voltage multiplier circuit having an input node and an output node, comprising:

transfer clock means for providing a transfer clock signal;

pump clock means for providing a pump clock signal having high and low levels;

pump capacitor means for capacitively coupling said pump clock means to said output node;

switching means for selectively coupling the output node to or isolating it from the input node in response to said transfer clock signal so that said switching means couples said input node to said output node during an interval when said pump clock is at said high level to equalize the potential between said input and output nodes, and to isolate said nodes when the potential at the output node is lower than the potential at the input node.

4,734,600

NOISE DAMPED DYNAMO ELECTRIC MACHINE, ESPECIALLY VEHICULAR TYPE ALTERNATOR

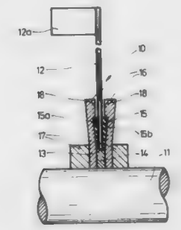
Günther Bergan, Ludwigsburg; Manfred Frister, Schwieberdingen; Gerhard Henneberger, Möglingen; Peter Lack, Bietigheim-Bissingen, and Stefan Renner, Weissach-Flacht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,278

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543544

Int. Cl.⁴ H02K *5/24, 9/00*

U.S. Cl. 310—51 **20 Claims**



1. Noise damped dynamo electric machine, especially vehicular type alternator, having

a rotor shaft (**11**);

a ventilator wheel (**12**, **12***a*) having a disk-shaped portion defining two oppositely located side surfaces, seated on the rotor shaft; and

means for securing the ventilator wheel to the rotor shaft while attenuating noise generation comprising

an axial clamping system, axially clamping the ventilator wheel to the rotor shaft having

in axially aligned position,

a material which is elastically pressure transferring while damping vibration transferred thereto located immediately adjacent a portion of at least one of the side surfaces of the ventilator wheel;

a spring pressure element seated on the shaft; and

a counter element located on said shaft and facing the other side surface of the ventilator wheel, said elements being secured to the shaft in axially defined positions to clamp the ventilator wheel between said elements with the elastically pressure transferring material between at least one of said elements and the ventilator wheel.

4,734,601

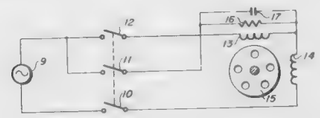
NOISE SUPPRESSION CIRCUIT FOR PARALLEL RESONANT MOTOR

Alexander J. Lewus, 9844 N. 11th Ave., Phoenix, Ariz. 85021

Filed Aug. 24, 1987, Ser. No. 88,241

Int. Cl.⁴ H02K *11/00;* **H02P** *1/44*

U.S. Cl. 310—68 E **19 Claims**



1. An alternating current motor having a stator core for operation from a source of alternating current power, including in combination:

a rotor for said motor;

a first winding with first and second ends;

a second winding with first and second ends, the first end of said second winding connected in series to the second end of said first winding at a first junction on the stator core for inducing rotation of said rotor;

a source of alternating current power;

first switch means connected between said source of alternating current power and said series-connected first and second windings for applying alternating current power to said series-connected first and second windings throughout the starting and running operation of said motor when said first switch is closed;

first capacitor means having first and second terminals, one terminal of which is connected to one of said first and second ends of said first winding;

second switch means connected between the other terminal of said capacitor means and the other of said ends of said first winding for causing alternating current power to be applied to said capacitor means when both said first and second switch means are closed, said capacitor means thereby connected in parallel with said first winding to form an LC parallel resonant circuit therewith at the frequency of alternating current power applied from said source of alternating current power;

energy dissipation means connected across the first and second terminals of said first capacitor means at least when said second switch means is open; and

means for causing said first and second switch means to be opened together and to be closed together, whereby with said second switch means open, said first capacitor means is electrically isolated from said first winding to prevent said first capacitor means for discharging into said first winding.

4,734,602

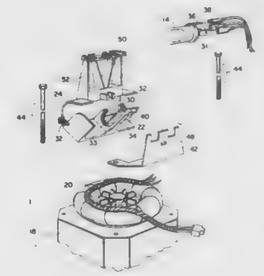
MOTOR PROTECTOR RECEPTACLE FOR A REFRIGERATION COMPRESSOR

Bret R. Hauser, Larue, and Thomas E. Jensen, Tyler, both of Tex., assignors to American Standard Inc., New York, N.Y.

Filed Feb. 24, 1987, Ser. No. 18,309

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 C **19 Claims**



1. A device for mounting a heat responsive overload protector near a heat source, said mounting device comprising a receptacle having a heat retaining shield and adapted to hold said overload protector between said heat source and said shield such that one side of said overload protector faces toward said heat source in heat exchange relationship therewith, and an opposite side of said overload protector faces away from said heat source and toward said heat retaining shield so that said shield helps prevent heat loss from said protector, said receptacle also having an opening for providing a fluid passage directly between said heat source and said overload protector.

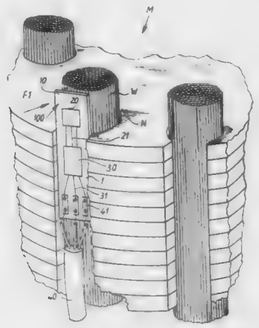
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,603

MOTOR CONTROL MOUNTING

Johann von der Heide, Schramberg; Georg F. Papst, and Rolf Mueller, both of St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, Black Forest, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,470
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519901
Int. Cl.[4] H02K *29/08*
U.S. Cl. 310—72 4 Claims



1. A brushless d.c. motor having a rotor with a magnetic field, a stator, slots in the stator having a given width and cross section, a winding system held in the cross section of the slots of the stator, electronic controls controlling current in the winding system and a Hall device detecting the position of the rotor and providing a control signal for the electronic controls to regulate the motor, the motor further comprising an elongated substrate mounting both the Hall device and the associated electronic controls; an envelope enclosing in common the substrate, the Hall device, and the electronic controls, the width of the combined envelope and substrate being less than the given width of the cross section of the slots, the Hall device being mounted on the elongated substrate adjacent one of its ends, and the combination envelope with substrate, Hall device and electronic controls being disposed within the cross-sectional area of one of the motor slots and with the Hall device end extending outside the slot but within the magnetic field of the rotor, whereby the Hall device is able to provide an effective control signal substantially interference free in response to the magnetic field of the rotor.

4,734,604

FRICTION BRAKING SYSTEM AND APPARATUS FOR APPLIANCE INDUCTION MOTOR DRIVE

Carl G. Sontheimer, Greenwich, and William R. Smith-Vaniz, Darien, both of Conn., assignors to Cuisinarts, Inc., Greenwich, Conn.

Filed Aug. 1, 1986, Ser. No. 892,767
Int. Cl.[4] H02K *7/10*
U.S. Cl. 310—76 7 Claims

1. In an induction motor in a home electrical appliance, said induction motor including a housing, bearing means associated with the housing, a motor shaft within the housing mounted by said bearing means for rotation about its axis, said motor shaft extending outside of the housing and having power take-off means thereon external of said housing for enabling mechanical power to be delivered from said motor shaft to a working tool, a rotor in said housing mounted on said motor shaft, an electrically energizable electromagnetic stator fixed in said housing concentric with said rotor and encircling said rotor for causing said rotor to turn when said stator is electrically energized by alternating current, a friction braking system located totally inside of said housing for frictionally braking rotation of the rotor whenever the flow of electrical power to the motor ceases, said friction braking system comprising:

said rotor being shiftable in axial position relative to said stator,

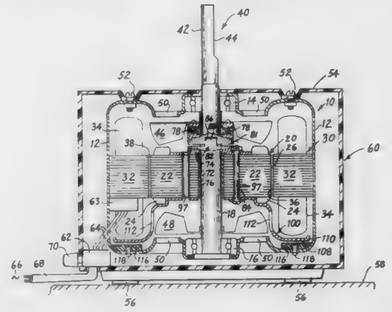
said rotor being shiftable in axial position relative to said motor shaft,

a first coupling affixed to the motor shaft for the motor shaft and said first coupling to rotate as a unit,

a second coupling affixed to the rotor for the second coupling and the rotor to relate as a unit and to shift axially as a unit,

said second coupling being mechanically engaged with said first coupling for transmitting the rotary motion of the rotor to the motor shaft while permitting the rotor and said second coupling to shift axially with respect to said first coupling for preventing any angular displacement of said rotor relative to said shaft regardless of the axial position of said rotor,

said rotor during running of said induction motor being drawn into axial alignment with the stator by the electromagnetic effect of the stator when electrically energized,



said rotor being subjected to an axial thrust in a predetermined axial direction for shifting the rotor in a first axial direction out of aligment with the stator upon cessation of electrical energization of the stator,

a brake lining mounted in fixed position within said housing,

a brake disc secured to said rotor for causing said rotor and brake disc to rotate together and to stop together,

said brake disc having an annular frictional surface concentric about said axis,

said annular frictional surface being in opposed relationship with said brake lining and being spaced closely therefrom when said rotor is in axial alignment with said stator during running of said motor,

said shifting of said rotor in said first axial direction bringing said annular frictional surface against said brake lining for frictionally braking the rotor to stop turning, and

said rotor shifting in a second direction opposite to said first direction separating said annular frictional surface from said brake lining for releasing the friction braking upon electrical energization of said stator as said rotor is drawn into axial alignment with the stator and starts running.

4,734,605

LINEAR DRIVING MECHANISM

Sokichi Hayashi, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1986, Ser. No. 907,592
Int. Cl.[4] H02K *7/06*
U.S. Cl. 310—80 4 Claims

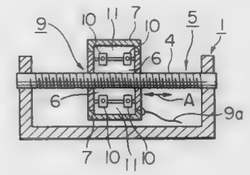
1. A linear driving mechanism comprising in combination:

guide means mounted to a frame;

a guide axis which is stationary with respect to said frame and which has a threaded portion;

a rotor movably mounted with respect to said guide axis on said threaded portion;

a stator mounted to the outside of said rotor via a bearing member;



a movable table which is mounted to said stator and reciprocally movably mounted and supported on said guide means to reciprocate along said guide;

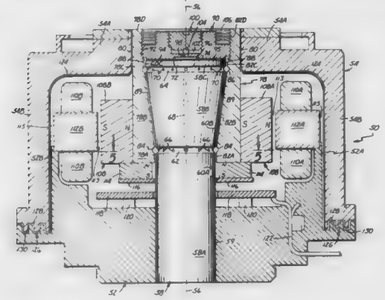
whereby said movable table is reciprocally movable linearly by rotating said rotor.

4,734,606

ELECTRIC MOTOR WITH FERROFLUID BEARING

Chester S. Hajec, 2195 W. Highway 36, St. Paul, Minn. 55113

Filed Nov. 20, 1985, Ser. No. 830,350
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 46 Claims



1. An electric motor comprising:

a base;

a hub for rotation about an axis;

a magnetically permeable shaft attached to the base for defining the axis; the shaft defining an inner bearing race;

a magnetically permeable sleeve attached to the hub and coaxially positioned with the shaft, the sleeve defining an outer bearing race spaced from the inner bearing race of the shaft to define a first gap therebetween;

a ferrofluid lubricant;

stator winding means supported by the base for providing magnetic fields for causing rotation of the hub; and

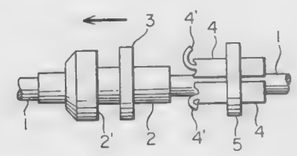
permanent magnet means rotatable with the sleeve; separated from the stator winding means by an air gap, for providing magnetic fields which interact with the magnetic fields provided by the stator winding means to cause rotation of the hub, the permanent magnet means, the shaft and the sleeve forming a magnetic flux path for maintaining the ferrofluid within the gap.

4,734,607

MINIATURE MOTOR WITH SPARK QUENCHING CONNECTION BETWEEN COMMUTATOR AND BRUSHES

Masaaki Ikawa, and Kazuichi Mabuchi, both of Chiba, Japan, assignors to Mabuchi Motor Co., Ltd., Japan

Filed Nov. 10, 1986, Ser. No. 930,691
Claims priority, application Japan, Nov. 15, 1985, 60-175928
Int. Cl.[4] H02K *13/10*
U.S. Cl. 310—233 3 Claims



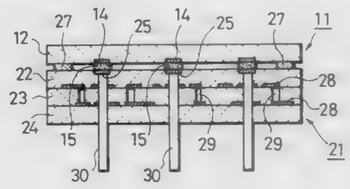
3. A miniature motor having a motor shaft, an insulating cylinder fitted on said shaft, a commutator segments with corresponding commutator terminals integrally formed with said commutator segments, said commutator segments fitting over said insulating cylinder, an insulated washer on said commutator segments for fixing said commutator segments on said insulating cylinder, an electrically conductive rubber ring fitting over said insulating cylinder abutting said insulating washer, said commutator terminals extending beneath said insulated washer and outwardly therefrom, and a flange abutting said rubber ring.

4,734,608

ELASTIC SURFACE WAVE ELEMENT

Takehiro Takoshima, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 31, 1986, Ser. No. 926,369
Claims priority, application Japan, Nov. 7, 1985, 60-249790
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R 5 Claims



1. An elastic surface wave element comprising:

a piezoelectric substrate having at least one pair of comb-shaped electrodes connected to respective first terminal sections having a certain thickness on a lower planar surface of said substrate;

a multi-layered printed circuit board having second terminal sections provided on an upper planar surface thereof which have a certain thickness and correspond in position to said first terminal sections,

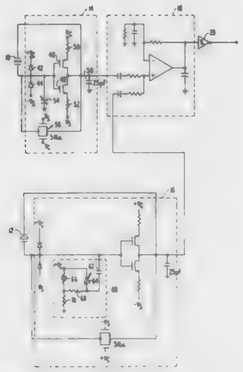
wherein said lower planar surface of said substrate is disposed facing said upper planar surface of said printed circuit board spaced therefrom by a predetermined gap, and said first terminal sections are electrically connected and mechanically bonded to said second terminal sections by a joining layer applied between each pair of corresponding terminal sections, said predetermined gap being provided by the thicknesses of said first terminal sections joined to said second terminal sections; and

a sound wave absorbing layer provided sealingly in the

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predetermined gap around an outer periphery of said substrate and said printed circuit board joined together.

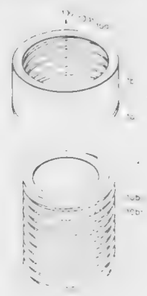
4,734,609
GAS DENSITY TRANSDUCER
Richard Jasmine, Menlo Park, Calif., assignor to Calogic Corporation, Fremont, Calif.
Filed Jul. 25, 1986, Ser. No. 890,661
Int. Cl.[4] H01L *41/08*; G01N *31/00*; G01L *11/00*
U.S. Cl. 310—315 **16 Claims**



1. A gas density transducer comprising:
a reference tuning fork crystal oscillator sealed within a chamber having a fixed gas density;
a detector tuning fork crystal oscillator exposed to the density of the gas surrounding said transducer; and
means for comparing the frequency of signals from said reference and detector oscillators and producing an output signal proportional to the difference in the frequencies of said signals.

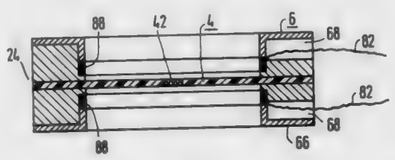
4,734,610
VIBRATION WAVE MOTOR
Ichiro Okumura; Hitoshi Mukohjima, both of Yokohama, and Sadayuki Ueha, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 23, 1987, Ser. No. 29,182
Claims priority, application Japan, Mar. 25, 1986, 61-67588; Sep. 30, 1986, 61-232665; Sep. 30, 1986, 61-232666; Sep. 30, 1986, 61-232667
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **13 Claims**

1. A vibration wave motor comprising:
(a) circular shape vibration means having a helical stepped portion inside or outside thereof;
(b) means, coupled to said vibration means, for causing said vibration means to generate a travelling vibration wave propagating along a circumferential direction of said vibration means; and
(c) movable means having a stepped portion, threadably engaged with said helical stepped portion said movable



means being frictionally driven by the travelling vibration wave generated by said vibration means.

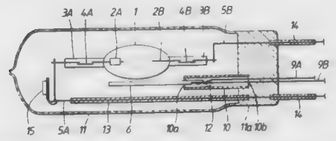
4,734,611
ULTRASONIC SENSOR
Bernd Granz, Oberasbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Dec. 4, 1986, Ser. No. 937,840
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545382
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—324 **11 Claims**



1. An ultrasonic sensor for use in a sound-carrying liquid, comprising:
a support structure;
a polymer foil at least peripherally attached to said support structure and having piezoelectrically activated section; and
electrodes electrically coupled to section, said electrodes being separated from said section by a zone filled with said sound-carrying liquid.

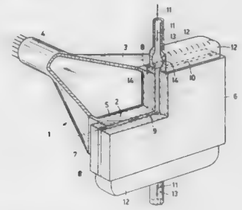
4,734,612
HIGH PRESSURE METAL VAPOR DISCHARGE LAMP
Hiroki Sasaki, Yokohama; Kiyoshi Saita, Yokosuka; Akihiro Inoue, Chigasaki; Hiroyoshi Takanishi, and Nobuyoshi Kuno, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 26, 1986, Ser. No. 878,667
Claims priority, application Japan, Jul. 15, 1985, 60-106968[U]; Oct. 18, 1985, 60-159516[U]
Int. Cl.[4] H01J *1/22, 7/30*
U.S. Cl. 313—15 **9 Claims**

1. A high pressure metal vapor discharge lamp comprising:
an outer bulb having a seal portion;
an arc tube enclosed within said outer bulb, said arc tube having at leat a pair of electrodes and containing at least a light emitting material and a rare gas;
a first pair of lead wires, one end of which are connected to the electrodes in said arc tube and the other end of which are mounted at the seal portion of said outer bulb;
a pre-heater disposed within said outer bulb, said pre-heater having a heating element and an electrical insulating material covering the heating element, facing said arc tube for heating said arc tube; and



a second pair of lead wires, one end of which are connected to the heating element of said pre-heater and the other end of which are mounted at the seal portion of said outer bulb; and
an electrical insulating tube surrounds the portion of said second pair of lead wires which are within said outer bulb.

4,734,613
LIQUID COOLED DISPLAY TUBE
Gerritt B. Gerritsen, and Willem M. Van Alphen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 9, 1984, Ser. No. 569,374
Claims priority, application Netherlands, Jan. 13, 1983, 8300114
Int. Cl.[4] H01J *29/86, 7/24*
U.S. Cl. 313—36 **5 Claims**



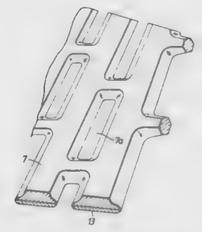
1. A display tube comprising
an evacuated envelope in which an electron beam is generated
a substantially rectangular display window having an inside surface in said envelope and an opposed outside surface, said inside surface having a display screen thereon,
a light transmitting second window outside of said envelope substantially parallel to said outside surface of said display window,
a light transmitting cooling liquid flowing between said display window and said second window
a substantially rectangular space through which said cooling liquid flows between said windows, said space having a depth defined by the spacing between said windows, said spacing being less than 1 mm, said space having opposed inlet and outlet apertures, said apertures having substantially the same dimensions as a cross section of said space at right angles to the direction of flow,
a chamber having dimensions exceeding the spacing between said windows, said inlet aperture opening smoothly into said chamber, whereby,
the influence of different refractive indices between the cooling liquid and said windows is small.

4,734,614
ELECTRIC LAMP PROVIDED WITH AN INTERFERENCE FILTER
Gijsbert Kuus, Turnhout, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 5, 1986, Ser. No. 871,033
Claims priority, application Netherlands, Jun. 11, 1985, 8501674
Int. Cl.[4] H01J *5/08*; H01K *1/32*
U.S. Cl. 313—112 **2 Claims**



1. An electric lamp provided with a glass lamp vessel sealed in a vacuum-tight manner and having an SiO_2 content of at least 95% by weight, current supply conductors extending through the wall of the lamp vessel to an electric element arranged in the lamp vessel and an interference filter of alternating layers consisting essentially of SiO_2 and consisting essentially of niobium oxide provided on the glass lamp vessel.

4,734,615
COLOR CATHODE RAY TUBE
Norio Koike; Hidemi Matsuda; Kiyoshi Tokita, and Kancharu Kida, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 11, 1986, Ser. No. 884,615
Claims priority, application Japan, Jul. 17, 1985, 60-155981
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 **7 Claims**



1. A color cathode ray tube comprising:
a phosphor screen;
a shadow mask with a large number of apertures, arranged in the vicinity of said phosphor screen;
an electron gun generating an electron beam passing through said apertures of said shadow mask to excite said phosphor screen;
wherein said shadow mask is coated with a layer consisting essentially of a binder selected from the group consisting of amorphous metal oxide, amorphous metal hydroxide and mixture thereof; and
a filler selected from the group consisting of metal, metal oxide, metal carbide, metal nitride and mixture thereof.

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4,734,616

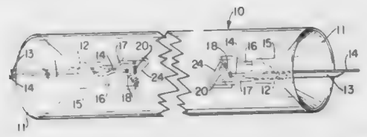
FLUORESENT LAMP WITH DOUBLE CATHODE AND PROBE

Donald P. Northrop, Glen Rock, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.

Continuation of Ser. No. 599,456, Apr. 12, 1984, abandoned. This application Oct. 1, 1986, Ser. No. 915,911

Int. Cl.⁴ H01J *61/42, 61/067*

U.S. Cl. 313—492 **13 Claims**



1. A fluorescent lamp of the type having a sealed envelope with a phosphor coating on an internal wall thereof and having an electrode at each end adapted to receive current from an external current source and an ionizable medium for supporting an electron arc stream therein between said electrode, wherein at least one of said electrodes comprises:

first cathode means having first and second ends adapted to be electrically connected to two active leads of said external current source for emitting electrons resonsive to an electric current received from said external source;

second cathode means having first and second ends for emitting electrons responsive to an electric current, said second cathode means first end being electrically connected to said first cathode means first end and thereby adapting it to be connected to one active lead of said external current source and its second end left unconnected; and

electron collecting means electrically connected to said second cathode means second end and extending outwardly from said second cathode means toward the electrode at the other end of the envelope and into the electron arc stream for capturing electrons from said arc stream and supplying the electric current resulting therefrom to said second cathode means, said electron collecting means collecting electrons in an amount of sufficient current to induce thermionic heating of said second cathode means to cause it to emit electrons such that at least a part of the production of said electron arc stream transfers from said first to said second cathode means.

4,734,617

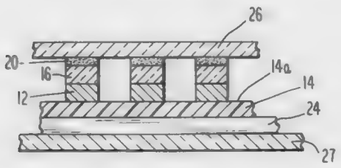
ELECTROLUMINESCENT DISPLAY AND METHOD OF MAKING SAME

Sidney Jacobs, 2607 Mimi Cir., Philadelphia, Pa. 19131, and John S. Peluso, 70 Lady Diana Cir., Marlton, N.J. 08053

Filed Jun. 2, 1986, Ser. No. 869,436

Int. Cl.⁴ H05B *33/10, 33/02*

U.S. Cl. 313—506 **11 Claims**



1. A method for making an electroluminescent display comprising the steps of:

providing an electroluminescent panel having an electroluminescent material on a first surface of a non-conducting substrate and a transparent conductor covering said electroluminescent material;

producing on said transparent conductor an ultraviolet ink mask resistant to etching solvent, radiating said ultraviolet ink with ultraviolet light to cure said ultraviolet ink;

covering selected areas of said transparent conductor and corresponding areas of said electroluminescent material lying beneath masked areas of said transparent conductor, each masked area comprised of a unitary display segment and lead segment;

applying an etching solvent to unmasked portions of said transparent conductor to etch away unmasked portions of said transparent conductor and unmasked portions of said electroluminescent material and to produce selected regions of layered electroluminescent material and transparent conductor each comprised of a unitary display segment and lead segment;

applying a metallic conductor to selected areas of a second surface of said substrate opposite from said first surface, each selected region of metallic conductor comprised of a unitary display segment and lead segment;

enclosing the etched electroluminescent panel with said metallic conductor applied within a non-conducting envelope having a transparent surface extending over said regions of layered electroluminescent material and transparent conductor;

and attaching a first set of terminals to said lead segments of said transparent conductor and a second set of terminals to said lead segments of said metallic conductor.

4,734,618

ELECTROLUMINESCENT PANEL COMPRISING A LAYER OF SILICON BETWEEN A TRANSPARENT ELECTRODE AND A DIELECTRIC LAYER AND A METHOD OF MAKING THE SAME

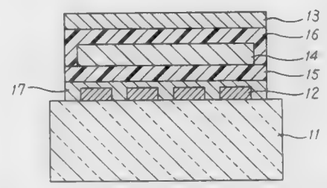
Takeo Matsudaira, and Yasumoto Shimizu, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jan. 30, 1986, Ser. No. 824,071

Claims priority, application Japan, Jan. 31, 1985, 60-15447

Int. Cl.⁴ H05B *33/22, 33/02*

U.S. Cl. 313—509 **6 Claims**



1. In an electroluminescent panel comprising a transparent electrode, an intermediate layer in contact with said transparent electrode, a dielectric layer in contact with said intermediate layer, an electroluminescent layer on said dielectric layer, and a back electrode overlying said electroluminescent layer, the improvement wherein said intermediate layer consists of silicon without any silicon oxide.

4,734,619

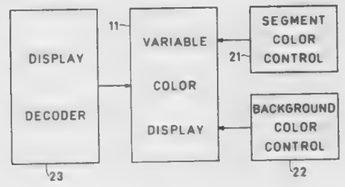
DISPLAY DEVICE WITH VARIABLE COLOR BACKGROUND

Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada M6S 4T2

Filed Jul. 7, 1986, Ser. No. 882,430

Int. Cl.⁴ G09G *3/14, 3/04;* **G08B** *5/36*

U.S. Cl. 313—510 **5 Claims**



1. A variable color display device comprising:

a plurality of variable color display areas arranged in a pattern, each said display area including a plurality of display light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a variable color background area substantially surrounding said display areas and including a plurality of background regions adjacent to said display areas, each said background region including a plurality of light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a plurality of opaque walls for optically separating said background regions from adjacent display areas; and

means for selectively activating said display light sources, to illuminate certain of said display areas in a first color, and said background light sources, to illuminate said background regions in a second color different from said first color.

4,734,620

RESONANT DEGAUSSING APPARATUS

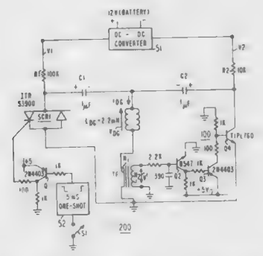
Juergen F. Hemme, Meilen, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 30, 1987, Ser. No. 79,322

Claims priority, application United Kingdom, Mar. 13, 1987, 8705956

Int. Cl.⁴ H01J *29/06*

U.S. Cl. 315—8 **10 Claims**



1. A resonant degaussing circuit of a television apparatus, comprising:

a degaussing coil;

a first switch;

a first capacitance that is precharged prior to a degaussing interval, said first capacitance being coupled to said degaussing coil by said first switch to form with said degaussing coil a resonant circuit that generates a plurality of cycles of a degaussing current in said degaussing coil, during said degaussing interval;

a second capacitance that is precharged prior to at least one of said plurality of cycles of said degaussing current; and

a second switch for coupling said second capacitance to said first capacitance during a predetermined portion of said at least one cycle of said degaussing current to couple charge from said second capacitance to said resonant circuit during said degaussing interval.

4,734,621

DEVICE FOR PRODUCING A SLIDING OR TRAVELING MAGNETIC FIELD, IN PARTICULAR FOR IONIC PROCESSING UNDER MAGNETIC FIELD

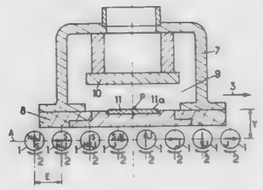
Jean P. Yonnet, and Joel Penelon, both of Meylan, France, assignors to Atelier d'Electro Themie et de Constructions, Meylan, France

Filed Dec. 24, 1986, Ser. No. 945,984

Claims priority, application France, Dec. 27, 1985, 85 19352

Int. Cl.⁴ H01J *7/24;* **H05B** *31/26*

U.S. Cl. 315—111.41 **11 Claims**



1. A device for producing a traveling magnetic field, with a substantially constant modulus in a working region (**11***a*), using movable permanent magnets, characterized in that the permanent magnets are provided in the form of cylindrical bars (**1**) with at least one pair of diametrically opposed magnetic poles extending along the axial length of each said bar, said bars being arranged side by side with their axes parallel and equally spaced (E) and in the same plane (A), the magnetic poles (J) of the bars (**1**) being successively angularly offset by a constant angle, said cylindrical bars (**1**) being rotationally driven around their axis at the same angular velocity and in the same direction, the said working region (**11***a*) being parallel to the plane (A) of the axis of said bars, and the distance (Y) separating the said working region (**11***a*) from the plane (A) of the axes of the bars (**1**) being at least 0.75 times the distance (E) between the axes of two adjacent bars.

4,734,622

DISSOCIATOR FOR ATOMIC MASERS

Samuel R. Stein, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed May 14, 1986, Ser. No. 863,210

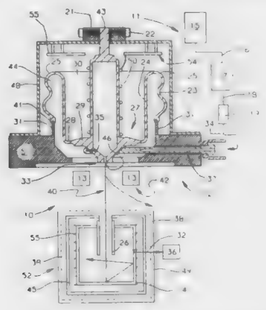
Int. Cl.⁴ H01J *7/24;* **H05B** *31/26*

U.S. Cl. 315—111.81 **23 Claims**

1. A dissociator comprising a base, a dissociation chamber for generating atomic particles capable of being influenced by a state-selecting magnetic field, said chamber having an opening serving as an inlet and an orifice serving as an exit for causing the formation of a narrow beam of atomic particles therefrom, means for dissociating molecular species to form

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atomic particles, yieldable means comprising a flexible concentric wall and feed tube connected to said chamber, and means



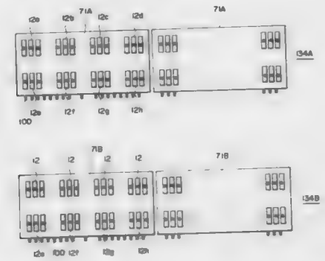
for asserting displacement of the yieldable means to orient the dissociation chamber.

4,734,623

FLUORESCENT DISPLAY APPARATUS

Akio Ohkoshi, Tokyo; Koji Tsuruta, Kanagawa; Kunio Shikakura, and Hideaki Nakagawa, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 901,788, Aug. 29, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 83,891
Claims priority, application Japan, Aug. 30, 1985, 60-191705
Int. Cl.[4] G06G *3/10*
U.S. Cl. 315—169.4 **6 Claims**



1. In a fluorescent display screen apparatus, a display unit comprising:

a first display cell consisting of a plurality of sets of fluorescent display segments of different colors arranged in a certain order; and outer leads arranged on one side,

a second display cell consisting of a plurality of sets of fluorescent display segments of different colors same in number and color as of said first display cell, but in opposite order of arrangement of colors to said first display cell, and outer leads arranged on the same side as of said first display cell,

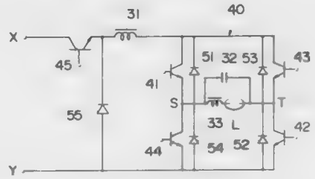
said first and second display cells being arrayed to construct said display unit such that their outer leads confront each other and align alternately, whereby said display screen apparatus being made up of a plurality of said display units in a matrix array.

4,734,624

DISCHARGE LAMP DRIVING CIRCUIT

Haruo Nagase, Yawata, and Kiyoaki Uchihashi, Moriguchi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 9, 1986, Ser. No. 883,803
Claims priority, application Japan, Jul. 25, 1985, 60-164388; Jul. 25, 1985, 60-164389
Int. Cl.[4] H05B *37/00, 39/04, 41/07*
U.S. Cl. 315—243 **5 Claims**



1. A discharge lamp driving circuit, comprising:

a DC voltage source;

a discharge lamp;

a current limiting inductor inserted in series between the voltage source and the lamp;

means connected to the DC voltage for operating the lamp at a low frequency AC voltage while repetitively interrupting, at a high frequency, the voltage component to be applied to the lamp, said means comprising a bridge inverter having at least one pair of switching elements controlled to alternately reverse the DC voltage at the low frequency so as to apply the resulting AC voltage to the lamp at the low frequency, and switching means for repetitively interrupting, at the high frequency, the voltage component to be applied to the lamp;

control means for providing an all-off period during which the switching elements of the bridge invertor are simultaneously off for a predetermined time interval at the polarity reversal of the AC voltage being applied to the lamp in order to prevent the power source from being short circuited through the circuit of the bridge invertor;

a bypass capacitor connected in parallel with the lamp for bypassing the high frequency component resulting from the high frequency interrupting operation of the switching means; and

an oscillation-including inductor connected in series with the lamp and in parallel relation with the bypass capacitor, said oscillation-inducing inductor forming, with said bypass capacitor, a series oscillating circuit which causes an alternating current to flow through the lamp during the all-off period.

4,734,625

CONTROL CIRCUIT FOR SYSTEM FOR CONTROLLING THE OPERATION OF ELECTRIC LIGHTS

Michael Geanous, and Richard G. Confer, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Oct. 18, 1984, Ser. No. 662,231
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—313 **4 Claims**

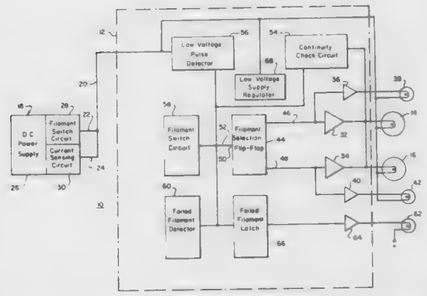
1. A circuit adapted to control the operation of first and second sources of visible light each producing a distinct pattern, said circuit comprising:

a first switch associated with said first light source and a second switch associated with said second light source,

each of said switches adapted to operate in first and second states, each of said switches applying energizing power received by it to said associated light source when in its first state and preventing the application of energizing power to said associated light source when in its second state, each of said switches defining an input adapted to receive control signals, each of said switches assuming its first state when a control signal of a first type is applied to said input and assuming its second state when-a control signal of a second type is applied to said input;

control signal generating means defining a first output which is operably associated with said first switch and a second output which is operably associated with said second switch, said control signal generating means for generating said control signals at said outputs for application to said switches, said control signal generating means being in a first state when a control signal of first type is available at said first output and a control signal of said second type is available at said second output, said control signal generating means being in a second state when a control signal of said first type is available at said second output and a control signal of said second type is available at said first output, said control signal generating means defining an input, said control signal generating means changing states each time a pulse signal is applied to said input thereof; and

means for applying said pulse signals to said input of said control signal generating means each time the level of said energizing power drops below a predetermined level for a predetermined period of time.

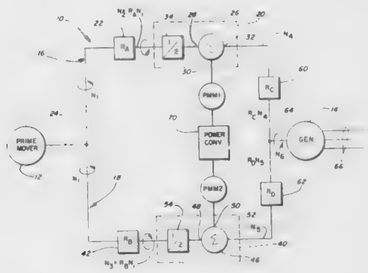


4,734,626

DOUBLE DIFFERENTIAL, ELECTRICALLY COMPENSATED CONSTANT SPEED DRIVE

Thomas Sutrina, Rockford, and Bryan W. Dishner, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1986, Ser. No. 945,869
Int. Cl.[4] H02P *1/16, 15/00*
U.S. Cl. 318—76 **13 Claims**



1. A constant speed drive for developing constant speed motive power from variable speed motive power developed by a prime mover, comprising:

first and second differentials each having first and second inputs and an output, the differential outputs being coupled together and producing the constant speed motive power, the first input of the first and second differentials being coupled through gear sets to the output of the prime mover whereby the first input of the first differential is driven at a speed greater than a desired output speed of the drive and the first input of the second differential is driven at a speed less than the desired output speed;

a first permanent magnet machine coupled to the second input of the first differential, the first permanent magnet machine being driven as a generator to develop alternating current power at power windings thereof;

a second permanent magnet machine having a motive power shaft coupled to the second input of the second differential, the second permanent magnet machine including electrical power windings; and

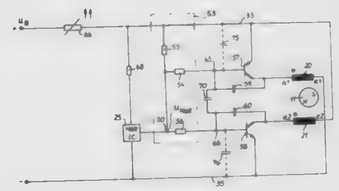
a power converter interconnecting the power windings of the first and second permanent magnet machines for operating the second permanent magnet machine as a motor to develop compensating speed of appropriate magnitude and direction to cause the output of the second differential to develop motive power at the desired speed.

4,734,627

BRUSHLESS D.C. MOTOR HAVING TWO CONDUCTORS PER PHASE ENERGIZED ALTERNATELY BY COMPLEMENTARY-CONDUCTIVITY-TYPE SEMICONDUCTORS CONTROLLED BY THE SAME ROTOR-POSITION SIGNAL, AT TIMES MODIFIED BY A COMPENSATING TECHNIQUE

Ernst M. Koerner, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,548
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1983, 3342986
Int. Cl.[4] H02K *29/08*
U.S. Cl. 318—254 **27 Claims**



1. A brushless d.c. motor having a permanent-magnet rotor and a wound stator, the stator being provided with a stator winding comprising first conductor and second conductor means which are to be energized in alternation to each other to establish, alternately, a stator flux of a respective first and a stator flux of a respective second polarity at the part of the stator associated with that stator-winding phase,

first and second power-supply lines connectable to a D.C. power source,

first and second semiconductor control means for each such stator-winding phase and being of opposite respective conductivity types and each having a respective main current path with two end terminals and a respective control input,

the main current path of the first semiconductor control means and the first conductor means of the respective stator-winding phase being connected together between the first and second power-supply lines such that the first semiconductor control means when conductive or ON carries current of the first conductor means,

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the main current path of the second semiconductor control means and the second conductor means of the respective stator-winding phase being connected together between the first and second power-supply lines such that the second semiconductor control means when conductive or ON carries current of the second conductor means,

rotor-position sensing means operative for producing at a single output a rotor-position signal that assumes a first value when the turning rotor reaches a predetermined first angular position and a second value when the turning rotor reaches a predetermined second angular position, one of said values being a relatively high value and the other being a relatively low value,

connecting means connecting said single output of said rotor-position senisng means to said first and second control inputs

such that, when the rotor-position signal changes from the low to the high value thereof, first and second control-input signals respectively present at said first and second control inputs both assume in response thereto predetermined relatively high values causing the first semiconductor control means to be rendered conductive or ON and the second non-conductive or OFF

and such that, when the rotor-position signal changes from the high to the low value thereof, the first and second control-input signals both assume in response thereto predetermined relatively low values causing the first semiconductor control means to be rendered non-conductive or OFF and the second conductive or ON,

and wherein, in the absence of compensating means recited below,

said first signal exhibits a tendency to reach said predetermined relatively high value thereof more quickly than does said second signal,

and likewise said second signal exhibits a tendency to reach said predetermined relatively low value thereof more quickly than does said first signal,

as a result of which each of the two semiconductor control means exhibits a tendency to be rendered conductive or ON more quickly than the other semiconductor control means is being rendered non-conductive or OFF,

and compensating means connected to the control inputs of said first and second semiconductor control means and

upon a change of said rotor-position signal from said low to said high value thereof, operative for slowing the rate at which said first signal reaches said predetermined relatively high value in dependence upon the speed at which the second signal reaches said predetermined relatively high value,

and upon a change of said rotor-position signal from said high to said low value thereof, operative for slowing the rate at which said second signal reaches said predetermined relatively low value in dependence upon the speed at which the first signal reaches said predetermined relatively low value,

whereby to counteract said tendency of each semiconductor control means to be rendered conductive or ON more quickly than the other semiconductor control means is being rendered non-conductive or OFF.

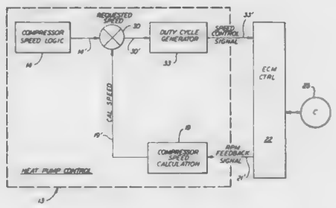
4,734,628

ELECTRICALLY COMMUTATED, VARIABLE SPEED COMPRESSOR CONTROL SYSTEM

Ronald W. Bench, Kirkville, and Robert W. Peitz, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 1, 1986, Ser. No. 936,423
Int. Cl.[4] H02P *5/16;* **F25D** *17/00*
U.S. Cl. 318—309 **6 Claims**

1. An electrically commutated motor (ECM) controller arrangement for controlling the operational speed of a variable speed motor compressor driven by an electrically commutated motor comprising an ECM controller for controlling the speed of the motor, said controller receiving back EMF signals from the electrically commutated motor and producing feedback signals representative of said back EMF, compressor speed logic means for generating a desired motor speed setpont signal, compressor speed calculation means for calculating actual compresor speed signals from said EMF feedback signals produced by said electrically commutated motor controller, error means for monitoring the error between said desired



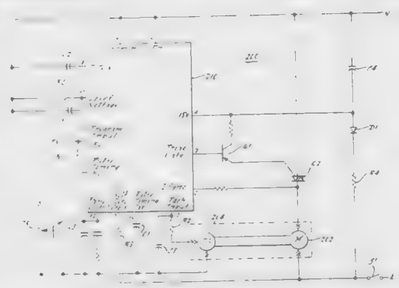
motor speed setpoint and said calculated actual compressor speed signal, said error means producing an error signal indicative of said error, and duty cycle generator means for producing a speed control signal representative of said error signal, said speed control signal being transmitted to the ECM controller for adjusting the speed of the electrically commutated motor driven compressor.

4,734,629

VARIABLE SPEED TRIGGER SWITCH

William R. Lessig, III, Hunt Valley; Dale K. Wheeler, Fallston; R. Roby Bailey, Jr., Forest Hill, all of Md., and Stephen W. Smith, Raleigh, N.C., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 764,340, Aug. 9, 1985, Pat. No. 4,649,245. This application Mar. 5, 1987, Ser. No. 22,372
Int. Cl.[4] H02P *5/06, 7/00*
U.S. Cl. 318—332 **4 Claims**



1. For a power tool having a motor and means for producing a feedback signal related to the actual speed of the motor, a variable speed trigger switch that is adapted to be connected to an AC power line and to the motor of the tool for controlling the application of power to the motor, comprising:

a housing defining a trigger aperture, a pair of stationary contacts one of which is electrically connected to the AC power line, a strip of electrical resistance material, a spring return trigger slidably mounted in said housing through said aperture and carrying a bridging contact adapted to electrically interconnect said stationary contacts as said trigger is retracted and a wiper contact adapted to contact along said strip of electrical resistance material as said trigger is retracted, and an electrical motor speed control circuit mounted on a printed circuit board located within said housing and including a semiconductor control device connected in series with said

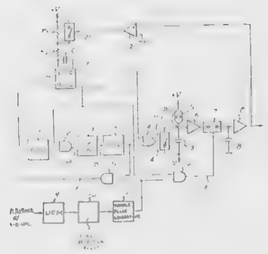
motor across the AC power line for controlling the application of power to the motor, and control circuit means for controlling the conduction angle of said semiconductor control device relative to the AC power line signal in accordance with the position of said trigger; said control circuit means including: (i) an integrated circuit adapted to provide conventional closed loop motor speed control and comprising a first input port adapted to receive a voltage signal related to the desired motor speed, a second input port connected to receive said feedback signal, error circuit means for comparing said voltage signal to said feedback signal and producing an error signal in accordance with said comparison, a first output port connected to the output of said error circuit means, and timing circuit means responsive to said error signal for producing a firing signal at a second output port in accordance with said error signal, (ii) a voltage supply circuit for providing a fixed voltage signal to said first input port of said integrated circuit corresponding to a predetermined motor speed, and (iii) clamping circuit means connected between said wiper contact and said first output port of said integrated circuit for limiting the voltage of said error signal to a value related to the voltage at said wiper contact, such that for voltage signals at said wiper contact below the value of said fixed voltage signal, said control circuit means functions as an open loop controller by providing a firing signal to said semiconductor control device in accordance with the value of the signal at said wiper contact and allowing the speed of the motor to vary in accordance with the load applied to the power tool, and for voltage signals at said wiper contact above the value of said fixed voltage signal, said control circuit means attempts to maintain said predetermined motor speed when the power tool is loaded by increasing the conduction angle of said semiconductor control device to a maximum conduction angle related to the value of the signal at said wiper contact.

4,734,630

METHOD AND APPARATUS FOR PHASE COMPARISON ADAPTED TO PRODUCE AN ERROR SIGNAL AGAINST AN INPUT SIGNAL HAVING A RELATIVELY WIDE RANGE OF PHASE AND FREQUENCY VARIATION

Takashi Okano, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 839,587, Mar. 14, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 22,514
Claims priority, application Japan, Mar. 16, 1985, 60-52855
Int. Cl.[4] H02P *7/00*
U.S. Cl. 318—608 **22 Claims**



1. A method of phase comparison, including a ramp-form signal generating step for generating a ramp-form signal, and sample and hold step for sampling levels of said ramp-form signal with a sampling pulse train signal which is synchronized with a predetermined input signal whose phase change is to be detected and providing a hold level of sampled signals as a phase error signal, wherein said ramp-form signal generating step comprises:

reference frequency signal generating step for generating a reference frequency signal of a predetermined frequency;

dividing step for dividing said reference frequency signal;

detection step for detecting a state in which each pulses of said sampling pulse train signal is generated at a time outside a period of a predetermined section of said ramp-form signal and producing a detection signal;

shift pulse generating step for generating a shift pulse signal having a predetermined pulse width in response to said detection signal; and,

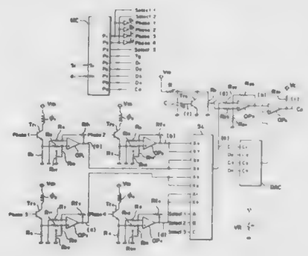
gating step for stopping the supply of said reference frequency signal for said dividing step upon presence of said shift pulse signal, and wherein said ramp-form signal is normally generated using an output pulse train signal of said dividing step.

4,734,631

STEP MOTOR CONTROL

Shigeo Kamikura, and Yasushi Ema, both of Kadaira, Japan, assignors to Silver Seiko Ltd., Japan

Filed Jul. 22, 1986, Ser. No. 887,956
Claims priority, application Japan, Jul. 25, 1985, 60-162810
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—685 **20 Claims**



1. A control system for controlling a stepping motor of the type including a rotor and a plurality of electromagnetic field winding adapted to be separately energized to control rotation of said rotor, comprising:

means for generating a signal representative of the back electromotive force induced by said rotor in an energized one of said field windings;

means for generating a reference signal corresponding to a desired angle of lead in driving said rotor of said motor;

means for detecting coincidence of said signal representative of the back electromotive force with said reference signal; and

driving means operable upon detection of the coincidence between said signal representative of the back electromotive force and said reference signal for starting selective energization and deenergization of said field windings for a subsequent stepping motion of said motor.

4,734,632

DRIVING DEVICE FOR A STEPPING MOTOR

Shigeo Kamikura, and Yasushi Ema, both of Kodaira, Japan, assignors to Silver Seiko Ltd., Japan

Filed Sep. 26, 1986, Ser. No. 912,057
Claims priority, application Japan, Oct. 17, 1985, 60-231791
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—685 **15 Claims**

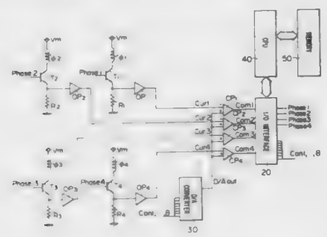
1. A driving device for a stepping motor, comprising:

detecting means for detecting a voltage corresponding to an electric current flowing through field windings of individual phases of said stepping motor;

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storing means in which saturation curves of electric currents flowing through said field windings of said phases are stored;

comparing means for comparing the voltage value detected by said detecting means with a value of the saturation curves stored in said storing means; and



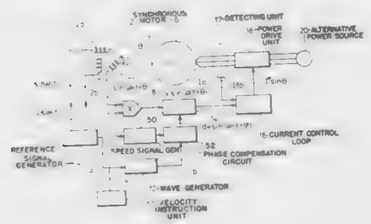
driving signal developing means for developing a driving signal for a subsequent next step when a difference between the voltage value and the value of the saturated curves at said comparing means reaches a predetermined value.

4,734,633

SPEED CONTROL APPARATUS FOR A SYNCHRONOUS MOTOR

Tadahiro Ono, and Naoshi Miura, both of Shizuoka, Japan, assignors to Toei Denki Kabushiki Kaisha and Toshiba Kikai Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,585
Claims priority, application Japan, Jun. 5, 1984, 59-115340
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—723 **10 Claims**



1. A speed control apparatus for a synchronous motor comprising:

means for designating a rotational speed of the motor;

means for producing an angular position signal with respect to an angular position of a revolving magnetic field corresponding to that of a rotor on the motor;

means for producing an armature current command signal in accordance with a speed instruction supplied from said speed designating means and said angular position signal supplied from said angular position signal producing means;

rotational speed signal producing means responsive to said angular position signal for producing a speed signal corresponding to the speed of said motor;

phase compensation means responsive to said speed signal for advancing a phase of said armature current command signal with respect to the angular position of said rotor of the motor; and

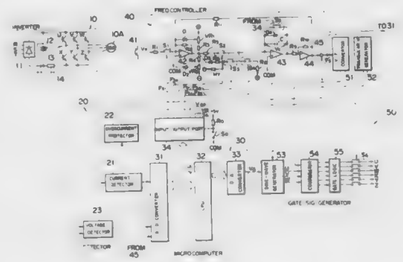
means for producing a desired armature current on armature windings of the motor including a current control loop circuit responsive to said phase-advanced armature current command signal for outputting said desired armature current.

4,734,634

METHOD AND SYSTEM FOR RECONNECTING INVERTER TO ROTATING MOTORS

Yasutami Kito, Haruhi, and Kuniake Yasukawa, Gifu, both of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Continuation of Ser. No. 719,465, Apr. 3, 1985. This application Nov. 28, 1986, Ser. No. 938,321
Claims priority, application Japan, Sep. 5, 1984, 59-186217; Sep. 21, 1984, 59-198065
Int. Cl.[4] H02P *3/18*
U.S. Cl. 318—778 **6 Claims**



1. A method of reconnecting to an inertially rotating motor an inverter disconnected from the motor during powered operation of the motor and inverter, comprising the steps of:

(a) detecting a power failure or a motor accident condition causing the inverter to be disconnected from the powered motor and resulting in inertial rotation of the motor at a reduced speed due to loss of power from the powering inverter therefrom;

(b) detecting inverter current;

(c) restarting the inverter at an increased frequency and reduced voltage level to provide to the rotating motor a restarting voltage having a frequency higher than a frequency corresponding to the speed of inertial rotation of the motor and a restarting voltage level lower than a rated voltage of the motor;

(d) generating a first command signal F_{S1} for restarting said inverter frequency, generating a second command signal F_{S2} for decreasing inverter frequency after passage of a predetermined time period from generation of said first command signal F_{S1}, generating a third command signal F_{S3} for maintaining inverter frequency when detected inverter current drops below a predetermined current value, generating a fourth command signal F_{S4} for increasing inverter frequency when a ratio of inverter voltage level to inverter frequency reaches a predetermined value, generating a fifth command signal F_{S5} for controlling inverter frequency when inverter frequency and voltage level both attain predetermined values therefor at the predetermined ratio thereof;

(e) generating a first voltage command signal V_{S1} for generation of an inverter voltage level by said inverter after passage of a second predetermined time period from generation of said first command signal F_{S1}, generating a second voltage command signal V_{S2} for controlling said inverter voltage level after passage of a third predetermined time period from generation of said first voltage command signal V_{S1}, generating a third voltage command signal V_{S3} for increasing inverter voltage level when the detected inverter current drops below said predetermined current value, generating a fourth voltage command signal V_{S4} for increasing said inverter voltage level when the ratio of inverter voltage level to inverter frequency reaches said predetermined value thereof, and generating a fifth inverter voltage command V_{S5} for controlling inverter voltage level when inverter frequency and voltage level both attain said predetermined values therefor at the predetermined ratio thereof;

(f) outputting a first voltage representative of a first inverter frequency starting signal for restarting the inverter at a predetermined starting frequency in response to the first frequency command signal F_{S1}, outputting a second voltage representative of a second inverter frequency decreasing signal for gradually decreasing the frequency of the restarted inverter in response to the second frequency command signal F_{S2}, outputting a third voltage representative of a third inverter frequency maintaining signal for maintaining the decreasing inverter frequency at a constant value in response to the third frequency command signal F_{S3}, outputting a fourth voltage representative of a fourth inverter frequency increasing signal for increasing the maintained frequency in response to the fourth frequency command signal F_{S4}, and outputting a fifth voltage representative of a fifth inverter frequency controlling signal for steadily controlling inverter frequency in response to the fifth frequency command signal F_{S5}; and

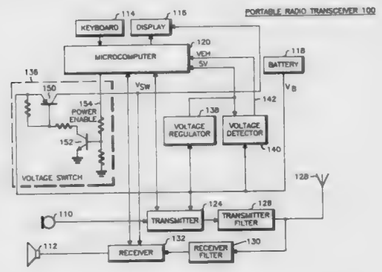
(g) sequentially generating pulse-width-modulated inverter gate signals to activate the inverter in response to the first, second, third, fourth and fifth voltages representative of inverter frequencies and to the first, second, third, fourth and fifth inverter voltage command signals.

4,734,635

MICROPROCESSOR CONTROLLED BATTERY RECONDITIONER FOR PORTABLE RADIO TRANSCEIVERS

David J. Theobald, Algonquin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1986, Ser. No. 911,692
Int. Cl.[4] H02J *7/00;* **H01M** *10/46*
U.S. Cl. 320—13 **9 Claims**



1. A portable radio, comprising in combination:

a rechargeable battery producing a predetermined nominal voltage and having a predetermined minimum voltage when deep discharged;

a keyboard having a plurality of actuable keys;

a radio receiver;

a radio transmitter; and

battery reconditioning circuitry comprising:

detecting means coupled to the battery for sensing the magnitude of the battery voltage;

switching means for applying the battery voltage to at least a portion of one of the radio receiver and radio transmitter in response to an enable signal;

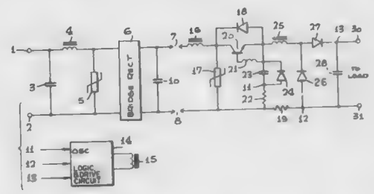
control means coupled to said detecting means, switching means and keyboard for producing the enable signal in response to actuation of a pre-selected sequence of keys, said control means comparing the sensed magnitude of the battery voltage to a predetermined minimum voltage magnitude and disabling said switching means when the sensed magnitude of the battery voltage is substantially the same as the predetermined minimum voltage magnitude, whereby the battery is deep discharged to the predetermined minimum voltage.

4,734,636

RESONANT SWITCHING REGULATOR

Carlile R. Stevens, 468 El Rio Rd., Danville, Calif. 94526

Filed Sep. 23, 1985, Ser. No. 779,133
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—235 **7 Claims**



1. A regulated DC power supply comprising a source of DC voltage having a common terminal;

an on and off switching element having two sides;

a first inductor which is connected to said source of DC voltage and one side of said on and off switching element;

a first capacitor connected to the other side of said on and off switching element and to said common terminal such as to place said first inductor, said on and off switching element and said capacitor in series across said source of DC voltage;

a first diode connected in parallel with said on and off switching elements, polarized to conduct only in the opposite direction as said on and off switching element conducts current;

a current sensing element further connected in series with said first inductor, said on and off switching element, said first capacitor, and said source of DC voltage;

a second inductor, a second diode, and a second capacitor connected in series with each other, the combined series combination connected in parallel across said first capacitor, said second capacitor to perform as an output filter capacitor whereby a load may be directly connected thereacross;

an oscillator, logic, and drive circuit connected to turn on and off said on and off switching element, said oscillator, logic and drive circuit, to accept output from said current sensing element to turn off said on and off switching element only during that part of the cycle of operation when no current is passing through said on and off switching element, and to turn on said on and off switching element only when current is no longer flowing out of said first capacitor through said second inductor as sensed by said current sensing element;

a feedback path operably connected to said second capacitor and said oscillator, logic and drive circuit to cause the on and off switching element to turn on only when the voltage across said output filter capacitor drops below a predetermined level.

4,734,637

APPARATUS FOR MEASURING THE LENGTH OF AN ELECTRICAL LINE

Jiann-Neng Chen, Newton, and Stephen A. Cohen, Andover, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed Apr. 16, 1986, Ser. No. 852,842
Int. Cl.[4] G01R *31/02, 31/11*
U.S. Cl. 324—58 R **28 Claims**

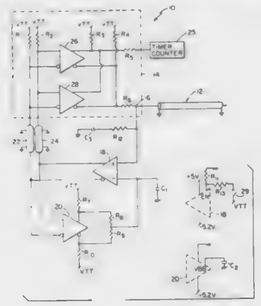
1. Apparatus for precisely and quickly measuring the length

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of a line under test to an electrical discontinuity of said line, said apparatus comprising

an edge generator for providing an edge to one end of said line,

a reflection detector for detecting the edge reflection return-



ing from said discontinuity to said one end and triggering said edge generator to provide an edge at a fixed time after detecting said edge reflection so as to cause said edge generator to repeatedly provide said edges at a frequency related to the propagation delay in said length of line, and

a frequency measurer connected to measure said frequency.

4,734,638

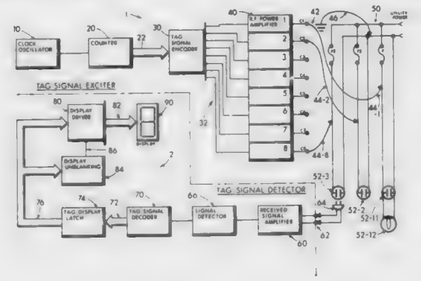
ELECTRIC OUTLET AND CABLE TRACING METHOD AND APPARATUS

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed May 28, 1986, Ser. No. 867,448

Int. Cl.[4] G01R *19/00*

U.S. Cl. 324—66 **20 Claims**



1. Circuit tracer method effective for identifying each of several substantially separate circuits, comprising the steps of:

a. providing a source effective for developing a plurality of uniquely coded tag signals each comprising a high frequency signal effectively modulated with a distinctive substantially lower frequency pulse train signal;

b. exciting each of said several circuits with a substantially separate uniquely coded tag signal;

c. sensing the tag signal on at least one of possibly several terminal locations on each said circuit;

d. indicating which uniquely coded tag signal is being sensed; and,

e. utilizing the indicated tag signal for circuit identification.

4,734,639

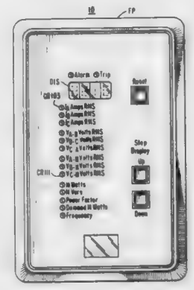
MASTER METERING MODULE WITH VOLTAGE SELECTOR

Gary F. Saletta; Daniel P. Orange, both of Penn Township, Westmoreland County; Joseph C. Engel, Monroeville Boro, all of Pa.; Denis A. Mueller, Asheville, N.C., and Robert T. Elms, Monroeville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1986, Ser. No. 868,834

Int. Cl.[4] G01R *19/00*

U.S. Cl. 324—107 **6 Claims**



1. Circuit apparatus of the kind which produces an output signal which is related to the difference between a first line voltage and either a second line voltage or neutral when present, comprising:

terminal means for receiving said first line voltage, said second line voltage and said neutral when present;

microprocessor controlled switch means having an output terminal and first and second switch means input terminals, said first switch means input terminal being connected to said second line voltage at said terminal means and said second switch means input terminal being connected to said neutral when present at said terminal means, said microprocessor controlled switch means also having a control terminal which is utilized to connect said first and said second switch means input terminal to said output terminal of said switch means;

differential means having an output terminal and having a pair of input terminals for being interconnected at one of said pair of input terminals to said first line voltage at said terminal means and for being interconnected at the other of said pair of input terminals to said input terminal of said microprocessor controlled switch means; and

first programmable means for being actuated to indicate if a neutral is present;

second programmable means for being actuated to indicate if line-to-line voltage is desired;

microprocessor means connected to said control terminal of said switch means, said first programmable means and said second programmable means for being conditioned to provide a control signal to said microprocessor controlled switch means for interconnecting said first switch means input terminal to said output terminal thereof when said first programmable means indicates a neutral is not present or when said first programmable means indicates a neutral is present and said second programmable means indicates line-to-line voltage is desired or for interconnecting said second switch means input terminal to said output terminal when said first programmable means indicates a neutral is present and said second programmable means indicates line-to-line voltage is not desired, so that the output terminal of said differential means provides an output signal which is related to the difference between said first line voltage and said second line voltage or the difference between said first line voltage and neutral when present depending upon the condition of said microprocessor means.

4,734,640

WELDING CURRENT MEASURING APPARATUS

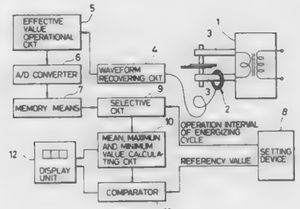
Reiji Kitahori, and Masato Furudate, both of Kanagawa, Japan, assignors to Dengensha Manufacturing Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1986, Ser. No. 839,382

Claims priority, application Japan, Mar. 20, 1985, 60-56457

Int. Cl.[4] G01R *19/165*

U.S. Cl. 324—127 **4 Claims**



1. A welding current measuring apparatus for a resistance welding machine, comprising:

a current detector for detecting welding current flowing through said resistance welding machine;

memory means for successively storing and holding the current values detected; and

means for specifying a desired energizing cycle interval for computing and displaying the currents after completion of welding;

said energizing cycle interval being specified after completion of welding so that the value of a current flowing in said specified interval may be displayed.

4,734,641

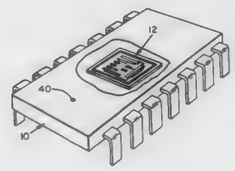
METHOD FOR THE THERMAL CHARACTERIZATION OF SEMICONDUCTOR PACKAGING SYSTEMS

Dee H. Byrd, Jr., Hillsboro, and Michael H. Williams, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 9, 1987, Ser. No. 23,595

Int. Cl.[4] G01N *25/18*

U.S. Cl. 324—158 R **21 Claims**



1. A method for measuring the thermal characteristics of a packaging system for semiconductors comprising:

providing a resistor comprising a substrate having a layer of platinum deposited thereon;

mounting said resistor within a package designed for the containment of a semiconductor device;

thermally calibrating said resistor within said package to obtain a mathematical correlation between temperature and resistance for said resistor;

connecting said resistor to a test circuit having a voltage source therein;

determining the voltage across said resistor and the resistance thereof during the operation of said circuit;

using said mathematical correlation to obtain a temperature value corresponding to said resistance of said resistor during the operation of said circuit, said temperature value representing the temperature at the surface of said resistor during its operation;

selecting a reference point on the outside of said package;

measuring the temperature at said reference point during the operation of said circuit; and

calculating the temperature gradient between the surface of said resistor and said reference point.

4,734,642

DEVICE FOR USE IN EDDY CURRENT TESTING FOR TRANSMISSION OF SIGNALS BETWEEN A SIGNAL PROCESSING DEVICE AND A SIGNAL SOURCE

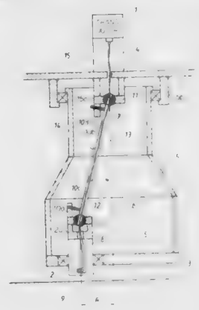
Bengt H. Törnblom, Västerås, Sweden, assignor to Tornbloms Kvalitetskontroll AB, Sweden

Filed Jan. 6, 1986, Ser. No. 816,270

Claims priority, application Sweden, Jan. 8, 1985, 8500065

Int. Cl.[4] G01N *27/90;* **H01R** *35/00*

U.S. Cl. 324—226 **10 Claims**



1. A device for transmission of signals between a signal processing device and a signal source mounted in a housing being movable relative to a test object, comprising a non-rotating base member, a holder having an end face adapted to be positioned adjacent a surface of the test object for rotatably supporting the signal source, a support member extending from said non-rotating base member, and including a first bearing for rotatably supporting the holder about a rotation axis intersecting said test object, a second bearing in the end face of the holder by which the signal source housing is eccentrically journalled to the holder, a connecting link in the form of a tube interconnecting the non-rotating base member and the signal source housing, a first coupling mechanically connecting the connecting link to the non-rotating base member adjacent to the rotation axis of the holder, a second coupling mechanically connecting the connecting link to the signal source housing, and signal conducting means within the connecting link extending between the signal processing device and the signal source through the first and second couplings, said first and second couplings being flexible couplings permitting the connecting link to rotate relative to the non-rotating base member, and rotation limiting means for substantially preventing the signal source to rotate more than 360 degrees relative to the non-rotating base member and including projections extending outwardly from the tube and engaging respective projections extending from said signal source and said non-rotating base member adjacent to the first and second couplings, said connecting link tube being adapted to allow liquid coolant to be transported to the signal source.

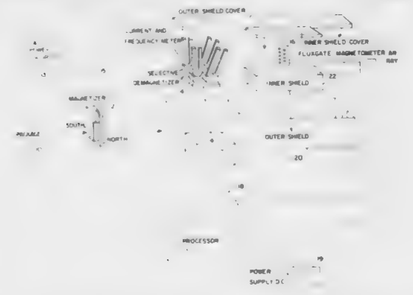
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4,734,643

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF MAGNETIC INK WITHIN A PACKAGE BY MAGNETIZING AND SELECTIVELY REMAGNITIZING THE FERRO-MAGNETIC MATERIALS IN THE PACKAGE

David M. Bubenik; Gerald August, both of Palo Alto; Richard K. Niles, Berkeley, all of Calif., and James M. Pippin, Fort Worth, Tex., assignors to ElectroCom Automation, Inc., Arlington, Tex.

Filed Aug. 5, 1985, Ser. No. 762,711
Int. Cl.[4] G01N *27/72;* **G01R** *33/12;* **B07C** *5/344;* **G06K** *7/08*
U.S. Cl. 324—232 **8 Claims**



1. An apparatus for detecting the presence of magnetic ink within a package, comprising:

magnetizing means that produces a magnetic field passing through the package such that enclosed ferro-magnetic materials are magnetized and selectively remagnetized to generate resultant magnetic moment vectors that are a function of the field as well as the magnetic characteristics of the enclosed materials, said magnetizing means further comprising

a first magnetic field that magnetizes the ferro-magnetic materials within the package such that their magnetic moment vectors are aligned in a first direction that is normal to a plane that is anticipated to contain magnetic ink; and

a second magnetic field that remagnetizes by reducing and aligning, in a second or more directions, the magnetic moment vectors of magnetically soft ferro-magnetic materials, where at least one such second direction of alignment is chosen to lie within a plane anticipated to contain magnetic ink;

a detector that generates signals responsive to the magnetic moment vectors within the package; and

a processor that receives the signals, compares at least one characteristic of the signals to at least one standard, and determines whether magnetic ink is present within the package.

4,734,644

FLUX CANCELLING YOKE TYPE MAGNETIC TRANSDUCER HEAD

Shigeyoshi Imakoshi; Hideo Suyama; Yutaka Soda, and Munekatsu Fukuyama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1986, Ser. No. 841,259
Claims priority, application Japan, Mar. 20, 1985, 60-56322
Int. Cl.[4] G01R *33/02;* **H01L** *43/00;* **G01B** *5/33, 5/127*
U.S. Cl. 324—252 **4 Claims**

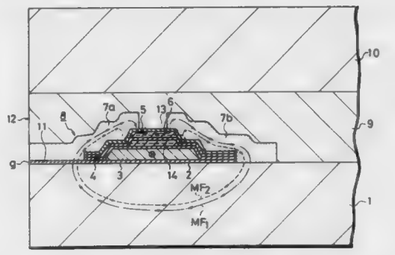
1. A yoke type magnetic transducer head utilizing a magnetoresistance effect comprising:

a lower soft magnetic core and an upper soft magnetic core forming an operating gap at one end thereof facing a traveling magnetic recording medium,

said upper soft magnetic layer having a cut away portion therein dividing a front core portion and a rear core portion,

a magnetoresistance sensing portion provided to said cut away portion to magnetically bridge said front core portion and said rear core portion thus forming a closed magnetic path of said lower soft magnetic core, said operating gap, said front core portion, said magnetoresistance sensing portion and said rear core portion,

a first bias magnetic field means generated by applying current at least through said magnetoresistance sensing portion, passing magnetic flux generated by said first bias



magnetic field means along one direction in said magnetoresistance sensing portion and said upper and lower magnetic core portions,

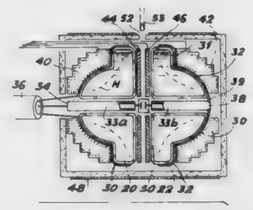
and a second bias magnetic field means generated by a hard magnetic layer provided adjacent to said magnetoresistance sensing portion, passing magnetic flux along said one direction in said magnetoresistance sensing portion and along another direction in said upper and lower magnetic core portions to at least partially cancel said magnetic flux generated by said first magnetic field means in said upper and lower core portions.

4,734,645

NMR MAGNETOMETER PROBE WITH A TUNEABLE CAVITY IN ITS CENTER AND A DOUBLE CENTRAL CYLINDRICAL MEMBER

Henri Glenart, Corenc; Nelly Kernevez, Grenoble, and Claude Sonrel, Brie et Angonnes, all of France, assignors to Commissariat a l'energie Atomique, Paris, France

Filed Jun. 12, 1986, Ser. No. 873,720
Claims priority, application France, Jun. 21, 1985, 85 09488
Int. Cl.[4] G01R *33/00*
U.S. Cl. 324—301 **5 Claims**



1. A spin coupling nuclear magnetic resonance magnetometer probe without forbidden axis, said probe comprising:

at least two liquid samples contained in at least two bottles, said bottles being placed in a very high frequency resonant cavity, which is constituted by a central conductor and an outer conductive wall, said central conductor comprising a first section having a first end adapted to be connected to a central conductor of coaxial cable and a second end, and

a second section having a first end and a second end connected to the outer conductive wall by a short circuit, at least one regulatable capacitor connected between said second end of said first section and said first end of said second section, said regulatable capacitor permitting the regulation of the resonant frequency of the cavity, the probe also comprising at least two windings for sampling and reinjecting a signal at the Larmor frequency defined by the magnetic field in which the probe is located and by the gyromagnetic ratio of the samples used, said two windings surrounding at least part of the samples,

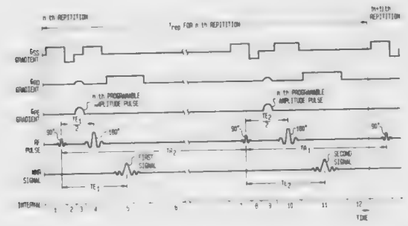
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4,734,646

METHOD FOR OBTAINING T1-WEIGHTED AND T2-WEIGHTED NMR IMAGES FOR A PLURALITY OF SELECTED PLANES IN THE COURSE OF A SINGLE SCAN

Rajendra K. Shenoy, Commack; Robert B. Wolf, Medford; Terry Morrone, Greenlawn, and Raymond V. Damadian, Woodbury, all of N.Y., assignors to Fonar Corporation, Melville, N.Y.

Filed Sep. 16, 1986, Ser. No. 907,895
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **32 Claims**



1. A method for obtaining T1-weighted and T2-weighted NMR image data for a plurality of selected planes in an object in the course of a single scan using nuclear magnetic resonance techniques, said method comprising:

a. positioning an object in a static homogeneous magnetic field;

b. obtaining NMR imaging data for a T1-weighted image and a T2-weighted image in a first selected plane of said object by subjecting said object to a plurality of repetitions of a repetition sequence composed of NMR excitation and magnetic field gradient pulses, each repetition sequence including (i) applying a first excitation pulse and reading out a first NMR signal produced by said first excitation pulse at a time TE_1 after said first excitation pulse, and (ii) applying a second excitation pulse and reading out a second NMR signal produced by said second excitation pulse at a time TE_2 after said second excitation pulse, said first and second excitation pulses each being applied in a manner so as to only excite selected nuclei in said first selected plane of said object, said first excitation pulse being applied during said repetition sequence after a recovery time interval TR_1 from a preceding excitation pulse and said second excitation pulse being applied during said repetition sequence after a recovery time interval TR_2 from a preceding excitation pulse, said repetition sequence being repeated at a repetition time interval T_{rep} which is equal to the sum of said TR_1 and TR_2 intervals, and said plurality of repetitions of said repetition sequence being carried out in a manner to encode spatial information into a collection of said first and second NMR signals to obtain said NMR image data for a T1-weighted image and a T2-weighted image for said first selected plane, said TE_1 and TR_1 being selected so that said collection of said first NMR signals is representative of T1-weighted imaging data, and said TE_2 and TR_2 being selected so that said collection of said second NMR signals is representative of T2-weighted imaging data; and

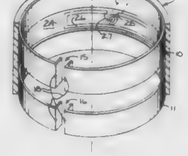
c. carrying out step (b) set forth above for at least one additional selected plane of said object to obtain NMR imaging data for T1-weighted and T2-weighted images for said at least one additional selected plane, said repetition time interval T_{rep} at which said repetition sequence is repeated for said at least one additional selected plane being substantially the same as said repetition time interval T_{rep} at which said repetition sequence is repeated for said first selected plane, each of said first and second excitation pulses for each repetition of said repetition sequence for said at least one additional selected plane being applied in a manner so as to only excite selected nuclei in said at least one additional selected plane, and each step (i) for each repetition of said repetition sequence for said at least one additional selected plane being carried out during the corresponding repetition of said repetition sequence for said first selected plane at a different portion of said repetition time interval T_{rep} for said first selected plane than said step (i) for said first selected plane, and each step (ii) for each repetition of said repetition sequence for said at least one additional selected plane being carried out during the corresponding repetition of said repetition sequence for said first selected plane at a different portion of said repetition time interval T_{rep} for said first selected plane than said step (ii) for said first selected plane.

4,734,647

NMR LOCAL COIL WITH FOIL COUPLING LOOP

Lou M. Yoshimura, Milwaukee, Wis., assignor to Medical Advances, Inc., Wauwatosa, Wis.

Filed Mar. 16, 1987, Ser. No. 26,294
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **9 Claims**



1. In a local coil for use in NMR imaging which includes a pair of loop-gap resonators that are positioned adjacent to each other along a common axis and the loops thereof are mounted in spaced relationship on a common cylindrical base that encircles the common axis, the improvement therein comprising:

a head connector mounted to the base and having a pair of terminals which connect to leads in a transmission line; and

a conductive path supported by the base and having two ends which electrically connect to the respective terminals on the head connector, the conductive path extending in a closed path that is substantially coplanar with the loops of the pair of loop-gap resonators and which encircles a portion of the space between the loops of the pair of loop-gap resonators.

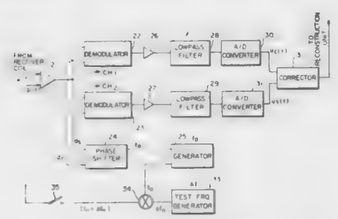
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4,734,648

QUADRATURE DETECTION CIRCUIT FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

Yoshio Machida, Tochigi, and Masahiko Hatanaka, Otawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1987, Ser. No. 31,803
Claims priority, application Japan, Mar. 31, 1986, 60-70788
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **12 Claims**



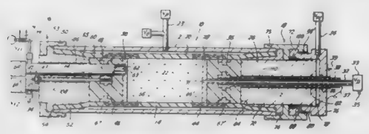
1. A quadrature detection circuit for nuclear magnetic resonance apparatus, comprising:
(a) means for generating first and second reference signals having a phase shift relative to one another, and having a common frequency f_o;
(b) a test signal generator for generating a test signal having a frequency Δf_o which is slightly different from that of said first and second reference signals;
(c) first and second demodulating means for demodulating the test signal with said first and second reference signals respectively to respectively produce first and second demodulated signals;
(d) amplitude detecting means for detecting first and second amplitudes of said first and second demodulated signals to obtain an amplitude difference therebetween;
(e) phase error detecting means for detecting the period of at least one of said first and second demodulated signals and phase difference between said first and second demodulated signals to obtain a phase error; and,
(f) compensating means for compensating an NMR signal demodulated by said demodulating means with said first and second reference signals for said phase error and amplitude difference.

4,734,649

APPARATUS FOR MEASURING THE RESISTIVITY OF A SAMPLE

Harold T. Barnaby, Duncanville, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 10, 1986, Ser. No. 837,811
Int. Cl.[4] G01N *27/04*; G01R *27/08*
U.S. Cl. 324—376 **13 Claims**



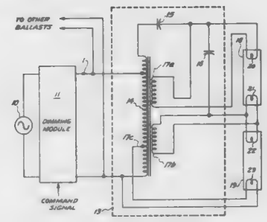
1. An apparatus for measuring the resistivity of a sample having opposite end faces, comprising:
a barrel having an inner wall surface;
a flexible sleeve mounted within said barrel, said flexible sleeve having inner and outer wall surfaces, said flexible sleeve defining an annular chamber between the inner wall surface of said barrel and the outer surface of said flexible sleeve;
upstream and downstream end-cap assembly means for sealing said flexible sleeve against said barrel;
a first and a second current electrode for electrically contacting the opposite end faces of said sample received by said flexible sleeve;
a first and a second voltage collector, insulated from said first and second current electrode, mounted outboard of and concentric with said first and second current electrode;
a first and a second voltage electrode embedded in said flexible sleeve, in spaced-apart relationship, said first and second voltage electrode having laterally spaced-apart contacts arranged flush with the inner wall surface of said flexible sleeve, the spaced apart contacts of each said voltage electrode straddling said first and second current electrode, encircling and contacting the received sample and said first and second voltage collector for electrically coupling said sample with said first and second voltage collector, respectively; and
means for axially and laterally loading said received sample.

4,734,650

ADJUSTING FEEDBACK GAIN IN A FLUORESCENT LAMP DIMMING CONTROL

Robert P. Alley, Clifton Park; William H. Bicknell, Ballston Lake, and Kevin C. Routh, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,143
Int. Cl.[4] G05F *1/10*
U.S. Cl. 324—414 **15 Claims**



1. A method for estimating full load current for a fluorescent lighting system employing a plurality of fluorescent lamps, comprising the steps of:
(1) turning on full power to said fluorescent lighting system; and
(2) measuring the current flowing to said fluorescent lighting system after initial transients decay and before the lamps of said lighting system begin conducting.

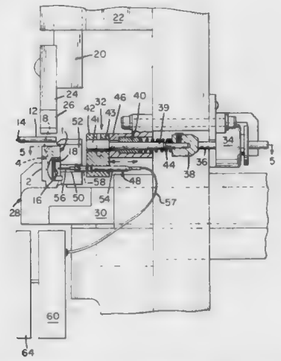
4,734,651

ELECTRICAL CONTINUITY AND SHORT CIRCUIT TESTING

Joseph R. Keller, Harrisburg, and Michael D. Strong, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 30, 1986, Ser. No. 880,268
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] G01R *31/04*
U.S. Cl. 324—538 **9 Claims**

1. Apparatus for testing for electrical continuity between electrical terminals of a multicontact electrical connector and electrically conductive cores of electrical leads which have been connected to the terminals and for testing for short circuiting therebetween, the apparatus comprising:
a frame;
a connector support on the frame;
a plurality of test probes on the frame;
means for simultaneously electrically connecting the test probes, each to a respective terminal of the connector when it is supported by the connector support;
an electrical continuity test circuit means connectible to each test probe, for producing a continuity success signal where electrical continuity exists between a terminal connected to the test probe by said connecting means and the electrically conductive core of a lead connected to the terminal;
a multiplexer for connecting said test circuit means to each test probe in turn when the test probes have been connected to said terminals by said connecting means, to enable said test circuit means to carry out a continuity test program;
a source of short circuit test electrical potential;
switch means connected to said source and to each of the test probes, for simultaneously transmitting said potential to selected first ones of said test probes, upon completion of said continuity test program; and



short circuit detecting means responsive to the presence of said test potential on second ones of said test probes, to indicate the presence of a short circuit, wherein said continuity test circuit means comprises an oscillatory circuit, a bridge circuit, a signal comparator responsive to unbalanced inputs from the bridge circuit, and means for emitting said continuity success signal, the oscillatory circuit having an outlet connected to inlets of the bridge circuit and therby to said multiplexer, outlets of the bridge circuit being connected to respective inlets of the signal comparator an outlet of which is connected to said emitting means; an arm of the bridge circuit being grounded through an electrically controlled voltage sensitive variable capacitor connected to a source of control potential for causing said capacitor to balance said bridge circuit prior to the connection of the continuity test circuit means to each test probe.

4,734,652

METHOD AND APPARATUS FOR WIDEBAND FREQUENCY DISCRIMINATION

Jose Meza, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Aug. 18, 1986, Ser. No. 898,147
Int. Cl.[4] H03K *5/00*; H03L *7/00*
U.S. Cl. 328—140 **16 Claims**

1. A wideband frequency discriminator, comprising:
a first power divider for dividing an input signal into first, second and third output signals;
means connected to the first power divider for receiving the first output signal and generating a time-delayed version thereof and for receiving the second output signal and generating a time-delayed version thereof;
a second power divider connected to said means for receiving and to the first power divider for receiving the time-delayed versions of the first and second output signals and for receiving the third output and in response thereto generating a vector sum output of these signals; and



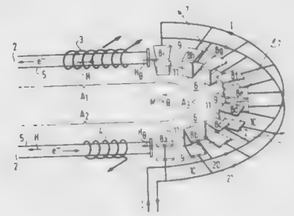
means connected to the second power divider for processing the vector sum output to generate a frequency-discriminated signal.

4,734,653

MAGNETIC FIELD APPARATUS FOR A PARTICLE ACCELERATOR HAVING A SUPPLEMENTAL WINDING WITH A HOLLOW GROOVE STRUCTURE

Andreas Jahnke, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,111
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506562
Int. Cl.[4] H01J *23/10*
U.S. Cl. 328—233 **8 Claims**



1. A magnetic field apparatus for an electrically charged particle accelerator having a particle track, the particle track including at least one curved section having a plurality of magnetic-field-generating windings, and wherein at least one supplemental winding for focusing the electrically charged particles is provided, the supplemental winding comprising means for generating an azimuthal guding field for the particles during acceleration of the particles in a region of the at least one curved section of the particle track, said supplemental winding comprising a curved electrical conductor arrangement which has a curvature adapted to the curvature of the curved section of the particle track and which partly encloses the particle track, said electrical conductor arrangement having a curved hollow groove structure which is slotted on the outside thereby allowing emission of synchrotron radiation laterally outwardly, and further including means for suppressing eddy currents, said conductor arrangement carrying a current transverse to the particle track.

4,734,654

LINEAR CMOS TRANSCONDUCTANCE ELEMENT

Francisco J. Fernandez, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 19, 1986, Ser. No. 898,444
Int. Cl.[4] H03F *3/16, 3/45*
U.S. Cl. 330—277 **25 Claims**

1. A linear voltage to current transducer, comprising:
a first composite transistor including a first n-type field effect transistor having gate, drain and source terminals, and a first p-type field effect transistor having gate, drain and source terminals, and having the source terminal of said

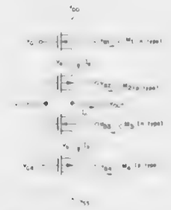
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first n-type transistor connected to the source terminal of said first p-type transistor;

a second composite transistor including a second n-type field effect transistor having gate, drain and source terminals, and a second p-type field effect transistor having gate, drain and source terminals, and having the source terminal of said second n-type transistor connected to the source terminal of said second p-type transistor;

said second n-type transistor being matched to said first n-type transistor and said second p-type transistor being matched to said first p-type transistor;

at least one signal input means connected to at least one of the gate terminals of at least one of said composite transistors for controlling the current through said composite transistors;



variable biasing means connected to at least one of the gate terminals of at least one of said composite transistors for biasing all of said n-type and p-type transistors in constant saturation and for adjusting the transconductance; and

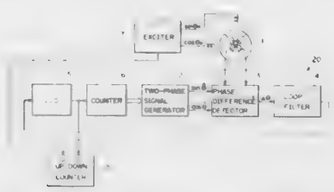
current differencing means connected between said first composite transistor and said second composite transistor for generating a current output in proportion to the difference between the currents flowing through said first and second composite transistors in linear response to large-signal voltages applied to said at least one signal input means.

4,734,655

DIGITAL ROTATION DETECTING APPARATUS

Jyoji Kawai, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1986, Ser. No. 903,296
Claims priority, application Japan, Oct. 4, 1985, 60-222256
Int. Cl.[4] H03L *7/06;* **H02P** *5/00*
U.S. Cl. 331—25 **6 Claims**



6. A digital rotation detecting apparatus which excites a two-phase resolver by an exciter to control the frequency of said exciter so as to synchronize phases of output of said two-phase resolver and output of a two-phase reference oscillator, thereby detecting a rotation angle of said two-phase resolver, comprising:

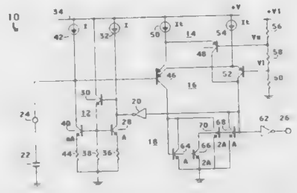
a counting means which makes one of a frequency relating to the frequency of the output of said two-phase reference oscillator and a frequency relating to the frequency of the output of said exciter an object of up count, and makes the other an object of down count, thereby detecting the rotation angle of said two-phase resolver.

4,734,656

MERGED INTEGRATED OSCILLATOR CIRCUIT

Ira Miller, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 2, 1987, Ser. No. 2
Int. Cl.[4] H03B *5/24*
U.S. Cl. 331—111 **7 Claims**



1. An oscillator for producing oscillatory output signals, comprising:

a current mirror circuit having an input and an output which is enabled and disabled accordingly in response to a control signal applied thereto for sinking first and second currents at said input and output respectively when enabled, said second current being greater than said first current;

constant current source means for providing first and second substantially equal currents at first and second outputs, said first and second outputs being coupled to said input and output respectively of said current mirror circuit;

charge storage means coupled to said output of said current mirror circuit, said charge storage means being charged and discharged between first and second voltage levels at substantially equal rates as said current mirror circuit is alternately disabled and enabled;

threshold voltage producing means for establishing a lower and an upper threshold voltage at first and second outputs;

merged comparing means having first, second and third inputs and first and second outputs, said first and second inputs being coupled respectively to said first and second outputs of said threshold voltage producing means, said third input being coupled to said output of said current mirror circuit, said comparing means being switched between first and second output level states in response to said charge storage means being charged and discharged between said first and second voltage levels; and

latch load means coupled to said first and second outputs of said comparing means and being responsive to said comparing means for providing said control signal.

4,734,657

RF MODEM WITH OSCILLATOR SWITCHING CIRCUIT

Gerald L. Somer, Sebastopol, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

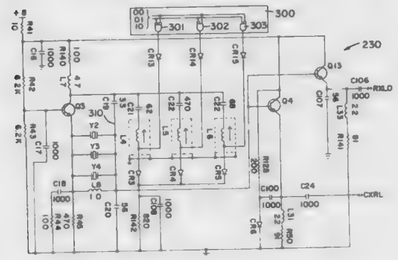
Filed Nov. 17, 1986, Ser. No. 931,765
Int. Cl.[4] H03B *5/32*
U.S. Cl. 331—116 R **21 Claims**

1. A channel switching oscillator for generating a radio frequency carrier signal, comprising:

means for generating a time varying periodic signal;

a plurality of nonswitchable frequency determining means for establishing the frequency of the periodic signal;

a plurality of tank circuits individually switchable into the oscillator, each of said tank circuits resonant with a frequency determming means; and



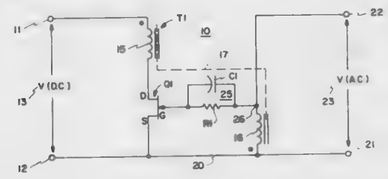
means for switching each of the tank circuits into the oscillator, whereby the tank circuit switched into the oscillator resonates with a frequency determining means.

4,734,658

LOW VOLTAGE DRIVEN OSCILLATOR CIRCUIT

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 14, 1987, Ser. No. 85,506
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—117 R **5 Claims**



1. A low voltage driven oscillator circuit, including: transformer means having a first winding and a second winding with said windings magnetically coupled; solid state current control means having current conducting path means and further including current control electrode means; said current conducting path means and said first winding connected in a series circuit and said series circuit adapted to be connected to a source of low voltage, direct current potential; high impedance circuit means including connection means connecting said current control electrode to a first end of said second winding and to a first output conductor for said oscillator circuit; and common connection means connecting a second output conductor for said oscillator circuit to a second end of said second winding which in turn is connected to said solid state current control means.

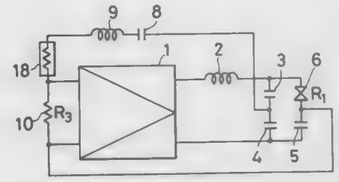
4,734,659

ULTRASONIC OSCILLATOR

Yasuhisa Tanaka; Hiroyuki Takezi, both of Tachikawa; Masami Endoh, and Makoto Yoneda, both of Oi, all of Japan, assignors to Ultrasonic Engineering Co., Ltd. and Toa Nenryo Kegyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 34,235
Claims priority, application Japan, Apr. 3, 1986, 61-75477
Int. Cl.[4] H03B *5/32, 5/38*
U.S. Cl. 331—139 **10 Claims**

1. An ultrasonic oscillator comprising an ultrasonic vibrator for driving an ultrasonic vibrator horn of an ultrasonic atomizer; a balanced circuit in which the ultrasonic vibrator is connected so that a balanced condition is established with respect to the damped capacity of the ultrasonic vibrator; and amplifier means for sending a signal to the balanced circuit and which includes a feedback circuit for positively feeding back the signal output from the balanced circuit; said feedback circuit having means connected thereto for adjusting the feedback quantity so that, when the ultrasonic oscillator starts the oscillation, the signal feedback quantity output from the balanced circuit is adjusted to make the gain of the amplifier means much greater than 1, and when the oscillator is in the steadily oscillating condition, the signal feedback quantity output from the balanced circuit is adjusted to broaden the allowable frequency band width of the ultrasonic vibrator.

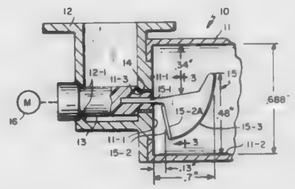


4,734,660

SIGNAL POLARIZATION ROTATOR

Frederick W. Lofgren, Charlton, Mass., assignor to Northern Satellite Corporation, Hopkinton, Mass.

Filed May 23, 1986, Ser. No. 866,774
Int. Cl.[4] H01P *1/165*
U.S. Cl. 333—21 A **16 Claims**



9. A microwave device comprising a circular waveguide for launching the TE_{11} transverse electric signal in a circular waveguide based on received microwave energy, and an electrically conductive metal element partially positioned in said circular waveguide for converting the TE_{11} transverse electric signal to the TEM coaxial mode in a opening at the rear of the waveguide into which a portion of the element extends, said element comprising a first section which acts as the center of a coaxial line and extends into said opening, a second section which is suspended over the rear terminating wall of the circular waveguide, a curved or tapered section which progressively gets further away from the longitudinal inner wall of the circular waveguide as it extends away from said second section, a gap radiator section, and a high impedance section coupled between said gap radiator section and said first section.

4,734,661

COAX TO SLAB LINE CONNECTOR AND PROGRAMMABLE ATTENUATOR USING THE SAME

David H. Shores, Beaverton, and John R. Snook, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

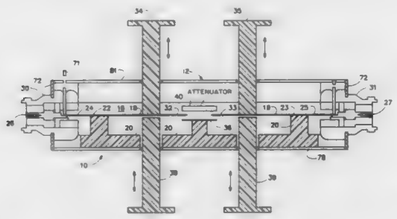
Filed Dec. 4, 1986, Ser. No. 937,660
Int. Cl.[4] H01P *1/04, 1/22*
U.S. Cl. 333—33 **11 Claims**

1. A coaxial connector for use with a slab line, comprising:

a coaxial outer conductor including a central cavity;

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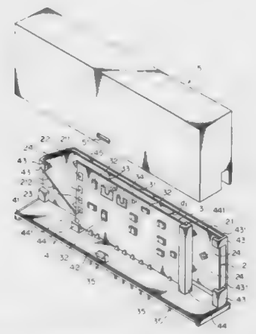
an insulating member mounted within the coaxial outer conductor;
a coaxial inner conductor supported by the insulating member;
rigid pin means extending into the central cavity for pressing an inner conductor of the slab line against an inner conductor interface surface of the coaxial inner conductor within the confines of the coaxial outer conductor; and
an anvil positioned between the coaxial inner and outer conductors to support the inner conductor interface surface, the anvil being a contiguous extension of the insulating member.



4,734,662
COMB FILTER

Masaaki Izumida; Sinya Nakai, both of Kanagawa, and Akira Ohashi, Akita, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,806
Claims priority, application Japan, Mar. 11, 1986, 61-35815[U]; May 7, 1986, 61-69136[U]; Oct. 1, 1986, 61-151933[U]
Int. Cl.⁴ H03H *7/01, 9/05*
U.S. Cl. 333—174 **8 Claims**

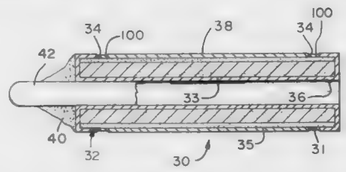


1. A comb filter comprising;
a support;
an ultrasonic delay line element mountable on said support,
a process circuit board having a substrate and electronic components on said substrate, the electronic components being coupleable with said delay line element to implement a comb filter circuit,
some of said electronic components on said process circuit board being subject to adjustment,
a first holder fixed to said support, said first holder having a groove which accepts said delay line element,
a second holder fixed to said support, said second holder having a groove which accepts said substrate of the process circuit board,
a plurality of pins fixed to said substrate for external connection of the comb filter,
a housing covering said process circuit board and said solid delay line by being engaged with said support,
said second holder being fixed in front of said first holder so that components on said substrate can be adjusted without being covered by said delay line element.

4,734,663
SEALED FILTER MEMBERS AND PROCESS FOR MAKING SAME

Stephen E. Focht, Willow Street, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 24, 1986, Ser. No. 922,604
Int. Cl.⁴ H03H *7/01, 3/00*
U.S. Cl. 333—182 **15 Claims**



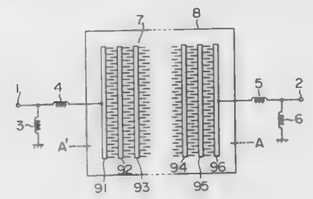
8. A filter member of the type comprising a body means having plating material disposed on substantially all surfaces thereof wherein the plating material comprises a plurality of discontinuous sections said filter member being characterized in that:
the surface of an unplated filter body means comprises the selected first and second portions, said selected first surface portions defining discontinuities between and surrounding said second surface portions;
a dielectric polymerizable material is polymerized on said selected first surface portions of said unplated body means and adherent thereto defining sealed surface portions;
said plating material is disposed on said second surface portions defining plated surface portions;
whereby said plated surface portions comprise electrically disconnected electrode means and said polymerized dielectric material both excludes said plating material from said sealed surface portions during plating and permanently seals said body means at said sealed surface portions, defining a plated filter member having said plated surface portions and sealed surface portions.

4,734,664
SURFACE ACOUSTIC WAVE RESONATOR

Mitsutaka Hikita, Hachioji; Atsushi Sumioka, Kodaira, and Yoshikatu Ishida, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki, both of, Japan

Filed Mar. 26, 1986, Ser. No. 844,104
Claims priority, application Japan, Mar. 27, 1985, 60-60645
Int. Cl.⁴ H03H *9/64, 9/25*
U.S. Cl. 333—193 **6 Claims**

1. A surface acoustic wave filter comprising:
a plurality of one-port surface acoustic wave resonators made with interdigital electrodes formed on one surface of a substrate and connected in series;
an earth metal conductor formed on another surface of the substrate corresponding to an input resonator and an output resonator among said plurality of one-port surface acoustic wave resonators;
a first matching circuit for matching with an external load connected between an input terminal of said input resonator and said earth metal conductor; and

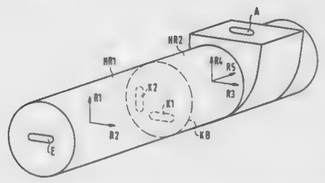


a second matching circuit for matching with an external load connected between an output terminal of said output resonator and said earth metal conductor.

4,734,665
MICROWAVE FILTER

Uwe Rosenberg, Alimersbach i.T., and Dieter Wolk, Korb, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 23, 1987, Ser. No. 65,566
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621299
Int. Cl.⁴ H01P *1/208, 7/06*
U.S. Cl. 333—212 **4 Claims**



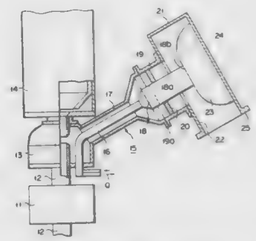
1. In a microwave filter comprising at least two cavity resonators disposed adjacent one another, and means including a coupling aperture disposed between said resonators for coupling microwave energy between said resonators, one of said cavity resonators constituting means for propagating microwave energy having a TE mode and the other of said cavity resonators constituting means for propagating microwave energy having a TM mode, the improvement wherein said means including a coupling aperture are constructed for coupling the TE mode in said one cavity resonator with the TM mode in said other cavity resonator.

4,734,666
MICROWAVE APPARATUS HAVING COAXIAL WAVEGUIDE PARTITIONED BY VACUUM-TIGHT DIELECTRIC PLATE

Keiji Ohya, Yokosuka, and Yoshio Kawakami, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 17, 1987, Ser. No. 39,281
Claims priority, application Japan, Apr. 18, 1986, 61-89406
Int. Cl.⁴ H01P *7/06*
U.S. Cl. 333—230 **8 Claims**

1. A microwave apparatus comprising:
a microwave resonant cavity;
first coaxial waveguide assembly having first outer and inner conductor sections which are air-tightly coupled to and extended from said microwave resonant cavity and a first thick metal block, and the first inner conductor section being coaxially located inside of the first outer conductor section and provided with a distal end section to which the first thick metal block is fixed, the first thick metal block being provided with a distal end face, a first cylindrical recess of a predetermined depth opened at the distal end face and a second cylindrical recess coaxially arranged with the first cylindrical recess and opened in the first cylindrical recess, and the second cylindrical recess having a diameter smaller than that of the first cylindrical recess; and
a second coaxial waveguide assembly air-tightly coupled to said first coaxial waveguide assembly to assemble a coaxial waveguide of the microwave apparatus, said second coaxial waveguide assembly having a second outer conductor section which is provided with a first thin metal cylinder, a second inner conductor section which is coaxially arranged in the second outer conductor section and

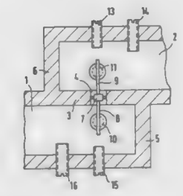


provided with a second thin metal cylinder and a distal end, a second thick metal block fixed to the distal end of the second inner conductor, and an air-tight dielectric window plate which is air-tightly jointed between the inner and outer thin metal cylinders to define a vacuum space, wherein the second metal block is fitted in the second cylindrical recess of the first metal block in the vacuum space and mechanically and electrically connected thereto to form an inner coupling section and the first outer conductor section being air-tightly welded to the second outer conductor section to form an outer coupling section, the inner coupling section having a high frequency matching annular groove being defined between the second metal block and the first metal block.

4,734,667
ARRANGEMENT FOR COUPLING WAVEGUIDE MODES BETWEEN TWO WAVEGUIDES VIA A SEMICONDUCTOR ELEMENT

Michael Alberty, Backnang, and Walter Gross, Auenwald, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Feb. 4, 1987, Ser. No. 10,789
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603454
Int. Cl.⁴ H01P *5/00*
U.S. Cl. 333—250 **8 Claims**



1. In an arrangement for coupling waveguide modes between two waveguides via a semiconductor element, wherein the two waveguides have a common partition wall provided with a coupling aperture, the semiconductor element is in-

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serted into the coupling aperture between the two waveguides, is in ground contact with the common partition wall, and has two connecting arms, one connecting arm extending as a coupling probe into one of the waveguides and the other connecting arm extending as a coupling probe into the other waveguide, the improvement wherein:

said waveguides each have a short-circuiting end wall and a common side wall constituting said common partition wall so that said two waveguides extend parallel to, and overlap one another at least over a partial length where they are separated from one another by said common side wall.

4,734,668

ELECTROMAGNETIC RELAY

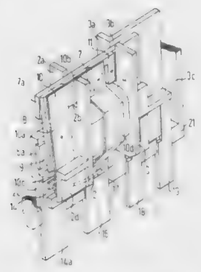
Michael Dittmann, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 46,034

Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615948; Mar. 9, 1987, 3707502

Int. Cl.[4] H01H *62/02*

U.S. Cl. 335—128 **32 Claims**



1. An electromagnetic relay, comprising:

a coil winding applied to a coil body having a coil axis extending parallel to a plane of integration of said relay;

two coil flanges having said coil body therebetween;

a U-shaped flat core yoke having a principle plane extending perpendicular to said plane of integration, a portion of said yoke being disposed above said coil winding,

a first leg of said core yoke extending through said coil body in an axial direction as a core,

a second leg of said core yoke proceeding outside of said coil as a yoke;

a plate-shaped armature seated at a free end of said yoke and forming a working air gap with a free end of said core;

an angled leaf spring secured to said yoke and to said armature, said leaf spring having a portion extending beyond a free armature end to form a contact spring;

a first terminal element connected in electrically conductive fashion to said leaf spring;

second and third coil terminal elements;

plug-in channels in said coil body for fastening said second and third terminal elements;

at least one cooperating contact element provided in said coil body; and

all of said terminal elements being conducted in one plane toward outside said relay perpendicularly to a connecting plane of said relay.

4,734,669

ELECTROMAGNETIC CONTACTOR

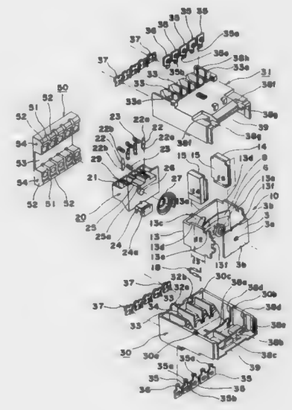
Kozo Maenishi, Nagaokakyo; Takashi Tanaka, Takatsuki; Haruo Ogata, Nagaokakyo; Youichi Nakanishi, Kyoto, and Kenichi Tsuruyoshi, Kusatsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 21, 1986, Ser. No. 898,520

Claims priority, application Japan, Aug. 23, 1985, 60-186145; Aug. 30, 1985, 60-133937[U]; Sep. 4, 1985, 60-136145[U]; Sep. 10, 1985, 60-201125; Sep. 18, 1985, 60-207495; Sep. 19, 1985, 60-207891

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—132 **34 Claims**



1. An electromagnetic contactor which opens and closes a fixed contact by means of a movable contact provided in a movable insulation stand through a movable polar member to be reciprocating in accordance with excitation and de-magnetization of an electromagnetic device, wherein said electromagnetic device, comprising:

a first yoke member having a generally]-shaped configuration with a hole at one side;

a second yoke member of a plate-like configuration with guide a guide opening corresponding to the hole of the first yoke member;

a slidable spring having a leaf spring, wherein the slidable spring slidably fits onto the second yoke to permit delicate adjustment of a movable polar member by sliding the slidable spring relative to the second yoke;

at least a pair of third yoke members installed within a space surrounded by the first and second yoke members;

at least a pair of permanent magnets each inserted between the first yoke member and the third yoke member with placing the same polarity opposite to that of the other;

a cylindrical coil with an opening provided between the pair of third yoke members;

an iron core inserted slidably through the opening of the coil member, the iron core being moved slidingly along the coil member when the coil member is excited;

a pair of iron pieces fixed at both ends of the iron core and positioned against the pair of third yoke members, an embracing member connecting the iron the movable insulation stand provided with the movable contact thereon, and wherein

the fixed point of contact being provided at a stationary position facing the movable contact.

4,734,670

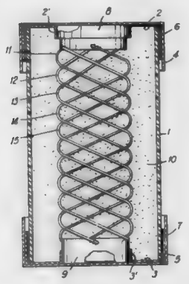
ELEMENT FOR A CURRENT LIMITING FUSE

Arthur C. Westrom, Stone Mountain; Billy R. Livesay, Atlanta, and W. Ralph Crooks, Stone Mountain, all of Ga., assignors to Kearney, National, Inc., Atlanta, Ga.

Filed Aug. 29, 1986, Ser. No. 902,316

Int. Cl.[4] H01H *85/02*

U.S. Cl. 337—159 **23 Claims**



1. A new alloy for use as a fuse element in a current limiting fuse application, which comprises cadmium and a minor amount of a metal effective to stabilize grain structure at elevated temperatures of normal usage of the fuse element as compared with fuse elements made of substantially pure cadmium, said minor amount of a metal being selected from the group consisting of zinc and silver and being present in amount of up to about 2.5% by weight.

4,734,671

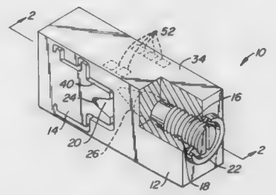
STRAIN GAGE BEAM HAVING INTEGRAL OVERLOAD PROTECTION

Walter H. Eisele, Malibu, and Peter C. Tack, Camarillo, both of Calif., assignors to Solartron Electronics, Inc., Oxnard, Calif.

Filed Oct. 22, 1986, Ser. No. 921,713

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—4 **11 Claims**



1. An improved deflector beam of the type including a block, a deflectable element formed integrally within the block, and means for detecting deformation of the block resulting from a force applied to the deflectable element, said improvement comprising means on the block for selectively limiting motion of the deflectable element relative to the block wherein said means for limiting the motion of the deflectable element is adjustable over a range of deflections.

4,734,672

VARIABLE RESISTOR CIRCUIT MODULE AND METHOD OF MANUFACTURE

Kofu Kawana, and Tsutae Okuya, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

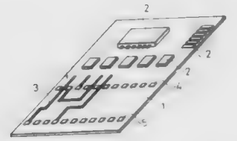
Filed Sep. 19, 1986, Ser. No. 909,490

Claims priority, application Japan, Sep. 25, 1985, 60-145077

Int. Cl.[4] H01C *1/012*

U.S. Cl. 338—312 **3 Claims**

1. A method for manufacturing a variable resistor circuit module comprising the steps of: printing a thick organic film first substrate having pairs of resistor patterns for varying resistance and conductive collector patterns arranged side by side, preparing separately a copper foil second printed substrate having copper foil soldering lands for mounting electric parts, laminating said first and second substrates together with insulating hot melt material and an electroconductive heat seal



connector to electrically connect said copper foil soldering lands, said sliding resistor patterns, and said conductive collector patterns of said substrates by means of through holes formed at terminals in the sliding resistor and conductive collector patterns, and arranging mechanical component means on the variable resistor circuit module for sliding movement thereon to vary the resistance value on the second printed substrate.

4,734,673

APPARATUS FOR DETECTING A START OF AN ENGINE FOR A MOTOR VEHICLE

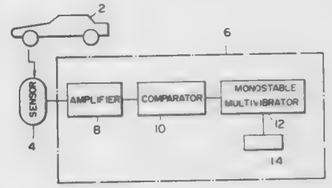
Youichi Murata, Nagoya, and Fumioki Shibata, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 453,154, Dec. 27, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 840,477

Claims priority, application Japan, Dec. 28, 1981, 56-197131[U]

Int. Cl.[4] B60Q *1/00;* **G08B** *21/00*

U.S. Cl. 340—52 R **8 Claims**



1. An apparatus for detecting the start and stop of an engine starter motor energized through a wire from a battery in a motor vehicle, comprising:

sensor means including a coil detachably disposed around said wire for sensing variations in a magnetic flux generated around said wire when a direct current for driving said starter motor starts flowing and subsequently stops flowing from said battery through said wire to said starter motor, and for outputting voltage signals corresponding to said variations in magnetic flux; and

judging means for comparing said voltage signals outputted from said sensor means with a reference voltage signal and for outputting detecting signals which indicate respectively that said starter motor is started and stopped when said voltage signals exceed said reference voltage signal by a predetermined amount, said judging means comprising an amplifier for amplifying said voltage signals, a comparator for comparing each amplified voltage signal with said reference voltage signal to generate a pulse

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signal when an amplified voltage signal exceeds said reference voltage by said predetermined amount, and a monostable multivibrator responsive to said pulse signal from said comparator to generate said detecting signals to provide an indication of starting and stopping of said starter motor.

4,734,674

TIRE PRESSURE WARNING SYSTEM

Perry W. Thomas, Grandview, Mo.; Rex O. Bare, Irvine; Earl F. Robinson, El Toro, both of Calif., and Wayne Hayob, Lenexa, Kans., assignors to Jack Taylor, Mobile, Ala.

Filed Apr. 8, 1985, Ser. No. 720,709
Int. Cl.[4] B60C *23/00*; H01H *35/24*
U.S. Cl. 340—58 **24 Claims**



1. A tire pressure warning system, comprising: a first detector, comprising:

a body portion having a bottom end adapted to mount on a tire valve stem, a top end opposite the bottom end, and an inside and an outside;

a pressure transducer in said body for detecting the pressure in a tire;

an electrical switch actuated by said pressure transducer such that said switch is in a first state at a predetermined low pressure and in a second state at any pressure above a predetermined, higher pressure;

a sensor in said body for sensing whether said switch is in said first or second state;

a transmitter in said body actuated by said sensor when said switch is in said first state for sending a plurlaity of discontinuous, modulated RF signal bursts of a predetermined code sequence through an RF output to indicate a tire pressure below said predetermined pressure;

a counter in said body for counting the number of signal bursts transmitted and disabling the transmitter when a predetermined number of bursts have been transmitted in response to said switch continuing to said first state; and

control means associated with said detector for automatically re-enabling the disabled transmitter and initializing said counter only when said switch is returned to said second state from said first state, whereby said counter disables said transmitter only when the tire pressure is low for a predetermined time period and when the tire pressure changes from low to high pressure, said control means resets said counter and re-enables the disabled transmitter.

4,734,675

COLLISION AVOIDANCE SIGNAL

Jack Wen, 5F, 87 Sung Chiang Rd., Taipei 10428, Taiwan

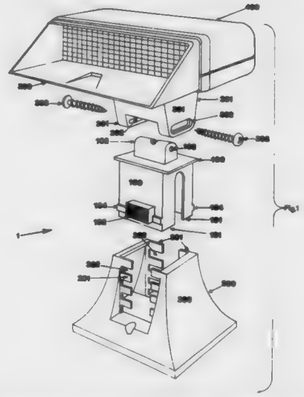
Filed Aug. 11, 1986, Ser. No. 895,178
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 340—71 **3 Claims**

1. A collision avoidance signal for vehicles comprising,

(a) a pedestal;

(b) a mounting bracket having a top surface, and front and rear resilient support feet fixedly attached to the top surface and downwardly projecting therefrom, said front and rear resilient support feet being movable towards each other in response to an externally applied pressure and then returnable to their original position when the externally applied pressure is released;

(c) a cooperating indexing means for vertical positioning of the mounting bracket relative to the pedestal wherein said cooperating indexing means comprises at least one horizontal detent attached to each support foot of the mounting bracket, and a plurality of horizontal notches forming teeth attached to the pedestal and disposed as a front pair and a rear pair of opposing vertical rows of horizontal teeth, said opposing pairs of vertical rows of horizontal



teeth being spaced apart so as to admit external pressure to the support feet of the mounting bracket, said front and rear pair of vertical rows of horizontal teeth being spaced apart so as to admit the front and rear support feet of the mounting bracket between them, and said horizontal notches being capable of engaging and receiving the horizontal detents of the support feet when externally applied pressure is released;

(d) an indicator signal;

(e) a means for attaching the indicator signal to the mounting bracket so that it is both horizontally movable and pivotable with respect to the mounting bracket.

4,734,676

METHOD AND DEVICE FOR DETECTING A PARTICULAR BIT PATTERN IN A SERIAL TRAIN OF BITS

Simon Huon, Roquefort les Pins, and Victor Spagnol, Cagnes sur Mer, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 17, 1985, Ser. No. 745,548
Claims priority, application European Pat. Off., Jun. 29, 1984, 84430025.1
Int. Cl.[4] G05B *1/00*; G06F *7/38*
U.S. Cl. 340—146.2 **2 Claims**

1. A device for detecting a particular pattern of N bits in a serial train of binary coded bits, said device comprises:

an address generator;

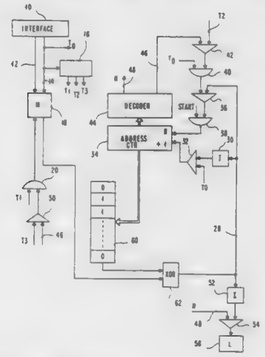
first storage means containing a first table of N entries, the nth of which comprises an information item denoting a match or a mismatch depending on whether the nth bit of the bit pattern to be detected has a first or a second binary value;

second storage means containing a second table of N entries, the nth of which comprises an information item denoting a match or a mismatch depending on whether the nth bit of the bit pattern to be detected has said second binary value or not;

means for selecting an entry in said first or second storage means according to whether the bit being examined in the train of bits has said first or second binary value, the address of said entry being indicated by the address generator;

means for incrementing by one the content of said address generator when the addressed entry contains an information item denoting a match;

means for resetting to zero the content of said address generator when the addressed entry contains an information



item denoting a mismatch, and for addressing the first entry in said first or second storage means according to whether the bit being examined has said first or second binary value, if the content of said address generator is different from zero; and

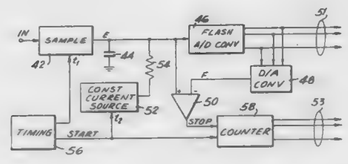
means for indicating that said bit pattern has been detected when the content of said address generator is N and the addressed entry contains an information item denoting a match.

4,734,677

COARSE/FINE A-D CONVERTER USING RAMP WAVEFORM TO GENERATE FINE DIGITAL SIGNAL

Brian V. Cake, Monroe, N.Y., and Frederick W. Sippach, Tenafly, N.J., assignors to LeCroy Research Systems Corporation, Spring Valley, N.Y.

Filed Aug. 28, 1986, Ser. No. 900,994
Int. Cl.[4] H03M *1/54*
U.S. Cl. 340—347 AD **14 Claims**



1. An analog-to-digital converter, comprising:

sample and hold means for sampling an input analog signal and for storing a sample thereof;

A/D converting means coupled to said sample and hold means to produce a coarse digital representation of the stored sample;

D/A converting means coupled to said A/D converting means for producing a coarse analog representation of said coarse digital representation;

means coupled to said sample and hold means and operative after said coarse analog representation is produced to reduce the level of said stored sample;

comparator means coupled to said sample and hold means and to said D/A converting means for detecting when the level of said stored sample is substantially equal to said coarse analog representation to produce a stop signal; and

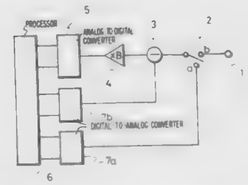
counting means initiated with the reduction in level of said stored sample to commence a counting operation and responsive to said stop signal to terminate said counting operation, whereby the count of said counting means comprises a fine digital representation, said coarse and fine digital representations combining to form the output of said analog-to-digital converter.

4,734,678

HIGH-RESOLUTION A/D CONVERTER

Masafumi Take, and Haruo Takeda, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,045
Claims priority, application Japan, Mar. 5, 1986, 61-48003
Int. Cl.[4] H03M *1/10*
U.S. Cl. 340—347 CC **1 Claim**



1. A high-resolution A/D converter which comprises:

a first D/A converter;

a switch for selecting an output signal of said first D/A converter and an analog input signal;

a second D/A converter;

an adder which performs the addition or subtraction of a signal that has passed through said switch and an output signal of said second D/A converter;

an amplifier for amplifying the output signal of said adder;

an A/D converter for converting the output signal of said amplifier into a digital value; and

a processor which reads the output of said A/D converter and give input values to said first and second D/A converters;

wherein said processor stores all minimum bit widths of said first and second D/A converters, when said first D/A converter is selected as an input by said switch, and corrects the digital output value when the analog signal is selected as an input by said switch.

4,734,679

PUSHBUTTON KEYBOARD ASSEMBLY

Steven W. Haskins, Mt. Juliet, Tenn., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 12, 1986, Ser. No. 873,723
Int. Cl.[4] H04L *1/00*
U.S. Cl. 340—365 R **6 Claims**

1. A pushbutton keyboard assembly comprising:

a circuit board having a circuit pattern on an upper surface, said circuit pattern including a plurality of switch positions;

a switch associated with each switch position;

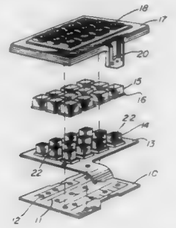
a pushbutton positioned over each switch position and moveable for actuation of said switch, each pushbutton having a top surface and a peripheral wall extending down from said top surface;

a cap positioned directly over each pushbutton, each cap having a clear top wall and a peripheral wall extending down from said top wall to a bottom edge, said peripheral wall of each cap substantially surrounding said peripheral wall of each pushbutton so that each cap is closely fitted

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over a pushbutton, and an outwardly extending flange at said bottom edge, each cap being free of permanent connection to any pushbutton and other caps;

a dial cover extending over the circuit board and including a plurality of apertures, and aperture for each pushbutton



and cap, the outwardly extending flange on each cap being in contact with an undersurface of the dial cover when the pushbutton is in an unactuated position; and

indicia formed on the top surface of each pushbutton and visible through the top wall of the related cap.

4,734,680

DETECTION SYSTEM WITH RANDOMIZED TRANSMISSIONS

Stacy E. Gehman, Lincoln, Nebr.; Kevin T. Ruddell, Seattle, Wash., and Brian D. Dawson, Lincoln, Nebr., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 6, 1986, Ser. No. 826,726

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—539 **2 Claims**

1. A detection system comprising:

a plurality of sending units, each of said units comprising:

sensing means for sensing a condition;

means for generating a pseudo-random number;

means responsive to said sensing means and said means for generating for sending a data signal representative of said condition at pseudo-randomized time intervals, said means including a means for cycling through a number of timing loops in a microprocessor program equal to said pseudo-random number before outputting said data, and a means for delaying the sending of said data signal for a predetermined time interval in addition to the pseudo-random time interval; and

receiving means for receiving said data signals and producing an output indicative of said condition.

4,734,681

SENSOR FOR DETECTING CONDITION IN SLURRY TRANSPORT LINE OF WET BLASTING APPARATUS

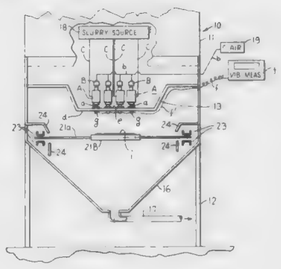
Hidemasa Suzuki, Shizuoka, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Jul. 3, 1986, Ser. No. 882,076

Claims priority, application Japan, Nov. 13, 1985, 60-173564

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—608 **5 Claims**



1. Sensing apparatus for detecting the condition of a slurry transport line of a wet blasting machine, comprising:

blasting guns connected to the slurry transportation line and each having a nozzle for projecting slurry supplied thereto through said slurry transportation line;

a gun supporting member for supporting said blasting guns in a position of use;

vibration isolating, resilient means supporting each said gun on said gun supporting member while isolating each gun from vibration of the other gun or guns;

a vibration sensor having an electric output changeable with vibration applied to said vibration sensor, said vibration sensor being fixed on one of said guns for monitoring the vibration thereof and thereby the condition of the slurry transport line to said gun;

an electric measuring device driven by said vibration sensor for indicating a characteristic of the vibration of said gun and thereby indicating the condition of the slurry transportation line feeding said gun.

4,734,682

LOW FLUID LEVEL WARNING SYSTEM

Charles R. Bond, Jr., 2241 Boston, S.E., Grand Rapids, Mich. 49506

Filed Jun. 27, 1986, Ser. No. 879,275

Int. Cl.[4] G08B *21/00*; B60Q *1/00*

U.S. Cl. 340—614 **12 Claims**



1. A low fluid level warning system for use with a reservoir to provide a warning when the level of fluid in the reservoir is below a predetermined level, the warning system comprising:

first conduit means having an opening positioned near the bottom inner surface of the reservoir at a first level thereof and below said predetermined level for receiving fluid therefrom;

selectively activated circulating means having activated and deactivated states, and connected to the first conduit means for pumping fluid from the reservoir upwardly through the first conduit means when in the activated state;

pressure chamber means connected to said circulating means to receive pressurized fluid from said circulating means;

pressure-sensing means connected to the pressure chamber means for sensing the pressure therein; and

indicator means having activated and deactivated states and connected to the pressure-sensing means for providing an indication of the pressure in the pressure chamber means, whereby the indicator means is in the deactivated state when the pressure in the pressure chamber means is above a predetermined pressure and the indicator means is in the activated state when the pressure in the pressure chamber means is below the predetermined pressure;

said indicator means being deactivated substantially immediately upon selectively activating the circulating means following a state of deactivating the circulating means when the level of fluid in the reservoir is above the predetermined level;

the improvement which comprises:

the warning system further comprises means for delaying deactivation of the indicator means for a relatively short defined period of time only when the level of fluid in the reservoir is above the first level and below the predetermined level, whereupon after said defined period of time, said indicator means will be deactivated.

4,734,683

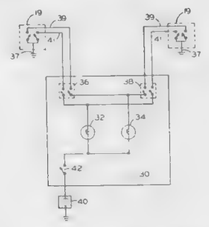
ELECTRONIC ROW WIDTH MONITOR

Mark E. Howell, Jr., Rte. 1, Box 1316, Parma, Id. 83660, and James M. Howell, Rte. #2, Wilder, Id. 83676

Continuation-in-part of Ser. No. 797,607, Nov. 13, 1985, abandoned. This application Feb. 10, 1987, Ser. No. 15,555

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—684 **1 Claim**



1. A guidance system for providing guidance signals to an operator for guiding a vehicle to provide a desired path for a towed implement with respect to a precut furrow, said system comprising;

a mounting member removeably attached to said towed implement;

upper and lower elongated parallel frame members disposed intermediate forward and aft pivot members, said parallel frame members pivotally attached to said forward and aft pivot members permitting said parallel frame members to pivot in the vertical plane with respect to said forward and aft pivot members;

a forward mounting pin rotatably attached in a vertical orientation to said mounting member, said forward pivot member rigidly attached to said forward mounting pin permitting said parallel frame members to pivot in a horizontal plane about the vertical axis of said forward mounting pin;

elongated sled runner means having a forward upwardly curved end portion, said upwardly curved end portion orientated in the vertical plane and rotatably attached to said aft pivot member permitting said sled runner means to pivot in the horizontal plane about the vertical axis of said upwardly curved end portion and permitting motion of said sled runner means in the vertical plane while maintaining said sled runner means in a horizontal orientation, said sled runner means normally riding in said precut furrow;

first and second normally open switch means fixedly attached to said forward mounting pin in spaced apart relationship with said mounting member, said parallel frame members responsive to the motion of said towed implement to rotate said forward mounting pin closing said first switch means if said towed implement veers beyond a predetermined angle in a first direction with respect to said precut furrow and closing said second switch means if said towed implement veers beyond a predetermined angle in a second direction with respect to said precut furrow; and

first and second signaling means coupled to said first and second switch means, respectively, said first signaling means activated when said first switch is closed and said second signaling means activated when said second switch is closed.

4,734,684

DEVICE AND METHOD FOR USE IN ADJUSTING THE DISTANCE BETWEEN TWO PARALLEL SURFACES

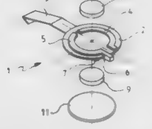
Jilles M. Limburg, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Nov. 26, 1986, Ser. No. 935,243

Claims priority, application Netherlands, Dec. 6, 1985, 8503363

Int. Cl.[4] C08B *21/00*

U.S. Cl. 340—686 **6 Claims**



1. A device for use in adjusting within predetermined limits the distance between two parallel surfaces comprising:

(a) an electrically insulating flat support having two separated electrodes on each side, one of the electrodes on each side being able to be connected to an electrical voltage source;

(b) two resiliently deformable members having different resilient deformability from one another, each one being in contact with one side of the electrically insulating flat support in an area not covered by the two electrodes and projecting past the electrodes in a direction perpendicular to the plane of the electrically insulating flat support;

(c) two electrically conductive members, each one in contact with one of the resiliently deformable members and extending over the two electrodes so that each can establish an electrical connection between the two electrodes when the resiliently deformable member is deformed by compression; and

(d) a signaling circuit which signals when no electrodes are connected, when one pair is connected, or when both pairs are connected.

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4,734,685

POSITION CONTROL APPARATUS

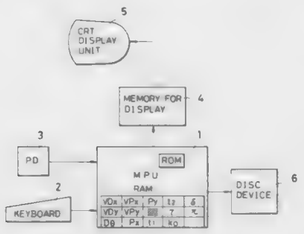
Yasuhiro Watanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 632,025

Claims priority, application Japan, Jul. 28, 1983, 58-136723

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—710 **17 Claims**



1. A position control apparatus comprising:

first storage means for storing display information;

a pointing device for identifying for display a portion of the display information stored in said first storage means by moving freely on a plane;

detection means for detecting a vector of movement of said pointing device;

calculation means for calculating a velocity of movement from the vector of movement detected by said detection means;

discrimination means, responsive to at least one parameter of said vector, for discriminating whether the vector of movement of said pointing device detected by said detection means is indicative of a valid direction of movement thereof;

second storage means for storing the velocity of movement calculated by said calculation means when said discrimination means discriminates that the direction of movement can be determined from said vector of movement; and

control means for moving the portion identified for display at a velocity corresponding to the velocity stored in said second storage means even when the movement of said pointing device is stopped.

4,734,686

GAS DISCHARGE DISPLAY APPARATUS

Takio Okamoto, Kusatsu; Ryoji Inutsuka, and Yukiharu Ito, both of Osaka, all of Japan, assignors to Matsushita Electronics Corp., Japan

Filed Nov. 20, 1986, Ser. No. 932,598

Claims priority, application Japan, Nov. 20, 1985, 60-260152; Jun. 10, 1986, 61-134148

Int. Cl.[4] G09G *3/28*

U.S. Cl. 340—713 **4 Claims**

1. A gas discharge display apparatus comprising:

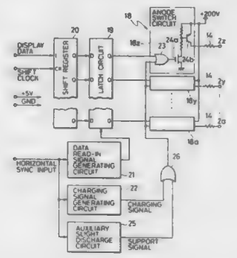
a gas discharge display panel comprising first and second plate members disposed with a surface of said first plate member closely adjacent and parallel to a surface of said second plate member, with at least one of said plate members being formed of an optically transparent material, an array of elongated stripe-shaped anodes formed on said surface of said first plate member, an array of elongated stripe-shaped cathodes formed on said surface of said second plate member and oriented at right angles to said anodes to thereby define an array of display elements at regions of intersection between said anodes and cathodes, and an array of elongated dielectric partitioning members oriented parallel to said anodes and respectively disposed between mutually adjacent pairs of said anodes;

cathode switching circuit means responsive to an externally applied horizontal sync signal for sequentially connecting each of said cathodes to a cathode selection potential during respective cathode scanning intervals, in synchronism with said horizontal sync signal;

latch circuit means for storing display data to be displayed above successive ones of said cathodes during successive ones of said cathode scanning intervals;

anode switching circuit means responsive to said display data in said latch circuit means for applying an anode activation potential to selected ones of said anodes in accordance with said display data during each of said cathode scanning intervals, said cathode selection potential and anode activation potential being determined such as to produce a display discharge state when applied simultaneously to one of said anodes and said cathodes defining one of said display elements, whereby light is emitted from said display element;

charging signal generating circuit means for producing a



charging signal, in synchronism with said horizontal sync signal, during a blanking interval preceding each of said cathode scanning intervals, said anode switching circuit means being coupled to receive said charging signal and responsive thereto for applying said anode activation potential to all of said anodes during said blanking interval, for thereby charging stray capacitances which are associated with said anodes, and;

circuit means for generating a support signal in synchronism with said horizontal sync signal during each of said cathode scanning intervals, said anode switching circuit means being coupled to receive said support signal and responsive thereto for applying said anode activation potential to all of said anodes during a time interval of fixed duration which is substantially shorter than said cathode scanning interval and which commences after a fixed time interval following the commencement of said cathode scanning interval.

4,734,687

MONITORING

Edwin P. Jones, Great Malvern, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Dec. 31, 1985, Ser. No. 814,953

Claims priority, application United Kingdom, Jan. 25, 1985, 8501936; Feb. 16, 1985, 8504020

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—715 **11 Claims**

1. Signal processing apparatus for fault monitoring comprising:

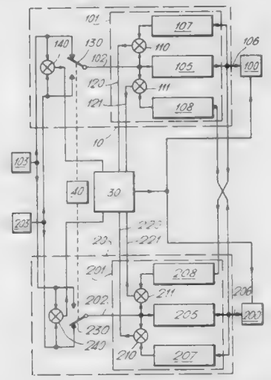
two parallel lanes each including a first and a second signal processor means;

means for applying a nominally identical input signal to the respective said first processor means of each of said two parallel lanes;

each of said first processor means performing nominally identical processing functions on the respective input signal applied thereto for producing thereby two corresponding nominally identical output signals, one for each said lane;

each said second processor means performing nominally identical inverse signal processing functions on the respective said output signal of the associated first processor means for producing therby two nominally identical inverse signals, one for each lane, each said inverse signal being nominally identical to the corresponding one of said two input signals;

first comparator means responsive jointly to said input signal of the first lane and said inverse signal from said second



processor means of said first lane for providing a first output manifestation of the comparison;

third processor means also responsive to the output signal of the first processor of one of said two lanes for performing a nominally inverse signal processing function for producing a nominally inverse signal which is nominally identical to the input signal associated with said one lane;

second comparator means responsive jointly to said inverse signal from said third processor means and to the input signal of the other of said lanes for producing a further output manifestation of the comparison.

4,734,688

METHODS AND MEANS FOR TESTING FAULTS IN A LIQUID CRYSTAL DISPLAY SYSTEM

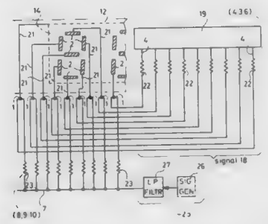
Jürgen Adams, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany

Filed Aug. 27, 1985, Ser. No. 770,163

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432247

Int. Cl.[4] G09G *3/18*

U.S. Cl. 340—715 **21 Claims**



1. A method for visually indicating a malfunction in supply lines to a liquid crystal display, said display including a plurality of segment electrodes, at least one back electrode, and a plurality of separately controllable display contacts for connecting said segment electrodes and said back electrode, respectively, to said supply lines, said method comprising:

generating separate operating signals for said segment electrodes and said back electrode, said separate operating signals causing a relatively steady display of said segment electrodes;

applying said separate operating signals through said supply lines to said segment electrodes and said back electrode;

generating checking signals for said segment electrodes and said back electrode, said checking signals being capable of causing said segment electrodes to visibly blink; and

applying said checking signals through respective impedance paths to said segment electrodes and said back electrode so that said checking signals are in superposition with said operating signals, said operating signals being different from said checking signals and said impedance paths each having an impedance which is substantially larger than that of said supplying, whereby when there is no malfunction in said supply lines, said operating signals override said checking signals and the segment electrodes and the back electrode are effectively driven by said operating signals, while when there is a malfunction in said supply lines either blocking or substantially limiting said operating signals, said segment electrodes and said back electrode are driven by said checking signals thereby causing said segment electrodes to visibly blink.

4,734,689

DISPLAY APPARATUS WHICH CAN SCROLL DISPLAYED DATA WITH REGARD TO CURSOR POSITION

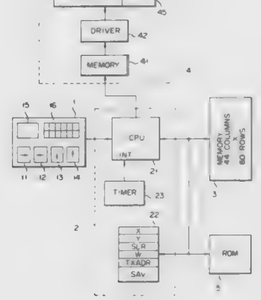
Shigeo Kurakake, Hanno, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 833,055

Claims priority, application Japan, Mar. 7, 1985, 60-45642; Apr. 30, 1985, 60-92423

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—726 **7 Claims**



1. A display apparatus which can scroll displayed data in response to a cursor position command, comprising:

storage means for storing data to be displayed over a plurality of lines;

display means for reading out an amount of stored data from said storage means for display on a screen having a certain line display range with line numbers increasing from top to bottom, and for displaying the readout data as display data within the line display range of the screen, together with a cursor mark which indicates a position where correction of the display data may be made;

input means for inputting cursor movement commands in-

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cluding a down-movement command and an up-movement command for the cursor mark;

cursor position-detecting means for determining if the cursor mark is displayed in a predetermined narrow screen region which is located at approximately the middle of said screen, in response to a cursor movement command entered by said input means;

first data detecting means for determining if said storage means contains data for display at lines exceeding the greatest line of data displayed within the display range of said screen when said cursor position-detecting means determines that the cursor mark is currently positioned in the predetermined narrow screen region and said input means enters a down-movement command;

down movement-controlling means responsive to said first data detecting means for maintaining the cursor mark at the current position, and for scrolling up on said screen the data read out from said storage means and displayed on said screen by one line if said storage means stores data at lines exceeding the greatest line of data currently displayed on said screen, and for maintaining the current display of lines of data fixed on the screen and moving the cursor mark position down by one line if no data is stored in said storage means at lines exceeding those currently displayed;

second data detecting means for determining if said storage means contains data for display at lines less than the least line of data displayed within the display range of said screen when said cursor position-detecting means determines that the cursor mark is currently positioned in the predetermined narrow screen region and said input means enters an up-movement command; and

up movement-controlling means responsive to said second data detecting means for maintaining the cursor mark at the current position and for scrolling down on said screen the data read out from said storage means and displayed on said screen by one line if said storage means stores data at lines less than the least line of data currently displayed on said screen, and for maintaining the current display of lines of data fixed on the screen and moving the cursor mark position up by one line if no data is stored in said storage means at lines less than those currently displayed.

4,734,690

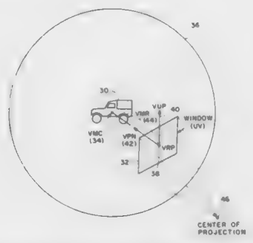
METHOD AND APPARATUS FOR SPHERICAL PANNING

William G. Waller, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 633,156, Jul. 20, 1984, abandoned. This application Apr. 6, 1987, Ser. No. 33,851

Int. Cl.⁴ G09G *1/02*

U.S. Cl. 340—729 **12 Claims**



1. A three-dimensional panning method comprising the steps of:

storing applied graphic information representing a three-dimensional object in a first three-dimensional coordinate modeling space;

defining a second three-dimensional coordinate space as a viewing space from which the object may be viewed, the viewing space being movable at a selected radial distance around a selected reference point in the modeling space;

inputting and storing further information including panning information specifying a position from which to view the object;

moving the viewing space to the specified position in response to the panning information, effecting a transform of the coordinates of the object to the viewing space and to a two-dimensional coordinate screen space; and

displaying a two-dimensional image of the transformed coordinates, providing a view of the object from the panned-to-position.

4,734,691

VIDEO BIT TRANSITION ADVANCEMENT CIRCUIT

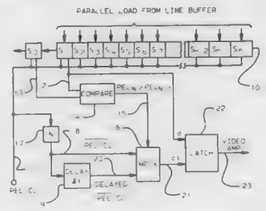
Geoffrey A. Bailey, Winchester, and Milan H. Miessler, Ampfield, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1986, Ser. No. 826,692

Claims priority, application European Pat. Off., Mar. 4, 1985, 85301482.7

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—744 **7 Claims**



1. A video display system of the kind in which the brightness of consecutive image points on a screen of a raster scanned CRT is defined by the values of consecutive pels of a digital video drive waveform, each such pel comprising one bit or a plurality of video bits processed in parallel, and in which means is provided for extending the duration of selected pels in the video waveform in order at least partially to compensate for image distortion introduced by the finite video amplifier rise and fall times of the CRT, characterized in that said means for extending the duration comprises, comparator means for examining each pel in relation to its immediately preceding neighbor in order to detect a transition therebetween representing an increase in brightness value from the immediately preceding pel to the currently examined pel, and re-timing means for causing the advancement in time by a predetermined interval of any such transition in the video drive waveform relative to remaining transitions.

4,734,692

DRIVER CIRCUIT FOR LIQUID CRYSTAL DISPLAY

Masaki Hosono, Fujisawa, and Yukio Nemoto, Kanagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 24, 1986, Ser. No. 855,458

Claims priority, application Japan, Apr. 26, 1985, 60-90006; Apr. 26, 1985, 60-90008

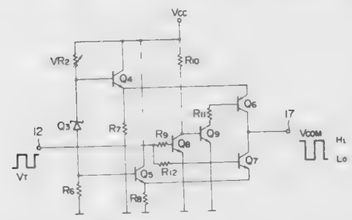
Int. Cl.⁴ G09G *3/36*

U.S. Cl. 340—789 **4 Claims**

1. A driver circuit for A.C. driving a liquid crystal display cell, comprising:

polarity inversion means for polarity-inverting, with a given period, a display signal voltage to be applied to one electrode of the liquid crystal display cell and a common voltage to be applied to an opposite common electrode thereof, respectively; and

D.C. level shifting means for varying the D.C. voltage level of at least one of the signal voltage and common voltage polarity-inverted with said given period by the same amount in the same direction in each period, said D.C. level shifting means comprising a first transistor for receiving the polarity inverted signal voltage, a series circuit comprising first and second resistors connected with the emitter of said first transistor, a signal voltage output terminal provided at the connection point of said first and second resistors and a constant current source with its current value being adjustable, connected in parallel to said second resistor.



4,734,693

SWITCH LOCK INSTALLATION

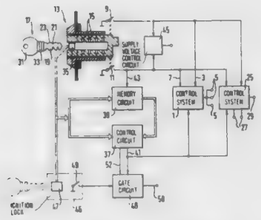
Joachim Dluhosch, Schweinfurt; Hans Fliege, Obertheres; Dieter Lutz, Schweinfurt; Franz Nagler, Gädheim/Ottendorf; Horst Oppitz; Christoph Thielen, both of Dittelbrunn, and Wolfgang Thieler, Hassfurt-Uchenhofen, all of Fed. Rep. of Germany, assignors to Sachs-Systemtechnik GmbH, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,759

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426508

Int. Cl.⁴ G06F *7/04;* **G06K** *7/01;* **E05B** *49/00*

U.S. Cl. 340—825.31 **11 Claims**



1. A switch lock installation comprising:

a lock having mechanical tumblers for locking the lock in a predetermined position and providing a first key secret information,

a key for mechanically unlocking the mechanical tumblers and manually moving the lock in a closure direction and in an opening direction, said key having an elongated shank and comprising on its shank, insertable into the lock, an information carrier including at least one element arranged in the carrier and forming a second key secret information,

a reading device provided on the lock for reading the at least one element forming the second key secret information from the information carrier,

a memory circuit for storing ideal information data of the second key secret information,

a control circuit for generating a control signal in dependence upon the ideal information data stored in the memory circuit and the information read by the reading device and having a switch actuable by means of the lock and coupled with the lock,

the improvement being that the information carrier comprises, for variation according to choice of the second key secret information, the at least one information carrier element which is variable positionable in relation to the shank of the key , and that the switch is actuatable on movement of the lock in the closure direction and activates the memory circuit for the writing in of the information read by the reading device as ideal information data of the second key secret information,

the lock is formed as a cylinder lock and the key is formed as a flat key with a handle piece and a longitudinally extending shank protruding therefrom in the direction of a plane of the handle piece and provided with at least one or recesses and protuberances for the actuation of the tumblers of the lock, and wherein said information carrier is arranged in a region of the transition from the shank to the handle piece,

the information carrier comprises at least one disc extending substantially in the direction of the plane of the handle piece, said disc being mounted on the key rotatably about an axis extending transversely of the plane of the disc and carrying at least one permanent magnet as said at least one information carrier element, and wherien the reading device comprises a plurality of magnetic field sensors for the generation of a signal representative of the position of the disc in relation to the key.

4,734,694

PAGER

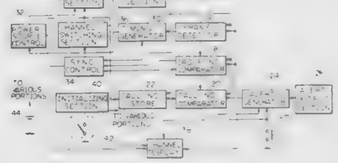
Shinjiro Umetsu; Yutaka Ichikawa, and Koichi Nagata, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 12, 1985, Ser. No. 764,857

Claims priority, application Japan, Aug. 22, 1984, 59-174665

Int. Cl.⁴ G08B *5/22;* **H04B** *11/16*

U.S. Cl. 340—825.44 **8 Claims**



1. A pager comprising:

a radio section for selectively receiving one of n radio frequency signals (n being an integer not smaller than 2) whose frequencies are different from each other, each radio frequency signal being modulated by a signal comprising a plurality of paging signal groups each of which is made up of at least a frame sync which is the same as frame sync signals of the other groups, a group designation signal which differs from group designation signals of the other groups, and a plurality of paging signals;

a channel control section for controlling a receive frequency assigned to said radio section;

a timing generator section for performing a control such that only an own paging signal group with which the pager is associated is received; and

a synchronization control section for controlling a synchronization condition of the pager with the own paging signal group;

said timing generator section operating in a first intermittent reception mode when a power source of the pager is

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turned on or when the pager is non-synchronous to the own paging signal group and in a second intermittent reception mode when the paper is synchronous to the own paging signal group;

during the first intermittent reception mode operation the channel control section sequentially switching the receive frequency until a frame sync signal has been detected, the synchronization control section tuning the pager to the receive frequency on which the frame sync signal has been detected;

when the pager has been tuned to the own group, the channel control section locking the receive frequency at a particular frequency which has occurred when the pager has been tuned.

4,734,695

SECURE CARD AND SENSING SYSTEM

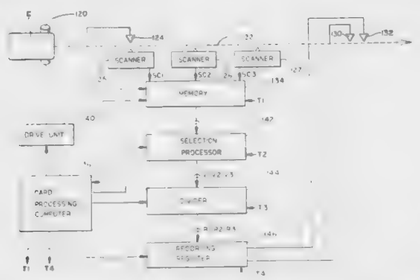
Robert N. Goldman, Kailua, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.

Division of Ser. No. 657,849, Oct. 4, 1984, Pat. No. 4,656,473, which is a continuation-in-part of Ser. No. 503,392, Jun. 10, 1983, Pat. No. 4,476,468, which is a continuation-in-part of Ser. No. 276,282, Jun. 22, 1981, Pat. No. 4,423,415, which is a continuation-in-part of Ser. No. 161,838, Jun. 23, 1980, abandoned. This application Aug. 25, 1986, Ser. No. 900,660

The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.[4] H04Q *9/00*; G06K *5/00*

U.S. Cl. 340—825.340 **5 Claims**



1. An authenticator device for machine sensing, as to control or regulate transactions or operations, comprising:

a card in a sheet form and including a medium in at least a certain area thereof comprising a synthetic integral material for altering an orientation-frequency property of impinging light in a random characteristic pattern over said area and accordingly to modulate the orientation-frequency property of light impinging a select portion of said area; and

a record associated with said card indicative of the orientation-frequency altering property of said medium for said select portion of said area usable to verify said authenticator device as genuine.

4,734,696

SYSTEM AND METHOD FOR TRANSMITTING INFORMATION

William P. Rogers, Collingswood, N.J., assignor to Telenex Corporation, Mt. Laurel, N.J.

Filed Dec. 2, 1985, Ser. No. 803,812

Int. Cl.[4] H04J *3/16*; H04Q *11/04*

U.S. Cl. 340—825.510 **13 Claims**

1. In a communication system comprising a communications line, a first source of a first set of N relatively more slowly variable separate signals, a second source of a second set of M relatively more rapidly variable separate signals, first means for repetitively sampling said first set of signals successively to produce a first set of corresponding sequential samples thereof on said line, and second means for repetitively sampling said second set of signals successively to produce a second set of corresponding sequential samples thereof on said line, the improvement comprising:

means for normally rendering operative said first sampling means to produce on said line said first set of corresponding sequential samples;

means responsive to a change in any of said second set of signals for interrupting the operation of said first sampling means and for rendering said second sampling means operative to produce said second set of corresponding sequential samples on said line only in response to said change; and

means for restoring the operation of said first sampling means when said second sampling means has operated to sample all of said signals of said second set a predetermined number of times without a further change occurring in any of said second set of signals.

4,734,697

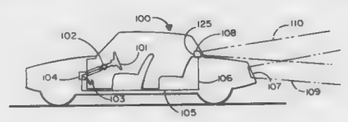
MOTOR VEHICLE TAIL LIGHT ASSEMBLY WITH DIMMER CONTROLLER

Melvis I. Robinson, and Kent B. Robinson, both of 18230 Kingsdale, Redondo Beach, Calif. 90278

Filed Jul. 25, 1986, Ser. No. 889,388

Int. Cl.[4] B60Q *1/22, 1/44*

U.S. Cl. 340—902 **6 Claims**



1. A light assembly for rear mounted, eye level use with motor vehicles, comprising,

housing means,

a plurality of light emitting devices mounted in said housing means,

lens cover means mounted at said housing means and comprising a plurality of sections having different colors whereby a selected color indication is produced when at least one of said plurality of light emitting devices is selectively activated,

said color indication having a recognized conventional safety characteristic to motorists,

reflector means disposed in said housing means adjacent to said light emitting devices for reflecting light from said light devices outwardly through said lens cover means,

control means for selectively activating said plurality of light emitting devices,

said control means includes switch means for selectively activating at least one of said light emitting devices to signal to the driver of a following motor vehicle that the headlights thereof are on high beam,

sensor means mounted at said housing means and connected to said control means,

said sensor means operative to activate said switch when the headlights of a following motor vehicle are on high beam, and

indicator means passing through said housing means whereby activation of one of more of said light emitting devices can be detected from the back said housing means.

4,734,698

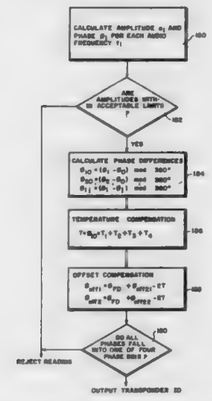
PASSIVE INTERROGATOR LABEL SYSTEM HAVING OFFSET COMPENSATION AND TEMPERATURE COMPENSATION FOR A SURFACE ACOUSTIC WAVE TRANSPONDER

Paul A. Nysen, Sunnyvale, and Michael R. McCoy, Los Altos, both of Calif., assignors to X-Cyte, Inc., Mountain View, Calif.

Filed Oct. 31, 1985, Ser. No. 793,165

Int. Cl.[4] G01S *13/80*

U.S. Cl. 342—44 **9 Claims**



1. In a system for interrogating a plurality of transponders, each carrying encoded information, said system comprising:

(a) at least one transponder for receiving a first signal and transmitting second signal in reply thereto, said transponder comprising signal transforming means, coupled to receive said first signal as an input, for producing said second signal as an output, said signal transforming means including:

(1) a plurality of signal delay means coupled to receive said first signal, each signal delay means providing an intermediate signal having a nominal, known delay time with respect to said first signal, different signal delay means providing different delay times which increase successively from shortest to longest; and

(2) signal combining means, coupled to at least some of said signal delay means, for combining at least some of said intermediate signals in a known manner to produce said second signal, said signal delay means and/or said signal combining means imparting a known informational code to said second signal associated with said transponder;

(b) interrogator/receiver means for transmitting said first signal to, and receiving said second signal from said at least one transponder; and

(c) signal decoding and processing means, coupled to said interrogator/receiver means, for determining said informational code associated with each transponder;

the improvement wherein said signal decoding and processing means includes means for compensating unknown variations in said nominal, known delay time of each signal delay means, said compensating means including:

(1) means for measuring the actual difference in delay time between at least two successively longer delay times of respective signal delay means; and

(2) means for determining said nominal, known delay times of the other signal delay means, using said actual delay time difference as a standard.

4,734,699

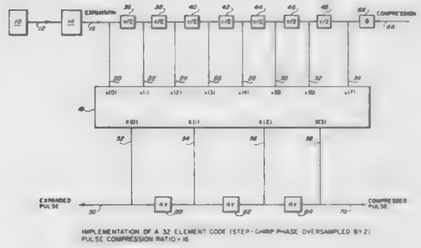
DOPPLER-IMPROVED POLYPHASE PULSE EXPANDER-COMPRESSOR

Frank F. Kretschmer, Jr., Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 7, 1986, Ser. No. 848,880

Int. Cl.[4] G01S *13/28*

U.S. Cl. 342—201 **19 Claims**



1. In a frequency-derived polyphase-coded expansion and compression system, a method of reducing cyclic variation in the amplitude of the compressed pulse waveform due to doppler shift, comprising:

generating kN^2 phase coded elements, from a phase characteristic corresponding to a consecutive sample of a chirp waveform with an information bandwidth B, sampled at a rate having a frequency S, with $k=S/B$ and where N is an integer;

sequencing said phase coded elements consecutively over a period corresponding to $T=N^2/B$ to form a new expanded polyphase-coded signal;

conjugating an echo of said new expanded polyphase-coded signal to form conjugated phase coded elements, and

combining said conjugated phase coded elements to form a compressed output signal of amplitude N^2k and width 1/B.

4,734,700

GROUP ANTENNA WITH ELECTRONICALLY PHASE-CONTROLLED BEAM

Anton Brunner, Starnberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,605

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524148

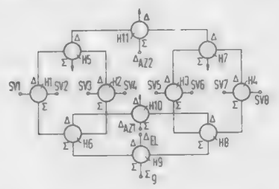
Int. Cl.[4] G01S *3/04, 13/44*

U.S. Cl. 342—373 **15 Claims**

1. A group antenna comprising a plurality of line-fed individual radiators having omni-directional characteristics which are mounted within the volume of an imaginary body, particularly a sphere, and which are arranged symmetrically with respect to a horizontal plane E1 and two vertical plane E2 and E3 which intersect perpendicularly to each other, said group antenna being electronically phase-controlled so as to sweep the beam in all directions for radar scanning, characterized in

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that the individual radiators (1) are divided into eight octant sub-volumes (V1 through V8) which are respectively limited relative to one another by said three planes E1, E2, and E3 and which are separatly fed signals for the formation of an overall sum signal (ϵ_g), as well as an elevation difference signal (Δ_{E1}), and two azimuth difference signals (Δ_{AZ1}, Δ_{AZ2}), the signals SV1 through SV8 of the eight octants are combined in a circuit so as to obtain the overall sum signal, the elevation difference signal and the two azimuth difference signals and said circuit comprising, a total of eleven elements such as ring hybrids or magic T's operating as follows:



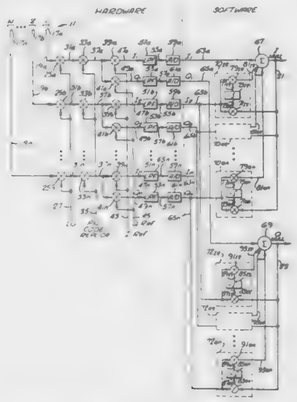
(1) forming 4 first sum and 4 first difference signals from 4 hybrid rings representative of the sum and difference signals of octants adjacent one another;
(2) forming 2 second sum signals and 4 second difference signals with 4 additional hybrid rings from the aforementioned 4 first sum signals and 4 first difference signals such that the sum and difference signals derived form adjacent octant pairs are combined;
(3) combining the 2 second sum signals and 4 second difference signals in 3 further additional hybrid rings to form the desired overall sum signal, elevation difference signal and 2 azimuth difference signals.

4,734,701

NULL PROCESSING RECEIVER APPARATUS AND METHOD

Paul H. Grobert, Granada Hills, Calif., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Mar. 12, 1986, Ser. No. 838,920
Int. Cl.[4] G01S *3/16*
U.S. Cl. 342—380 **22 Claims**



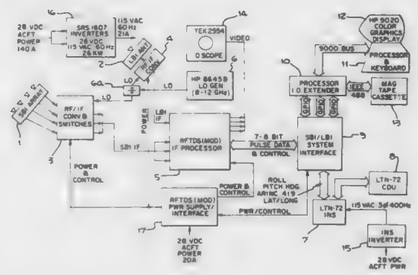
1. Signal processing receiver apparatus comprising:
demodulator means for demodulating a plurality of modulated signals to produce a primary information signal and one or more related auxiliary information signals, all of the information signals containing an interference signal;
weighting means for operating on the one or more auxililary information signals, to produce a corresponding number of intermediate signals; and
summing means for summing together the primary information signal and the one or more intermediate signals to produce a sum signal in which the interference signal is substantially nulled out;
wherein the weighting means includes
correlation means responsive to the one or more auxiliary information signals for producing a corresponding number of weighting signals, said correlation means including means for correlating the sum signal with each of the one or more auxiliary information signals to produce the corresponding number of weighting signals, and
multiplier means for multiplying the one or more auxiliary information signals by their corresponding weighting signals to produce the one or more intermediate signals;
at least one of the primary and one or more information signals, the one or more weighting signals, the one or more intermediate signals and the sum signal being a baseband digital code signal.

4,734,702

PASSIVE RANGING METHOD AND APPARATUS

Albert Kaplan, College Park, Md., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Feb. 25, 1986, Ser. No. 833,730
Int. Cl.[4] G01S *5/02*
U.S. Cl. 342—424 **25 Claims**



1. An improved passive ranging method of the class which includes measuring the ambiguous change in phase of an emitter's signal occurring between a plurality of points along a path separated by arbitrary periods of time and distance with a Long Baseline Interferometer (LBI) mounted on a platform moving between said points, wherein the improvement comprises the steps of: measuring said phase unambiguously and sequentially at said points with a Short Baseline Interferometer (SBI) mounted on said platform, using said SBI unambiguous phase measurements to estimate range, and using said established range to resolve the ambiguity in said LBI change in phase measurements.

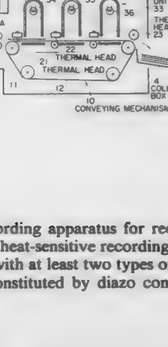
4,734,703

THREE-WAVE ANTENNA FOR VEHICLE

Kazuhiko Nakase, Tokyo, and Yoshima Egashira, Kanagawa, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,749
Claims priority, application Japan, Apr. 1, 1985, 60-68853
Int. Cl.[4] H01Q *5/00, 21/28*
U.S. Cl. 343—790 **1 Claim**

1. A three-wave common antenna for vehicles comprising:
an elongated tubular AM/FM antenna coupled to and extending outwardly from a vehicle body at a lower end, said AM/FM antenna not being an optimum antenna length;
a non-grounded ultra high frequency antenna coupled to an upper end of said AM/FM antenna, a radiation pattern in a vertical plane of said ultra high frequency antenna being substantially in a horizontal direction;
a coaxial feeder cable for ultra high frequency, one end of said coaxial feeder cable being coupled to an input of said non-grounded ultra high frequency antenna and said coaxial feeder cable being led inside of the vehicle body along said AM/FM antenna;
a characteristic compensating electric circuit coupled to an input of said AM/FM antenna for electrically compensating for said AM/FM antenna not being the optimum antenna length; and
a feeder cable for AM/FM waves, one end of said feeder cable being coupled to an output of said characteristic compensating electric circuit.

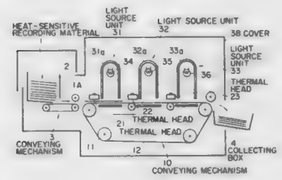


4,734,704

THERMAL RECORDING APPARATUS

Shigemitsu Mizutani, Kanagawa; Jun Yamaguchi, Shizuoka, and Tadashi Miyakama, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 29, 1985, Ser. No. 803,656
Claims priority, application Japan, Nov. 30, 1984, 59-252890; Mar. 19, 1985, 60-55077; Apr. 1, 1985, 60-68857; Apr. 1, 1985, 60-68858; May 15, 1985, 60-103501
Int. Cl.[4] G01D *15/10*; G03C *5/16*
U.S. Cl. 346—76 PH **12 Claims**



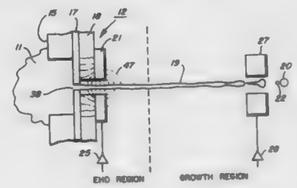
1. A thermal recording apparatus for recording images in multiple colors on a heat-sensitive recording material having a substrate provided with at least two types of thermal coloring elements thereon constituted by diazo compounds and coupling components which are respectively developable at different temperatures to produce different colors, said apparatus comprising:
a conveying means for conveying said heat-sensitive recording material;
at least two thermal recording heads positioned at points spaced along said conveying means;
means for controlling the temperatures of said thermal recording heads to respective temperatures for activating portions of said thermal coloring elements corresponding to images to be recorded on respective coloring elements; and
a light source means between said thermal recording heads for emitting light with a wavelength for decomposing the diazo compound of the thermal coloring element activated by the thermal head which is upstream of said light source means, whereby one thermal coloring element is subjected first to thermal recording by said upstream thermal head and then the unactivated diazo compound thereof is subjected to decomposition by the light from said light source means, and thereby images in colors obtained by thermally activating the respective thermal coloring elements are obtained.

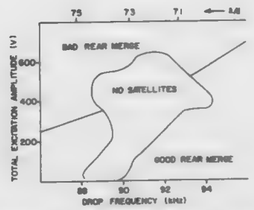
4,734,705

INK JET PRINTER WITH SATELLITE DROPLET CONTROL

Ivan Rezanka, Pittsford, N.Y., and Joseph M. Crowley, Morgan Hill, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1986, Ser. No. 895,417
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **5 Claims**





1. An improved continuous stream-type pagewidth ink jet printer of the type having a pressurized ink filled manifold with a nozzle plate containing a plurality of nozzles from which ink streams are emitted, the ink streams being externally stimulated by a time varying pressure to cause them to break up into droplets at a predetermined distance from the nozzles whereat the droplets are charged in accordance with digitized data signals, the charged droplets following flight paths through an electrostatic field to specific pixel locations on a recording medium, wherein the improvement comprises:
stimulating the ink streams with a predetermined time-varying pressure which can be represented by a combination of two time-varying components, one being a predetermined fundamental frequency component and the other compo-

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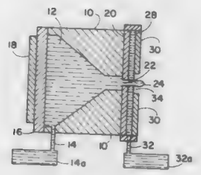
nent being a second harmonic component of the fundamental frequency component, the magnitude, phase, and frequency range of said components being selected such that they both grow on the ink streams, so that the combination of said two time-varying pressure components suppress or control the formation of satellites.

4,734,706

FILM-PROTECTED PRINT HEAD FOR AN INK JET PRINTER OR THE LIKE

Hue P. Le, Aloha, and James C. Oswald, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 10, 1986, Ser. No. 838,240
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 21 Claims



3. A printing device comprising:

a print head body defining a fluid chamber and an orifice in communication with the fluid chamber and opening in the direction of the external atmosphere,

a non-gaseous fluid in the fluid chamber,

a liquid membrane separating the orifice from the external atmosphere, the liquid of the membrane being substantially immiscible with the non-gaseous fluid, and

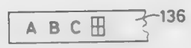
pressure means for ejecting the non-gaseous fluid from the fluid chamber through the orifice and through the liquid membrane.

4,734,707

RECORDER WITH DISPLAY INDICATING A SYMBOL FOR TEXT AND GRAPHICAL DATA

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 9, 1986, Ser. No. 849,821
Claims priority, application Japan, Apr. 13, 1985, 60-78791; Apr. 13, 1985, 60-78792
Int. Cl.[4] G01D *9/00*; G06F *15/626*; B41G *3/00*
U.S. Cl. 346—33 R 10 Claims



1. A recording apparatus capable of recording characters and graphical representations on a recording medium with a recording instrument, comprising:

an input device through which character data and graph data are entered;

display means for displaying said character data and said graph data entered through said input device;

memory means comprising a text memory for storing said character data, and a graph memory for storing said graph data;

a recording mechanism for effecting relative movements between said recording instrument and said recording medium, for recording said characters and said graphical representations on said recording medium with said recording instrument; and

control means for controlling said display means and said recording mechanism according to said character data and said graph data;

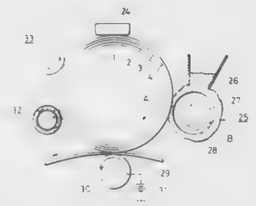
said control means being operable to store in said text memory a set of special symbol data indicative of storage of each set of said graph data in said graph memory corresponding to each one of said graphical representations, said control means being further operable to control said display means so as to display a special symbol represented by said special symbol data, together with said characters represented by said character data, said control means inhibiting said recording mechanism from recording said special symbol when said recording mechanism is activated to record said characters according to said character data.

4,734,708

MAGNETIC RECORDING MEDIUM AND MAGNETIC RECORDING METHOD

Koichi Saitoh; Teruhiko Itami; Toshifumi Kimoto, and Kiyoshi Horie, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 411,187, Aug. 25, 1982, Pat. No. 4,503,438. This application Sep. 23, 1983, Ser. No. 535,116
Claims priority, application Japan, Aug. 28, 1981, 56-134262
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[4] G01D *15/12*
U.S. Cl. 346—74.4 5 Claims



1. A magnetic recording medium comprising: a first magnetic layer having an uniform magnetization pattern therein, a non-magnetic intermediate layer, a second magnetic layer which can be thermally magnetized, and a base layer on which said three layers are formed in the stated order.

4,734,709

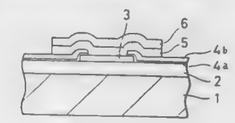
THERMAL HEAD AND METHOD FOR FABRICATING

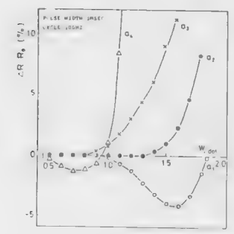
Kenichi Kobayashi, and Hiroshi Fujimagari, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Ebina, Japan

Filed Apr. 28, 1986, Ser. No. 856,387
Claims priority, application Japan, May 7, 1985, 60-96373
Int. Cl.[4] G01D *15/10*; H01C *1/012*; B05D *5/12*
U.S. Cl. 346—76 PH 5 Claims

1. A thermal head comprising an electrode pattern and a heating resistor film, for printing picture information by selectively supplying power to the heating resistor film so as to heat

said film according to said picture information, characterized in that said heating resistor film is made of tantalum nitride





(Ta_2N) a hexagonal close-packed lattice orientated in (101) direction.

4,734,710

THERMAL LABEL PRINTER

Yo Sato, Tokyo, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Apr. 18, 1986, Ser. No. 853,681
Claims priority, application Japan, Apr. 26, 1985, 60-89001; Apr. 26, 1985, 60-89002; Apr. 26, 1985, 60-89003
Int. Cl.[4] G01D *15/10*; B65C *9/18*; B41J *3/20*; G06K *19/00*
U.S. Cl. 346—76 PH 21 Claims



19. A portable printer for printing labels or the like, comprising:

means for advancing a printing medium through the printer thermal print head for printing information on the printing medium;

a mechanically adjustable connection means for enabling the printer to be detachably connected directly to a data terminal unit; and

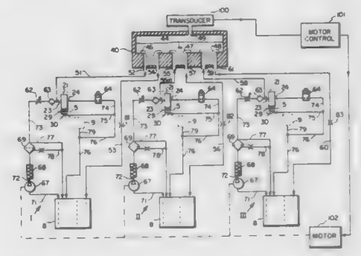
electrical connector means for providing a detachable and direct electrical connection between the printer and a data terminal unit and for transmitting through the electrical connector means printing information for the printer.

4,734,711

PRESSURE REGULATION SYSTEM FOR MULTI-HEAD INK JET PRINTING APPARATUS

Michael J. Piatt, Enon, and Kevin L. Houser, Kettering, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,265
Int. Cl.[4] G01D *15/18*; F04B *49/00*
U.S. Cl. 346—75 7 Claims



1. In continuous ink jet printing apparatus of the kind having a plurality of discrete ink circulation systems that respectively circulate different color inks for different ink jet print heads and in which each such circulation system includes: (i) an ink supply reservoir, (ii) a supply conduit extending from the system reservoir to the system print head and (iii) pump means for delivering ink through said supply conduit, an improved ink pressure regulation system comprising:

(a) a plurality of pressure regulation branch conduits each respectively extending from sites of their respective circulation system that are indicative of their system's print head pressure to a return for their systems's ink supply reservoir, each such branch conduit including along its passage, a flexible conduit portion that is highly pliant to pressure differentials thereacross;

(b) common pressure reservoir means including a substantially rigid housing confining detection fluid in common fluid communication with the exterior of all of the branch conduit flexible portions;

(c) a variable drive means commonly coupled to each system's pump means; and

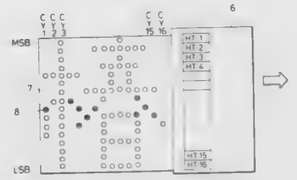
(d) detection and control means for regulating said common pump drive means in response to variations in the pressure of said detection fluid to maintain the pressure at each of said system sites at a common nominal pressure.

4,734,712

RECORDING APPARATUS

Shoji Kanemura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 704,931, Feb. 25, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 931,966
Claims priority, application Japan, Feb. 29, 1984, 59-35961
Int. Cl.[4] G01J *15/00*
U.S. Cl. 346—76 PH 11 Claims



1. An apparatus for recording one complete pattern by

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recording a combination of a plurality of partial patterns in at least one of an ordinary manner and an altered manner, comprising:

discriminating means for determining whether a partial pattern next to be recorded is located at a predetermined position relative to a partial pattern presently to be recorded; and

control means for recording said partial pattern presently to be recorded in the altered manner when it is determined by said discriminating means that the partial pattern next to be recorded is located at the predetermined position relative to said partial pattern presently to be recorded.

4,734,713

THERMAL PRINTER

Yo Sato, Tokyo, and Tsutomu Ono, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Apr. 18, 1986, Ser. No. 853,686
Claims priority, application Japan, Apr. 26, 1985, 60-89004
Int. Cl.⁴ G01D *15/10*; **B65C** *9/18*; **B41J** *3/20*; **G06K** *19/00*
U.S. Cl. 346—76 PH **13 Claims**



1. A device for tracking and marking packages or the like having information thereon, comprising:

a thermal printer for printing information on labels;

first input means for receiving said information contained on said packages;

memory means having a first portion for storing said information therein, a second portion having stored therein predetermined package information and predetermined corresponding package information, and a third portion;

control means connected to said thermal printer, said input means and said memory means, for producing an output signal when said information stored in said first portion of said memory means matches said predetermined information stored in said second portion of said memory means, and for controlling said thermal printer to print on said labels, said corresponding package information, in response to said output signal;

I/O port means connected to said control means and effective for communicating with an external computer for recording results of said comparisons of said information to said predetermined package information;

a print medium position detector means for detecting alignment holes disposed at predetermined positions relative to said labels to enable positioning of said labels in said thermal printer;

a print medium passage in said device and a print medium transport means connected to said print medium and to said control means for moving said print medium in response to the occurrence of printing on said labels; and

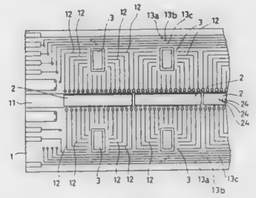
means for storing in said third portion of said memory means selected ones of said information contained on said packages for which matching data was not located in said first memory portion.

4,734,714

OPTICAL PRINT HEAD WITH LED DIODE ARRAY

Hiromi Takasu, and Shigeru Sakaguchi, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

PCT No. PCT/JP84/00462, § 371 Date Jun. 11, 1985, § 102(e) Date Jun. 11, 1985, PCT Pub. No. WO86/02045, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 27, 1984, Ser. No. 743,669
Int. Cl.⁴ G01D *9/42*
U.S. Cl. 346—107 R **8 Claims**



1. An optical printing head for an optical printer comprising:

(i) a plurality of light emitting diode arrays having a multiplicity of aligned light emitting areas arranged substantially in a line, with one feeding path for each of said light emitting areas being substantially commonly connected, and the other feeding path for said light emitting areas being divided into a plurality of m groups, where $m \geqq 2$, so that adjacent light emitting areas belong to groups different from each other,

(ii) means for storing printing data provided for the respective ones of said groups with respect to said other feeding path for light emitting areas of said plurality of light emitting diode arrays, including shift registers for transferring the printing data and driving means for supplying current to said light emitting areas by means of the data from said shift registers,

(iii) data distribution means coupled to said shift registers for distributing a series of printing data of one dot line via serial transfer at a predetermined speed in said shift registers for the respective ones of said groups, at a shifting speed of 1/m of said serial transfer speed, and

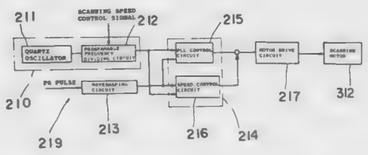
(iv) driving timing means for outputting data simultaneously for the respective ones of said means for storing data from said shift registers to said driving means, and driving said driving means in a static manner for the light emitting areas of one dot line to simultaneously and selectively emit light from said light emitting areas.

4,734,715

VARIABLE LIGHT BEAM SCANNING APPARATUS

Takashi Shiraishi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 14, 1986, Ser. No. 863,172
Claims priority, application Japan, May 31, 1985, 60-119074
Int. Cl.⁴ G01D *9/42*
U.S. Cl. 346—108 **5 Claims**



1. Light beam scanning apparatus in which light beams are modulated with image information signals and the modulated light beams are radiated onto a photosensitive body comprising:

a light source for producing light beams;

a first scanning means comprising a rotating mirror for causing the light beams produced by said light source to effect scanning at a first speed and in a first direction with respect to a photosensitive body;

a second scanning means for causing the light beams produced by said light source to effect scanning at a second speed and in a second direction which is perpendicular to said first direction;

an image formation means for forming an image constituted by continuous or discontinuous dots on said photosensitive body after scanning in said first and second directions; and

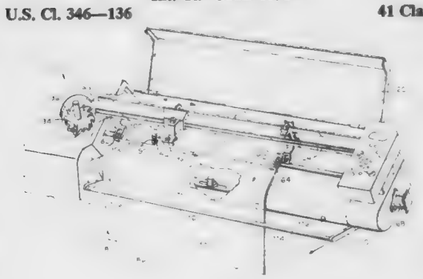
a speed control means for controlling the speed of the rotation of said rotating mirror and the light beam scanning in said first direction caused by said first scanning means in a manner such that the density of dots successively formed in said second direction is variable.

4,734,716

PLOTTER AND ALIGNING METHOD

Eric Silverberg; James A. Parnell, both of Austin; Marvin L. Freeman, Round Rock, and Robert A. Johnson, Georgetown, all of Tex., assignors to Ametek, Inc., Austin, Tex.

Filed Oct. 30, 1986, Ser. No. 925,067
Int. Cl.⁴ G01D *15/24*
U.S. Cl. 346—136 **41 Claims**



16. In plotter apparatus adapted to receive a signal comprising a frame, means for transporting a sheet through said frame along a first axis, and means for marking the sheet moving through said frame in accordance with the signal received, the improvement comprising system for accurately aligning a sheet with a first linear side parallel to the first axis comprising:

(a) as said transporting means, a horizontally spaced pair of sheet transport means adapted to be disposed adjacent opposite sides of the sheet for independently transporting the sheet sides both forwardly and rearwardly, both with both of said transport means transporting the sheet sides in the same direction at the same rate to transport the sheet forwardly or rearwardly and with a first one of said transport means transporting the first side of the sheet at a lesser rate than a second one of said transport means transports the second side of the sheet to swivel the sheet;

(b) means spaced a given distance X_1 from said first transport means for sensing the first side of the sheet disposed adjacent said first transport means; and

(c) means for aligning the first side of the sheet with said sensing means comprising

(i) means for aligning by use of said sensing means two points A and B narrowly spaced from each other by the distance X_1 along the first side of the sheet;

(ii) means for then aligning by use of said sensing means a fourth point D widely spaced from point B by the distance X_2 along the first side of the sheet; and

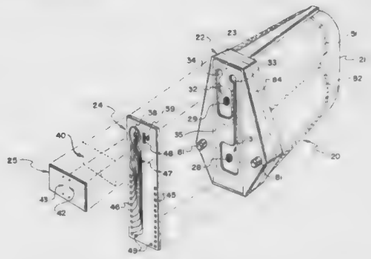
(iii) means for finally aligning by computation and without use of said sensing means a third point C intermedaite points B and D and narrowly spaced from point D by the distance X_1 along the first side of the sheet.

4,734,717

INSERTABLE, MULTI-ARRAY PRINT/CARTRIDGE

Wilson P. Rayfield, Centerville, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,135
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—140 R **10 Claims**



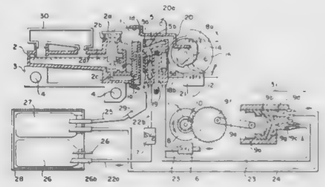
1. For use in ink jet printing apparatus, an insertable print-/cartridge having (i) ink reservoir means, (ii) at least two arrays of drop generating elements, (iii) a support for coupling said ink reservoir means and said drop generating arrays and (iv) an orifice plate comprising at least two orifice arrays aligned in spaced relation over respective drop generative arrays, said orifice plate: (a) being an integral element wherein said orifice arrays are precisely inter-located and (b) having an integral indexing surface located precisely with respect to said orifice arrays.

4,734,718

INK JET PRINTER NOZZLE CLOG PREVENTIVE APPARATUS

Fusao Iwagami, and Minoru Sakama, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 828,889, Feb. 13, 1986, abandoned. This application May 13, 1987, Ser. No. 48,963
Claims priority, application Japan, Feb. 13, 1985, 60-27397
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printer nozzle clog preventive apparatus comprising:

a carriage movable outside of a printing zone;

a printing head provided on the carriage, said printing head including at least one printing head nozzle being covered with a cap member when a printing operation is not being conducted, and said cap member being provided opposite said printing head nozzle on the carriage;

means for moving said cap member toward and away from said printing head nozzle, said means including a driving source;

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pump means, connected to the interior of said cap member, when said printing head nozzle is covered with said cap member whereby said negative pressure creates a vacuum state in said cap member;

maintenance solution supply means for supplying said interior of said cap member and said printing head nozzle with maintenance solution;

means for determining one of a plurality of modes of said printer, said plurality of modes including power ON, power OFF, and a nozzle recovery mode, wherein said nozzle printer in recovery mode discharges ink clogs from said printing head nozzle when said printer has remained ON but inoperative for a predetermined length of time;

control means, responsive to said means for determining, for controlling said means for moving, said pump means, and said maintenance solution supply means according to the current mode of the printer; and

instruction means for instructing a nozzle recovery operation in response to the determination of a nozzle recovery mode.

4,734,719

CAPPING DEVICE AND LIQUID INJECTION RECORDING APPARATUS

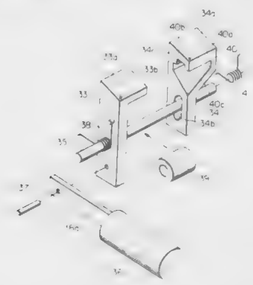
Tetsuo Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 690,942, Jan. 14, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 16,527

Claims priority, application Japan, Jan. 19, 1984, 59-6368

Int. Cl.[4] G01D *15/18;* **B65B** *7/28;* **B67B** *5/00*

U.S. Cl. 346—140 R **16 Claims**



1. A capping device comprising:

a cap movable between an open position spaced from a head of a liquid injection recording apparatus and a capping position in which said cap is moved toward the head for capping orifices in the head for discharging liquid,

moving means for cooperating with said cap and with pump means for discharging liquid through the orifices, said moving means being movable between a plurality of positions to move said cap between the open and capping positions thereof and to operate the pump means

first and second engaging members, each having an engaging portion adapted to be engaged with said moving means to restrict movement thereof, wherein moving said moving means to one of the positions thereof disengages said moving means and said second engaging member and

releasing means for moving at least said first engaging member to disengage said moving means and said first engaging member.

4,734,720

ELECTROSTATIC RECORDING APPARATUS WITH IMPROVED RECORDING ELECTRODE

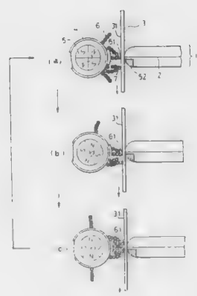
Akihiko Ishii, Tokyo; Mikio Amaya, Kawasaki; Junzo Nakajima, Yokohama, and Kunihiko Sato, Funabashi, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 17, 1986, Ser. No. 886,474

Claims priority, application Japan, Jul. 18, 1985, 60-156909; Sep. 25, 1985, 60-213125; Sep. 25, 1985, 60-213126; Sep. 25, 1985, 60-213127

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—155 **16 Claims**



1. An electrostatic recording apparatus comprising:

a recording electrode means and a back electrode means for applying image signals therebetween, wherein said recording electrode and said back electrode are positioned with a predetermined gap therebetween, and wherein said recording electrode has a molded body and stylus electrodes embedded therein;

a magnetic brush means positioned adjacent a side of said back electrode opposite from said recording electrode means and including a rotatable magnet roller having a plurality of alternate magnetic poles on a surface thereof and a fixed cylindrical sleeve spaced from and concentric with said magnet roller, said magnetic brush means transporting a magnetic toner on said back electrode means positioned adjacent said cylindrical sleeve;

a recording medium movable through said gap between said recording electrode means and said back electrode means, said recording medium moving through said gap in contact with said recording electrode means and said recording medium being subject to a discharge from said recording electrode means which imparts a charge on a surface of said recording medium corresponding to said image signal; and

a magnetic piece embedded in a tip portion of said recording electrode means, said magnetic piece influencing the magnetic flux paths originating from said magnetic roller and enhancing transfer of said magnetic toner from said back electrode means to said recording medium adjacent said tip of said recording electrode means regardless of the magnetic pole position of said magnetic roller relative to said tip of said recording electrode means.

4,734,721

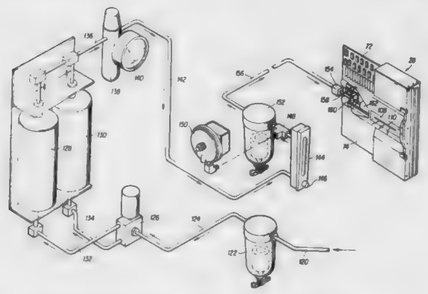
ELECTROSTATIC PRINTER UTILIZING DEHUMIDIFIED AIR

Alan H. Boyer, East Sullivan; Graham D. Walter, Peterborough, and Robert A. Moore, Amherst, all of N.H., assignors to Markem Corporation, Keene, N.H.

Filed Oct. 4, 1985, Ser. No. 784,506

Int. Cl.[4] G03G *15/00*

U.S. Cl. 346—159 **12 Claims**



1. An electrostatic print head system comprising:

(a) an ion modulated electrostatic print head,

(b) a means for supplying unheated dehumidified air having a relative humidity of less than about 20 percent at or near ambient temperature, and

(c) a means for directing the dehumidified air at, near or through the print head.

4,734,722

ION GENERATOR STRUCTURE

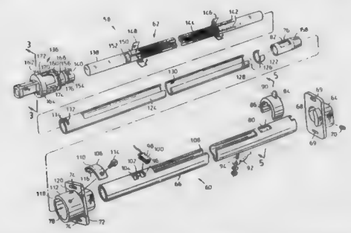
Anjrzej Maczuszenko, Etobicoke; Paul E. Plasschaert, Limehouse, and Ross Mair, Barrie, all of Canada, assignors to Delphax Systems, Mississauga, Canada

Filed Dec. 23, 1985, Ser. No. 812,210

Claims priority, application Canada, Dec. 24, 1984, 470987

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—159 **9 Claims**



1. A corona device for use in modifying an electrostatic charge on a dielectric receptor surface of a printer and the like, the corona device comprising:

a housing attached to the printer and having an elongated tube defining a first window facing said surface, an inner mounting supporting an inner end of the tube and a socket supporting the outer end of the tube, and location means;

an ion generator comprising an elongate support rod, a plurality of corona wires extending axially and spaced angularly about the rod, a protector encasing the rod and spaced radially from the corona wires, the protector defining a second window and being adapted to enter the tube through the socket with the said windows in registration and the tube and protector including means maintaining said registration, and an end piece attached to the end of the rod for moving the rod angularly and being coupled for relative angular movement to the protector; and

the end piece being engageable for rotation in the socket to permit the end piece to rotate the rod to bring a selected one of the corona wires into alignment with the windows for energizing to modify the said electrostatic charge on the dielectric receptor surface.

4,734,723

ELECTROPHOTOGRAHIC PRINTER

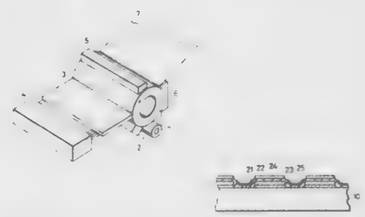
Yoshimitsu Ishitobi, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Jun. 16, 1986, Ser. No. 874,850

Claims priority, application Japan, Jun. 14, 1985, 60-129432

Int. Cl.[4] G01D *15/06, 15/10*

U.S. Cl. 346—160 **8 Claims**



1. An electrophotographic printer comprising:

a photoreceptor;

a charging device positioned adjacent said photoreceptor for charging the same;

a developing device positioned adjacent said photoreceptor for forming a toner density pattern on a charged area thereof;

a transfer device positioned adjacent said photoreceptor for transferring a toner image therefrom onto a sheet of paper;

an optical head, positioned adjacent said photoreceptor and including a substrate;

a light-emitting means for emitting light arranged along one edge portion of the substrate, said light-emitting means comprising an array of electro-luminescent devices, said electro-luminescent devices comprising a first metal electrode layer formed on said substrate, an electro-luminescent material layer formed on said first electrode layer, an electrical insulating layer formed on said electro-luminescent material layer, and a second metal electrode layer formed on said electrical insulating layer; and

a light transmitting means for transmitting light emitted from said emitting means to said photoreceptor; said transmitting means comprising an array of light wave guide strips.

4,734,724

METHOD AND ARRANGEMENT FOR THE AUTOMATIC CONTROL OF AERIAL PHOTOGRAPHIC CAMERAS

Thomas Braunschweig, Jena; Bernard Beck, and Norbert Diete, both of Jena-Lobeda, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Aug. 22, 1986, Ser. No. 899,194

Claims priority, application German Democratic Rep., Oct. 2, 1985, 2813245

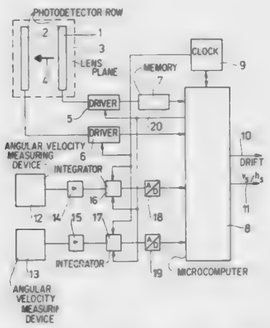
Int. Cl.[4] G03B *39/00*

U.S. Cl. 354—66 **8 Claims**

1. In the method for the automatic control of aerial photography cameras, in which the displacement of a terrain image on a projected area is determined by comparing the image data from two photodetector rows disposed on a projected area essentially perpendicularly to the direction of motion of the terrain image, storing the image data of the row lying in front

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in the direction of motion of the terrain image temporarily and comparing it in a time-slot pattern with the image data of the second photodetector row and deterimining the ratio v_g/h_g from the time determined for the shift of identical picture structures from the first to the second row and determining the drift from the shift along the direction of the rows and converting these values into control data for the aerial camera, the



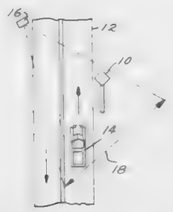
improvement wherein essentially in the identical time-slot pattern, determining at least the magnitude of the tilt (ω) of the aircraft about its longitudinal axis, calculating the corresponding shift of the image of the picture structure from the magnitude of this tilt (ω) and taking into consideration the shift caused by the tilt (ω) in the comparison of the image data of the two rows.

4,734,725

APPARATUS FOR PHOTOGRAPHING OBJECTS AND/OR PERSONS SIMULTANEOUSLY WITH THE OCCURRENCE OF A PREDETERMINED EVENT

John C. A. Bierman, 4304 Garfield St., Anchorage, Ak. 99503

Filed Dec. 11, 1986, Ser. No. 940,748
Int. Cl.[4] G03B *15/00, 17/38;* **G08G** *1/00;* **E01F** *9/00*
U.S. Cl. 354—76 **7 Claims**



1. Apparatus for photographing persons when they shoot traffic signs along highways, said apparatus comprising:

means in operative relationship with said traffic sign for detecting the impact of a bullet against said sign;

transmitting means in operative relationship with said detecting means for transmitting an encoded radiofrequency signal into the air for a first predetermined time period in response to activation of said detecting means by impact of a bullet against said sign;

receiver means remotely positioned from said transmitting means for receiving said radiofrequency signal from said transmitting means and for providing a first resultant encoded electrical output signal;

means in operative relationship with said receiver means for decoding said encoded output signal and for providing a second resultant electrical output signal; and

a camera positioned to enable photographing of said persons and vehicles within a predetermined area adjacent to said traffic sign and in operative relationship with said receiver means and with said decoding means for enabling operation of said camera for said first predetermined time period in response to said second resultant electrical output signal;

said transmitting means including:

timer means in operative relationship with said detecting means for providing a third electrical output signal during said first predetermined time period in response to activation of said detecting means by impact of a bullet against said sign;

encoding menas in operative relationship with said timer means for receiving said third output signal and for providing a fourth resultant encoded electrical output signal; and

oscillator-transmitter means in operative relationship with said encoding means for receiving said fourth encoded output signal and for transmitting said resultant encoded radiofrequency signal into the air; and

said detecting means including:

a first electrically conducting substantially flat sign number;

a second electrically conducting substantially flat sign member which carries the message of said traffic sign;

a plurality of electrically insulating connectors between said sign members and connecting together said sign members;

an electrically insulating spacer element mounted on each of said connectors and positioned between said first and second sign members for normally maintaining said sign members in predetermined spaced apart relationship with respect to each other;

a first electrically conducting element in contact with said first sign member and in electrical circuit relationship with said transmitting means; and

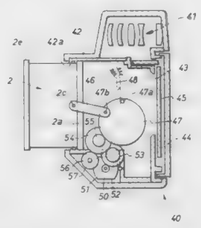
a second electrically conducting element in contact with said second sign member and in electrical circuit relationship with said transmitting means.

4,734,726

APPARATUS FOR MOVING A LENS

Akira Takahashi, Kawasaki; Saburo Sasaki, Tokyo; Koichi Nishi, Yokohama, and Shinichiro Koshiishi, Hachioji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 38,980
Claims priority, application Japan, Apr. 21, 1986, 61-58822[U]
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—195.1 **1 Claim**



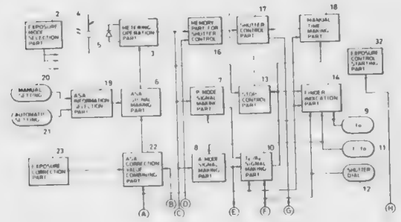
1. An apparatus for moving a lens between first and second positions, comprising; a support member means for supporting said lens, an electric motor connected to said support member means for moving said support member, a control circuit means connected to said motor for suppling a first current to said motor to move said support member means from said first position to said second position and vice versa and a second current to said motor to hold said support member means at least one of said first position and second position, said second current being smaller than said first current.

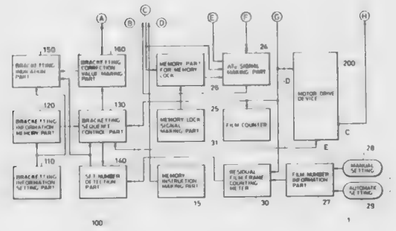
4,734,727

BRACKETING EXPOSURE CONTROL CAMERA

Mikio Takemae, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,732
Claims priority, application Japan, Dec. 21, 1984, 59-270050
Int. Cl.[4] G03B *7/00, 1/66*
U.S. Cl. 354—412 **8 Claims**





1. A bracketing exposure control camera having exposure means for controlling an exposure operation of each of a plurality of film frames and exposure correction means for causing said exposure means to perform exposure operations of respective frames at different exposure values, comprising:

driving means for winding said film after said exposure means is operated and for operating said exposure means after a winding operation, thereby alternately performing an exposure operation and a widning operation;

frame number setting means for setting a given number of exposure frames;

control means for operating said exposure correction means and controlling said driving means so that said exposure means performs exposure operations corresponding to said given number of exposure frames set by said frame number setting means;

means for producing a frame signal indicative of a number of unexposed film frames; and

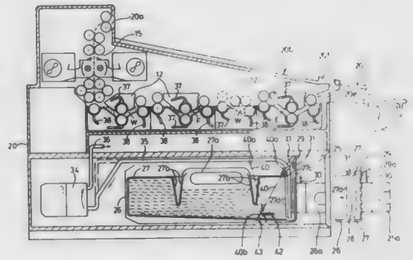
detection means responsive to said frame signal for detecting that the number of exposure frames set by said frame number setting means is larger than the number of unexposed frames and for producing a detection signal.

4,734,728

APPARATUS FOR PROCESSING SHEET FILMS

Jürgen Müller, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,378
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609526
Int. Cl.[4] G03D *3/06*
U.S. Cl. 354—324 **17 Claims**



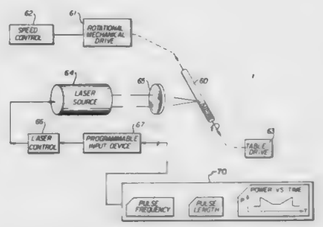
1. An apparatus for processing of sheet films, comprising developing means for developing sheet films and provided with a plurality of chambers through which the sheet films are movable; pumping means for pumping a processing material; means forming at least one drawer receiving compartment; at least one drawer provided with a plurality of containers for liquids required by said developing means and formed so that upon insertion of said drawer into said receiving compartment a communication is established between said pumping means and a respective one of said containers.

4,734,729

STUDDED SQUEEGEE ROLLER

Gerald T. Hertzel; Gerald F. Pickens, and Matthew J. Visbaras, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1985, Ser. No. 762,898
Int. Cl.[4] G03D *9/02*
U.S. Cl. 354—304 **22 Claims**



1. For use in an apparatus for spreading a fluid composition between adjacent sheets or layers, a squeegee roller which includes a circumferential surface upon which is formed a texture; a plurality of discrete substantially incompressible stud-like bumps on the roller to provide the texture and subsurface voids located beneath the bumps; and wherein the average height of bumps located upon one diametral section of the roller surface is substantially different from the average height of bumps located upon another diametral section of the roller surface so as to provide different effective roller diameters for such sections, and further wherein the average bump heights of the diametral sections gradually decrease to form a taper in the effective diameters of the roller.

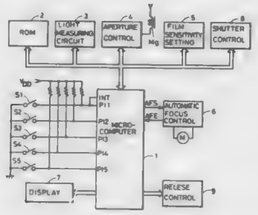
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4,734,730

AUTOMATIC FOCUS DETECTING CAMERA

Hiroshi Ootsuka, Sakai; Nobuyuki Taniguchi, Nishinomiya, and Akihiko Fujino, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1986, Ser. No. 906,829
Claims priority, application Japan, Sep. 17, 1985, 60-204994; Sep. 30, 1985, 60-218767
Int. Cl.[4] G03B *3/00, 7/00, 17/38*
U.S. Cl. 354—402 18 Claims



1. An automatic focus detecting camera comprising:

detecting means for detecting a focusing condition of an objective lens mounted on said camera by receiving light transmitted through said objective lens;

aperture determining means for determining a first aperture value of said objective lens to produce a first aperture signal indicative of said first determined aperture value;

first stopping-down means, including a first operating member operable manually, for stopping down an aperture diaphragm of said objective lens to a diameter corresponding to said first aperture signal in response to an operation of said first operating member for a photographing operation of said camera;

operating means, including a second operating member operable manually, for producing an operating signal when said second operating member is operated;

second aperture signal producing means for producing a second aperture signal indicative of a second predetermined aperture value;

second stopping-down means for stopping down the aperture diaphragm of said objective lens to a diameter corresponding to said first aperture signal in response to said operating signal prior to said photographing operation;

comparison means for comparing said first aperture signal with said second aperture signal to produce a comparison signal indicative of the compared result; and

controlling means for controlling operation of said detecting means in accordance with said comparison signal so that the operation of said detecting means is limited when said first aperture value is larger than said second aperture value and that the operation of said detecting means is free from the limitation when said first aperture value is equal to and smaller than said second aperture value.

4,734,731

FILMSPEED-CORRECTED DIGITAL EXPOSURE CONTROL SYSTEM FOR ELECTRONIC CAMERAS

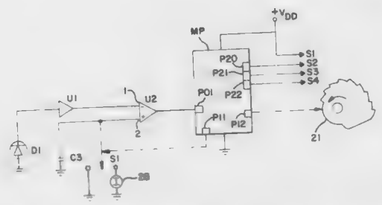
John Logeman, Park Ridge, Ill., assignor to W. Haking Enterprises Limited, North Point, Hong Kong

Filed Feb. 5, 1987, Ser. No. 6,149
Int. Cl.[4] G03B *7/091*
U.S. Cl. 354—410 7 Claims

1. In an electrically controlled camera having scene-sensing photosensing means for providing an analogue signal indicative of the level of scene illumination, filmspeed entry means for providing an electrical signal condition indicative of filmspeed, conversion means responsively coupled to said photosensing means and said filmspeed entry means for providing a digital representation of the product of filmspeed and scene illumination, memory means for storing said product, and exposure control means for adjusting exposure according to said stored product, the improvement comprising:

timing means responsive to said analogue signal and actuatable to an active condition at a initial time for producing at the output thereof a unique signal condition after an interval of time, said timing means including means for causing said interval to vary according to the sensed level of scene illumination;

interrogating means responsive to said filmspeed-indicating electrical signal condition and coupled to the output of said timing means for periodically momentarily interrogating the status of said output at a rate governed by said filmspeed-indicating electrical signal condition, said interrogating means including means for storing in said memory means a digital representation of the number of such interrogations as a successively incremented count, said interrogation means including means responsive to an interrogation detecting the presence of said unique signal condition for terminating further incrementation of said count, so that the value of said stored count is a representation of said product of scene illumination level and filmspeed.



4,734,732

FILM TRANSPORTATION DEVICE FOR CAMERA

Tetsuya Nishio; Tsunemasa Ohara, both of Tokyo, and Ryuichi Kobayashi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1987, Ser. No. 41,078
Claims priority, application Japan, Apr. 25, 1986, 61-96174; May 1, 1986, 61-99364; Jun. 16, 1986, 61-139627; Jul. 1, 1986, 61-152608
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.11 11 Claims



1. A film transportation device for a camera having an electric motor as the drive source for advancing the film, in which for each frame of film to be advanced there is provided a speed control period for, while giving a driving power to the motor, controlling its speed, and a braking period that follows, comprising:

(a) voltage checking means for seeking a voltage information of an electrical power source for driving the motor; and

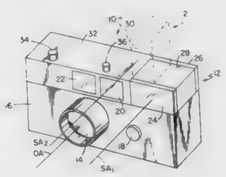
(b) control means for controlling the effective voltage given to the motor in said speed control period on the basis of the voltage information sought by said voltage checking means, said control means increasing said effective voltage when said voltage information represents a lower voltage.

4,734,733

CAMERA WITH TWO POSITION STROBE

Roger C. Clapp, Wellesley, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 21, 1987, Ser. No. 98,981
Int. Cl.[4] G03B *15/03*
U.S. Cl. 354—414 18 Claims



1. A photographic camera comprising:

a housing;

an objective lens mounted in a wall of said housing for directing image-bearing light toward a film unit supported at a focal plane within said housing, said objective lens having an optical axis which defines a first axis;

means for initiating a photographic exposure cycle;

means for measuring the intensity of ambient light reflected from a scene; and

a source of artificial illumination having a second axis along which artificial illumination is directed toward the scene to be photographed subsequent to actuation of said initiating means, said source being mounted for automatic movement from a first position, wherein said first and second axes are relatively close, for illuminating the scene when said measuring means records an ambient light level being reflected from the scene which exceeds a predetermined value, to a second position, in which the distance between said first and second axes is greater than in said first position, for illuminating the scene when said measuring means records an ambient light level being reflected from the scene which is less than said predetermined value, the intensity of the illumination being directed toward the scene being greater in said second position than in said first position.

4,734,734

IMAGE FORMING APPARATUS AND ERASURE ILLUMINATION DEVICE THEREFOR

Hideaki Yano, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

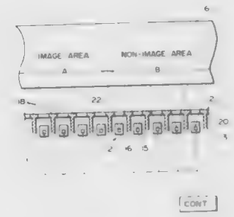
Filed Jan. 28, 1986, Ser. No. 823,290
Claims priority, application Japan, Feb. 1, 1985, 60-018094; Feb. 1, 1985, 60-018095; Feb. 1, 1985, 60-018096
Int. Cl.[4] G03G *15/00, 15/04*
U.S. Cl. 355—3 R 27 Claims

1. An illumination device for illuminating an image bearing member, comprising:

a plurality of LED elements arranged substantially along a line extending in use in a direction crossing with a direction of movement of the image bearing member;

light blocking means provided for and corresponding to each of said LED elements and having substantially rectangular apertures, each of which is associated with a corresponding LED element and each of which allows light from its associated LED element to pass to the image bearing member to illuminate it with a substantially rectangular illumination area; and

a plurality of lens means opposed to said apertures, wherein a distance a from a light emitting chip of said LED element and said aperture, a length b of a diagonal line of the aperture, a distance c from the light emitting chip of said LED elements to said lens means and a maximum diameter d of the lens means satisfy:



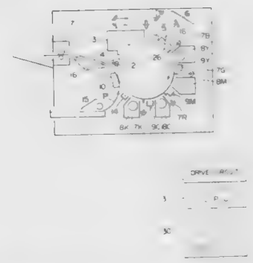
$d \geqq bc/a.$

4,734,735

IMAGE APPARATUS HAVING A COLOR SEPARATION FUNCTION

Satoshi Haneda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1986, Ser. No. 897,730
Claims priority, application Japan, Aug. 23, 1985, 60-186435; Aug. 30, 1985, 60-192391; Aug. 30, 1985, 60-192393
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 8 Claims



1. An image forming apparatus comprising image exposure means, whole surface exposure means by light of specific colors, and developing means, wherein each of said means is disposed opposite to a photosensitive member having a surface insulating layer and having a color separation function, and wherein a particular color in an original image is converted into another color by combination of said whole surface exposure and development.

4,734,736

RECIRCULATING DOCUMENT FEEDER

Kent A. Randall, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,650
Int. Cl.[4] G03G *21/00;* B65H *5/22*
U.S. Cl. 355—14 SH 8 Claims

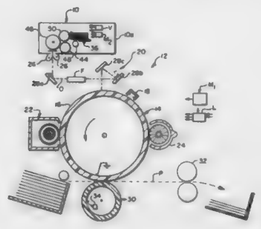
1. A document feeder for recirculating simplex or duplex document sheets in a sheet stack to and from a scanning station of a reproduction apparatus of the type including a donor member for producing simplex copies of simplex document sheets, duplex copies of simplex document sheets, duplex copies of simplex document sheets, or duplex copies of duplex document sheets, said document feeder comprising:

means for holding a stack of document sheets;

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a first rotatably mounted cylinder located in spaced relation to said stack holding means and in juxtaposition with said scanning station, said cylinder including means for selectively tacking a document sheet to the peripheral surface thereof;

second and third rotatably mounted cylinders, located between said stack holding means and said first cylinder in substantial nip relation with said first cylinder and with one another, said second and third cylinders respectively including means for selectively tacking a document sheet to the peripheral surface thereof;



means for bidirectionally rotating said first, second and third cylinders;

means for transporting a document sheet from said stack holding means into the nip between said second and third cylinder; and

control means, operatively associated with said bidirectional rotating means, said transporting means, and said tacking means for effecting transport of simplex of duplex document sheets seriatem from said stack holding means past said scanning station and back to said stack holding means in proper orientation and direction of transport to enable the desired production of simplex or duplex copies.

4,734,737

CONTROL OF TONER CONCENTRATION IN A DEVELOPER

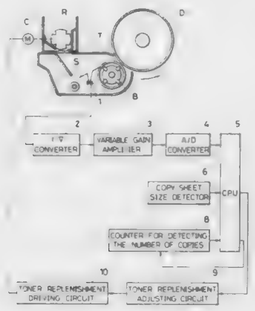
Yasushi Koichi, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,922

Claims priority, application Japan, Jun. 18, 1984, 59-124872

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—14 D **11 Claims**



6. A system for controlling the toner concentration of a developer comprised of toner and carrier for use in developing an electrostatic latent image, comprising:

first storing means for storing therein a quantity of said developer for use in developing said latent image;

second storing means for storing therein a quantity of said toner to be supplied to said first storing means;

regulating means interposed between said first and second storing means for regulating the flow of said toner from said second storing means to said first storing means;

detecting means for detecting a current toner concentration of said developer; and

means for setting a timing of a next toner concentration detecting operation by said detecting means in accordance with a degree of deviation of a current toner concentration level detected by said detecting means from a predetermined reference level.

4,734,738

COPYING APPARATUS

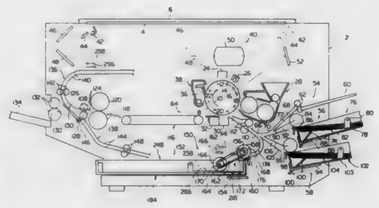
Toshio Yamanaka, Yao, and Yasuji Sumida, Kita Katsuragi, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 23, 1986, Ser. No. 854,838

Claims priority, application Japan, Apr. 28, 1985, 60-91711; Apr. 29, 1985, 60-92000; Apr. 30, 1985, 60-94082

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 SH **30 Claims**



1. In a copying apparatus comprising a housing, a photosensitive member disposed within the housing, an image-forming means for forming an image on the photosensitive member, a copying paper conveying passage defined within the housing and extending through a transfer zone where the image formed on the photosensitive member is transferred to a copying paper sheet, a copying paper feed means for feeding a copying paper sheet to the upstream end of the paper conveying passage, a copying paper returning passage defined within the housing, a conveyance control means adapted to be selectively held at a first position for discharging the paper sheet conveyed through the paper conveying passage out of the housing and a second position for conducting the paper sheet to the paper returning passage, and a copying paper receiving and delivering means capable of receiving the paper sheet returned through the paper returning passage and delivering it to the upstream end of the paper conveying passage, the improvement of means for enabling said copying paper receiving and delivery means to be employed, when said copying apparatus is in a mode of operation for forming an image on only one surface of a copying paper sheet and said conveyance control means is maintained in said first position thereof blocking passage of the paper sheets to said paper returning passage, as an alternative source of copying paper sheets, separate from said copying paper feed means, for feeding copying paper sheets to said upstream end of said paper conveying passage, said enabling means including a construction of said copying paper receiving and delivering means comprising:

a paper receiving stand supporting means positioned within said housing;

a copying paper receiving stand constructed to be manually loaded with copying paper sheets and to be selectively manually detachable insertable into and removable from said supporting means at a position with respect thereto to enable delivery to said upstream end of said paper conveying passage of the manually loaded copy paper sheets; and

said copying paper receiving stand further having means for, when said copying paper receiving stand is in said position and when said copying apparatus is in a mode of operation for forming images on both surfaces of a copying paper sheet fed from said copying paper feed means, receiving paper sheets returned through said paper returning passage such that the thus received paper sheets may be delivered therefrom to said upstream end of said paper conveying passage.

4,734,739

IMAGE FORMING APPARATUS WITH FUNCTION PERMITTING KEY ENTRY DURING WAITING TIME

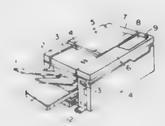
Tsuneki Inuzuka, Machida; Koichi Murakami, Tokyo; Kenji Kurita, Mitaka, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

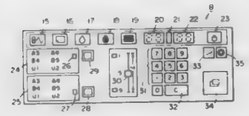
Continuation of Ser. No. 483,189, Apr. 8, 1983, which is a division of Ser. No. 329,017, Dec. 9, 1981, which is a division of Ser. No. 68,483, Aug. 21, 1979. This application Jul. 3, 1984, Ser. No. 627,723

Claims priority, application Japan, Aug. 24, 1978, 53-103044; Aug. 24, 1978, 53-103048; Aug. 24, 1978, 53-103050; Aug. 31, 1978, 53-106736; Sep. 1, 1978, 53-107094

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**





1. Image forming apparatus comprising:

number input means for inputting the desired number of image formations;

first display means for indicating the set number

second display means for indicating a ready condition in which the apparatus is ready to perform an image forming operation;

starter means for commanding a start of the image forming operation;

timer means for controlling the first display means to automatically return the set number to one if the starter means fails to command the start of an image forming operation during a predetermined period of time after the number is set by the number input means; and

control means for controlling the number input means to permit the number input means to set the number of image formations even during a period for which the apparatus stands ready to perform the image forming operation,

wherein said control means controls the timer means to actuate the timer after the ready condition is indicated.

4,734,740

IMAGE FORMATION METHOD AND APPARATUS

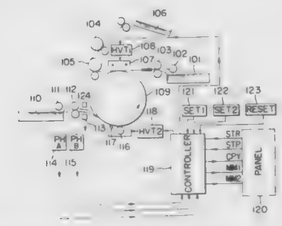
Motoharu Fujii, Tokyo; Takao Muramatsu, Yokohama; Noboru Koumura, Tokyo; Susumu Sugiura, Yamato; Nobuhiro Takekawa, Tokyo, and Syusei Tsukada, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 542,074, Oct. 14, 1983, abandoned, which is a continuation of Ser. No. 296,324, Aug. 26, 1981, abandoned, which is a continuation of Ser. No. 63,430, Aug. 3, 1979, abandoned, which is a continuation of Ser. No. 760,257, Jan. 18, 1977, abandoned. This application Apr. 28, 1986, Ser. No. 858,082

Claims priority, application Japan, Jan. 26, 1976, 51-7749

Int. Cl.[4] G03G *15/06, 15/22, 21/00*

U.S. Cl. 355—14 R **31 Claims**



1. An image formation apparatus comprising:

an electrostatically chargeable member having an optical density which changes with change of its reproducing power;

charging means for forming an electrostatic latent image on said chargeable member;

developing means for developing said electrostatic latent image into a visual image;

transferring means for transferring the visual image onto a recording member;

means for detecting the optical density before said chargeable member is charged by said charging means; and

means for controlling at least one of said charging means, developing means and transferring means in accordance with an output of said detecting means.

4,734,741

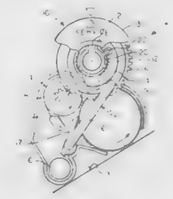
PARTICULATE MATERIAL CLEANING APPARATUS

Paul M. Hanner, Rochester, and Gary B. Bertram, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 13, 1987, Ser. No. 85,664

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **20 Claims**



14. Cleaning apparatus for cleaning toner off a moving surface, said apparatus being of the type including brush means for moving particulate cleaning material through an endless path which path includes cleaning relationship with said moving surface;

characterized by a particulate cleaning material replacement device including:

means for receiving a container containing particulate clean-

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ing material and having an opening, said means being rotatable between a first position in which said container opening is generally up and a second position in which said opeing is in metering relation with said brush means; and

means for rotating said container receiving means from said first to said second positions in response to operation of said apparatus.

19. Cleaning apparatus for cleaning toner off a moving surface, said apparatus being of the type including brush means for moving particulate cleaning material through an endless path which path includes cleaning relationship with said moving surface;

characterized by a particulate cleaning material replacement device including:

means for receiving a container containing particulate cleaning material;

means for changing said container from a condition permitting replacement of the container to a condition permitting emptying of particulate material from said container to said brush means; and

skive strippig means movable into and out of stripping relation with said brush means in response to change of conditions of a received container to automatically remove old particulate material from said brush means when adding new material.

4,734,742

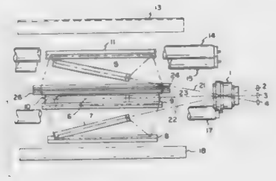
DUPLEX SCANNER

Robert C. Klumpp, Holcomb; Frederick B. Messbauer, Rochester, and Donald C. Buch, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1986, Ser. No. 933,663

Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—23 **7 Claims**



1. A duplex scanner having:

a lens;

first and second exposure stations positioned to receive a document with the stations facing opposite sides of a document so received;

means for directing light from one side of a received document at the first station along a first optical path through said lens to a first electrooptical sensor in an image plane of the lens, and for directing light from the other side of the document at the second station along a second optical path through said lens to a second electrooptical sensor in an image plane of the lens, said electrooptical sensors being of the type having separately electronically addressable image sensing picture elements; and

means for effecting relative movement between the light directing means and a received document.

4,734,743

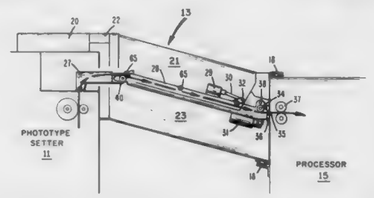
LIGHT TIGHT SLIDABLE TRANSPORT FOR TRANSFERRING LIGHT SENSITIVE MATERIALS

Edward G. Gregory, Sr., Reston, Va., assignor to LogEtronics, Inc., Springfield, Va.

Filed Apr. 15, 1987, Ser. No. 38,373

Int. Cl.[4] G03B *27/30, 27/32, 27/52*

U.S. Cl. 355—27 **4 Claims**



1. In a system for processing photographic images, wherein light-sensitive photographic materials are selectively exposed to form an image, and said exposed materials are processed to form a print of said image, an apparatus for conveying said exposed materials in a light tight environment to a photographic material processor comprising:

a shroud member having a bottom, top and first and second open ends, said shroud member supported at one of said open ends to said processor for linear movement parallel to the axis of a photographic material receiving slot;

a material transporter having a material receiving end disposed to receive said exposed photographic materials, and a delivery end to convey said materials to a receiving slot of said print processor said transporter delivery end supported in said shroud for pivotal movement about an axis adjacent said processor, whereby said material transporter delivery end may be tilted from a material delivery position away from said slot when said shroud top is removed; and

a gasket member disposed about said material transporter delivery end, connected to tilt with said transporter, said gasket member being compressed against the periphery of said material receiving slot when said transporter is in said delivery position and said gasket being tilted away from said slot when said transporter is in said service position, permitting said shroud and transporter to be slid away from said material receiving slot.

4,734,744

JAM DETECTOR FOR INTERMEDIATE TRAY OF A COPYING MACHINE

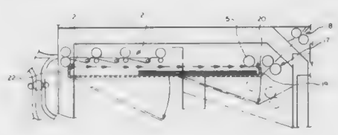
Kazushi Yamamoto, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1987, Ser. No. 13,909

Claims priority, application Japan, Feb. 20, 1986, 61-36038

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 SH **8 Claims**



1. In a copying machine having an intermediate tray for temporarily supporting copy paper after one side thereof has been subjected to image transferring proces until said paper is transported again to a paper feeding section of said copying machine, the improvement wherein said coping machine further comprises a jam detector with an optical system adapted to pass a light beam along the entire length of said intermediate tray in the direction of motion of said copy paper.

4,734,745

METHOD FOR PROJECTING AND EXPOSING A PHOTOMASK PATTERN ONTO RE-EXPOSING SUBSTRATES AND ITS APPARATUS

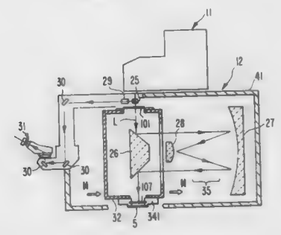
Kazutoshi Ohta, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1986, Ser. No. 839,538

Claims priority, application Japan, Mar. 27, 1985, 60-062444

Int. Cl.[4] G03B *27/52, 27/70*

U.S. Cl. 355—45 **3 Claims**



1. An apparatus for projecting an optical image of a photomask pattern of a master mask onto and thereby exposing a re-exposing substrate and using, for alignment purposes, first positioning markers marked on said master mask and second positioning markers marked on said master mask and second positioning markers marked on a standard marker substrate, said first positioning markers being arranged with a predetermined pitch on said master mask in association with said photomask pattern and said second positioning markers being arranged with the same predetermined pitch, said apparatus comprising:

a frame;

light beam emitting means secured to said frame and emitting a light beam along a predetermined direction;

optical condensing mean having an optical axis and secured to said frame with the optical axis in alignment with the predetermined direction of, and to receive, the light beam;

a carriage;

means for mounting said carriage for movement relatively to said frame and for mounting to said carriage, for common movement therewith, said master mask, said re-exposing substrate, and said standard marker substrate, said master mask and said standard marker substrate being positioned at the conjugate planes of the optical condensing means and said standard marker substrate being positioned in close proximity to said re-exposing substrate and intermediate said optical condensing means and said re-exposing substrate;

said mounting means further comprising means for aligning said carriage for movement in a direction perpendicular to the predetermined direction of the light beam and of the corresponding optical axis of said optical condensing means and for aligning said master mask and said re-exposing substrate to be perpendicular to the light beam and the corresponding optical axis of the optical condensing means during movement of said carriage and of said master mask and said re-exposing substrate therewith and for aligning said standard marker substrate with said re-exposing substrate;

means for moving said carriage to cause scanning of said master mask and of said standard marker substrate for projecting an optical image of the photomask pattern of said master mask onto said re-exposing substrate, for exposing same, and for projecting an optical image of the first positioning markers of said master mask and a shadow image of said second positioning markers of said standard marker substrate on said re-exposing substrate; and

alignment scope means secured to said frame for observing, by reflected light, the images of the first and second positioning markers projected on said re-exposing substrate, during the aforesaid optical scanning, for inspecting the alignment and for monitoring the minimization of deviation between the first and second positioning markers during adjustment of the alignment by said means for aligning.

4,734,746

EXPOSURE METHOD AND SYSTEM FOR PHOTOLITHOGRAPHY

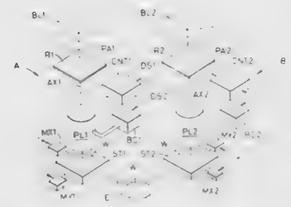
Kazuo Ushida, Tokyo; Satoru Anzai, Zama; Kazuaki Suzuki; Toshio Matsuura, both of Tokyo; Kyoichi Suwa, Yokohama, and Koichi Matsumoto, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 876,485, Jun. 20, 1986, abandoned. This application May 12, 1987, Ser. No. 51,236

Claims priority, application Japan, Jun. 24, 1985, 60-137629; Jul. 3, 1985, 60-146340; Jul. 24, 1985, 60-163489

Int. Cl.[4] G03B *27/32, 27/42*

U.S. Cl. 355—53 **19 Claims**



1. An exposure method for photolithography comprising the steps of:

(a) forming a first pattern on a substrate by the use of a first exposure apparatus including a first imaging optical system having a reduction magnification $1/\beta 1$ and an image circle of a diameter $\phi 1$; and

(b) forming a second pattern on said substrate on which said first pattern has been formed, by the use of a second exposure apparatus including a second imaging optical system having a reduction magnification $1/\beta 2$ different from said reduction magnification $1/\beta 1$ and an image circle of a diameter $\phi 2$, wherein when N is an integer, the conditions that $\beta 1 \times \phi 1 = \beta 2 \times \phi 2$ and $\phi 1 = N \times \phi 2$ are satisfied.

4,734,747

COPYING MACHINE WITH A COPY PAPER DETECTION DEVICE

Masakiyo Okuda, Kashiwara; Kazuyuki Ohnishi, Nara; Shoichiro Yoshiura, Yamatokoriyama; Kimihito Yamasaki, Ikoma, and Haruyoshi Ikeda, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1985, Ser. No. 812,927

Claims priority, application Japan, Dec. 27, 1984, 59-276565; Dec. 27, 1984, 59-276577

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH **4 Claims**

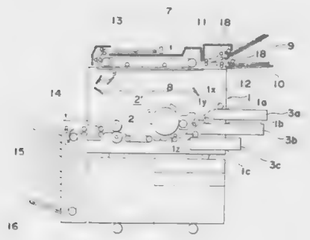
1. A copying machine comprising:

copy process means for making at least one copy of an original put on an original platform on at least one copy paper sheet;

original transferring means attached to the copying machine for automatically transferring at least one original to be copied to the original platform;

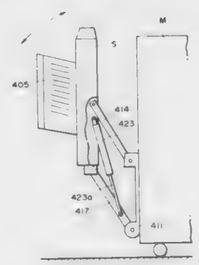
VOL 1088 ISS 5 MR 29 1988 UMI

means for reserving the number of copy paper sheets corresponding to the number of originals to be copied;
paper storing means for storing a number of copy paper sheets;
means for detachably receiving said paper storing means on said copying machine;
means for feeding each one of said plurality of copy paper sheets from said paper storing means to said copy process means;
means for detecting the number of copy paper sheets present in said paper storing means, said means for detecting the number of copy paper sheets present in said paper storing means including a plurality of light receiving elements in a vertical arrangement within said paper storing means and at least one light emitting element in an opposing



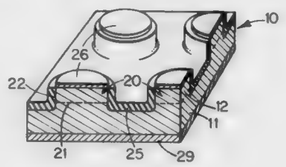
relationship to said plurality of light receiving elements, the number of copy paper sheets present in said paper storing means being determined by counting the number of said light receiving elements which receive light;
means for designating the number of originals to be copied;
means for determining whether or not the number of copy paper sheets present in said paper storing means exceeds the total number of copies to be made for each original designated by said means for designating within a predetermined length of time after said paper storing means is set in the copying machine and prior to feeding the copy paper sheets to the paper process means; and
means for warning an operator that the total number of originals to be copied is greater than the number of copy paper sheets present in said paper storing means.

4,734,748
AUXILIARY MACHINE SUPPORTING STRUCTURE FOR IMAGE FORMING APPARATUS
Toshiaki Murayama, Tokyo, and Kazumi Umezawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 18, 1987, Ser. No. 27,307
Claims priority, application Japan, Mar. 20, 1986, 61-63455; Mar. 28, 1986, 61-70173; Mar. 28, 1986, 61-70174; Jun. 9, 1986, 61-133560
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH **18 Claims**



1. A device for separably supporting an auxiliary means to an image forming apparatus, comprising:
supporting means for supporting the auxiliary means and for allowing the auxiliary means to move up and down between an operative position wherein the auxiliary means is cooperable with the image forming apparatus and a retracted position wherein said auxiliary means is retracted from the operative position; and
means for retaining the auxiliary means at the operative position.

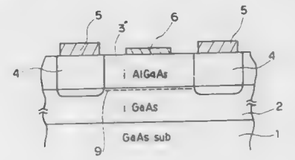
4,734,749
SEMICONDUCTOR MESA CONTACT WITH LOW PARASITIC CAPACITANCE AND RESISTANCE
Clifford A. Levi, Billerica, Mass., assignor to Alpha Industries, Inc., Woburn, Mass.
Continuation of Ser. No. 878,086, Feb. 15, 1978, abandoned, which is a continuation of Ser. No. 512,443, Oct. 7, 1974, abandoned, which is a continuation of Ser. No. 265,260, Jun. 22, 1972, abandoned, which is a division of Ser. No. 19,085, Mar. 12, 1970, abandoned, and a continuation-in-part of Ser. No. 835,402, Jun. 23, 1969, abandoned. This application Apr. 7, 1981, Ser. No. 251,912
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 **1 Claim**



1. A mesa semiconductor device comprising,
body of silicon semiconductor material having a top surface and edge surfaces defining a mesa of height within the range of 2–100 microns,

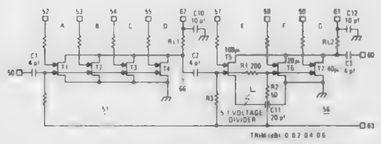
the entire area of said edge surfaces being coated with a thermally grown passivating insulating silicon oxide layer,
said top surface being entirely covered with a nitride,
whereby said nitride may be removed by etching said device with phosphoric acid without removing said thermally grown passivating insulating silicon oxide layer so that said entire top surface may then receive a conducting layer establishing one of ohmic contact and a barrier junction with said entire top surface.

4,734,750
HIGH ELECTRON MOBILITY HETEROJUNCTION SEMICONDUCTOR DEVICES
Shigeru Okamura, Machida, and Tomonori Ishikawa, Fujisawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 873,151, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 354,516, Mar. 3, 1982, abandoned. This application Jun. 29, 1987, Ser. No. 68,820
Claims priority, application Japan, Mar. 6, 1981, 56-32088
Int. Cl.[4] H01L *24/80, 27/14, 29/161, 25/04*
U.S. Cl. 357—16 **8 Claims**



1. A high electron mobility heterojunction semiconductor device comprising:
a pair of layers including an electron source layer and a channel layer for providing a heterojunction therebetween, said channel layer having an electron affinity larger than that of said electron source layer, said pair of layers being arranged for exposing at least one portion thereof to an electromagnetic wave; and
a container for holding said pair of layers at a sufficiently low temperature for maintaining an electron gas which forms in said channel layer adjacent the heterojunction, said electron source layer containing substantially no impurities and said channel layer containing substantially no impurities, and the device characteristics can be changed as a result of the surface density of said electron gas being changed by exposure to said electromagnetic wave.

4,734,751
SIGNAL SCALING MESFET OF A SEGMENTED DUAL GATE DESIGN
Ying C. Hwang, Liverpool, and Young K. Chen, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.
Filed May 20, 1985, Ser. No. 735,991
Int. Cl.[4] H01L *29/80, 27/04*
U.S. Cl. 357—22 **2 Claims**



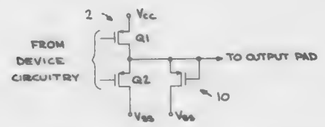
1. A monolithically integrated active MESFET exhibiting an accurate small signal transfer, adjustable in selected discrete steps, comprising
A. an input terminal for application of an input signal,
B. an output terminal for derivation of an output signal and application of drain potentials,
C. a source terminal for application of source potentials,
D. an (m+n) fold plurality of terminals for application of transconductance control potentials,
E. a dual gate MESFET, subdivided into a first n-fold quantity of selectively activated MESFET segments, each segment having a predetermined width to achieve a desired transconductance for relatively larger steps in signal transfer and including
(1) an electroded source region connected to said source terminal,
(2) an electroded drain region connected to said output terminal, and
(3) a gate region defined between said source and drain regions having
(i) a signal gate electrode disposed between said source and an activating gate electrode electrically connected to said input terminal for modifying the output signal current of said MESFET as a function of the transconductance of the segment, and
(ii) an activating gate electrode disposed between said signal gate and said drain for turning current flow "ON" and "OFF" in said MESFET segment, and electrically connected to one of said (m+n) fold plurality of transconductance control terminals,
F. said dual gate MESFET being further subdivided into a second, m-fold quantity of selectively activated MESFET segments, each segment having a predetermined width to achieve a desired transconductance for relatively smaller steps in signal transfer, and including
(1) an electroded source region connected to said source terminal,
(2) an electroded drain region connected to said output terminal, and
(3) a gate region defined beween said source and drain regions having
(i) a signal gate electrode, disposed between said source and an activating gate electrode, for modifying the output signal current of said MESFET as a function of the transconductance of the segment, and
(ii) an activating gate electrode disposed between said signal gate and said drain for turning current flow "ON" and "OFF" in said MESFET segment, and electrically connected to one of said (m+n) fold plurality transconductance control terminals, and G. voltage division means electrically connected between said input terminal and said m-fold signal gate electrodes to apply a reduced signal voltage thereto so that wider segments may be used while a proportionately smaller equivalent transconductance is provided,
said (m+n) fold MESFET segment transconductances being weighted and ordered for converting to an electrical control signal coupled to said (m+n) fold control terminals such that successive combinations of active segments provide a desired series of transfer values.

4,734,752
ELECTROSTATIC DISCHARGE PROTECTION DEVICE FOR CMOS INTEGRATED CIRCUIT OUTPUTS
Yow-Juang B. Liu, San Jose, and Salvatore Cagnina, Los Altos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Sep. 27, 1985, Ser. No. 781,287
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **12 Claims**

12. An electrostatic discharge protection device for an output of an integrated circuit, the integrated circuit having an output buffer comprising first and second transistors, the first

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transistor having a gate terminal, a drain terminal coupled to a Vcc reference potential level and a source terminal coupled to an output pad, the second transistor having a gate terminal, a drain terminal coupled to the output pad and a source terminal coupled to a Vss reference potential level, the device comprising an ESD field effect transistor having its drain and gate terminals connected to the output pad and having its source terminal connected to a source circuit potential, the ESD transistor having dimensions and doping levels such that it turns on when an electrostatic discharge voltage on the output pad reaches a first voltage level, the first voltage level being much less than the gated diode breakdown voltage and the junction breakdown voltage of both the first and second transistors, but greater than the highest voltage reached by the output pad during normal operation of the integrated circuit,



turn-on of the ESD transistor being in the punch-through mode, wherein the ESD transistor comprises:

a p-type substrate;

an n-type drain well region in the substrate;

an n-type source well region in the substrate;

a channel region in the substrate, separating the drain well region and the source well region;

an insulator layer superposing the substrate, the gate terminal superposing the insulator layer over the channel region;

a drain terminal region in the drain well region, the drain terminal region being doped n^+, the drain terminal being coupled to the drain terminal region; and

a source terminal region in the source well region, the source terminal region being doped n^+, the source terminal being coupled to the source terminal region.

4,734,753

THERMOCOMPRESSION BONDING OF COPPER LEADS TO A METALLIZED CERAMIC SUBSTRATE

Benjamin H. Cranston, Hopewell Township, Mercer County, N.J.; Richard L. Hunsberger, Spring Township, Berks County, Pa., and Donald A. Machusak, Hopewell Township, Mercer County, N.J., assignors to American Telephone and Telegraph Company and AT&T Technologies, Inc., both of Berkeley Heights, N.J.

Continuation of Ser. No. 718,498, Apr. 1, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 921,908

Int. Cl.[4] H01L *23/50*

U.S. Cl. 357—67 **5 Claims**



1. An electronic device comprising:

a ceramic substrate having metallized patterns thereon;

a semiconductor chip bonded to first ends of the metallized patterns; and

at least one unalloyed copper lead, having an average grain size from 0.035 to 0.055 mm, with a portion thereof thermocompressively bonded to a second end of the metallized pattern.

4,734,754

SEMICONDUCTOR DEVICE HAVING IMPROVED STRUCTURE OF MULTI-WIRING LAYERS

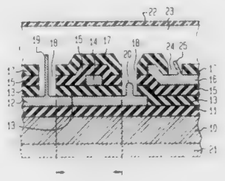
Kiyoshi Nikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,181

Claims priority, application Japan, May 7, 1984, 59-90376

Int. Cl.[4] H01L *23/10, 23/48, 23/18*

U.S. Cl. 357—68 **7 Claims**



1. A semiconductor device comprising a semiconductor chip and a housing hermetically containing said semiconductor chip therein, said semiconductor chip including a semiconductor substrate, an insulating layer formed on a major surface of said semiconductor substrate, a first wiring layer including aluminum formed on said insulating layer and extending in one direction, an intermediate insulating film provided on said first wiring layer and on said insulating layer, a second wiring layer formed on said intermediate insulating film and partially overlapping said first wiring layer via said intermediate insulating film, and an opening formed in said intermediate insulating film at a location where said first wiring layer is present thereunder and said second wiring layer is absent thereabove to expose the surface of said first wiring layer within said housing.

4,734,755

ALTERNATING LOAD STABLE SWITCHABLE SEMICONDUCTOR DEVICE

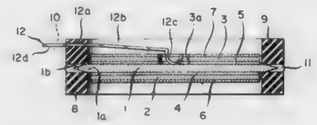
Winfried Schierz, Heideck, Fed. Rep. of Germany, assignor to Semikron Gesellschaft für Gleichrichterbau, Nuremberg, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,621

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421672

Int. Cl.[4] H01L *23/00, 23/28*

U.S. Cl. 357—74 **22 Claims**



1. A semiconductor device element where a prepared edge of the semiconductor wafer is disposed between two annular insulating bodies comprising

a semiconductor wafer;

a first contact piece attached to one of the main current faces of the semiconductor wafer;

a second contact piece attached to one of the main current faces of the semiconductor wafer such that the semiconductor wafer together with the contact pieces form a stack;

a metallic coating suitable for pressure contacting and covering a free contact face of a respective contact piece;

a supportive covering covering the free remaining surface sections of the stack;

insulating bodies surrounding the stack;

a material providing adhesive effects on surrounding materials, into which material the edge zone of the semiconducting wafer disposed between the insulating bodies is submerged and whereby the material providing adhesive effects is associated with the insulating bodies and whereby the insulating bodies which are adjoining the contact pieces and the stack form a dense enveloping of the semiconductor wafer;

a control current conductor having a section running through one of the insulating bodies, which conductor is solidly and sealingly enclosed.

4,734,756

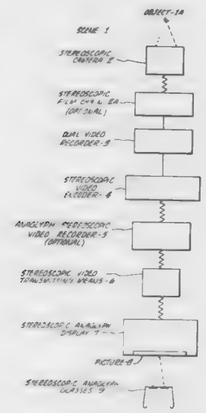
STEREOSCOPIC TELEVISION SYSTEM

James F. Butterfield, Van Nuys; Stanton W. Alger, Monrovia, and Daniel L. Symmes, Los Angeles, all of Calif., assignors to 3-D Video Corporation, Hollywood, Calif.

Continuation of Ser. No. 336,299, Dec. 31, 1981, abandoned. This application Dec. 3, 1984, Ser. No. 677,205

Int. Cl.[4] H04N *15/00, 13/00*

U.S. Cl. 358—3 **12 Claims**



1. A stereoscopic pictorial system using a stereo-pair of images and a stereo-pair of standard video signals to produce a stereoscopic video signal, comprising

dual pickup means for picking up said stereo-pair of images and for providing said stereo-pair of standard video signals, said stereo-pair of standard video signals including a first standard video signal having a first luminance signal and a second standard video signal having a second luminance signal,

subcarrier means for generating a television subcarrier signal,

differencing means for determining the difference between the first luminance signal and the second luminance signal,

modulating means for modulating the television subcarrier signal with the difference between the first and second luminance signals to produce a stereoscopic difference signal, and

encoding means for encoding the stereoscopic difference signal with the first standard video signal to produce said stereoscopic video signal.

4,734,757

COLOR BURST PHASE DETECTION SYSTEM FOR USE IN A VIDEO DISK PLAYER SYSTEM

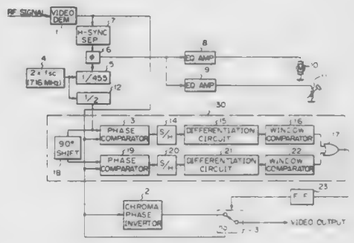
Toru Akiyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,674

Claims priority, application Japan, Jun. 17, 1985, 60-131499

Int. Cl.[4] A04N *9/455*

U.S. Cl. 358—19 **10 Claims**



6. A color burst phase detection system adapted for use in a video information reproducing system including a frame memory, a phase control circuit connected to said frame memory and a switch circuit for selectively supplying one of a video signal from the frame memory and a video signal through the phase control circuit, comprising:

input means for receiving a video signal including a color burst signal from the frame memory of the video information reproducing system;

reference color subcarrier signal generating means for generating a reference color subcarrier signal whose frequency is substantially equal to the frequency of said color burst signal;

phase comparing means connected to said input means and said reference color subcarrier signal generating means, for phase comparing said color burst signal included in said video signal with said reference color subcarrier signal and producing a phase comparing signal; and

detection means connected to said phase comparing means, for detecting a level change of said phase comparing signal and producing a burst phase inversion detection signal for controlling the switch circuit of the video information reproduction system when said level change of said phase comparing signal exceeds a predetermined reference level.

4,734,758

SIGNAL PROCESSING CIRCUIT

Masahiro Honjo, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 22, 1986, Ser. No. 854,746

Claims priority, application Japan, Apr. 25, 1985, 60-89218; Dec. 10, 1985, 60-277103; Dec. 10, 1985, 60-277104

Int. Cl.[4] H04N *9/78*

U.S. Cl. 358—31 **14 Claims**

1. A signal processing circuit comprising:

a converter for converting a change in the vertical direction of each of amplitude and phase of an input chrominance signal into a change in the direction of amplitude;

a first delay circuit for delaying the output of said converter by a predetermined time period;

a second delay circuit for further delaying the output of said first delay circuit by a predetermined time period;

a first comparing circuit for comparing the amplitude level of the output of said converter with the amplitude level of the output of said first delay circuit;

a second comparing circuit for comparing the amplitude level of the output of said first delay circuit with the

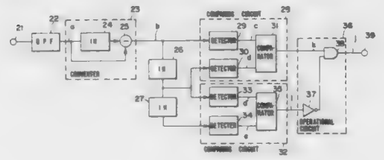
VOL 1088 ISS 5 MR 29 1988 UMI

amplitude level of the output of said second delay circuit; and

an operational circuit for making an operation with the output of said first comparing circuit and the output of said second comparing circuit, whereby a vertical correlation of each the amplitude and phase of the chrominance signal is adapted to be detected.

8. A signal processing circuit comprising:

a converter for converting a change in the vertical direction of each of amplitude and phase of an input chrominance signal into a change in the direction of amplitude;





a first delay circuit for delaying the output of said converter by a predetermined time period;

a comparing circuit for comparing the amplitude level of the output of said converter with the amplitude level of the output of said first delay circuit;

a second delay circuit for delaying the output of said comparing circuit by the predetermined time period; and

an operational circuit for making an operation with the output of said comparing circuit and the output of said second delay circuit, whereby a vertical correlation of each the amplitude and phase of the chrominance signal is adapted to be detected.

4,734,759

A VIDEO PRINTER HAVING COLOR SIGNAL INTERPOLATION CIRCUIT

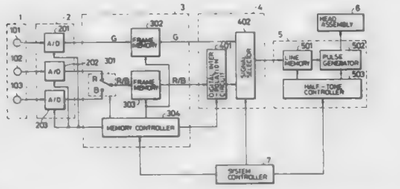
Yasunori Kobori, Yokohama; Toshihiko Gotoh, Tokyo, and Kentaro Hanma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1986, Ser. No. 859,808

Claims priority, application Japan, May 9, 1985, 60-96601

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—75 **19 Claims**



1. A signal processing circuit for a color video printer wherein images of first, second and third colors are successively printed to reproduce a color print on a surface for printing, comprising:

a signal input portion which includes first, second and third color signal input means that are respectively supplied with first, second and third color signals corresponding to the images of the first, second and third colors;

memory means which includes a first memory for storing samples of the first color signal, and a second memory for storing samples of both the second and third color signals;

switch means connected to said second and third color signal input means and said second memory for supplying to said second memory samples of said second and third color signals alternately;

data interpolation means connected to said second memory for generating a first interpolation data signal based on samples of the second color signal and a second interpolation data signal based on samples of the third color signal stored in said second memory and for delivering an interpolated color signal including the second or third color signal stored in said second memory and said first or second interpolation data signal, respectively, wherein said data interpolation means includes means for delivering, as the interpolation data signal, data which is previously determined when the interpolation value is to be in the first line or the last line of an image;

selector means connected to said first memory and said data interpolation means for delivering samples of the first color signal read out from said first memory and the interpolated signal including one of the first and second interpolation data signals received from said data interpolation means as print signals in a printing order; and

print means connected to said selector means for printing images on a surface-for-printing successively in accordance with the print signals supplied from said selector means.

4,734,760

MULTI-COLOR IMAGE RECORDING APPARATUS WITH TWO SCANNERS AND ONE PRINTER

Kenji Futaki, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 930,067, Nov. 12, 1986, abandoned, which is a continuation of Ser. No. 741,574, Jun. 5, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 77,945

Claims priority, application Japan, Jun. 14, 1984, 59-120821

Int. Cl.[4] H04N *1/40, 1/46*

U.S. Cl. 358—75 **3 Claims**

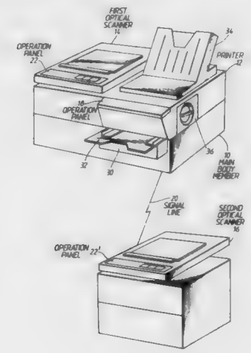
1. A multi-color recording apparatus comprising:

a copying unit having a first scanner for reading out an image of a document by optically scanning the document, and a first start key for initiating the operation of said first scanner;

a scanning unit located apart from said copy unit and having a second scanner for reading out an image of a document by optically scanning the document, a manually operable on-line scanner key for designating said second scanner and a second start key for initiating the operation of said second scanner;

said copying unit further having a controller for converting an output signal of one of said first and second scanners to a set of color component signals, a printer for recording a color image by overlapping images for every color component on an image recording medium according to the color component signals output from said controller and a mode key for designating one of said first and second scanners, so that one of said first and second scanners

designated by said mode key is operative to start the optical scan of the document; and





a communication line, connected between said scanning unit and said copying unit, for transmitting the output signal from said second scanner to said controller.

4,734,761

COLOR IMAGE RECORDING APPARATUS USING A COLOR RECORDING CATHODE-RAY TUBE WITH A BLUE-GREEN PHOSPHOR, A RED PHOSPHOR, AND BLUE, GREEN, AND RED STRIPE FILTERS

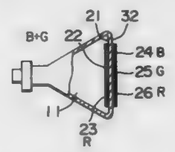
Kenichi Kondoh, Hachioji; Tetsuo Takaku, Tsurugashima; Hideki Morita, and Hirotaka Hara, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 614,466, May 25, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 940,151

Claims priority, application Japan, Jun. 2, 1983, 58-99178; Aug. 12, 1983, 58-148649; Aug. 12, 1983, 58-125916[U]; Aug. 19, 1983, 58-151002; Aug. 19, 1983, 58-151003

Int. Cl.[4] H04N *1/46, 1/23;* H01J *29/32*

U.S. Cl. 358—78 **4 Claims**



1. A color image recording apparatus for recording a color image, comprising a cathode-ray tube, said cathode-ray tube including a screen having an inner surface to be bombarded by an electron beam, said inner surface being coated in a striped manner with a first fluorescent material for emitting blue and green light when bombarded by said electron beam, and with a second fluorescent material for emitting red light when bombarded by said electron beam, said screen further having an outer surface for emitting light emitted by said fluorescent materials, said outer surface being provided with a blue filter and a green filter each opposed to a respective portion of said first fluorescent material, and with a red filter opposed to said second fluorescent material.

4,734,762

COLOR IMAGE READING APPARATUS WITH A PLURALITY OF LINE SENSORS IN WHICH A WHITE BALANCE OPERATION IS PERFORMED BY DETERMINING AMPLIFIER GAINS WHILE READING A WHITE REFERENCE PLATE

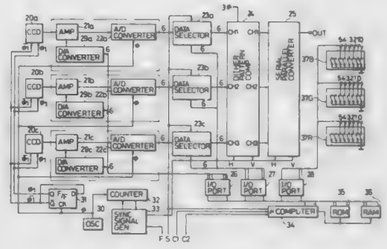
Takao Aoki, Abiko; Mitsuhiro Tokuhara, Chigasaki, and Yoshinori Ikeda, Matsudo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,237, Oct. 18, 1983, abandoned. This application Jun. 12, 1987, Ser. No. 61,042

Claims priority, application Japan, Oct. 20, 1982, 57-183864

Int. Cl.[4] G03F *3/08;* H04N *1/46, 9/73*

U.S. Cl. 358—80 **11 Claims**



1. A color image reading apparatus comprising:

a plurality of linear sensor means for reading a color document, each of said linear sensor means photoelectrically reading a different portion of a line of the color document in a divided manner and generating a plurality of color component signals representing colors on the color document;

a plurality of amplifying means each for amplifying said plurality of color component signals generated by a respective one of said plurality of linear sensor means;

determining means for determining gains for said plurality of amplifying means to use in amplifying corresponding ones of said plurality of color component signals on the basis of a plurality of reference color component signals generated by reading a reference member having a reference density with said plurality of linear sensor means; and

correcting means for causing each of said plurality of amplifying means to amplify said plurality of color component signals using the respective gains determined by said determining means, thereby correcting the level of each of said plurality of color component signals representing colors on the color document generated by each of said plurality of linear sensor means.

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4,734,763

APPARATUS FOR GENERATING POSITIVE OR NEGATIVE IMAGE OUTPUT SIGNALS FROM EITHER POSITIVE OR NEGATIVE ORIGINALS

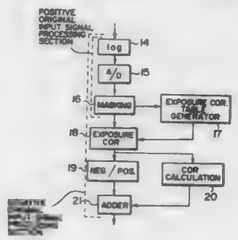
Hitoshi Urabe; Takao Shigaki, and Osamu Shimazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

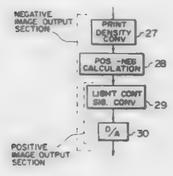
Continuation of Ser. No. 627,701, Jul. 3, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,454

Claims priority, application Japan, Jul. 4, 1983, 58-121325; Mar. 12, 1984, 59-46897

Int. Cl.[4] G03F 3/08; H04N 1/46

U.S. Cl. 358—80 **4 Claims**





1. An image processing apparatus adapted to selectively generate positive and negative image outputs from negative and positive originals, which comprises:

(i) a positive original input signal processing section for converting a positive image signal obtained by photoelectric scanning of a positive original into a density signal representing a positive image,

(ii) a negative original input signal processing section for converting a negative image signal obtained by photoelectric scanning of a negative original into a density signal representing a positive image,

(iii) a color processing section provided with processing means such as a gradiation conversion means, a color correction means and a sharpness enhancement means for conducting color processing of said density signal representing a positive image which is input from said positive original input signal processing section or said negative original input signal processing section so that a desired density is obtained on an output photosensitive material or an ultimate printing photosensitive material and for sending out the color-processed density signal representing a positive image as an output signal,

(iv) a positive image output section for converting said output signal of said color processing section into a light amount control signal for a light source emitting light to which an output photosensitive material for forming a positive image is exposed, and for sending out said light amount control signal, and

(v) a negative image output section for converting said output signal of said color processing section into a density signal representing a negative image, converting said density signal representing a negative image into a light amount control signal for a light source emitting light to which a photosensitive material for forming an intermediate negative is exposed, and then sending out said light amount control signal, said negative image output section converting said output signal of said color processing section into said density signal representing a negative image so that the density of a negative image obtained by exposing said photosensitive material for forming an intermediate negative on the basis of said light amount control signal sent out from said negative image output section is such that said desired density is obtained when said negative image is printed on the ultimate printing photosensitive material.

4,734,764

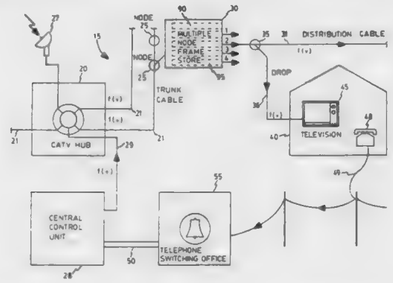
CABLE TELEVISION SYSTEM SELECTIVELY DISTRIBUTING PRE-RECORDED VIDEO AND AUDIO MESSAGES

Terrence H. Pocock, Mount Brydges; Peter J. M. Coumans, London; Richard M. McNorgan, London, and George M. Hart, London, all of Canada, assignors to Cableshare, Inc., London, Canada

Filed May 6, 1985, Ser. No. 730,822

Int. Cl.[4] H04N 7/10

U.S. Cl. 358—86 **51 Claims**



40. A node frame store for storing a video frame having at least one video field being a first plurality of scan lines representing a vertical blanking interval, and a second plurality of scan lines representing video picture data, and for storing an audio frame having a first plurlity of scan lines representing a vertical blanking interval, and a second plurality of scan lines representing audio data, the node frame store comprising;

(A) a television tuner communicating with a primary path and adapted to pass a preselected channel that is carrying said frames;

(B) a channel blocker in parallel with the television tuner to block the channel carrying said frames on the primary path, while allowing other channel frequencies on the primary path to pass onto a second path;

(C) a node frame store module comprising;

(i) an audio frame storage means, connected to the television tuner (A), to receive audio frames and to convert those audio frames into an analogue audio signal;

(ii) a video frame storage means connected to the television tuner (A) adapted for the storage and transmisson of a video frame;

(iii) a node frame store processing unit that examines at least each video frame passed by the television tuner and identifies those audio and video frames that are addressed to a predetermined address, and upon such identification, activates the audio and video frame storage means to store respective identified frames;

(iv) means to modulate both the video frame from the video frame store means and the analogue audio from the audio frame store onto a predetermined television channel; and

(v) means to transmit onto the second path the channels passed by the channel blocker and the channel created by means (C)(iv)).

41. In a cable televison system of the type in which video information is transmitted on a primary communication link for dissemination to subscribers by means of a plurality of secondary paths, apparatus for providing individual video messages to the subscribers over a common transmission channel of said system, comprising:

means for storing a plurality of individual video messages;

means responsive to a subscriber-initiated request for selecting one of said video messages, encoding the selected message with an address associated with the subscriber, and transmitting the encoded message on said primary link over said common channel;

a plurality of means respectively located at the junctions of said primary link and said secondary paths for receiving video information transmitted over at least said common channel and, responsive to an address which is different for each of said receiving means, for storing the selected message; and

means for transmitting the stored message over one of said secondary paths on said common channel to a television receiver of the subscriber who initiated the request.

4,734,765

VIDEO/AUDIO INFORMATION TRANSMISSION SYSTEM

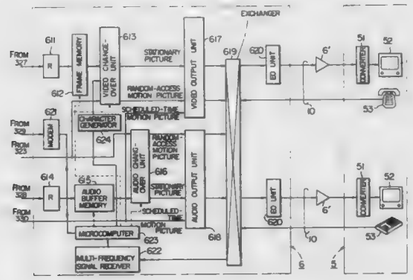
Shigetoshi Okada, Kanazawa; Shoichi Matsuhashi, Tokyo; Yoji Shibata, and Wataru Kosuge, both of Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,704

Claims priority, application Japan, Dec. 2, 1977, 52-143969

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—102 **9 Claims**



1. A video/audio information service system comprising:

a center including therein files in which video/audio information are recorded, the center being disposed at a first location;

a plurality of subcenters disposed at different second locations spaced from said first location between said center and a plurality of subscriber terminals, respective subscriber terminals being disposed at different third locations and associated with respective ones of said subcenters, the distance beween said subscriber terminals and said center being greater than the distance between said subscriber terminals and associated subcenter, each of said subcenters including therein a character generator means for generating character information for an input monitor means corresponding to character information inputted from said subscriber terminals, change-over switch means for changing over said video/audio information and said character information, said change-over switch means being coupled to said character generator means, a plurality of video/audio buffer memories coupled to said change-over switch means, exchange means coupled to said video/audio buffer memories for communicating with said associated subscriber terminals, video system means having a frame memory, a video change-over unit coupled to said frame memory, a video output unit coupled to said video change-over unit and said character generator means coupled to said video change-over unit, audio system means having an audio change-over unit, said audio buffer memory coupled to said audio change-over unit and an audio output unit coupled to said audio change-over unit, control system means having a multi-frequency receiver and a microcomputer coupled to said multi-frequency receiver, said audio buffer memory and said character generator means, and said exchange means having an exchanger coupled to said audio and video output units and end office units coupled to said exchanger,

first transmission path means for connecting said center and said subcenters respectively to transmit said video/audio information in an analog baseband signal form, said character generator means in each subcenter being provided for diminishing traffic of said first transmission path means between said center and subcenters; and

second transmission path means for connecting said subcenter and said subscriber terminals respectively to transmit said video/audio information and said character information in an analog baseband signal form.

4,734,766

METHOD AND SYSTEM FOR LOCATING AND INSPECTING SEAM WELD IN METAL SEAM-WELDED PIPE

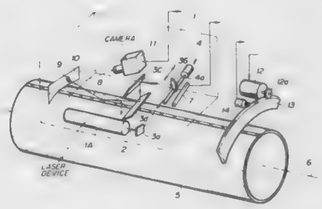
Motoji Shiozumi; Yuichiro Asano, and Akira Torao, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

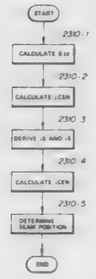
Filed Aug. 18, 1986, Ser. No. 897,525

Claims priority, application Japan, Aug. 19, 1985, 60-180531; Dec. 10, 1985, 60-276039

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—106 **32 Claims**





1. A system for locating a seam on an elongated seam-welded pipe, comprising:

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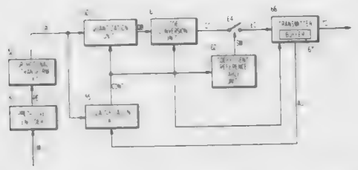
first means for scanning a laser beam across the surface of said seam-welded pipe through a plurality of scanning points aligned circumferentially of the pipe;
second means for receiving the laser beam reflected from each of said scanning points on said pipe surface;
third means for recording said received laser beam in the form of a video image, one frame for each scanning point, said video image containing luminosity data for a predetermined number of pixels in each of a predetermined number of scan lines in each frame;
fourth means for locating the width of a bright area in each frame, which bright area is made up of pixels of luminosity exceeding a predetermined value;
fifth means for comparing said width of said bright area in each frame with a threshold value and producing a binary signal of value "1" when said width of said bright area is greater than said threshold value and of value "0" otherwise;
sixth means for deriving a moving average of the values of the binary signals for a given number of successive frames, determining the frames over which said averaged value was maximized and for recording the address numbers of the first and the last frames where said maximum average values were obtained; and
seventh means for deriving the location of the center of the welded seam by finding the address of the frame intermediate said first and last frames.

4,734,767

ENCODER CAPABLE OF FAITHFULLY AND ADAPTIVELY ENCODING A MOVING IMAGE

Masahide Kaneko, Kanagawa; Mutsumi Ohta, Tokyo; Kiichi Matsuda, and Yoichi Kato, both of Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Limited and Nippon Telegraph and Telephone Corporation, all of, Japan

Filed Mar. 24, 1987, Ser. No. 29,565
Claims priority, application Japan, Mar. 24, 1986, 61-66526
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **13 Claims**



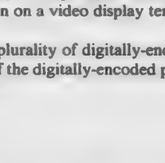
1. An encoder for use in encoding a moving image into a sequence of encoded image codes in response to a sequence of coefficient blocks, each coefficient block being composed of a plurality of orthogonal transform coefficients resulting from orthogonal transform of predictive error signals which are produced by predictively coding a plurality of picture elements of said moving image at every picture block, said encoder comprising a quantization unit having a plurality of quantization characteristics, a code conversion unit having a plurality of code conversion characteristics, and a coefficient selection unit having a plurality of coefficient selection characteristics, each of said coefficient blocks being processed through said quantization unit, said code conversion unit, and said coefficient selection unit into said encoded image codes by selecting said quantization characteristics, said code conversion characteristics, and said coefficient selection characteristics, wherein the improvement comprises:
classifying means responsive to said coefficient blocks for classifying each of said coefficient blocks into a selected one of statistically determined classes with reference to the orthogonal transform coefficients included in each of said coefficient blocks, to produce a control signal representative of said selected one of the classes; and
delivering means for delivering said control signal to at least two of said quantization unit, said code conversion unit, and said coefficient selection unit to select at least two of said quantization characteristics, said code conversion characteristics, and said coefficient selection characteristics.

4,734,768

METHOD FOR TRANSMITTING DIFFERENTIAL PULSE CODE MODULATION (DPCM) VALUES

Guenther Pexa, Woerthsee, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 43,823
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614690
Int. Cl.[4] H04N *7/137;* **H04B** *14/04, 14/06*
U.S. Cl. 358—135 **10 Claims**



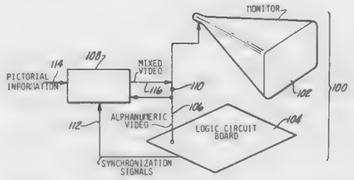
1. A method for transmitting differential pulse code modulation values by conversion into data words of different lengths, comprising the steps of:
Converting a plurality of successive differential pulse code modulated values into data words of identical, optimally-minimum lengths; and
Combining the data words with a preamble identifying their length to form a respective data block of constant length; and
Transmitting the data block.

4,734,769

METHOD AND APPARATUS FOR DISPLAY OF VARIABLE INTENSITY PICTURES ON A VIDEO DISPLAY TERMINAL

Mark A. Davis, East Lansing, Mich., assignor to Professional Guidance Systems, Inc., Lansing, Mich.

Filed Jun. 17, 1985, Ser. No. 745,441
Int. Cl.[4] H04N *7/06, 7/08*
U.S. Cl. 358—142 **16 Claims**



1. A method of displaying photographic information comprising a plurality of digitally-encoded pixels and alphanumeric information on a video display terminal, comprising the steps of:
receiving the plurality of digitally-encoded pixels;
storing each of the digitally-encoded pixels in a digital memory means;

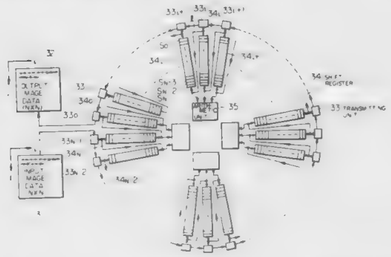
receiving a video signal representing the alphanumeric information;
reading at least some of the digitally-encoded pixels from the digital memory means; and
producing a composite video signal by combining the received video signal and the stored, digitally-encoded pixels that are read from the digital memory means.

4,734,770

IMAGE DATA PROCESSING METHOD AND DEVICE THEREFOR

Ikuo Matsuba, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,541
Claims priority, application Japan, Mar. 13, 1986, 61-53678; Nov. 7, 1986, 61-263914
Int. Cl.[4] H04N *5/213*
U.S. Cl. 358—167 **13 Claims**



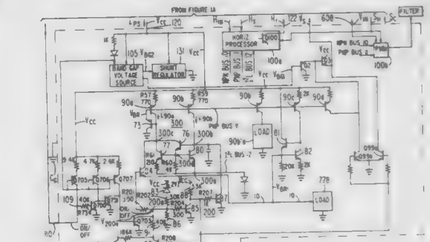
13. An image data processing system for treating first image data consisting of a plurality of pixels having values corresponding to their gray level, several of which contain noise components, and transforming them into second image data, in which the noise components are reduced or eliminated, comprising:
a plurality of multistage shift register means, each of which holds a plurality of pixel data and shifts them;
connecting means for forming a single ring shift register mechanism by connecting said plurality of shift register means in series in the form of a ring;
a plurality of operating means for performing operations of same type connected with several particular stages in said ring shift register mechanism; and
input means for distributing inputted image data to said plurality of shift register means so that the relative position of the pixels in the inputted image is maintained;
whereby said operating means perform operations, which make a probability calculated on the basis of the image energy, which is a function of the values of the image data, greatest by the Monte Carlo method.

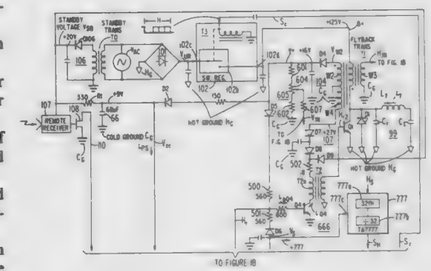
4,734,771

START-UP CONTROL CIRCUITRY FOR A TELEVISION APPARATUS

Jeffery B. Lendaro, Noblesville; Robert L. Shanley, II, Indianapolis, both of Ind.; Jack Craft, Bridgewater, and Michael L. Low, Old Bridge, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 24, 1987, Ser. No. 42,078
Int. Cl.[4] H04N *5/63*
U.S. Cl. 358—190 **19 Claims**





1. A television apparatus power supply comprising:
a source of an input supply voltage;
a transformer having a first winding that is coupled to said input supply voltage;
means coupled to a second winding of said transformer for generating a first supply voltage at a first terminal during operation in a standby mode and during operation in a start-up interval;
a source of an on/off control signal that is selectively indicative when operation in said standby mode is required and when operation in a power-up mode is required;
a control circuit responsive to said on/off control signal for generating a signal at a first frequency, said control circuit being energized during said start-up interval from a voltage that is derived from said first supply voltage;
a first switching transistor responsive to said signal at said first frequency and to said on/off control signal and having a main current conducting electrode that is periodically switched at a rate that is determined by said first frequency signal during operation in each of said power-up mode and said start-up interval;
means responsive to said on/off control signal and coupled to said first supply voltage for generating at a second terminal a second supply voltage during said start-up interval but not in said standby mode;
a second switching transistor having a main current conducting electrode that is coupled to said first supply voltage during both said start-up interval and said standby mode and having a control electrode that is coupled to said second supply voltage, said control electrode of said second switching transistor being responsive to the switching of the main current conducting electrode of said first switching transistor for causing said second switching transistor to be conductive during said start-up interval; and
an output stage of said power supply coupled to said main current conducting electrode of said second switching transistor for generating during said power-up mode a third supply voltage that is coupled to said main current conducting electrode of said second switching transistor.

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4,734,772

SOLID-STATE IMAGING DEVICE COMPATIBLE WITH DIFFERENT TELEVISION SYSTEMS

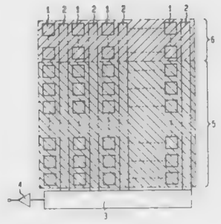
Ikuo Akiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 771,837, Aug. 30, 1985, Pat. No. 4,706,122. This application Jun. 22, 1987, Ser. No. 64,531

Claims priority, application Japan, Aug. 30, 1984, 59-180979; Nov. 16, 1984, 59-241751

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.13 **6 Claims**



1. In a solid-state imaging device compatible with first and second television systems and having first and second areas of photoelectrical conversion elements for accumulating signal charges corresponding to incident light, a method of reading out the signal charges comprising the steps of:

selecting one of the television systems;

applying driving pulses at a first rate to the imaging device for reading out signal charges from the first area; and

applying driving pulses at a second rate to the imaging device for reading out signal charges from the second area;

wherein the first and second rates are determined in accordance with the television system selected.

4,734,773

IMAGING APPARATUS HAVING HIGH-FREQUENCY ELECTRON PURGING CIRCUIT OPERABLE DURING AN EXPOSURE TIME

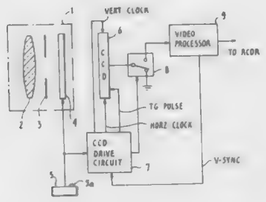
Kazuhiko Ueda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Aug. 19, 1986, Ser. No. 897,980

Claims priority, application Japan, Aug. 20, 1985, 60-182662

Int. Cl.[4] H04N *5/238*

U.S. Cl. 358—213.13 **2 Claims**



1. An imaging apparatus comprising:

an image sensor having an array of successively arranged photoelectrical conversion areas isolated from each other by insulative regions, shift register means and a transfer gate having a barrier potential lower than a barrier potential of said insulative regions for transferring electrons developed in said conversion areas to said shift register means in response to a gate triggering pulse applied thereto;

means for generating a triggering pulse;

an optical unit for exposing said conversion areas to incident light for a time interval in response to said triggering pulse to cause said electrons to develop in said conversion areas;

means responsive to said triggering device for generating high-frequency clock pulses and supplying the high-frequency clock pulses to said shift register means throughout said time interval to cause the shift register means to purge electrons transferred thereto from said conversion areas bypassing said transfer gate in the absence of said gate control signal; and

means for generating low-frequency clock pulses immediately following the end of said exposure time and supplying the low-frequency clock pulses to said shift register means to cause it to discharge electrons transferred thereto from said conversion areas through said transfer gate to a utilization circuit.

4,734,774

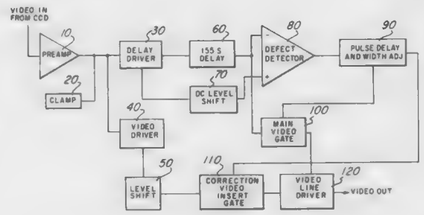
CCD IMAGER VIDEO OUTPUT DEFECT COMPENSATION

Frank L. Skaggs, Dallas; Stanley W. Holcomb, Richardson, both of Tex.; Benny R. Baker, deceased, late of Albuquerque, N. Mex., and Patricia J. Peterson, heir, Sacremento, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 522,541, Aug. 10, 1983, abandoned, which is a continuation of Ser. No. 292,757, Aug. 14, 1981, abandoned. This application Dec. 3, 1984, Ser. No. 677,320

Int. Cl.[4] H04N *9/07*

U.S. Cl. 358—213.15 **6 Claims**



1. A system for detecting, in the video output of a CCD imager array, pixel signals which are generated by defective sensors in said array, and for compensating said video output to restore said video output to a state closely approximating the video output from a defect-free imager array, comprising:

delay circuit means for delaying said video output;

comparator circuit means for comparing said delayed video to real-time video and for identifying each pixel signal value of said real-time video output as defective if and only if each said pixel value exceeds the preceeding pixel value by more than a predetermined percentage, and

correction circuit means for inhibiting said defective pixel signals from becoming part of corrected video, and for inserting in place of each defective pixel signal, a pixel signal from an adjacent good sensor.

4,734,775

CAMERA FOR RECORDING TELEVISION, PHOTOGRAPHIC OR CINEMATOGRAPHIC IMAGES

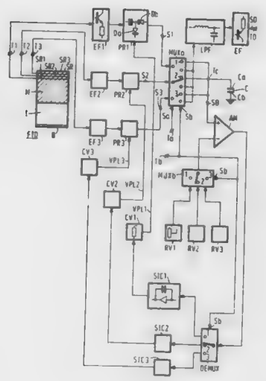
Hendrik Blom, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1986, Ser. No. 892,522

Claims priority, application Netherlands, Aug. 30, 1985, 8502379

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.16 **4 Claims**



1. A camera for recording television, photographic or cinematographic images including a solid-state image sensor in the form of a charge transfer device comprising a pick-up member, a storage member and a parallel-in-series-out shift register member having at least two shift registers, each being coupled to a distinct sensor output terminal, said storage and shift register members being shielded from incident light and said pick-up member being shielded from incident light over a strip, the image sensor in said camera being operative for obtaining a picture signal having a periodical picture information associated with a scene to be recorded and a periodical dark current information originating from below the said strip and being associated with a signal black level, said picture signal being obtained after a picture information integration period in the pick-up member and a charge transfer period for the transfer between pick-up member and storage member, characterized in that each sensor output terminal is coupled via an associated peak rectifier circuit for fixing a signal reset level to an associated input of a first multiplex circuit having two outputs for a respective coupling to a camera output terminal for supplying a composite camera picture signal, and to a capacitance terminal connected to a capacitor for carrying the signal black level, the capacitance terminal being coupled to an input of a differential amplifier circuit another input of which has a reference voltage circuit connected to it, an output of the differential amplifier circuit being coupled via a demultiplex circuit to series arrangements of a signal storage circuit and a control voltage circuit, each series arrangement being coupled to one of the associated peak rectifier circuits for applying a control voltage thereto to fix the signal reset level.

4,734,776

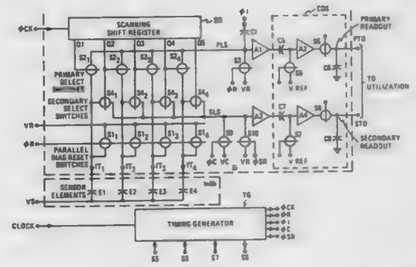
READOUT CIRCUIT FOR AN OPTICAL SENSING CHARGE INJECTION DEVICE FACILITATING AN EXTENDED DYNAMIC RANGE

Samuel C. Wang, Manlius, and David N. Ludington, New Hartford, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 15, 1986, Ser. No. 896,648

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.31 **4 Claims**



1. In a charge injection device (CID) for optical sensing having an extended dynamic range, the combination comprising

A. n optical sensor elements (E_{1-n}) arranged in an array on a substrate, each element when reversely biased and suitably pulsed, forming a potential well in which optically induced charges may be stored, the charge which accumulates with the bias disconnected causing a reduction in depth of said potential well, the depth of which may be reestablished by periodically resetting said bias over a prolonged charge integration period, said optically induced charge being detectable after periodic resetting by application of an injection pulse adequate to collapse said potential well, or detectable without injection until the sensor element is reset,

B. a readout circuit, comprising

(1) n input terminals (IT_{1-n}) each connected to one of said n sensor elements (E_{1-n}), a first node including a primary sensing line (PLS), a second node including a secondary sensing line (SLS), and a primary (PTO) and a secondary (STO) signal output,

(2) (i) a first voltage source (VR) suitable for reversely biasing said sensor elements,

(ii) n parallel bias reset switches ($S1_{1-n}$), each for connecting a corresponding sensor element to said first voltage source (VR),

(iii) a primary reset switch (S3) for connecting said primary sensing line to said first voltage source (VR); and

(iv) a secondary reset switch (S10) for connecting said secondary sensing line to said first voltage source (VR),

(3) n primary select switches ($S2_{1-n}$) for connecting successive sensor elements to said primary sensing line for primary readout,

(4) n secondary select switches ($S4_{1-n}$) for connecting successive sensor elements to said secondary sensing line for secondary readout,

(5) primary pulse injection means (CI) for application of said injection pulse coupled to said primary sensing line and via said primary select switch ($S2_j$) to each (jth) sensor element for removing stored charge from said selected element, the leading edge of said injection pulse collapsing the potential well, and the trailing edge of said injection pulse reestablishing said potential well,

(6) a first and second correlated double sampling circuit (CDS) connected respectively to said primary (PLS)

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and said secondary (SLS) sensing lines for providing a primary (PTO) and a secondary (STO) readout signal,

(7) timing means including

(i) a scanning shift register connected to control said primary ($S2_{1-n}$) and said secondary ($S4_{1-n}$) select switch for establishing a primary and a secondary select interval respectively for each (jth) sensor element, the secondary select interval of the jth sensor element occurring during the primary select interval of the (j+1)th sensor element, and

(ii) a timing generator for timing the operation of said scanning shift register, said switches, said charge injection means (CI), and said correlated double sampling circuits,

said primary sensing line in each sensor element readout interval (t_p) after resetting, being connected to said jth sensor element via primary select switch $S2_j$ during the primary select interval, said jth sensor element being successively sampled by said first correlated double sampling circuit, pulsed by said primary charge injection means (CI), and resampled by said first correlated double sampling circuit to provide said primary readout signal (PTO), the charge integration period for primary readout being approximately (n−1) sensor element readout intervals with resetting occurring every sensor element readout interval for sensitive low signal operation,

said secondary sensing line in each sensor element readout interval (t_p), after resetting, being connected to said (j−1)th sensor element via secondary select switch $S4_{j-1}$ during the secondary select interval, said (j−1)th sensor element being twice sampled by said second double sampling circuit over a charge integration period (t_{si}) to provide said secondary readout signal (STO), the charge integration period for secondary readout taking place within a single sensor element readout interval for unsaturated large signal operation.

4,734,777

IMAGE PICK-UP APPARATUS HAVING AN EXPOSURE CONTROL DEVICE

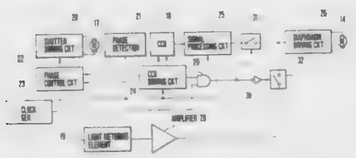
Tadashi Okino, Tokyo, and Shinji Sakai, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 558,769, Dec. 6, 1983, abandoned. This application Jun. 1, 1987, Ser. No. 57,716

Claims priority, application Japan, Dec. 7, 1982, 57-214408; Mar. 31, 1983, 58-56217; Apr. 7, 1983, 58-61882; Apr. 20, 1983, 58-70589

Int. Cl.⁴ H04N *5/238*; G03B *7/00*

U.S. Cl. 358—228 **60 Claims**



1. An image pick-up apparatus, comprising:

image pick-up means for converting an object image into an electrical signal;

light metering means other than said image pick-up means for detecting a brightness of the object image; and

exposure control means for controlling an exposure condition of said image pick-up means in response to a sequential output of said light metering means and said image pick-up means.

4,734,778

SOLID-STATE IMAGE PICKUP APPARATUS

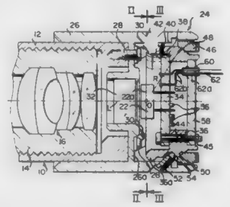
Kazunari Kobayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,357

Claims priority, application Japan, Aug. 9, 1985, 60-175507

Int. Cl.⁴ H04N *5/30*

U.S. Cl. 358—229 **4 Claims**



1. A solid-state image pickup apparatus for picking up an optical image formed by an objective optical system, comprising:

a solid-state image sensor having a pickup face opposed to the optical system; and

a support mechanism supporting the image sensor, said mechanism including a body disposed in a predetermined position relative to the optical system, a base on which the image sensor is fixed, an adjusting member supporting the base so that the base can move in a direction parallel to the pickup face, centering means for moving the base to align the center of the pickup face with the optical axis of the optical system, a focusing member supported by the body to be movable along the optical axis of the optical system, said adjusting member being supported by the body and the focusing member to be movable together with the focusing member along the optical axis of the optical system and universally movable around the point of intersection of the pickup face and the optical axis, and tilting means for universally moving the adjusting member to adjust the tilt of the pickup face relative to the optical axis.

4,734,779

VIDEO PROJECTION SYSTEM

Maurice E. Levis, New York, N.Y., and Ralph Carmen, Lebanon, N.J., assignors to Video Matrix Corporation, Hackensack, N.J.

Continuation-in-part of Ser. No. 886,728, Jul. 18, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,790

Int. Cl.⁴ H04N *9/16, 7/18*

U.S. Cl. 358—231 **15 Claims**

1. A large screen video display system to display video images comprising:

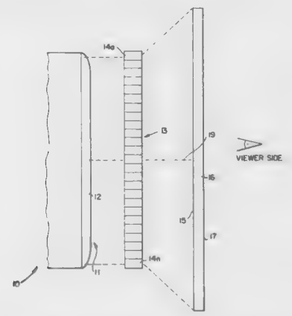
a plurality of at least four video monitors arranged adjacent each other to form an array of said monitors, each of said monitors having a face plate upon which a video image appears;

a plurality of lenticular optical plates each plate comprising a plurality of lens elements positioned side-by-side to form a plate of lens elements, one of said lenticular optical plates being positioned in front of the face plate of each of said respective video monitors;

segment circuit means to divide an original video image into segments so that each segment is displayed on a respective one of said video monitors;

sub-segment circuit means to divide each of said segments into a plurality of video image sub-segments, which sub-segments are displayed on each of said respective video monitors, the said sub-segments corresponding in location and number to the lens elements of the respective optical plate corresponding to the monitor on which the sub-segments are displayed; and

a rear projection screen having a rear surface and a front surface upon which the final image to be viewed appears, the said lens elements forming images on said rear surface, which images are combined on said screen to form a unitary video image.



4,734,780

HIGH SPEED FACSIMILE COMMUNICATION SYSTEM

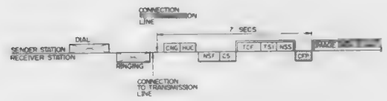
Yoshitaka Iwata, Yokohama; Kunihiro Sakata, Miura, and Shuichi Hirano, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,502

Claims priority, application Japan, May 17, 1985, 60-104065

Int. Cl.⁴ H04N *1/32*

U.S. Cl. 358—257 **3 Claims**



1. A method for high-speed G3 facsimile communication, comprising steps of:

establishing a transmission line between a sender station and a receiver station;

sending from said sender station a procedure shortening signal as a low-speed modem signal before said receiver station can send out a CED signal, said procedure shortening signal being of a HDLC-frame structure, wherein areas FIF and FCF thereof contain predetermined bit arrays indicating a nonstandard command not based on the CCITT T30 and a data rate designating the transmission rate, respectively;

sending out initial identification signals NSF and CSI from said receiver station in response to the reception of said procedure shortening signal; and

sending out the control procedure signals TCF, TSI and NSS from said sender station as high-speed modem signals in response to the reception of said initial identification signals.

4,734,781

AUTOMATIC FRAMING DEVICE FOR PHOTOGRAPHIC USE

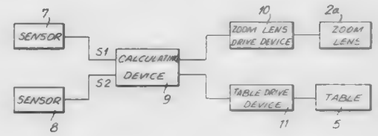
Isao Takahashi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 22, 1986, Ser. No. 888,784

Claims priority, application Japan, Jul. 25, 1985, 60-112946[U]

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—280 **3 Claims**



1. An automatic framing device for photographic use for recording a video signal representing a sheet bearing photographic image or the like on a recording medium by taking said sheet by photographing means, comprising a table having a horizontal plane positioned beneath said photographing means, movable in directions of an X axis and a Y axis in said horizontal plane with said sheet placed on said horizontal plane, an L-shaped position restricting member disposed on said table for restricting position of said sheet on said table by contacting a corner of said sheet against said L-shaped position restricting member, a first sensor and a second sensor for detecting lengths of sides of said sheet along said X axis and Y axis from a reference point, said reference point being a cross-point of contact lines of said sheet with said L-shaped position restricting member, and a control means for comparing length signals representing lengths of sides of said sheet detected by said first and second sensors, driving a zoom lens of said photographing means so as the entire area of said sheet to be within a viewing frame of said photographing means in dependence on output signal of said first sensor when

$$\frac{\text{signal detected by second sensor}}{\text{signal detected by first sensor}} < \frac{b}{a} = \frac{\text{length of shorter side of viewing frame}}{\text{length of longer side of viewing frame}}$$

or on output signal of said second sensor when

$$\frac{\text{signal detected by second sensor}}{\text{signal detected by first sensor}} > \frac{b}{a}$$

and moving said table so as the optical axis of said zoom lens to be positioned centrally of said sheet.

4,734,782

IMAGE PROCESSING APPARATUS OR SYSTEM WITH PLURAL READING UNITS, CAPABLE OF DIFFERENTLY PROCESSING VARIOUS AREAS OF AN ORIGINAL

Katsuyoshi Maeshima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 598,167, Apr. 9, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 931,014

Claims priority, application Japan, Apr. 12, 1983, 58-63855; Apr. 12, 1983, 58-63856

Int. Cl.⁴ H04N *1/40, 1/10*

U.S. Cl. 358—280 **12 Claims**

1. An image processing system comprising:

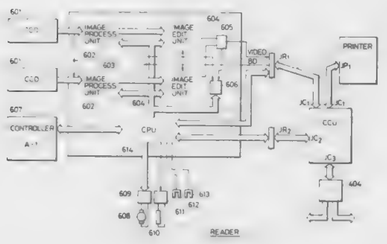
designation means for designating a plurality of areas of an original to be separately processed;

reading means for reading the original and outputting a first electric signal representative of the original;

process means for image-processing the electric signal for

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each of the areas designated by said designation means, wherein said process means comprises first processing means resposnive to a level of the first electrical signal for controlling a recording signal to produce a first resultant signal having three or more levels in pulse width, and second processing means responsive to a level of the first



electrical signal for controlling the recording signal to produce a second resultant signal having two levels in pulse width; and

record mean for recording an image on a recording member in response to the first and second resultant signals from said respective first and second processing means.

4,734,783

SHADING ELIMINATION DEVICE FOR IMAGE READ-OUT APPARATUS

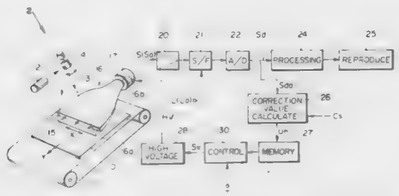
Kazuo Horikawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 22, 1986, Ser. No. 899,156

Claims priority, application Japan, Aug. 26, 1985, 60-187041; Aug. 26, 1985, 60-187042

Int. Cl.⁴ H04M *1/40*

U.S. Cl. 358—280 **12 Claims**



1. A shading elimination device for an image read-out apparatus for scanning a recording medium carrying an image recorded thereon with a light beam, obtaining light carrying image information, guiding the light by a light guiding optical system, and detecting the guided light by a photodetector connected with the light guiding optical system,

the shading elimination device comprising:

(i) a storage means for storing characteristics of shading caused by intensity nonuniformity of said scanning light beam, scanning speed nonuniformity, light guiding nonuniformity of said light guiding optical system, sensitivity nonuniformity of said photodetector, or the like,

(ii) a sensitivity adjustment means for adjusting the sensitivity of said photodetector, and

(iii) a control circuit for receiving a signal representing said characteristics of shading from said storage means, and controlling said sensitivity adjustment means to eliminate a change in the output of said photodetector caused by said shading.

4,734,784

IMAGE PROCESSING APPARATUS

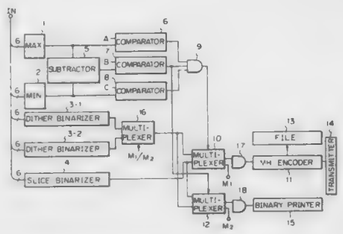
Kanou Tanaka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 737,045, May 23, 1985, abandoned. This application Jul. 28, 1987, Ser. No. 78,028

Claims priority, application Japan, Jun. 5, 1984, 59-114824

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—283 **15 Claims**



1. An image processing apparatus comprising:

image data input means;

processing means for processing the image data inputted from said image data input means to produce a reproduction signal, said processing means being capable of processing the image data in at least several processing modes;

selection means for selecting a transfer destination of the reproduction signal from said processing means; and

switching means for switching the processing mode of said processing means in accordance with the selection by said selection means.

4,734,785

IMAGE PROCESSING APPARATUS HAVING AN AUTOMATIC SAMPLING MODIFICATION FUNCTION

Masahiro Takei, Yokohama, and Makoto Takayama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,536

Claims priority, application Japan, Mar. 2, 1984, 59-38874

Int. Cl.⁴ H04N *1/387, 1/393, 1/46*

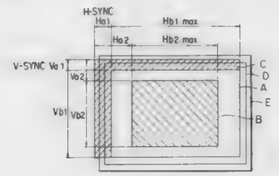
U.S. Cl. 358—285 **11 Claims**

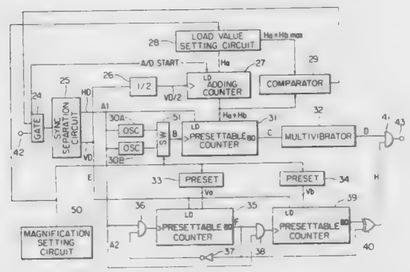
1. An image processing apparatus comprising:

sampling means for sampling an image signal consisting of a number of horizontal scanning lines;

interval changing means for changing a sampling interval in the horizontal scanning direction of said sampling means;

region changing means for narrowing a sampling region of said sampling means in response to narrowing of the sampling interval; and





interpolating means for performing interpolation in the vertical scanning direction in response to narrowing of the sampling interval.

4,734,786

IMAGE PROCESSING APPARATUS

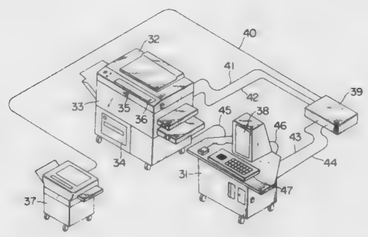
Takashi Minakawa, and Yasuhisa Ishizawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,924

Claims priority, application Japan, Oct. 17, 1983, 58-193876

Int. Cl.⁴ H04N *1/04*

U.S. Cl. 358—287 **15 Claims**



1. An image processing apparatus comprising:

image data input means; and

processing means for processing image data from said input means;

said processing means changing the size of predetermined areas of the image data for each of said areas in accordance with an input magnification factor, said predetermined areas having a plurality of image data in conjunction with a half-tone processing operation.

4,734,787

ORIGINAL READER

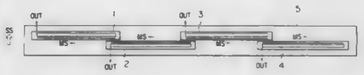
Kimiyoshi Hayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 632,879, Jul. 20, 1984, abandoned. This application Mar. 10, 1987, Ser. No. 23,968

Claims priority, application Japan, Jul. 29, 1983, 58-140006; Jul. 29, 1983, 58-140007

Int. Cl.⁴ H04N *1/40, 1/10*

U.S. Cl. 358—293 **17 Claims**



1. An original reader comprising:

a plurality of line sensor chips provided on a substrate and each having a plurality of photosensor elements, said line sensor chips being arranged such that lines read by adjacent line sensor chips mutually differ, said chips being arranged to read an original image on a division basis and image reading areas of the adjacent line sensor chips being partially overlapped;

means for causing relative movement of said plurality of line sensor chips and an original, for reading the original image, in a direction perpendicular to a scanning direction of said plurality of line sensor chips;

delay means for delaying an analog output of the line sensor chip which scans the original before others of said plurality of line sensor chips by a predetermined time; and

means for eliminating, from outputs of said plurality of line sensor chips, outputs corresponding to said overlapped image reading areas.

4,734,788

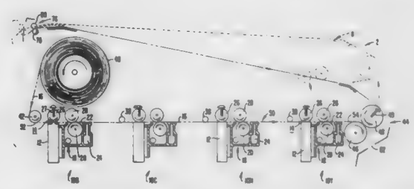
SINGLE PASS ELECTROSTATIC COLOR PRINTER/PLOTTER HAVING STRAIGHT PAPER PATH

David M. Emmett, Palo Alto; Robert L. Nieto, Concord, and Joseph Camacho, San Jose, all of Calif., assignors to Benson, Inc., Mountain View, Calif.

Filed Sep. 5, 1986, Ser. No. 904,137

Int. Cl.⁴ H04N *1/23;* G03G *15/01;* G01D *15/14*

U.S. Cl. 358—300 **26 Claims**



1. A single pass electrostatic color printer/plotter comprising:

a frame having a media inlet and a media outlet;

a media supply for providing a length of a medium, having first and second generally parallel lateral edges, to the media inlet;

a single media driver at the media outlet for pulling the medium in a forward direction only from the media inlet to the media outlet; and

a printing assembly including a plurality of print stations mounted to the frame and positioned along a substantially straight media path between the media inlet and the media outlet, the print stations each adapted to minimize any deviation of the medium from the substantially straight media path.

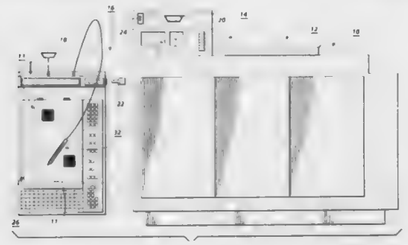
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,789

EDITING COPYING MACHINE

Craig A. Smith, Pittsford; Thomas B. Wall; Robert L. Kurtz, both of Fairport, and Ruediger W. Knodt, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1987, Ser. No. 9,862
Int. Cl.[4] G03G *15/04*
U.S. Cl. 358—300 **27 Claims**



1. An apparatus for producing an altered copy of an original document; including:

means for reproducing copies of an original document;

means, located remotely from said reproducing means, for changing the information of the original document and generating a signal indicative of the changes in the original document, said changing means being adapted to support the original document with the information thereon visible; and

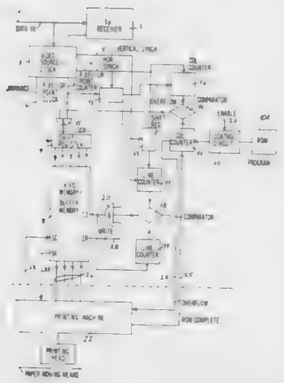
means, operatively associated with said changing means and arranged to overlay the original document, for indicating the region of the original document being altered on the copy.

4,734,790

VIDEO PRINTING PROCESS AND APPARATUS

Jean A. Pajus, Ismier, and Christiane S. Luneau, Cesson, both of France, assignors to Etablissement Public de Diffusion dit "Telediffusion de France" and L'Etat Francais le Secretaire d'Etat aux Postes et Telecommunications, both of, France

Continuation-in-part of Ser. No. 757,192, Jul. 22, 1985, abandoned, which is a continuation of Ser. No. 93,040, Nov. 9, 1979, abandoned. This application May 9, 1986, Ser. No. 861,308
Claims priority, application France, Nov. 13, 1978, 78 32431
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—310 **7 Claims**



1. A process for printing two-dimensional images responsive to video signals by means of a multiple point printing head having k print points, the process comprising the steps of:

(1) continuously converting said video signals into continuously repeated binary code signals representing a grid of points, wherein said grid has m horizontal lines corresponding to the lines of a television picture, each horizontal line having a length comprising n points,

(2) grouping vertical lines of said grid into form n/k columns, each of said columns comprising k vertical lines,

(3) reading out point data to said printing head (a) beginning with the point binary data of a first line in a last column, (b) then the point binary data of a second line in the last column, and (c) so on up to the point binary data of an mth line in the last column,

(4) shifting the printing head by a length corresponding to the width of the printing head,

(5) reading out the point binary data of the next column, and

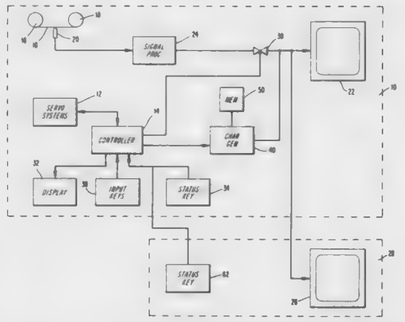
(6) continuing to shift the head and readout point binary data column by column, interrupted by head shifts, to print the point binary data of every column up to the mth line of the first column.

4,734,791

VIDEO TAPE RECORDER HAVING STATUS DISPLAY MODE

John C. Stearns, San Jose, and Michael D. Arbuthnot, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1986, Ser. No. 850,803
Int. Cl.[4] H04N *17/06*
U.S. Cl. 358—335 **14 Claims**



1. A video recording and/or reproducing system which facilitates rapid assessment of the operating states of multiple components which determine the configuration of the system, comprising:

means for recording and/or reproducing a television signal with respect to a video record medium;

a television signal display monitor for receiving said television signal and displaying images related thereto;

multiple operating subsystems for controlling said recording and/or reproducing means and the display of images on said monitor, each of said subsystems having at least two selectable operating states to configure the recording and/or reproducing system for a desired mode of operation;

means for manually selecting an operating state for each of said subsystems;

means for generating a request to review the current configuration of said system; and

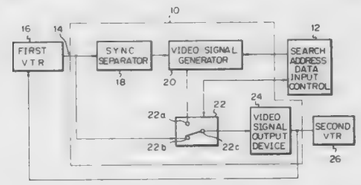
means responsive to said request for determining the current selected state of each of said operating subsystems and for generating a display of messages on said television signal display monitor which identifies each subsystem and its determined state.

4,734,792

RECORD ADDRESS DATA RECORDING APPARATUS FOR USE WITH A VTR OR THE LIKE

Eiichi Maeda, Kawanishi, and Fujiaki Narita, Amagasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,449
Claims priority, application Japan, Jul. 24, 1984, 59-154628; Jul. 24, 1984, 59-154629; Sep. 7, 1984, 59-188539; Oct. 30, 1984, 59-229298
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 **8 Claims**



1. A data insertion device for video tape recorders comprising:

an address data input control means;

sync separator means supplied with a video signal which is reproduced by said video tape recorder (VTR) from the video tape in a play back mode, for separating the sync signals from the video signal;

video signal generator means for adding the sync signals separated by said sync separator means to the data to be inserted which is supplied from the address data input control means;

switching means for, while the address data is inserted into the video tape by the record head of the VTR, delivering a video signal outputted from said video signal generator means and, while the address data is not inserted, delivering the reproduced video signal outputted from the VTR; and

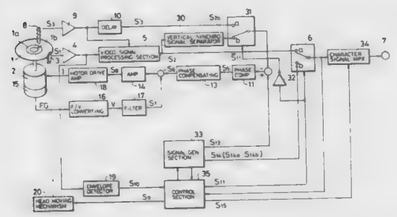
video signal transferring means for transferring the video signal outputted from said switching means to the record head of the VTR.

4,734,793

SYNCHRONIZATION CONTROL SYSTEM IN VIDEO SIGNAL REPRODUCING DEVICE

Kiyotaka Kaneko; Katsuo Nakadai; Izumi Miyake, and Kazuya Oda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Japan

Filed Feb. 21, 1986, Ser. No. 831,912
Claims priority, application Japan, Feb. 21, 1985, 60-34071
Int. Cl.[4] H04N *5/94, 5/95*
U.S. Cl. 358—336 **21 Claims**



1. A video signal reproducing apparatus for use with a magnetic disk of the type that has a phase generate signal generating source at a portion thereof, the position of which having a predetermined relationship in phase with a synchronization of said disk, comprising:

disk information detecting means, located opposing said disk, for reading information from said disk and producing output signals indicative of: 1) a phase generate signal from said phase generate signal generating source on said disk, and 2) a video signal from said disk;

drive means for causing relative positional movement between said magnetic disk and said information detecting means, said drive means having a controlling input and producing an output signal indicative of said relative positional movement;

signal generating means, coupled to an output of said disk information detecting means, for producing a compound synchronization signal comprising a vertical sync signal and a horizontal sync signal synchronized with said video signal, and for producing a servo reference signal, synchronized with at least one of said sync signals in said compound synchronization signal;

switch means, coupled to receive said video signal and said compound synchronization signal as input signals, and responsive to a control input signal, for selectively outputting one of said input signals based on said control input signal;

phase detection and correction means, for receiving another synchronization signal from said magnetic disk, and receiving said servo reference signal, and producing an output signal indicative of a difference therebetween, said output signal being used, along with said output signal of said drive means to control said drive means, and wherein said another synchronization signal is said phase generate signal at least during periods of switching between tracks of said disk; and

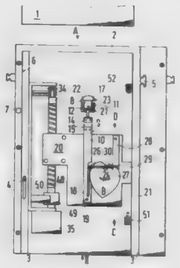
control means for commanding a switching between tracks of said disk, and producing and sending a switching signal to said control input of said switch means, said switching signal commanding an output of said composite synchronization signal during said switching of tracks.

4,734,794

DEVICE FOR RECORDING AND REPRODUCING AUDIO SIGNALS ON FLAT RECTANGULAR RECORDING MEDIA

Gottfried Mehnert, Messelstrasse 25, D-100 Berlin 33, and Karl-Ludwig Zorn, Breite Strasse 42, D-1000 Berlin 33, both of Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,788
Int. Cl.[4] G11B *5/58, 25/04*
U.S. Cl. 360—2 **9 Claims**



1. A device for recording and reproducing audio signals on flat rectangular recording media, which media has a magnetic coating or the like on at least one side, the subject device comprising a magnetic head movable by means of a heart-shaped cam which guides the head for recording or reproducing, back and forth across the recording media in mutually parallel, uniformly spaced lines, a transition taking place at the end of each line to the next line; mechanisms that ensure the

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lines are tracked in the reproducing mode in the same direction of movement of the magnetic head as in the recording mode; said heart-shaped cam having an asymmetric shape; said magnetic head being pivotably mounted on one end of a swing arm which carries between its ends a cam follower peg that continuously engages said heart-shaped cam while under spring loading, the other end of said swing arm being pivotably joined to a sliding carriage plate which is slidably guided perpendicularly to the chord of the aforesaid back and forth path of movement of said magnetic head for each said line; and means controlled by the reversal of direction of said magnetic head causing equal transitional steps in said perpendicular movement of said sliding carriage.

4,734,795

APPARATUS FOR REPRODUCING AUDIO SIGNAL

Takashi Fukami; Akira Sakamoto, and Masataka Yoritate, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

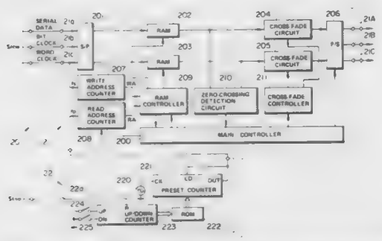
PCT No. PCT/JP84/00433, § 371 Date May 9, 1985, § 102(e) Date May 9, 1985, PCT Pub. No. WO85/01377, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 10, 1984, Ser. No. 734,263

Claims priority, application Japan, Sep. 9, 1983, 58-166269; Dec. 14, 1983, 58-234171

Int. Cl.⁴ G11B *5/00, 5/08*

U.S. Cl. 360—8 **6 Claims**



1. An apparatus for reproducing an audio signal comprisng a reproducing unit wherein audio signal data are reproduced at a variable α-times speed from a medium on which said audio signal data was previously recorded at a predetermined sampling frequency Fs, and a pitch conversion unit wherein pitch conversion of the reproduced audio signal is effected such that said audio signal data at a sampling frequency fs ($=\alpha$Fs) obtained from said reproducing unit are written into a memory with a write clock corresponding to said reproducing sampling frequency fs and read out from said memory with a read clock corresponding to a frequency fp which is β times said predetermined sampling frequency Fs, where β is a selected multiplier.

4,734,796

TECHNIQUE FOR PREVENTING UNAUTHORIZED COPYING OF INFORMATION RECORDED ON A RECORDING MEDIUM AND A PROTECTED RECORDING MEDIUM

Amiram Grynberg, 24 Rimon St., Neve Monoson, and Henry Klein, 6 Hadeganiot St., Rehovot, both of Israel

Filed Sep. 6, 1983, Ser. No. 529,683

Claims priority, application Israel, Apr. 14, 1983, 68401; Jun. 15, 1983, 68989

Int. Cl.⁴ G11B *15/04, 19/04, 5/09*

U.S. Cl. 360—60 **8 Claims**

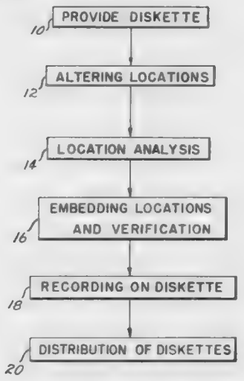
1. A method for prevention of usage of unauthorized copies of information recording media, such as diskettes, comprising the steps of:

producing a variable signature on the information recording medium, which variable signature provides a different signal output upon multiple readings:

analyzing the information recording media after producing the variable signature to provide a storable indication of the precise locations of the variable signature;

recording onto the signature bearing recording media information the copying of which is to be resisted, the information thus recorded including said storable indication of the precise location of the variable signature; and

embedding onto the signature bearing recording medium instructions requiring:



reading the information recording medium at the location of the variable signature a plurality of times;

comparing the read signatures obtained upon said plurality of readings to determine whether variation is present therebetween; and

providing an output indication permitting usage of information stored on said information recording medium only in response to sensed variation in the read signatures upon said plurality of readings.

4,734,797

PCM-SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

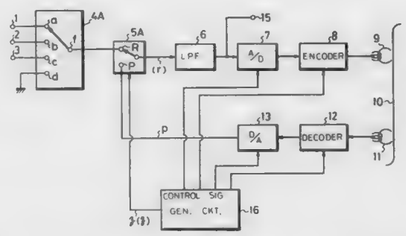
Takao Takahashi, and Hajime Inoue, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 799,925

Claims priority, application Japan, Dec. 6, 1984, 59-258268

Int. Cl.⁴ G11B *15/12, 5/00*

U.S. Cl. 360—61 **9 Claims**



1. Pulse code modulated signal apparatus having a recording mode and a reproducing mode and comprising:

a plurality of input terminals for respectively receiving a plurality of input signals;

a digital-to-analog converter for receiving a reproduced digital input signal in said reproducing mode and producing an analog output signal corresponding thereto;

input switch means for making a selection of one of said plurality of input signals in the recording mode and a selection of a non-signal in the reproducng mode and producing a switched output corresponding thereto;

selector switch means having a first input connected to said switched output from said input switch means and a second input connected to said analog output signal and producing a selected output therefrom;

filter means for filtering said selected output; and

control means for controlling said selector switch means in said reproducing mode to select alternately said analog output signal and said non-signal from said input switch means, thereby providing aperture compensation.

4,734,798

MAGNETIC RECORDING AND REPRODUCING APPARATUS

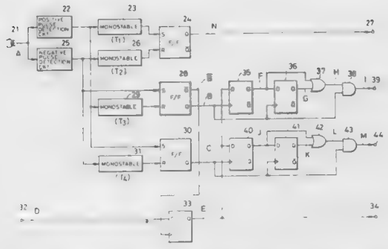
Takashi Uchimi, and Hiroyuki Umeda, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jul. 18, 1986, Ser. No. 886,927

Claims priority, application Japan, Jul. 19, 1985, 60-159741

Int. Cl.⁴ G11B *5/03*

U.S. Cl. 360—66 **5 Claims**



1. A magnetic recording and reproducing apparatus comprising means for generating a recording current, means for generating an erase current, a motor-driven head drum having at least one rotary recording head mounted thereon for recording signals on a magnetic tape in response to said recording current and for reproducing said signals and further having at least one rotary erase head for scanning signal tracks which have been recorded by said rotary recording head, to erase said signal tracks in response to said erase current, said signal tracks being successively formed with a fixed track width and a fixed pitch, in which said rotary erase head is formed with a track width which is equal to at least twice a value W, where W is the product of the number of said rotary recording heads multiplied by the pitch of said signal tracks, divided by the number of said rotary erase heads, whereby during erasure of said signal tracks said rotary erase head scans over substantially the entire width of each of said signal tracks twice in succession, and further comprising control means for controlling the supply of said recording current and said erase current to said rotary recording head and rotary erase head respectively such that upon termination of supply of said erase current to said rotary erase head a supply of said recording current to said rotary recording head is continued during a specific period of time, for thereby executing recording upon a portion of said magnetic tape which has been immediately previously erased by said rotary erase head.

4,734,799

APPARATUS FOR TRACKING MAGNETIC HEAD ON ROTARY MAGNETIC RECORDING MEDIUM BY ENVELOPE DETECTION

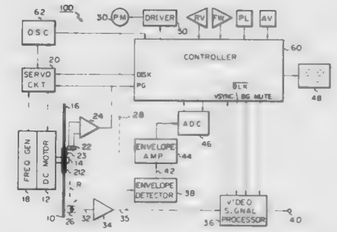
Izumi Miyake, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1985, Ser. No. 750,267

Claims priority, application Japan, Jul. 2, 1984, 59-135153

Int. Cl.⁴ G11B *21//10*

U.S. Cl. 360—78 **5 Claims**



1. A tracking apparatus for a rotary magnetic recording medium on which a plurality of tracks are recorded, each track defining an endless loop, comprising:

magnetic head means for sensing signals recorded on one of the plurality of tracks;

head transport means for transporting said magnetic head means across the rotary magnetic recording medium;

detector means for detecting an envelope of the signals sensed by said magnetic head means;

control means for controlling said head transport means to cause said magnetic head means to be transported onto desired ones of the plurality of tracks on the basis of the detected envelope; and

sync signal producing means for producing a reference signal which is synchronous with rotation of the recording medium;

said control means being responsive to the reference signal to receive the detected envelope and effect tracking of said magnetic head means by said head transport means.

4,734,800

CHANGEOVER MECHANISM FOR SELECTIVELY DRIVING TAPE LOADING AND CASSETTE LOADING IN A TAPE RECORDER

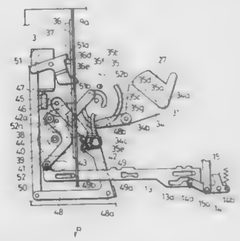
Shoji Suzuki, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

Filed Mar. 28, 1986, Ser. No. 845,593

Claims priority, application Japan, Mar. 28, 1985, 60-43993[U]

Int. Cl.⁴ G11B *15/665, 15/675, 5/008, 15/18*

U.S. Cl. 360—85 **1 Claim**



1. A changeover mechanism for selectively driving tape

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loading and cassette loading in a cassette tape recorder having a chassis, a single reversible motor in the chassis providing a power output in a forward direction for driving a cassette moving mechanism to move a tape cassette inserted in the chassis to a loading position and driving a tape loading mechanism to load a tape in the cassette around a recorder head, and in a reverse direction to unload the tape from the recorder head and eject the tape cassette from the chassis, said changeover mechanism comprising:

a rotatable cassette moving gear (**41**) in mesh with a cassette moving mechanism for moving the inserted cassette to a loading position when said cassette moving gear is rotated in a forward direction, and for moving the cassette from the loading position to an ejection position when said gear is rotated in a reverse direction;

a rotatable positive motion cam (**35**) having a spiral groove formed therein, said groove extending between an outer (**35***d*) position and an inner (**35***c*) position, in which one end of a pivotable sector gear (**34**) is slidably retained for pivoting the sector gear correspondingly in response to rotation of the positive motion cam in forward and reverse directions, said sector gear being meshed with a tape loading mechanism for loading and unloading the tape around the recorder head, said inner position of said groove corresponding to a position of said tape loading mechanism in which the tape is fully unloaded from the recorder head;

a pivotable reversing lever having one end pivotally mounted to the chassis about a pivot axis and another end engageable with said one end of said sector gear (**34**) such that said reversing lever is shifted between a first position and a second position when said one end of said sector gear is slidably moved between said outer position and said inner position of said groove, respectively, by rotation of said positive motion cam, said reversing lever being shifted to said second position only when said one end of said sector gear has moved substantially completely to said inner position of said groove;

a pivotable arm (**42**) having one end pivotally mounted to the chassis, a pinion (**43**) supported at an intermediate portion thereof and being driven in forward and reverse rotation of the reversible motor for moving the cassette to the loading position and loading the tape, and for unloading the tape and ejecting the cassette, respectively, and a fore end connected by a bistable spring arranged to a part of said reversing lever for positively switching said pinion when said reversing lever is shifted by said sector gear from said first position to said second position, between a position in mesh with said positive motion cam and a position in mesh with said rotatable cassette moving gear, said pinion being spaced apart from said cassette moving gear when it is in mesh with said positive motion cam, and spaced apart from said positive motion cam when it is engaged with said cassette moving gear,

wherein said bistable spring arrangement comprises a torsion coil spring having two ends each mounted on a respective support point on said fore end of said pivotable arm and on said part of said reversing lever such that a line passing between the pivot axis of said reversible lever and the support point thereof is moved to one side and then the other relative to the support point on the pivotable arm when said reversing lever is shifted between said first and second positions, whereby said pinion is positively switched to mesh sequentially with said tape loading mechanism and then with said cassette moving mechanism by rotation of said single reversible motor in one direction.

4,734,801

RETAINING DEVICE FOR AN EJECT LEVER OF A DISK RECORDING AND REPRODUCING APPARATUS

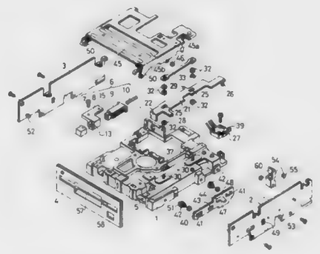
Kuninobu Takeda; Osamu Shigenai, and Takashi Toyama, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed May 23, 1985, Ser. No. 737,156

Claims priority, application Japan, May 23, 1984, 59-74502[U]; May 25, 1984, 59-75739[U]

Int. Cl.⁴ G11B *17/00, 17/04*

U.S. Cl. 360—97 **3 Claims**



1. A retaining device for retaining a disc eject lever in position on a bearing member of a disc player while preventing the same from slipping out of position, comprising:

a pair of guide pins anchored upright on said bearing member of said disc player at a predetermined spacing from each other and each having a circumferential groove near an end thereof;

said eject lever having extension allowing means for allowing said ends of said guide pins to extend therethrough when said eject lever is mounted thereon against said bearing member; and

a generally flat linear retainer member which has a certain flexibility and is formed at both its ends with engagement means arranged at said predetermined spacing for engagement with said circumferential grooves of said guide pins with said retainer member lying flat against said eject lever and extending linearly between said guide pins to hold said eject lever thereon, said retainer member being conveniently installed on said guide pins by its flexibility allowing it to be slightly bent so that said engagement means at both ends can be fitted in said circumferential grooves of said guide pins, and said retainer member thereafter snugly fitting and extending linearly between said pins and lying flat against said eject lever,

wherein said extension allowing means includes a pair of slots sized and positioned to ensure allowance of the extensions of said guide pins therethrough.

4,734,802

FILM MAGNETIC HEAD SLIDER HAVING A CONTACTING PORTION CONTAINING ZIRCONIA AND CARBON

Shinsuke Higuchi; Yukio Takeda, both of Hitachi; Shiro Iijima, Mito; Masaki Ohura, and Sadanori Nagaike, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,536

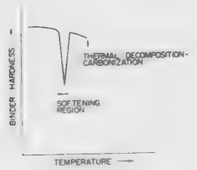
Claims priority, application Japan, Oct. 2, 1984, 59-205609; Nov. 29, 1984, 59-252701

Int. Cl.⁴ G11B *5/60, 5/187, 15/64, 17/32*

U.S. Cl. 360—103 **7 Claims**

1. A film magnetic head slider which comprises a slider performing contact-start-stop actions on a recording medium and being provided with a film magnetic head device on a side end of the slider, at least the recording medium-contacting part of a slider being made from a sintered material containing

ZrO_2 in the cubic system as the major component, and having an average crystal grain size of not more than 5 μm, a carbon



content of 0.01 to 1% by weight, and thermal conductivity of not more than 0.02 cal/cm.sec.°C.

4,734,803

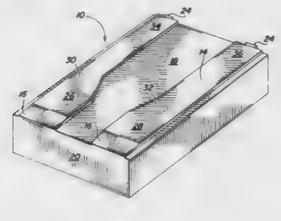
MAGNETIC HEAD AIR BEARING SLIDER

Henry S. Nishihira, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Mar. 20, 1986, Ser. No. 841,646

Int. Cl.⁴ G11B *21/20*

U.S. Cl. 360—103 **9 Claims**



1. In a multirail air bearing slider for supporting a transducer:

a slider body having leading and trailing ends and an air bearing surface;

a pair of substantially coplanar side rails disposed along the sides of said air bearing surface to form a recessed section, open at both the leading and trailing ends of said slider, between said side rails;

each said side rails having a tapered section at the leading end and a width, as measured normal to the leading to trailing dimension of said slider, that decreases to a predetermined value at a point remote from said leading end, and wherein said width of said side rails does not substantially exceed said predetermined value between said point and said trailing end of said slider.

4,734,804

MAGNETIC HEAD DRIVING MECHANISM FOR A MAGNETIC DISK DRIVE

Shuichi Hanabusa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,422

Claims priority, application Japan, Feb. 27, 1984, 59-35525

Int. Cl.⁴ G11B *5/54, 5/55*

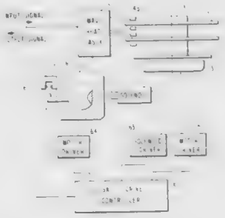
U.S. Cl. 360—104 **10 Claims**

10. A magnetic head positioning mechanism for positioning a magnetic head at a target track of a magnetic disk driven by a spindle motor, said magnetic head being floated from a surface of said magnetic disk with a flying clearance therebetween by an airflow caused by rotation of said magnetic disk, said magnetic head contacting said surface of said magnetic disk when said rotation of said magnetic disk is stopped, said magnetic head positioning mechanism comprising:

a carriage for mounting said magnetic head, said carriage being movable in a radial direction of said magnetic disk;

a stepping motor for enabling said carriage to move in said radial direction so as to position said magnetic head at the target track of said magnetic disk, said stepping motor including a rotary shaft coupled to said carriage at one end;

cylindrical damper housing fixedly secured to the other end of said rotary shaft to rotate together with said rotary shaft, said damper housing including a sealed cylindrical hollow portion disposed around said rotary shaft and teeth provided around an outer circumferential surface of said damper housing;



an inertial flywheel provided in said hollow portion, said flywheel being rotatable in said hollow portion, viscous fluid filling remaining parts of said hollow portion;

a solenoid including a plunger disposed opposite to said outer circumferential surface of said damper housing, said plunger being provided with a spring for enabling said plunger to engage said teeth of said damper housing to prevent said stepping motor from rotating, said plunger being disengaged from said teeth of said damper housing by exciting said solenoid, said solenoid being excited while said spindle rotates said magnetic disk, whereby said magnetic head is prevented from moving in said radial direction of said magnetic disk when said magnetic head contacts said surface of said magnetic disk.

4,734,805

MAGNETIC HEAD SUPPORTING MECHANISM

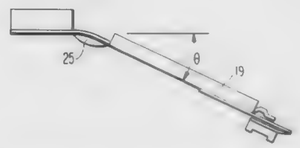
Tadaharu Yamada, and Makoto Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,202

Claims priority, application Japan, Feb. 9, 1984, 59-22256

Int. Cl.⁴ G11B *5/48, 5/55, 5/596*

U.S. Cl. 360—104 **10 Claims**



1. A magnetic head supporting mechanism for positioning a magnetic head at a target track on the surface of a magnetic disk, comprising:

an arm section for moving said magnetic head to radially access different data tracks of said magnetic disk;

a suspension element made of a single resilient plate including, in order, a first section fixed to said arm section, a second section contiguous to said first section, and a third section contiguous to said second section;

means coupled to said third section for rendering said third section rigid against bending force;

a magnetic head slider assembly supported at the free end of

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said third section opposing the surface of said magnetic disk; and

a flexible resin firmly attached to the surface of said second section of said suspension element, with the surface of said flexible resin except for a portion of said flexible resin attaching to said suspension element, being open to the air, said flexible resin being firmly attached to the surface of said second section facing said magnetic disk.

4,734,806

CAM PLATE FOR POSITIONING HEAD BASE AND PINCH ROLLER IN TAPE PLAYER

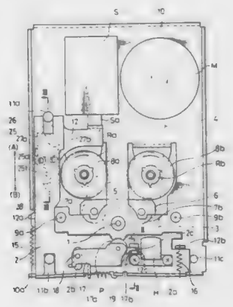
Norimasa Komatsu, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 16, 1986, Ser. No. 852,428

Claims priority, application Japan, Apr. 16, 1985, 60-54633[U]

Int. Cl.⁴ G11B *5/54, 21/22*

U.S. Cl. 360—105 **4 Claims**



1. A tape player comprising:

a chassis;

a capstan rotatably supported on said chassis;

a pair of reel bases mounted rotatably on said chassis for winding a tape of a tape cassette in one and the other directions;

a prime mover for rotationally driving said capstan and said reel bases for winding the tape in one and the other directions;

a head base supported slidably on said chassis;

a magnetic head fixed on said head base which is movable with said head base to be placed in contact and displaced out of contact with the tape;

a pinch roller movably supported on said chassis which is movable into and out of contact with said capstan for feeding the tape therebetween;

a drive plate connected to said head base and said pinch roller which is slidably supported on said chassis for sliding movement between an engaged position, wherein said magnetic head is placed in contact with the tape and the pinch roller is in contact with the capstan for playing or recording operations, and a retracted position, wherein said head base is displaced out of contact with the tape and the pinch roller is out of contact with said capstan;

a solenoid connected to said drive plate for moving said drive plate toward the engaged position when it is energized and for releasing said drive plate toward the retracted position when it is deenergized; and said chassis

bias means connected between said drive plate and said chassis for biasing said drive plate to move toward the retracted position when said solenoid is deenergized,

wherein the improvement comprises a cam mechanism actuated by the same said solenoid for holding and releasing said drive plate at an intermediate position between said engaged and said retracted positions, in which said magnetic head is in light contact with the tape and said pinch roller is slightly apart from said capstan for cue, review, or erasing operations, said cam mechanism including a cam plate supported on one of said drive plate and said chassis and an engaging member fixed on the other of said drive plate and said chassis, said cam plate having a stopper portion for holding said engaging member in the intermediate position when said solenoid if first deenergized after being energized to move said drive plate to said engaged position, and a guide portion for passing said engaging member and allowing said drive plate to be returned from said intermediate position to said retracted position by said bias means when said solenoid is subsequently energized and then deenergized.

4,734,807

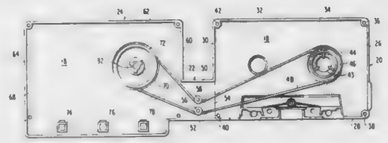
CASSETTE TAPE CLEANER

David Duley, Rte. #2, Box 224, Dexter, Mo. 63841

Continuation of Ser. No. 782,634, Oct. 2, 1985. This application Jun. 22, 1987, Ser. No. 65,095

Int. Cl.⁴ G11B *5/41*

U.S. Cl. 360—128 **5 Claims**



1. A tape cleaning device, particularly for cleaning tape contained in cartridges, cassettes or analogous receptacles, comprising:

a housing shaped to receive and hold a receptacle accommodating tape which is to be cleaned;

means in said housing for advancing the tape in the receptacle past an opening in the receptacle through which a tape playing or recording device normally engages the tape, and past a cleaning station in the housing; and

tape cleaning means in said housing at said cleaning station in a position to engage and clean the tape through the opening as the tape is advanced past said cleaning station, said tape cleaning means comprising more than two spaced apart, upstanding posts disposed closely adjacent the path of the tape being advanced, each post having a longitudinal axis extending transverse to the direction of movement of the tape and parallel to the plane of the tape at said station, and a sleeve-like tape cleaning pad replaceably mounted on each said post for successive engagement with the tape as the tape moves past the posts for cleaning the tape as the tape advances past the cleaning pads, said cleaning pads on successive posts performing discrete functions and being normally stationary on said posts but being selectively rotatable on the posts to bring successive portions of the pad into engagement with the tape, and said pads being removable from the post for replacement with a fresh pad, whereby a fresh section of cleaning pad may be selected for engagement with the tape.

4,734,808

TAPE GUIDE FOR USE IN TAPE RECORDER

Takaaki Kori, and Satosh Ohta, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,530

Claims priority, application Japan, Sep. 28, 1984, 59-203818

Int. Cl.⁴ G11B *15/60;* **B65H** *23/04;* **G03B** *1/48*

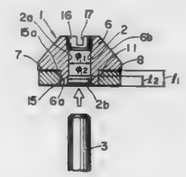
U.S. Cl. 360—130.2 **9 Claims**

1. A tape guide, for use in a tape recorder, comprising:

a rotatable cylindrical shaft;

a generally annular member having a major part and mounted on said cylindrical shaft for rotation therewith,

said annular member being formed with a coaxially projecting sleeve portion axially extending from the major part of said annular member, said annular member being transpierced by a coaxially extending cylindrical bore for receiving said cylindrical shaft, said cylindrical bore comprising a first section extending through said major part and a second section extending through said sleeve portion, said first section having an internal diameter suitable for establishing secure attachment to said cylindrical shaft, said second section being arranged in alignment with said first section and including a first portion having a diameter substantially equal to the diameter of said first section and a predetermined axial length and a second portion having a greater internal diameter than that of said first section,



said second section receiving said cylindrical shaft while maintaining a given clearance between the external periphery of said cylindrical shaft and the internal periphery thereof; and

a ring made of ceramics coaxially and intimately disposed about said sleeve portion for rotation with said annular member, said ring having a bevelled inner edge so that an annular space is defined between said ceramic ring and said annular member, said annular space having an axial length coextensive with the predetermined axial length of said first portion of said second section of said cylindrical bore whereby said second portion having a greater internal diameter than said first section and said annular space reduce stress on said ceramic ring.

4,734,809

STABILIZING MEMBER FOR A FLEXIBLE DISC IN A RECORDING AND/OR REPRODUCING APPARATUS

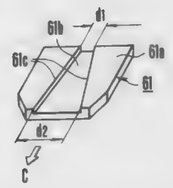
Mitsumi Inuma, Kanagawa, and Tsukasa Uehara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 664,706, Oct. 25, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 908,886

Claims priority, application Japan, Oct. 27, 1983, 58-201521

Int. Cl.⁴ G11B *15/60, 5/012*

U.S. Cl. 360—130.34 **15 Claims**



1. A record and/or reproducing apparatus using a disc-shaped flexible record-bearing medium, comprising:

(a) rotation means for rotating the medium;

(b) a recording and/or reproducing head arranged to confront a recording surface of the medium and movable in a radial direction of the medium; and

(c) a stabilizing member arranged to confront another surface of the medium thereby sandwiching the medium between the stabilizing member and said head, said stabilizing member having a recessed portion formed therein extending along a path of movement of said head, a width of said recessed portion, in the radial direction of said medium, being larger at a central portion of the medium than a peripheral portion of the medium.

4,734,810

MAGNETIC RECORDING MEDIUM COMPRISING PROTRUSION ON ITS SURFACE AND A PLASMA TREATED SUBSTRATE AND RECORDING/REPRODUCING METHOD THEREFOR

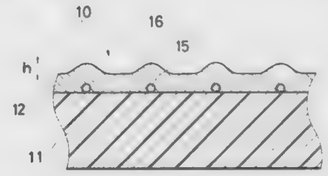
Masatoshi Nakayama; Kunihiro Ueda, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,436

Claims priority, application Japan, Aug. 2, 1984, 59-163249

Int. Cl.⁴ G11B *5/62, 5/712, 5/78, 5/82*

U.S. Cl. 360—131 **11 Claims**



1. A magnetic recording medium comprising

a flexible substrate having opposed major surfaces, and

a ferromagnetic metal thin film layer on one surface of the substrate primarily comprisnig cobalt, the magnetic recording medium being used in combination with a magnetic head having a gap, characterized in that

said substrate is plasma treated at a frequency of 10 KHz to 200 KHz,

said metal thin film layer contains oxygen, and

the medium has protrusions on its surface at an average density of at least $10^5/a^2$ per square millimeter of the surface, the protrusions having a height of 30 to 300 Å, where a is the distance of the magnetic head gap and is 0.1 to 0.5 μm.

4,734,811

MAGNETIC TRANSDUCING HEAD

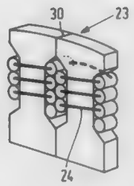
Jakob G. Siekman, Son, and Johann R. P. N. Crüts, Eindhoven, both of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 7, 1986, Ser. No. 849,226

Claims priority, application Netherlands, Apr. 19, 1985, 8501144

Int. Cl.⁴ G11B *5/17*

U.S. Cl. 360—123 **6 Claims**



1. A magnetic transducing head comprising

two core limbs of magnetizable material, said limbs being spaced to form a transducing gap therebetween, each limb having an inside facing the inside of the other limb, an

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outside opposing the inside of the respective limb, and a pair of opposed lateral sides between said inside and said outside,

a bundle of insulated wires bonded to the inside of at least one of said core limbs and extending between the opposed lateral sides thereof, each of said insulated wires having an end at one of said lateral sides,

a bundle of insulated wires bonded to the outside of said at least one of said core limbs and extending between the opposed lateral sides thereof, each of said insulated wires having an end at said one of said lateral sides,

connection wires extending across said one lateral side between respective ends, at said one lateral side, of wires in the bundle on the inside and wires in the bundle on the outside to complete the turns of a coil, whereby,

wire bonding techniques known from integrated circuit technology may be used to connect the connection wires to wire ends in the bundles.

4,734,812

TAPE CARTRIDGE WITH ERASURE-PREVENTING INDICATOR PLUG

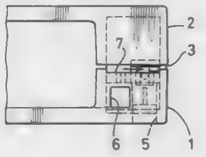
Kimio Tanaka, Saku; Haruo Shiba, Komoro, and Yoshiya Sakata, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 647,336, Sep. 5, 1984, abandoned. This application Jan. 30, 1987, Ser. No. 10,592

Claims priority, application Japan, Sep. 9, 1983, 58-139111

Int. Cl.[4] G11B *23/02, 15/04, 19/04*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cartridge having first and second housing sections, one of said housing sections comprising first and second walls mating at a right angle, a first discrete opening formed in said first wall, a second discrete opening formed in said second wall, a discrete slot formed in said second wall and spaced from said second opening, and a plug having first and second walls and mounted within said cartridge so as to slide on said first and second walls at said one section in the longitudinal direction of said slot between first and second positions, said plug being provided with a portion projecting into said slot so as to be accessible from the exterior of said cartridge, and means for releasably locking said plug in said first and second positions, said first and second openings being spaced apart such that either said first wall of said plug blocks said first opening and said second wall of said plug clears said second opening or said first wall of said plug clears said first opening and said second wall of said plug blocks said second opening depending on whether said plug is in said first or second position, whereby the opening blocked by a plug wall provides an indication of the recordable status of said cartridge.

4,734,813

CLAMPER HOLDING MECHANISM FOR POSITIONING AN INFORMATION RECORDING DISK

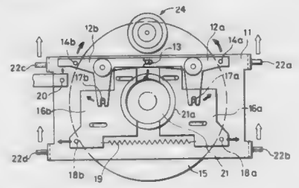
Akira Bessho, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,436

Claims priority, application Japan, Apr. 30, 1984, 59-63747[U]

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **5 Claims**



1. A clamper holding mechanism for positioning an information recording disk, comprising:

a spindle having a surface for supporting the disk,

an assembly including a tray for receiving the disk and a plate having a central opening mounted above and spaced apart from the tray,

a magnetic clamper movably disposed in the central opening, said clamper having flange portions for limiting the movement therein,

positioning means including primary lever means each having a surface opposing the magnetic clamper for engaging selectively magnetic clamper, said positioning means including a plurality of spaced projections for engaging selectively the disk at the outer perimeter thereof for engaging and transporting the disk in the tray,

said positioning means being movable to a first position for positioning the opposing surfaces of the primary lever means to engage the clamper and for positioning the plurality of spaced projections to engage the edge of the disk, said positioning means being movable to a second position for positioning the opposing surfaces of the lever means and the projections to release the clamper and the disk, respectively,

said assembly being movable in a first direction when the positioning means are in said first position for positioning the disk in registry with the spindle, said assembly being movable in a second direction when the positioning means are moving from said first position to said second position for releasing the magnetic clamper for magnetically clamping the disk between the clamper and the supporting surface of the spindle, said clamper being rotatable with the spindle.

4,734,814

PLURAL DISK CARTRIDGE ARRANGEMENT

Toyomi Fujino, Kanagawa, and Norio Hasegawa, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 933,886

Claims priority, application Japan, Nov. 30, 1985, 60-185286[U]

Int. Cl.[4] G11B *23/03, 17/22, 17/02;* **B65D** *85/30*

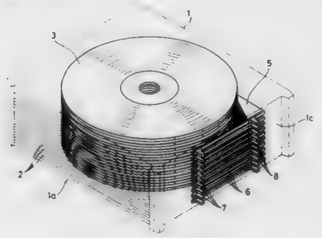
U.S. Cl. 360—133 **5 Claims**

1. A disk cartridge comprising:

a disk cartridge body for charging therein a plurality of disks so that the disks are stacked by shelf-like partitions;

biasing means, provided inside the disk cartridge body, for biasing the disk to be stored in a storage direction; and

a plurality of slide members, each having a projecting portion projecting outwardly from a side surface of said disk cartridge body and a push portion for pushing the stored disk in a discharging direction, and slidably provided along discharge and storage directions of the stored disk, for discharging or charging the disk to be stored against a biasing force of said biasing means upon operation of said projecting portion,



wherein click locking engaging portions each consisting of an engaging portion provided to either of said disk cartridge body or said slide member and an corresponding engaging portion provided to the other are formed at a position where said slide member is temporarily locked at the disk storage position.

4,734,815

DISC CARTRIDGE WITH A CLEANING MECHANISM

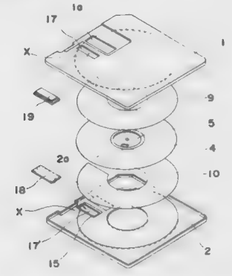
Nobuhiko Naganawa, Ibaragi; Yoshitake Kato, Ibaragi; Minoru Fujita, Ibaragi, and Kazuya Fukunaga, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 23, 1986, Ser. No. 888,424

Claims priority, application Japan, Jul. 23, 1985, 60-161107; Nov. 22, 1985, 60-261405

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—133 **7 Claims**



1. A disc cartridge comprising an outer case formed of a top half and a bottom half assembled to the top half to provide a disc chamber for accommodating a recording disc adapted to be rotated, a pair of pressure plates movably captured within the top half and bottom half of said outer case respectively so as to oppose each other in proper alignment, cleaning sheets positioned between said disc and said pressure plates, and openings defined respectively in said top half and bottom half of said outer case for accommodating each of said pressure plates such that said pressure plates are adapted to contact their associated cleaning sheet and exert a substantially uniform normal pressure onto said disc, said pressure plates and corresponding openings juxtapositioned just prior to head insertion openings defined in said top and bottom half.

4,734,816

DEMAGNETIZING DEVICE ESPECIALLY FOR NAVAL VESSELS

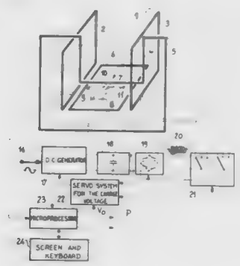
Germain Guillemin, and Jean J. Perion, both of Brest, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 19, 1986, Ser. No. 909,252

Claims priority, application France, Sep. 27, 1985, 85 14374

Int. Cl.[4] H01H *47/00*

U.S. Cl. 361—149 **5 Claims**



1. Demagnetizing device, especially for vessels, comprising:

conductors forming turns placed in the vicinity of an object to be demagnetized;

capacitors;

means for charging the capacitors to a determined voltage;

means for discharging the capacitors into the conductors;

at least one magnetometer for measuring the magnetization of the object to be demagnetized;

and means for servo-controlling the charge voltage of the capacitors as a function of the magnetization measured by the magnetometer.

4,734,817

MAGNETIC CLUTCH

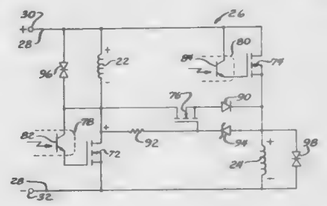
William A. Baker, Milwaukee, and Richard Shemanske, Brookfield, both of Wis., assignors to PT Components, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 669,683, Nov. 9, 1984, Pat. No. 4,609,965. This application Aug. 28, 1986, Ser. No. 901,266

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] H01H *47/32*

U.S. Cl. 361—190 **17 Claims**



1. Electronic switching means for controlling the operation of an electromagnetic apparatus having first and second coil winding means,

said switching means at times connecting said first and said second coil winding means in parallel and at other times in series, whereby said first and said second coil winding means are initially energized at a maximum ampere turns start mode when connected in parallel and said first and said second coil winding means are thereafter energized to

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a minimum ampere turns run mode when connected in series comprising

a power source providing energy to said first and said second coil winding means,

first contact means disposed between said first and said second coil winding means at first sides thereof,

second contact means disposed between said first and said second coil winding means at second sides thereof,

third contact means disposed between said first and said second coil winding means interconnecting a first side of one of said coil winding means with a second side of the other of said coil winding means,

whereby when said first and said second contact means are activated to an on position, said third contact means remains in an off position and said first and said second coil winding means are connected in parallel for initial start mode operation, and

whereby when said first and said second contact means are switched to an off position, said third contact means is activated to an on position and said first and said second coil winding means are connected in series for run mode operation.

4,734,818

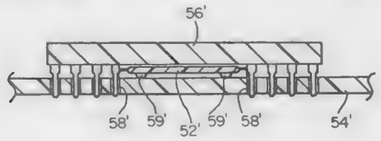
DECOUPLING CAPACITOR FOR SURFACE MOUNTED LEADLESS CHIP CARRIERS, SURFACE MOUNTED LEADED CHIP CARRIERS AND PIN GRID ARRAY PACKAGES

Jorge M. Hernandez, Mesa, and Aleta Gilderdale, Chandler, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 890,489, Jul. 25, 1986, Pat. No. 4,667,267, which is a continuation-in-part of Ser. No. 811,673, Dec. 20, 1985, Pat. No. 4,626,958, which is a continuation of Ser. No. 693,189, Jan. 22, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 28,172

Int. Cl.⁴ H01G *1/14, 4/10;* **H05K** *7/10*

U.S. Cl. 361—305 **40 Claims**



1. A decoupling capacitor for use with a surface mounted leaded chip carrier package or a surface mounted leadless chip carrier package wherein the surface mounted leaded chip carrier package and surface mounted leadless chip carrier package have an array of conductive connecting means arranged exteriorly on the perimeter thereof, at least some of the conductive connecting means being first and second voltage level conductive connective means, the capacitor including:

at least one multilayer capacitor chip having interleaved layers of conductive material and dielectric material with alternating layers of conductive material being electrically connected and defining first and second groups of conductive layers, each of said first and second groups having at least one exposed conductive layer defining a first exposed conductive layer and a second exposed conductive layer;

a first conductor in electrical contact with said first exposed conductive layer and defining a first voltage level conductor;

a second conductor in electrical contact with said second exposed conductive layer and defining a second voltage level conductor;

a plurality of first leads in a predetermined configuration in electrical contact with said first conductor and extending outwardly therefrom;

a plurality of second leads in a predetermined configuration in electrical contact with said second conductor and extending outwardly therefrom;

the configurations of said first and second leads corresponding to configurations of first and second voltage levels of connecting means of the surface mounted leaded chip carrier package or surface mounted leadless chip carrier package; and

an insulating material surrounding said dielectric body and conductors, said first and second leads extending through said insulating material.

4,734,819

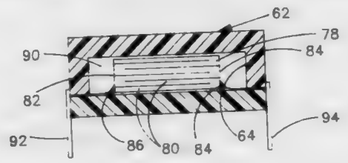
DECOUPLING CAPACITOR FOR SURFACE MOUNTED LEADLESS CHIP CARRIER, SURFACE MOUNTED LEADED CHIP CARRIER AND PIN GRID ARRAY PACKAGE

Jorge M. Hernandez, and Rodney W. Larson, both of Mesa, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 890,489, Jul. 25, 1986, Pat. No. 4,667,267, which is a continuation-in-part of Ser. No. 811,673, Dec. 20, 1985, Pat. No. 4,626,958, which is a continuation of Ser. No. 693,189, Jan. 22, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 27,739

Int. Cl.⁴ H01G *1/14;* **H01C** *1/01*

U.S. Cl. 361—306 **39 Claims**



1. An electronic subassembly comprising:

a surface mountable leadless integrated circuit chip carrier package, said leadless chip carrier package having an array of conductive connecting means arranged exteriorly on the perimeter thereof, at least some of the connecting means being first and second voltage level connecting means;

a circuit board, said circuit board having conductive pads thereon receiving said connecting means from said leadless chip carrier package; and

decoupling capacitor means, said decoupling capacitor means being mounted over and aligned with said leadless chip carrier package and electrically communicating with said circuit board, said capacitor means comprising;

at least one multilayer capacitor chip having interleaved layers of conductive material and dielectric material with alternating layers of conductive material being electrically connected and defining first and second groups of conductive layers, each of said first and second groups having at least one exposed conductive layer defining a first exposed conductive layer and a second exposed conductive layer;

first conductive layer means associated with ceramic substrate means and in electrical contact with said first exposed conductive layer and defining a first voltage level conductive layer means;

second conductive layer means associated with ceramic substrate means and in electrical contact with said second exposed conductive layer and defining a second voltage level conductive layer means;

a plurality of first leads in a predetermined configuration in electrical contact with said first conductive layer means and extending outwardly therefrom;

a plurality of second leads in a predetermined configuration in electrical contact with said second conductive layer means and extending outwardly therefrom; and

the configurations of said first and second leads corresponding to configurations of first and second voltage levels of connecting means of said leadless chip carrier package.

4,734,820

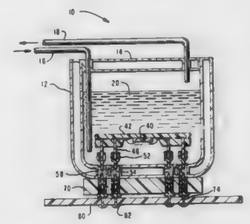
CRYOGENIC PACKAGING SCHEME

Donald K. Lauffer, Poway; Ikuo J. Sanwo, San Marcos, and Donald G. Tipon, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 16, 1987, Ser. No. 39,056

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—385 **3 Claims**



1. An integrated circuit package comprising:

a Dewar vessel;

an integrated circuit chip having a plurality of electrical conductors;

a pin grid array package mounting said integrated circuit chip, said pin grid array package having a plurality of pin conductors projecting from a surface of the pin grid array package which pin conductors are in electrical contact with the electrical conductors of said integrated circuit chip;

a plurality of openings through said Dewar vessel, corresponding in location to the plurality of pin conductors projecting from the surface of the pin grid array package;

a low thermal, electrically conductive, material filling each of said plurality of openings;

a plurality of electrically conductive pins each embedded at one end in said low thermal, electrically conductive, material and having at the opposite end an open receiver holding an amount of mercury, said plurality of electrically conductive pins extending toward the inner part of the Dewar vessel so as to engage corresponding ones of said plurality of pin conductors projecting from said pin grid array package;

a plurality of electrical conductive connector pins each embedded at one end in said low thermal electrically conductive material and projecting outward from said Dewar vessel; and

a receiving pin grid array receiving the plurality of electrically conductive connector pins projecting outward from said Dewar vessel to facilitate the electrical connection of said integrated circuit chip to a printed circuit board.

4,734,821

ELECTROLYTIC CAPACITOR

Takeshi Morimoto; Yoshiki Hamatani; Toshiya Matsubara, all of Yokohama; Naoto Iwano, and Hideo Shimizu, both of Fujisawa, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo and Elna Company Ltd., Fujisawa, both of, Japan

Filed May 13, 1987, Ser. No. 49,297

Claims priority, application Japan, May 13, 1986, 61-107769; May 20, 1986, 61-113484; May 20, 1986, 61-113485; Sep. 11, 1986, 61-212611

Int. Cl.⁴ H01G *9/00*

U.S. Cl. 361—433 **13 Claims**

1. An electrolytic capacitor comprising a capacitor element and an electrolyte impregnated to the element, wherein the electrolyte comprises an organic polar solvent and a solute dissolved in the solvent, said solute being selected from the group consisting of a quaternary ammonium salt of an aromatic carboxylic acid, a quaternary ammonium salt of cycloalkene carboxylic acid and a quaternary ammonium salt of an unsaturated aliphatic carboxylic acid.

4,734,822

ELECTRONIC CIRCUIT ENSURING PROTECTION AGAINST ELECTRICAL DISCHARGE, IN PARTICULAR FOR HAIRDRYERS

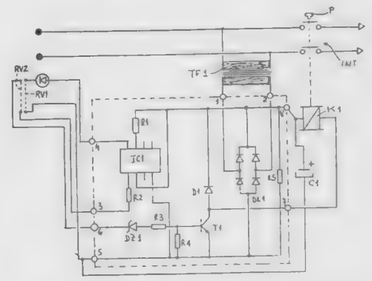
Giovanni Gilardoni, Via Statale Bergamina, 23, and Sergio Gilardoni, Via Defendente, 17, both of 20075 Lodi (Milano), Italy

Filed Aug. 19, 1986, Ser. No. 897,834

Claims priority, application Italy, Sep. 13, 1985, 22142 A/85

Int. Cl.⁴ H02H *9/08*

U.S. Cl. 361—42 **3 Claims**



1. An electronic safety device of the type comprising a pair of parallel, slightly spaced-apart metal sensing grids, and an electronic control and tripping circuit which maintains energized a relay for closing a control switch of an electrical feed line, each of the two grids being connected to the electronic control and tripping circuit by a pair of connection wires through which a supplementary control current constantly flows, accidental interruption of one of two circuits each formed by a grid and two respective connection wires causing tripping of said control circuit, each said grid being in series between its associated said two connection wires.

4,734,823

FAULT CURRENT INTERRUPTER AND EXPLOSIVE DISCONNECTOR FOR SURGE ARRESTER

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Corporation, Chicago, Ill.

Filed Nov. 1, 1985, Ser. No. 794,085

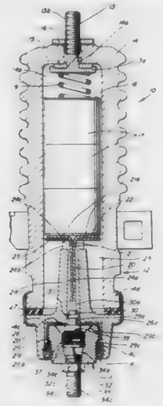
Int. Cl.⁴ H02H *3/22*

U.S. Cl. 361—125 **23 Claims**

1. A fault current disconnector for a surge arrester comprising an insulating member formed of arc quenching material and having bore means for quenching an arc, a conductive member extending within said bore means, a sealed venting chamber at least partially surrounding said insulating member, said chamber being in communication with one end of said

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bore means for venting of hot gases from said bore means, and means for moving said conductive member to form an arc, said



moving means comprising an explosive charge disposed at a second end of said bore means.

4,734,824

ELECTRICAL INSULATING OIL AND ELECTRICAL APPLIANCES IMPREGNATED WITH THE SAME

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Division of Ser. No. 711,155, Mar. 13, 1985, Pat. No. 4,621,302. This application Jun. 23, 1986, Ser. No. 877,272
Claims priority, application Japan, Mar. 14, 1984, 59-48591
Int. Cl.[4] H01G *4/22*
U.S. Cl. 361—315 **12 Claims**

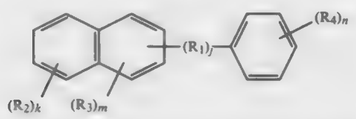
1. An oil-impregnated capacitor comprising dielectric or insulating material, wherein at least a part of said dielectric or insulating material is made of an insulating plastic film and said capacitor being impregnated with an electrical insulating oil composition comprising:

(a) 0.1 to 40% by weight of at least one monoolefin or diolefin having three condensed or non-condensed aromatic rings selected from the group consisting of olefins which are represented by one of the following General Formulae (III) or (IV), and

(b) 99.9 to 60% by weight of other electrical insulating oil,

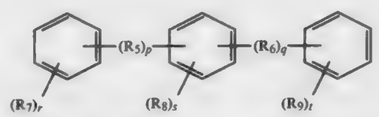
wherein said (a) and (b) are the only electrical insulating oil components of said composition, and said (a) components are soluble in said (b) components,

said General Formula (III) being



wherein R_1 is an aliphatic hydrocarbon group having 1 to 4 carbon atoms and having no or one or two ethylenically unsaturated double bonds, each of R_2 to R_4 is an aliphatic hydrocarbon group selected from the group consisting of methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, vinyl, propenyl, isopropenyl, alkyl, butenyl and butadienyl, j is 0 or 1, each of k, m and n is an integer from 0 to 3, and the total number of ethylenically unsaturated double bonds in R_1, R_2 of k in number, R_3 of m in number and R_4 of n in number is 1 or 2, and

said General Formula (IV) being



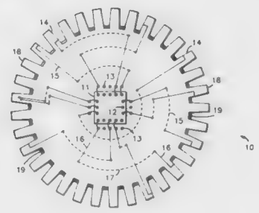
wherein each of R_5 and R_6 is an aliphatic hydrocarbon group having 1 to 4 carbon atoms and having no or one or two ethylenically unsaturated double bonds, each of R_7 to R_9 an aliphatic hydrocarbon group selected from the group consisting of methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, vinyl, propenyl, isopropenyl, allyl, butenyl and butadienyl, each of p and q is 0 or 1, each of r, s and t is an integer from 0 to 3, and the total number of ethylenically unsaturated double bonds in R_5, R_6, R_7 of r in number, R_8 of s in number and R_9 of t in number is 1 or 2.

4,734,825

INTEGRATED CIRCUIT STACKABLE PACKAGE

William M. Peterson, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 5, 1986, Ser. No. 904,077
Int. Cl.[4] H05K *1/11*
U.S. Cl. 361—414 **18 Claims**



1. An integrated circuit stackable package comprising:

a gear shaped interconnect device having a first surface, a second surface, and a plurality of gear shaped teeth spaced about a periphery of said interconnect device;

a plurality of conductive contacts being disposed about said plurality of gear shaped teeth; and

an integrated circuit being coupled to said gear shaped interconnect device, said integrated circuit having a plurality of leads each being coupled to one of said plurality of conductive contacts.

4,734,826

WORK SURFACE WITH CHANNEL FOR POWER COMMUNICATION CABLING

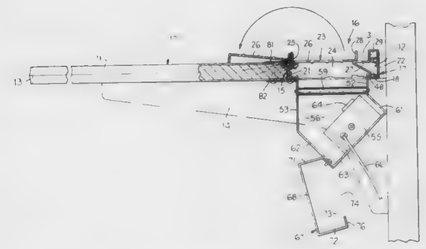
Harold R. Wilson, Holland, and Allen B. Belka, Wayland, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Continuation of Ser. No. 837,909, Mar. 10, 1986, abandoned. This application Jun. 5, 1987, Ser. No. 59,150
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—428 **11 Claims**

1. In a work surface structure having a horizontally enlarged top member with an enlarged and substantially planar upper working surface, the top member being of substantially rectangular configuration and including longitudinally extending front and rear edges, the improvement comprising:

channel means fixedly secured to and extending longitudinally along said rear edge for defining an elongated channel-like space for cables or conduits, said channel means including a longitudinally elongated channel-like member having a bottom wall, and openable cover means associated with said channel-like member and being pivotally mounted relative thereto for swinging movement between open and closed positions, said cover means when in said closed position extending across and substantially closing off the upper side of said channel member and being approximately flush with the upper working surface;

said bottom wall of said channel-like member having first and second openings extending therethrough, said openings being spaced apart from one another and individually



elongated in the longitudinal direction of said channel-like member;

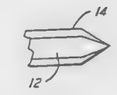
first and second removable, longitudinally elongated tray modules respectively positioned within said first and second openings and removably supported on the bottom wall of said channel-like member, said first and second tray modules substantially occupying said first and second openings and having side flanges which upwardly overlap said bottom wall adjacent the sides of said openings for permitting the tray modules to be removably supported on the bottom wall when occupying said first and second openings.

4,734,827

TANTALUM CAPACITOR LEAD WIRE

James Wong, Wayland, Mass., assignor to Supercon, Inc., Shrewsbury, Mass.

Continuation-in-part of Ser. No. 812,140, Dec. 23, 1985, Pat. No. 4,646,197, and a continuation-in-part of Ser. No. 851,343, Apr. 14, 1986, Pat. No. 4,674,009. This application Apr. 7, 1987, Ser. No. 35,187
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[4] H01G *9/00;* **B21C** *1/00*
U.S. Cl. 361—433 **8 Claims**



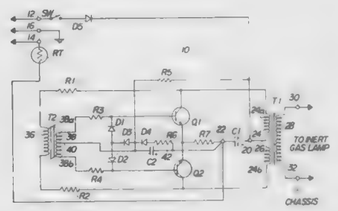
5. A capacitor comprising flexible elongated metallic structure providing a lead to a capacitor anode formed of sintered tantalum powder, said flexible structure comprising a tantalum wire having a cross-section less than 1 mm, said wire comprising a core of a metal other than tantalum and at least one discrete surface layer of tantalum surrounding said core, the tantalum layer having a radial thickness less than 0.3 mm, both ends of said lead being outside of said sintered anode body whereby none of said core metal is exposed to the sintered tantalum powder of said anode.

4,734,828

HIGH FREQUENCY-HIGH VOLTAGE POWER CONVERTER CIRCUIT

Frank J. Vargo, 5620 SW. Third Ct., Plantation, Fla. 33317

Filed Apr. 27, 1987, Ser. No. 42,973
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—22 **8 Claims**



1. A power supply for powering an inert gas lamp, comprising:

conversion means, coupled to an a.c. power supply, for generating substantially d.c. output; and

transformation means, having an input coupled to said conversion means and an output to be coupled to an inert gas lamp, for providing to the inert gas lamp a high frequency a.c. voltage having a frequency of at least 25 kilohertz and a voltage of at least 2000 volts, the magnitude of said voltage corresponding to the voltage supplied by said conversion means;

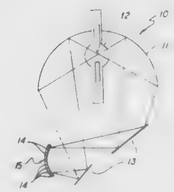
said transformer means including an output transformer having a first primary winding with a center tap coupled to said d.c. output of said conversion means and a secondary winding that is to be coupled to the inert gas lamp, and switching means coupled to said d.c. output of said conversion means for supplying an alternating current to said primary winding of said output transformer, said alternating current varying in polarity at a frequency of at least 25 kilohertz.

4,734,829

SHORT ARC LAMP IMAGE TRANSFORMER

Frederick Y. Wu, Cos Cob, Conn., and David A. Markle, Saratoga, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 12, 1985, Ser. No. 796,339
Int. Cl.[4] F21V *8/00*
U.S. Cl. 362—32 **18 Claims**



1. A light transformer, comprising:

a point source of light;

mirror means associated with said point source of light for projecting said light as a plurality of separate images conforming as a group to a desired shape;

a like plurality of reflecting facets formed as a group to said desired shape, each of said facets disposed to receive respective ones of said images and oriented to reflect said

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images such that the chief ray of each image is parallel to the chief rays of adjacent images;

light pipe means formed in said desired shape for receiving at one end said images whereby light emitted at the other end of said light pipe means conforms to said desired shape.

4,734,830

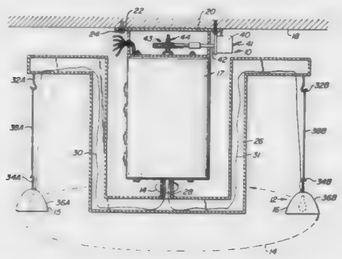
METHOD AND APPARATUS FOR ARTIFICIALLY ILLUMINATING VEGETATION

Michael R. Cristian, Arcata; Genaro R. Calabrese, Ferndale, and Jaxon Hice, Santa Rosa, all of Calif., assignors to Sun Circle, Inc., Ferndale, Calif.

Continuation-in-part of Ser. No. 6,615,982, May 30, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 891,506

Int. Cl.⁴ F21V *21/30*

U.S. Cl. 362—35 **14 Claims**



1. Apparatus for artificially illuminating vegetation, comprising:

a source of artificial light including a plurality of grow lamps, at least two of the plurality of grow lamps having different power requirements, the artificial light having a spectrum and intensity for controlling a preselected growth characteristic of the vegetation when the artificial light is impinged on the vegetation; and

means for imparting low-frequency non-linear cyclic movement to the source of artificial light, said imparting means composed of:

a housing;

means for mounting the housing to a ceiling;

a motor mounted on the housing, the motor having a drive shaft;

an arm extending outwardly from the housing;

coupling means for coupling the drive shaft to the arm;

a plurality of means for suspending the plurality of grow lamps from the arm;

slip ring means associated with the coupling means;

brush means associated with the housing, the brush means having brushes in positions juxtaposed with the slip ring means;

first electrical conductor means for conducting electrical power to the brushes; and

second electrical conductor means for conducting electrical power from the slip ring means to the plurality of grow lamps.

4,734,831

VISOR WITH CONCEALED REMOVABLE VANITY MIRROR

Michael T. Keyser, Holland, and Russell L. Clark, Zeeland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed May 28, 1986, Ser. No. 867,194

Int. Cl.⁴ B60Q *3/00*

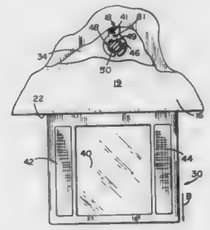
U.S. Cl. 362—74 **36 Claims**

1. A vehicle visor comprising:

a visor body defining a recess with an opening at one edge of said visor body for access to said recess;

a mirror panel assembly including a mirror on one side, said panel assembly shaped to fit within said recess; and

means for pivotally coupling said panel assembly to said visor body for pivotal movement in a plane paralel to the plane of said visor body and between a stored position



within said recess, a first use position pivotally rotated from said visor body and a second use position removed from said visor body, said means including a resilient member which deflects to allow said panel assembly to be grasped and removed from said visor body when in said second position for use of said mirror remote from said visor.

4,734,832

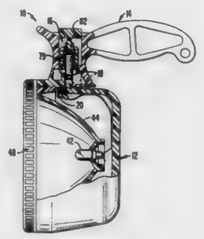
SPOTLIGHT WITH INTERCHANGEABLE HANDLE

Roger A. Moriano, San Mateo, and Ralph F. Osterhout, San Francisco, both of Calif., assignors to Tekna, Belmont, Calif.

Filed May 23, 1986, Ser. No. 868,238

Int. Cl.⁴ F21L *11/00;* **F21V** *31/02*

U.S. Cl. 362—158 **8 Claims**



1. A lighting apparatus:

a first detachable handle including actuable means for moving a magnet between a first position and a second position; and

an enclosure physically separate from the handle and including external means for coupling the handle; an internal magnetic switch located proximate the coupling means so that said switch is actuated as the magnet in the handle moves from the first to the second position; and internal means defining a circuit electrically connected to said magnetic switch, said enclosure remaining sealed when said handle is removed.

4,734,833

WIND LANTERN

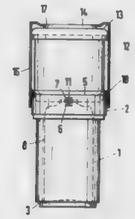
Peter Schneeberger, Etzmattenstr. 40, D-7800 Freiburg-Tiengen, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,732

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536852

Int. Cl.⁴ F21L *19/02*

U.S. Cl. 362—161 **3 Claims**



1. In a wind lantern consisting of a container having a bottom end, a can held by said container and filled with liquid wax having at its upper end a small tube with a wick extending into the can serving as the burner, and a glas globe adapted to be placed on the container, the improvement comprising:

a detachable base disposed on the bottom end of the container, said base having an outer step extending around the base and a center core provided with a center bore, so that for transport of the wind lantern, the base may be placed on the top edge of the container between the glass globe and the can filled with liquid wax, so as to seal the can.

4,734,834

COMPACT WATERPROOF LIGHTING LAMP WITH ADJUSTABLE LIGHT BEAM

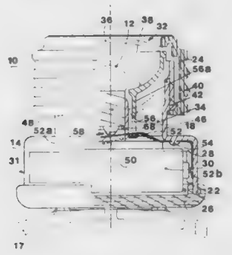
Paul Petzl, St. Vincent De Mercuze, and Pierre Petzl, St. Nazaire les Eymes, both of France, assignors to Petzl S.A., Brignoud, France

Filed Apr. 24, 1987, Ser. No. 42,426

Claims priority, application France, Apr. 30, 1986, 86 06435

Int. Cl.⁴ F21L *7/00*

U.S. Cl. 362—187 **8 Claims**



1. A portable lighting lamp, especially for mounting on the head of the user comprising:

an electric bulb housed inside a reflector to emit a light beam through a transparent screen,

a direct current power source comprising a positive pole and a negative pole electrically connected to the bulb by a current supply system,

an adjsutment collar designed to ensure displacement of the reflector to cause a variation in the light beam focus, and operation of the bulb switch,

a single casing having an insulating body subdivided by an intermediate wall into a first rear compartment housing the power supply unit, and a second front compartment housing the bulb and the adjustable focusing device, the volume of the second compartment being variable when said collar is actuated manually,

the intermediate wall being provided with a communication orifice between the two adjacent compartments and with a fixed sleeve extending axially in the second front compartment opposite the orifice to house the bulb,

a first elastic contact blade of the switch arranged in said orifice of the wall, and cooperating with a flange associated with the reflector, said blade being secured to a fixing point on the intermediate wall, and comprising a contact part urged by elasticity against the bulb contact stud in the closed position of the switch, and an opposite connection part located in the first rear compartment and in electrical connection with one of the poles of the power supply unit.

4,734,835

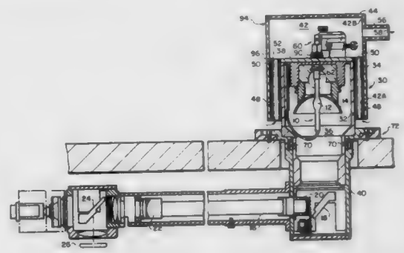
LAMP HOUSING AND VENTILATING SYSTEM THEREFOR

James C. Vines, San Jose, and Bruce J. Ruff, Los Gatos, both of Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 26, 1986, Ser. No. 912,910

Int. Cl.⁴ F21V *29/00*

U.S. Cl. 362—264 **6 Claims**



1. A system for providing a stable environment for the operation of a mercury vapor arc lamp and for containing the vapor therefrom in the event of the explosion of said lamp comprising:

a housing for the mercury vapor arc lamp, said housing including first and second concentric cylindrical walls, and first and second top walls, a sealed first or inner chamber, defined by said first cylindrical wall and by said first top wall, said lamp being contained within said inner chamber;

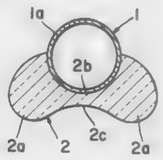
a second or outer chamber having a lower annular portion defined between said first and second cylindrical walls, the remainder or upper portion of said outer chamber being defined by said second cylindrical wall and by said second top wall;

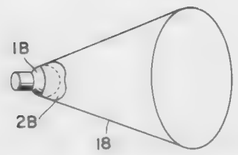
a cooling means, including a series of spaced elongated, radially directed, fins having inlet passages therebetween, disposed in said annular portion of said outer chamber;

ventilating means, including vacuum means connected to the upper portion of said outer chamber, and further including an inlet opening to the inlet passages in the annular portion of said outer chamber for permitting cooling ambient air to enter the annular portion and be drawn off by said vacuum means.

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4,734,836
LIGHTING APPARATUS
Masataka Negishi, 29-19, Daito 2-Chome, Urawa-shi, Saitama-ken, Japan
PCT No. PCT/JP85/00540, § 371 Date May 22, 1986, § 102(e) Date May 22, 1986, PCT Pub. No. WO86/02139, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 30, 1985, Ser. No. 878,967
Claims priority, application Japan, Sep. 29, 1984, 59-147856[U]
Int. Cl.⁴ F21V *5/00*
U.S. Cl. 362—311 **11 Claims**

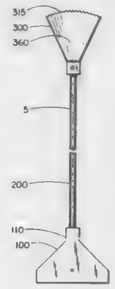




1. A lighting apparatus, comprising: a light source having an outer surface circular in cross section; and a light control lens having a recess complemental to said outer surface and fitted directly on said outer surface by means of said recess in a manner to cover at least a part of said outer surface and to cause luminous flux from the light source to pass through the lens so as to be emitted outward, said light control lens, in its section taken along a plane passing through an optical axis of said luminous flux, having a pair of spaced apart swelled portions disposed on opposite sides of said optical axis and protruding in directions away from the light source and in the directions of said luminous flux, and a recessed portion formed on the opposite side of said recess and between the swelled portions, said swelled portions and recessed portion having convex and concave contours, respectively, so bounded and defined by a smoothly continuous curve as to produce a diverging luminous flux and a predetermined distribution and range of incidence of the luminous flux.

4,734,837
VARIABLE ILLUMINATION LIGHT FIXTURE
Lance D. Chantry, and Leo J. Blackman, both of 374 13th St., Brooklyn, N.Y. 11215
Filed Feb. 2, 1987, Ser. No. 9,698
Int. Cl.⁴ F21V *1/06*
U.S. Cl. 362—352 **6 Claims**

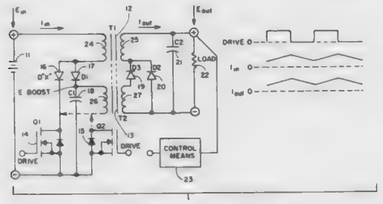
1. A variable intensity light fixture comprising:
(a) at least one light bulb;
(b) an enclosure for containing said at least one light bulb, said enclosure comprising an enclosure base, a pair of panels hinged to said enclosure base, and a light-pervious bellows attached to said enclosure base and extending between said two panels so as to complete said enclosure;
(c) first means for alternately opening up or closing down said enclosure by moving said enclosure's panels away from or towards one another, respectively; and
(d) second means for alternatively brightening or dimming the intensity of said at least one light bulb contained within said enclosure, said second means being linked to said first means so that (1) said enclosure can be opened up and the intensity of said at least one light bulb simultaneously increased so as to increase the illumination of said light fixture, or (2) said enclosure can be closed down and the intensity of said at least one light bulb simultaneously decreased so as to decrease the illumination of said light fixture.



4,734,838
NON-ABRASIVE CLUTCH FOR PHARMACY STYLE LAMPS
Louis D. Pike, Moreland Hills, Ohio, assignor to Pike Machine Products, Cleveland, Ohio
Filed Apr. 6, 1987, Ser. No. 34,634
Int. Cl.⁴ F21M *18/00*
U.S. Cl. 362—427 **20 Claims**

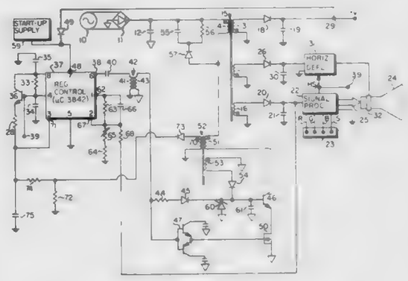
1. A pharmacy style lamp assembly comprising:
a finished metal tube including a vertically disposed lower tube portion having a finished surface and a light bulb receiving socket connected with an upper tube portion, the upper and lower tube portions defining a closed internal passage through which a power cord extends;
a unitary clutch block constructed completely of a non-abrasive material which is sufficiently softer than the finished surface to prevent the tube from being scratched by sliding interaction between the clutch block and the finished metal tube lower portion, the clutch block defining a vertical passage in which the lower tube portion is rotatably and slidingly received, the vertical passage being integrally defined by the non-abrasive clutch block material such that the finished metal tube is not scratched during rotating and sliding, the clutch block further defining a threaded bore therethrough transverse to and intersecting the vertical passage;
a threaded member having an inner end of the non-abrasive material and a manual grasping portion on an outer end, the threaded member being threadedly received in the threaded bore with the non-abrasive inner end directly and frictionally engaging the lower tube portion such that rotating the threaded member adjusts frictional engagement with the lower tube portion, whereby resistance to rotational and sliding movement of the finished metal tube is selectively adjusted; and,
a support means for supporting the unitary clutch block.

4,734,839
SOURCE VOLT-AMPERE/LOAD VOLT-AMPERE DIFFERENTIAL CONVERTER
Fred O. Barthold, 1873 Wilstone Ave., Leucadia, Calif. 92024
Filed Mar. 23, 1987, Ser. No. 28,900
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—16 **32 Claims**



1. A source volt-ampere/load volt-ampere differential converter circuit of single quadrant compound switching DC-DC topology comprising:
a DC voltage source;
a first power transformer including a primary winding and a secondary winding, said first power transformer being configured and polarized in the isolated boost mode (flyback);
a second power transformer including a primary winding and a secondary winding, said second power transformer being configured and polarized in the isolated buck mode (forward);
a first switching device to selectively couple said voltage source across the primary winding of said first power transformer;
a second switching device to selectively couple the boost voltage product of said first power transformer/said first switching device across the primary winding of said second power transformer;
a first unidirectional conducting device connected in series between said first switching device and the primary winding of said first power transformer and oriented to conduct during conduction by said first switching device;
a second unidirectional conducting device connected in series between the junction of said first unidirectional conducting device/primary winding of said first power transformer and a first capacitor, and oriented to conduct during non-conduction by said first switching device;
said first capacitor connected between the series combination of said second unidirectional conducting device/primary winding of said first power transformer and said DC voltage source negative, and oriented to integrate the boost voltage product of said first switching device and said first power transformer;
a third unidirectional conducting device connected in series with the secondary windings of said first and second power transformers, and oriented to conduct during conduction by said second switching device;
a fourth unidirectional conducting device connected in parallel with the series combination of said third unidirectional conducting device/secondary winding of said second power transformer, and oriented to conduct during nonconduction by said first switching device;
a second capacitor connected in parallel with the series combination of said third unidirectional conducting device/secondary windings of said first and second power transformers, and oriented to integrate the compound boost-buck voltage product of said first and second power transformers/said first and second switching devices/said first, second, third, and fourth unidirectional conducting devices/said first capacitor;
a utilization load connected across said second capacitor;
a control means for selectively and simultaneously opening and closing said first and second switching devices for compound energy transfer from said DC voltage source to said utilization load, and responsive to the differential transfer function $\delta = t\ on/(t\ on + t\ off)/\{1 - [t\ on/(t\ on + t\ off)]\}$.

4,734,840
REGULATOR FOR ISOLATED CHASSIS POWER SUPPLY
Peter D. Osman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.
Filed Oct. 31, 1986, Ser. No. 926,031
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—21 **1 Claim**



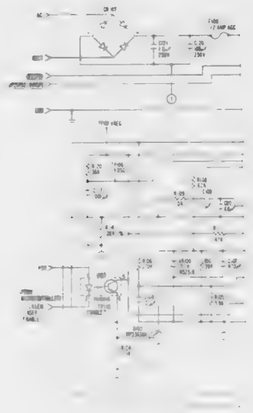
1. A power supply for a video apparatus comprising:
a source of unregulated voltage;
a first winding coupled to said source of unregulated voltage for being energized therefrom;
a switch coupled to said first winding and electrically non-isolated therefrom for controlling the energization of said first winding in response to an input signal;
a second winding, electrically isolated from said first winding, being energized in response to the energization of said first winding for providing power to a load;
means electricly isolated from said first winding for providing a first feedback signal derived in response to the voltage developed across said second winding;
means responsive to said first feedback signal for producing an output signal;
means including a third winding electrically isolated from said first winding, for providing a second feedback signal derived in response to the current flow in said first winding; and
control means electrically isolated from said first winding and responsive to said output signal and to said second feedback signal for generating said input for said switch.

4,734,841
LASER POWER SUPPLY CIRCUIT
Randy D. Elliott, and Matt D. Schler, both of Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Sep. 12, 1986, Ser. No. 907,291
Int. Cl.⁴ H02M *3/335;* **H01S** *3/00*
U.S. Cl. 363—21 **14 Claims**

1. A power supply for a gas laser, comprising:
a primary controlled and switched flyback circuitry;
secondary circuitry supplied by the primary circuitry, with a transformer between the primary circuitry and the secondary circuitry; and

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the secondary circuitry including spark gap means for creating a voltage buildup to achieve a high ionization voltage required for the laser and for releasing the high ionization voltage in quick pulses for starting the laser, and further including operating supply means associated with the secondary circuitry and the primary circuitry for supply-





ing the laser at a normal operating voltage much lower than the ionization voltage after the laser has started; and wherein the spark gap means includes a spark gap and connected capacitor means for raising the output voltage of the circuit seen by the laser above voltage occurring anywhere else in the circuit.

4,734,842

SIGNAL CONVERTER

Klaus Hantke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,891

Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616711

Int. Cl.[4] H02M *1/12*

U.S. Cl. 363—41 **12 Claims**

1. A signal converter comprising:

(a) an operational amplifier having an inverting input, a noninverting input and an output, a scaled signal corresponding to a measured voltage level and an auxiliary signal coupled to the noninverting input of the operational amplifier;

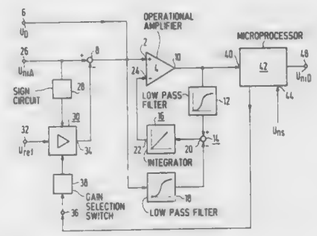
(b) an integrator having an input and an output, the output of the integrator being coupled to the inverting input of the operational amplifier as a correction signal;

(c) a first lowpass filter having an input and an output, the input coupled to the output of the operational amplifier;

(d) a first summing point coupled to the input of the integrator and to the output of the first lowpass filter;

(e) a second lowpass filter having an input and an output, the input coupled to the non-inverting input of the operational amplifier and the output coupled to the first summing point;

(f) a second summing point, having first and second inputs



and an output, a signal to be converted being coupled to the first input and the output being the scaled signal coupled to the non-inverting input and of the operational amplifier;

(g) a sign circuit having an input an output indicative of the sign of the signal to be converted, the input coupled to the first input of the second summing point;

(h) a gain selection circuit having an input and an output, the input being a signal indicative of a measuring range; and

(i) an amplifier circuit having first, second and third inputs and an output, the output coupled to the second input of the second summing point, the first input coupled to the output of the gain selection circuit, the second input coupled to the output of the sign circuit and the third input coupled to a reference signal.

4,734,843

ELECTRICAL POWER CONTROL SYSTEMS

Stanley Beddoe, Hampshire, and Robert Ireland, Wiltshire, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Feb. 27, 1987, Ser. No. 19,896

Claims priority, application United Kingdom, Feb. 28, 1986, 8605073

Int. Cl.[4] H02M *7/10*

U.S. Cl. 363—50 **5 Claims**

1. A power control system for the remote control of one or more remote power supply circuits in which a power controller comprises means for producing an a.c. control signal which is arranged to be transmitted over a single pair of control conductors forming part of a d.c. isolated control link to a remote power supply circuit for the operation thereof, in which variable impedance switching means at the remote power supply circuit modifies the impedance reflected back over the control link to the power controller in accordance with the condition of the power supply switching circuit and in which detector means in the power controller senses changes in the impedance of the variable impedance switching circuit and accordingly provides an indication of the state of the remote power supply circuit.

4,734,844

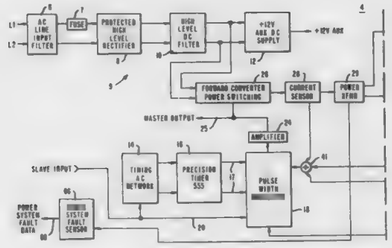
MASTER/SLAVE CURRENT SHARING, PWM POWER SUPPLY

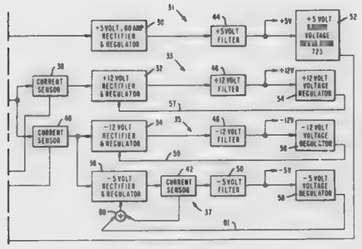
Paul M. Rhoads, Orlando, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 8, 1987, Ser. No. 59,071

Int. Cl.[4] H02M *7/00*

U.S. Cl. 363—72 **7 Claims**





1. An apparatus for causing a plurality of switching power supplies of the PWM type to share a current output load by synchronizing the PWM switching control signals thereof, comprising:

a first switching power supply having a PWM control circuit;

at least one additional switching power supply having a PWM control circuit substantially identical to said first switching power supply;

output interconnecting means for paralleling an output of said first power switching supply with a corresponding output of each additional switching power supply;

means connecting said first switching power supply to each additional switching power supply for synchronizing each PWM control circuit in each additional switching power supply to said PWM control circuit of said first switching power supply; and

means for reproducing at an output of each additional switching power supply PWM control circuit, a control signal substantially identical to an external output of said first switching power supply PWM control circuit;

whereby each of the plurality of switching power supplies supplies a substantially equal share of the output current load.

4,734,845

SYSTEM FOR SIMULTANEOUS DISPLAY OF A TROJECTORY UPON A STILL PICTURE

Hideaki Kawamura; Teruyuki Matsumura, both of Hachioji, and Takashi Iwagaya, Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

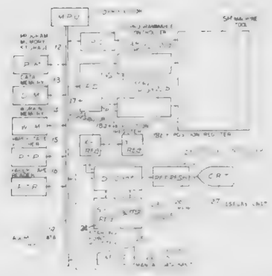
PCT No. PCT/JP86/00059, § 371 Date Sep. 22, 1986, § 102(e) Date Sep. 22, 1986, PCT Pub. No. WO86/04697, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 12, 1986, Ser. No. 913,658

Claims priority, application Japan, Feb. 12, 1985, 60-25053

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—146 **7 Claims**



1. A trajectory display system for displaying a still picture, which includes a machining region, and a trajectory by making a color designation in the form of a black base picture background color and a three-color bit pattern, comprising:

(a) memory means for storing data corresponding to the still picture and the trajectory;

(b) means for displaying the trajectory at the same time that the still picture is displayed in superimposed form based on the data in said memory means; and

(c) display control means for designating a still picture display color as well as a machining region color and a trajectory display color on the display means in a relationship where the colors designated are mutually complementary.

4,734,846

APPARATUS FOR PROVIDING AN INDICATION OF COMPACTION IN VIBRATION COMPACTING MACHINES

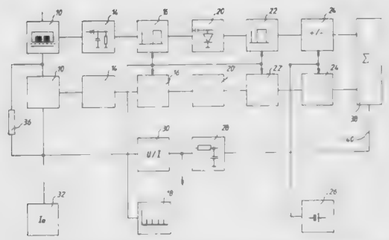
Fritz Konig, Wuppertal, Fed. Rep. of Germany, assignor to Case Vibromax GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 10, 1985, Ser. No. 743,164

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421824

Int. Cl.[4] G05D *19/00*; E01C *19/28*

U.S. Cl. 364—153 **33 Claims**



1. Apparatus for indicating compaction in vibration com-

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pacting machines of the type having a vibrating working part, an acceleration pick-up attached to said vibrating working part, means to pick-up acceleration values during consecutive observation intervals, and means responsive to the preselected acceleration value to produce an output signal indicative of the obtained compaction, said apparatus comprising:

means for preselecting a sequence of stepped acceleration values by which intermediate acceleration intervals are defined;

means responsive to said means for preselecting for determining which of said stepped acceleration values is exceeded during an observation interval; and

indicating means operatively connected to said means for determining for providing an indication of the acceleration.

17. A method for providing an indication of compaction in vibration compacting machines of the type having a vibrating working part comprising the steps of:

monitoring the acceleration of said vibrating working part to derive a monitored value;

preselecting an acceleration value;

comparing said preselected value with said monitoring value; and

generating a control signal for driving said preselected value toward said monitored value at a rate proportional to the difference between the monitored and preselected values.

31. An apparatus for providing an indication of compaction in vibration compacting machines of the type having a vibrating working part, said apparatus comprising:

an acceleration monitor mounted on said working part, said monitor generating a first signal proportional to the acceleration of said working part;

a resistor having a series of variable potential taps;

a power source for creating a potential difference across said resistors;

a comparison circuit for comparing the magnitude of said first signal with the magnitude of the signal appearing on each of said variable potential taps when said power source is energized, said comparison circuit generating a different output signal for each variable potential tap when said first signal exceeds the potential thereon; and

a summing circuit for summing said output signals, said summing circuit generating a signal indicative of the degree of compaction.

4,734,847

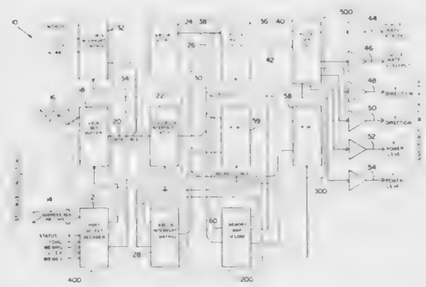
MICROSTEPPING MOTOR CONTROLLER CIRCUIT

L. Wayne Hunter, 15075 NW. Pioneer Rd., Beaverton, Oreg. 97006

Filed Dec. 16, 1985, Ser. No. 809,492

Int. Cl.[4] G05B *19/40*; H02P *8/00*

U.S. Cl. 364—174 **5 Claims**



4. A controller circuit for generating a train of signal pulses to control the movement of a stepper motor about at least one axis, comprising:

means for storing an acceleration value, a maximum velocity value, and a distance value;

microprocessor means running at a first predetermined rate for adding the acceleration value to itself cumulatively to produce a velocity value and for adding the velocity to itself cumulatively to produce a distance value; and

multiplier means for interrupting the microprocessor means at the first predetermined rate to receive the distance value produced and for multiplying the distance value at a second, faster predetermined rate to produce the pulse train at the faster predetermined rate.

4,734,848

COMBINATION REDUCTION PROCESSING METHOD AND APPARATUS

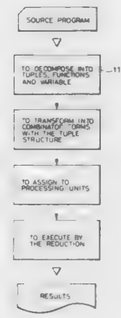
Koichi Yamano, Tama, and Akihiko Takano, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 754,967

Claims priority, application Japan, Jul. 17, 1984, 59-146820; Aug. 29, 1984, 59-178317

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—200 **19 Claims**



1. A data processing method in an information processing system having a processor means comprising the steps of:

transforming a program into an applicative graph which includes tuples, functions and variables;

abstracting said applicative graph to transform it into a combinator graph;

assigning the program in the combinator graph to a plurality of process units; and

executing an assigned program through reductions.

4,734,849

INFORMATION-PROCESSING SYSTEM HAVING A SINGLE CHIP ARITHMETIC CONTROL UNIT WITH MEANS FOR PREFETCHING INSTRUCTIONS

Tsuneo Kinoshita; Fumitaka Sato, both of Tokyo, and Isamu Yamazaki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 236,116, Feb. 19, 1981, Pat. No. 4,616,331. This application Jul. 16, 1986, Ser. No. 886,807

Claims priority, application Japan, Feb. 25, 1980, 55-22489; Mar. 11, 1980, 55-30531; Mar. 11, 1980, 55-30532

Int. Cl.[4] G06F *9/38, 9/00*

U.S. Cl. 364—200 **3 Claims**

1. An information-processing system comprising:

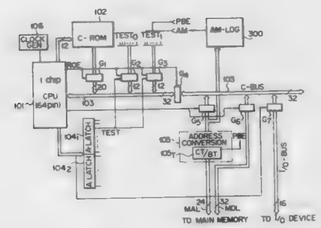
(a) an arithmetic control unit formed on one chip including:

(i) means for generating a series of access commands, to an external main memory containing user instructions, to prefetch instructions;

(ii) a buffer for storing a plurality of said prefetched instructions in a first queue having a head and a number of positions, each position for storing the result of an access command which will be one of: a result of a legal access command or of a result of an illegal access command, instructions from the head of said being output in preparation for execution;

(iii) means for storing a plurality of signals indicating the legality or illegality of the results of the access commands in a second queue having a head, the second queue having the same number of positions as the first queue, each position for storing the one of the plurality of signals corresponding to contents of a corresponding position in the first queue, said means for storing a plurality of signals including means for generating said plurality of signals indicating the illegality of the result of the access command in the case were the prefetched instruction is a write instruction to an address holding a branch instruction or an interrupt instruction;

(iv) means, coupled with said buffer and with said means for storing, for generating an interrupt, when the signal



at the head of the second queue indicates that the access command that resulted in the contents of the head of the first queue was illegal, at the time the head of the first queue is output;

(b) means, disposed externally to said control unit, for generating said plurality of signals, in response to said series of access-commands; and

(c) means for controlling transfers between said arithmetic control unit, said main memory, and said means for generating said plurality of signals including means for transmitting;

(i) said series of access commands from said control unit to said main memory and to said means for generating said plurality of signals;

(ii) said instruction from a main memory to said control unit; and

(iii) said plurality of signals from said means for generating said plurality of signals to said arithmetic control unit.

4,734,850

DATA PROCESS SYSTEM INCLUDING PLURAL STORAGE MEANS EACH CAPABLE OF CONCURRENT AND INTERMEDIATE READING AND WRITING OF A SET OF DATA SIGNALS

Shunichi Torii, Musashino; Shigeo Nagashima, Hachioji, and Koichiro Omoda, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 303,186, Sep. 17, 1981, Pat. No. 4,433,394. This application Feb. 17, 1984, Ser. No. 581,077

Claims priority, application Japan, Sep. 19, 1980, 55-129326

Int. Cl.[4] G06F *9/18*

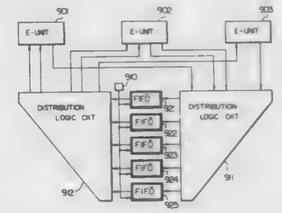
U.S. Cl. 364—200 **19 Claims**

1. A data processor, comprising:

(a) a plurality of storage means each capable of holding a set of data signals in sequentially ordered storage locations within each storage means and each storage means having means for concurrently reading data signals from and writing data dsignals to different storage locations therein;

(b) a plurality of opeation means each for performing an arithmetic or logical operation on sequentially provided operand data signals so as to sequentially provide result data signals corresponding to the results of said operation in parallel to receipt of new operand data signals;

(c) connect means respnsive to instructions for connecting at least one selected operation means to sequentially receive a set of data signals, as a set of operand data signals, from first storage means selected to provide a set of data signals held thereby and for connecting said selected operation means to provide sequentially a set of result data signals to second storage means selected to receive a set of result data signals, said connect means including means operable to connect said second selected storage means to sequentially provide the set of result data signals received thereby to another selected operation means when said second storage means is further selected to provide a set of data signals held thereby;



(d) control means connected to said plurality of storage means for controlling storage means selected to provide a set of data signals held thereby so as to sequentially read the set of data signals from the storage locations within said selected storage means according to the predetermined order of the storage locations and for controlling storage means selected to receive a set of data signals so as to sequentially write a set of result data signals provided from selected operation means into the storage locations within said selected storage means according to the predetermined order of the storage locations, said control means including detect means connected to said plurality of storage means for detecting whether or not each data signal to be read next is already present therein so as to postpone valid readout of the data signal to be read next when the detection result is negative.

4,734,851

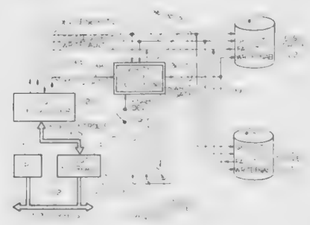
WRITE PROTECT CONTROL CIRCUIT FOR COMPUTER HARD DISC SYSTEMS

Dennis Director, 3116 Central St., Evanston, Ill. 60201

Filed Apr. 17, 1985, Ser. No. 723,880

Int. Cl.[4] G06F *13/12*

U.S. Cl. 364—200 **3 Claims**



1. A write protect system comprising:

a computer having at least one memory means, said memory means including a hard disc drive,

a controller coupled to said hard disc drive by at least one information transfer bus and at least one control data bus,

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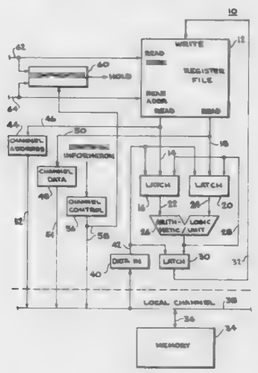
means for selecting said hard disc drive for operation by sending a signal from said controller to said hard disc drive on a first wire in said control data bus,
means for enabling said hard disc drive to erase data in said hard disc drive by sending a signal from said controller to said hard disc drive on a second wire in said control data bus,
circuit means coupled to said control data bus for monitoring signals transmitted on said first wire in said control data bus,
guard means for selectively interrupting the signal from said enabling means on the second wire to prevent said hard disk drive from being enabled to erase data thereby preventing data from being accidentially erased from said hard disc drive,
said guard means including a plurality of logic devices, at least one of said logic devices having an output coupled to said hard disc drive and at least one of said logic devices having an input coupled to said enabling means by connection to said second wire, and a manual switch coupled to said logic devices for controlling the logic states of said logic devices to enable gating of the signal from the enabling means responsive to the manual switch,
whereby data cannot be erased from said hard disc drive when said manual switch is in a selected write protect state.

4,734,852

MECHANISM FOR PERFORMING DATA REFERENCES TO STORAGE IN PARALLEL WITH INSTRUCTION EXECUTION ON A REDUCED INSTRUCTION-SET PROCESSOR

William M. Johnson, San Jose; Rod G. Fleck, Mountain View; Cheng-Gang Kong, San Jose, all of Calif., and Ole Moller, Nivaa, Denmark, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 30, 1985, Ser. No. 771,435
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **8 Claims**



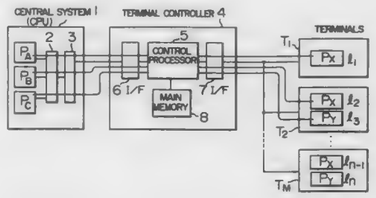
1. A digital processor control which cyclically executes instructions from a set including a load from memory and a store to memory instruction and provides instruction execution simultaneously with access to a memory, comprising:
file means having a first and a econd output terminal, a first and a second read address terminal, and an input terminal, for storing a plurality of plural-bit words, each storage location having a designator, said file means further for generating at said first and said second output terminals signals corresponding to said word stored in the location having a designator specified by said signals applied to said first and said second read address terminals, respectively;
first means having an output terminal, said first means connected to said memory for temporarily receiving and storing a word retrieved from said memory in response to execution of said load from memory instruction, and for generating at said output terminal signals corresponding to said word;
combining means having a plurality of input terminals connected to said file means output terminals and to said first means output terminal for arithmetically combining selectable ones of said signals applied at said input terminals and for generating signals corresponding to said combination;
second and third means connected to said file means first and second, respectively, output terminal for temporarily receiving and storing signals corresponding to a word generated thereat, said second and third means having an output terminal connected to said memory;
fourth means for temporarily receiving and storing control information and for generating channel control signals therefrom; and
first latch multiplex means responsive to said signals generated by said combining means and by said first means for temporarily storing one of said signals for selectably conducting to said file means input terminal said one of said signals;
wherein said memory stores the contents of said third means in response to said contents of said second, and fourth means; and
wherein said combining means selects said contents of said first means until said first latch multiplex means conducts and contents of said first means to said file means.

4,734,853

TERMINAL CONTROL SYSTEM

Kazuo Nakano, Aichi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,612
Claims priority, application Japan, Dec. 3, 1984, 59-255438
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **5 Claims**



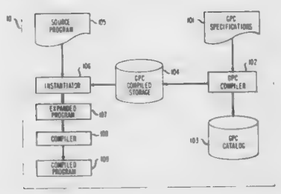
1. A terminal control system in an online system having a central processing system for executing different application programs, a terminal controller connected to said central processing system and a plurality of terminals connected to said terminal controller, each of said plurality of terminals including at least one logical terminal for executing a different application program, said terminal controller comprising: protocol execution means for controlling communication between said terminals and said central processing system;
control tables associated with respective logical terminals for storing application identification information; and
means responsive to a macroinstruction containing application identification information received from a particular logical terminal when an application program is initiated or switched by said particular logical terminal one of said control tables associated with said particular logical terminal; wherein
said protocol execution means includes means responsive to application identification information stored in said control tables for extracting a protocol most suitable for an application program being executed so that a terminal having said particular logical terminal communicates with said central processing system in accordance with said extracted protocol.

4,734,854

SYSTEM FOR GENERATING SOFTWARE SOURCE CODE COMPONENTS

Siroos K. Afshar, Manalapan, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Oct. 8, 1985, Ser. No. 785,787
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **13 Claims**



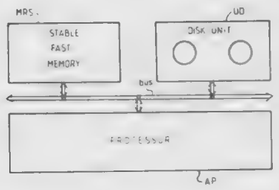
1. A system for generating concrete software programs from supplied generic specifications, said system comprising
a compiler for compiling language statements specifying generic software components, each specified generic software component corresponding to one or more user requestable programming services, and each of said programming services being specified by a collection of language statements,
means responsive to said compiler for storing the compiled language statements specifying said generic software components,
means having an input for receiving language statements specifying a particular software application, the language statements specifying said particular software application including at least one indirect statement and at least one request statement, each indirect statement naming any one of said specified generic software components and each request statement naming one user requestable programming service in one named generic software component, said receiving means including
first means responsive to each indirect statement for locating the stored language statements specifying the one generic software component named in that indirect statement,
second means responsive to each request statement for locating the collection of language statements specifying the user requestable programming service named in that request statement in the stored language statements located by said first means, and
means responsive to the collection of language statements located by said second means for creating a concrete version of said particular software application wherein said concrete version is devoid of indirect and request statements.

4,734,855

APPARATUS AND METHOD FOR FAST AND STABLE DATA STORAGE

Michel P. P. A. Banâtre; Jean-Pierre A. F. J. Banâtre, both of La Fresnais; Florimond E. A. Ployette, Reanes; Bertrand J. G. Decouty, Acigne, and Yves H. Prunault, Corps-Nuds, all of France, assignors to INRIA-Institut National de Recherche en Informatique et en Automatique, Le Chesnay, France

PCT No. PCT/FR84/00231, § 371 Date Jun. 13, 1985, § 102(e) Date Jun. 13, 1985, PCT Pub. No. WO85/01815, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 16, 1984, Ser. No. 749,622
Claims priority, application France, Oct. 17, 1983, 83 16488
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **17 Claims**



1. A data storage apparatus comprising:
banks of externally addressable non-volatile memory, which are provided with selective write/read controls, and which are capable of forming a part of an address space of a processor; and
access authorization means connected with said memory banks and suitable for selectively designating a memory zone constituted by at least a portion of one of the banks for a write operation or a read operation in response to an access authorization request, said write or read operation being constituted by an indivisible transfer of a group of elementary data items, said access authorization request being exclusive and destroyed after said memory zone has been addressed.

4,734,856

AUTOGENERIC SYSTEM

Dannie E. Davis, Rte. One, Box 266-C, Elmore, Ala. 36025

Filed Mar. 2, 1984, Ser. No. 585,403
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—300 **2 Claims**

1. In self-organising planning and manufacturing systems, the linguistic/gnostic kerning (knowledge and understanding compression by symbol factoring and naming) ability to convert thoughts into things and the fundamental ability to use language, which comprises:
(a) the linguistic process of creating an internalized knowledge form of input binary strings via the process of "signature compression of binary strings"; and
(b) the linguistic process of syntactical and lentactical decoding of internal knowledge modules by the process of "phrase rcognition" allowing partial matches and included "noise" terms; and
(c) the linguistic process of writing a multidimensional directed graph to self-organize a complex multidimensional network of objects with directed characteristics by the process of "Groak" which consists of the process;
(1) mark all objects that refer to defined concepts as level one,
(2) recursively mark all objects that are not marked AND that have only references to lower levels as resolved at the current level, continue until no object changes status before moving to the next level,
(3) terminate when no object changes status for a level; ard
(d) the linguistic process of linking objects and removing

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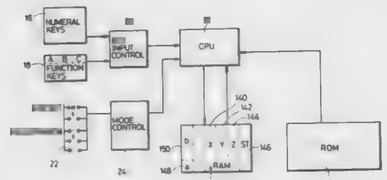
symbolic references to "Bind" a template by the organization directed by "Groak", to produce a new object that has attributes of the parent objects but may be manipulated as a single symbolic reference.

4,734,857

FIXED AMOUNT OR FIXED RATE DISCOUNT/PREMIUM CALCULATION IN AN ELECTRONIC CASH REGISTER

Toshiaki Fujiwara, Nara, and Ryuji Miyazaki, Kashiwara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1982, Ser. No. 412,380
Claims priority, application Japan, Sep. 8, 1981, 56-133916
Int. Cl.⁴ G07G *1/12*
U.S. Cl. 364—405 **2 Claims**



1. An electronic cash register comprising:

setting means for selectively placing said cash register in either a presetting mode of operation or a normal regristration mode of operation;

a first function key operational in said presetting mode for setting said cash register in a fixed amount discount mode and a second function key opertional in said presetting mode for setting said cash register in a fixed rate discount mode;

memory means responsive to said first and second function keys for storing a signal representing either said fixed amount discount mode or said fixed rate discount mode;

discount instruction input means operational in said normal registration mode of operation for instructing said cash register to perform a discount calculation; and

control means responsive to said discount instruction input means and responsive to said signal in said memory means in said normal registration mode of operation for conducting either a fixed amount discount calculation or a fixed rate discount calculation.

4,734,858

DATA TERMINAL AND SYSTEM FOR PLACING ORDERS

Hubert J. Schlafly, Greenwich, Conn., assignor to Portel Services Network, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 558,303, Dec. 5, 1983, abandoned. This application Nov. 26, 1984, Ser. No. 674,696
Int. Cl.⁴ G06F *15/22, 15/20*
U.S. Cl. 364—408 **14 Claims**

1. A system for ordering services of goods by generating digital data representative of particular orders to a local processor center over telephone lines comprising:

a plurality of hand-carryable user data terminals assigned to individual users with respective uniquely associated user identification codes;

each data terminal having:

(A) a data storage medium including a send memory in which ordering data and identification data for transmission to the local processing center is stored;

(B) a display of alpha-numeric characters;

(C) a keyboard having functional code keys and order defining keys which carry both alpha and numerical characters, and means for generating key signals respectively identifying individually actuated keys and individual alpha and numeric characters thereon;

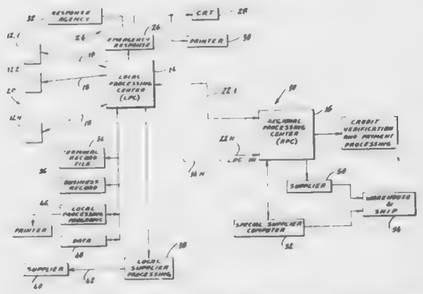
(D) said send memory storing data representative of an identification of the data terminal;

(E) means for causing on said display a display of a visually readable prompt which characterizes subsequent key actuations as representative of an identification code of the user of the terminal, and means for storing said user identification code in said send memory;

(F) means for causing on said display a display of selected prompts, each of which characterizes subsequent order key actuations and associated key signals as representative of predetermined data of a particular order, and means for storing key signals representative of the latter key actuations in a location of the send memory designated for said particular order;

(G) automatic dialing means for establishing a telephone communication link between the data terminal and the local processor center;

(H) means for actuating said automatic dialing means and



transmitting all of the data accumulated in the send memory to said local processing center over said link in a short burst; and means for receiving response data over said link from said local processing center and storing said response data in the data terminal storage medium;

(I) means responsive to said response data from the local processor center for causing a corresponding display thereof on said display;

said local processor center including:

(A) means for verifying data representative of terminal number and the user identification as received from respective ones of said terminals;

(B) means for identifying the order data being sent by a terminal;

(C) means for transmitting an evaluation response to a said terminal with respect to order and identification data sent by the terminal; and

means for terminating said telephone link a predetermined short time after said evaluation response transmittal to limit the duration of said communication link.

4,734,859

METHOD AND APPARATUS FOR HANDLING TRANSACTION SLIPS INCLUDING ILLEGIBLE CHARACTERS

Tsuyoshi Hamaguchi, Hadano; Ken Onomoto, Kawasaki; Takashi Nakamura, Tokyo, and Yasuo Okuma, Seto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

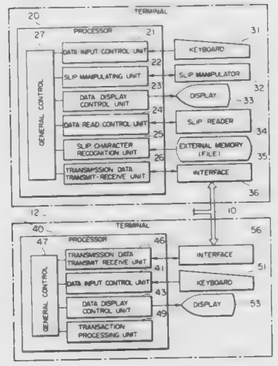
Filed Aug. 22, 1985, Ser. No. 768,325
Claims priority, application Japan, Aug. 24, 1984, 59-176482
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 364—408 **10 Claims**

1. A method for handling transaction slips in a transaction processing system in which at least two terminal devices are

connected to a common transmission line to transfer data including the hand-written contents of transaction slips to carry out transactions on the basis of said data, comprising:

reading from a transaction slip data which has been hand-written by a person initiating a transaction on the basis of said transaction slip using a first terminal device, in which the read out data may contain illegible characters;

transferring the data read out by said first terminal device to a second terminal device through said common transmission line at least when the data is misread or rejected in said first terminal device due to the presence of illegible characters in the data;



correcting the data in said second terminal device;

transferring the corrected data from said second terminal device to said first terminal device through said common transmission line;

obtaining an approval for the corrected data from the person initiating the transaction on the basis of said transaction slip in said first terminal device; and

indicating that an execution of the transaction based on the corrected data is allowable when the approval is received by said first terminal device from said person.

4,734,860

SIMPLIFIED BORE HOLE SURVEYING SYSTEM BY KINEMATIC NAVIGATION WITHOUT GYROS

Werner H. Egli, Minneapolis, and Lawrence C. Vallot, Shoreview, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 21, 1986, Ser. No. 831,983
Int. Cl.⁴ E21B *47/022*
U.S. Cl. 364—422 **9 Claims**

1. Bore hole survey apparatus, comprising:

an instrumentation pod adapted for travel down a bore hole to be surveyed;

said pod including accelerometer means for sensing the Earth's gravity vector with respect to a frame of reference of the pod;

a plurality of rods, including means for attachment of said pod to one of said rods and means for interconnecting said rods to form a rod string for lowering said pod into said bore hole, said rods configured to permit limited motions thereof with respect to adjacent rods in response to turns or curves in the bore hole as the rod string is lowered;

said rod string being a continuous length of rods from the surface of the Earth to said pod; and

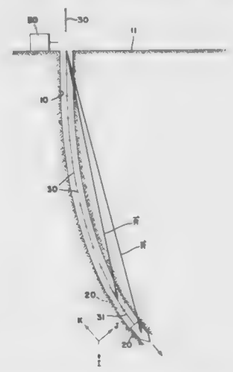
computation means connected for receiving signals from said accelerometer means and responsive to said signals and to the incremental rod-by-rod lowering of said pod into said bore hole for calculating the attitude and updated position of said pod based on successive accelerometer readings and mathematically modeled motions of the rods in following curves in the bore hole as the pod is lowered in the bore hole.

7. A method of surveying a bore hole, comprising the steps of:

inserting an instrumentation pod containing accelerometer means into the bore hole to be surveyed;

connecting a plurality of rods to form a continuous rod string with the pod adjacent to the lead end thereof;

lowering the instrumentation pod and the rod string into the bore hole, the rods being configured to permit limited



motions thereof with respect to adjacent rods in response to turns or curves encountered as the pod and rod string is lowered in the bore hole;

sensing the Earth's gravity vector by said accelerometer means for successive incremental steps of lowering of the pod; and

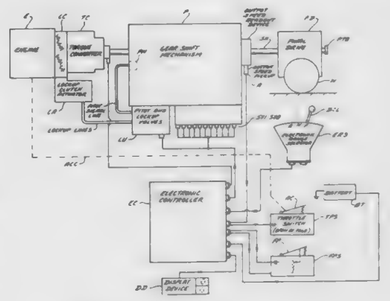
calculating the attitude and updated position of said pod based on successive accelerometer readings and mathematically modeled motions of the rods in following curves in the bore hole as the pod is lowered.

4,734,861

ELECTRONIC CONTROL FOR MOTOR VEHICLE TRANSMISSION

Robert B. Bertolasi; Richard A. Zwicky, and Paul C. Blank, all of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Continuation of Ser. No. 644,699, Aug. 27, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 883,864
Int. Cl.⁴ B60K *41/00*
U.S. Cl. 364—424.1 **7 Claims**

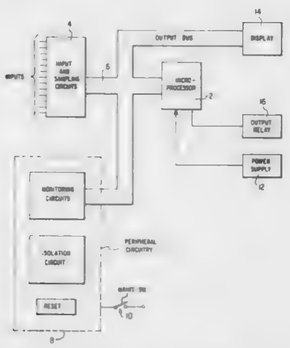


1. In combination:

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a first component operable at various speeds;
signal generating means responsive to the speed of said first component for providing an input signal comprising a series of pulsed signals which are variable in frequency and pulse width and whose frequency is related to said speed, each pulsed signal having a leading edge;
a transducer having means operable in response to an output signal to effect operation of a second component;
and an electric controller for receiving said input signal and for providing said output signal and comprising:
a counter for measuring the length of the time interval between the leading edges of an incoming pulsed signal and the preceding pulsed signal, means for resetting said counter in response to each incoming pulsed signal, and means responsive to detection of a time interval of predetermined length between said incoming pulsed signal and said preceding pulsed signal to determine frequency and to provide said output signal to effect operation of said transducer and said second component.

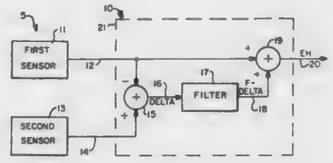
4,734,862
CONFLICT MONITOR
Edward Marcus, P.O. Box 5342, Baltimore, Md. 21209, and Franklyn M. Rybak, 11648 Manor Rd., Glen Arm, Md. 21057
Filed May 14, 1985, Ser. No. 733,842
Int. Cl.[4] B60Q *9/00*; G06F *15/48*
U.S. Cl. 364—436 **18 Claims**



1. Apparatus for processing a first plurality of condition-indicating signals comprising a plurality of first scanning means, each of said first scanning means having input means for receiving a second plurality of said condition-indicating signals and producing a first output signal representative thereof said second plurality being less than said first plurality, a second scanning means receiving each output signal from said plurality of first scanning means as an input signal and producing a second output signal, and control means for producing address signals for causing said second scanning means to pass signals from a selected one of said plurality of first scanning means while also causing said selected one to pass said second plurality of condition-indicating signals sequentially to said second scanning means, wherein said condition-indicating signals represent voltages applied to traffic-control lights and said control means comprises processor means for determining whether selected ones of said condition-indicating signals are at a predetermined level and for producing a signal indicative thereof.

16. A method for programming a traffic conflict monitor to identify permissible conflicts between channels comprising the steps of providing a plurality of input terminals connected to corresponding terminals on a program-board said program board having means to connect selected said program board terminals to designate permissible conflicts, providing a ground terminal connected to a common terminal on said program board, connecting a ground means to establish said common terminal at a predetermined voltage, determining the voltages at said plurality of input terminals and supplying the voltages thus obtained to a processor means, said processor means using the determined voltages to determine which of said conflicts are not permissible when said processor is used in a conflict determining mode.

4,734,863
APPARATUS FOR GENERATING A HEADING SIGNAL FOR A LAND VEHICLE
Stanley K. Honey, Newark; Kenneth A. Milnes, Fremont, and Walter B. Zavoli, Palo Alto, all of Calif., assignors to Etak, Inc., Menlo Park, Calif.
Filed Mar. 6, 1985, Ser. No. 708,741
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **29 Claims**

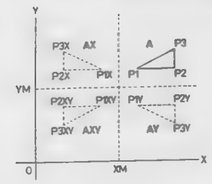


7. An apparatus for generating data regarding a heading of a land vehicle, comprising:
first sensor means for generating a first direction signal including heading information indicating a heading of the land vehicle and errors having primarily first spectral characteristics;
second sensor means for generating a second direction signal including heading information indicating a heading of the land vehicle and errors having primarily second spectral characteristics that are different from said first spectral characteristics; and
processing means, responsive to said first and second direction signals, for generating an estimated heading of the land vehicle, including
first means for combining said first direction signal and said second direction signal to generate a combined error signal essentially isolating said first and second errors from said heading information;
filter means for filtering said combined error signal according to filter characteristics approximating said first spectral characteristics to generate a filtered error signal including essentially said second errors; and
second means for combining said filtered error signal and said second direction signal to offset said second errors and thereby provide the estimated heading.

4,734,864
NUMERICAL CONTROL APPARATUS WITH PROGRAMMABLE MIRROR IMAGE FUNCTION
Hideaki Kawamura, and Takao Sasaki, both of Hachiouji, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP85/00277, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05473, PCT Pub. Date Dec. 5, 1985
PCT Filed May 21, 1985, Ser. No. 823,498
Claims priority, application Japan, May 22, 1984, 59-101757
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 **3 Claims**

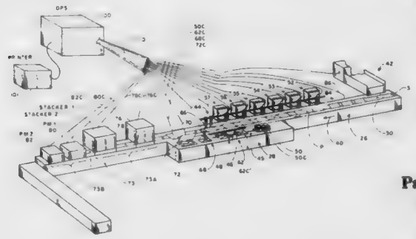
1. A numerical control apparatus with a programmable mirror image function, comprising:
program reading means for reading a machining program;
mirror image code discriminating means for discriminating whether or not a mirror image code and at least one coordinate axis position at which a mirror is placed, are set in the machining program;

mirror image instruction storage means for storing execution data for only the at least one coordinate axis at which the mirror is placed, and for clearing the execution data for the other coordinate axes, the execution data representing that the mirror image instruction is being executed;
mirror position storage means for storing a mirror position designated by the machining program for each coordinate axis;
shift instruction value converting means for converting, for a coordinate axis corresponding to the execution data stored in said mirror image instruction storage means, a



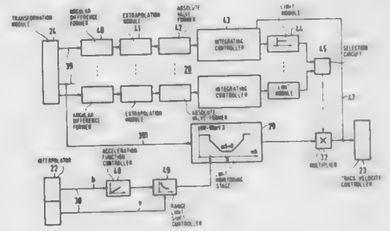
shift instruction value read from the machining program to a mirror image shift instruction value in response to the mirror position stored in said mirror position storage means and in accordance with a predetermined conversion equation which is a function of the mirror position and the shift instruction value, and for outputting the mirror image shift instruction value; and
means for performing machining for the at least one coordinate axis associated with the stored execution data in accordance with the mirror image shift instruction value, and for performing machining for a coordinate axes other than the at least one coordinate axis in accordance with the shift instruction value.

4,734,865
INSERTION MACHINE WITH AUDIT TRAIL AND COMMAND PROTOCOL
Christopher K. Scullion, and Bruce A. Muschlitz, both of Bethlehem, Pa., assignors to Bell & Howell Company, Chicago, Ill.
Continuation-in-part of Ser. No. 823,427, Jan. 28, 1986, abandoned. This application Mar. 10, 1986, Ser. No. 837,625
Int. Cl.[4] G06F *15/20*; B65H *39/02*
U.S. Cl. 364—478 **59 Claims**



1. A method of monitoring a plurality of operations performed by a machine of the type in which a plurality of feed stations selectively feed documents onto an insert track for inclusion with a group of related documents, said method comprising the steps of:
establishing an initiation time for a first time base during which said plurality of operations are to be monitored;
counting, over said first time base, the number of events associated with each of said plurality of operations;
establishing at least a temporary termination time for said first time base at which said count is at least temporarily terminated; and,
averaging the number of events counted over said first time base to obtain an indication with respect to one of said operations of the number of events occurring per unit of time.

4,734,866
COMPUTER CONTROLLER FOR AN INDUSTRIAL MULTIAXIS ROBOT
Richard Barteit, Erlangen, and Christof Meier, Heroldsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jun. 10, 1985, Ser. No. 742,805
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424762
Int. Cl.[4] G05B *19/00*
U.S. Cl. 364—513 **4 Claims**



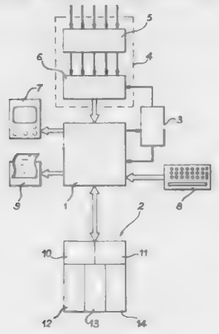
1. A computer controller for an industrial multiaxis robot, in which the motion of the robot tip along a track given in fixed coordinates is transformed into corresponding velocity reference values for drives in the individual axes, comprising:
means having said velocity reference values as inputs for reducing the track velocity of the predetermined overall motion of the robot until none of the velocity reference values exceeds a limit associated with that reference value if at least one velocity reference value of one axis exceeds its associated limit; and
further means having at least one of said velocity reference values as an input and coupled to said means for reducing the track velocity for reducing the velocity of the overall motion in predetermined position ranges of at least one of the individual axes;
limits of said predetermined position ranges and the reduction of the velocity being dependent on at least one of th respective track velocity and track acceleration.

4,734,867
SYSTEM FOR DISPLAYING EVOLUTION OF ONE PHYSICAL PARAMETER COMPARED WITH DEVELOPMENT OF ANOTHER PHYSICAL PARAMETER
Paul Janin, Taverny, and Jean-Louis Queri, Marseille, both of France, assignors to Electricite de France, France
Filed Dec. 13, 1984, Ser. No. 681,224
Claims priority, application France, Dec. 14, 1983, 83 20038
Int. Cl.[4] G06F *15/62*
U.S. Cl. 364—518 **4 Claims**

1. A system for the display of time-variable physical parameters, comprising a computer, a memory connected to said computer for recording acquired values of these parameters, a regulatable frequency clock connected to means for the acquisition of the values of these parameters in order to fix at least one predetermined sampling or acquisition frequency for the values of said parameters, outputs of said acquisition means being connected to the computer, as well as display means connected to the computer, wherein said system also com-

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prises means for simultaneously recording in the computer memory and at the same frequency and in the time acquired order, the development of the acquired values of one of these parameters compared with the development of the acquired values of the other of said parameters, the computer controlling the display means in order to obtain the image of the graph or graphs representing said development, the computer being capable of selecting the recorded values of said parameters in the memory at a predetermined selection frequency different than said predetermined sampling frequency.

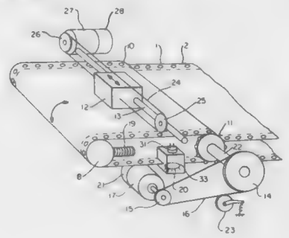


4,734,868

PRECISION PAPER TRANSPORT SYSTEM

Thomas J. DeLacy, Santa Clara County, Calif., assignor to VFN Technology Inc., Cupertino, Calif.

Filed Jul. 21, 1986, Ser. No. 887,660
Int. Cl.[4] G05B *11/01*
U.S. Cl. 364—519 **25 Claims**



1. A paper transport system for advancing and accurately positioning a piece of paper having leading and trailing edges and right and left sides relative to a print head, said print head including means for printing a plurality of lines or swath of characters per single paper index, from the right side to the left side of said paper along lines orthogonal to the direction of advance of the paper, said transport system comprising

drive means for intermittently advancing said paper relative to said print head,

means for detecting one of a plurality of demarcations on said paper, each of said lines of characters having a known position relative to one of said demarcations,

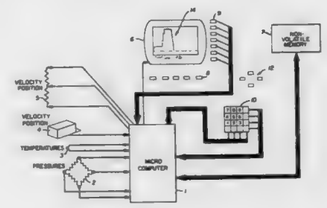
control means to regulate said drive means for positioning said paper relative to said lines or swath, and responsive to said demarcation detection means, whereby said paper and each line to be printed thereon is reliably and repeatably positioned relative to its previous or succeeding adjacent print line or swath.

4,734,869

DIAGNOSTIC METHOD FOR ANALYZING AND MONITORING THE PROCESS PARAMETERS IN THE OPERATION OF RECIPROCATING EQUIPMENT

John Mickowski, 127 Main St., Franklin, N.J. 07416

Continuation-in-part of Ser. No. 292,168, Aug. 12, 1981, Pat. No. 4,504,920. This application Mar. 11, 1985, Ser. No. 710,046
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[4] G06F *15/46*; G01D *3/08*
U.S. Cl. 364—550 **6 Claims**



1. A diagnostic method for analyzing and monitoring the process parameters of reciprocating equipment in which a linear reciprocating injection device is traversed over a fixed stroke length at high speed comprising the steps of:

(a) dividing said stroke length into a predetermined number of incremental positions;

(b) generating analog data corresponding to at least the position of said injection device and the pressure developed by said injection device at each such incremental position;

(c) recording the time transpired in the movement of said injection device along said stroke length;

(d) deriving the velocity of said injection device at each such incremental position;

(e) graphically displaying the data corresponding to pressure and velocity on a display screen of a cathode ray tube as a function of the incremental position of said injection device along said stroke length until said velocity reaches a predetermined minimum level, with said display forming a master profile for said data;

(f) storing the data representing said master profile at a predetermined address location in a nonvolatile memory of a microcomputer;

(g) repeating the sequence of generating, calculating and storing analog data corresponding to pressure and velocity as a function of stroke position for a second die casting operating to form a current profile of such data for such second operation, and

(h) displaying said current profile on said display screen along with said master profile for diagnostic comparison purposes.

4,734,870

POSITION COORDINATE DETERMINATION DEVICE WITH DIAGONAL DELAY LINE

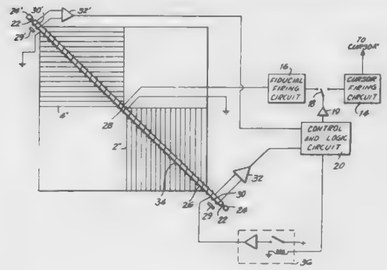
Edward J. Snyder, 6 MacArthur Rd., Trumbull, Conn. 06611, and Jamie L. Barbetti, 64 Ellis St., Milford, Conn. 06460

Filed Aug. 9, 1985, Ser. No. 764,797
Int. Cl.[4] G08C *21/00*
U.S. Cl. 364—556 **20 Claims**

1. An automatic position coordinate determining device comprising:

(a) a data tablet having a top surface and a bottom surface, and comprising a sheet of electromagnetic shielding having a periphery, a first plurality of electrical conductors, each conductor of said first plurality having first and second conductor portions arranged above and below said shielding respectively, and having a third conductor portion wrapped around said periphery of said shielding and connecting said first and second conductor portions, said first conductor portions being parallel, equidistantly spaced, and substantially transverse to a first coordinate axis, and a second plurality of electical conductors, each conductor of said second plurality having first and second conductor portions arranged above and below said shielding respectively, and having a third conductor portion wrapped around said periphery of said shielding and connecting said first and second conductor portions, said first conductor portions of said second plurality of conductors being parallel, equidistantly spaced, and substantilly transverse to a second coordinate axis, said first and second conductor portions of said first plurality of conductors being electrically insulated from said first and second conductor portions respectively of said second plurality of conductors;

(b) a magnetostrictive element arranged below said shielding and proximal to said second conductor portions, said magnetostrictive element being inductively coupled to



each of said second conductor portions such that a pair of oppositely propagating strain waves are produced in said magnetostrictive element in response to a current pulse in any one of said first conductor portions;

(c) a pointer movable over said top surface of said tablet and including a flux-producing element which is capable of being inductively coupled to at least one of said first conductor portions of said first plurality of electrical conductors and to at least one of said first conductor portions of said second plurality of electrical conductors when said pointer is proximal to said top surface such that a current pulse is induced in said inductively coupled first conductor portions in response to a current pulse in said flux-producing element;

(d) a current source electrically connected to output a current pulse to said flux-producing element; and

(e) a sensor means arranged at a reference position proximal to said magnetostrictive element, said sensor means being capable of outputting a pulsed signal in response to detection of the arrival of a propagating strain wave at said reference position.

4,734,871

WIRELESS BATTERY POWERED TEMPERATURE REMOTE CONTROLLER

Hideo Tsunoda, Numazu, and Harunobu Nukushina, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

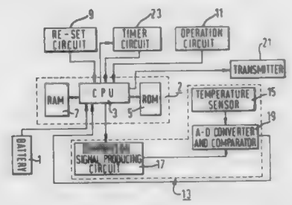
Filed Sep. 3, 1985, Ser. No. 771,805
Claims priority, application Japan, Aug. 31, 1984, 59-180284
Int. Cl.[4] G05D *23/00*; F24F *11/00*
U.S. Cl. 364—557 **5 Claims**

1. A wireless type control apparatus for controlling a heating or cooling apparatus comprising:

temperature sensing means for producing a signal indicating a temperature;

computer means for receiving said temperature signal and for producing a control signal in response to said temperature signal during an operation period, and entering a halt period at times other than said operation period and for producing a command signal which is at a first level when the computer means is in said operation period and at a second level when in said halt period, said computer means entering said halt period upon receiving a halt signal at a halt signal input terminal thereof;

transmitting means for transmitting said control signal to said heating or cooling apparatus; and



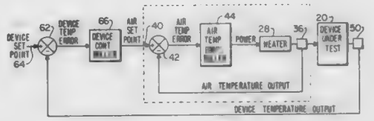
an R-C timer, comprising a resistor and a capacitor, for controlling when said computer means is to be in one of said operation and halt periods, said R-C timer coupled to said computer means to receive said command signal, and to begin a charging sequence when said command signal is at said first level, said R-C timer having its output coupled to said halt signal input terminal of said computer means as said halt signal, said halt signal produced to halt said computer means after a voltage buildup on the capacitor C of said R-C timer reaches a predetermined level, said computer means then causing said command signal to be output at said second level which allows said R-C timer to discharge, so that said halt signal is removed from the halt signal input terminal after a predetermined time.

4,734,872

TEMPERATURE CONTROL FOR DEVICE UNDER TEST

George Eager, and Pater Selverstone, both of Cambridge, Mass., assignors to Temptronic Corporation, Newton, Mass.

Filed Apr. 30, 1985, Ser. No. 728,860
Int. Cl.[4] G01K *17/00*
U.S. Cl. 364—557 **17 Claims**



1. In a system for precisely controlling the temperature of a substantially solid object through a range of temperatures, said system including (a) support means for supporting said object; (b) means, responsive to a control signal, for contorlling the temperature of a fluid; (c) means for directing said fluid into direct contact with an object supported by sa support means so as to control the temperature of said object; (d) menas for generaitng a first signal as a function of the current temperature of said fluid; (e) means for generating a second signal as a function of the desired temperature of said fluid; and (f) means for generating said control signal as a function of the different between said first and second signals; wherein the improvement comprises:

said means for generating said second signal as a function of

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the desired temperature of the fluid includes means for generating said second signal as a function of the difference between the desired temperature of said object and the actual tmeperature of said object.

4,734,873

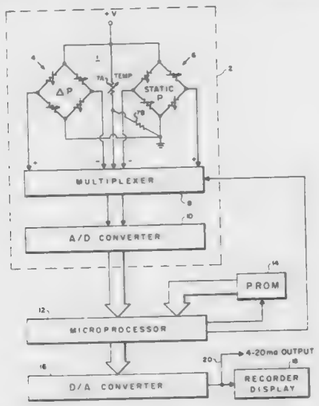
METHOD OF DIGITAL PROCESS VARIABLE TRANSMITTER CALIBRATION AND A PROCESS VARIABLE TRANSMITTER SYSTEM UTILIZING THE SAME

John R. Malloy, deceased, late of Drexel Hill (by Virginia M. Malloy, executrix), and Arthur M. Olsen, Pennsburg, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 576,494, Feb. 2, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 886,999

Int. Cl.⁴ G01C *25/00, 17/38;* G01R *1/02*

U.S. Cl. 364—571 **13 Claims**



7. A process variable transmitter apparatus comprising

analog-to-digital converter means for converting an analog output from a process variable sensor into a digital representation thereof,

a non-volatile memory means for storing a transmitter characterization equation in the form of

$PV=A_0A_1P+A_2P^2+\ldots+A_iP^i$ where

$A_i=f(S,T)$ and PV is the process variable, P is the output of a process variable differential value measuring sensor, S is the output of a process variable static value measuring sensor and T is the output of a sensor measuring an environmental temperature affecting the outputs of ther process variable measuring sensors and where

$$A_i = S^0[a_{0i} + a_{1i}T + a_{2i}T^2 + \ldots + a_{ni}T^n] + S^1[b_{0i} + b_{1i}T + b_{2i}T^2 + \ldots + b_{ni}T^n] + \ldots + S^m[w_{0i} + w_{2i}T + w_{2i}T^2 + \ldots + w_{ni}T^n],$$ and

a digital computer means connected to said converter means and said memory means for computing a digital output in accordance with the stored transmitter characterization equation to produce a corrected version of the digital representation from said converter means independent of the effects of the environment conditions.

4,734,874

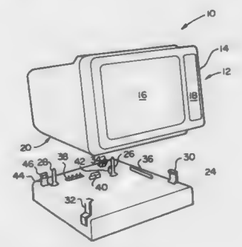
CORDLESS COMPUTER ASSEMBLY

Hewon Hwang, Somerville; John C. Killian, Jr., Sudbury; Jeffrey M. Lewis, Maynard, and Victor M. Samarov, Carlisle, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 12, 1986, Ser. No. 862,007

Int. Cl.⁴ G06F *1/00*

U.S. Cl. 364—708 **8 Claims**



1. A computer assembly comprising:

A. a computer main unit including a main housing and a computer contained inside the housing, the main unit including a cathode-ray-tube display and a main-unit connector for providing electrical connection to signal paths in the computer to which a peripheral device must have access in order to operate in cooperation with the computer, the main housing including a bottom wall forming a plurality of locating recesses and associated guide surfaces that converge to the located recesses to guide locating pins into the locating recesses, the main-unit housing further forming a plurality of catch surfaces adapted for capture by latches on an expansion unit; and

B. an expansion unit including an expansion-unit housing and a peripheral device contained in the expansion-unit housing, the expansion unit including an expansion-unit connector electrically connected to the peripheral device and adapted for operative engagement with the main-unit connector to provide electrical communication between the peripheral device and the signal paths of the computer to which the peripheral device must be connected in order to operate in cooperation therewith, the expansion-unit housing having a lower surface adapted to rest on a horizontal surface and having an upper surface adapted to support the main unit thereon and forming a mounting pin associated with each of the locating recesses and so located thereon that, when the mounting pins are simultaneously in contact with the guide surfaces associated with the associated locating recesses, the guide surfaces guide the expansion unit into a position in which the expansion-unit connector is in operative engagement with the main-unit connctor, the expansion unit further including a plurality of latches adapted to capture the catch surfaces of the main-unit housing when the main unit is lowered onto the expansion unit and thereby secure the expansion unit to the main unit.

4,734,875

LOG MIXER CIRCUIT

Judit K. Florence, Menlo Park, and Roy W. Latham, Newark, both of Calif., assignors to The Singer Company, Binghampton, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,213

Int. Cl.⁴ G06F *7/38*

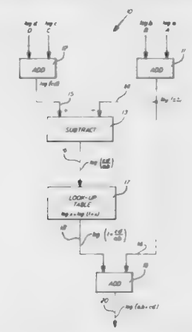
U.S. Cl. 364—715 **3 Claims**

1. A digital logarithmic mixer comprising:

first add circuit means having first and second signal inputs, each of said first and second signal inputs representing a number, said first add circuit means having an output, the output signal representing the sum of said first and second signal inputs;

second add circuit means having third and fourth signal inputs, each of said third and fourth signal inputs representing a number, said second add circuit means having an output, the output signal representing the sum of said third and fourth signal inputs;

a subtractor circuit means, having first and second subtractor inputs, said first subtractor circuit means input being the output of said first add circuit means, and the



second subtractor circuit means input being the output of said second add circuit means, said subtractor circuit means including a subtractor output;

look up table means connected to the output of said subtractor circuit means for producing a look up table output; and

third add circuit means having a first input from the output of the second add circuit means and a second input from the output of the look up table for producing a result corresponding to the logarithmic mix operation.

4,734,876

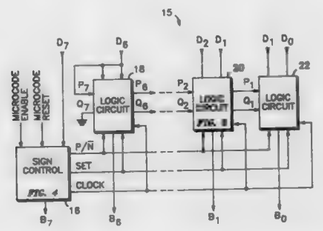
CIRCUIT FOR SELECTING ONE OF A PLURALITY OF EXPONENTIAL VALUES TO A PREDETERMINED BASE TO PROVIDE A MAXIMUM VALUE

Tim A. Williams, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1985, Ser. No. 810,451

Int. Cl.⁴ G06F *7/02*

U.S. Cl. 364—715 **8 Claims**



1. A circuit for receiving a plurality of input operands representing exponential values relative to a predetermined base value which is less than one and selecting the operand which when used as an exponent of the base value represents a maximum value, comprising:

first transcoder means for sequentially receiving each of the input operands and providing a first intermediate operand in response to each received operand, each of the first intermediate operands indicating the bit position of a most significant bit of the respective input operand;

logic means coupled to the first transcoder means for selectively receiving the first intermediate operands and comparing a most recently received first intermediate operand with a previous maximum value first intermediate operand to provide a second intermediate operand which represents the maximum valued operand of all of the previously received first intermediate operands including the most recently received first intermediate operand; and

second transcoder means coupled to the logic means for selectively receiving the second intermediate operands and transcoding each received second intermediate operand to provide an output indicating the one of the plurality of input operands which raises the base value to the maximum value.

4,734,877

VECTOR PROCESSING SYSTEM

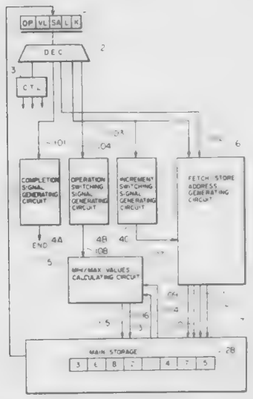
Akiharu Sakata, Kokubunji; Shunichi Torii, Musashino, and Yoshifumi Takamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,625

Claims priority, application Japan, Mar. 10, 1986, 61-50378

Int. Cl.⁴ G06F *15/347*

U.S. Cl. 364—730 **3 Claims**



1. A vector processing system comprising:

a main storage for storing vector instructions and vector data;

an instruction register for holding an instruction read out of said main storage;

a decoder for decoding the vector instruction held in said instruction register; and

an execution means operative to implement a vector operation in response to an output of said decoder, including a facility which, when a sort instruction inclusive of a vector starting address, increment switching parameter and operation switching parameter has been set up in said instruction register, implements a sorting process specified by said instruction for vector data stored in said main storage, said facility comprising means in which said operation switching parameter is set and which produces an operation switching signal in compliance with the number of operations and the position of a vector element to be operated, means in which said increment switching parameter is set and which produces an increment switching signal in compliance with the position of the element to be operated, fetch/store address generating means in which said vector starting address and said increment switching parameter are set and which in compliance with said

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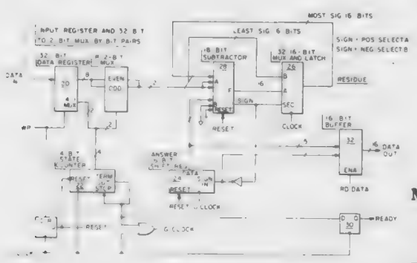
settings generates addresses of vector elements to be sorted for reading out and writing in said main storage successively in an incremental manner and generates said addresses with incremental value thereof being changed in compliance with said increment switching signal, and operation means which implements an operation for sorting vector elements read out of said main storage in compliance with said operation switching signal, said facility implementing sorting for all elements of vector data to be sorted when said sort instruction is set up in said instruction register.

4,734,878

CIRCUIT FOR PERFORMING SQUARE ROOT FUNCTIONS

Patrick L. Sutcliffe, Citrus Heights, Calif., assignor to General Electric Company, Milwaukee, Wis.

Filed Oct. 31, 1985, Ser. No. 794,094
Int. Cl.[4] G06F *7/552*
U.S. Cl. 364—752 **4 Claims**



1. Circuitry for performing square root functions comprising
a data register for an input number,
a state counter,
an answer shift register having an input and an output,
a loop including a subtractor having two inputs and an output, a latch connected to said subtractor output and to one of said subtractor inputs, means connecting said subtractor output to said input of said answer shift register, and means connecting said output of said answer shift register to the other of said subtractor inputs,
means connecting data bit pairs stored in said data register to said one of said subtractor inputs, said data bit pairs being selected in response to said state counter and concatenated with data from said latch to form concatenated data as one input to said subtractor from which data from said answer shift register is subtracted, and
said latch receiving an output signal from said subtractor and said answer shift register receiving a "1" bit when said concatenated data is equal to or greater than data from said answer shift register, said latch receiving the concatenated data and said answer shift register receiving a "0" when said concatenated data is less than data from said answer shift register, said loop operating on data until a terminal count is reached by said state counter.

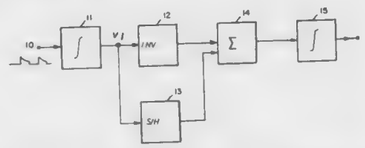
4,734,879

ANALOG COMPUTING METHOD OF SOLVING A SECOND ORDER DIFFERENTIAL EQUATION

Hung C. Lin, 8 Schindler Ct., Silver Spring, Md. 20903, and Hwey C. Chien, Steward Towers, Rm. 1411, 200 Fort Meade Rd., Laurel, Md. 20707

Filed Sep. 24, 1985, Ser. No. 779,429
Int. Cl.[4] G06G *7/18*
U.S. Cl. 364—810 **13 Claims**

1. A method of solving a second order differential equation using an analog computation circuit technique, said differential equation having a derivative of an unknown quantity V with respect to a variable X, comprising the steps of
first integrating said second derivative of the differential equation to obtain a first integral with an electronic integrator,
deriving a constant of integration based on first boundary conditions of said unknown quantity at a certain value of said variable using sample-hold circuit technique with a switched capacitor,



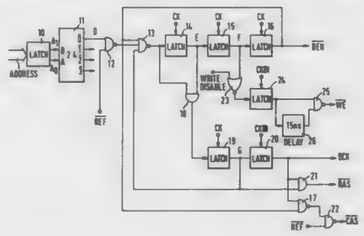
summing said first integral with said constant of integration to obtain a sum with a summing amplifier,
integrating said sum to obtain a second integral using a second electronic integrator,
setting said second integral to a second boundary condition of said unknown quantity and another value of said variable by means of electronic adjustment.

4,734,880

DYNAMIC RANDOM ACCESS MEMORY ARRANGEMENTS HAVING WE, RAS, AND CAS DERIVED FROM A SINGLE SYSTEM CLOCK

Mark C. Collins, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,564
Claims priority, application United Kingdom, Apr. 12, 1983, 8309814
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **4 Claims**



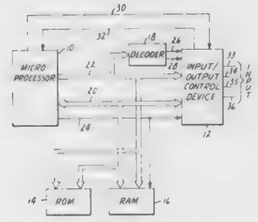
1. A dynamic random access memory arrangement for storing digital television signal data under control of a single system clock signal from a system clock generator and input address signals corresponding to said data, the arrangement comprising: delay means receiving said single system clock signal for producing therefrom a plurality of latch clock signals having predetermined time delays; means for deriving a write enable signal, a row address strobe signal, and a column address strobe signal from said single system clock signal, wherein timing of each respective write enable signal, row address strobe signal, and column address strobe signal is determined by a leading edge of successive pulses of said single system clock signal; and dynamic random access memory means having a data input and a data output for said data, and an address input for said input address signals; and latch means connected to said address input, said data input, and said data output, of said dynamic random access memory means for controlling address and data flow therein in response to said plurality of latch clock signals, and said dynamic random access memory is controlled by said write enable signal, said row address strobe signals and said column address strobe signal, whereby said digital television signal data fed into said data input through said latch means is stored in said dynamic random access memory at addresses determined by said input address signals in response to said write enable signal, said row address strobe signal and said column address strobe signal.

4,734,881

MICROPROCESSOR CONTROLLED SIGNAL DISCRIMINATION CIRCUITRY

Theodore D. Klein, Waconia, and Michael R. Oran, Chaska, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1986, Ser. No. 830,535
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **5 Claims**



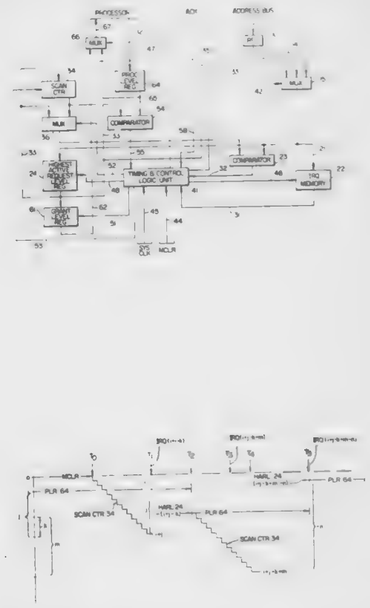
1. Circuitry for the validation of repetitive signals received by the circuitry including:
input/output circuitry having a plurality of signal inputs for receiving signals, said input/output circuitry providing information as to when and which of said signal inputs receives a signal and is controlled by a microprocessor for establishing when and at which of said signal inputs a signal can be received;
programmable microprocessor connected to said input/output circuitry;
a random access memory connectd to said input/output circuitry and said programmable microprocessor;
a read only memory connected to said programmable microprocessor for storing instructions for said programmable microprocessor;
said programmable microprocessor programmed for operating with said input/output circuitry and said random access memory for controlling said input/output circuitry for permitting any of said signal inputs to receive a signal and when a signal is received at one of said signal inputs providing a "lock-out" time interval during which none of said signal inputs can receive a signal and upon completion of said lock-out time interval establishing a "window" time interval during which a signal can be received only at said one of said signal inputs, said "lock-out" and "window" time intervals being provided each time a signal is received at said one of said signal inputs permitting any of said signal inputs to receive a signal in the event a signal is not received during a "window" time interval, a signal received to establish said one of said signal inputs being considered valid by said programmable microprocessor when a predetermined number of signals are received at said one of said inputs before a "window" interval is provided during which a signal is not received at said one of said inputs.

4,734,882

MULTILEVEL INTERRUPT HANDLING SCHEME

Alfredo A. Romagosa, Ft. Lauderdale, Fla., assignor to Harris Corp., Melbourne, Fla.

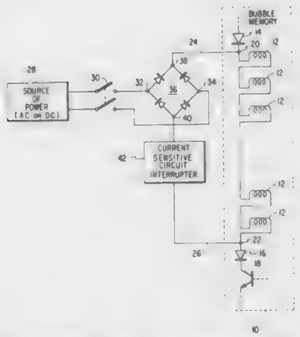
Filed Apr. 1, 1985, Ser. No. 718,272
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **12 Claims**



1. For use with a data processing system wherein interrupt requests for service by a processing device are transmitted over a processor communication link, each interrupt request having a prescribed level of priority, an arrangement for controllably coupling interrupt requests to said processing device comprising:
random access memory means, coupled to said processor communication link and having a plurality of addressable storage locations, for storing, sequentially in time, interrupt requests supplied over said communication link in accordance with the order in time that said requests are supplied thereto and in memory address locations associated with the respective levels of priority of said requests;
memory address scanning means, coupled to said random access memory means, for scanning the storage locations of said random access memory means to locate a stored interrupt request whose priority level among requests stored by said random access memory means is highest;
register means for controllably storing an interrupt requests; and
comparison means, coupled to said processing device and to said register means, for comparing the contents of said register means with the level of task execution activity of said processing device and, upon detecting the level of task execution activity of said processing device to be less than the priority level as represented by the contents of said register means, causing the contents of said register means to be forwarded to said processing device as an interrupt request.

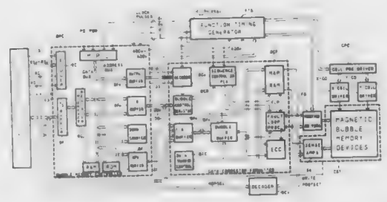
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,883
MAGNETIC BUBBLE MEMORY PURGE AND VERIFICATION SYSTEM
Bruce C. Perkin, Tujunga, Calif., assignor to The Singer Company, Stamford, Conn.
Filed May 10, 1985, Ser. No. 732,780
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—1 **2 Claims**



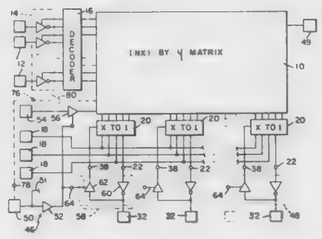
1. In combination with a bubble memory having a Z-axis thermal compensation coil, an arrangement for erasing the contents of said memory comprising:
a source of electrical power having two output terminals;
means for connecting said terminals to one side of a normally open double pole single throw switch;
a diode bridge having a pair of input terminals and a pair of output terminals;
means for connecting the second side of said switch to said diode bridge input terminals;
means for connecting a first of said diode bridge output terminals to a first end of said coil;
a current sensitive circuit interrupter;
means for connecting the second of said diode bridge output terminals to a first side of said interrupter; and
means for connecting the second side of said interrupter to the second end of said coil.

4,734,884
MAGNETIC BUBBLE MEMORY SYSTEM WITH FUNCTION OF PROTECTING SPECIFIC STORAGE AREA OF BUBBLE MEMORY FROM REWRITING
Tatsuhiko Kohno, Tokyo, and Kazutoshi Yoshida, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 16, 1985, Ser. No. 734,606
Claims priority, application Japan, May 16, 1984, 59-96467
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—1 **2 Claims**



1. An information handling system comprising a magnetic bubble memory device with a plurality of redundant storage areas usable for defective storage areas thereof, a bubble memory controller, a host central processing unit and means for inhibiting accessing of said defective storage areas to protect information from being read out therefrom and/or writing therein, said controller having a write protection function in which an information read out from a certain address region of said device and address information representative of an address region for said device in which new information is to be written are compared, and a writing operation for the storage areas other than said defective storage areas of said device is inhibited according to the comparison result.

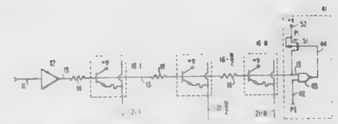
4,734,885
PROGRAMMING ARRANGEMENT FOR PROGRAMMABLE DEVICES
Thomas M. Luich, Puyallup, Wash., assignor to Harris Corporation, Melbourne, Fla.
Filed Oct. 17, 1985, Ser. No. 788,585
Int. Cl.[4] G11C *17/06*
U.S. Cl. 365—94 **18 Claims**



1. A programmable matrix having bit addressing inputs, bit outputs, a power supply input, a programming current input, and programming control circuitry, said control circuitry comprising:
a multi-purpose input pin;
programming current circuit means, connected to the programming current input, for providing a flow of programming current to the matrix;
bidirectional output buffer means, connected to the bit outputs of the matrix and having at least one buffer output and having a control input for receiving a programming enable signal, for providing a current path for said programming current in response to application of a normal operating level voltage signal to said buffer output and substantially simultaneous application of a normal operating level voltage signal to the power supply input while said programming enable signal is present at the control input; and
programming circuit means, connected to the multi-purpose input pin and to the control input of the bidirectional output buffer means, for producing said programming enable signal in response to application of a first higher than normal operating level voltage signal to the multi-purpose input pin.

4,734,886
AUXILIARY WORD LINE DRIVER FOR EFFECTIVELY CONTROLLING PROGRAMMABILITY OF FUSIBLE LINKS
Timothy L. Blankenship, Palm Bay, Fla., and Joseph G. Nolan, III, San Jose, Calif., assignors to Harris Corporation, Melbourne, Fla.
Filed Oct. 22, 1985, Ser. No. 790,115
Int. Cl.[4] G11C *17/00, 17/06*
U.S. Cl. 365—94 **3 Claims**

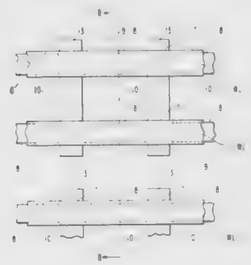
1. For use in a circuit having a plurality of storage elements, selected characteristics of which are programmable by the application thereto of a control stimulus coupled to said elements through a prescribed medium, an arrangement for enhancing the capability of said prescribed medium to supply said control stimulus to said storage elements comprising a plurality of control stimulus supplying devices coupled to said medium, and wherein said respective ones of said control stimulus supplying devices are coupled to spaced apart locations of said prescribed medium, and wherein said prescribed medium is an electrically resistive medium and each of said storage elements includes a fusible element to which an electrical characteristic-altering current is coupled in response to the application of a control stimulus to said each storage element, and wherein a storage element includes controlled switching element, coupled between a source of electrical characteristic-altering current and said fusible element, and responsive to the application of a control stimulus thereto from said resistive medium for coupling said source of electrical characteristic-altering current to said fusible element, and wherein said resistive medium comprises an interconnect layer of semiconductor material overlying a substrate containing said plurality of storage elements and wherein respective ones of said control stimulus supplying devices are coupled to spaced apart locations of said interconnect layer, and wherein said circuit comprises a memory array of said storage elements, and wherein said interconnect layer comprises a respective word line



through which selected ones of said storage elements are addressed, and wherein said control stimulus supplying devices include a first word line driver coupled to a first location of said interconnect layer and an auxiliary word line driver coupled to a second location of said interconnect layer spaced apart from said first location thereof, and wherein said first and auxiliary word line drivers are coupled to opposite ends of said interconnect layer, and wherein said auxiliary word line driver comprises a logic gate one input of which is coupled to said interconnect layer and an output of which is coupled to control the selective coupling of a prescribed voltage level to said interconnect layer, and wherein said logic gate comprises a NAND gate a first input of which is coupled to said interconnect layer, an output of which is coupled to a switching circuit for selectively coupling said voltage level to said interconnect layer, a second input of said NAND gate being coupled to receive a prescribed programming input, and wherein a storage element further includes a transistor, a first, input electrode of which is coupled to a prescribed voltage supply terminal, a second, control electrode of which is coupled to said interconnect layer, and a third, output electrode of which is coupled to one end of said fusible element, and wherein a second end of said fusible element is coupled to a respective bit line of said memory array.

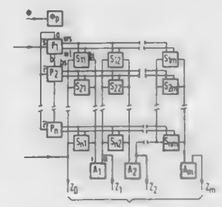
4,734,887
ERASABLE PROGRAMMABLE READ ONLY MEMORY (EPROM) DEVICE AND A PROCESS TO FABRICATE THEREOF
Shinji Sugatani, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 15, 1986, Ser. No. 941,439
Claims priority, application Japan, Jan. 14, 1986, 61-005310
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—185 **5 Claims**

1. An erasable programmable read only memory (EPROM) device having plurality of memory cell FETs (field effect transistors) arranged in a matrix on a semiconductor substrate, said memory cell FET comprising:
a floating gate for storing voltage on it and controlling the conductivity of said memory cell FET;
a first gate insulation film provided between said floating gate and said substrate for insulating said floating gate from said substrate;
a control gate positioned over said floating gate for controlling the voltage of said floating gate;
a second gate insulation film provided between said floating gate and said control gate for insulating said floating gate from said control gate; and



device separation regions provided on both sides in gate width direction of said floating gate for separating said memory cell FET from adjacent memory cell FETs on both sides,
wherein said floating gate being positioned underneath said control gate, the width of said control gate being equal to the length of said floating gate, and said floating gate and said device separation regions are aligned side by side at the edge of the floating gate on its gate width sides.

4,734,888
CIRCUIT ARRANGEMENT COMPRISING A MATRIX SHAPED MEMORY ARRANGEMENT FOR VARIABLY ADJUSTABLE TIME DELAY OF DIGITAL SIGNALS
Reinhard Tielert, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Feb. 12, 1986, Ser. No. 828,512
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506603
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—194 **7 Claims**



1. A circuit arrangement for providing a variably adjustable time delay for a data stream of digital signals, comprising:
a memory matrix including a plurality of storage elements arranged in columns and rows, each of said storage elements comprising a three-transistor cell having overlapping write/read cycles, a separate write bit line and a separate read bit line for each column respectively connected to each cell of the respective column, and a separate write word line and a separate read word line for each row respectively connected to each cell of the respective row;
a reset control signal input for receiving a reset control signal;

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a continuously steppable clocked row selector including a plurality of cascaded selector stages each including two mutually offset signal outputs respectively connected to a respective write word line and a respective read word line and each including a control input connected to said reset control signal input for receiving a reset signal at an arbitrary time for setting the first stage and resetting all other stages of said row selector;

an undelayed data output and a plurality of delayed data outputs;

a data input for receiving an input data stream to be delayed, said data input connected to said write bit line of a first of said columns and to said undelayed data output; and

a plurality of amplifiers each assigned to a respective column including an input connected to a respective read bit line of the respective column and an output connected to a respective delayed data output and to said bit write line of the adjacent column,

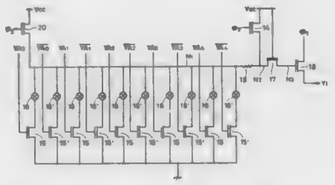
the spacing between reset signals selected to be equal to the desired delay between said undelayed data output and the delay output of the first column.

4,734,889

SEMICONDUCTOR MEMORY

Koichiro Mashiko; Yoshikazu Morooka; Tadato Yamagata, and Yuto Ikeda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,359
Claims priority, application Japan, Mar. 22, 1985, 60-59234
Int. Cl.⁴ G11C *13/00, 11/40*
U.S. Cl. 365—200 **6 Claims**



5. A semiconductor memory of a redundant design comprising:

a memory cell array in which a plurality of memory cells are regularly arrayed along a plurality of word lines and a plurality of bit lines perpendicular to said word lines and an arbitrary one of said memory cells can be specified by the combination of a column address and a row address,

reading means for selecting one of said word lines by said row address to read out onto said bit lines, an information charge of the memory cells connected to said selected one of said word lines,

means for selecting one of said bit lines by said column address to provide to a device located external to said semiconductor memory the information charge amplified by said sense amplifier connected to said selected one of said bit lines, and

a spare column decoder for selecting a spare bit line when a column address corresponding to a defective bit line is applied,

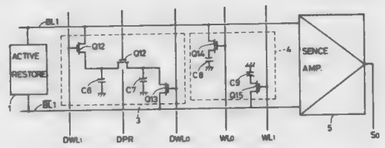
said semiconductor memory being characterized in that a plurality of charging means are provided in said spare column decoder, each said charging means comprising a switched constant voltage source.

4,734,890

DYNAMIC RAM HAVING FULL-SIZED DUMMY CELL

Hideshi Miyatake; Kazuyasu Fujishima; Masaki Kumanoya; Hideto Hidaka; Katsumi Dosaka, and Yasuhiro Konishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,369
Claims priority, application Japan, Nov. 13, 1985, 60-257081
Int. Cl.⁴ G11C *11/40, 13/00*
U.S. Cl. 365—210 **3 Claims**



1. A dynamic RAM having with an active period and a precharge period for processing a signal, comprising

a pair of bit lines including a first bit line and a second bit line,

a first memory capacitor,

first switching means connected between said first bit line and said first memory capacitor for selectively connecting said first memory capacitor to said first bit line,

a first word line for controlling said first switching means,

a second memory capacitor having the same capacitance as said first memory capacitor,

second switching means connected between said second bit line and said second memory capacitor for selectively connecting said second memory capacitor to said second bit line,

a second word line for controlling said second switching means,

a first dummy capacitor having the same capacitance as said first memory capacitor,

third switching means connected between said first bit line and said first dummy capacitor for selectively connecting said first dummy capacitor to said first bit line,

a first dummy word line for controlling said third switching means,

a second dummy capacitor having the same capacitance as said first memory capacitor,

fourth switching means connected between said second bit line and said second dummy capacitor for selectively connecting said second dummy capacitor to said second bit line,

a second dummy word line for controlling said fourth switching means,

fifth switching means connected between said first dummy capacitor and second dummy capacitor for equalizing said first and second dummy capacitors,

a sense amplifier connected to said pair of bit lines for sensing said pair of bit lines during said active period,

word line driving means for selectively outputting a first word line signal or a second word line signal before said sensing during said active period, said first word line signal driving said first word line and rendering said first switching means conductive, said second word line signal driving said second word line and rendering said second switching means conductive,

first dummy word line driving means for selectively outputting a first dummy word line signal or a second dummy word line signal before said sensing during said active period, said first dummy word line signal driving said first dummy word line and rendering said third switching means conductive, said second dummy word line signal driving said second dummy word line and rendering said fourth switching means conductive, said first dummy word line signal being outputted in response to said second word line signal and said second dummy word line signal being outputted in response to said first word line signal,

second dummy word line driving means for outputting a DWC signal for rendering said third and fourth switching means conductive after said sensing during said active period, and

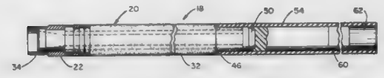
equalizing signal outputting means for rendering said fifth switching means conductive to equalize said first and second dummy capacitors during said precharge period after said active period.

4,734,891

AFT DROGUE MODULE FOR TOWED SONAR ARRAY

George A. McGowan, Westminster, and David B. MacCulloch, Saugus, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 20, 1986, Ser. No. 876,611
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 367—15 **19 Claims**



1. A drogue module for a towed sonar array, said drogue module comprising:

a coupling at the forward end of said drogue module, said coupling having an interior cone surface which is divergent towards the forward end of said module;

a body connected to said coupling, said body having a diameter substantially equal to said coupling and said body including a tensile strength member extending into and engaged within said coupling, said strength member being expanded to said conical surface and filled with a plug to prevent pulling of said strength member out of said coupling; and

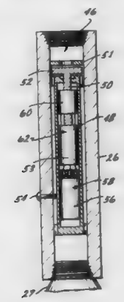
an aft hose connected to said body, said aft hose having a damper therein for damping whipping of said drogue module as it is towed through water.

4,734,892

METHOD AND TOOL FOR LOGGING-WHILE-DRILLING

Oleg Kotlyar, 3714 S. Highland Dr., #19, Salt Lake City, Utah 84106

Continuation-in-part of Ser. No. 529,381, Sep. 6, 1983, abandoned. This application Nov. 8, 1985, Ser. No. 796,586
Int. Cl.⁴ H04H *9/00;* **G01V** *1/00*
U.S. Cl. 367—83 **8 Claims**



1. A logging-while-drilling tool for use in an earth drilling apparatus comprising:

a drill string having a drill bit at the lower end thereof, said drill string receiving flow of drilling fluid which flows through said drill bit,

a housing positioned in said drill string and above said drill bit such that drilling fluid which is circulated through the drill string will flow around the housing;

a shaft journaled in the housing;

means mounted on said shaft outside of said housing and including a rotating element and said means having a pressure response characteristic related to the rotational speed of said rotating element for generating pressure pulses in response to changes in the rotational speed of said rotating element while said drilling fluid continuously flows therethrough;

said rotating element being continuously and rotatingly driven solely by drilling fluid flowing through said drill string and having a predetermined pressure response characteristic in response to continuous flow therethrough; and

means for changing the rotational speed of said rotating element in order to change the pressure response thereof while said drilling fluid flows therethrough and thereby to generate a pressure pulse which is transmitted through said drilling fluid.

4,734,893

APPARATUS AND METHOD FOR TRANSMITTING DOWNHOLE CONDITIONS TO THE SURFACE

Jack R. Claycomb, Houston, Tex., assignor to Navigator MWD, Inc., Houston, Tex.

Filed Oct. 6, 1986, Ser. No. 915,630
Int. Cl.⁴ H04H *9/00;* **G01V** *1/00*
U.S. Cl. 367—85 **6 Claims**



1. A measuring while drilling mud-pulse telemetry system for use while drilling a borehold in the earth, the system comprising:

(a) an elongate, hollow tubular member adapted to be connected in a drill string;

(b) constriction means in said tubular member for creating a sequence of pressure puises in drilling fluid circulated through the drill string;

(c) a mud pulser sub mounted within said hollow tubular member and extending into a length a drill pipe in the drill string for producing pressure pulses in the drilling fluid, said mud pulser sub including a rod member having a plurality of spaced peaks and valleys formed along a lower portion of said rod member;

(d) a closed hydraulic fluid system for modulating downward movement of said rod member of said mud pulser sub;

(e) sensor means responsive to a variable of interest in the

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borehole for forming a signal indicative of a value of the variable of interest;

(f) switch means operatively connected to said sensor means, said switch means being engageable with said lower portion of said mud pulser sub and being actuable upon downward movement of said rod member of said mud pulser sub; and

(g) battery means operatively connected to said sensor means for operation thereof.

4,734,894

ELECTROACOUSTIC PULSE SOURCE FOR HIGH RESOLUTION SEISMIC PROSPECTINGS

Giovanni B. Cannelli; Enrico D'Ottavi, and Silvio Santoboni, all of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

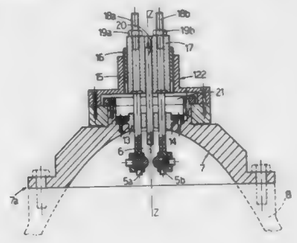
PCT No. PCT/IT85/00039, § 371 Date Jun. 4, 1986, § 102(e) Date Jun. 4, 1986, PCT Pub. No. WO86/02739, PCT Pub. Date May 9, 1986

PCT Filed Oct. 22, 1985, Ser. No. 878,377

Claims priority, application Italy, Oct. 23, 1984, 49127 A/84

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 367—147 **6 Claims**



1. A seismic source adapted for high resolution seismic prospecting comprising:

an electroacoustic transducer including a metallic hollow bell-shaped structure having a closed head and an open base that is closed by an elastic diaphragm, and being filled with a dielectric liquid, the structure having an inner reflective surface in the shape of a circular paraboloid having a vertical axis and a focal point, the structure further enclosing a pair of main electrodes positioned near the head on opposite sides of the focal point and with a gap therebetween, an auxiliary electrode positioned in the gap between the two main electrodes, and means for moving the main and auxiliary electrodes vertically along the vertical axis to vary their distance from the focal point and for moving the main electrodes horizontally normal to the axis to vary the width of the gap;

first circuit means for storing energy in a capacitor bank for maintaining a voltage across the main electrodes insufficient for initiating a discharge across the gap so long as the dielectric liquid in the gap is not ionized, and;

second circuit means connected between one of the main electrodes and the auxiliary electrode for establishing therebetween controllably a voltage sufficient to ionize the dielectric liquid in the gap whereby there is triggered an electrical discharge between the two main electrodes across the gap for exciting an acoustic wave in the dielectric liquid directed at the elastic diaphragm at the base end of the hollow structure.

4,734,895

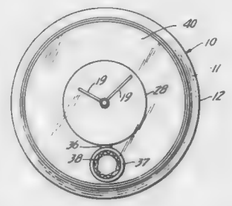
NOVELTY WATCH CONSTRUCTION

Mark Grosskopf, Palm Beach, Fla., assignor to Jewelmasters, Inc., West Palm Beach, Fla.

Filed Jul. 20, 1987, Ser. No. 75,403

Int. Cl.⁴ G04B *19/06, 25/06*

U.S. Cl. 368—229 **3 Claims**



1. A novelty watch construction comprising: a generally circular watch case, including a bezel, a crystal and a back cover overlying opposite sides of said bezel; a watch movement disposed adjacent said cover, a first dial member overlying said movement having a diameter substantially equal to the diameter of said crystal, a second dial member overlying said first dial member in spaced parallel relation and having a diameter substantially less than that of said first dial member; means supporting said second dial member in said spaced parallel relation relative to said first dial member to define a circular interstice therebetween; bearing means supported by said last-mentioned means and having an axis of rotation perpendicular first and second dial members; a pendulum supported for rotation by said bearing means and having a radially oriented support extending past the periphery of said second dial member, and a decorative member supported by said pendulum on a free end thereof, said decorative member moving in an arcuate path beneath said crystal and radially outwardly of said second dial member.

4,734,896

BURGLARPROOFING DEVICE FOR A CAR-CARRIED ACOUSTIC APPARATUS

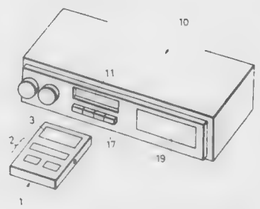
Satoshi Soma, and Masaru Noguchi, both of Iwaki, Japan, assignors to Alpine Electronics, Ltd., Japan

Filed Sep. 2, 1986, Ser. No. 902,754

Claims priority, application Japan, Sep. 6, 1985, 60-198057

Int. Cl.⁴ G08B *13/14*

U.S. Cl. 340—568 **10 Claims**



1. A burglarproofing device for a car-carried acoustic apparatus, comprising:

a portable controller having memory means in which a pass number or word is sorted and data outputting means connected to said memory means located at a predetermined position on said controller;

said car-carried acoustic apparatus having a receiving hole for receiving said controller inserted therein, and including data inputting means located at a predetermined position in said receiving hole in opposing relationship to said data outputting means of said controller when said controller is inserted in said receiving hole, discriminating means for discriminating coincidence between the pass number of word read out from said controller through said data outputting means to said data inputting means and a verification number or word previously stored in said discriminating means, and enabling means responsive only to a coincidence signal received from said discriminating means for enabling operation of said car-carried acoustic apparatus,

whereby said car-carried acoustic apparatus is rendered operative only when said controller has been inserted into said receiving hole of said car-carried acoustic apparatus and the pass number or word thereof coincides with said previously stored verification number or word.

4,734,897

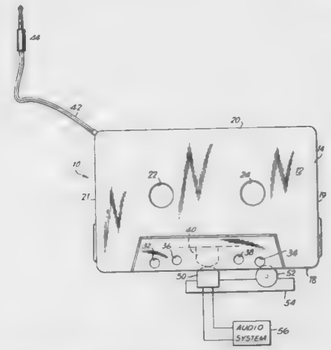
CASSETTE ADAPTER FOR PLAYBACK DEVICE, SUCH AS A COMPACT DISK PLAYER

Larry Schotz, Cedarburg, Wis., assignor to Recoton Corporation, Long Island City, N.Y.

Continuation-in-part of Ser. No. 797,706, Nov. 13, 1985, abandoned. This application Jul. 25, 1986, Ser. No. 890,355

Int. Cl.⁴ H04B *1/20*

U.S. Cl. 369—2 **19 Claims**



1. An adapter for enabling the signals produced by a device of the type having a headphone jack to be reproduced as audio sounds by a cassette player audio system of the type having a cassette playback deck in systems of the front-loading and side-loading types wherein said cassette is normally disposed and positioned in use substantially completely within the confines of said cassette playback deck and wherein said playback decks include a pair of spaced reel-drive spindles and a playback head, said adapter comprising: a housing of a configuration of a cassette normally used with said playback deck, said housing having at least a pair of openings to receive said pair of reel-drive spindles associated with said playback deck; a record head supported in said housing in a position for contacting the playback head of said playback deck when said adapter is received in said playback deck; audio circuit means within said housing and electrically connected to said record head for providing audio signals to said record head; electrical conducting means having one end coupled to said audio circuit means within said adapter and extending form said adapter, said electrical conducting means being coupled at its other end to a plug compatible with the headphone jack of said device; said electrical conducting means being movable between a first position such that said adapter may be used with a playback deck of the front-loading type and a second position such that said adapter may be used with a play back deck of the side-loading type so that said electrical conducting means when said adapter is positioned in such playback deck passes out of said playback deck free of interference with said playback deck; whereby when said adapter is received by said playback deck and said plug is connected to said headphone jack, the signals produced by said device are applied to said record head and applied thereby to said playback head and thence reproduced by said audio system.

4,734,898

AUTOCHANGER TYPE DISC PLAYER

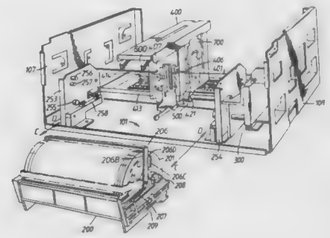
Kaoru Morinaga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 14, 1985, Ser. No. 744,677

Claims priority, application Japan, Jun. 15, 1984, 59-123116; Jun. 15, 1984, 59-123117

Int. Cl.⁴ G11B *17/22*

U.S. Cl. 369—39 **15 Claims**



1. An autochanger type disc player, comprising:

means for storing a plurality of closely spaced, parallel discs;

means for playing said discs;

means for transferring a selected one of said discs from said disc storing means to said disc playing means, said disc transferring means being movable along said plurality of discs in said disc storing means and including a disc guide having a disc inlet alignable with said selected disc in said disc storing means, said disc guide having a forward face portion facing said disc storing means, said selected disc passing through said disc inlet during transfer of said selected disc from said disc storing means to said disc playing means; and

restraining means for preventing discs other than said selected disc from entering said disc inlet, said restraining means including a restraining member connected to one side of said disc inlet and projecting from said forward face portion of said disc guide toward said disc storing means.

4,734,899

OPTICAL SCANNING UNIT FOR PROJECTING A BEAM ONTO AN OPTICAL RECORD CARRIER WITH POSITIONAL CONTROL USING SETS OF THREE COILS WITH EACH SET CONNECTED USING TWO AMPLIFIERS

Robert N. J. Van Sluys, Hasselt, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1986, Ser. No. 889,151

Claims priority, application Netherlands, Jan. 27, 1986, 8600168

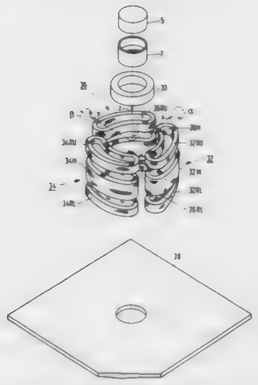
Int. Cl.⁴ G11B *7/09, 7/095, 21/16*

U.S. Cl. 369—45 **5 Claims**

1. An optical scanning unit for controlling and directing a radiation beam towards recording tracks on a surface to be scanned of an information carrier, which scanning unit comprises an objective, a translational-position and angular-position detection system for detecting the position of the objective and an electro-magnetic actuating means for correcting the

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position of the objective relative to the information carrier in response to electrical error signals supplied by the translational-position and angular-position detection system, the actuating means comprising a movable objective holder which comprises a cylindrical axially magnetized magnet with magnetic poles at its axial ends and at least three sets of coils disposed in the magnetic field of the magnet, which sets are arranged adjacent one another viewed in the circumferential direction of



the magnet and cooperate with the magnet via an airgap, characterized in that each set of coils comprises two peripheral coils which are each situated substantially within the magnetic field near opposite axial ends of said magnet, and at least one central coil arranged between the peripheral coils, and

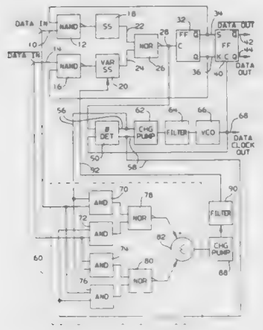
each set of coils is electrically connected to a matrix circuit via only two amplifiers, which matrix circuit receives said error signals and supplies control signals to said amplifiers.

4,734,900

RESTORING AND CLOCKING PULSE WIDTH MODULATED DATA

Neil R. Davie, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1986, Ser. No. 855,560
Int. Cl.[4] H04N *5/76;* **G11B** *5/09*
U.S. Cl. 369—59 **17 Claims**



1. A method for clocking pulse width modulated data wherein data is represented by the timing of leading and trailing edges of pulses, the method comprising the steps of:

detecting the leading edges of data pulses;

detecting the trailing edges of data pulses;

providing signals representative of the detected leading and trailing edges;

generating a clock signal in response to the leading and trailing edge signals, said clock signal following the shifts of said edge signals, that occur in the same direction, in order to provide an expected time for the detection of said edges;

comparing the timing of the signals representative of said edges with the expected time and generating a width correction signal representative of unintended width variations in the data pulses as manifested by shifts of the leading and trailing edges in opposite directions relative to the expected time provided by said clock signal; and

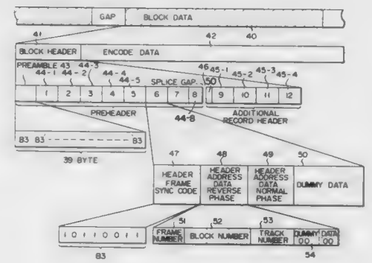
shifting the relative timing between leading and trailing edge signals in response to the width correction signal to restore the width of the data pulses to the expected width between the leading and trailing edge signals.

4,734,901

RECORDING AND REPRODUCING APPARATUS

Hiroyasu Murakami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 9, 1984, Ser. No. 669,876
Claims priority, application Japan, Nov. 14, 1983, 58-213515
Int. Cl.[4] G11B *7/00, 5/09*
U.S. Cl. 369—59 **15 Claims**



1. A recording medium for a recording and reproducing device in which recording and reproducing can be carried out using blocks on said recording medium which are formed by dividing tracks on the recording medium, said recording medium comprising:

at least one information recording track, divided into a plurality of blocks;

each of said blocks including at least a block header area and at least an encode data area;

said block header area including (a) a plurality of preheader areas, each said preheader area storing address data indicative of each of said blocks of one of said at least one information recording track, and (b) a block-synchronous code data, said block-synchronous code data formed by code-converting a particular code to form a code-converted particular code, then partly modifying said code-converted particular code to form a modified code-converted particular code, said partly modifying occuring such that a predetermined number of continuous same bits are included in said modified code-converted particular code; and

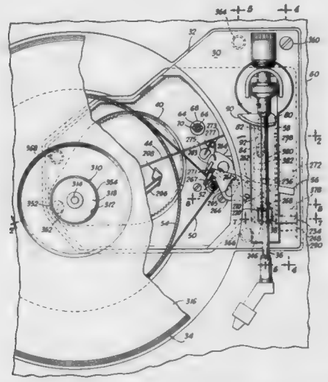
said encode data area includes a plurality of data frame areas, each said data frame area storing recording data and a data frame-synchronous code, said data frame-synchronous code including a code pattern which is substantially different from said modified code-converted synchronous code in a way such that said block-synchronous code and said frame-synchronous code can be distinguished.

4,734,902

RECORD PLAYER

James T. Dennis, 2312 NW. 57th St., Oklahoma City, Okla. 73112, and George Kolomayets, Chicago, Ill., assignors to James T. Dennis, Oklahoma City, Okla.

Filed May 8, 1985, Ser. No. 732,242
Int. Cl.[4] G11B *17/08, 17/16*
U.S. Cl. 369—176 **51 Claims**



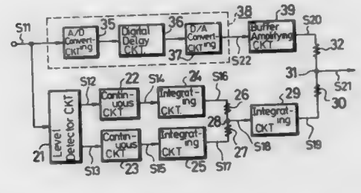
1. In a record player, the combination of, a rotatable turntable, means for rotating said turntable, a tone arm pivotally mounted at a point beyond said turntable and having a cartridge receiving outer end, a tone arm lift member vertically movable to engage said tone arm and raise the outer end thereof, a control knob, means responsive to movement of said control knob to a first position for moving said lift member upwardly, thereby to raise the outer end of said tone arm to a cueing position above said turntable without energizing said turntable rotating means, and means responsive to the movement of said control knob to a second position for energizing said turntable rotating means.

4,734,903

LEVEL CONTROL CIRCUIT FOR LIGHT BEAM RECORDING APPARATUS

Hidemichi Shirai, and Yoshio Ozaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP84/00262, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05486, PCT Pub. Date Dec. 5, 1985
PCT Filed May 23, 1984, Ser. No. 823,501
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—107 **8 Claims**



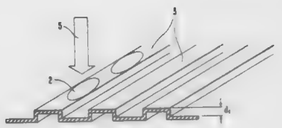
1. An information recording apparatus in which an exposing locus is formed on a film by irradiating the film with an exposing beam, in which the width of the exposing locus is changed in response to an input audio signal, and in which an average level position of said exposing locus is controlled in response to the signal level of said input audio signal, characterized by a level detector circuit for comparing said input audio signal with a predetermined reference level signal, a continuous circuit for making a compared output from said level detector circuit continuous, a first integrating circuit for integerating the continuous output from said continuous circuit and a second integrating circuit for integrating an integretated output from said first integrating circuit and delivering a twice integrated signal to control said average level position of said exposing locus upon the exposure and recording.

4,734,904

REPRODUCING-ONLY AND RECORDABLE-REPRODUCEABLE OPTICAL DISCS AND COMMON OPTICAL DISC PLAYER THEREFOR

Ryoichi Imanaka, Hirakata; Yoshihiro Okino, Uji, and Tetsuo Saimi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 733,805, May 14, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 27,410
Claims priority, application Japan, May 16, 1984, 59-97973
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—109 **2 Claims**



1. The combination of recordable-reproduceable optical discs and reproducing-only optical discs and an optical disc player having a common optical system for reproducing recorded signals both from a recordable-reproduceable optical disc having pregrooves and a reproducing-only optical disc having recording pits, wherein said common optical system has a common laser for irradiating both recordable-reproduceable discs and reproducing-only discs with a laser beam used for reading said discs, said laser having a wavelength λ, and wherein a depth or height of said pregrooves of said recordable-reproduceable optical disc is made equal to or less than λ/8n and a depth or height of said recording pits of said reproducing-only optical disc is made equal to or greater than λ/8n but less than λ/4n and wherein n is a refractive index of a substrate of said discs or a refractive index of a protective layer provided on a surface of said discs.

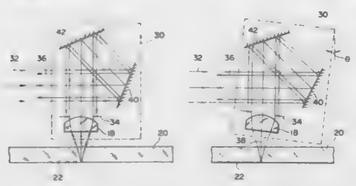
VOL 1088 ISS 5 MR 29 1988 UMI

4,734,905

OPTICAL HEAD DEVICE

Tetsuro Kuwayama, Yokohama; Shigeyuki Suda, and Yasuo Nakamura, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi K.K., Chichibu, both of, Japan

Filed Dec. 5, 1984, Ser. No. 678,593
Claims priority, application Japan, Dec. 7, 1983, 58-229837
Int. Cl.[4] G11B *7/135*
U.S. Cl. 369—111 **5 Claims**



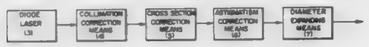
1. An optical head device comprising a light source unit, deflecting means for varying the direction of travel of a light beam emitted from said light source unit, condensing means for condensing the light beam from said deflecting means on a recording medium, and moving means for moving said deflecting means and condensing means relative to said recording medium, said deflecting means consisting of plural reflecting surfaces having a predetermined fixed angle therebetween and said fixed angle being set so that the variation of an angle in the direction of the light beam from said deflecting means to said condensing means, resulting from rotative displacement of said deflecting means with respect to at least one axis, be extinguished.

4,734,906

OPTICAL DISK RECORDING AND READOUT SYSTEM HAVING READ, WRITE AND COARSE LIGHT BEAMS

James W. Baer, Boulder, and Scott D. Wilson, Thornton, both of Colo., assignors to Storage Technology Partners 11, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,692
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G11B *7/00;* **G02B** *5/04*
U.S. Cl. 363—112 **4 Claims**



1. A self-contained, replaceable laser module for use in an optical information storage and retrieval device, said module presenting a reformed laser beam for using in reading or writing data in the optical information storage and retrieval device, said laser module comprised of:

a base plate;

a diode laser, said laser emitting a divergent, astigmatic, non-circular cross-sectioned light beam, said laser being fixedly attached to the base plate;

means for collimating the light beam emitted by the diode laser, said collimating means being fixedly attached to the base plate in a position to receive the beam emitted by the diode laser;

means for correcting the astigmatism of the light beam emitted by the diode laser, said means being fixed and positioned on the base plate to correct the astigmatism in the specific diode laser attached to the base plate, and;

means for expanding the major or minor axis of the incident beam so as to circularize the cross-section of the beam, said means being positioned on the base plate so as to induce an in-line expansion of the beam and thereby correct the crosssection of the individual diode laser attached to the base plate, said means comprising an in-line prism beam modifier system comprised of a first prism positioned and oriented to receive the incident elliptical cross-sectioned beam and partially circularize said beam, a second prism positioned and oriented to receive the partially circularized beam from the first prism and fully circularize the beam, and a planar mirror positioned between the first and the second prism so as to receive the beam exiting from the first prism and reflect the beam into the second prism, the configuration and position of the prisms oriented such that the path of the beam upon exiting the second prism is coaxial with the path of the beam incident upon the first prism;

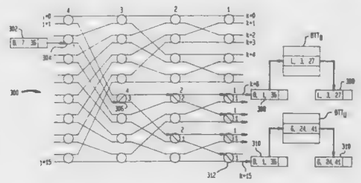
wherein the prism beam modifier system further comprises said means for correcting the astigmatism of the incident beam, such that upon the beam passing through said first and second prisms at a non-normal angle, an astigmatism is introduced into the beam by said first and second prism which corrects the astigmatism of the beam emitted by the diode laser.

4,734,907

BROADCAST PACKET SWITCHING NETWORK

Jonathan S. Turner, University City, Mo., assignor to Washington University, St. Louis, Mo.

Filed Sep. 6, 1985, Ser. No. 773,380
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—60 **19 Claims**



1. A packet switch comprising

copy network means for receiving information packets at individual inputs thereof and replicating identical copies at multiple outlets thereof,

routing and distribution network means for receiving packets from said copy network means and transmitting them to predetermined destinations, and

control means responsive to information contained in the packets for determining the number of copies to be replicated by said copy means and said destinations.

4,734,908

HIGH SPEED TRUNK INTERFACE WITH CONCURRENT PROTOCOL HANDLERS

Kurt A. Hedlund, Chicago, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1986, Ser. No. 926,012
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **12 Claims**

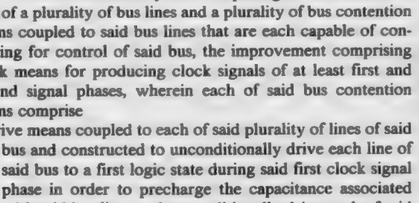
1. A digital trunk interface for receiving a plurality of packets from a high speed digital trunk, comprising:

a first protocol handler means responsive to the start of one of said packets for storing a subset of said one of said packets;

said first protocol handler means further responsive to said start of said one of said packets received from said trunk for transmitting an initialization signal;

means for delaying said one of said packets received from said trunk;

a second protocol handler means responsive to said delayed one of said packets for processing said delayed one of said packets; and



means for controlling the communication of said delayed one of said packets from said second protocol handler in response to said initialization signal and said stored subset.

4,734,909

VERSATILE INTERCONNECTION BUS

Donald B. Bennett, Burnsville; Lee T. Thorsrud, Saint Paul, and Thomas W. Petschauer, Bloomington, all of Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Continuation of Ser. No. 356,051, Mar. 8, 1982, abandoned. This application Aug. 21, 1986, Ser. No. 898,810
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85 **12 Claims**

1. In a bus arbitration system comprising a bus which consists of a plurality of bus lines and a plurality of bus contention means coupled to said bus lines that are each capable of contending for control of said bus, the improvement comprising clock means for producing clock signals of at least first and second signal phases, wherein each of said bus contention means comprise

drive means coupled to each of said plurality of lines of said bus and constructed to unconditionally drive each line of said bus to a first logic state during said first clock signal phase in order to precharge the capacitance associated with said bus lines and to conditionally drive each of said bus lines to either a first logic state, or to a second logic state,, in accordance with an established priority code during said second clock signal phase,

read means for reading the logic state of said bus lines during said second clock signal phase,

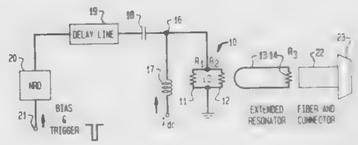
priority determining means for comparing the logic state patterns of the bus lines which are associated with the priority codes of each of said bus contention means with the logic state pattern that is established by said conditionally driven lines and for removing all of said bus contention means from contention for said bus for which said logic state patterns do not match.

4,734,910

SELF MODE LOCKED SEMICONDUCTOR LASER DIODE

Hossein Izadpanah, Randolph, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 25, 1987, Ser. No. 29,802
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 **9 Claims**



1. A self mode-locked laser system comprising:

a semiconductor laser diode having a first facet and a second facet, optical radiation being emitted from said second facet when said diode is driven;

an optical system disposed to reflect at least a portion of said optical radiation back into said diode thereby inducing self-coupling in said laser to generate an oscillating light pulse; and

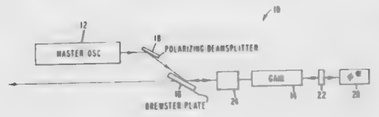
an electronic gain means coupled to said laser for controlling said oscillating light pulse in said laser to produce sustained steady-state oscillation, thereby made locking said laser.

4,734,911

EFFICIENT PHASE CONJUGATE LASER

Hans W. Bruesselbach, Calabasas, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1986, Ser. No. 839,475
Int. Cl.[4] H01S *3/10, 3/8, 3/13*
U.S. Cl. 372—21 **23 Claims**



1. A pulsed laser apparatus utilizing a master oscillator, power amplifier configuration wherein a master oscillator provides a source of laser radiation pulses that are injected into an amplifying stage where said pulses are amplified to provide higher power laser output radiation, said laser apparatus comprising:

a master oscillator radiation source for providing low energy, high quality, output radiation pulses;

an amplifier stage comprising a laser gain medium disposed along an optical path and adapted to receive output radiation pulses from said master oscillator radiation source and amplify said pulses to provide amplified laser radiation pulses;

isolation means disposed along said optical path for selectively coupling a predetermined portion of the energy of said radiation pulses which traverse the optical path between said master oscillator radiation source and said amplifier stage;

phase conjugation means disposed along said optical path on the opposite side of said amplifier stage from said coupling means, for reflecting phase conjugate laser radiation pulses in response to amplified laser radiation pulses incident thereon; and

delay means disposed between said amplifier stage and said

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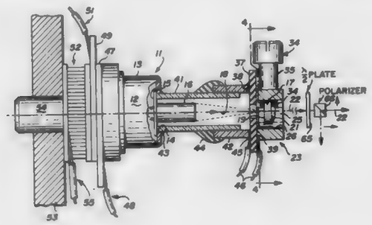
phase conjugation means for substantially delaying said reflected phase conjugated laser radiation pulses reflected by said phase conjugation means until radiation pulses traversing said laser gain medium have exited said laser gain medium.

4,734,912

LASER DIODE END PUMPED ND:YAG SINGLE MODE LASER

David G. Scerbak, Morgan Hill, and Leonard P. Pearson, Palo Alto, both of Calif., assignors to Lightwave Electronics Corp., Mountain View, Calif.

Filed Jun. 6, 1986, Ser. No. 871,490
Int. Cl.⁴ H01S *3/10*
U.S. Cl. 372—27 **15 Claims**



1. In a method for producing single-mode, linearly polarized, coherent radiation at optical wavelengths, the steps of:

generating a beam of coherent optical pumping radiation from a diode laser;

directing the beam of optical pumping radiation through a solid member of generally non-birefingent lasant material to optically pump said member of lasant material and to provide a gain bandwidth having a characteristic peaked gain curve;

disposing said member of lasant material within an optical resonator having an optical axis passing through the member of lasant material for exciting a plurality of resonant axial modes of said optical resonator with coherent optical radiation at a plurality of optical wavelengths;

dimensioning the optical path length of the optical resonator to be sufficiently short such that essentially only two adjacent non-polarized optical resonant axial modes of said resonator will lase when centered in frequency on opposite sides of the peak of the gain curve within the optical resonator containing the optically pumped member of lasant material; and

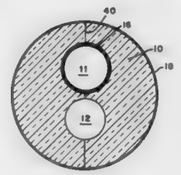
stressing the member of lasant material to produce therein a stress with a predominant component transverse to the optical axis of the optical resonator to produce a stress related birefringence of said lasant material causing linear polarization of the two excited axial modes of the optical resonator along an axis normal to the direction of the stress in the member of lasant material and to produce a third excited axial mode of optical resonance of said optical resonator, said third mode of resonance being linearly polarized parallel to the direction of the applied stress and having a resonant optical wavelength inbetween the optical wavelengths of said first two excited optical resonant modes, whereby the energy of the third excited optical mode can be separated by a polarization sensitive device from the energy of the first two excited optical modes to produce a single-mode linearly polarized output.

4,734,913

UNITARY SOLID-STATE LASER

Robert C. Morris, Ledgewood, N.J.; Norman G. Schroeder, Timonium, Md.; Jerry W. Kuper, Martinsville, N.J.; Michael L. Shand, Morristown, N.J., and Joseph J. Barrett, Morris Plains, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 16, 1985, Ser. No. 809,606
Int. Cl.⁴ H01S *3/04*
U.S. Cl. 372—34 **10 Claims**



1. A unitary laser comprising:

(a) a transparent, thermally-conductive solid housing;

(b) a laser medium that has two opposite ends and is embedded in a first cavity in the housing;

(c) a pump lamp for exciting the laser medium that is embedded in a second cavity in the housing,

(d) a filter coating on said pump lamp and extending around the pump lamp for eliminating unwanted components of the lamp output which do not efficiently excite the laser medium by reflecting back into said pump lamp components of the lamp output that do not efficiently excite the laser medium; and

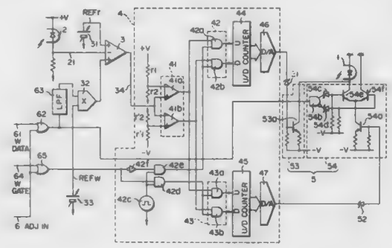
(e) reflectors adjacent to the opposite ends of the laser medium that define an optical resonant cavity and support coherent radiation emitted by the laser medium.

4,734,914

STABILIZED LASER APPARATUS

Shozi Yoshikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,557
Claims priority, application Japan, Mar. 15, 1985, 60-52020
Int. Cl.⁴ H01S *3/00, 3/04;* **G01J** *1/32;* **G02F** *1/00*
U.S. Cl. 372—33 **8 Claims**



3. A stabilized laser apparatus, comprising:

laser source means for emitting a laser beam in response to a drive signal, including means for modulating the drive signal in accordance with a supplied modulating signal so that the intensity of the emitted laser beam is modulated in accordance with the modulating signal;

photodetecting means for detecting the intensity of the modulated laser beam emitted from said laser source means, and for producing a corresponding ouput signal;

control means for adjusting the drive signal in accordance with a difference between a reference signal and the output signal from said photodetecting means, said control means comprising memory means for storing an adjusted driving signal; and

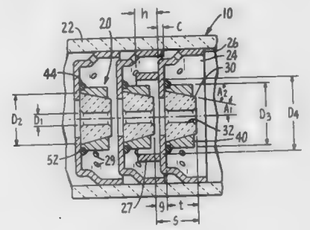
adjusting means for supplying an adjustment instruction signal to said modulating means of said laser source means in the absence of the modulating signal, so that a modulated laser beam is emitted by said laser source means and the drive signal is adjusted by said control means even when the modulating signal is not supplied to said modulating means.

4,734,915

CONDUCTION COOLED LASER BORE STRUCTURES FORMED FROM GRAPHITE AND OTHER MATERIALS

Wayne S. Mefferd, Los Altos Hills, and Joseph L. Dallarosa, Los Altos, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Mar. 26, 1985, Ser. No. 716,111
Int. Cl.⁴ H01S *3/03*
U.S. Cl. 372—61 **61 Claims**



1. A mechanically constrained bore assembly for use within a gas laser tube, said bore assembly being mountable to a heat conducting member, said heat conducting member having a central opening and a periphery, with the periphery of said heat conducting member being attached to the tube of the gas laser at the inner surface thereof, said bore assembly comprising:

a discharge confining element formed from a sputter-resistant material, said discharge confining element having a central channel; and

an outer support member disposed about at least a portion of said discharge confining element and connected to the heat conducting member such that said discharge confining element is mechanically constrained whereby during operation of the laser, a thermally conductive path is estblished between the discharge confining element and the outer support member, thereby providing a suputter-resistant inner bore as well as a path for cooling said bore by conduction.

4,734,916

LASER OSCILLATING APPARATUS

Ethan D. Hoag, Boston, Mass., assignor to Laser Corporation of America, Lowell, Mass.

Filed Mar. 20, 1986, Ser. No. 841,626
Int. Cl.⁴ H01S *3/03*
U.S. Cl. 372—65 **7 Claims**

1. A laser oscillating apparatus comprising:

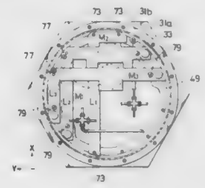
a. a cylindrical outer housing having a first end cap at one end thereof and a second end cap at the opposite end thereof to form a gas tight enclosure;

b. temperature maintenance means for maintaining said outer housing at a substantially constant temperature;

c. a plurality of mirrors disposed in reflecting relationship at the opposite ends of said outer housing so as to repeatedly reflect a ray of radiation through a lasing region defined along the optical path between the opposed mirrors;

d. laser oscillating means comprising paired discharge electrodes oppositely positioned along the optical path between the opposed mirrors and defining therebetween the lasing region, gas flow generating means for producing a circulatory flow of lasing gas through the lasing region between the paired discharge electrodes, and heat exchahnger means disposed in circumferentially spaced relationship within said outer housing between the opposed mirrors; and

e. means for supporting said laser oscillating means within said outer housing comprising a first ring member fixedly



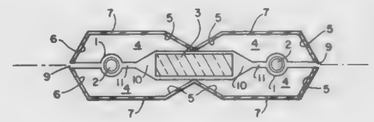
mounted to said outer housing at one end thereof, a second ring member slidably translatible with respect to said outer housing disposed is supporting contact with said outer housing at the opposite end thereof, and internal supporting means for mounting the discharge electrodes, the gas flow generating means, and the heat transfer means to at least said first ring member thereby forming a unitized structure the slidably translatable second ring member being freely longitudinally movable within asid outer housing to compensate for a temperature differential between said unitized structure and the substantially constant temperature outer housing in responses to thermal expansion and contraction of the unitized structure.

4,734,917

FLUORESCENT CONVERTER PUMPED CAVITY FOR LASER SYSTEM

Christopher D. Johnson, Binghamton, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed Dec. 31, 1985, Ser. No. 815,324
Int. Cl.⁴ H01S *3/091*
U.S. Cl. 372—70 **5 Claims**



1. A multi-lamp laser system comprisng:

(a) an active slab laser element having major planar surfaces;

(b) a plurality of lamps positioned symmetrically with respect to said laser element and on opposite ends of said major surfaces;

(c) solid fluorescent converter elements having interior and outer surfaces, said interior surfaces of said converter elements defining an interior cavity for surrounding and retaining said slab laser, and additional interior cavities for supporting said plurality of lamps;

(d) passage means communicating between each of said lamp cavities and the interior cavity retaining said laser to provide a direct illumination path to said laser from each of the lamps,

(e) metallic reflecting means on the outer surfaces of said converter elements to reflect light from said lamp trans-

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mitted through said converter elements as well as spectrally shifted light from the fluorescent conversion taking place in said converter elements onto the major surfaces of said slab laser element;

(f) said passage means communicating between each of said lamp cavities and the minor surface of said slab laser element whereby the minor surfaces of said laser is directly pumped by a portion of the light emitted from said lamps.

4,734,918

LUMINOUS BAND DISPLAY DEVICE

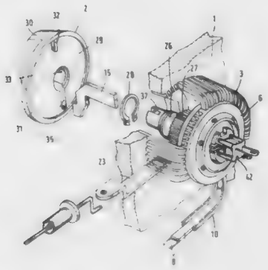
Karl-Heinz Bauer, and Reinhold Wolf, both of Bad Neustadt-/Saale, Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,095

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317807

Int. Cl.⁴ G01J *5/04;* **G02D** *6/00;* **G05D** *25/00*

U.S. Cl. 374—131 **26 Claims**



1. A luminous band display device for the thermometer scale-like display of the position of a control of an operating condition in a heating and ventilating system, the control being adjustable about its axis, comprising a plurality of light guides, each said light guide having an inlet end and an outlet end, the outlet ends of said light guides being arranged to form a row of luminous segments, luminous center means having a light source and a generally transparent electrical socket thereabout, the inlet ends of said light guides being in optical connection with said luminous center means, cover means within said socket and between said light source and said inlet ends for modifying the light therefrom, means for rotating said cover means in accordance with the position of said control, at least one color filter, a portion of said color filter fixed on said cover means, the extent to which said color filter is fixed on said cover means being rotatably related to the position of said control, whereby said color filter intercepts and modifies light at a plurality of said inlet ends of said light guides corresponding to said control position, said color filter having a length corresponding to at least all of said light guide inlet ends, at least one opening in said socket for passing said color filter therethrough so that a portion of said color filter is outside said socket, guide means for guiding and projecting said color filter through said socket opening.

4,734,919

CIRCUIT FOR SERIAL DATA COMMUNICATION AND POWER TRANSMISSION

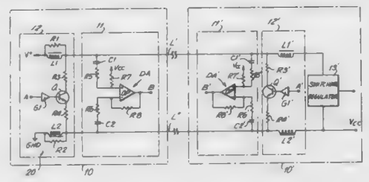
Choe J. Tae, Seoul, Rep. of Korea, assignor to Gold Star Tele-Electric Co., Ltd. Incorporated, Chung-gu Seoul, Rep. of Korea

Filed Feb. 12, 1982, Ser. No. 348,130

Claims priority, application Rep. of Korea, Feb. 20, 1981, 549/1981[U]

Int. Cl.⁴ H04B *3/50;* **H04L** *25/02*

U.S. Cl. 375—7 **12 Claims**



1. A circuit for serial data communication and power transmission between a main controller and sub-station along two balanced transmission lines, comprising:

power supply means for providing a DC voltage to the sub-station along the transmission lines, said power supply means including DC voltage supply means and choke coils coupled between the DC voltage supply means and the transmission lines;

main controller sending means for generating two first data signals of substantially equal magnitude and opposite polarity in response to a first serial format input signal, and supplying the first data signals along the transmission lines;

sub-station receiving means for detecting first data signals on the transmission lines and converting the first data signals into a first serial format output data signal; and

regulating means, coupled to the transmission lines for supplying a DC bias voltage to the sub-station receiving means from the DC voltage provided by the power supply means, said regulating means including choke coils coupled to the transmission lines for substantially eliminating non-DC components from the DC bias voltages.

4,734,920

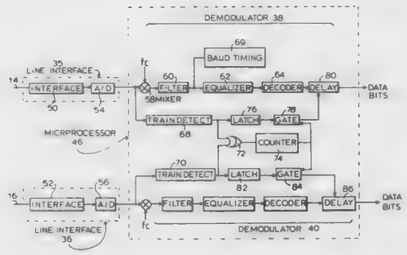
HIGH SPEED MODEM FOR MULTIPLE COMMUNICATION CIRCUITS

William L. Betts, St. Petersburg, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Oct. 10, 1984, Ser. No. 659,287

Int. Cl.⁴ H04B *1/38*

U.S. Cl. 375—8 **7 Claims**



2. A system for exchanging high speed data signals over two low speed data channels comprising:

a. transmitter means coupled to said data channels for receiving a high speed data stream from data transmission equipment and including:

1. partitioning means for partitioning said high speed data stream into a first and a second low speed data stream;
2. A first modulator section coupled to said partitioning means for generating a first stream of modulated signals corresponding to said first low speed data stream for transmission over said first channel; and
3. a second modulator section coupled to said partitioning means for generating a second stream of modulated signals corresponding to said second low speed data stream, for transmission over said second channel; and

b. receiver means coupled to said data channels for receiving said first and second streams of modulation signals and including:

1. a first demodulator for generating a first output data stream corresponding to said first stream of modulated signals;
2. a second demodulator for generating a second output data stream corresponding to said second stream of modulated signals;
3. said first and second demodulators comprising delay detecting means for detecting a differential delay between said first and second streams of modulated signals, and comprising automatic delay means for causing one of said first and second streams of modulated signals to be delayed in accordance with said delay; and
4. combining means for generating a combined output data stream from said first and second output data streams and wherein said first and second streams of modulated signals are preceded by first and second training signals on the corresponding channels, and wherein said first demodulator further comprises a first training detector for detecting said first training signals; said second demodulator further comprises a second training detector for detecting said second training signals; and said delay detecting means is coupled to the outputs of said first and second training detectors for detecting said differential delay.

4,734,921

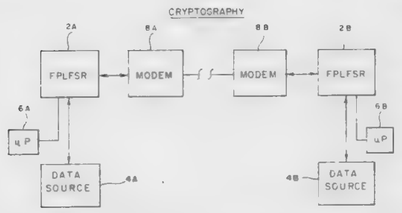
FULLY PROGRAMMABLE LINEAR FEEDBACK SHIFT REGISTER

David A. Giangano, Elmhurst, and Cecelia Jankowski, East Norwich, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 25, 1986, Ser. No. 934,588

Int. Cl.⁴ G11C *15/00, 21/00, 29/00*

U.S. Cl. 377—72 **13 Claims**



1. A fully programmable linear feedback shift register, comprising:

a plurality of cascaded flip-flops;

first means working cooperatively with the flip-flops for selecting a number of the flip-flops;

second means connected to the outputs of the flip-flops and the first means for receiving data from the last of the selected flip-flops;

first input means electrically connected to the flip-flops and a load control means for, upon a first command from the load control means, feeding a first set of data in parallel to the selected flip-flops, thereby establishing in the selected flip-flops a set of predetermined data, wherein the load control means, when not commanding the input means to feed the first set of data in parallel to the flip-flops, initiates a second command for inputting from a second input means a second set of data serially to the selected flip-flops;

third means connected to the second means and working cooperatively with the load control means and the first input means for routing the data from the last of the selected flip-flops to the first of the selected flip-flops, thereby causing the data in the respective selected flip-flops to advance to succeeding selected flip-flops;

whereby the second set of data is encoded by the set of predetermined data and wherein the encoded data are circulated through the selected flip-flops.

4,734,922

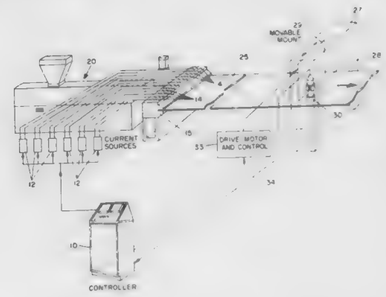
NUCLEAR GAUGE TRAVERSE

Holton E. Harris, Westport, Conn., assignor to Harrel, Inc., East Norwalk, Conn.

Filed Dec. 18, 1986, Ser. No. 943,658

Int. Cl.⁴ G01B *15/02;* **G01N** *23/16;* **B29C** *35/08*

U.S. Cl. 378—089 **1 Claim**



1. In an extruded sheeet thickness monitoring and correction system a sheet extension die having a plurality of electrically controllable sheet thickness altering means at spaced locations across the width of the die, a nuclear thickness gauge having a measurement time constant in the range 0.5 to 10 sec., a traverse including means for mounting the gauge for movement transversely across the sheet, motor means electrically controllable for rapid starting and stopping and being connected in driving relation to the gauge mounting means, for moving the gauge on the traverse across the sheet, the improvement comprising electrical motor control means for (a) stopping the gauge at multiple measurement points across the width of the sheet, (b) maintaining the gauge stopped at each of the measurement points for a period at least as long as the time constant of the gauge, and (c) moving the gauge quickly between measurement points, an extruder controller means connected with a gauge output and with the electrical motor control means for determining thickness at said multiple measurement points, said extruder controller means being connected in control relation with the plurality of electrically controllable sheet thickness altering means to alter thickness at the locations of particular measurement points in response to departures from predetermined thicknesses thereat, such that, by rapid movement between measurement points, the time of the gauge totally traversing the sheet width is substantially reduced below the time necessary to move the gauge at a constant speed across the sheet, enabling more rapidly occurring thickness measurements at the measurement points and quicker correction of the thickness profile across the sheet commensurately, said die having a width of at least 10 inches, and at least 20 sheet thickness altering means, and the system having at

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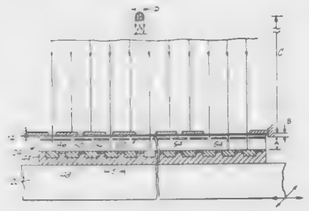
least 20 corresponding measurement points across the width of the extruded sheet, the gauge stopping time at each of the measurement points being at least 0.5 seconds and the gauge movement time between measurement points being less than two seconds.

4,734,923

LITHOGRAPHIC SYSTEM MASK INSPECTION DEVICE

Robert D. Frankel, and John F. Hoose, both of Rochester, N.Y., assignors to Hampshire Instruments, Inc, Rochester, N.Y.

Filed May 19, 1986, Ser. No. 864,543
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—34 **50 Claims**



1. A mask inspection device for inspecting features larger than a given size on an image defining mask used in a semiconductor imaging system, said system being of a type in which energy is provided towards said mask to thereby cause an image of energy to be provided during the semiconductor device fabrication process, said mask inspection system comprising:

a substrate having an array of energy responsive devices thereon;

an array of energy transmissive openings, each of which corresponds to and is aligned with one of said energy responsive devices and has a size related to said given size, said array of openings being positioned remote from said energy responsive devices such that any energy applied through an opening is applied to the energy responsive device corresponding to that opening; and

means for providing data manifesting the changed condition of said energy responsive devices to comparing means for a determination of the mask features;

said inspection device being moved in incremental steps across said image.

4,734,924

X-RAY GENERATOR USING TETRODE TUBES AS SWITCHING ELEMENTS

Mitsuru Yahata, and Hidetoshi Kudo, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 8, 1986, Ser. No. 917,078
Claims priority, application Japan, Oct. 15, 1985, 60-227692; Oct. 23, 1985, 60-235277
Int. Cl.[4] H05G *01/26, 01/54*
U.S. Cl. 378—118 **5 Claims**

1. An X-ray generator comprising:

an X-ray tube having an anode, cathode, and grounded center metal electrode;

a first high-voltage power source connected to said anode of said X-ray tube, to apply a positive high voltage to said anode of said X-ray tube;

a second high-voltage power source connected to said cathode of said X-ray tube, to apply a negative high voltage to said cathode of said X-ray tube;

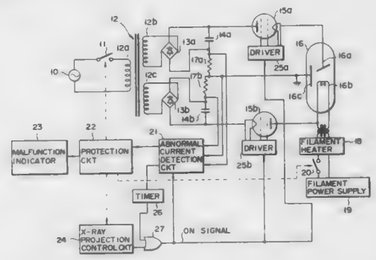
first switching means connected between said first high-voltage power source and said anode of said X-ray tube;

second switching means connected between said second high-voltage power source and said cathode of said X-ray tube;

control-signal supply means connected to said first and second switching means, for supplying a control signal for simultaneously turning said first and second switching means on and off;

abnormal-current detection means connected to said first and second high-voltage power sources, for detecting an abnormal current flowing through said X-ray tube; and

protection circuit means connected to said abnormal-current detection means, for causing at least the control signal supply means to stop the supply of the control signal to said first and second switching means, upon receipt of the detection of the abnormal current, the improvement wherein



said abnormal-current detection means generates a short-circuiting fault detection signal indicative of a short-circuiting fault of said second switching means, in response to an abnormal current flowing through said center metal electrode of said X-ray tube, due to the short-circuiting fault of said second switching means, which fault may arise during an OFF period of said first and second switching means; and

means is further provided for subsequently supplying a turn-on signal to at least said first switching means, in response to the short-circuiting fault detection signal from said abnormal-current detection means, to cause said first switching means to be turned on.

4,734,925

PLAIN FILM PLATFORM FOR PROJECTING SCREEN APPARATUS, X-RAY PICTURE APPARATUS OR THE LIKE

Jürgen Müller; Günther Schindlbeck, and Michael Reichart, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,872
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432258
Int. Cl.[4] G03B *42/02*
U.S. Cl. 378—173 **18 Claims**

1. X-ray imaging apparatus comprising:

means for converting an x-ray image into a visible light image;

means for projecting said image onto a photographing plane;

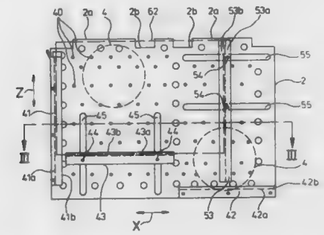
film platform means for positioning a plane sheet film in said photographing plane;

means for storing unexposed sheet film;

means for storing exposed sheet film;

means for transporting sheet film between said means for storing and said film platform means wherein said film platform means includes a vertically arranged platform member which is open above for automatic insertion and withdrawal of films and has two vertical sides and upper and lower horizontal sides; and a plurality of guiding strips for inserting and hold a film in direct contact with the film, said guiding strips including a first guiding strip

which is fixed and extends along one vertical side of said platform member, a second lower guiding strip which is fixed and extends horizontally at said lower side of said lower side, and a third guiding strip arranged displaceably transversely to said second guiding strip and in the region between said first guiding strip and said second guiding



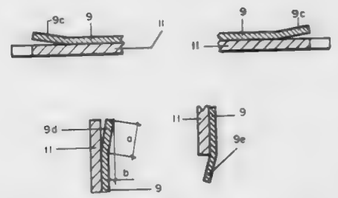
strip in a direction parallel to said second guiding strip; and a fourth strip which is mirror-inverted relative to said first guiding strip and is arranged displaceably in a direction transversely relative to the latter, said fourth guiding strip extending vertically downward to said second guiding strip; and drive means for adjusting the positions of said third and fourth strips.

4,734,926

X-RAY FILM CASSETTE FOR DAYLIGHT SYSTEM

Rudolf Singer, Hassenroth, and Hans P. Weihe, Frankfurt, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1986, Ser. No. 864,856
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520196
Int. Cl.[4] G03B *42/04*
U.S. Cl. 378—187 **5 Claims**



1. An X-ray film cassette for daylight systems, comprising:

a flat, light-impermeable housing, which has on one face a light-tight, closeable, slit-shaped film insertion opening,

two intensifying screens fitted inside the housing substantially parallel to each other, one of which is affixed on an elastic pad and the other directly on a firm, film pressure plate that is movable substantially perpendicularly to the plane of the intensifying screens, and adapted to receive a film sheet therebetween,

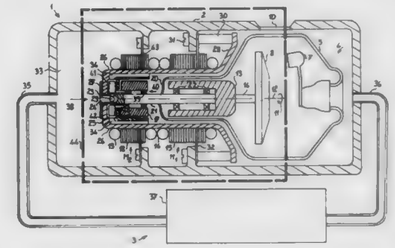
characterized in that the intensifying screen affixed to the pressure plate has edge zones that are not bonded to the pressure plate.

4,734,927

EQUIPPED FORCE-CONVECTION HOUSING UNIT FOR A ROTATING-ANODE X-RAY TUBE

Jacques Leguen, Paris, and André Plessis, Les Moulineaux, both of France, assignors to Thomson-CGR, Paris, France

Filed Dec. 18, 1985, Ser. No. 810,374
Claims priority, application France, Dec. 21, 1984, 84 19649
Int. Cl.[4] H01J *35/10*
U.S. Cl. 378—200 **24 Claims**



1. An X-ray assembly comprising:

(a) a housing having an inlet and an outlet;

(b) an external circulation system coupled to said inlet and to said outlet for circulating a cooling fluid through said housing during use of the assembly;

(c) an envelope disposed in said housing;

(d) a first motor comprising a first stator disposed in said housing outside said envelope and a first rotor electrically coupled to said first stator, said first rotor being disposed in said envelope and being concentric to a longitudinal axis;

(e) an anode disposed in said envelope and mechanically coupled to said first rotor for rotation about said longitudinal axis; and

(f) a flow-initiating device disposed in said housing outside said envelope, said flow-initiating device comprising:

(i) a second motor comprising a second stator disposed in said housing outside said envelope and a second rotor electrically coupled to said second stator, said second rotor being disposed in said housing outside said envelope and being concentric to said longitudinal axis, and

(ii) a fluid driving means mechanically coupled to said second rotor for rotation about said longitudinal axis.

4,734,928

CELLULAR MOBILE PHONE WITH A PLURALITY OF ACCESSING TELEPHONE NUMBERS FOR ALLOWING ACCESS TO THE MOBILE PHONES BY ANY ONE OF THE TELEPHONES NUMBERS

Sheldon Weiner; Sherwin A. Brook, both of Northbrook, and Michael G. Freitag, Palos Park, all of Ill., assignors to B/W Investments, Chicago, Ill.

Continuation of Ser. No. 874,577, Jun. 16, 1986, Pat. No. 4,677,653. This application Mar. 18, 1987, Ser. No. 27,179
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—59 **6 Claims**

1. A method of using a cellular mobile telephone unit, which cellular mobile phone telephone comprises a microprocessor, comprising:

(a) simultaneously providing at least first and a second distinct user telephone numbers in a memory means;

(b) selecting one of the at least first and second distinct user

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telephone numbers to be used for making an outgoing call based thereon;



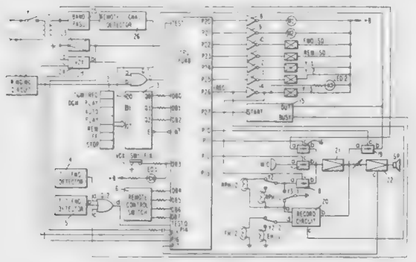
(c) said step (b) comprising coupling the selected one of the distinct user telephone numbers to the microprocessor of the cellular mobile telephone unit.

4,734,929

TELEPHONE ANSWERING MACHINES FOR COLLECT CALL

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Japan

Filed Jul. 26, 1985, Ser. No. 759,276
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—81 **6 Claims**



1. A method of operating an automatic telephone answering and recording device for accepting a collect call, the device having a mode selection switch for selection between a conventional telephone answering mode in which the length of the caller's message is not limited and a fixed time charge hangup mode for accepting collect calls in which the caller is only allowed a fixed amount of time charge to deliver a message, comprising the steps of:

upon selection by the selection switch of the conventional telephone answering mode, sending a conventional telephone answering message on the telephone lines to a caller upon receipt of an incoming call; and

upon selection by the selection switch of the fixed time charge hangup mode, sending a collect call acceptance message on the telephone lines to the operator upon receipt of an incoming call, then upon connection between the caller and called party by the operator, sending the conventional telephone answering message to the caller, and automatically hanging up upon passage of a fixed period of time for recording the caller's voice.

4. In an automatic telephone answering and recording device having means for receiving an incoming telephone call and forming a telephone loop circuit, a first recording medium for storing prerecorded outgoing messages and a second recording medium for recording incoming messages from a caller,

means for accepting collect calls, comprising:

a mode in which the length of the caller's message is not limited selection switch for selection between a conventional telephone answering mode and a fixed time charge hangup mode for accepting collect calls in which the caller is only allowed a fixed amount of time charge to deliver a message;

means responsive to a conventional telephone answering mode selection by said switch for sending a conventional telephone answering message on the telephone lines to a caller upon receipt of an incoming call; and

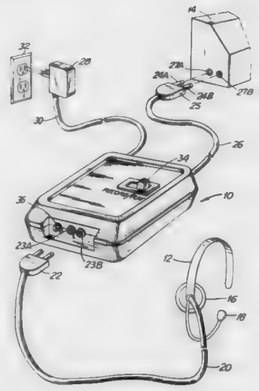
means responsive to the fixed time charge hangup mode selection by said switch for (1) sending a collect call acceptance message on the telephone lines to the operator upon receipt of an incoming call, (2) sending the conventional telephone answering message to the caller upon connection between the caller and called party by the operator and (3) automatically hanging up upon passage of a fixed period of time for recording the caller's voice.

4,734,930

VOICE RECORDING APPARATUS

Alvaro Quiros, 1811 Southpointe Dr., Sarasota, Fla. 33581, and Charles E. Murphy, 3717 Riviera Dr., Sarasota, Fla. 33582

Continuation of Ser. No. 926,887, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 675,107, Nov. 26, 1984, abandoned. This application Jun. 17, 1987, Ser. No. 60,968
Int. Cl.[4] H04M *3/50*
U.S. Cl. 379—88 **5 Claims**



1. Apparatus for exchanging voice information between a PBX operator's microphone and receiver and a PBX switching matrix, comprising:

analog signal input/output (I/O) interface means responsive to the operator's microphone and to the PBX switching matrix, for presenting voice signals from the PBX switching matrix to the operator's receiver and for presenting voice signals from the operator's microphone and recorded voice messages from a signals recording means to the PBX switching matrix;

said analog signal input/output (I/O) interface means comprising signal conditioning circuitry including signal summing means responsive at each of two inputs to actual voice signals from the operator's microphone and to recorded voice messages from said signal recording means, for presenting each of said voice signals to the PBX switching matrix;

said analog signal input/output (I/O) interface means including means to provide full duplex exchange of voice signals between said PBX switching matrix and the operator's microphone and receiver;

mode switch means, operable in a first mode and a second mode, alternately, in response to operator selection;

actuating switch means, operable in an off state and on statge, alternately, in response to operator selection;

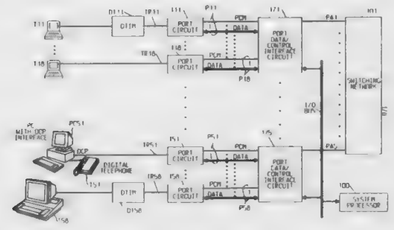
signal recording means, responsive to said mode switch means, said actuating switch means, and to said analog signal input/output (I/O interface means, for message recording the operator's voice signals in response to said mode switch means being in said first mode in the presence of said actuating switch means being in said on state, and for presenting said recorded messages to said analog signal input/output (I/O) interface means in response to said mode switch means being in said second mode in the presence of said actuating switch means being in said on state.

4,734,931

INTEGRATED CALLING DIRECTORY

James W. Bourg, Monmouth Beach, N.J., and Thomas J. Tierney, Jr., Aurora, Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems Inc., Holmdel, N.J.

Filed Mar. 21, 1986, Ser. No. 842,682
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—93 **13 Claims**



1. In a business communication system which serves a plurality of terminal devices, each of which is connected to the business communication system by an associated port circuit, said business communication system including at least one centralized calling directory file for storing a list of called parties and their telephone numbers, calling directory apparatus associated with one of said terminal devices for automatically originating a call through said business communication system to a called party designated by a user at said one terminal device comprising:

processing means;

means interposed between said one terminal device, its corresponding port circuit and also connected to said processing means for connecting said processing means to both said port circuit and said one terminal device;

calling directory file means in said processing means for storing a list of called parties and their associated telephone numbers;

means in said processing means responsive to said user entering the name of said called party into said one terminal device for sequentially scanning said calling directory file means and said centralized calling directory using said name of the called party to obtain the telephone number of said called party;

means in said processing emans for originating a communication connection to said called party via said connecting means in response to said scanning means locating the name of said called party;

adjunct processing means conntect to said business communication system via one of said port circuits for storing a centralized list of called parties and their associated telephone numbers;

means in said originating means responsive to said scanning means failing to locate an entry in said calling directory file means corresponding to said name of the called party for establishing a communication connection to said adjunct processing means via said connecting means; and

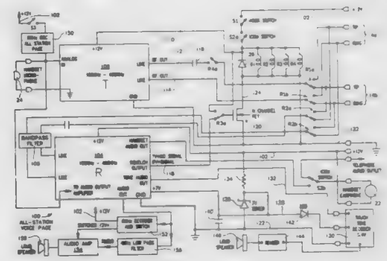
means in said originating means responsive to said communication connection for querying said adjunct processing means to obtain the telephone number associated with said name of the called party from said centralized list.

4,734,932

TELEPHONE LOCAL INTERCOM SYSTEM

Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94402

Filed Sep. 25, 1986, Ser. No. 911,898
Int. Cl.[4] H04M *1/72, 9/02*
U.S. Cl. 379—160 **27 Claims**



11. An improved intercom circuit arrangement for use with at least a plurality of like configured telephone instruments connectable and operable within a local telephone network having at least one telephone subscriber line extending between the said instruments and to a central office facility of a telephone system and capable for use with a multiplicity of said instruments within said network without modification or adaptation of any said instrument therein, said arrangement for providing a full duplex local talk path for a local intercom between the said instruments connected within said arrangement and a control key for connecting an itercom circuit of the instrument to the telephone line, the itnercom circuit in the each of said instruments comprising:

frequency modulated receiver means connectable to a handset receiver or loudspeaker of a first of said instruments and to said telephone line for normally receiving a radio carrier signal having a predetermined first frequency and for selectably receiving a radio carrier signal having a predetermined second frequency different from the first and generated at a second of said instruments and frequency modulated by an audio signal generated by a handset or other microphone of the second said instrument, said receiver means for generating a control signal upon detection of the presence of an existing carrier signal on the said telephone line,

frequency modulated transmitter means connectable to a handset or other microphone of said first instrument and to said telephone line for normally generating a carrier signal having said predetermined second frequency and for selectably generating a carrier signal having said predetermined first frequency, said generated carrier being frequency modulated by an audio signal generated at said microphone of said first instrument and which modulated carrier is applied to said telephone line,

switching means at said instruments which is responsive to operation of said control key at an intercom call originating one of said instruments for changing the selection of said first to said second frequency of said receiver means and said second to said first frequency of said transmitter means and having override means responsive to the presence of said control signal at an intercom call receiving one of said instruments for inhibiting changing of the

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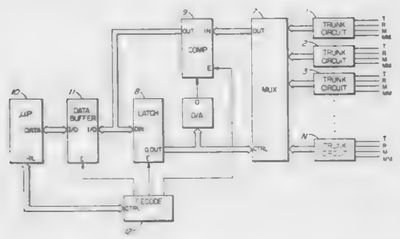
selection of said first and second frequencies at said receiver and transmitter means thereof.

4,734,933

TELEPHONE LINE STATUS CIRCUIT

John A. Barsellotti, Kanata, and Douglas C. Oddy, Ottawa, both of Canada, assignors to Mitel Corp., Canada

Filed Nov. 4, 1985, Ser. No. 794,696
Claims priority, application Canada, Jun. 12, 1985, 483829
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—164 **25 Claims**



1. A line status circuit for connection to a PABX and one or more telephone lines carrying a first plurality of status signals indicative of the status of one or more remote telephone circuits, comprised of:

(a) a control circuit for generating command signals,

(b) means for receiving said status signals carried by said one or more telephone lines, and generating control signals in response thereto,

(c) means for receiving one or more first command signals from the control circuit and generating one or more threshold signals in response thereto, and

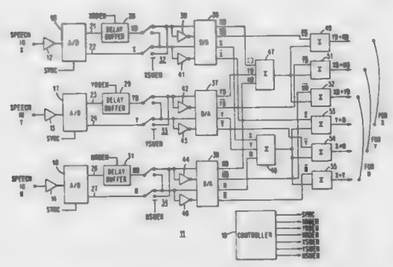
(d) means for receiving one or more second command signals from said control circuit, and in response comparing predetermined ones of said control signals with said one or more threshold signals, and generating a plurality of output signals less than said first plurality of status signals, whereby said output signals provide an indication to said PABX of the status of said remote telephone circuits.

4,734,934

BINAURAL TELECONFERENCING SYSTEM

George J. Boggs, Weston, and John F. Egan, Chelmsford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 24, 1986, Ser. No. 934,077
Int. Cl.[4] H04M *3/56*
U.S. Cl. 379—202 **16 Claims**



1. Teleconferencing apparatus for providing binaural discrimination for each of n conferees, where n is an integer greater than two, comprising

means for amplifying speech from a first of said conferees,

means for amplifying speech from a second of said conferees,

means for amplifying speech from a third of said conferees,

means for providing the amplified speech of said first conferee along a first path,

means for providing the amplified speech of said first conferee, delayed a time duration t_1, along a second path,

means for providing the amplified speech of said second conferee along a third path,

means for providing the amplified speech of said second conferee, delayed a time duration t_2, along a fourth path,

means for providing the amplified speech of said third conferee along a fifth path,

means for providing the amplified speech of said third conferee, delayed a time duration t_3, along a sixth path,

means for combining the provided amplified speech from one of said first and said second paths, from one of said third and said fourth paths, and from one of said fifth and said sixth paths, into a first combination,

means for combining the provided amplified speech from the other of said first and said second paths, from the other of said third and said fourth paths, and from the other of said fifth and said sixth paths, into a second combination,

means for suppressing the amplified speech of said one of said first and said second paths from said first combination, and directing the resulting suppressed combination along a first line to said first conferee,

means for suppressing the amplified speech of said other of said first and said second paths from said second combination, and directing the resulting suppressed combination along a second line to said first conferee,

means for suppressing the amplified speech of said one of said third and said fourth paths from said first combination, and directing the resulting suppressed combination along a third line to said second conferee,

means for suppressing the amplified speech of said other of said third and said fourth paths from said second combination, and directing the resulting suppressed combination along a fourth line to said second conferee,

means for suppressing the amplified speech of said one of said fifth and said sixth paths from said first combination, and directing the resulting suppressed combination along a fifth line to said third conferee, and

means for suppressing the amplified speech of said other of said fifth and said sixth paths from said second combination, and directing the resulting suppressed combination along a sixth line to said third conferee.

4,734,935

COMMUNICATION SYSTEM WITH REMOTELY CONTROLLABLE SIGNAL RECEIVING MEANS

Kentaro Toudo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,272
Claims priority, application Japan, May 23, 1985, 60-110739
Int. Cl.[4] H04M *7/14*; H04Q *3/58*
U.S. Cl. 379—236 **5 Claims**

1. A communication system with remotely controllable signal receiving means comprising:

first means having a receive function responsive to a start-signal from a terminal device connected thereto via a communication line, said first means arranged at one of a plug-in or plug-out states wherein said first means is connected to the terminal device in the plug-in state and is not connected to the terminal device in the plug-out state;

second means storing start-signal type information of the terminal device in a manner indexable with accommodation location information of the terminal device;

third means for independently monitoring the plug-in and plug-out states of said first means and detecting a change in the states; and

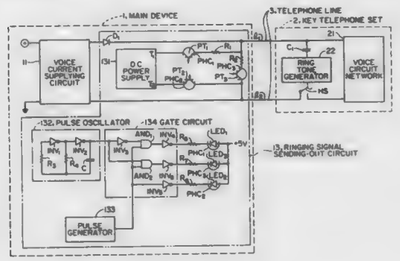
fourth means for controlling an initial setting of the receive function of said first means on the basis of the start-signal type information stored in said second means, said fourth means further being responsive to the change in the states of said first means detected by said third means wherein communication service to said first means in the plug-out state is inhibited and wherein the receive function of said first means is reset when said first means is changed into the plug-in state.

4,734,936

RINGING SIGNAL SENDING-OUT CIRCUIT

Jouji Tanaka, Kawasaki; Yoshiji Tanimoto, and Masaaki Saito, both of Tokyo, all of Japan, assignors to Nitsuko Limited and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,237
Claims priority, application Japan, Nov. 15, 1984, 59-239388
Int. Cl.[4] H04M *3/02*
U.S. Cl. 379—253 **6 Claims**



1. A ringing signal sending-out circuit for sending out repeating ringing signals each having a certain duration and a relatively high voltage and a predetermined low frequency to a telephone set through a telephone line with a predetermined time interval between each ringing signal, which circuit comprises:

D.C power supply means for providing a D.C. output of said relatively high voltage, said D.C. power supply means having a positive output terminal and a negative output terminal;

connecting circuit means for operatively connecting said D.C. power supply means to a telephone line having first and second conductors, said connecting circuit means comprising:

a first photocoupler including a first light emission diode and a first phototransistor photocoupled thereto, said positive output terminal being connected to said first conductor of the telephone line through said first phototransistor; and

a second photocoupler including a second light emission diode and a second phototransistor photocoupled thereto, said negative output terminal being connected to said second conductor of the telephone line through said second phototransistor;

pulse oscillator means for producing a relatively low voltage pulse signal having said predetermined low frequency of each ringing signal to be produced; and

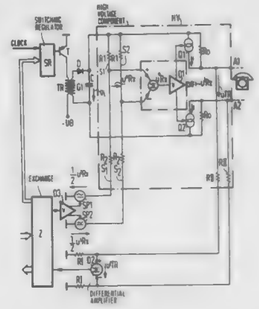
photocoupler driving means coupled to said pulse oscillator means, said photocoupler driving means comprising pulse generator means for generating pulses with said predetermined time interval wherein the duration of each pulse corresponds to said certain duration of each ringing signal, gate circuit means for supplying said low voltage pulse signal from said pulse oscillator means to said first light emission diode of said first photocoupler in response to said pulses from said pulse generator means, and means for supplying said pulses from said pulse generator means to said second light emission diode of said second photocoupler so that a ringing signal is generated and sent out to the telephone line with said predetermined time interval.

4,734,937

TELEPHONE INSTALLATION

Eberhard Schmid, Poing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

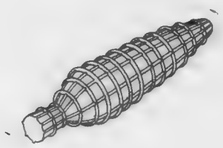
Continuation of Ser. No. 765,554, Aug. 12, 1985, abandoned, which is a continuation of Ser. No. 540,198, Oct. 7, 1983, abandoned. This application Nov. 3, 1986, Ser. No. 928,603
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, 3237652
Int. Cl.[4] H04M *19/02*
U.S. Cl. 379—253 **13 Claims**



1. Circuit arrangement for a telephone system disposed between a telephone exchange and a telephone instrument , the circuit arrangement being connected to the telephone instrument via two telephone wires; and comprising: current feed means for providing current feed for the telephone instrument; an integrated low-voltage circuit section ; a high-voltage circuit section connected to said telephone instrument ; a switching regulator included in the low-voltage section controllingly engaging the high-voltage section, a transformer having a primary winding connected to said switching regulator and a secondary winding connected to the high-voltage section for providing galvanic isolation between the switching regulator and the high-voltage section, and a first and a second pair of high-resistivity voltage dividers for providing two-way galvanic control signalling between said low-voltage section and said high voltage section.

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294,880
SNACK FOOD
Haruo Ito, Mie, Japan, assignor to Kabushiki-Kaisha Ito-Seisen-bu-Honten, Yokkaichi, Japan
Filed Jun. 25, 1985, Ser. No. 748,723
Claims priority, application Japan, Dec. 29, 1984, 59-54272
Term of patent 14 years
U.S. Cl. D1—125



294,881
CHEVRON JACKET STRUCTURE
Richard Swanson, 3902 NE. 157th Pl., Seattle, Wash. 98155
Filed Mar. 5, 1985, Ser. No. 708,493
Term of patent 14 years
U.S. Cl. D2—192



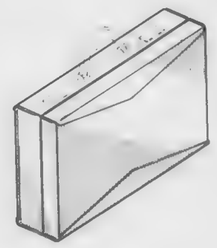
294,882
T-SHIRT
Irene Harrell, 7043 S. Indiana Ave., Chicago, Ill. 60637
Filed Feb. 27, 1985, Ser. No. 706,133
Term of patent 14 years
U.S. Cl. D2—210



294,883
FISHING ROD CASE
David A. McMillin, 8134 Queenwood Ct., Baton Rouge, La. 70806
Filed Mar. 15, 1985, Ser. No. 712,105
Term of patent 14 years
U.S. Cl. D3—38



294,884
ATTACHE CASE
Hyun S. Kim, Newcastle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed May 8, 1985, Ser. No. 731,940
The portion of the term of this patent subsequent to Jun. 10, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—76



294,885
ELECTRIC TOOTHBRUSH
David V. Mollenhoff, 1501 Morrison St., Madison, Wis. 53703
Filed May 6, 1985, Ser. No. 730,430
Term of patent 14 years
U.S. Cl. D4—101

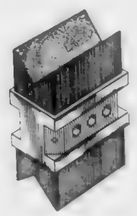


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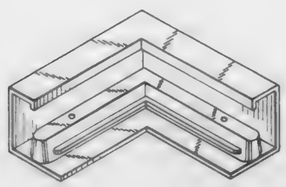
294,886
HEAD FOR A CLEANING BRUSH SUITABLE FOR RADIATORS AND THE LIKE
Evelyn Lee, 132 E. Goepp St., Bethlehem, Pa. 18018
Filed Sep. 22, 1986, Ser. No. 910,184
Term of patent 14 years
U.S. Cl. D4—120



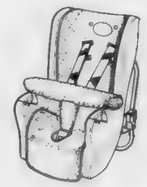
294,887
CONTACT LENS BRUSH
Sidney F. Young, 6333 N. 37th Ave., Phoenix, Ariz. 85019
Filed Sep. 19, 1986, Ser. No. 910,193
Term of patent 14 years
U.S. Cl. D4—120



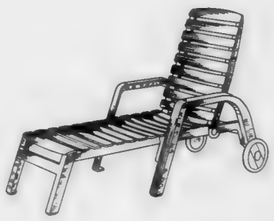
294,888
FOSTER FRAME CORNER
Roger A. Kazanowski, 1026 Monroe, Dearborn, Mich. 48124
Filed May 29, 1985, Ser. No. 738,858
Term of patent 14 years
U.S. Cl. D6—300



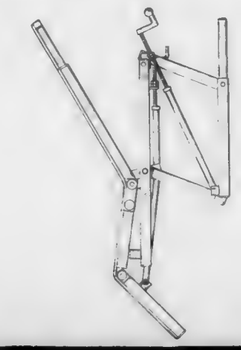
294,889
BABY SEAT
Shinroku Nakao, Kanagawa, and Yoshiyasu Ishii, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Aug. 23, 1985, Ser. No. 768,767
Claims priority, application Japan, Apr. 18, 1985, 60-15891
Term of patent 14 years
U.S. Cl. D6—333



294,890
CHAISE LOUNGE
Manfred Hubert, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Sep. 17, 1985, Ser. No. 777,036
Claims priority, application Hague, Apr. 15, 1985, DM/005108
Term of patent 14 years
U.S. Cl. D6—361



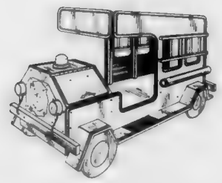
294,891
PORTABLE DENTAL CHAIR OR SIMILAR ARTICLE
Opanin N. Gyaami, 12762 Fremontia Ave., Grand Terrace, Calif. 92324
Filed Aug. 12, 1985, Ser. No. 764,539
Term of patent 14 years
U.S. Cl. D6—361



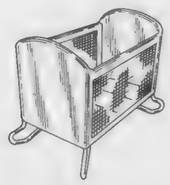
294,892
LAWN CHAIR
Manfred Hubert, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Sep. 17, 1985, Ser. No. 777,037
Claims priority, application Hague, Apr. 15, 1985, DM/005108
Term of patent 14 years
U.S. Cl. D6—370



294,893
BUNK BED
Robert W. Mowery, 8210 Jeanes St., Philadelphia, Pa. 19111, and Thomas Schramdt, 1840 Fulmer St., Philadelphia, Pa. 19115
Filed Mar. 18, 1985, Ser. No. 713,001
Term of patent 14 years
U.S. Cl. D6—388



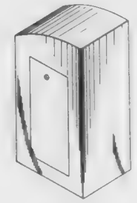
294,894
PORTABLE CRIB
Daniel J. D'Arcy, Lancaster; Stanley M. Kujawski, and David G. Waples, both of East Aurora, all of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 22, 1985, Ser. No. 806,243
Term of patent 14 years
U.S. Cl. D6—390



294,895
PORTABLE UTILITY CLOTHING RACK
Joseph P. Valento, 9159 Dinsdale St., Downey, Calif. 90240
Filed May 28, 1985, Ser. No. 737,696
Term of patent 14 years
U.S. Cl. D6—411



294,896
MODULAR UNIT FOR CABINET, BENCH OR THE LIKE
Charles G. Weiss, 1106 Washington St., Hoboken, N.J. 07030
Filed Oct. 31, 1985, Ser. No. 793,255
Term of patent 14 years
U.S. Cl. D6—432

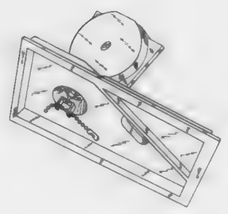


294,897
FILE BOX
Gregory J. Wenkman, Middleton, Wis., assignor to Traex Corporation, Dane, Wis.
Filed Feb. 19, 1985, Ser. No. 702,908
Term of patent 14 years
U.S. Cl. D6—448



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294,898
SCISSORS DISPLAY TRAY
Clair H. Gingher, Jr., P.O. Box 8865, Greensboro, N.C. 27419
Division of Ser. No. 644,350, Aug. 27, 1984. This application Jan. 5, 1987, Ser. No. 3,391
Term of patent 14 years
U.S. Cl. D6—466



294,900
PORTABLE ORTHOPEDIC SEAT CUSHION
William P. Willingham, Winter Park, Fla., assignor to Back Joy, Inc., Maitland, Fla.
Filed Sep. 23, 1985, Ser. No. 778,561
Term of patent 14 years
U.S. Cl. D6—502

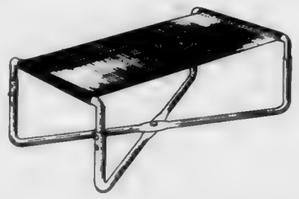




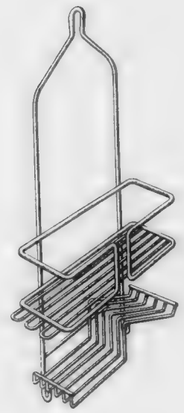
294,899
MAGAZINE RACK
Robert W. Anderson, III, 329 E. Third Ave., Runnemede, N.J. 08078
Filed Oct. 15, 1985, Ser. No. 787,723
Term of patent 14 years
U.S. Cl. D6—473



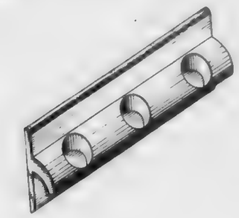
294,901
HEAD REST
John M. Partin, 6740 Hibiscus Dr., Muncie, Ind. 47302
Filed Oct. 24, 1985, Ser. No. 791,137
Term of patent 14 years
U.S. Cl. D6—502

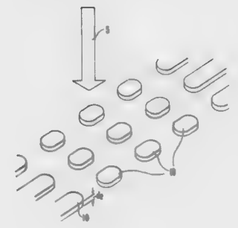


294,902
SHOWER CADDY
Abbe J. Sussman, Chicago, Ill., assignor to Ladlow Industries, Inc., Elgin, Ill.
Filed Mar. 8, 1985, Ser. No. 709,905
Term of patent 14 years
U.S. Cl. D6—525

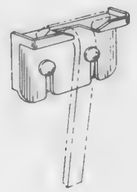


294,904
DISPOSABLE RAZOR HOLDER
Gerald N. Bleskachek, 783 N. Summit Rd., Bath, Pa. 18014
Filed Mar. 3, 1986, Ser. No. 841,363
Term of patent 14 years
U.S. Cl. D6—526

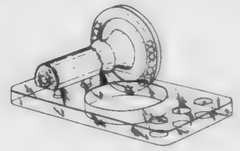




294,903
SAFETY RAZOR HOLDER
John F. Pokorny, Algonquin, Ill., assignor to Douglas Mold, Inc., Marengo, Ill.
Filed Mar. 12, 1986, Ser. No. 838,686
Term of patent 14 years
U.S. Cl. D6—526

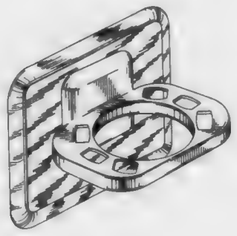


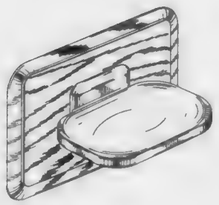
294,905
COMBINED TOOTHBRUSH AND TUMBLER HOLDER
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,171
Term of patent 14 years
U.S. Cl. D6—531



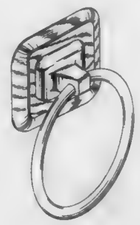
VOL 1088 ISS 5 MR 29 1988 UMI

294,906
BATHROOM ACCESSORY HOLDER
Daniel L. Pool, Paradise Valley, Ariz., assignor to Designer Bathware, Inc., Phoenix, Ariz.
Division of Ser. No. 845,772, Mar. 24, 1986, Pat. No. Des. 291,753, which is a division of Ser. No. 514,002, Jul. 15, 1983, Pat. No. Des. 283,188. This application Jun. 18, 1987, Ser. No. 63,636
Term of patent 14 years
U.S. Cl. D6—531

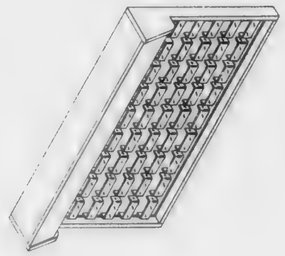




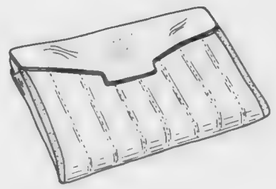
294,907
RING TOWEL HOLDER
Daniel L. Pool, Paradise Valley, Ariz., assignor to Designer Bathware, Inc., Phoenix, Ariz.
Division of Ser. No. 845,772, Mar. 24, 1986, Pat. No. Des. 291,753, which is a division of Ser. No. 514,002, Jul. 15, 1983, Pat. No. Des. 283,188. This application Jun. 17, 1987, Ser. No. 63,631
Term of patent 14 years
U.S. Cl. D6—546

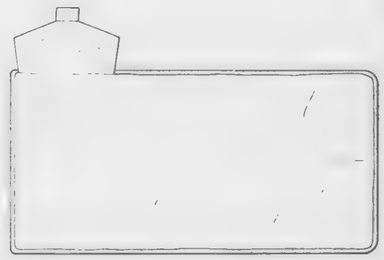


294,908
ADVERTISING DISPLAY BOARD AND BUSINESS CARD HOLDERS THEREFOR
Edward N. Childress, Rte. 5, Albertville, Ala. 35950
Filed Apr. 5, 1985, Ser. No. 720,558
Term of patent 14 years
U.S. Cl. D6—570



294,909
FOLDABLE DIAPER-CHANGING MAT
Karen A. Donnor, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 762,136
Term of patent 14 years
U.S. Cl. D6—595

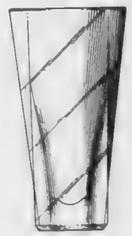


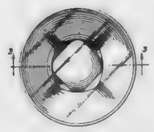


294,910
DEVICE FOR SECURING FITTED SHEETS
Gene Garding, 239 19 ¼ Ave. #2 N, Saint Cloud, Minn. 56301
Filed Jul. 13, 1984, Ser. No. 630,420
Term of patent 14 years
U.S. Cl. D6—607

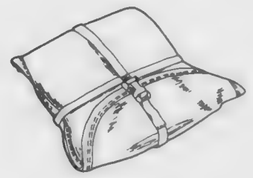


294,911
TUMBLER OR SIMILAR ARTICLE
Jean J. Durand, LaBute 62510, Arques, France
Filed Aug. 13, 1985, Ser. No. 765,224
Term of patent 14 years
U.S. Cl. D7—6

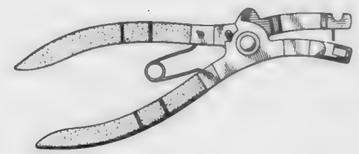




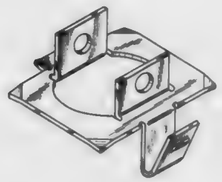
294,912
INSULATED PORTABLE FOOD CARRIER
Henry C. Rivera, 700 Pueble Rd., Milford, Mich. 48042
Filed Sep. 4, 1985, Ser. No. 772,425
Term of patent 14 years
U.S. Cl. D7—77



294,913
TOOL FOR TIGHTENING TIE-WRAPS AROUND WIRE BUNDLES
Thomas R. Jurgens, 11772 Grant Dr., Yucaipa, Calif. 92399
Filed Mar. 4, 1985, Ser. No. 708,440
Term of patent 14 years
U.S. Cl. D8—52

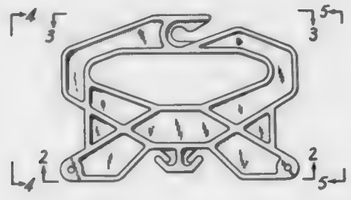


294,914
COMBINED ANTI-ROTATIONAL BRACKET AND SNAP-IN CLIP
Charles Chase, East Meadow, and Stanley S. Breaner, Massapequa, both of N.Y., assignors to Leviton Manufacturing Company, Inc.
Filed Sep. 23, 1985, Ser. No. 777,882
Term of patent 14 years
U.S. Cl. D8—373

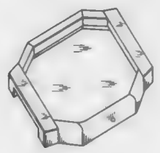


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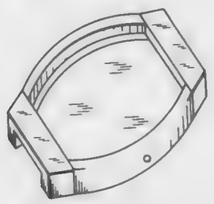
294,915
COMBINED KITE STRING WINDER, KITE HOLDER AND CARRYING HANDLE FOR A BAG
Frank Alonso, Malibu, Calif., assignor to Lunar Star Kites, Inc., Pacoima, Calif.
Filed May 6, 1985, Ser. No. 731,449
Term of patent 14 years
U.S. Cl. D6—358



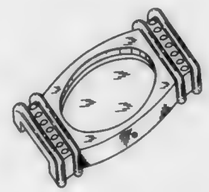
294,916
WATCH CASE
Harumichi Kabaya, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 18, 1985, Ser. No. 777,244
Claims priority, application Japan, Apr. 4, 1985, 60-13636
Term of patent 14 years
U.S. Cl. D10—30



294,917
WATCH CASE
Harumichi Kabaya, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 18, 1985, Ser. No. 777,429
Claims priority, application Japan, Apr. 4, 1985, 60-13635
Term of patent 14 years
U.S. Cl. D10—30



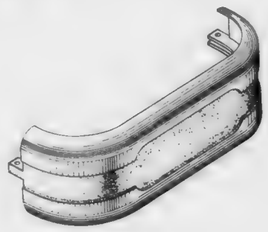
294,918
WATCH CASE
Harumichi Kabaya, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 18, 1985, Ser. No. 777,445
Claims priority, application Japan, Apr. 4, 1985, 60-13632
Term of patent 14 years
U.S. Cl. D10—30



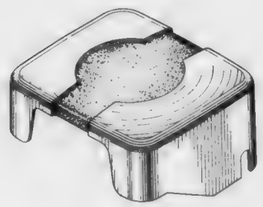
294,919
WRIST WATCH
Gianfranco Ferre', Via della Spiga 19 A, 20122 Milano, Italy
Filed Sep. 4, 1985, Ser. No. 772,622
Claims priority, application Italy, Mar. 5, 1985, 35660/85[U]
Term of patent 14 years
U.S. Cl. D10—32



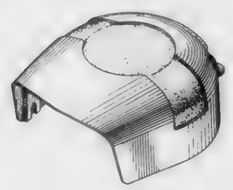
294,920
MOTORCYCLE OIL TRIM COVER
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Nov. 1, 1985, Ser. No. 793,993
Term of patent 14 years
U.S. Cl. D12—126



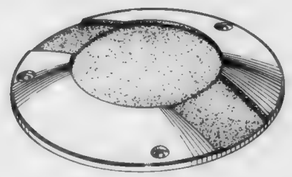
294,921
MOTORCYCLE COIL COVER
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Nov. 1, 1985, Ser. No. 793,994
Term of patent 14 years
U.S. Cl. D12—126



294,922
MOTORCYCLE HORN COVER
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Nov. 1, 1985, Ser. No. 793,995
Term of patent 14 years
U.S. Cl. D12—126



294,923
COVER FOR MOTORCYCLE DERBY, POINTS OR CALIPER INSERT
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Nov. 1, 1985, Ser. No. 793,996
Term of patent 14 years
U.S. Cl. D12—126



294,924
MOTORCYCLE TIRE
Toshiaki Kobayashi, Tokyo, and Toru Osawa, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 8, 1985, Ser. No. 803,983
Term of patent 14 years
U.S. Cl. D12—146



294,925
TIRE FOR AUTOCYCLE
Tsutomu Sakuma, Shiki; Tamotsu Miura, Yokohama, and Takashi Hino, Kawasaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 17, 1985, Ser. No. 776,820
Claims priority, application Japan, Mar. 22, 1985, 60-11331
Term of patent 14 years
U.S. Cl. D12—147



294,926
AUTOMOBILE TIRE
Hideaki Nishio, Saitama, and Seiji Ito, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 10, 1985, Ser. No. 807,430
Claims priority, application Japan, Jun. 28, 1985, 60-27238
Term of patent 14 years
U.S. Cl. D12—147

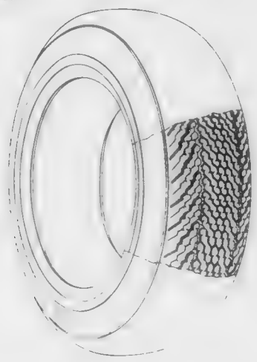


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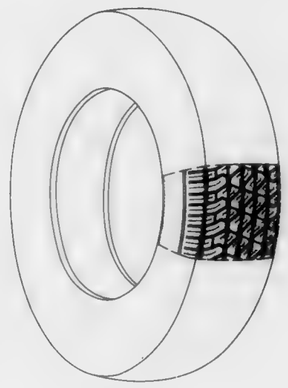
294,927
MOTORCYCLE TIRE
Toshiaki Kobayashi, and Kiyoshi Takase, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 11, 1986, Ser. No. 844,291
Claims priority, application Japan, Sep. 12, 1985, 60-38287
Term of patent 14 years
U.S. Cl. D12—147



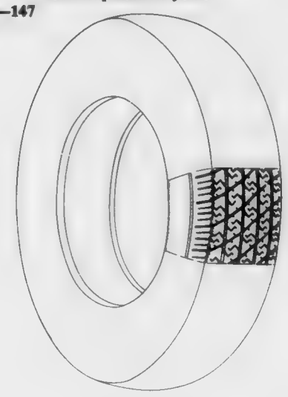
294,928
TIRE
Kevin F. Clemens, Simpsonville, and Robert D. McGinty, Greenville, both of S.C., assignors to Michelin Recherche et Technique, Switzerland
Filed Oct. 22, 1985, Ser. No. 790,206
Term of patent 14 years
U.S. Cl. D12—147



294,929
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Continuation-in-part of Ser. No. 706,521, Feb. 28, 1985, Pat. No. Des. 291,792. This application Mar. 26, 1986, Ser. No. 846,986
Term of patent 14 years
U.S. Cl. D12—147



294,930
TIRE
Douglas J. Slagh, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Mar. 26, 1986, Ser. No. 846,987
Term of patent 14 years
U.S. Cl. D12—147



294,931
MOTORCYCLE TIRE
Kazushige Ikeda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 24, 1986, Ser. No. 834,878
Claims priority, application Japan, Nov. 21, 1985, 60-48964
Term of patent 14 years
U.S. Cl. D12—147



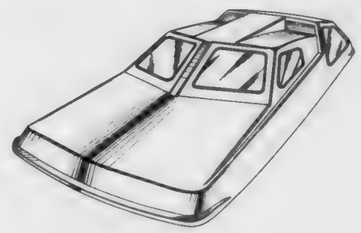
294,932
MOTORCYCLE TIRE
Shinsuke Hayama, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 24, 1986, Ser. No. 834,880
Claims priority, application Japan, Nov. 21, 1985, 60-48965
Term of patent 14 years
U.S. Cl. D12—147



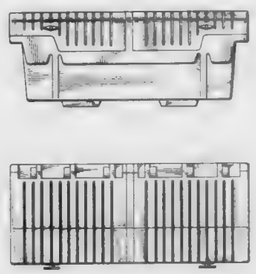
294,933
MOTORCYCLE TIRE
Kazushige Ikeda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 24, 1986, Ser. No. 834,484
Claims priority, application Japan, Nov. 21, 1985, 60-48966
Term of patent 14 years
U.S. Cl. D12—147



294,934
REPLACEMENT VAN TOP
Paul E. Thomas, 1808 Mill La., Dothan, Ala. 36303
Filed May 16, 1985, Ser. No. 734,903
Term of patent 14 years
U.S. Cl. D12—156



294,935
CONTAINER FOR A PICK-UP TRUCK OR THE LIKE
Robert D. Grossman, 22 Rivo Alto Dr., Miami, Fla. 33139
Filed Jan. 22, 1986, Ser. No. 821,455
Term of patent 14 years
U.S. Cl. D12—157

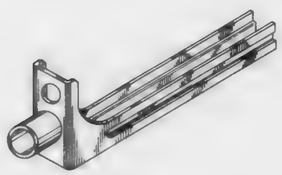


294,936
RAIN CAP FOR AN ENGINE EXHAUST STACK OR PIPE
Robert Brill, 805 Noble Ct., Golden, Colo. 80401
Filed Dec. 31, 1985, Ser. No. 815,259
Term of patent 14 years
U.S. Cl. D12—194

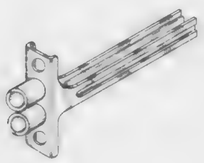


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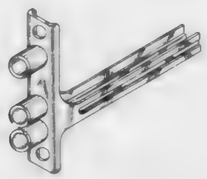
294,937
SINGLE TELEPHONE JACK FRAME
George W. Newton, Durham, N.C., assignor to Trimm, Inc., Libertyville, Ill.
Filed Mar. 5, 1985, Ser. No. 708,546
Term of patent 14 years
U.S. Cl. D13—24



294,938
DOUBLE TELEPHONE JACK FRAME
George W. Newton, Durham, N.C., assignor to Trimm, Inc., Libertyville, Ill.
Filed Mar. 5, 1985, Ser. No. 708,554
Term of patent 14 years
U.S. Cl. D13—24

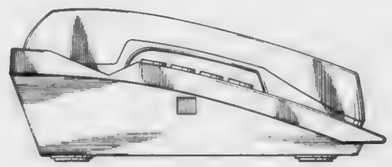


294,939
TRIPLE TELEPHONE JACK FRAME
George W. Newton, Durham, N.C., assignor to Trimm, Inc., Libertyville, Ill.
Filed Mar. 5, 1985, Ser. No. 708,555
Term of patent 14 years
U.S. Cl. D13—24

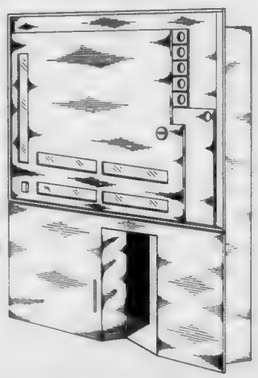


294,940
TELEPHONE SET
Wilbert C. Brown, Fairfield; James E. Butler, Bridgeport, and John Cuccio, Westport, all of Conn., assignors to Tie/Communications, Inc., Shelton, Conn.
Filed Aug. 16, 1985, Ser. No. 766,176
Term of patent 14 years
U.S. Cl. D14—58





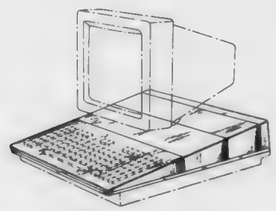
294,941
COMPUTER CONSOLE
Thomas J. David, Worthington; Jaimie B. Alexander; Gregg M. Davis, both of Columbus, and Ronald J. Sears, Worthington, all of Ohio, assignors to Tokheim Corporation, Fort Wayne, Ind.
Filed Jul. 1, 1985, Ser. No. 749,992
Term of patent 14 years
U.S. Cl. D14—100



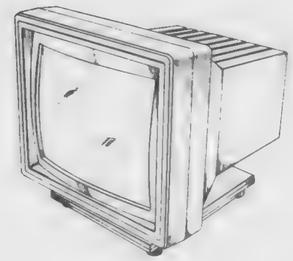
294,942
DATA ENTRY AND DISPLAY TERMINAL
Michel J. P. Fiscel, Paris, France, assignor to Compagnie de Signaux et d'Entreprises Electriques, Paris, France
Filed Mar. 14, 1984, Ser. No. 589,559
Claims priority, application France, Oct. 19, 1983, 83 3790
Term of patent 14 years
U.S. Cl. D14—106



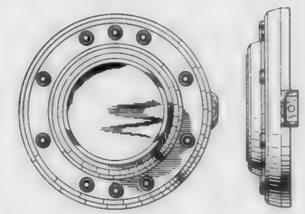
294,943
BASE FOR COMPUTER, COMPUTER TERMINAL OR SIMILAR ARTICLE
Alvin D. Day, San Jose, Calif.; Stephen G. Miggels, Wyckoff, N.J.; Michael J. Nuttall, Palo Alto, Calif., and Gordon E. Sylvester, Jamaica, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.; AT&T Information Systems Inc., Morristown, N.J. and Convergent Technologies, Inc., Santa Clara, Calif.
Division of Ser. No. 715,191, Mar. 22, 1985, Pat. No. Des. 290,703. This application Jul. 1, 1987, Ser. No. 68,999
Term of patent 14 years
U.S. Cl. D14—114



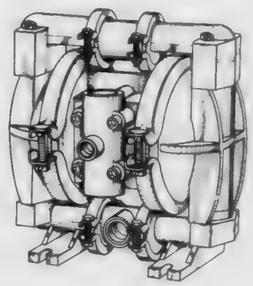
294,944
COMPUTER VIDEO MONITOR UNIT OR SIMILAR ARTICLE
Robin Chu, San Francisco, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1985, Ser. No. 791,847
Term of patent 14 years
U.S. Cl. D14—113



294,945
DISTRIBUTOR CAP COVER
William J. Segal, Torrence, Calif., assignor to Mr. Gasket Company, Inc., Cleveland, Ohio
Filed May 7, 1985, Ser. No. 731,264
Term of patent 14 years
U.S. Cl. D15—5

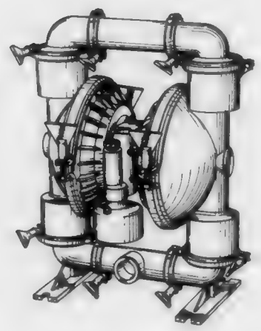


294,946
AIR DRIVEN DIAPHRAGM PUMP
James K. Wilden, Yucaipa, Calif., assignor to Wilden Pump & Engineering Co., Colton, Calif.
Filed Aug. 6, 1984, Ser. No. 638,062
Term of patent 14 years
U.S. Cl. D15—7

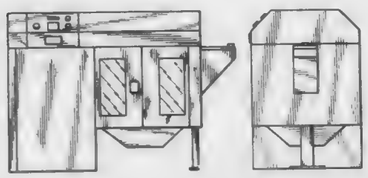


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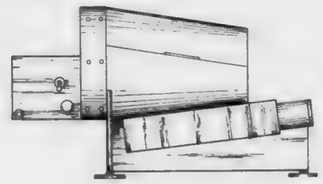
294,947
AIR DRIVEN DIAPHRAGM PUMP
James K. Wilden, Yucaipa, Calif., assignor to Wilden Pump & Engineering Co., Colton, Calif.
Filed Aug. 6, 1984, Ser. No. 638,054
Term of patent 14 years
U.S. Cl. D15—7



294,948
PARTICLE SIZE ANALYZER
Glenn J. Pogne, and William E. Lower, both of Cincinnati, Ohio, assignors to Rotex, Inc., Cincinnati, Ohio
Filed Jan. 17, 1986, Ser. No. 819,594
Term of patent 14 years
U.S. Cl. D15—147



294,949
FASTENER FEEDER HOUSING
Richard F. Hirsch, Arcadia, Calif., assignor to USM Corporation, Farmington, Conn.
Filed Jul. 11, 1985, Ser. No. 753,894
Term of patent 14 years
U.S. Cl. D15—199

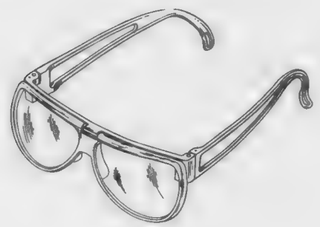




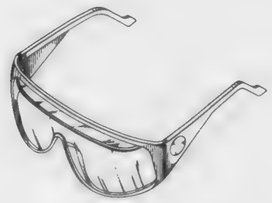
294,950
EYEGLASSES WITH FLIP-UP LENSES
Robert N. Shelton, Leominster, Mass., and Gail S. Mowrer, Nashua, N.H., assignors to Foster Grant Corporation, Leominster, Mass.
Filed Dec. 31, 1985, Ser. No. 815,331
Term of patent 14 years
U.S. Cl. D16—102



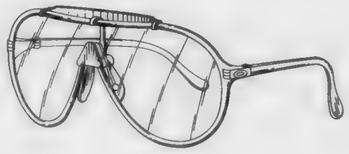
294,951
EYEGLASSES WITH FLIP-UP LENSES
Robert N. Shelton, Leominster, Mass., and Gail S. Mowrer, Nashua, N.H., assignors to Foster Grant Corporation, Leominster, Mass.
Filed Dec. 31, 1985, Ser. No. 815,425
Term of patent 14 years
U.S. Cl. D16—102



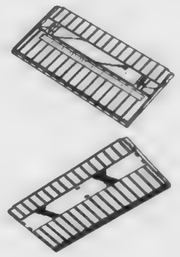
294,952
SUNGLASSES
Douglas A. Wilson, Lincoln, R.I., assignor to Uvex Winter Optical, Inc., Smithfield, R.I.
Filed Jun. 2, 1986, Ser. No. 870,247
Term of patent 14 years
U.S. Cl. D16—110



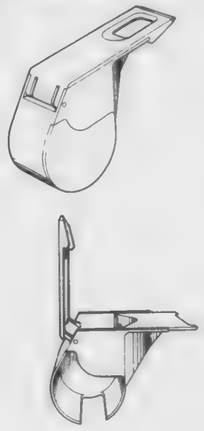
294,953
SUNGLASSES
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Beinasco, Italy
Filed May 13, 1985, Ser. No. 733,542
Claims priority, application Italy, Nov. 13, 1984, 54040/84[U]
Term of patent 14 years
U.S. Cl. D16—112



294,954
SHEET PAPER FEEDER FOR PRINTER
Hiromitsu Nagahiro, Ube, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1985, Ser. No. 805,547
Claims priority, application Japan, Aug. 7, 1985, 60-33465
Term of patent 14 years
U.S. Cl. D18—22

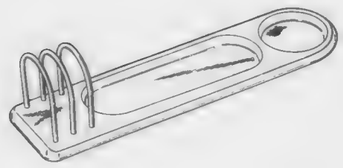


294,955
COMBINED POSTAL STAMP DISPENSER AND MOISTENER
Börje Ragnerstam, Vällingby, Sweden, assignor to Postverkets Industrier, Ulvsunda, Sweden
Filed Jan. 3, 1985, Ser. No. 688,487
Claims priority, application Sweden, Jul. 3, 1984, 84-1964
Term of patent 14 years
U.S. Cl. D19—67

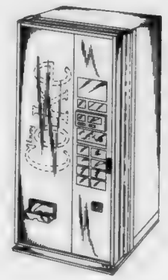


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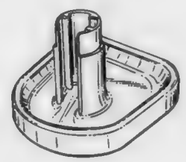
294,956
PEN TRAY
Kaat Hagberg, and Marianne Hagberg, both of Stora Södergatan, Sweden, assignors to IKEA of Sweden AB, Almhult, Sweden
Filed Jun. 25, 1985, Ser. No. 748,603
Claims priority, application Sweden, Mar. 12, 1985, 85-0627
Term of patent 14 years
U.S. Cl. D19—77



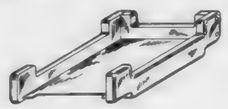
294,958
VENDING MACHINE
Eddie W. King, Marietta; Herman K. Duke, Atlanta, and Don S. Summerville, Decatur, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 557,319, Dec. 2, 1983. This application Dec. 18, 1986, Ser. No. 943,157
Term of patent 14 years
U.S. Cl. D20—5



294,959
COLLECTING BASE FOR A MARBLE GAME RAMP
William J. Wichman, Glendora, Calif., assignor to Discovery Toys, Inc., Pleasant Hill, Calif.
Filed Jun. 4, 1985, Ser. No. 741,315
Term of patent 14 years
U.S. Cl. D21—19

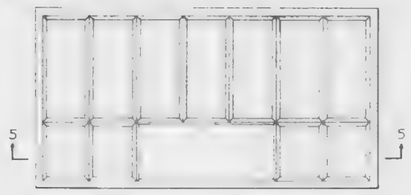


294,957
STACKABLE FILE TRAY
Arlan D. Lothe, Sun Prairie, Wis., assignor to Evco Office Products, DeForest, Wis.
Filed Aug. 19, 1985, Ser. No. 766,574
Term of patent 14 years
U.S. Cl. D19—92

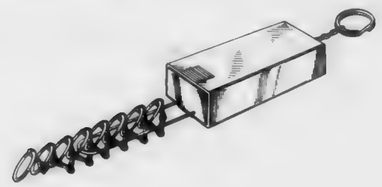




294,960
DIVIDED TRAY FOR CARD GAMES
Jerry A. Corbett, P.O. Box 3011, Monterey, Calif. 93942, assignor to Leland C. Underwood, Carmel Valley; Jerry A. Corbett, Monterey; John A. Pearne, San Jose and Lawrence C. Ludwig, Sacramento, all of, Calif.
Filed Apr. 29, 1985, Ser. No. 728,099
Term of patent 14 years
U.S. Cl. D21—54



294,961
PUZZLE TOY
Octavian Iancului, 2636 W. Porter, Apt. G, Fullerton, Calif. 92633
Filed Jul. 30, 1985, Ser. No. 761,046
Term of patent 14 years
U.S. Cl. D21—106



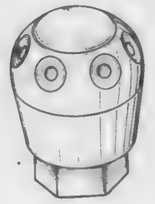
294,962
SKI
Andrej Robic, Radovljica, Yugoslavia, assignor to "Elan" Tovarna Sportnega Orodja N.Sol.O., Begunje na Gorenjskem, Yugoslavia
Filed May 24, 1985, Ser. No. 737,533
Claims priority, application Yugoslavia, Nov. 27, 1984, 584/84
Term of patent 14 years
U.S. Cl. D21—229

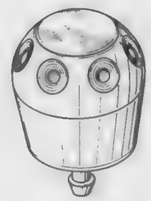


294,963
FILTER BAG FOR SWIMMING POOL CLEANERS
J. Jesus Alanis, San Marcos, and Paul Greskovics, Manhattan Beach, both of Calif., assignors to Alopex Industries, Inc., San Marcos, Calif.
Filed Nov. 2, 1984, Ser. No. 667,858
Term of patent 14 years
U.S. Cl. D23—209

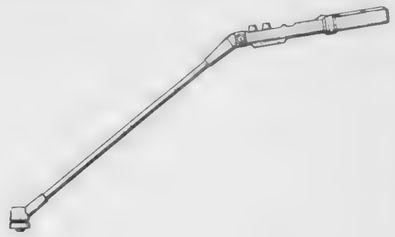


294,964
WATER DISTRIBUTION VALVE FOR A DRIP IRRIGATION SYSTEM
Edward V. Mendenhall, 43 Margarita, Camarillo, Calif. 93010
Filed Aug. 8, 1986, Ser. No. 894,950
Term of patent 14 years
U.S. Cl. D23—214



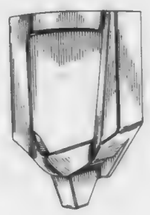


294,965
SPRAYER WAND
Clive W. Garrard, Foxton, and Anthony C. L. Wass, Stamford, both of England, assignors to Imperial Chemical Industries Plc, London, England
Filed Mar. 4, 1985, Ser. No. 707,848
Claims priority, application United Kingdom, Sep. 4, 1984, 1021893
Term of patent 14 years
U.S. Cl. D23—226

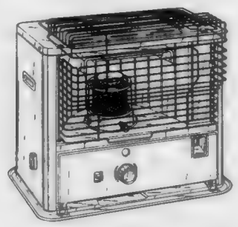


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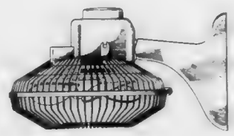
294,966
URINAL
Herbert V. Kohler, Jr., Kohler, and Donald W. Doman, Janesville, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 7, 1985, Ser. No. 796,095
Term of patent 14 years
U.S. Cl. D23—302

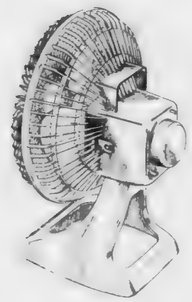


294,967
KEROSENE STOVE
Koichi Sakai, Moriguchi, Japan, assignor to Imanishi Kinzoku Kogyo Kasbushiki Kaisha, Japan
Filed Sep. 4, 1985, Ser. No. 772,301
Term of patent 14 years
U.S. Cl. D23—338

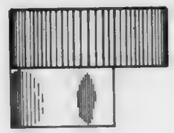


294,968
ELECTRIC FAN
Shao Shin-Chin, San-Chung, Taiwan, assignor to Holmes Products Corp., Holliston, Mass.
Filed Jan. 30, 1986, Ser. No. 824,174
Term of patent 14 years
U.S. Cl. D23—382

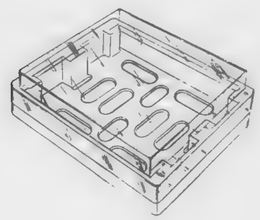




294,969
COMBINED LOCKING AND UNLOCKING NUT FOR GROUND JOINTED GLASSWARE
Robert J. Miskinis, 9330 Stevens Rd., Santee, Calif. 92071
Filed Sep. 23, 1985, Ser. No. 778,698
Term of patent 14 years
U.S. Cl. D24—29



294,970
CONTAINER FOR MICROSCOPE SLIDES
Gerd Marienfeld, Beim Oelsteg 10, Bad Mergentheim, Fed. Rep. of Germany
Filed Dec. 11, 1984, Ser. No. 680,560
Term of patent 14 years
U.S. Cl. D24—31



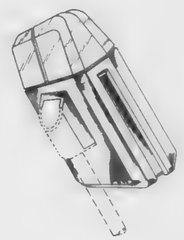
294,971
PORTABLE HEATING PAD
Anne W. Wheeler, 12936 Beethoven Blvd., Silver Spring, Md. 20904
Filed Jul. 24, 1985, Ser. No. 758,352
Term of patent 14 years
U.S. Cl. D24—36



294,972
INCONTINENCE GUARD FOR MALES
Berndt M. Nicklasson, Mölnlycke, Sweden, assignor to Mölnlycke Aktiebolag, Goteburg, Sweden
Filed Nov. 13, 1985, Ser. No. 805,109
Claims priority, application Sweden, May 14, 1985, 85-1290
Term of patent 14 years
U.S. Cl. D24—51



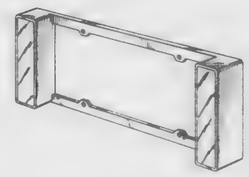
294,973
MARINE NAVIGATIONAL LIGHT
Vincent H. Bowman, Chicago, Ill., assignor to Attwood Corporation, Lowell, Mich.
Filed Aug. 5, 1985, Ser. No. 762,384
Term of patent 14 years
U.S. Cl. D26—28



294,974
MARINE NAVIGATIONAL BOW LIGHT
Stanley T. Greaens, Chicago, Ill., assignor to Attwood Corporation, Lowell, Mich.
Filed Oct. 23, 1985, Ser. No. 790,381
Term of patent 14 years
U.S. Cl. D26—35

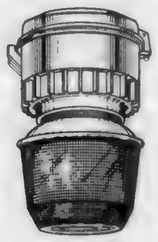


294,975
COMBINED LICENSE PLATE BRACKET AND VEHICLE BACK-UP SIGNAL LIGHTS
Ronald C. Lester, 635 Freeman Ave., Kansas City, Kans. 66101
Filed Mar. 18, 1985, Ser. No. 712,963
Term of patent 14 years
U.S. Cl. D26—34

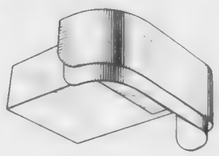


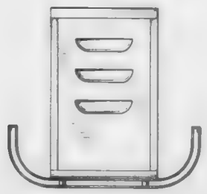
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294,976
INDUSTRIAL LUMINAIRE
Robert L. Ewing, 1440 Twin Pines Ct., Newark, Ohio 43055
Filed Feb. 5, 1985, Ser. No. 698,310
Term of patent 14 years
U.S. Cl. D26—85



294,977
WALL LAMP
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Aug. 2, 1985, Ser. No. 761,789
The portion of the term of this patent subsequent to Mar. 15, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—86

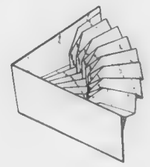




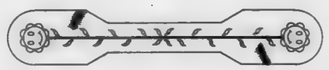
294,978
COMBINED LAMP AND NIGHT LIGHT
Tobin Wolf, 1610 Harmon Cove Twrs., Secaucus, N.J. 07094
Filed Oct. 7, 1985, Ser. No. 784,744
Term of patent 14 years
U.S. Cl. D26—93



294,979
ASHTRAY
Patricia Gilda, 6 Hermann Dr., Monterey, Calif. 93940; William F. Mann, 25 Main St., and Winthrop D. Allen, III, 25 Clawson St., both of Bisbee, Ariz. 85603
Filed May 17, 1985, Ser. No. 735,463
Term of patent 14 years
U.S. Cl. D27—8

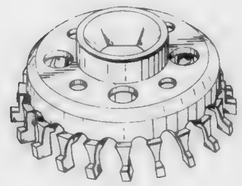


294,980
FLEXIBLE CHIN REST FOR HAIR DRYER HOOD
Kathleen M. Freson, 312 Van Buren St., Huntingburg, Ind. 47542
Filed May 29, 1985, Ser. No. 739,084
Term of patent 14 years
U.S. Cl. D28—18

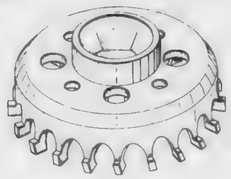




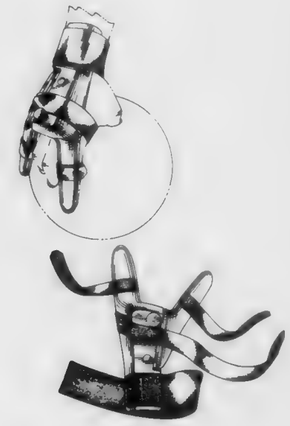
294,981
SHAVING CUTTER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan
Filed Aug. 21, 1985, Ser. No. 767,966
Claims priority, application Japan, Feb. 23, 1985, 60-6800
Term of patent 14 years
U.S. Cl. D28—50



294,982
SHAVING CUTTER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan
Filed Aug. 23, 1985, Ser. No. 768,568
Claims priority, application Japan, Feb. 23, 1985, 60-6799
Term of patent 14 years
U.S. Cl. D28—50



294,983
BOWLING GLOVE
Charles J. Purin, and Guenther F. Kluever, both of Rockford, Ill., assignors to Rockford Sport Products, Inc., Rockford, Ill.
Filed Sep. 19, 1985, Ser. No. 777,930
Term of patent 14 years
U.S. Cl. D29—20



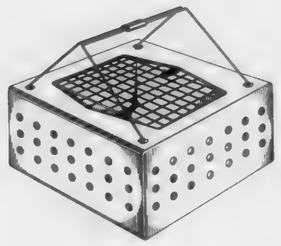
294,984
BALL-CATCHING GLOVE
Richard L. Green, 2517 Florida St., No. 4, Huntington Beach, Calif. 92648
Filed Nov. 25, 1985, Ser. No. 806,354
Term of patent 14 years
U.S. Cl. D29—22



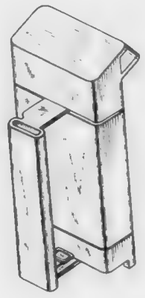


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294,985
PET CARRIER
Joanna Blieden, 45 North Ave., Providence, R.I. 02906
Filed Feb. 3, 1986, Ser. No. 825,871
Term of patent 14 years
U.S. Cl. D50—109

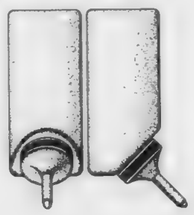


294,987
FABRIC STEAMER
Ronald L. Muller, Old Saybrook, and Keith R. Wruck, Chester, both of Ill., assignors to North American Philips Corporation, New York, N.Y.
Filed Mar. 7, 1985, Ser. No. 709,016
Term of patent 14 years
U.S. Cl. D32—17



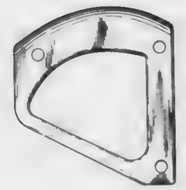
294,986
COMBINED WATER BOTTLE AND DRINKING TUBE FOR ANIMALS
Frank W. Atchley, 461 Walnut St., Napa, Calif. 94558
Filed Jul. 10, 1986, Ser. No. 884,199
Term of patent 14 years
U.S. Cl. D30—132



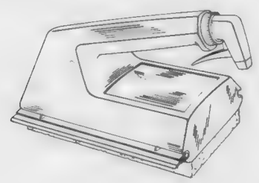


294,988
HANDLE GRIP FOR A VACUUM CLEANER
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed Nov. 1, 1985, Ser. No. 793,909
Term of patent 14 years
U.S. Cl. D32—34





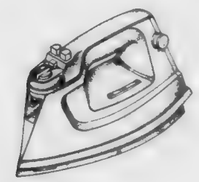
294,989
MANUAL WINDOW WASHER DEVICE
Danny R. Jinkins, 337 Center St., Bryan, Ohio 43506
Filed Jan. 17, 1985, Ser. No. 692,174
Term of patent 14 years
U.S. Cl. D32—45



294,990
CLOTHESPIN
Mary A. Stern, 9512 Fifth Pl., Lorton, Va. 22079
Filed Mar. 1, 1985, Ser. No. 707,198
Term of patent 14 years
U.S. Cl. D32—65



294,991
STEAM IRON
Marshall B. Johnson, and John C. Meadway, both of Chillicothe, Ohio, assignors to Wearever-Proctorsilex, Chillicothe, Ohio
Filed Jun. 26, 1986, Ser. No. 878,751
Term of patent 14 years
U.S. Cl. D32—70



294,992
WASTE CONTAINER
Gary L. Bouge, Marshall, Mo.
Filed Apr. 8, 1985, Ser. No. 720,864
Term of patent 14 years
U.S. Cl. D34—1



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ENCLOSURE FOR USE PRIMARILY IN A GARDEN

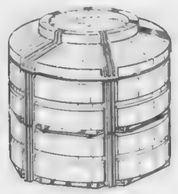
Thomas L. Faul, Washago, Canada, assignor to Barclay Horticulture Mfg. Ltd., Downsview, Canada

Filed Nov. 15, 1985, Ser. No. 805,220

Claims priority, application Canada, Aug. 9, 1985, 09-08-85-7

Term of patent 14 years

U.S. Cl. D34—1



294,994

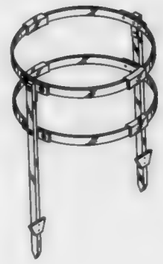
REFUSE CONTAINER SUPPORT

Norma J. Burgett, 1017 W. 7th St., Beardstown, Ill. 62618

Filed Jul. 25, 1985, Ser. No. 758,875

Term of patent 14 years

U.S. Cl. D34—6



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MARCH, 1988

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
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A/G Technology Corporation: *See*—
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A.R.E. S.A.R.L.: *See*—
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Abe, Hidetoshi; Mukoh, Akio; Kitamura, Teruo; Kamezawa, Norimasa; Hanawa, Yasuo; and Sato, Mikio, to Hitachi, Ltd. Liquid crystal display device. 4,733,949, Cl. 350-350.00R.

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Adam, Colin M.; Okazaki, Kenji; Skinner, David J.; and Corey, Robert G., to Allied Corporation. Method of producing rapidly solidified aluminum-transition metal-silicon alloys. 4,734,130, Cl. 75-68.00A.

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Adams, William E., 4,734,027, Cl. 425-556.000.

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Campbell, David L.; and Tembhekar, Ravindra D., 4,734,596, Cl. 307-350.000.
Johnson, William M.; Fleck, Rod G.; Kong, Cheng-Gang; and Moller, Ole, 4,734,852, Cl. 364-200.000.
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Berry, W. Wes, 4,734,200, Cl. 210-677.000.

Aebi, Gilbert, to Stellram S.A. Milling cutter for machining T-shaped grooves. 4,733,995, Cl. 407-34.000.

Aerospace Corporation, The: *See*—
Ives, Neil A.; and Leung, Martin S., 4,734,151, Cl. 156-637.000.

Afshar, Siroos K., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. System for generating software source code components. 4,734,854, Cl. 364-200.000.

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Muller, Jurgen, 4,734,728, Cl. 354-324.000.
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Howard, Lee J.; and Rowles, Howard C., 4,734,115, Cl. 62-40.000.

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Gallant, Ben J.; and Kulischenko, Walter G., 4,733,503, Cl. 51-410.000.

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Kohyama, Mikihiro; and Wakatsuki, Goroei, to Honda Giken Kogyo Kabushiki Kaisha. Air intake system. 4,733,639, Cl. 123-198.00E.

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Kawai, Yoichi; Maki, Masami; Abe, Masaru; Yokote, Sachio; and Sekiguchi, Katsumi, 4,734,450, Cl. 524-413.000.
Takuma, Keisuke; Kato, Kimitoshi; Aiga, Hiroshi; Yamada, Yasuyuki; and Nishizawa, Tsutomu, 4,734,218, Cl. 252-299.610.
Tamai, Shoji; Kawashima, Saburo; Sonobe, Yoshiho; Ohta, Masahiro; Oikawa, Hideaki; and Yamaguchi, Akihiro, 4,734,482, Cl. 528-185.000.

Mitsunaga, Takuro: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, 4,733,998, Cl. 409-132.000.

Miura, Naoshi: *See—*
Ono, Tadahiro; and Miura, Naoshi, 4,734,633, Cl. 318-723.000.

Miyachi Electronic Company: *See—*
Namiki, Mitsuo, 4,734,556, Cl. 219-110.000.

Miyahara, Noriyuki: *See—*
Horikawa, Yoshiaki; Kajitani, Kazuo; and Miyahara, Noriyuki, 4,734,570, Cl. 250-201.000.

Miyakama, Tadashi: *See—*
Mizutani, Shigemitsu; Yamaguchi, Jun; and Miyakama, Tadashi, 4,734,704, Cl. 346-76.0PH.

Miyake, Izumi, to Fuji Photo Film Co., Ltd. Apparatus for tracking magnetic head on rotary magnetic recording medium by envelope detection. 4,734,799, Cl. 360-78.000.

Miyake, Izumi: *See—*
Kaneko, Kiyotaka; Nakadai, Katsuo; Miyake, Izumi; and Oda, Kazuya, 4,734,793, Cl. 358-336.000.

Miyake, Kouichi, to CKD Kabushiki Kaisha. Lubricator with channel which communicates reservoir with oil drop hole. 4,733,753, Cl. 184-55.100.

Miyamoto, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Fluid sealed mounting. 4,733,854, Cl. 267-140.100.

Miyano, Seiji: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Usui, Toshinao; Unno, Ryoichi; Kimura, Hiromoto; Fukushima, Masato; Oka, Mitsuru; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Miyano, Seiji; and Sumoto, Kunihiro, 4,734,411, Cl. 514-220.000.

Miyasaka, Kenji: *See—*
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,734,196, Cl. 210-500.360.

Miyatake, Hideshi; Fujishima, Kazuyasu; Kumanoya, Masaki; Hidaka, Hideto; Dosaka, Katsumi; and Konishi, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Dynamic RAM having full-sized dummy cell. 4,734,890, Cl. 365-210.000.

Miyazaki, Hiroharu: *See—*
Inagaki, Takafumi; Nakamura, Kazumasa; and Miyazaki, Hiroharu, 4,733,760, Cl. 192-3.00R.

Miyazaki, Ryuji: *See—*
Fujiwara, Toshiaki; and Miyazaki, Ryuji, 4,734,857, Cl. 364-405.000.

Miyoshi, Keiji: *See—*
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Miyoshi, Masanobu: *See—*
Takada, Shun; Miyoshi, Masanobu; and Onodera, Kaoru, 4,734,358, Cl. 430-550.000.

Mizerak, Robert J.: *See—*
Line, William F.; Chaudhary, Vinod K.; Chicoye, Etzer; and Mizerak, Robert J., 4,734,364, Cl. 435-95.000.

Mizuguchi, Yoshifumi: *See—*
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Mizutani, Shigemitsu; Yamaguchi, Jun; and Miyakama, Tadashi, to Fuji Photo Film Co., Ltd. Thermal recording apparatus. 4,734,704, Cl. 346-76.0PH.

MMD Design & Consultancy Limited: *See—*
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Mobil Oil Corporation: *See—*
Alameddine, Bassem R.; and Jones, Lloyd G., 4,733,726, Cl. 166-263.000.

Mobley, Larry W.; Jennings, James K.; and Turner, Robert B., to Dow Chemical Company, The. Stabilizers for filled polyol compositions. 4,734,455, Cl. 524-710.000.

Moen, Bruce A., to Adolph Coors Company. System for forming an opening in a container end member. 4,733,793, Cl. 220-269.000.

Moggi, Giovanni; and Cirillo, Gianna, to Montedison S.p.A. Vulcanizable compositions of fluoroelastomers having improved self-lubricating properties and a fast cure rate. 4,734,465, Cl. 525-340.000.

Mohr, Gerard; and Lorscheider, Frederic, to Societe Anonyme styled: Framafer. Continuously advancing machine for works on a railway track. 4,733,614, Cl. 104-7.100.

Mol, Grietje N.: *See—*
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Moldenius, Steve, to Sunds Defibrator AB. Method of two-stage peroxide bleaching of mechanical or semi-mechanical pulp. 4,734,160, Cl. 162-71.000.

Molecular Diagnostics, Inc.: *See—*
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Kolanowski, Clarence; and Patterson, Richard L., 4,733,463, Cl. 29-861.000.

Moller, Ole: *See—*
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Molloy, John. Sheet rock support devise. 4,733,844, Cl. 248-354.100.

Mon, George, to United States of America, Army. Fluidic set-point pressure sensor. 4,733,695, Cl. 137-829.000.

Mondek, Martin J., to Outboard Marine Corporation. Marine propulsion device air intake system. 4,734,070, Cl. 440-88.000.

Monia, Victor, to Visa Technologies, Inc. Method for making a magnetic transducer head cleaning card. 4,734,145, Cl. 156-244.110.

Monsanto Company: *See—*
Phillion, Dennis P., 4,734,517, Cl. 558-072.000.

Monte, William T., to Dow Chemical Company, The. Novel sulfonamides and method of making. 4,734,123, Cl. 71-92.000.

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Moosmuller, Helmut, deceased (by Moosmuller, Marita, legal representative), to Fa.marmos Buro-und Organsations-mittel. Binder mechanism. 4,733,985, Cl. 402-27.000.

Moosmuller, Marita, legal representative: *See—*
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Moran, James P., Jr., to Loctite Corporation. Radio frequency device utilizing EMI-blocking coating at connections with external leads. 4,734,541, Cl. 174-35.00R.

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Moriano, Roger A.; and Osterhout, Ralph F., to Tekna. Spotlight with interchangeable handle. 4,734,832, Cl. 362-158.000.

Morimoto, Takeshi; Hamatani, Yoshiki; Matsubara, Toshiya; Iwano, Naoto; and Shimizu, Hideo, to Asahi Glass Company Ltd.; and Elna Company Ltd. Electrolytic capacitor. 4,734,821, Cl. 361-433.000.

Morinaga, Kaoru, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,734,898, Cl. 369-39.000.

Morita, Hideki: *See—*
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Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,733,728, Cl. 166-274.000.

Morita, Katsuhisa: *See—*
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Morita, Kiyozi; Ando, Masami; and Yamasaki, Mitito, to Gunei Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of fiberboards. 4,734,231, Cl. 264-45.300.

Moritz, Alfred: *See—*
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Moriuchi, Yousuke; and Kohsai, Tadashi, to Terumo Kabushiki Kaisha. Pressure transducer apparatus. 4,733,566, Cl. 73-756.000.

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Morris, Robert C.; Schroeder, Norman G.; Kuper, Jerry W.; Shand, Michael L.; and Barrett, Joseph J., to Allied Corporation. Unitary solid-state laser. 4,734,913, Cl. 372-34.000.

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Mouzer, Helmut, to Hoechst AG. Multilayer film formed of polyester and having a core layer suitable for thermoplastic embossing. 4,734,335, Cl. 428-480.000.

Mouzin, Gilbert: *See—*
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Mueller, Clifford F., to Schwinn Bicycle Company. Bicycle frame with supplemental step or platform for performing freestyle maneuvers. 4,733,881, Cl. 280-291.000.

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Mueller, Rolf: *See—*
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Mulawski, Walter J. Alignment-impact indicator for firearms. 4,733,490, Cl. 42-100.000.

Muller, Jurgen, to Agfa-Gevaert AG. Apparatus for processing sheet films. 4,734,728, Cl. 354-324.000.

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Murata Kikai Kabushiki Kaishal: *See—*
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Murata, Youichi; and Shibata, Fumioki, to Toyota Jidosha Kabushiki Kaisha. Apparatus for detecting a start of an engine for a motor vehicle. 4,734,673, Cl. 340-52.00R.

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Murphy, Charles E.: *See—*
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Murphy, Jack W., to In-Situ, Inc. Electrolytic process for the simultaneous deposition of gold and replenishment of elemental iodine. 4,734,171, Cl. 204-111.000.

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Muth, James C., to Milcor Incorporated. Gravity closing fire-rated ceiling access door. 4,733,511, Cl. 52-204.000.

Muto, Shigeaki; Yoshikumi, Chikao; Furusho, Takao; Motokawa, Isamu; Onishi, Yoko; Kanno, Akihiko; Fujii, Takayoshi; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cephalosporin derivative, process for producing the same and pharmaceutical composition containing the same. 4,734,409, Cl. 514-206.000.

Mutoh, Hideo; and Otsuji, Tadashi, to Akebono Brake Industry Co., Ltd. Method for integrating a boot piston into a disk brake. 4,733,454, Cl. 29-450.000.

Myers, Roderick J., to Conoco Inc. Adjustable riser top joint and method of use. 4,733,991, Cl. 405-195.000.

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Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,734,084, Cl. 474-80.000.

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Tateda, Koichi; Tsuda, Tatsuya; and Ando, Yuzi, to Sharp Kabushiki Kaisha. Heating apparatus with humidity sensor. 4,734,554, Cl. 219-10.55B.

Tateno, Eiji, to Fujitsu Limited. Electronic part insertion apparatus. 4,733,459, Cl. 29-741.000.

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Yokoi, Kazuma; Iida, Takao; and Sagawa, Toshimasa, to Nippon Mektron, Limited. Process for producing hexafluoroacetone hydrate. 4,734,169, Cl. 204-79.000.

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Yokote, Yoshihiro, to NSK-Warner K.K. Seat belt. 4,733,886, Cl. 280-804.000.

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Yokoyama, Keiichi; Kato, Koji; Kitahara, Takumi; Ohno, Hiroyasu; Nishina, Takashi; Kumakura, Mikio; Awaya, Akira; Nakano, Takuo; Watanabe, Kazuyuki; and Saruta, Sakae, to Mitsui Petrochemical Industries, Ltd. Quinazoline compounds and antihypertensives. 4,734,418, Cl. 514-258.000.

Yokoyama, Meiso; Takahashi, Makoto; and Ohkawa, Hiroshi, to Nippon Seiki Co., Ltd. Decorative display apparatus. 4,733,488, Cl. 40-544.000.

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Yonnet, Jean P.; and Penelon, Joel, to Atelier d'Electro Themie et de Constructions. Device for producing a sliding or traveling magnetic field, in particular for ionic processing under magnetic field. 4,734,621, Cl. 315-111.410.

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Yoshida, Hajime, to Nikken Chemical Laboratory Co., Ltd. Lipophobicating solution for electrophotographic plates for offset printing contains phytic acid and at least two dicarboxylic acids. 4,734,132, Cl. 106-2.000.

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Yoshikawa, Shozi, to Olympus Optical Co., Ltd. Stabilized laser apparatus. 4,734,914, Cl. 372-33.000.

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Yoshimura, Lou M., to Medical Advances, Inc. NMR local coil with foil coupling loop. 4,734,647, Cl. 324-318.000.

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Zemba, Joseph A., Jr.; and Taylor, Paul, to Pure-N-Simple. Pulsed ion generator for water purification system. 4,734,176, Cl. 204-149.000.

Zemlicka, Alvin R.; Bertram, Francis; and Menzel, Jay L., to Brunswick Corporation. Marine engine exhaust assembly. 4,734,071, Cl. 440-89.000.

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Schwander, Hansrudolf; and Zickendraht, Christian, 4,734,490, Cl. 534-782.000.

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Brady, Daniel F.; Larson, Spencer B.; Ziegler, David B.; and Johnson, Charles B., 4,733,798, Cl. 222-23.000.

Ziegler, Walter J., to Institut Dr. Ziegler. L-lysine pyruvate and l-histidine pyruvate and their use in therapy of tissue and mucosa damage. 4,734,276, Cl. 424-10.000.

Zimmer, Ernst; and Binder, Karl L., to Kuka Schweissanlagen; and Roboter GmbH. Multi-purpose industrial robot. 4,733,576, Cl. 74-665.00L.

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Zorn, Karl-Ludwig: *See—*
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501 Valeo: *See—*
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TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Apple Computer, Inc.: *See*—
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Hovey, Dean; Sachs, James; Yurchenco, James; and Lapson, William, Re. 32,633, Cl. 340-710.000.

Atkinson, William D., to Apple Computer, Inc. Display system. Re. 32,632, Cl. 340-709.000.

Baba, Toru; and Saito, Yasuo, to Kioritz Corporation. Mowing machine with annular inertia shifter. Re. 32,629, Cl. 30-276.000.

Chmiel, Chester T.; and Cotsakis, Daniel J., to Uniroyal Plastics Company, Inc. Adhesive for bonding cured EPDM rubber. Re. 32,634, Cl. 524-432.000.

Cotsakis, Daniel J.: *See*—
Chmiel, Chester T.; and Cotsakis, Daniel J., Re. 32,634, Cl. 524-432.000.

Finney, Philip F. Thermocouple and method of making the thermocouple and of mounting the thermocouple on a heat exchanger tube. Re. 32,630, Cl. 136-229.000.

Frazier Precision Instrument Company, Inc.: *See*—
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Holometrics, Inc.: *See*—
Layer, Howard P., Re. 32,631, Cl. 177-211.000.

Hovey, Dean; Sachs, James; Yurchenco, James; and Lapson, William, to Apple Computer, Inc. Cursor control device. Re. 32,633, Cl. 340-710.000.

Kioritz Corporation: *See*—
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Lapson, William: *See*—
Hovey, Dean; Sachs, James; Yurchenco, James; and Lapson, William, Re. 32,633, Cl. 340-710.000.

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Sachs, James: *See*—
Hovey, Dean; Sachs, James; Yurchenco, James; and Lapson, William, Re. 32,633, Cl. 340-710.000.

Saito, Yasuo: *See*—
Baba, Toru; and Saito, Yasuo, Re. 32,629, Cl. 30-276.000.

Uniroyal Plastics Company, Inc.: *See*—
Chmiel, Chester T.; and Cotsakis, Daniel J., Re. 32,634, Cl. 524-432.000.

Yurchenco, James: *See*—
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TO WHOM

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Chang, John C. H., to Wallace Computer Services, Inc. Multi-sheet assembly using autogenous coating. B1 4,425,386, 3-29-88, Cl. 427-256.000.

deLarosiere, Pierre J., to International Container Systems, Inc. Case for beverage bottles. B1 4,344,530, 3-29-88, Cl. 206-203.000.

Delaval Turbine, Inc.: *See*—
Repose, John; and Niatas, Ulysses, B1 4,039,228, Cl. 384-312.000.

Fine, Harvey A., to Weldotron Corporation. Integrated stretch-wrap packaging system. B1 4,548,024, 3-29-88, Cl. 53-502.000.

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Hudspeth, Thomas; and Keeling, Harmon H., to Hughes Aircraft Company. Microwave diplexer. B1 4,427,953, 3-29-88, Cl. 333-134.000.

Hughes Aircraft Company: *See*—
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Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, to Ricoh Company, Ltd. Two-component dry-type developer. B1 4,562,136, 3-29-88, Cl. 430-107.000.

International Container Systems, Inc.: *See*—
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Uetsuji, Yonekazu; and Watanabe, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. General-purpose internal combustion engine with vertical crank shaft. B1 4,570,584, 3-29-88, Cl. 123-179.0SE.

Wallace Computer Services, Inc.: *See*—
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Watanabe, Shoji: *See*—
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Gresens, Stanley T., 294,974, Cl. D26-35.000.

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Pool, Daniel L., 294,907, Cl. D6-546.000.

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90 4,733,508
126.5 4,733,509
202 4,733,510
204 4,733,511
238.1 4,733,512
317 4,733,514
396 4,733,513
473 4,733,515

CLASS 53
84 4,733,516
4,733,517
444 4,733,518
456 4,733,519
502 B1 4,548,024
559 4,733,520
580 4,733,521

CLASS 55
5 4,734,105
16 4,734,106
67 4,734,107
84 4,734,108
92 4,734,109
96 4,734,110
97 4,734,111
158 4,734,112
504 4,734,113

CLASS 56
17.4 4,733,522
209 4,733,523
400.15 4,733,524
503 4,733,525

CLASS 60
39.02 4,733,526
39.05 4,733,527
39.091 4,733,529
39.12 4,733,528
202 4,733,530
259 4,733,531
407 4,733,532
431 4,733,533
595 4,733,534
605.1 4,733,535
618 4,733,536
655 4,733,537
752 4,733,538

CLASS 62
37 4,734,114
40 4,734,115
73 4,733,539
133 4,733,540
186 4,733,541
263 4,733,542
4,733,543
532 4,734,116

CLASS 63
12 4,733,544

CLASS 65
3.12 4,734,117
102 4,734,118

CLASS 66
202 4,733,545
4,733,546

CLASS 68
12 R 4,733,547

CLASS 70
25 4,733,548
68 4,733,549

CLASS 71
86 4,734,119
87 4,734,120
88 4,734,121
92 4,734,122
4,734,123
4,734,124
4,734,125
4,734,126

CLASS 72
348 4,733,550
393 4,733,551
405 4,733,552

CLASS 73
4 V 4,733,553
46 4,733,554
49.3 4,733,555
64 4,733,556
64.2 4,733,557
118.1 4,733,558
195 4,733,559
304 C 4,733,560
579 4,733,561
626 4,733,562
706 4,733,563
715 4,733,564
756 4,733,566
784 4,733,567
4,733,568
861.33 4,733,570
861.38 4,733,569
862.65 4,733,571

CLASS 74
44 4,733,572
473 R 4,733,574
473 SW 4,733,573
493 4,733,575
665 L 4,733,576
710.5 4,733,577
713 4,733,578
804 4,733,579
864 4,733,581
866 4,733,580
867 4,733,582

CLASS 75
10.11 4,734,127
35 4,734,128
63 4,734,129
68 A 4,734,130
244 4,734,131

CLASS 81
177.2 4,733,583
177.85 4,733,584

CLASS 82
21 A 4,733,585

CLASS 83
39 4,733,586
411 R 4,733,587
857 4,733,588
858 4,733,589

CLASS 84
1.01 4,733,591
1.1 4,733,590
151 4,733,592
484 4,733,593

CLASS 86
31 4,733,594

CLASS 89
1.51 4,733,597
8 4,733,595
34 4,733,596

CLASS 91
168 4,733,598
250 4,733,599
358 A 4,733,600
374 4,733,601

CLASS 92
21 MR 4,733,602
88 4,733,604
92 4,733,603

CLASS 98
2.11 4,733,605
119 4,733,606

CLASS 99
348 4,733,607
423 4,733,608

CLASS 102
213 4,733,609
332 4,733,610
439 4,733,611
521 4,733,612
532 4,733,613

CLASS 104
7.1 4,733,614
110 4,733,615
296 4,733,616

CLASS 105
29.2 4,733,617

CLASS 106
2 4,734,132
85 4,734,133
90 4,734,134
287.23 4,734,135
304 4,734,136
308 M 4,734,137

CLASS 108
140 4,733,618

CLASS 110
229 4,733,619
336 4,733,620
347 4,733,621

CLASS 112
240 4,733,622

CLASS 114
103 4,733,624
230 4,733,625
267 4,733,626
270 4,733,627
311 4,733,628
357 4,733,629

CLASS 118
50.1 4,733,746
109 4,733,630
719 4,733,631
729 4,733,632

CLASS 119
29 4,733,633
51.12 4,733,634

CLASS 122
26 4,733,635
39 4,733,636
488 4,733,637

CLASS 123
179 SE B1 4,570,584
198 B 4,733,638
198 D 4,733,640
198 E 4,733,639
276 4,733,641
4,733,642
4,733,643
352 4,733,644
502 4,733,645
597 4,733,646

CLASS 124
23 R 4,733,647
86 4,733,648

CLASS 125
16 R 4,733,649

CLASS 126
343.5 A 4,733,650
409 4,733,651

CLASS 128
1 D 4,733,652
1.2 4,733,653
61 4,733,655
80 C 4,733,656
92 YM 4,733,657
92 YY 4,733,654
94 4,733,658
156 4,733,659
303 B 4,733,661
303.1 4,733,660
305 4,733,662
312 4,733,663
334 R 4,733,664
343 4,733,665
346 4,733,666
419 PG 4,733,667
660 4,733,668
663 4,733,669
693 4,733,670
754 4,733,671

CLASS 130
27 T 4,733,672

CLASS 131
84.1 4,733,673
255 4,733,674
270 4,733,675
290 4,733,676

CLASS 132
7 4,733,677

CLASS 134
27 4,734,138
115 R 4,733,678
138 4,733,679

CLASS 135
16 4,733,681
69 4,733,682
89 4,733,683

CLASS 136
210 4,734,139
229 Re.32,630

CLASS 137
2 4,733,684
119 4,733,685
203 4,733,686
338 4,733,687
454.6 4,733,688
494 4,733,689
513.7 4,733,690
596.16 4,733,691
614.03 4,733,692
625.17 4,733,693
4,733,694
829 4,733,695
883 4,733,696
884 4,733,697

CLASS 138
38 4,733,698
145 4,733,699

CLASS 139
383 R 4,733,700

CLASS 140
93.2 4,733,701

CLASS 141
31 4,733,680
105 4,733,702

CLASS 144
285 4,733,703
286 R 4,733,704

CLASS 148
126.1 4,734,140

CLASS 149
35 4,734,141

CLASS 152
177 4,733,705
209 R 4,733,706
417 4,733,707
527 4,733,708
548 4,733,709

CLASS 156
73.1 4,734,142
102 4,734,143
123 4,734,144
148 4,734,146
212 4,734,147
244.11 4,734,145
251 4,734,148
381 4,734,149
502 4,734,153
4,734,154
578 4,734,150
583.1 4,734,155
632 4,734,156
637 4,734,151
643 4,734,157
4,734,158
646 4,734,152

CLASS 159
16.1 4,734,159

CLASS 160
84.1 4,733,710
4,733,711

CLASS 162
71 4,734,160
78 4,734,161
84 4,734,162
181.3 4,734,163
348 4,734,164

CLASS 164
16 4,733,712
18 4,733,713
130 4,733,714
306 4,733,715
418 4,733,716
476 4,733,717

CLASS 165
4 4,733,718
12 4,733,719
80.4 4,733,720
89 4,733,721
159 4,733,722

CLASS 166
51 4,733,723
252 4,733,724
4,733,725
263 4,733,726
273 4,733,727
274 4,733,728
276 4,733,729

CLASS 172
519 4,733,730

CLASS 173
91 4,733,731

CLASS 174
35 R 4,734,541

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36 4,734,542
88 R 4,734,543
117 F 4,734,544
120 SR 4,734,545

CLASS 175

9 4,733,732
45 4,733,733
65 4,733,734
393 4,733,735

CLASS 177

211 Re.32,631
255 4,733,736

CLASS 178

19 4,734,546

CLASS 180

7.1 4,733,737
53.1 4,733,738
90 4,733,739
168 4,733,740
219 4,733,741
223 4,733,742
255 4,733,743
256 4,733,744
315 4,733,745

CLASS 181

107 4,733,747
141 4,733,748
144 4,733,749
202 4,733,750
217 4,733,751

CLASS 182

86 4,733,752

CLASS 184

55.1 4,733,753

CLASS 186

53 4,733,754

CLASS 188

2 F 4,733,755
170 4,733,756
181 A 4,733,757
267 4,733,758

CLASS 190

18 A 4,733,759

CLASS 192

3 R 4,733,760
3.25 4,733,761
98 4,733,762
4,733,763
4,733,764

CLASS 194

206 4,733,765
240 4,733,766

CLASS 198

304 4,733,767
369 4,733,768
503 4,733,769
599 4,733,770
735 4,733,771
781 4,733,772

CLASS 200

1 V 4,734,547
38 R 4,734,548
61.41 4,734,549

CLASS 201

44 4,734,165

CLASS 202

100 4,734,166
176 4,734,167

CLASS 204

79 4,734,169
98 4,734,170
111 4,734,171
117 4,734,172
129.1 4,734,173
129.5 4,734,174
130 4,734,175
149 4,734,176
157.2 4,734,177
192.38 4,734,178
199 4,734,179
254 4,734,180
257 4,734,181
290 R 4,734,182
298 4,734,183
409 4,734,184

CLASS 206

0.5 4,733,774
3 4,733,773
5 4,733,775
203 B1 4,344,530
305 4,733,776
316 4,733,777
332 4,733,778
[illegible] 4,733,779
554 4,733,780

CLASS 208

114 4,734,185
251 H 4,734,186

CLASS 210

101 4,734,187
107 4,734,188
169 4,734,189
198.2 4,734,190
220 4,734,191
242.3 4,734,193
335 4,734,192
390 4,734,194
493.1 4,734,195
500.36 4,734,196
629 4,734,197
647 4,734,198
674 4,734,199
677 4,734,200
685 4,734,201
695 4,734,202
698 4,734,203
708 4,734,204
4,734,205
727 4,734,206
765 4,734,207
767 4,734,208

CLASS 211

41 4,733,781
57.1 4,733,782

CLASS 212

205 4,733,783

CLASS 215

32 4,733,784
229 4,733,785
230 4,733,786
251 4,733,787
295 4,733,788

CLASS 219

10.53 4,734,552
10.55 B 4,734,553
4,734,554
109 4,734,555
110 4,734,556
121 LP 4,734,558
121 LQ 4,734,557
121 LT 4,734,550
121 PY 4,734,551
241 4,734,559
271 4,734,560
275 4,734,561
413 4,734,562
543 4,734,563

CLASS 220

8 4,733,789
23.83 4,733,790
[illegible] R 4,733,791
216 4,733,792
269 4,733,793
[illegible] 4,733,794
316 4,733,795
339 4,733,796

CLASS 221

8 4,733,797

CLASS 222

23 4,733,798
79 4,733,799
107 4,733,800
4,733,801
181 4,733,802
276 4,733,803
465.1 4,733,804

CLASS 224

39 4,733,805
202 4,733,806
4,733,807
219 4,733,808
329 4,733,809
4,733,810

CLASS 227

105 4,733,811
147 4,733,812

CLASS 228

1.1 4,733,813
2 4,733,814
4.1 4,733,815
190 4,733,816

CLASS 229

69 4,733,817
162 4,733,916

CLASS 235

380 4,734,564
454 4,734,565
455 4,734,566
[illegible] 4,734,567
487 4,734,568
4,734,569

CLASS 239

102.2 4,733,820
224 4,733,821
428.5 4,733,818
4,733,819
585 4,733,822
601 4,733,823
[illegible] 4,733,824

CLASS 241

19 4,733,825
52 4,733,826
101.2 4,733,827
236 4,733,828

CLASS 242

35.6 R 4,733,829
84.1 L 4,733,831
84.5 R 4,733,830
107.6 4,733,832

CLASS 244

114 R 4,733,833
134 R 4,733,834

CLASS 248

71 4,733,835
[illegible] 4,733,836
4,733,837
124 4,733,838
180 4,733,839
205.3 4,733,840
222.1 4,733,841
231.5 4,733,842
[illegible] 4,733,843
354.1 4,733,844
429 4,733,845
479 4,733,846
550 4,733,847
642 4,733,848

CLASS 249

60 4,733,849

CLASS 250

201 4,734,570
4,734,571
202 4,734,572
213 VT 4,734,573
221 4,734,574
4,734,575
225 4,734,576
227 4,734,577
234 4,734,578
282 4,734,579
324 4,734,580
327.2 4,734,581
332 4,734,582
4,734,583
343 4,734,584
353 4,734,585
370 4,734,588
503.1 4,734,586
560 4,734,587
578 4,734,589

CLASS 252

47 4,734,209
47.5 4,734,210
51.5 A 4,734,211
51.5 R 4,734,212
52 R 4,734,213
135 4,734,214
162 4,734,215
181 4,734,216
299.61 4,734,217
4,734,218
400.54 4,734,219
500 4,734,220
544 4,734,221
546 4,734,222
548 4,734,223
558 4,734,224

CLASS 254

134.4 4,733,850

CLASS 256

[illegible] 4,733,851

CLASS 260

386 4,734,225
420 4,734,226

CLASS 261

91 4,734,235

CLASS 264

13 4,734,227
22 4,734,228
40.6 4,734,229
45.3 4,734,231
46.4 4,734,230
46.6 4,734,232
[illegible] 4,734,233
[illegible] 4,734,234
112 4,734,236
122 4,734,237
144 4,734,238
187 4,734,239
211.13 4,734,240
254 4,734,241
318 4,734,242
328.8 4,734,243
515 4,734,244
564 4,734,245

CLASS 266

227 4,733,852
272 4,733,853

CLASS 267

140.1 4,733,854
294 4,733,855

CLASS 270

1.1 4,733,856

CLASS 271

296 4,733,857

CLASS 272

70 4,733,858
96 4,733,859
134 4,733,860
137 4,733,861
4,733,862

CLASS 273

1 A 4,733,864
1 R 4,733,863
26 A 4,733,865
51 B1 4,330,122
73 R 4,733,866
[illegible] 4,733,867
194 R 4,733,868
236 4,733,869
278 4,733,870
399 4,733,871

CLASS 277

26 4,733,872
96.1 4,733,873
110 4,733,874

CLASS 280

6 H 4,733,875
4,733,876
33.99 R 4,733,877
47.37 R 4,733,882
91 4,733,878
154.5 R 4,733,879
234 4,733,880
291 4,733,881
661 4,733,884
707 4,733,883
767 4,733,885
[illegible] 4,733,886

CLASS 283

[illegible] 4,733,887

CLASS 285

4 4,733,888
16 4,733,889
174 4,733,890

CLASS 290

1 C 4,734,590

CLASS 291

27 4,733,891

CLASS 292

216 4,733,892
320 4,733,893

CLASS 293

120 4,733,894

CLASS 294

67.1 4,733,896
88 4,733,895
162 4,733,897

CLASS 296

24 R 4,733,898
4,733,899
37.16 4,733,901
37.8 4,733,900
39 A 4,733,902
65 R 4,733,903
213 4,733,904

CLASS 297

129 4,733,905
184 4,733,906
188 4,733,907
194 4,733,908
250 4,733,909
300 4,733,910
345 4,733,911
379 4,733,912
[illegible] 4,733,913

CLASS 299

81 4,733,914
4,733,915

CLASS 300

7 4,733,917

CLASS 303

22 R 4,733,918
28 4,733,919
106 4,733,920
111 4,733,921
113 4,733,922

CLASS 307

219.1 4,734,591
290 4,734,592
297 4,734,593
309 4,734,594
315 4,734,595
350 4,734,596
481 4,734,597
491 4,734,598
497 4,734,599

CLASS 310

51 4,734,600
68 C 4,734,602
68 E 4,734,601
72 4,734,603
76 4,734,604
80 4,734,605
90.5 4,734,606
233 4,734,607
313 R 4,734,608
315 4,734,609
323 4,734,610
324 4,734,611

CLASS 312

201 4,733,923
237 4,733,924
248 4,733,925

CLASS 313

15 4,734,612
36 4,734,613
112 4,734,614
402 4,734,615
492 4,734,616
506 4,734,617
509 4,734,618
510 4,734,619

CLASS 315

8 4,734,620
111.41 4,734,621
111.81 4,734,622
169.4 4,734,623
243 4,734,624
313 4,734,625

CLASS 318

76 4,734,626
254 4,734,627
309 4,734,628
332 4,734,629
608 4,734,630
685 4,734,631
4,734,632
723 4,734,633
778 4,734,634

CLASS 320

13 4,734,635

CLASS 323

235 4,734,636

CLASS 324

58 R 4,734,637
66 4,734,638
107 4,734,639
127 4,734,640
158 R 4,734,641
226 4,734,642
232 4,734,643
252 4,734,644
301 4,734,645
309 4,734,646
318 4,734,647
322 4,734,648
376 4,734,649
414 4,734,650
538 4,734,651

CLASS 328

140 4,734,652
233 4,734,653

CLASS 330

277 4,734,654

CLASS 331

25 4,734,655
111 4,734,656
116 R 4,734,657
117 R 4,734,658
139 4,734,659

CLASS 333

21 A 4,734,660
33 4,734,661
134 B1 4,427,953
174 4,734,662
182 4,734,663
193 4,734,664
212 4,734,665
230 4,734,666
250 4,734,667

CLASS 335

128 4,734,668
132 4,734,669

CLASS 337

159 4,734,670

CLASS 338

4 4,734,671
312 4,734,672

CLASS 340

52 R 4,734,673
[illegible] 4,734,674
71 4,734,675
146.2 4,734,676
347 AD 4,734,677
347 CC 4,734,678
365 R 4,734,679
539 4,734,680
568 4,734,896
608 4,734,681
614 4,734,682
[illegible] 4,734,683
686 4,734,684
709 Re.32,632
710 Re.32,633
4,734,685
713 4,734,686
715 4,734,687
4,734,688
726 4,734,689
729 4,734,690
744 4,734,691
789 4,734,692
825.31 4,734,693
825.340 4,734,695
825.44 4,734,694
825.510 4,734,696
902 4,734,697

CLASS 342

44 4,734,698
201 4,734,699
373 4,734,700
380 4,734,701
424 4,734,702

CLASS 343

790 4,734,703

CLASS 346

1.1 4,734,705
4,734,706
33 R 4,734,707
74.4 4,734,708
75 4,734,711
76 PH 4,734,704
4,734,709
4,734,710
4,734,712
4,734,713
107 R 4,734,714
[illegible] 4,734,715
136 4,734,716
140 R 4,734,717
4,734,718
4,734,719
155 4,734,720
159 4,734,721
4,734,722
160 4,734,723

CLASS 350

1.1 4,733,926
96.12 4,733,927
96.15 4,733,928
4,733,929
4,733,930
96.18 4,733,931
96.20 4,733,932
4,733,933
4,733,934
96.21 4,733,935
4,733,936
96.26 4,733,937
96.29 4,733,938
96.30 4,733,939
96.31 4,733,940
96.33 4,733,941

96.34 4,733,942
162.16 4,733,943
167 4,733,944
253 4,733,945
321 4,733,946
334 4,733,947
339 F 4,733,948
350 R 4,733,949
392 4,733,950
423 4,733,951
426 4,733,952
432 4,733,953
523 4,733,954
[illegible] 4,733,955
624 4,733,956
636 4,733,957

CLASS 351

158 4,733,958
177 4,733,959

CLASS 353

1 4,733,960

CLASS 354

[illegible] 4,734,724
76 4,734,725
173.11 4,734,732
195.1 4,734,726
304 4,734,729
324 4,734,728
[illegible] 4,734,730
410 4,734,731
412 4,734,727
414 4,734,733

CLASS 355

3 R 4,734,734
3 SH 4,734,744
4 4,734,735
14 R 4,734,739
4,734,740
14 SH 4,734,736
4,734,738
4,734,747
4,734,748
15 4,734,741
23 4,734,742
27 4,734,743
45 4,734,745
53 4,734,746
140 4,734,737

CLASS 356

3 4,733,961
28 4,733,962
35 4,733,963
35.5 4,733,964
326 4,733,965
350 4,733,966
361 4,733,967
374 4,733,968
375 4,733,969

CLASS 357

15 4,734,749
16 4,734,750
22 4,734,751
23.4 4,734,752
23.5 4,733,482
67 4,734,753
[illegible] 4,734,754
74 4,734,755

CLASS 358

3 4,734,756
19 4,734,757
31 4,734,758
75 4,734,759
4,734,760
78 4,734,761
80 4,734,762
4,734,763
86 4,734,764
102 4,734,765
106 4,734,766
133 4,734,767
135 4,734,768
142 4,734,769
167 4,734,770
190 4,734,771
213.13 4,734,772
4,734,773
213.15 4,734,774
213.16 4,734,775
213.31 4,734,776
228 4,734,777
229 4,734,778
231 4,734,779
257 4,734,780
280 4,734,781
4,734,782
4,734,783
283 4,734,784
285 4,734,785
287 4,734,786
293 4,734,787
[illegible] 4,734,788
4,734,789
310 4,734,790
335 4,734,791
4,734,792
336 4,734,793

CLASS 360

2 4,734,794
8 4,734,795
60 4,734,796
61 4,734,797
[illegible] 4,734,798
78 4,734,799
[illegible] 4,734,800
97 4,734,801
103 4,734,802
4,734,803
[illegible] 4,734,804
4,734,805
105 4,734,806
123 4,734,811
128 4,734,807
130.2 4,734,808
130.34 4,734,809
131 4,734,810
132 4,734,812
133 4,734,813
4,734,814
4,734,815

CLASS 361

42 4,734,822
125 4,734,823
149 4,734,816
[illegible] 4,734,817
306 4,734,818
4,734,819
315 4,734,824
385 4,734,820
414 4,734,825
428 4,734,826
433 4,734,821
4,734,827

CLASS 362

32 4,734,829
35 4,734,830
74 4,734,831
158 4,734,832
161 4,734,833
187 4,734,834
264 4,734,835
311 4,734,836
352 4,734,837
427 4,734,838

CLASS 363

16 4,734,839
21 4,734,840
4,734,841
22 4,734,828
41 4,734,842
[illegible] 4,734,843
72 4,734,844
112 4,734,906

CLASS 364

146 4,734,845
153 4,734,846
174 4,734,847
200 4,734,848
4,734,849
4,734,850
4,734,851
4,734,852
4,734,853
4,734,854
4,734,855
[illegible] 4,734,856
405 4,734,857
[illegible] 4,734,858
4,734,859
4,734,860
4,734,861
4,734,862
4,734,863
4,734,864
4,734,865
4,734,866
4,734,867
4,734,868
4,734,869
4,734,870
4,734,871
4,734,872
4,734,873
4,734,874
4,734,875
4,734,876
4,734,877
4,734,878
4,734,879
4,734,880
4,734,881
4,734,882

CLASS 365

1 4,734,883
4,734,884
[illegible] 4,734,885
4,734,886
[illegible] 4,734,887
194 4,734,888
[illegible] 4,734,889
210 4,734,890

CLASS 366

79 4,733,970
141 4,733,971
270 4,733,972

CLASS 367

15 4,734,891
[illegible] 4,734,892
85 4,734,893
147 4,734,894

CLASS 368

229 4,734,895

CLASS 369

[illegible] 4,734,897
39 4,734,898
45 4,734,899
[illegible] 4,734,900
4,734,901
107 4,734,903
109 4,734,904
111 4,734,905
176 4,734,902

CLASS 370

60 4,734,907
4,734,908
85 4,734,909

CLASS 372

18 4,734,910
21 4,734,911
27 4,734,912
33 4,734,914
34 4,734,913
61 4,734,915
65 4,734,916
70 4,734,917

CLASS 374

5 4,733,973
103 4,733,974
131 4,734,918
144 4,733,975

CLASS 375

7 4,734,919
8 4,734,920

CLASS 376

133 4,734,246
4,734,247
203 4,734,248
214 4,734,249
261 4,734,251
292 4,734,250
336 4,734,252

CLASS 377

72 4,734,921

CLASS 378

34 4,734,923
[illegible] 4,734,922
118 4,734,924
173 4,734,925
187 4,734,926
200 4,734,927

CLASS 379

[illegible] 4,734,928
[illegible] 4,734,929
[illegible] 4,734,930
93 4,734,931
[illegible] 4,734,932
164 4,734,933
202 4,734,934
236 4,734,935
253 4,734,936
4,734,937

CLASS 384

97 4,733,976
312 B1 4,039,228
477 4,733,977
482 4,733,978
620 4,733,979

CLASS 400

207 4,733,980
292 4,733,981
[illegible] 4,733,982

CLASS 401

146 4,733,983
190 4,733,984

CLASS 402

27 4,733,985

CLASS 403

306 4,733,986
326 4,733,987
373 4,733,988

CLASS 405

43 4,733,989
115 4,733,990
195 4,733,991
215 4,733,992
224 4,733,993
244 4,733,994

CLASS 407

34 4,733,995

CLASS 408

79 4,733,996
230 B1 3,697,188

CLASS 409

[illegible] 4,733,997
132 4,733,998
136 4,733,999
233 4,734,000

CLASS 411

119 4,734,001
311 4,734,002
468 4,734,003

CLASS 414

217 4,734,004
273 4,734,005
719 4,734,006

CLASS 415

9 4,734,007
53 T 4,734,008
170 R 4,734,009

CLASS 416

196 R 4,734,010

CLASS 417

[illegible] 4,734,011
32 4,734,012
225 4,734,013
269 4,734,014
354 4,734,015
360 4,734,016
366 4,734,017
423 R 4,734,018
[illegible] 4,734,019

CLASS 418

55 4,734,020

CLASS 419

30 4,734,253

CLASS 420

492 4,734,255
497 4,734,254
571 4,734,256

CLASS 422

13 4,734,257
16 4,734,258
4,734,259
58 4,734,260
100 4,734,261
[illegible] 4,734,262
135 4,734,263
[illegible] 4,734,264
165 4,734,265
225 4,734,266
249 4,734,267
292 4,734,268
310 4,734,269

CLASS 423

29 4,734,270
82 4,734,271
178 4,734,272
219 4,734,273
265 4,734,274

CLASS 424

[illegible] 4,734,275
4,734,276
70 4,734,277
76.3 4,734,278
85 4,734,279
195.1 4,734,280
[illegible] 4,734,281
410 4,734,282
439 4,734,283
455 4,734,284
468 4,734,285
489 4,734,286

CLASS 425

60 4,734,021
62 4,734,022
130 4,734,023
132 4,734,024
145 4,734,025
302.1 4,734,026
556 4,734,027

CLASS 426

41 4,734,287
107 4,734,288
302 4,734,289
4,734,290
325 4,734,291
410 4,734,292
[illegible] 4,734,293
[illegible] 4,734,294

CLASS 427

[illegible] 4,734,295
97 4,734,296
248.1 4,734,297
256 4,734,298
B1 4,425,386
[illegible] 4,734,299
444 4,734,300

CLASS 428

8 4,734,301
15 4,734,302
35 4,734,303
4,734,304
36 4,734,305
71 4,734,306
[illegible] 4,734,307
113 4,734,308
120 4,734,309
151 4,734,310
152 4,734,311
157 4,734,312
159 4,734,313
174 4,734,314
[illegible] 4,734,315
210 4,734,316
215 4,734,317
216 4,734,318
4,734,319
224 B1 4,381,331
231 4,734,320
283 4,734,321
312.6 4,734,322
317.3 4,734,323
4,734,324
323 4,734,325
328 4,734,326
332 4,734,327
336 4,734,328
383 4,734,329
411.1 4,734,330
412 4,734,331
414 4,734,332
423.1 4,734,333
457 4,734,334
[illegible] 4,734,335
537.5 4,734,336
595 4,734,337
[illegible] 4,734,338
698 4,734,340
701 4,734,339

CLASS 429

62 4,734,341
152 4,734,342
192 4,734,343
[illegible] 4,734,344

CLASS 430

1 4,734,345
56 4,734,346
66 4,734,347
[illegible] 4,734,348
[illegible] 4,734,349
107 B1 4,562,136
110 4,734,350
114 4,734,351
115 4,734,352
236 4,734,353
247 4,734,354
270 4,734,355
293 4,734,356
376 4,734,357
550 4,734,358
945 4,734,359

CLASS 431

175 4,734,028
211 4,734,029

CLASS 432

72 4,734,030
264 4,734,031

CLASS 433

5 4,734,032
[illegible] 4,734,033
68 4,734,034
102 4,734,035

CLASS 434

157 4,734,036
236 4,734,037
4,734,038
274 4,734,039
433 4,734,040

CLASS 435

25 4,734,360
[illegible] 4,734,361
[illegible] 4,734,362
[illegible] 4,734,363
95 4,734,364
[illegible] 4,734,365
[illegible] 4,734,366
135 4,734,367
145 4,734,368
240.49 4,734,369
253 4,734,370
[illegible] 4,734,371
291 4,734,372
296 4,734,373
302 4,734,374

CLASS 436

74 4,734,375
79 4,734,376
161 4,734,377
175 4,734,378

CLASS 437

3 4,734,380
5 4,734,381
31 4,734,382
42 4,734,383
52 4,734,384
002 4,734,379
129 4,734,385
141 4,734,168
[illegible] 4,734,386
234 4,734,387

CLASS 439

62 4,734,042
65 4,734,043
78 4,734,044
79 4,734,045
101 4,734,046
161 4,734,047
201 4,734,048
259 4,734,049
289 4,734,050
4,734,051
293 4,734,052
329 4,734,053
[illegible] 4,734,054
456 4,734,055
460 4,734,056
589 4,734,057
607 4,734,058
621 4,734,059
637 4,734,041
[illegible] 4,734,060
709 4,734,061
783 4,734,062
[illegible] 4,734,063
852 4,734,064

CLASS 440

1 4,734,065
6 4,734,066
[illegible] 4,734,067
[illegible] 4,734,068
61 4,734,069
88 4,734,070
89 4,734,071

CLASS 441

79 4,733,496
105 4,734,072

CLASS 445

50 4,734,073

CLASS 446

[illegible] 4,734,074
321 4,734,075
423 4,734,076
[illegible] 4,734,077

CLASS 450

[illegible] 4,734,078

CLASS 464

17 4,734,079
26 4,734,080
71 4,734,081

CLASS 474

28 4,734,082
78 4,734,083
[illegible] 4,734,084
242 4,734,085
262 4,734,086
270 4,734,087

CLASS 493

194 4,734,088

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CLASS 494			245	4,734,414	**CLASS 523**		243	4,734,474	575	4,734,499	196	4,734,523
27	4,734,089		247	4,734,415	201	4,734,445	263	4,734,473	**CLASS 544**		232	4,734,525
CLASS 501			253	4,734,416	**CLASS 524**		273	4,734,475	398	4,734,500	265	4,734,524
64	4,734,388		255	4,734,417	106	4,734,446	304	4,734,476	**CLASS 546**		**CLASS 564**	
73	4,734,389		258	4,734,418	271	4,734,447	320	4,734,477	69	4,734,501	282	4,734,526
96	4,734,390		259	4,734,419	317	4,734,448	**CLASS 527**		242	4,734,502	**CLASS 568**	
CLASS 502			274	4,734,421	328	4,734,449	300	4,734,478	345	4,734,503	47	4,734,527
84	4,734,391		362	4,734,420	413	4,734,450	**CLASS 528**		**CLASS 548**		309	4,734,528
335	4,734,392		369	4,734,422	432	Re.32,634	18	4,734,479	308	4,734,506	310	4,734,529
404	4,734,393		382	4,734,424	493	4,734,451	43	4,734,481	342	4,734,509	567	4,734,530
434	4,734,394			4,734,425	533	4,734,452	49	4,734,480	364	4,734,504	744	4,734,531
CLASS 503			398	4,734,427	555	4,734,453	185	4,734,482		4,734,505	931	4,734,532
200	4,734,395		399	4,734,428		4,734,454	194	4,734,483	532	4,734,508	**CLASS 570**	
227	4,734,396		406	4,734,429	710	4,734,455	196	4,734,488	566	4,734,510	201	4,734,533
	4,734,397			4,734,430	**CLASS 525**		216	4,734,485	**CLASS 549**		216	4,734,534
CLASS 514			407	4,734,431	74	4,734,456	336	4,734,487	214	4,734,512	261	4,734,535
2	4,734,398		413	4,734,423	149	4,734,457	347	4,734,486	273	4,734,511	**CLASS 585**	
12	4,734,399		469	4,734,432		4,734,458	502	4,734,484	389	4,734,513	269	4,734,536
	4,734,400		508	4,734,433	247	4,734,459	**CLASS 534**		450	4,734,507	274	4,734,540
14	4,734,401		535	4,734,434	279	4,734,460	649	4,734,489	**CLASS 556**		415	4,734,537
54	4,734,402		562	4,734,435	293	4,734,461	782	4,734,490	32	4,734,515	606	4,734,538
	4,734,403		594	4,734,436	340	4,734,465	**CLASS 536**		70	4,734,514	739	4,734,539
115	4,734,404		653	4,734,437	420	4,734,464	6.4	4,734,493	**CLASS 558**		**CLASS 604**	
161	4,734,405			4,734,438	424	4,734,462	7.1	4,734,492	54	4,734,516	20	4,734,090
183	4,734,406		**CLASS 521**		433	4,734,466	27	4,734,491	072	4,734,517	54	4,734,091
196	4,734,407		54	4,734,439	440	4,734,463	**CLASS 540**		277	4,734,518	67	4,734,092
206	4,734,408		95	4,734,440	524	4,734,467	200	4,734,497	**CLASS 560**		95	4,734,093
	4,734,409		139	4,734,441	529	4,734,468	205	4,734,494	75	4,734,519	284	4,734,094
212	4,734,410		163	4,734,442	537	4,734,469	355	4,734,496	115	4,734,520	**CLASS 623**	
220	4,734,411		171	4,734,443	538	4,734,470	364	4,734,495	157	4,734,521	6	4,734,095
221	4,734,412		**CLASS 522**		**CLASS 526**	4,734,471		4,734,498	186	4,734,522		4,734,096
222	4,734,413		24	4,734,444	239	4,734,472					11	4,734,097

CLASSIFICATION OF DESIGNS

D1—	125	294,880		502	294,900		32	294,919			294,938		92	294,957		85	294,976
D2—	192	294,881			294,901	D12—	126	294,920			294,939	D20—	5	294,958		86	294,977
	210	294,882		525	294,902			294,921	D14—	58	294,940	D21—	19	294,959		93	294,978
D3—	38	294,883		526	294,903			294,922		100	294,941		54	294,960	D27—	8	294,979
	76	294,884			294,904			294,923		106	294,942		106	294,961	D28—	18	294,980
D4—	101	294,885		531	294,905		146	294,924		113	294,944		229	294,962		50	294,981
	120	294,886			294,906		147	294,925		114	294,943	D23—	209	294,963			294,982
		294,887		546	294,907			294,926	D15—	5	294,945		214	294,964	D29—	20	294,983
D6—	300	294,888		570	294,908			294,927		7	294,946		226	294,965		22	294,984
	333	294,889		595	294,909			294,928			294,947		302	294,966	D30—	132	294,986
	361	294,890		607	294,910			294,929		147	294,948		338	294,967	D32—	17	294,987
		294,891	D7—	6	294,911			294,930		199	294,949		382	294,968		34	294,988
	370	294,892		77	294,912			294,931	D16—	102	294,950	D24—	29	294,969		45	294,989
	388	294,893	D8—	52	294,913			294,932			294,951		31	294,970		65	294,990
	390	294,894		358	294,915			294,933		110	294,952		36	294,971		70	294,991
	411	294,895		373	294,914		156	294,934		112	294,953		51	294,972	D34—	1	294,992
	432	294,896	D10—	30	294,916		157	294,935	D18—	22	294,954	D26—	28	294,973			294,993
	448	294,897			294,917		194	294,936	D19—	67	294,955		34	294,975		6	294,994
	466	294,898			294,918	D13—	24	294,937		77	294,956		35	294,974	D50—	109	294,985
	473	294,899															

CLASSIFICATION OF PLANTS

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		6,136		6,137		6,138		9	6,139		6,140	6,141

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,734,856	4,733,751	4,734,300		4,733,959		4,734,882		4,734,731
02 :	4,734,725	4,733,776	4,734,337		4,734,491		4,734,886		4,734,823
04 :	4,733,419	4,733,797	4,734,360		4,734,622		4,734,895		4,734,851
	4,733,451	4,733,803	4,734,381		4,734,906		4,734,920		4,734,861
	4,733,553	4,733,806	4,734,382	09 :	4,733,472		4,734,930		4,734,908
	4,733,661	4,733,839	4,734,398		4,733,514	13 :	4,733,717		4,734,928
	4,734,033	4,733,852	4,734,466		4,733,784		4,733,796		4,425,386
	4,734,224	4,733,862	4,734,537		4,733,817		4,733,864	18 :	Re.32,634
	4,734,546	4,733,865	4,734,542		4,733,827		4,734,139		4,733,578
	4,734,601	4,733,866	4,734,544		4,733,844		4,734,188		4,733,710
	4,734,656	4,733,867	4,734,559		4,733,856		4,734,206		4,733,744
	4,734,818	4,733,869	4,734,563		4,733,945		4,734,222		4,734,049
	4,734,819	4,733,874	4,734,564		4,733,967		4,734,235		4,734,067
	4,734,825	4,733,880	4,734,565		4,734,036		4,734,236		4,734,375
	4,734,900	4,733,895	4,734,593		4,734,057		4,734,455		4,734,408
	4,212,088	4,733,899	4,734,596		4,734,159		4,734,670		4,734,429
05 :	4,733,491	4,733,902	4,734,599		4,734,355	15 :	4,734,695		4,734,430
	4,733,705	4,733,905	4,734,609		4,734,363	16 :	4,733,493		4,734,431
	4,733,788	4,733,906	4,734,636		4,734,457		4,734,683		4,734,437
	4,733,799	4,733,907	4,734,643		4,734,541	17 :	Re.32,630		4,734,498
	4,734,166	4,733,919	4,734,657		4,734,572		4,733,463		4,734,501
	4,734,442	4,733,924	4,734,671		4,734,604		4,733,521		4,734,504
06 :	Re.32,632	4,733,926	4,734,697		4,734,829		4,733,613		4,734,505
	Re.32,633	4,733,927	4,734,698		4,734,858		4,733,663		4,734,548
	4,733,411	4,733,931	4,734,701		4,734,870		4,733,670		4,734,771
	4,733,427	4,733,933	4,734,752		4,734,922		4,733,674		4,734,840
	4,733,436	4,733,938	4,734,756	10 :	4,734,324		4,733,703	19 :	4,733,450
	4,733,438	4,733,944	4,734,788		4,734,352		4,733,778		4,733,539
	4,733,468	4,733,955	4,734,791		4,734,486		4,733,823		4,733,738
	4,733,471	4,733,956	4,734,803		4,734,502		4,733,840		4,733,742
	4,733,473	4,733,966	4,734,820		4,734,503		4,733,871		4,733,876
	4,733,495	4,734,001	4,734,830	11 :	4,734,579		4,733,881		4,734,028
	4,733,508	4,734,003	4,734,832	12 :	4,733,424		4,733,958		4,734,068
	4,733,519	4,734,037	4,734,835		4,733,467		4,733,972		4,734,552
	4,733,530	4,734,039	4,734,839		4,733,476		4,733,989	20 :	4,733,534
	4,733,531	4,734,045	4,734,852		4,733,512		4,733,997	22 :	4,733,417
	4,733,549	4,734,047	4,734,863		4,733,529		4,734,058		4,733,554
	4,733,559	4,734,051	4,734,868		4,733,537		4,734,070		4,733,723
	4,733,567	4,734,059	4,734,875		4,733,638		4,734,103		4,733,785
	4,733,571	4,734,076	4,734,878		4,733,679		4,734,203		4,733,808
	4,733,583	4,734,092	4,734,883		4,733,752		4,734,211		4,733,831
	4,733,592	4,734,123	4,734,891		4,733,767		4,734,258		4,734,270
	4,733,618	4,734,145	4,734,911		4,733,783		4,734,327		4,734,471
	4,733,624	4,734,151	4,734,912		4,733,860		4,734,333	23 :	4,733,423
	4,733,625	4,734,158	4,734,915		4,733,975		4,734,366	24 :	Re.32,631
	4,733,654	4,734,179	4,734,932		4,734,167		4,734,374		4,733,441
	4,733,656	4,734,212	4,427,953		4,734,176		4,734,378		4,733,466
	4,733,668	4,734,232	08 :	4,733,579		4,734,187		4,734,473		4,733,477
	4,733,669	4,734,246		4,733,790		4,734,200		4,734,540		4,733,695
	4,733,678	4,734,247		4,733,793		4,734,420		4,734,590		4,733,850
	4,733,682	4,734,248		4,733,830		4,734,573		4,734,594		4,734,005
	4,733,689	4,734,252		4,733,870		4,734,828		4,734,626		4,734,089
	4,733,748	4,734,269		4,733,884		4,734,844		4,734,635		4,734,142

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4,734,226	4,733,904	4,733,787	4,734,350	4,734,307	4,733,727
4,734,401	4,733,908	4,733,792	4,734,377	4,734,534	4,733,732
4,734,438	4,733,909	4,733,809	4,734,388	4,734,902	4,733,733
4,734,584	4,733,912	4,733,868	4,734,396	41 : 4,733,492	4,733,737
4,734,629	4,734,002	4,733,893	4,734,397	4,734,038	4,733,745
4,734,699	4,734,008	4,733,940	4,734,423	4,734,138	4,733,747
4,734,702	4,734,063	4,733,970	4,734,512	4,734,229	4,733,754
4,734,862	4,734,147	4,733,996	4,734,555	4,734,576	4,733,789
4,734,879	4,734,184	4,734,012	4,734,577	4,734,641	4,733,802
25 : 4,733,425	4,734,194	4,734,073	4,734,582	4,734,661	4,733,836
4,733,490	4,734,268	4,734,124	4,734,583	4,734,690	4,733,888
4,733,536	4,734,285	4,734,130	4,734,628	4,734,706	4,733,890
4,733,538	4,734,370	4,734,141	4,734,646	4,734,841	4,733,897
4,733,541	4,734,393	4,734,205	4,734,650	4,734,847	4,733,898
4,733,555	4,734,415	4,734,237	4,734,677	42 : 4,733,415	4,733,961
4,733,561	4,734,443	4,734,240	4,734,705	4,733,456	4,733,971
4,733,587	4,734,453	4,734,256	4,734,729	4,733,524	4,733,991
4,733,651	4,734,463	4,734,266	4,734,736	4,733,527	4,734,011
4,733,658	4,734,521	4,734,277	4,734,741	4,733,633	4,734,042
4,733,660	4,734,527	4,734,296	4,734,742	4,733,794	4,734,078
4,733,662	4,734,682	4,734,369	4,734,751	4,733,807	4,734,081
4,733,702	4,734,769	4,734,380	4,734,776	4,733,851	4,734,168
4,733,775	4,734,826	4,734,399	4,734,779	4,733,853	4,734,181
4,733,780	4,734,831	4,734,400	4,734,789	4,733,855	4,734,241
4,734,034	4,330,122	4,734,421	4,734,837	4,733,896	4,734,273
4,734,072	27 : 4,733,430	4,734,424	4,734,917	4,733,914	4,734,274
4,734,106	4,733,449	4,734,426	4,734,921	4,733,960	4,734,301
4,734,140	4,733,489	4,734,435	4,734,923	4,733,973	4,734,468
4,734,150	4,733,494	4,734,440	37 : 4,733,412	4,734,009	4,734,518
4,734,152	4,733,500	4,734,472	4,733,480	4,734,019	4,734,592
4,734,174	4,733,558	4,734,475	4,733,545	4,734,027	4,734,602
4,734,190	4,733,667	4,734,497	4,733,758	4,734,043	4,734,649
4,734,192	4,733,671	4,734,508	4,733,965	4,734,044	4,734,652
4,734,295	4,733,741	4,734,513	4,734,066	4,734,061	4,734,716
4,734,302	4,733,786	4,734,589	4,734,189	4,734,091	4,734,774
4,734,331	4,733,798	4,734,616	4,734,282	4,734,095	4,734,876
4,734,344	4,733,842	4,734,696	4,734,306	4,734,115	4,734,893
4,734,362	4,733,861	4,734,753	4,734,309	4,734,250	49 : 4,734,040
4,734,414	4,733,877	4,734,854	4,734,551	4,734,291	4,734,892
4,734,495	4,733,951	4,734,869	3,697,188	4,734,308	51 : 4,733,609
4,734,514	4,733,969	4,734,910	39 : 4,733,418	4,734,329	4,733,611
4,734,530	4,733,982	4,734,913	4,733,518	4,734,356	4,733,935
4,734,561	4,734,000	4,734,931	4,733,532	4,734,434	4,734,017
4,734,637	4,734,041	4,039,228	4,733,595	4,734,580	4,734,157
4,734,638	4,734,104	4,548,024	4,733,620	4,734,617	4,734,197
4,734,660	4,734,198	35 : 4,733,610	4,733,629	4,734,625	4,734,743
4,734,733	4,734,288	4,733,664	4,733,696	4,734,639	53 : 4,733,513
4,734,749	4,734,413	4,734,177	4,733,697	4,734,651	4,733,648
4,734,827	4,734,458	4,734,586	4,733,708	4,734,663	4,733,791
4,734,872	4,734,606	36 : 4,733,432	4,733,709	4,734,865	4,734,108
4,734,874	4,734,654	4,733,502	4,733,736	4,734,873	4,734,109
4,734,916	4,734,658	4,733,560	4,733,740	4,381,331	4,734,227
4,734,934	4,734,860	4,733,593	4,733,774	44 : 4,733,453	4,734,451
26 : 4,733,413	4,734,881	4,733,607	4,733,816	4,733,544	4,734,885
4,733,414	4,734,909	4,733,675	4,733,834	4,733,589	54 : 4,733,628
4,733,431	29 : 4,733,730	4,733,686	4,733,859	4,733,773	4,733,929
4,733,439	4,733,812	4,733,818	4,733,889	4,734,372	4,734,538
4,733,448	4,734,032	4,733,819	4,733,986	45 : 4,734,098	55 : 4,733,422
4,733,474	4,734,086	4,733,835	4,734,016	4,734,149	4,733,435
4,733,481	4,734,290	4,733,857	4,734,162	46 : 4,734,524	4,733,510
4,733,556	4,734,517	4,733,863	4,734,254	47 : 4,733,550	4,733,511
4,733,573	4,734,519	4,733,887	4,734,342	4,734,272	4,733,644
4,733,596	4,734,674	4,733,936	4,734,376	4,734,679	4,733,713
4,733,597	4,734,807	4,733,937	4,734,441	48 : 4,733,498	4,733,750
4,733,646	4,734,907	4,733,974	4,734,445	4,733,503	4,733,810
4,733,652	31 : 4,734,680	4,734,046	4,734,446	4,733,542	4,733,848
4,733,677	33 : 4,734,230	4,734,064	4,734,487	4,733,543	4,733,923
4,733,707	4,734,721	4,734,074	4,734,531	4,733,557	4,733,962
4,733,712	34 : 4,733,410	4,734,090	4,734,711	4,733,569	4,734,071
4,733,719	4,733,475	4,734,133	4,734,717	4,733,636	4,734,164
4,733,749	4,733,584	4,734,144	4,734,838	4,733,665	4,734,311
4,733,755	4,733,622	4,734,185	40 : 4,733,725	4,733,666	4,734,364
4,733,804	4,733,623	4,734,199	4,733,729	4,733,680	4,734,647
4,733,841	4,733,631	4,734,208	4,734,146	4,733,684	4,734,817
4,733,843	4,733,659	4,734,275	4,734,186	4,733,724	4,734,897
4,733,894	4,733,768	4,734,294	4,734,259	4,733,726	56 : 4,734,171
4,733,900	4,733,782	4,734,349			

DESIGN PATENTS

01 : 294,908	294,945	09 : 294,940	294,980	36 : 294,894	294,893
294,934	294,946	294,977	20 : 294,975	294,909	294,904
04 : 294,887	294,947	294,987	22 : 294,883	294,914	294,905
294,906	294,949	12 : 294,900	24 : 294,971	37 : 294,898	44 : 294,952
294,907	294,959	294,935	25 : 294,950	294,937	294,985
D6 : 294,891	294,960	13 : 294,958	294,951	294,938	45 : 294,928
294,895	294,961	17 : 294,882	26 : 294,888	294,939	294,929
294,913	294,963	294,902	294,910	39 : 294,941	294,930
294,915	294,964	294,903	294,912	294,948	51 : 294,990
294,920	294,969	294,973	294,988	294,976	53 : 294,881
294,921	294,979	294,974	29 : 294,992	294,989	55 : 294,885
294,922	294,984	294,983	34 : 294,896	294,991	294,897
294,923	294,986	294,994	294,899	42 : 294,884	294,957
294,943	294,936	18 : 294,901	294,978	294,886	294,966
294,944	08 :				

PLANT PATENTS

D6 : 6,135					
6,136	6,137	6,138	6,139	6,140	6,141

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